Hydraulic Training Systems

Teaching and learning hydraulics in real-time

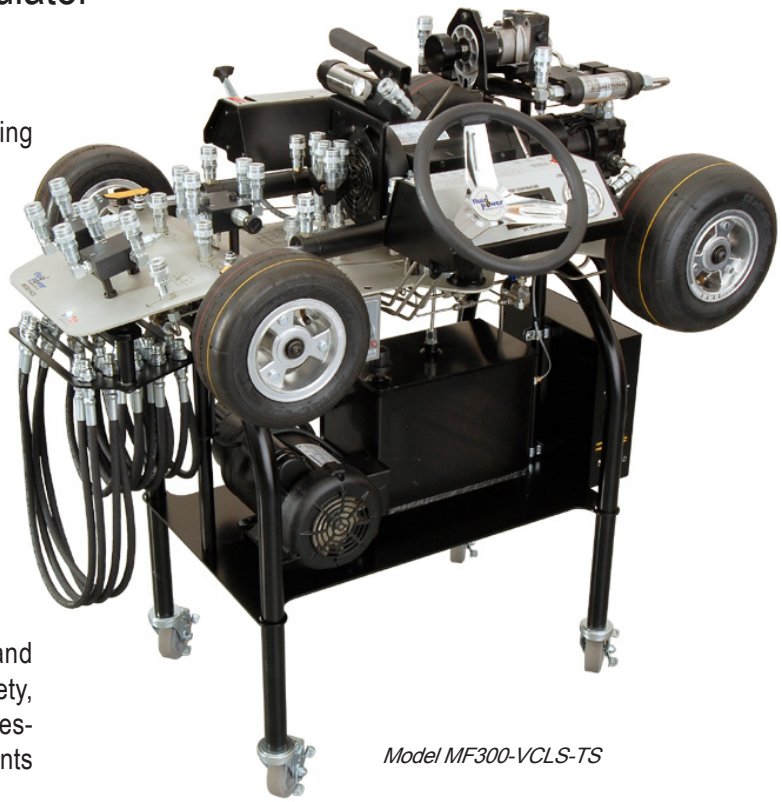
MF300-VCLS Hydrostatic Transmission and Hydraulic Steering Training Simulator

Handcrafted with pride in AMERICA

Purpose -

The MF300-VCLS is an extremely versatile 2-in-1 training simulator designed for teaching and learning hydraulic steering and hydrostatic transmissions.

The front-end has a fully-functional hydraulic steering system that is identical to those found on articulated machines such as front-end loaders. The rear-end features a fully-functional hydrostatic (hydraulic) transmission identical to those in skid-steer type loaders and many other types of industrial and mobile machinery.



Model MF300-VCLS-TS

How the Model MF300-VCLS simulator will benefit instructors and students -

Hydrostatic Transmissions are widely used in mobile and industrial machinery. Due to problems associated with safety, liability, the environment, cost, floor-space and limited accessibility actual machines are not always available to students for hands-on learning.

The Model MF300-VCLS was designed exclusively for educational purposes with many unique features:

- The hydrostatic transmission is mounted waist-high for group activities and discussion
- Dual, bi-directional flow meters installed in the closed loop make it possible for students to see how the oil flow reverses direction when the displacement control mechanism moves over-center
- The system is equipped with two identical overcenter pumps - one is fully functional and the other is cutaway for students to see the internal workings. The pumps are mounted above one another and are mechanically linked so students can see exactly how the displacement control mechanism works when the system is in operation.

There is no visual aid that brings this type of clarity to helping instructors teach and students learn hydrostatic drives.

The optional troubleshooting package makes it possible, at the flick-of-a-switch, to cause components to wear out.

Hydraulic Steering is found on almost every type of mobile machine from forklifts to front-end loaders. Vehicles with rigid steering axles usually have articulating front and rear frames.

Hydraulic steering systems typically consist of an orbitrol steering valve, cross-port relief valve, and one or two steering cylinders.

The front-end of the Model MF300-VCLS features a fully functional hydraulic steering system designed exclusively for educational purposes. As students rotate the steering wheel they can see, in real-time, exactly how all the steering components function and interact.

The optional troubleshooting package makes it possible, at the flick-of-a-switch, to cause components to wear out.

