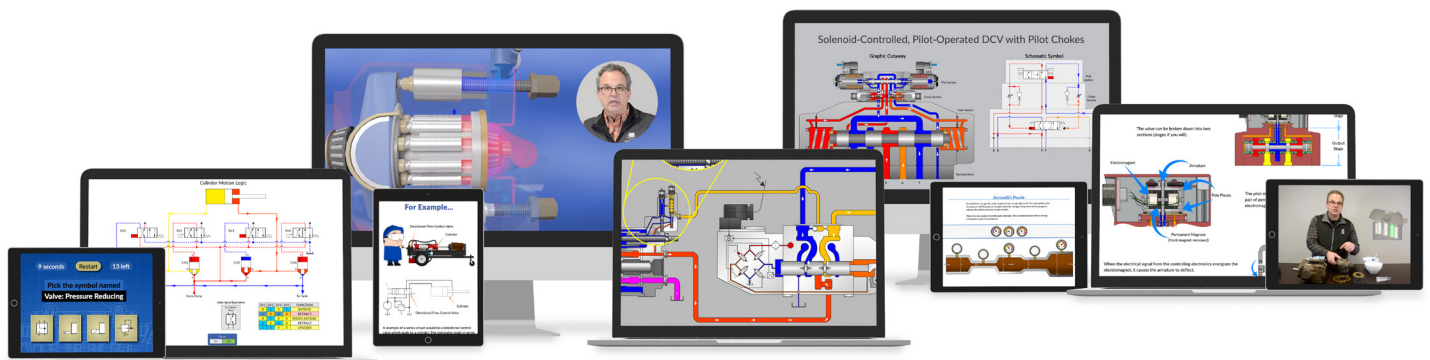
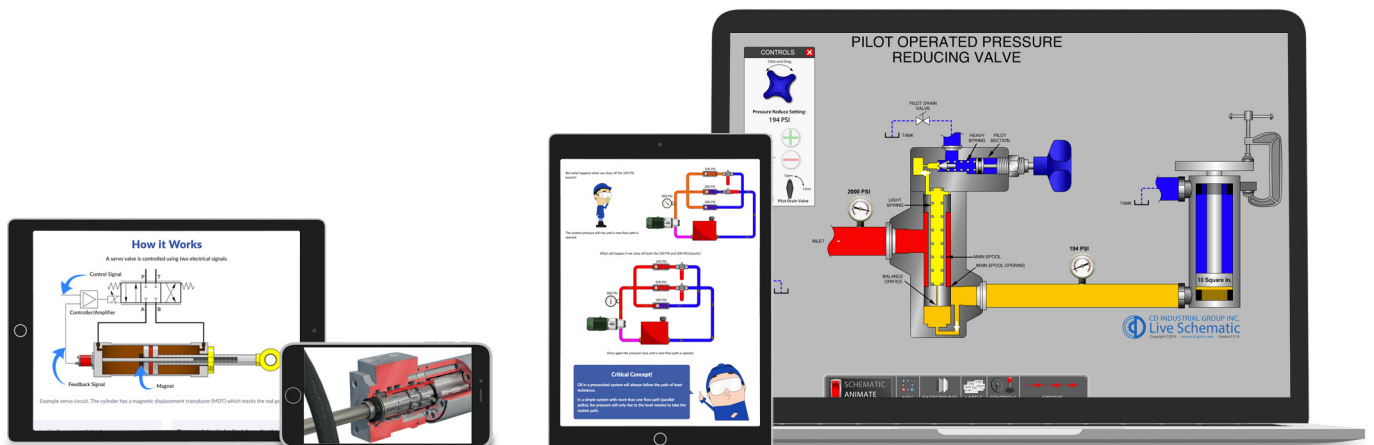


# LunchBox Sessions



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# Summary

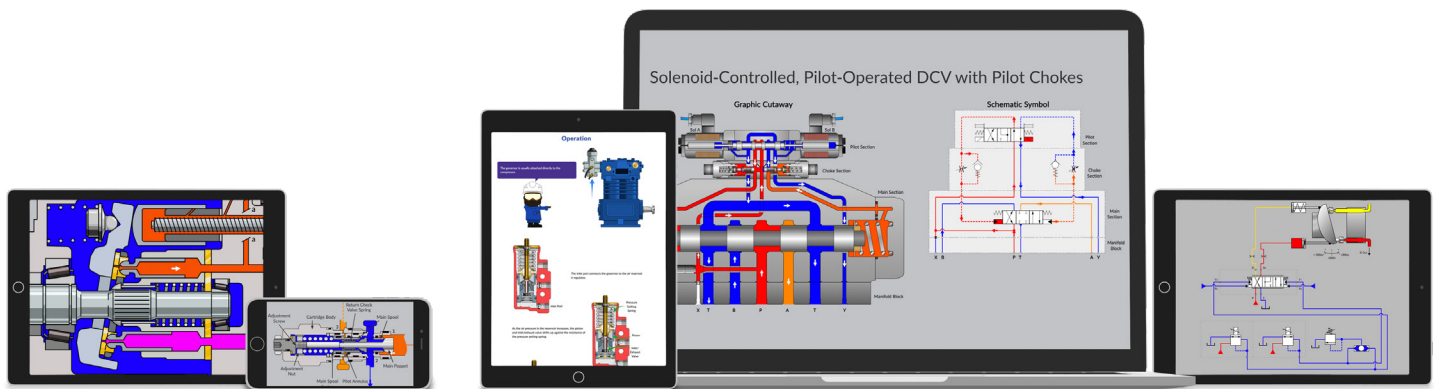
LunchBox Sessions is an online resource for teaching and learning the skills that technicians need. It includes a library of over 60 sessions and more than 500 learning materials, building from the core principles of hydraulic and electrical systems up to advanced troubleshooting techniques. Multiple styles of learning are accommodated. Information is delivered through lessons and videos, reinforcement and exploration are supported by interactive simulations, and assessment is offered through puzzles and quizzes. Our materials are informed by over twenty years of on-site instructor-led training, and built with our Live Schematic simulation technology. First launched in 2014, LunchBox Sessions is now used daily by individuals, schools, small businesses, and large enterprises around the world.



## Curriculum

The LunchBox Sessions classroom is a radically different experience. Principles that can be complicated to explain are internalized with a few minutes of play and observation. Students are able to see and experience cause and effect immediately, which speeds up the comprehension process and allows the learner to cover ground much more quickly than in a traditional learning experience.

Each session covers a single subject in-depth—like relief valves, position sensors, or schematic reading—and is designed to support multiple approaches to learning and teaching. Learners are offered a variety of materials that can be completed on a lunch break, while in transit, or during dedicated training time. Teachers are able to use all of our materials to support their instruction, with simulations and quizzes proving highly effective in a group setting.

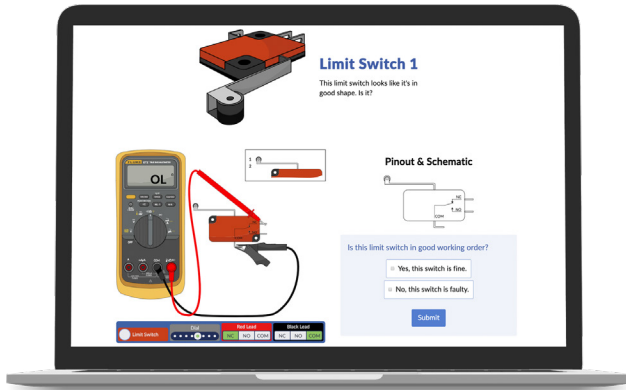


Inside each session, you'll find a variety of learning materials. Lessons introduce and explore new ideas with an approachable writing style and clear, detailed illustration. Simulations are useful to both learners and instructors, allowing live interaction with a single component, a circuit, or a complete machine system.

Videos carefully explain complicated ideas with 2d animation, 3d animation, and live action teaching.

The LunchBox Sessions curriculum contains all these materials and more, so that each learner can receive information in a form that works uniquely well for them.

## Assessment

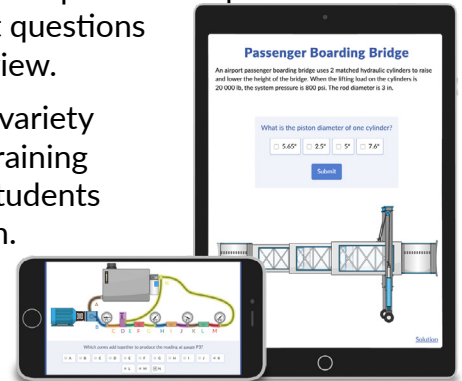


LunchBox Sessions takes an innovative approach to the entire learning process, so our approach to assessment is just as interesting. Learners will encounter small activities throughout each lesson, offering just-in-time feedback on how well they're absorbing the information. Many of our sessions include interactive puzzles, which are more challenging activities than those found within the lessons, useful for drilling in on the material and skills, or assisting memorization.

Every one of our electrical and hydraulic sessions concludes with a dynamic quiz. These quizzes are

freshly regenerated each time they're taken, pulling together different questions and answers to challenge each learner with a unique but balanced review.

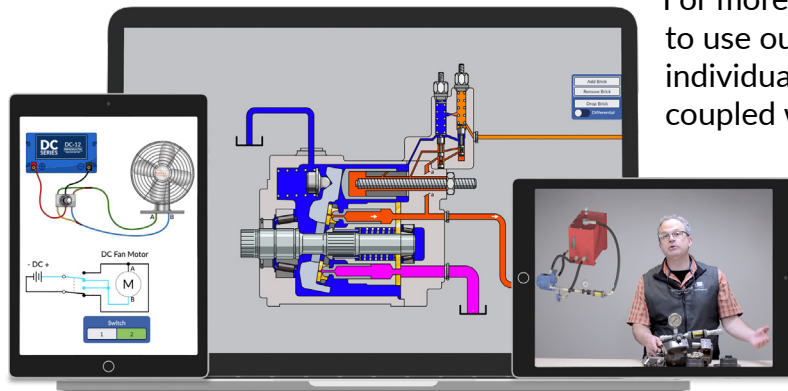
Quizzes can be taken multiple times by each learner, which unlocks a variety of potential uses. Some teams use them as a pre-assessment before training or hiring. Instructors use them with a group of students as a survey. Students preparing for an exam use them like flash cards to assist memorization. And, of course, the traditional use is as a final test at the end of a session to ensure that learners understood the material.



## Tools for Teams

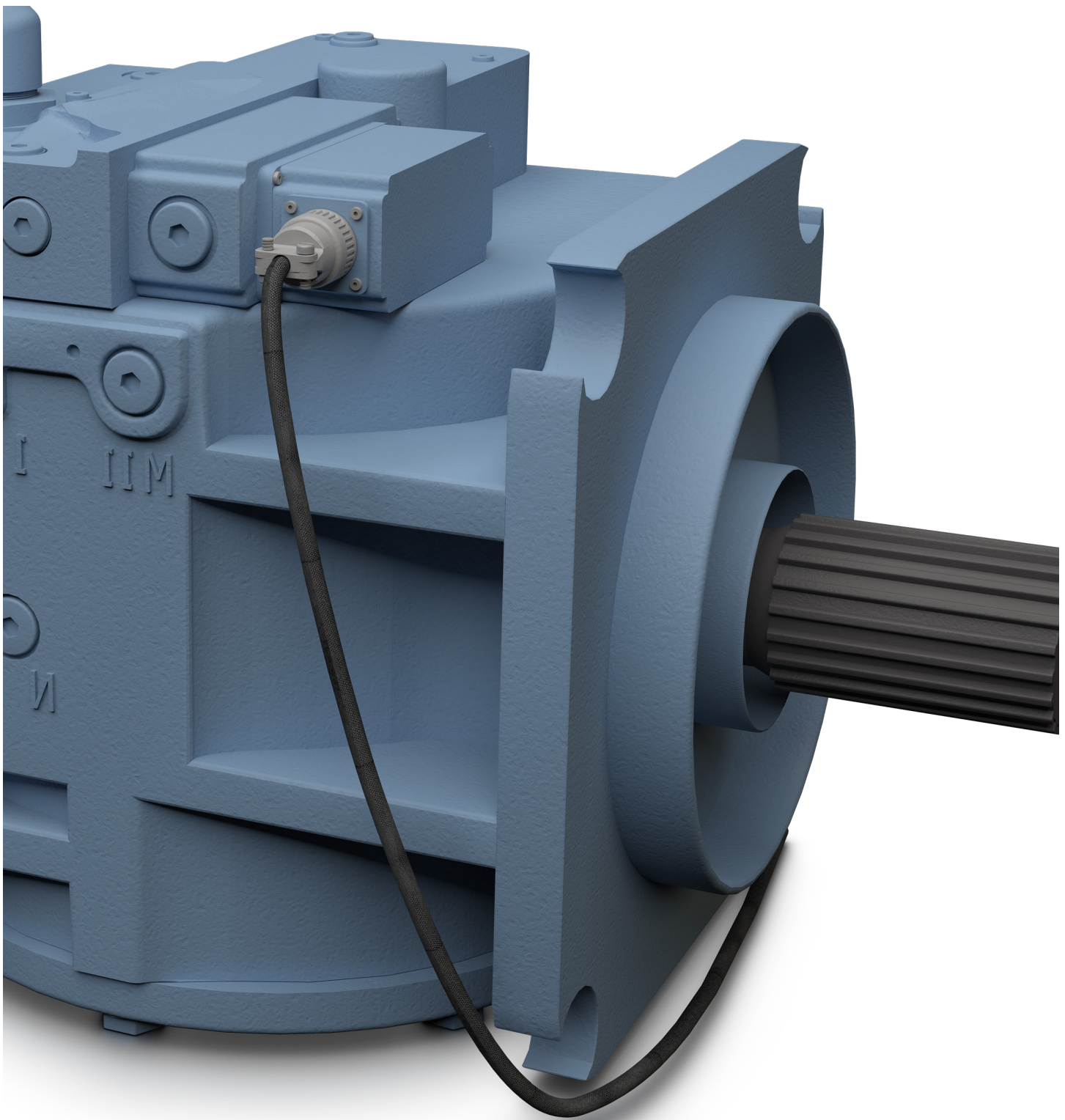
While learners will have their hands full (and then some) with our library of lessons, simulations, and other materials, instructors and supervisors have their own unique needs. That's why LunchBox Sessions offers a powerful suite of tools for teams, including user management, learning history, data export, and access control.

Instructors can view a historical summary of all quiz scores, filter down to a particular session or learner, and even drill-in to the results of an individual quiz to see in which areas learners are competent or struggling. The time spent in each session and learning material is also captured and aggregated for instructor review.



For more advanced instructors, there are also ways to use our Live Schematic simulations as a form of individual or group assessment, especially when coupled with physical simulators. For select clients, we also offer a comprehensive quiz that covers all the hydraulic content at once. Contact us to learn more about all our team tools and get recommendations for making the most of LunchBox Sessions.





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“The days of textbooks and institutional lectures are history.  
Your online interactive e-learning content is great!”

*John P.  
Heavy Equipment Technician Educator*

# Curriculum: Hydraulics

## Fluid Power Basics

### Lessons

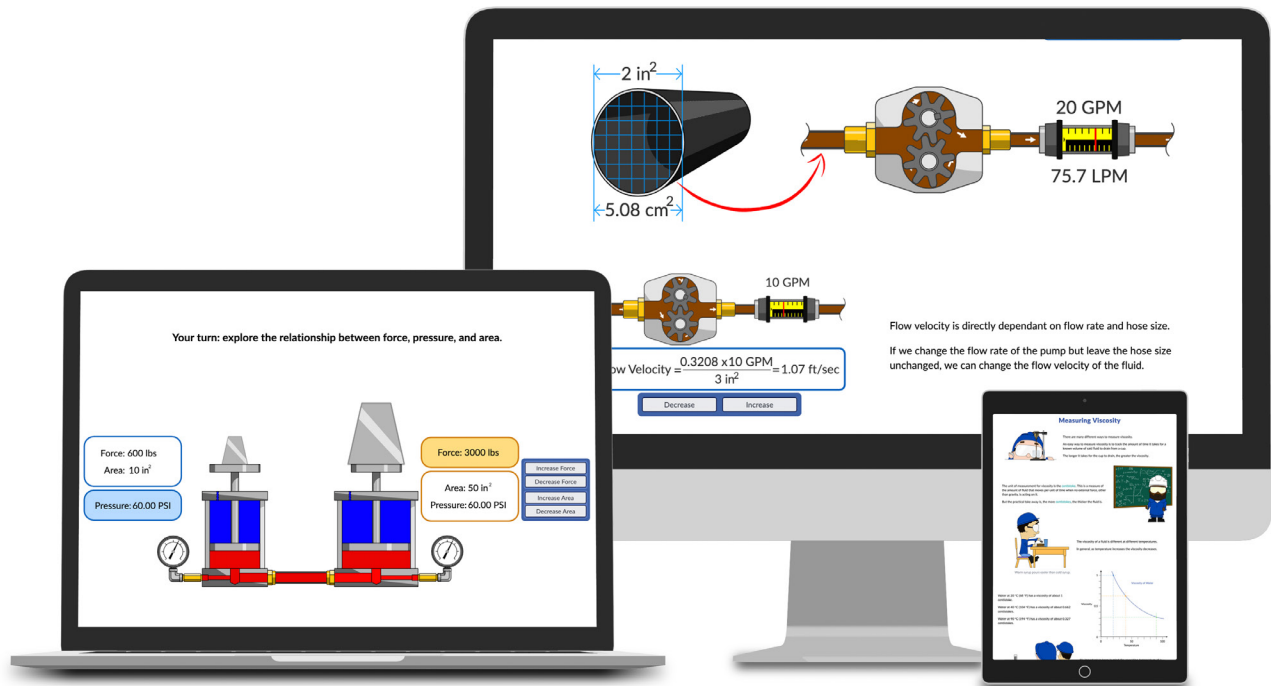
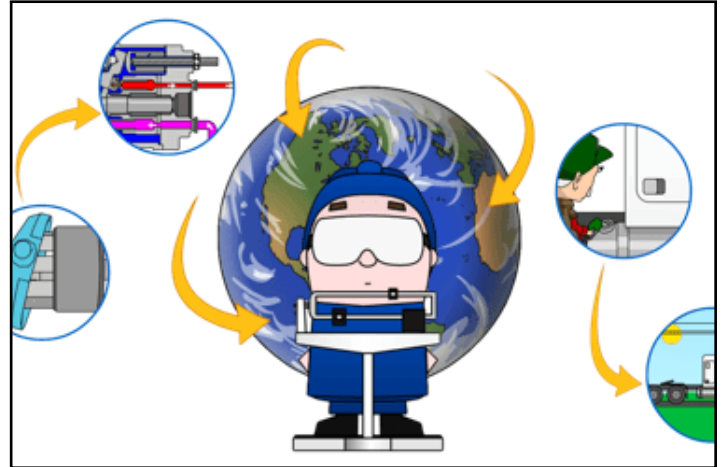
- Energy Basics
- Hydraulic Basics
- Fluid Basics: Part. 1
- Fluid Basics: Part. 2

