Kerbal Space Program - Bug #10079

Symmetrical struts can cause large off-axis veering forces

07/01/2016 04:29 PM - bewing

Status:	Confirmed	**Start date:**	07/01/2016
Severity:	Normal	**% Done:**	10%
Assignee:			
Category:	Parts		
Target version:			
Version:	1.1.3	**Language:**	English (US)
Platform:	Windows	**Mod Related:**	No
Expansion:			

Description

This issue existed in 1.1.2, also. (64 bit KSP 1.1.2 and 1.1.3 on Win7 pro)

What happens: a rocket built with struts (placed with symmetry) will sometimes veer strongly off-course during launch. If you remove the struts, the rocket flies straight.

To replicate the bug: Launch the attached "territug1" rocket straight up with SAS. During the first stage nothing much will happen. As the second stage burns, however, the rocket will suffer severe yaw forces (and smaller pitch forces). The SAS will manage to fight it for a while, until the forces become too large. Make sure to note at the time the veering occurs, **the rocket has reached space**. So this cannot be an aerodynamic effect.

Then launch "territug2" the same way. This is an identical rocket, except that the struts on the top of the second stage have been removed.
If you edit territug2 in the VAB and put the struts back on, it will go back to veering during launch.

The attached sandbox mode savegame & logfiles are from a territug1 rocket experiencing veering in flight. (probably useless)

History

#1 - 07/02/2016 03:45 AM - Anquietas

- File territug3.craft added

- File territug4.craft added

- File KSP.log added

- File output_log.txt added

- Status changed from New to Confirmed

- % Done changed from 0 to 10

Confirmed the issue described. After some experimenting, came up with 2 variants of territug1 that still demonstrate the issue but to varying degrees. They would seem to suggest the mass/structure of the payload is a factor.

#2 - 07/04/2016 03:48 PM - sal_vager

I don't think it's the struts themselves, as if you place some structural girders on the payload of the territug2, add struts to those girders and launch it, the struts have absolutely no effect on the crafts stability.

Instead what the struts are doing is affecting the ability of your SRB's to flex on their surface attach points.

With no struts the pair of SRB's are able to flex equally, so their combined thrust stays pointing through the center line of your craft.

With the struts starting on the boosters and terminating on the payload there is a twisting effect on the SRB's, causing the 'force' you reported, the further off the center of the SRB's the worse this 'force' is.

With the struts placed in snap symmetry on the payload and terminating on the SRB's there's virtually no off-axis veering at all.

So the placement of the struts is having an effect, but it's not the struts causing the veering, it's your engines.

#3 - 07/19/2016 09:33 AM - bewing

"With the struts placed in snap symmetry on the payload and terminating on the SRB's there's virtually no off-axis veering at all."
But that is not a reasonable thing to do, because if the struts are on the payload, then they remain on the payload forever -- adding immense drag, and some mass. So the struts always have to reach from the lower stage to the upper one. Unless the drag issue gets fixed.

Files

territug1.craft	78 KB	07/01/2016	bewing
territug2.craft	74.9 KB	07/01/2016	bewing
output_log.txt	467 KB	07/01/2016	bewing
KSP.log	215 KB	07/01/2016	bewing
veering.sfs	372 KB	07/01/2016	bewing
territug3.craft	71.9 KB	07/02/2016	Anquietas
territug4.craft	72.8 KB	07/02/2016	Anquietas
KSP.log	329 KB	07/02/2016	Anquietas
output_log.txt	748 KB	07/02/2016	Anquietas