

BUILD YOUR OWN SHOCK DYNO

WWW.SHOCKSETUP.COM

"Calibration"

Build your own Shock Dyno.

This presentation demonstrates how to build your own shock dyno. You can view it in Slide Show or by browsing through the slides in Normal View.

Materials

Calibration

Hardware Kit Components

Pictures

Shock Dyno Kits:

www.shocksetup.com



Save all the work!

Get it all at:

www.shocksetup.com





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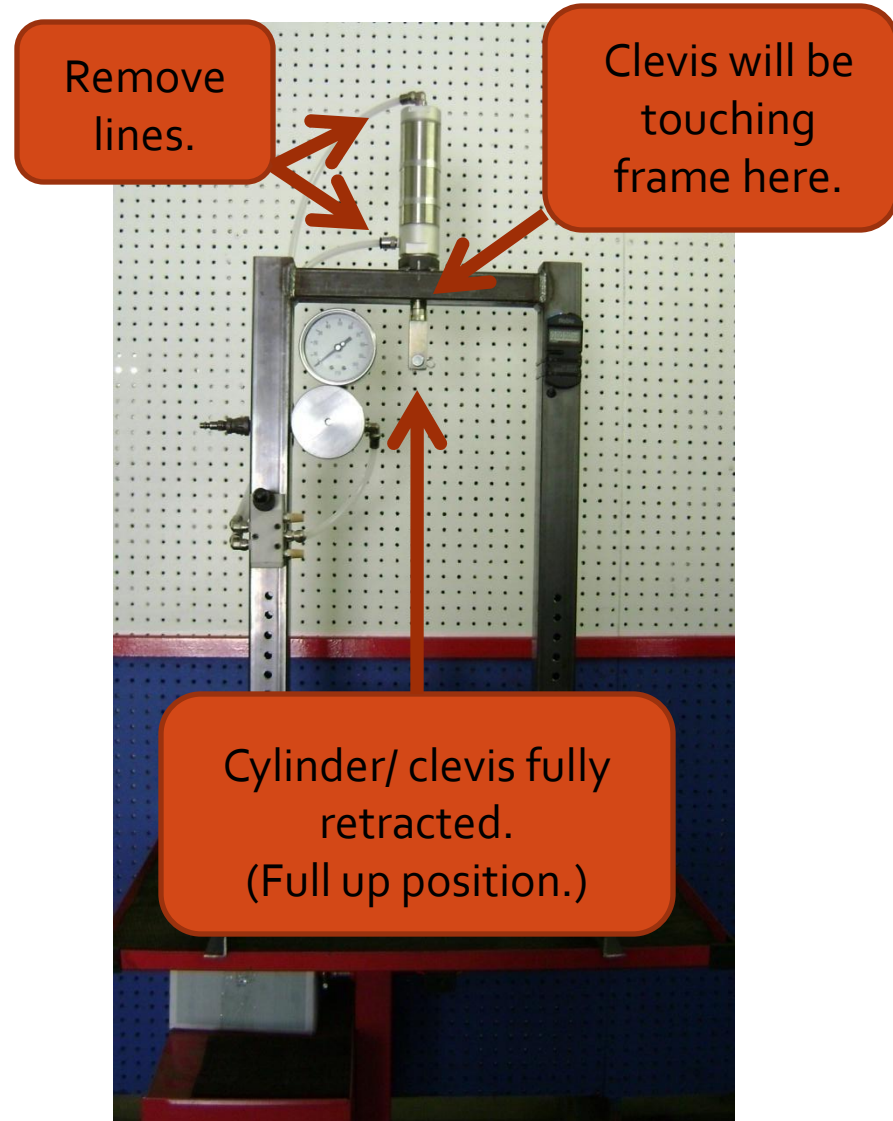
Overview of "Tools" Needed

- 1.) Dial Calipers (Preferred) or 6" machinist scale.
 - 2.) Pen/ pencil/ marker to mark the cylinder/shaft, and scratch paper to record measurements.
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Instructions

Step 1.) Remove the lines at the top and bottom of the cylinder and start with the cylinder fully retracted.

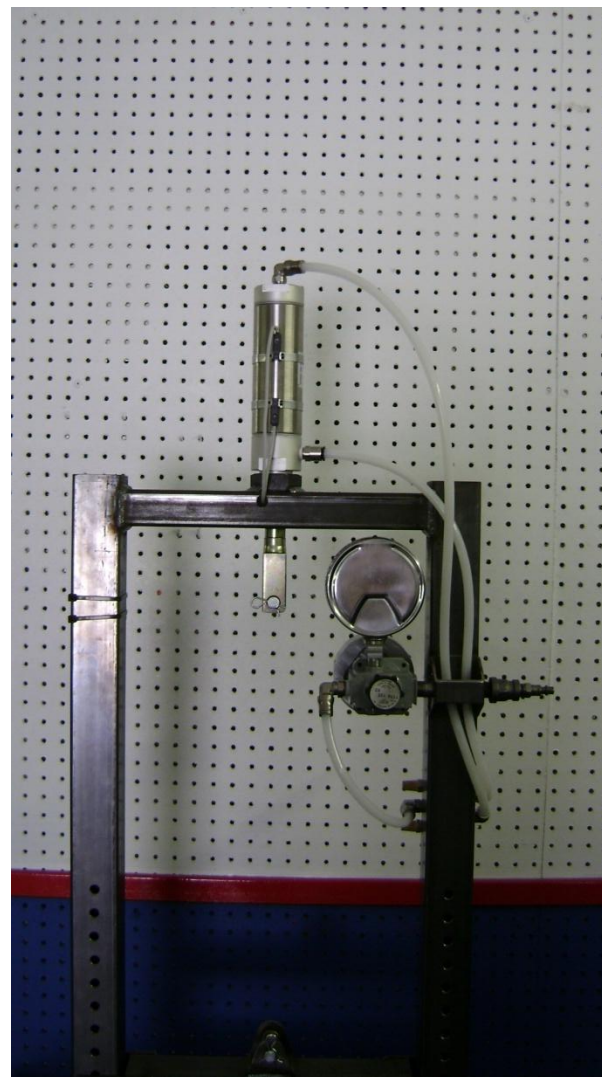
Note: The lines remove easily by compressing the fitting lock into the body and pulling the plastic line out. Similar to an air hose coupler.





