Internal Vernier calliper tool built for wellhead investigation.

- Design brief:
  1) To develop a tool enabling in singular operations the ability to **visually** penetrate the wellhead to determine the inner structure dimensions.
  2) To develop a tool enabling in singular operations the ability to **mechanically** visually penetrate the wellhead to determine the inner structure dimensions.

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Specifications.

- Weight: 28kg in air
- Height: 2570mm
- Diameter: 540mm at circular base
- Hydraulics:
  Pressure = 1500psi minimum. 3000psi maximum.
  Supplied with two x 3 mtr long hoses with -4 jic female swivel ends.
- Please ensure the speed of the cylinder extend and retract is set to clients request by adjusting the supplied flow controls at the end of the hydraulic hoses.

Hydraulic connections.
Please set the cylinder extend and retract speed prior to deployment.

ROV fly's the tool onto well head using the supplied ROV manipulator handle while orienting the three guide legs arounds the THREE existing ‘broken stub’ sections.

The tool penetrates inside top of wellhead when installed.

The hydraulic cylinder is then activated to SLOWLY run the Vernier tool inside the well head whilst simultaneously observing the red and black measuring scales and Vernier scale.

Mock up of wellhead shown with Vernier tool in place.

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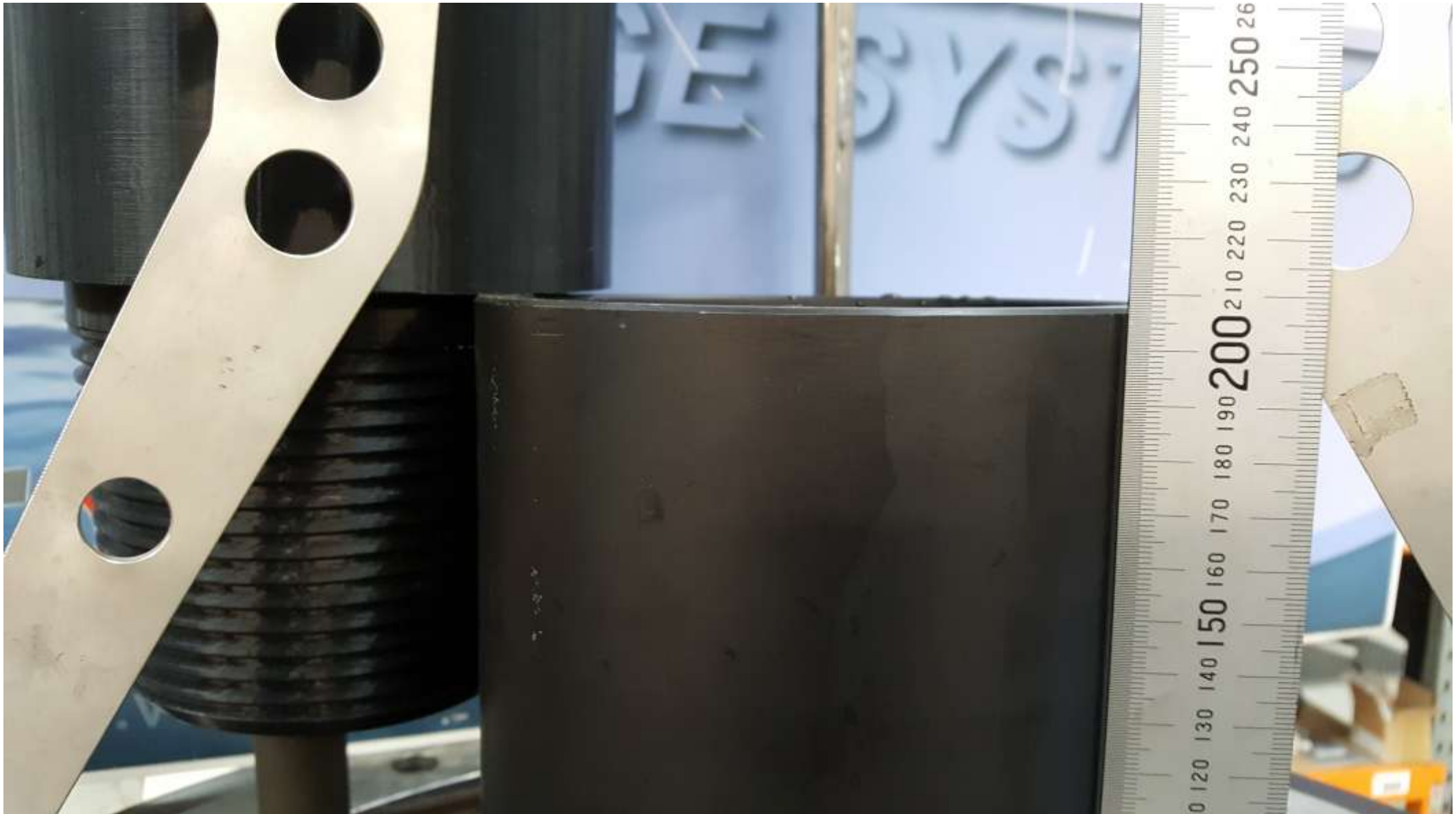
Mock up of wellhead shown with camera mounted in place of the Vernier tool.

