CREATING POWER SOLUTIONS.

Single-cylinder engines for the digital future

Hatz E1 technology

Engine evolution with Hatz E1 technology

Breaking new technological ground is part of our corporate philosophy. With the new Hatz E1 technology, we carry that philosophy forward into the digital age.

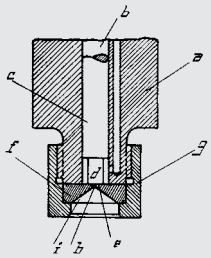
As a world-renowned engine manufacturer, we continually research and develop new technologies for diesel engines. Since the company was founded, it has been in our corporate DNA to set milestones in engine technology. But this is no end in itself; we revolutionise the interplay of people, engines and machines to make your work easier.

Hatz is a pioneer in diesel engine technology for tough industrial applications and a driving force for innovation and progress. The invention of diesel injection with a flattened pinpoint nozzle, the first lightweight engine, the highest performance single-cylinder diesel engine in the world or the world's first multi-cylinder engine with a downsizing principle and electronic control – these are just a few of the milestones in Hatz's company history.

Today, we find ourselves in the middle of the next big step: Industry 4.0 and digitalisation. And here as well, Hatz is your competent technology partner for bringing the traditional engine and machine concepts into the new industrial age – digitally with numerous additional benefits for your business. With the new E1 technology, we are now bringing single-cylinder engines into the networked future.

Nozzle needle with flattened pinpoint

1926



First diesel engine made of lightweight metal

1958

Silent Pack: 90% sound insulation

1976

World's most powerful single-cylinder diesel engine

1996

First downsizing industrial diesel engine

2014

Sponsored by

Bavarian Ministry of Economic Affairs, Regional Development and Energy

E1

Empowering connectivity.

E1 technology: First electronically controlled single-cylinder diesel engine

2020

E1 technology: electronic control for single-cylinder engines

With our Hatz E1 technology, we offer you the world's first electronic control for single-cylinder engines. We bridge the gap between mechanically controlled engines and the requirements of modern companies that work digitally.

For the first time, you can benefit from a combination of proven durability, reliability and longevity in single-cylinder engines with forward-looking electronic components that until now were only available for larger engines and machines.

E1 technology is optimised for Hatz single-cylinder engines. They offer not only maximum functionality, but also durability, as the mechanically controlled engines have demonstrated hundreds of thousands of times in the field. The most important electronic components are the engine control unit, sensors and electronic fuel injector, with an electromagnetic valve specially developed by Hatz in cooperation with Bosch. The interplay of mechanics and electronics optimises engine operation, while also enabling the integrated networking of small equipment for the first time. Interfaces to the control unit allow data to be exchanged at all times. On the one hand, the transfer of data in both directions enables engine data to be analysed, while on the other, it allows new data to be loaded, such as predefined engine speeds or software updates.

Numerous and widely used engines and machines that previously played no role in Industry 4.0 are now part of the digitalisation strategy in companies.

Engine control unit

The key component of E1 technology is the control unit. Constant measurements, for example, of the speed and fuel injection rate, provide precise data on the load condition of the machine. In addition to regulating the engine, the control unit sends engine-related data via CAN J1939. For example, the service life, capacity, engine condition or need for service can easily be read. This interface also offers the convenient option to analyse the engine using the HDS² diagnostic tool.

Diagnostic interface

The universal diagnostic interface is used to connect to the Hatz HDS² diagnostic tool. All data can be read centrally, and new data can be transferred to the device, when needed.

Sensors

The sensors used in E1 technology provide a basis for data collection and control. There are sensors for speed, ambient pressure and oil pressure, as well as for ambient, oil and engine temperature.

Accessories

The full range of accessories for the corresponding single-cylinder series is also available for models with Hatz E1 technology.

Injector nozzle

The tried and tested Hatz injector nozzle distributes the amount of fuel calculated by the control unit and ensures optimal power delivery.

Fuel filter

The fuel filter protects the fuel system, consisting of fuel lines, fuel pump and injector nozzle, from unwanted impurities. It prevents premature wear and defects.

