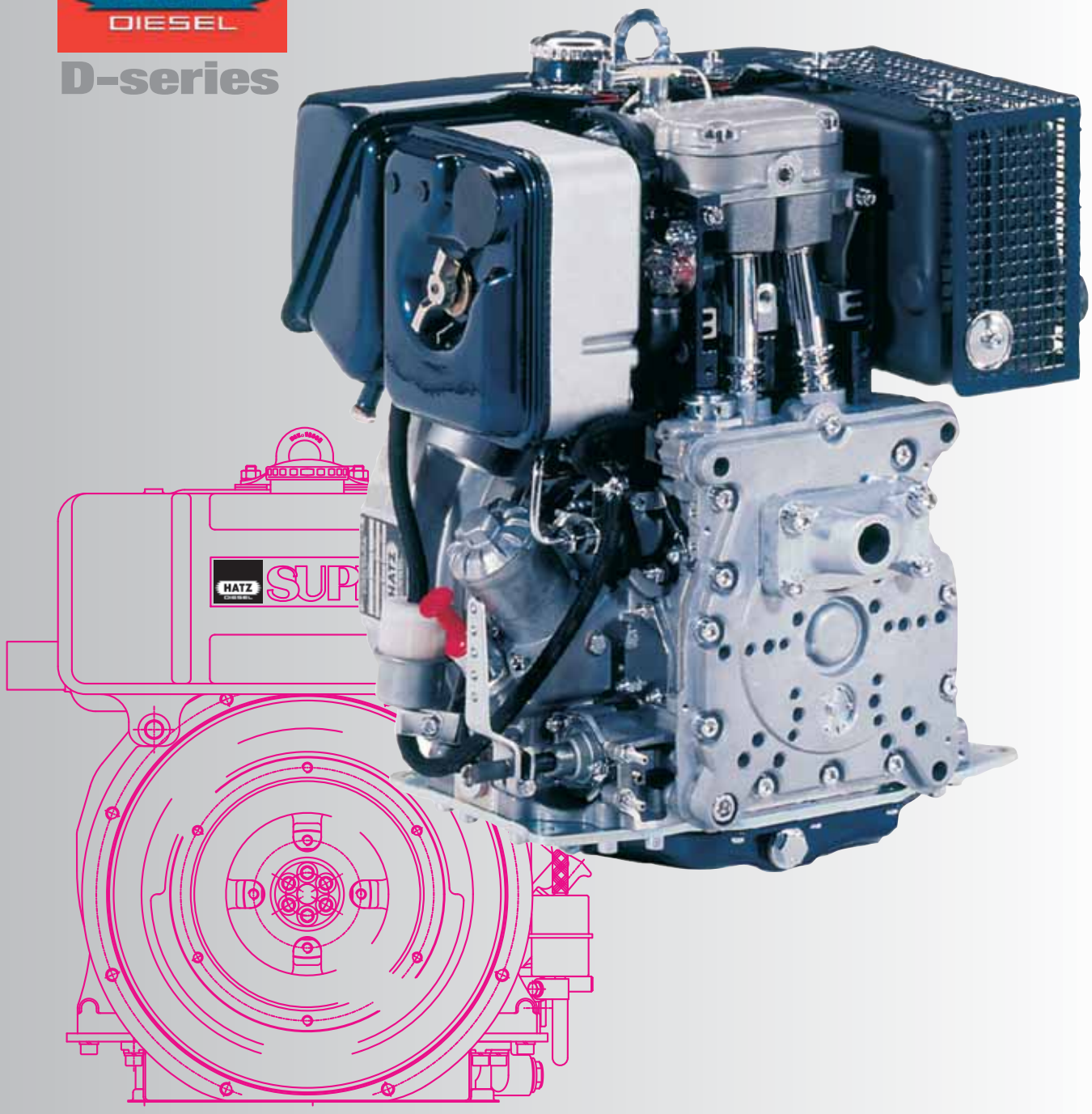
HATZ DIESEL

D-series



1D41 • 1D50

1D41 • 2.5 - 6.4 kW **1D50** • 3.3 - 7.9 kW

SUPRA

REVOLUTIONARY TECHNIQUE FOR
SINGLE-CYLINDER DIESEL ENGINES

SUPRA

Design

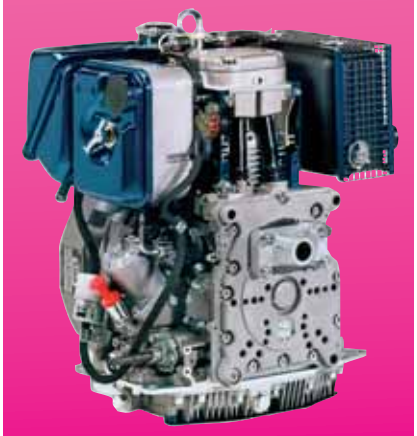
- Aircooled single-cylinder four stroke Diesel engines.
- Vertical cylinder.
- Crankcase in light alloy, diecast. Cylinder of grey cast iron.
- Cylinder head in light alloy.
- Crankshaft and big end in plain bearings.
- Direct injection, multi-hole nozzle.
