



Morehouse
THE FORCE IN CALIBRATION SINCE 1925

ISO/IEC 17025 / ANSI/NCSLI Z540.3 Accredited

Operation and Instruction Manual

Hydraulic hand pump & Jack



Morehouse Instrument Company, Inc
1742 Sixth Ave., York, PA, 17403 - 2675 USA



P: (717) 843-0081
F: (717) 846-4193



info@mhforce.com
www.mhforce.com



Table of Contents

1. Introduction & Description.....	2
2. Preparation for Use.....	3
A. Preparing the Hand Pump for Use	
B. Preparing the Hydraulic Jack for Use	
3. Hand Pump Operation.....	4
4. Maintenance Instructions.....	5
A. General Maintenance.....	5
B. Air Bleed Procedure for Hydraulic Jack.....	5
C. Disassembly for Hand Pump.....	6
D. Service Instructions for Hand Pump.....	6
E. Priming Instructions for Hand Pump.....	7
F. Hand Pump Parts List.....	8



Introduction & Description

Hydraulic Jack

The Morehouse Hydraulic Jack, Figure 1, is specially designed and constructed for precise calibration work. The Jack has a maximum ram travel of one inch. Hydraulic pressure at capacity load is approximately 4500 psi.

Hand Pump

The hydraulic jack is activated by a two-speed hand pump. An auxiliary screw piston (Vernier piston) is provided on the pump for application of minute increments of force. The pump is connected to the hydraulic jack by means of a hydraulic hose assembly with a quick-disconnect coupling.