Instructions

Step 2.) Turn the dyno around so you are looking at the backside.





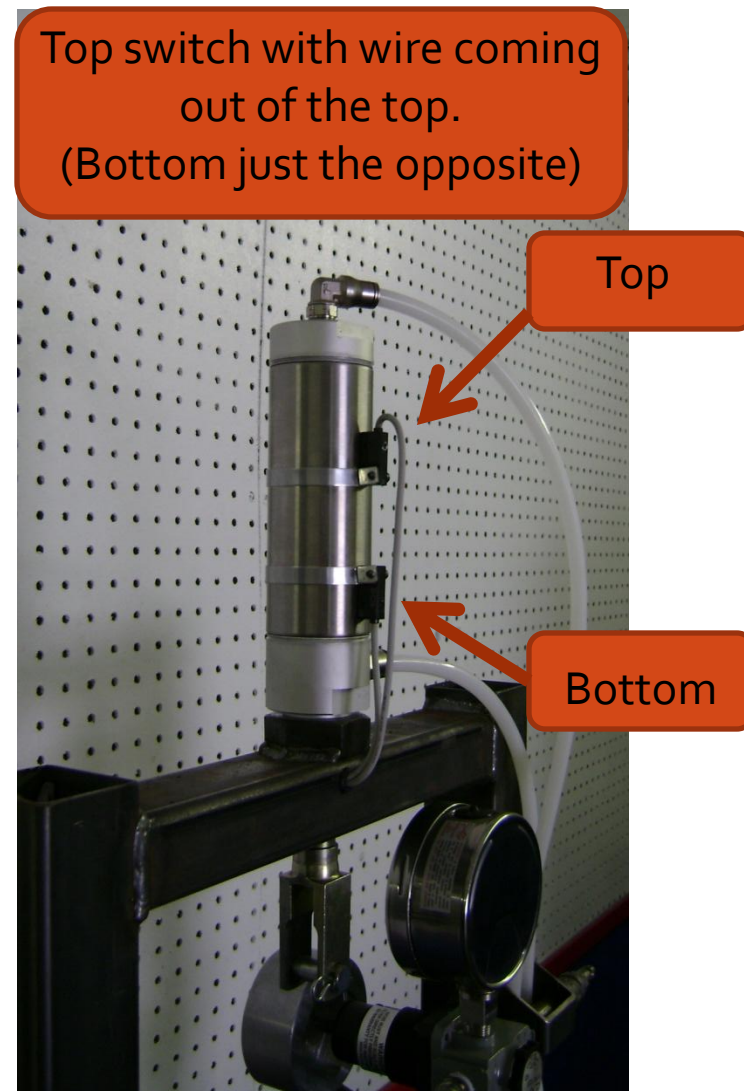
Instructions

Step 3.) Install the reed switches as shown.

IMPORTANT!

The top switch will have the wire exiting the top of the switch. The bottom switch will have the wire coming out of the bottom of the switch.

See next slides!



Instructions

Step 4.) Now with the cylinder fully retracted, loosen the top "Reed" switch clamp, and slide it towards the top of the cylinder, until you here the timer "Beep" indicating it started running.

Mark the top of the switch location with a pencil mark or equivalent. This indicates, at this point, the timer begins running.

Note: You may want to do this several times to get an accurate location/mark.

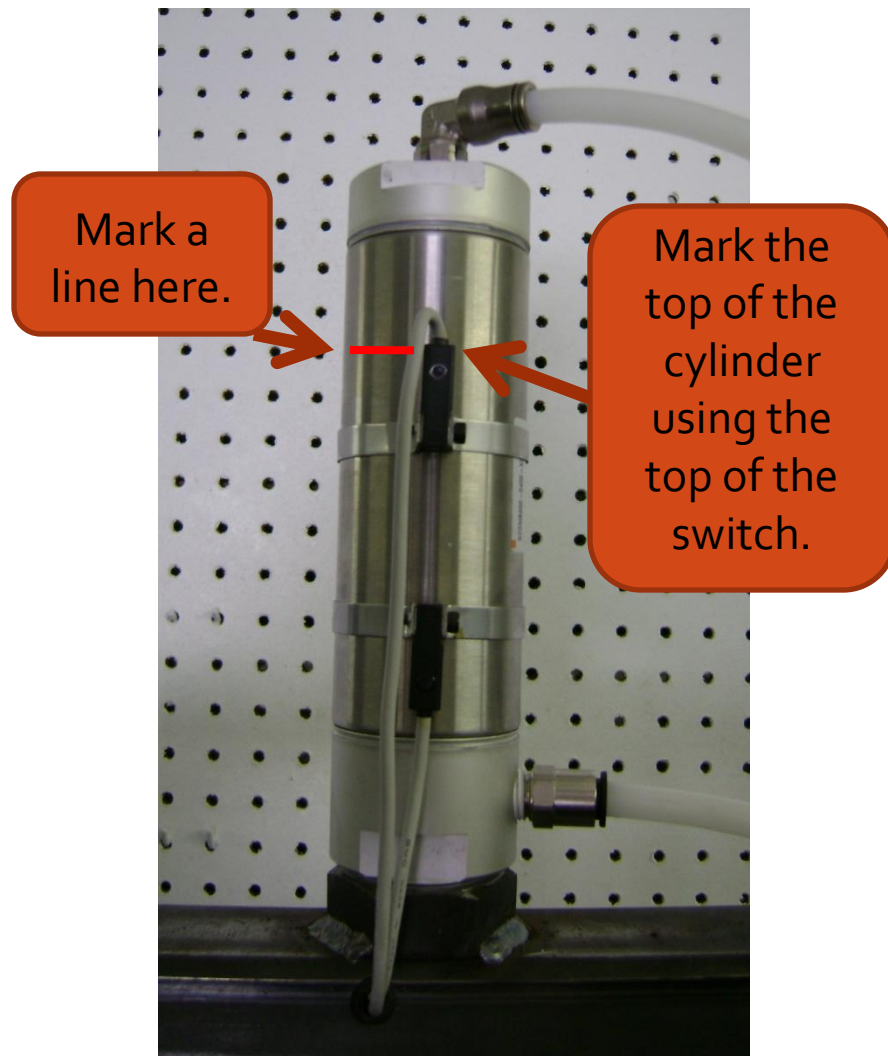




Instructions

Step 4.) Cont

Red line indicates mark.

