

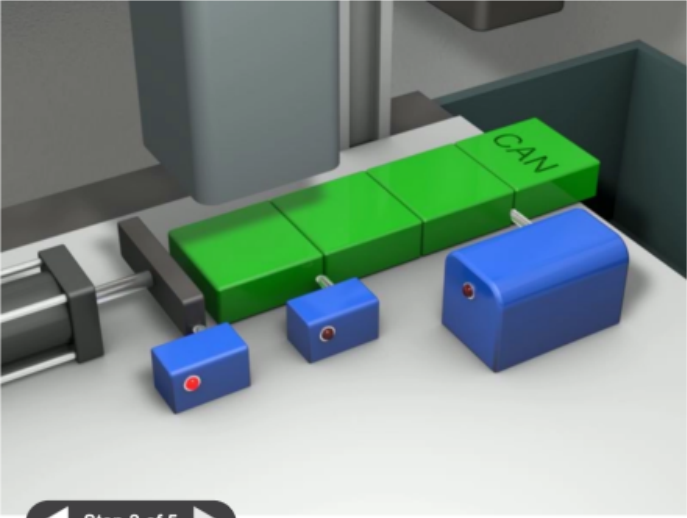
# Electro-Fluid Power | Multimedia Courseware

Introduction to Electrical Control Systems - WXB861-XC01XEN-E1

Objective 7: Describe the Operation of a Non-Servo Type Automatic Control System and Give an Application

Operation of a Non-Servo Type Automatic Control System

The controller de-energizes the solenoid of the DCV powering the feed cylinder, causing the feed cylinder to retract. Once it is retracted it actuates LS2.



Step 2 of 5

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## Multimedia Courseware: MB861

Electric relay control of hydraulic and pneumatic systems is essential across a wide variety of industry applications. Amatrol's Multimedia Courseware – Electro-Fluid Power (MB861) teaches learners essential electro-fluid power concepts and skills applicable throughout modern industry. Learners using Amatrol's electro-fluid power eLearning course begin by studying electrical control systems and basic control and power devices. From these building blocks, learners begin practicing industry-relevant electro-fluid power skills, like connecting and operating circuits to control sequencing, timers, and pressure.

## Teach Electro-Fluid Power

### In-Depth, Comprehensive Electro-Fluid Power Curriculum Connected to Real-World Skills

The Electro-Fluid Power multimedia course covers the following topics:

#### Introduction to Electrical Control Systems

Learners begin with an introduction to electrical control systems, including electrical control concepts and logic elements. Individual lessons focus on topics like types of automatic control systems, basic rules of electrical safety, and elements of control logic. Learners will also practice skills, such as developing a sequence of operations given an application, connecting and operating an OR logic control circuit to control an indicator lamp, and connecting and operating a NOR logic control circuit.

#### Basic Control Devices

Learners will study the components and operation of basic control devices, including ladder diagrams, indicators, pushbuttons, and selector switches. Individual lessons focus on topics like components of ladder diagrams, indicator lamp schematic symbols, and types of pushbutton switch operators. Learners will also practice skills, such as drawing a ladder diagram given a pictorial of a control circuit, designing a ladder diagram using one or more logic elements, and connecting and operating a pushbutton switch given a ladder diagram.

#### Power Devices

Learners using Amatrol's electro-fluid power eLearning course will study basic principles of power devices, including hydraulic solenoid-operated valves, pneumatic solenoid-operated valves, and transformers. Individual lessons focus on topics like types of hydraulic solenoids, the function of electro-pneumatic controls, and types of

circuit protection. Learners will also practice skills, such as connecting and operating a double-acting cylinder using a 4/3 solenoid-operated hydraulic DCV, using the manual override of a solenoid-operated pneumatic DCV to jog a cylinder, and connecting and operating a unidirectional pneumatic motor using a 5/2 solenoid-operated DCV.

### **Control Relays**

Learners will study various aspects and components of control relays, including relay operation and relay and motor control applications. Individual lessons focus on topics like general purpose relays, seal-in circuits, and unidirectional and bidirectional motor control start/stop circuits. Learners will also practice skills, such as connecting and operating a relay given a ladder diagram, designing a logic circuit that uses a relay, and connecting and operating a bidirectional motor control start/stop circuit.

### **Sequencing Control**

Learners using Amatrol's electro-fluid power eLearning course will study various aspects of sequencing control, including limit switch operation, cylinder sequencing, and multiple cylinder control. Individual lessons focus on topics like heavy-duty limit switches, single- and continuous-cycle reciprocation circuits, and the function of multiple cylinders in a machine. Learners will also practice skills, such as connecting and operating a control circuit containing a limit switch given a ladder diagram, designing a relay circuit to continuously cycle a cylinder using a double-solenoid DCV, and connecting and operating a dual-cylinder control circuit using two limit switches.

### **Timer Control**

Learners will study the basic principles of timer control, including time-delay relays and photoelectric sensors. Individual lessons focus on topics like types of time-delay relays, time-driven sequencing, and types of photoelectric detection methods. Learners will also practice skills, such as connecting and operating a control circuit with a timer relay, designing a control circuit to perform a cylinder dwell, and connecting and operating a photoelectric sensor.

### **Pressure Control Applications**

Learners using Amatrol's electro-fluid power eLearning course will study basic principles of pressure control applications, including solenoid-operated relief valves and pressure switches. Individual lessons focus on topics like pump unloading circuits, hydraulic pressure switches, and pressure-controlled sequencing. Learners will also practice skills, such as connecting and operating a pump unloading circuit that uses a solenoid relief valve, designing a two-pressure control circuit that uses a solenoid relief valve, and connecting and operating a pressure-controlled electro-fluid power sequencing circuit.

### **Circuit Applications**

Learners will study various aspects of circuit applications, including safety circuits, modes of operation, and rapid traverse-slow feed. Individual lessons focus on topics like safety interlock circuits, manual and automatic modes of operation, and rapid traverse-slow feed relay circuits. Learners will also practice skills, such as connecting and operating an emergency stop control circuit, designing a continuous-cycle, synchronized cylinder circuit with a manual mode, and connecting and operating a rapid traverse-slow feed relay circuit.

## **Interactive eLearning with Learning Management System**

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### **Highly-Interactive Multimedia Format Appeals to All Learning Styles**

Amatrol's interactive [eLearning](#) curriculum integrates various types of learning methods to create an engaging, effective learning experience. Amatrol's multimedia eLearning curriculum includes text with voiceovers, videos, 3D animations, pictures, and interactive activities, quizzes, and self-reviews.

### **Free Learning Management System (LMS)**

Amatrol eLearning is easy-to-use for both students and instructors. Its web-based interface is simple to navigate and available on any WebGL-compatible Internet browser. Instructors love Amatrol eLearning for its simple, yet sophisticated Learning Management System (LMS). The LMS allows instructors to create custom courses, monitor student participation, track course progress, assess knowledge levels prior to a course, and test knowledge levels after completion. Learners appreciate the fact that they can start and stop as needed, moving through each Amatrol course at their own pace. If a self-review reveals that they didn't understand a particular topic as well as they thought they did, they can revisit it before moving on.

## Additional Info

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### Requirements:

- Computer (See [Computer Requirements](#))

### Referenced Equipment:

- Electro-Fluid Power Learning System ([85-EF](#))
- Electro-Hydraulics Learning System ([85-EH](#))
- Electro-Pneumatics Learning System ([85-EP](#))

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