

Delphi Diesel Fuel Injectors

Delphi Diesel Fuel Injectors are a family of highly versatile mechanical products that can be adapted for use in a wide range of light duty, medium duty and heavy duty fuel systems for both direct injection and indirect injection diesel engines. They are precision-engineered for both mechanically- and electronically-controlled pump line nozzle systems. They can be configured in conventional bar-type designs for axial-feed or side-feed, or forged body designs for a variety of angled side-feed applications.

The nozzle valve of Delphi Diesel Fuel Injectors is mechanically closed by a high stress-capable spring, and the opening pressure is accurately set by high precision shims. Their proven, cost effective technology and application flexibility provide manufacturers with excellent value.

Low Spring Injector Features and Options:

- Valve spring positioned low in injector body for reduced moving mass
- Holder body types: bar stock or forged construction
- Body diameters from 17 mm upward
- Compact profiles
- Direct injection (DI) engine and indirect injection (IDI) engine versions available
- Range of inlet and backleak configurations
- Start-of-injection sensor injectors
- Enhanced injection pressure option:
 - Specifically developed to be compatible with electronic unit pump (EUP) systems operating at high injection pressures
 - May be installed within the cylinder head, connecting to the EUP with a purpose-made high pressure line/connecting tube
 - Injectors withstand operating pressures up to 2,000 bar

Nozzle Options:

- **Multi-Hole Nozzles for Direct Injection Engines**
 - Long Stem Nozzle options available include:
 - Guide diameters from 4 mm to 6 mm
 - Various spray cone angles with injection hole configurations specifically tailored to individual engine requirements
 - Outline to ISO standards more commonly with 7 mm or 9 mm diameter shank
 - Variety of seat profiles available to suit application requirements
 - Sac-type nozzles available with mini-sac or conical sac
 - Valve covered orifice (VCO) nozzles that contribute to low carbon emissions
 - Nozzle holes tailored to the engine application with hole diameters from 0.12 mm and with options for hole form pre-conditioning and holes with conical form
 - Long Stem Nozzles are available in two types:
 - Standard guide configuration
 - Extended guide configuration, which is important when space is limited or extreme injection pressures are encountered



Delphi offers a variety of diesel fuel injectors to meet a wide range of applications.

- **Pintle Nozzles for Indirect Injection Engines**
 - Produce a single spray plume tailored to match pre-combustion chamber swirl characteristics
 - International standard short stem types available
 - Optional pintaux (Pintle/auxiliary) hole produces high velocity spray at a low injection rate for improved cold starting and reduced engine knock idling

▶ Benefits

- Bar and forged body designs available
- High pressure injection capability up to 2,000 bar
- Design configuration flexibility
- Proven reliability and durability
- Wide range of nozzle options available
- Cost effective technology
- Target emissions: Euro II, III and IV; US02 and US04; Tier II and III; and equivalent

▶ Typical Applications

Delphi offers a wide range of diesel fuel injectors for automotive and non-automotive automotive applications.

▶ Performance Advantages

Delphi Diesel Fuel Injectors are available in a wide range of designs, which can be specifically tailored to the requirements of the customer and the individual engine program. This provides manufacturers the freedom to optimize the engine and vehicle emissions performance with engine design and other fuel system components. When combined with other appropriate fuel system components, Delphi Diesel Fuel Injectors have proven to contribute to the achievement of emissions standards up to and including Euro IV.

▶ The Delphi Advantage

Delphi is actively involved in the development of advanced diesel technology. Extensive experience in high pressure fuel injection technology has helped Delphi develop several innovative design and control strategies to meet customer needs for cost-competitive injection systems that provide accurate injection over the life of the engine and low noise. Delphi has 15 diesel design and engineering centers located in Europe, Asia, North America and South America, and 21 diesel manufacturing facilities in 13 countries enabling exception on-time delivery.

As a global leader in engine management systems, Delphi can help manufacturers around the world meet emissions requirements, improve fuel economy and enhance performance. Delphi is a source for high value solutions and our systems approach is built into every product. And, Delphi has a thorough understanding of automotive markets around the world and a global network of resources.



Samples of Delphi's direct injection (DI) injectors for diesel engines.



Fuel spray from Delphi diesel injector for direct injection (DI) engines.