



L Series



2L41C • 13.5 - 27 kW    3L41C • 20.6 - 36.9 kW    4L41C • 27 - 46.1 kW

# SilentPACK

THE EXTREMELY SILENT INDUSTRIAL  
MULTI-CYLINDER DIESEL ENGINE

2L41C • 3L41C • 4L41C

***The HATZ Silent Pack is the quietest engine for equipment installation in its class – and it's ready for immediate application.***

***The Hatz Silent Pack has every conceivable feature that an optimal built-in diesel engine should possess by today's standards.***

### ***Extremely quiet***

The capsule reduces the engine noise by 90 % to 10 % = 10 dBA.

### ***Ready for operation***

With an air cleaner attached, exhaust silencing and a cable loom for starting and monitoring). Nothing is loose, everything is ready for installation.

### ***Easily accessible***

Provided with servicing points easily accessible from the outside or under a cover with quick release fasteners; hydraulic pumps can also be installed under the sound-absorbing enclosure to reduce noise emissions.

### ***Noise insulation***

Supported on feet that are insulated against structure-borne noise and can be mounted on frames or plates (which means that hardly any structure-borne noise is transferred to the equipment).

### ***Balancer shafts***

Equipped with additional mass balancer shafts which suppress disturbing vibration before it can even arise.

### ***Low installed dimensions***

Designed to occupy only a minimum of space, since the noise-protection capsule fits closely around the engine block.

### ***Optimum cooling air flow***

Equipped with cool-air ducting that regulates thermal conditions in the noise-protection capsule so that the Silent Pack can be operated in all known climate zones (in a hot, dusty desert or in Alaska's icy winter).

### ***Friendly to the environment***

HATZ has achieved significant success in the reduction of noise and exhaust gas emissions.

The engines are certified by: EU Directive 97/68, step 3A, ECE-R24 EPA Tier II, Regulation 40 CFR Part 89 / CARB Tier II and from 2008 Interim Tier IV.

