

## RockSim & EngEdit – Engine File (.rse) Format Guide

This guide provides a streamlined overview of the .rse engine file format used in **RockSim** and **EngEdit**, including required fields, simulation behavior, and best practices.

Parameter	Required	Description	Purpose
<i>mfg</i>	Yes	Manufacturer name	Metadata & filtering
<i>code</i>	Yes	Unique engine identifier	Primary lookup key
<i>type</i>	Yes	Engine type (e.g., reloadable)	UI metadata only
<i>dia</i>	Yes	Diameter in mm	Used in fit checks
<i>len</i>	Yes	Length in mm	Used in design validation
<i>initWt</i>	Yes	Initial engine mass (kg or g)	Used in burn-time mass formula
<i>propWt</i>	Yes	Propellant mass (kg or g)	Used in depletion calculation
<i>burn-time</i>	Yes	Burn duration in seconds	Used for simulation and integration
<i>Itot</i>	Yes	Total impulse (Ns)	Simulation validation
<i>avgThrust / peakThrust</i>	Yes	Average / peak thrust (N)	Display and validation
<i>delays</i>	Yes	Comma-separated delay values	For engine configuration
<i>auto-calc-mass / auto-calc-cg</i>	No	Enables Rock-Sim to auto-generate mass/CG curves	Uses internal logic
<i>&lt;data&gt;: t / f</i>	Yes	Time vs Thrust data points	Mandatory for simulation
<i>&lt;data&gt;: m / cg</i>	No	Mass and CG over time	Needed if auto-calc is off

## Summary:

Include <engine> with key attributes: code, mfg, dia, len, initMass, propMass, burn-time, delays, and thrust curve in <data> with at least t and f values for each datapoint.

If you omit m and cg values, you must set:

- auto-calc-mass="1" → Rocksim will compute mass using:  
$$m(t) = \text{initMass} - (\text{propMass} / \text{burnTime}) * t$$
- auto-calc-cg="1" → CG is fixed at engine center

Without either the values or the flags, simulation will show incorrect or flat mass/CG graphs.

Optional rendering attributes like tDiv, FDiv, etc., control how graphs are drawn but are not required.

(Note: EngEdit can show curves from data but doesn't currently auto-generate m or cg. Auto calculation only takes place in Rocksim)

## Example XML Snippet (Minimal Valid File)

```
<engine code="E9-6" mfg="Estes" dia="24" len="70" initWt="0.063"
  propWt="0.015" burn-time="1.8" ltot="15" avgThrust="10"
  peakThrust="14" delays="4,6,8" auto-calc-mass="1" auto-calc-cg="1">

  <data>
    <point t="0.0" f="0.0"/>
    <point t="0.2" f="8.5"/>
    <point t="0.4" f="10.2"/>
    <point t="1.8" f="0.0"/>
  </data>
</engine>
```

## Unit Conventions

All measurements should be in SI units:

- Length: mm
- Mass: g or kg
- Thrust: Newtons
- Time: seconds