

Kerbal Space Program - Bug #25730

The use of the excavator to mine asteroids increases the mass of the system

07/07/2020 05:34 AM - diego_he

Status:	Resolved	Start date:	07/07/2020
Severity:	Low	% Done:	100%
Assignee:			
Category:	Physics		
Target version:	1.12.0		
Version:	1.10.0	Language:	English (US), Português-Brazil (Portuguese-Brazil)
Platform:	Windows	Mod Related:	No
Expansion:	Core Game		

Description

When it extracts ore from the asteroid to the ship, the total mass of the system cannot change, because it is moving the ore from the asteroid to the ship and not creating ore.

Apparently, the game is keeping the total mass of the asteroid fixed and, when using the excavator, the ore's mass is added to the system.

In my test the mass of the ship is 6.7t (picture1) and the asteroid mass is 178.4t.

The total mass of the system (ship + asteroid) is 185.1t (picture2).

If I remove 1.5t of ore from the asteroid and put it on the ship, the mass of the asteroid decreases by 1.5t and the mass of the ship increases by 1.5t, so the total mass must remain 185.1t.

Picture3 shows that the amount of minerals is added to the system, indicating an increase in the total mass of the system by 1.5t. I believe there is a bug here, because the game is keeping the mass of the asteroid fixed and adding ore mass to the system.

If disengage the ship from the asteroid, the mass will return to $6.7t + 1.5t = 8.2t$ (picture4)

Now, if I discard the ore from the ship and connect to the asteroid again, we can see that the game keeps the mass of the asteroid fixed because it considers the total mass equal to picture2, even with the asteroid without 1.5t of ore. (picture5)

The video showing the problem <https://youtu.be/SRzGvAtCRrA>

History

#1 - 07/07/2020 08:17 PM - RafaHdz

- Status changed from New to Confirmed

- % Done changed from 0 to 10

#3 - 07/16/2020 09:30 PM - tjandreas

Could be related to the fix for Bug [#24855](#). Unlike that bug, this one appears to have no workaround...

#4 - 07/18/2020 02:13 AM - tjandreas

- File Fig1.jpg added

- File Fig2.jpg added

Additional info: apparently the game is resetting all asteroids to their **original** mass values when you fly them. Even on asteroids I mined out years ago. The PotatoRoid "mass" property in the save file is no longer consistent with the "currentMass" property of the ModuleAsteroidInfo module.

#5 - 09/15/2020 12:41 AM - jj

- Expansion deleted (Making History)

- Language English (US) added

Basically the mass of the asteroid doesn't actually decrease when mined. This affects the mass display in the tracking station and I have also confirmed in testing that the inertia of the asteroid stays the same.

To reproduce:

1. Grab asteroid.
2. Take note of mass of the vessel (ship+asteroid) in tracking station's engineer panel.

3. Mine the asteroid down by at least one ton.
4. Discard ore.
5. Note that, incorrectly the mass of the asteroid has not decreased in tracking station engineer's display.

I don't see how this is low priority, since it

1. Practically breaks the feature and all contracts related to moving asteroids, since it makes moving them exponentially harder than it already is.
2. Breaks a feature that has worked before.

#6 - 11/24/2020 11:08 PM - Neilski

jj wrote:

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1. Practically breaks the feature and all contracts related to moving asteroids, since it makes moving them exponentially harder than it already is.
2. Breaks a feature that has worked before.

Good grief. I gave up playing this game many months ago because of the previous asteroid bug ([#24855](#)).

Having seen that it had been fixed, I have just resumed playing and tried to finish some missions. After mucking about and editing my save files to (I thought!) fix the initial discrepancy, I found that the mass keeps leaping back up and that indeed the system mass INCREASES when you start harvesting.

So yes, I'd echo jj's comment - how on earth can this be low priority? It completely knackers the asteroid feature of the game.

#7 - 11/25/2020 03:18 PM - Neilski

tjandreas wrote:

Additional info: apparently the game is resetting all asteroids to their **original** mass values when you fly them. Even on asteroids I mined out years ago. The PotatoRoid "mass" property in the save file is no longer consistent with the "currentMass" property of the ModuleAsteroidInfo module.

I'm very keen to understand how it's deciding what the original mass of the asteroid was (I'm seeing something like this happening too).

