Hydraulics & Pneumatics

Chapter 3: Pneumatics (Design of Multi-Actuators Pneumatic Circuit)

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Lesson Outcome

- By the end of this lecture, student should be able to:
  - Design and analyze multiple-actuators pneumatic circuit for more than one actuators

Content

- Control of Multiple Actuators in Pneumatic
- Connectionin Multiple Connecting LInes

Control of Multiple Actuator

- Define motions of all actuators
- Divide sequence into groups
- Determine limit switch status
- Identify number of connecting line
  (= number of groups)
- Identify number of reversing valve
  (= number of groups – 1)

Control of Multiple Actuator

- Example
  - A pneumatic actuated drilling machine, contained of two DAC. When the workpiece is located at it position, cylinder A will clamp the workpiece. Then, the drilling process is started, where the spindle is controlled by cylinder B. After finish drilling, cylinder B will retract to the initial position, before the clamping cylinder retract.

Control of Multiple Actuator

1. Define motion

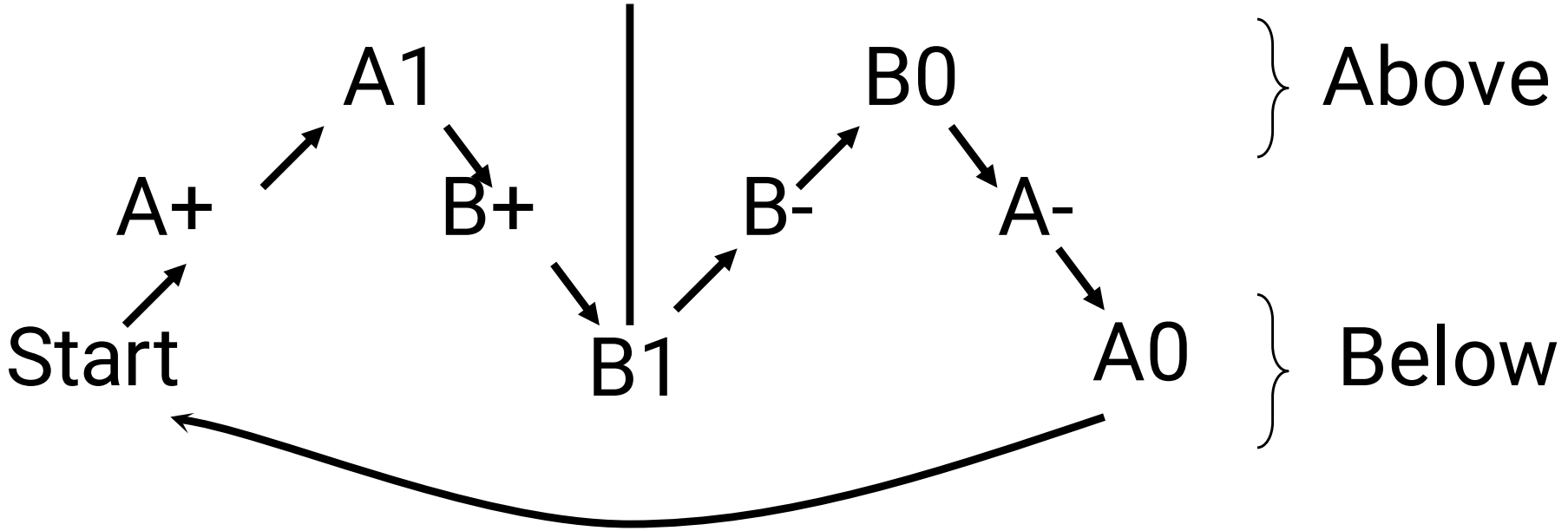
A+ B+ B- A-

2. Groups

A+ B+	B- A-
K	K2
1	

Control of Multiple Actuator

3. Limit switch status



Control of Multiple Actuator

4. Number of connecting line

