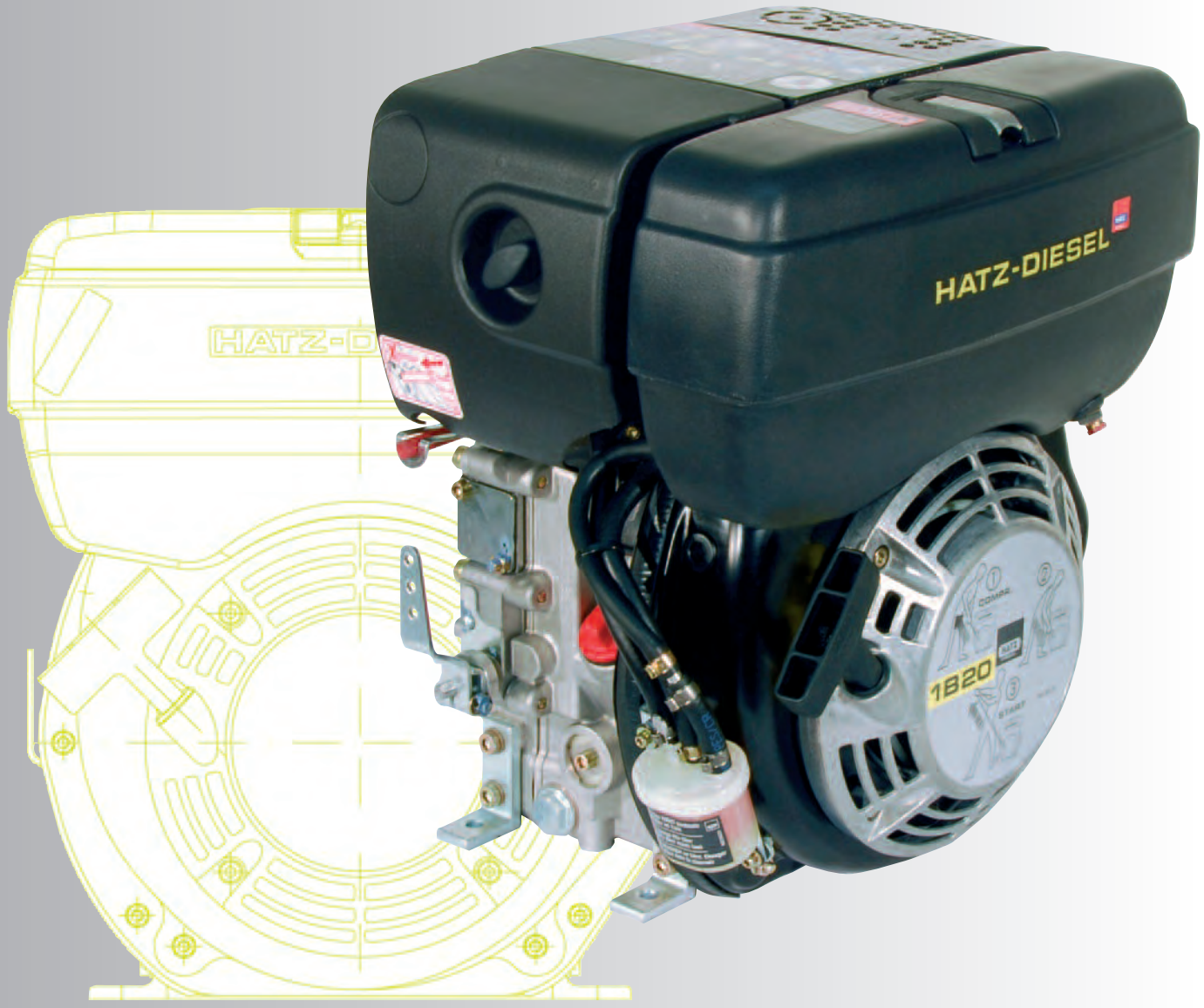
HATZ DIESEL

B-Series

1B20 • 1B27 • 1B30 • 1B40 • 1B50



1B20 • 1.4-3.5 kW **1B27** • 1.6-4.0 kW **1B30** • 2.1-5.4 kW
1B40 • 3.2-7.5 kW **1B50** • 3.5-8.0 kW

THE CHALLENGERS:

