



University of
Nottingham
UK | CHINA | MALAYSIA

MMME2044 Group Design & Make

Air Motor

Clinic session for PDR (part 1)

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Outline of session

The purpose of the PDR clinic session is

- to support the design activities and the preparation for PDR
- to give an overview of the PDR pre-forma
- to recap creative design methods from 1st year and their use in PDR submission
- to clarify and discuss general and specific questions

Preliminary Design Review (PDR)

Preliminary Design Review (PDR) is a key stage of the whole design process and normally performed at the end of conceptual design

- to present possible concepts, methods of evaluation and rationale for choosing a concept
- to present a refined design with initial assessment of preliminary calculations
- to report on team working and plans for next stage of project

Note: PDR is a formative submission

What should be included in PDR submission?

- **A single group report in PDF format submitted on Moodle by 3pm, Friday, 28th October**
- **A PDR check list and PDR pro-forma are available in the Group D&M project folder in the Design Tutorial and Support section on Moodle**
- **PDR report should include (in PDF format)**
 - Completed PDR checklist (1 page per group)
 - Statement of Requirements (1 page per group)
 - Concept generation with annotations (1 page per student)
 - Morphology chart (1 ½ pages per group)
 - Concept selection (2~3 pages per group)
 - Summary and plan of Team working (2/3 page per group)
- **A typical PDR report is between 10~15 A4 pages**
- **Use the name “PDR_Group number” in submission, e.g. “PDR_Grp22.PDF”**

Methods for concept generation

Prof Geoff Kirk will give a recap on **Creativity and Concept Generation**. His lecture slides can be accessed from the [link](#) to **1st year MMME1024 module**

➤ **Brainstorming**

A commonly used group creativity activity for concept generation

➤ **Analogy**

- A way to identify and use similarities in forms, features and other characteristics of one solution to solve another design problem
- Search for relevant information from various sources may be a good start

➤ **Morphology chart**

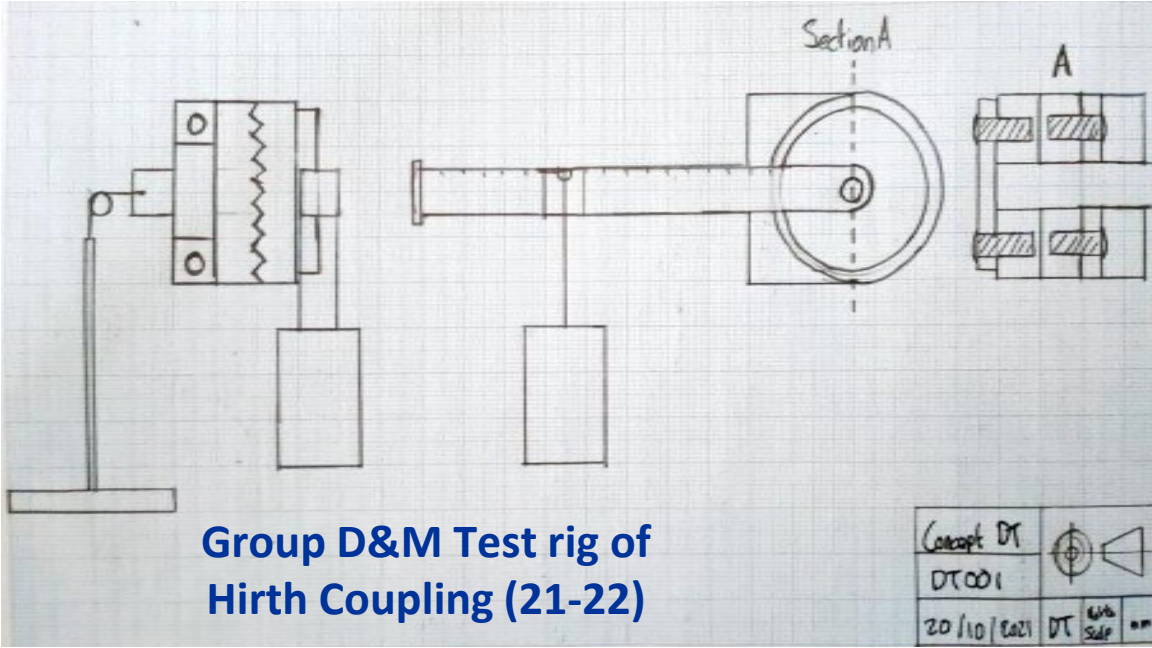
A useful method to identify key enabling functions and possible solutions. Various combinations or mapping could lead to an optimum solution

Methods of concept/design presentation

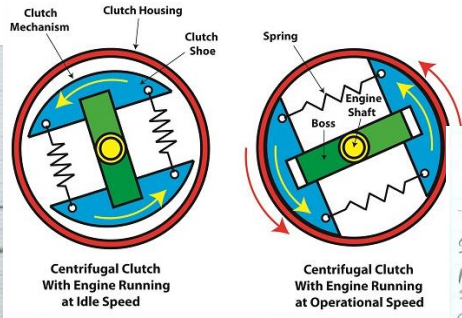
- **A hand sketch (or stick diagram) with annotations** is an efficient means to
 - capture ideas,
 - identify key components,
 - define a general layout and working mechanism.
- A scaled **embodiment sketch/drawing** or a sectional **view of a simple Solidworks assembly model** is a useful means to show the overall layout and assembled components of some details.
- *A complete set of GA (General Assembly), detail drawings and Solidworks CAD assembly/part models plus other documents, e.g. report, calculation/evaluation data are the official outcome and documentation of a design for production and handover to customers **(only for CDR submission later)***

