HI-LO Welding Gauge • Cat # 1 • Gauge Overview

The HI-LO Welding Gauge, from the G.A.L. Gage Company, is an essential tool for pipe and weld inspection. It can perform the following functions:

- Internal Misalignment
- Pipe Wall Thickness
- Leg Length for a Fillet Weld
- Crown Height

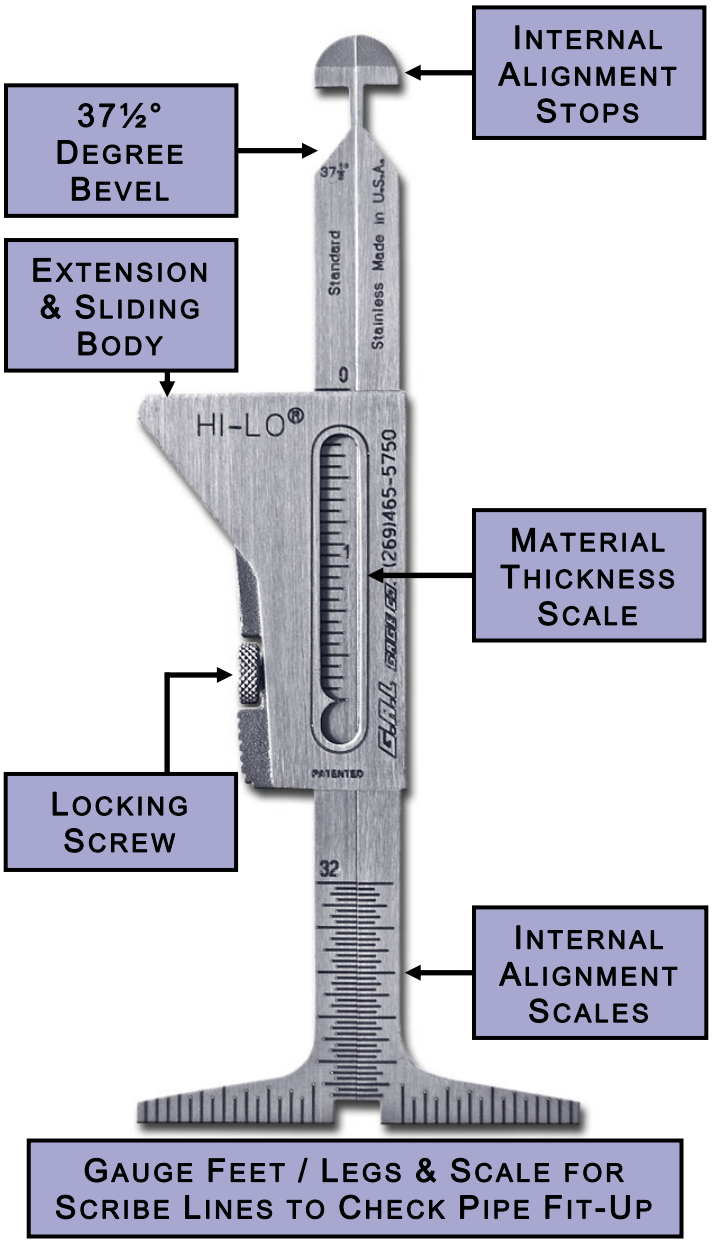
There are two go no-go features of this gauge which are used to verify that the beveled angle is the required 37-1/2 degrees and that the required gap after fit-up is no larger than 3/32nd. Scribe lines on the feet can be used to calculate the required 1/16th gap after fit-up for socket welds; if one of our patented GAP-A-LETS is not used. For added versatility, this gauge comes in standard (inches) and metric (millimeters).

Scales Overview

There are three scales on this gauge. The Material Thickness Scale measures in 16ths. The Internal Alignment Scale measures in 3/32nds and the Scales for the Scribe Lines measures in 16ths.

CAUTION: The metal strips that connect the Internal Alignment Stops to the 37-1/2° bevel can be bent when removing from the pipe after a measurement. Use care and caution when extracting from a pipe to prevent damaging your gauge.

