Purification Of Sea Water By Cooling I.C. Engines

H. Hebin Raj

***Abstract*— The main abstract of this paper is to purify sea water into fresh water. About 75% of the inlet sea water is get purified into fresh drinking water. Initially the sea water from the tank is allowed to flow through the aluminium tubes which are kept in between the fins of the engine. By the heat produced by the engine the water is converted into vapour again the vapour is cooled to water thus the pure water is obtained.**

***Index Terms*— Water, Engine, Fins, Vapour, Cool.**

INTRODUCTION

Water plays major role in our daily life, without water no one can survey in this world but nowadays we are running out of fresh water. So the only water source we have is sea water. By this project we can purify the small amount of sea water to drinking water.

GOALS

1. To purify sea water into drinking water.
2. To cool the engine heat by purifying the salt water.

BASIC COMPONENTS

- ★ Sea water storage tank
- ★ Aluminium tubes
- ★ Hot water storage tank
- ★ Water pump
- ★ Condenser
- ★ Pure water collector

sea water storage tank

It is a initial water storage tank which is kept at the top most side of the vechiles so that the water from the tank can be flow easily to the fins, it is made up of plastic, corrosion resistance and whose storage capacity is 1.5 liters.

Aluminium tubes

The tubes which are made up of aluminium is call aluminium tube, since aluminium is the good conductor of heat it is used in this project. The size of the tube varies as the gap between the engine fins.

Hot water storage tank

It is also a storage tank that is used for storing the hot water since the tank has to width stand high temperature it should be manufactured with high strength material so that the tank is made up of aluminium which can width stand high temperature and also corrosion resistance.

Water Pump

The Pump is a device which is used to transfer the water from one point to another point here the specification of pump is 12v and the speed of the motor is 1500 rpm which is sufficient to pump the water from the lower level of the vechile to the initil storage tank.

Condenser

Condenser is an apparatus or container for condensing vapor into liquid. Here the water is used to condense the vapour, so the vapour is passed through the tube and it is covered by another tube which is circulated by cooling water.

Pure water collector

Its also a storage tank which is made up of plastic because the pure water obtained is at low temperature, the storage capacity of tank is 1.5 liter.

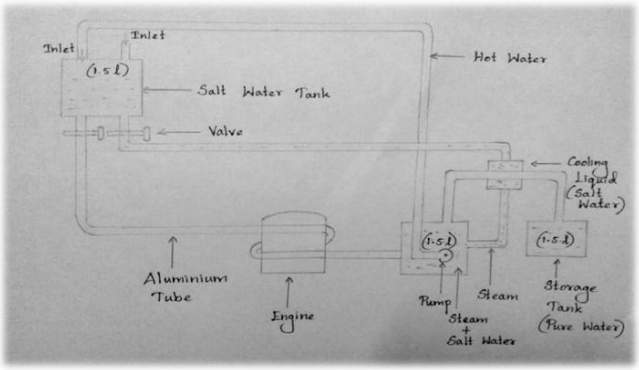

Fig: Schematic diagram of Purification of sea water by cooling I.C. engines.

CONSTRUCTION

- The sea water storage tank is kept at the top of the vehicle i.e near to the petrol tank which is provided by an valve for open and close.
- The aluminium tube from the storage tank is circulated through the fins of the engine.
- The tube is connected to the hot water storage tank.
- From the hot water tank the vapour is allowed to flow through the pipe, this pipe is coverd by another pipe through which the cold sea water is circulated.
- Finaly the fresh water is stored in the fresh water storage tank.

Manuscript received May, 2017.

***H. Hebin Raj**, Third Year Mechanical Engineering, Annai Vailankanni College of Engineering, Azhagappapuram, Tamilnadu, India, Mobile No.: +917418175165*

WORKING

- Initially the sea water is filled to the sea water storage tank which is provide by two valves.
- From the storage tank the water is allowed to flow through the aluminium tube which is fixed in between the fins of the engine.
- Thus the water inside the tube get heated and converted into water+vapour.
- The water+vapour is allowed to store in the hot water storage tank from that tank the vapour is allowed to flow through a pipe
- This pipe is covered by another pipe which is circulated by the cold water from the sea water tank.
- And the coolant water also collected in the hot water storage tank.
- A small pump is used to pump the remaining water in the hot water tank to the initial storage tank.
- At last the fresh water is collected in the fresh water storage tank.
- This process is repeated for many times to obtain 75% of fresh water from the inlet sea water.
- At last the remaining 25% of water is drained.
- So by using this method the engine can also be cooled. Since the water is circulated over the engine.

ITEM	NEEDED
Plastic Tank (1.5L)	1
12V D.C. Pump	1
Aluminium Tube	As required
Aluminium Tnak (1.5L)	1
Condensing tube	1

Table: Requirments

Efficiency Chart

Water Type	40Km/hr	50Km/ hr	<60Km/ hr
Sea water	60%%	62%	65%
Pond Water	70%	74%	80%
Bore water	65%	67%	70%

Table: Efficiency Chart

CONCLUSION

The water is major source of human life so we have to save the water and also we have know to use any kind of water as drinking water, by this method of water purification the sea water and any kind of hard water can be purified and ued for irrigation and drinking purposes.

REFERENCES

1) David L. Gardner, Carl Q. Howard, "Waste Heat Driven Thermoacoustic engine and refrigerator", Proceedings of ACOUSTICS 2009, 23-25 November 2009, Adelaide, Australia.
2) J. S. Jadhao, D. G. Thombare, "Review on Exhaust gas recovery for I.C. Engine", International Journal of Engineering and Innovative Technology (IJEIT) Volume 2, Issue 12, June 2013.
3) Erica K. Jacobsen, "Journal of Chemical Education", Madison, WI 53715 *J. Chem. Educ.*, 2004, 81 (2), p 224A
DOI**:** 10.1021/ed081p224A Publication Date (Web): February 1, 2004
4) Erica K. Jacobsen, "Water Filteration: Small Changes Make a Difference", J. Chem. Educ., *2008, 85 (7), p 892*.
5) S. W. Parr, "Scientific Aspects of water Purification", *J. Am. Chem. Soc.*, **1907**, *29* (7), pp 1134–1135

H. Hebin Raj, Third Year Mechanical Engineering, Annai Vailankanni College Of Engineering, Azhagappapuram, Tamilnadu, India. Mobile No.: +917418175165.