

# ME 24-688 – Week 1-8

## Team CAD Project Assignment

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### 1 Seat Handle Release Design

Your team has just won a new design project from an automotive company to design a new seat handle release mechanism for an existing seat product they offer. The goal for your four person design team is produce a concept of your design and then complete your design so it is ready for manufacturing. The customer has provided you with several design requirements that must be achieved within your design and also all of the required CAD data for the existing seat product to start with. The following sections will provide additional information on this team project assignment.

#### 1.1 Design Requirements

The following design requirements have been established for this project. Please ensure your submitted design addresses all of these requirements.

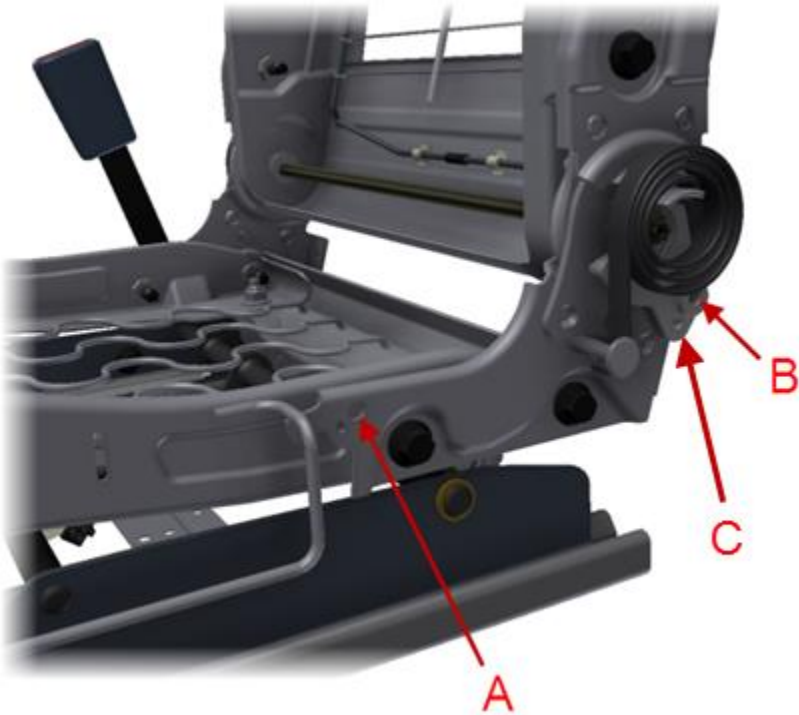
- There will be over 100,000 of these products produced so the design must be designed for high volume production.
- Design a handle release mechanism that mounts and pivots around the center of the hole marked as “A” in the below image and connect to hole “B” to pivot part “C” marked that releases the back seat to pivot.
- The pin that would go into the hole of the frame marked as “A” in the following image needs to be pressed fitted to be held into place or welded to the frame.
- The new design must be capable of being assembled by hand with modest hand tools only to lower manufacturing and assembly costs.
- The new complete design cannot have more than nine (9) new parts to complete the project.
- Design a new plastic switch pad that matches the theme of the handle and hand mounts onto the provided electrical switch. See the image below for additional information.
- The final assembly must include the provided side plastic cover shield part with the new handle part on the outside.
- There must be a spring added to the mechanism so there is tension force applied to the handle so it remains in the down position until force is applied to lift the handle upwards.
- To ensure the handle has a home down position and a maximum up position design your mechanism to hit the seat frame as marked for hard stops limiting the movement of the handle.

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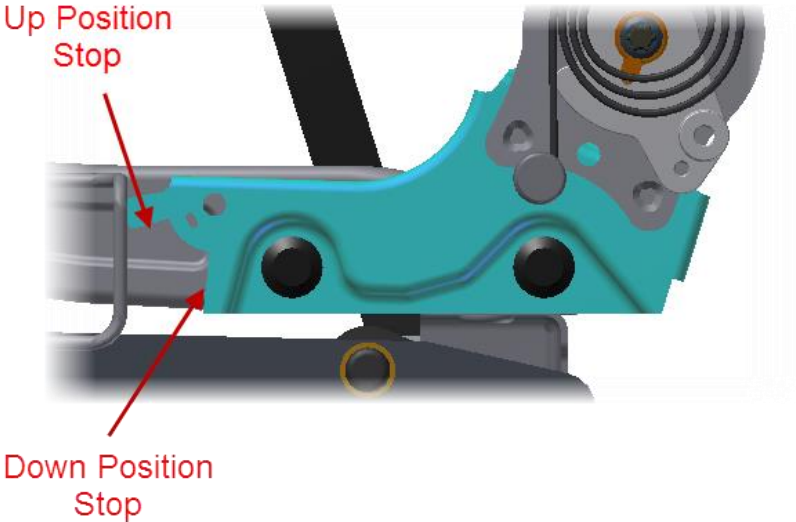
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### Mounting Positions



