



The challengers

The engineering result of careful market research:

Small, light, powerful and universally applicable

1B20 • 1B30 • 1B40

1.4 - 7.7 kW • 1.8 - 10.5 HP

Exhaust reduced types on request

EPA II / **CARB II** / **ECE-R24**



Design

- Air-cooled single-cylinder 4-stroke Diesel engine.
- Vertical cylinder.
- Light alloy diecast cylinder crankcase.
- Light alloy cylinder head.
- Forged crankshaft
- Light alloy piston for low free forces of gravity.
- Lubrication by pressurised circulation of oil, fine screen filtering in main flow.
- Valve control by rocker, push-rods and tappets.

Characteristics

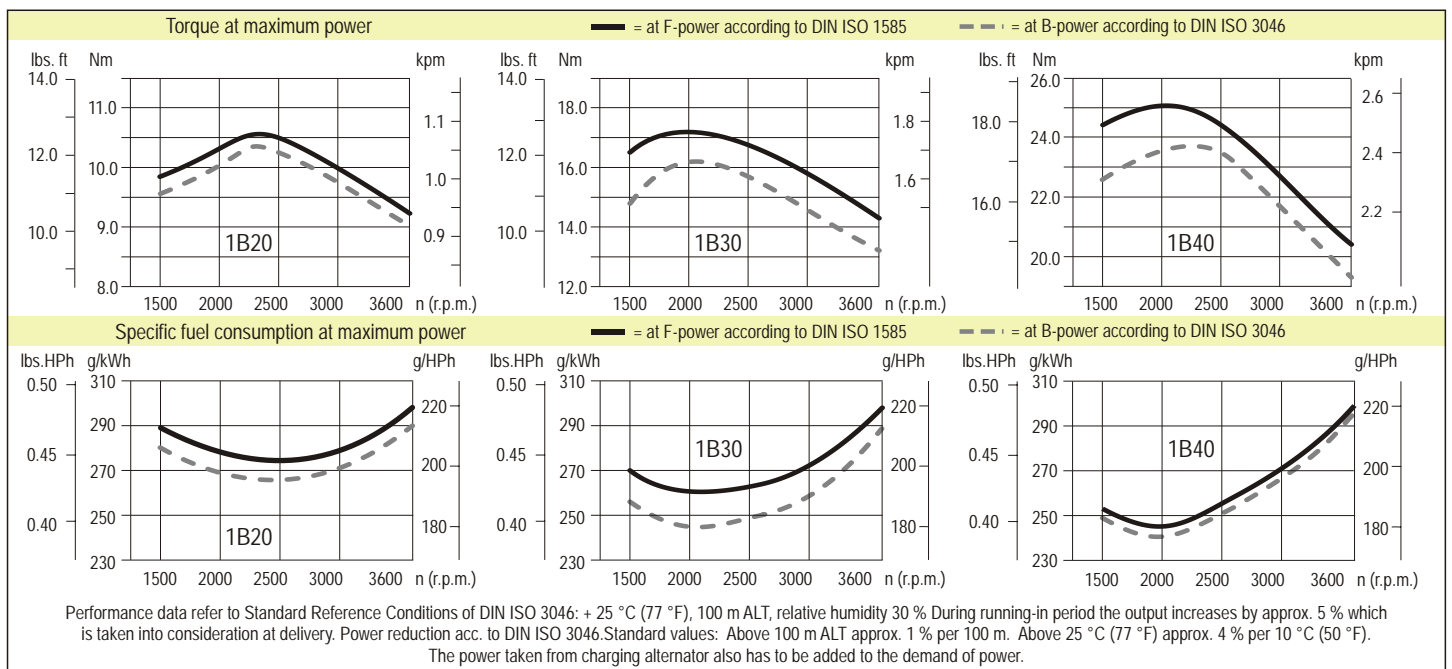
- Direct injection.
- Compression 1:22. Good cold start performance.
- Fuel orientated mixture preparation. Result: excellent exhaust quality. EPA - CARB.
- Speed regulation by spring-loaded governor.
Proportionality < 5% at 3000 / 3600 r.p.m.
- The control cover houses the governor, the entire valve drive, the injector pump drive and the automatic decompression system and oil pump.
- Oil drain on both (narrow) sides of the engine. This gives free access of at least one drain position for almost all installations.
- Dry air filter with paper cartridge and integrated pre-cleaner.
- Cooling fan and AC generator incorporated in the flywheel (not sensitive to dust).
- 4 separate engine feet permit mounting on uneven foundations.
Differences of level of up to 1 mm can be corrected.
- Exhaust outlet flexible as regards both position and direction of exit.

