

ALTERNATIVE POWER SOURCE ENGINE

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Abstract - In 21st Century because of expanding populaces and advancements, people groups are going more towards car for their solaces and because of expanding requests of car the fuel which is the like water for individuals and fuel for vehicles running on IC Engine. Means there will be no life for individual without water and same for car without fuel. So due to expanding vehicles the prerequisite of fuel is additionally expanding which will prompted annihilation of fuel, so it is important to discover interchange hotspot for running the motor and keeping up the solaces of human lives, so the reason for the task is to create vitality which can show the motor to methods for magnets known as Electromagnetic Engine. Hence there is need of diminish the emanation of gases like CO, SO₂, NO_x, which are unsafe to nature. The primary goal of this undertaking is to create contamination free motor which satisfies the fuel necessity. The working standard of electromagnetic motor depends on repugnance wonder for example Repulsive fascination between two electromagnets. This rule moves cylinder TDC to BDC and the other way around by placing similar setup at bottom for single piston or via interconnection between two pistons for multiple chamber Engines.

Key Words: *Electromagnetic Engine, Repulsion, CO-Carbon Monoxide, SO₂- Sulfur Dioxide, NO_x-Nitrogen Oxide, TDC-To Dead center, BDC-Bottom Dead Center, Single piston, Chambers.*

1. INTRODUCTION

Since ages the human humankind has developed numerous new advancements which will assist with lessening his exertion for his day by day needs. One such sort of development is a "motor". The interior burning motor is a motor wherein the ignition of a fuel happens with an oxidizer in a burning chamber that is a necessary piece of the motor. The fundamental issue with the traditional IC motor is that they need fuel for ignition and when these energizes are scorched there is freedom of huge measure of contaminations.

Another worry is that individuals will in general use fuel pushed vehicles in any event, for short separation travel, albeit electric vehicles are accessible in the market for quite a while however are not so extremely main stream due to significant expense and less strength. The developing interest for fuel and the exhaustion of fuel saves have made it the need of great importance to utilize exchange motor system. A requirement for one of a kind structure motor was required, to expand the movement at savvy way. In this way, there was pressing necessity to think of a substitute type of a motor which is totally eco-accommodating and simple to keep up. The electromagnetic motor can substitute as an elective motor. It works totally on battery current, in this manner controlling the contamination to extremely enormous degree [1]. It very well may be considered as a totally green innovation. The electromagnetic motor can substitute as an elective motor. It works totally on battery current, in this manner controlling the contamination to extremely enormous degree. It very well may be considered as a totally green innovation.

2. LITERATURE SURVEY

In the late 1820s and mid 1830s two of the world's driving researchers; Michael Faraday and Joseph Henry were leading a progression of trials using the newfound marvel of electromagnetism. This work prompted various researchers attempting to create down to earth electric engines. The early electromagnetic motors can be extensively partitioned into two gatherings. The first to show up were the responding motors. One issue that confronted the experimenters was changing over the straight movement of an electromagnet into a turning movement [2]. Contemporary steam motors tackled this issue by the utilization of interfacing poles and wrenches and at first it appeared to be coherent to go with the same pattern. These responding electromagnetic motors are an entrancing case of one of innovations impasses.

The subsequent gathering was the turning motors spearheaded by Paul-Gustav Foment. These got rid of the associating bars and linkages of the responding motor and advanced into the cutting edge electric engine. In spite of the fact that the electric engine was a significant improvement as another force source, the choices around then being water, wind, or steam, it would be numerous prior years it turned out to be broadly utilized. The issue was that the main commonsense wellspring of power supply during the 1840s was batteries; solid electrical force circulation didn't get accessible until well into the second 50% of the nineteenth century. During the 1840s it was assessed that an electric engine controlled by zinc/carbon batteries cost multiple times more to run than a coal terminated steam motor of identical force.