Fuel valve

An elementary component of E1 technology is the electromagnetic fuel valve, which Hatz developed in cooperation with Bosch. Fuel quantity and injection duration and timing are precisely controlled based on the information from the control unit.

Core engine

Tried and proven for more than 20 years and field tested hundreds of thousands of times, the basic engines of the B- and D-series are the basis for engines with E1 technology.

Digitalisation creates added value for machine manufacturers

Not only does digital engine control optimise engine operation and make it easier to tune the engine for the machine. It is also the basis for new, faster and more precise services designed specifically with machine operators in mind.

E1 technology offers machine manufacturers like yourself far-reaching innovations and benefits. There is no longer a need to produce dozens of versions of the same engine model due to mechanical presets. Engines with E1 technology provide a unified platform for every application scenario. For example, constant speeds or defined speed ranges can be specified simply and individually with the control unit via the CAN bus as one option.

Next-generation service
Hatz E1 technology makes it easier for you to diagnose and maintain single-cylinder engines. The engine information is easily read at the central data interface via the HDS² diagnostic software from Hatz. Not only does it record all the engine data, such as running time, speeds or temperature values; evaluation of the data on-site or via remote diagnosis at Hatz shows whether repairs or maintenance are needed, thereby guaranteeing flawless operation over a long period.

Basis for new services

The new E1 technology from Hatz offers much more than just the ability to optimise existing tasks. The digital technology provides a basis for new services, which you can design individually in accordance with your requirements. Possible examples include ordering genuine parts automatically for specific machines or actively replacing engines and machines at the operator's premises once the average maximum service life is reached: Connected Services for optimised and new business processes.

Benefits for you

- Fewer engine versions because the machine manufacturer can configure the speed individually to suit the application
- A digital speed setpoint ensures that the speed is accurately maintained, regardless of environmental conditions
- Ability to perform on-site and remote diagnosis with Hatz HDS²
- The Hatz control unit offers new, convenient functions, such as starter and engine protection, automatic shutdown when the engine idles for too long
- Enables Connected Services via data interface
- Meets the emissions requirements according to EU Stage V and US EPA Tier 4 final

Empowering connectivity.

Benefits of E1 technology in everyday machine operation

As a machine operator, you can take advantage of the new opportunities offered by electronically controlled E1 engines to optimise operation, maintenance and hence operational readiness.

Technical support has always made working with machines safer, easier and more efficient. For Hatz, that is reason enough to offer additional functions for optimised and simplified operation in the form of a digital control unit. These functions include, for example, automatic start protection to avoid damaging the starter and constant monitoring of speed, oil pressure and temperatures. Idling detection for automatic shutoff during long idle times is another helpful function that offers potential savings for many applications, as it enables machine owners to avoid inefficient uptime or unnecessarily high wear and tear.

Furthermore, E1 technology enables the engine to be adapted to different fuel alternatives, such as synthetic fuel.

Reliable database
Manual and frequently incomplete documentation on operating times and maintenance intervals is replaced by precise data from the electronic E1 engine control unit. It provides you at all times with accurate information on the latest data from the sensors and on consumption or service life.

Connected Services for lightweight equipment
E1 technology can do even more. The data from the electronic engine control unit can provide a basis for digital applications that used to be available only for large equipment. Efficient fleet management, digital tracking of machines, accurate billing of customers based on precise recording of operating times – these are just a few examples of applications that are open to you thanks to E1 technology from Hatz.

E1 Empowering connectivity.

Engine convenience functions, including

- Starter protection: Avoid damage caused by overloading the starter or attempting to start a running engine
- Engine protection: Avoid damage by monitoring speed, oil pressure, oil and cylinder temperature. Reduce output or stop when limits are exceeded
- Individually configure maximum idle times with automatic shutoff when engine idles for too long
- Prerequisite for future adaptation to alternative fuels

Connected Services, including

- Health status
- Recording of operating time
- Service optimisation
- Localisation
- Integration in fleet management

Hatz Connected Services
In the future, small machines and lightweight equipment with single-cylinder engines will also be able to benefit from the possibilities of networking and digitalisation. Concepts such as autonomous operation, digital machine folders, condition monitoring, remote maintenance and much more are possible with E1 technology.