### Puzzles

- Bernoulli's Puzzle
- Pascal's Puzzle
- The FPA Equation

### Quiz

- Fluid Power Basics



# Pressure and Flow

## Lesson

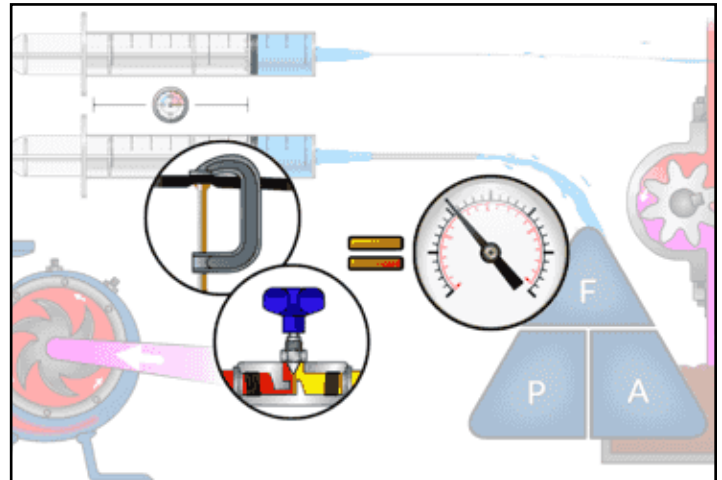
- Pressure & Flow

## Adventure

- Pressure: Part 1
- Pressure: Part 2
- Pressure: Part 3
- Pressure: Part 4
- Pressure: Part 5

## Reference

- Force = Pressure x Area



## Video

- The FPA Triangle
- Why Pressure Depends on Piston Surface Area

## Simulations

- Flow vs. Pressure
- Downstream Resistance
- Limiting Pressure
- Long Hose Pressure Drop
- Path of Least Resistance
- Pressure: Resistance to Flow

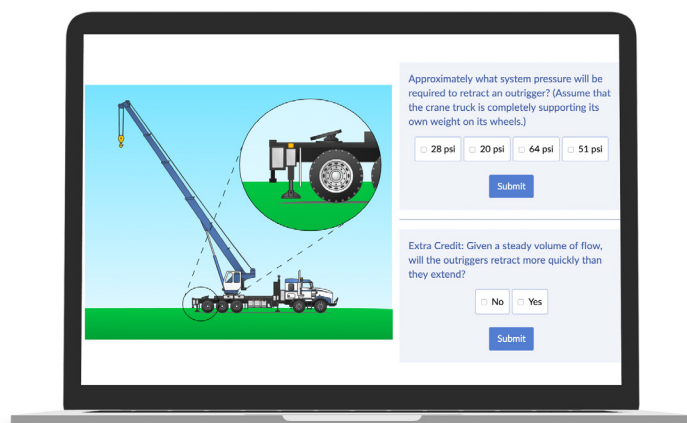
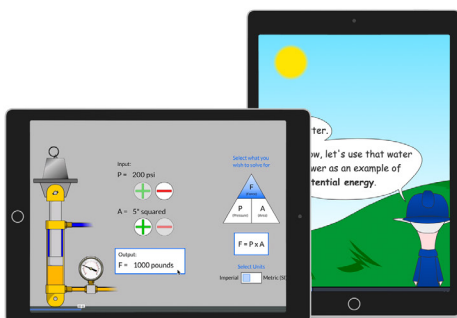


## Puzzles

- Resistance Creates Pressure
- Cylinder Calculations (Cap End)
- Cylinder Calculations (Rod End)

## Quiz

- Pressure and Flow



# Hydraulic Schematic Symbols

## Lessons

- Basic Elements of Schematic Symbols
- Introduction to Valve Symbol Reading

## Video

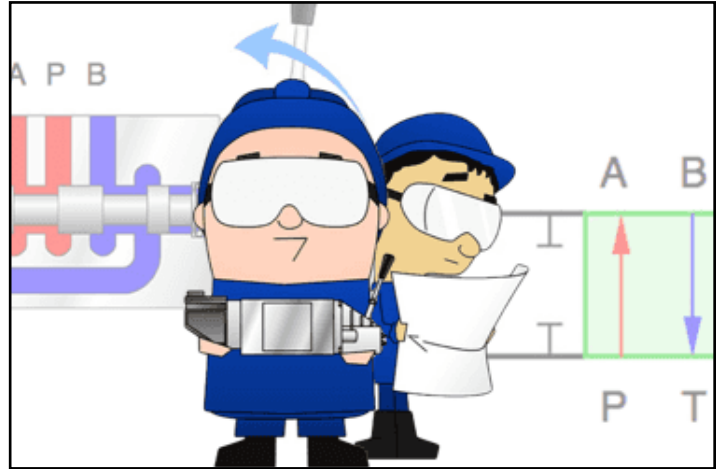
- How to Read Valve Section Schematics
- How to Read Cylinder Section Schematics
- How to Read Hydraulic Power Unit Schematics

## Puzzles

- Basic Schematic Symbols
- Common Schematic Symbols
- Valve Schematic Symbols
- Describe This Valve

## Quiz

- Hydraulic Schematic Symbols



# Hydraulic Hazards & Safety

## Lesson

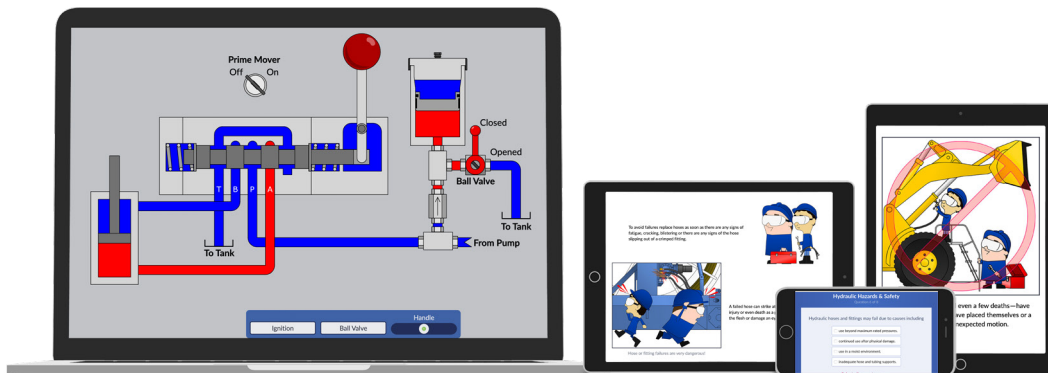
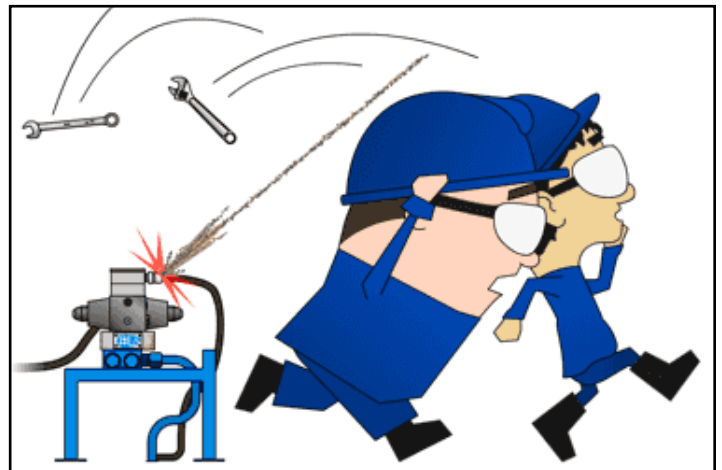
- Fluid Power Safety

## Simulation

- Zero Energy State

## Quiz

- Hydraulic Hazards & Safety



# Hydraulic Actuators

## Lessons

- Hydraulic Motors
- Cylinder Drift

## Videos

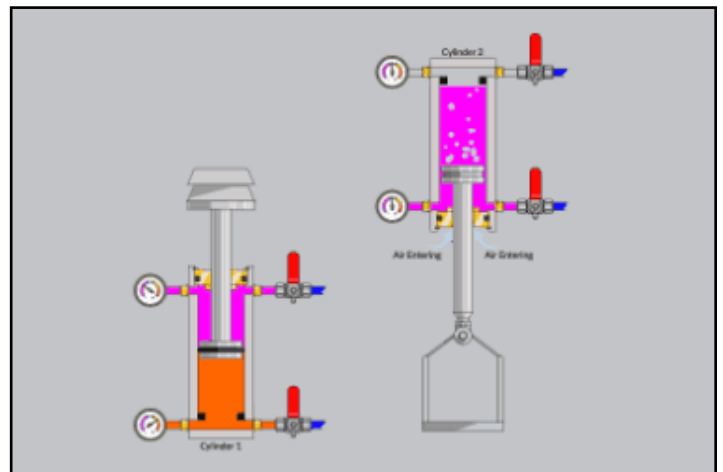
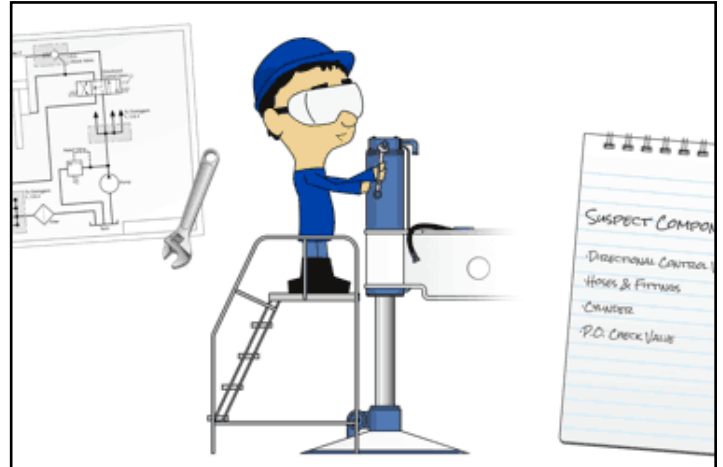
- Cylinder Drift
- Cylinder Pressure Intensification
- Purpose of the Piston Seal

## Simulations

- Cushioned Cylinder
- Cylinder Drift
- Extend and Retract Volumes
- Piston Seal Purpose
- Simple Gear Motor
- Cylinder Pressure Intensification

## Quiz

- Hydraulic Actuators



# Hydraulic Steering

## Lesson

- Hydraulic Steering

## Videos

- 3D Steering Valve Tour
- The Orbitrol (HMU) Valve
- The Steering Amplifier Valve

## Simulation

- Steering Valve

## Quiz

- Hydraulic Steering





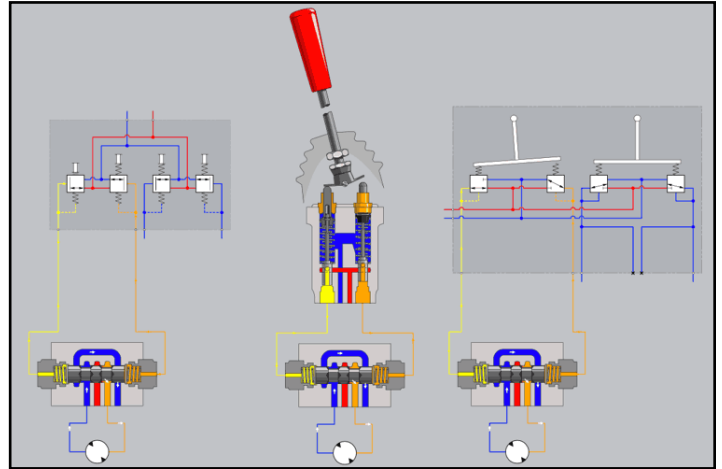
# Pilot Controllers

## Videos

- Pilot Controller
- Pilot Controller: Exploded Parts

## Simulation

- Joystick Examples



# Parallel and Series Systems

## Lessons

- Parallel and Series Systems

## Videos

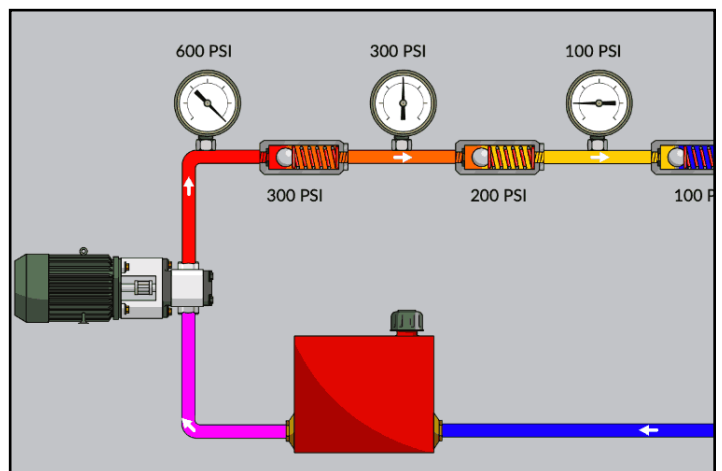
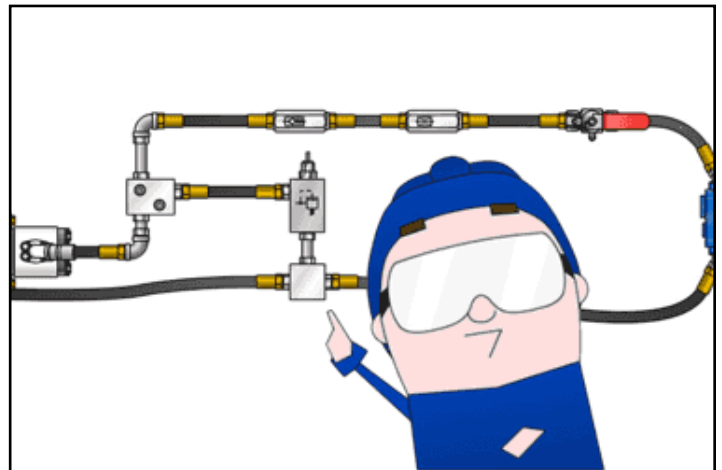
- How to Use System Pressure to Troubleshoot
- Pressure in Parallel Circuits
- Pressure Drops In Series Circuits

## Simulation

- Series Pressure Drops
- More on Pressure Drops
- Parallel Example 1
- Parallel Example 2
- Parallel System Puzzler
- Path of Least Resistance
- Series Parallel Paths
- Series & Parallel Paths Practice

## Quiz

- Parallel and Series Systems



# Flow & Directional Control Valves

## Lessons

- Intro to Directional Control Valves
- Flow Control Fundamentals
- Process Control Valves
- Solenoid Controlled, Pilot Operated Valves

## Videos

- Directional Control Valve Basics (Part 1)
- Directional Control Valve Basics (Part 2)
- Directional Control Valve Centers
- Valve Solenoid Basics
- Solenoid-Controlled Pilot-Operated Directional Control Valve
- Adjusting Pilot Chokes
- Pressure Compensated Flow Control (Part 1)
- Pressure Compensated Flow Control (Part 2)
- Pressure Compensated Flow Control (Part 3)
- Pressure Compensated Flow Divider
- Meter-In vs. Meter-Out
- Using Meter-In & Meter-Out Together (Part 1)
- Using Meter-In & Meter-Out Together (Part 2)

## Simulations

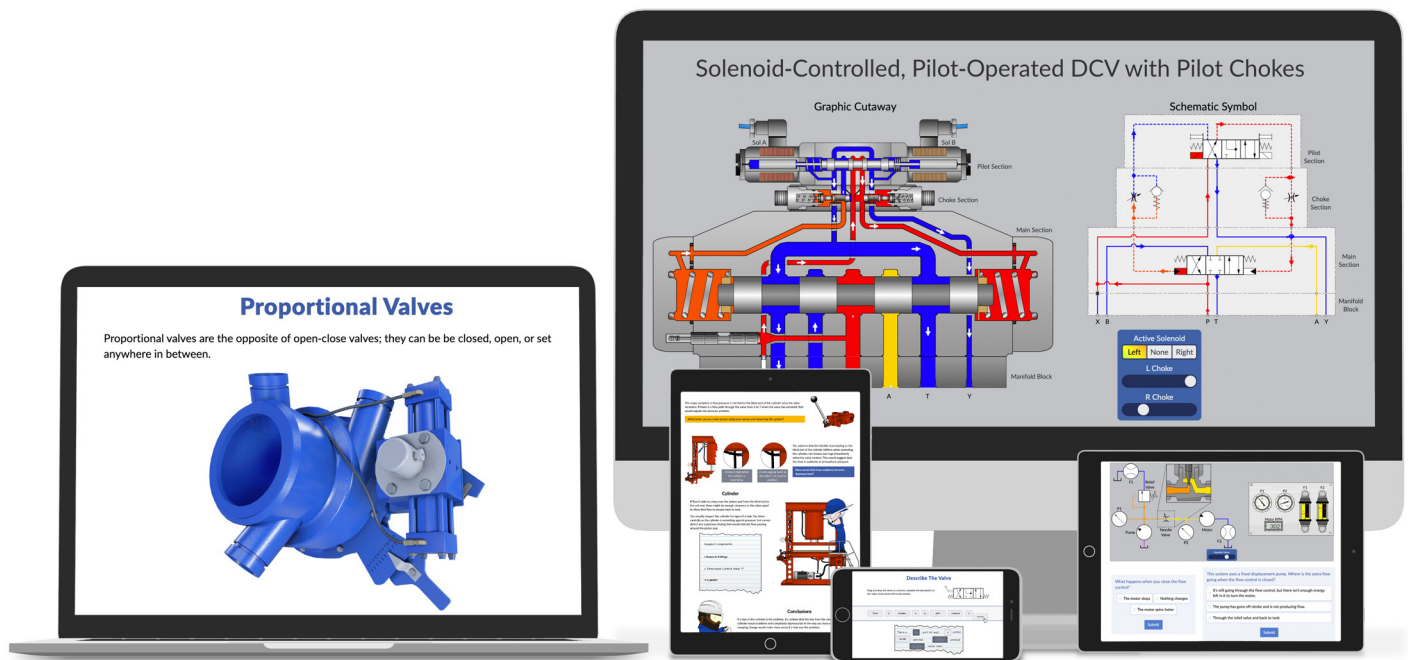
- Directional Control Valve
- Solenoid Controlled, Pilot Operated Directional Control Valve
- Solenoid Controlled, Pilot Operated Directional Control Valve with Pilot Chokes
- Select the Best Valve Center
- Simple Pilot-Operated Check Valve Examples
- Load Lock Valves: Drawworks
- Load Lock Valves: Outriggers
- Flow Divider
- Simple Flow Control Circuit
- Simple Flow Control with Pressure Change
- Pressure Compensated Flow Control
- Meter-in and Meter-out Flow Control