### Hard Stop Positions

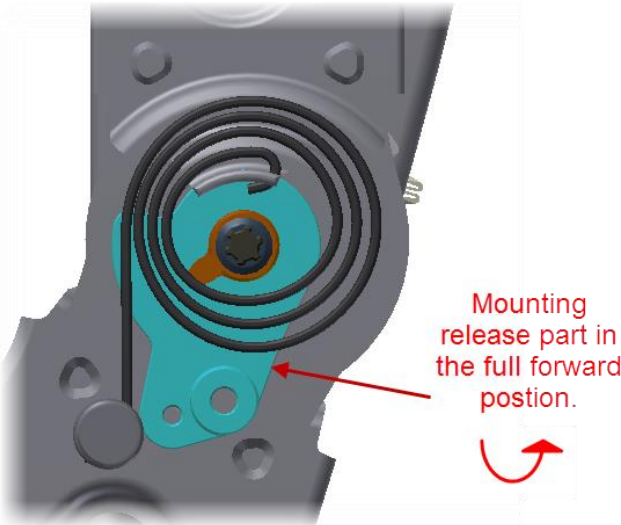
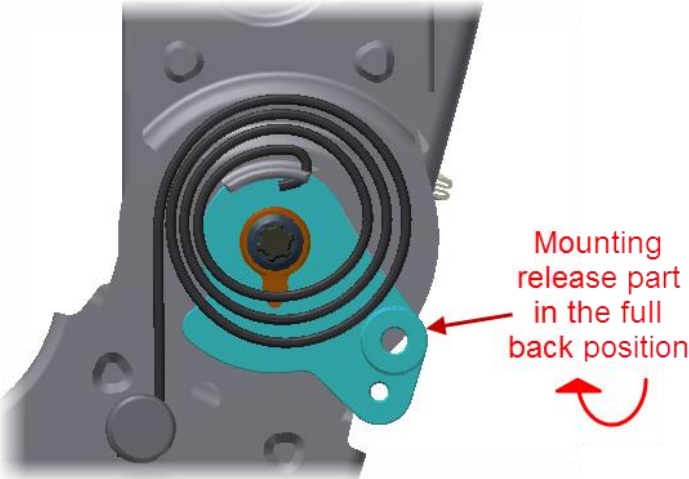


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### Release Cam Pivot Positions