If we can understand what it's using for that calculation, we perhaps stand a chance of editing the save file so as to mitigate the bug - e.g. put the mass down to a reasonable (or even the correct!) level again before each burn...

I've looked in the save file and tried a few things but have not yet found a way to do it. (If this issue is already under discussion on the forum I'd welcome a link, because my searches have turned up nothing.)

#8 - 11/30/2020 06:41 PM - Neilski

OK, no idea if/where I should post this on the forum - have seen no sign of a discussion about it there, just a few vague references (and maybe one to this bug page) - so here's my recipe for working around the bug, which I found accidentally while attempting to understand it.

It's a faff but it appears to work very reliably (not yet had one I couldn't fix but some took a few attempts).

Steps:

- capture one or more asteroids, because you can't "fix" them until after capture
- release the asteroids to be fixed, and back off a wee bit because the shape will change (then cancel velocity to make recapture easier later!) - if you don't release first you can still fix it but will regret it later when you try to release it :-D
- make a note of the asteroid names
- save the game, make a copy of the SFS file, and edit the copy
- for each asteroid to be fixed: search for the asteroid name until you find its VESSEL entry, and then find the seed value in the ModuleAsteroid section
- search and replace all instances of that seed with a new value (one instance in ModuleAsteroid, one for each contract for which the asteroid is a match, maybe others)
- how to choose "a new value"? bizarrely almost anything seems to work - this could mean changing it by a single digit or going for something totally different; I've tried various things and more than 90% of my changes were successful, but of course **I have no clue why** (class C example: I replaced 5ish instances of 35983897 with 35983898; class D: replaced 4 instances of -58758673 with -58758672; class E: I replaced -28602474 with -28602462 when -28602473 and -28602472 didn't work)
- load the edited file and recapture each asteroid (shape change means some repositioning may be necessary for a clean capture)
- verify if the system mass is now correct (i.e. matches sum of pre-capture ship mass & asteroid mass shown when you right-click) and that the system mass stays constant when mining; if not, re-edit file and choose another seed (even 0 worked for me during testing(!), but would clearly have bad implications for asteroid-related contracts and I didn't test having two asteroids with the same seed)
- ponder why in heck changing the seed should influence the buggy behaviour (I really really want to see that bit of source code!)

#9 - 12/01/2020 09:24 PM - Neilski

Update: the workaround can "expire". I've observed that with a particular class E (the same one that had required several attempts), the system mass was suddenly way too high and increasing, after I had taken its true mass down from 1950ish tons to 1650 ish. Need more testing to understand what happened and at what mass, but its definitely reproducible. (This may be an insight into what madness is going on in the source code :-))

Happily I was still able to "fix" it again by re-changing the seed, so at worst the workaround seems to do what I originally wanted and permit maneuvering, even if it needs to be recharged now and then. (NB: only one asteroid seems to have exhibited this so far, with several others behaving OK.)

Edited 5 days later to add:

Sadly, the fix now seems likely to be temporary on all asteroids, and stops working entirely at some point (i.e. I stop being able to find a new seed which "works").

The combination of seed and class appears to create a non-zero minimum mass for each roid. So I can't land my 112 t mined-out class E on Kerbin because KSP thinks it's more like 800 t. I tried a bunch of seeds for that one (literally a couple of dozen), and the effective asteroid mass ranged from roughly 800 t to almost 3600 t. (Again, I'd love to see the code because *just maybe* there's a seed which gives an effective mass closer to the real thing.)

No more asteroid contracts for me for the time being; back to waiting for the bug to be fixed.

Edited again to add:

Well heck, seriously red face here. I have no idea how it took so long for the penny to drop, but I've belatedly realised that all I was ever doing by tweaking the seed was "choosing" a lighter "birth" mass for the roid. As long as this was lighter than the current mass, the bug didn't bite because (as tJandreas pretty much says above), the bug simply means that the roids can never be lighter than their nominal birth mass. If you start with a roid that's relatively heavy for its class, you will easily find a new seed which corresponds to a much lighter birth mass, allowing you to mine it and move it without pain. If you start with a light roid, or mine most of the mass away, you're stuffed unless you change the class, but that change would I imagine break any contracts you might want to complete. (PS: I no longer feel like I need to see the source code because the behaviour is no longer a mystery, LOL.)

#10 - 12/18/2020 12:44 PM - svpluto2

This affects console edition too.

