



Wankel Rotary Piston Engine Design Project

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DOI: [10.5281/zenodo.11117047](https://doi.org/10.5281/zenodo.11117047)

Submission Date: 16 April 2024 | Published Date: 06 May 2024

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Abstract

This study explains the “WANKEL ROTARY PISTON ENGINE DESIGN PROJECT” realized by the students who study at Automotive Technology Department at Iğdır University, Turkey.

Asst. Prof. Dr. Emin Taner ELMAS, who is the Department Head of Division of Motor Vehicles and Transportation Technologies, Department of Automotive Technology, at Vocational School of Higher Education for Technical Sciences of Iğdır University, Turkey, gives information about the WANKEL ROTARY PISTON ENGINE DESIGN PROJECT that the 2nd year students of the Automotive Technology Program were working on during 2021-2022 Academic Year Spring Semester.

Keywords: Wankel Rotary Piston Engine, Internal Combustion Engine.

INTRODUCTION & METHOD, FINDINGS AND DISCUSSION & CONCLUSION

This study explains the “WANKEL ROTARY PISTON ENGINE DESIGN PROJECT” realized by the students who study at Automotive Technology Department at Iğdır University, Turkey.

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Under the advisory of **Asst. Prof. Dr. Emin Taner ELMAS**, 2nd year students of the Automotive Technology Program named Beytullah Ocak, Muhammed Yunus Gürbüz, Mesut Çınar and Ramazan Yeşilbudak performed their work on developing a revised Wankel Engine design. The project study is based on the principle of modifying and improving the movement-producing part called “Rotor of the Wankel Engine”, which is in the alternative engines class of internal combustion engines and also known as Rotary Engine, and ultimately designing a revised engine with its disadvantages eliminated, 3D modeling and carried out using a specific drawing program.

