

881135 - 3G ESP Cartridge Redesign

Week 49

1. Doug Pargett
 - a. Meetings with Function to review design status.

Week 45

1. Doug Pargett
 - a. Meetings with Function for the new Archive only cartridge.
 - b. Redesigning the G3 ESP spindle assembly for the Function cartridges.

Week 44

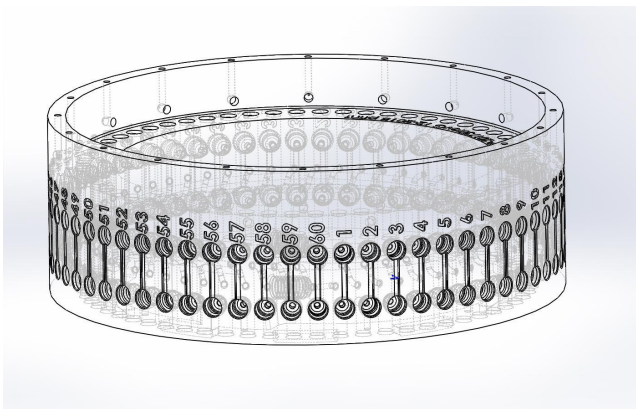
1. Doug Pargett
 - a. Meetings for the
 - b. Redesigning the Toroid Valve array and several other parts.

Week 43

1. Doug Pargett
 - a. Redesigning the G3 ESP toroid valve array and cartridge mounting system to use the new Function cartridges.
 - b. Meetings and discussions about cartridge springs and testing.

Week 42

1. Doug Pargett
 - a. Started redesign of toroid array... about 10% done so far. Lots of other parts in the G3 system will need to be redesigned as well.



b.

Week 41

1. Doug Pargett
 - a. Built up an actuator and single cartridge seawater valve for the Tower instrument. Installed and upgraded Tower.
 - b. Develop a few concept designs of valve push/pull and release mechanisms to possibly replace the spring return system that is getting stuck. One concept is quite promising.

Week 40

1. Doug Pargett
 - a. Developing a push and pull valve pin grabber

Week 39

1. Doug Pargett
 - a. Testing cartridges and spring

Week 38

1. Doug Pargett
 - a. Testing new cartridges at pressure
 - b. Testing of PV actuation forces
 - c. Designing new toroid valves for bench instruments.

Week 37

1. Doug Pargett
 - a. Testing cartridges and forces to actuate valves

Week 36

1. Doug Pargett
 - a. Testing the new cartridge at pressure.

Week 35

1. Doug Pargett
 - a. In the few hours I could be onsite this last week, I helped modify the Alpha 3 cartridge and it passed pressure testing.
 - b. Picked up equipment from Function in Palo Alto.

Week 34

1. Doug Pargett
 - a. Pressure testing of Alpha 3 cartridge
 - b. Setting up to test a press fit seal pin on cartridges

Week 32

1. Doug Pargett
 - a. Vacuum testing of V2.2 cartridges with Nadia
 - b. Dropped off the Stumpy ESP Instrument and equipment at Function's Palo Alto office.

Week 29

1. Doug Pargett
 - a. Following the design mods and tests, commenting when needed.

Week 28

1. Doug Pargett
 - a. Investigated a proposed plunger material change.

- b. FEA work on thermal heating of the cartridges to try and predict how proposed changes might work with the existing heater.

Week 25

1. Doug Pargett
 - a. Ran several FEA analyses on proposed mods to the alpha 3 cartridge.
 - b. Meetings

Week 23

1. Doug Pargett
 - a. Running FEA of Alpha 3 design. Looks promising, still have some questions on a seal arrangement.

Week 22

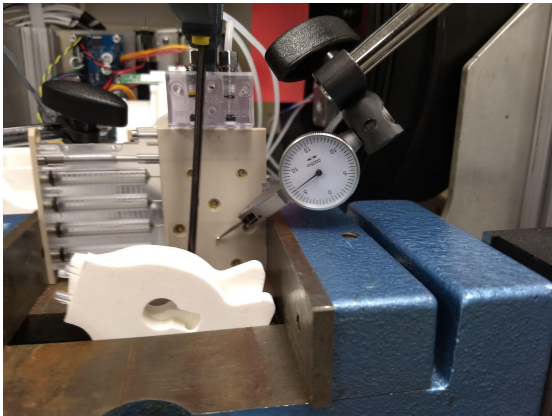
1. Doug Pargett
 - a. Testing cartridge fastener strength
 - b. Reviewing the newest alpha 3 design

