

LASER IGNITION FOR AUTOMOTIVE ENGINES

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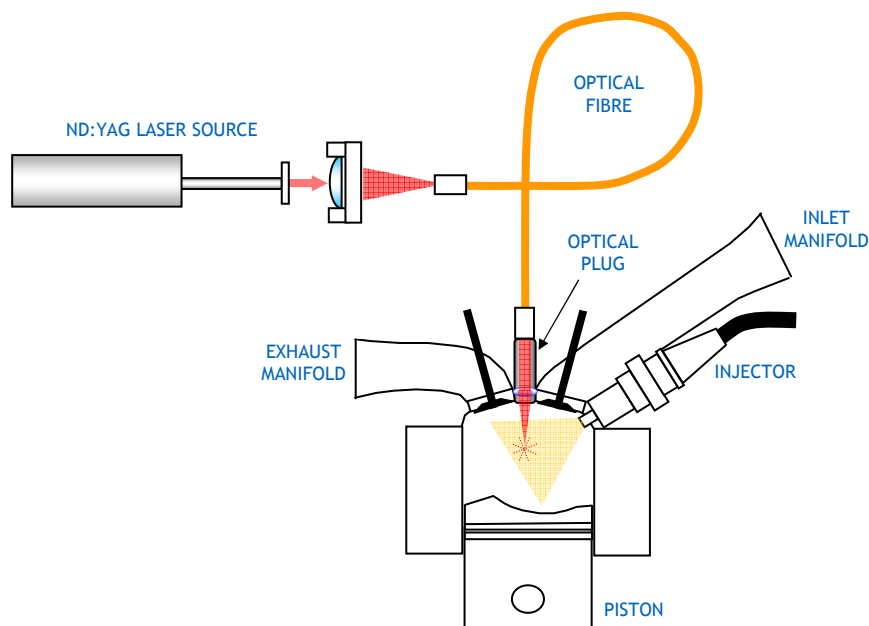
Ford Motor Company Ltd

COST AND DURATION

The Carbon Trust contribution towards this project is £198,910. The project started in July 2008 and is due for completion in June 2010.

PROJECT REFERENCE NUMBER

076-207



Optical fibre, laser ignition system for next generation GDI Ford engine

OBJECTIVES

The aim of this project is to reduce tailpipe exhaust emissions, particularly CO₂, from automotive engines using an improved ignition system based on lasers.

To do this, the following objectives will be met:

- An optimised laser ignition (LI) optical system will be developed
- A robust LI optical plug will be designed
- Suitable optical fibres to deliver the laser beam from the source to the plug will be determined.

SUMMARY

Modern gasoline internal combustion engines are more efficient and cleaner than their predecessors due to stricter and more effective control of operating parameters. However, engine design is still restricted by the limitations of the ignition method.

Large improvements in engine efficiency can be achieved using an improved ignition system based on LI. Anticipated combustion benefits, which will affect the environmental performance of the engines, include:

- Increased combustion speed and thermal efficiency
- Controllable ignition location that can be optimised for different operating conditions
- The elimination of cold-start, spark plug fouling.
- No disturbance to in-cylinder flow due to the spark plug.
- Increased flexibility in the design of the cylinder head and combustion chamber.

LI also addresses an issue that has, to date, inhibited the uptake of bio-fuelled engine technology by consumers (i.e. cold-start difficulties). It is envisaged that a successful LI system would reduce this problem and, therefore, lead to greater sales of bio-fuel vehicles.

