



# Guided Bend and Tensile Tester Manual

Models 273-25 & 273-55  
For 25/55-Ton Applications

## About Us

We appreciate your business!

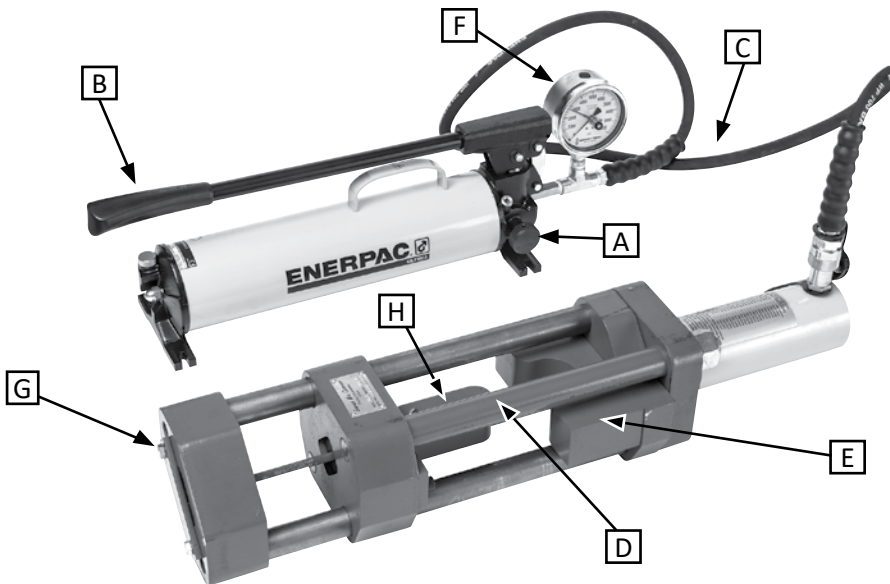
Congratulations on your new SAWYER product. We are proud to have you as our customer and will strive to provide you with the best service and reliability in the industry. This product is backed by our extensive warranty and world-wide service network. To locate your nearest distributor or service agency, please contact us at the phone number and address listed on the bottom of each page.

### You are in good company!

Sawyer Manufacturing Company is the world leader in the design and manufacture of pipeline and welding equipment and has been since 1948. Sawyer equipment has become a standard in the industry and continues to set the benchmark for quality and durability.

This user operation manual has been made to instruct you for the best use and operation of your Sawyer product. Your satisfaction with our products is our main goal. Please read this entire manual carefully, noting all tips, notes and warnings. Safety always comes first.

## Parts Diagram

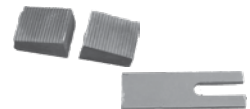


! CAUTION !

**CAUTION:** Sawyer Manufacturing Company offers a precise weld qualification test for tensile strength and guided bend operations. The buildup of high pressure inside the hydraulic guided bend and tensile testing machine can cause injury to personnel and damage to equipment. To avoid a rapid discharge, ensure that all pressure hoses are connected and secure. When the hydraulic pressure does not increase enough to bend or break the sample, check the hydraulic fluid levels and add hydraulic fluid as necessary. Please refer to ENERPAC manual for maintenance of ENERPAC pump.

- A. Hydraulic Relief Valve
- B. ENERPAC Hydraulic Pump (526-5)
- C. Hydraulic Hose Fitting
- D. Plunger
- E. Die
- F. Pressure Gauge (526-27)

- G. Jaw Retainer (525AO-B)
- H. Plunger "L" Bolt (A110B-C)
- I. (4x) Jaws *\*not included\**
- J. (1) Jaws Tensioner *\*not included\**



Record the following information for warranty purposes:

Where purchased: \_\_\_\_\_

Purchase date: \_\_\_\_\_

Equipment Serial #: \_\_\_\_\_

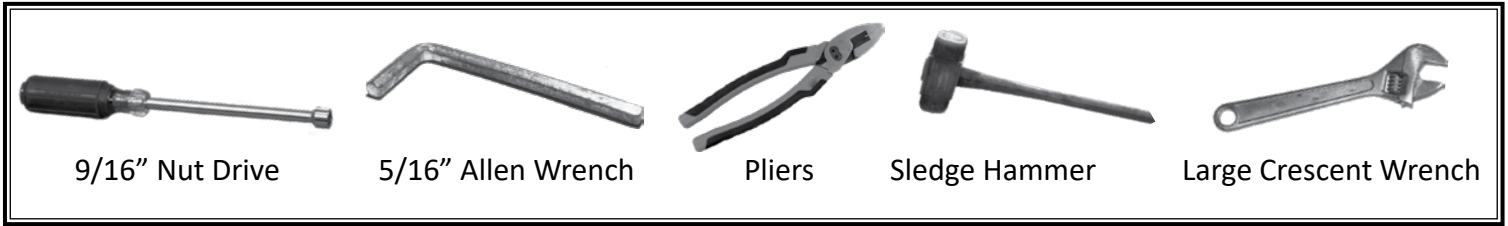
### Warranty

All products manufactured by or for Sawyer Manufacturing Company are guaranteed against defects due to faulty workmanship or materials for twelve months from the date of purchase.

