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# Modern Engineering For Design Of Liquid Propellant Rocket Engines (Progress In Astronautics And Aeronautics)



## Synopsis

From the component design, to the subsystem design, to the engine systems design, engine development and flight-vehicle application, this how-to text bridges the gap between basic physical and design principles and actual rocket-engine design as it's done in industry.

## Book Information

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## Customer Reviews

Excellent updated version of NASA's well known SP-125. It's true that other books such as Space Propulsion Analysis and Design and especially Rocket Propulsion Elements can also provide sufficient overviews of the theory behind rocket propulsion, including liquid rocket propulsion. However, what this provides in addition is an exposition of the practical knowledge and everyday details required in turning theoretical rockets from general specifications on paper to practical working implementations. These practical descriptions and tips are supplemented by the many pictures scattered throughout the book which serve to exemplify far more effectively than the illustrations in other rocket propulsion books I have read. My only complaint about the book is of course that it is in Imperial, rather than SI units. But having to make conversions of equations and constants from this book is a small price to pay for the wealth of in-depth knowledge contained within.

The other reviewers are correct when they say the text is worth the money. However the copy I received had pages that were wrinkled where they formed the spine of the book. The first and last 20 pages or so were affected. It feels as if the stitching was applied while the pages were not completely flat, resulting in a wave in the paper as it's attached to the spine. The book cracked as it opened because the pages flexed (oil canned at the spine) as you turned them. Disappointing because it was carefully shrink wrapped when I got it. Of course I quickly replaced it but the next specimen off the publisher assembly line was far worse, all the pages were affected, and in the end it is probably the 'replacement' I will send back. I still recommend this book, it's just that good.

I got this for one of my kids, who was young, and wanted to know why it was difficult to make rockets. For this purpose, the book is great. It shows you several aspects of the design problems. You can see this from the table of contents - it tries very hard to cover as much ground as is sensible. The difficulty for European readers is that the units are all imperial, that is, Gallons, Pounds, feet, inches, and so forth. This makes the numerical details - a sense of scale for what is being discussed - quite inaccessible for most of us over here. It's worth noting that this also led to the downfall of at least one recent space mission to Mars. Remarks like "it's not rocket science" can certainly be shown as having a truthful sort of origin by looking at this. To "do" anything with this book, you would absolutely have to develop further and deeply in the following disciplines; 1. Chemistry 2. Metallurgy 3. Thermodynamics 4. Mechanics 5. Experience with CAD, esp. simulation with solid and liquid state systems. 6. Maths 7. Electronics 8. Reliability... 9. ??? I wonder if any single mind could get round all of these, possibly, but you would be pretty lucky to get the chance nowadays. Education isn't cheap. I don't think, though, that there is any harm in wanting to get as close to this as you like. The book is truly wonderful, almost a work of art, and even if jobs in this area are scarce, this has got to be worthwhile. Read this, do the background study, get a degree or two, and you may eventually get into industrial plant design, maybe even medical electronics, aerospace, or something. Why not? The world would be a better place if more people would dream a bit and aspire to do the hard stuff. I am full of admiration for people who did better than I did and are working in these kinds of fields. I'm going to get a few more books in this series, though I have to say, I'm a bit nervous about ordering books with titles including the words "missile propulsion". We live in troubled times.

This is a fine book for the rocket scientist wannabe. The book is really great, but only scratches the surface since it does not "reveal" all the details behind the art of designing liquid rockets. I was

surprised to hear from many Russian specialists that this book brings "stupid solutions" (in their own words) to such simple an "elementary" problems - an example of this being the resonance igniter sketch shown on page 125 - "it simply doesn't work" they said. Well, the fact is that Russian books are much more detailed. And although they are written in Russian, it is not quite difficult to understand the equations and the design criteria. In short: this book is a must have for any serious rocket designer and you should buy it - but don't forget to grab some "foreign" literature - take a look at "Gakhun - Construction and Design of LPRE (in Russian)", it will tell you a whole different story.

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