- Valve control by rocker, push-rods, tappets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

Characteristics

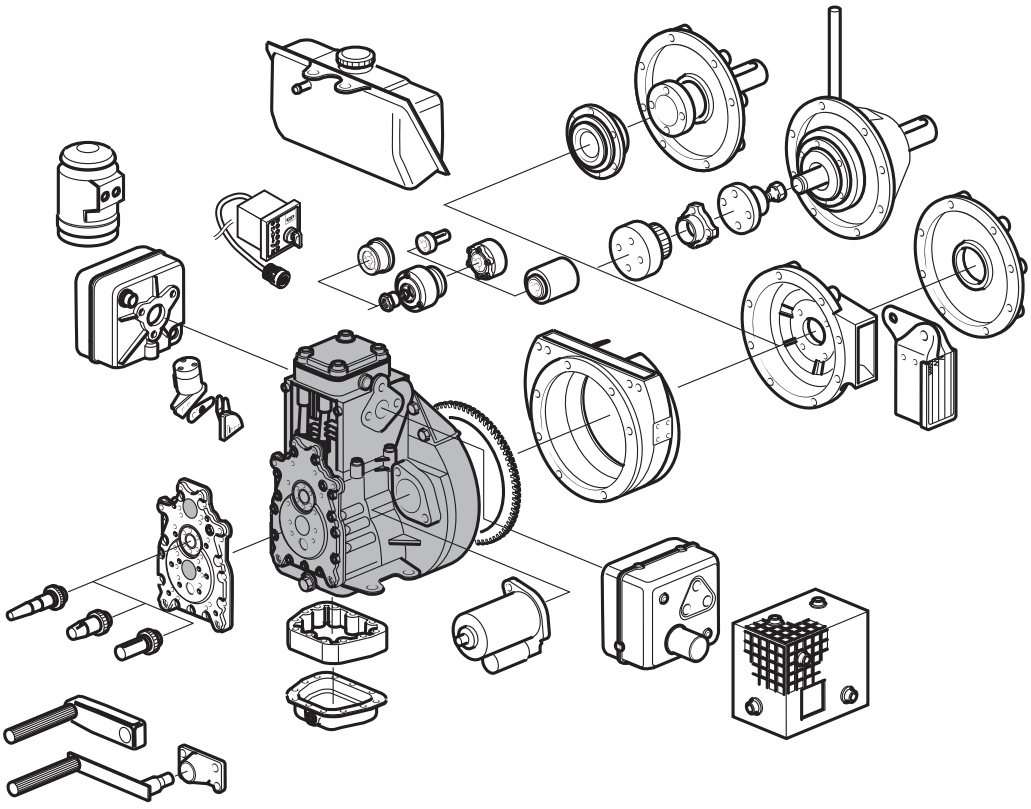
- Denoised: emission of noise reduced to the absolute minimum by means of design features and precision manufacture.
- Low fuel consumption.
- Favourable exhaust emission values. EPA and CARB certified.
- Robust: long engine life.
- Extensive interchangeability of parts within the engine family **D**.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

