

UWTSD

WISA



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Project Planning.

Engineering Management ACHA5012

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1 Introduction

In this group project we have been tasked with improving and upgrading the university's Morgan and ensuring that it is race ready. This involves understanding the category of racing that the vehicle is used for and identifying areas where we can enhance performance, safety, and reliability without sacrificing one for another, all whilst abiding by the rules and regulations.

This project is important and useful as it helps develop an array of professional and technical skills, such as teamwork, clear communication, problem solving, organisation, critical thinking, analytical ability, and research skills. It also offers the opportunity to gain experience in gathering accurate and live data along side using specialised equipment, machinery, and software. Moreover, beyond skill development, this project contributes to improved vehicle performance on the track, increased safety, and a deeper understanding of the vehicle's systems and operation which will benefit future work carried out on the Morgan.

Within this wider project, my specific contribution involves investigating the current air-box setup on the Morgan and exploring ways to improve or re-invent the system alongside one of my team members, Jay Hodson.

1.1 Aims

Aim 1 – Assess the existing air-box system on the Morgan.

Aim 2 – Develop and then analyse our improved air-box concepts.

Aim 3 – Implement our chosen, optimised air-box system.

1.2 Objectives

Objective 1.1 – Investigate limitations of current air-box design.

Objective 1.2 – Gather data from vehicle with original air-box setup.

Objective 1.3 – Use data gathered to pinpoint areas for improvement.

Objective 2.1 – To create concept designs of improved air-box system.

Objective 2.2 – To model designs in CAD.

Objective 2.3 – Gather data from designs and compare them.

Objective 3.1 – To select final design using the data gathered.

Objective 3.2 – To finalise chosen design by implementing any improvements.

Objective 3.3 – To produce and fit to the Morgan.

2 Team Roles & Responsibilities

2.1 Team Roles Overview

Table 1 - Table of team member's project roles.

Group Member	Role	Task Description
Joshua Davies	Chassis Investigation.	To investigate, research and improve the current chassis system.
Luke Davies	Suspension Investigation. VI Grade Development.	To investigate, research and improve the current chassis system and to develop a VI grade model of the Morgan.
Niall Hindmarch	VI Grade Development.	To create and develop a VI Grade model of the Morgan.
Jay Hodson	Air-Box Investigation.	To investigate and improve the current air box system.
Nia Jenkins	Investigate braking system and tyres.	To investigate and improve the current braking system and tyre set up.
Keira Phillips	Air-Box Investigation.	To investigate and improve the current air box system.

2.2 Personal Role Analysis

My Belbin's team role profile shows that I am well suited to both the technical and analytical responsibilities involved in redesigning the Morgan's intake system. Firstly, my highest score is under Implementer, this suggests that I work in an organised, methodical, and practical manner. These are essential qualities for carrying out the tasks required within this project, such as, collecting accurate measurements, researching suitable materials, and overall ensuring that each stage of the air-box development follows a clear plan.

Secondly, I scored highly under Coordinator, showing that I am confident in planning tasks, managing work loads, and ensuring that the team activities remain aligned with the project aims. This allows me to support my contribution to structuring the project process and maintaining consistency throughout the investigation and development stages.

Thirdly, I scored strongly under Team Worker which suggests that I collaborate effectively, communicate clearly, and support everyone within the project. This is detrimental because my contribution to the project involves close coordination with my teammates, the sharing of data, discussing design constraints, and agreeing on design choices, characteristics, and prototypes.

Lastly, I scored adequately under Monitor Evaluator, indicating that I am able to think carefully, objectively analyse information, and make well-informed decisions. These are crucial qualities when comparing design options, evaluating test data, and deciding on a chosen air-box design. The combination of these roles demonstrates that I have the analytical mindset, teamwork skills, communication and organisation abilities required to successfully contribute to the improvement of the intake system.

3 Group Tasks & Time Plan

3.1 Joshua Davies

Table 2 - Table of Joshua Davies' Tasks and Time plan.

