

## ELETRONIC MANAGEMENT OF OTTO CYCLE ENGINES

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### Objectives

Modeling, building and testing two control units for automotive Otto Cycle ICE's and, subsequently, develop algorithms for closed-loop control using sensors to measure exhaust-gas oxygen concentration (Lambda) and fuel composition (Flex-fuel).

### Materials and Methods

This project relies on the cooperative efforts of RIBEIRO, G. G.; SANTOS, F. G. The study has been divided into steps to meet the goals initially proposed:

- Study and revision of previous projects;
- Hardware construction;
- Bench-testing: Hardware in the Loop and V-Modeling;
- Software development and improvement;
- Engine testing on *Volkswagen Gol, 2009, G5 1.6L, Total Flex*;
- Data acquisition and data analysis.

### Results

Due to the complexity of this project, this work was responsible for the preparation and validation of the hardware quality.

The initial design of the printed circuit board was designed by 464 components, which were manually welded into two units.

After the ready hardware, quality test were carried out to ascertain the reliability of component welding, which proved to be very satisfactory. However, he came up with board design problems.



Picture 1: Electronic Control Unity finished

### Conclusions

The control unit modeled and built achieved the proposed objectives, resulting in a hardware that presented great build quality and powering the system.

Project fostered by *Associação dos Engenheiros Politécnicos*.

### References

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