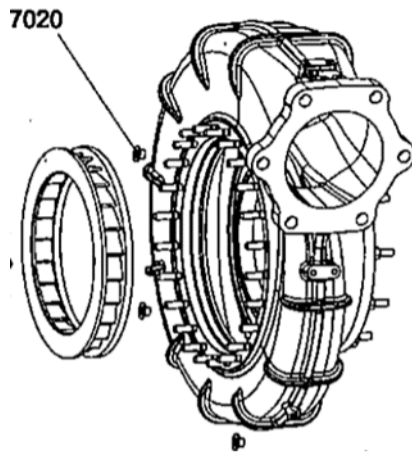


Introduction

This project focused on the research, design, and development of a nozzle ring extraction tool for a High-Pressure Radial (HPR) turbocharger, from the German turbocharger manufacturing company Kompressorenbau Bannewitz GmbH (KBB)



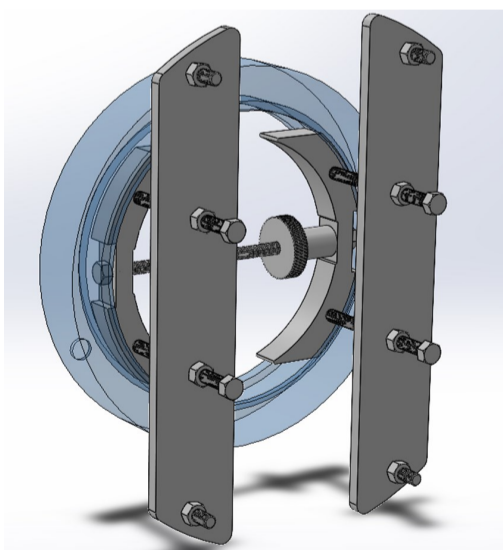
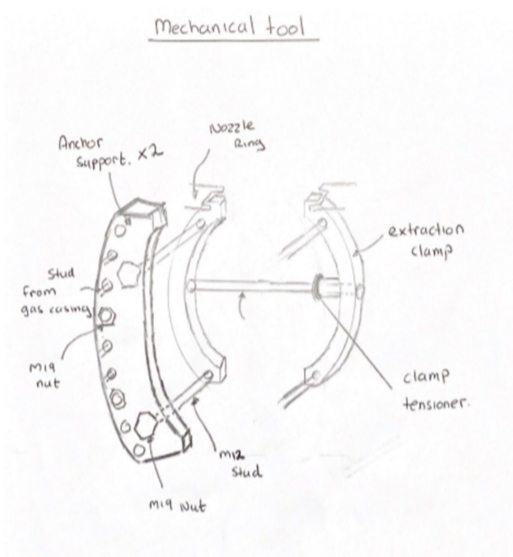
Aims:

The aim was to research, design, develop, prototype, test and evaluate a nozzle ring extraction tool for an HPR type nozzle ring.

Objectives:

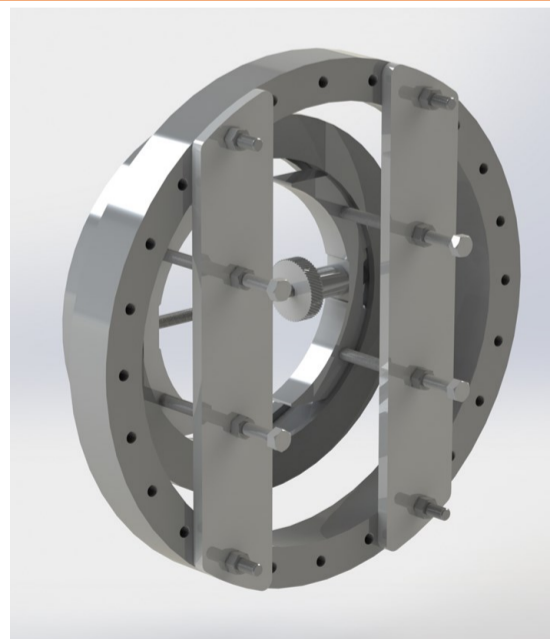
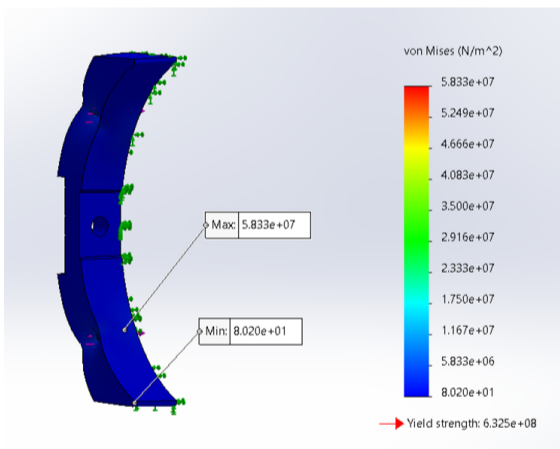
- To propose a new solution/product and develop its product design specifications.
- To conceptually design the new product.
- To detail design and develop the new solution/product.
- To prototype, test and evaluate the new product.
- Research a suitable material to ensure the design runs at its optimal performance.
- To conduct a user-based survey, whereby people will inform me if this design will be useful or not.

Solution Development



Testing of Design:

All design testing was conducted through solid works. Major components were put under an FEA test, with optimisation being carried out if the component did not reach the required specifications.



What Is the Problem?

Nozzle ring is challenging to remove from gas casing



Why Is this a Problem?

Extra 4-6 hours of work needed to remove nozzle ring.
Risk of damaging nozzle ring or turbocharger.



Will an Extraction Tool be Beneficial?

A survey was sent to 12 professionals within the engineering industry to establish if an extraction tool will be necessary, with all participants responding "Yes".



Conclusion

Overall the extraction tool proved a success. However, due to COVID-19 it was not possible to create a working prototype. Looking to the future, it would be good to create a prototype and monitor how the extraction tool functions in a real life scenario.

Will the created extraction tool be utilised?

Another survey was sent to the same 12 people asking if the created extraction tool would be utilised on the removal of a HPR nozzle ring, with all participants responding "Yes".