REVOLUTIONARY TECHNIQUE FOR SINGLE-CYLINDER DIESEL ENGINES

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

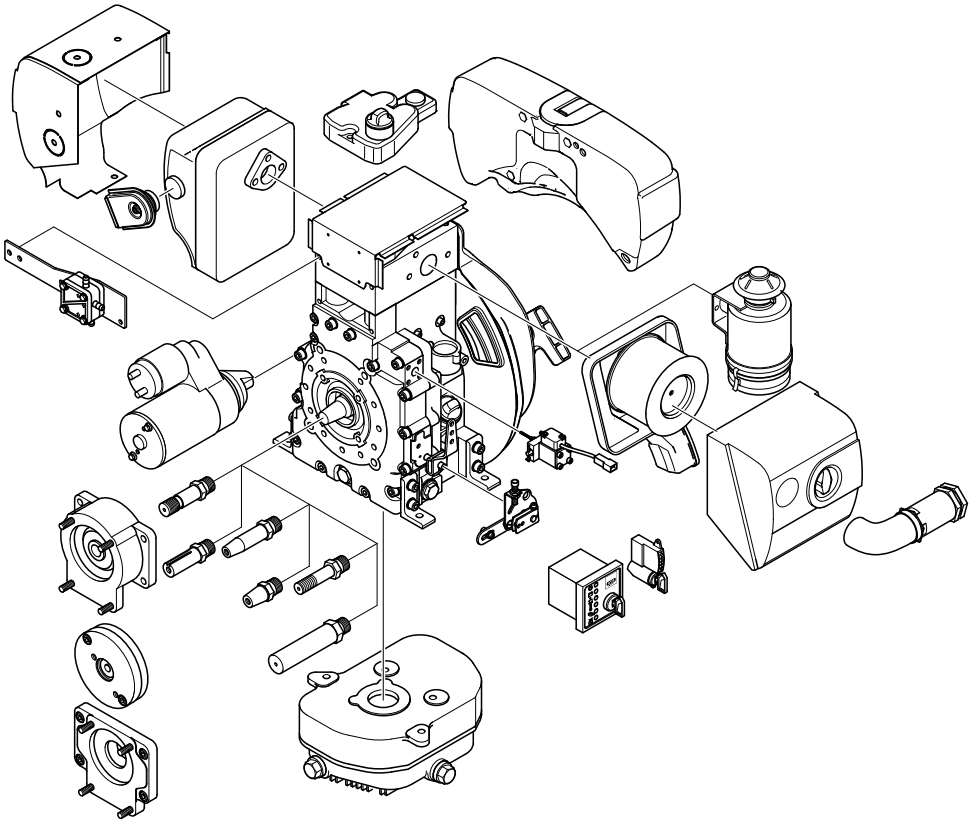
- Direct injection.
- Compression from 1:21 to 1:22. Good cold start performance.
- Fuel orientated mixture preparation. Result: excellent exhaust quality. EPA/CARB.
- Speed regulation by spring-loaded governor.
  Proportionality < 5% at 3000 / 3600 r.p.m.
- The control cover houses the governor, the 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 seperate 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.