All FPTI™ simulators are available for operation at any voltage or frequency

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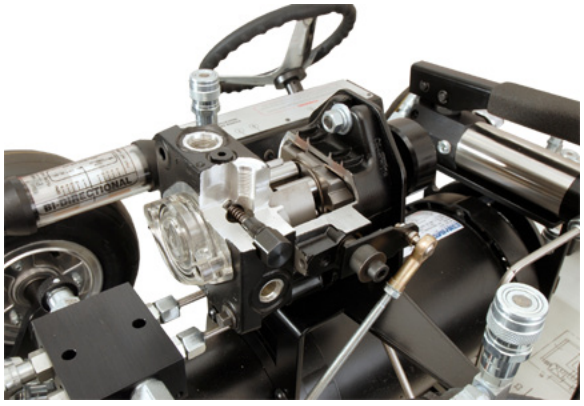
The MF300-VCLS consists of:

- Extremely attractive aesthetic design suitable for classroom or lab use. Ideally sized for instructor led group activities.

Hydrostatic Transmission:

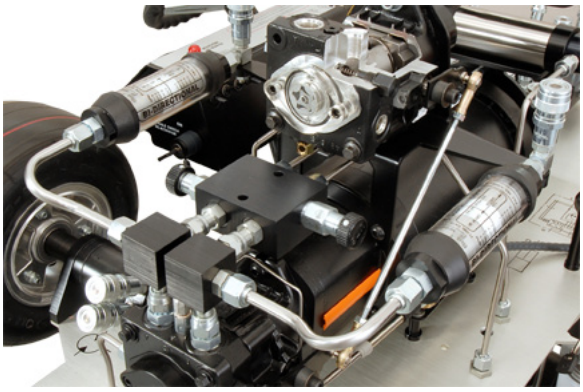
- Cutaway overcenter pump includes transparent charge pump. Output shaft has large knob to facilitate rotation
- Pump (functional) - overcenter, variable volume, axial piston-type with internal high-pressure relief valves, check valves, charge pump and charge pressure relief valve
- Pump (cutaway) - overcenter, variable volume, axial piston - type with internal high-pressure relief valves, check valves, charge pump (w/transparent cover) and charge pressure relief valve



- Electric motor: 1.5-HP TEFC (Kw 1) 1800-RPM; 115V single-phase; 15 amps
- On/off switch, panel-mounted, with light and thermal over-load protection
- Pressure relief valves - dual, cross port, cartridge-type, adjustable, externally mounted

NOTE: These were added because the internal relief valves are fixed-type. These allow students to learn how to adjust pressure relief valves in a hydrostatic transmission.

- Wheel drive motors - dual, fixed displacement, gerotor-type, high-torque/low-speed
- Dual, bi-directional flow meters in closed loop



- Manual forward, reverse, and speed selector
- Digital tachometer, panel-mounted - indicates wheel speed
- Pressure gauge - charge pressure 0-7 bar (0-100 PSI), Bourdon tube-type, panel-mount, glycerine-filled
- Drive wheels (rear) are designed to spin freely to avoid getting caught in clothing
- Reservoir capacity: 19 liters (5 gallons)
- Oil filter: return-line w/bypass valve; spin on/off; 10 micron

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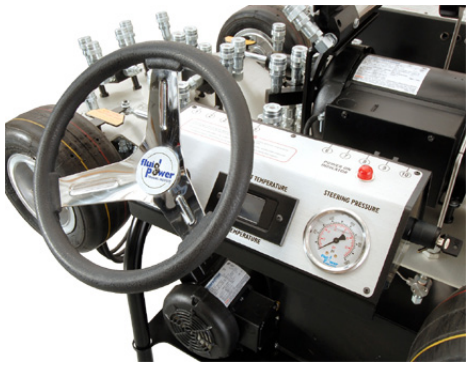
Hydraulic Steering:

- Pump - fixed displacement, gear-type
- Electric motor: 1-HP TEFC (.75Kw), 1800-RPM; 115V single-phase; 15 amps
- On/off switch, panel-mounted, with light and thermal overload protection
- Main pressure relief valve - knob adjustable, cartridge-type
- Orbitrol steering valve
- Cross-port pressure relief valves - knob-adjustable, cartridge-type
- Steering cylinders - dual, single-rod, double-acting
- Steering wheel
- Oil and ambient temperature gauges - digital, panel-mount.



- Safety pressure relief valve - pre-set, non-adjustable
- Hydraulic reservoir - shared with hydrostatic transmission
- Steel and aluminum construction
- All parts finished with durable powder coat
- Four (4) wheel, medium-duty swivel casters w/brakes

Options -

Troubleshooting package (MF300-VCLS-TS):

- Hydrostatic transmission - switches automatically introduce wear-related faults into pump
- Steering - switches automatically introduce wear-related faults into steering pump, main pressure relief valve, cross-port relief valve, orbitrol valve, and steering cylinders
- *Pressure/leak test pump mounted on simulator

*Pressure/leak testing is a technology that developed by FPTI for field-testing hydraulic components. This revolutionary technology makes it possible for technicians to test 95% of the hydraulic components in any industrial or mobile hydraulic system with the prime mover safely locked out. There is no need to remove a component or disassemble it and each test averages 15-minutes

Course Materials and Visual Aids -

- Manual - Introduction to Hydrostatic Transmissions
- Instructor's guide and answer sheets
- Visual Presentation - Introduction to Hydrostatic Transmissions Full-color, PowerPoint presentation in CD format
- Student workbook featuring trainer activities
- Optional: CD – "How to teach hydrostatic transmissions"

This CD is ideal for instructors who are new to teaching hydraulics.

