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RESEARCH ARTICLE

SYSTEM THAT INTERFERES WITH THE FIRST LAW OF THERMODYNAMICS

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Abstract

The first law of thermodynamics, also known as Law of Conservation of Energy, states that work cannot be created or destroyed in an isolated system. Here-in presented is a system, tested and with calculations that interferes with the first law of thermodynamics. The proposed and tested system shows that it takes less work to pump air underwater than the work that is produced by the quantity of water lifted above the water level with that underwater air pressure that lifts the system, in addition to the work that accumulated in the air stored underwater. Unfortunately it is however it is not possible to utilize this work to generate a perpentual motion machine. It generates free energy, free energy is subject to irreversible loss in the course of such work.

Introduction:-

Description:

The reproducable tests described here-in utilizing figure 1, shows that it takes less work to pump a certain quantity of air volume underwater in an underwater container to lift an container filled with water that is connected to it above, above the water level, than the work that is required to pump that air volume below the water level.

Small quantities of upward air pressure underwater can lift heavy objects above the surface of the water level, thereby generating large quantities of work.

To pump air underwater, small pumps/compressors can pump air deep beneath the water level, without requiring significant increases in power demand. Pumps/compressors have a PSI far superior than rather deep underwater PSI levels.

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The first physical replicable test is done by filling a 1. bottle with air and connecting/taping a 2. bottle of water above it with double the volume of water as that of air in bottle 1. Thereafter letting the bottle 1. Connected to bottle 2. float without it falling to one side.

This first test showed that it only takes approximately half the volume of air underwater to lift the full volume of water. i.e. it takes a volume of around 0.5 m^3 of air underwater to lift approximately 1 m^3 of volume of water above the water level.

Physical replicable thermodynamics test:
The physical replicable thermodynamics test was done as shown in figure 1. with two boxes placed and taped on top of each other then recording the quantity of power and the time needed for a small air pump to pump air underwater to lift this volume of water above the water level. Then calculating the work required by an air pump to lift this water tank with an air tank above the water level. The results and tests described hereafter show that less power/work input is needed, than the work that is produced. Therefore work done by lifting the 'box with water' above the water level and there is also work done by accumulating air in the 'box with air'.

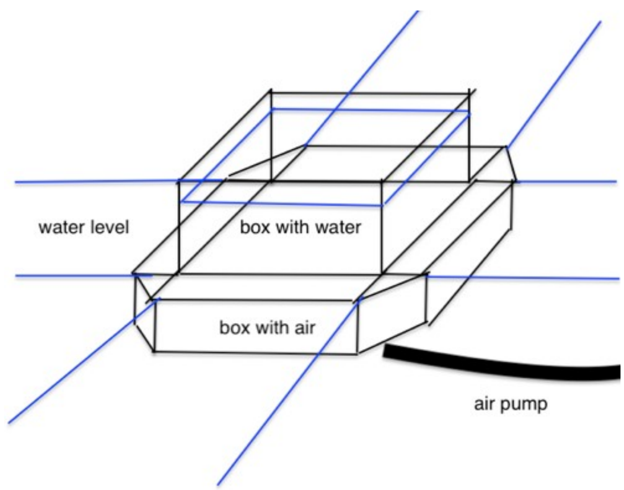

Figure 1.

Formulas utilized:

$$\delta W = PdV \quad [1]$$

"δW denotes an infinitesimal increment of work done by the system, transferring energy to the surroundings."
"P denotes the pressure inside the system, that it exerts on the moving wall that transmits force to the surroundings"
"dV denotes the infinitesimal increment of the volume of the system."[1]

The dimensions of the 'box with water' were 25cm*11cm*18.5cm thus having a volume of 0.0050875 m^3.

"Pressure is the atmospheric pressure or barometric pres- sure at sea level is approximately 14.7 psi or 101 kPa."
"The standard atmosphere is a unit of pressure defined as 101,325 Pa" [4]
δW=0.0050875*101300 = 515 J

In addition there is work generated by the air pressure that is underwater shown in the figure 1 where the 'box with air' is filled with air underwater when the 'box with water' is above the water level.

