ENGINEERING
CENTRE OF EXCELLENCE

PROJECT SUMMARY

Automotive Customer: Gearbox Design

Turnkey Solution

Extension of Team

Engineering Consultancy

Challenge

- Support of a new customer project where they lacked the bandwidth to complete

Solution

- Provided a team of engineers to support the customer's Principle Engineer over a period of months
- Project management arranged in unison and all design tasks taken on board
- Conceptual design, detail design, manufacturing drawings and supplier liaisons
- Assembly and part models hosted on local server with integrated collaboration with customer

Benefits

- Customer was able to take on a new project and cope with their peak workload to ensure the project was completed in parallel to others

Idea Review

Specification

Research

Networking

Creative Problem Solving

First Principles

Conceptual Design

Process Methodology

Detail Design

Advanced Engineering

Prototyping and Iteration

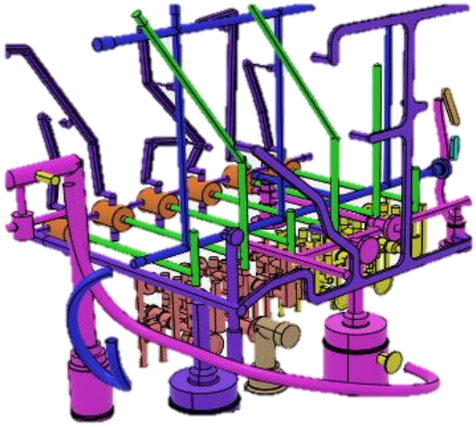
Materials and Processes

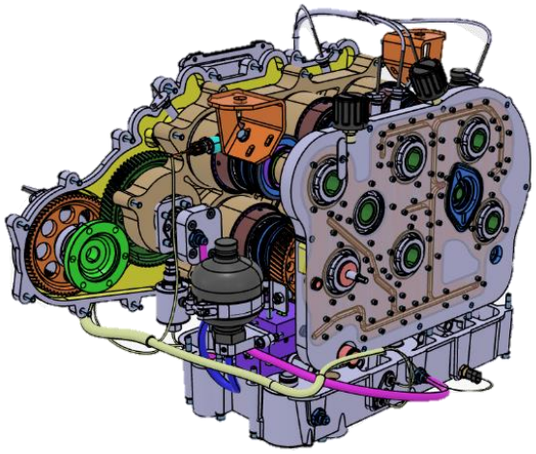
Product Development

Manufacturing Drawings

Value Engineering

Automated Design





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EXPERIENCE MATTERS

ENGINEERING
CENTRE OF EXCELLENCE

PROJECT SUMMARY

Automotive Customer: EMotor Design Support

Turnkey Solution

Extension of Team

Engineering Consultancy

Idea Review

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Creative Problem Solving

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Advanced Engineering

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Challenge

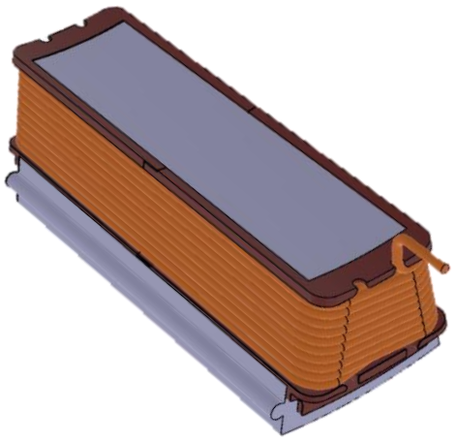
- Collaborative development and repackaging of existing Emotor design to suit individual consumer requirements.

Solution

- Development of bespoke modular insulators to work in various Emotor length derivatives of the core design.
- Ensured core critical technology could be packaged within the customers design and align with all interfaces without compromise.
- The work was completed iteratively and dynamically, adjusting the design to meet with the customers developing requirements.
- Support provided for design functions including complex conceptual designs to use various manufacturing processes including CNC machining and injection moulding.

Benefits

- Assistance with hand calculations, supplier & customer meetings, completion of detailed designs, and generation of 2D drawings to international standards.



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EXPERIENCE MATTERS

ENGINEERING
CENTRE OF EXCELLENCE

PROJECT SUMMARY

Product Design Support: Ski Grinder

Turnkey Solution
Extension of Team
Engineering Consultancy

Idea Review
Specification
Research
Networking
Creative Problem Solving
First Principles
Conceptual Design
Process Methodology
Detail Design
Advanced Engineering
Prototyping and Iteration
Materials and Processes
Product Development
Manufacturing Drawings
Value Engineering
Automated Design

Challenge

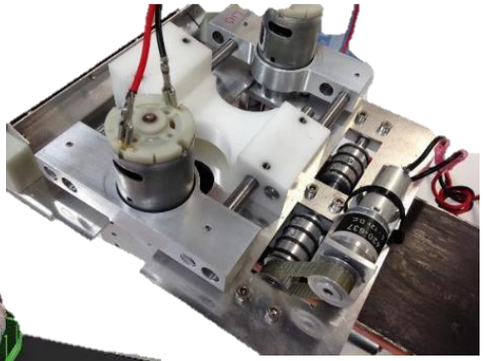
- To aid the design of a multifunctional ski grinding and waxing device for portable use

Solution

- Product design specification, initial concepts, detail design, drawings, and preliminary testing
- Understanding the specification and what engineering fundamentals can be used to meet it, or where reuse of existing technology can minimize cost of components
- Creative problem solving to aid key areas of the design and make its development unique

Benefits

- Full turnkey project taken on board whilst the inventor had little to no time to complete themselves
- Minimal risk due to full project quotation
- Customer took away initial design and test results to develop for suitable market



