

# Delphi DPGE Medium Duty Diesel Rotary Fuel Injection Pump

The Delphi DPGE Medium Duty Diesel Rotary Fuel Injection Pump is a fixed speed pump based on the Delphi DP200 Series of fuel pumps and includes mechanical governor enhancements providing durable governor performance to ISO 8528-5 Alternator Set Class G2 standards. The pump offers light load advance and is suitable for fixed speed applications which must comply with EU 2007 and U.S. Tier III exhaust emissions standards. The pump offers easy in-service conversion to electronic operation using an integrated governor controller and actuator. The main components of the Delphi DPGE Pump include:



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- Fuel inlet
- Transfer pump with pressure regulator and viscosity compensation
- Distributor pumping system with four plungers
- Internal cam ring
- Driveshaft with locking feature
- Load Advance control
- Cold running advance for operation at low engine coolant temperatures
- Metering valve
- Mechanical governor with low friction and wear features
- Governor transient stabilizer
- Electric shut-off

Options include:

- Clockwise or anti-clockwise drive
- Rape methyl ester (RME) 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

- Enhancements to the design of the governor improve wear performance of the governor components and low friction pivots reduce hysteresis performance between governor load on and load off characteristics.
- A hydraulic damper fitted to the governor helps keep the alternator stable and within acceptable governing requirements.
- A simple conversion to electronic governing with an integrated governor controller and actuator allows in-service upgrades. No separate controller is needed, helping to minimize wiring harness complexity. Digital control helps provide precise governing with multiple governing strategies such as isochronous load sharing, 50/60 Hz switching, and auxiliary load sharing.

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- Light load advance is designed to help meet EU 2007 and U.S. Tier III emissions standards for generating sets. Retarded full load injection timing reduces nitrous oxide emissions, and light load advance travel capability to 20° engine maintains misfire margin at part load.
- The integrated wax-motor 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 locked ready for installation on the engine.
- If required, the pump can be provided with a feature which allows factory timing setting to be over-checked or re-set.
- Available industry-standard adaptors for quick fitting connectors provide low pressure system connection to the inlet and backleak of the pump.
- Optional elastomer seals throughout the pump enable bio-diesel fuel compatibility.

(Note: Bio-diesel fuels are not recommended for installations that are used infrequently such as "Stand-by" Alternator Sets, due to the unstable nature of the fuel.)

## ▶ Typical Applications

The Delphi DPGE Medium Duty Diesel Rotary Fuel Injection Pump is suitable for three, four and six-cylinder diesel engines used for fixed speed applications such as alternator sets (gen sets). It can be used on naturally aspirated and in turbocharged engines, with or without charge air cooling.

## ▶ Performance Advantages

The basic operating principal of the Delphi DPGE Medium Duty Diesel Rotary Fuel Injection Pump is the same as the highly successful Delphi DP200 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 adjusting plates. At lower engine loads, fuel is controlled via the governor, which throttles filling of the pump. 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 the 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 actively involved in the development of advanced diesel technology that will help manufacturers meet stringent emissions standards while enhancing fuel economy and performance. Extensive experience in high pressure fuel injection technology has also helped Delphi develop several innovative design and control strategies to meet customer needs for cost-competitive, high value injection systems that provide accurate injection over the life of the engine, helping minimize emissions and providing robust performance 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 exceptional on-time delivery.