

MSD Team P17453

Weekly Update

Week 9

3/23/17 - 3/30/17

Weekly Accomplishments:

- Calibrated back pressure regulating valve
- Updated Bill of Materials with muffler attachments for exhaust valve and o-ring grease
- Updated Problem Tracking
- Learned how to duty cycle the solenoid valves if necessary
- Ordered muffler and o-ring grease
- Did more preliminary tests to look at the frequency spectrum of a few different valve timing configurations
- More progress on technical paper and poster

To do by next week:

- Install o-ring grease and exhaust muffler
 - Verify muffler does not hinder performance
- Finalize system timing to match the real compressor pressure curve better
- More Vibration/consistency testing
- Continue working on poster and technical paper
- Continue to update Edge website
 - Begin going through and cleaning up older web pages

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Meeting Notes

3/28/17

Meeting Accomplishments:

- Received correct back pressure regulator
 - Calibrated to about the correct back pressure
- Updated Bill of Materials with muffler attachments for exhaust valve
- Updated Problem Tracking
- Worked on adjusting timing on solenoid valves to better copy pressure curve
- Figured out how to do a duty cycle in SignalExpress
 - Rewired DAQ for the duty cycle
 - Need to fix timing on solenoid valves to better replicate pressure curve
- More progress on technical paper
- Added teammates as Imagine RIT Exhibitors on imagine.rit.edu

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Meeting Notes

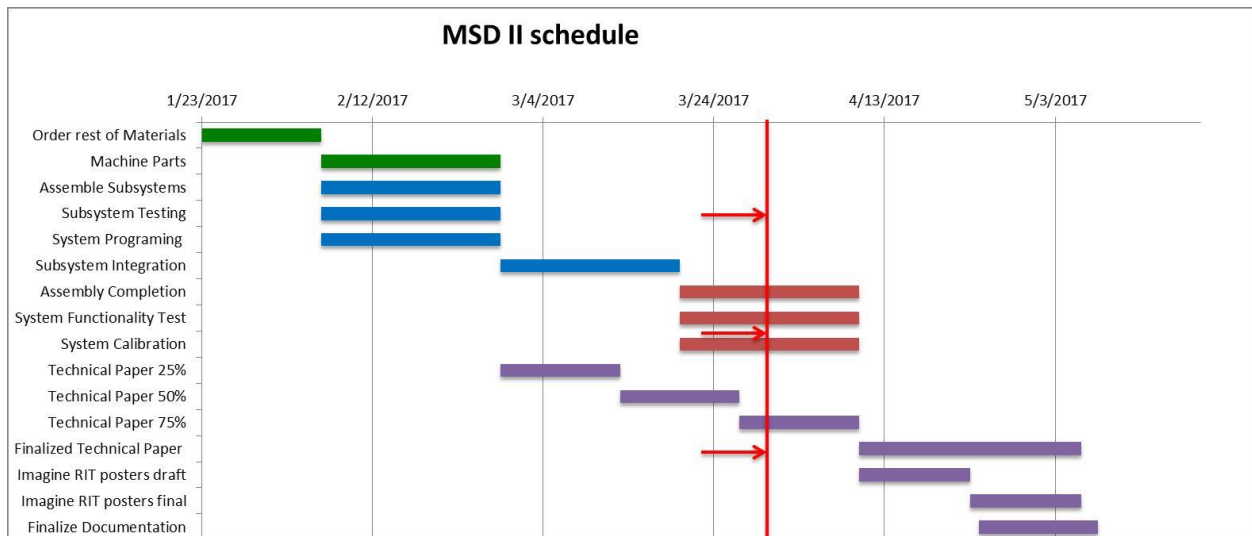
3/30/17

Meeting Accomplishments:

- Ordered muffler attachments for exhaust valve and o-ring grease to hold o-rings in place
- Updated Bill of Materials with o-ring grease
- Discussed timing the solenoid valves to leave a time when only the poppet valves are open at the crest of the pressure curve
- Did more preliminary tests to look at the frequency spectrum of a few different valve timing configurations
 - Instant switch from intake to exhaust
 - Exhaust opens a little before intake closes
 - 100ms gap of both intake and exhaust closed, two tests for both sets of springs
 - The data still needs to be analyzed
- More progress on technical paper and poster

	Identifying & Selecting Problem PSP 1	Analyzing Problem PSP 2	Generating Potential Solutions PSP 3	Selecting & Planning Solution PSP 4	Implementing Solution PSP 5	Evaluating Solution PSP 6
Rating	R1	R2	R3	Y4	Y5	G6
CRITICAL	Solenoid valve coils don't fit on new solenoid valves	The previous team's solenoid coils don't fit onto our valves	Drill out hole to make them fit, buy new solenoid coils	Dr. Kolodziej suggested buying new solenoid coils	Added correct coils to BOM and placed order	New coils received and successfully tested on valves.
	Metal shavings discovered between collector and valve housing	Metal shavings were found to be magnetic indicating they are not from any of the aluminum parts	It is likely that these shavings were picked up in the CNC left over from a previous job	All components will be cleaned and the system will be run again and checked for shavings	All components have been cleaned and tested, pending inspection for additional material	
MAJOR	Valve control loop not producing even signals	DAQ Signal Express has processing delay between loops	Find alternative control system or compensate for the delay	Consume the delay in one of the necessary hold delays during valve actuation	Recorded LED indicators and measured time delay, subtracted that from a valve actuation delay	Signal express now gives even signal to valve drivers.
	3/8 Hose Barb fitting does not thread into hole in collector	Tapered NPT thread on collector was tapped in wrong direction	Increase hole size, retap and purchase larger fitting. Retap in correct direction if possible	Rob advised that retapping the hole in the correct direction would work just fine.	Hole was retapped and the fitting threaded in successfully	No leaks were observed at the joint in question.
	System is excessively loud	Exhaust port airflow produces a lot of sound	Locate a muffler to be used on the exhaust port to quiet it down	Reasonable muffler found on Grainger for this application	Order placed 3/30/2017	
	Pressure regulator does not hold a constant pressure in the back pressure tank	Terminology research indicates the difference between pressure and backpressure regulators	Determine the correct regulator and place an order for it	Correct style and fit backpressure regulator has been found	Order placed 3/9/2017	New regulator functions as desired and maintains a far more steady back pressure.
ORDINARY	How to mount solenoid valves on 8020 frame	There are no mounting threads or surfaces on the valves	Zip-ties, Velcro ties, hose-clamps, L-bracket between valve and hose	L-bracket would look and work the best, relatively easy to implement	L-bracket design completed with parts on order	L-Brackets machined and assembled with success
	Relief valve not rated for our pressures	The previous existing team's relief valve is not rated high enough	Order new pressure relief valve	Part will be purchased	Part has been added to BOM and will be ordered	Correct part received, installed, tested, and confirmed as correct
	Frame wobbles on the table top	8020 cannot be assembled completely square and level	Create feet for the frame with some adjustability to level.	Rubber strips can be bonded to the bottom of the 8020 frame as feet	Rubber strips cut to size were attached using epoxy to the bottom of the frame	The frame no longer wobbles

Updated Problem Tracking: Revision I



Gantt Chart: Team progress through week 9.