

# **Test Project Day 3**

## **Mechanical Design Challenge**

### **WSC2013\_TP05\_M3\_EN**

Submitted by: Autodesk® Inc.

## **CONTENTS**

This Test Project proposal consists of the following documentation/files:

<b>PROJECT 1</b>	<b>PROJECT 2</b>
WSC2013_TP05_M3_EN.doc	WSC2013_TP05_M3_EN.doc
WSC2013_TP05_M3_PROJ1.pdf	Data Files folder > 02_Conveyor > All files
Data Files folder > 01_Hedgetrimmer > All files	

## **INTRODUCTION**

Your company has asked you to work on two design projects. The first is to model an alternate design for a hedge trimmer. The second is to create multiple versions of a conveyor.

## **DESCRIPTION OF PROJECTS AND TASKS**

### ***PROJECT 1***

After you have reviewed the prints, design brief and data files, you revise, model and assemble the alternate design for a hedge trimmer. You also create an exploded view drawing and 3 animations.

### ***PROJECT 2***

After you have reviewed the prints, design brief, and data files, you create 2 new versions of the conveyor system design. You also create a rendered image and a drawing.

You have **6 hours** to complete the projects.

## **INSTRUCTIONS TO THE COMPETITOR**

### ***OPEN AND REVIEW SUPPLIED FILES FOR PROJECT 1***

1. WSC2013\_TP05\_M3\_PROJ1.pdf is the design brief.
2. Supplied assembly and part files are located in Data Files > 01\_Hedgetrimmer.
3. WSC2013\_TP05\_M3\_PROJ1.iam is the current design of the hedge trimmer body.
4. Open 8102401-1201-Base.ipt. This is the starting file for the alternate housing design. It is described as the left half of the design.
  - i. The YZ and XY work planes align with the existing design, 8102401-1201.

### ***MODEL AND ASSEMBLE THE PARTS FOR PROJECT 1***

1. Review the part sketches and notes in the PDF file. Complete the tasks.
  - i. Design new hedge trimmer housing parts (right and left) from 8102401-1201-Base.ipt based on the images supplied.
  - ii. Model the blades and drive parts.
  - iii. Open 8102401-14.ipt. Model the handle based on the images given in the PDF file.
  - iv. Assemble the hedge trimmer. Create a single assembly with the original and alternate housing designs. The alternate housing design should be visible.
  - v. Switch Mechanism (#4) and Guard (#10) are not required on the new design.
2. Save the assembly using competition file naming conventions.

### ***CREATE A DRAWING FOR PROJECT 1***

1. To complete the drawing:
  - i. Create an exploded, shaded isometric view of the hedge trimmer with the alternate housing visible.
  - ii. Add balloons and a parts list. The parts list should have 3 columns, ITEM, QTY, and PART NUMBER. All parts must be listed.

## CREATE ANIMATIONS FOR PROJECT 1

1. Using Autodesk Inventor, create an animation as follows:
  - i. Illustrate the 2 housing designs. Start the animation with the original housing design visible.
  - ii. Screen size: 1024x768
  - iii. Length: 15 seconds
  - iv. Save the file using the competition file naming convention.
2. Using Autodesk Inventor, create an animation as follows:
  - i. Animate the hedge trimmer blades functioning.
    - i. The gearing must be visible at some point during the animation.
    - ii. A nut and bolt assembly and the slot in the blades must be visible at some point during the animation.
  - ii. Screen size: 1024x768
  - iii. Length: 15 seconds
  - iv. Save the file using the competition file naming convention.
3. Create an exploding animation of the hedge trimmer.
  - i. Use the alternate housing body design for this animation.
  - ii. Save the file in AVI format using the competition file naming convention.

## OPEN AND REVIEW SUPPLIED FILES FOR PROJECT 2

1. Supplied assembly and part files are located in Data Files > 02\_Conveyor.

## CREATE MULTIPLE VERSIONS OF CONVEYORS FOR PROJECT 2

1. Your company has designed a small conveyor system. You must create the 2 new conveyor systems (medium and large) from the given small assembly. The sizes are:

DIMENSION NAME	SMALL	MEDIUM	LARGE
length	1200	1600	2000
width	498	798	998
height	800	800	1000

## CREATE A DRAWING FOR PROJECT 2

1. On an A2 sheet, produce a drawing showing the 3 conveyors designs, identifying the overall dimensions on each.

## CREATE A RENDERED IMAGE FOR PROJECT 2

1. Using Inventor Studio, create a rendered image showing all 3 conveyor designs as follows:
  - i. Image size: 640 x 480.
  - ii. Save the file in PNG format using the competition file naming convention.

## MARKING SCHEME

CRITERION	SUB-CRITERION	MARKS P1 (O/S)		MARKS P2 (O/S)	
C1	Fulfilment of the Design Brief	10	1	3	0
C2	Physical simulation	4	1.5	0	0
C3	Exploded view simulation	2	1.5	0	0
C4	Photo rendering	0	0	1	1
	<b>Sub-Total:</b>	16	4	4	1
	<b>Total:</b>	20		5	