



# Increase Fuel Efficiency with Direct Fuel Injection System Design (20130097, Dr. Zongxuan Sun)

Technology No. 20130097

**IP Status:** Issued US Patent; **Application #:** 14/758,882

## Direct Fuel Injection System Increases Engine Efficiency

The direct fuel injection system design incorporates a fuel injection assembly to deliver continuously variable injection flow rate by controlling the injector needle position. An iterative learning control feedback circuit controller is utilized to provide the optimum fuel injection rate at all times. This increases the fuel combustion efficiency and leads to improved fuel economy.

### MN-IP Try and Buy

#### Try

- Trial fee is \$5,000 for a six month license

#### Buy

- \$30,000 conversion fee (TRY to BUY)
- No patent costs
- Royalty rate of 3% (2% for MN company)
- Royalty free for first \$1M in sales

## Improve Fuel Economy and Reduce Engine Emissions

The most common method of fuel injection currently uses multiple injection; the described invention overcomes the injection quality inconsistency caused by the conventional system. By

controlling the position of the needle the design can deliver a continuous variable injection flow rate, which can increase engine performance, improve fuel efficiency and reduce emissions.

#### **BENEFITS OF DIRECT FUEL INJECTOR SYSTEM:**

- The iterative learning control corrects the injection flow rate cycle by cycle, leading to optimum fuel injection.
- Optimum fuel injection can increase engine efficiency, improve fuel economy and reduce emissions.
- Lower emissions lead to a more environmentally friendly engine.

#### **Researchers**

Zongxuan Sun, PhD

*Department of Mechanical Engineering, School of Science and Engineering*

[External Link](http://www.me.umn.edu) (www.me.umn.edu)

<https://license.umn.edu/product/increase-fuel-efficiency-with-direct-fuel-injection-system-design>