

Delphi Multec[®] Medium Duty Diesel Common Rail System

The Delphi Multec[®] Medium Duty Diesel Common Rail (MDCR) System is an advanced diesel fuel injection system with variants capable of 2,000 bar system pressure. It uses a fast-acting solenoid injector design to optimize fuel rate, spray shape and accuracy, which provides small injection quantities in a compact injector package. Using closed-loop control strategies, it delivers precise fuel quantities over the life of the engine for cost-effective, robust emissions and acoustics performance.

► Benefits of Major Components

Electronically Actuated Injectors

- Driven by a pressure-balanced 12 V solenoid valve, the force required to move the solenoid remains constant regardless of prevailing injection pressure thus eliminating the space and cost of larger solenoid valves or retention springs
- Flexible packaging with axial-feed, integral side-feed and pressure tube high pressure connections
- Body diameter options including 17, 19 and 26 mm available in a wide variety of lengths
- Multiple injection capability (pre-, main, and post injections; up to five per cycle) to help reduce emissions as required by Euro 5/6, US10, Tier 4 Final and beyond
- Individual Injector Characterization provides superb performance, reducing delivery quantity variation while also helping to reduce manufacturing costs and improve quality
- Low fuel backflow design helps reduce parasitic losses and reduces requirements for return flow cooling
- Electrical connector with IP69 sealing, which allows for location under the valve cover



Delphi Multec[®] Medium Duty Diesel Common Rail System includes: (clockwise from top right) DF12 Injectors and DFR3 Rail, DFP4 High Pressure Fuel Pump, DCM3.3 Medium Duty Controller, and DFF3 Fuel Filter. (Other variants of these products are available, depending on application requirements.)

High Pressure Pump

- Capable of 2,000 bar system pressure
- Modular pump design with capability for engine ratings up to 320 kW
- Includes integrated inlet-metering valve and transfer pump
- Options include fuel supply for a DPF regeneration system, pressure limiting valve, and fuel temperature sensor

Common Rail with Integral Pressure Sensor

- Tubular rail design can be customized to individual customer requirements
- Options include high pressure relief valve and a mechanical pressure limiting valve
- Hydraulically optimized to reduce pressure wave interaction, allowing precise control of up to five injections per cycle

Filtration Unit

- Filter range with option including integral water sensor, hand priming pump and electrical heater
- High efficiency filter medium
- The design may be customized to match application requirements

Electronic Control Units

- 32-bit processor
- Variants available for chassis or engine mounting
- Delphi proprietary engine management software which, in addition to controlling the Delphi Multec Medium Duty Diesel Common Rail System, includes control strategies for the engine and many vehicle/machine functions
- Options for integration with 24 V electrical systems

▶ **Typical Applications**

The Delphi Multec Medium Duty Diesel Common Rail System is suitable for single- and multi-cylinder engines in medium duty on- and off-highway vehicle applications to enable manufacturers to meet Euro 5/6, US10, Tier 4 Final and future emissions standards.

▶ **Performance Advantages**

The Delphi Multec Medium Duty Diesel Common Rail System offers significant simplification of fuel and control systems.

- The injectors operate at 12 V with low energy requirements, enabling a less complex and more cost-effective electronics design.
- Slim injectors are available to allow efficient packaging in 4-valve cylinder heads.
- The injectors may perform the pressure relief function in conjunction with the inlet metering system to eliminate the need for a separate high pressure valve.
- The Individual Injector Control strategy improves consistency of cylinder-to-cylinder injected fuel quantity.
- The Accelerometer Pilot Control (APC) "listens" to engine combustion and adjusts the injector drive pulse to help the engine, over its life, maintain consistently clean, quiet and smooth running.

▶ **The Delphi Advantage**

Delphi is a world leader in innovation, design and the manufacture of medium duty diesel fuel systems. Delphi offers the benefits of many years' experience in the medium duty diesel market and a long history of working closely with manufacturers. Delphi medium duty diesel fuel systems can be found on millions of engines around the world.

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 expertise is built into every product. Delphi's flexible engineering approach encourages collaboration. And, Delphi has a thorough understanding of automotive markets around the world and a global network of resources.



Delphi offers diesel injectors with axial-feed, integral side-feed and pressure tube high pressure connections.