#11 - 01/05/2021 10:21 AM - mahanako

- File *kerbal_asteroid_bug.png* added

Excavating the asteroid, converting the ore to fuel and burning all the fuel should make the asteroid lighter - as shown in the asteroid info itself. But the asteroid does not get lighter.

#13 - 03/16/2021 07:39 PM - vinix38

I can confirm this bug is still happening as of KSP 1.11.2 (windows-10 64bits)

#14 - 03/22/2021 05:15 PM - victorr

vinix38 wrote:

I can confirm this bug is still happening as of KSP 1.11.2 (windows-10 64bits)

Vinix38. We made some changes in 1.11.2, but are very interested in learning more about what you are seeing after the update. Could you give us more details? A save file would help us a lot.

#15 - 03/23/2021 10:58 AM - jj

- File *x.zip* added

- File *vessel.png* added

- File *before.png* added

- File *after.png* added

The craft is attached to a comet, has drills, ISRU and an engine. It drills the comet, converts the ore to fuel and burns it. This should reduce the mass of the system.

I first took a screenshot of the mass of the system from the tracking station, see *before.png*.

I then drilled, converted and burned some of the comet and took another screenshot from the tracking station, see *after.png*.

Note how the mass has increased, instead of decreased.

Save file is also attached.

#16 - 05/01/2021 10:01 AM - flart

- File *TJx3W5G - Imgur.jpg* added

also can confirm the bug.

Lowering asteroid mass, when you mining it (the mass in the PAW, the PART[*PotatoRoid*]/MODULE[*ModuleAsteroidInfo*]/currentMass) does not propagate to the real mass of the asteroid PART[*PotatoRoid*]/mass, that probably is used for the dV calculation

#17 - 06/24/2021 08:12 PM - vinix38

victorr wrote:

vinix38 wrote:

I can confirm this bug is still happening as of KSP 1.11.2 (windows-10 64bits)

Vinix38. We made some changes in 1.11.2, but are very interested in learning more about what you are seeing after the update. Could you give us more details? A save file would help us a lot.

As described many times above : mining an asteroid decreases the mass shown in the PAW, but not the physical one. A completely mined out asteroid has the exact same weight as when it was fresh. This is a stock behavior, but the addition of informative mods shows clearly the ship's mass increasing when it should be in equilibrium.
It is most game-breaking when trying to land with parachutes or calculating delta-V.

#18 - 06/24/2021 10:22 PM - victorr

We have made some changes in this last 1.12.0 release and would like some feedback on this issue. Thanks.

#19 - 06/24/2021 10:22 PM - victorr

- Status changed from Confirmed to Ready to Test
- Target version set to 1.12.0
- % Done changed from 10 to 80

#20 - 06/25/2021 05:58 PM - vinix38

- File Capture d'écran 2021-06-25 195411.png added
- File Capture d'écran 2021-06-25 195436.png added

Tested on an 1.12.0 install, on a freshly generated asteroid, and I can still see the mass of the system increasing. Same thing on an asteroid generated in previous versions. The bug seems to be still there.

#21 - 08/06/2021 06:49 PM - Technicalfool

- Status changed from Ready to Test to Resolved
- % Done changed from 80 to 100

This should be fixed in the very latest version. Please continue to report if this is not the case.

#22 - 08/12/2021 06:11 PM - flart

I can confirm, the bug is fixed (also on an old save)

Files

picture1.png	1.41 MB	07/07/2020	diego_he
picture2.png	1.46 MB	07/07/2020	diego_he
picture3.png	1.47 MB	07/07/2020	diego_he
picture4.png	1.38 MB	07/07/2020	diego_he
picture5.png	1.55 MB	07/07/2020	diego_he
Fig2.jpg	363 KB	07/18/2020	tjandreas
Fig1.jpg	408 KB	07/18/2020	tjandreas
kerbal_asteroid_bug.png	1.58 MB	01/05/2021	mahanako
x.zip	29.4 KB	03/23/2021	jj
vessel.png	2.53 MB	03/23/2021	jj
before.png	1.01 MB	03/23/2021	jj
after.png	1.39 MB	03/23/2021	jj
TJx3W5G - lmgur.jpg	97.4 KB	05/01/2021	flart
Capture d'écran 2021-06-25 195411.png	5.49 KB	06/25/2021	vinix38
Capture d'écran 2021-06-25 195436.png	5.27 KB	06/25/2021	vinix38