

Delphi Diesel Injectors

Description

Delphi's conventional Diesel Injectors are precision-engineered for both mechanically and electronically controlled pump line nozzle systems. The Delphi range comprises a variety of holder and nozzle combinations for all major engine configurations.

The injector's two main components are:

- Nozzle holders for either axial or side fuel feed and available in various ISO outlines, including: 17 mm, 19 mm, and 21 mm outside diameters. They are supplied in traditional high spring configuration or the more modern low spring arrangement. They include:
 - Valve spring
 - Spindle and/or spring seat
 - Shim or adjusting cap for spring load adjustment
 - Fuel inlet and backleak connections
 - Nozzle cap nut
 - Mounting hardware
- Nozzle assembly incorporating body and needle valve



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

Benefits

- Extensive portfolio of proven nozzles produced through aggressive technology development efforts and intended to meet virtually any major engine application
- Complete selection of product features that can meet most customer requirements
- Precision-engineered for robust performance and durability
- Responsive, experienced sales and engineering support to help achieve customer satisfaction

DELPHI

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Delphi Diesel Injectors

Nozzle Options

Multi-Hole Nozzles

- For Direct Injection (DI) engines
- Inject fuel directly into cylinder, with a combustion chamber formed in the top of the piston
- Long Stem Nozzles include:
 - 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 provide low hydrocarbon emissions
- Long Stem Nozzles are available in two types:
 - Standard guide configuration
 - Advanced extended guide configuration important where space is limited or extreme injection pressures encountered

Pintle Nozzles

- For Indirect Injection (IDI) Engines
- Produce a single spray plume that is tailored to match pre-combustion chamber or swirl chamber characteristics
- Long and short stem types available
- Long stem pintle nozzle offers reduced coking and better dynamic performance
- Optional pintaux (pintle/auxiliary) hole produces high-velocity spray at a low injection rate for improved cold starting and reduced engine knock at idling



Samples of Delphi Direct Injection (DI) Injectors for diesel engines



Samples of Delphi Indirect Injection (IDI) Injectors

Delphi Diesel Injectors

Low Spring Injector Features

- Valve spring positioned low in injector body for reduced moving mass
- Holder body types: bar stock or forged construction
- Compact profiles
- Direct Injection (DI) engine and Indirect Injection (IDI) engine versions available
- Range of inlet and backleak configurations
- Outside diameters of more popular holders: range from 17 mm to 25 mm

Low Spring Injector Options

Two-stage Injectors

- Designed to help combat engine noise by reducing combustion pressure rise and peak cylinder pressure—without loss of power
- Restricts opening during first stage of operation; during second stage, injector opens fully
- Injection during second stage occurs at higher pressure and injection rate
- Additional spring and thrust component used to achieve second stage
- Adjustable opening pressures and lifts for custom applications
- Typically used in small, high-speed DI engines (passenger cars, light trucks and vans)

Start-of-Injection Sensor Injectors

- Sensor integrated with control system
- Part of the injection timing feedback loop
- Helps maintain accurate injection timing over the life of the engine by compensating for engine wear

Unit Pump Injectors

- An extension to the low spring injector family
- Specifically tailored for use with electronic unit pump (EUP) at high injection pressures
- Typically installed within cylinder head, connecting to the EUP with a purpose-made high-pressure line/connecting tube
- Injectors withstand operating pressures up to 2000 bar

Delphi Advantage

Delphi is an industry leader in diesel fuel injection systems and is developing advanced technologies to help vehicle manufacturers meet new emissions requirements and to enhance fuel economy and performance.