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The World Premiere

An air cooled single-cylinder diesel engine with vertical shaft

1B20V • 1B30V • 1B40V

1.4 - 7.7 kW • 1.8 - 10.5 HP

5 / 629 E Printed in Germany

Modifications, which serve the technical improvements, are reserved.



Design

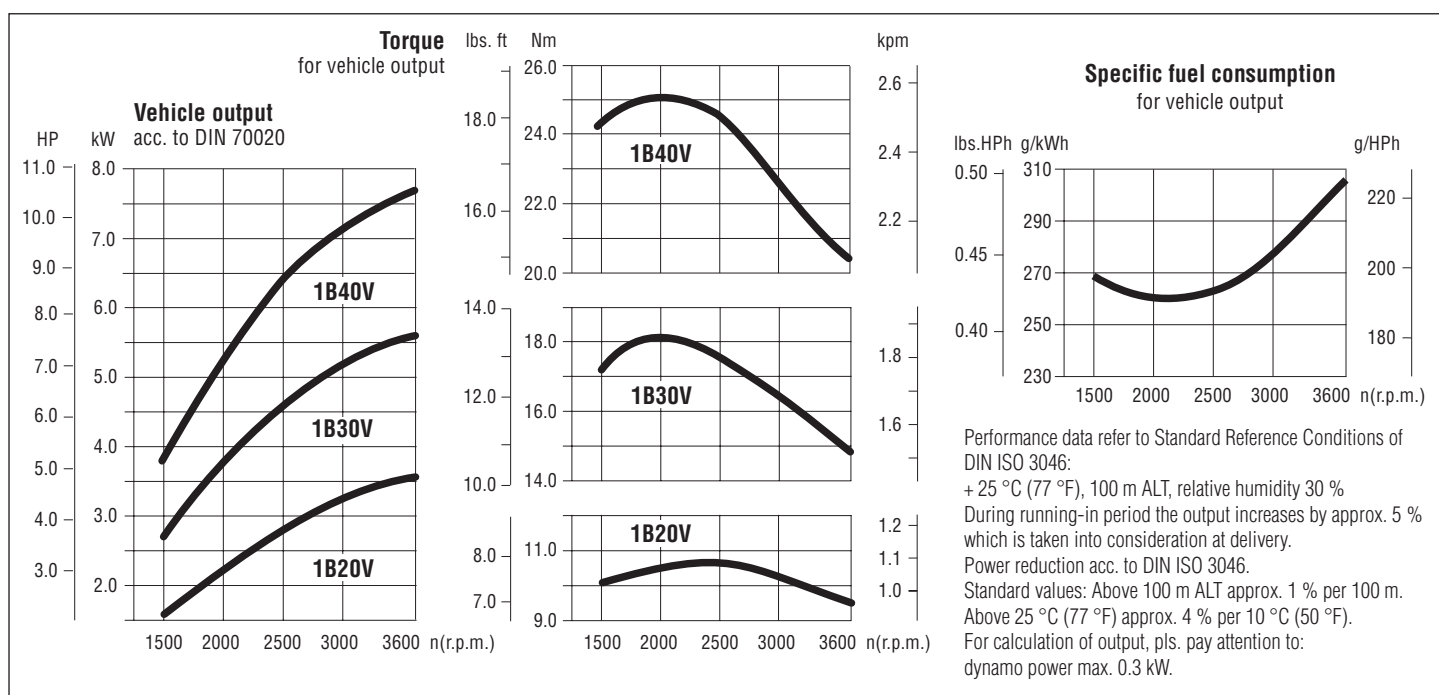
- Air-cooled single-cylinder 4-stroke Diesel engine.
- Horizontal cylinder.
- Light alloy diecast cylinder crankcase.
- Light alloy cylinder head .
- Forged crankshaft.
- Light alloy piston for low free forces of gravity.
- Lubrication by pressurised circulation of oil, fine screen filtering in main 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.
- 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.
- Dry air filter with paper cartridge and integrated pre-cleaner.
- Cooling fan and AC generator incorporated in the flywheel (not sensitive to dust).
- Exhaust outlet flexible as regards both position and direction of exit.

Engine type	Dimensions (mm)		
	Lenght	Width	Height
1B20V	399	360	300
1B30V	428	370	327
1B40V	477	394	360

Technical data		1B20V	1B30V	1B40V
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	22	22
Lub. oil consumption		apprx. 0.5% 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	apprx. 800 r.p.m.		
	Static speed droop	apprx. 5% at 3000 r.p.m.		



Performance table			1B20V		1B30V		1B40V	
	Hatz-Stand.	r.p.m.	kW	HP	kW	HP	kW	HP
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	2.6	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		1B20V	1B30V	1B40V
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⁾	25 ²⁾	25 ²⁾
Starter		12 V - 0.8 kW		
Current alternator charging at 3000 / 1500 r.p.m.		14 V - approx.14 A / 7 A		
Battery capacity	min / max Ah	36 / 60 Ah		