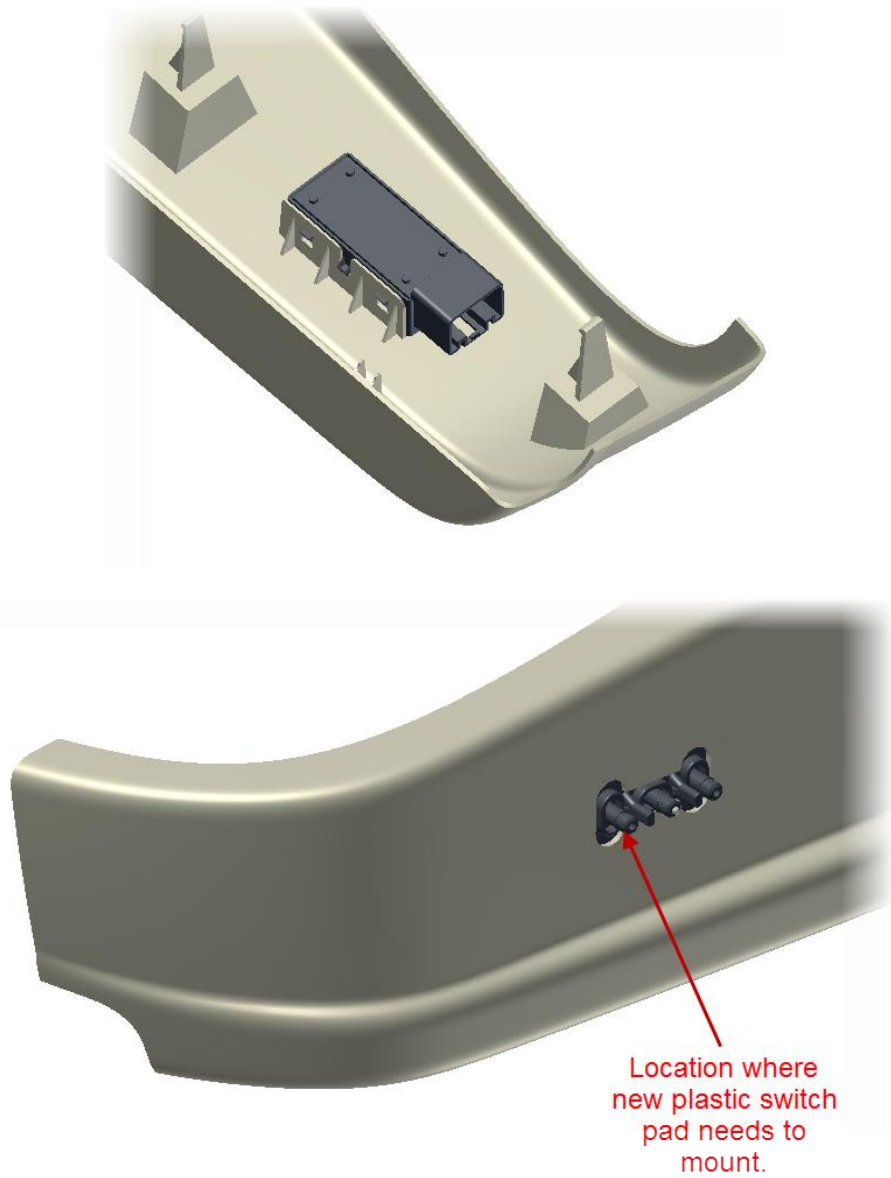


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### Electrical Switch Mounting and Placement



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### 1.2 Provided Items

The existing seat assembly file is provided that all of the new components will need to mount to and assemble with.

#### Main Seat Assembly



#### Images for Conceptual Design Background



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The following components are provided to complete the design. The plastic cover shield is required to be assembled on the side of the seat. The power seat motor control switch snaps into the side plastic cover and will be where you need to mount your switch pad from the outside. The provided spring model can be used if desired on the handle mechanism or a new spring part can be used or used.

Part Image	File Name	Description
	2012-5-1005.ipt	Side plastic cover shield for seat
	2012-5-1006.ipt	Power seat motor control switch
	2012-4-1011.ipt	(Optional Use) Spring
	Team Project 1 Seat Assembly Files.zip Seat Assembly.iam	Seat Assembly and parts

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### 1.3 Final Deliverables

Outlined below are the project assignment deliverables, grading elements, and assignment schedule.

#### Final Presentation Requirements

The following elements are required to be submitted to complete the project assignment.

- Submit a created presentation video with audio narration (5 minutes long maximum).
  - Camtasia Relay **MUST** be used
    - Submission is only available while connected to the Carnegie Mellon Network
- Camtasia Relay will publish the following formats:
  - Flash
  - Silverlight
  - .MP4
- Showcase the following elements:
  1. Team responsibility matrix and team introduction
  2. Conceptual Design Sketches of Design
  3. Overall Mechanism Design Detail (How does it work)
  4. Prove the design is manufacturing ready
  5. Assembly drawing showcasing new components
  6. High quality Visualization of the new complete assembled design.
- The intended audience of this video is a presentation to an automotive client to win a contract to design a manufacture the new seat release mechanism.
  
- Submit 3D Autodesk Inventor model files of all new part created (No more than 9 new parts)
- Submit a 3D DWF of the final assembly

#### Report Requirements

The following elements are required for the final report:

- No more than ten (10) – 8.5” x 11” pages of PowerPoint presentation
- Page 1: Group name and member names
- Page 2 -8: Conceptual design sketch, screen shots of parts, screen shots of the assembly, explanation of how the mechanism work, engineering drawings, etc...

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### Assignment Schedule

- **Interim Report**
  - Submit conceptual design sketch images of handle and seat switch pad
  - Submit project task list with resource assignments
    - Please submit all materials into the team AFS directory
  - **Due 6pm October 10, 2013**
  
- **Final Report**
  - Submit Autodesk Inventor model files and DWG files
  - Submit PowerPoint report file
  - Submit 5 min design presentation video (with audio explanation)
  - **Due noon October 16, 2013**
  
- **Presentation**
  - **8:30am-10:20am October 17, 2013**

### Grading Elements

The following elements will be used to determine the final team grade for the assignment.

#### Elements

- 10% - Conceptual Design (Styling, Concept)
- 10% - Were DFA and DFM concepts applied to the design
  - Manufacturability
  - Design Complexity
- 30% - Design Requirements
  - Hard Stops
  - Number of Parts
  - Mounting Positions
  - Spring Tensioner
  - Hand Assembly
- 40% - Presentation Quality
- 10% - BOM Fully Populated