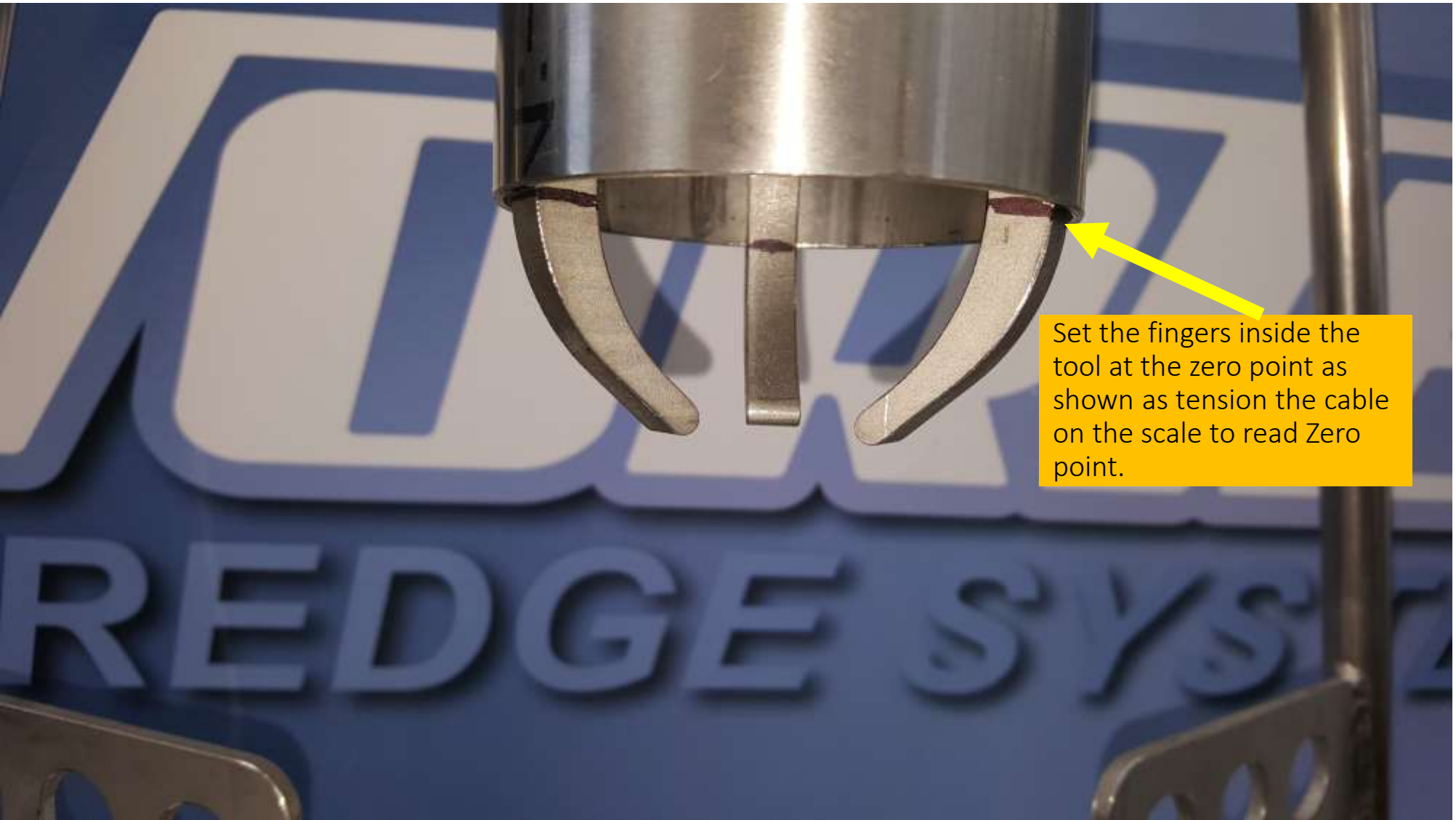
Mock up of wellhead shown with camera mounted in place of the Vernier tool.