## Puzzle

- Directional Control Valve Centers

## Quiz

- Flow & Directional Control Valves



# Cartridge Valves

## Lesson

- Slip-In Cartridge Valve

## Video

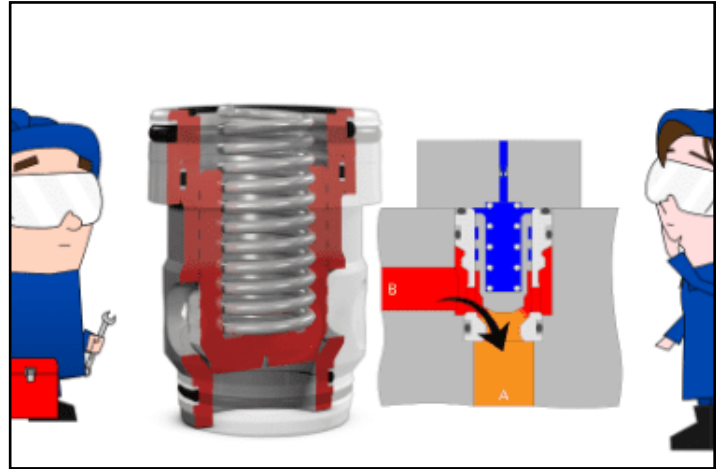
- Slip-In Cartridge Valve
- 50% Annular Poppet with Damping Nose

## Simulation

- Cylinder Motion Logic

## Quiz

- Cartridge Valves



# Open & Closed Center Systems

## Lesson

- Open and Closed Center Systems

## Simulations

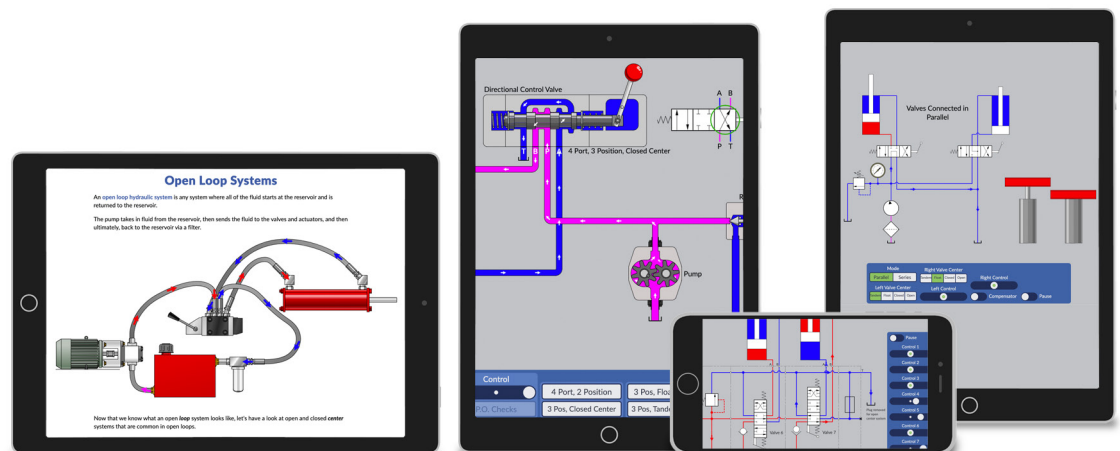
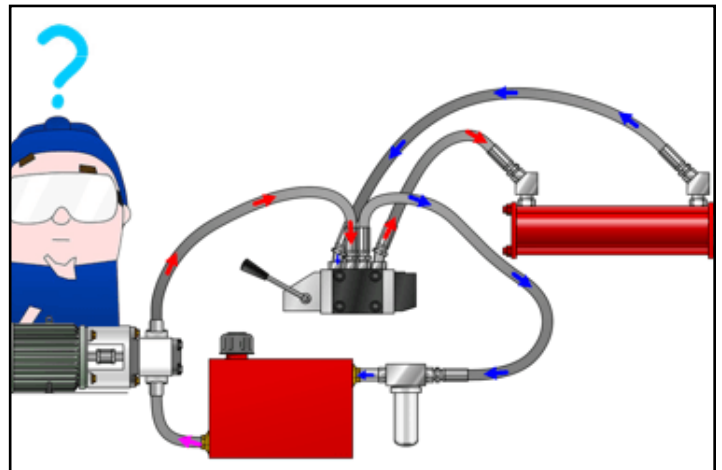
- Sectional Valve Banks
- Valve Centers in Parallel & Series
- Directional Control Valve Centers

## Puzzles

- Classify the System
- Match the Valve Centers
- Tandem Valve Centers

## Quiz

- Open and Closed Center Systems



## Positive and Non-Positive Pumping

## Lessons

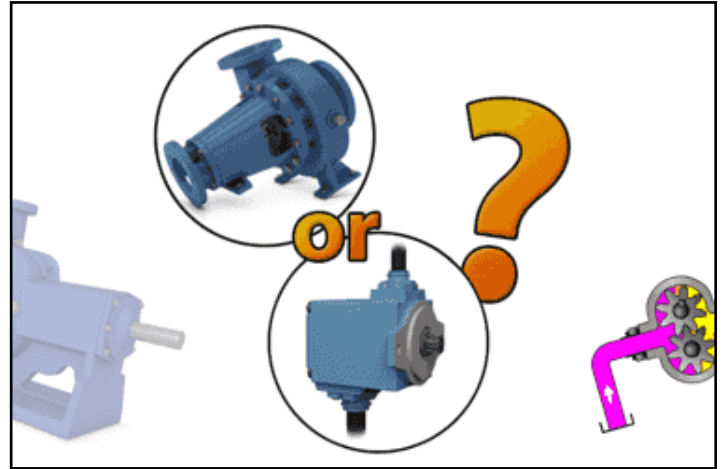
- Positive and Non-Positive Pumping
- Cavitation and Aeration

## Video

- Gardner Denver 2045LX Tour

## Simulations

- Compare Two Systems
- Flooded, Starved and Charged Pumps
- Non-Positive Suction Head
- Viscosity and Flow Rate



## Puzzles

- Compare Two Systems
- Pick the Pump (Positive or Non-Positive)

## Quiz

- Positive and Non-Positive Pumping



# Fixed & Variable Displacement Pumps

## Lessons

- Intro to Hydraulic Pumps
- Intro to Gear Pumps
- Intro to Vane Pumps
- Intro to Piston Pumps
- Intro to Pressure Compensated Pumps

## Videos

- How to Readjust an Incorrect Pressure Compensator Setting (Part 1)
- Oilgear PVWJ Max Volume Adjustment
- Oilgear PVWJ Pressure Compensator
- Piston Pumping Action Simplified (3D)
- Pressure Compensated Pump Adjustments (Part 1)
- Pressure Compensated Pump Adjustments (Part 2)
- Simplified One Piston Swashplate (3D)
- Sources of Piston Pump Case Drain Flow
- Axial Piston Pumps: Parts and Basic Features (3D)
- Axial Piston Pumps: Pressure Compensator Function (3D)
- Axial Piston Pumps: Constant and Variable Flow (3D)
- Axial Piston Pumps: Adjustments (3D)
- Axial Piston Pumps: Pump Testing Basics (3D)

## Simulations

- Pressure Compensated Pump Adjustments
- Pressure Compensator Vs. Relief Valve
- Pressure Compensated Pump with Test Kit
- Basic Pressure Compensated Piston Pump
- Basic Pressure Compensated Vane Pump
- Compare Fixed and Variable Pumps
- Efficiency of Different Pump Designs
- Pressure: Internal Leakage
- Simple Pressure Comp. Circuit
- Vent Port Controlled, Pressure Compensated Pump

## Puzzle

- Fixed or Variable Displacement Pump?

## Quiz

- Fixed & Variable Displacement Pumps





# Hydrostatic Systems

## Lesson

- Hydrostatic (Closed Loop) Systems

## Videos

- Closed Loop (Hydrostatic) Charge Pressure
- Closed Loop (Hydrostatic) Systems (Part 1)
- Closed Loop (Hydrostatic) Systems (Part 2)
- Goldcup 900 Tour (3D)
- Pump Displacement Control Basics
- Swash Plate Flow Demo (3D)

## Simulations

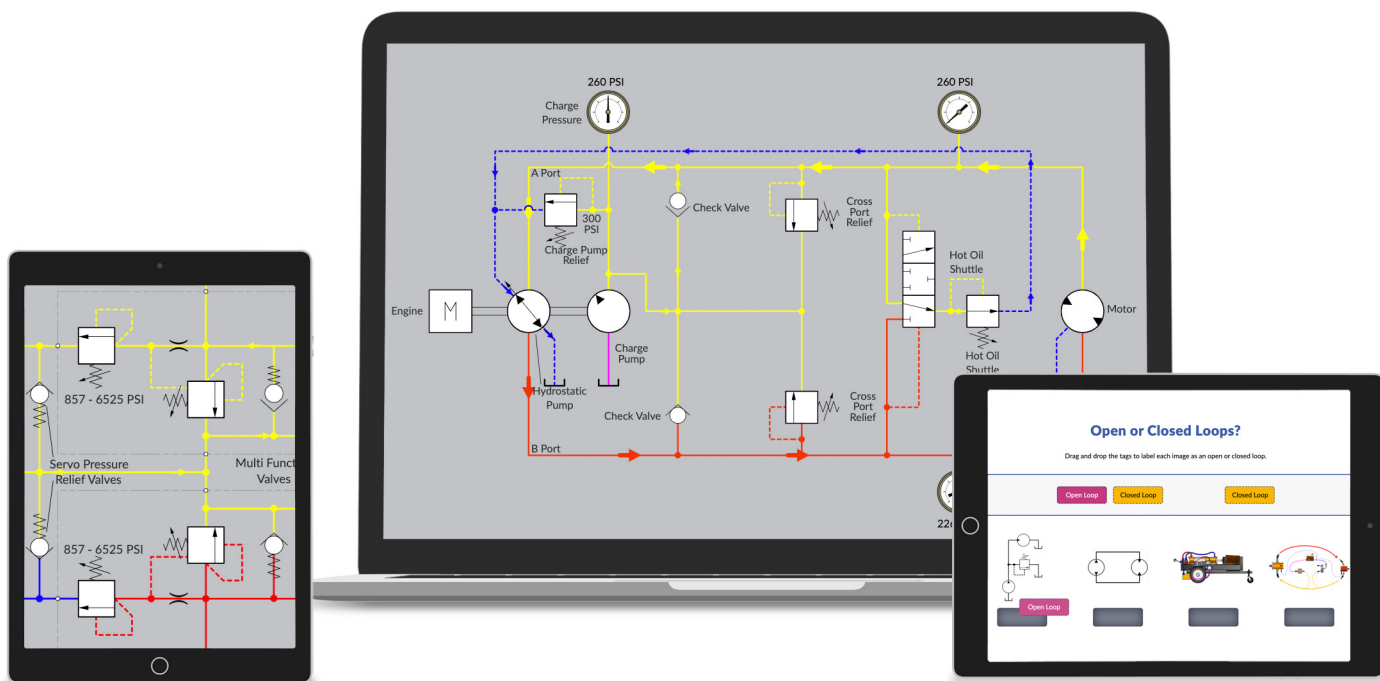
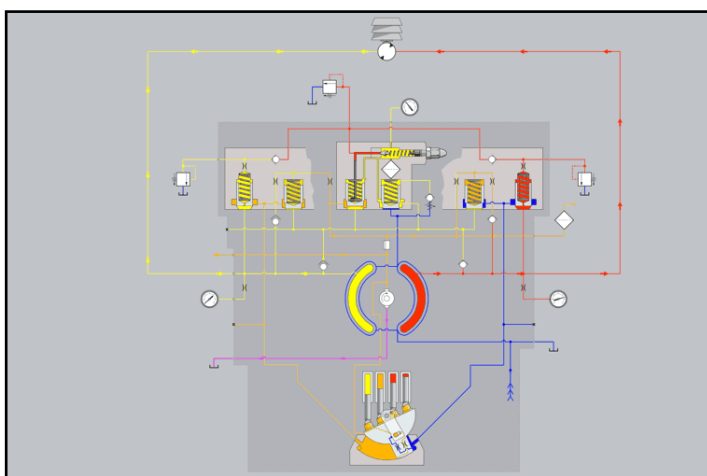
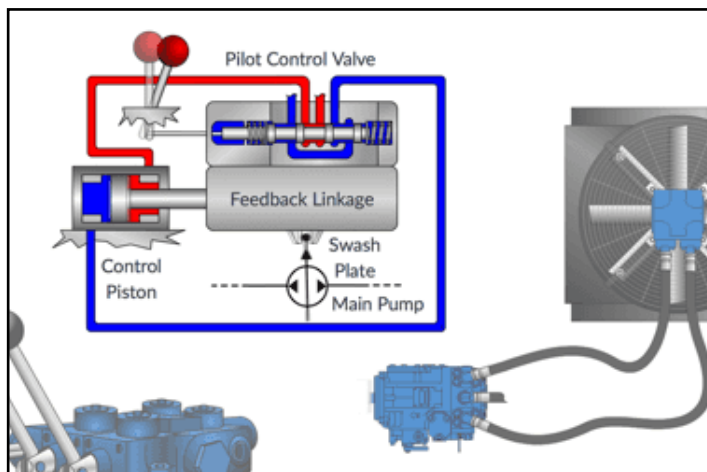
- Closed (Hydrostatic) Loop
- Open vs. Closed Loop Hydraulic Systems
- P14P Pump: Vent Controls
- Rexroth A4V Pump
- Sauer 90
- Servo Pump Displacement Control

## Puzzle

- Open or Closed Loop?

## Quiz

- Open & Closed Loop Systems



# Hydraulic Accessories

## Lessons

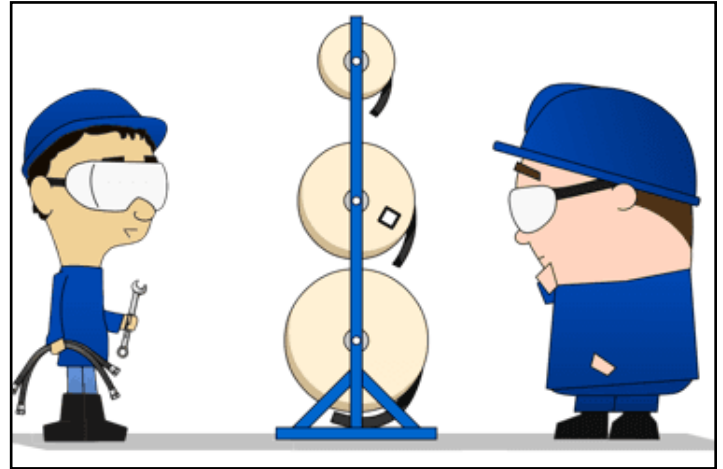
- Accumulator Basics
- Filtration and Contamination
- Hydraulic Fittings Part 1: Threads
- Quick Couplers Maintenance & Faults
- Selecting the Right Hose for Your Application

## Reference

- Nomograph

## Videos

- Quick Coupler (Flat Face)
- Quick Coupler (Poppet Style)
- What is a Hydraulic Tank Breather?



## Simulation

- Accumulator Functions

## Quiz

- Hydraulic Accessories

# Pressure Reducing Valves

## Lesson

- Pressure Reducing Valves

## Videos

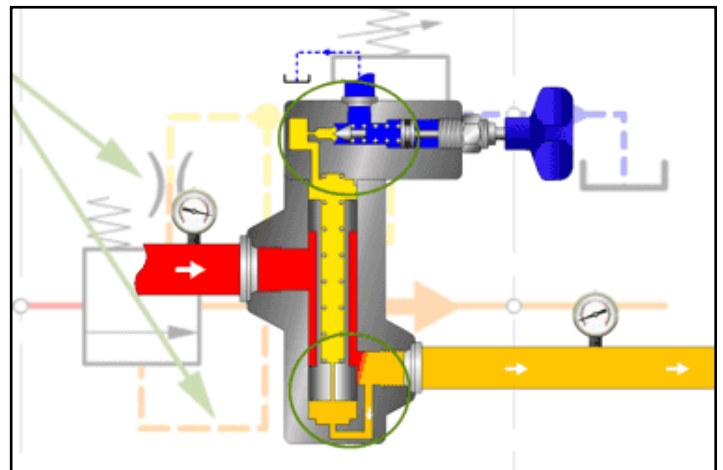
- Pilot-Operated Pressure Reducing Valve (Part 1)
- Troubleshooting a Pressure Reducing Valve

## Simulations

- Pressure Reducing Valve with Port Relief
- Pressure Reducing Valve: Pilot Operated

## Quiz

- Pressure Reducing Valves



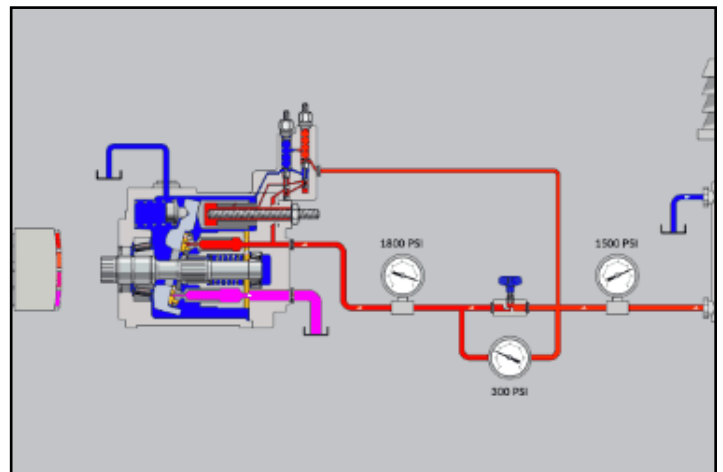
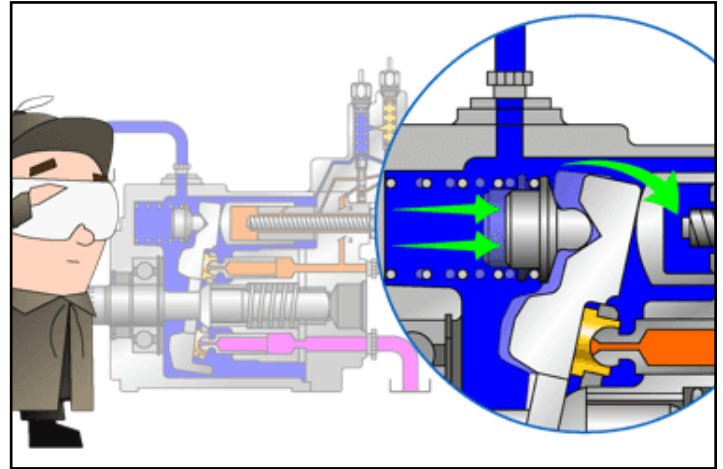
# Load Sensing Pumps