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

Permissible load on power-take-off points

1B20 / 1B30

max. permissible radial force

$$F1 = \frac{60\,000}{L \text{ (mm)} - 70} \text{ (N)}$$

max. permissible axial force

$$F2 = 800 \text{ (N)}$$

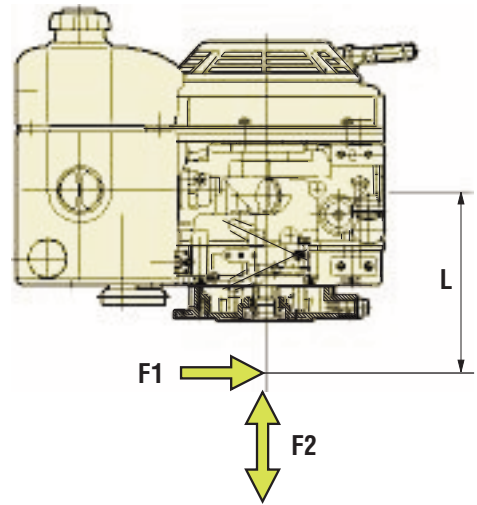
1B40

max. permissible radial force

$$F1 = \frac{62\,600}{L \text{ (mm)} - 84} \text{ (N)}$$

max. permissible axial force

$$F2 = 1200 \text{ (N)}$$



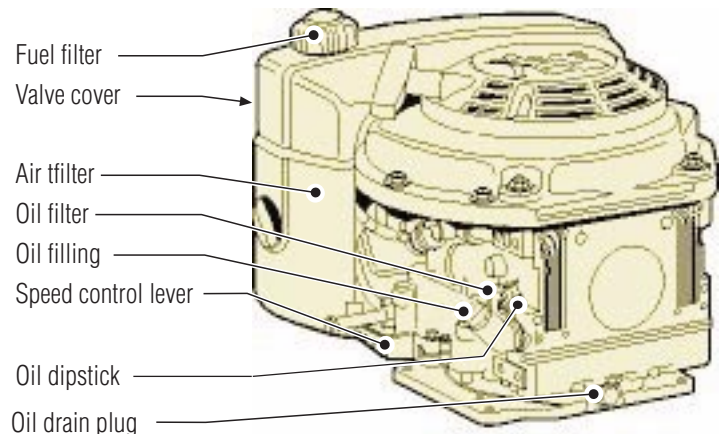
Maintenance- and operating points

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 service and operation points are easily accessible before delivery your machine to the customer.



Electrical equipment

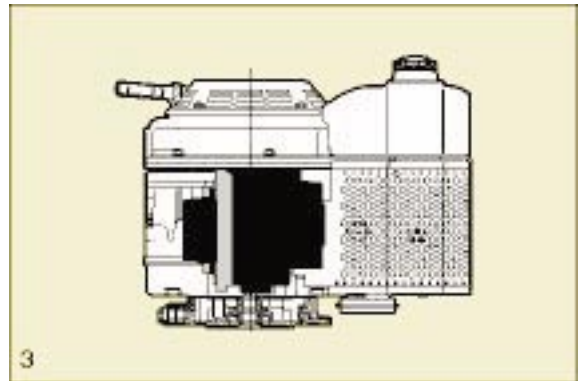
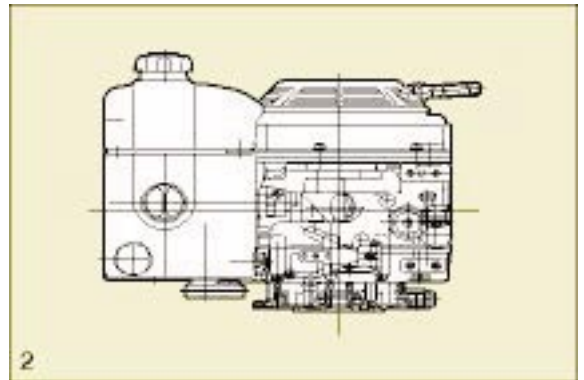
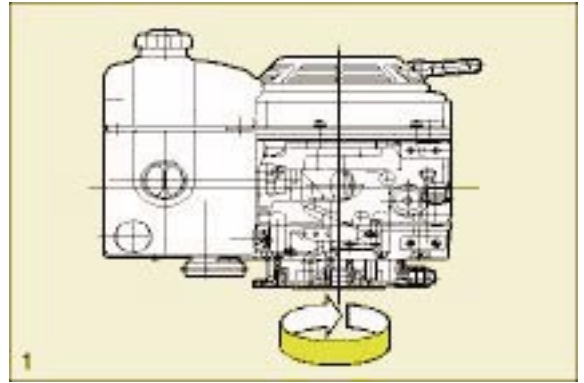
Starter-switchboard-instruments incl. LED-display are mounted to the engine or will be delivered upon request as switchboard-instruments with cable (2 m) loose. The engine is started and controlled from this instrument box. Instrument box and cable harness are part of the additional equipment and supplied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

1B20V • 1B30V • 1B40V

Power-Take-Off and Sense of Rotation

- Power-take-off shaft, governor side, with max. engine speed, 100 %.
Different stub-shafts, see page 5.
Radial loading capacity, see page 6.
- Sense of rotation: clockwise when facing recoil start.



Engine Designations

- Execution 1B20V: up to 3600 r.p.m.
- Execution 1B30V: up to 3600 r.p.m.
- Execution 1B40V: up to 3600 r.p.m.

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).

Weights

incl. tank, air filter, and exhaust silencer	1B20V		1B30V		1B40V	
	kg	lbs.	kg	lbs.	kg	lbs.
Variant VIII	30.0	66.1	35.0	77.2	50.0	110.2
Variant XI	34.8	76.7	39.8	87.7	55.3	121.9

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).

Light metal housing not painted. Sheet metal parts painted. Engine without oil.

Accessories: Tools and gaskets for 1st maintenance, instruction booklet, spare parts list and "Service International".

Further equipment included in engine variants:

- Variant VIII: Recoilstarter
- Variant XI: Electric starter 12 V, alternator 14 V, engine wiring, gearing

Additional equipment

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