= number of groups

= 2

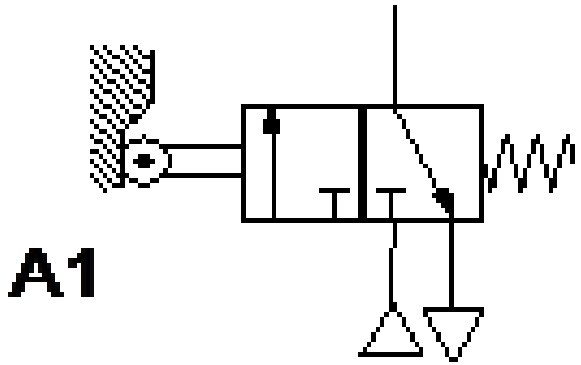
5. Number of reversing valve

= number of groups – 1

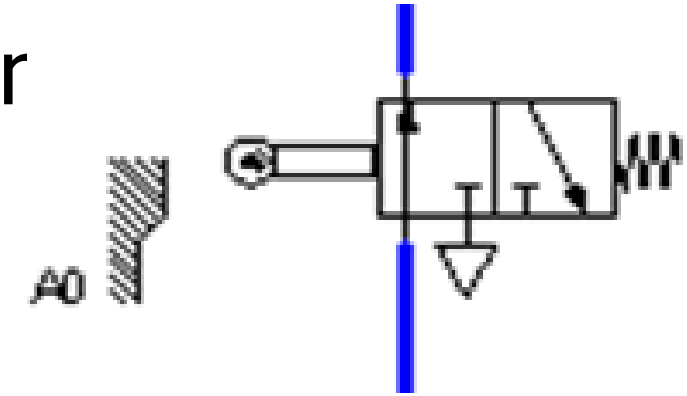
= 1

Introduction to pneumatic sensor

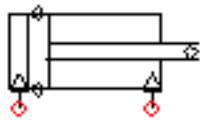
- Mechanical sensor, initial position

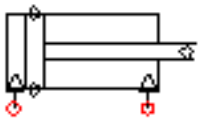