3. Definition of Electromagnetic Engine

An Engine driving gadget with attractive parts that help in the activity of cylinder moved motors by connecting the gadget independently to the cylinders, making the cylinders play out the all over pushes Without the utilization [3] of fuel in this manner assembling the motor, dispensing with the need of fuel and forestalling contamination debilitating into the climate. This motor has attractive protecting wellbeing parts to shield individuals and other electronic gadgets from solid uncommon earth magnets and electromagnets.

4. PRINCIPLE

An Engine fueling gadget with attractive parts that help in the activity of cylinder pushed motors by appending the gadget separately to the cylinders, making the cylinders play out the here and there pushes Without the utilization of fuel along these lines activating the motor, disposing of the need of fuel and forestalling contamination depleting into the air. This motor has attractive protecting security parts to shield individuals and other electronic gadgets from solid uncommon earth magnets and electromagnets [4]. A straight current conveying conductor delivers a roundabout attractive field around itself at all focuses along its length and that the course of turn of this attractive field relies on the bearing of current stream through the conductor, the Left Hand Rule. The power that sets up the attractive field relies upon the quantity of turns on the loop and the extent of the present streaming. This power is called the Magneto Motive Force and the unit of estimation is the Ampere-turn. This equivalent the present occasions the number of turns. ($MMF = I \times n$). The material that the attractive field is being developed in, right now, has a protection from being polarized. This protection from the transition develop is called Hesitance. The attractive field doesn't show up in a flash, it starts from nothing when the current is first turned on and as the present increments so the attractive field increments. When the current is killed the field sets aside a little effort to decay once more.

$$H = (I \times N)/L$$

Where:

H - Is the quality of the attractive field in ampere turns/
Meter, (At/m)

N - Is the quantity of turns of the loop

I - Is the present coursing through the curl in amps, (A)

L - Is the length of the loop in meters, (m).

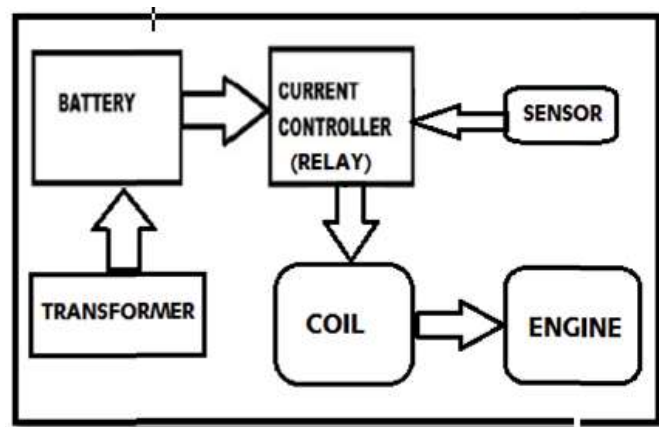
5. MATERIAL AND WORKING

A MAGNETIC REPULSION ENGINE comprises of a non-attractive chamber, cylinder with interfacing bar, flywheel and wrench shaft course of action, and a couple of perpetual magnets. The development of these motors is comparable as that of average IC motor. Here, the sparkle fitting and valves at the chamber head is supplanted by a changeless magnet. Another perpetual magnet [9] is put at the highest point of the cylinder which can uninhibitedly respond alongside the cylinder. Both the magnets are masterminded so that their surfaces are confronting each other with like shafts. Little openings are given at the chamber to normal air course. As the name speak to, the MAGNETIC REPULSION ENGINE will take a shot at the guideline of attraction of aversion. At the point when the cylinder at the BDC is furnished with starting turning exertion, it will move from BDC to TDC causing 180o pivot of wrench shaft. As the magnet set at the highest point of the cylinder and magnet fix at chamber head are confronting each other with like posts, the aversion power will begin following up on both the magnets. Least the separation between the magnets will influence higher aversion power [10]. Hence when cylinder comes to at TDC, the aversion power will repulse the magnets and accordingly the attractive cylinder will move descending from TDC to BDC causing further 180o revolution of wrench shaft and accordingly one complete turn of wrench shaft is gotten. After cylinder comes to BDC the flywheel will pull the cylinder back towards TDC and subsequently cycle refreshes. The motor will deal with two stroke for example pressure and force stroke. Right now, perpetual neodymium iron-boron magnet was clung to the top surface of the cylinder. Consequently the magnet went alongside the cylinder with responding movement [7]. So there were two magnets adhered to every cylinder which responded inside the chamber. The magnets were fixed so that the shaft direction was a similar way. For example on the off chance that the south shafts of both the magnets were fixed to cylinder surface, at that point the north shafts were presented to the air.