Exhaust reduced types on request

EPA TIER IV

CARB TIER IV

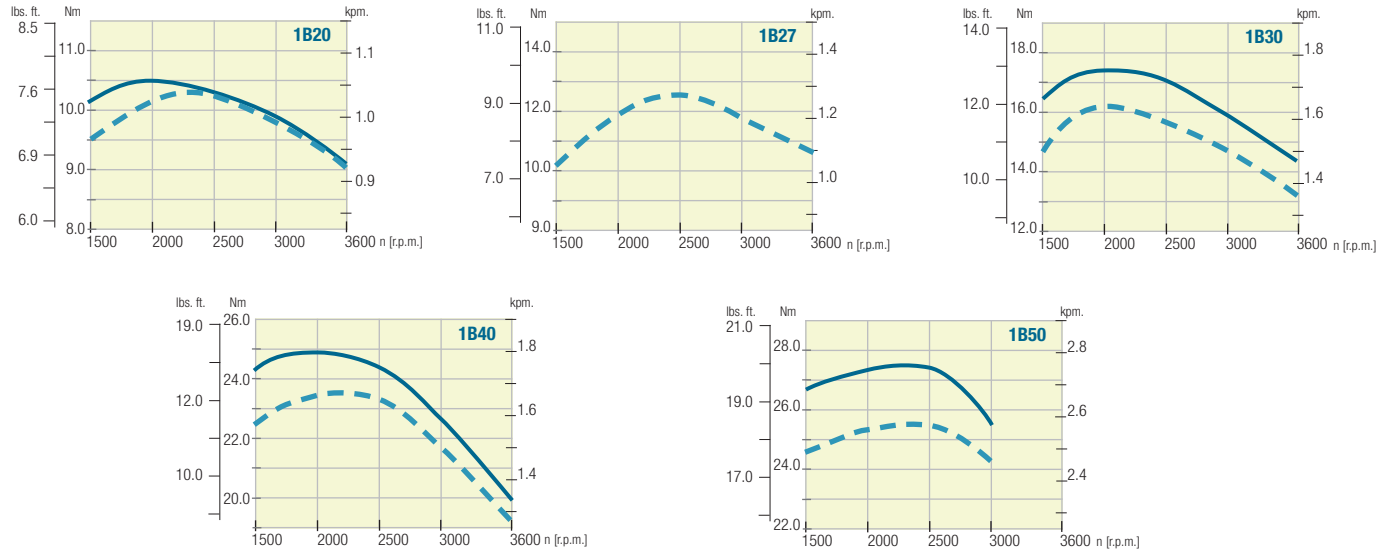
Additional equipment



Technical data		1B20	1B27	1B30	1B40	1B50
Number of cylinders		1	1	1	1	1
Bore x stroke	mm	69 x 65	74 x 65	80 x 69	88 x 76	93 x 76
	inches	2.72 x 2.56	2.91 x 2.56	3.15 x 2.72	3.46 x 2.99	3.66 x 2.99
Displacement	l	0.243	0.280	0.347	0.462	0.517
	cu.in.	14.82	17.09	21.18	28.19	31.55
Mean piston speed at 3000 r.p.m.	m/s	6.5	6.5	6.9	7.6	7.6
	ft/min	1280	1280	1358	1496	1496
Compression ratio		22	21.5	21.5	20.5	20.5
Lub. oil consumption, related to full load		max. 1 % of fuel consumption				
Lub. oil capacity max. / min.	l	0.9 / 0.4	0.9 / 0.4	1.1 / 0.6	1.5 / 0.7	1.55 / 0.75
	US qts	0.95 / 0.42	0.95 / 0.42	1.16 / 0.63	1.59 / 0.74	1.64 / 0.77
Speed control	Idle speed	approx. 1000 r.p.m.				approx. 800 r.p.m.
	static speed droop	approx. 5% bei 3000 r.p.m.				

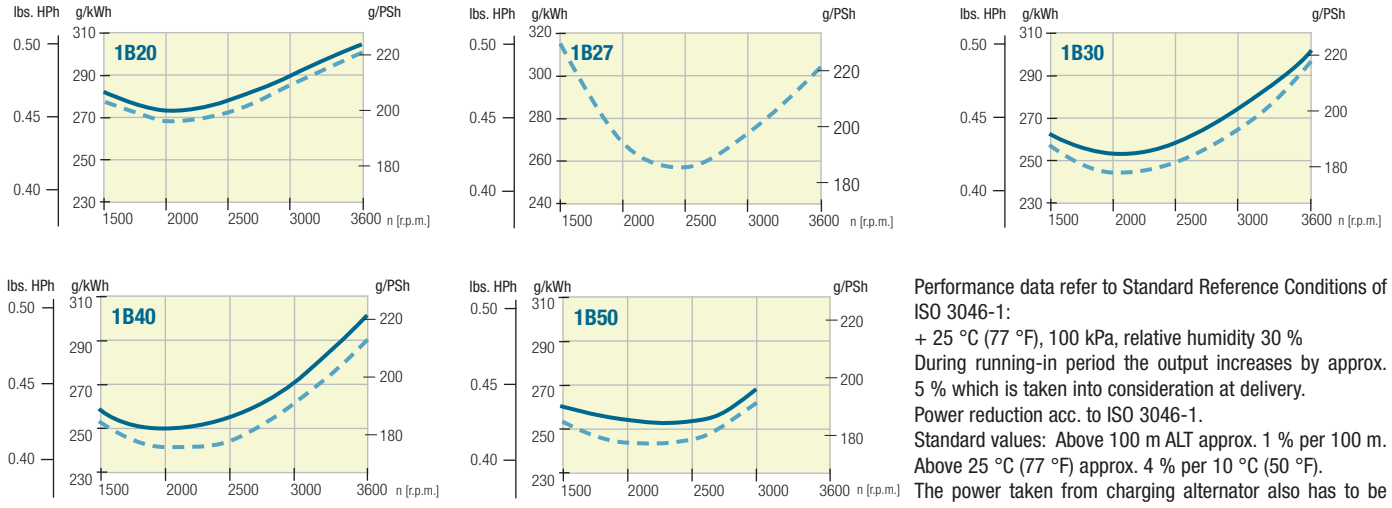
Torque at maximum power

= at F-power according to DIN ISO 1585 — = at B-power according to ISO 3046-1



Specific fuel consumption at maximum power

= at F-power according to DIN ISO 1585 — = at B-power according to ISO 3046-1



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.

Installation data		1B20	1B27	1B30	1B40	1B50
Combustion air required at 3000 r.p.m. approx. [1]	m^3 / min	0.35	0.42	0.52	0.69	0.78
	cu. ft./min	12	15	18	24	28
Cooling air required at 3000 r.p.m. approx. [1]	m^3 / min	4.2	4.2	6.0	7.3	7.6
	cu. ft./min	148	148	212	257	268
Starter		12 V - 1.0 kW – 24 V - 1.6 kW				
Alternator charging current 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 in the air requiremen

Permissible load on power-take-off points

1B20 / 1B27 / 1B30

max. permissible radial force

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

max. permissible axial force

F2 = 800 (N)

