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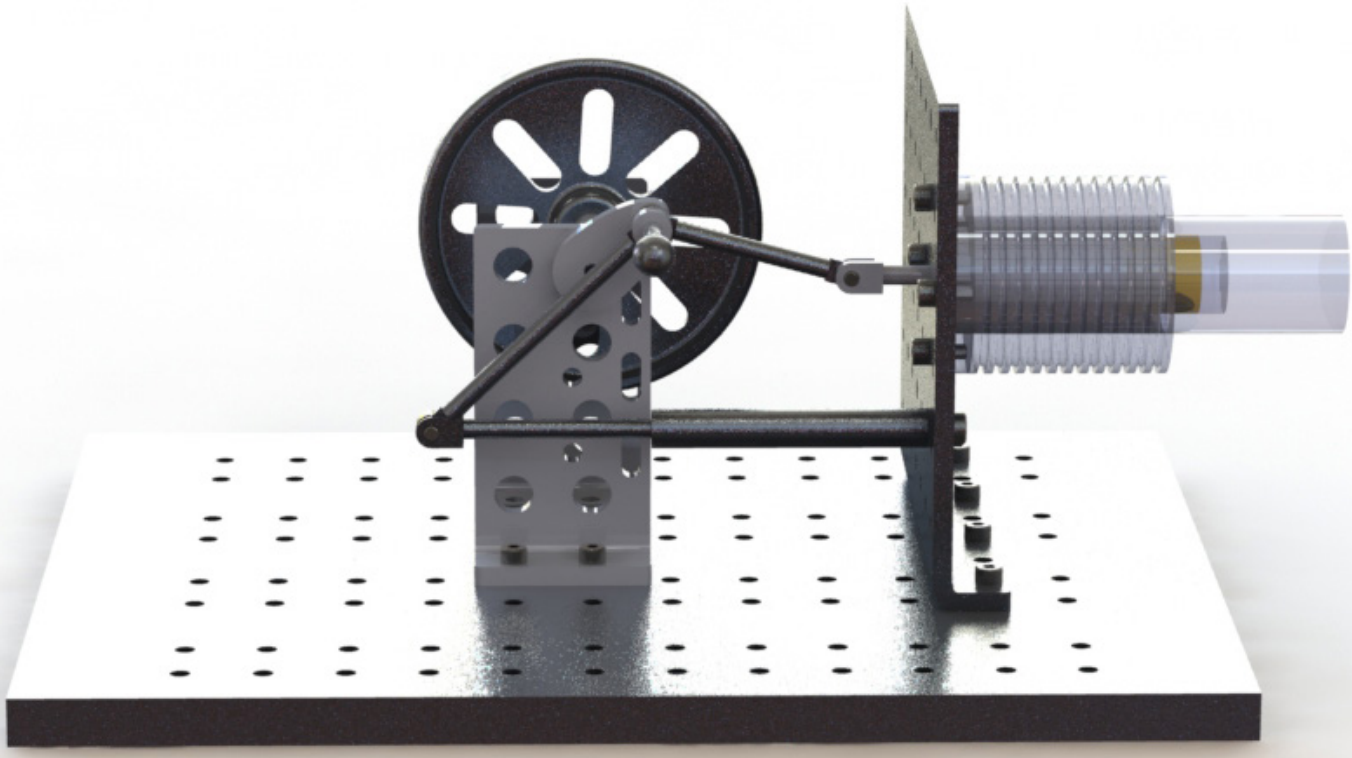
SOLIDWORKS® 2015 in 5 Hours with Video Instruction



David C. Planchard, CSWP,
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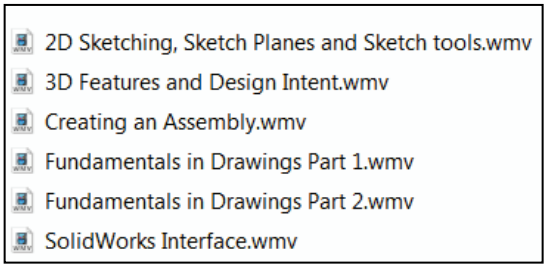
View the provided videos for each section of the book to enhance the user experience.

