

# A NOVEL ENERGY EXTRACTION SCHEME WITH GREATER RELIABILITY

Sreejith.C.<sup>1</sup>, Muthu Kumar.C.<sup>2</sup>, Pradap Singh.P.<sup>3</sup>, Ans.M.Raj<sup>4</sup>, Christopher.T.<sup>5</sup>

<sup>1,2,3,4,5</sup>UG Scholars, Department of Mechanical Engineering,

PSN College of Engineering and Technology (Autonomous), Tirunelveli, India

**Abstract-** *The present day situation of the current world is difficult to envision without vehicle. Consequently it an essential test for car ventures to outline proficient and practical motor. The execution of the motor again relies on upon the kind of fuel utilized, the cooling framework, the grease framework, the scope of temperature in which the motor works and so on. In the event that the components are dealt with then the execution of the motor can be made strides. In this paper the impact of the fuel acclimatizing metallic nano-particles is considered. After the ignition of fuel in the burning chamber the side effects of burning (water vapor and carbon dioxide) are further crumbled, the separation of water being an exothermal procedure indicates the warmth admission of the motor. The nourishment for the motor being warmth and not the fuel, it is valuable in each sense to concentrate most extreme conceivable measure of warmth from the given mass of fuel. This procedure has both benefits and negative marks which are appeared by the far reaching investigation of the fuel utilized as a part of an inside burning motor, the synthetic procedure required in the ignition and the procedure of fumes.*

**Keywords-** Heat Transfer, Conductivity, Nanofluids.

## 1. INTRODUCTION

With vivacious advancement in the enterprises like marine designing hardware, send building, aviation and other assembling businesses the handling interest of vast and complex parts progressively every day. Presently days the greater part of the assembling enterprises are related with substantial apparatuses and gear to lead the propel innovation, all things considered "gantry machine" a sort of load lifting hardware is broadly utilizing as a part of the vast majority of the businesses. Research and development of the gantry machine instrument has been taken a vital review that incorporates plan, examination and advancement of the whole gantry structure. Gantry structure is somewhat overwhelming stacking lifting machine starting with one place then onto the next place it advantages to finish work viably and proficiently with optimized time and decrease in the human work. The continually expanding interest of vehicle has prompt to the constant specialized progression in this field. The execution of a motor is not just reliant on the effectiveness of the motor, additionally on different elements like start framework, cooling framework, transmission framework, emanation from

fumes and life span of the motor. However here we will concentrate the impact of thumping by suspending metallic nano particles in the fuel and attempt to abatement it. Nano liquids comprise of a transporter fluid, for example, water, ethylene glycol, fuel and so forth scattered with minor nano-scale particles known as nano particles.

The suspending of metallic nanoparticles to the fuel of an inner burning motor will diminish the particular warmth of the fuel i.e; less measure of vitality will be required to expand the temperature of unit mass of the fuel (shaped in the wake of suspending metallic nano molecule) through 10C when contrasted with the first fuel, subsequently making it less demanding to touch off the fuel.

The byproducts of clean combustion are mainly carbon dioxide and water vapor.

$2C_8H_{18} + 25O_2 \rightarrow 16CO_2 + 18H_2O$  (for gasoline)  $4C_{12}H_{23} + 71O_2 \rightarrow 48CO_2 + 46H_2O$  (for diesel)

Presently if by one means or another the water vapor can be separated into hydrogen and oxygen, then we can use the warmth created by this separation which is an exothermal procedure and along these lines increment the warmth vitality sustained into the motor. Each care must be taken in the outline thought of the motor so that the results of separation don't recombine once more, in light of the fact that if this happens then it will be a warmth devouring procedure which is undesirable. The oxygen and hydrogen can be securely depleted to the air diminishing the environmental contamination, which involves real concern nowadays. This procedure of separation of water or water vapor into its segment components i.e; hydrogen and oxygen is by and large a troublesome procedure, yet the nearness of metallic nano particles for instance aluminum nano molecule will make the separation procedure a reckless procedure. This is the rule of hydrogen power device. Christo Ananth et al. [2] proposed a system about Efficient Sensor Network for Vehicle Security. Today vehicle theft rate is very high, greater challenges are coming from thieves thus tracking/ alarming systems are being deployed with an increasingly popularity. As per as security is concerned today most of the vehicles are running on the LPG so it is necessary to monitor any leakage or level