This guarantee is limited to the repair or replacement of any parts found to be defective, and no other liability—expressed, implied, or contingent—is assumed.

# Installation

## Tools Needed For Assembly\*



\*Not Included

## Installation

*Tip: Unit can be mounted vertically or horizontally.*

*Tip: Unscrew plastic caps before installing hoses.*

*Note: Loosen oil fitting for proper pump ventilation.*

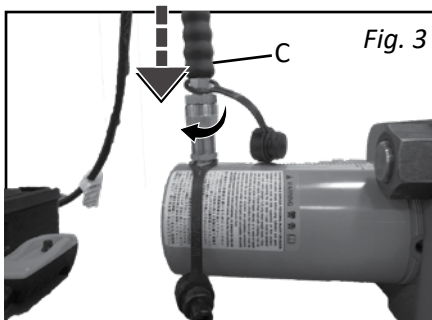
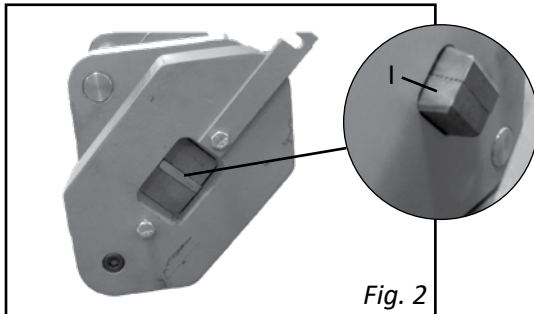
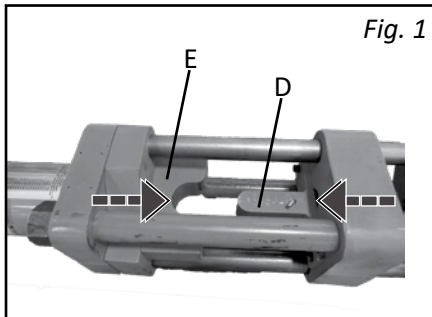
*Tip: Thread hose ends with Teflon tape to avoid leaks.*

1. Install die (E, Fig.1) and plunger (D, Fig.1) set for appropriate coupon size thickness and specification. (ASME, API, AWS)

*Note: Use 5/16" Allen head wrench.*

2. Install jaws (I, Fig. 2) to tensile tester according to coupon thickness and specification. (ASME, API, AWS)

3. Install hydraulic hose fitting (C, Fig. 3) to tensile testing machine.



## Guided Bend Operation

*Note: Refer to AWS, ASME and API specifications for bended coupon samples.*

*Tip: Mount hydraulic hand pump down to stable environment.*

*Tip: Hydraulic hand pump can be mounted vertically or horizontally.*

### **Bend**

This Bend test is designed to evaluate the quality of welds as a function of ductility in ferrous and nonferrous products as evidenced by their ability to resist cracking during bending.

Reference:

#### **3 Types of Bends:**

A. Transverse side bend. The weld is transverse to the longitudinal axis of the specimen which is bent so that either one of the side surface becomes the convex surface of the bent specimen.

B. Transverse face bend. The weld is transverse to the longitudinal axis of the specimen which is bent so that the weld face becomes the convex surface of the bent specimen.

C. Transverse root bend. The weld is transverse to the longitudinal axis of the specimen which is bent so that the weld root becomes the convex surface of the bent specimen.

*Note: For more information please refer to the following publications:  
AWS D1.2–D1.2M: 2003; API 5LC (R2006); API 1104 (R2010).*

Fig. 5



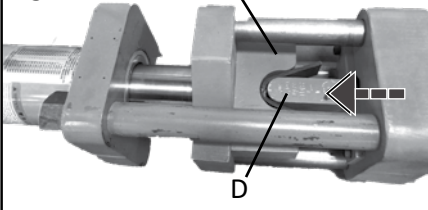
1. Place coupon across supports of die. (E, Fig. 5)