Mock up of wellhead shown with Vernier tool in place showing height of threaded joint.



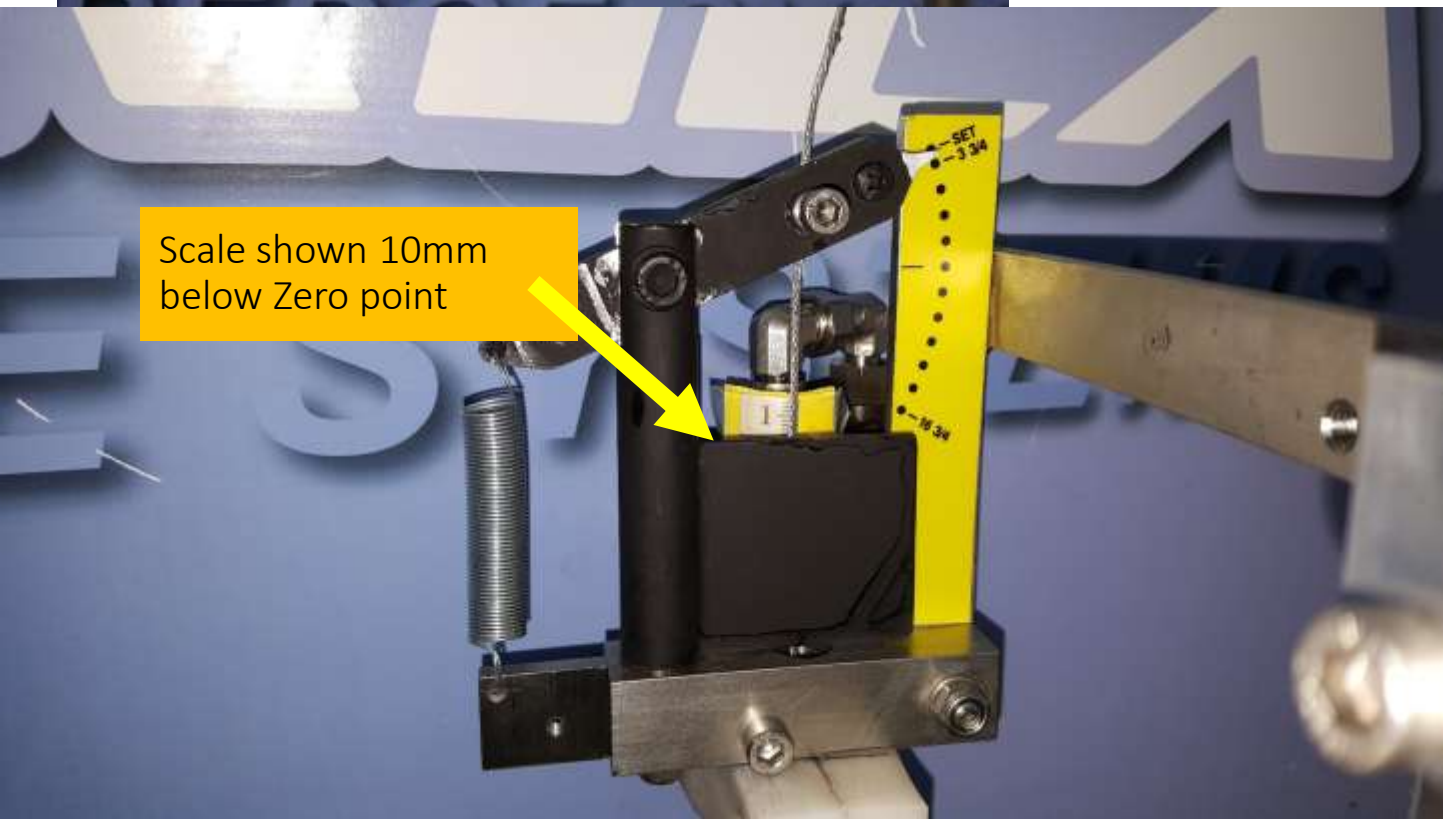
Vernier caliper assembly.

