



When speaking of **suction power**, how it is generated and what its limits are not always clearly understood.



In order to grasp this concept (suction power) firstly it is important to understand the difference between **vacuum**, suction power generator, and **pressure**.

Thus the characteristics and advantages offered by the suction device will be better understood.

Regarding the **depression**, or vacuum created (by means of hand-operated, electric, air-operated pump, Venturi principle, etc.) it can be assumed that the maximum vacuum reached is almost equal to the atmospheric pressure outside the suction system.

This value, in fact, can never be exceeded, because an atmospheric pressure higher than that outside the drainer itself cannot be removed from the tank.

On the other hand, the **pressure** is obtained anywhere by transferring and compressing fluids (or air) without limits to quantity. Therefore the desired pressure values can be obtained from any pump without limits (save for eventual problems due to pump resistance and/or any connected tanks or systems).

In other words, regarding vacuum,

if a thief (suction pump) steals money (air) from a person, the maximum amount of money (suction) that can be stolen (air) is what the person has on him.

On the other hand, regarding pressure:

if a benefactor wishes to transfer money (air pressure) to someone's pocket (tank or system), he will find no limits (apart from eventual resistance of the pocket).



Fig. A

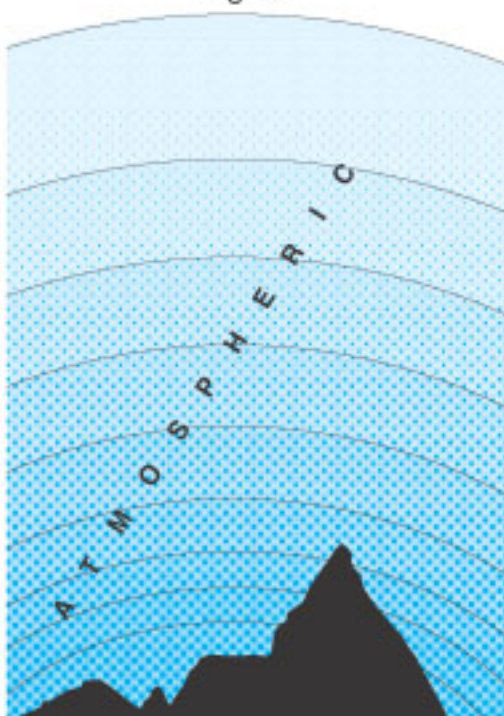


Fig. B



Therefore, once it is understood that the suction or vacuum power cannot be higher than the pressure outside the suction system, the outside atmospheric pressure around us and the suction system must be known.

This means knowing the value of the atmospheric pressure (air) and its variation with altitude.

An important characteristic of the atmosphere (i.e. the air) is its compressibility. The lower levels of the atmosphere, i.e. those closest to the ground, are denser and more compressed than those situated at higher levels (see figure A).

Precisely what happens with a pile of flour bags. (See figure B)



It was in 1642 when the physicist Torricelli measured the atmospheric pressure by means of the famous experience that gave rise to the mercury barometer.

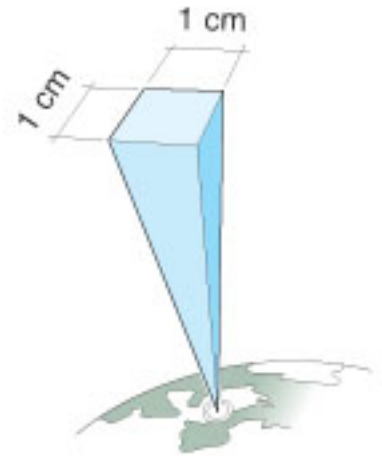
In this way it was possible to establish that the "normal pressure", i.e. the weight of the atmosphere at sea level, is **1 atmosphere**.

At sea level the air exerts a weight of approximately 1 kg per square centimetre.

### TRY TO IMAGINE:

that one kilogram per square centimetre, corresponding to 10 tons per square metre of area, is almost the same as a block of lead of one cubic metre.

Man, however, does not feel this weight because the pressure of air present in every cell of the human body perfectly counteracts the outside air pressure; the same thing occurs at the bottom of the oceans where fish live at pressures of 10 - 100 times greater.



### KNOWING NOW THAT:

- the **pressure of the air at sea level is 1 Atm**, and that it varies with **altitude**;
- a suction system or oil drainer can exert a maximum suction force almost equal to the outside air pressure;

### IT CAN BE ASSUMED THAT:

- in Venice, which is **at sea level**, the maximum vacuum of any oil drainer, apart from its functioning (Venturi, air-operated pump, electric pump, etc.) will be **almost 1 atmosphere**.
- at Denver, which is **2,000 metres above sea level**, the maximum vacuum of the oil drainer will be **almost 0.8 atmospheres**.