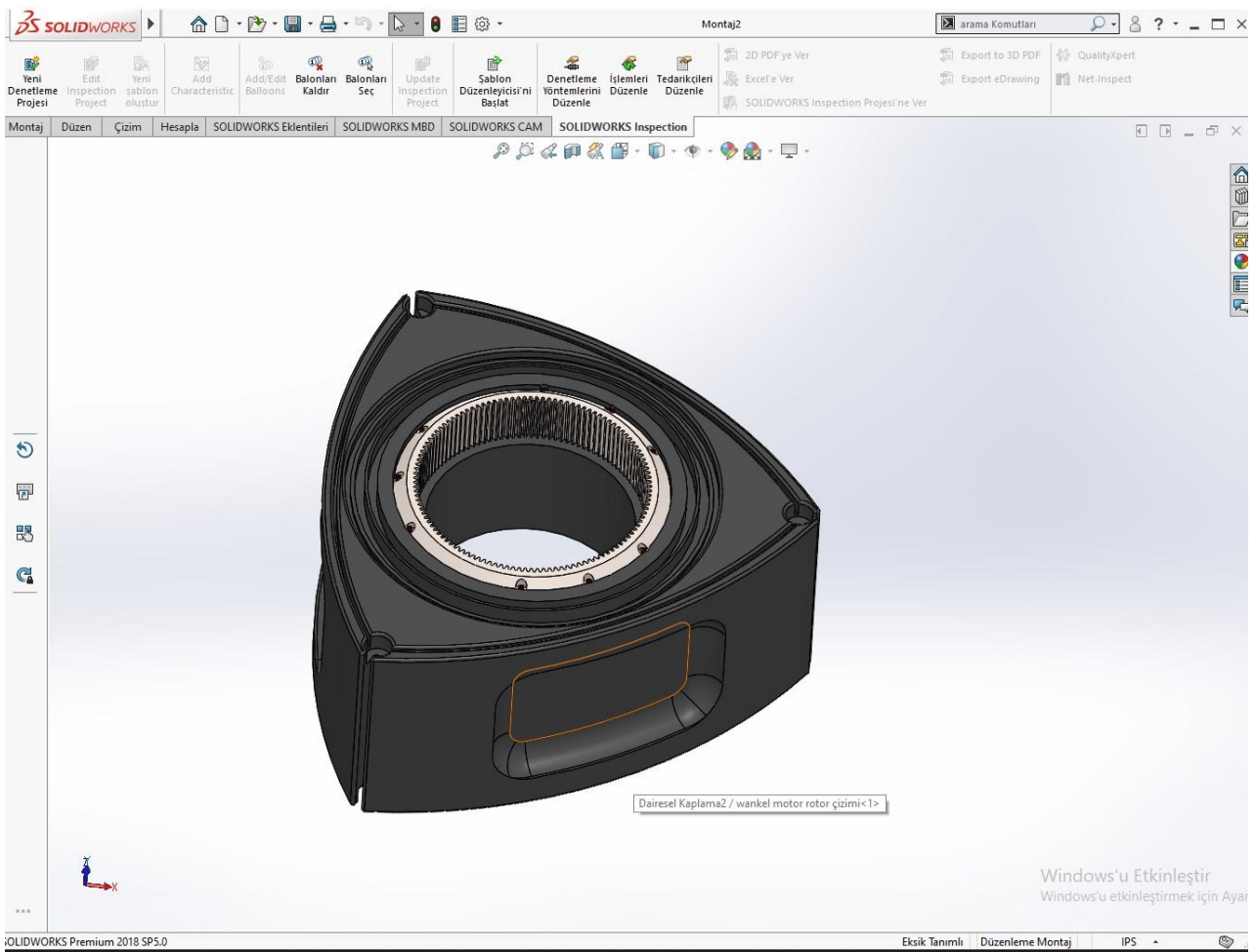
The mentioned students at the above paragraph became interested in this project while they were studying the subject of Wankel Engines in the course called Alternative Engines and Alternative Fuel Systems taught by **Asst. Prof. Dr. Emin Taner ELMAS**. Stating that the project in question will be revised in the Rotor part, which is the rotating piston of the Wankel Engine, the rotor rings will be redesigned, and that an appropriate type of piston liner sealing part will be placed on the engine block, and that when the project is completed, the modified Wankel engine will have a

superior sealing feature and a long engine life. The engine exhaust emission shall be much better and the fuel consumption will decrease. The volumetric efficiency will increase and the overall engine performance will be greater. The rotor revision will also provide an improved engine sound.