Task	Start date	End date
Research current chassis development	15/10/25	24/10/25
Work out stress analysis	24/10/25	30/10/25
Work with Luke to help improve suspension	30/10/25	3/11/25
Test upgrades	3/11/25	14/11/25
Compare results to previous years	14/11/25	28/11/25
Construct new model	28/11/25	TBD

3.2 Luke Davies

Table 3 - Table of Luke Davies' Tasks and Time plan.

Task	Start date	End Date
Research existing Vehicle Data	13/10/25	23/10/25
Collect vehicle data	24/11/25	01/12/25
Measure geometry	24/11/25	04/12/25
Create a suspension model	05/12/25	12/12/25
Kinematic simulation	13/12/25	20/12/25
On the car kinematics test	05/01/26	30/01/26
Kinematic results analysis and comparison	31/01/26	11/02/26
Gather team members' data and create vi model	02/12/25	01/02/26
Model comparison	02/02/26	12/02/26
Report write-up and presentation	01/02/26	21/03/26

3.3 Niall Hindmarch

N/A

3.4 Jay Hodson

Table 4 - Table of Jay Hodson's Tasks and Time plan.

Task	Description	Start date	End date
Research	. Researching different design ideas of different intake system. . Looking for key areas to address and different materials that would be best.	3/11/25	2/12/25
Designing	. Producing rough sketches. . Selecting our favourite design . Creating chosen design using SolidWorks software.	1/12/25	25/12/25
Manufacturing	. Manufacture the chosen design using our chosen material.	TBD	TBD
Testing	. Fit new design to Morgan then take for testing.	TBD	TBD
Analysing	. Analyse and compare test data to evaluate whether our design is more effective than the standard intake system. . Investigate the possibility of any faults or flaws in the design.	TBD	TBD
Meetings	. Weekly meeting on either a Monday or Tuesday with our project lecturer where we discuss plans and if progress in our role is being made.	13/10/25	TBD
Presentation	. Presentation will be produced by everyone in the group and will be presented to summarise the groups progress and the plans for the future until our final presentation at the end of the academic year.	01/02/26	21/03/26

3.5 Nia Jenkins

Table 5 - Table of Nia Jenkins' Tasks and Time plan.

Task	Start date	Complete by
Identify the current brake system and tyre setup	06/10/2025	10/10/2025
Research the relevant racing regulations	13/10/2025	15/10/2025
Research the existing brake systems	08/10/2025	15/10/2025
Measure and record the wheel clearance	08/10/2025	22/10/2025
Analyse the data from the previous outing of the Morgan	TBD	TBD
Evaluate the potential for caliper upgrade	22/10/2025	10/12/2025
Assess feasibility of wheel spacers	22/10/2025	10/12/2025
Purchase multiple sets of tyres ready for any condition	04/11/2025	12/11/2025
Purchase and prepare the upgraded components (if required)	TBD	TBD
Install the upgraded components (if required)	TBD	TBD
Install the spacers (if required)	TBD	TBD
Install the new tyres (if required)	TBD	TBD

4 Personal Task Overview

4.1 Personal Task List

Table 6 - Overview Table of Personal Tasks.

Task	Task Description	Duration Of Task (Start & End date)	Method(s) Used	Equipment Required
Group Meetings	Every Monday or Tuesday we will meet with our group and project lecturer to review progress, development and plans for the week, along with discussing any issues we may have encountered.	13/10/25 – TBD	This involves group discussion, a review of weekly progress, planning and any feedback.	. Laptop or notebook to record notes.
Investigation	Investigate the limitations of the current air-box including airflow restrictions and design potential design flaws that may affect efficiency. We will also investigate any limitations we may need to consider whilst developing an improved system.	03/10/25 – 10/11/25	This will involve inspecting the Morgan, photographing components, and reviewing any pre-existing documentation that we have been provided on the vehicle.	. Access to the Morgan. . Laptop or notebook to record findings. . Camera.
Research Materials	Research materials that would be best suited to produce an	03/10/25 – 10/11/25	This will involve online researching, reviewing academic sources and	. Laptop or computer.