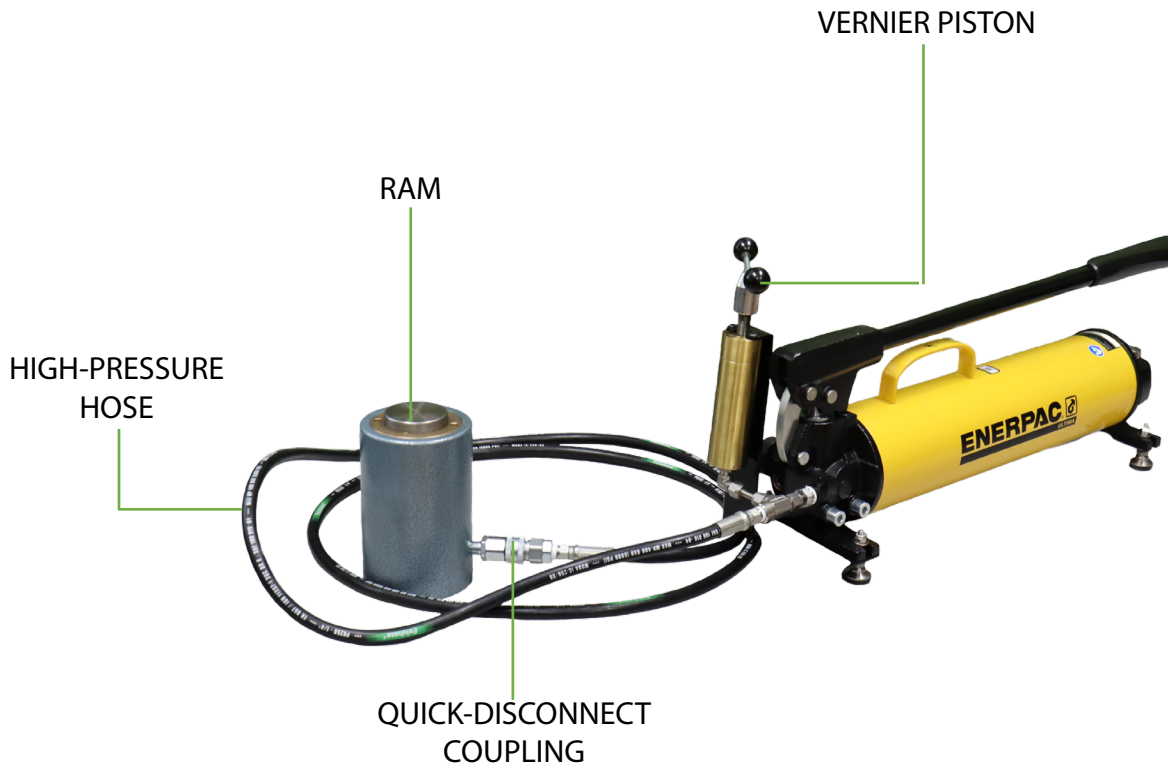


Figure 1: Hand Pump Connected to Hydraulic Jack



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Hydraulic Hand Pump & Jack Manual (PM-5253)

Preparation for Use

Preparing the Hand Pump for Use

Before connecting the hand pump to the jack, check the oil level in the reservoir. With the jack fully retracted, remove the fill plug and confirm the oil reaches the level mark on the pump. If oil is needed, add Enerpac HF hydraulic oil or an equivalent petroleum-based anti-wear hydraulic oil with an ISO Viscosity Grade of 32 and a viscosity index of 100 or higher. Fill only to the level mark, then replace the plug. Do not use brake fluid, water-glycol, or synthetic fluids, which can damage the pump's standard seals.

Do not fill the reservoir to the top. The pump needs some air in the reservoir to work properly, and a completely full reservoir forms a vacuum that stops oil from flowing out. Always add oil with the jack retracted, or the system will hold more oil than the reservoir can take back when the jack returns.

Preparing the Hydraulic Jack for Use

All hydraulic jacks are furnished with a self-sealing hose coupling. The P80 has a 3/8" NPTF outlet port, so a matching coupler must be installed on the pump or hose before connecting to the jack. Wrap threaded fittings with 1 1/2 turns of PTFE tape, leaving the first full thread bare so tape cannot shed into the system. Install a pressure gauge in-line from the pump to monitor system pressure.

The jacks are fully bled and checked at the factory before shipment. If the pump and jack feel "spongy" during use, air has likely entered the system. To remove it, close the release valve and position the pump higher than the jack, with the jack's plunger end down. Pump the jack to full extension, then open the release valve to retract it. This pushes trapped air back to the pump reservoir. Repeat as needed, then recheck the oil level. If the system still feels spongy after several cycles, contact Morehouse for service.



Operation

Hand Pump Operation

The hand pump is a two-speed design. With no load on the jack, the pump runs in a high-flow first stage that advances the ram quickly. When the ram contacts the load, the pump automatically shifts to a low-flow second stage to build pressure. No valve or lever needs to be operated to change stages. For best performance, work the handle at a moderate speed during the first stage. Pumping too fast in the first stage keeps the pump from delivering its full volume of oil.

Close the release valve by turning it clockwise. Working the handle then pumps oil from the reservoir to the jack, and pressure holds until the release valve is opened. To release pressure and return oil to the reservoir, turn the release valve counterclockwise.

Caution: Close the release valve finger tight only. Using tools on the release valve can damage it and cause the pump to malfunction.

At high pressure, short handle strokes reduce the effort needed. The pump gives the most leverage in the last 5° of each stroke. The pump can be operated horizontally or vertically. When it is vertical, the hose end must point down, or the pump will draw in air and will not build pressure properly. Operation of the hand pump is entirely conventional. Operating the hand lever causes oil to be pumped from the reservoir to the outlet. When the relief valve is closed (handle rotated toward the hose connection on the pump body), pressure is developed within the pump. Opening this valve relieves the oil back to the reservoir. In operating the relief valve, use modest pressure on the handle - just enough to prevent leakage.

Caution: The pump handle can kick back under load. Always stand to the side of the pump, away from the handle's line of travel. Never add an extension to the pump handle.

The pump has a factory-set internal relief valve that protects the system from over-pressurization. Do not attempt to adjust or remove it.

If the hand pump and hydraulic jack feel "spongy" during use, there may be air in the system. Remove the air as described in Preparing the Hydraulic Jack for Use. If the system still feels spongy after several cycles, contact Morehouse for service.

