

## Re: Spaceship One in perspective

**Source:** <http://sci.tech-archive.net/Archive/sci.space.shuttle/2004-06/0727.html>

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**From:** Scott Moore ([samiam\\_at\\_moorecad.com](mailto:samiam_at_moorecad.com))

**Date:** 06/30/04

Date: Wed, 30 Jun 2004 17:20:33 GMT

Jeff Findley wrote:

> "Scott Moore" <[samiam@moorecad.com](mailto:samiam@moorecad.com)> wrote in message  
> news:h5iEc.112811\$2i5.101000@attbi\_s52...  
>  
>>Jeff Findley wrote:  
>>  
>>  
>>>When you start talking about launch vehicles to LEO and beyond, solids  
>  
> start  
>  
>>>looking very unattractive and hybrids don't look so good either.  
>>>  
>>>Jeff  
>>  
>>For a beginner to the subject, can you say why that is ?  
>  
>  
> Generally lower ISP and a higher empty weight than a liquid engine. ISP is  
> a measure of the performance of a fuel/engine combination and is a bit  
> lengthy to explain in detail.  
>  
> As for the empty weight issue, with a solid, your fuel/oxidizer container  
> and your combustion chamber are the \*same\* structure, so it's got to be able  
> to withstand the pressure and temperatures of the combustion chamber. When  
> you look at a shuttle SRB, pretty much the entire length of the SRB is  
> (heavy) combustion chamber. These things are so sturdy (heavy), they are  
> dropped into the ocean (with parachutes), fished out of the water, and  
> re-used.  
>  
> On a liquid fueled booster, the tanks are just tanks, so they have to deal  
> with considerably less pressure and can be made much lighter weight. On the  
> old Atlas ICBM (liquid fueled) the tanks were extremely lightweight. The  
> tanks were so thin and light they called them balloon tanks. They had to be  
> pressurized to several PSI on the ground or else they would collapse. If  
> you ever see an old Atlas ICBM on display, don't be surprised if it's  
> atta