

For a schedule of open enrollment classes or to bring this training to your plant or facility, contact us @

1-877-97-TRAIN

www.AmericanTrainco.com

"...practical..."

Ed Clancy - Sr. Eng.  
- Montgomery County

"...easy to understand..."

Ted Huyett - Mgr. EH&S  
- PPG Industries

"HANDS-ON"

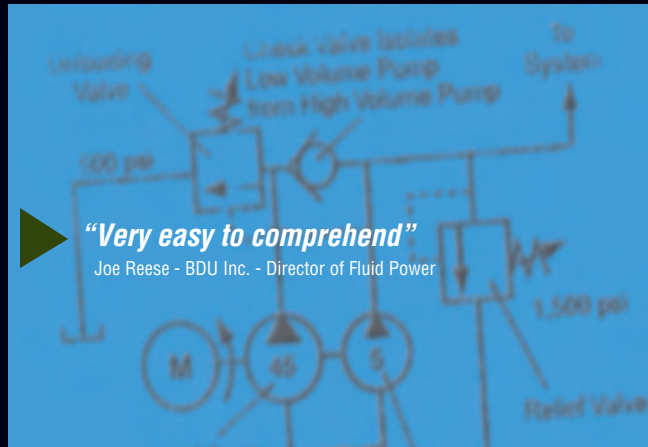
# Understanding & Troubleshooting Hydraulics™

**Day 1 – Systems and Components:**  
*What they are and how they work*



**Day 2 – Troubleshooting:**  
*How to identify and fix common problems*

**Free MTAA  
Certification Testing!**



"Very easy to comprehend"

Joe Reese - BDU Inc. - Director of Fluid Power

- This seminar can also be presented at your facility for larger groups
- Reserve Your Space Now! Call 1-877-97-TRAIN
- Check us out online at [www.AmericanTrainco.com](http://www.AmericanTrainco.com) for a complete listing of all seminars coming to your area

▶ **“Started the class with no knowledge of hydraulics and ended with confidence”**

Mike Smith - Mechanic - Johns-Manville

## Understanding & Troubleshooting **Hydraulics™**

### **PURPOSE OF TRAINING**

Being able to operate, maintain and troubleshoot your own hydraulic equipment and systems starts with simply understanding how and why all the various components work. That is what this course is all about. We will provide you the basic building blocks and information you need to become proficient in working with hydraulics. This course is perfect for multi-craft technicians or even skilled fluid power technicians who just need a solid refresher. And because we know time is money this seminar is designed to have immediate impact so that you can start saving maintenance dollars on costly repairs and service calls today!

We approach our students as if they were our own employees. We give them real world, practical knowledge. Students attending this course are expected to go back to their workplace and immediately apply what they have learned. Now that's "Real World" training!

### **TRAINING OUTCOMES**

Upon completion of this course, students will receive a training certificate and 1.4 Continuing Education Units indicating that the student has learned to:

- Identify hydraulic components by their schematic symbols
- Understand the applications of both primary and auxiliary components
- Select the correct valves, motors and actuators to obtain desired results
- Design simple hydraulic circuits using schematics
- Diagnose and avoid common system & component problems
- Understand the differences and commonness of mobile and industrial hydraulics
- Determine applications for, install and charge an accumulator
- Select, size, seal and route hydraulic pipes and hoses
- Control heat, filtration and contamination in hydraulic systems
- Work with hydraulic fluids and components in a safe and environmentally friendly manner
- Properly test and inspect hydraulic systems
- Diagnose system versus component problems
- Evaluate the cause and effect of changing or re-sizing system components

### **TEACHING PHILOSOPHY**

"Real World Training...for Real World Needs", is not just our slogan, but also our mission statement. At American Trainco, we approach our students as if they were our own employees. We instruct and guide them in practical knowledge that allows them to immediately go back to their workplace and apply what they have learned. Our instructors are seasoned veterans with years of real world experience, and the students who attend our seminars often get more from a few days of training than an entire year of reading textbooks or watching videos. How do we know? They tell us.

Anyone can teach theory, but there simply is no substitution for experience. What sets American Trainco apart is our ability to communicate that experience to our students. As one attendee told us at the end of his two-day training course, "I think I can go back to work now and teach the veterans a thing or two."

Mission accomplished.