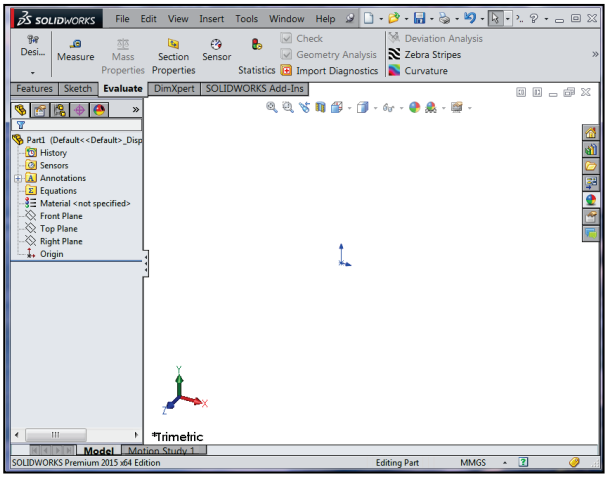


- SOLIDWORKS Interface.
- 2D Sketching, Sketch Planes and Sketch tools.
- 3D Features and Design Intent.
- Creating an Assembly.
- Fundamentals in Drawings Part 1 & Part2.

Overview of Chapters

Chapter 1: Overview of SOLIDWORKS and the User Interface

SOLIDWORKS is a design software application used to create 2D and 3D sketches, 3D parts and assemblies and 2D drawings.



Chapter 1 introduces the user to the SOLIDWORKS 2015 User Interface (UI) and CommandManager: Menu bar toolbar, Menu bar menu, Drop-down menus, Context toolbars, Consolidated drop-down toolbars, System feedback icons, Confirmation Corner, Heads-up View toolbar, Document Properties and more.

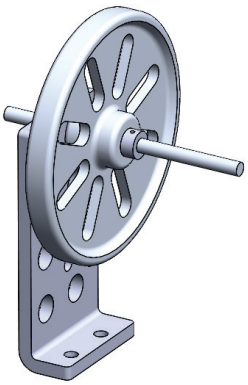
How do you start a SOLIDWORKS session? How do you open a new or existing part? How do you start a model in SOLIDWORKS? What is design intent?

Chapter 2: 2D Sketching, Features and Parts

Learn about 2D Sketching and 3D features. Create a new part called Wheel with user defined document properties.

Create the Wheel for the Fly Wheel sub-assembly. Utilize the Fly Wheel sub-assembly in the final Stirling Engine assembly.

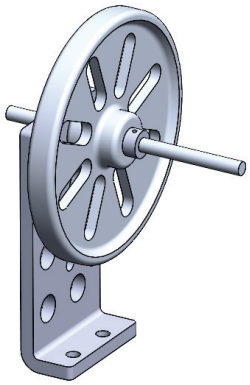
Apply the following sketch and feature tools: Circle, Line Centerline, Centerpoint Straight Slot, Mirror Entities, Extruded Boss, Extruded Cut, Revolved Boss, Circular Pattern, Hole Wizard and Fillet.



Incorporate design change into a part using proper design intent, along with applying multiple geometric relations: Coincident, Vertical, Horizontal, Tangent and Midpoint and feature and sketch modifications.

Utilize the Material, Mass Properties and Appearance tool on the Wheel.

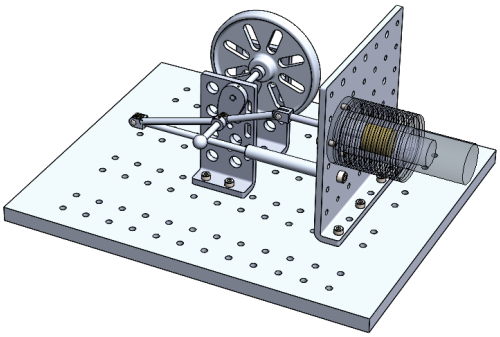
Chapter 3: Assembly Modeling - Bottom-up method



Learn about the Bottom-up assembly method and create two new assemblies with user defined document properties:

- Fly Wheel.
- Stirling Engine.

Insert the following Standard and Quick mate types: Coincident, Concentric, Distance and Tangent.

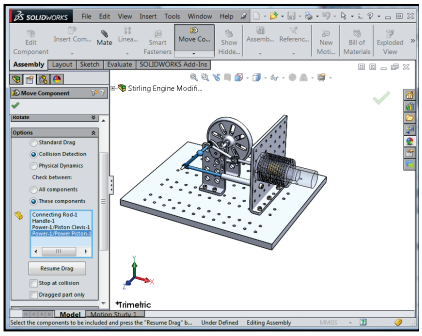


Utilize the following assembly tools: Insert Component, Suppress, Un-suppress, Mate, Move Component, Rotate Component, Interference Detection, Hide, Show, Flexible, Ridge and Multiple mate mode.

Create an Exploded View with animation.

Apply the Measure and Mass Properties tool to modify a component in the Stirling Engine assembly.

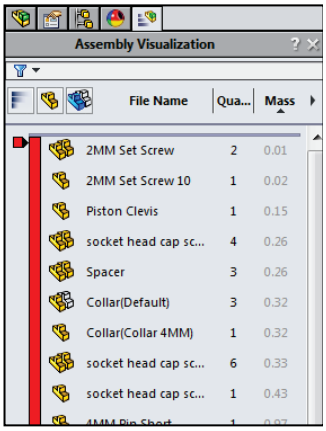
Chapter 4: Design Modifications



Address clearance, interference, static and dynamic behavior of the Stirling Engine Modified assembly.