## Lesson

- Load Sensing Pumps

## Videos

- Understanding Hydraulic Load Sense
- What is a Load Sensing Pump?
- Load Sensing Accuracy
- How to Read Load Sense Pump Symbols
- Dynamics of a Load Sense System Adjustment
- Load Sense Live Schematic
- Pressure Compensated Flow Control Valves In a Load Sense System
- Load Sense Bleed to Standby

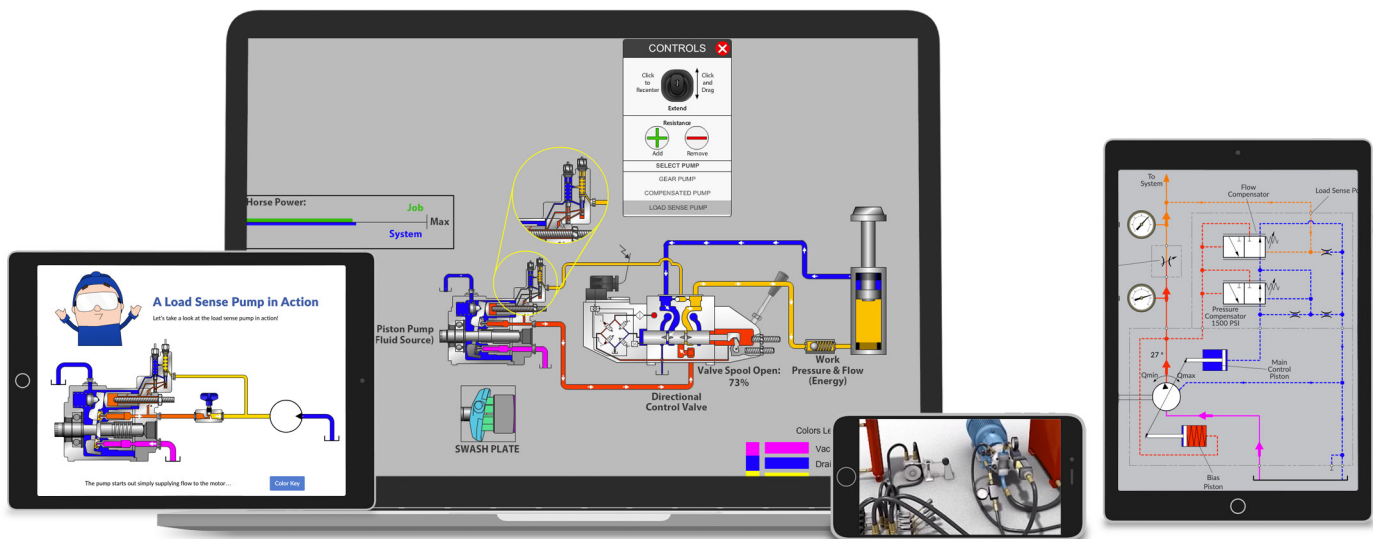


## Simulations

- A Simple Load Sense System
- Efficiency: Pressure Compensated vs. Load Sensing
- Load Sense Ensures Accuracy
- Load Sensing Control on a Piston Pump
- Load Sensing Pump Symbol – Rexroth A10VO
- Rexroth A11VO
- Two Section Load Sense System

## Quiz

- Load Sensing Pumps



# Pressure Relief Valves

## Lessons

- Intro to Pressure Control Valves
- Direct Acting Relief Valves
- Balanced, Pilot Operated Relief Valves

## Videos

- Cartridge Relief Valve, Vent Port
- Relief Valve Basics
- Direct Acting Relief Valve
- Balanced, Pilot-Operated Relief Valve
- Balanced, Pilot Operated Relief Valve: Basic Functions and Features (3D)
- Relief Valve Remote Control
- Electric Relief Valve Remote Control
- Cross-Port Braking
- How to Interpret Pressure Valves
- How to Identify Relief Valve Components

## Simulations

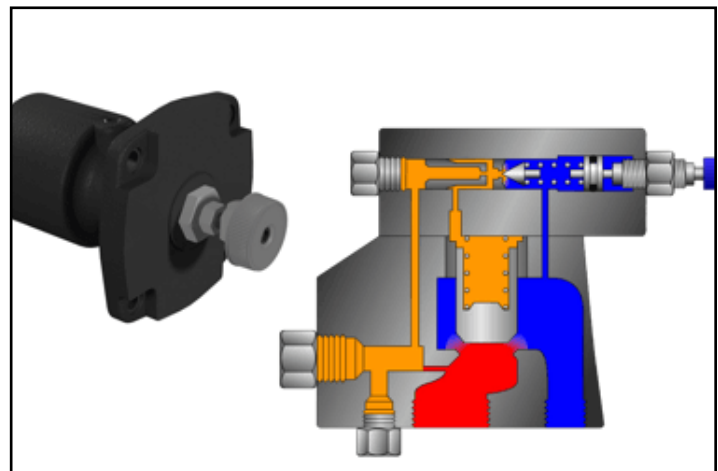
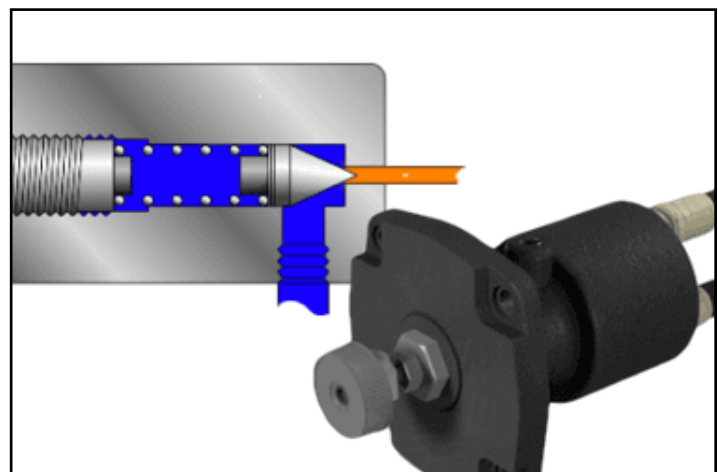
- Basic Relief Valve: Direct Acting
- Anatomy & Behaviour of a Relief Valve: Direct Acting
- Anatomy & Behaviour of a Relief Valve: Balanced, Pilot Operated
- Eaton Relief Valve: Balanced
- Sun Cartridge Relief Valve: Balanced
- System Relief Valve Control: Variations

## Puzzles

- Build a Simple Relief Valve
- Build a 3D Relief Valve
- Build a Relief Valve Schematic Symbol
- Fill in the Relief Valve 1
- Fill in the Relief Valve 2

## Quiz

- Pressure Relief Valves



# Cross-Port Relief Valves

## Lesson

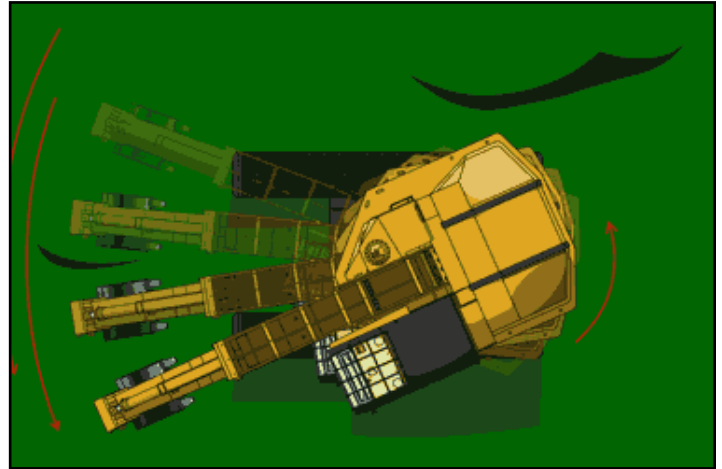
- Cross-Port Relief Valves

## Simulations

- Cross-Port Relief: Braking
- Cross-Port Relief: Example

## Quiz

- Cross-Port Relief Valves



# Unloading Valves

## Lesson

- Unloading Valves

## Video

- Unloading Valve Basics

## Simulations

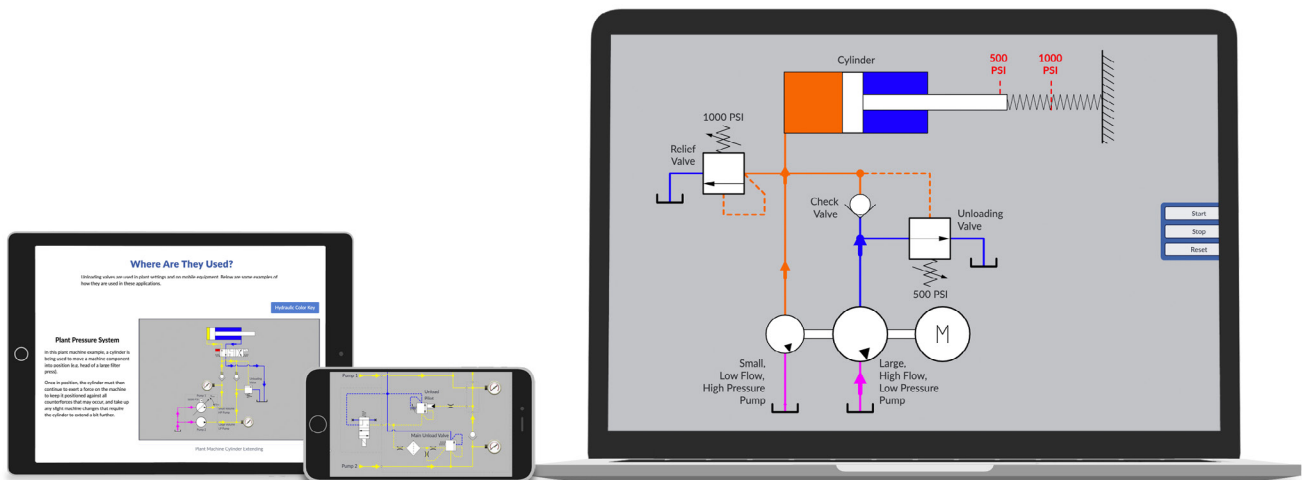
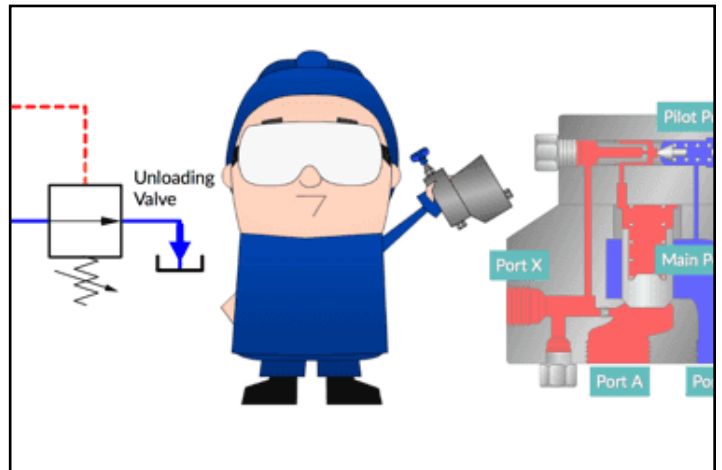
- Unloading Valve – Example A
- Unloading Valve – Example B

## Puzzle

- Build the Unloading Valve

## Quiz

- Unloading Valves





# Sequence Valves

## Lesson

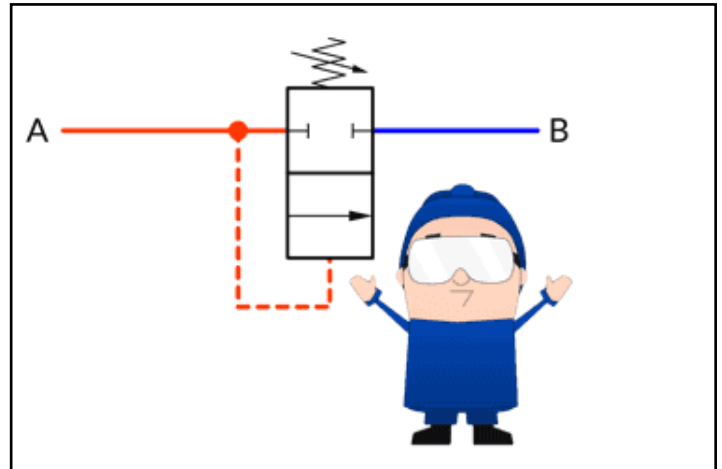
- Sequence Valves

## Simulations

- Sequence Valve Example
- Sequence Valve Injector Example

## Quiz

- Sequence Valves



# Counterbalance Valves

## Lesson

- Counterbalance Valves

## Video

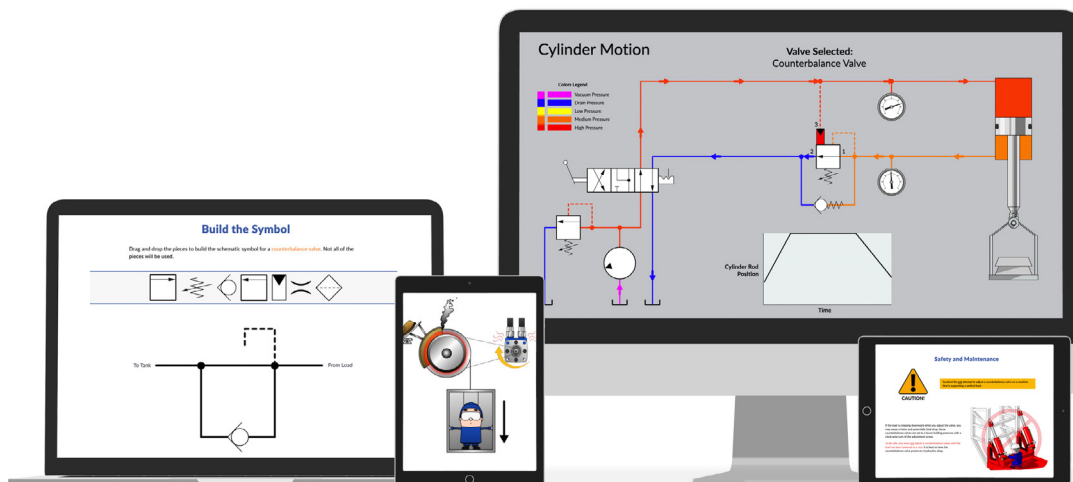
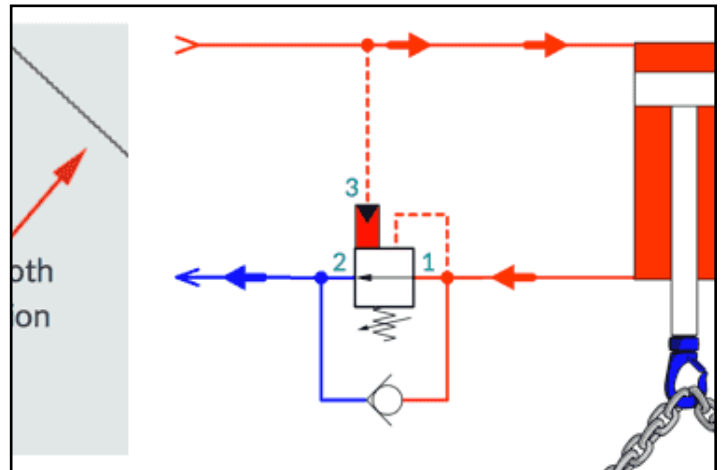
- Vertical Cylinder Motion with a Counterbalance Valve
- Vertical Cylinder Motion With a Pilot-Operated Check Valve

## Simulations

- Counterbalance Valve: Detailed Function
- Counterbalance vs. Pilot Operated Check Valve.

## Quiz

- Counterbalance Valves



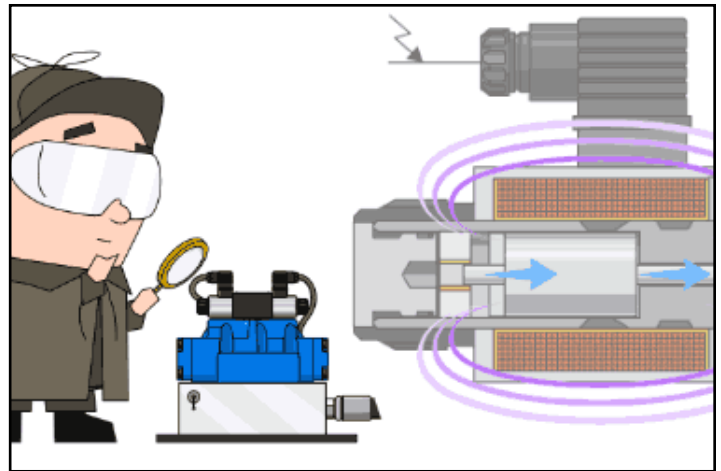
# Electro-Hydraulic Valves

## Lessons

- Proportional Valves
- Servo Valves

## Videos

- Servo Valve: Mechanical Null
- Two-Stage Servo Valve: Nozzle Flapper Anatomy
- Two Stage Servo Valve: Nozzle Flapper Function
- Woodward (HR Textron) RDDV Valve Function
- Woodward (HR Textron) RDDV Valve Parts



## Quiz

- Electro-Hydraulics Valves

# Troubleshooting Processes

## Lesson

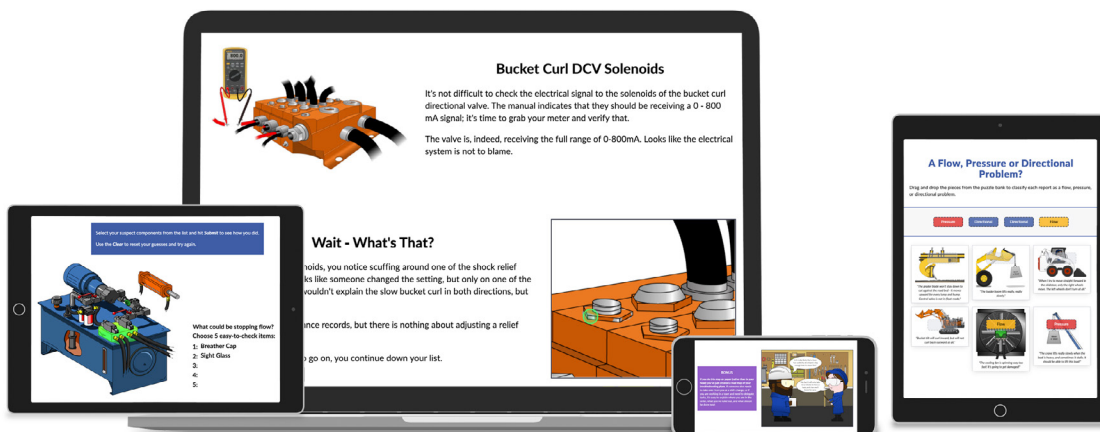
- The Ten Step Troubleshooting Process (Excavator)