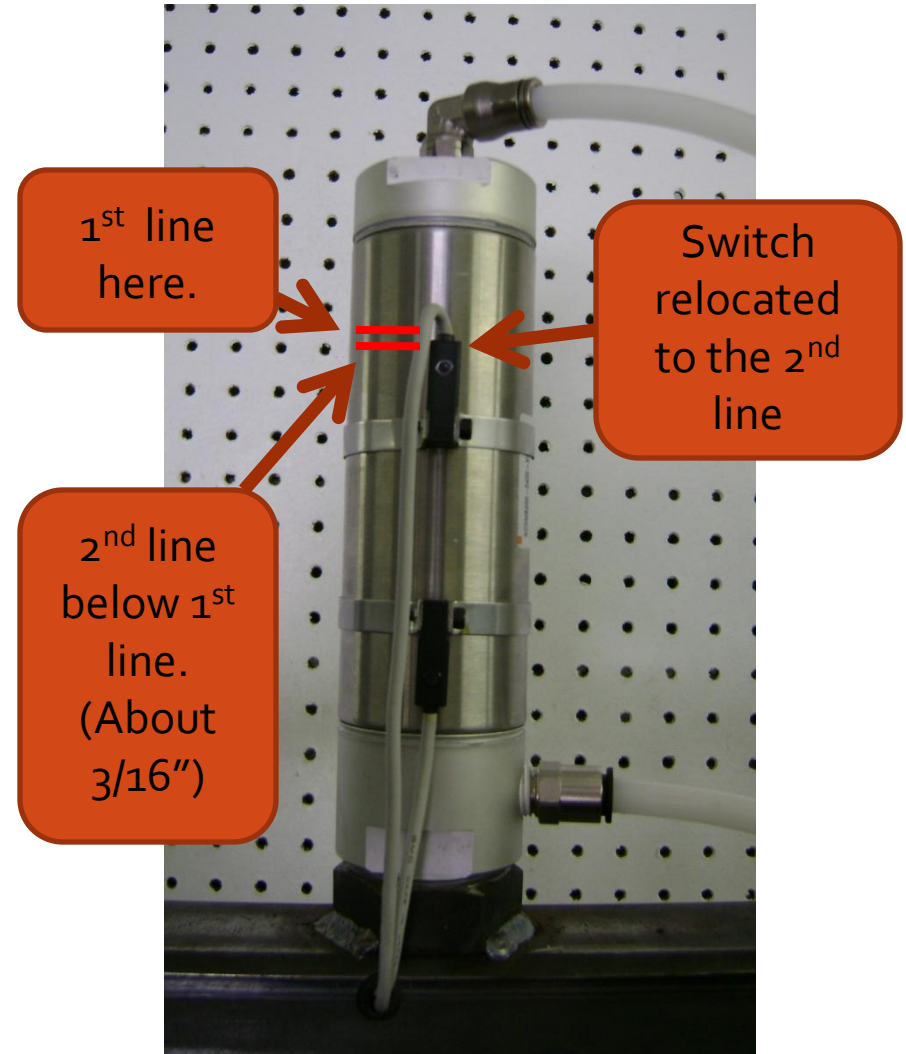


Instructions

Step 5.) Mark a second line approx. $3/16$ " "BELOW" the first line and position the switch at your second mark.

(This isn't critical, just get it close.)

Note: This gives the cylinder a chance to ramp up with pressure, and also a point for the reed to switch back off after a cycle. (The piston must pass by the switch totally, to allow it to be open, then close, and open again, when the piston passes by the reed switch.)

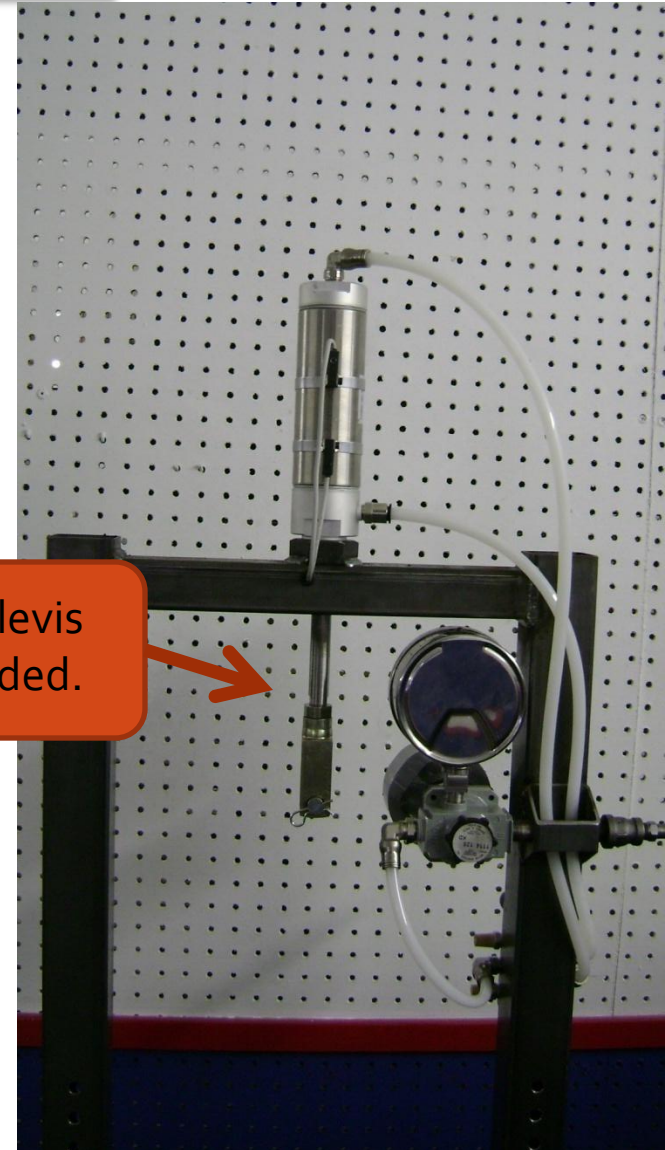


Instructions

Step 6.) The next step will be to duplicate the process with the bottom reed switch.

Start by extending the cylinder/clevis fully.

Cylinder/ clevis fully extended.