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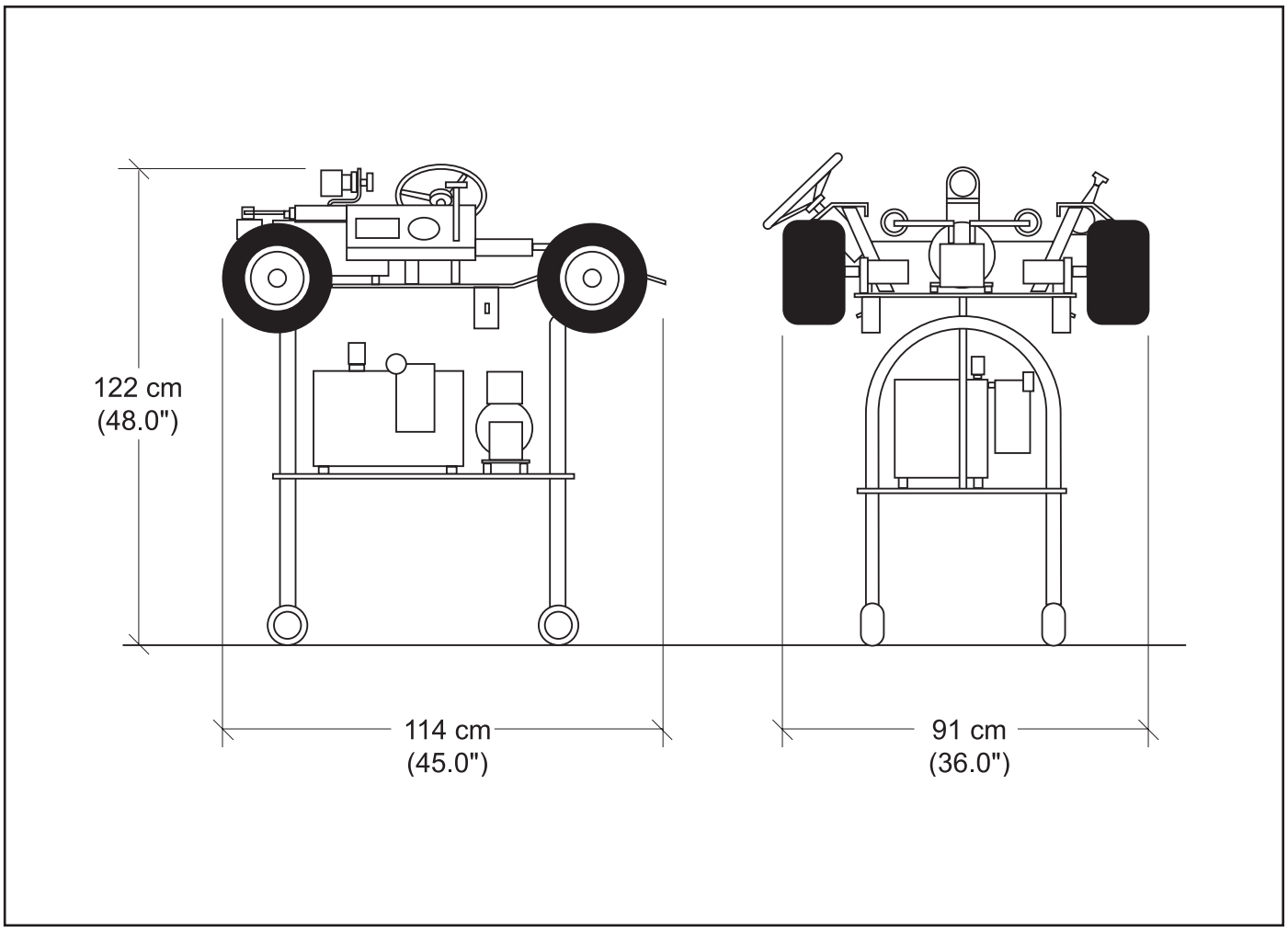
Shipping Specifications -

Shipping weight (does not include pallet and packaging):
168 kgs (370 lbs)

Shipping dimensions:
122 cm (48”) tall x 114 cm (45”) wide x 91 cm (36”) deep

Warranty -

FPTI™ warrantees it’s products against defect in materials or workmanship for a period of two (2) years from date of delivery.



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