

Laboratory III: Hydraulic Cylinders

Objective of this Laboratory:

Learn about fits and tolerances of real components.
Examine bolts and nuts and methods of assembly.
Observe examples of seals and the associated tolerances.

Location:

Wyman 163.

Procedure:

You will want to assign these tasks among the members of the group in order to complete the lab within one hour.

Take apart the hydraulic cylinder provided.

Measure the diameter of the cylinder and the wall thickness. You will use these to estimate the pressure that can be safely developed in the cylinder.

Measure the diameter of the rod as accurately as you can. What tolerances do you think were provided to the manufacturer, and why?

Measure the inner diameter of the cylinder and the outer diameter of the piston. Measure the size and depth of the seal groove. Why are these dimensions chosen?

Examine the seals. Choose any one of the seals and describe how it operates.

Measure the size of the bolts and the screw threads used. Also measure the length of the bolts and the length of the head carrying the bolts. You will later calculate the torque that should be used to tighten the bolts for a safe cylinder pressure.

Reassemble the cylinder.

Clean up after yourself. Replace all tools where you found them.

All of the questions asked above must be answered in the lab report.

This lab report is due in class on Wednesday, April 15, 2009.