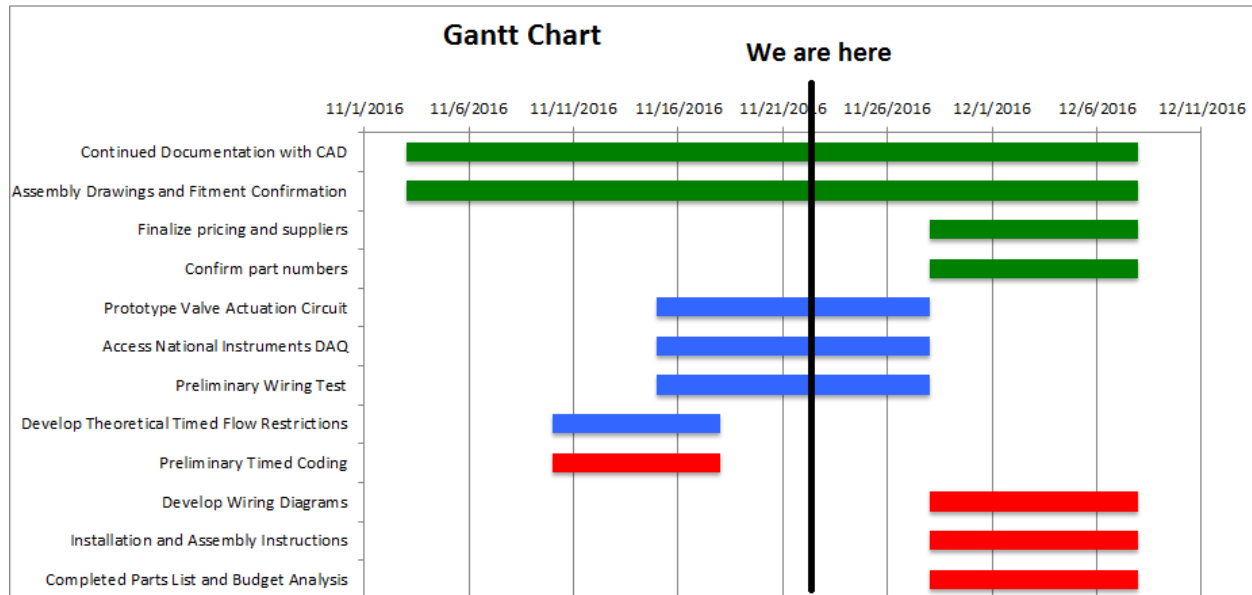


## Senior Design Group P17453

### Detailed Design Progress Report

November 22<sup>nd</sup>, 2016

Recapping from our previous design review:

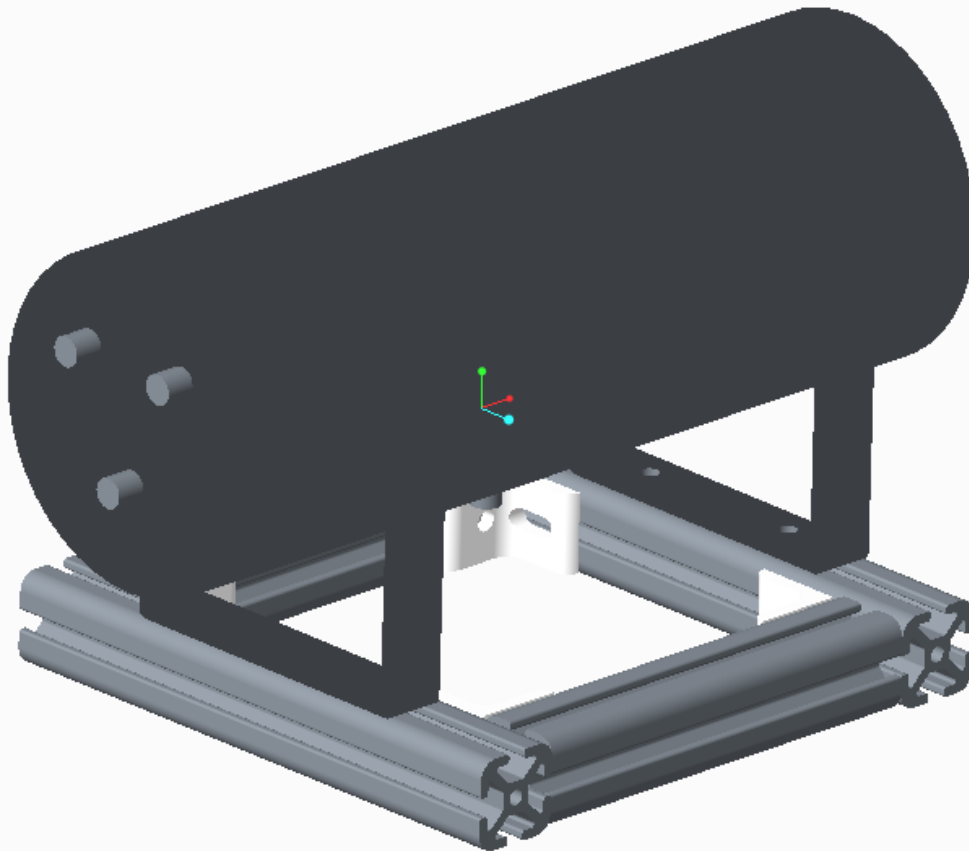


#### Completed tasks:

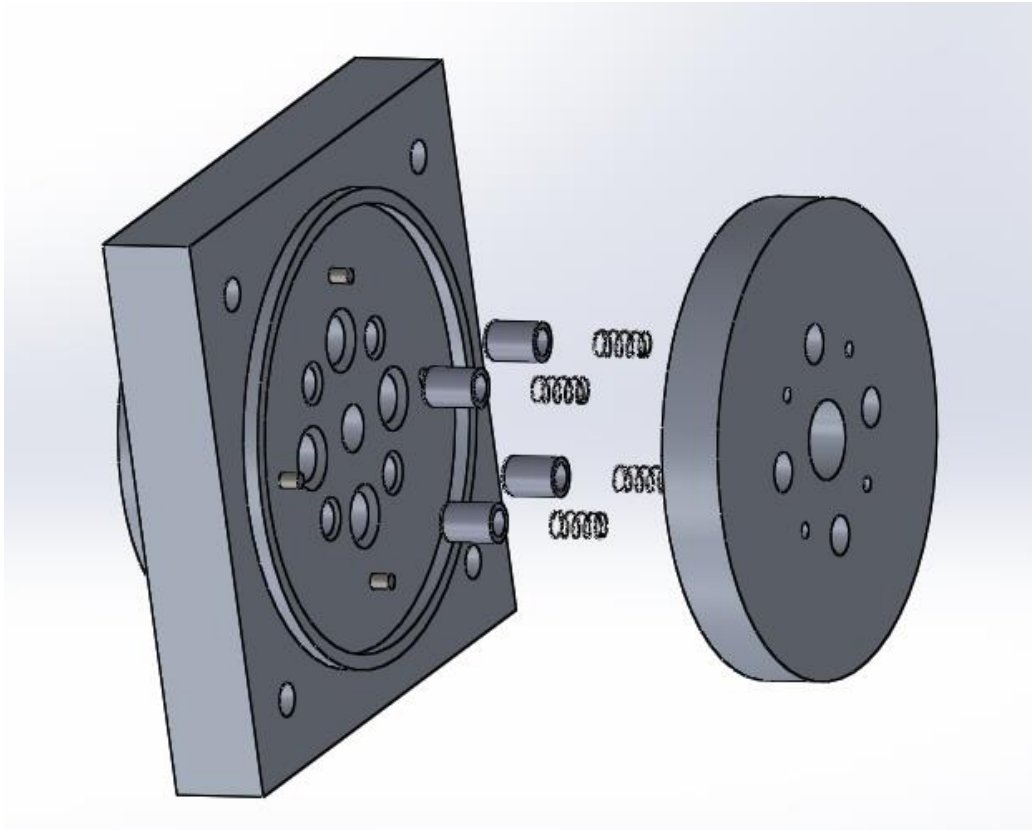
- CAD modeling of our 8020 frame for the discharge tank
- Updating other various CAD models
- Decision to isolate pressure vessel with damping (separate from 8020 frame)
- Populating the Edge site with files
- Pricing on various parts to be ordered
- Back pressure vessel ordered & received to help finalize dimensions
- Updated matlab code for different orifice size
- Update draft of bill of materials
- Created draft wiring diagram flow chart
- Created draft test plans for MSD II
- Set final design review goals

Tasks to be completed before final design review:

- CAD drawings for machined/ modified parts (Ryan, Brandon)
- Finalize CAD parts/ assembly for new discharge tank mounting dimensions (Ryan)
- Finalize Bill of Materials (Brandon)
- Update Risk Assessment (Carvey)
- Test the solenoid driver we have with a MyDAQ (Alex)
- Populating the Edge site with updated files (Ryan)
- Uploading screenshots and requirements for the final design review page (everyone)
- We must contact a distributor for Parker to get pricing on their solenoid valves.(Alex)