Verifier the behavior between the following components: Power Piston, Power Clevis, Connecting Rod and Handle in the assembly.

Apply the following assembly tools: Move, Rotate, Collision Detection, Interference Detection, Selected Components, Edit Feature and Center of Mass.

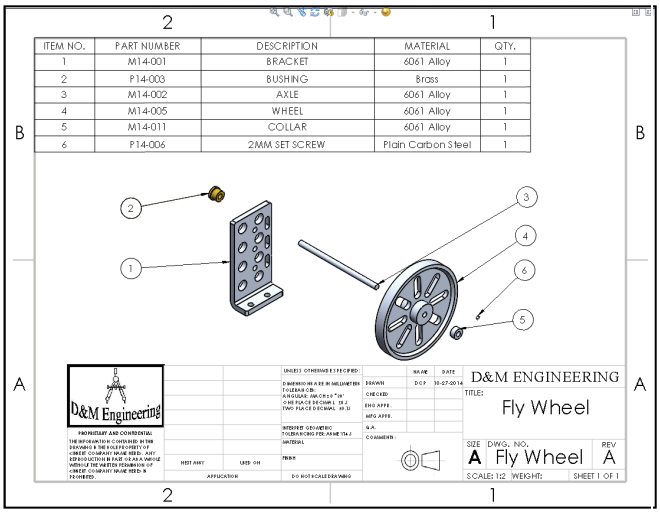


Utilize the Assembly Visualization tool on the Stirling Engine assembly and sort by component mass.

Create a new Coordinate System on the Stirling Engine assembly relative to the default origin.

Run a Motion Study and save the Motion Study AVI file.

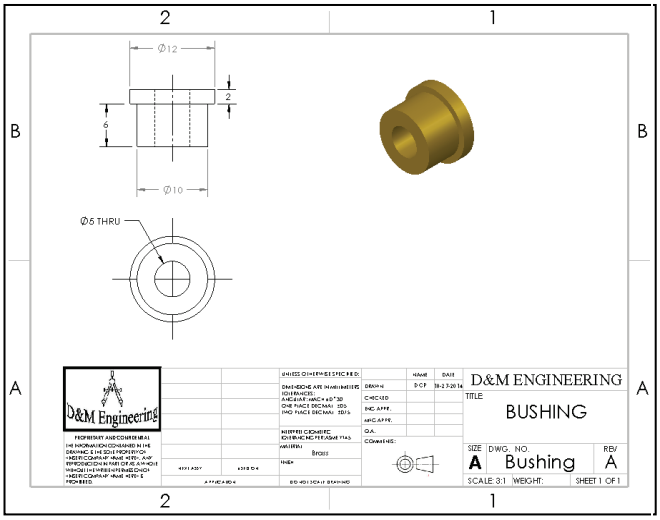
Chapter 5: Drawing and Dimensioning Fundamentals



Learn about Drawing and Dimension Fundamentals and create two new drawings with user defined document properties:

- Fly Wheel Assembly.
- Bushing.

Create the Fly Wheel Assembly drawing with an Exploded Isometric view.



Utilize a Bill of Materials, Magnetic lines and Balloons.

Learn about Custom Properties and the Title Block.

Create the Bushing Part drawing utilizing Third Angle Projection with two standard Orthographic views: Front, Top and an Isometric view.

Address imported dimensions from the Model Items tool.

Insert additional dimensions using the Smart Dimension tool along with all needed annotations.

Chapter 6: Additive Manufacturing - 3D Printing

Provide a basic understanding between the differences of Subtractive vs. Additive manufacturing. To comprehend 3D printer terminology along with a working knowledge of preparing, saving and printing a part on a low cost printer.

All low cost 3D printers have common terms, issues and components. This chapter is designed to address the following items. On the completion of this chapter, you will be able to:

- Understand the key differences between Subtractive and Additive manufacturing.
- Save a SOLIDWORKS model in an STL file format.

- Discuss the advantages and disadvantages of filament materials used in a low cost 3D printer :
  - PLA (Polylactic acid).
  - ABS (Acrylonitrile butadiene styrene).
- Prepare a low cost printer, and prepare the part.
- Understand part orientation and its effects on the final 3D print.
- Recognize the following 3D printer terms:
  - Raft.
  - Support.
  - Resolution.
  - Slicer Engine.
  - Extruder temperature.
  - Scale.
- Remove the part from the printer, understand the printer limitations and address fit tolerances for interlocking parts.