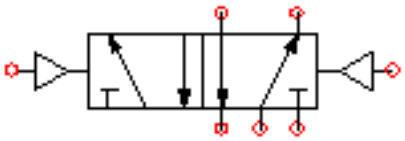
- Activated positior

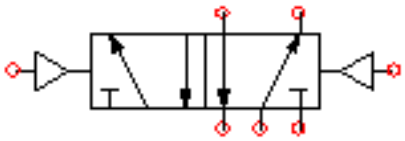


Draw basic circuit



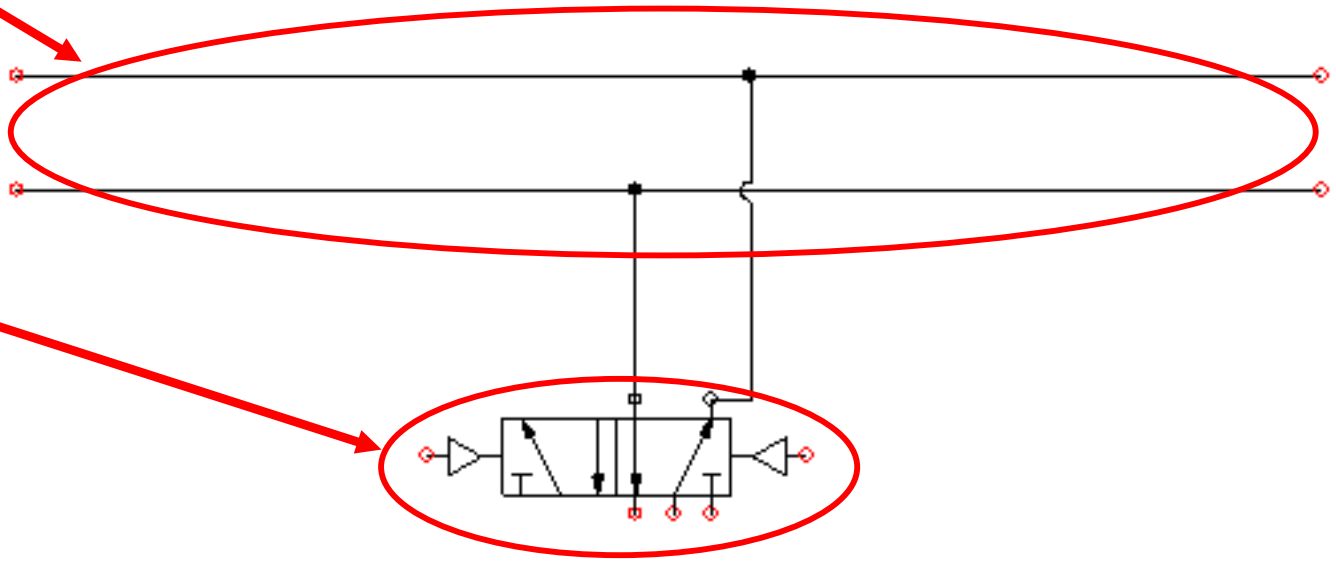






2 connecting lines

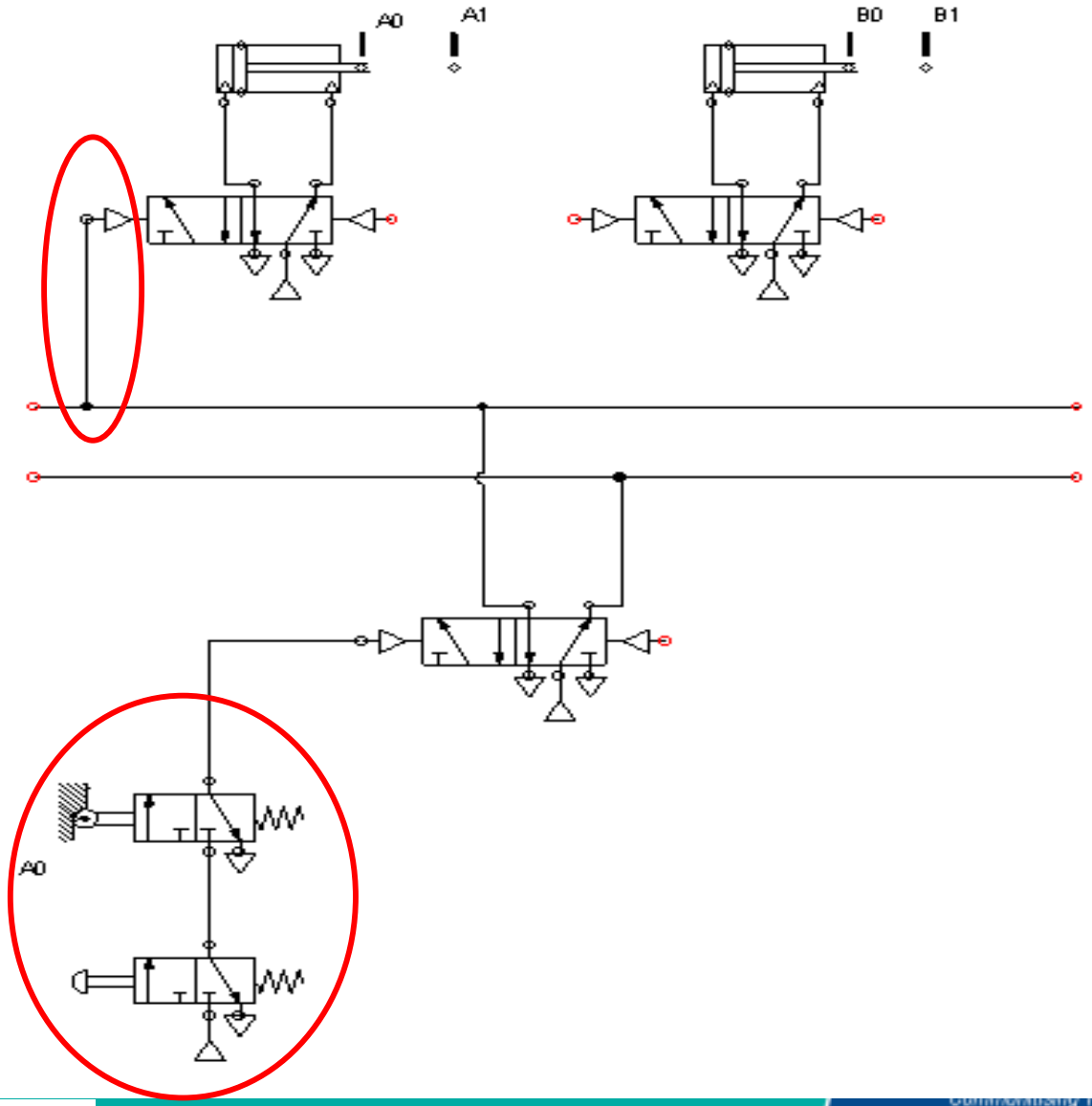
1 reversing valve



Control of Multiple Actuator

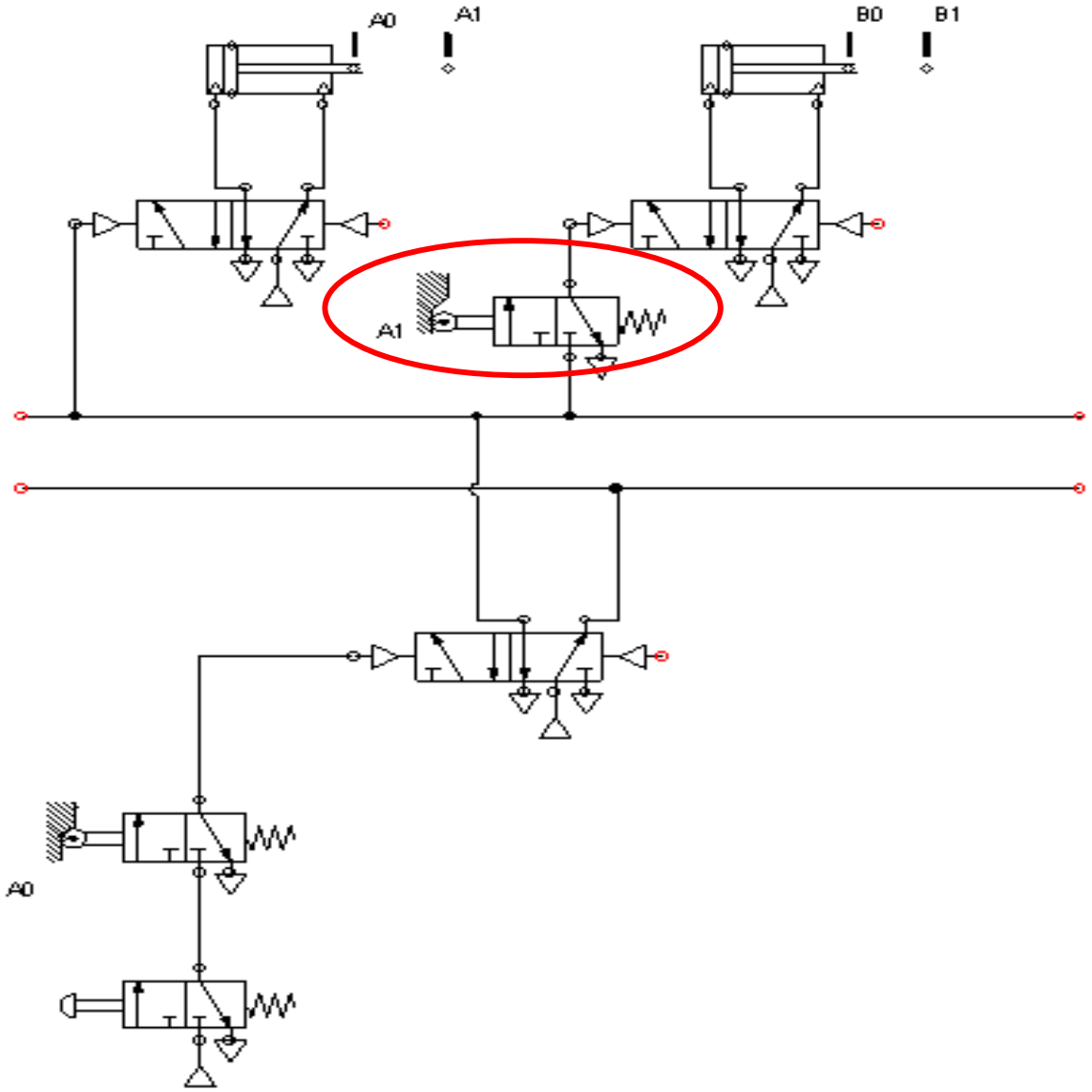
