

Flexible in design - versatile in use

# Hydraulic components for heavy-duty on-highway engines



**LIEBHERR**

# Injector Platform LI1

## New injector platform LI1 for maximum freedom of application

LI1 common rail injectors have been developed for use in large series of light, medium and heavy duty engines. The slim and compactly built design with flexible connection dimensions allows maximum freedom in terms of engine installation space. The software-controlled Injection Timing Control (ITC) function works without an additional connector interface. The latest materials and manufacturing technologies have been used, for a significant increase in system efficiency.

## More installation space for the engine

The particularly short design (maximum 90 mm) of the side-feed injector and the continuous 21 mm housing diameter of the top-feed variant mean additional space in the cylinder head of the engine. The optimized clamping brackets supports provide more flexibility in the area of the valve train. This can reduce the width across flats of the bracket down to 12 mm while increasing the contact surface.

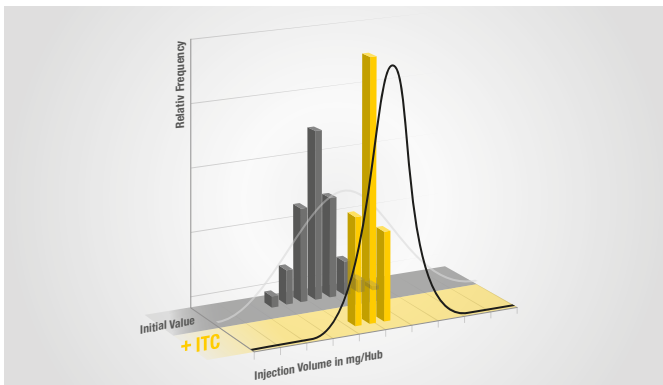


## Wide range of applications

The LI1 stands out with its particularly slim injector concept. This makes it very easy to adapt to a wide variety of engine variants. With its slim and compact design, it is suitable for almost every installation situation in light, medium and heavy-duty applications due to the diverse housing variants and the flexible connection dimensions. The injectors cover a large flow range and are ideal for use in engines from 1 to 2.7 litres per cylinder.

## Minimal application effort

Liebherr LI1 common rail injectors enable activation of the injection timing control functionality via a software module in the electrical control unit (ECU). No additional sensors or electrical connections are needed. The start and end of injection are known without the need for additional sensors and the calibration they require, which significantly reduces efforts during initial application and tuning of the engine.



## Constant performance throughout the service life

With the help of the injection timing control (ITC) function, even small quantities of fuel can be dosed more precisely. Each injector has the necessary hardware to determine the start and end of injection. The software regulates the amount of fuel to be delivered individually for each subsequent injection. This compensates for drift and keeps the injection quantity from the injector constant over the entire service life.

### Long lifetime

Use of the latest material technologies in a special material combination provides the required strength for limited injector dimensions. Combined with mass-produced materials proven for use in challenging applications for years, the LI1 platform has outstanding resistance to demanding and particle-contaminated fuels.

Technical Information	LI1
System pressure	250 - 2,500 bar
Nozzle diameter	7 mm
Hydraulic flow rate	400 - 1,200 ml/30sec
Min. injection separation	100 µs
Permanent leakage	0
Service life on-highway	Medium Duty: 1 million km Heavy Duty: 1.6 million km
Service life off-highway	Medium Duty: 15,000 hours Heavy Duty: 25,000 hours
Control leakage	< 15 ml/min

### High mechanical protection

To meet the increased vibration requirements in the construction machinery sector, the injectors of the LI1 platform are equipped with an electrical interface (E1). In conjunction with a special cap, this complies with protection class IP6K9K. The connector housing is moulded directly to the injector via an injection moulding process. No additional electrical connections in the injector are needed. The plug contact ensures polarity for the injection timing control function for up to 100 plug cycles.

### Precision and stability in mass production

With its competence centre for microprecision components in Deggendorf, Liebherr proves its high level of expertise in the manufacture of stable mass-produced components for modular design. All functionally critical components of the injector platform are designed and manufactured identically. Tolerance differences are reduced to a minimum. A laser process ensures ultra-small bore diameters, which ensures ultra-low CO<sup>2</sup> emissions.

## High Pressure Pump LP7.2

### Common rail high pressure pump LP7.2 for highest hydraulic efficiency

With the LP7.2 high-pressure pump, digital inlet valves control the fuel supply and help, for each cylinder to measure the exact amount of fuel supplied individually. The special design of the pump makes it possible to hold generally occurring dead volumes particularly low. Energy losses are thereby reduced to a minimum. With its very high efficiency, the LP7.2 contributes to low fuel consumption of the engine.

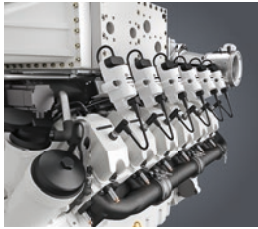
### Easy integration into the engine

Due to their construction as a roller tappet pump LP7.2 is small, lightweight and compact and therefore easy to integrate into existing engine compartments. Like all Liebherr common-rail high-pressure pumps, the LP7.2 has an oil-lubricated drive, making it robust and reliable even under the harshest environmental conditions.



Technical Information	LP7.2
System pressure	250 - 2,500 bar
Max. flow rate	265 l/h
Rated pump speed	3,500 rpm @ 2,500 bar
Max. speed (overspeed)	4,500 rpm @ 1,800 bar

# Liebherr Components



Gas engines



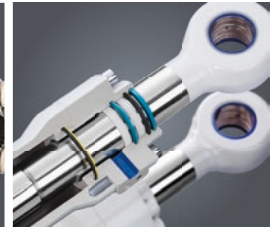
Diesel engines



Fuel injection systems



Axial piston hydraulics



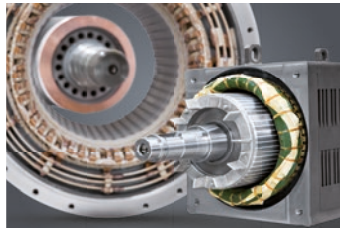
Hydraulic cylinders



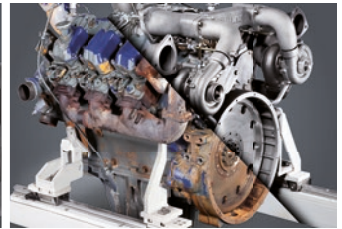
Slewing bearings



Gearboxes and winches



Electric machines



Remanufacturing



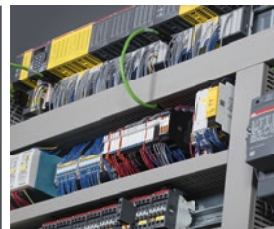
Human-machine interfaces and gateways



Control electronics and sensor technology



Power electronics



Control cabinets



Software

From A to Z – the components division of the Liebherr Group offers a broad range of solutions in the area of mechanical, hydraulic, electric and electronic drive system and control technology. The efficient components and systems are produced at a total of ten production sites around the world to the highest standards of quality. Central contact persons for all product lines are available to our customers at Liebherr-

Components AG and the regional sales and distribution branches.

Liebherr is your partner for joint success: from the product idea to development, manufacture and commissioning right through to customer service solutions like remanufacturing.

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