410M.16 Pneumatic System Troubleshooting

Course Objectives

- **Follow an organized and methodical system of troubleshooting.**
- **Recognize the inherent dangers of stored energy, and follow best practices for ensuring that equipment is safe to approach, diagnose, and repair.**
- **Observe common faults in pneumatic systems, and trace each particular fault back to a specific component.**
- **Complete a systematic troubleshooting exercise on a simple pneumatic circuit.**

Course Outline

- **Troubleshooting**
  - Definition of Troubleshooting
  - Preparation for troubleshooting
  - How to cope with distractions

- **Systematic procedures**
  - Safety
    - Lock-out / Tag-out
    - Stored Energy
    - OSHA Regulations
    - Maintaining the appropriate mental attitude
  - Questions to ask
    - What
    - When
    - Where
  - Visual Inspections
  - Schematics and Manuals
  - Operate the Machine
  - Re-Check for Stored Energy

- Isolate Subsystems
- Isolate the Component
- Repair or Replace
- Test your Repair or Replacement
- Make a Final Report

- **Common Faults and Associated Components**
  - Compressed Air Filtration
    - Common Problems
    - Plumbing Design
    - Filtration
    - Pressure Regulators
    - Coalescing Filters
    - Water Removal Filters
    - Lubricators
    - Lock-Out Tag-Out Components
  - Directional Control Valves
    - Common Problems
      - Electrical
      - Mechanical
      - Contamination Related
      - Leakage
      - Silencers
      - Reclassifiers
  - Pneumatic Actuators
    - Common Problems
      - Mounting Issues
      - Misalignment
      - Side Load
      - Stop Tubes
      - Over-size Rods

- Sizing
  - Loads
  - Mass
  - Acceleration
  - Kinetic Energy
    - Cushioning
    - Shock Absorbers
    - Load Ratio

- Seal Failure
  - Mechanical
  - Chemical Attack
  - General Wear
  - Sticking

- Speed Controllers
  - Type
  - Selection
    - Meter In
    - Meter Out