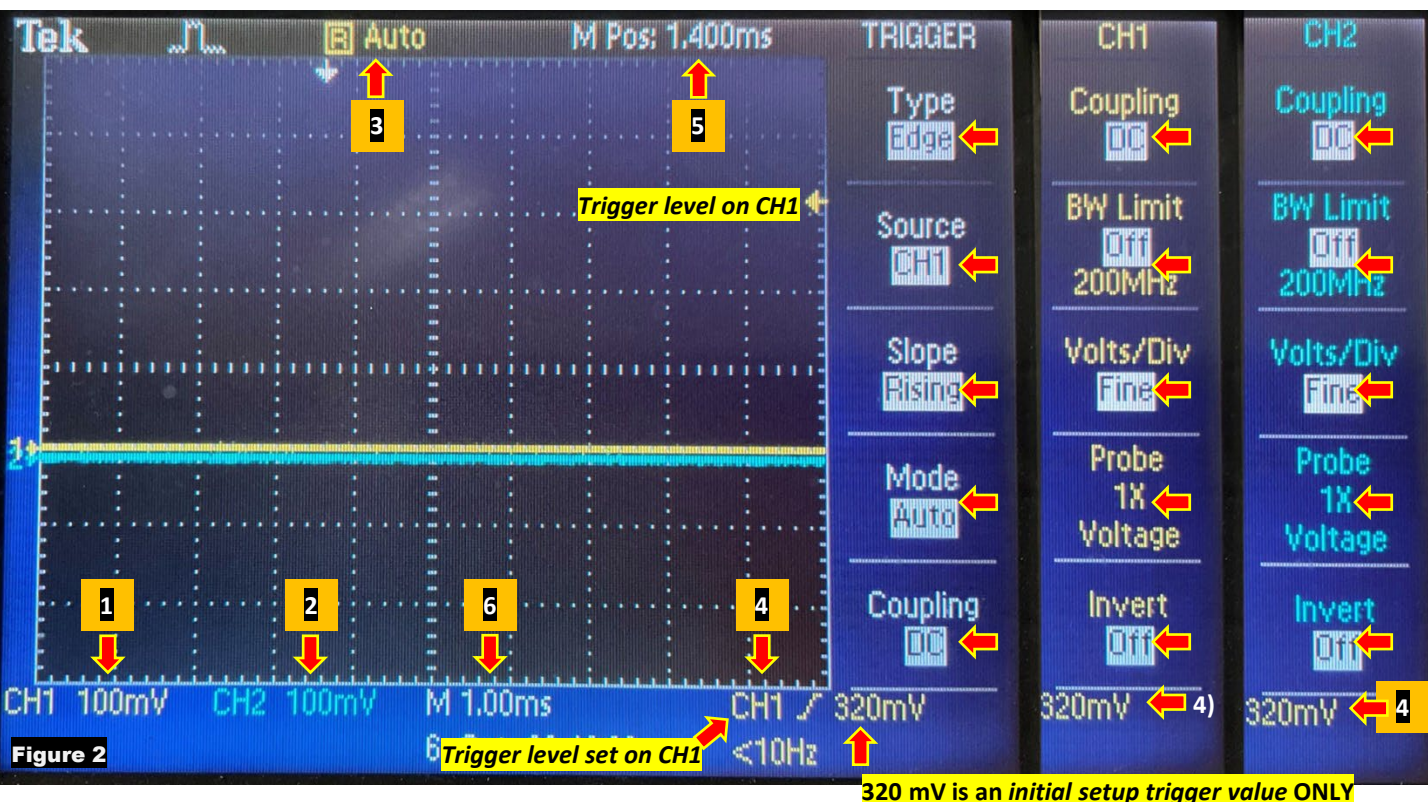


Initial setup (Oscilloscope Tektronix TDS 2024B)

- 1) Check all connections and assure all power buttons on the power board are ON
- 2) Let the *isolation valve* and the *relief valve* OPEN; and turn on the **vacuum pump**
- 3) Install a **new diaphragm** on the coupling, and *make sure the O-ring surface area is well covered*
Tighten the wings nut & use thicker diaphragm when an 'premature burst' has occurred
- 4) Turn-on the **oscilloscope**, use the respective control buttons/dials (Fig. 1)
- 5) Press the AUTOSET button and wait until **[A] Auto** is displayed (Fig. 2)

**Figure 1****Tektronix TDS 2024 B**

- 6) Assure the setup parameters are as per shown by *red arrows & their respected values*