## Puzzles

- A Flow, Pressure, or Directional Problem?
- Easy-to-Check Items
- Lumber Stacker Puzzle

## Quiz

- Troubleshooting Processes



# Curriculum: Electrical

## Basic Electrical Concepts

### Lesson

- Basic Electrical Units

### Reference

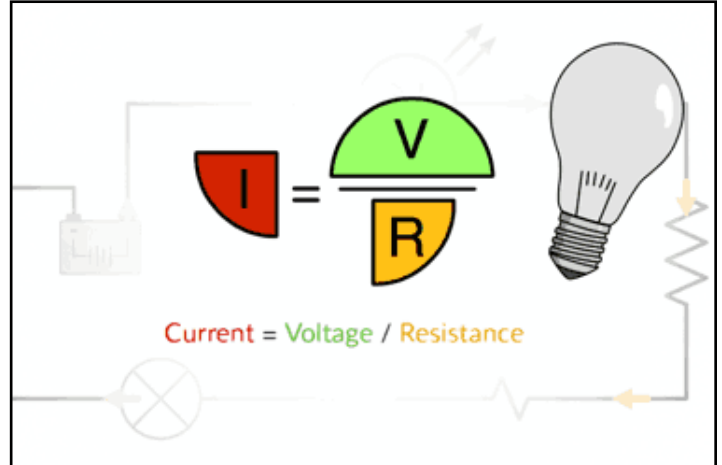
- Ohm's Law

### Puzzle

- Ohm's Law Equations

### Quiz

- Basic Electrical Concepts



## Electrical Hazards and Safety

### Lessons

- Electrical Safety
- Zero Energy

### Quiz

- Electrical Hazards and Safety



# Waveforms & Signal Generation

## Lessons

- Alternating Current
- Pulse Width Modulation (PWM)

## Simulations

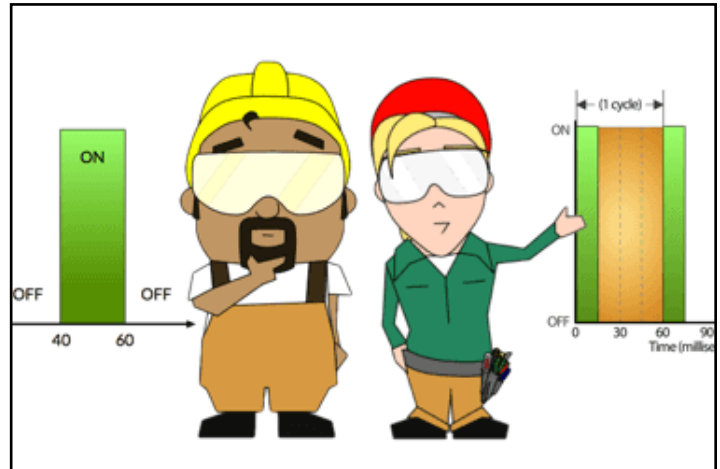
- Simple PWM
- Interactive Graph

## Puzzle

- Alternating Current

## Quiz

- Waveforms & Signal Generation



# Series & Parallel Circuit Basics

## Lesson

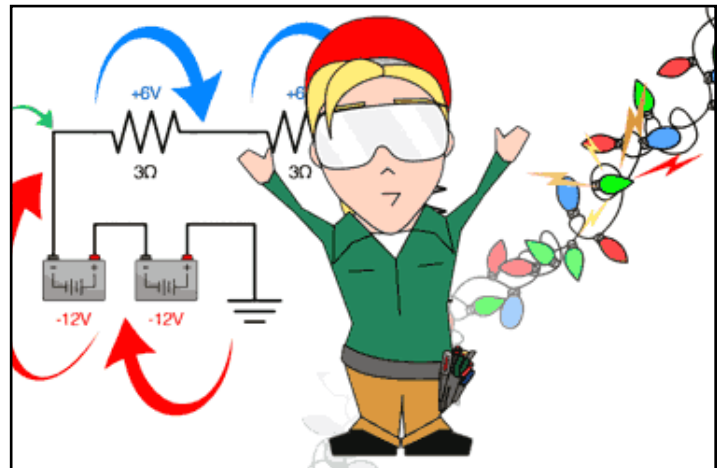
- Series & Parallel Circuit Basics

## Puzzles

- Series Circuit Puzzles Warmup
- Series Circuit Practice
- Parallel Circuit Practice
- Combination Circuit Practice
- 12V Parallel Battery Hookup
- 24V Series Battery Hookup

## Quiz

- Series & Parallel Circuit Basics



# Interpreting Electrical Schematics

## Lesson

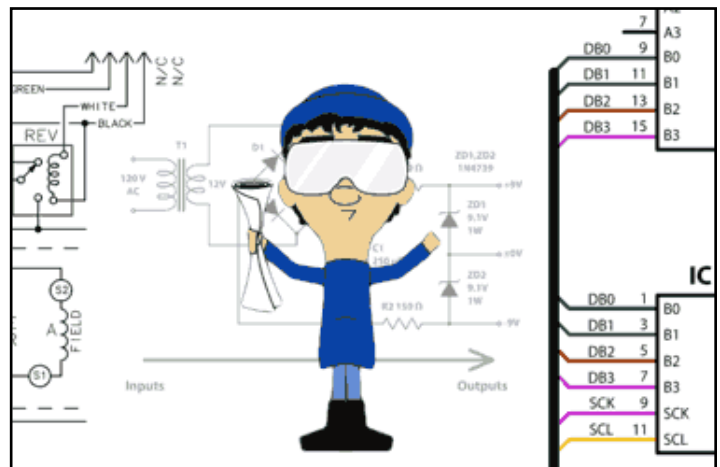
- Interpreting Electrical Schematics

## Puzzles

- Build A Power Supply
- Electrical Symbols

## Quiz

- Interpreting Electrical Schematics



# Open & Short Circuit Faults

## Lessons

- Open & Short Circuit Faults
- Open Circuit Troubleshooting
- Short Circuit Troubleshooting Part 1
- Short Circuit Troubleshooting Part 2

## Simulation

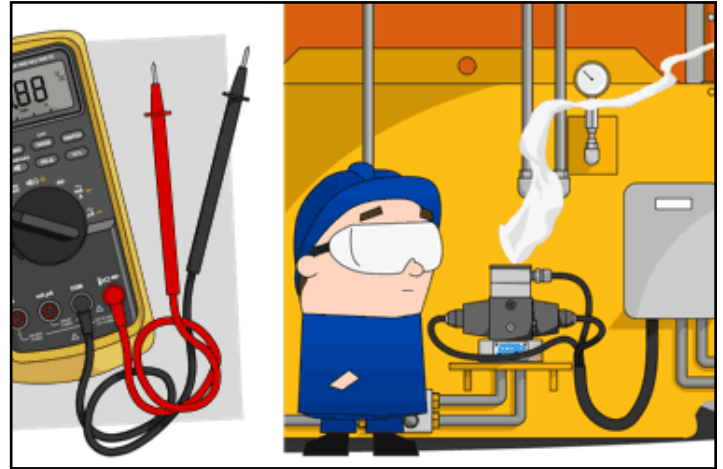
- Loader Lights and Fan Electrical Circuit

## Puzzle

- Open & Short Circuit Faults

## Quiz

- Open & Short Circuit Faults



## Connectors

## Lessons

- Connectors
- Soldering Basics
- Deutsch Connector Crimping and Assembly

## Quiz

- Connectors





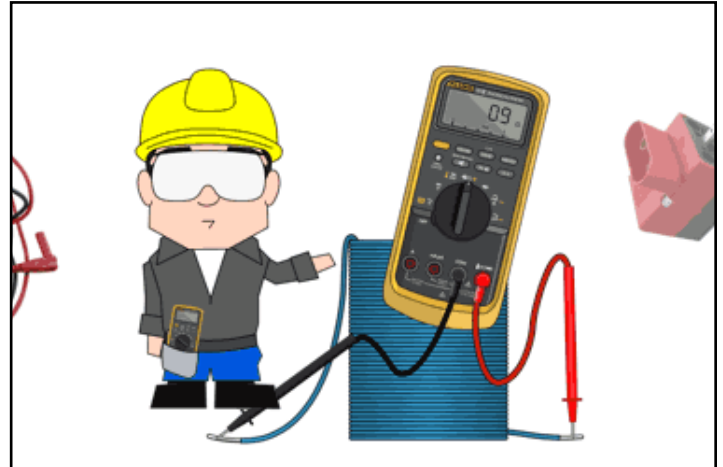
# Electrical Measurements

## Lessons

- Digital Multimeters (Part 1)
- Digital Multimeters (Part 2)
- Performing a Continuity Test

## Quiz

- Electrical Measurements



# Diodes

## Lesson

- Diodes

## Puzzles

- Build a Flyback Diode
- Diode Spill
- Diodes – Anodes & Cathodes

## Quiz

- Diodes



# Variable Resistors

## Lesson

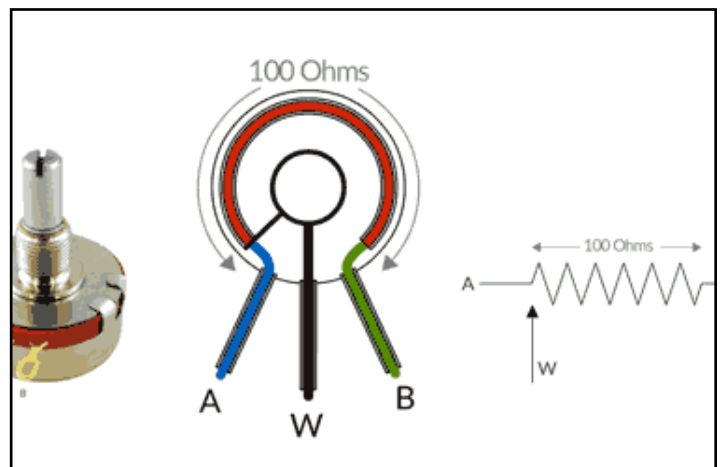
- Variable Resistors

## Puzzle

- Resistor Value

## Quiz

- Variable Resistors



# CAN Bus

## Lessons

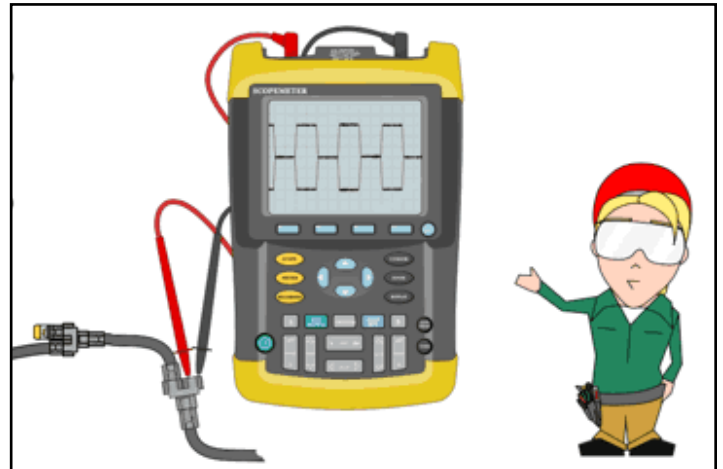
- Intro to CAN Bus
- CAN Data Transfer Process and Message Structure

## Simulation

- Message Arbitration
- Transfer Stages

## Quiz

- CAN Bus



# Relays

## Lesson

- Relays

## Reference

- Relays Reference

## Simulation

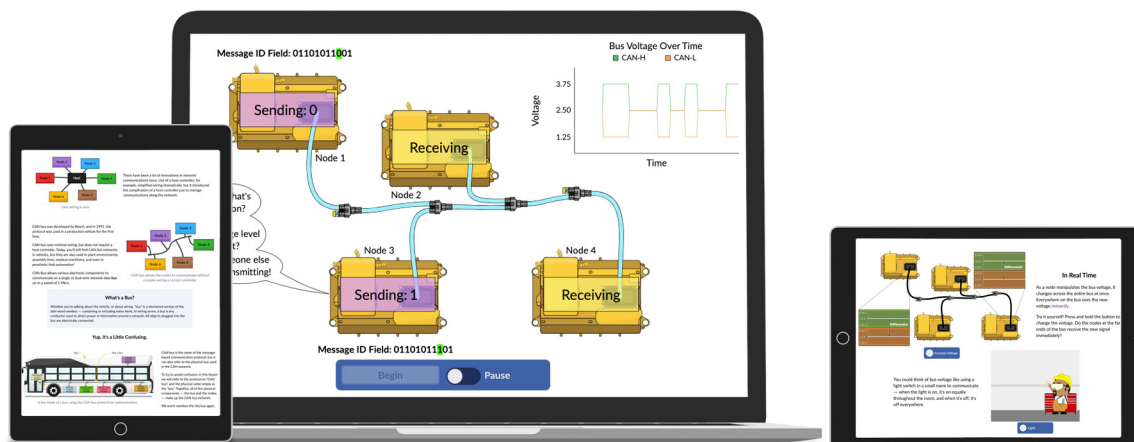
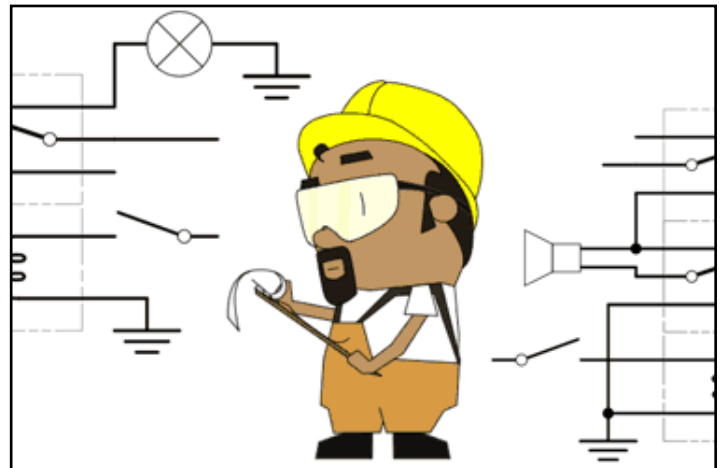
- Sealed-in Relay
- Single Pole Double Throw Relay

## Puzzles

- Relay Puzzle
- Extra Relay Puzzles

## Quiz

- Relays



# Switches

## Lesson

- Switches

## Reference

- Types of Switches

## Simulation

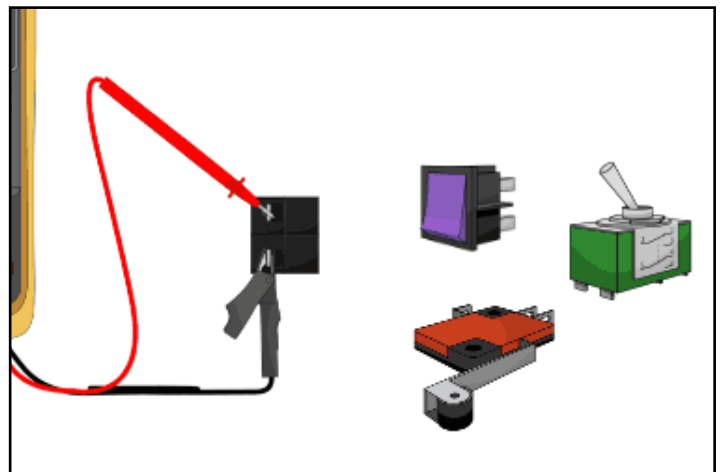
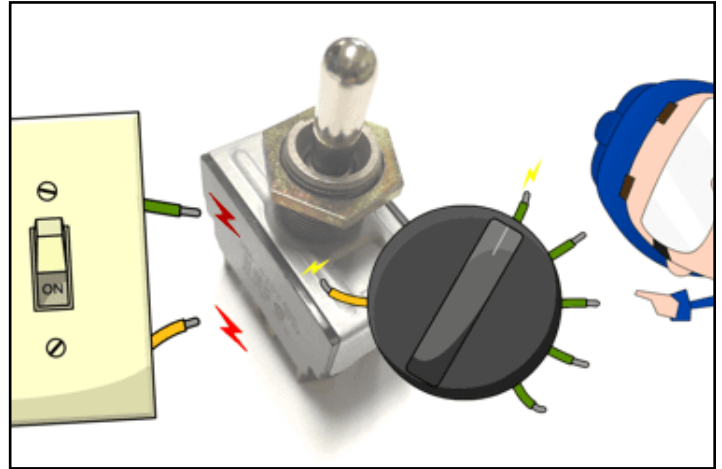
- Double Pole Double Throw
- Simple Switch Circuit
- Single Pole 5 Throw
- Single Pole Double Throw On-Off-On
- Single Pole Single Throw
- Three-Way Switching Circuit

