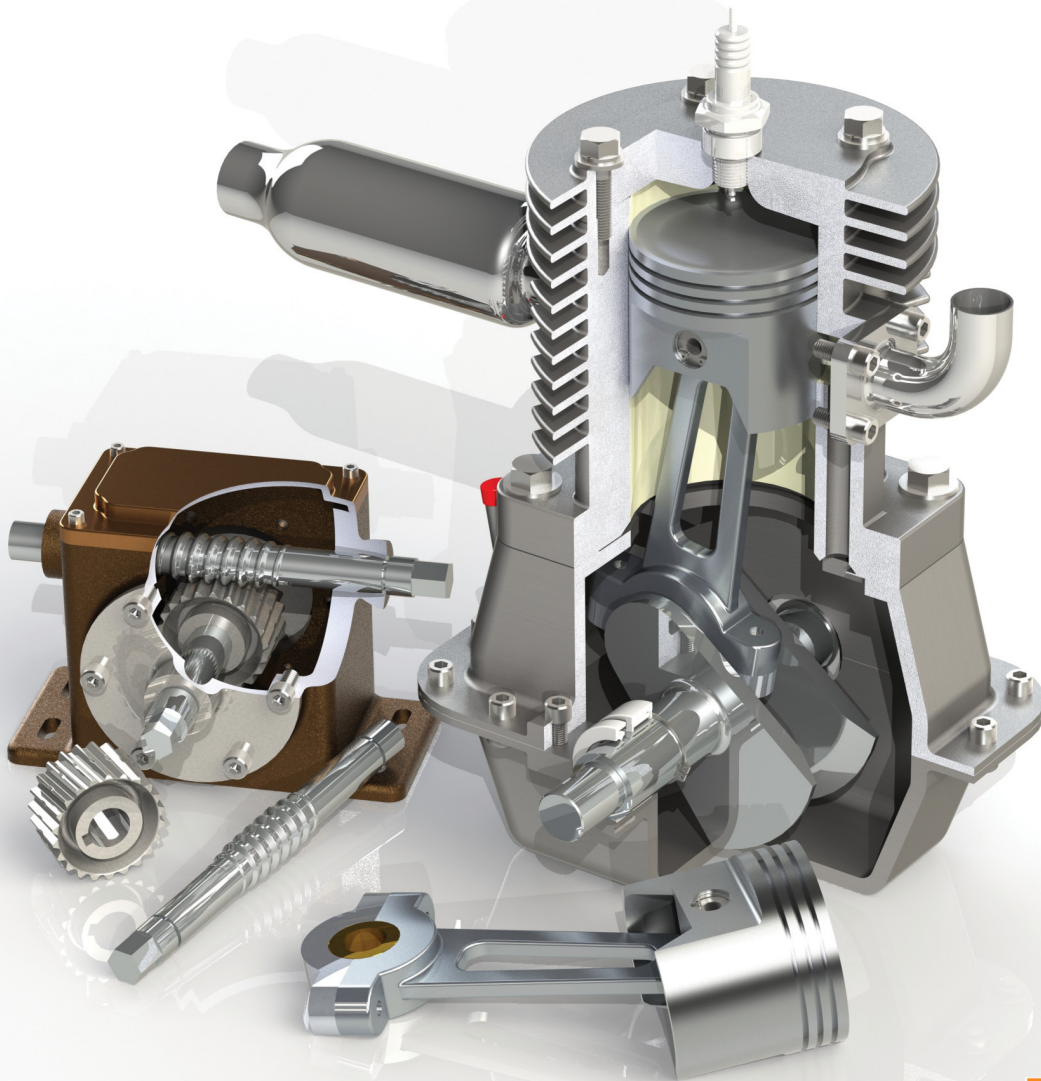


# Beginner's Guide to SolidWorks® 2013 - Level I

Parts, Assemblies, Drawings, Simulation Xpress



Alejandro Reyes MSME, CSWP, CSWI



Visit the following websites to learn more about this book:



[amazon.com](https://www.amazon.com)

[BARNES & NOBLE](https://www.barnesandnoble.com)

[Google books](https://books.google.com)

# Table of Contents

<b>Introduction</b> .....	<b>1</b>
Prerequisites.....	1
<b>The SolidWorks Interface</b> .....	<b>3</b>
<b>Part Modeling</b> .....	<b>11</b>
The Housing.....	13
The Side Cover.....	85
The Top Cover.....	99
The Offset Shaft.....	125
More about Auxiliary Geometry:.....	143
The Worm Gear.....	153
The Worm Gear Shaft.....	171
<b>Special Features: Sweep, Loft and Wrap</b> .....	<b>181</b>
Sweep: Cup and Springs.....	183
Loft: Bottle.....	211
Wrap Feature.....	221
<b>Detail Drawing</b> .....	<b>233</b>
Drawing One: The Housing.....	235
Drawing Two: The Side Cover.....	267
Drawing Three: The Top Cover.....	285
Drawing Four: The Offset Shaft.....	301
Drawing Five: The Worm Gear.....	309
Drawing Six: The Worm Gear Shaft.....	323
<b>Assembly Modeling</b> .....	<b>333</b>
The Gear Housing Assembly.....	335
SmartMates.....	359
Fasteners.....	371
Configurations using Design Tables.....	381
Interference Detection.....	395
Exploded View.....	405
Assembly and Design Table Drawings.....	419
<b>Analysis: SimulationXpress</b> .....	<b>429</b>
Background. Why Analysis?.....	431
Analysis of a simple part.....	434
A final word on analysis.....	451
<b>Collaboration: eDrawings</b> .....	<b>453</b>
How to collaborate with non-SolidWorks users.....	453
<b>Final Comments</b> .....	<b>457</b>
<b>Appendix</b> .....	<b>459</b>
Document templates.....	459
Engine Part Features Sequence.....	465
<b>Index</b> .....	<b>469</b>

List of commands introduced in each chapter. Note that many commands are used extensively in following chapters after been presented.

