

P5514B-70M/P5514B-70M-EP

Hydraulic Comparison Test Pump

Users Manual

April 2021

© 2021 Fluke Corporation. All rights reserved.

Specifications are subject to change without notice.

All product names are trademarks of their respective companies.

LIMITED WARRANTY AND LIMITATION OF LIABILITY

Each Fluke product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is one year and begins on the date of shipment. Parts, product repairs, and services are warranted for 90 days. This warranty extends only to the original buyer or end-user customer of a Fluke authorized reseller, and does not apply to fuses, disposable batteries, or to any product which, in Fluke's opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation or handling. Fluke warrants that software will operate substantially in accordance with its functional specifications for 90 days and that it has been properly recorded on non-defective media. Fluke does not warrant that software will be error free or operate without interruption.

Fluke authorized resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Fluke. Warranty support is available only if product is purchased through a Fluke authorized sales outlet or Buyer has paid the applicable international price. Fluke reserves the right to invoice Buyer for importation costs of repair/replacement parts when product purchased in one country is submitted for repair in another country.

Fluke's warranty obligation is limited, at Fluke's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to a Fluke authorized service center within the warranty period.

To obtain warranty service, contact your nearest Fluke authorized service center to obtain return authorization information, then send the product to that service center, with a description of the difficulty, postage and insurance prepaid (FOB Destination). Fluke assumes no risk for damage in transit. Following warranty repair, the product will be returned to Buyer, transportation prepaid (FOB Destination). If Fluke determines that failure was caused by neglect, misuse, contamination, alteration, accident, or abnormal condition of operation or handling, including overvoltage failures caused by use outside the product's specified rating, or normal wear and tear of mechanical components, Fluke will provide an estimate of repair costs and obtain authorization before commencing the work. Following repair, the product will be returned to the Buyer transportation prepaid and the Buyer will be billed for the repair and return transportation charges (FOB Shipping Point).

THIS WARRANTY IS BUYER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. FLUKE SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, INCLUDING LOSS OF DATA, ARISING FROM ANY CAUSE OR THEORY.

Since some countries or states do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any provision of this Warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision.

Fluke Corporation
P.O. Box 9090
Everett, WA 98206-9090
U.S.A.

11/99

Table of Contents

Title	Page
Preparation.....	1
How to Contact Fluke Calibration.....	1
Safety Information	1
Specifications	2
Operating Fluid Compatibility	2
DUT Connection.....	3
Operation	4
Priming.....	4
Pressure Operation.....	4
Ancillary Equipment	5
Pointer Remover/Punch, P5551	5
Master Gauges	6

Preparation

This manual covers the P5514B-70M and P5514B-70M-EP.

The Comparison Test Pump checks pressure-measuring instruments against Master Test Gauges.

Note

The terms "Master Test Gauge" and "Gauge" in this document refer to any pressure-measuring instrument such as Transfer Standards, Digital Calibrators, and Transducers. The Fluke 700G and 2700G Digital Test Gauges are recommended for this application.

This system is only as accurate as the Master Test Gauge used. The Master Test Gauge must be regularly calibrated to ensure accuracy is maintained.

Specifications

Pressure Range	70 MPa (10 000 psi)
Pressure Connections	M20
Adapters Provided	1/4 NPT Female (quantity 2), 1/2 NPT Female, 1/4 BSP Female, 1/2 BSP Female
P5514B-70M Seal Material	Viton®
P5514B-70M-EP Seal Material	Ethylene Propylene
Screw Press Displacement	20 cm ³ (1.2 in ³)
Reservoir Volume	75 cm ³ (4.5 in ³)
Fine Adjustment Displacement	0.06 cm ³ (0.004 in ³)
Size (H,W,D)	150 x 330 x 280 mm (6 x 3 x 11 in)
Weight	5 kg (11 lb)
Safety	2014/68/EU, Pressure Equipment Directive (PED) - Article 4, Paragraph 3

Operating Fluid Compatibility

The standard system uses Viton O-ring seals and is for use with a wide range of fluids. Compatible fluids include, but are not limited to, mineral oils, water, and solvents. For compatibility with phosphate esters, a model with ethylene propylene seals is available. See Table 1.

