

Calibration of Pressure Gauges

Note: Reotemp recommends that all gauges be recalibrated at the factory, or by a qualified calibration facility. However, if the user has a calibrated reference pressure capability (see fig. 1), the following procedure will help as a general guide to calibrating a pressure gauge.

It should also be noted that this procedure is general in nature; mechanical properties of pressure gauges and specific results will vary. Some gauges have bendable parts (see fig. 2), while others have sliding parts (see fig. 3). The gauge technician must be flexible in applying these general steps to the specific gauge being calibrated.

Calibration consists of two parts:

- a. Full scale adjustment (steps 1 – 5)
- b. Verification of linearity (step 6 - 7)

This procedure assumes the user has a comparator-type pressure reference, and can generate the required pressures accurately. It also assumes that the user is familiar with pressure gauge safety and testing recommendations in ASME B40.1

“UUT” refers to the Unit Under Test (the gauge being calibrated).

“REF” refers to the reference gauge.

“100%” refers to 100% of gauge scale; “10%” refers to 10% of gauge scale; etc.

1. Mount the pointer.
 - a. If UUT has a stop pin, mount pointer at 10%, with pressure at 10% of scale.
 - b. If UUT has no stop pin, mount pointer a zero, with no pressure on UUT.
2. Apply pressure so UUT reads 100%. Read actual REF pressure. Note if UUT is reading high or low, and degree of variation.
3. Remove pressure, and remove pointer and dial (if necessary).
4. Adjust full scale slide or gooseneck:
 - a. If REF was greater than UUT, reduce distance between pushrod and shaft.
 - b. If REF was less than UUT, increase distance between pushrod and shaft.
5. Mount dial and pointer. Repeat steps 1 – 4 until UUT reads within specified accuracy with respect to REF when at 100%.
6. Apply 25%, 50%, 75%, and 100% to UUT. At each point, compare UUT to REF. If all values are within specified limits, slowly reduce pressure and check descending pressure at 75%, 50%, and 25%. If any intermediate readings are out of limits, perform step 7. If 100% reading was out of limits, go back to step 1. If all readings are within limits, calibration is finished.

7. Remove pressure from UUT, and remove pointer and dial. Adjust pushrod (linearity adjustment) as follows:
 - a. If REF was reading higher than UUT in step 6, lengthen the pushrod (this may require loosening and sliding, or bending).
 - b. If REF was reading lower than UUT in step 6, shorten the pushrod (this may require loosening and sliding, or bending).
8. Repeat steps 1 – 6.
 - a. If UUT and REF agree within accuracy limits, calibration is finished.
 - b. If UUT and REF disagree by more than accuracy limits, go back to step 3.
9. Note: If linearity cannot be achieved with the above procedure, other factors (such as dial centering, mechanical friction in movement) may need to be addressed.