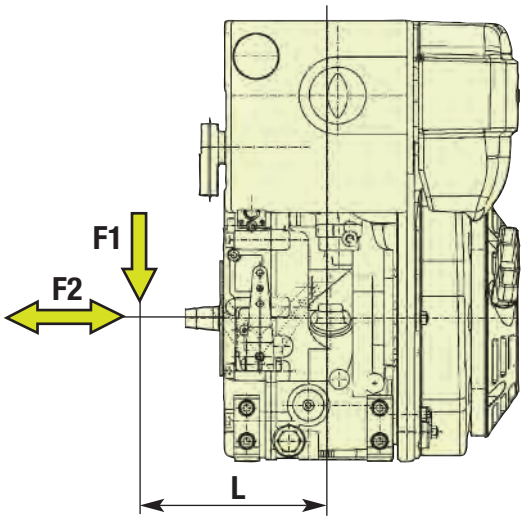
1B40 / 1B50

max. permissible radial force

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

max. permissible axial force

F2 = 1200 (N)



1

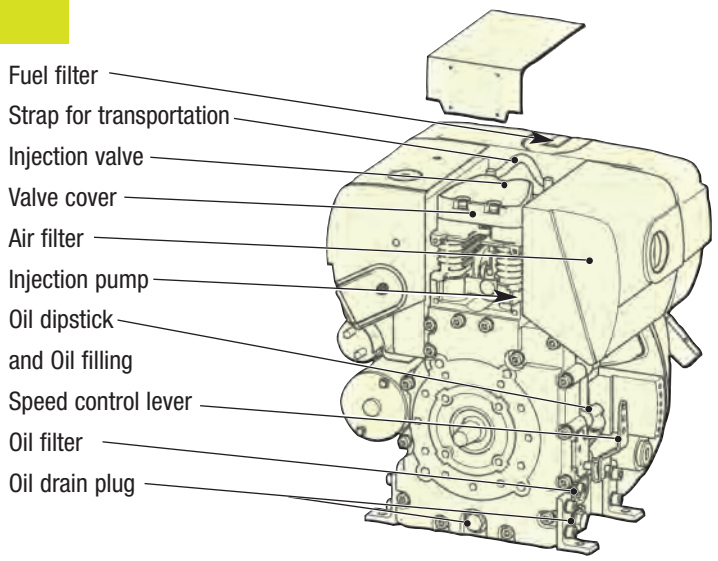
Maintenance and operating points

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 conscientous the engine will be maintened.

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



2

Electrical equipment

Starter-switchboard-instruments incl. LED-display are mounted to the engine or will be delivered upon request as swithboard-instru-ments 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 - 10 °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.
www.hatz-diesel.com

Power-Take-Off and Sense of Rotation

- Power-take-off shaft, governor side, with max. engine speed, Sense of rotation anti-clockwise (fig. 3).
- Different stub-shafts (page 6).
- at thread assembled shafts J_{max} = 0.04 kgm2
- Radial loading capacity, see picture 1.
- Hydraulic pump mounting as very short-mounted add. equipment.

Engine models

- **Version 1B20 / 27** :1500 r.p.m. bis 3600 r.p.m.
- **Version 1B30** :1500 r.p.m. bis 3600 r.p.m.
- **Version 1B40T** :1500 r.p.m. bis 3600 r.p.m.
- **Version 1B40U** :1500 r.p.m. bis 3600 r.p.m.
- **Version 1B50T** :1500 r.p.m. bis 3000 r.p.m.
- **Version 1B50U** :1500 r.p.m. bis 3000 r.p.m.

U: with additional counter balance
T: without additional counter balance

Engine variants

- **Variant VIII :** Engine with Recoil-start on flywheel side (fig 4).
- **Variant XI :** Engine with electric start 12 V and Recoil-start (fig. 5).
- **Variant XIII :** Engine with electric start 24 V and Recoil-start (fig. 5).

Weight

incl. tank, air filter, and exhaust silencer	1B20		1B27		1B30		1B40		1B50	
	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.
Variant VIII	28.0	61.7	29.0	63.9	35.0	77.1	48.0	105.8	51.2	112.9
Variant XI / XIII	32.8	72.2	33.8	74.5	37.8	83.3	53.3	117.5	56.5	124.6

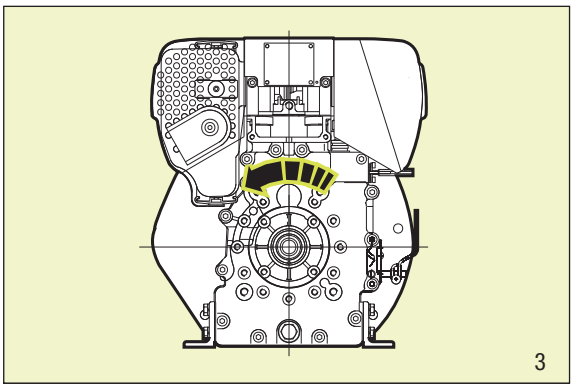
Scope of delivery of engine in standard equipment

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: Gaskets for 1st maintenance

Further equipment included in engine variants:

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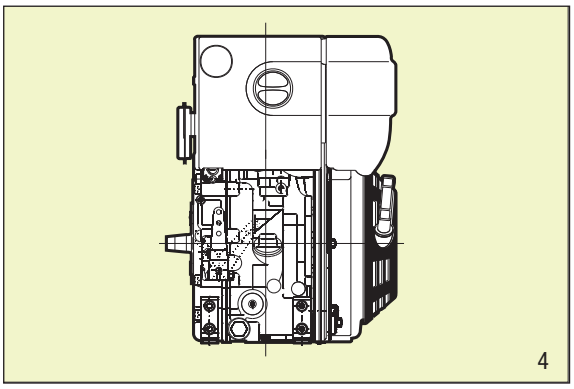
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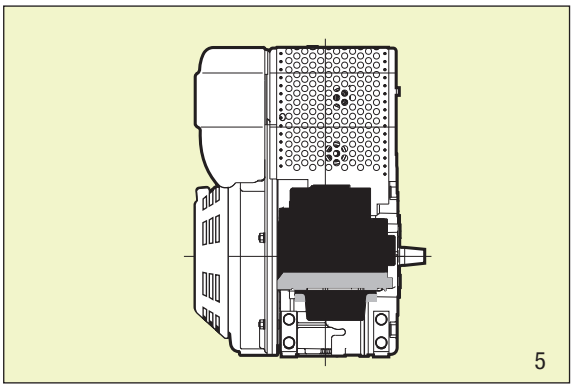

5

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”.

You find out details at our HATZ-contracting partners.

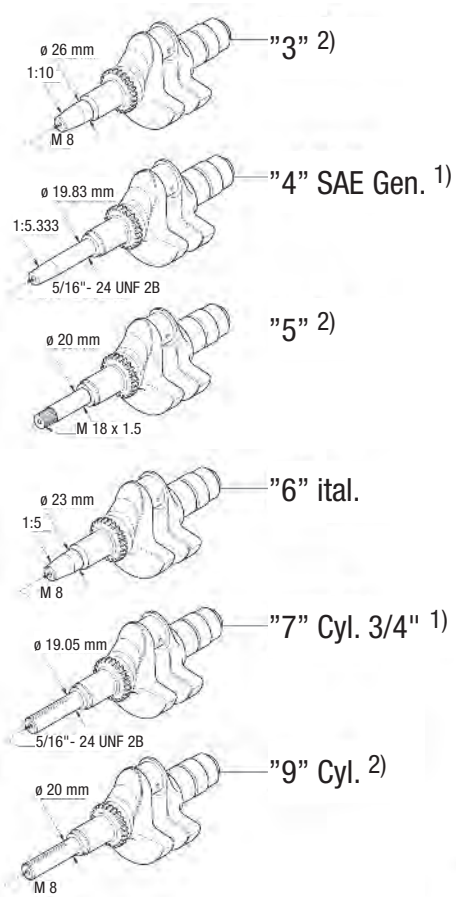
Performance table			1B20		1B27		1B30		1B40		1B50	
	Hatz-Stand.	min^{-1}	kW*	HP*	kW*	HP*	kW*	HP*	kW*	HP*	kW*	HP*
Vehicle output acc. to DIN ISO 1585.	F	3600	3.5	4.8	—	—	5.4	7.3	7.5	10.2	—	—
		3000	3.1	4.2	—	—	5.0	6.8	7.1	9.7	8.0	10.9
		2600	2.8	3.8	—	—	4.6	6.3	6.6	9.0	7.4	10.1
		2300	2.5	3.4	—	—	4.1	5.6	6.0	8.2	6.6	9.0
		2000	2.2	3.0	—	—	3.6	4.9	5.2	7.2	5.7	7.8
		1800	1.9	2.6	—	—	3.3	4.5	4.6	6.3	5.1	6.9
		1500	1.6	2.2	—	—	2.6	3.5	3.8	5.2	4.2	5.7
ISO net brake fuel stop power (IFN) for strong intermittent load acc. to ISO 3046-1.	B	3600	3.4	4.6	4.0	5.4	5.0	6.8	7.3	9.9	—	—
		3000	3.1	4.2	3.7	5.0	4.6	6.3	6.8	9.2	7.6	10.3
		2600	2.8	3.8	3.4	4.6	4.2	5.7	6.3	8.6	6.9	9.4
		2300	2.5	3.4	3.0	4.1	3.9	5.3	5.7	7.8	6.2	8.4
		2000	2.1	2.9	2.5	3.4	3.4	4.6	4.9	6.7	5.3	7.2
		1800	1.9	2.6	2.2	3.0	3.0	4.1	4.4	6.0	4.7	6.4
		1500	1.5	2.0	1.6	2.2	2.3	3.1	3.5	4.8	3.9	5.3
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	3.1	4.2	—	—	4.5	6.1	6.5	8.8	—	—
		3000	2.8	3.8	—	—	4.2	5.7	6.1	8.3	6.8	9.2
		2600	2.5	3.4	—	—	3.8	5.2	5.6	7.6	6.2	8.4
		2300	2.2	3.0	—	—	3.5	4.8	5.1	6.9	5.5	7.5
		2000	1.9	2.6	—	—	3.1	4.2	4.4	6.0	4.8	6.5
		1800	1.7	2.3	—	—	2.7	3.7	3.9	5.3	4.2	5.7
		1500	1.4	1.9	—	—	2.1	2.9	3.2	4.4	3.5	4.8