6. METHODOLOGY

At the point when same shafts of two magnets are brought close, at that point they will repulse one another and will move into the other way and when the contrary posts of the magnets are brought closer from far separation than they will feel the appealing power. This wonder is used to plan a motor utilizing perpetual furthermore, electromagnet. The examination was completed after different plan alterations and magnet courses of action [6]. The last course of action utilized in the investigation is mounting the lasting magnet on the cylinder while electromagnet at the highest point of the chamber at Top Dead Center position. The battery was joined to the electromagnet that empowered the electromagnet when the cylinder came to TDC position.

7. BLOCK DIAGRAM



The working of the proposed motor can be all around examined by experiencing the accompanying block diagram. The fundamental parts required are battery (power source), high evaluating current controller for example hand-off, transformer [2], loop and the electromagnetic motor with power magnet.

8. COMPONENT DESIGN

The structure of the attractive shocking motor is like regular motor plan. The electromagnet was situated at TDC position of the motor chamber supplanting CAM component and the perpetual magnet [8] was dashed on the cylinder. The motor cylinder was associated with the crankshaft through the interfacing pole. The associating bar was associated by methods for a cylinder pin with the crankshaft. The portrayal of each part is given underneath.

- **Electromagnet:** It was made of copper windings of reasonable measure wined across iron compound center. When force was turned on electromagnet repulsed the cylinder devouring exceptionally less force.
- **Piston:** A solid Neodymium magnet was dashed over the cylinder.
- **Connecting pole:** It interfaces the cylinder to the crankshaft.
- **Crank shaft:** It was made of steel compound which rotated as cylinder moved descending.
- **Proximity Sensor:** It was utilized as a control switch for on and off of electromagnet or timing.
- **Circuit:** It was utilized to adjust the current in the electromagnet also, shielded it from jerks.
- **Crank case:** It encompassed the crankshaft and was built with aluminum.

The schematic and genuine picture of the Engine is appeared in Figure 1. Figure 2 shows the planning circuit with Current Balancer, Relay and vicinity sensor. It was utilized for timing the on and off of the electromagnet. The Current balancer is used to keep the sensor from any sort of a snap. It is kept up with the voltage of 12V and current to 50A or less as balanced. The present balancer additionally forestalled the sensor to wear out as the sensor is touchy to high voltages and flows. Closeness Sensor is utilized to turn on and off the electromagnet. It worked a ways off of 10 mm-20 mm. The hand-off is utilized as a switch and it was worked when the sensor detected a metallic plate in front of it. It detected the nearness of the metal a good ways off of 20 mm. It was utilized with a sensor for signal moving to protest be worked.