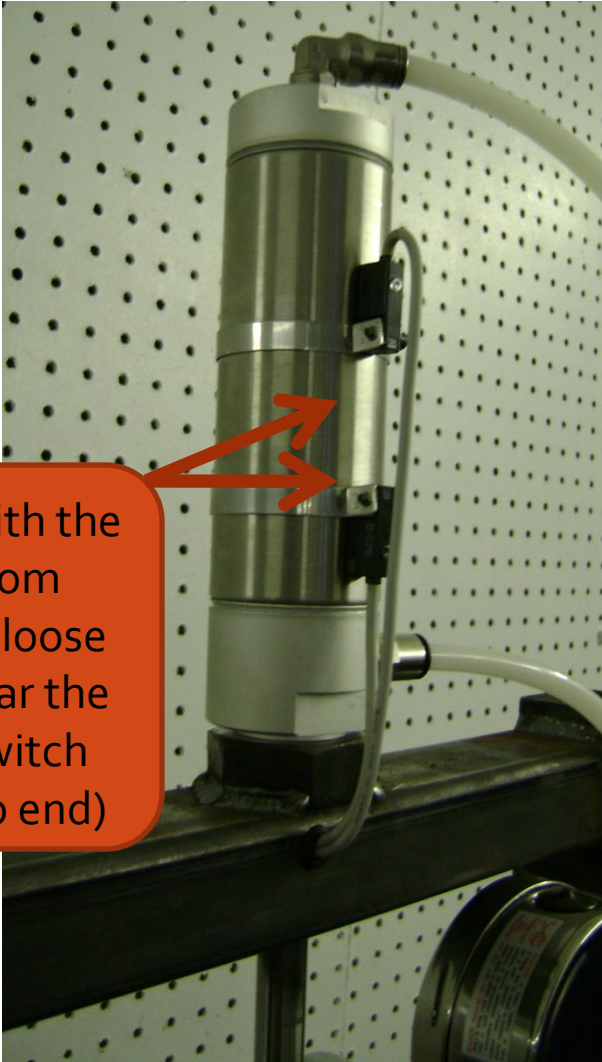


Instructions

Step 7.) Now loosen your bottom reed switch clamp and slide it "UP" against the top reed switch.

(They will be butted together, end to end.)

Then slide the switch down, slowly, to you here the timer "BEEP", then mark the cylinder at the bottom of the switch. Just as we did with the top switch earlier. (Again, you may want to do this several times to get an accurate mark.)



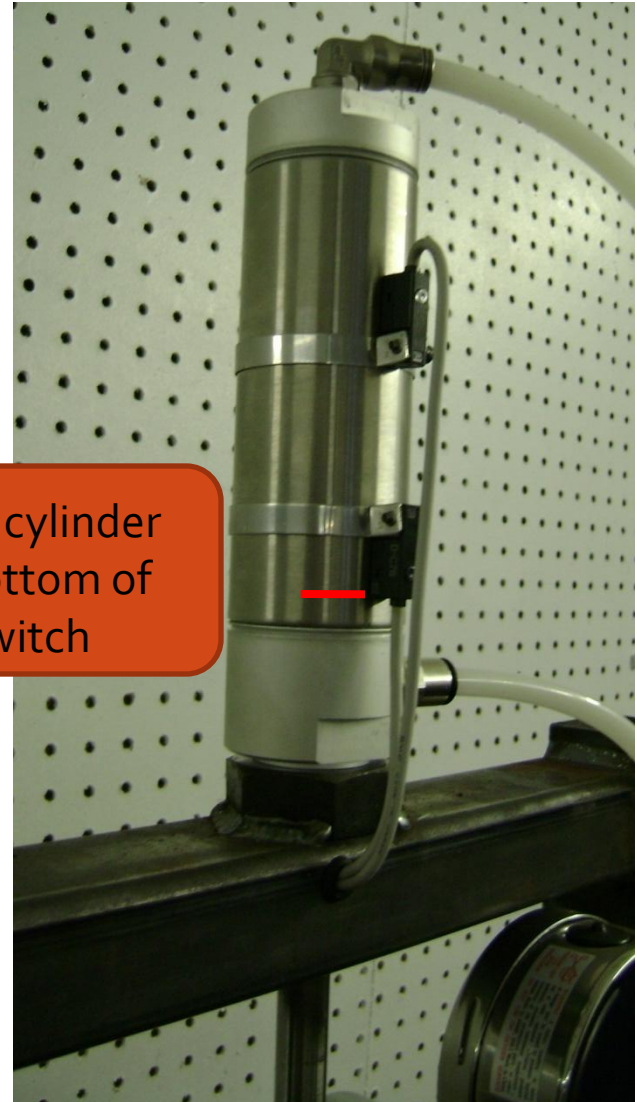
Start with the bottom switch loose and near the top switch (End to end)

Instructions

Step 7.) Cont.

After you get the timer to "BEEP"
mark the bottom of the switch.

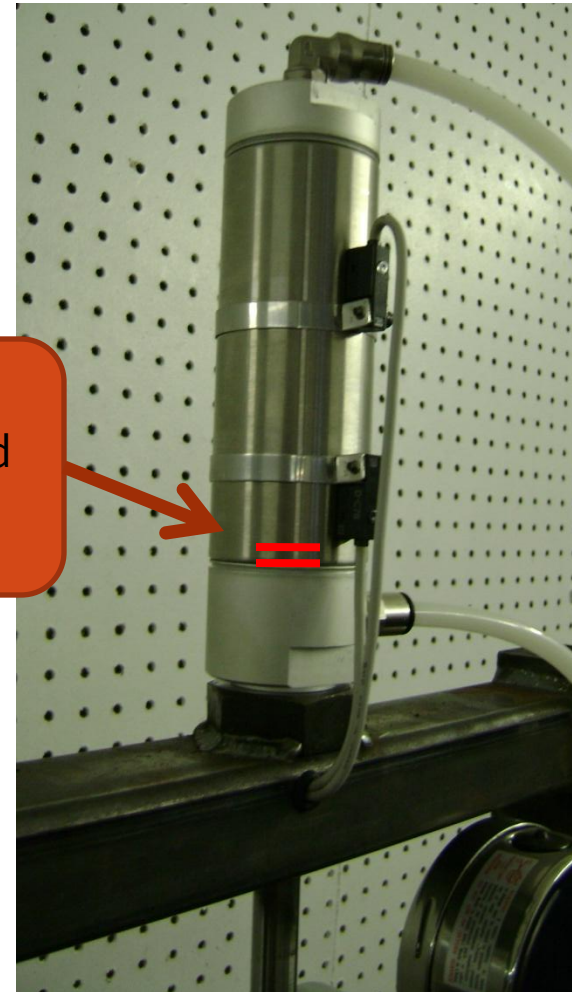
Mark the cylinder
at the bottom of
the switch



Instructions

Step 8.) Now, make another mark approx. 3/16" "UP" from the bottom mark and position the switch to that mark.