A+ →

Start A0



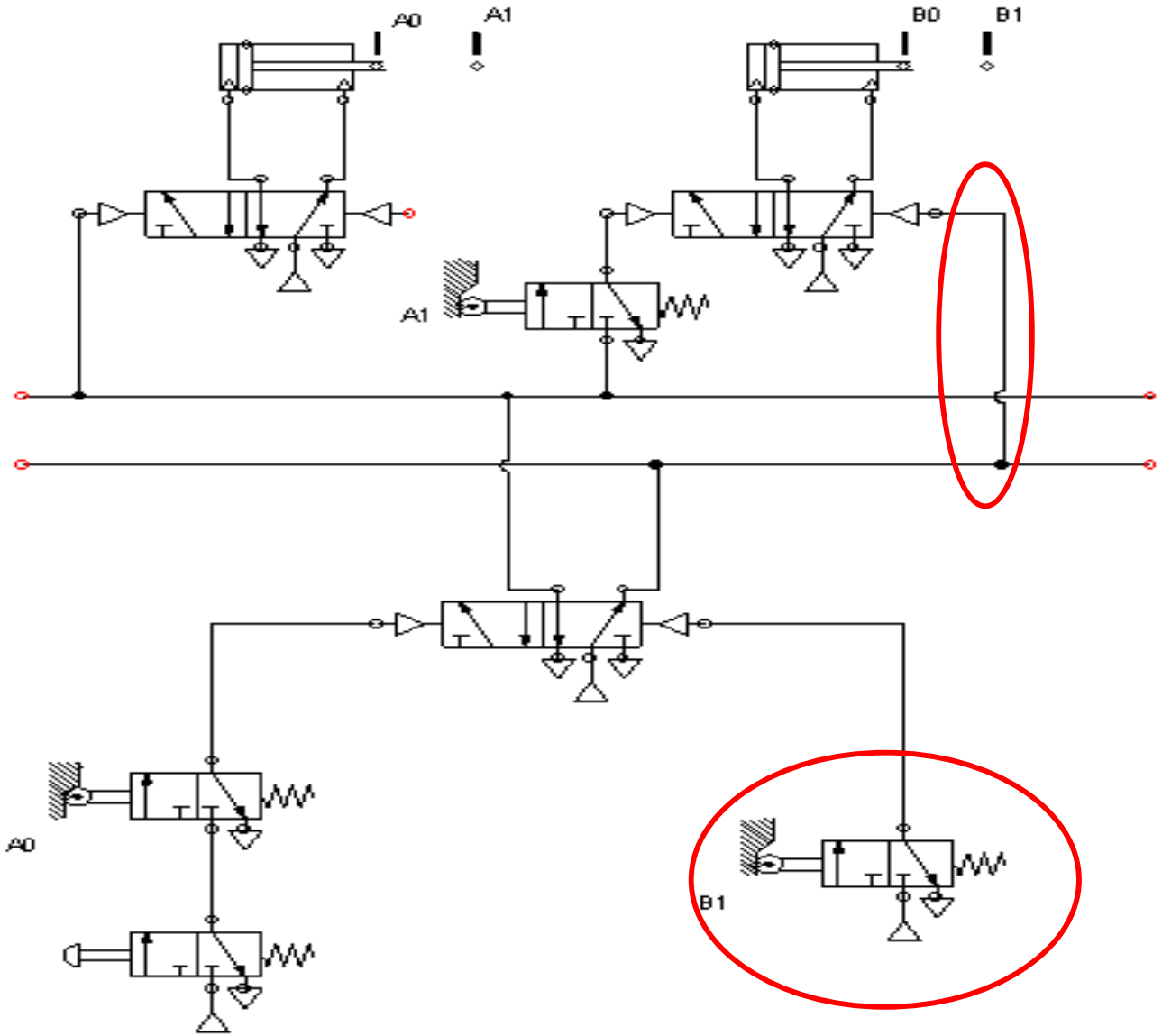
Control of Multiple Actuator

B+ → A1



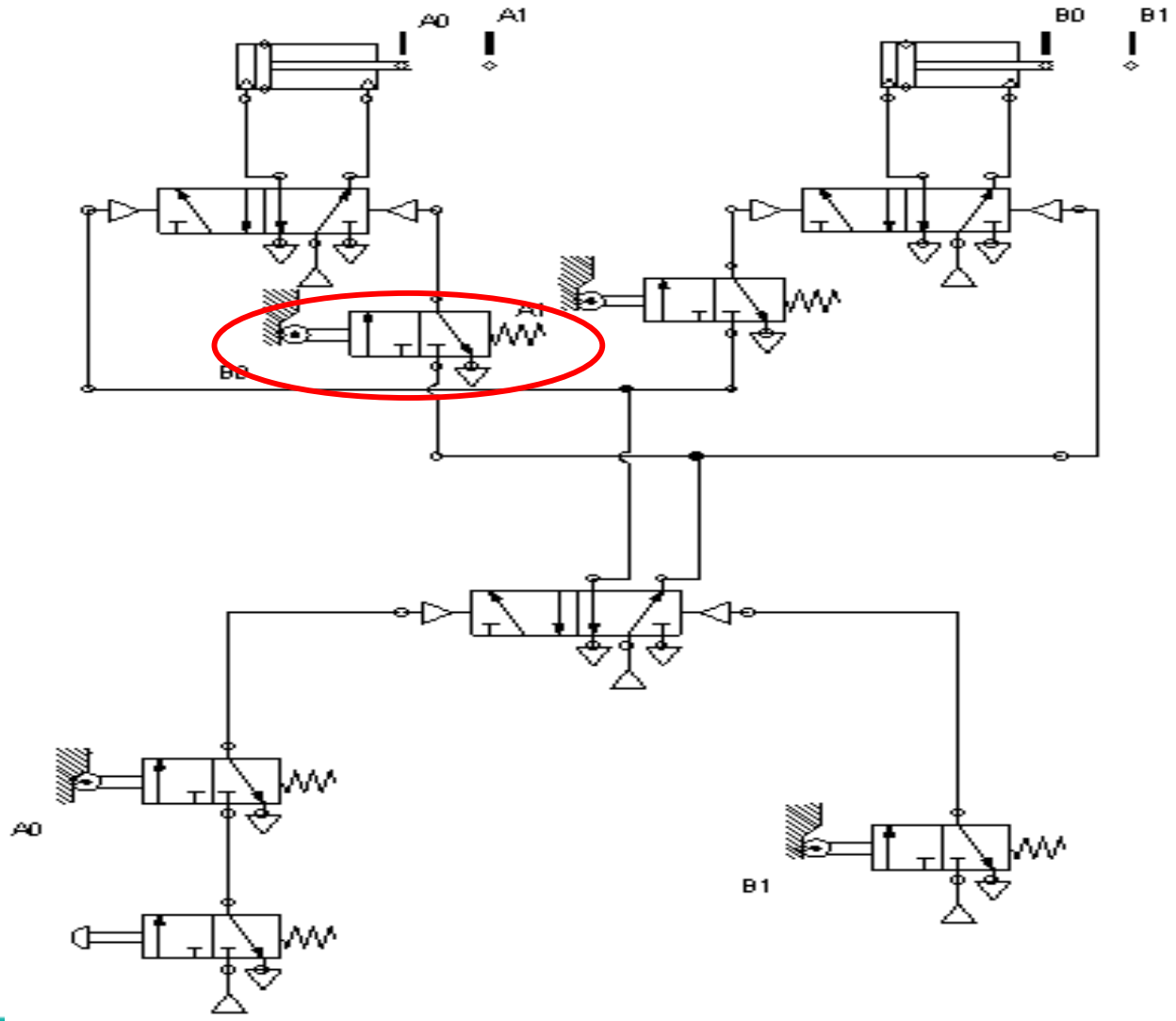
Control of Multiple Actuator

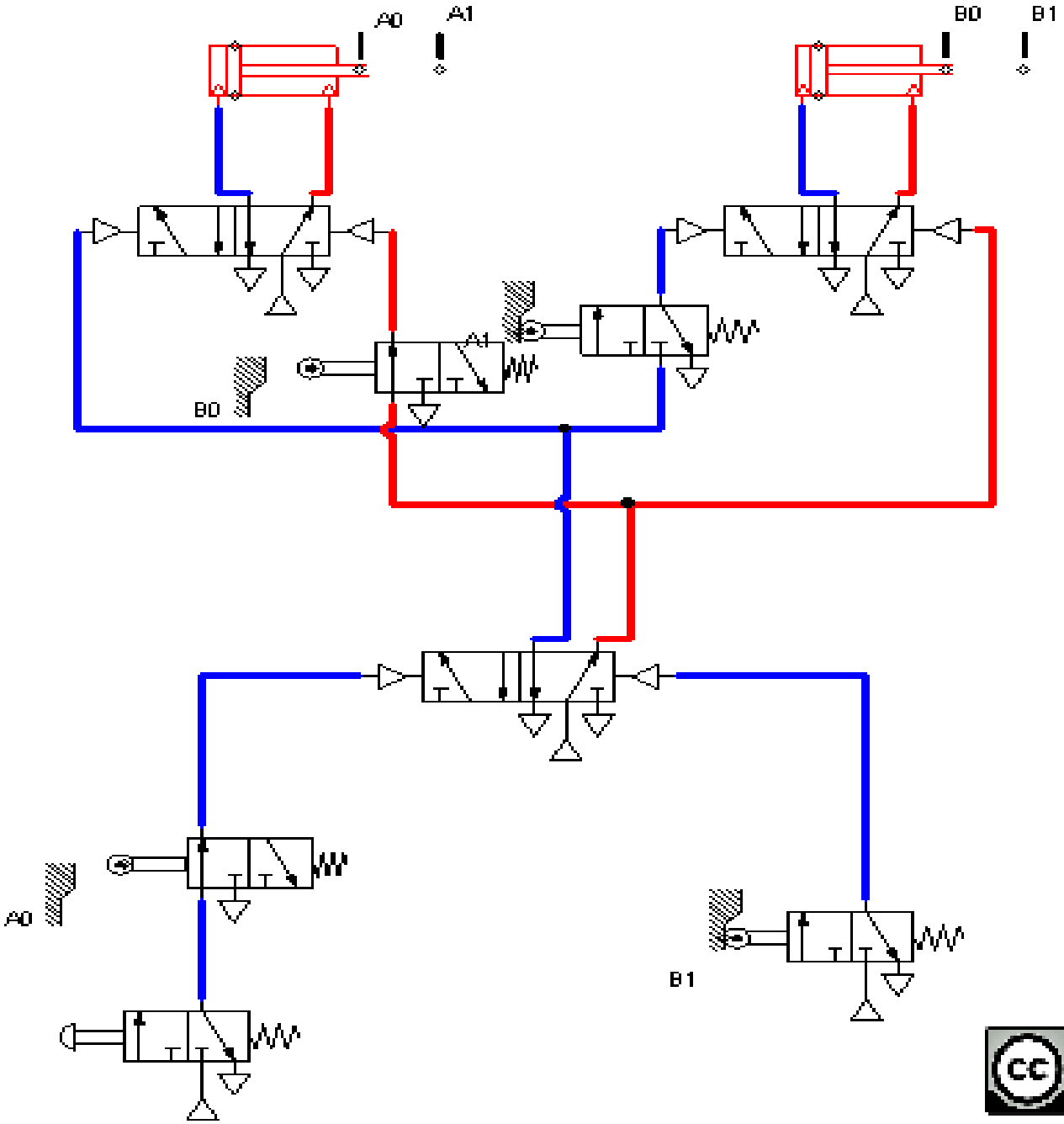
B- → B1



Control of Multiple Actuator

A- → B0





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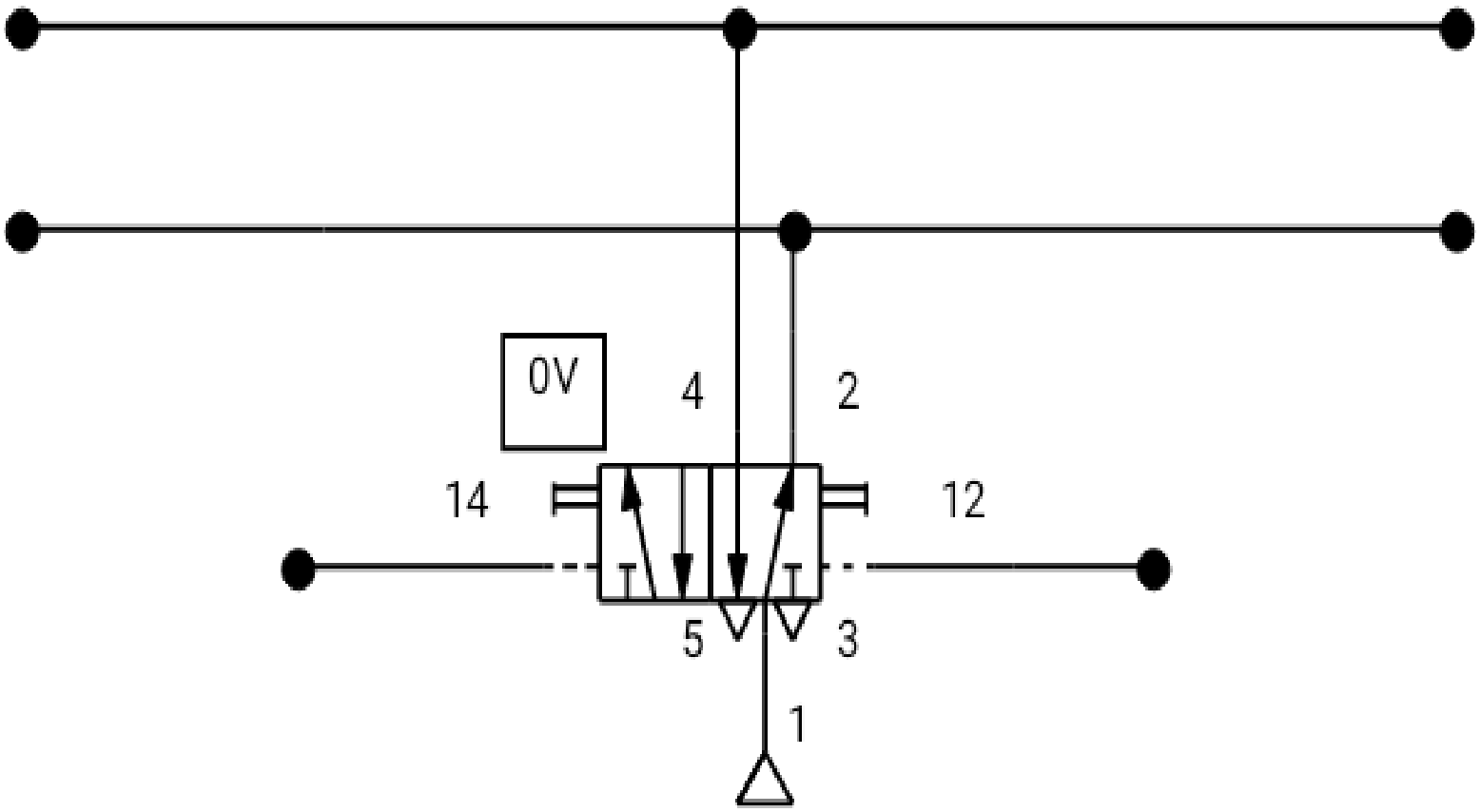