Exhaust reduced types on request

EPA II
EPA IV *(2010)*
CARB II
CARB IV *(2010)*

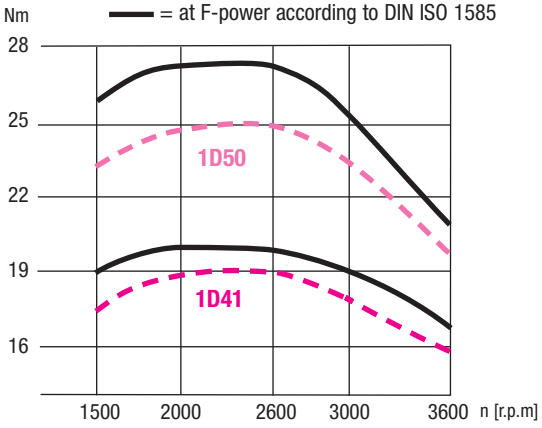


Additional equipment

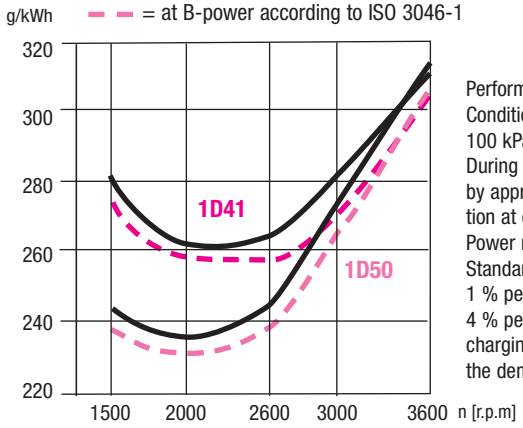


Technical data		1D41.	1D50.
Number of cylinders		1	1
Bore x stroke	mm	90 x 65	97 x 70
	inches	3.54 x 2.56	3.82 x 2.76
Displacement	l	0.413	0.517
	cu.in.	25.2	31.5
Mean piston speed at 3000 r.p.m.	m/s	6.5	7.0
	ft/min	1280	1378
Compression ratio		21.0	20.5
Lub. oil consumption		approx. 1% of fuel consumption, related to full load	
Lub. oil capacity max. / min.	l	1.2 / 0.8	1.5 / 1.0
	US qts	1.14 / 0.76	1.42 / 0.95
Speed control	lowest idle speed	approx. 800 r.p.m.	
	static speed droop	approx. 5 % at 3000 r.p.m.	

Torque at maximum power



Specific fuel consumption at maximum power



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.

Performance table			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	5.8	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 strongly intermittent load acc. to ISO 3046-1.	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	5.4	7.3
		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 ISO 3046-1.	B	3600	6.0	8.2	7.5	10.2
		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	6.3
		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 ISO 3046-1. For constant speed and constant load (ICFN).	S	3600	5.4	7.3	6.8	9.2
		3000	5.1	6.9	6.7	9.1
		2600	4.6	6.3	6.1	8.3
		2300	4.1	5.6	5.4	7.3
		2000	3.6	4.9	4.7	6.4
		1800	3.1	4.2	4.1	5.6
		1500	2.5	3.4	3.3	4.5

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

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	4.5	5.5
	cu.ft./min	159	195
Permanent tilting	max. degrees	30	30
Moment of inertia	kgm^2	0.24 (0.28) [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 (3.5 HP)	
Alternator charging current at 3000 / 1500 r.p.m.		14 V - approx. 9 A / 4 A — 28 V - approx. 5 A / 2 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 [2] Variant I (heavy flywheel)