	air box depending on their thermal resistance, weight, durability, and cost.		the comparison of material properties.	. Internet Access.
Research Suitable Piping	Research suitable piping options based on durability, thermal resistance, airflow performance, and cost.	03/10/25 – 10/11/25	This will involve online research and comparisons of specifications.	. Computer or Laptop. . Internet Access
Research Suitable Filter Types	Research suitable filter types and evaluate flow rate, efficiency, cost, and maintenance requirements.	03/10/25 – 11/10/25	This will involve online research, analysing performance data and comparing manufacturer specifications for filters.	. Laptop or Computer. . Internet Access.
Research Production Methods	Research manufacturing processes we can utilise to produce our air-box depending on what materials we use, and how feasible they are.	24/11/25 – 02/12/25	This will involve using online research to discover and evaluate the cost and required equipment for each process, alongside comparing the benefits and limitations of them.	. Laptop or Computer. . Internet Access.
Research Methods To Gather Data	Research methods that we can use to gather data from the Morgan, such as air flow and air temperature.	24/11/25 – 02/12/25	This will involve using online research to study sensor types and data-logging approaches, along with reviewing any available manufacturer documentation.	. Laptop or computer. . Internet Access.

Collect Vehicle Data	Use the researched methods to gather required data from the Morgan.	24/11/25 – 02/12/25	This will involve using sensors to take readings, along with observing airflow readings and intake temperatures and either digitally or manually recording our findings.	. Access to the Morgan. . Any Specialised Equipment. . Laptop or Notebook to record gathered data.
Collect Measurements	Measure the area where we are installing the new air-box.	24/11/25 – 02/12/25	This will involve measuring the internal space of the engine bay and checking clearances.	. Access to the Morgan. . Laptop or Notebook to record measurements. . Tape measure . Digital Callipers
Create Concept Designs	Create rough designs of our air-box.	01/12/25 – 14/12/25	This will involve brainstorming and either hand sketching or digitally sketching multiple designs.	. Tablet or iPad. . Sketch pad. . Pencils.
Produce Designs In CAD	Use CAD software to produce virtual models of our designs.	15/12/25 – 19/12/25	This will involve revising our sketched designs prior to 3D modelling them, this will also involve importing the vehicle measurements into our chosen CAD software.	. Laptop or Computer. . CAD software / Solidworks.
Select chosen design to prototype	Select favoured CAD design to produce as a prototype.	TBD	This will involve comparing all of our designs and evaluating	. Laptop or Computer.

			their feasibility and predicted performance.	. Access to CAD files.
Test & Analyse prototyped design	We will test our chosen design and compare the data to the data gathered with the original air-box fitted.	TBD	This will involve flow testing the design and temporarily fitting it to the vehicle to test temperatures and record measurements then comparing all the data gathered.	. Prototyped design. . Access to the Morgan. . Access to the Flow bench. . Temperature sensors. . Laptop or Notebook to record data.
Improve Final Design (If applicable)	Improve final design using data obtained through testing.	TBD	This will involve adjustments in CAD, analysing weaknesses and any material and geometry modifications.	. Laptop or Computer. . CAD software / Solidworks.
Fit To Vehicle	Fit finalised and tested design to the Morgan.	TBD	This involves checking fitment and clearances to install the air-box and secure components whilst documenting the installation.	. Access to the Morgan. . Tools.
Produce Report	Using our findings we will produce a written report, recording our planning and process.	01/02/26 – 21/03/26	This will involve communicating with my team to write, insert images, data, diagrams, and any references into a word document.	. Laptop or Computer. . Microsoft Word.
Produce Presentation	Work with every member in the group to produce and	23/11/25 – TBD	This will involve communicating with my team to create slides of	. Laptop or Computer. . Microsoft PowerPoint.

	present a presentation.		summarised findings and group rehearsals.	
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4.2 Table of Preliminary Bill Of Materials

Table 7 - Table of Preliminary Bill of Materials.