<p><b>PART MODELING</b></p> <p><b>Housing:</b></p> <p>New Part          Create Sketch          Confirmation Corner          Sketch Grid          Auto-Rotate view normal to Sketch plane          Sketch Rectangle          Sketch Centerline          Sketch Relations          Smart Dimension          Sketch Status          Extrude Boss/Base          Document Units          View Orientation          Mouse Gestures          Menu Customization          Center Rectangle          Fillet          Magnifying Glass          Extruded Cut          Through All (End condition)          Sketch Fillet          Rename Features          Circle          Instant 3D          Mirror Features          Model Display Styles          Fly-Out FeatureManager          Dimension Tolerance          Hole Wizard          Cosmetic Threads          Sketch Point          Edit Sketch          Rebuild          Circular Pattern          Automatic Relations          Temporary Axes</p>	<p>Sketch Slot          Sketch Numeric Input          Linear Pattern          Edit Material          Mass Properties</p> <p><b>Side Cover</b></p> <p>Revolved Boss/Base          Trim Entities          Extend Entities          Construction Geometry</p> <p><b>Top Cover</b></p> <p>Offset Entities          Mirror Entities (Sketch)          Up to Surface (End condition)          Shell          Measure Tool          Select Other          More Fillet options</p> <p><b>Offset Shaft</b></p> <p>Revolved Cut          Auxiliary Planes          Hide/Show sketch          Convert Entities          Polygon (Sketch)          Flip Side to Cut          Axis (Reference geometry)          Coordinate Systems</p> <p><b>Worm Gear</b></p> <p>Mid Plane (End Condition)          Chamfer          Dimension to Arc          Direction 2 (End Condition)</p> <p><b>Worm Gear Shaft</b></p> <p><i>General Review of previous commands</i></p>	<p><b>SWEEP, LOFT, WRAP</b></p> <p><b>Sweep</b></p> <p>Thin Feature          Ellipse          Auxiliary Plane at point          Sweep          Up to Next (End condition)          Full Round Fillet          Helix          Variable pitch helix          Open Sketch Cut          Guide Curves</p> <p><b>Loft</b></p> <p>Offset Plane          Hide/Show Plane          Loft          Start/End Conditions          Model Section View</p> <p><b>Wrap</b></p> <p>Wrap          Intersection Curve</p> <p><b>DETAIL DRAWING</b></p> <p><b>Housing Drawing</b></p> <p>Part Configurations          Suppress Feature          Parent Child Relation          Unsuppress          Configure Dimensions          Change Configuration          New Drawing          Make Drawing from Part          View Palette (Drawing)          Projected View          Tangent Edge Display          Section View          Detail View          Model Items          (Import dimensions)</p>
---	---	--

Drawing cleanup  
Center Mark/Centerlines  
Add Sheet to Drawing  
Model View  
    Configuration  
Rename Sheet  
Layers

**Side Cover Drawing**  
Reference Dimension  
Dimension Parentheses  
Sheet Scale  
View Scale

**Top Cover Drawing**  
Display only Cut Surface  
Display Dimension As  
diameter  
Ordinate Dimension  
Add to Ordinate  
Notes  
Custom Document  
    Properties  
Parametric Notes  
Link to Property

**Offset Shaft Drawing**  
Broken View

**Worm Gear Drawing**  
Display Sheet Format  
Insert Model View  
Crop View  
Ellipse  
Angle Dimension  
Tolerance/Precision  
Chamfer Dimension  
Edit Sheet Format / Title  
    Block  
Edit Sheet

**Worm Gear Shaft  
Drawing**  
Broken-Out Section  
Spline

**ASSEMBLY MODELING**

New Assembly  
Add New Component  
Change Configuration  
Mates  
Concentric Mate  
Coincident Mate  
Move Component  
Rotate Component  
Change Appearance  
Parallel Mate  
Hide/Show Component  
SmartMates  
Mirror Components  
Width Mate  
Toolbox Fasteners  
Design Library  
Add Fasteners  
Cosmetic Thread Display  
Configurations using  
    Design Tables  
Show Feature  
    Dimensions  
Rename Dimensions  
Edit Design Table  
Mate Reference  
Design Library  
Interference Detection  
Change dimensions in  
    the assembly  
Collision Detection  
Isolate  
Gear Mate  
Component Transparency  
Drawing update  
Exploded View creation  
Collapse View  
Animate Exploded view

**Assembly Drawing**  
Show Assembly in  
    exploded view  
Bill of Materials  
Add Custom Properties  
    to bill of Materials  
Open Part from  
    assembly drawing  
Format Bill of Materials  
Auto Balloons

**SimulationXpress**  
Analysis Background  
Split Line  
SimulationXpress  
Model Fixture  
Model Forces  
Meshing  
Run Simulation  
Review results  
Factor of Safety  
Generate reports  
Model changes and  
    simulation update  
Model optimization

**eDrawings**

**Appendix**  
Document Templates