Caution: Do not attempt to exceed the 1-inch stroke of the ram in the jack cylinder. Considerable damage may result if pressure is applied after the ram has reached its limit of travel.



Maintenance

General Maintenance

Routine maintenance consists of checking the oil level, keeping the system clean, lubricating the pump, and changing the oil once a year.

Check the oil level in the reservoir regularly, always with the jack fully retracted. Add oil only to the level mark on the pump, using Enerpac HF hydraulic oil or an equivalent petroleum-based anti-wear hydraulic oil with an ISO Viscosity Grade of 32 and a viscosity index of 100 or higher.

When the coupler halves are disconnected, always screw on the dust caps. Dirt that enters the system can cause the pump, jack, or valve to fail.

To extend pump life and improve performance, lubricate the beam pin, cross pin, and piston head regularly with roller bearing grease.

Drain all oil and refill with clean oil every 12 months, or more often if the pump is used in a dirty environment. To change the oil, remove the fill plug, tilt the pump to drain the old oil, fill the reservoir to the level mark, and replace the fill plug. Dispose of used oil properly.

Troubleshooting

If the jack does not advance, advances slowly, or advances in spurts, check that the oil level is not low, the release valve is fully closed, and all couplers are fully tightened. Make sure the load does not exceed the rated capacity. Air trapped in the system or a binding ram can also cause this problem.

If the jack advances but does not hold pressure, check all connections for leaks. If the connections are tight and leak free, either the jack seals are leaking or the pump is leaking internally, and the equipment must be serviced.

If the jack does not retract, retracts only part way, or retracts more slowly than normal, check that the release valve is fully open, the reservoir is not overfilled, and all couplers are fully tightened. Air in the system, a hose with too small an inside diameter, a broken ram return spring, or other damage to the jack can also cause this problem.

The pump outlet is a 3/8" NPTF port. When connecting fittings, wrap the threads with 1 1/2 turns of PTFE tape, leaving the first full thread bare so tape cannot shed into the system.

Air Bleed Procedure for Hydraulic Jack

If the hand pump and hydraulic jack feel “spongy” during use, there may be air in the system. If this occurs, the trapped air will need to be bled out of the system.

To bleed the hydraulic jack, place it on its side on a bench or other suitable work surface, then proceed as follows:

1. Check the oil level in the pump reservoir by removing the fill plug. If oil must be added, use the oil specified in Preparation for Use, and fill only to the level mark. Replace the fill plug.
2. With the hydraulic hose disconnected from the hydraulic jack and connected only to the hand pump, close the release valve and pump the hydraulic hose full of oil. (The poppet of the hose half of the self-sealing quick-disconnect coupling must be depressed to accomplish this.)
3. Connect the hydraulic hose to the jack cylinder fitting, and pump the jack ram out to full stroke (approximately 25 mm or 1 inch).
4. Roll the jack to bring the air bleed location to the highest point.
5. Alternately open the air bleed and roll the jack back and forth. (The ram return spring will keep sufficient pressure on the fluid to purge the air.)
6. After the jack has been bled of all entrapped air, tighten the air bleed securely, recheck the pump oil level, and replace the jack in its original position on the calibrating machine.

Service and Repair

The hand pump should be serviced only by a qualified hydraulic technician. Use only genuine Enerpac replacement parts, which are available from an authorized Enerpac service center. For service on the pump or hydraulic jack, contact Morehouse.



Priming Instructions for Hand Pump

If the pump runs out of oil, air can enter the pump and the system, and the jack may not advance properly until the air is removed. To restore normal operation, refill the reservoir and purge the air as follows:

1. Fully retract the jack. Remove the fill plug and fill the reservoir to the level mark on the pump, using the oil specified in Preparation for Use. Replace the fill plug.
2. Close the release valve and position the pump higher than the jack, with the jack's plunger end down.
3. Pump the jack to full extension, then open the release valve to retract it. This forces trapped air back to the pump reservoir.
4. Repeat step 3 as necessary until the jack advances and retracts smoothly.
5. Recheck the oil level and add oil if needed, filling only to the level mark.