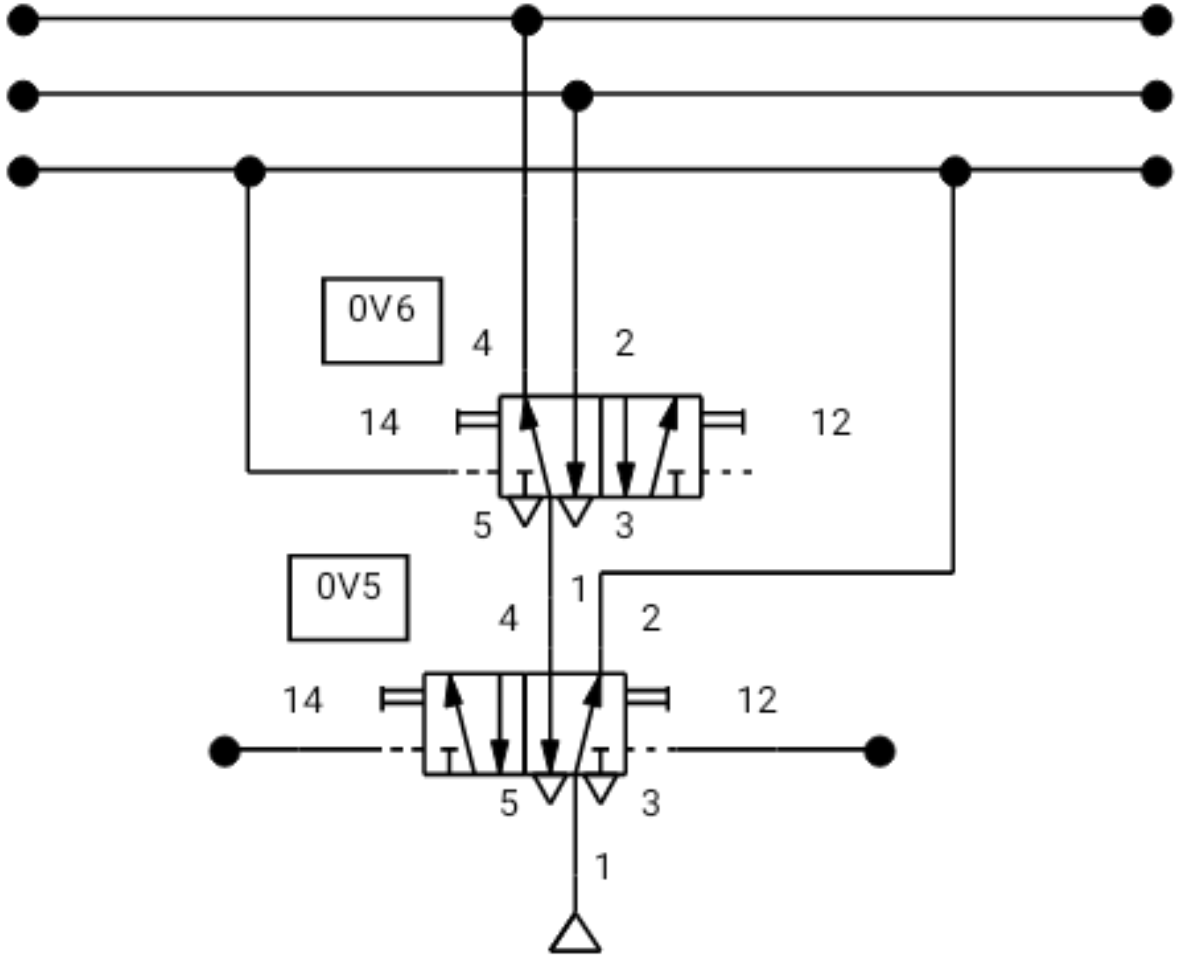
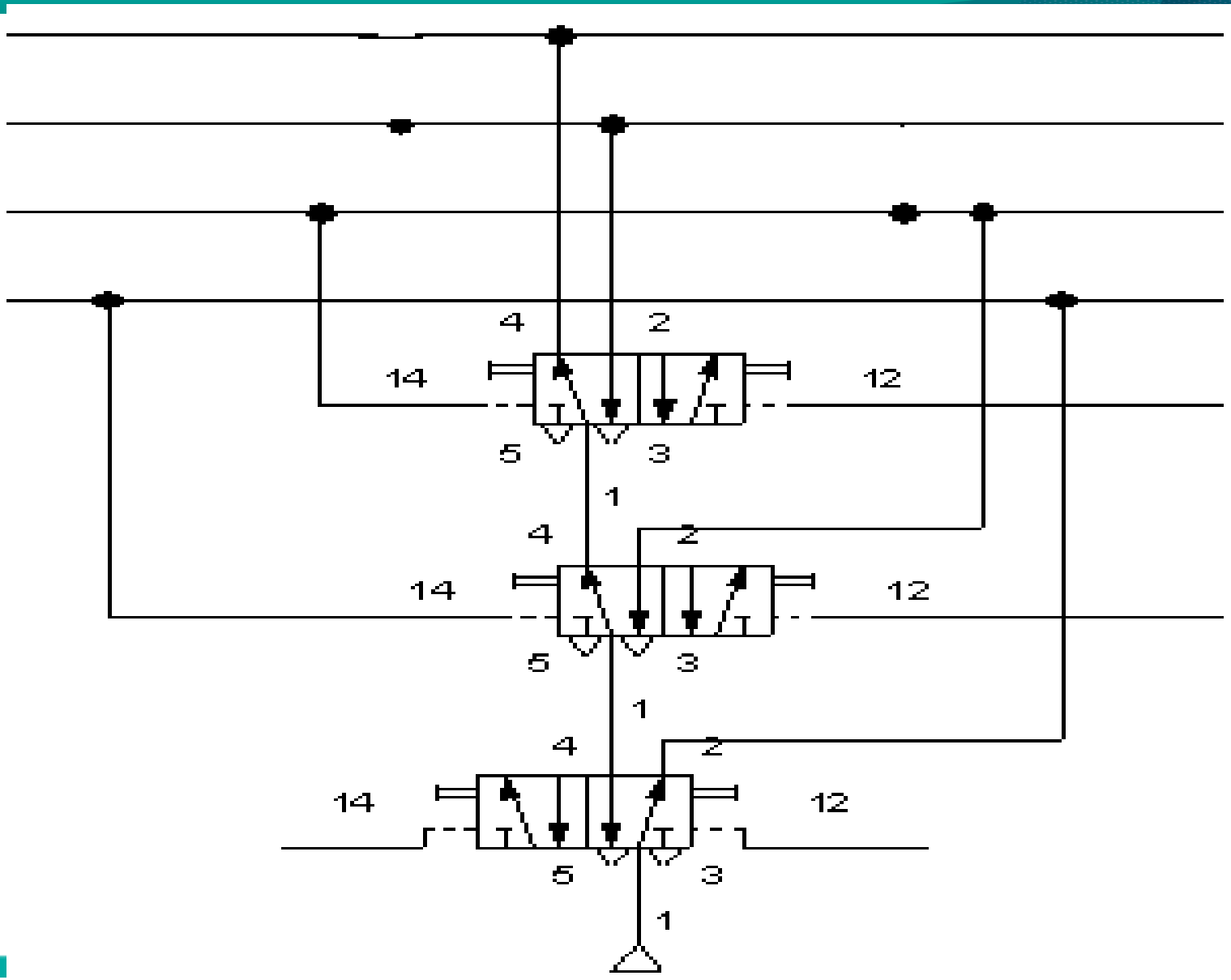
Connection of single reversing valve



Connection of double reversing valve



Connection of triple reversing valve



Summary

- In this lesson, we have learn how to design multi-actuator pneumatic circuit.