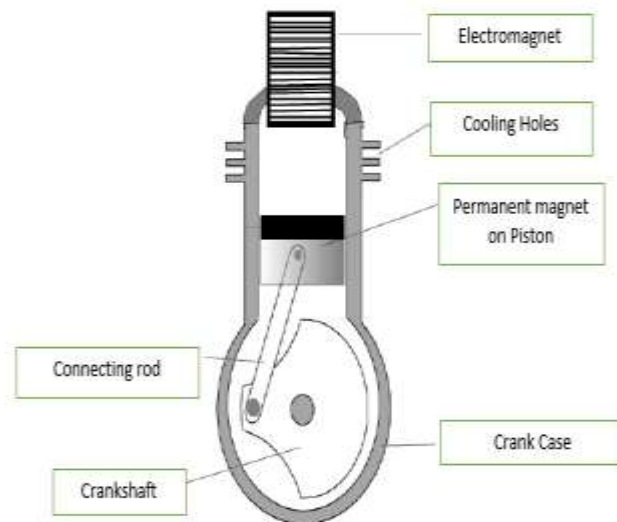


Figure 1: The schematic picture of Engine.

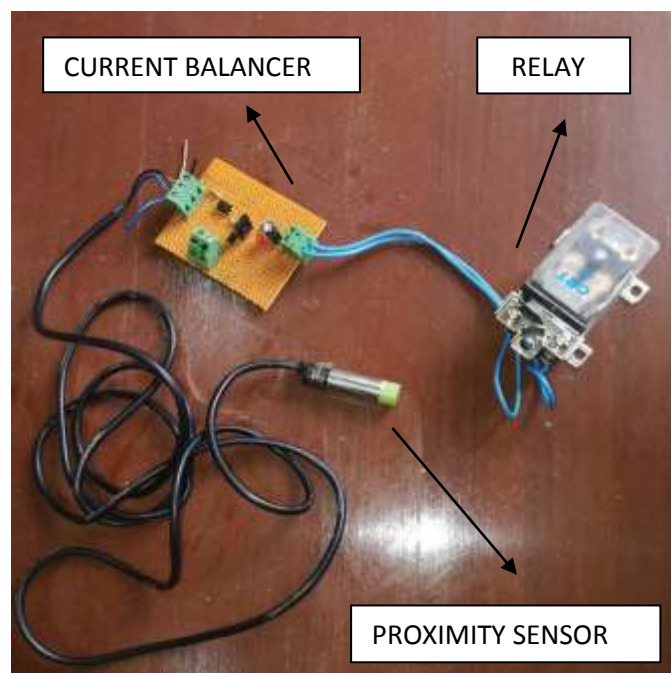


Figure 2: Planning Circuit

9. Electromagnet

The center was made of iron composite it polarizes as of now passed through it in Nano-seconds [8]. The electromagnet was planned that it could lift a load of 20 kg. The center distance across was kept 50 mm and the all out width of electromagnet 60 mm. The electromagnet is appeared in Figure 3. To work the electromagnet an underlying current of 8A was required. At this current stockpile, the electromagnet charged effectively and adequately. Greatest ampere of 50A and 24V can be giving. A hand-off is connected with an electromagnet to control its activity of on and off. A sensor is connected toward the finish of a hand-off that creates a sign to work the transfer as appeared in Figure 4.



Figure 3: Electromagnet



Figure 4: Electromagnet with Relay and Proxy Sensor

10. Center for Electromagnet

Various centers were utilized for various purposes. Table 1 shows the list of cores and their properties.

It was discovered that the delicate iron was the main center that suits our necessity. It was the main center that could without much of a stretch become a magnet when the current was gone through it [8]. The quality of the magnet can be expanded by essentially expanding the Ampere of current through the curl. It loses its attractive field effectively when current quits moving through it. Copper winding was utilized as it was more productive than silver wire and had longer life.