If the pump is operated in the vertical position, the hose end must point down. Otherwise the pump will draw in air and will not build pressure properly.

If the pump still does not build pressure after the air has been purged, check that the release valve is fully closed, all couplers are fully tightened, and the load does not exceed the jack's rated capacity. If the problem continues, the pump requires service by a qualified hydraulic technician. Contact Morehouse for service.



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Hydraulic Hand Pump & Jack Manual (PM-5253)

Parts Lists

The parts list included in this manual shows the replacement parts available for the Enerpac P80 hand pump supplied with Morehouse hydraulic jacks. Many internal pump parts are available only as part of a repair kit and are not sold separately. Drawings and parts lists for specific capacity hydraulic jacks are supplied separately.

When ordering hand pump parts, state the Enerpac part number, description, and quantity required. When ordering hydraulic jack parts, include the serial number and capacity of the jack (as stamped on the jack body), along with the part number, name, and quantity required.



Parts List for Enerpac Hand Pump

Part No.	Nomenclature	Quantity
DD1634062	Linkage	1
DD1649061	Pin	1
DD1650061	Pin	2
CB415044	Retaining Ring	3
DX4160550	Grip, Handle	1
DD2537026	Decal, Product Spec	1
DD3045026	Decal, Enerpac	2
R515245-2	Plug, Shipping	1
CCA0529057-1A	Spring Pin, M5, 30 mm	1
DD1642900	Beam Subassembly	1
DD2539070	Tubing, Handle	1
DD2589226	Decal, Warning	1
DC7887026	Decal, Read Instruction	1
CB813167	Copper Gasket	1
CL341055	Acorn Nut, 0.438-14	1
B1010503	O-Ring, Size -112 (Std.)	1
B1112203	O-Ring, Size -112 (Viton)	1
DD3063009	Plug, Oil Fill	1
CL127149	Tie Rod	1
DD1644025	Reservoir	1
B1155517	Square Ring, -155 (Std.)	1
B1155518	Square Ring, -155 (Viton)	1
DD3077020	End Cap	1
DD1609051	Plunger	1
DX4162044	Wiper	1
B1022503	O-Ring, Size -217 (Std.)	1
B1217203	O-Ring, Size -217 (Viton)	1
B1217565	Back-up Ring, Size -217	1
B1011803	O-Ring, Size -011 (Std.)	1
B1011203	O-Ring, Size -011 (Viton)	1
B1011564	Back-up Ring	1
B1106503	O-Ring, Size -240 (Std.)	1
B1240203	O-Ring, Size -240 (Viton)	1
A1009245	Plug, Tank Port	1
B1006016	Ball, 7/32" Dia.	3
A8197110	Spring	2



Parts List for Enerpac Hand Pump

Part No.	Nomenclature	Quantity
B1009016	Ball, 5/16" Dia.	3
DD2538185	Plug	3
B159167	Gasket	3
S1183	Spring	2
DD3030040	Spindle	1
DD2747225	Cartridge	1
DX4452147	Knob, Release Valve	1
DD3082028	Set Screw, M6 x 1 x 16 mm	1
B1004503	O-Ring, Size -009 (Std.)	1
B1009203	O-Ring, Size -009 (Viton)	2
B1003016	Ball, 1/8" Dia.	1
A8038570	Ball Cap	1
A8126110	Spring	1
DC10131048	Set Screw, .437-20 x .38	3
DD3075186	Spacer	1
DC7234009	Plug	1
B1009803	O-Ring, Size -009 (Std.)	1
DX4075061	Pin	1
B1004803	O-Ring, Size -004 (Std.)	1
B1004203	O-Ring, Size -004 (Viton)	1
B1004564	Back-up Ring, Size -004	2
A8038110	Spring	1
CAA0415061-2A	Dowel Pin, M4 x 12 mm	1
DX4713092	Fitting, Pick-up Tube	1
A1006245	Flush Plug, 1/16"	3
DD2520038	Oil Filter	1
A8021018	Screen	1