**Figure 2****320 mV is an initial setup trigger value ONLY**

Experimental

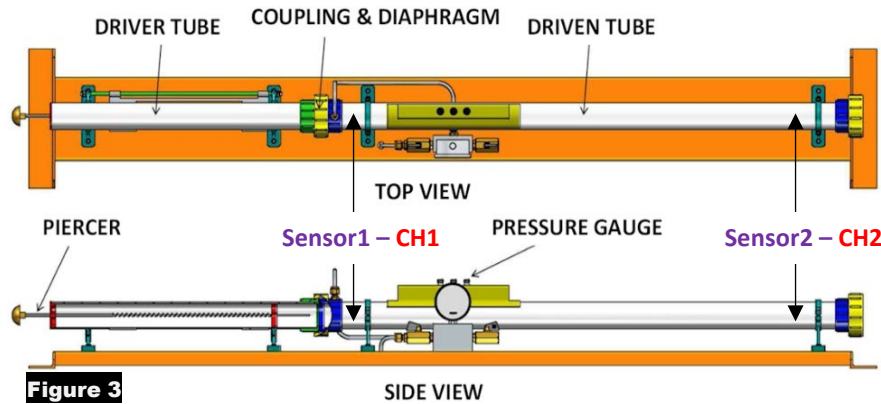


Figure 3

- 7) Make sure the *isolation valve* and the *relief valve* are OPEN
- 8) Make sure the *trigger level* has been **set to CH1**
- 9) Ensure the pressure inside the *Driven* section is zero; then close the *relief valve*
- 10) With the *vacuum pump* ON, adjust the *isolation valve* to achieve a range of pressures
- 11) **Observe** output voltage signals (**blue/yellow lines**) of **CH1** & **CH2** for range of pressures
The response of CH1 and CH2 should be linear lines and are repeatable
- 6) Adjust the *isolation valve* to achieve a desire pressure (-80 kPa), SHUT the valve when achieved
- 7) Adjust **CH1** & **CH2** voltage scales of the oscilloscope output display (Fig. 4) by dialling *Position-knobs*
- 8) And lower the *trigger level* to **just above blue-yellow lines** (Fig. 4)
- 9) Push *Single SEQ* button to arm the *oscilloscope*
- 10) Notice that **[R] Ready** is displayed
- 11) Pierce the *diaphragm* to create a shock wave
- 12) The captured data will be shown on display (Fig. 5)
- 13) The **Acq Complete** is shown at the top
- 14) Insert an USB Flash Drive to a port, under the display
- 15) Click *Save* button to store the data
- 16) Wait until the recording finish
- 17) Repeat from step 2) if needed

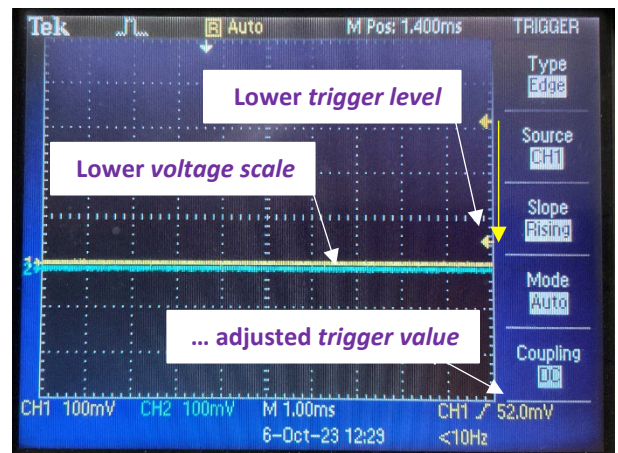


Figure 4

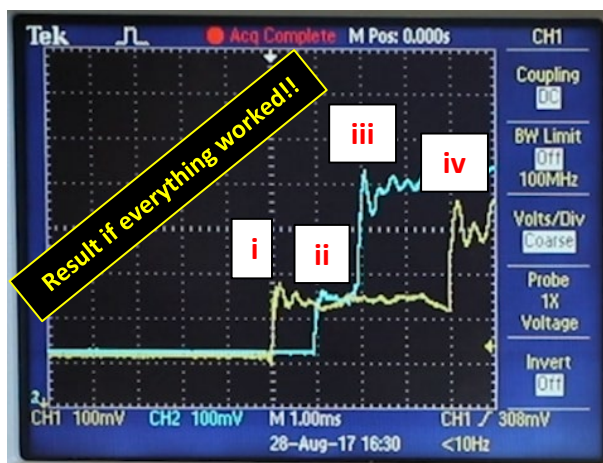


Figure 5

[i] The 1st pressure rise corresponds to the primary shock travelling along the tube (from *Sensor-1*, yellow line)

[ii] The 2nd pressure rise occurs due to the shockwave reached the end of the driven tube (the *Sensor-2*, blue line)

[iii] The 3rd pressure rise occurs due to reflected shockwave of the end of the *driven tube* reaches the *Sensor-2*

[iv] The 4th pressure rise occurs due to reflected shockwave of the end of the *driven tube* finally reaches the *Sensor-1*