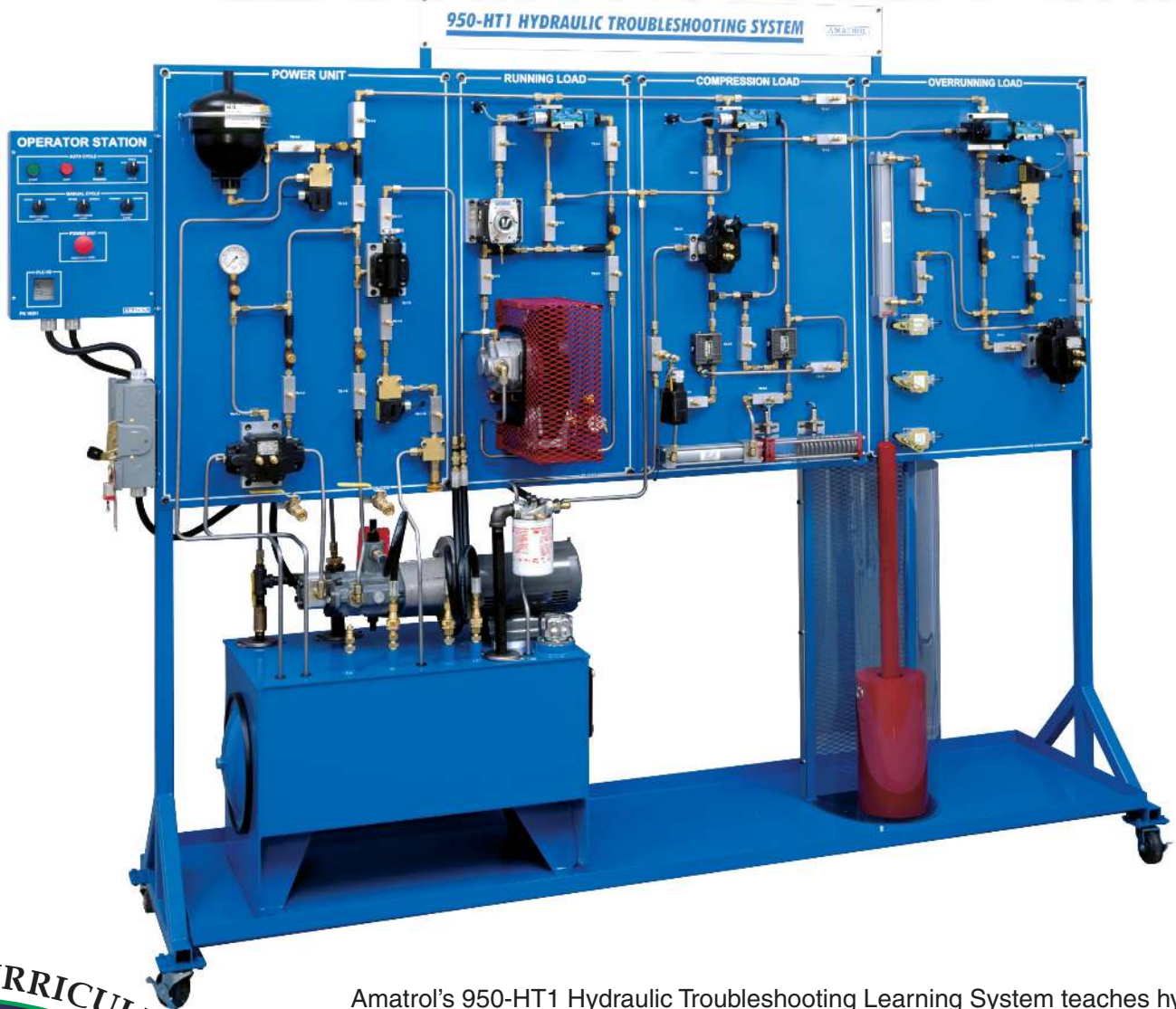


# HYDRAULIC TROUBLESHOOTING LEARNING SYSTEM 950-HT1



**CURRICULUM IS THE KEY TO LEARNING**

## Learning Topics:

- Troubleshooting
- Startup/Shutdown
- Installation
- Maintenance
- Flushing
- System Tuning
- Unloader Valves
- Pilot-Operated DCVs
- Counterbalance Valves
- Subplate-Mounted Valves
- Dial-Type Flow Control Valves
- Pressure-Comp Pumps
- JIC Tie-Rod Cylinders
- Motor Drains
- Hi-Lo Pumps

Amatrol's 950-HT1 Hydraulic Troubleshooting Learning System teaches hydraulic troubleshooting by providing a hands-on learning station that models a real world hydraulically-powered machine. The 950-HT1 includes a wide array of faults that can be inserted into the system automatically. It is the first product to offer a realistic troubleshooting experience for students because the faults are inserted throughout the system, including the hydraulic, mechanical and electrical components.

The 950-HT1 is set up like a real machine with realistic loads, pressures, and heavy-duty hydraulic components, just like students will see on the job! This feature also makes the 950-HT1 an excellent system for teaching advanced hydraulics, system tuning, installation, and maintenance. The Hydraulic Troubleshooting Learning System consists of a mobile workstation with hydraulic power unit, (4) machine application panels, PLC control, fault insertion system, troubleshooting and servicing package, student learning materials for both theory and lab, and teacher's guide. Hydraulic application panels include: power unit controls, rotary load, compression load, and overrunning load.