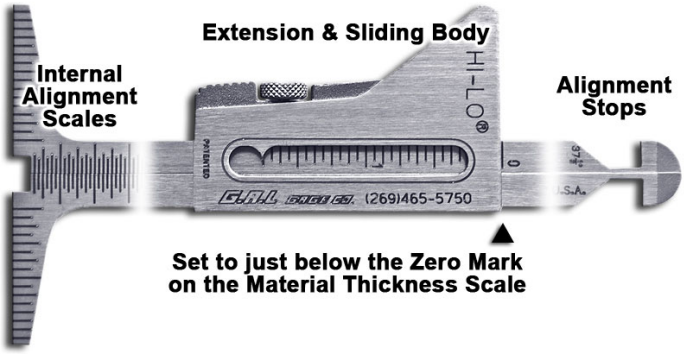
Parts of the Gauge



Identifying the Zero Position

The versatility of the gauge requires that after a measurement is taken and another one is needed **the gauge must be returned to Zero Position before a new measurement is taken**. Zero Position for the gauge is achieved when the **Internal Alignment Scales** and the **Alignment Stops** mirror each other. Also, the **Right Edge of the Extension & Sliding Body** should be just below the **Zero Mark** on the **Material Thickness Scale (See Figure 1)**.

Figure #1



How to Measure the Fit-Up Gap

The Alignment Stops are milled with exact precision to have 3/32nd and 1/16th measurements. The 3/32nd is the width of the lower portion of the Stops (left edge in photo) and 1/16th is the width at the top of the Stops (right edge in photo) -- **See Figure 2**. Gauge should be in Zero Position. Turn the gauge 90 degrees and insert the tip of the Stops into the gap. If the Stops will not fit into the gap then the gap measures less than 1/16th. If the Stops fit partially then the gap measures in-between 1/16th and 3/32nd. If the Stops move freely in the gap then the measurement is wider than 3/32nd **(See Figure 3)**.

Figure #2

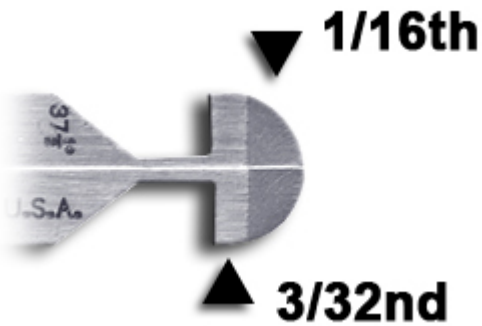
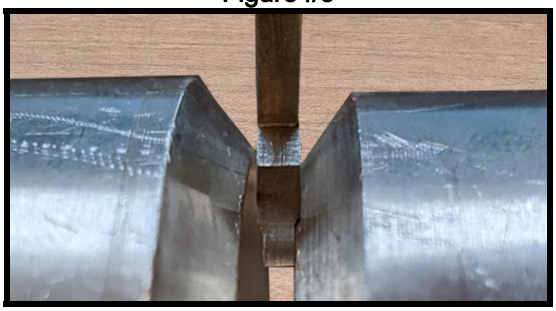


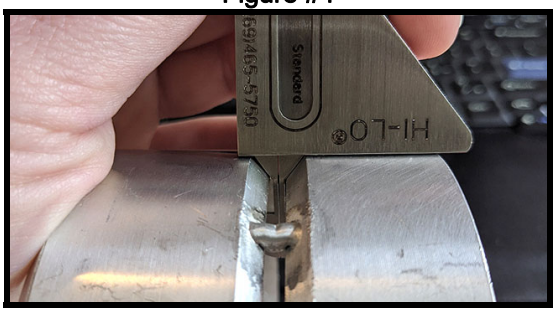
Figure #3



How to Check for 37-1/2 Degree Bevel

Gauge should be in Zero Position. Turn the gauge 90 degrees and lower the Alignment Stops into the gap of the pipe until the top edge of the Beveled Angle touches the pipe. Turn the gauge back to the original position. Turn the locking screw and lower the Sliding Body until the top edge of the extension touches the surface of the pipe. Square the shoulders of the beveled angle by moving the legs of the gauge **(See Figure 4)**.

Figure #4



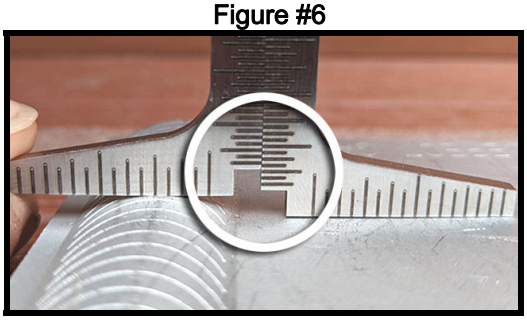
How to Measure Crown Height of a Butt Weld

Gauge should be in Zero Position. Loosen the locking screw and raise the leg that is on the same side of the weld. Position the gauge on the horizontal member so that one foot is on the horizontal member and the other is raised above the weld. Lower the raised foot by pushing down gently on the raised Alignment Stop until the bottom of the foot touches the top of the weld **(See Figure 5)**.