***The Hatz Silent Pack is a perfect example of what we mean when we say:***

***„Mount it, bolt it on, start it up and hear just how pleasant it sounds.“***

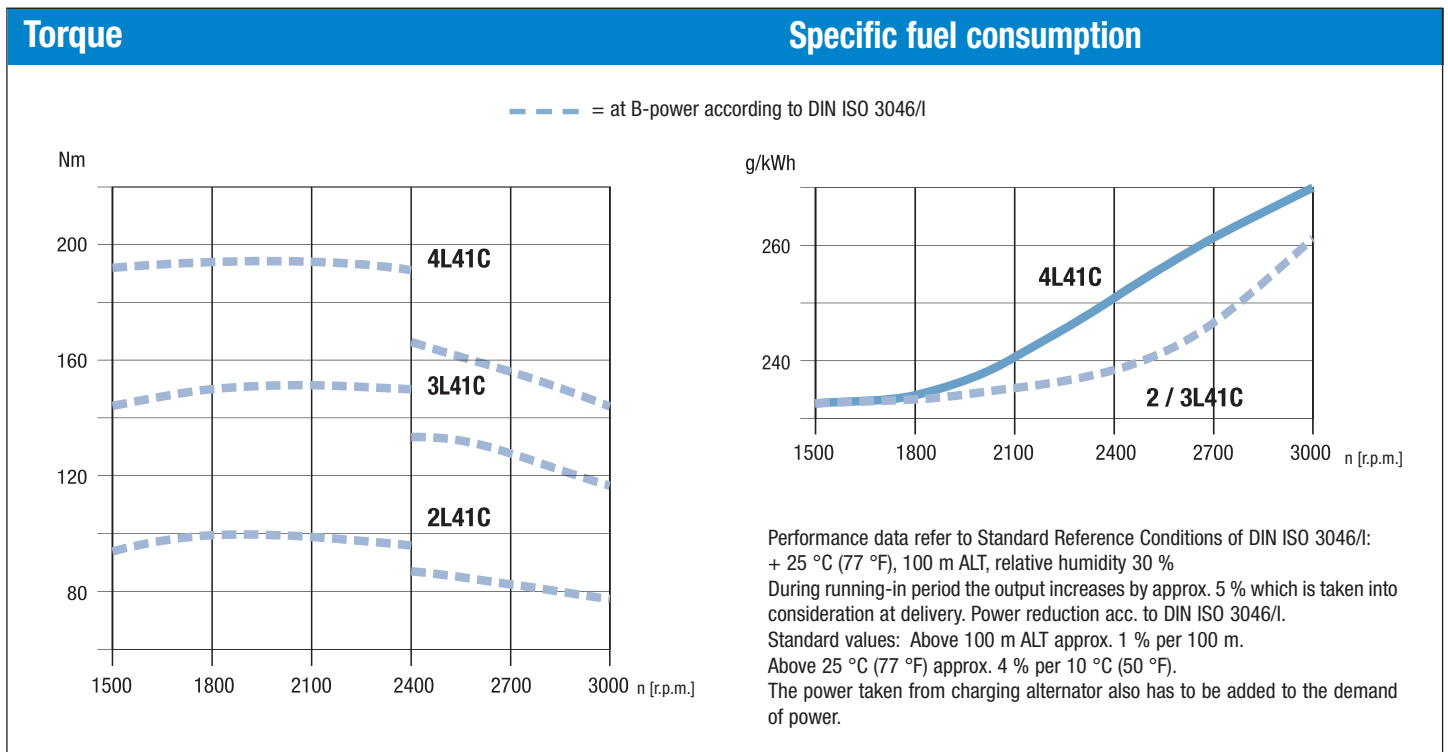
## **Design**

- Aircooled 2-, 3- and 4-cylinder fourstroke Diesel engines, modular design.
- Grey cast iron crankcase, vertical in-line cylinders.
- Crankshaft and conrod running on shell-bearing.
- Individual cylinders (grey cast iron), individual cylinder-heads (light metal) and individual injection pumps.
- Dismantling of piston and conrod possible in upwards direction.
- Direct injection with multi-hole nozzle.
- Valve control via camshaft, tappets, rocker and pushrod.
- Separate camshaft for drive of injection pump with centrifugal variable speed governor and automatic injection timer.
- Pressure feed lubrication with gear pump. Oilcooler and filter in main flow.
- Axial-type blower fan with incorporated alternator.
- The Silent Pack is an engine of family **L** with noise-proof capsule.
- The easy accessibility of maintenance and operating points remains unchanged also with the Silent Pack engines.

## **Characteristics**

- The Diesel engine ready for installation and operation
- All-Purpose industrial Diesel engines.
- Extremely low fuel- and oil consumption.
- Exhaust emission well below all valid limits for operating machines in EU, USA and Japan.
- Robust, and long life-engine.
- Extensive parts interchangeability due to modular system.
- Low repair cost due to individual cylinders, individual cylinder-heads and individual injection-pumps.
- Unusual reliability because of:
  - Automatic belt control
  - Automatic extra fuel device
  - Dry-type airfilter, protected against severe contamination.
  - Camshaft and oil pump driven by gear wheel
- Easy to service because of:
  - Automatic injection pump bleeding
  - Operating and maintenance points at one engine side only
  - Hydraulic belt tensioner
- The most silent industrial Diesel engine of its class.
- The capsule reduces the engine noise by 90%.
- Noisy auxiliary drives can be incorporated in the capsule.
- The exhaust silencer is integrated into contour of the capsule.

Technical data		2L41C	3L41C	4L41C
Number of cylinders		2	3	4
Bore x stroke	mm	102 x 105	102 x 105	102 x 105
	inches	4.02 x 4.13	4.02 x 4.13	4.02 x 4.13
Displacement	l	1.716	2.574	3.432
	cu.in.	104.7	157.0	209.4
Mean piston speed at 3000 r.p.m.	m/s	10.5	10.5	10.5
	ft/min	2067	2067	2067
Compression ratio		20.0	20.0	20.0
Sub. oil consumption		approx. 0.5 % of fuel consumption, related to full load		
Sub. oil capacity max. / min.	l	4.5 / 2.5	8.0 / 5.0	13.0 / 5.0
	US qts	4.8 / 2.6	8.5 / 5.3	13.7 / 5.3
Speed control	lowest idle speed	approx. 900 r.p.m.		
	static speed droop	approx. 5% at 3000 r.p.m.		