Work (J)= volume (m^3)*pressure (Pa)
[1]

0.0025m^3*101,325Pa= 253 J

The work input was tested twice, once with a small pump of 2.6 W and a 122 W pump.

The work input was 122 Watts for 3.5 seconds and 2.6 W for 128 seconds to pump sufficient air in the 'box with air' to lift 'the box with water' above the water level.

122*3.5=427J
2.6*128=332J

The lower work required for the smaller pump is due to the lower PSI of the pump and since it lifted less water

W=E
E=P*t [5]

The following test was done with a plug power meter, two boxes, a pump and a weight scale. The work that is free energy Patm * ΔV being larger than the input with only a small negligeable work of mgh done that is utilizeable.

Therefore the system interferes with the first law of thermodynamics that states a system is not able to produce a higher quantity of work than the work input is in an isolated system.

Physical reproducible tests based on work :-

The physical test was done with a plug power meter, two boxes, an air pump and a weight scale. It was measured for how many seconds air was pumped underwater to lift the top box filled with 5 litres of water above the water level. Then calculating the power work input utilized for this process, to pump this air underwater to lift the 5 litres of water.

For the total work out generated, this thermodynamics formula was used:

$$W_{out} = P_{atm}\Delta V + mgh$$

The dimensions of the box were 25cm*11cm*18.5cm thus having a volume of 0.0050875 m^3.

Then the above formula was applied 101,300N/m^2*(0.0050875)m^3+5kg(9.8m/s^2)(0.011m) equal 520 Joules of work generated.

Then the power input was calculated: it took 3.5 seconds for the air pump to fill the lower box with sufficient underwater air to lift the whole water filled upper box above the water level. There was a higher quantity of underwater air than needed in the lower box to lift the upper box in this test. Joules is energy, what equals watts what is power times time. The power demand of the pump was 122 Watts, for 3.5 seconds what results in a Joule quantity of 122W times 3.5s what is 427 J.

The work generated to lift the water container above the water was 520 J and the input power was 427 J.

In addition there is work in the underwater air pressure. this work content is:
Work (J)= volume (m^3)*pressure (Pa)

0.0025m^3*101,325Pa= 253 J
The work generated is 520 J added to 253 J is 773J generated with an input of 427 J.

Test 2 with smaller pump:
2.6 W for 128 seconds

To lift the system with 4.6 litres of water

δW=Volume*atmP
δW=0.0046*101300 = 465 J

E=P*t
2.6W*128S = 332 J

2.3 litres of air under the surface
0.0023 m^3*101,325 Pa= 233 J

332 J (work input) < 698 J (work ouput)
427 J (work input) < 773 J (work input)

Test precautions for accurate replicability:
During pumping initiation in the first pump required a slightly higher power demand for compression for the first 2 to 3 seconds of approximately 20%>, however after that power demand stays stable. Power demand also does not increase with pumping air underwater related to pumping air above the surface. When utilizing the same pump for 30 seconds or 300 seconds when lifting a bigger structure, the initial higher power demand does not significantly the affect average power or energy input. This higher energy/power input would only increase energy input slightly by approximately 5% to less than 1% depending on the time taken for pumping air and thus the resulting in a similar average power demand. This problem can simply be solved by utilizing a smaller W pump or increasing the size of the system with a similar pump. i.e. increasing time of pumping, this would provide a lower average power demand than the starting power demand and the result would not be impacted significantly. In addition the smaller PSI with small 2.6 W air pump also reduced the power input demands.

Conclusion:-

The test should be further replicated with improvements in the system. Unfortunately however the only recuperable part of power is the mgh. From the underwater air pressure and above the water level water. Therefore a perpetual motion machine is not described. This work is published for science and for possible further improvements in the system for others to possible find ways to utilize work to utilize the power generated by the system.

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