Read the measurement from the 32nd scale **(See Figure 6)**.

Figure #5

Figure #6



How to Measure Leg of a Fillet Weld

Gauge should be in Zero Position. Loosen the locking screw and raise the leg that is on the same side of the weld. Position the gauge on the horizontal member so that one foot is on the horizontal member and the other is raised above the weld **(See Figure 7)**.

Lower the raised foot by pushing down gently on the raised Alignment Stop until the bottom of the foot touches the toe of the weld. Read the measurement from the 32nd scale **(See Figure 8)**.

Figure #7

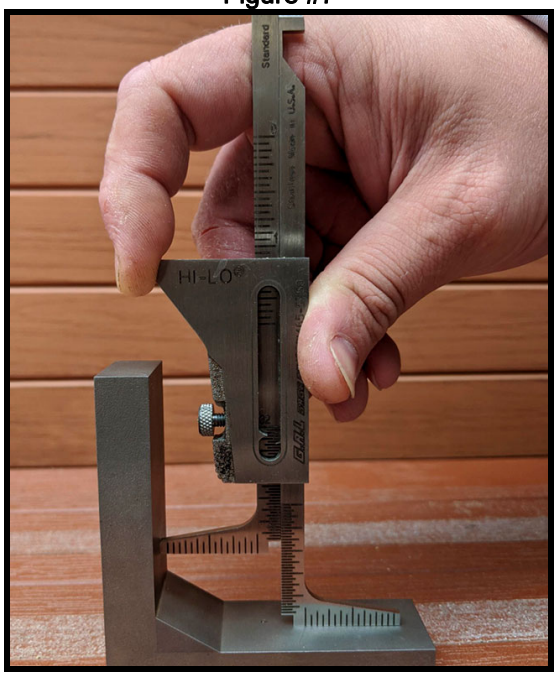
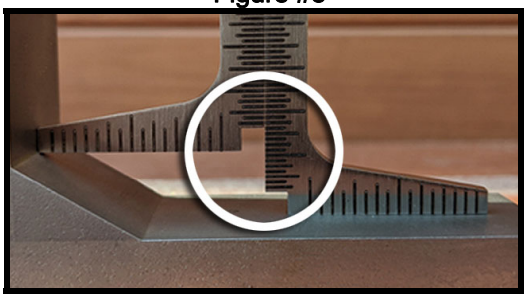


Figure #8



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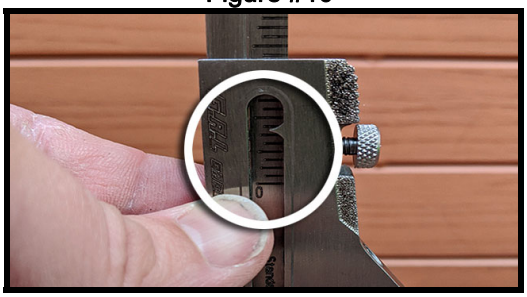
How to Measure Pipe Wall Thickness

Gauge should be in Zero Position. Turn the gauge 90 degrees and lower the Alignment Stops into the gap of the pipe. Turn the gauge back to original position. **Stop when the tip of the bevel touches the gap.** Loosen the locking screw and lower the extension until the top edge touches the surface of the pipe. Pull the leg, on the same side of the pipe whose thickness needs to be measured, until the Alignment Stop touches the interior of the pipe **(See Figure 9)**. Read the measurement from the 16th scale **(See Figure 10)**.

Figures #9 & #11

Figure #10

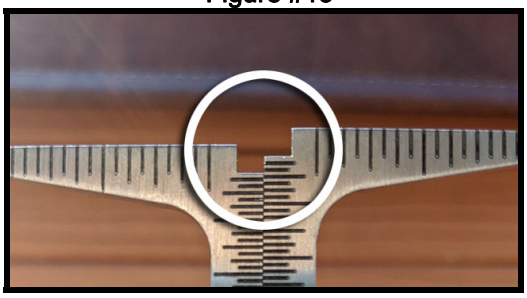


How to Measure Internal Misalignment

Gauge should be in Zero Position. Turn the gauge 90 degrees and lower the Alignment Stops into the gap of the pipe. Turn the gauge back to original position. **Stop when the tip of the bevel touches the gap.** Loosen the locking screw and lower the extension until the top edge touches the surface of the pipe. Pull one leg up until the Alignment Stop touches the interior of the pipe **(See Figure 11)**. Pull the other leg up until the Alignment Stop touches the interior of the pipe. **Both Alignment Stops should be in contact with the interior of the pipe (See Figure 12).** Read the measurement from the 32nd scale **(See Figure 13)**.