Performance table			2L41C		3L41C		4L41C	
	Hatz-Stand.	r.p.m.	kW	HP	kW	HP	kW	HP
Vehicle output acc. to DIN ISO 1585.	F	3000	27.0	36.7	—	—	—	—
		2600	25.3	34.4	—	—	—	—
		2350	23.1	31.4	—	—	—	—
ISO net brake fuel stop power (IFN) for strongly intermittent load acc. to DIN ISO 3046/I.	B <sub>Si</sub>	3000	25.7	35.0	36.9	50.2	—	—
		2600	24.5	33.3	36.9	50.2	—	—
		2350	22.5	30.6	34.4	46.8	—	—
ISO net brake fuel stop power (IFN) for intermittent load acc. to DIN ISO 3046/I.	B	3000	24.4	33.2	36.7	49.9	46.1	62.7
		2600	23.2	31.6	35.2	47.9	43.5	59.2
		2300	23.5	32.0	35.9	48.8	45.1	61.3
		2000	20.9	28.4	31.2	42.4	40.0	54.4
		1800	18.7	25.4	28.0	38.1	36.7	49.9
		1500	15.0	20.4	22.9	31.1	30.0	40.8
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	3000	22.0	29.9	33.0	44.9	41.7	56.7
		2600	20.9	28.4	31.7	43.1	39.2	53.3
		2300	21.2	28.8	32.3	43.9	40.6	55.2
		2000	18.8	25.6	28.1	38.2	36.0	49.0
		1800	16.8	22.8	25.2	34.3	33.0	44.9
		1500	13.5	18.4	20.6	28.0	27.0	36.7

Installation data		2L41C	3L41C	4L41C
Combustion air required at 3000 r.p.m. approx. <sup>1)</sup>	m <sup>3</sup> / min	2.6	3.9	5.2
	cu.ft./min	92	138	184
Combustion air required at 1500 r.p.m. approx. <sup>1)</sup>	m <sup>3</sup> / min	29	39	42
	cu.ft./min	1024	1377	1483
Permanent tilting	max. degrees	30° <sup>2)</sup> 3) 4) 5)	25° <sup>2)</sup> 3) 4) 30° <sup>5)</sup>	25° <sup>4)</sup> 30° <sup>5)</sup> 15° <sup>2)</sup> 18° <sup>3)</sup>
Moment of inertia	SAE-flywheel 8"	0.64 kgm <sup>2</sup> (15.2 lb.ft <sup>2</sup> )	0.65 kgm <sup>2</sup> (15.4 lb.ft <sup>2</sup> )	0.67 kgm <sup>2</sup> (15.9 lb.ft <sup>2</sup> )
	flywheel for F+S clutch	0.49 kgm <sup>2</sup> (11.6 lb.ft <sup>2</sup> )	0.50 kgm <sup>2</sup> (11.9 lb.ft <sup>2</sup> )	0.51 kgm <sup>2</sup> (12.1 lb.ft <sup>2</sup> )
Starter motor		12 V - 2.7 kW (3.7 HP) — 24 V - 4.0 kW (5.4 HP)		
Alternator charging current at 3000 / 1500 r.p.m.		14 V - 60 / 42 A — 28 V - 40 / 28 A		
Battery capacity	min / max. Ah	12 V - 88 / 143 Ah — 24 V - 55 / 110 Ah		

<sup>1)</sup> For other r.p.m. there is a linear reduction of the air requirement <sup>2)</sup> Applicable for flywheel up <sup>3)</sup> Applicable for flywheel low  
<sup>4)</sup> Applicable for oilfilter low <sup>5)</sup> Applicable for oilfilter up

## Permissible load on power-take-off points

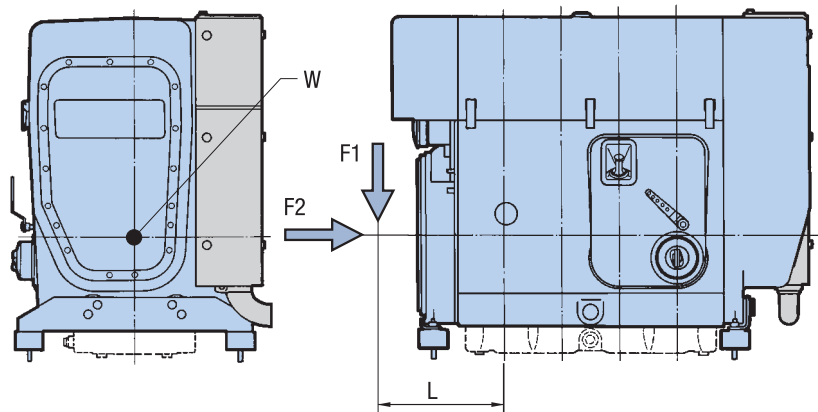
- Flywheel: Power-take-off axial and radial at full engine torque.

**Max. permissible radial force F1:**

$$F1 = \frac{400\,000}{L \text{ (mm)} - 73} \text{ (N)}$$

**Max. permissible axial force F2:**

$$F2 = 2700 \text{ N}$$



- Shaft W: Suitable for axial power-take-off, for example adaption of a hydraulic pump. Max. torque 70 Nm drive with engine speed. Axial and radial forces not permitted.