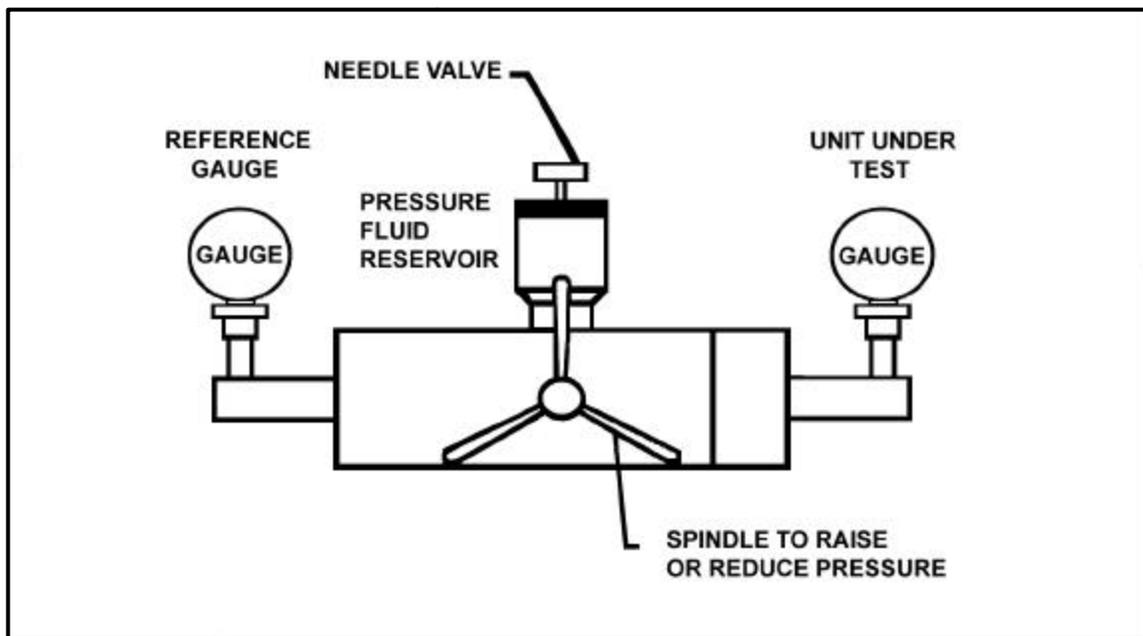


fig. 1 – typical gauge comparator

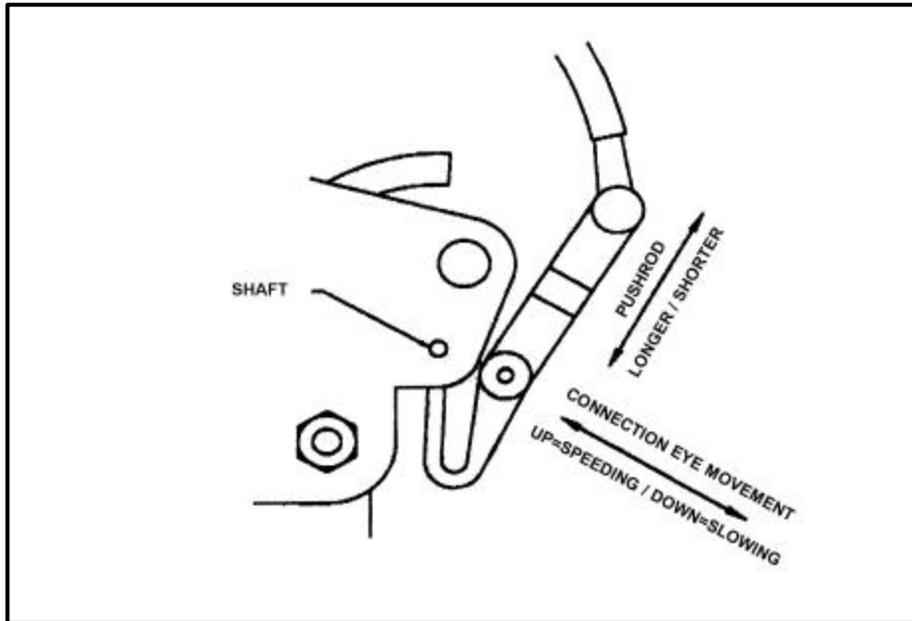


Fig. 2 – typical movement with bendable adjustments

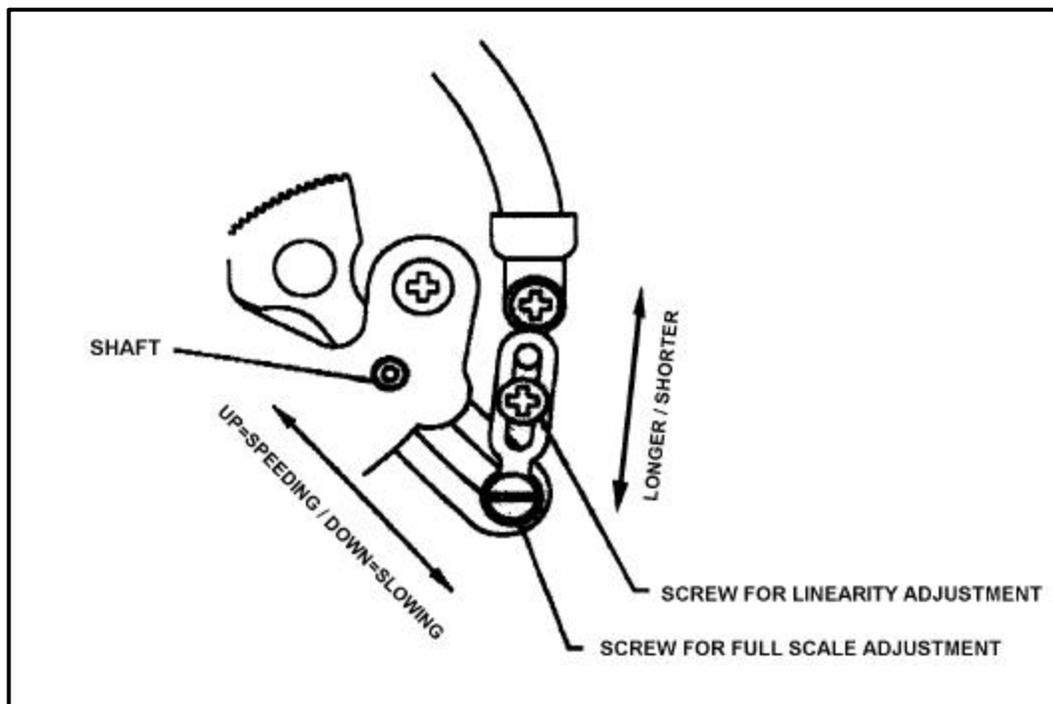


Fig. 3 – typical movement with sliding adjustments