

**From:** "jeffrey E." <jeevacation@gmail.com>

**To:** Peter Attia <[REDACTED]>

**Subject:** Re: Re:

**Date:** Sat, 20 Jun 2015 19:17:55 +0000

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seeing the fuel on the ground in palm beach

On Sat, Jun 20, 2015 at 3:12 PM, Peter Attia <[REDACTED]> wrote:

Why did you tell me????? I wanted to figure this out!!!

How long did it take you to figure out?

**From:** jeffrey E. [mailto:[jeevacation@gmail.com](mailto:jeevacation@gmail.com)]

**Sent:** Saturday, June 20, 2015 12:11 PM

**To:** Peter Attia

**Subject:** Re:

i did not repaint ANS, fuel expands when heated, . so though the plane intially took the same amount of fuel the black wings heated the fuel and threw it overboard!!!

On Sat, Jun 20, 2015 at 3:05 PM, Peter Attia <[REDACTED]> wrote:

I have a few ideas, and if wrong a few questions...

Other ideas:

1. Even though you dismissed weight, I wonder if there is something about the weight that alters the optimal fuel burn ration during takeoff when thrust is highest that hinders range down line?
2. Does the pain alter the high lift devices such that takeoff and landing are less fuel efficient?

Observations:

1. I've never seen a commercial jet painted black... I wonder if the problem is the color or the application/variant you used
2. Supersonic jets (no need for Bernoulli) are black all the time (though this may have more to do with anti-radar) and/or they may be willing to give up range in exchange for these

3. I was trying to do a Gedankenexperiment to simplify the problem: imagine two fast cars, identical in every way, except one is painted black. Would the same range-reduction effect be observed? If not, would it be because cars are dominated by rolling resistance and form drag, while subsonic planes are dominated by skin friction? Or would the effect be absent because the speeds are too low?

Lastly, a question:

When you “undid” this black paint thing, did you strip off the black paint, or did you just re-paint? If the latter, did you recoup the lost range?

P

**From:** jeffrey E. [mailto:[jeevacation@gmail.com](mailto:jeevacation@gmail.com)]  
**Sent:** Saturday, June 20, 2015 5:34 AM  
**To:** Peter Attia  
**Subject:**

figure it out yet

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