### **ABOUT OUR INSTRUCTORS**

All American Trainco instructors are required to have a formal education and real world work experience. They need to be leaders in their field. We don't hire field people without teaching experience, and we don't hire teachers without field experience. They must have both. And since attendees critique the instructor at the end of each class, a positive and enjoyable learning experience is virtually guaranteed.

### **TRAINING CERTIFICATE**

After completion of this seminar students will receive a personalized Certificate of Completion and 1.4 CEU's (Continuing Education Units) approved by the Maintenance Training Association of the Americas.

### **UNAFFILIATED & NON-COMMERCIAL**

Unlike some training experiences, you won't get a sales presentation at an American Trainco seminar - all you get is an honest, commercially unbiased education. We do not engage in the practice of selling or promoting any other company's products or services, so you know that by attending one of our seminars, your time and money is well spent.

### **HIGH QUALITY PRESENTATIONS**

Not all people involved in maintenance learn the same way. That's why we use a combination of hands-on equipment, instructor demonstrations, cut-aways and the very latest in animation to teach attendees in this class. We completely submerge the student in the world of hydraulics using these different techniques to make sure they fully understand what they have come to learn. And our books are specifically designed with the maintenance person in mind too. We know that they don't always have a lot of time to read volumes of literature so our manuals are quick and to the point, providing students the same charts, descriptions, pictures and bulleted items they'll see during the presentation.

### **WHO SHOULD ATTEND**

This course is designed for anyone who needs to understand hydraulic components and systems for work in industrial and mobile equipment applications. Attendees come from a wide variety of industries, skill-levels, company sizes, and backgrounds, so if you're not sure you'll fit in or will benefit from these classes, don't worry - you will - as long as your work involves hydraulics! People who will benefit from attending this seminar include...

#### **Maintenance Personnel in:**

<i>Manufacturing Plants</i>	<i>Commercial Buildings</i>
<i>Utilities</i>	<i>Waste Water Facilities</i>
<i>Government Buildings</i>	<i>Construction</i>
<i>Research Facilities</i>	<i>Mining</i>
<i>Oil Refineries</i>	

#### **Including:**

<i>Mechanics</i>	<i>Pipe Fitters</i>
<i>Machine Operators</i>	<i>Apprentices</i>
<i>Plant Managers</i>	<i>Supervisors</i>
<i>All Multi-craft/Cross Training Personnel</i>	

#### **FREE-MTAA CERTIFICATION TEST (optional)**

In addition to receiving MTAA approved CEU's for this class, you may also elect to take an MTAA Hydraulic Systems & Components Certification test. Instructions for taking the test will be provided at the end of the seminar.

## Day 1

### SYSTEMS & COMPONENTS: *What They Are and How They Work*

This course begins with an overview of hydraulic principles and progresses through hydraulic system components including pumps, valves, cylinders, motors, rotary actuators, accumulators and filters with emphasis placed on component structure and the identification of the components by the proper symbol as standardized by ANSI and ISO.

Methods of instruction include lecture, discussion, audio-visual material including power point presentation, animation of components and systems, hands-on lab exercises with real world hydraulic components and actual operating training stations.

#### COURSE OUTLINE

- Hydraulic Principles
- Positive-Displacement Pumps
- Flow Control Valves
- Directional Control Valves
- Check Valves
- Hydraulic Cylinders
- Hydraulic Motors
- Hydraulic Rotary Actuators
- Pressure Control Valves
- Pilot Operated Pressure Control Valves
- Accumulators
- Fluid Conductors
- Reservoirs, Heat Exchangers and Filters

▶ ***“The instructor gave “Real World” applications, experiences, and terminology to make the whole seminar practical.”***

Nathanya Myers - Human Genome Sciences Inc.

## Day 2

### TROUBLESHOOTING: *How to Identify and Fix Common Problems*

During Day 1, students gained a “working knowledge” of hydraulic components and their function within an operational system. This course builds on that knowledge and is designed to help the student become aware of the decision making process that is part of a good troubleshooting procedure.

Using state of the art animated software and hands-on exercises, the instructor focuses on the troubleshooting process and the inspection and testing tasks that are part of a systematic approach to locating malfunctions and their underlying causes.

The hands-on lab exercises require the students to troubleshoot real world system problems. Every application which is discussed is totally dissected in the animated program. This animation program allows the instructor to recalibrate; pressure, flow, torque, load and even upsize and downsize of components.