Materials	Quantity	Estimated Cost	Supplier	Lead Times
Carbon Fibre	. 500 x 470mm sheet . 2mm thick	£69.25	Easy Composites (www.easycomposites.co.uk)	Unknown
Steel	. 1mm thick	£22.45p/m ²	Metals4U (www.Metals4U.co.uk)	5-6 Days
Aluminium	. 2000 x 1000mm sheet . 1mm thick	£37.94	Aluminium Warehouse (Aluminium Warehouse)	2-4 Days
3D Printer Filament	. 1Kg .1.75mm Diameter	£26.99	Filamentive (www.Filamentive.com)	Unknown
Silicone Hose	. 1000mm	£45.99	Mods4U (Mods4U.co.uk)	Unknown

5 Milestones

5.1 Group Milestones

Table 8 - Table of Group Milestones

Milestones
First presentation completed.
Written report submitted.
Final presentation completed.

5.2 Personal Milestones

Table 9 - Table of Personal Milestones.

Milestones
Completing initial investigation.
Finalising research and requirements.
Completing concept designs.
Completing CAD designs.
Manufactured Prototype.
Tested prototypes and final design chosen.
Final air-box fitted to vehicle.

5.3 Team Member Milestones

Joshua Davies:

Table 10 - Table of Joshua Davies' Milestones.

Milestones
Completing research on current chassis.
Completing stress analysis.
Completing collaboration with Luke to improve the suspension.
Completing the testing of upgrades.
Completing the comparison of results to data gathered in previous years.
Completing the construction on the new model.

Luke Davies:

Table 11 - Table of Luke Davies' Milestones.

Milestones
Completing vehicle data research.
Completing data collection.
Finalising Geometry measurements.
Creating suspension model.
Completing kinematic simulation.
Completing the on-vehicle kinematic test.
Completing the analysis and comparison of results.
Completing the VI model.
Completing the comparison and validation process of the VI model.

Jay Hodson:

Table 12 - Table of Jay Hodson's Milestones.

Milestones
Completing initial investigation.
Finalising research and requirements.
Completing concept designs.
Completing CAD designs.
Manufactured Prototype.
Tested prototypes and final design chosen.
Final air-box fitted to vehicle.

Nia Jenkins:

Table 13 - Table of Nia Jenkin's Milestones.

Milestones
Identifying the initial brake and tyre systems.
Completing the research of race regulations and brake systems.
Completing the evaluation of original brake and tyre performance.
Confirming upgrade feasibility.
Installing the upgraded brake and tyre components.

6 Gateway Objective

A critical gateway within my portion of the project is the testing and analysis of our prototyped air-box design. This is because this stage determines whether the updated design provides measurable performance improvements to the airflow and intake temperatures compared to the original system. If the prototype does not meet our targets, it will not pass the gateway and therefore trigger a redesign process to address the identified weaknesses. Passing this gateway is essential as it ensures good design quality, safety, and efficiency before any more resources are committed to the design, if the prototype meets our targets we can justify moving forward and adding any final improvements that support both the performance and reliability requirements of the Morgan.

