

American Trainco - Over 100,000 Satisfied Students

HYDRAULIC
MAINTENANCE
LEVEL II:

HYDRAULIC TROUBLESHOOTING & APPLICATION

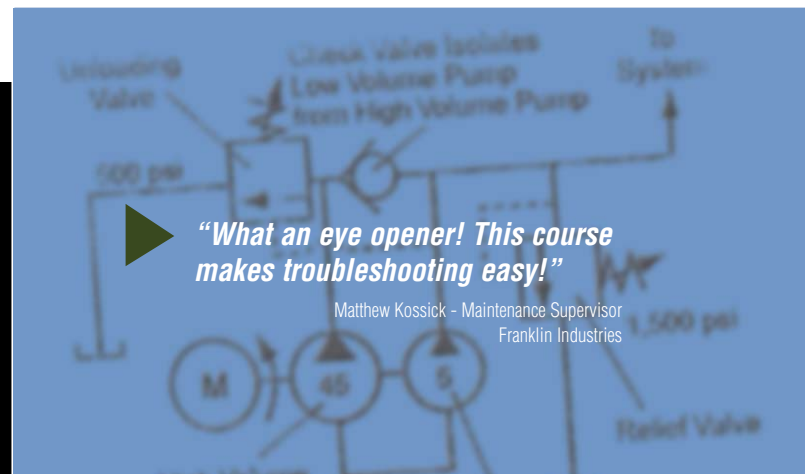
Including Real World "Hands-On" Demonstrations & State-of-the-Art Animation

For a schedule
of classes in your
area, call us @

1-877-978-7246

or visit
www.AmericanTrainco.com

Have a question of your own? Bring it to this class and get it answered guaranteed - or your money back!



Attend this seminar and get answers to questions like these....

- No system pressure, where do you look?
- What caused a blown drive shaft seal on your pump?
- Does your system experience intensification? What causes it?
- Can you replace a pressure compensated pump with a gear pump?
- You have a problem with force, which components might be affected?
- What is an acceptable level of vacuum at the inlet of a pump?
- Your cylinders are drifting. What causes that & how do you stop it?

Free MTAA
Certification Testing!

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



▶ **“Practical time saving techniques.”**

▶ **“Straight forward approach makes troubleshooting easy.”**

HYDRAULIC TROUBLESHOOTING & APPLICATION

Including Real World “Hands-On” Demonstrations & State-of-the-Art Animation

PURPOSE OF SEMINAR

Do you know what work needs to be done but can't quite figure out the hydraulic application to do it? Do you have new problems pop up or old, chronic problems that never go away? Then this seminar is for you. We provide a practical and down to earth education so that you can go back to your plant or facility and immediately apply what you have learned. So much more than the typical theory and information course, students attending this seminar will get real world solutions to their real world hydraulic problems.

In the course, you'll learn to focus on the troubleshooting process and the inspection and testing tasks that are part of a systematic approach to locating malfunctions and their underlying causes. Students will become aware of decision-making processes, which is the first important step to a solid troubleshooting procedure. And several hands-on lab demonstrations will allow the students to troubleshoot real world system problems. Every application discussed will be totally dissected in a state-of-the-art animated program so that the students can see what happens when they recalibrate pressure, flow, torque, load or even upsize and downsize components.

No longer will you need to guess or try to fix problems by merely substituting parts. When it comes time to fix something after attending this seminar, you'll know exactly what to do, why you are doing it and be confident that it works!

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:

- Create and match a variety of hydraulic applications to the work to be performed
- Properly test and inspect hydraulic systems
- Diagnose system versus component problems
- Distinguish problem “symptoms” from the actual “cause”
- Apply a common-sense, systematic approach to troubleshooting
- Evaluate the cause and effect of changing or re-sizing system components
- Recommend and implement change towards fixing problems

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 and 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 Troubleshooting & Application *Certification* test. Instructions for taking the test will be provided at the end of the seminar.

C O U R S E O V E R V I E W

Session I - Applications

Before you shoot, you need to know your target. Before you troubleshoot a hydraulic system, you need to know your application. Therefore, the first part of this seminar is dedicated to defining your target by discussing and illustrating a wide variety of common applications used in fluid power technology. After you have determined the system to use and the work to be performed, you will discover what happens when you reduce or increase pressure, increase or decrease flow, adjust torque or resize a component. At the end of this session you will have a complete understanding of why and how the equipment and systems you choose are the right applications for your specific job.

Discussion Topics – Session I

- Directional and pressure control of actuators
- Cylinders in parallel
- Cylinders in series
- Sequence control of actuators
- Hydraulic pump unloading
- Hydraulic motors in parallel circuit
- Hydraulic motors in series circuit
- Mobile hydraulic application
- Hydrostatic transmission
- Combination hydrostatic transmission
- System reaction to pressure and torque adjustments
- Effects of under sizing components
- Electric control of actuators

Session II – Troubleshooting

Now that you know your applications, session II teaches students to move from knowledge to action. Problems with your hydraulic system can be caused by a variety of factors like poor conceptual design, bad engineering of components, contamination in the system, undetectable leaks, wrong sizing, calculation errors, bad connections, misalignment, wrong pressures, wrong components, or simply bad maintenance habits. The symptoms associated with these problems are noises, leaks, vibration, heat, the need to frequently replace parts, and poor performance or downtime of your system. In this session students will learn to use a systematic approach for troubleshooting that will allow them to quickly resolve issues and define solutions for their biggest hydraulic headaches.

Discussion Topics - Session II

- 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 leakage control
- Troubleshooting hydrostatic transmission

"Very down to earth and practical"

Rick VanSeters - Product Engineer
Parker Hannifin

SEMINAR AGENDA

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

SEMINAR FEE

\$985 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:

- Arc Flash Electrical Safety
- Basic Electricity for Non-Electricians
- Electrical Troubleshooting
- Air Conditioning and Refrigeration
- Boiler Operation, Maintenance & Safety
- Variable Frequency Drives
- PLC's for Non-Programmers
- Electrical Diagrams, Schematics & Drawings
- Standby Generators & Emergency Power
- Pumps and Pump Systems
- 2005 National Electrical Code®
- Electrical PM & Best Practices
- Hydraulic Systems
- Hydraulic Troubleshooting
- Facility Security Management
- Emergency Preparedness

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.

Contact **Dan or David** at **1-877-97-TRAIN**, email **DavidH@AmericanTrainco.com**, or visit us on the web at **www.AmericanTrainco.com**.

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SEMINAR FEE
\$985 both days

FIVE EASY WAYS TO REGISTER:

- 1) **Internet** 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

▼

"What an eye opener! This course makes troubleshooting easy!"

Matthew Kossick -
Maintenance Supervisor
Franklin Industries

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or visit

www.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 _____	

Other Seminars Coming To You Area!

- Arc Flash Electrical Safety
- Basic Electricity for Non-Electricians
- Electrical Troubleshooting
- Air Conditioning and Refrigeration
- Boiler Operation, Maintenance & Safety
- Variable Frequency Drives
- PLC's for Non-Programmers
- Electrical Diagrams, Schematics & Drawings
- Standby Generators & Emergency Power
- Pumps and Pump Systems
- 2005 National Electrical Code®
- Electrical PM & Best Practices
- Hydraulic Systems
- Hydraulic Troubleshooting
- Facility Security Management
- Emergency Preparedness

Call 1-877-97-TRAIN, or visit
www.AmericanTrainco.com
to get your complete schedule today!

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Englewood, CO 80155



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