

Delphi DP210 Rotary Mechanical Diesel Fuel Injection Pump

The Delphi DP210 Rotary Mechanical Diesel Fuel Injection Pump is based on the Delphi DPA and DPS pumps, as well as the more advanced DP200 Series. It is a viable alternative to electronic control for diesel engine applications that must meet U.S. Tier II and equivalent emissions standards. The DP210 Injection Pump's performance capability includes improved injection timing control, enhanced fuel/torque curve shaping, and improved pump-to-engine timing. The main components of the DP210 Injection Pump include:

- Fuel inlet with inlet pressure variation and fuel viscosity compensation
- Transfer pump with pressure regulator
- Four-plunger pumping element with enhanced filling capability
- Distributor system with reduced high pressure volume
- Internal cam ring with scroll plate filling control
- Injection timing control with increased light load advance travel
- Zero backlash drive shaft with increased shaft locking torque and improved timing accuracy
- Metering valve
- Mechanical all-speed governor
- Torque trimmer with excess fuel provision
- Electric shut-off



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Options include:

- Clockwise or anti-clockwise drive
- Boost control for turbocharged engines
- Cold running injection timing control for operation at low engine coolant temperatures
- Mechanical generator set governing
- Electronic generator set governing conversion capability
- B20 and ultra low sulphur diesel compatible component package
- Adaptors for quick-fitting, low pressure connections
- Two plunger design for low ratings and indirect injection (IDI) applications
- Timing overcheck feature

► Benefits

- Light load advance enhancements are designed to help meet U.S Tier II and equivalent emissions standards. Retarded full load injection timing reduces nitrous oxide (NO_x) emissions, and light load advance travel capability to 28° engine maintains misfire margin at part load. The light load injection timing is set on each pump and the speed advance is controlled by a fixed stop at rated speed to provide advance consistency. The advance response rate is optimized to help prevent transient misfire.
- Torque curve shaping provides delivery capacity up to 120 mm³ of fuel per pumping stroke and enables higher levels of torque backup.
- An available solenoid actuated cold advance helps prevent misfire when the engine coolant temperature is low.

- New methods of measuring and setting injection timing help meet emissions requirements. Once the pump is set, the drive shaft can be clamped using an improved locking method.
- Available industry-standard adaptors for quick-fitting connectors provide low pressure system connection to the inlet and backleak of the pump. The advance box enables packaging in confined engine installations.

▶ **Typical Applications**

The Delphi DP210 Rotary Mechanical Diesel Fuel Injection Pump is suitable for three-, four-, and six-cylinder engines in on- and off-road applications. It can be used in naturally aspirated and turbocharged engines with or without charge air cooling.

▶ **Performance Advantages**

The basic operating principle of the Delphi DP210 Rotary Mechanical Diesel Fuel Injection Pump is the same as the highly successful Delphi DP200, DPS, and DPA fuel injection pumps. Fuel enters the pump and is raised to a pressure of about six bar for proper control of fuel quantity and timing.

Between injections, fuel is fed through a control (metering) valve into the distributor rotor center. At full fuel, the valve is held open and the pump delivers maximum fuel quantity. It is regulated by the maximum displacement of the pumping plungers and controlled by moveable scroll plates. A maximum fuel curve shaping device is designed specifically for each engine application to optimize fuel delivery at any engine speed. At lower engine loads, fuel is controlled via the governor, which throttles filling of the pipe.

During the pumping phase, the plungers are forced inward causing an injection pulse to travel from the pump to the injector in the engine cylinder via delivery valve and high pressure pipe. Timing of the injection is controlled or altered by rotation of the cam relative to the pumping plungers and drive shaft.

▶ **The Delphi Advantage**

Delphi is a world leader in innovation, design and the manufacture of medium duty diesel fuel systems. Delphi has 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 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 markets around the world and a global network of resources.