MEG820B - COMBINED BASIC AND MOBILE HYDRAULICS

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DESCRIPTION:

The MEG820 Combined Basic and Mobile Hydraulics program provides hands on activities with components commonly used in construction equipment, agricultural and utility vehicles. The program includes: Instructional Modules, General Reference Manuals, Instructor's Guide, Hydraulic Tester and Mobile Hydraulic Workstation. It has a variable working pressure capacity of 500 - 1000 PSI and includes a heavy duty workbench with instruments and gauges. This self contained unit is a turnkey program with all of the various components, hoses, pumps, and trays to build dozens of cuircuits.

EDUCATIONAL ADVANTAGES:

- Fully operational Hydraulic system made to replicate industry & mobile hydraulic systems.
- Combines theory to practice from basic to advanced concepts.
- Hydraulic Tester - Test mobile hydraulic circuits on the bench or test live work circuits.
- Gear Pump, Vane Pump and Axial Piston/Variable displacement pump.

MOBILE HYDRAULIC INSTRUCTIONAL MODULES:

These modules are competency based, individualized packets, include objectives based on hydraulic tasks a mechanic would need for construction, agriculture and road vehicles. Detailed procedures for accomplishing each task, learning activities, instruction sheets(s), student self-check sheet, instructor's final checklist, and checkout activities.

1. Using Competency Based Modules
2. Practicing Hydraulic Safety
3. Identifying Hydraulic Schematic Symbols
4. Identifying and Describing Basic Hydraulic Principles
5. Analyzing Component Relationships
6. Changing Hydraulic Oil and Filters
7. Analyzing Pump/Motor Operation
8. Analyzing Cylinder Operation
9. Analyzing Accumulator Operation
10. Analyzing Open Center Circuit Operation

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MOBILE HYDRAULIC INSTRUCTIONAL MODULES (CONT.):

11. Analyzing Closed Center Circuit Operation
12. Analyzing Pressure Control Valves and Circuit Operation
13. Analyzing Flow Control Valves and Circuit Operation
14. Inspecting Reservoirs and Coolers
15. Inspecting and Replacing Hydraulic Lines and Fittings
16. Inspecting Hydraulic Components
17. Troubleshooting Hydraulic Systems
18. Testing Hydraulic Components
19. Measuring with a Micrometer
20. Disassembling and Inspecting Hydraulics Cylinder
21. Disassembling, Inspecting and Charging Accumulators
22. Disassembling, Inspecting and Adjusting Pressure Control Valves
23. Disassembling and Inspecting Directional Control Valves
24. Disassembling and Inspecting Hydraulic Pumps
25. Disassembling and Inspecting Hydraulic Motors

MOBILE HYDRAULICS MANUAL:

This manual is to contain information on hydraulic basics and mobile hydraulics applications. Manual to be printed in four different colors to show various pressures on diagram and also to contain many photos and drawings to supplement text. Manual to cover the following topics and to be used as part of the instructional modules above:

I. Hydraulic Principals
II. Reservoirs & Accessories
III. Principles of Pump Operation
IV. Principles of Actuator Operation
V. Principles of Valve Operation
VI. Mobile Circuits and Circuit Diagrams
VII. Power Steering
VIII. Hydrostatic Drives
IX. Hydraulic Piping & Fittings
X. Leakage & Sealing

COMPONENT REFERENCE MANUAL:

To provide technical and service information on each of the components provided with Megatech's Mobile Hydraulic Training Bench. To be used by both students and teachers, it is part of the master manual.

ALL PURPOSE HYDRAULIC WORK STATION:

Tabletop to be 18-gauge steel and measure 32" W x 72" L x 38" H. To accept a motor/pump mount tray and two mobile mounting trays. Bench frame to be 1/16" steel mounted and four casters. Bench to have 20 gauge steel sides and back, and two sliding, lockable front doors. Bench to have the following features:

1. Reservoir: The reservoir to be 10 gallons storage and all-steel construction. To include strainer, filter, breather, sight gauge, temperature gauge, clean outdoor, baffle and filler cap. Inlet and outlet of reservoir to be connected directly to supply and return manifolds on bench top.

ALL PURPOSE HYDRAULIC WORK STATIONALL PURPOSE HYDRAULIC WORK STATION (CONT.):

2. Mounting Tray and Component Storage: The bench to be capable of storing four trays 26" L x 22 ½ " W under lock and key. To be utilized for storing mobile components and mounting trays. Two steel component storage trays to be included in the bench.

3. Hose Storage and Drain Trays: The bench to hold hydraulic hoses under top overhang on storage hooks. Hoses to drain into two removable 20-gauge steel drain trays.