Week 21

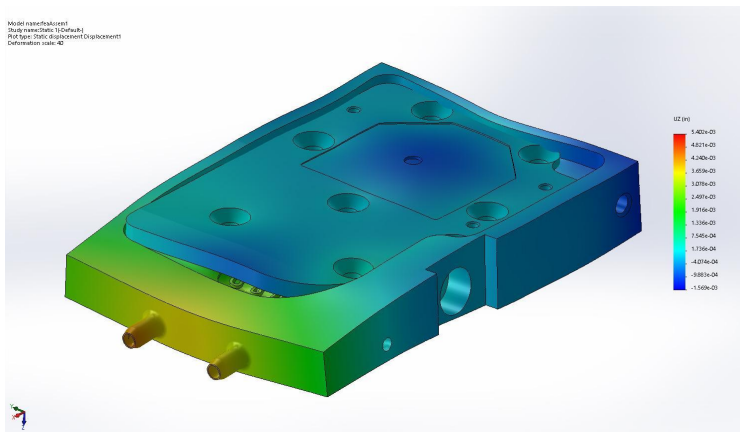
1. Doug Pargett
 - a. More testing of cartridges to narrow down the leak path.
 - b. FEA of the model to try some new options

Week 20

1. Doug Pargett
 - a. Lots of cartridge testing and FEA analysis



b.



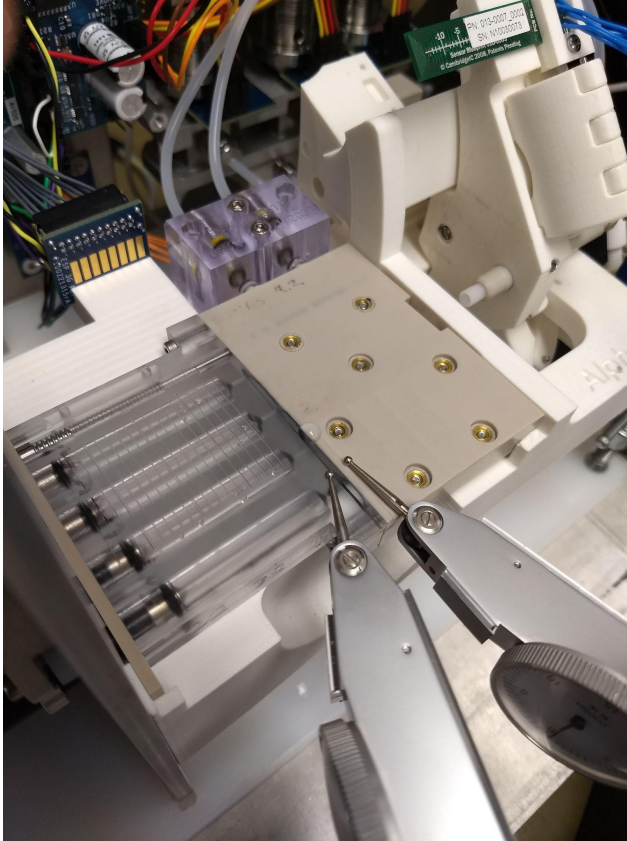
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Week 19

1. Doug Pargett
 - a. Lots of cartridge testing.

Week 18

1. Doug Pargett
 - a. Pressure testing new cartridges, seal mods and assembly methods.



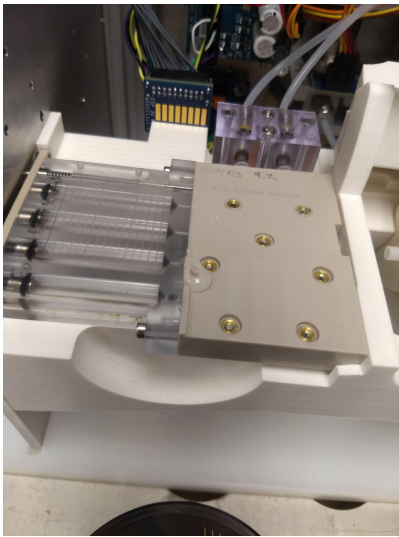
b.