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

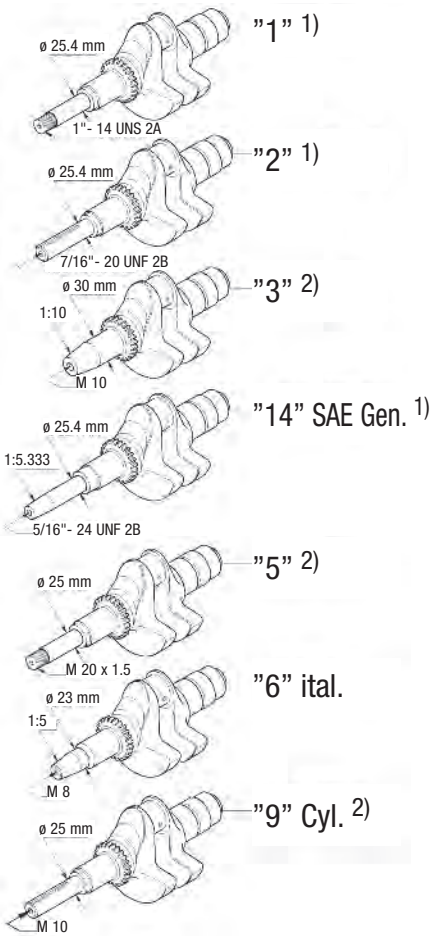
Selection of available shaft forms

[1] according to SAE J 609
[2] according to LEMA LES 1203-1991

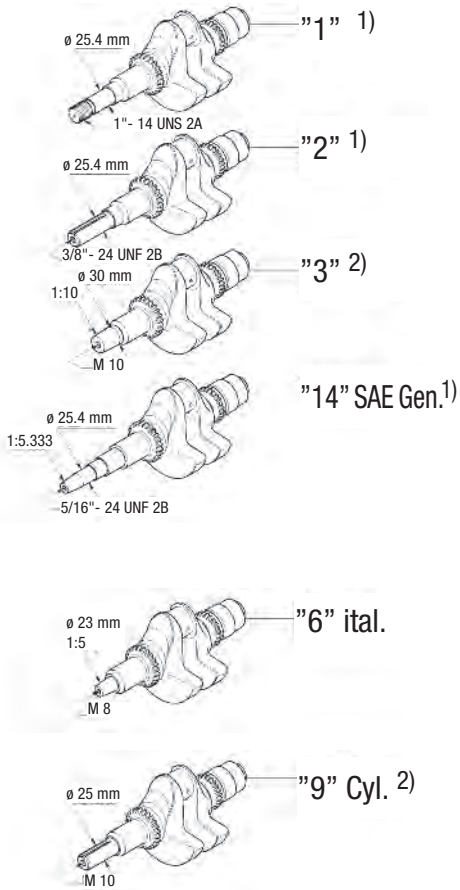
1B20 / 1B27