2nd mark 3/16" "UP"
from the 1st mark and
switch relocated.






Instructions

Step 9.) From this point, you should be able to attach shop air (Min. 125 psi supply pressure.) and put a shock into the dyno.

(I would start with about 30 psi at the regulator.)

Then cycle the dyno full up and full down.



Example: Start dyno in full up position.

(Shock is extended.)

With the timer off, cycle your lever valve down.

You should see the timer start almost immediately, then the timer should stop, just before the dyno stops at its full down stroke. (If it is correct, you almost don't see any delay.)

Then, repeat the process for the upstroke of the dyno. (And actually the shocks compression stroke.)

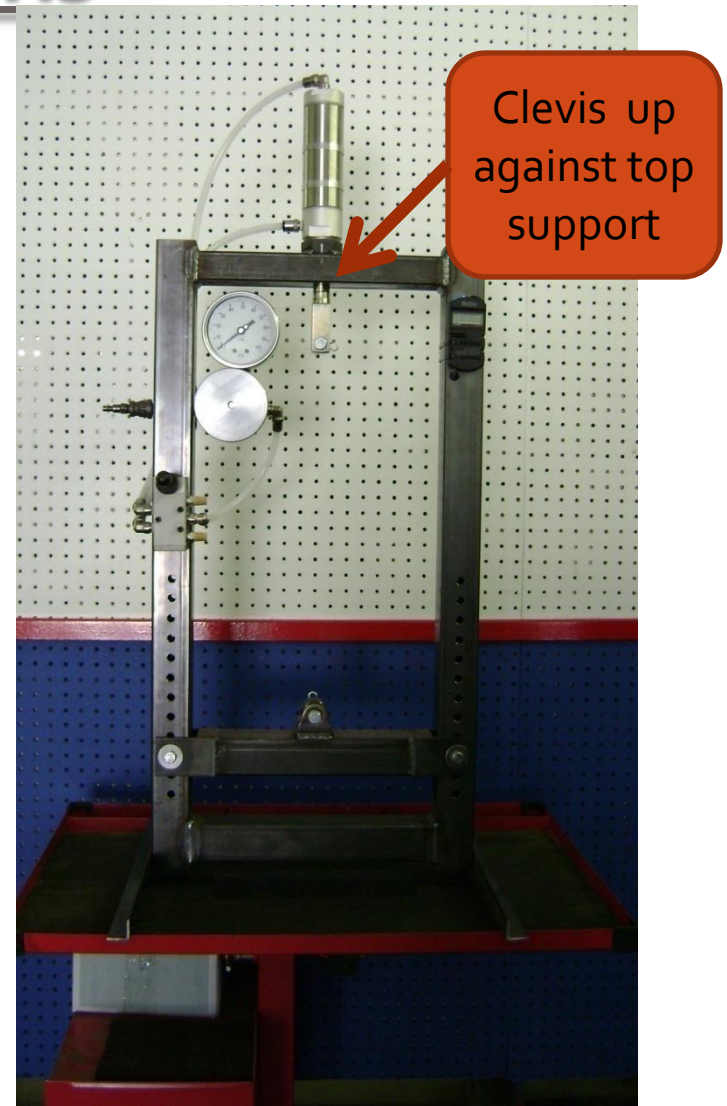
Instructions

IMPORTANT:

Remove the shop air from the dyno regulator.

Step 10.) Start with the dyno cylinder fully compressed.

(Clevis against top dyno support.)

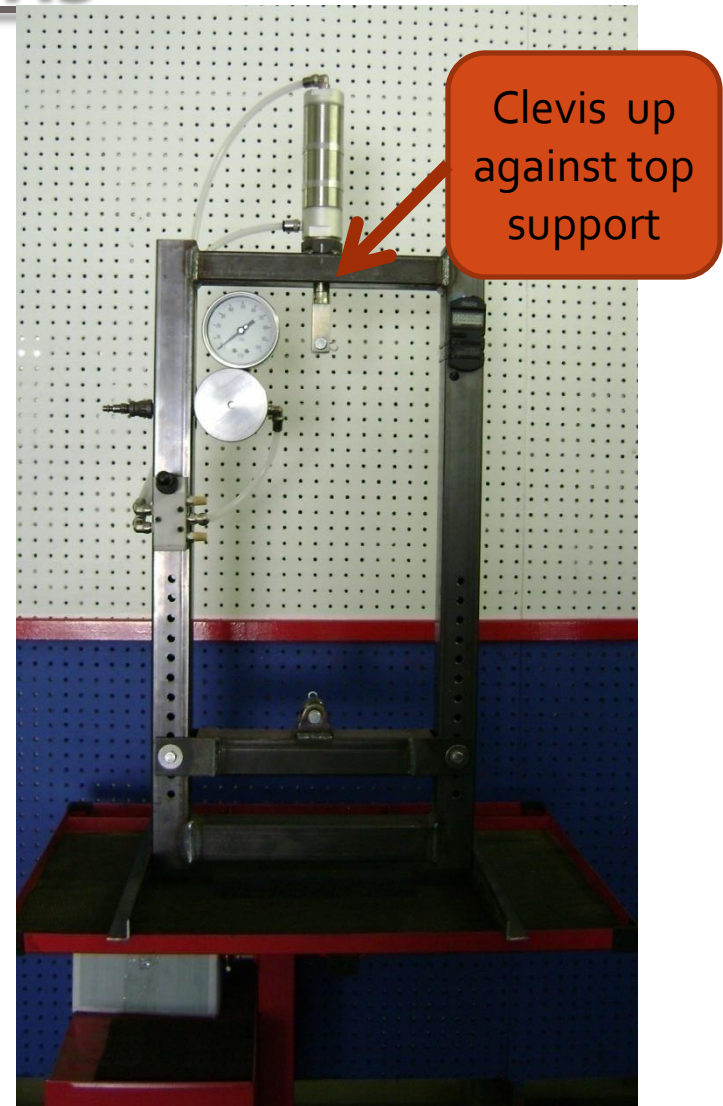


Instructions

Note: You will notice during the next few steps, the effects of a new piston in the cylinder. It becomes “sticky” at times. And just when you don’t need it to be.