## Puzzle

- Junk Drawer
- Switches

## Quiz

- Switches



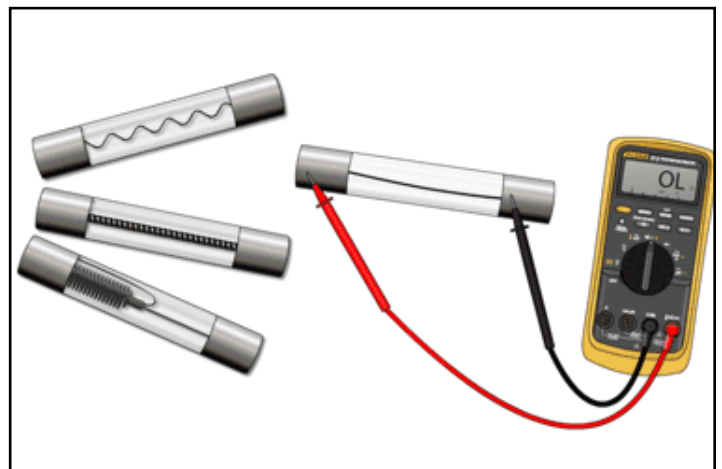
# Fuses & Circuit Breakers

## Lesson

- Fuses & Circuit Breakers

## Quiz

- Fuses & Circuit Breakers



# Starting & Charging Systems

## Lesson

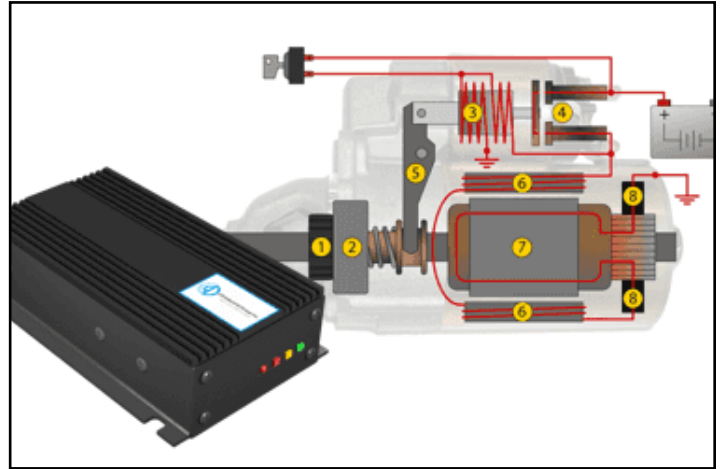
- Starting & Charging Systems

## Puzzle

- 24V Advanced Battery Hookup

## Quiz

- Starting & Charging Systems



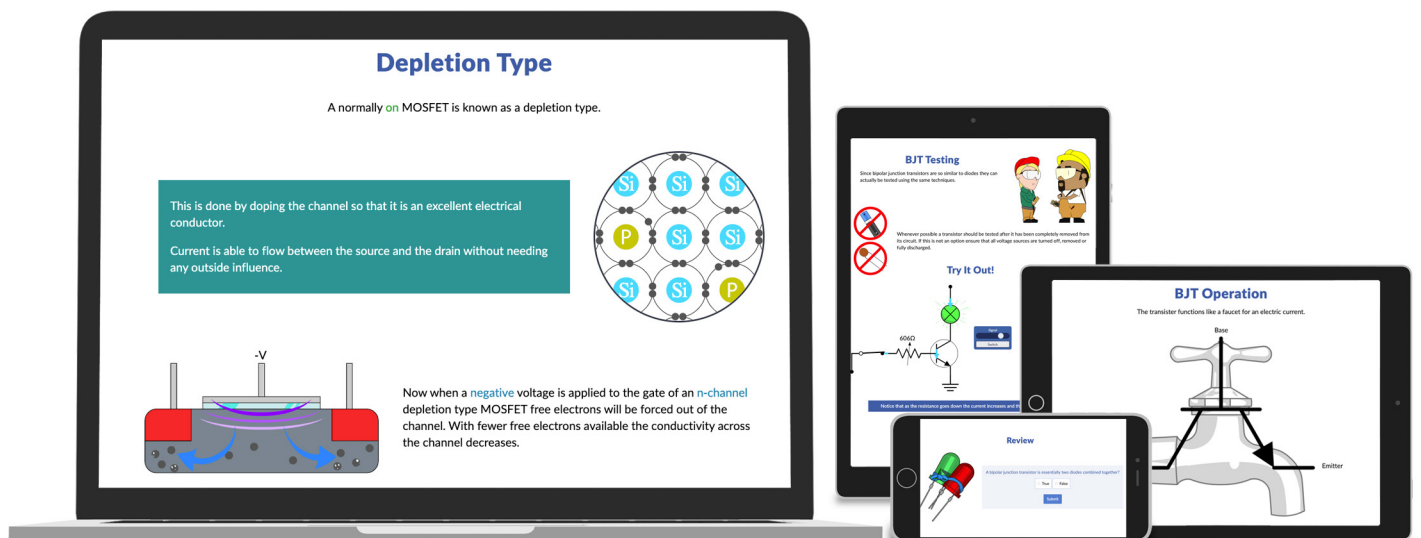
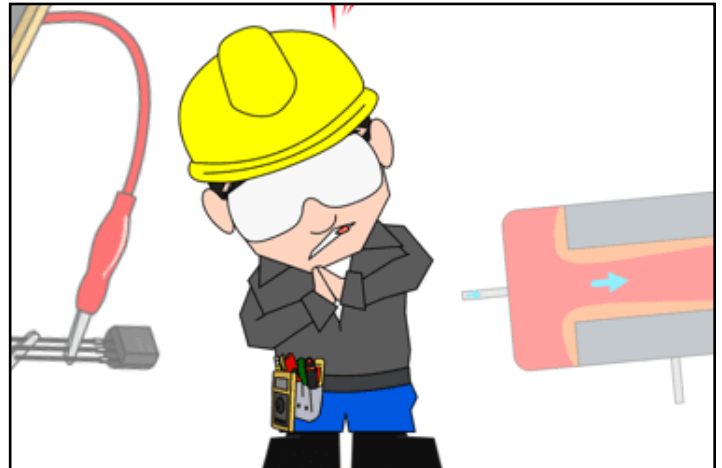
# Semiconductors

## Lesson

- Transistors
- Semiconductor Protection

## Quiz

- Semiconductors



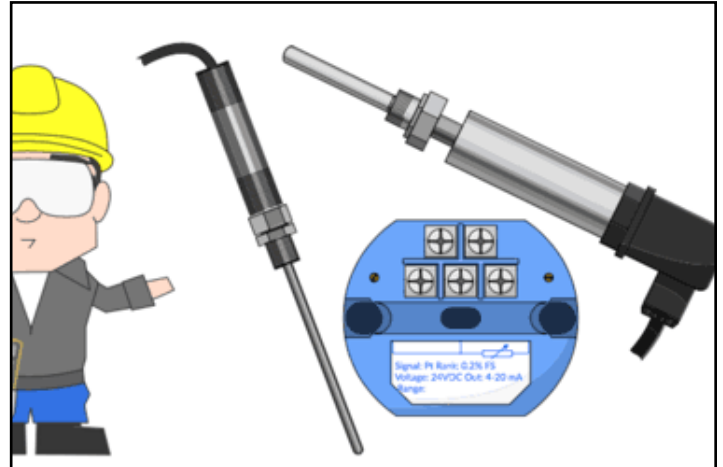
## Sensor Basics

### Lessons

- Sensor Wiring
- Sensors, Transducers, Transmitters
- Normalizing

### Simulations

- Level Sensor: Sourcing
- Level Sensor: Sinking
- 3-Wire PNP Proximity Sensor
- 3-Wire NPN Proximity Sensor
- 4-Wire PNP Proximity Sensor
- 4-Wire NPN Proximity Sensor
- Control Loop
- 2-Wire Control Loops
- 4-Wire Control Loops
- Level Transmitter Control Loop



### Puzzle

- Sinking or Sourcing?

### Quiz

- Sensors

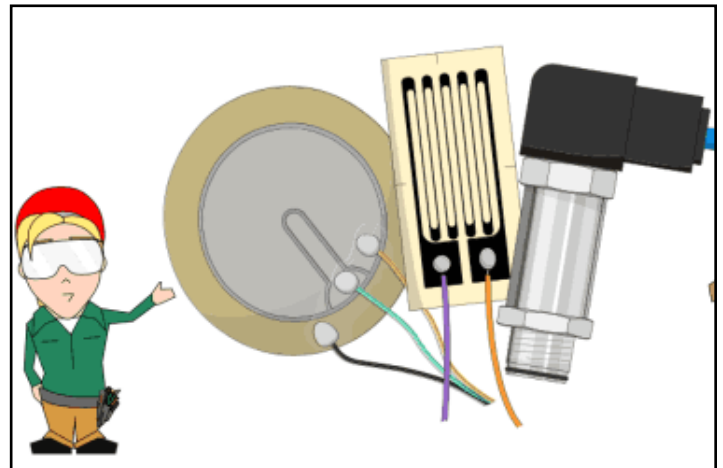
## Pressure Sensors

### Lesson

- Pressure Sensor Basics

### Simulations

- Manometer
- Diaphragm Pressure Gauge
- Bourdon-Tube Pressure Gauge
- Variable Capacitance Pressure Gauge
- Crane Load Cell
- Strain Gauge (Wheatstone Bridge)
- Piezoelectric Sensor
- Differential Pressure (Manometer)



### Quiz

- Pressure Sensors

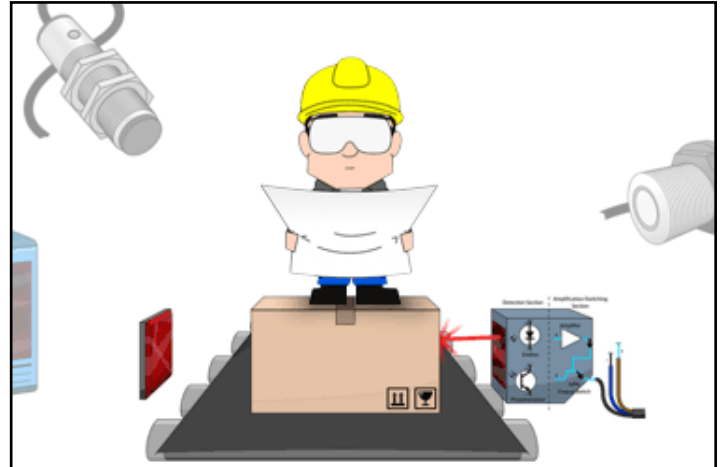
# Position Sensors

## Lesson

- Proximity Sensor Basics

## Simulations

- Inductive Proximity Sensor
- Through-Beam Photoelectric Sensor
- Capacitive Proximity Sensor
- Reflective Photoelectric Sensor
- Diffuse Photoelectric Sensor
- Retroreflective Photoelectric Sensor (Internal Circuit)
- Diffuse Ultrasonic Proximity Sensor (Internal Circuit)



## Quiz

- Position Sensors

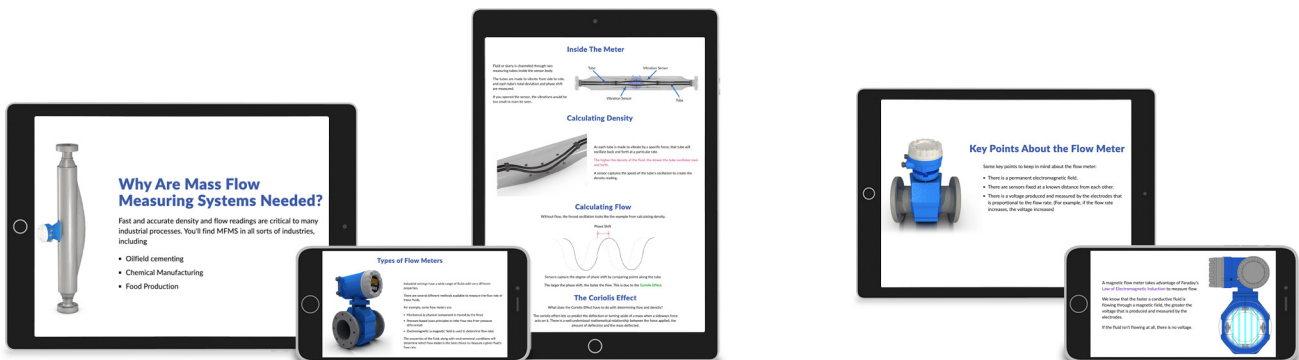
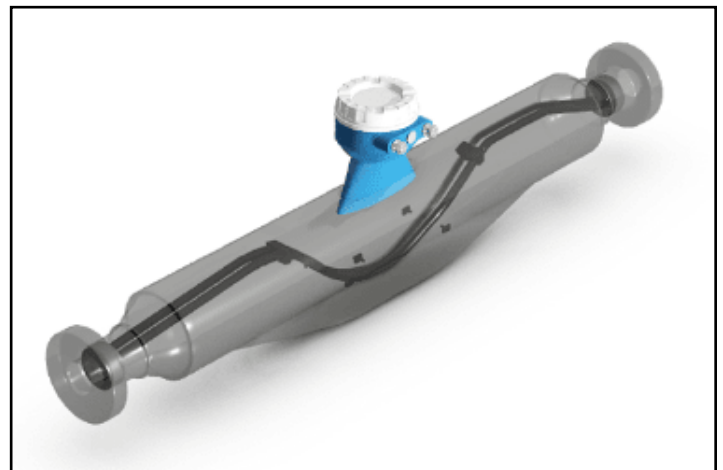
# Flow Sensors

## Lessons

- Electromagnetic Flow Meter
- Mass Flow Measuring System

## Quiz

- Flow Sensors





# Curriculum: Machinery

## Oilfield Pumping

### Lesson

- Plunger Pumps

### Reference

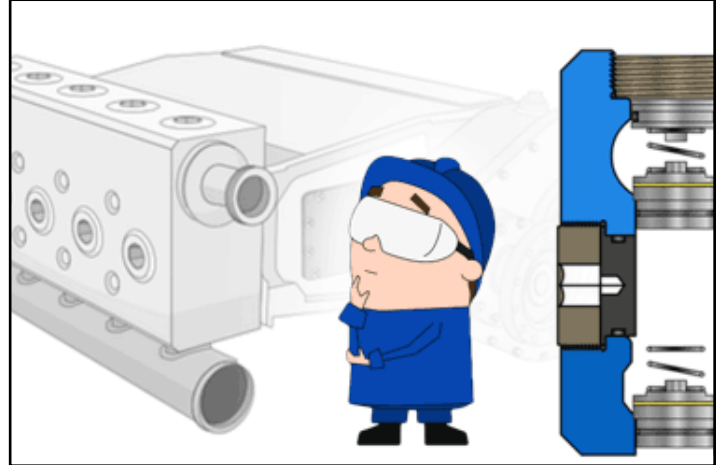
- Plunger Pump Maintenance

### Simulations

- Plunger Pump Cross Section
- Triplex Pump (Top Down)
- Quintuplex Pump (Top Down)

### Quiz

- Oilfield Pumping



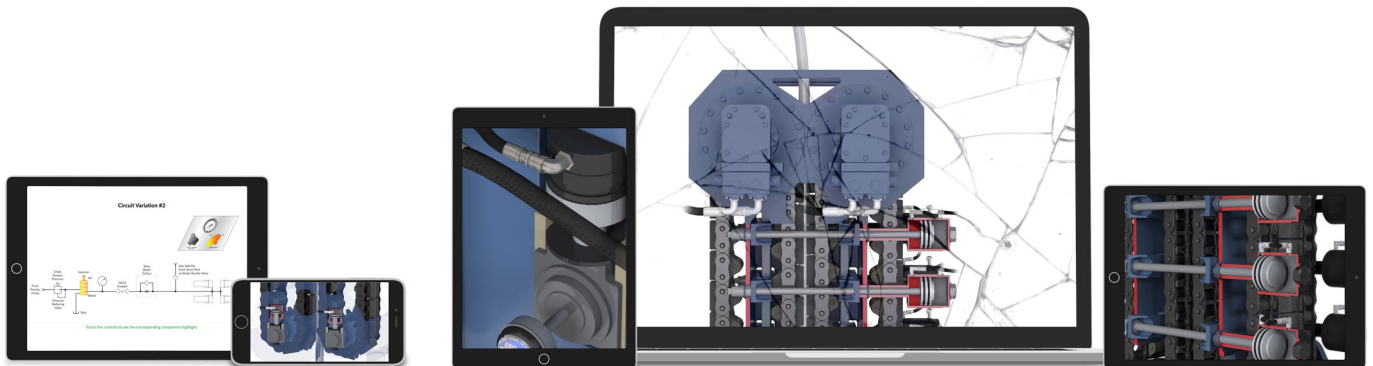
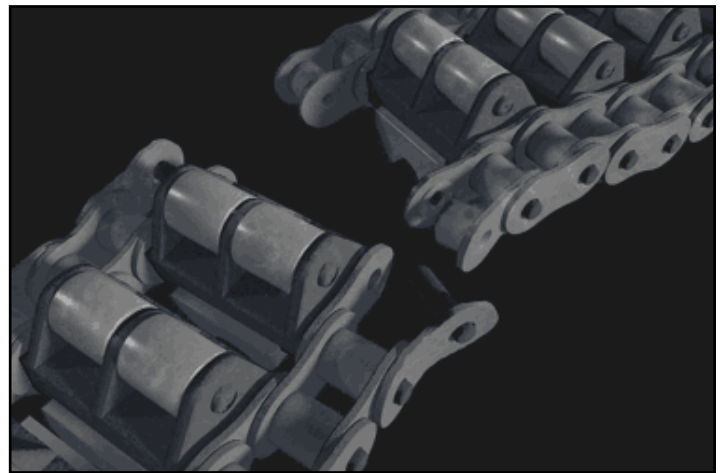
## Coiled Tubing Units

### Lessons

- Diagnosing Problems with Injector Chain Tension
- Diagnosing Problems with Injector Traction

### Simulations

- Closed Loop Injector
- Injector Traction Schematic



# Oilfield Cementing

## Lesson

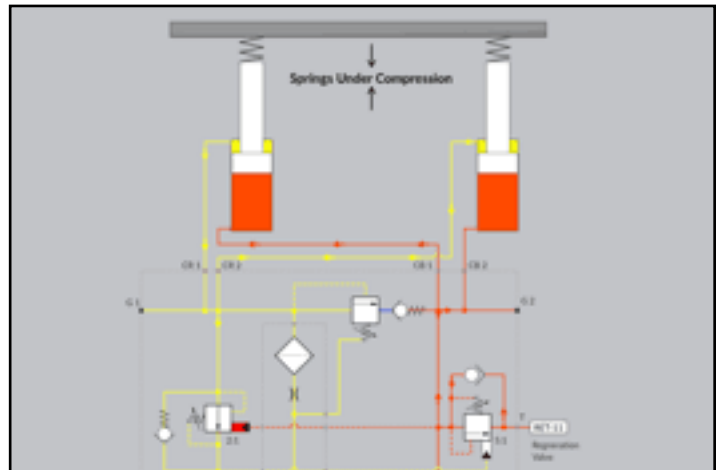
- Mixing Head, Cement Metering Valve & Diffuser



# Blast Hole Drills

## Simulations

- AC DM45 Control of Pump Pressure, Diverters, Brakes
- AC DM45 Propel and Drill
- AC DM45 Holdback Cylinders