#### COURSE OUTLINE

- Application
- Troubleshooting
  - ✓ Safety
  - ✓ Basic Troubleshooting Requirements
  - ✓ Generalization on Troubleshooting
  - ✓ Noisy and Cavitating Pumps
  - ✓ No System Pressure
  - ✓ Low or Erratic System Pressure
  - ✓ No Movement of Actuator
  - ✓ Slow or Erratic Actuator
  - ✓ System Running Hot
  - ✓ Common Cylinder Problems
  - ✓ Solenoid Failure
  - ✓ Internal and External Leaking Control
  - ✓ Troubleshooting Hydrostatic Transmission

#### SEMINAR AGENDA

7:30 am	Registration
8:00 am	Class Begins
12:00 - 1:00 pm	Lunch (on your own)
4:30 pm	Class Ends

#### SEMINAR FEE

\$490 Each Day \$980 Both Days

#### NO RISK REGISTRATION & MONEY-BACK GUARANTEE

If you're not sure you'll be able to attend this seminar, you can still make a reservation to hold your space in class. While payment is due prior to the start of the seminar, you may choose a full refund or credit for cancellations made at least 24 hours in advance. Student substitutions can also be freely made at any time prior to the start of the seminar. Refunds will not be issued for registered attendees who fail to show up and have not given a notice of cancellation. In the rare event that you do not receive the expected value after attending our seminar, simply notify us in writing of your reasons and your money will be promptly refunded.

#### OTHER SEMINARS

American Trainco presents a variety of maintenance training seminars throughout the country on a regular basis. Contact us to find out more about the training courses coming to your area, including:

- Basic Electricity for the Non-Electrician™
- Electrical Troubleshooting
- Air Conditioning & Refrigeration
- Boiler Operation, Maintenance & Safety™
- Arc Flash Protection & Electrical Safety™
- 2008 National Electrical Code®

And 20+ other courses in the following areas:

- Electrical / Electrical Controls
- HVACR
- Mechanical
- Facility & Plant Management
- Fluid Power
- Pumps / Piping
- Codes / Standards / Safety

#### IN-HOUSE TRAINING

You can bring this or any other maintenance training program directly to your facility. Simply give us a call, tell us what you're looking for, and we'll provide you a quote. We also provide custom training for courses not listed in this brochure.

Call **1-877-97-TRAIN** and ask for Dan or Adam, or email [AdamC@AmericanTrainco.com](mailto:AdamC@AmericanTrainco.com). Visit us on the web at [www.AmericanTrainco.com](http://www.AmericanTrainco.com)

Reserve Your Space Now!

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*“Helpful information that will improve my performance at my plant”*

Vatche Der Kaloustian  
Maintenance Engineer  
BAS Recycling

## Understanding & Troubleshooting **Hydraulics™**

**SEMINAR FEE: \$490 Each Day \$980 Both Days**

**FIVE EASY WAYS TO REGISTER:**

- 1) **Internet** [www.AmericanTrainco.com](http://www.AmericanTrainco.com)
- 2) **Fax** (303) 531-4565
- 3) **Phone** Toll Free 1-877-97-TRAIN 1-877-978-7246 or (303) 531-4560
- 4) **Mail** this form to: American Trainco, Inc. P.O. Box 3397 Englewood, CO 80155
- 5) **E-mail** the information requested on this form to: [Sales@AmericanTrainco.com](mailto:Sales@AmericanTrainco.com)

**Authorizing Person/Supervisor:** Name \_\_\_\_\_

Title \_\_\_\_\_ Company Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_

Seminar Attendees:	Name	Title	E-Mail	Seminar City

**Billing Information:** (Please fill out this section only if the "Bill To" name and address is different than the Authorizing Person's name and address above.)

Individual's Name \_\_\_\_\_ Title \_\_\_\_\_ Company Name \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_

**Payment Method:**

- Visa     MasterCard     Discover     American Express

Card Number: \_\_\_\_\_

Expiration Date: \_\_\_\_\_

Name on Card: \_\_\_\_\_

Signature: \_\_\_\_\_

Check Enclosed (Make payable to: American Trainco, Inc.)

Bill Purchase Order #: \_\_\_\_\_



PO Box 3397  
Englewood, CO 80155



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### BLOCK PURCHASING PROGRAM

Buy your training in bulk and save up to 25%! This program can be used to register any person for any seminar, at any location and for any date.

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*Call*

**1-877-97-TRAIN**

PROMOTION CODE

**X05**

