

L2561 Rev. O 08/01

**SERVICE INSTRUCTIONS:** These service instructions are intended to be used by qualified personnel at authorized Enerpac Service Centers. Users of Enerpac equipment should see Instruction Sheet L505 for installation, operation, and maintenance.

#### SAFETY FIRST

Carefully plan your system by selecting components designed to perform the intended operation and which will adequately perform with existing equipment. Always check the product limitations regarding pressure ranges, load capacities, and set-up requirements. The system operating pressure must not exceed the pressure rating of the lowest rated component in the system. Read all CAUTIONS, WARNINGS, and INSTRUCTIONS included with, or attached to, each product. Follow all safety precautions to avoid personal injury or property damage during the system operation. ENERPAC CANNOT BE RESPONSIBLE FOR DAMAGE OR INJURY RESULTING FROM UNSAFE USE OF PRODUCT, LACK OF MAINTENANCE, OR INCORRECT PRODUCT AND SYSTEM APPLICATION.

Contact ENERPAC when in doubt as to safety precautions, or applications.

#### 1.0 FILLING INSTRUCTIONS FOR LIQUID PRESSURE GAUGES

##### 1.1 Gauge Set-up

Gauges should be positioned so that the filling plug is at the top of the gauge. The temperature of the liquid filling fluid should be between 68 °F to 85 °F (20 °C to 29 °C.) Remove the filling plug by prying it up with a blunt instrument, being careful not to puncture the plug or damage the internals of the gauge.

##### 1.2 Gauge Filling

- Using a funnel, fill the gauge until the liquid begins to appear at the bottom of the dial and allow the liquid to level off. Very thick fluids (such as glycerine at room temperature) flow extremely slowly down the back of the case and can overflow through the filling hole before the gauge appears to be full on the face. After the liquid has settled at the bottom of the gauge, continue to fill slowly, allowing the liquid to level off several times, until the proper amount of liquid has been added. (See Figure 1.)



**WARNING:** A funnel is recommended for filling the gauge to avoid spilling the filling fluid on the outside of the case. Excess filling fluid may cause the plug to become lubricated which may allow the plug to pop off when the gauge is exposed to high temperatures.

- Allow the gauge to "breathe" for at least 10 minutes, then replace the filling plug. Wipe away any excess fluid on the outside of the gauge. Gauges filled with glycerine or a glycerine/water mixture may be rinsed under running water if necessary, but must be completely dried before putting the gauge into a cardboard carton.

**NOTE:** Glycerine flows much faster when it is heated above room temperature. Enerpac recommends that the glycerine *not* be heated to more than 85 °F (29 °C). Filling temperatures above 85 °F (29 °C) may trap entrained air in the glycerine which will form tiny, hard to remove bubbles after several days on the shelf.



**CAUTION:** Gauges filled with glycerine or silicone cannot be used on applications where strong oxidizing agents are present. A chemical reaction, ignition or explosion may result. Oxidizing agents include but are not limited to oxygen, chlorine, nitric acid, and hydrogen peroxide. Completely fluorinated or chlorinated fluids such as HALOCARBON 4.2 should be used.

For Enerpac Glycerine-filled 4" Gauges

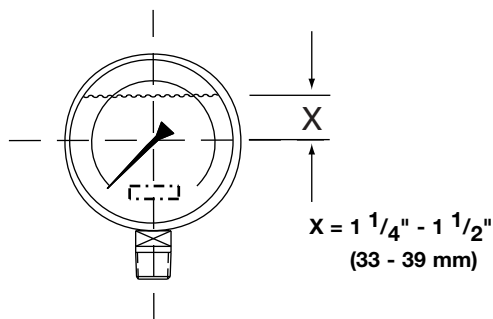


Figure 1

#### 2.0 LIQUID FILL FLUID AMBIENT TEMPERATURE RATINGS

##### 2.1 Allowable Operating Range

See Table 1 for temperature range in which the operation of the gauge is not adversely affected by the filling liquid. At temperatures above the maximum rating, the fluid may break down. At temperatures below the minimum rating, the fluid may solidify (freeze).

| Fill Fluid  | Allowable Operating Range          |
|---|------------------------------------|
| Glycerine<br>Dow 99.7% USP, Synthetic<br>Centistokes at 68 °F | -4 °F to 140 °F<br>-20 °C to 60 °C |

Table 1, Allowable Ambient Temperature Ratings

### 3.0 CASE VENTING FOR LIQUID FILLED GAUGE

For pressure gauges with full scale ranges of 100 psi and below (including vacuum and compound ranges of 30" HG-0-100 psi and below), case venting is necessary to preserve the accuracy. Temperature fluctuations during shipment cause the liquid to expand and contract which in turn increases or decreases case pressure. As a result, accuracy can be decreased and the pointer may not return to zero properly until the gauge is vented to the atmosphere.

#### 3.1 Gauge Venting

To vent an Enerpac gauge, simply cut the top part of the nipple plug on the gauge. This allows the case pressure of the gauge to be equal to the atmospheric pressure. Note that the gauge should be installed in a upright position (i.e., nipple plug at 12 o'clock) to prevent leakage.

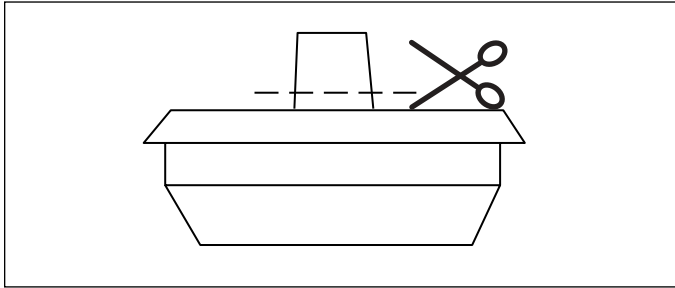


Figure 2, Nipple Plug

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