Permissible load on power-take-off points

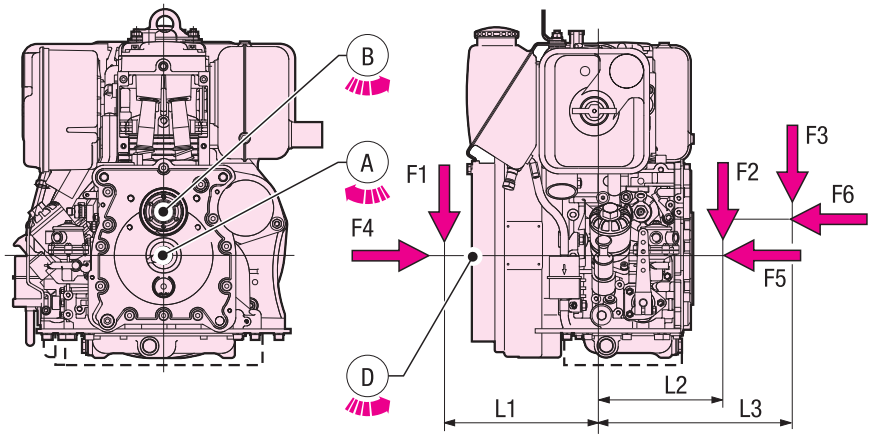
Max. permissible radial load

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

$$F2 = \frac{67\,500}{L\ 2\ (mm) - 128}\ (N)$$

$$F3 = \frac{99\,000}{L\ 3\ (mm) - 127}\ (N)$$

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



Transmissible torque:
A: 100 %
B: 100 %
D: 100 %

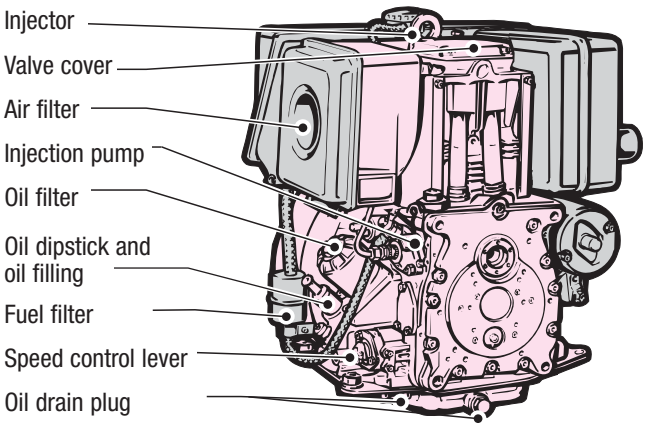
Max. permissible axial force: F4 = 1260 N, F5 = 1080 N, F6 = 900 N

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 promtly 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, 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: see figure 1 and 2.
- Engine can be flange-mounted at governor side (Standard or SAE flange).

Engine models

- **Version S:** counter-clockwise rotation (figure 1), 50 % balancing of free mass forces.
- **Version Z:** counter-clockwise rotation (figure 1), 100 % balancing of free mass forces of first order. (figure 3).

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

	Vari. I		Vari. II		Var. XI		Var. XIII	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
1 D41 **S**	75	165.3	71	156.5	78	172.0	78	172.0
1 D41 **Z**	77	169.8	73	160.9	81	178.6	81	178.6
1 D50 **S**	–	–	80	176.4	83	183.0	83	183.0
1 D50 **Z**	–	–	82	180.8	85	187.4	85	187.4

Mounting of engine

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

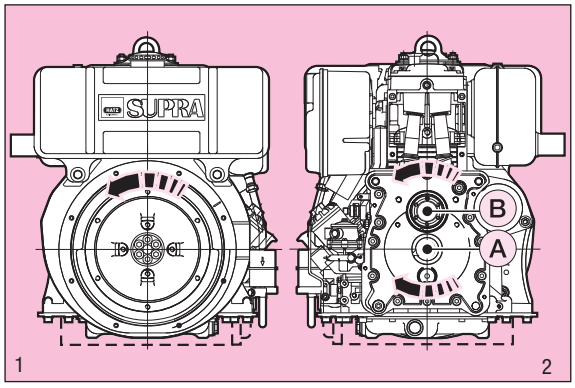
Scope of delivery of engine in standard equipment

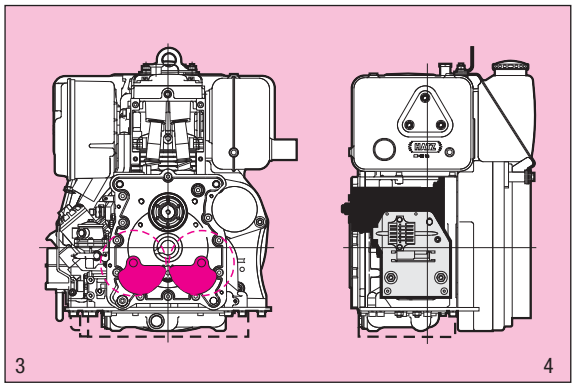
Engine tested for full load on test bench. Engine fitted with flywheel-fan, variable speed govenor, dry-type or oil bath air filter, automatic decompression, automatic extra fuel device, automatic bleeding, metering device for start oil, eye-hook for transport of engine (only to carry weight of the engine).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

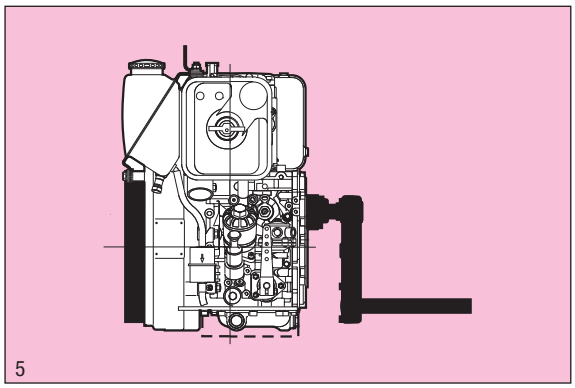
Additional equipment: Gaskets for 1st maintenance