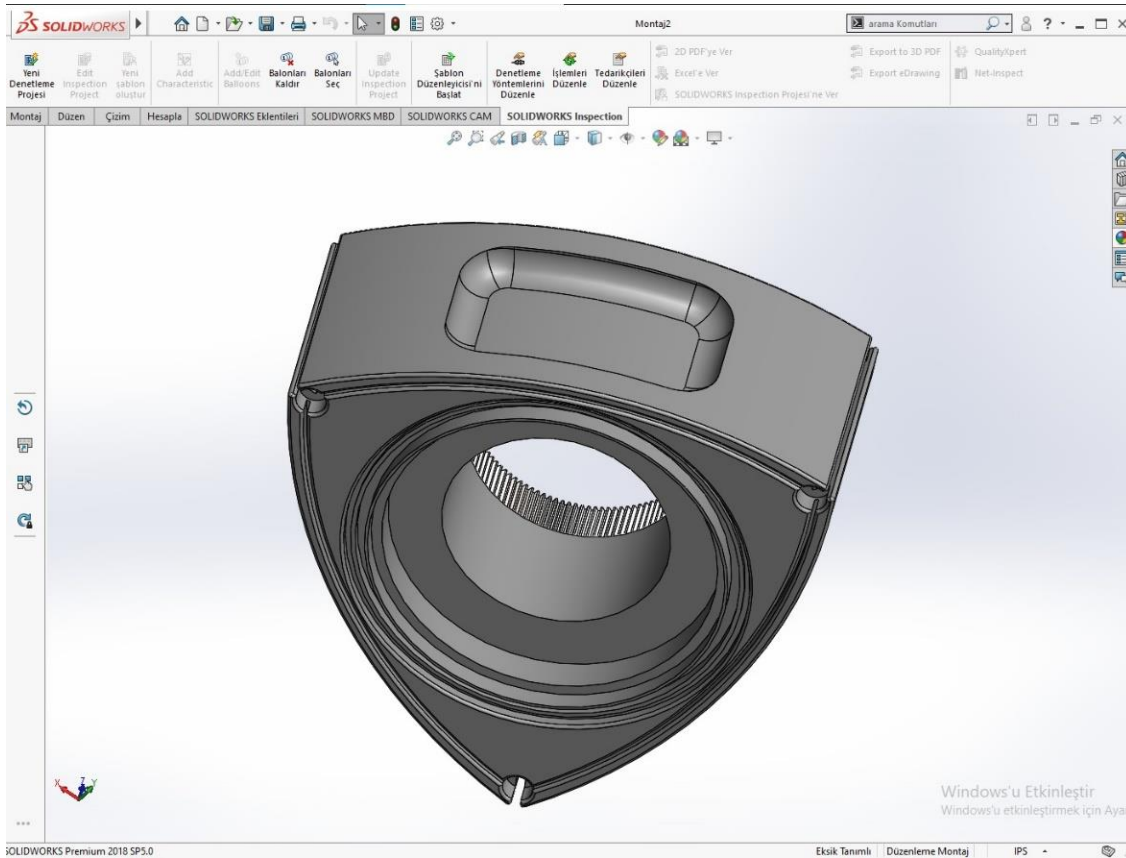
The aim of this project is that such a re-designed and revised Wankel engine can be used for internal combustion engine vehicles, and the ultimate goal is that if this engine can be produced as a domestic and national engine, it can be used in new generation electric hybrid vehicles together with electric motors.

The design drawings produced by the project team are given in Figure 1, Figure 2 and Figure 3, which show the re-designed and