It takes some patience during these last steps to get good measurements!

Note: These pistons lose their “stickiness” over time with use. Eventually, with the shop air removed, you can switch the lever down, and the shaft will fall to the bottom of the stroke without any help. I have tested new -vs- old with no noticeable difference in the results.



Instructions

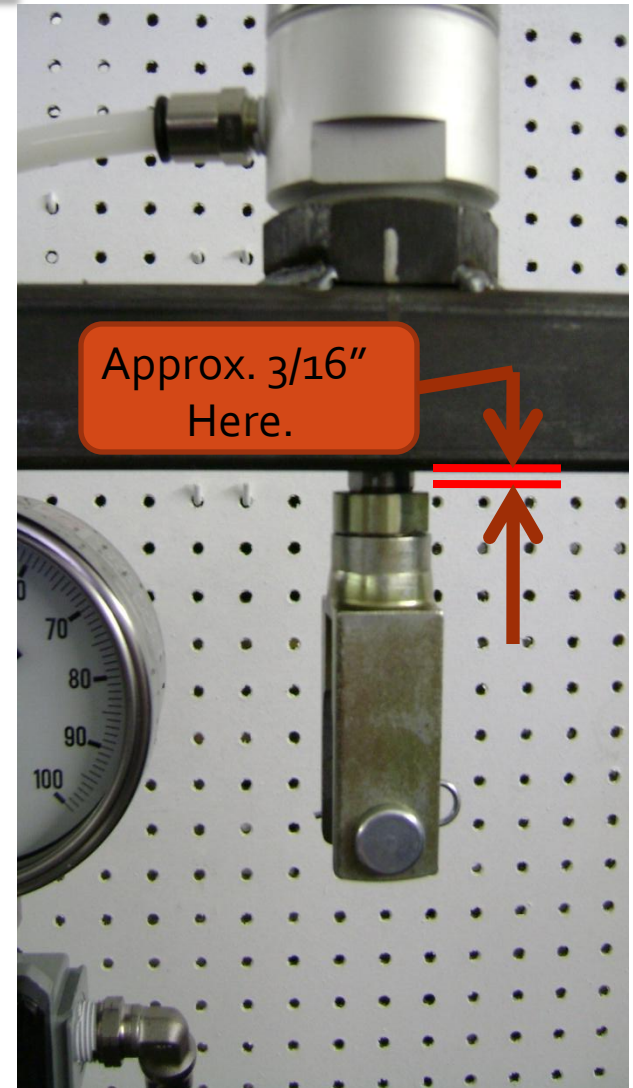
Step 11.) Have the dyno facing forward.

Slowly pull the clevis down, until timer "BEEPS." Do this several times to get a feel for it.

(Be sure your cylinder lines are removed to make this easier.) The following pic's show them installed, but not actually connected.

When your are sure you have it right at the timer activation, measure the distance from the clevis to the top dyno support.

NOTE: You should have about $3/16''$ between the clevis and top dyno support. Slightly more or less will be fine, as the program will compensate for this.



Instructions

Step 12.) Now we need an accurate measurement of this distance. I like to use dial calipers as shown. If you don't have any, at least get access to a machinist scale.

Record this measurement!

If you are using a scale, convert to a decimal.



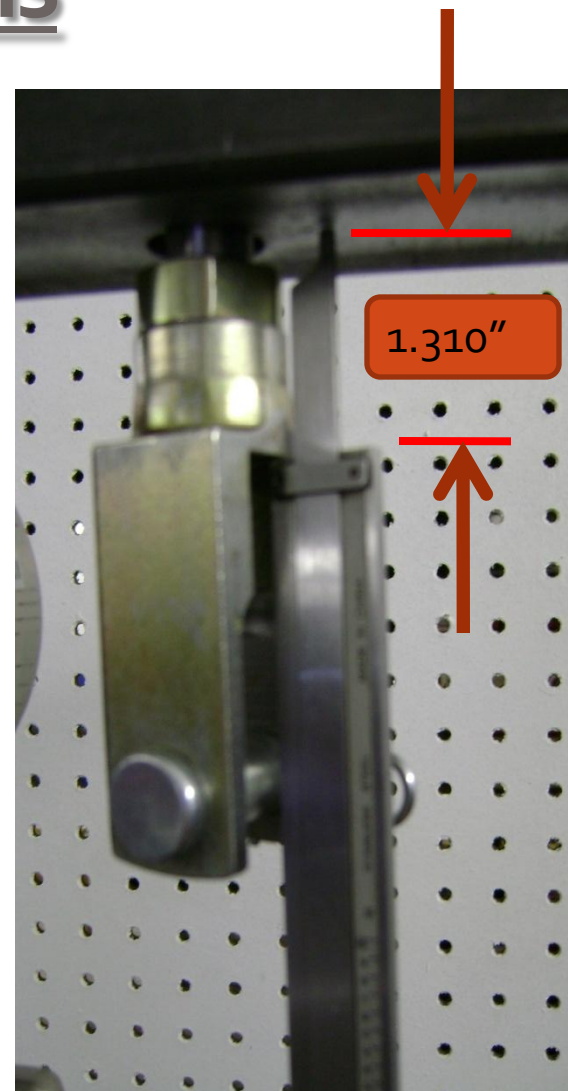


Instructions

Step 12.) Cont.

After checking several times, I have a reading of **1.310"** (Recorded.)

You will not likely have the same reading, just record what you actually have.