Engine Type	Dimensions (mm)		
	Length	Width	Height
1B20	268	360	400
1B30	295	370	430
1B40	315	394	480

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Technical data		1B20	1B30	1B40
Number of cylinders		1	1	1
Bore x stroke	mm	69 x 62	80 x 69	88 x 76
	inches	2.72 x 2.44	3.15 x 2.72	3.46 x 2.99
Displacement	l	0.232	0.347	0.462
	cu.in.	14.15	21.16	28.19
Mean piston speed at 3000 r.p.m.	m/s	6.2	6.9	7.6
	ft/min	1221	1358	1496
Compression ratio		22	21.5	21
Lub. oil consumption		approx. 1% of fuel consumption, related to full load		
Lub. oil capacity max. / min.	l	0.9 / 0.4	1.1 / 0.6	1.55 / 0.77
	US qts	0.95 / 0.42	1.16 / 0.63	1.64 / 0.81
Speed control	Idle speed	approx. 1000 r.p.m.		
	Static speed drop	approx. 5 % at 3000 r.p.m.		

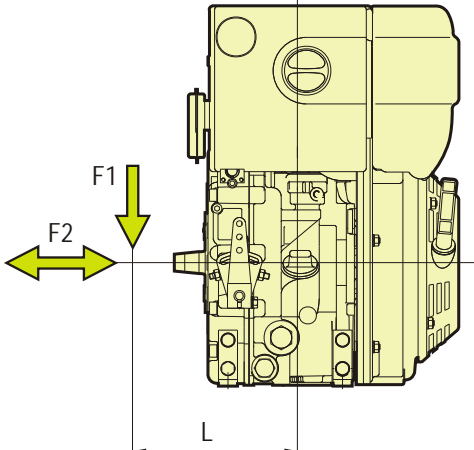


Performance table <i>SPECIAL OUTPUT ON REQUEST</i>			1B20		1B30		1B40	
	Hatz-Stand.	r.p.m.	kW	HP	kW	HP	kW	HP
Vehicle output acc. to DIN ISO 1585	F	3600	3.5	4.8	5.4	7.3	7.7	10.5
		3000	3.1	4.2	5.0	6.8	7.1	9.7
		2600	2.8	3.7	4.5	6.1	6.6	9.0
		2300	2.5	3.4	4.1	5.6	6.0	8.2
		2000	2.2	3.0	3.6	4.9	5.3	7.2
		1800	1.9	2.5	3.2	4.4	4.7	6.4
		1500	1.6	2.0	2.6	3.5	3.8	5.2
ISO net brake fuel stop power (IFN) for intermittent load acc. to DIN ISO 3046.	B	3600	3.4	4.6	5.0	6.8	7.3	9.9
		3000	3.1	4.2	4.6	6.3	6.8	9.3
		2600	2.8	3.7	4.2	5.7	6.3	8.6
		2300	2.5	3.4	3.9	5.3	5.7	7.8
		2000	2.1	2.8	3.4	4.6	4.9	6.7
		1800	1.9	2.5	3.0	4.1	4.4	6.0
		1500	1.5	2.0	2.3	3.1	3.6	4.9
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	3.1	4.2	4.5	6.1	6.6	9.0
		3000	2.8	3.8	4.1	5.6	6.2	8.4
		2600	2.5	3.4	3.8	5.2	5.8	7.9
		2300	2.2	3.1	3.5	4.7	5.2	7.1
		2000	1.9	2.6	3.1	4.2	4.5	6.1
		1800	1.7	2.3	2.7	3.7	4.0	5.4
		1500	1.4	1.8	2.1	2.8	3.2	4.4

