

Kerbal Space Program - Bug #19093

DLC Structural Tubes do not occlude drag of internal parts

05/29/2018 04:01 AM - raptor9_ksp

Status:	Duplicate	Start date:	05/28/2018
Severity:	Low	% Done:	100%
Assignee:			
Category:	Physics		
Target version:			
Version:	1.4.3	Language:	English (US)
Platform:	Windows	Mod Related:	No
Expansion:	Making History		

Description

The structural tubes from the Making History DLC do not appear to occlude drag from parts that are placed inside it, whereas parts enclosed inside a fairing are occluded.

To demonstrate, I made a simple rocket in a vanilla install of KSP 1.4.3. I placed a small ore tank with a series of cylindrical radial RCS tanks around it, enclosed within a fairing that's closed to the bottom of the nose cone. I launched straight up at max throttle and took a screenshot of the rocket as it passed through the transonic region at 300, 350 and 400 m/s with the Aero GUI and aero overlay enabled

Next I removed the fairing, but left the base to retain the mass for standardization. I placed a T-25 tank between the fairing base and the nose cone, and ensured the [ore/radial RCS tank] test payload was mounted properly to the internal nodes of the structural tube. Same launch sequence, same screenshots taken at 300, 350 and 400 m/s. You can see a significant difference in the total drag produced and the ballistic coefficient, as well as seeing the G-meter drop as the acceleration drops as well.

This issue wasn't present in 1.4.1, or at least it wasn't apparent to this magnitude. I had designed a rocket in 1.4.1 to go to the Mun, land, and come back, and now that I've revisited it in 1.4.3, it has trouble making orbital velocity from the launchpad due to the abnormally high drag.

I don't know if this bug was introduced in 1.4.2 or 1.4.3 since I didn't use 1.4.2.

Related issues:

Is duplicate of Kerbal Space Program - Bug #18126: Structural Tubes don't shi...

Investigating 03/19/2018

History

#1 - 05/29/2018 04:02 AM - raptor9_ksp

- File Tube 4.png added

- File Tube 5.png added

Two further screenshots taken after the first three Tube launches. This demonstrates all the enclosed parts producing so much drag it pulled the nose down, even with SAS locked to go straight up.

#2 - 05/29/2018 04:19 PM - diomedea

- Status changed from New to Duplicate

- % Done changed from 0 to 100

#3 - 05/29/2018 04:20 PM - diomedea

- Is duplicate of Bug #18126: Structural Tubes don't shield objects inside of them added

#4 - 05/29/2018 10:40 PM - jclovis3

- File Empty Tube with drag on cone.png added

- File Cone on 2nd interstage node of fairing has less drag.png added

I find that the contents of the tube have little to do with this problem. I removed the ore and monopropellant tanks and discovered that the tube itself causes the cone to display a great deal more drag than the fairing does. Take this first image, "Empty tube with drag on cone". Taken at about 60 m/s, you can see the green arrow showing the drag (would be red but I'm highlighting the part with my cursor to see it). Now in the next image, I used

the fairing with interstage nodes turned on, then attached the cone to the 2nd stage which is about the same height as the medium tube. Then closed the fairing to the cone as was done in the original fairing test. The drag in this instance was much less. If you wait until you're going faster, you'll see the drag stretch much longer with the structural tube connected to the cone than with the fairing base.

I pressed F12 to turn on the aero overlay, and zoomed in after setting the camera to focus on the AE-FF2 base.

Conclusion, cones have more drag when mounted on a structural tube than on a fairing base (yeah, tested that too) or interstage node.

#5 - 07/08/2018 03:20 AM - Anonymous

I suspect that much of the drag shown in the report is from the flat surface of the nose cone, and leading surface of the fuel tank. The new tubes do not seem to fill the gap between their neighbors, for aerodynamics purposes. Raptor9's rockets on KerbalX certainly suffer this extra drag, even when the tubes have no contents. Therefore I made a separate report <https://bugs.kerbalspaceprogram.com/issues/19376>

The old 'structural tube' part did fill the gap between its neighbors on the stack, but it did not shield its contents from drag. There is a patch for players who want hollow-parts to shield their contents, which could probably be extended to include the tubes from M.H.

<https://forum.kerbalspaceprogram.com/index.php?topic/139980-130-community-database-of-module-manager-patches-for-stock-ksp/&do=findComment&comment=3384236>

Files

settings.cfg	29.7 KB	05/29/2018	raptor9_ksp
KSP.log	355 KB	05/29/2018	raptor9_ksp
Drag Test - Tube.craft	23.1 KB	05/29/2018	raptor9_ksp
Drag Test - Fairing.craft	22.3 KB	05/29/2018	raptor9_ksp
Fairing 1.png	1.7 MB	05/29/2018	raptor9_ksp
Fairing 2.png	1.67 MB	05/29/2018	raptor9_ksp
Fairing 3.png	1.63 MB	05/29/2018	raptor9_ksp
Tube 1.png	1.8 MB	05/29/2018	raptor9_ksp
Tube 2.png	1.76 MB	05/29/2018	raptor9_ksp
Tube 3.png	1.67 MB	05/29/2018	raptor9_ksp
Tube 4.png	1.64 MB	05/29/2018	raptor9_ksp
Tube 5.png	1.63 MB	05/29/2018	raptor9_ksp
Empty Tube with drag on cone.png	868 KB	05/29/2018	jcloviss3
Cone on 2nd interstage node of fairing has less drag.png	824 KB	05/29/2018	jcloviss3