**AMATROL**<sup>®</sup>

[www.amatrol.com](http://www.amatrol.com)

# DESIGNED FOR LEARNING



Overrunning Load

drains, dial-type flow control valves, and JIC tie rod cylinders. These components, along with the real world applications and conditions make the trainer ideal for teaching **advanced hydraulic concepts**.



Troubleshooting Test-Points

**Real World Conditions** - Amatrol's 950-HT1 teaches troubleshooting effectively because the hydraulic system operates under actual load and pressure conditions. Each of the applications exposes students to a different type of load including inertial, friction, compression, and static loads. The system also operates at 1000 psig, a common industrial operating level. These loads and pressures are needed to properly operate components such as pressure-compensated flow control valves and counterbalance valves.

**Machine Applications** - The 950-HT1 gives students experience they normally could get only on the job. Each of the major circuit panels presents students with a common application. The PLC control offers a variety of hydraulic thumbwheel-selectable programs to change sequences, presenting students with different troubleshooting scenarios.

**Heavy Duty Components** - Amatrol's Hydraulic Troubleshooting Learning System uses heavy duty components like the ones students will see on the job. These include cast body pressure control valves, pilot-operated DCVs, motors with



Dial-Type Flow Valve

**Fault Insertion** - The 40-plus faults that make up the fault insertion system present students with realistic troubleshooting experiences. Faults can be inserted into the electrical system, loads, and hydraulic system. Test points and measurement instruments are included so students can troubleshoot in a realistic manner.

## TECHNICAL DATA

### Mobile Workstation

- Welded steel construction, swivel casters, drip pan
- Dimensions 108 in. (274.3 cm) L x 84 in. (213.4 cm) H x 24 in. (61 cm) W

### Hydraulic Power Unit

- Rated Pressure: 1000 psig/6900 kPa
- Pump, pressure-compensated, with max volume stop, 5 gpm
- Pump, fixed gear type, 1 gpm at 1750 rpm
- Electric motor, 3 hp, 208/230 VAC, 50/60Hz, 3 phase
- Reservoir, 20 gal./76Liters, JIC type
- Suction filters, strainer type (2)
- Suction gauge
- Return line filter, canister type
- Cavitation valve; air ingestion valve

### Overrunning Load Hydraulic Circuit Panel

- Directional control valve, 4-way, 3-position, pilot-operated, solenoid-operated
- Flow control valves, non-compensated (3)
- Counterbalance valve, cast body type with bypass check valve
- Cylinder, JIC type, 12 in stroke, 1 inch bore, cylinder cushions
- 2-way solenoid directional control valve
- Electrical limit switches, metal enclosure type, roller arm type (3)
- Load device, 125-lb weight, attached t cylinder rod, w/ guard

### Compression Load Hydraulic Circuit Panel

- Directional control valve, 4-way, 3-position, free float center, solenoid-operated
- Sandwich flow control valves, non-compensated (2)
- Pressure reducing valve, cast body type, subplate mounted with bypass check valve
- Cylinder, JIC type, 6 inch stroke, 1 inch bore
- Electronic sensors, inductive proximity type (2)
- Load device, spring type designed to simulate a compression load
- Pilot-operated check valves, external, cast body (2)

### Power Unit Hydraulic Circuit Panel

- Unloader valve- cast body type, subplate mount
- Check valves (3)
- Relief valve- cast body type with remote port, subplate mount
- Remote relief valve, direct operated, cartridge type
- Accumulator, bladder type, 60 cubic inch
- Vent valves, solenoid operated, 2-way (2)
- Needle valves (4)
- Pressure gauge, 0-1500 psig, 2.5-inch liquid filled
- 2-way shutoff valve

### Running Load Hydraulic Circuit Panel

- Directional control valve, 4-way, 3-position, blocked center, solenoid-operated
- Directional control valve subplate
- Flow control valves: (1) non-compensated, (1) pressure-compensated
- Dual cross cushion relief valve
- Make-up check valves, 1 psi spring (2)
- Hydraulic motor, drain line, .75 cu inch/rev displacement
- Load device, caliper brake with pressure regulator and gauge
- Flywheel with guard

### Hydraulic Troubleshooting & Servicing Package

- Flow meter with quick connect fittings
- 3-Pressure gauges, 0-1500 psig, 2.5-inch liquid filled, quick connect fitting (3)

### Control Center

- Programmable Controller, 20 inputs and 12 outputs
- Lockout/tagout; circuit breaker switch
- Thumbwheel switch with 8 selectable program sequences
- Power on indicator light
- Cycle start and stop pushbuttons
- Manual/auto selector switch; motor starter
- Emergency stop pushbutton
- Jog selector switches (3)

### Fault Insertion Center

- Manual Hydraulic/Mechanical Faults (27)
- Manual Electrical Faults (21)
- Manual Adjustment Faults (11)

### B544 Student Learning Activity Packets

### B554 Teachers' Guide

### Power Requirements:

- 3-Phase, 208 VAC, 60 Hz, 15 Amps, 5-Wire or
- 3-Phase, 230 VAC, 50 Hz, 16 Amps, 4-Wire