Installation data		1B20	1B30	1B40
Combustion air required at 3000 r.p.m. approx. 1)	m ³ / min	0.35	0.52	0.69
	cu.ft./min	13	19	25
Cooling air required at 3000 r.p.m. approx. 1)	m ³ / min	4.0	4.5	8.7
	cu.ft./min	140	160	309
Permanent tilting	max. degrees	25 ²⁾ , 35 ³⁾		
Starter		12 V - 1.0 kW – 24 V - 1.6 kW		
Current alternator charging at 3000 / 1500 r.p.m.		14 V - 14 A / 7 A – 28 V - 10 A / 5 A		
Battery capacity	min / max Ah	12 V - 36 / 60 Ah – 24 V - 24 / 44 Ah		

1) For other r.p.m. there is a linear reduction of the air requirement 2) Flywheel low 3) All other positions

Permissible load on power-take-off points

1B20 / 1B30	1B40	
max. permissible radial force	max. permissible radial force	
$F1 = \frac{60\,000}{L \text{ (mm)} - 70} \text{ (N)}$	$F1 = \frac{62\,600}{L \text{ (mm)} - 84} \text{ (N)}$	
max. permissible axial force	max. permissible axial force	
$F2 = 800 \text{ (N)}$	$F2 = 1200 \text{ (N)}$	

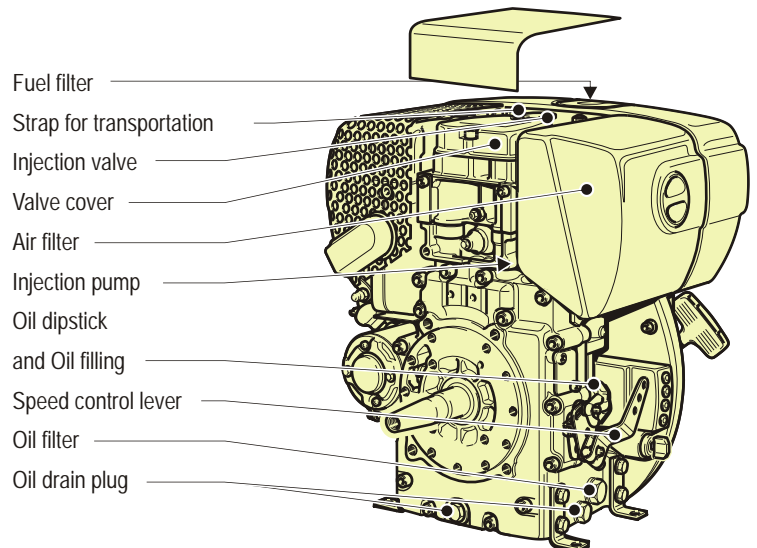
Maintenance- and operating points

To achieve the engines maximum life, it is essential that the engine gets serviced meticulously at regular intervals.

During your first installation please make sure that easy accessibility of service and operating points is assured.

The easier the accessibility is, the sooner and more conscientious the engine will be maintained.

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



Electrical equipment

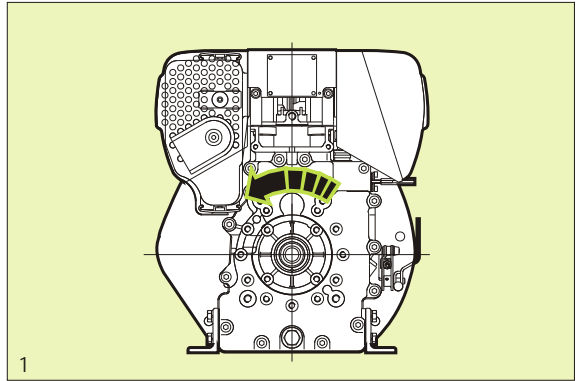
Starter-switchboard-instruments incl. LED-display are mounted to the engine or will be delivered upon request as switchboard-instruments with cable (2m) loose. The engine is started and controlled from this instrument box. Instrument box and cable harness are part of the additional equipment and supplied according to the

