ANTI-PLANE CRASH MODEL-2019

TAKING A CASE STUDY OF BOEING 747-400

Weight= 439,985 kg Density of hydrogen= 0.082kg/m^3

Volume= 159 cubic meters Molar gas volume at stp= 24 liters. Density of air =1.29 kg/m^3

For boeing 747-400 to float in air when its engines are off, the upward buoyant force, F_b should be equal to weight of helium, W_{He} plus weight of balloon, W_b plus weight of boeing, W_{be} : $F_b = W_{He} + W_b + W_{be}$

Formula reduces to since weight of balloon plus weght of helium are too small compared to weight of ***boeing 747-400***, therefore; $F_b = W_{be}$

$F_b =$ 439,985 kg x 9.8 $F_b =$ 4311853 N

How to generate this force from hydrogen gas.

$F_b =$ pVg, 4311853 $=$ 1.29 x V x 9.8 V= 341073 m^3

$V = 4/3 \prod r^3$ $341073 = 4/3 \prod r^3$ r=43.4 m^3

Meaning that, When we have attached a balloon capable of expanding upto 43.4 meter radius, a plane like ***boeing 747-400*** can be held in suspension in air and be prevented from diving from the air.

This can be achieved by carrying liquefied hydrogen gas cylinders along with the plane or chemical reactions that can produce the required volume of gas..