of LPG in order to provide safety to passenger. Also in this fast running world everybody is in hurry so it is required to provide fully automated maintenance system to make the journey of the passenger safe, comfortable and economical. To make the system more intelligent and advanced it is required to introduce some important developments that can help to promote not only the luxurious but also safety drive to the owner. The system "Efficient Sensor Network for Vehicle Security", introduces a new trend in automobile industry. Christo Ananth et al. [3] discussed about Intelligent Sensor Network for Vehicle Maintenance System. Modern automobiles are no longer mere mechanical devices; they are pervasively monitored through various sensor networks & using integrated circuits and microprocessor based design and control techniques while this transformation has driven major advancements in efficiency and safety. In the existing system the stress was given on the safety of the vehicle, modification in the physical structure of the vehicle but the proposed system introduces essential concept in the field of automobile industry. It is an interfacing of the advanced technologies like Embedded Systems and the Automobile world. This "Intelligent Sensor Network for Vehicle Maintenance System" is best suitable for vehicle security as well as for vehicle's maintenance. Further it also supports advanced feature of GSM module interfacing. Through this concept in case of any emergency or accident the system will automatically sense and records the different parameters like LPG gas level, Engine Temperature, present speed and etc. so that at the time of investigation this parameters may play important role to find out the possible reasons of the accident. Further, in case of accident & in case of stealing of vehicle GSM module will send SMS to the Police, insurance company as well as to the family members.

## II. OBJECTIVES

The goal is to diminish the thumping in a pressure start sort interior ignition motor and in the meantime remove most extreme conceivable measure of warmth from the fuel. This is finished by including metallic nanoparticles in the fuel (diesel, in the event of pressure start motors). The suspension of metallic nano particles empowers the fuel to smolder quick, which is the key variable to abstain from thumping. The nearness of the nano particles cause the simple separation of water atoms which being an exothermal procedure signifies the warmth contribution of the motor.

The accompanying are the motivation of the exploration:-

- 1) To think about the calorific estimation of traditional fuel of a CI motor and fuel joining nanoparticles tentatively.
- 2) To watch the mechanical wear and tear of a CI motor utilizing fuel having nanoparticles and contrasting it and that of CI motor utilizing customary fuel, remembering the inclination of thumping.

3) To acquire a stable nano liquid by scattering nano particles in fuel.

4) To review the fumes gasses and their unfavorable impact on condition.

5) To gauge the expansion in the cost of fuel and to figure out if the arrangement will be prudent keeping the cost and life span of the motor as a top priority.

Christo Ananth et al. [4] discussed about an eye blinking sensor. Nowadays heart attack patients are increasing day by day. "Though it is tough to save the heart attack patients, we can increase the statistics of saving the life of patients & the life of others whom they are responsible for. The main design of this project is to track the heart attack of patients who are suffering from any attacks during driving and send them a medical need & thereby to stop the vehicle to ensure that the persons along them are safe from accident. Here, an eye blinking sensor is used to sense the blinking of the eye. spO2 sensor checks the pulse rate of the patient. Both are connected to micro controller. If eye blinking gets stopped then the signal is sent to the controller to make an alarm through the buffer. If spO2 sensor senses a variation in pulse or low oxygen content in blood, it may results in heart failure and therefore the controller stops the motor of the vehicle. Then Tarang F4 transmitter is used to send the vehicle number & the mobile number of the patient to a nearest medical station within 25 km for medical aid. The pulse rate monitored via LCD. The Tarang F4 receiver receives the signal and passes through controller and the number gets displayed in the LCD screen and an alarm is produced through a buzzer as soon the signal is received. Christo Ananth et al. [5] discussed about a system, GSM based AMR has low infrastructure cost and it reduces man power. The system is fully automatic, hence the probability of error is reduced. The data is highly secured and it not only solve the problem of traditional meter reading system but also provides additional features such as power disconnection, reconnection and the concept of power management. The database stores the current month and also all the previous month data for the future use. Hence the system saves a lot amount of time and energy. Due to the power fluctuations, there might be a damage in the home appliances. Hence to avoid such damages and to protect the appliances, the voltage controlling method can be implemented. Christo Ananth et al. [6] discussed about a project, in this project an automatic meter reading system is designed using GSM Technology. The embedded micro controller is interfaced with the GSM Module. This setup is fitted in home. The energy meter is attached to the micro controller. This controller reads the data from the meter output and transfers that data to GSM Module through the serial port. The embedded micro controller has the knowledge of sending message to the system through the GSM module. Another system is placed in EB office, which is the authority office. When they send "unit request" to the microcontroller which is placed in home. Then the unit value is sent to the EB