1B30



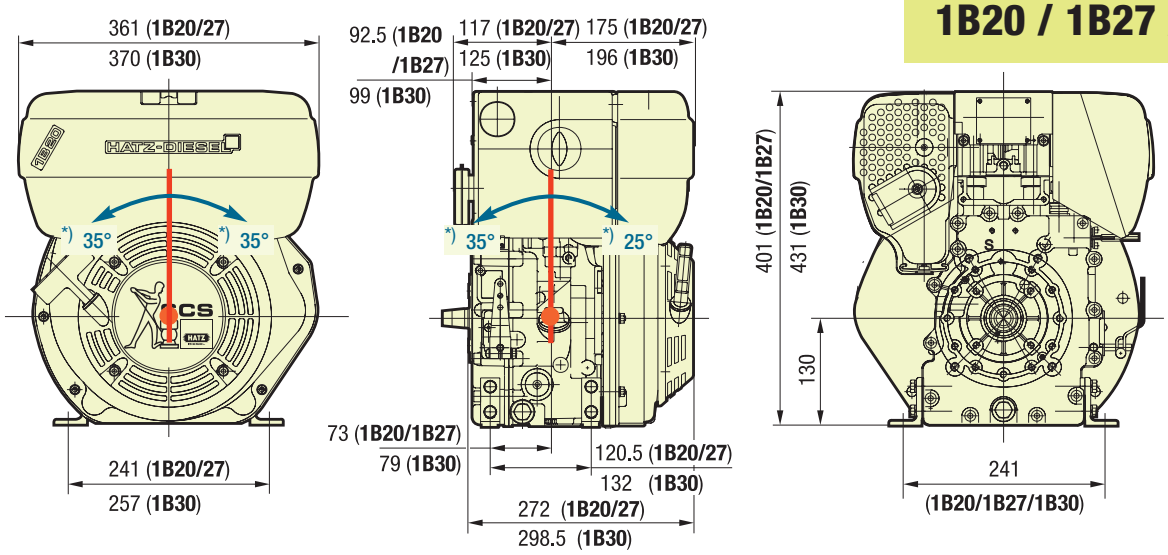
1B40 / 1B50



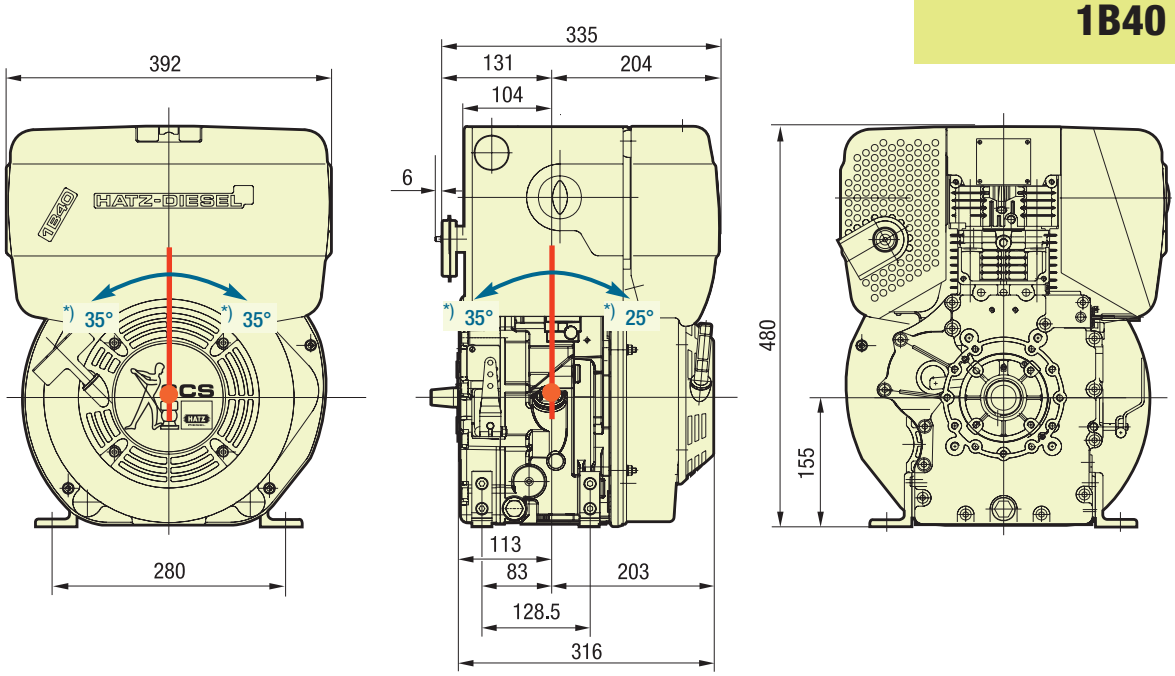
Dimensions

Drawings with detailed - and connection measures can either be demanded or downloaded as pdf- resp. dxf-file which are shown in the Internet.