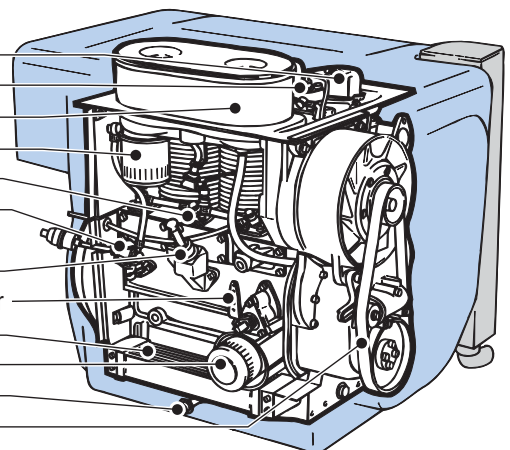
## Maintenance and operating points

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.

Valve cover  
 Injection valve  
 Air filter  
 Fuel filter  
 Injection pump  
 Fuel feed pump  
 Oil dipstick  
 and Oil filling  
 Speed control lever  
 Oil cooler  
 Oil filter  
 Oil drain plug  
 Poly-V-belt



## 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](http://www.hatz-diesel.com)

## Power-Take-Off and Sense of Rotation

- Power-take-off on flywheel-side (pict. 1).
- Power-take-off on governor side with engine speed, max. torque 70 Nm, radial force not permitted (pict. 2/W).
- Rotation see pict. 1 and 2.
- Engine flangeable at flywheel-side.

## Engine model

- with capsule, with additional counter balance shaft („U“ pict. 3).

## Engine variants (pict. 4)

- **Variant XI:** Engine with electric start 12 V
- **Variant XIII:** Engine with electric start 24 V

## Weight

2L41C, Var. XI, XIII		3L41C, Var. XI, XIII		4L41C, Var. XI, XIII	
kg	lbs.	kg	lbs.	kg	lbs.
276	608	331	730	396	873

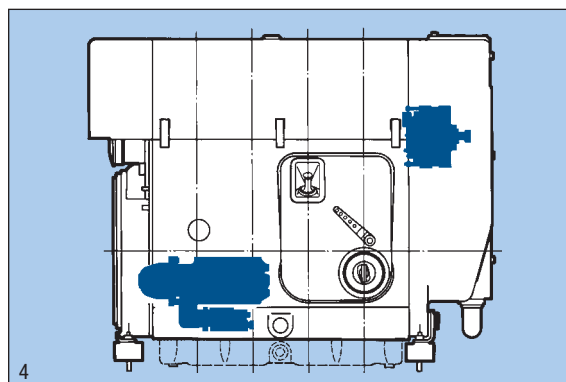
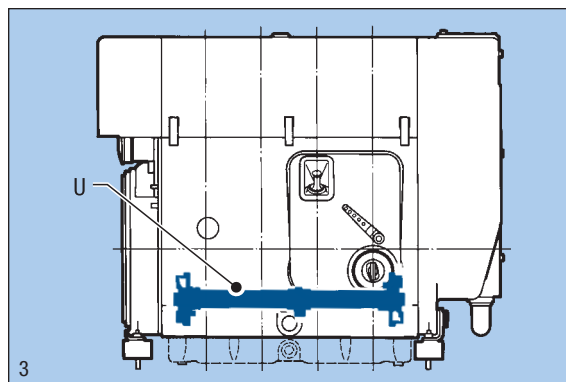
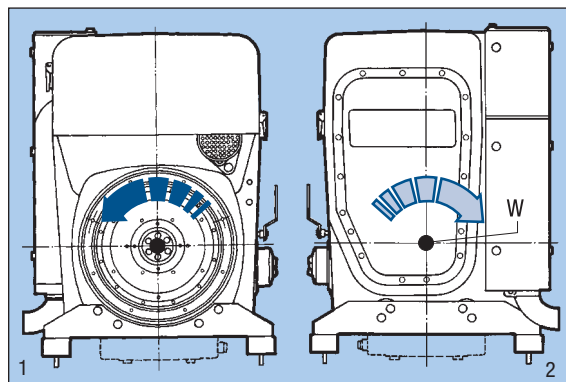
## Scope of delivery of engine

Engine tested for full load on test bench. Engine fitted with blower fan, variable speed governor, injection timer, lubricating oilfilter, dry-type air filter, hydraulic belt tensioner, automatic stop in case of belt failure, automatic extra fuel device, automatic injection pump bleeding, eye hook for transport of engine (only suitable to carry the engine weight). Painting in HATZ standard colours.  
No oil in engine.