Figure #12

Figure #13



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How to Use the Hi-Lo Gauge to Create a 1/16th Gap for Socket Welds

According to A.W.S. Standards Socket Welds require a minimum of 1/16th gap between the pipe and the bottom of the socket.

If you do not have one of our patented GAP-A-LETS you can use the Hi-Lo Gauge to determine the 1/16th gap for socket welds. This scale is in 16ths. Use the method below.

Gauge should be in Zero Position. Use the scribe lines, on the feet of the gauge, to make a 1/2 inch reference line from the face of the socket **(See Figure 14)**.

Bottom out the pipe by pushing the pipe all the way into the socket.

Use the scribe lines on the gauge to draw another line 3/4 of an inch, onto the pipe, from the face of the socket weld. Using the 3/4 inch mark and the scribe lines of the gauge, pull the pipe out from the socket weld 1/8 of an inch **(See Figure 15)**.

Tack the pipe to the socket. The measurement between the 1/2 inch reference line and the 3/4 inch mark, after movement, should be 1-5/16th **(See Figure 16)**. This measurement ensures the 1/16th gap required by A.W.S. Standards.

Important Note: Figure 16 does not show actual measurement. Also, the distance from the 1-5/16th implies that **tacking** has occurred which will naturally **draw the pipe into the socket.**

Figure #14

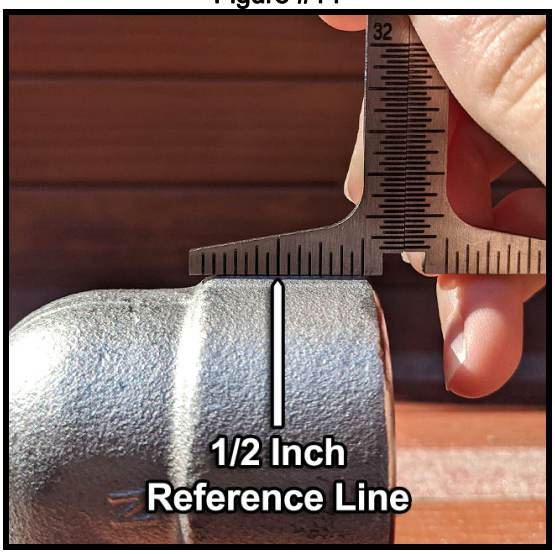


Figure #15

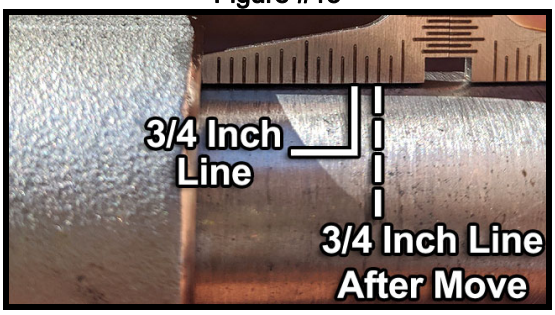
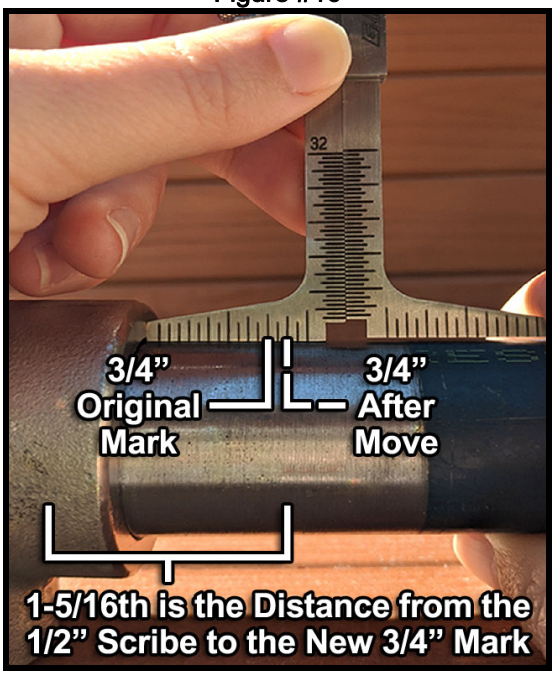


Figure #16



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