

MSD P18102: Customer Interview

1. What do you currently look at when purchasing a model rocket engine?
 - Engine last thing to buy
 - Mostly look at thrust
 - Make rocket
 - Weigh rocket
 - Decide on thrust
 - Burn time as well
 - Mass of engine
 - Thrust curves
 - What decides what your thrust curve
 - Long burn time and then ok thrust
 - This engine can get a rocket weighing

2. What performance do you need from an engine (max thrust, specific impulse, run time etc)
 - in this range to at least 30,000 feet
 - Make assumption on mass of rocket
 - Goal is to have engine max at 100 lbs
 - Payload is 10 lbs
 - Assume 150 lb rocket
 - Volume of chamber is changing as you burn
 - Want constant thrust
 - O/F ratio changes
 - Keep area constant based on grain shape
 - Want constant O/F ratio and \dot{m}
 - Wouldn't mind throttling but not hard requirement
 - Need to keep at constant thrust
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 - Potentially test at different mass flow rates
 - Design to MAX thrust
 - Want as much off the shelf things we need to buy
 - Not off the shelf: injector, nozzle,
 - Test fire goals:
 - O/F ratio
 - Flow rate through the valves
 - Throat flow rate
 - Temperature and pressures
 - Measure thrust
 - Isp, C* Cf

3. What level of throttling do we need to achieve? 80%
 - Need to be able to throttle some while in flight to get to EXACTLY 30,000
 - Potentially test fire at different throttle levels
4. What are the desired attachment points from the engine to the rocket?
 - Usually engines attachment involves:
 - Force plate transfers the loads to the structure
 - Retention ring keeps the engine from falling
 - Engine controller hardwired
 - Thermal isolation
 - Tanks are somewhat shoulds- need to consider realistic tanks that meet burst pressures
 - Goal is to develop realistic tank and pressurant system. More discussion on how realistic/hard these requirements are
5. Where will telemetry go from sensors on the engine? Are we going to have an umbilical connection that goes to the rocket? Or is the engine responsible for transferring its own data to the ground?
 - Will have to send telemetry from engine to rocket flight controller to then get sent to ground
 - Wired connection
 - Engine controller will receive desired signal from rocket flight computer and then is responsible for making sure engine throttles at that level

Other Notes

- Engine will need its own independent power source
- After launch, rocket will break into 3 pieces and parachute back down to ground