number of electrical safety features which are required. If the engine has to be started at temperatures below - 15 °C, engine must be fitted with a pre-heating system (glow plug) (additional equipment). Further additional equipments include automatic start and stop, remote control etc. Please ask for drawings and wirings diagrams.

1B20 • 1B30 • 1B40

Power-Take-Off and Sense of Rotation

- Power-take-off shaft, governor side, with max. engine speed, Sense of rotation anti-clockwise (fig. 1).
- Different stub-shafts (page 6).
- at mounting shafts $J_{max} = 0.04 \text{ kgm}^2$
- Radial loading capacity, see page 7.
- Hydraulic pump mounting as very short-mounted add.equipment.

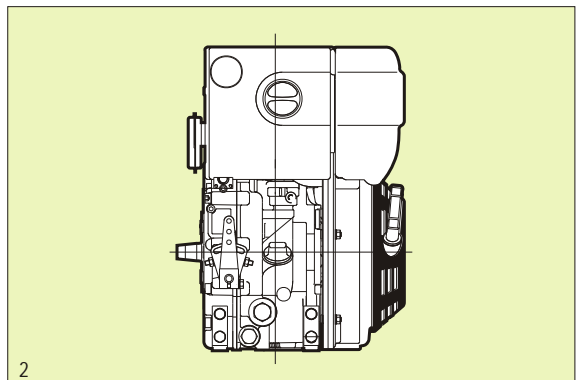


Engine Designations

- Execution 1B20. / 30.: up to 3600 r.p.m.
- Execution 1B40T. : up to 3600 r.p.m.
- Execution 1B40U.: up to 3600 r.p.m. with additional counter balance

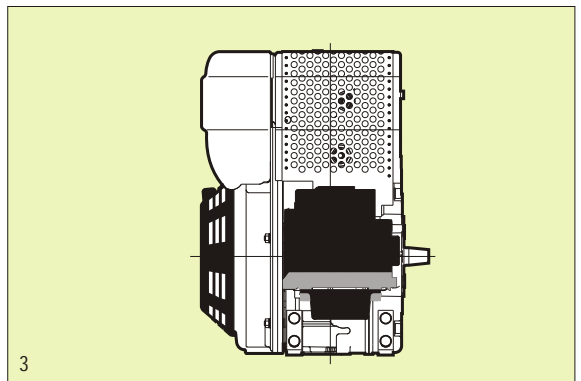
Engine Variants

- Variant VIII : Engine with Recoil-start on flywheel side (fig 2).
- Variant XI : Engine with electric start 12 V and Recoil-start (fig. 3).
- Variant XIII : Engine with electric start 24 V and Recoil-start (fig. 3).



Weights

incl. tank, air filter, and exhaust silencer	1B20		1B30		1B40	
	kg	lbs.	kg	lbs.	kg	lbs.
Variant VIII	28.0	61.7	33.0	72.7	48.0	105.8
Variant XI / XIII	32.8	72.2	37.8	83.3	53.3	117.9



Scope of Delivery of Engine

Engine tested for full load on test bench. Engine fitted with blower fan, variable speed governor, lubricating oilfilter, dry-type airfilter or oil-bath airfilter, automatic decompression system, automatic injection pump bleeding, filling device for start oil, strap for transportation (only suitable to carry the engine weight).

Further equipment included in engine variants:

- Variant VIII : Recoil starter
- Variant XI : Electric starter 12 V, Generator 14 V, engine wiring, gearing.
- Variant XIII : Electric starter 24 V, Generator 28 V, engine wiring, gearing.

Additional equipment

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