Hydraulics & Pneumatics

Chapter 3: Pneumatics (LAB #3)

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Objective

- By the end of lab, students should be able:
  - To study the multi-actuator circuits
  - To design a pneumatic and electro-pneumatic circuits
  - To familiarize student with simulation of pneumatic system

Punching Process

- A punching process is used to form a cylinder into basic ring shape before transferred to machining section. Firstly, the workpiece is clamped to prevent workpiece from moving around. Then, the die is pressed and released. Finally, the clamp cylinder is released after the die return to initial position.

Instruction

- Design and simulate an electro-pneumatic circuit diagram to represent the problem above (Automation Studio)
- Assemble the circuit in the workbench and identify how the system works

Lab report

1. Introduction (Min 2 pages)
   i. Introduce the pneumatic system for multi-actuator
   ii. State the objective (Discuss within the group)

2. Studied Problem (Min 1 full page)
   i. Explain and state the problem studied. Explain the punching problem above.

3. Methodology (Min 1 full page)
   i. Explain the steps in conducting this laboratory
   ii. Explain the steps in pneumatic circuit design

Lab report

4. Result (Min 2 pages)
   i. Insert the pneumatic diagram, simulation model etc, and assembled pneumatic system

5. Discussion (Min 2 full pages)
   i. Discuss your observation
   ii. Compare between simulation and actual practice
   iii. Pro and con of pneumatics system

6. Conclusion (Min 1 page)
   i. Explain what you have learn in this lab
   ii. How the simulation can help to improve pneumtic design