7 Summary

7.1 Personal Gantt Chart

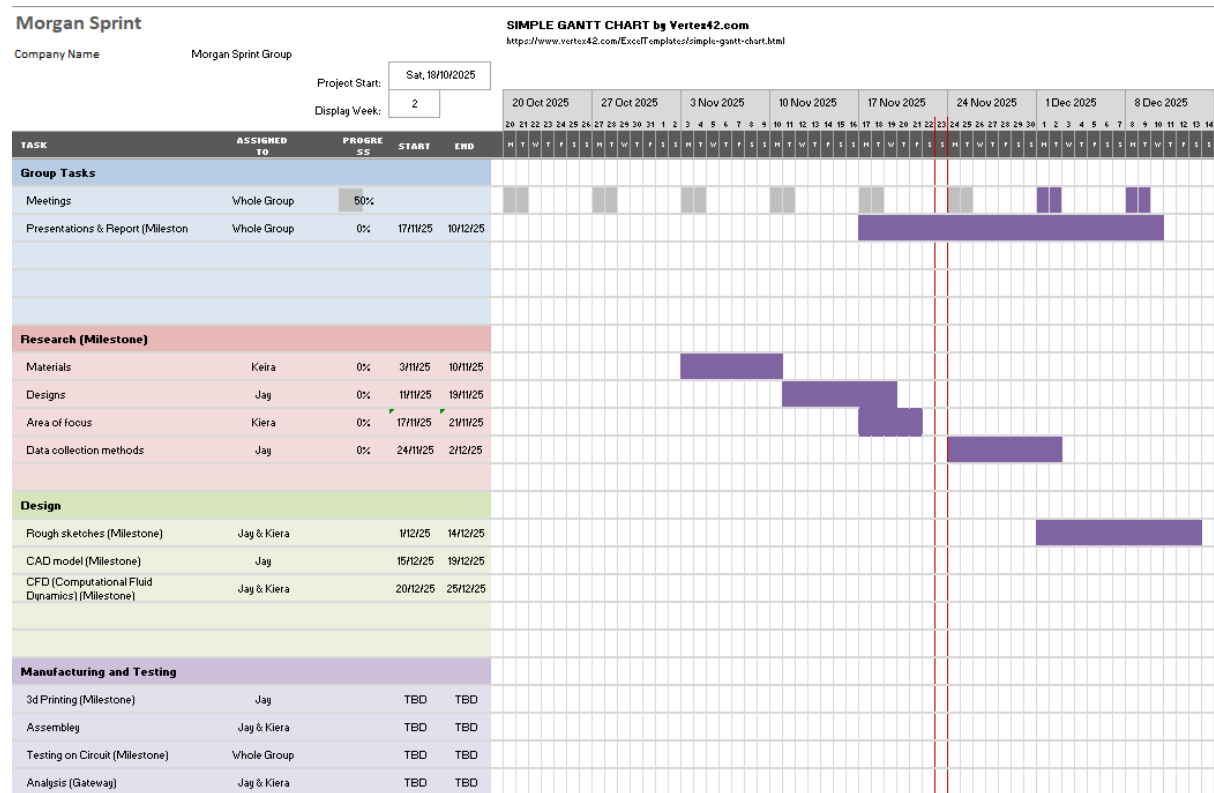


Figure 1 - Personal Gantt Chart.

