



DEPARTMENT OF AUTOMOTIVE AND AERONAUTICAL ENGINEERING

# Reverse Engineering of Passenger Jets – Classified Design Parameters

Task for a *Master thesis* according to university regulations

## Background

For competitive reasons manufacturers try to protect their product design with its inherent parameters. This is done to protect company know-how and to maintain a possible design advantage with respect to competing products. This principle is followed not only in case of military aircraft, but also for civil passenger jets. Parameters like maximum take-off mass are known as part of the certification process. Further parameters may be given, because they are uncritical or needed for aircraft operation. Other parameters like aerodynamic efficiency or engine efficiency are classified information. It would be beneficial to know such parameters to do own flight performance calculations or even redo a preliminary sizing of the aircraft under investigation. This can be done out of interest, educational exercise or for a more in depth case study. Knowing classified parameters would enable a comparison of various similar contemporary aircraft or to investigate the evolution of aircraft with their parameters throughout aviation history. Reverse Engineering is a legal possibility to acquire the knowledge withheld.

## Task

The task of this thesis is to investigate classified design parameters and find a method to calculate them from known aircraft parameters. This should be done by preliminary aircraft sizing in combination with reverse engineering. The tasks of the project are as follows:

- Review the basics of preliminary sizing of large (CS-25) passenger jet aircraft.
- Examine the concept of reverse engineering.
- Apply reverse engineering to preliminary sizing of large passenger jet aircraft.
- Construct a tool to enable reverse engineering to the given domain and level of detail.

- Apply the tool to a number of interesting passenger jets.
- Analyze and interpret the results. Summarize the results in a case study for every investigated and reverse engineered aircraft. Compare the results of the case studies.

The report has to be written in English based on German or international standards on report writing.