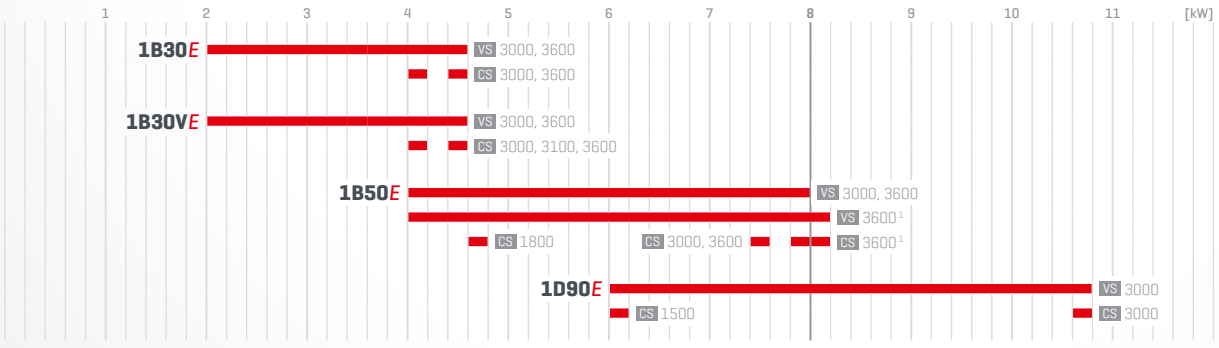
Hatz single-cylinder engines with E1 technology

From the industry's most compact to the world's most powerful single-cylinder engine, the new E1 technology from Hatz, with electronic fuel injection and engine control, is available for the models of Hatz's B- and D-series.

B-series: Flexible solution for every industry
The Hatz B-series is an industrial diesel engine that meets every requirement. The engines excel in mobile and stationary use in all applications with a power requirement of up to eight kilowatts thanks to their compact installation dimensions and low weight. The series also sets standards on the market in terms of durability and service life. Whether on vibratory plates or in the inhospitable atmosphere of Antarctica, the Hatz B-series has been tested hundreds of thousands of times in harsh environments.

D-series: high-performance and flexible
The Hatz D-series is ideally suited for challenging tasks. It is characterised in particular by high performance and flexibility. For example, the 1D90 engine is rated at 11.2 kilowatts, making it the highest performance single-cylinder diesel engine in the world. The engines are freely configurable and in the standard version are limited only to the core engine. By adding some of the many available options, however, the engines can be upgraded to real high-tech products. With up to three different power delivery points on a single engine, the Hatz D-series offers more choices for individual machine design than any other engine on the market.

E1 engine models – power ranges and rated speeds



VS Variable speed CS Constant speed

[1] EU Stage V only

1B30*E*

- Max. output 4.5 kW
- Max. torque 14.7 Nm
- Compact and lightweight design
- Weight 40.8 kg
- Electronic direct injection
- Speed control via CAN J1939, step switch, analogue
- Fulfils EU Stage V and US EPA Tier 4 final

1B30V*E*

- Max. output 4.5 kW
- Max. torque 14.7 Nm
- Vertical crankshaft
- Weight 42.8 kg
- Electronic direct injection
- Speed control via CAN J1939, step switch, analogue
- Fulfils EU Stage V and US EPA Tier 4 final

1B50*E*

- Max. output 7.9 kW
- Max. torque 25.7 Nm
- Compact and lightweight design
- Weight 57.5 kg
- Electronic direct injection
- Speed control via CAN J1939, step switch, analogue
- Fulfils EU Stage V and US EPA Tier 4 final

1D90*E*

- Max. output 10.5 kW
- Max. torque 39.3 Nm
- High-performance and rugged
- Weight 107 kg
- Electronic direct injection
- Speed control via CAN J1939, step switch, analogue
- Fulfils EU Stage V and US EPA Tier 4 final

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CREATING POWER SOLUTIONS.