revised rotor part of the Wankel Rotary Piston Engine. [1], [2], [3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13], [14], [15]

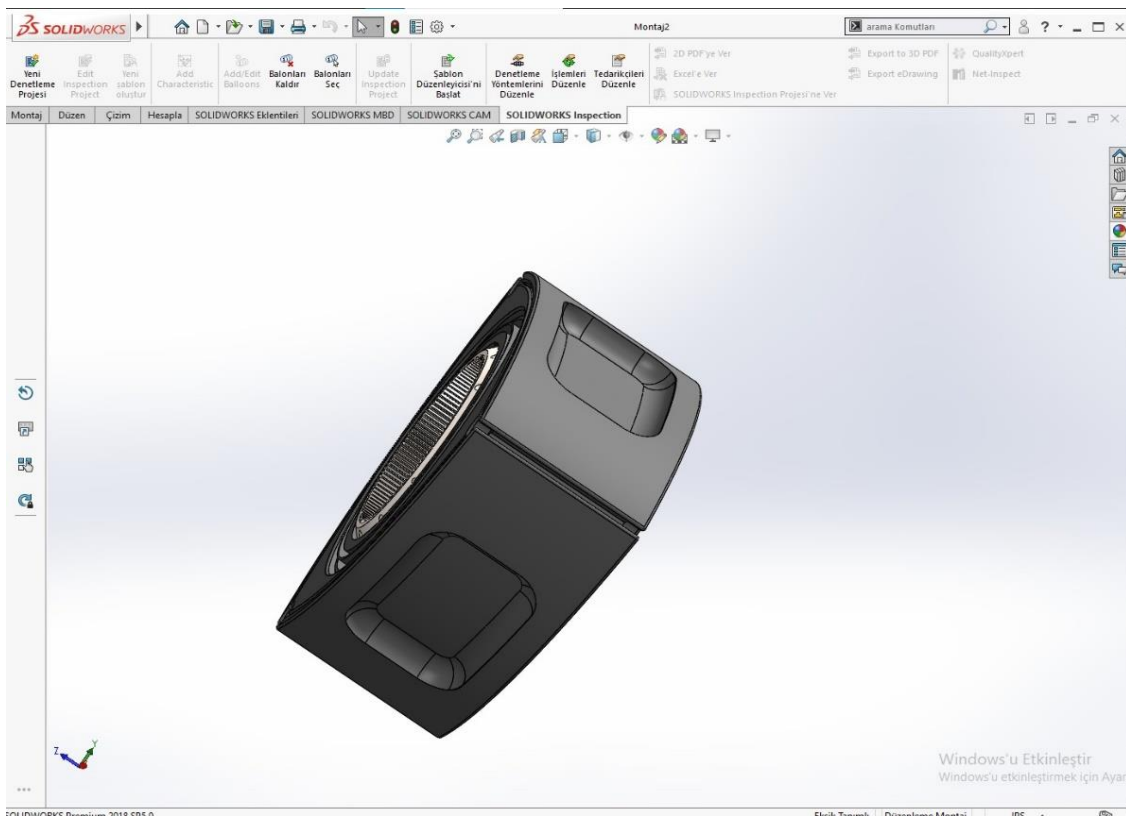
In addition to the fact that it is important for our Automotive Technology students to work on such a project for their own academic development, it is obviously very clear that this project will contribute greatly to the scientific and technical development of both our university and our country.