**Accessories:** Gasket for 1st maintenance.

Further equipment included in engine variants:

- **Variant XI:** Electric starter 12 V, 2.7 kW, alternator 14 V, 60 A, engine wiring, electric maintenance indicator for airfilter, oil pressure switch, fuel feed pump and fuel filter, exhaust manifold, engine brackets. Additional oil sump (4L41C).
- **Variant XIII:** Same as Variant XI, however electric starter 24 V, 4.0 kW and alternator 28 V, 40 A.



## Additional equipment

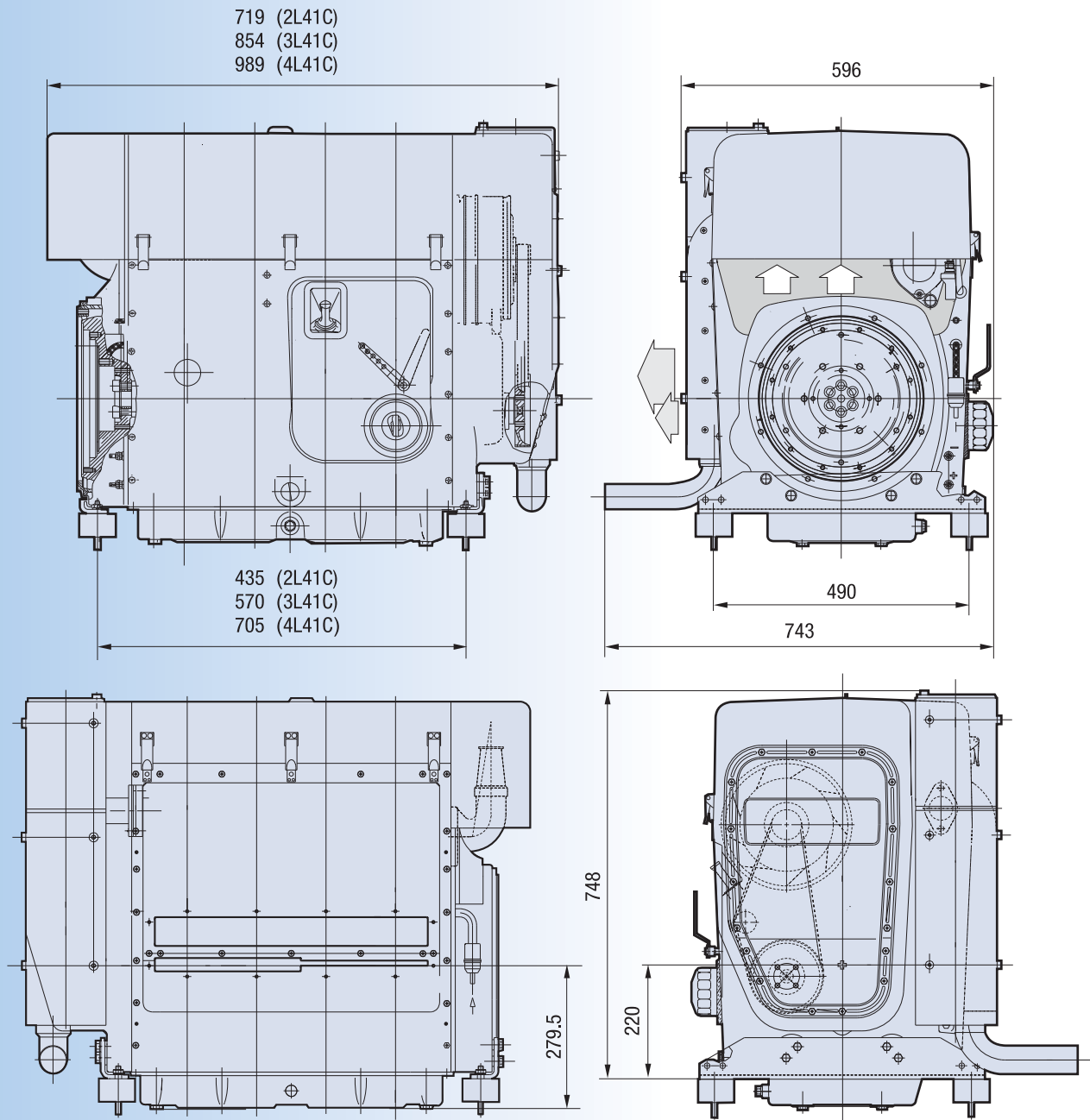
Thanks to the complete programme of additional equipment engine can be adapted to the special requirements of every application.

As a minimum every engine needs the “additional equipment, necessary for operation”.

For selection of additional equipment see “Engine and Equipment Survey”.



## Dimensions



Spread at outlines  $\pm 3$  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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