Kerbal Space Program - Bug #21981

DeltaV calculation incorrect with a fuel tank in the SM-25 Service Module and other fuel above it

04/24/2019 06:09 AM - abc

Status:	New	**Start date:**	04/24/2019
Severity:	Low	**% Done:**	0%
Assignee:			
Category:	Parts		
Target version:			
Version:	1.11.0	**Language:**	English (US)
Platform:	Windows	**Mod Related:**	No
Expansion:	Making History		

Description

If the SM-25 Service Module contains at least one fuel tank of any kind then the DeltaV calculation will not include fuel on top of the SM-25 when in the VAB, initially at launch before the engine is staged, and in some cases after the engine is staged depending on other stages.

A particular example that shows this:
1) start with a Mk3 Cockpit
2) add a Mk3 to 2.5m Adapter with Mk3 sides aligned
3) add SM-25 Service Module
3b) add a Rockomax X200-8 Fuel Tank (needed in 1.11.0)
4) add a RE-L10 "Poodle" Liquid Fuel Engine
5) observe dV reported 835 m/s burn 172s
6) turn SM-25 shroud off, add Oscar-B Fuel Tank to bottom center node, turn SM-25 shroud on
7) create new stage and move engine down
8) observe dV reported 16 m/s burn 5s

If this craft is launched, the dV will correct as soon as the engine is staged. However, with a few additional parts it isn't:

9) add TD-12 Decoupler to the top of the Mk3 Cockpit
10) add Aerodynamic Nose Cone above the decoupler
11) move decoupler to stage 0 with the SM-25 door

Now launch and stage the engine. If you run the engine at full blast, you can observe that you can burn longer than 5s and the fuel guage is showing the full fuel amount minus what is being burned. The dV stays near 16 m/s, slowly increasing by 1 m/s every 2-3 seconds or so while the engine is burning at max (I didn't check if it matters, but I have Max Physics Delta-Time per Frame maxed to 12 in the settings).

Now with engine on or off create a new stage and move the decoupler down. Observe a much higher dV. Move the decoupler's stage above the SM-25 door stage and observe the lower dV again on the engine stage and that the SM-25 door stage now has a dV that is the same or might be 1 m/s higher than the engine and the reported starting weight at this stage is the (incorrect) reported end weight of the engine stage.

Create a new blank stage below the SM-25 door (above the engine); the dVs stay the same. Move the blank stage up one to between the decoupler and SM-25 door. Now the higher dV is shown on the engine only. Now move the blank stage to the top. Now the lower dV is shown on both the engine and SM-25 door again.

This bug might or might not be related to the issue in Bug #20740. In my case it seems the added decoupler complicates things even though there is no fuel on the other side of it.

History

#1 - 12/18/2020 10:52 AM - abc

- Version changed from 1.7.0 to 1.11.0

There still seems to be an issue in 1.11.0 but slightly different. Turning the shroud off and then on can cause the issue to appear temporarily but it is corrected on save and load, launch, and some other actions within the VAB. The fuel tank in the SM-25 is not actually used for fuel (this is Bug #21141), but it can be used to transfer fuel to the large tank (actually this is just due to the difficulty setting Resource Transfer Obeys Crossfeed Rules not being set). If another fuel tank is added below the SM-25 (I used Rockomax X200-8 Fuel Tank) then it behaves as I described previously.

#2 - 12/18/2020 10:53 AM - abc

- Description updated