*Purchased air tank mounted on 8020 Aluminum*

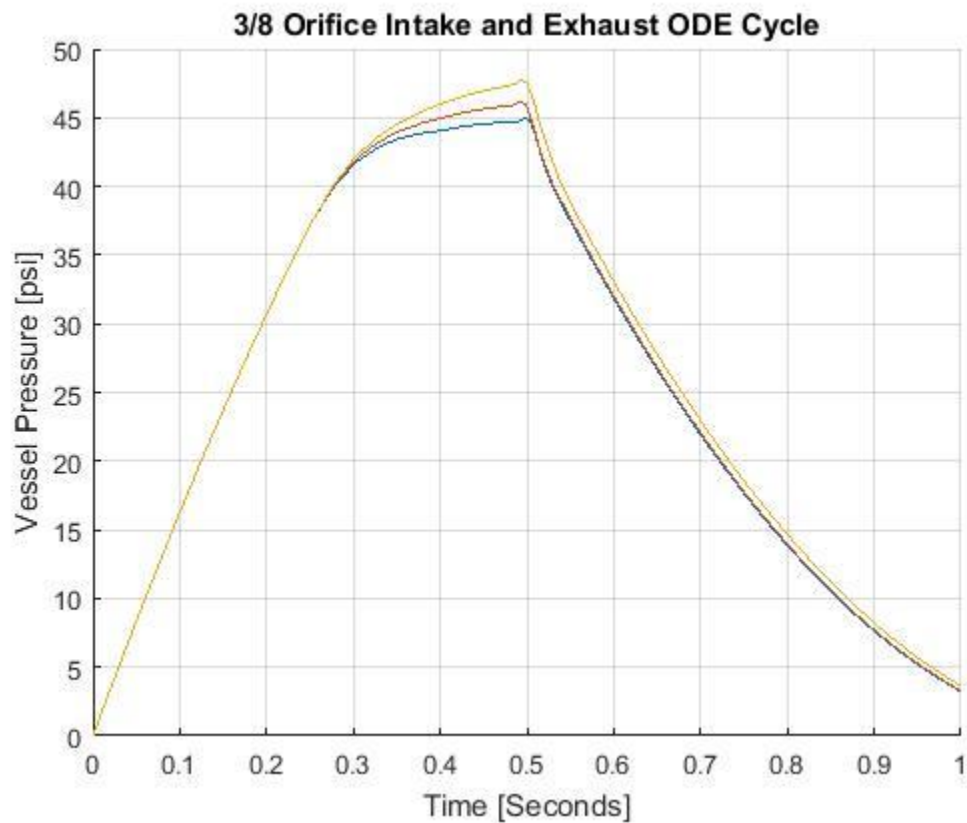


*Exploded view of Valve Assembly*

Team Part #	Manufacturer's Part #	Item Description
1	-	Intake Vessel (P16452's)
2	-	Valve Seat Block (P16452's)
3	06F23C2140AC F	Inlet Solenoid Valve
4	06F23C2140AC F	Outlet Solenoid Valve
5	52754	Safety Relief Valve (P16452's)
6	67CH	Pressure Regulator (P16452's)
7	2X25V2	Dual 25 amp PWM Motor Driver (P16452's)
8	1515	8020 Extruded Aluminum for Frame 54" LG
9	VXT1500	1.5 Gallon Air Tank with 6 x 1/4" Ports
10	1374N17 50A	Adhesive Rubber Sheet 6" x 6" x 1/4" 50A
11	02255859	Valve Housing Block, 8" x 8" x 1" Plate
12	02255859	Back Pressure Collector Vessel, 8" x 8" x 1" Plate
13	-	Tubing, Adapters, etc.
14	-	MyDAQ
15	1515	T-Slot Extrusion 15 Series
16	4295	Inside Corner Bracket
17	3286	T-Nut
18	3066	Cap Screw for T-Nuts
19	ISOMASPAD SKR 181834	Vibration Isolation Pad
20	5238K738	3/8" ID 270 PSI PVC Tubing, 10 ft

*Bill of materials (additional information on actual working document)*

Design decisions:



*Matlab plot of poppet pressure versus time*

- Solenoid valves must be of minimum 3/8ths orifice size in order to achieve desired frequency
- Poppet flow characteristics will have minimal effect on test bench performance (flow coefficient varied from .5 to .7)
- Anti-vibration mat will be purchased so that our poppet valve manifold is isolated from our solenoid valves and any other possible interference.

Questions/Concerns:

- Will we have access to a MyDAQ before the design review to test the solenoid driver?