LIFTING AND SHIFTING

Figure 6.6: Pneumatic Circuit Diagram for Lifting and Shifting

Signal Overlap

Signal Overlap can occur when simultaneously two active signals appear on both set and reset pilot ports of Final Control Valve. This is due to the required sequencing of cylinder. At the start, both signals ao and bo appear at the same time. This will not result in any change.

6.7. Illustration of Signal overlap
Multi Cylinder Applications Signal Elimination

On analyzing the status of set signal and reset signal for final control valve for different cylinders, it is observed that both set and reset signals could be present simultaneously at any instant of time, depending on the sequential operation of the cylinder. This does not permit further change in status of the valve. This situation is termed as signal overlap. To overcome this problem signal elimination techniques are used as listed below:

- **Use of Idle return lever limit switches**
- **Use of N.O Timers**
- **Use of Cascading with the help of reversing valves**
- **Use of Stepper Sequencer modules**

**Example 2: Clamping and Riveting**

- Sheet metal components are to be riveted using two Pneumatic Cylinders. A Clamping cylinder (A) first advance and clamps the sheet metal parts.
- While the parts are clamped a second cylinder (B) advance and performs riveting operation
- The riveting cylinder retracts and finally clamping cylinder retracts

![Figure: 6.8 : Clamping and Riveting Using Pneumatic Cylinders](image)

- Control Diagram is drawn below the motion diagram represents the status of various signals - the limit switches used to interrogate the piston position
- Signals 1.4 and 1.3 correspond to home position and extended position limit switches of cylinder A respectively
- Signals 2.2 and 2.3 correspond to home position and extended position limit switches of cylinder B respectively
Figure 6.9  Control Diagram for Sequence A+, B+, B-, B-

Figure 6.10  Pneumatic Control Circuit and Control Diagram