office PC through GSM module. According to the readings, the authority officer will send the information about the bill to the customer. If the customer doesn't pay bill on-time, the power supply to the corresponding home power unit is cut, by sending the command through to the microcontroller. Once the payment of bill is done the power supply is given to the customer. Power management concept is introduced, in which during the restriction mode only limited amount of power supply can be used by the customer. Christo Ananth et al. [7] discussed about Positioning Of a Vehicle in a Combined Indoor-Outdoor Scenario, The development in technology has given us all sophistications but equal amounts of threats too. This has brought us an urge to bring a complete security system that monitors an object continuously. Consider a situation where a cargo vehicle carrying valuable material is moving in an area using GPS (an outdoor sensor) we can monitor it but the actual problem arises when its movement involves both indoor (within the industry) and outdoor because GPS has its limitations in indoor environment. Hence it is essential to have an additional sensor that would enable us a continuous monitoring /tracking without cutoff of the signal. In this paper we bring out a solution by combining Ultra wide band (UWB) with GPS sensory information which eliminates the limitations of conventional tracking methods in mixed scenario(indoor and outdoor) The same method finds application in mobile robots, monitoring a person on grounds of security, etc. Christo Ananth et al. [8] discussed about Nanorobots Control Activation For Stenosed Coronary Occlusion, this paper presents the study of nanorobots control activation for stenosed coronary occlusion, with the practical use of chemical and thermal gradients for biomedical problems. The recent developments on nanotechnology new materials allied with electronics device miniaturization may enable nanorobots for the next few years. New possibilities for medicine are expected with the development of nanorobots. It may help to advance the treatment of a wide number of diseases: cardiovascular problems, neurosurgery, cancer, diabetes and new cell therapies. The implementation of new methodologies to help on manufacturing analyses and system design for the development of nanoscale molecular machine is one of the most important fields for research. The use of 3D physically based simulation in conjunction with clinical data may provide ways to design practical approaches for control and transducers development. Christo Ananth et al. [9] proposed a system, this fully automatic vehicle is equipped by micro controller, motor driving mechanism and battery. The power stored in the battery is used to drive the DC motor that causes the movement to AGV. The speed of rotation of DC motor i.e., velocity of AGV is controlled by the microprocessor controller. This is an era of automation where it is broadly defined as replacement of manual effort by mechanical power in all degrees of automation. The operation remains an essential part of the system although with changing demands on physical input as the degree of mechanization is increased.

### III. PROPOSED SYSTEM

The general properties of nano fluids are:-

1) Higher heat conduction due to larger exposed surface area of the nanoparticles (the conduction heat transfer rate  $Q_{\text{conduction}}$  is given by:-

$Q_{\text{conduction}} = K.A.dT/dx$  where,  $K$  = Thermal conductivity of the medium, which is greatly increased due to addition of nano particles

$A$  = Surface area across which conduction is taking place

$dT/dx$  = Temperature gradient

The above law is known as Fourier's Law of Conduction)

2) As the molecule measure diminishes, the warm conductivity increments.

3) The nano particles are so little in size that there is no danger of obstructing.

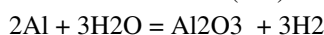
4) As the extent of the nano particles is less so is their mass. Along these lines their energy is unimportantly less and this wonder makes it incomprehensible for the nano particles to dissolve the metallic parts of the motor.

5) As the nano particles weigh less, the possibility of sedimentation is additionally less. This makes the nano liquid more steady.