How to set the cable between the caliper fingers and the Vernier scale.



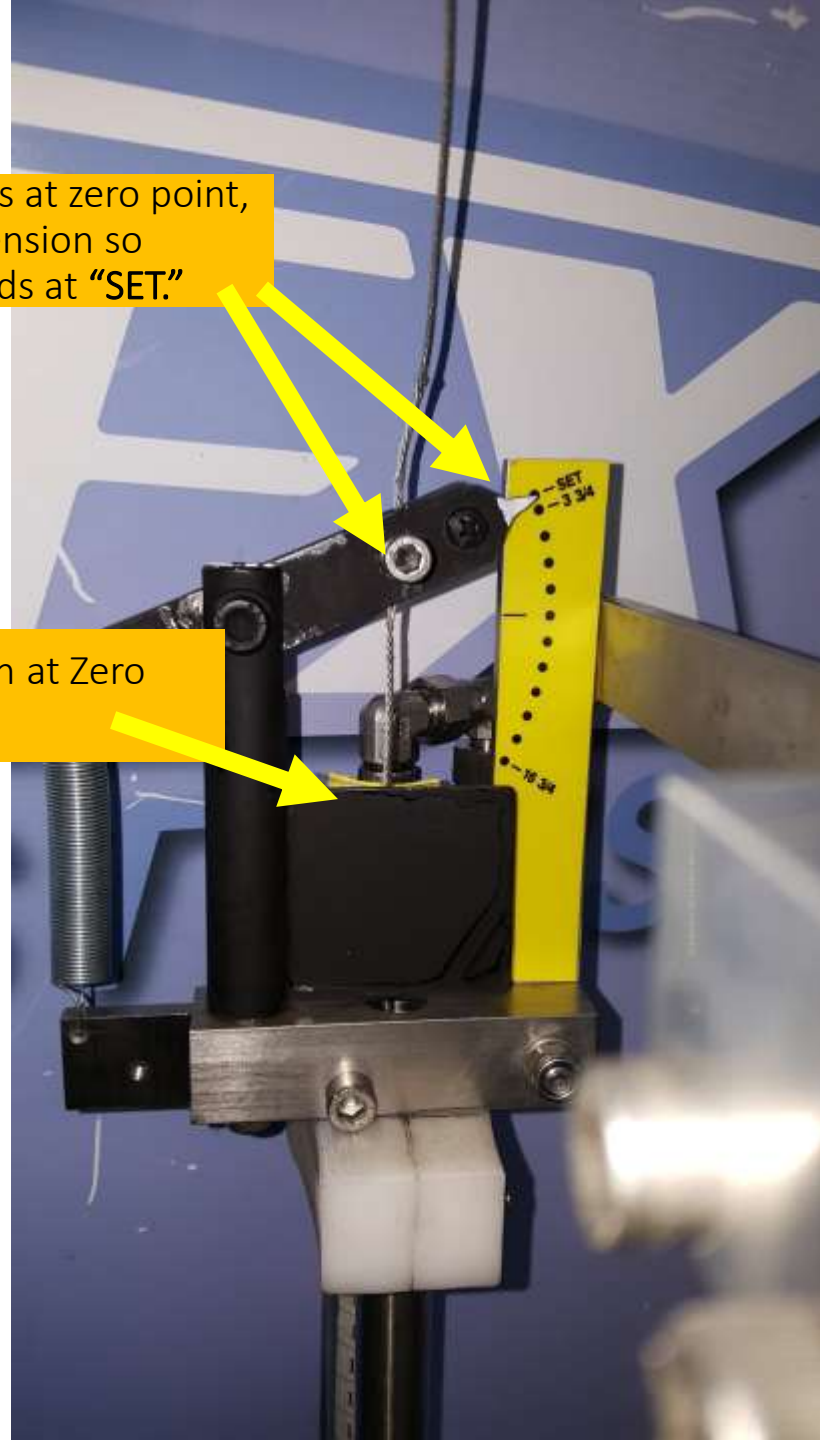
Caliper fingers at zero point.