Material	BS [T] BR	[T] HC	[A/m]	μ_{max} 1000 P	\times	[Ω m]
High purity Fe	2.1	1.3	4-240	30		9.6 $\times 10^{-8}$
Carbon steel	1.55	0.7-1.1	40-400	0.6		-
NGO Si-Fe M400-50AP	1.7	1.23	98.2	6.9		70 $\times 10^{-8}$
GO Si-Fe M089-27N	1.9	1.72	33	41.4		70 $\times 10^{-8}$
Ni80Fe20	1.1	-	0.4	100		100 $\times 10^{-8}$
Co50Fe50	2.45	1.5-2.2	160	5		7 $\times 10^{-8}$

Table 1: List of cores and their properties

11. Design Calculation:**1) Force applied by electromagnet on cylinder [1]**

Max. Power applied by electromagnet on cylinder

$$F1 = (N^2 I^2 \mu_0 A) / 2G^2$$

Where,

N = number of turns

I = Current coursing through loop

μ_0 = permeability Of Free Space = $4\pi \times 10^{-7}$ (Henry/m)

A = Cross-sectional zone of electromagnet

G = Least separation among electromagnet and perpetual magnet = 0.005 m

2) Force applied by perpetual magnet [1]

$$F2 = (B^2 A) / 2\mu_0$$

Presently motion thickness

$$B = Br/2 \left[\frac{D+z}{R^2 + (D+z)^2} \right]^{0.5} - \frac{z}{(R^2 + z^2)^{0.5}}$$

Where,

B = Flux thickness (T)

A = Cross-sectional zone of magnet

μ_0 = permeability Of Free Space = $4\pi \times 10^{-7}$ (Henry/m)

Br = Remanence field = 1.21 T

z = good ways from a shaft face = 0.005 m

D = thickness of magnet

R = Radius of the magnet

3) Total Force and Power yield created by the Engine [1]

$$\text{Absolute power } F = F1 + F2$$

$$\text{Torque } T = F r$$

$$\text{Force Output} = (2\pi n T) / 60$$

Where,

F = absolute power on cylinder

r = wrench range = 0.01m

n = rpm of shaft

12. Exploratory Results

A progression of the test was performed and various outcomes were gotten. At 3A ampere current the electromagnet didn't charge so an expansion battery was utilized and 8 A current was provided. The center charged and pushed the cylinder descending yet there was a few break in the development. Along these lines, chamber exhausting was done and drafted. of the chamber was expanded to 56 mm. The cylinder easily moved in the chamber [5,8]. The intensity of the magnet was insufficient that it could push the cylinder descending that it couldn't return upward.

A battery of 44A was utilized than the magnet fascination separation was experienced a good ways off of 108 mm while the chamber length was 98mm so this additionally halted the magnet connected to the cylinder to come up again yet the planning could be balanced. The aftereffects of current versus rpm are organized in Table 2 underneath.

S.No.	Voltage(V)	Current(A)	RPMS
1	12	3	0
2	12	8	0
3	12	14	1
4	12	38	5
5	12	44	187

Table 2: Current versus RPM

13. CONCLUSIONS

The electromagnetic motor has different points of interest. The principle advantage is, no fuel is being utilized in the motor. This results into no contamination which is very need in the present day circumstance. As there is no any sort of burning occurring inside the chamber there is truth be told, almost no warmth age by the loops. This disposes of the requirement for a cooling framework and alluring for any vehicle. As attractive vitality is being utilized the requirement for air channel, fuel tank, supply framework, fuel channel, fuel injector, fuel siphon, valves and so on are disregarded and the structure of the motor is made basic [11,12]. Likewise by the utilization of materials like Aluminum, titanium and so forth we can lessen the heaviness of the electromagnetic motor the electromagnetic motor (model motor) which takes a shot at the rule of attraction was effectively structure and developed.

- It utilizes power as its information. No fuel is devoured, which was the essential objective.
- The model makes no contamination and is eco-friendly.
- The model is a two stroke motor.
- Only the shocking power between the magnet and electromagnet is utilized for power age.
- Acceleration is finished by controlling the clock which controls the hand-off
- It can be gotten the time delay must be speeding up .
- The field quality of changeless magnet will increment with the diminishing separation along the stroke.
- It can be extricated that the field quality increments with increment in the current (A) in the loop of electromagnet.
- It can be seen that there is a radical difference in power for each millimeter and it goes diminishing with the expansion out yonder between magnets.

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