Fig. 6



2. Depress the ENERPAC pump. (B, Fig. 6)

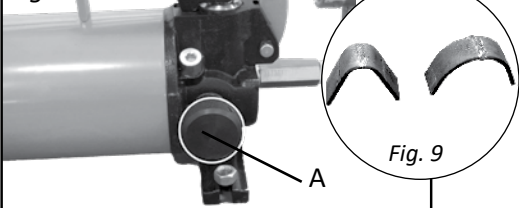
Fig. 7



3. Plunge (D, Fig. 7) the sample into the die. (E, Fig. 7)

*Note: A complete 180 degrees is recommended to complete the test.*

Fig. 8



4. Release pressure via Hydraulic Relief Valve (A, Fig. 8) and remove sample from die. (E, Fig. 9)

# Operation

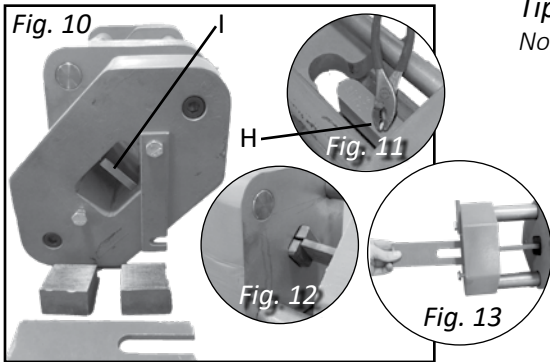
Note: Refer to AWS, ASME and API specifications for tensile test coupon samples.

Tip: Mount hydraulic hand pump down to stable environment.

Note: Hydraulic hand pump can be mounted vertically or horizontally.

Tip: When loading sample pull to highest point in jaws for easier removal.

Note: Make sure relief valve is tight before operation.



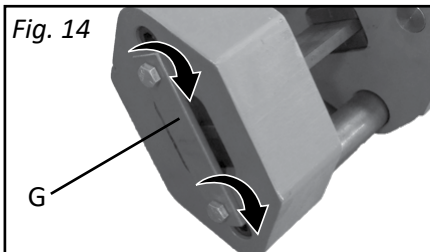
## 1. Install coupon into jaws. (I, Fig. 10)

A. Loosen plunger "L" bolt. (H, Fig. 11)

B. Push spring loaded jaws (I) on back of plunger (D) to insert coupon. (Fig. 12)

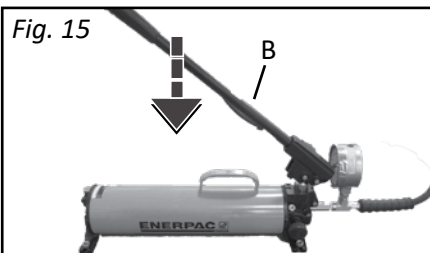
Note: Use jaw tensioner to tighten jaws against coupon. (Fig. 13)

C. Place remaining jaws (I) around coupon until it fits snug and the coupon is clear of the jaw retainer. (G, Fig. 13)



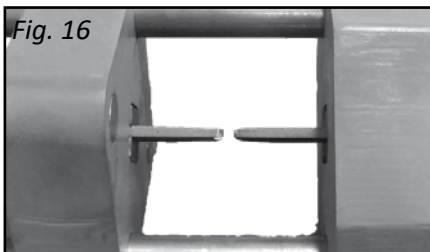
## 2. Place jaw retainer (G, Fig. 14) in the down position.

Note: Tighten retainer bolts using a 9/16" nut drive.



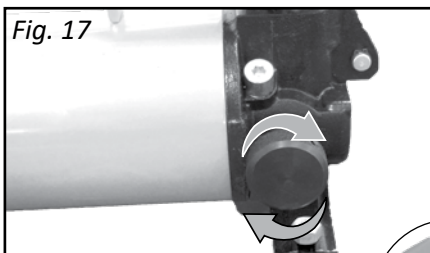
## 3. Move travel head away from machine by depressing ENERPAC pump. (B, Fig. 15)

Tip: Use short pumps to speed the process.

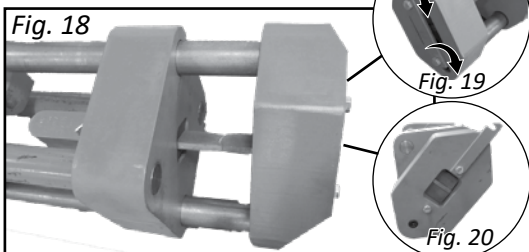


## 4. Keep depressing ENERPAC pump (B, Fig. 16) until coupon sample breaks.

Note: Refer to pump pressure chart.



## 5. Release pressure from pump/crank by turning relief valve. (A, Fig. 17)



## 6. Remove sample from jaws. (I, Fig. 18)

Tip: Use a hammer to loosen sample.

A. Loosen 9/16" retainer bolts (Fig. 19).

B. Pull jaw retainer up. (Fig. 20)

C. Remove sample from jaws.