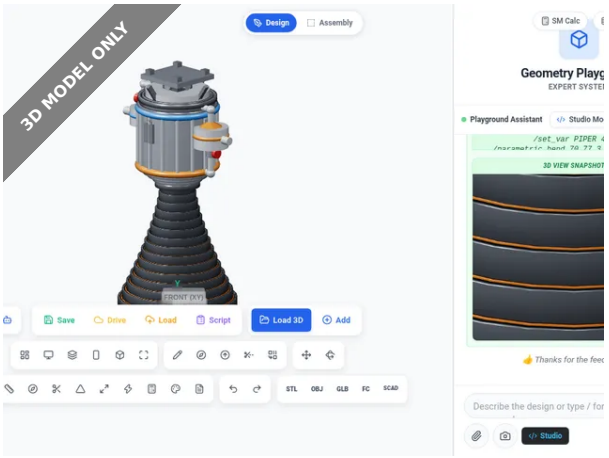

Customizable Methalox Rocket Engine Assembly Model (300 mm, 111 Parts)

TrueGeometry

VIEW IN BROWSER

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Summary

Full-flow staged-combustion style rocket engine display model - parametric, rebuild it in the browser with sliders

Learning > Engineering

Tags: display parametric rocket model nozzle education customizable engine turbopump methalox

A 111-part display model of a full-flow staged-combustion methalox rocket engine: hollow bell nozzle with copper liner, hollow combustion chamber, injector plate with 13 injector posts, 16 external cooling tubes between bronze and LOX-side manifold rings, methane and LOX turbopump housings, feed lines, two main valves, flanges, four mounting brackets with struts, and a gimbal block with thrust plate and lifting lugs. Exactly 300 mm tall with a 150 mm nozzle exit.

CUSTOMIZABLE: the model is built from one parametric TrueGeometry Playground recipe. Seven $VAR sliders ($EXIT, $TLEN, $THRT, $CHAM, $WALL, $TUBER, $PIPER) drive the main dimensions - open the recipe in the browser, tick Auto-Run, and drag the sliders. No CAD install needed.

Honest limit: the bell-nozzle station positions are generated numbers tied to the default dims, so sliders rescale the landmark parts but the bell curve shape itself is baked; for a different overall size, scale in your slicer.

Full TrueGeometry Playground commands: in the blog article below and in the attached recipe files (methalox-engine-recipes.zip). The attached guide PDF shows how to run the recipe and customize it with the sliders, step by step with screenshots.

Blog article (full recipe, build notes, printing notes): https://blog.truegeometry.com/0_0_0/blogs/post-5c8807ae.html

Open TrueGeometry Playground (free, in the browser): https://www.truegeometry.com/CoreWebGLTG/KBEAgentHTTP.html

Honest status: an original, simplified display model for teaching and desk display - not dimensioned after any specific real engine, and not a blueprint. Designed and mesh-checked in TrueGeometry Playground; not yet test-printed by us, so treat the first print as an experiment. If you print it, please test and post a Make - your feedback tunes the defaults and helps the community.

The main STL is the full upright assembly exactly as shown on the cover. No supports were modelled in; orient it nozzle-down and slice as one piece, or scale to 50% for a desk model.

AI-assisted design: yes, disclosed in the upload form. License: CC BY 4.0 - free to print, remix and share with attribution.

Model files

1-methalox-engine-assembly.stl

Other files

2-methalox-engine-recipes.zip

3-truegeometry-how-to-run-scripts.pdf

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