4. Motor/Pump Tray: The bench top to accept one motor/pump mount tray 19" L x 22" W. Tray to be constructed of 1 ¼" square, 14-gauge steel channels welded together. Tray to accommodate motor pump and adaptor for bench top mounting.

5. Power Console: The bench top to have a power console constructed from 20-guage steel, mounted on a 9" W x 71 ½" L, 180-gauge steel insert in top. Console to have two receptacles 20-amp, 115 volt, one main power circuit breaker, 2 poles, 20-amp, and lockable safety on/off switch motor control. Power console to include two hydraulic pressure gauges 0-1000 PSI and 0-3000 PSI.

MOBILE HYDRAULIC COMPONENT PACKAGE:

Mobile Hydraulic Component Package includes high quality, full size components:

(1) Gear pump, external gear 3.14 GPM @ 1200 RPM; 100 PSI 2 bolt SAE "A" flange mount
(1) Vane pump, balanced 2.3 GPM @ 1200 RPM; 100 PSI 2 bolt SAE "A" flange mount
(1) Axial piston/variable displacement pump with pressure compensator 5 GPM @1800 RPM; 500 PSI 2 bolt SAE "A' flange mount
(4) Directional control spool stack valves. All valves to be stacked together and mounted to a holding bracket. Handles to be included for each spool. The first section to be a four way, four position parallel spool with detent float. The second section to be a four way, three position parallel spool. The third section to be a three way, three position parallel spool. The fourth section to be a four way, three position parallel spool with three position detent, and center free flow. The directional valve to also include an anticavitation check built into one work port. The entire directional stack valve to be capable of converting to open-center, closed-center, and power beyond with interchangeable converstion plugs. Open-center and closed-center plugs are to be included.
(1) Pressure relief valve, adjustable. To be incorporated into the inlet cover of the directional control valve. Relief valve to be able to adjust working pressures from 200-1000 PSI standard, 1000-2500 PSI with high-pressure spring option.
(1) Pressure control valve with built in check valve. To be capable of being assembled as a counter-balanced, sequence, unloading, brake, or relief valve. To be mounted to a holding bracket.
(1) Lock Valve, double check, with mounting bracket.
(3) Cylinders; double acting, tie road type ends, to be provided with mounting brackets for bolting to bench top
(1) Cylinder vent with quick disconnects.
(1) Fluid motor; internal gear, high torque/low speed. To be mounted to a holding bracket.
(1) Relief valve; adjustable, to be mounted to a holding bracket.
(2) Flow control valves; built in reverse check.
(1) Return line filter assembly. To include pressure gauge to determine filter maintenance. Filter to be connected to a mounting bracket, which also functions as a common return manifold. To incorporate case drain connection with 1 PSI check valve for pumps.
(1) Accumulator; piston type, pre-charged to 400 PSI. To be mounted on holding bracket.
(4) Quick disconnect tees.

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MOBILE HYDRAULIC COMPONENT PACKAGE (CONT.):

(1) Modified tee with 2 quick disconnects and 1" JIC fitting.
(1) Flexible pump hose; to be capable of connecting pumps and reservoirs.
(1) Flexible relief valve hose; to be capable of connecting pumps and relief valve or hydraulic tester.
(1) Flexible filter hose; to be capable of connecting directional valve and filter assemble.
(1) Flexible return hose; to be capable of connecting the filter assembly to the reservoir.
(2) Flexible drain hoses.
(2) Mounting Trays; 26" x 22 ½: x 1 ¼; 14-gauge channel steel for mounting component on top of the bench. To include spring nuts and bolts for attaching components.
(10) Flexible general connection hoses; ½" steel quick disconnect, double check.

HYDRAULIC TESTER:

This tester to be intended for testing mobile hydraulic circuits on the bench or testing live work circuits. The unit to be manufactured from industrial quality components and to be capable of measuring:

1. Flow: 1-15 GPM or 1-3 GPM
2. Pressure: Up to 3000 PSI
3. Temperature: Up to 300 degrees Fahrenheit, Thermistor Electric Thermometer
4. Remote Sensor Provision: Tester to be contained in a 16-gauge steel case measuring 10 1/8" L x 8" W x 7 ½" H. Optional accessories available.

POWER SUPPLY:

The power supply for the mobile hydraulic components to be bench top mounted and plugged into the power console. Motor to be 56C frame single phase, 1 ½ HP, 1725 RPM Capacitor-start. The motor to have an SAE "A" pump-mounting adaptor bolted to its face for coupling all pumps included with the bench. All the necessary motor pump couplers and motor support bracket to be included

SPECIFICATIONS:

Approx. Size: 38" H x 32" W x 72" L
Approx. Weight: 650 lbs.