Fingers shown at Zero point



Scale shown 10mm below Zero point

With fingers at zero point, set cable tension so Vernier reads at **“SET.”**



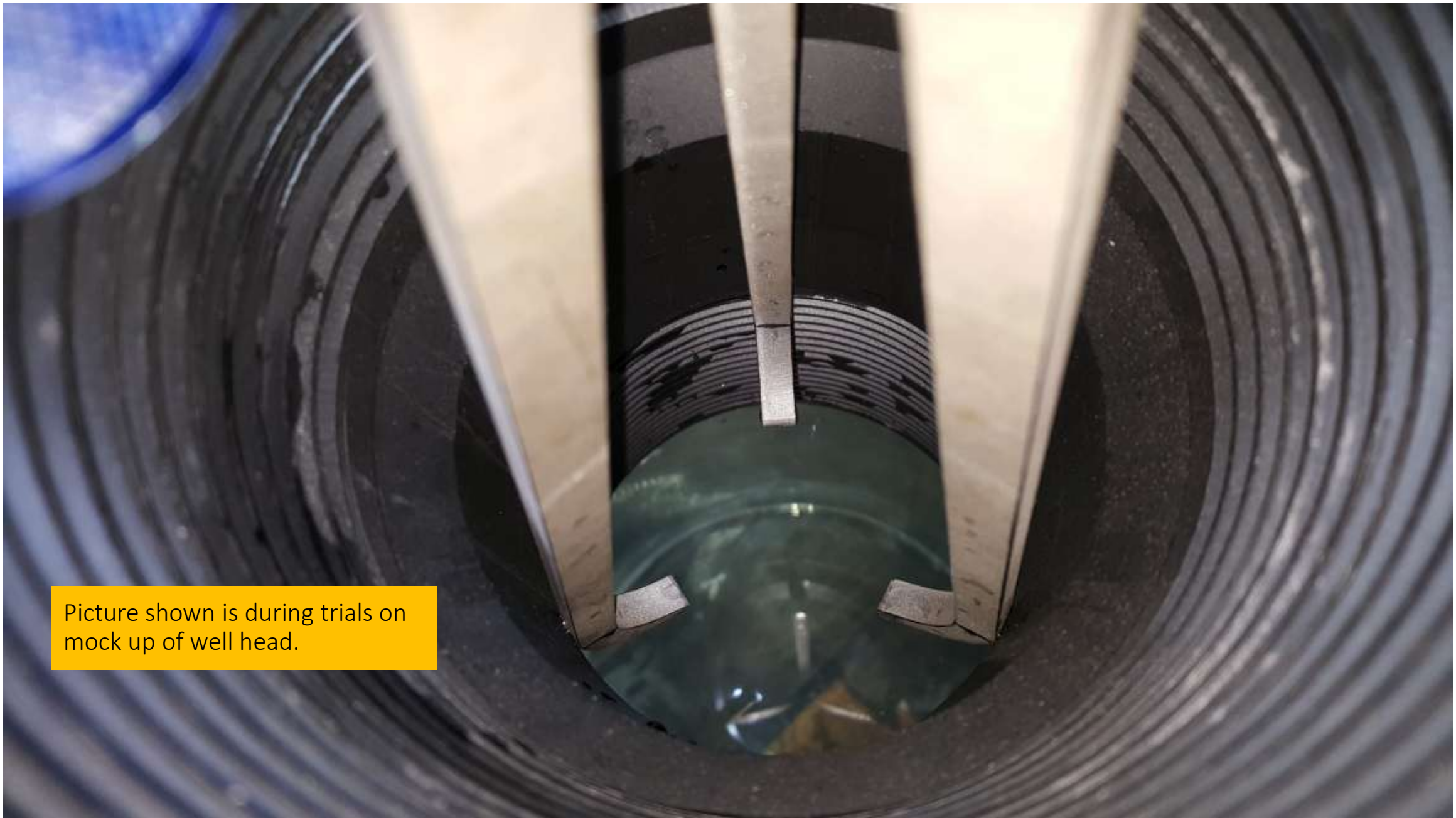
Scale shown at Zero point

Yellow scale and black numbers on the left showing Vernier at beginning of 3 ¾” thread centre transition.