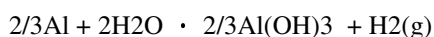
6) The warm diffusibility of the nanofluid is high contrasted with that of customary liquid. As  $\alpha = K/(\rho C)$ , where  $\alpha$  is the warm diffusibility of the liquid,  $K$  the warm conductivity,  $\rho$  the thickness of the liquid also,  $C$  its warmth limit. Warm diffusibility of a medium physically implies the capacity of the medium to permit the warmth vitality to get diffused through the medium all the more rapidly, which is an alluring condition for pressure start sort inward ignition motors. In a pressure start sort inner burning motor, if start postpone period is long, the amount of fuel collected in the barrel amid defer period will be huge, which will bring about high weight ascend amid uncontrolled ignition prompting to the era of high weight wave which when strikes the chamber produces sound. This marvel is known as thumping and it causes the life span of the motor less. In this way it is craved to diminish thumping. There is dependably a capable of being heard thump in the pressure start motors so clear outline between typical ignition and unusual burning (that is thumping) is impractical. Taking after variables will decrease the thumping propensity in pressure start motors:-

- 1) High temperature of charge.
- 2) High thickness of charge.
- 3) Short start delay.
- 4) Reactive blend.

In this manner plainly the fuel in a pressure start sort motor must blaze as quick as conceivable giving out vitality to lessen thumping and thus expanding the motor life span. It is realized that by scattering metallic nano particles in diesel its temperature rise will be less, however its thickness will likewise increment. The warmth limit of the fuel will diminish and henceforth less warmth is required by the fuel now for a huge ascent of temperature, which will prompt to shorter start delay. By scattering metallic nano particles the fuel likewise turns out to be artificially receptive. Henceforth a trade off ought to be made between the different benefits and bad marks of suspending metallic nano particles in diesel w.r.t the thumping inclination. The following are achievable reactions of aluminum nano particles with water:-



The primary response frames the aluminum hydroxide bayerite ( $\text{Al}(\text{OH})_3$ ) and hydrogen, the second response delivers the aluminum hydroxide boehmite ( $\text{AlO}(\text{OH})$ ) and hydrogen, and the third response shapes aluminum oxide and hydrogen. All the above responses are thermodynamically positive from room temperature past the softening purpose of aluminum ( $660^\circ\text{C}$ ). All the above responses are additionally very exothermic. The following table shows the thermodynamics of aluminum and water reaction:-



The reaction thermodynamics shown in the table below indicates that aluminum should spontaneously react with water. Christo Ananth et al.[10] discussed about E-plane and H-plane patterns which forms the basis of Microwave Engineering principles. The process is also a highly exothermal process summing up to the net heat input of the engine. The accompanying are the advantage of the purposed work:-

- 1) Less thumping propensity of fuel and thus the life span of the motor is more.
- 2) Heat can be removed from the separation of water which indicates the aggregate warmth contribution of the motor. The bad marks of the proposed work are taking after:-
  - 1) This idea of scattering metallic nano particles in fuel can't be utilized as a part of start sort interior burning motors since it will bring about overwhelming explosion.
  - 2) The fumes may contain the metallic nanoparticles which will bring about contamination of condition.
  - 3) The fuel will get to be distinctly costly.

The importance of the proposed think about regarding current situation on the planet is exceptionally critical. Vehicle has turned into an essential piece of everybody's live without which the procedure of innovative, prudent, logical advance is unimaginable. Subsequently it is particularly attractive to enhance this area with the goal that it can serve mankind in an all the more better and more extensive forthcoming.

Despite the fact that in the proposed concentrate the issues of natural contamination have not been engaged, it is a field to which consideration must be given.

The anticipated yield of the proposed study is as per the following:-

- 1) Less thumping in CI motor which will prompt to greater life span of the motor.

- 2) Increased warmth admission for a similar amount of fuel utilized, which will expand the productivity. Christo Ananth et al.[11] presented a brief outline on Electronic Devices and Circuits which forms the basis of the Clampers and Diodes.