Week 17

1. Doug Pargett
 - a. Reviewing new cartridge designs to try and find possible leak sources.
 - b. Inspecting parts and assemblies
 - c. Setting up method to measure cartridge deformation while testing new cartridges.

Week 15

1. Doug Pargett
 - a. Assisted in pressure testing of new test cartridges. We found some more leaks, but getting closer to the goal! Will likely need torque tools to pre-load screws correctly during assembly.



- b.
- c. Ordered lab tools to help measure part deformation when testing cartridges. We may need to “shape” some components to better seat the seals during assembly.

Week 14

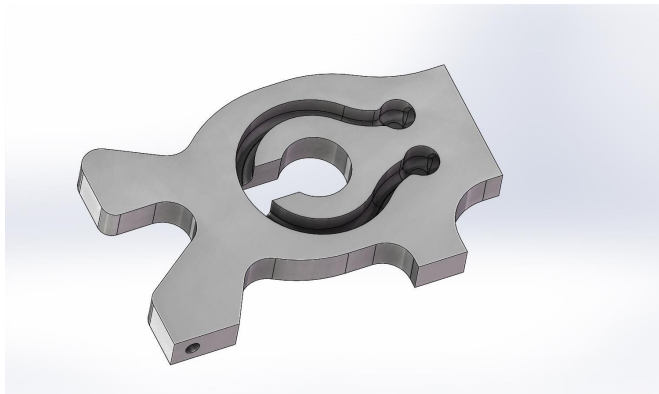
- 1. Doug Pargett
 - a. Pressure tested the FrankenTower.
 - b. 1st run of new cartridge tests (on parts that we knew had manufacturing problems) showed check valve leaks.

Week 13

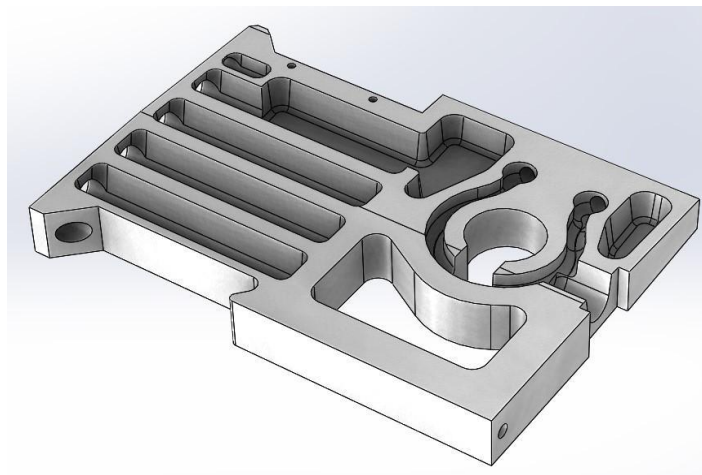
- 1. Doug Pargett
 - a. Redesigning new toroid valves to have retaining-hardstop clips removable when the instrument is fully assembled. This allows for a valve to be removed and have the seals replaced while the mechanism /instrument is fully assembled. In the last couple of weeks, we needed this benefit of the old system.

Week 12

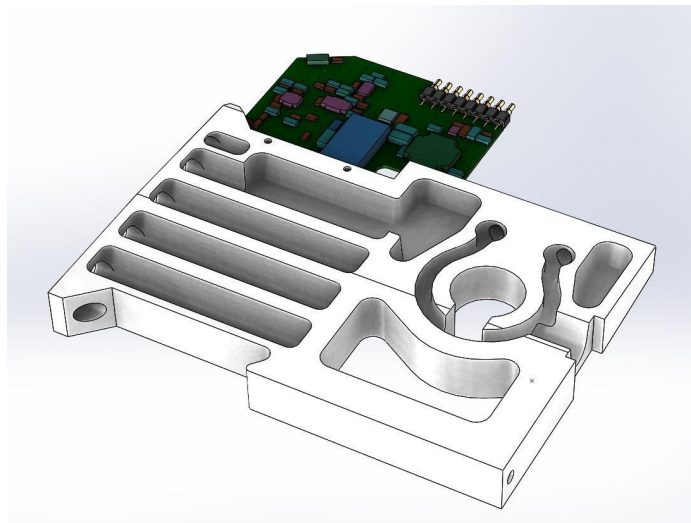
- 1. Doug Pargett
 - a. I designed a new “blank” cartridge that matches the porting and geometry of the new G3 ESP cartridges. The old blank cartridges were called “Fish” due to their shape. It is unlikely we can continue to call these “Fish”. Perhaps “Not A Fish”



