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RangeAero | Assignment

1 message

RangeAero Take-off <takeoff@range.aero> Tue, Aug 16, 2022 at 4:35 PM
Reply-To: takeoff@range.aero
To: pradeepmurthy96@gmail.com

Dear Pradeep,

Our team has assessed your profile and feel that you might be the right fit for the position. To make this assessment better, they would like you to solve an assignment before your application will be moved for the face-to-face interview.

Please go through the below mentioned problem statement which you need to solve.

Problem Statement:

Design the device for the manipulation of the given component & to be operated manually by a single person.

Specifications of the components:

- Solid cylinder with 250 mm diameter and 150 mm height.
- Material of the component is an Aluminium alloy.
- All the surfaces of the part are Teflon coated.

Part need to be manipulated according to following mentioned steps:

- Step 1: Component is initially lying on a flat horizontal surface (consider the flat horizontal floor) with one of its flat faces in contact with the horizontal surface. Pick up the component and move it vertically upward (along +Y axis) by 550 mm from the horizontal surface.
- Step 2: Rotate the component by 90 degrees clockwise about the X axis (moment vector pointing in +X direction)
- Step 3: Move the component horizontally along the -Y axis by 300 mm & hold the part in this position.

Note: All the movements in the manipulation steps are described in the body coordinate system.

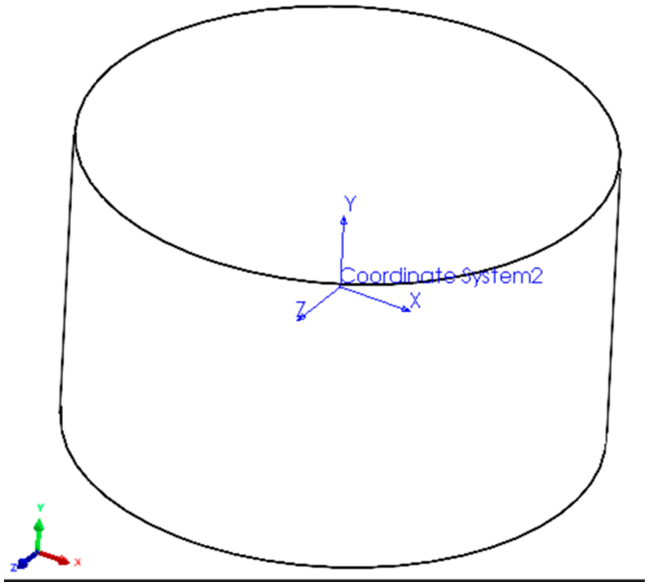

Figure 1: Body coordinate system (shown in blue lines)

Constraints:

- Maximum 4 actuators can be used in the device.
- The flat surface which was initially in contact with the horizontal floor surface needs to be completely unobstructed after the completion of step 3.
- The acceptable deviation in the position of the completion of step 3 is ± 0.2 mm along X, Y & Z axes (global coordinate system) and the deviation in angular position is ± 1 degree about all three axes.
- Also, during the manipulation, the contact surfaces of the component are not to be damaged (i.e., scratching, tearing, denting).

Your solution should contain:

- A complete manufacturable design of the device.
- A complete CAD model with all the parts and assemblies.
- Design document containing design calculations & analysis results (if any).
- Manufacturing drawings along with the detailed BOM, mentioning the parts used, quantity, material & manufacturing processes used.
- Attach images/snips from the CAD in the design document, showing the manipulation steps mentioned in the problem statement.

You're free to choose any CAD platform of your choice for modelling. Provide all CAD files in STEP format (assembly as well as part files) along with the files in the original format.

The documentation should follow the attached template. Template Document, to use this template go to file menu and select option "Make a copy".

Please submit your solution in 4 days from receiving this email. If you face any problem or have any questions then write to us on the same email thread.

Regards,

RangeAero Private Limited | Take-off