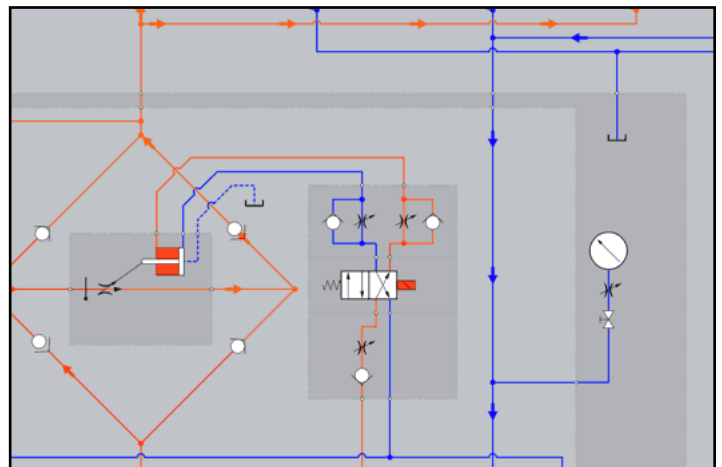
# Coal Stacker-Reclaimer

## Reference

- Coal Stacker-Reclaimer Printable Schematic

## Simulation

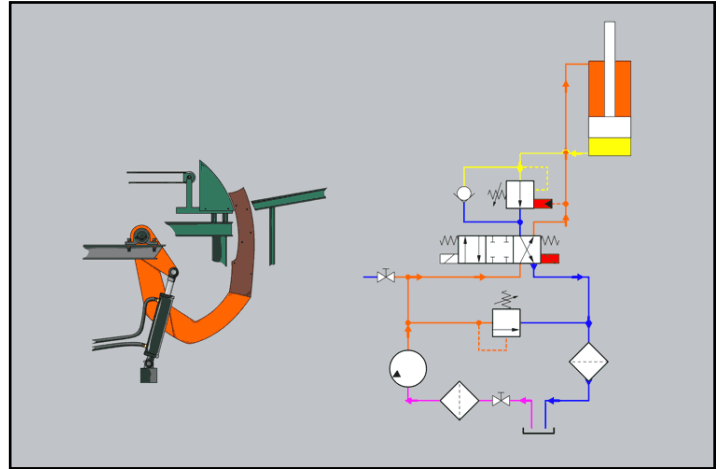
- Coal Stacker-Reclaimer



## Sawmill

### Simulation

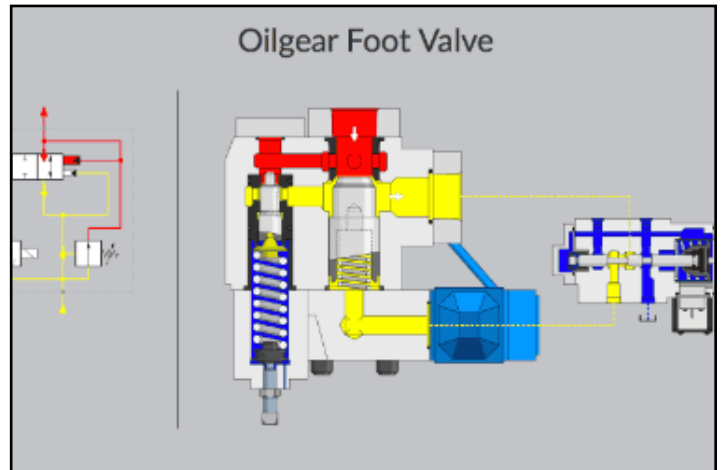
- Quadrant Feeder



## Pulp Bale Presses

### Simulations

- 1000 Ton Bale Press
- 1200 Ton Bale Press
- Bale Press with Oilgear Pump
- Oilgear Foot Valve (Bale Press)



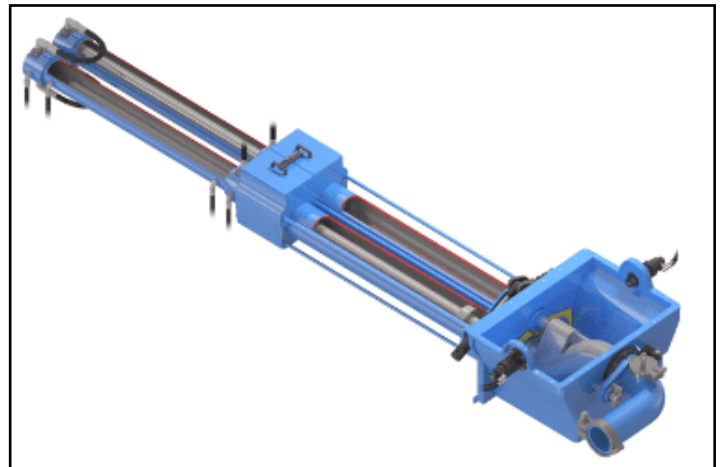
## Concrete Pump

### Videos

- S-Valve Assembly Spin
- S-Valve Slew

### Simulations

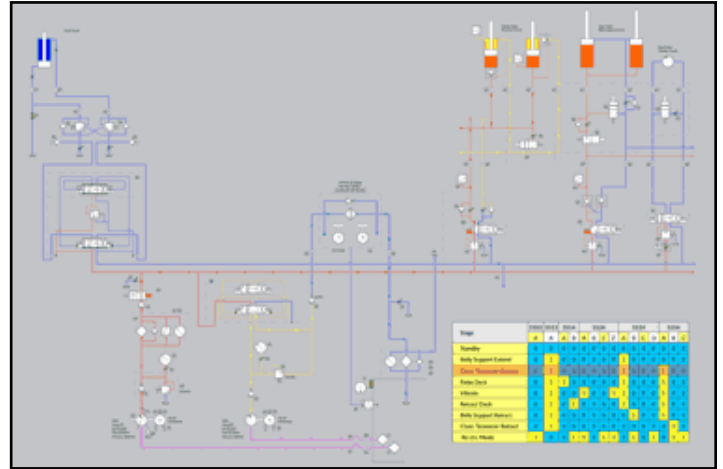
- Concrete Circuit: Simplified
- Concrete Pump: Simplified



## Truck Dumper

## Simulation

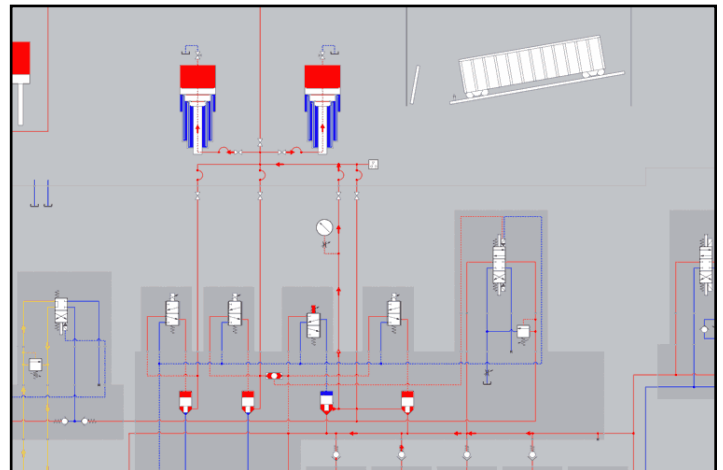
- Cartridge Valve Controlled
- Truck Dumper



## Rail Car Dumper

## Simulation

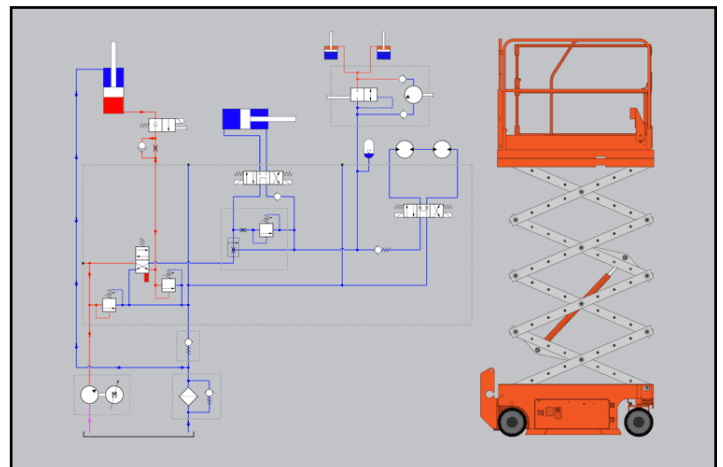
- Rail Car Dumper



## Aerial Work Platforms

## Simulation

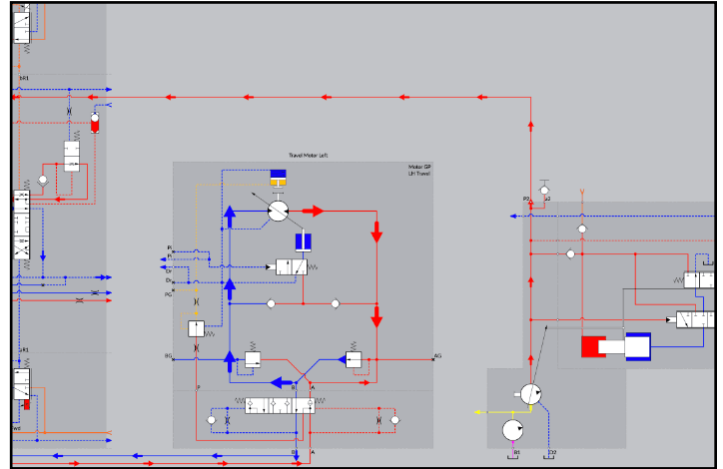
- Slab Scissor Lift



# Cat Excavators

## Simulations

- 385C Bucket and Boom Circuits
- 385C Swing Circuit
- 385C Track Drive



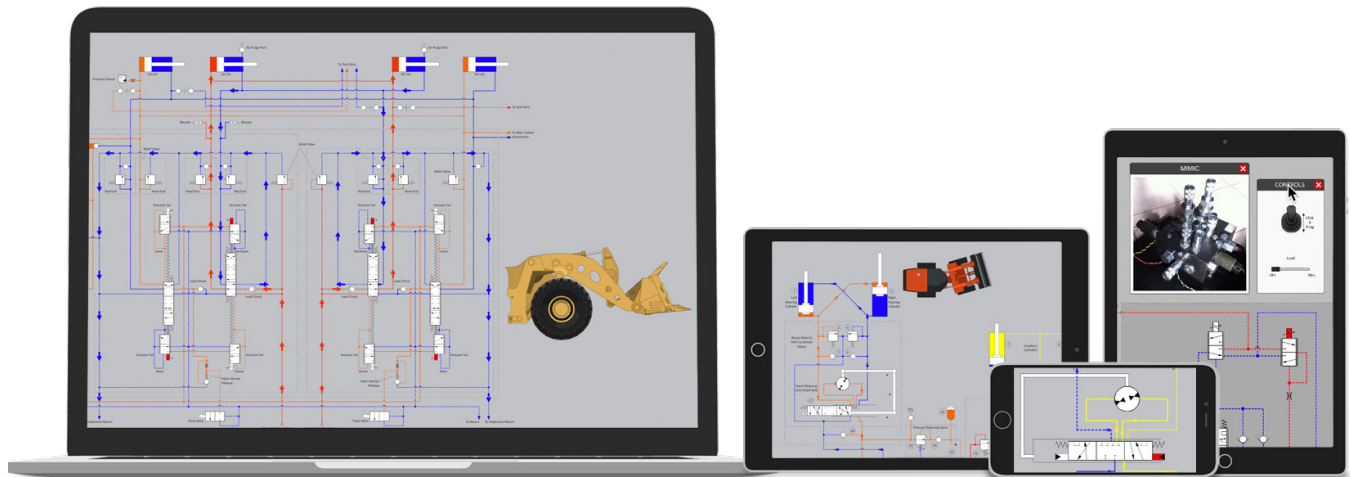
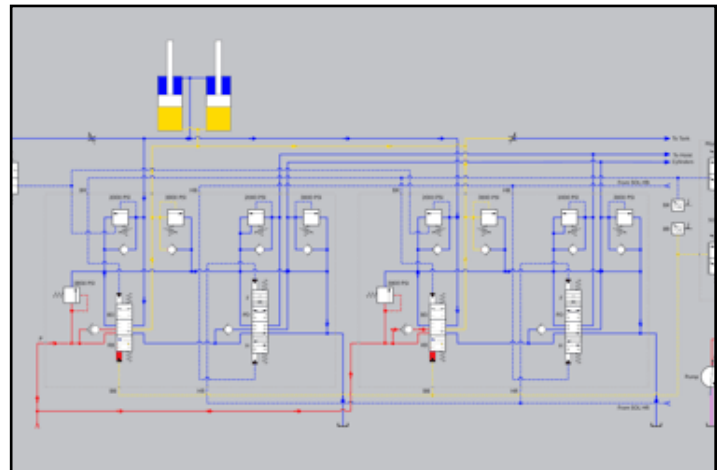
## Loaders

## Videos

- Ride Control
- Shock Relief
- Troubleshooting a Regenerative Lift Circuit

## Simulations

- Cat 993 Loader Implement
- Generic Wheel Loader
- Kalmar DRF450 Lift Cylinders
- Komatsu WA380 Boom & Bucket
- Komatsu WA380 Steering
- LeTourneau L-2350 Loader Bucket Circuit



# Deere-Hitachi Excavators & Shovels

## Lesson

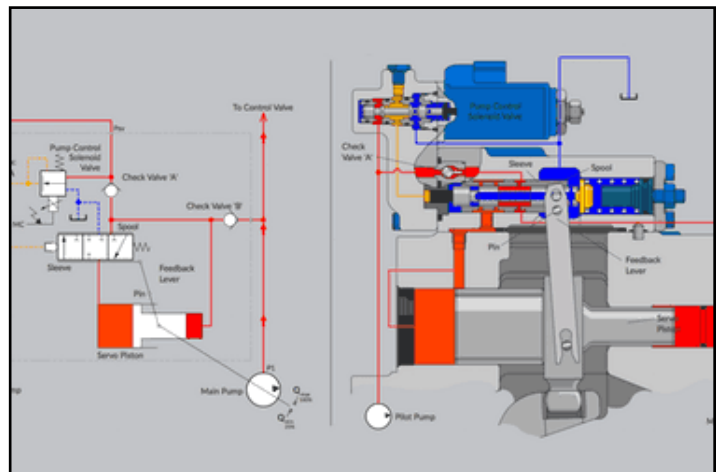
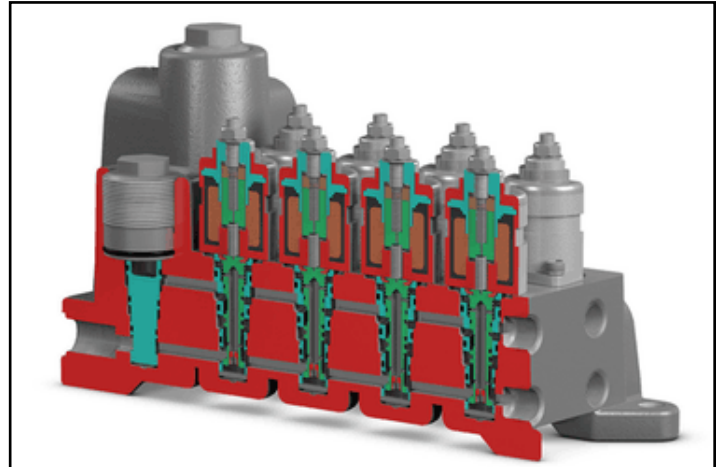
- EHC (Solenoid) Valves

## Videos

- EHC (Solenoid) Valves
- Hitachi (Kawasaki) Pump Controller
- Hitachi (Kawasaki) Pump Regulator

## Simulations

- Boom Valve
- Bucket Valve
- EX2500-6 Attachment Circuit
- Hitachi (John Deere) Fan Pump Regulator
- Hitachi (John Deere) Main Pump Regulator
- Hitachi (John Deere) Main Relief Valve
- Hitachi Arm Regenerative Circuit
- Hitachi Boom Flow Rate Control Valve
- Hitachi Cushion Cylinder
- Hitachi EHC to DQR Cutaway
- Hitachi Fast Filling Circuit
- Hitachi Lever to EHC Valve
- Hitachi Parking Brake Circuit
- Hitachi Shovel Folding Stairway
- Hitachi Swing Circuit
- Hitachi Travel Circuit
- Hitachi Travel Device



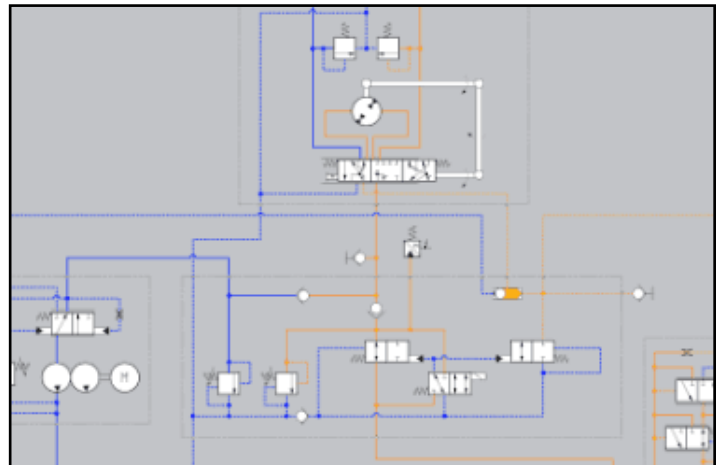
## Quiz

- EHC Valves Quiz

## Cat Haul Trucks

## Simulations

- 777 Steering
- 793 Hoist





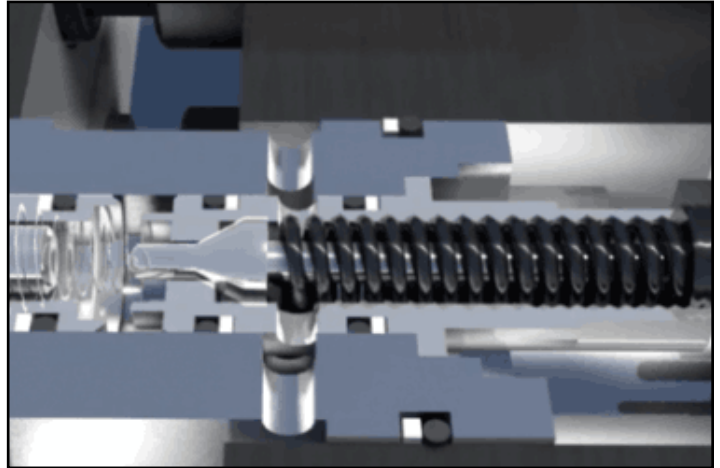
# Komatsu Haul Trucks

## Video

- Husco 6500 Inlet Section 3D Tour

## Simulations

- Komatsu Inlet Section
- 830E Brakes
- 830E Steering & Hoist
- 930E Bleeddown Manifold
- 930E Brakes
- 930E Hoist & Steering
- Split Spool Section



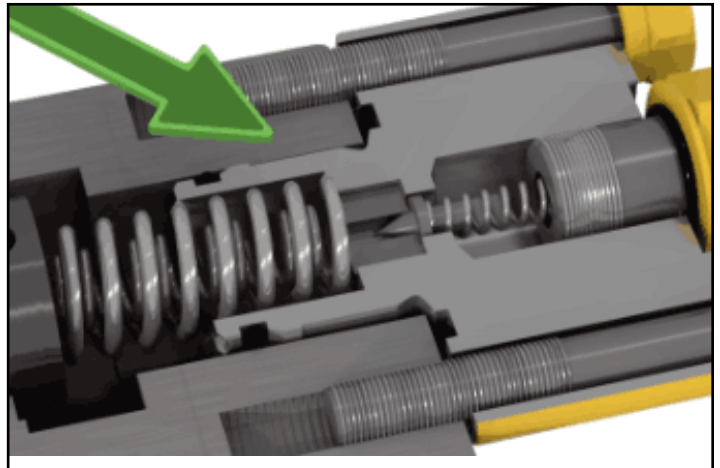
## Graders

## Videos

- 3D Tour of Caterpillar H Series Grader Combination Valve
- Pilot-Operated Check Valve Cylinder Troubleshooting (Part 1)
- Pilot-Operated Check Valve Cylinder Troubleshooting (Part 2)
- Pilot-Operated Check Valve Cylinder Troubleshooting (Part 3)
- Hydraulic Brakes