Examples of Embodiment sketch

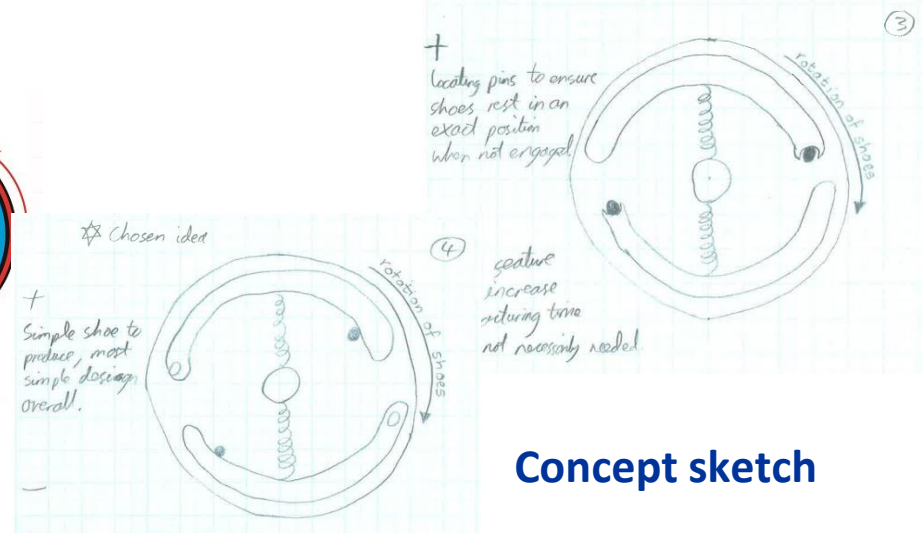
- **Embodiment sketches** show a general layout and overall sizing of key components in more details of a chosen concept.



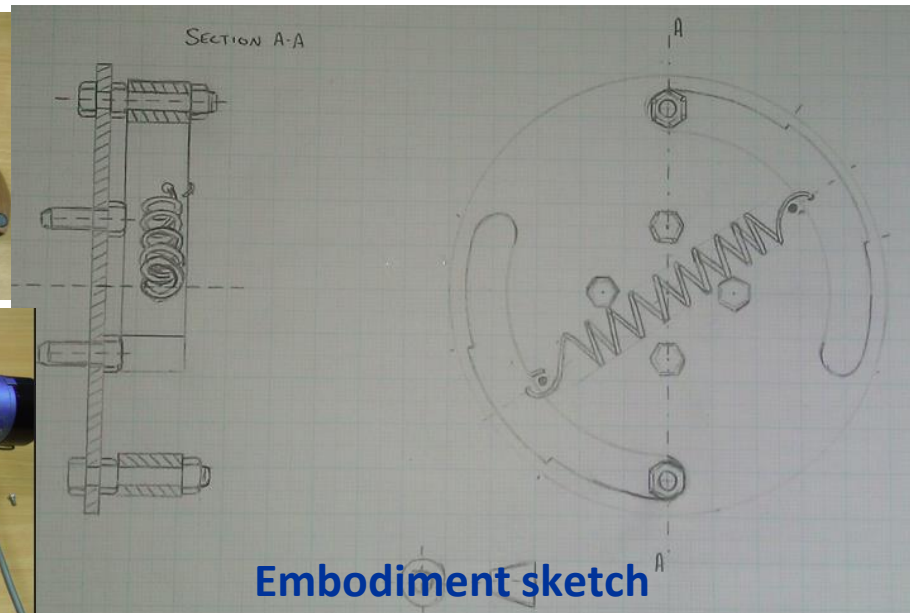
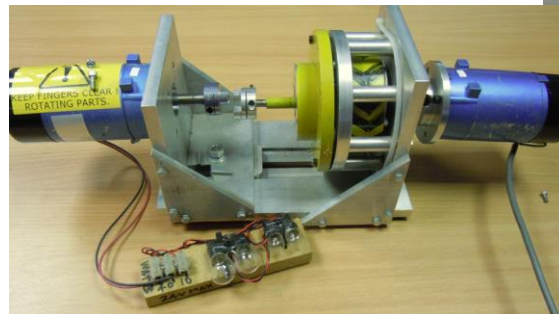
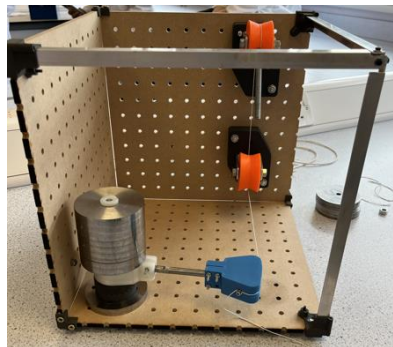
Group D&M Test rig of Hirth Coupling (21-22)



Group D&M Centrifugal clutch



Concept sketch



Embodiment sketch

Feedback

- **General feedback will be provided by your tutor**
 - **Satisfactory** - The deliverable was achieved on time to a **satisfactory standard** – you can proceed with your selected design.
 - **Category 1 Deficiency** - The deliverable was not achieved or there was a **major deficiency**. The deficiency needs to be addressed in a timescale.
 - **Category 2 Deficiency** - The deliverable was achieved but there was a **minor deficiency** to be addressed within an agreed timescale.
 - **Observation** - Items that are acceptable but **can be improved**.
 - Additional feedback on the presentation, quality and clarity of contents of the PDR report and possible areas for improvement