MIT 2.810 Manufacturing Processes and Systems

Fall 2013

Homework 9 – Design for Assembly

November 10, 2013

Problem 1

Consider the exploded view of a controller assembly as shown in figure 1.

1. Based on your study of this diagram, identify the assembly step which would take the most time to complete.

2. How many times does the assembly have to be re-oriented to complete various part insertions? Note: reorientation takes 4.5 sec of "insertion" time.

3. Write the assembly sequence, the handling and insertion times for each step, the total time needed to assemble this product, and the minimum part count. Calculate the assembly efficiency. Assume that you need 2.9 seconds to acquire a tool. Use the DFA time sheets provided in class. Cite any other reference that you use to estimate the times.

Note: To assemble the sensor, a tape has to be applied to the threads of the sensor, after which the adaptor nut can be fastened on. Applying tape takes 7 sec of "insertion" time.

References

1. Boothroyd et. al "Product Design for Manufacture and Assembly". The e-book can be found here: http://www.crcnetbase.com/ISBN/978-0-8247-4158-7 courtesy of the MIT Libraries.
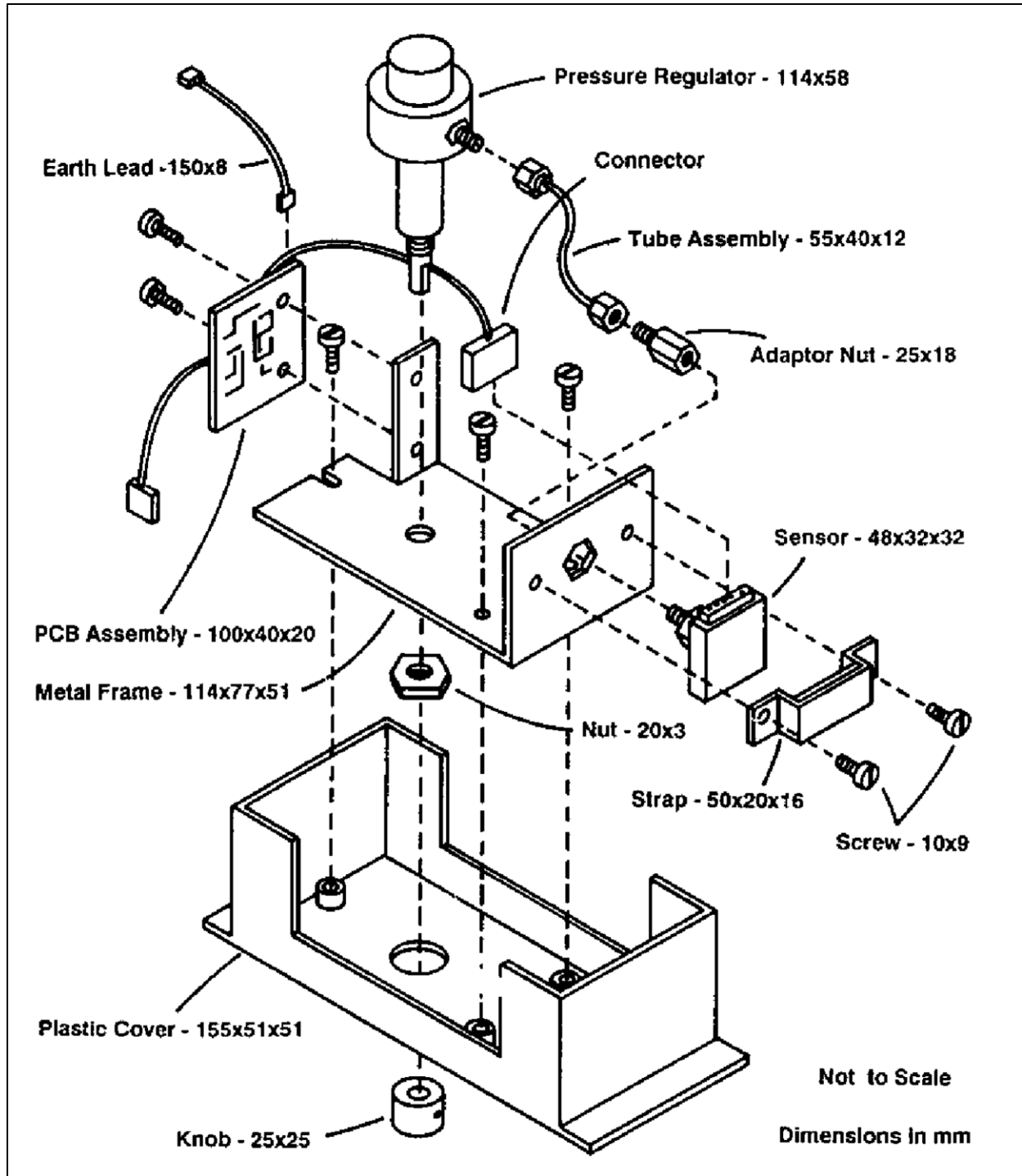
Figure 1: Controller Assembly