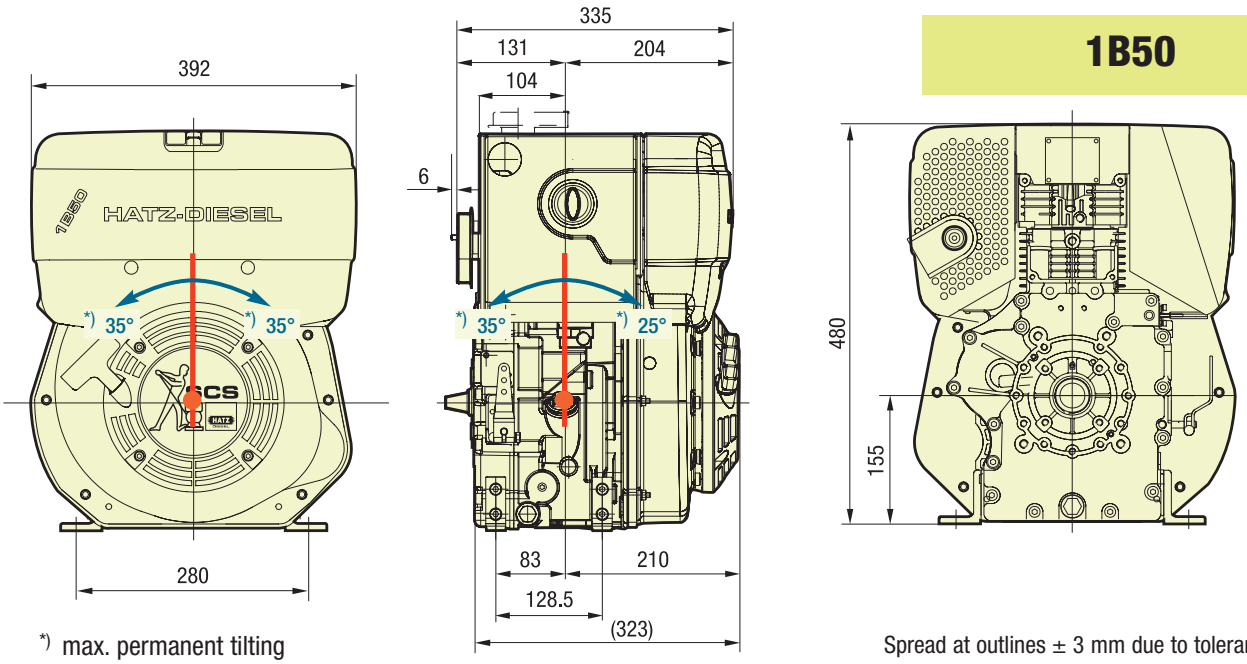
1B20 / 1B27 / 1B30



1B40

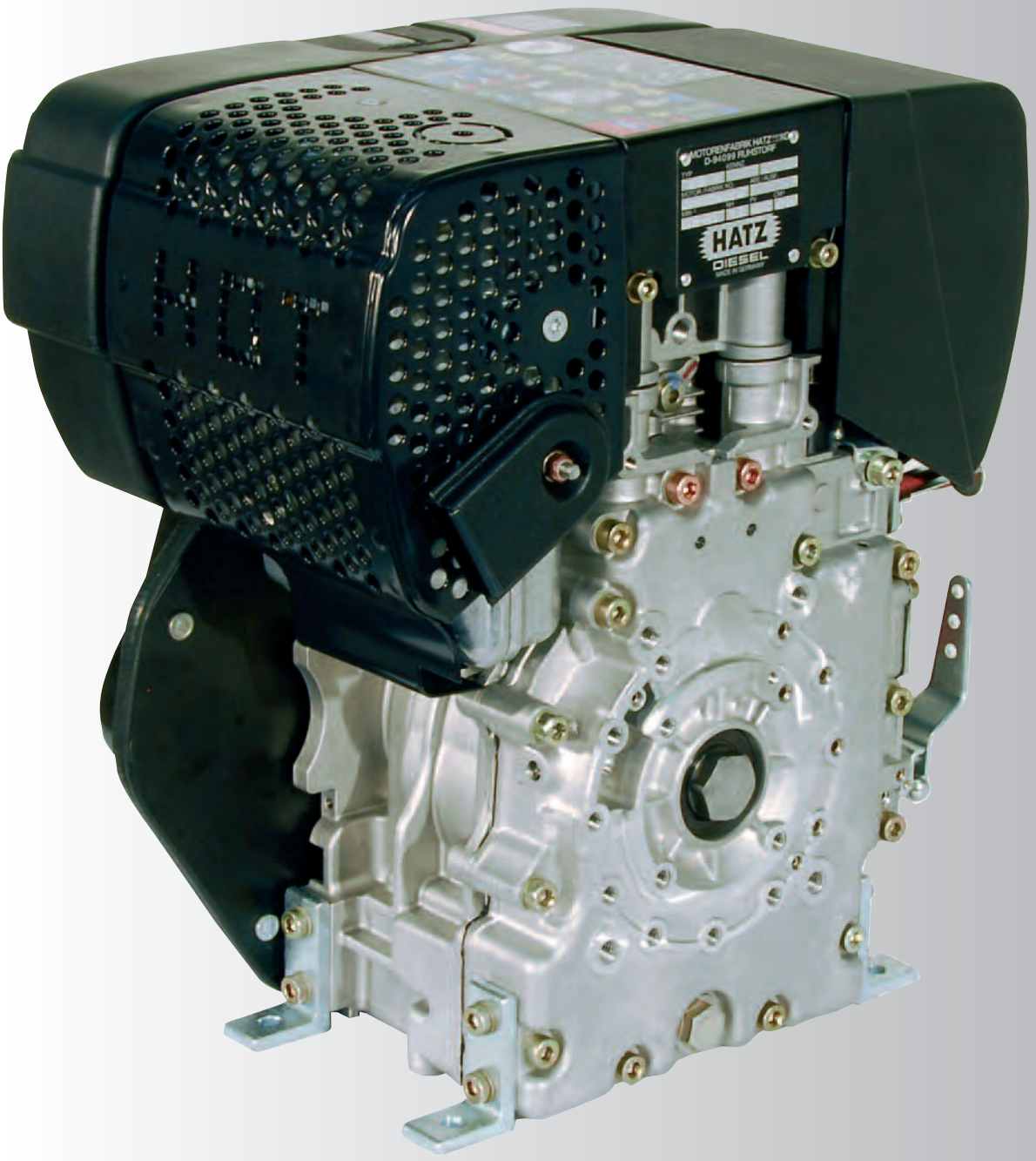


1B50



*) max. permanent tilting

Spread at outlines ± 3 mm due to tolerance.



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