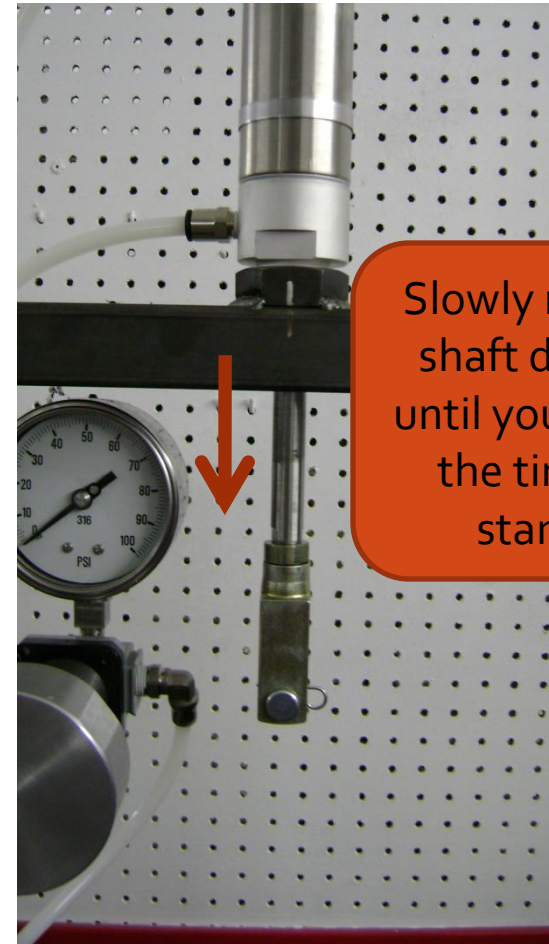


Instructions

Step 13.) **IMPORTANT- This next step only works 1 way!**

From your 1st measuring point, slowly move the shaft “down” until the timer “BEEPS” again. Measure with dial calipers to get this 2nd reading.

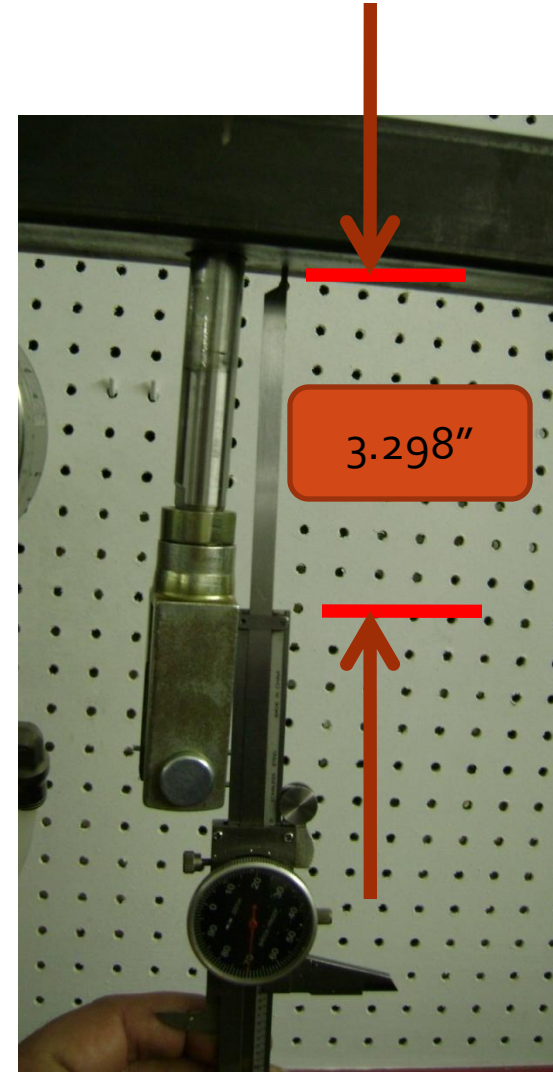
Don't fully extend the shaft and move up to get the beep! This method will not calibrate properly. You will end up with 2 completely different stroke settings.



Instructions

Step 14.) Record the reading from the point at which the timer "BEEPS".

I did this several times to get an average of **3.298"**.





Instructions

Step 15.) Take your 2nd reading and subtract the 1st reading from it.

Example:

My 2nd reading: 3.298

My 1st reading: -1.310

Total stroke= 1.988

The total measured stroke is 1.988".

This will be entered into the calibration screen of "BanditShockWave" software.

So, record this on paper.



Instructions

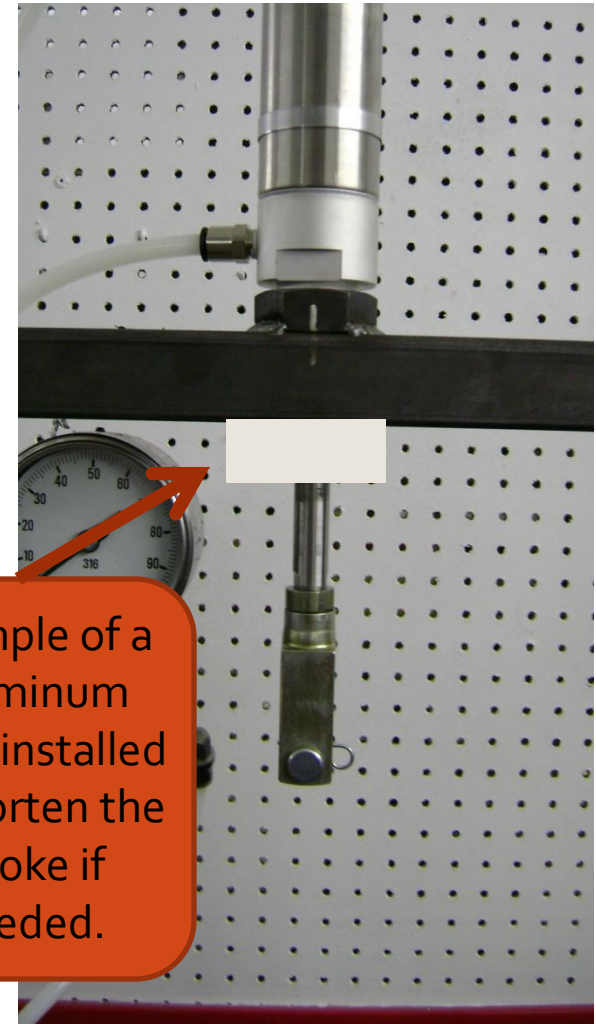
Note: If you wanted exactly a 2" stroke, you could further tune your top or bottom reed switches to get that.

I prefer to let the software take it from here.

Instructions

Also, say you have some smaller shocks, that you only can check a 1" stroke on. Just make a spacer (Approx. 1") out of aluminum stock or equivalent. Drill and tap some $\frac{1}{4}$ x 20 holes in the top support and put the spacer on. I use tapered head screws so they don't protrude out of the spacer.