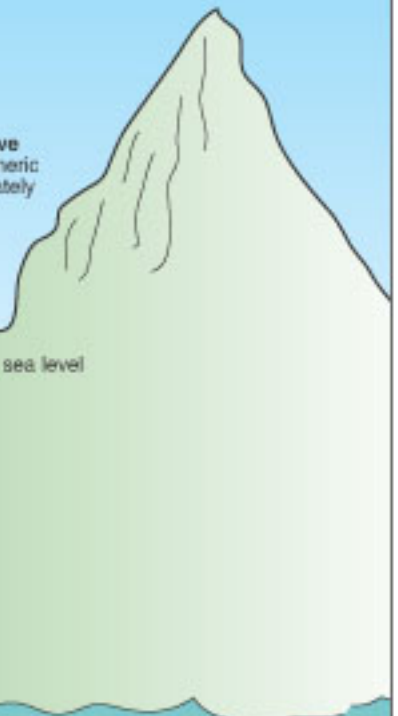
At 10,000 metres above sea level the atmospheric pressure is approximately 0.3 Atm



At 2,000 metres above sea level the atmospheric pressure is approximately 0.8 Atm

At 2,000 m above sea level

At sea level the atmospheric pressure is approximately 1 Atm





The fact that an ordinary suction device or oil drainer is unable to exert a suction force greater than the surrounding pressure is certainly not a limitation; in fact, there are many advantages with this "fixed" value:

- operator's safety,
- handy to use,
- lower running costs,

It must be remembered that **this suction force is more than adequate** for the purpose.

## WHAT MAKES THE RAASM DRAINER UNIQUE?



Once charged with air it is totally independent of any energy source.

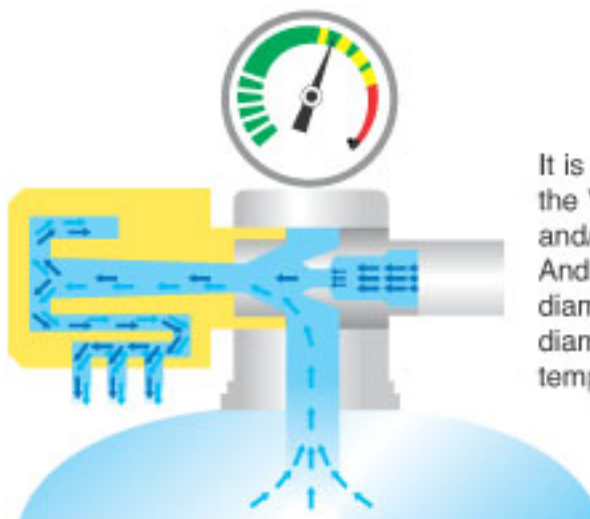
Unlike a normal suction device equipped with motors or apparatus requiring continuous connection to electrical power or compressed air, the RAASM suction device uses a simple and infallible system:

**the VENTURI PRINCIPLE.**

## HOW IT WORKS:

Connect a compressed-air line to the special suction device connection and introduce high pressure air (6.5-7 Bar max.) into the Venturi unit for a few seconds.

Obligated to pass through a special "MULTIPLIER NOZZLE", the jet of air speeds up considerably and forms lamellar lines, creating "eddies" that can suck up and draw all the air present in the suction device tank, thus creating a complete vacuum.



It is also important to point out that the suction force generated by the Venturi principle is equal to that obtained with air-operated and/or electric pumps.

And it is important to understand that suction speed depends on the diameter of the tube or probe used for draining (the greater the diameter the faster the suction) and on other conditions, such as temperature and density.

## THE RAASM WASTE OIL DRAINER is:



### ECONOMICAL:

Does not require continuous connection to an energy source (electric or pneumatic).

A single depressurization is sufficient for carrying out several oil changes.

### PRACTICAL:

Does not require auto lifts or pits in order to be used.

Draining must be done while the oil is hot (70/80°C) in order to prevent harmful solid residuals from forming on the bottom of the oil sump; in this way the engine remains cleaner and more reliable over time.

The level-gauge and the transparent chamber enable the quantity and quality of the sucked oil to be controlled immediately.

### FAST:

It takes just a few minutes to connect the suction probe to the engine and drain the oil.

Very easy to use, because all the operations occur through the engine dip-stick hole, thus eliminating inconvenient plug removals.

### ECOLOGICAL:

Does not dirty or cause scalding during the operation because there is never any contact with the oil.

The drainer is in line with the very latest ecology requirements, because collection is practical and clean, and complies perfectly with current norms concerning the management of waste oils.