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, gear ring
- **Variant XIII** : Starter 24 V, 2.5 kW, alternator 28 V, 5 A,cables, oil pressure switch, gear ring



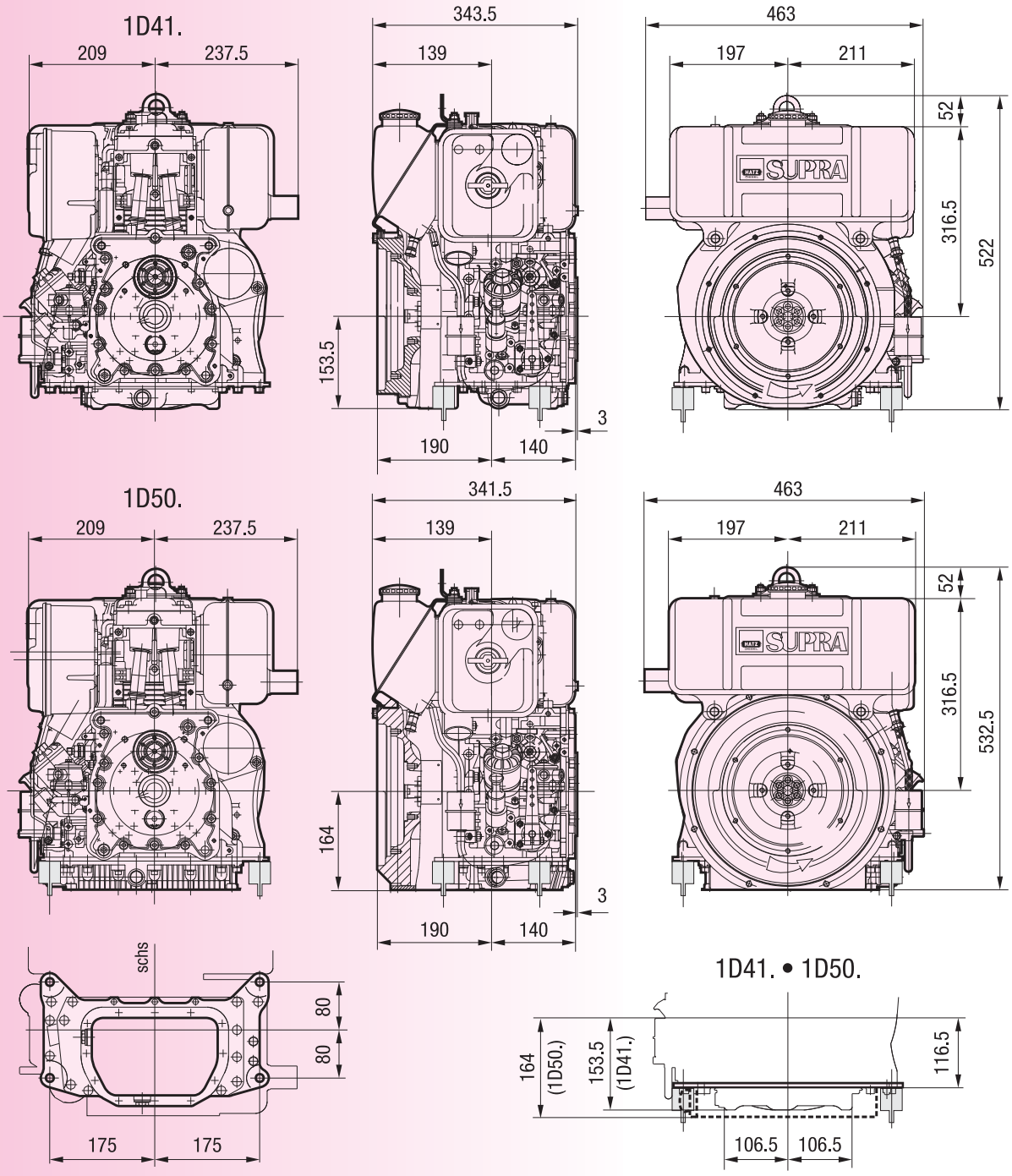




Additional equipment

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



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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