

Tests on Riveted Joints

Procedure:

1. In groups of two or three, obtain a sample of the material to be tested.
2. Measurements of the sample may be taken after the test.
3. Insert the sample into the test machine and have the instructor check the fixture.
4. Set the dial to the mid-range, start the hydraulic pump and zero the gauge. Apply force to your specimen by closing the drain and setting the dial to 15.
5. Record the maximum load and remove the sample pieces from the fixture.
6. Place one of the pieces in the vise and remove one of the rivets.
7. Using the appropriate instrument, measure and record the effective diameter of the rivet.
8. There are three ways the sample can fail. 1) The plates can pull apart at the narrowest part, a tension failure of the plate. 2) The rivets can fail in shear. 3) The plates can fail in bearing, the rivet crushes the plate area where it presses against the plate.

In your discussion section, answer the following questions. Include appropriate calculations.

- a. What was the mode of failure for your sample?
 - b. What was the highest stress on the rivet?
 - c. What was the highest average stress on the steel plate?
 - d. Considering the stress concentration, what was the maximum stress on the plate?
 - e. Estimate the tensile strength of the steel plate with the Rockwell hardness test.
 - f. Was the rivet stronger or weaker than your steel sample in the shear lab test?
9. Include the appropriate calculations
 10. Work the assigned homework problems associated with this lab and attach them to your report. (see back side of sheet).

Laboratory Problems: Rivet Test:

1. The figure below is of a riveted joint. The joint is fastened together using two bolts. Determine the required diameter of the bolts if the allowable shear stress for the bolts is 85 MPa.

