

## **MONDAY SESSIONS:**

### **Hydraulic Systems Part 1: Basics of Operation & Failure Analysis**

Tom Wanke, CFPE, Milwaukee School of Engineering

*This 4-part seminar series opens by introducing pressure, force, torque, flow, and other basic concepts of hydraulics technology. The role and operation of pumps, valves, actuators, filters, and other main components of a hydraulic system are covered and how they interact with each other in useful circuits.*

### **Hydraulic Systems Part 2: Basics of Operation & Failure Analysis**

Tom Wanke, CFPE, Milwaukee School of Engineering

*The series continues by reviewing malfunctions that can occur in hydraulic components and how to determine their cause. A systematic approach to troubleshooting is introduced as an alternative to trial-and-error part replacement methods so often practiced by untrained personnel.*

### **Hydraulic Systems Part 3: Troubleshooting & Diagnostics**

Tom Wanke, CFPE, Milwaukee School of Engineering

*Effectively troubleshooting a hydraulic system not only uses a systematic approach to find the source of problems, but also requires sophisticated tools to assess pressure, temperature, flow, fluid cleanliness, and other parameters. This session introduces essential troubleshooting instruments and how to use them effectively in troubleshooting.*

## **TUESDAY SESSIONS:**

### **Hydraulic Systems Part 4: Troubleshooting Circuit Problems**

Tom Wanke, CFPE, Milwaukee School of Engineering

*This comprehensive series winds up by presenting actual real-world circuits with various operating malfunctions. Participants will be challenged and assisted in finding the source of the malfunctions and determining how the problem can be corrected.*

### **Research Trends That Will Impact the Waste Reduction Industry**

Michael Gust, U. of Minn., Center for Compact & Efficient Fluid Power  
*Several research projects are being coordinated in the US by the Center for Compact and Efficient fluid Power that will have a positive impact on hydraulic systems used in waste reduction equipment. For example, high efficiency hydraulic fluids will reduce fuel or electricity consumption of machines, new pump technology will also save energy, and advanced user interfaces will boost productivity. These, and many other advancements, will be covered.*

### **Hybrid Hydraulic Drives**

*Hybrid hydraulic drives capture braking energy otherwise wasted in conventional drives to boost fuel economy and reduce brake maintenance costs. This session describes design and operation of hybrid drives and other advanced hydraulic systems that can cut operating costs while improving productivity in waste processing applications.*

### **Hybrid Drives and Other Innovative Hydraulic Solutions**

Mike Gerhart, Bosch Rexroth Corp.

*Hybrid hydraulic drives can dramatically reduce fuel consumption, emissions, and brake system maintenance of heavy vehicles that make frequent stops, such as refuse trucks. Member companies of the National Fluid Power Association have applied hybrid hydraulic drives to refuse trucks and other equipment across the country and will share the basis of this technology and its benefits.*

### **Hydraulic Launch Assist: Value-Added Hybrid Technology**

Vincent Duray, Eaton Vehicle Group

*Hydraulic Launch Assist: Value Added Hybrid Technology  
Although hydraulic hybrid drives are ideal for heavy vehicles that make frequent stops, a conventional transmission can be more fuel efficient at highway speeds. Hydraulic Launch Assist combines the best of both technologies by engaging the most appropriate drive technology for the situation.*

### **What Is Green and What Does It Look Like?**

Paul Vickard, Parker Hannifin Corp., Hydraulics Group Europe

*The presentation will describe efforts in Europe to save energy on refuse collection vehicles. This will cover the operation of the truck, as well as hydraulic drive solutions, some of which have been published in International Vehicle Technology magazine.*