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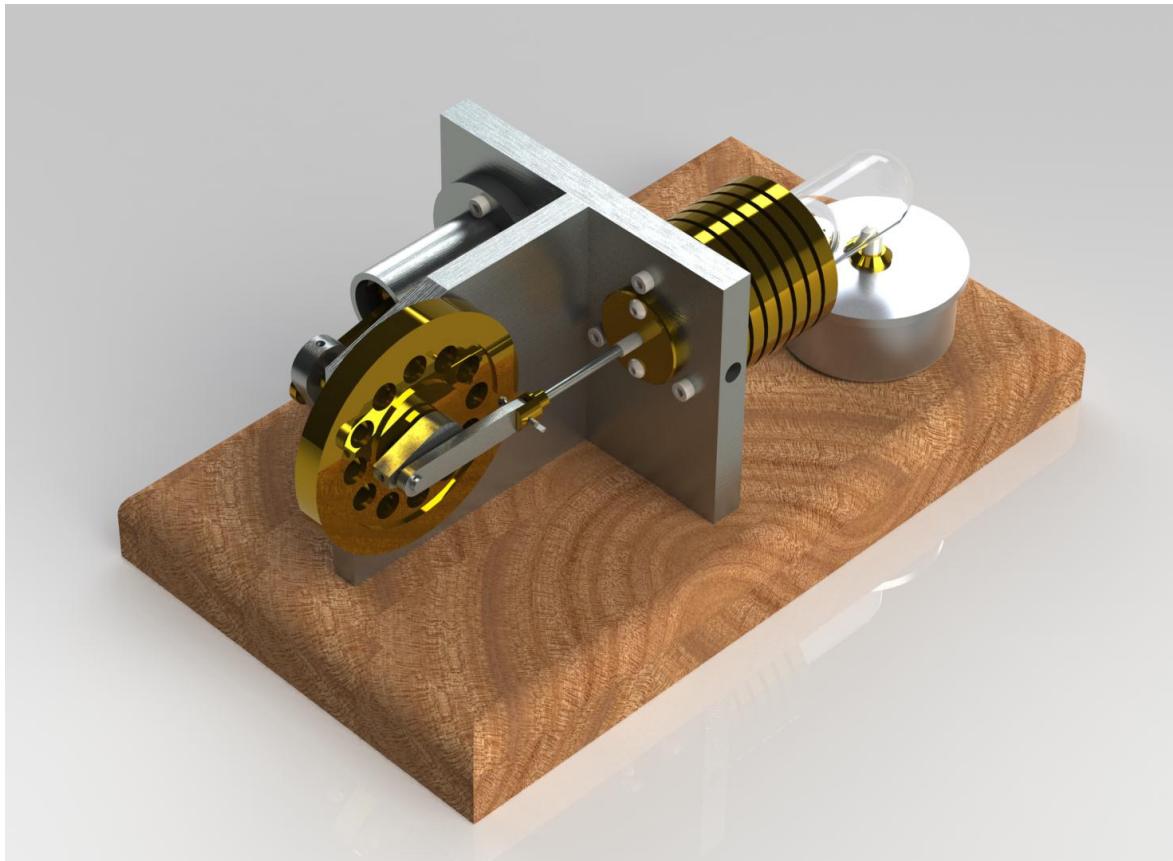
2012 Regional Heats

MECHANICAL ENGINEERING CAD

Modelling from Detail Drawings & Creating Assemblies



The Sector Skills Council
for Science, Engineering and
Manufacturing Technologies



Produced by:

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CAD Skills UK Ltd | "modelling your future"

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In Association with

Autodesk®

Regional Heat 2012

Matthew Bell

TASK: Modelling from Detail Drawings & Creating Assemblies

Time: 6.0 hours

Given: Part Drawings, Assembly Drawing, Part Files

Task:

Advanced and Higher

1. Create 3D models for all of the 14 parts shown on the 2D detail drawings as identified in the marking overview below.
2. Assemble the Stirling Engine in the correct assembly sequence.
3. Reproduce the given 2D-Assembly drawing with a parts list on one piece of A1 paper.
4. Produce an exploded view drawing on A2 paper which clearly shows all components and title this Stirling Engine Exploded View. Include in this a full parts list.

Higher Only

5. Produce an AVI file to demonstrate the full Physical Simulation of the Stirling Engine. The video should include:
 - i. 2 full 360 degree rotation of the entire engine whilst functioning
 - ii. Displacer Body must be shown
 - iii. Glass Piston Body must be shown
 - iv. Show all of the Wick
 - v. Flywheel must rotate at least 360 Degree
6. Produce an AVI file to demonstrate the Stirling Engine exploding and collapsing. The video should include:
 - i. Explode and then Collapse
 - ii. Follow a logical order
 - iii. All items must be clearly visible
 - iv. Screws spin to demonstrate functionality
 - v. Camera positions move to show currently exploding parts

Save your files according to the Competition Instructions.

USE OF COMPUTER:

Use of the computer is allowed from the beginning of the competition time.

OUTPUT

- Software Modeled Parts, Assemblies and Drawing Files (AVI Files).

NOTES

- All marks are to be taken from digital files and printing is not required.
- Drawings are NOT printed to scale.

MARKING

- All Marking is Objective and broken down as follows:

ADVANCED

Marking Aspect	Sum of Max Mark
Part Modelling	40
Assembly of Stirling Engine	20
Assembly Drawing of Stirling Engine	25
Exploded View Drawing of Stirling Engine	15
Grand Total	100

HIGHER

Marking Aspect	Sum of Max Mark
Part Modelling	40
Assembly of Stirling Engine	15
Assembly Drawing of Stirling Engine	15
Exploded View Drawing of Stirling Engine	10
AVI Files	20
Grand Total	100

Part Modelling

Parts Modelled	Mark
Cooling Cylinder	2.5
Cylinder Plate	5
Displacer Body	2.5
Guide Rod Connector	2.5
Plunger Connector Rod	2.5
Wheel	5
Pot	2.5
Piston Support Plate	2.5
Plunger Collar	2.5
Exterior Body of Cylinder	2.5
Candle Support	2.5
Axel Crankpin	2.5
Glass Piston Body	2.5
Displacer	2.5
Grand Total	40