Vernier at beginning of 3 ¾”thread centre transition.

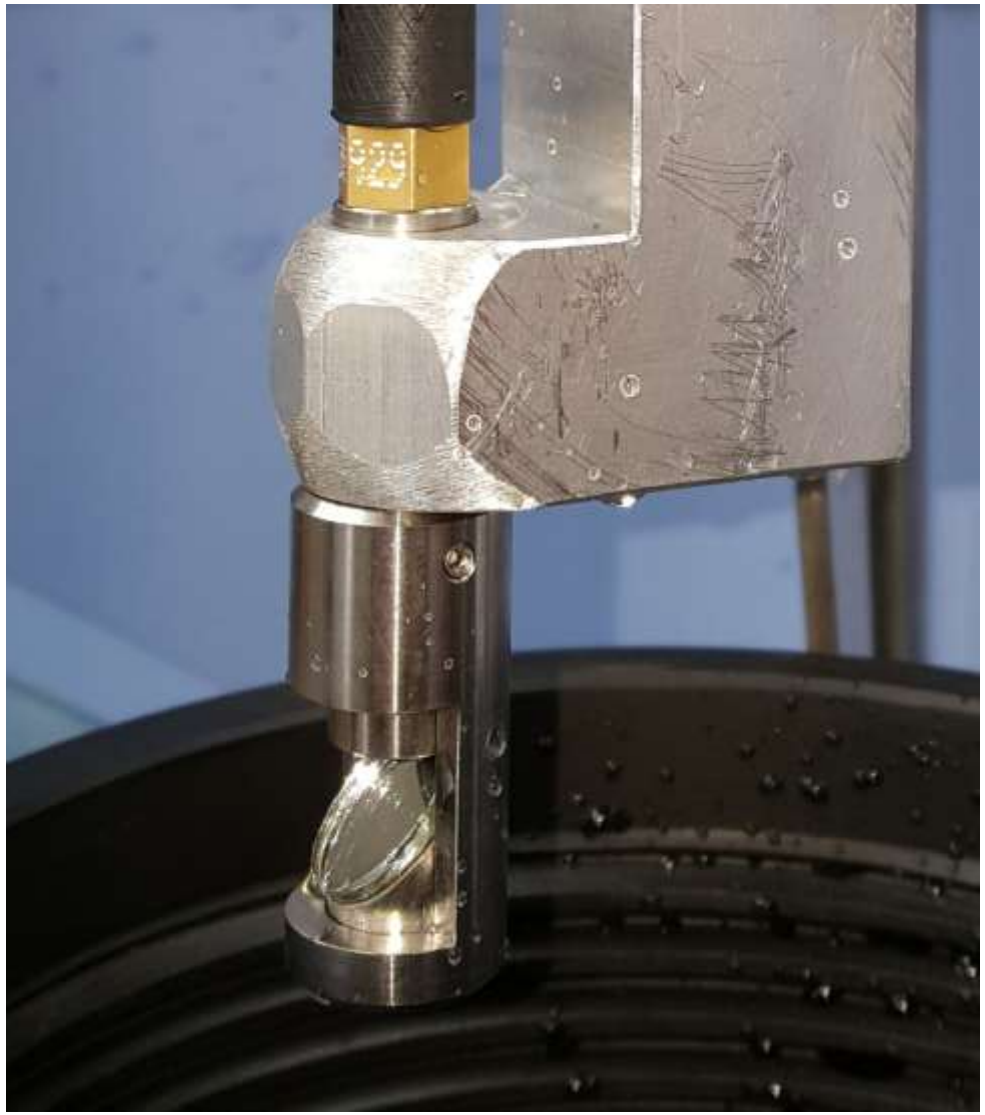
Yellow scale and black numbers on the left showing Vernier at end of 3 ¾”thread centre transition.

Vernier at end of 3 ¾” thread centre transition.



Yellow scale and black numbers on the left showing Vernier at first full 16 ¾” section touching 16 ¾” diameter.

Right angle camera assembly.



Right angle camera at zero point.

RED scale on the right when camera is at zero point as shown.

Use the RED numbers on the right.

Right angle camera at beginning of transition to 16 ¾”. Use the RED numbers on the right.