

Team Propulsion Homework

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UDMH, $I_{sp} = 333$

Single-stage LV will not work for this propellant.

Need to increase I_{sp} or decrease inert mass.

Total prop: 2-stage LV: 0.8154 kg

Total launch mass: 2-stage LV: 0.8997 kg

Total prop: 3-stage LV: 0.6232 kg

Total launch mass: 3-stage LV: 0.6882 kg

LOX + LH, $I_{sp} = 450$

Total prop: Single-stage LV: 0.4260 kg

Total launch mass: Single-stage LV: 0.4713 kg

Total prop: 2-stage LV: 0.1450 kg

Total launch mass: 2-stage LV: 0.1622 kg

Total prop: 3-stage LV: 0.1310 kg

Total launch mass: 3-stage LV: 0.1468 kg

Shuttle SRB, $I_{sp} = 250$

Single-stage LV will not work for this propellant.

Need to increase I_{sp} or decrease inert mass.

Total prop: 2-stage LV: 13.9483 kg

Total launch mass: 2-stage LV: 15.3458 kg

Total prop: 3-stage LV: 5.5144 kg

Total launch mass: 3-stage LV: 6.0685 kg