Table 1. Operating Fluid Compatibility

Model	O Rings
P5514B-70M	Viton
P5514B-70M-EP	Ethylene Propylene

1. Rotate the reservoir dust cover 1/2 turn.
2. Fill reservoir approximately 3/4 full with the appropriate fluid.
3. Rotate dust cover back to cover reservoir.

Caution

To avoid damage to the instrument, check the quality of the operating fluid during use. If the fluid becomes discolored, cloudy or particles appear in the reservoir, drain and flush the system with clean fluid.

DUT Connection

Caution

To prevent Product damage or damage to a gauge:

- To prevent incorrect sealing that creates an unsafe condition, do not use thread-sealing tape or any other sealing method on the DUT or the adapters. The Gauge Adapter sealing system can be hand-tight sealed up to 70 MPa (10500 psi). Wrenches or similar tools are not required. Over tightening can cause damage to threads or sealing faces.
- Before connection, ensure that there are O-rings fitted to the test port and gauge adapter.
- Check that the sealing face of the device to be fitted is clean and undamaged, as scratches or dents can form leak-paths.

To connect the DUT:

1. Select the appropriate adapter from the adapter set to match the thread on the DUT.
2. Screw the adapter fully onto the DUT so that the bottom face of the DUT seals on the O-ring inside the adapter. Hand-tight is sufficient.
3. Turn the adapter collar counter-clockwise until the adapter seals on the O-ring in the mounting post to mount the DUT/adapter assembly to the test port. Hand-tight is sufficient.
4. To adjust the position of the DUT, hold the adapter, and turn the collar clockwise 1/4-turn.
5. Position the DUT to face the desired direction, and turn the collar counter-clockwise to re-seal.

Operation

Priming

Follow these steps:

1. Open the reservoir valve one turn counter clockwise and turn screw press fully in.
2. Close the valve and turn screw press fully out.
3. Open the valve and turn screw, press fully in.

Note

During this operation, bubbles can appear in the reservoir as trapped air is expelled. For large volumes, repeat steps 2 and 3 until no further bubbles appear.

4. With the valve open, turn screw press fully out and close valve. The test pump is now ready for use.

Warning

Turning the capstan out with the reservoir valve closed generates approximately 15 inHg / 0.5 bar vacuum. If the DUT is vacuum sensitive, leave valve (13) open during priming operation.

Pressure Operation

Follow these steps:

1. Turn the screw press in to generate pressure.
2. Allow a few moments for the system to stabilize before taking any readings, especially after large changes in system pressure.

Note

Large, sudden changes in pressure will cause the system temperature to rise or fall, which can cause instrument readings to change as the fluid in the system expands or contracts, thus increasing or decreasing the pressure.

3. Use the fine adjustment control on the side of the manifold to make precise adjustments to the pressure.
4. Compare the reading of the gauge under test with that of the master gauge.
5. For the next higher calibration point, repeat from Priming, step 1.
6. To measure reducing pressures, turn the screw press out (counter-clockwise).
7. Depressurize the system by turning the screw press FULLY OUT, then open the reservoir valve.

⚠ Caution

Never release the system pressure by using the reservoir valve alone, as sudden depressurization will *shock* the system, which can damage the sensitive instruments attached to the system.

Ancillary Equipment

Pointer Remover/Punch, P5551

To remove and refit the pointer of a pressure gauge, use the pointer remover/punch instrument. This tool has a spring-loaded plunger to quickly and consistently refit the pointer. See Figure 1.

Figure 1. Pointer Remover/Punch



Master Gauges

See the associated instruction manuals for the gauges in Table 2 for detailed lists of available ranges and specifications.

Table 2. Gauges

Model	Nominal Specification
700G (See Figure 2)	0.05 % FS
700RG	0.04 % Reading + 0.01 % FS
2700G	0.02 % FS

Figure 2. Fluke 700G