Remember to recalibrate!



Example of a Aluminum stock installed to shorten the stroke if needed.

Instructions

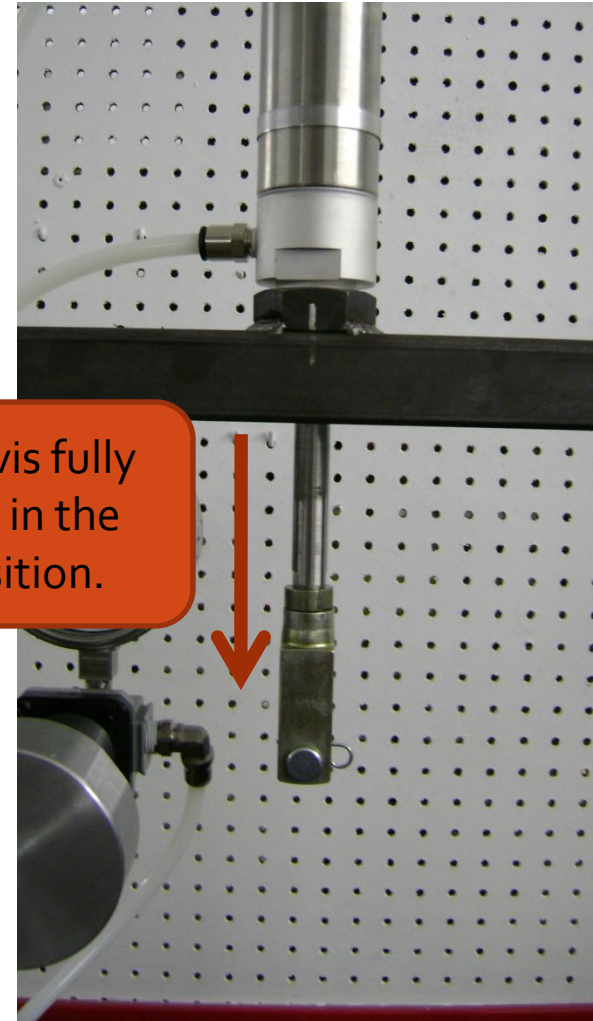
Step 16.) Ok, now that we have the down stroke measured and recorded, we need to check the upstroke of the dyno.

This should come out very close or even identical!

We are going to do the same measuring, but in reverse order.

First, extend the clevis fully.

Shaft/clevis fully extended in the down position.



Instructions

Step 17.) Now carefully compress the shaft into the cylinder until the timer "BEEPS". Do this several times to pick up the exact point.

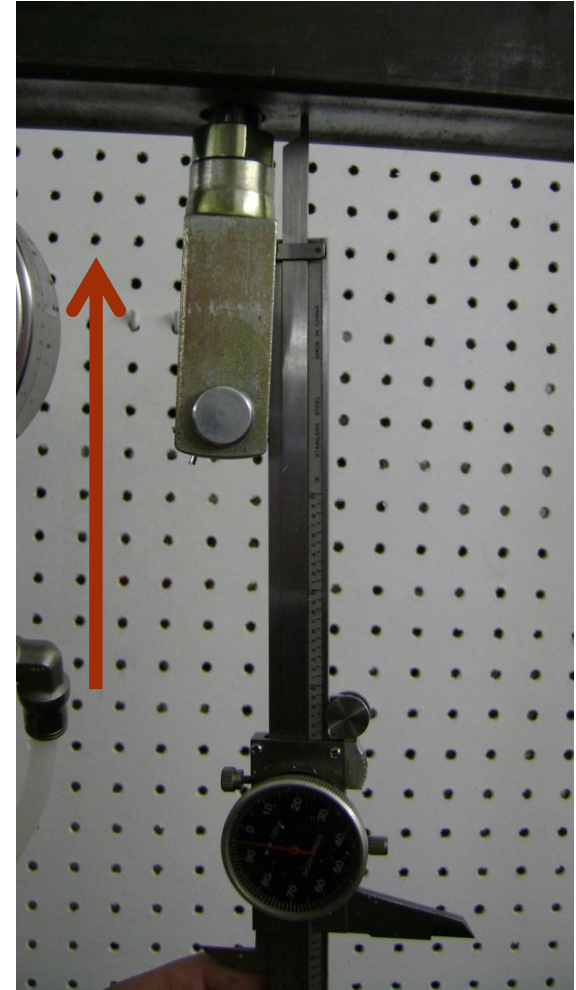
Then measure with dial calipers to get the measurement.

This particular dyno measures
3.718".



Instructions

Step 18.) Then, from this point, continue compressing the shaft into the cylinder until the timer "BEEPS". Then measure this reading. This dyno reads **1.727"**.





Instructions

Step 19.) Now take your 2nd reading and subtract it from your First reading.

Example:

My 1st reading: 3.718

My 2nd reading: 1.727

Total stroke= 2.991



Instructions

Step 20.)

My down stroke was 1.988"

My upstroke was 1.991"

Total difference is 0.003"

My assumption is that the switches read at exactly the same point, and my measurements are off by .003".

I will pretty much split the difference and call both strokes 2.990.

Instructions

Step 21.) Now we can enter the 2.990 strokes into the software.

Note: If you are convinced the stroke reading are different, you can put 2 different strokes into the calibration screen, and it will compensate!

Although, I recommend rechecking your work until you get within about .020 of each other, and split this difference.

The screenshot shows a spreadsheet window titled "BanditShockWaveIntegratedtime - OpenOffice.org Calc". The spreadsheet contains the following data:

Area: Cyl Ext	3.14159	Area: Cyl Comp	-2.83480
Stroke: Cyl Ext	1.990	Stroke: Cyl Comp	1.990
Cyl Ext Corr Fact	0	Cyl Comp Corr Fact	0.800

Two red arrows originate from a callout box at the bottom that says "Enter your strokes here." and point to the "Stroke: Cyl Ext" and "Stroke: Cyl Comp" cells in the second row of the table.



Instructions

END.

I hope you benefit from using your dyno. I have helped numerous teams with this style of dyno, with truly amazing results.

If you have any questions, comments or even concerns, please let me know at:

leon@shocksetup.com

Constructive criticism is always welcome!

Sincerely,

Leon Peasley

570-660-0139

www.shocksetup.com



Instructions

END

