Project **ABARTH 2000** - 5BHK-00/01
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Background

The brand name ABARTH symbolizes for insiders a piece of Austrian-Italian automobile history. Carlo ABARTH (1908-1979) was an Austrian engine-tuner. Interestingly some graduates of the HTL Steyr worked as designer engineers for ABARTH. We thought there was a need for action as there are no original spare parts available world-wide.

Project Targets

To create a true to the original copy of the ABARTH-engine-block type 236 – 2000 cm³ within the scope of a project for our school-leaving exam. The aims of this project work include:

- project-oriented lessons
- 3D-designing (ProEngineer)
- specialisation in model- and casting processes

Timeplan + Milestones

	12/99	Project start 5BHK-99/00
➲	09/00	**Transfer to the 5BHK-00/01**
	bis 03/01	3D-Design
	01/01	Model Manufacture – Rapid Prototyping
	02-04/01	Creating the 2D-drawings
	03-04/01	Core boxes, patterns and cores
➲	24.04.01	**Initial cast, and presentation**
	05/01	Documentation
➲	29.06.01	**Project-end, Final examination**

Results / Benefits

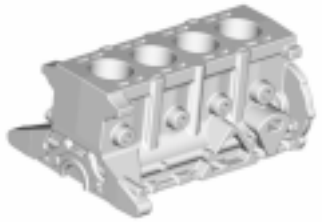
- 3D-Model of the engine-block
- Tooling for core- and pattern-manufacture
- 2 engine-blocks
- Contact with industry
- Know-how increase for the project-team

Abarth Engine-Block Type 236

The engine-type 236 was used in Grand tourisme sport-coupès as well as in open racing cars for competitions between 1963 and 1970.
The 2 litre-engine has a performance of up to 275 HP and 280 Nm at 6200 1/min.

3D-Design - ProEngineer

For the 3D-design ProEngineer was used. The engine-block has been designed and constructed using current best practice in the automobile industry using layout-skeleton-assembly methods. Each assembly is completely parameterised. The 3D-designing method has the advantage that the 3D-models of the engine block are essentially the same for both cores and tooling.



Model-Manufacture - Rapid Prototyping

Maize-staich model

Papier-mâchè model

Models were built using rapid-prototyping methods to illustrate the 3D-design, and also to enable control and analysis of any potential weak areas.

Corebox and Pattern Manufacture

The 3D-tooling designed in ProEngineer was transferred to a CAM-system. The manufacturing methods and strategies were finalised and directly transferred to the machine. CNC-manufacture of the core boxes and pattern plates could begin.

Core Production

The cores were made by means of core boxes produced using the Coldbox method. Only the water jacket core had to be produced using laser-sinter technology because of the extremely thin walls.

Casting

First the upper and lower moulding boxes with the pattern plates were made by hand. Then the cores were inserted, and cast iron poured at a temperature of approx. 1300 C. Finally after cooling down the sand cores were removed and the casting was cleaned up – **the first engine block was finished!**

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Project-Team

Picture: K. Steinparz, OÖ Kronen Zeitung

Andreas Frühwirth, Sabine Madlmayr, Stefan Polly

Project Managers

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Dipl.-Ing. Engelbert Wührer
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FL Gerhard Riepel
FOL Leopold Wiesinger
Coordination
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Sponsors

Becker GmbH, Steffenberg-Quotshausen
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Kritzinger Thomas, Absolvent der HTL Steyr
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Vantico GmbH, Wien
VAW Mandl&Berger, Linz
Wagner Schmelztechnik, Enns

HTL Steyr - HighTechLife

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Ausbildungszweige der HTL Steyr

Elektronik - Technische Informatik
Höhere Abteilung: 5-jährig mit Reifeprüfung
Fachschule: 4-jährig mit Abschlussprüfung

Fahrzeug- und Motorentechnik
Höhere Abteilung: 5-jährig mit Reifeprüfung
Fachschule: 4-jährig mit Abschlussprüfung

Maschinen- und Anlagentechnik
Höhere Abteilung: 5-jährig mit Reifeprüfung
Schwerpunkte: Mechatronik oder Umwelttechnik

Kunsthandwerk, Metallgestaltung und Design
Fachschule: 4-jährig mit Abschlussprüfung
Ausbildungszweige: Goldschmiede,
Graveure und Kunstschmiede

Department of Mechanical Engineering
Engine and Vehicle Technology

ABARTH 2000

The project-target was to create a copy of the ABARTH engine-block type 236 - 2000 cm³ true to the original.

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