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ENGINEERING
CENTRE OF EXCELLENCE

PROJECT SUMMARY

High Tech Customer: Test Rig Design and Development

Turnkey Solution
Extension of Team
Engineering Consultancy

Idea Review
Specification
Research
Networking
Creative Problem Solving
First Principles
Conceptual Design
Process Methodology
Detail Design
Advanced Engineering
Prototyping and Iteration
Materials and Processes
Product Development
Manufacturing Drawings
Value Engineering
Automated Design

Challenge

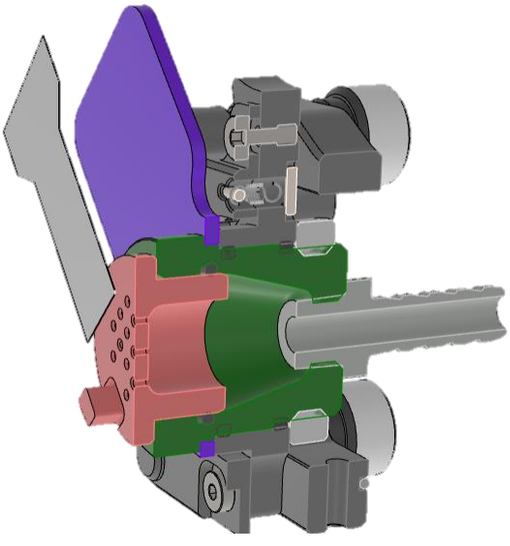
- To discover a novel method of holding a small, delicate silicon chip

Solution

- Product concept, design, drawing, order, testing and build
- Using two parallel paths of engineers in collaboration on conceptual design
- Simple engineered solution made on low tech components brought about through creative problem solving

Benefits

- Offset of heavy workload supported customer in achieving complete project delivery
- Minimal risk with initial investment on concept evaluation
- Continued working relationship with customer for further test rigs and design projects



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EXPERIENCE MATTERS

ENGINEERING
CENTRE OF EXCELLENCE

PROJECT SUMMARY

Automotive Customer: Gearbox Components

Turnkey Solution

Extension of Team

Engineering Consultancy

Idea Review

Specification

Research

Networking

Creative Problem Solving

First Principles

Conceptual Design

Process Methodology

Detail Design

Advanced Engineering

Prototyping and Iteration

Materials and Processes

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Manufacturing Drawings

Value Engineering

Automated Design

Challenge

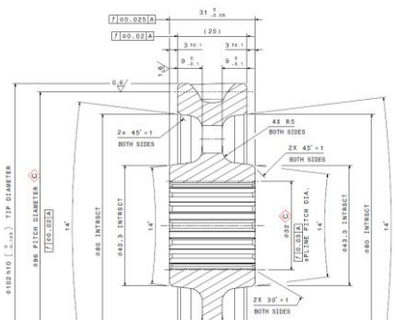
- Provide Engineering Design support for projects relating to gear and motor systems.

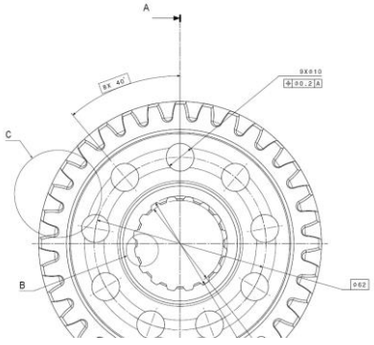
Solution

- Shift Fork – An existing design analysed using FE
- Manufacturing considerations applied for a low volume test production and drawings produced
- Motor Housing – NVH studies on existing design revealed failure at modal shapes.
- Gearbox Concept Development - Created housings, shafts and gear geometry including specification of sealing elements and considerations for oil distribution.
- Manufacturing drawings were created for all components to ISO 128, through use of GD&T to ISO 1101.

Benefits

- Improved Shift Fork to meet load extremes and fatigue endurance requirements.
- Subsequent higher volume design proposed for shift fork.
- Improved Motor Housing to meet all modal shape requirements and decreased weight.
- Gearbox Concept taken from initial stage to a production ready state.





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EXPERIENCE MATTERS

ENGINEERING
CENTRE OF EXCELLENCE

PROJECT SUMMARY

Product Design Support: Tymatic

Turnkey Solution

Extension of Team

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Challenge

- To create a battery-operated construction tool to replace the manual task of tying rebars together using steel wire.

Solution

- Evaluation of product requirements and generation of design specification including:

  - Size of the bars to be considered
  - Orientation of the ties
  - Weight distribution
  - Environmental conditions

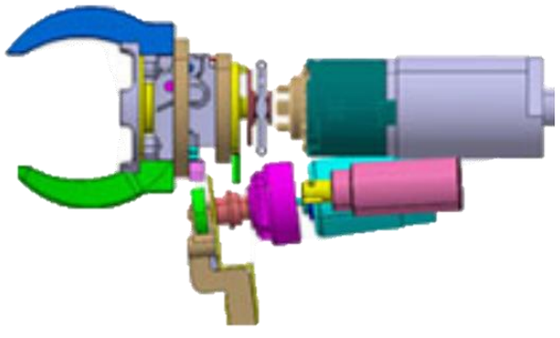
- The tying process was broken down into steps, e.g. feeding the wire around the bar, twisting the wire together, etc.
- Investigation of each step with solution development to address each challenge.

- Concepts were evaluated in order to generate an initial design proposal.

Benefits

- Design, manufacture and control system was developed within just 4 weeks.

- Development of a working prototype was a major step in providing investors with the confidence to continue funding the project, which is now on its way to being a fully developed production solution.



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