- b. A Fish:



- c. Not A Fish:
- d. These also have the capability of accepting a small electronics board and that would upgrade the blank cartridge to be "Smart".



- e. Smart Not A Fish:

Week 10

- 1. Doug Pargett
 - a. ESP Tower has been pressure calibrated, pump installed, and oil chamber filled.
 - b. Setting up for static hydrotest, and pressure testing of Tower with a mock-cartridge.

Week 9

- 1. Doug Pargett
 - a. Our equipment is back and the team is meeting with Function on their status and next steps.
 - b. Calibrating the Tower instrument's pressure sensors for High Pressure testing of the new cartridges.

Week 8

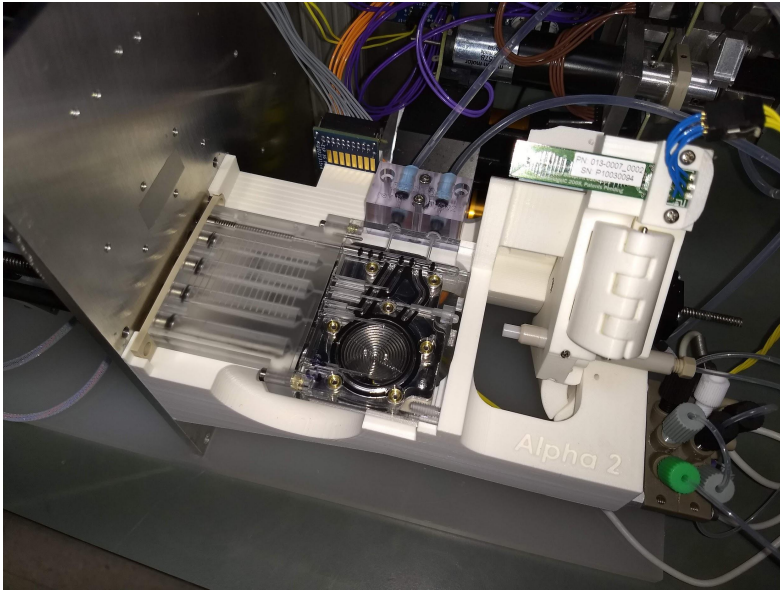
- 1. Doug Pargett
 - a. Function had a problem with a component on the single cartridge ESP they are using. I got them a replacement part from our other instrument, and gave them direction on how to replace it.

Week 7

- 1. Doug Pargett
 - a. Got the Stumpy instrument to Function for testing the new cartridges.

Week 6

1. Doug Pargett
 - a. Rebuilt the single cartridge ESPs to work with the newest test cartridges.



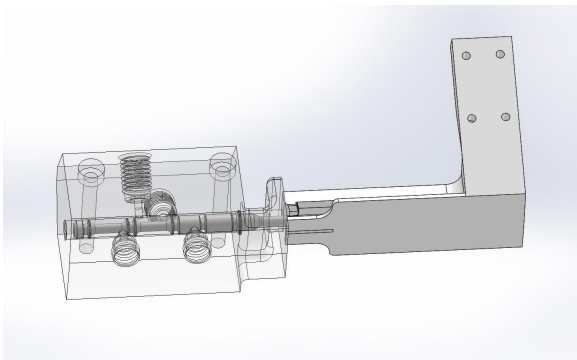
b.

Week 4

1. Doug Pargett
 - a. Sent new cartridge port coupling to Protocafe for 3d printing.

Week 3

1. Doug Pargett
 - a. Revising Toroid Valve for Alpha 2.2 cartridges



b.