# Table of Contents

Go To Technical Menu

# REF: Engine Mechanicals - Sub-02D

# Measuring the Volume of a Combustion Chamber

Article by billeuze of the XLFORUM [1)]

- **Tools**:
  - A dial gauge or a degree wheel & piston stop for finding TDC.
  - A Burette. (about a 3 foot long test tube with a valve at the bottom and graduations along the side).
    100ml is the perfect size because you only have to fill it once.
    50ml works but you have to refill it (which makes more room for error).
- **Liquid for Testing**:
  - Denatured alcohol (with food coloring added for better visibility) is suggested as a fluid medium to measure with since it evaporates.
    However, antifreeze was used in this instance.
    Straight water is not recommended as it may help set up rust in the metal parts.

## Engine Prep:

The forgoing was done with shovelheads on and ironhead case.
The heads were pulled and the ringlands and spaces between the rings were packed with axle grease to stop any fluid getting past the rings.

## With the Head On

| | | |
|---|---|---|
| First, find the top of bore. → | This may not be exact TDC since the piston (hovers<br>at the top a few degrees before the power stroke). → | Lock the crank to hold the piston in place. → |



On 57-03 engines, you can carefully screw a bolt into the timing hole until it snugs up against the flywheel. You can also place a piece of polyethylene tubing in the
timing hole then put the plug back in on top of it pushing the tubing into the flywheel. This puts plenty of friction against the wheels to stop them from rotating.

Bolt the heads on with the head gasket the same
type gasket your intending to run and prop up
the engine (head level / cylinder verticle). →

Tip it over until the front spark plug is sticking
straight up in the air. Brace engine, remove spark
plug and hang the burette over spark plug hole. →

First, fill the burette to above the mark, then bleed
some off the bottom till the level on top is right on the
“0” line. Then clamp it above the hole you want to fill. →


Place the hose over the spark plug hole and fill the
chamber up the third spark plug thread. →

This chamber took a total of 87 CC.
It only looks higher on the photo.
Take the reading from the bottom of the meniscus. →

Repeat for the second cylinder. Ø



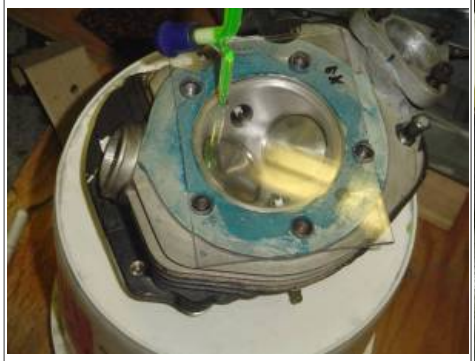
# With the Head Off

- Start with the piston in the bore (rings greased) but lowered down so the piston top is flush with the cylinder deck (if using dome piston) so you can submerge
  the whole piston dome in measured fluid.
- Fasten a piece of plexiglas with a hole in one end (big enough for the burette spout) on top.
  The hole should be at the high end of the plexiglase to allow air bubbles to escape thru the hole.
  Tilt the cylinder on a incline. Have it so that a spirit level bubble is completely over to one edge.

**Measure the Cylinder**:



**Measure the Head**:



Go To Technical Menu

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https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-era-specific-and-model-specific/ironhead-sportster-motorcycle-talk-1957-1985/138903-ccing-my-combustion-chambers?t=1507847