## Simulations

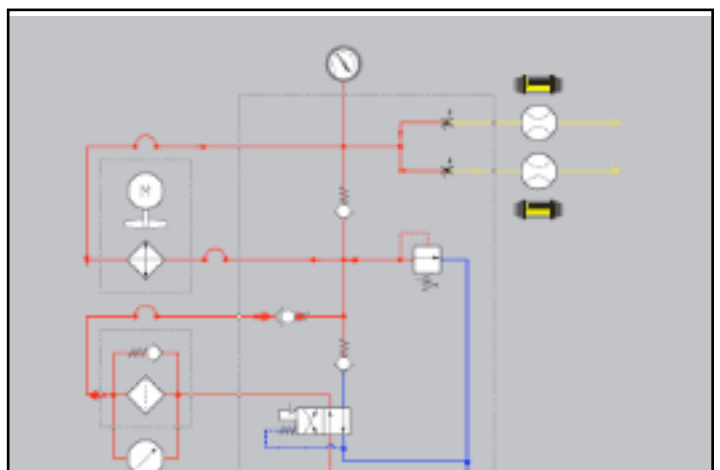
- Caterpillar M Grader Implements
- Caterpillar M Grader Steering



## Lube Systems

## Simulations

- Bearing Lube System
- Sleeve Bearing Lube Pump



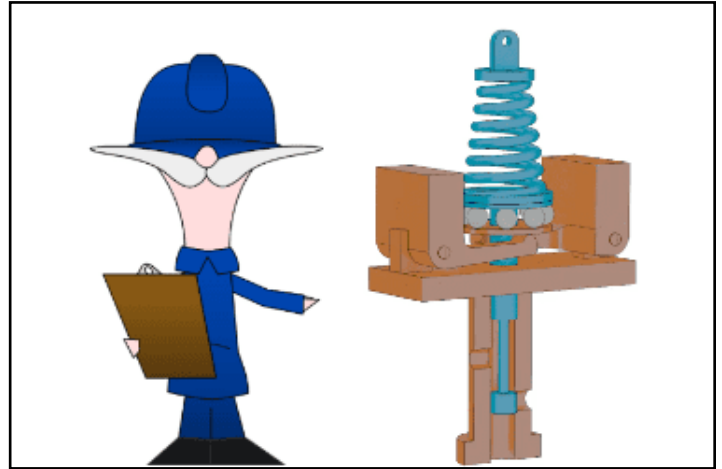
# Hydraulic Governor

## Lesson

- Governor Basics

## Simulation

- Simple Governor



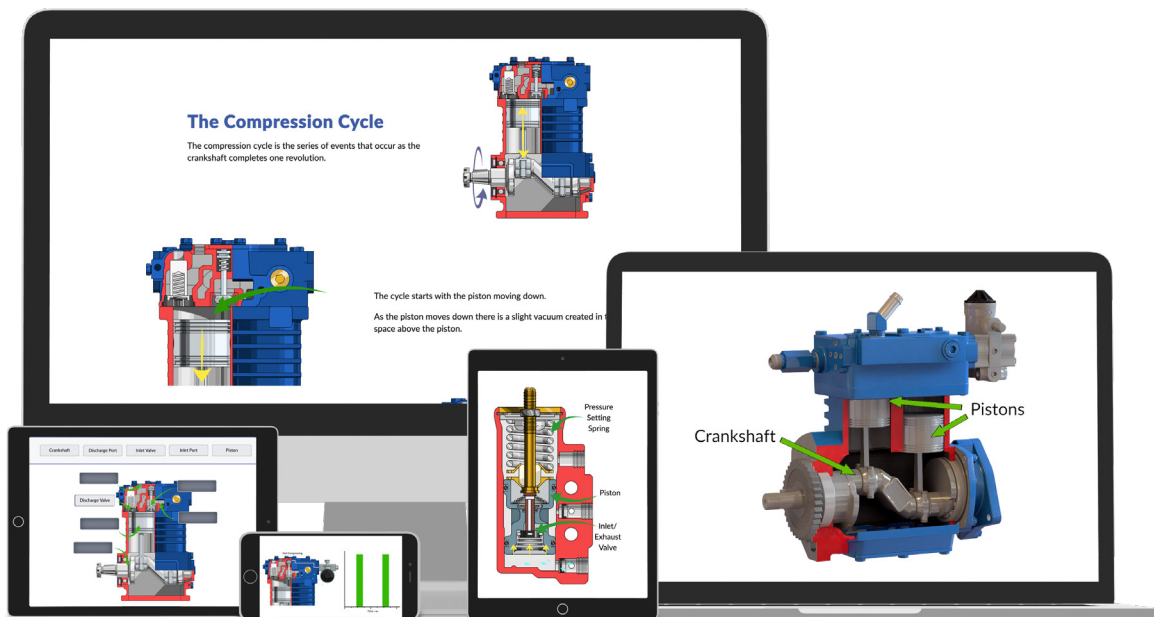
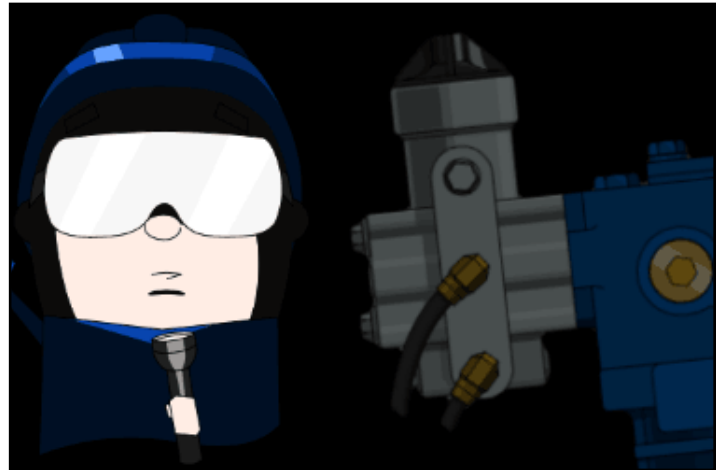
# Mobile Equipment Air Compressors

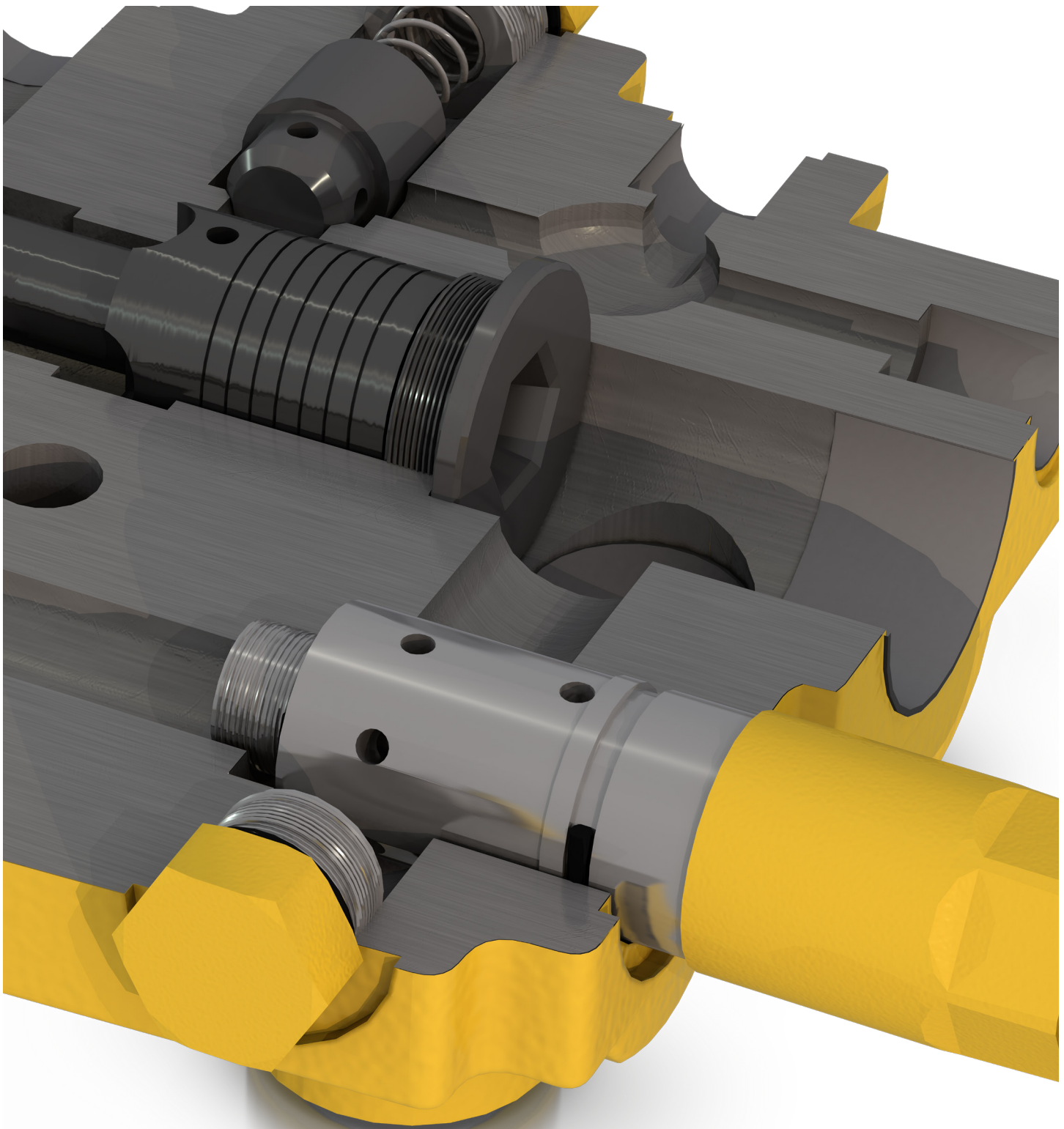
## Lessons

- Piston Compressors
- Air Governors

## Videos

- Piston Compressor Breakdown
- Piston Compressor Compressing Action





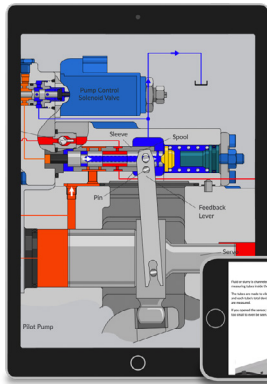
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"Been a huge fan for a few years now and will continue to be for years to come. Your work is unparalleled. I appreciate that you do not spare details when modeling components and systems. "

*Trey T.*

*MFCP - Motion and Flow Control Products*

# Additional Services



LunchBox Sessions is trusted by leading companies in resources, manufacturing, logistics, and aerospace. This is a proven solution at global scale. When you purchase LunchBox Sessions access for a team of 50 or more, a variety of additional services, features, and accommodations become available.

## Custom Content

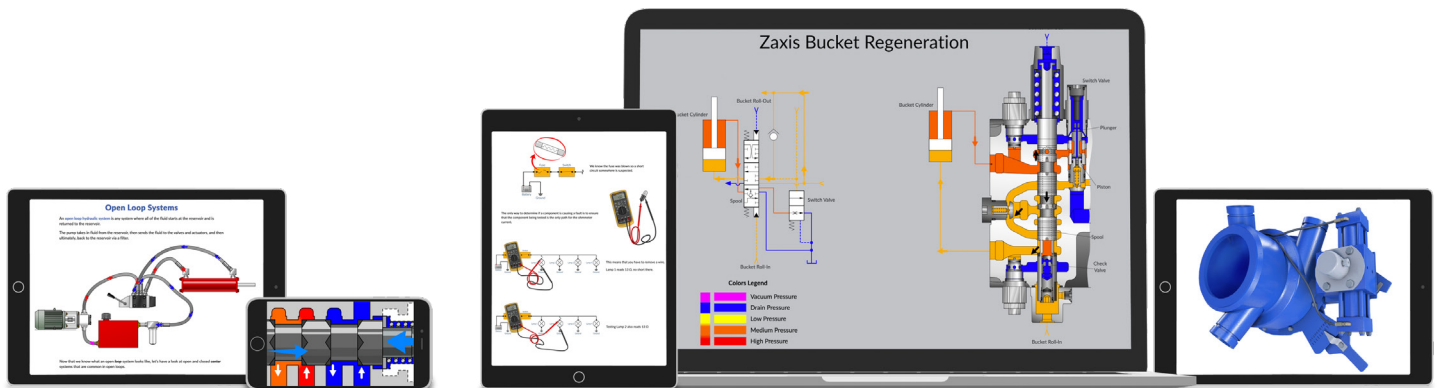
We build custom Live Schematic simulations, lessons, quizzes, and other learning tools featuring your own machines and systems. This custom learning content is produced directly from your schematics, giving your trainees familiar equipment to practice with while learning new concepts and skills on LunchBox Sessions. Your custom content is integrated directly with LunchBox Sessions, taking full advantage of our dynamic learning tools and providing full-fidelity learning history data to your training supervisors. When trainees operate your own hydraulic systems in this simulated form, seeing the flow paths come to life and pressure values change, driven entirely by trainees' own hand-eye interactive controls, then real systems-learning takes place.

Custom content is the most widely used benefit of large-scale LunchBox Sessions deployment, and is highly recommended. Content development fees and contract terms apply.

## Large Teams

For teams that require more than 50 active accounts, a discount curve is applied to the per-account price. The more accounts you need, the higher the discount percentage.

Large teams also have the option of domain-based authentication. Rather than manually inviting and managing learner accounts for your trainees and staff, we can set up automatic registration for any user email address matching your domain names.



Training at a global scale means a lot of accounts and a lot of data. To help, we can automatically sort your team members into private subteams by country, allowing regional staff to focus on just the people and data relevant to them, while global managers see the complete picture.

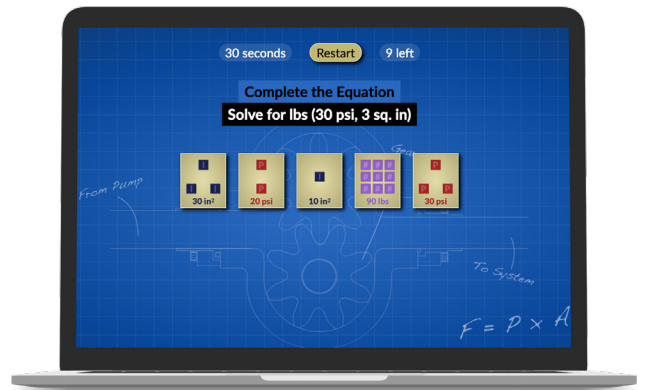
These features greatly simplify large scale deployment, and are available free of charge to teams of 50 or more.



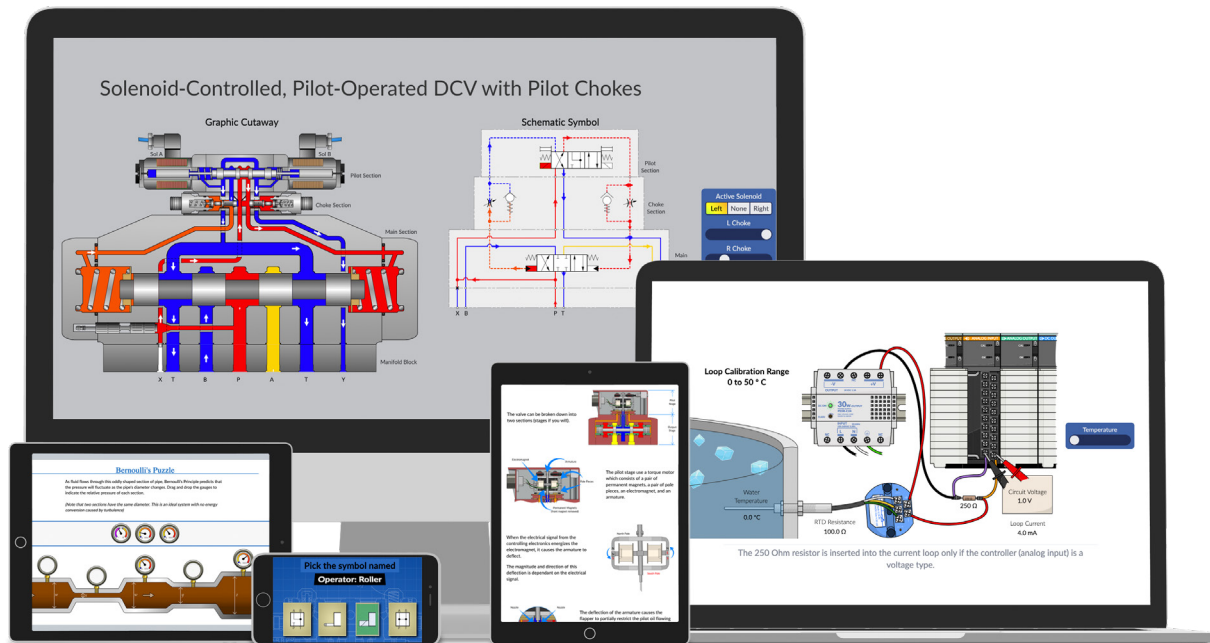
## System Integrations

LunchBox Sessions is its own LMS. The same team that makes our highly interactive learning media also designed the learning management tools. The content and the tools work tightly together, offering a breakthrough learning experience and a detailed record of learning activity that have never been possible in a traditional LMS. Most organizations choose to use LunchBox Sessions without an LMS integration, simplifying the experience for learners and managers.

If your organization already has an LMS and you choose to use it with LunchBox Sessions, we offer several integration points. We can send certain learning activity data to your LMS, auto-populate your LMS with links to our sessions and learning materials, and use your SSO authentication. LMS technical requirements, integration development fees, and contract terms apply.



## Our Approach



LunchBox Sessions is the result of tight collaboration between industrial subject matter experts, writers, artists, animators, programmers, videographers, and educators. Our team composition is unique within the field of industrial education, with renowned experts in hydraulic and electrical systems working directly with a dedicated team of content creators. We have developed our own suite of simulation technologies, refined our own style of technical illustration, and honed a clear and approachable tone to our writing. Our custom web platform delivers our learning media with industry-leading efficiency, suitable for use in data-constrained environments like remote mountaintop mines and off-shore drilling platforms. LunchBox Sessions is our ultimate vision for industrial education, brought to life with every new session we produce and every learner we help.



**1.866.628.3224 | [info@lunchboxsessions.com](mailto:info@lunchboxsessions.com)**

Kody H. 2020  
Machine Shop Maintenance, Lee Valley - Veritas Tools