

Extension Activity

Motor-Generator Set

Introduction

This activity is associated with four Engineering Areas: General Engineering; Mechanical Engineering; Energy, Sustainability and the Environment; and Aerospace and Aerothermal Engineering.

The activity relates to the efficient generation of electrical energy from fossil fuel. Specifically, we are interested in the use of a small internal combustion engine to generate electricity. This device is of increasing importance in electrically driven cars, where the limited energy storage capacity of batteries can be overcome by the use of a 'range-extender': a small engine and generator for recharging the batteries.

The aim is to investigate some of the design and performance issues of a motor-generator set in a range-extender application. Your task will be to examine the design and performance of the motor-generator set and to suggest improvements to the design. Test rigs in the mechanics lab will be used to perform experiments on running engines and generators and on their component parts. Aspects available for investigation are:

- (i) Materials, processing and design.
- (ii) Efficiency of the energy conversion.
- (iii) Vibration.
- (iv) Mechanical losses in the engine.
- (v) Valvetrain design and performance.
- (vi) Engine/generator speed control.

The activity runs twice during Lent term. Sign up online.

Contact Dr David Cole djc13@cam.ac.uk with any queries.