

**FLUKE**®

**Calibration**

# **P5514B-70M/P5514B-70M-EP**

## Hydraulic Comparison Test Pump

### Users Manual

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## 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

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

<b>Model</b>	<b>O Rings</b>
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