7.2 Overall Group Gantt Chart

Group Project

Company Name
Project Lead

Project Start: Thu, 16/10/2025
Display Week: 1

SIMPLE GANTT CHART by Vertex42.com

<https://www.vertex42.com/ExcelTemplates/simple-gantt-chart.html>

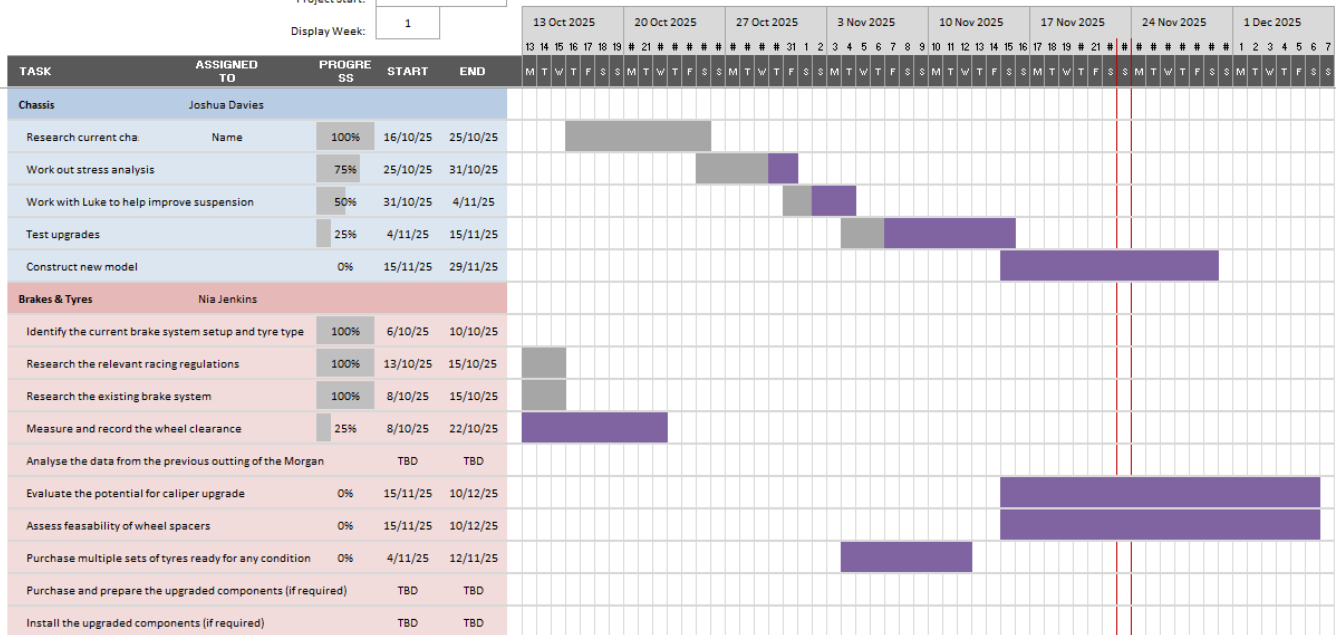


Figure 2 - Group Gantt Chart Part 1/2.

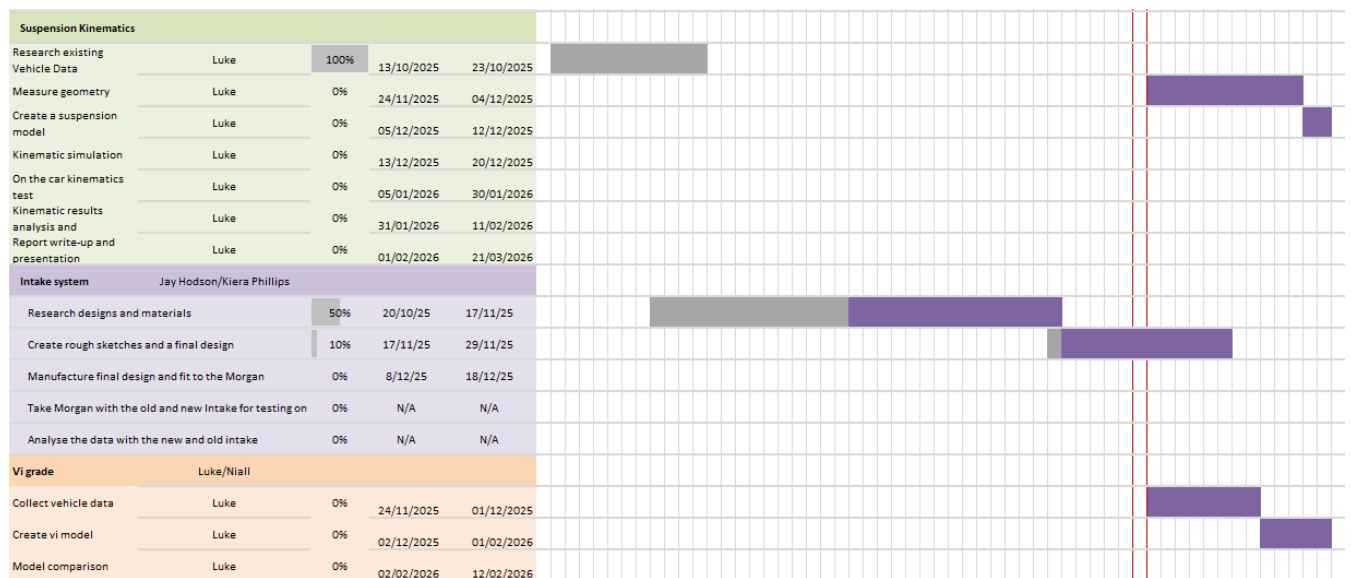


Figure 3 - Group Gantt Chart Part 2/2.

8 Risk Analysis

Table 14 - Table of Risk Analysis.

Risk	Impact	Risk Mitigation
A member of the group failing to participate and/or providing required information.	. Delays project progress. . Incomplete sections. . Increased workload for others in the group.	. Weekly progress meetings. . Clear and fair deadlines. . Shared documents. . Early report to project lecturer. . Reallocation of tasks if necessary.
Failure or Delay at a gateway task.	. Delays project progress. . Delays vehicle testing. . Delays installation work.	. Decide on contingency times. . Conduct small-scale testing early in the project. . Take care to accurately gather data. . Ensure effective communication amongst teammates.

9 References

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