#### IV. CONCLUSION

The present day situation of the current world is difficult to envision without vehicle. Consequently it is an essential test for car ventures to outline proficient and practical motor. The execution of the motor again relies on upon the kind of fuel utilized, the cooling framework, the grease framework, the scope of temperature in which the motor works and so on. In the event that the components are dealt with then the execution of the motor can be made strides. In this paper the impact of the fuel acclimatizing metallic nano-particles is considered. After the ignition of fuel in the burning chamber the side effects of burning (water vapor and carbon dioxide) are further crumbled, the separation of water being an exothermal procedure indicates the warmth admission of the motor. The nourishment for the motor being warmth and not the fuel, it is valuable in each sense to concentrate most extreme conceivable measure of warmth from the given mass of fuel. This procedure has both benefits and negative marks which are appeared by the far reaching investigation of the fuel utilized as a part of an inside burning motor, the synthetic procedure required in the ignition and the procedure of fumes.

#### 10. REFERENCES

- [1] Sheng-Qi Zhou and Rui Ni, "Measurement of the specific heat capacity of water-based  $\text{Al}_2\text{O}_3$  nanofluid", *APPLIED PHYSICS LETTERS* 92, 093123 \_2008\_
- [2] Christo Ananth, I.Uma Sankari, A.Vidhya, M.Vickneshwari, P.Karthiga, "Efficient Sensor Network for Vehicle Security", *International Journal of Advanced Scientific and Technical Research (IJST)*, Volume 2, Issue 4, March-April 2014, pp – 871-877
- [3] Christo Ananth, C.Sudalai@UtchiMahali, N.Ebenesar Jebadurai, S.Sankari@Saranya, T.Archana, "Intelligent sensor Network for Vehicle Maintenance system", *International Journal of Emerging Trends in Engineering*



and Development (IJETED), Vol.3, Issue 4, May 2014, pp-361-369

[4] Christo Ananth, S.Shafiqa Shalaysha, M.Vaishnavi, J.Sasi Rabiyaathul Sabena, A.P.L.Sangeetha, M.Santhi, "Realtime Monitoring Of Cardiac Patients At Distance Using Tarang Communication", International Journal of Innovative Research in Engineering & Science (IJIRES), Volume 9, Issue 3, September 2014, pp-15-20

[5] Christo Ananth, G.Poncelina, M.Poolammal, S.Priyanka, M.Rakshana, Praghash.K., "GSM Based AMR", International Journal of Advanced Research in Biology, Ecology, Science and Technology (IJARBEST), Volume 1, Issue 4, July 2015, pp:26-28

[6] Christo Ananth, Kanthimathi, Krishnammal, Jeyabala, Jothi Monika, Muthu Veni, "GSM Based Automatic Electricity Billing System", International Journal Of Advanced Research Trends In Engineering And Technology (IJARTET), Volume 2, Issue 7, July 2015, pp:16-21

[7] Christo Ananth, S.Silvia Rachel, E.Edinda Christy, K.Mala, "Probabilistic Framework for the Positioning Of a Vehicle in a Combined Indoor-Outdoor Scenario", International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE), Volume 2, Special Issue 13, March 2016, pp: 46-59

[8] Christo Ananth, R.K. Shunmuga Priya, T.Rashmi Anns, S.Kadhirunnisa, "NANOROBOTS CONTROL ACTIVATION FOR STENOSED CORONARY OCCLUSION", International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE), Volume 2, Special Issue 13, March 2016, pp: 60-76

[9] Christo Ananth, M.A.Fathima, M.Gnana Soundarya, M.L.Jothi Alphonsa Sundari, B.Gayathri, Praghash.K, "Fully Automatic Vehicle for Multipurpose Applications", International Journal Of Advanced Research in Biology, Engineering, Science and Technology (IJARBEST), Volume 1, Special Issue 2 - November 2015, pp.8-12.

[10] Christo Ananth, S.Esakki Rajavel, S.Allwin Devaraj, M.Suresh Chinnathampy. "RF and Microwave Engineering (Microwave Engineering).", ACES Publishers, Tirunelveli, India, ISBN: 978-81-910-747-5-8, Volume 1, June 2014, pp:1-300.

[11] Christo Ananth, W.Stalin Jacob, P.Jenifer Darling Rosita. "A Brief Outline On ELECTRONIC DEVICES & CIRCUITS.", ACES Publishers, Tirunelveli, India, ISBN: 978-81-910-747-7-2, Volume 3, April 2016, pp:1-300.