Figure_1: The drawing shows the re-designed revised rotor part of the Wankel Rotary Piston Engine. [8], [9], [12]



Figure_2: The drawing shows the re-designed revised rotor part of the Wankel Rotary Piston Engine. [8], [9], [12]



Figure_3: The drawing shows the re-designed revised rotor part of the Wankel Rotary Piston Engine. [8], [9], [12]

REFERENCES

1. Emin Taner E. (2023). Thermodynamical And Experimental Analysis of Design Parameters of a Heat Pipe Air Recuperator. *Global Journal of Research in Engineering & Computer Sciences*, 3(6), 6–33. <https://doi.org/10.5281/zenodo.10116309>
2. Elmas, Emin Taner (2019) Thermodynamical Balance Associated with Energy Transfer Analysis of the Universe Space as a Pressure Vessel Analogy. *Journal of Applied Sciences*, Redelve International Publications 2019(1): RDAPS- 10002.
3. Elmas, Emin Taner (2017) Productivity and Organizational Management (The Book) (Chapter 7): Prospective Characteristics of Contemporary Engineer (By the Approach of Mechanical Engineering) Contribution and Role of the Mechanical Engineer to the Organization Management and Productivity. Machado Carolina, Davim J Paulo (Eds.), DEGRUYTER, Walter de Gruyter GmbH, Berlin / Boston, Spain (ISBN:978-3-11-035545-1)
4. Elmas, Emin Taner (2017) Prospective Characteristics of Contemporary Engineer (By the Approach of Mechanical Engineering) Contribution and Role of the Mechanical Engineer to the Organization Management and Productivity). DeGruyter, Germany (DOI 10.1515 / 9783110355796-007)
5. Elmas, Emin Taner, Evaporation Plant for Recycling of Caustic Soda, *INTERNATIONAL JOURNAL of ENGINEERING TECHNOLOGIES-IJET* Emin Taner Elmas., Vol.3, No.3, 2017
6. Elmas, Emin Taner, (2014), Çağımızın Mühendisinden Beklenenler, Gece Kitaplığı, ISBN:9786053244158
7. Emin T. E. (2023). Design, Production, Installation, Commissioning, Energy Management and Project Management of an Energy Park Plant Consisting of Renewable Energy Systems Established at Iğdır University. In *Global Journal of Research in Engineering & Computer Sciences* (Vol. 3, Number 6, pp. 67–82). <https://doi.org/10.5281/zenodo.10406670>
8. Iğdır Üniversitesi, Basın Yayın Merkezi Haberi 1: OTOMOTİV BÖLÜMÜ ÖĞRENCİLERİNDEN WANKEL (ROTARY) DÖNER PİSTONLU MOTOR DİZAYNI PROJESİ - Iğdır Üniversitesi Teknik Bilimler M.Y.O. Motorlu Araçlar ve Ulaştırma Teknolojileri Bölüm Başkanı Dr. Öğr. Üyesi Emin Taner ELMAS, Otomotiv Teknolojisi Programı 2. Sınıf öğrencilerinin üzerinde çalıştıkları WANKEL MOTORU DİZAYNI projesi hakkında bilgi verdi. 2022
9. Ders Notları: T.C. Milli Eğitim Bakanlığı, Motorlu Taşıtlar Teknolojisi, Alternatif Yakıtlı Motorlar, Ankara 2014
10. ÇELİK ÜRETİMİNDE ELEKTRİK ARK OCAKLARINDA ENERJİ MALİYETLERİNİN VE ENERJİ VERİMLİLİK FAKTÖRLERİNİN ARAŞTIRILMASI INVESTIGATION ON ENERGY COSTS AND ENERGY EFFICIENCY FACTORS OF ELECTRIC ARC FURNACE FOR STEEL PRODUCTION, Fenerbahçe Üniversitesi Tasarım, Mimarlık ve Mühendislik Dergisi - Journal of Design, Architecture & Engineering Hasan TAMSÖZ *, Emin Taner ELMAS ** FBU-DAE 2021 1 (3): 163-180
11. SİNTER TESİSLERİNDE ENERJİ KULLANIM NOKTALARI VE ENERJİYİ VERİMLİ KULLANACAK YÖNTEMLERİN BELİRLENMESİ DETERMINATION OF ENERGY UTILIZATION POINTS AND THE METHODS USING THE EFFICIENT ENERGY FOR SINTERING PLANTS, Fenerbahçe Üniversitesi Tasarım, Mimarlık ve Mühendislik Dergisi - Journal of Design, Architecture & Engineering Adem KAYA*, Emin Taner ELMAS** FBU-DAE 2022 2 (2): 170-181
12. SOLIDWORKS, ©2002 - 2024 Dassault Systèmes - SolidWorks Corporation.
13. Emin Taner ELMAS. (2024). The Electrical Energy Production Possibility Research Study by using the Geothermal Hot Water Resources, which is a kind of Renewable Energy Resource, located at the Region of Mollakara Village which is a part of Diyadin Town and City of Ağrı, Turkey. In *Global Journal of Research in Engineering & Computer Sciences* (Vol. 4, Number 1, pp. 90–101). <https://doi.org/10.5281/zenodo.10729333>
14. ELMAS, Emin Taner. (2024). Energy Analysis, Energy Survey, Energy Efficiency and Energy Management Research carried out at Iğdır University. In *Global Journal of Research in Engineering & Computer Sciences* (Vol. 4, Number 2, pp. 12–30). <https://doi.org/10.5281/zenodo.10828077>
15. ELMAS, Emin Taner. (2024). A Research Study of Salt Dome (Salt Cave) Usage Possibility for CAES – Compressed Air Energy Storage Systems. In *Global Journal of Research in Engineering & Computer Sciences* (Vol. 4, Number 2, pp. 128–131). <https://doi.org/10.5281/zenodo.10980421>

CITATION

ELMAS, Emin Taner. (2024). Wankel Rotary Piston Engine Design Project. In *Global Journal of Research in Engineering & Computer Sciences* (Vol. 4, Number 3, pp. 1–4). <https://doi.org/10.5281/zenodo.11117047>