

Development and Implementation of Electric Engine

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Abstract— In this day and age, larger part for populace uses fuels for subordinate vehicle. Corresponding currents situation, Interest of fuels are additionally continues developing step by step. In this problem, we cannot supplant current motor without Hybrid Engine. In this day and age, large populace uses fuels subordinate vehicle. Corresponding currents situation, Interest for fuel are additionally continues developing step by step. On such issue, we could supplant the current motor with Hybrid Engine. It can run through Electric or Fuel methods. In Electric method, 36V DC supply is given for excitation of impermanent magnets where it is attached with piston and engine. Consequently, Piston work through attractions and repulsions processes. Excitation is close at the point where the motor changed to fuel mode where it works as IC motor.

Keywords: Electric Engine

I. INTRODUCTION

Right now, most vehicle use IC Engine used for vehicle somewhere marginal vehicle incorporate electrical engine. Featuring most of utilization for vehicle, this devours lots of regular vitality or furthermore causes a huge measure contamination toward earth. On such cases hybrids engine could remain utilized on the grounds that it is a greater amount of non-conventionally.

In prior undertakings, hybrids engine are prepared by two magnet-Permanents magnets or impermanent magnets. Permanent magnets produce fields lacking of excitations when impermanent magnets make fields after electric power applied.

Ideas for utilizing two magnets are supplanted through impermanent magnets. As over the piston's head similarly it is fitted over the motor. An explanation behind disregarding permanents magnets on grounds that where an engine remains utilized for fuels method; highs measure warmth created inside pistons make its demagnetize.

Operation Source

A. Operation method

There are two methods of activity in hybrid engines. These are stated below:

- 1) Electric method
- 2) Fuel method

1) Electric method

The Electric methods activity work on principles of magnetism. It has two electromagnets in which first one is placed at highest point of container or other one at highest point of the piston as appeared in Figure A. A supply of 420 V is given to the electromagnets for excitation. Nebulous corer are increasingly effective than others corer, it's utilized to fortify the engine productions of magnetic fields. The nebulous core is wounded by 26 gauge of the copper wire.

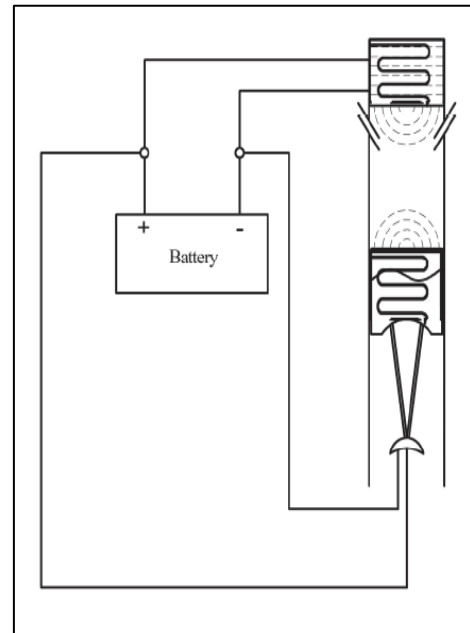


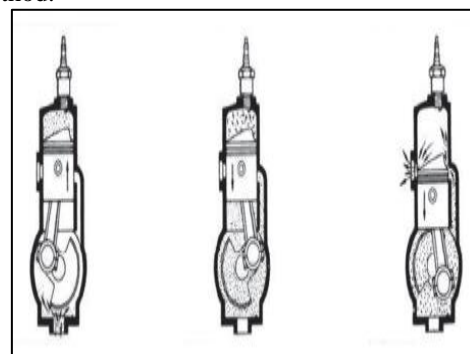
Fig. 1: Electric method

It has two corer Head's corer and piston's corer. Head's corer is wounded by 5000 turn whereas piston's corer has a winding of 2500 turns. When the corer is energized, head's corer delivers sturdy magnetic field than piston's corer because of distinction in the numbers of turn.

The consequence excitation, the core is changed such as electromagnets comparative pole. According to magnetic rule, the comparative pole cylinders make repulsive forces or move the piston downwards. In this manner electrically powered development which gives a rotational development makes the crankshaft move of the piston.

2) Fuel Method

The supply for excitation is turned off for exchanging the fuel method.



1. Compression 2. Power 3. Exhaust

Fig. 2: Fuel Method

Fuel method of hybrid engines has similar operation of an ordinary four stroke IC engine which is presented in figures B. The four-stroke motor principally includes 3 procedures of working steps. They are Power,

Exhaust and Compression. Initially the admission ports are open or air fuel blend will gone keen on crankses on compression stroke. At that point admission ports will shut or piston stays existence constrained complete through extending gas. Air-fuel blends stays existence compacted into crankses. Later, piston ventures pasts drain ports, in this manner inaugural that, at that point previous the admission ports, inaugural it. Such as drain gas stream out, Air fuel blend streams in toward feeling the squeeze on crankses. On other hand the cycles rehashes compressions strokes, force or drain strokes.

– Construction:

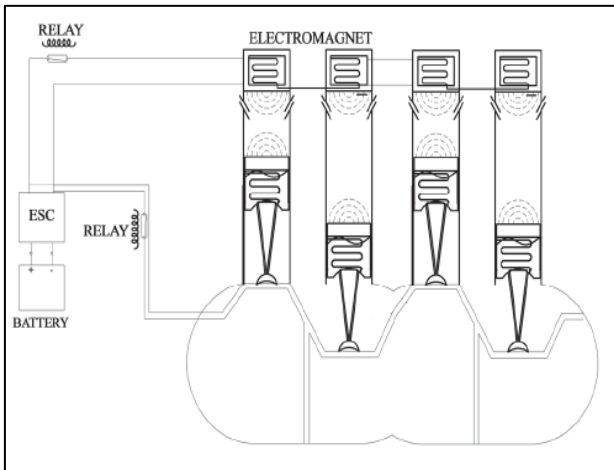


Fig 3: Hybrid Engine Construction

1) Supply

A DC Lead acid battery of 420V is utilized such as input sources of excitation of impermanent magnets.

2) Relay

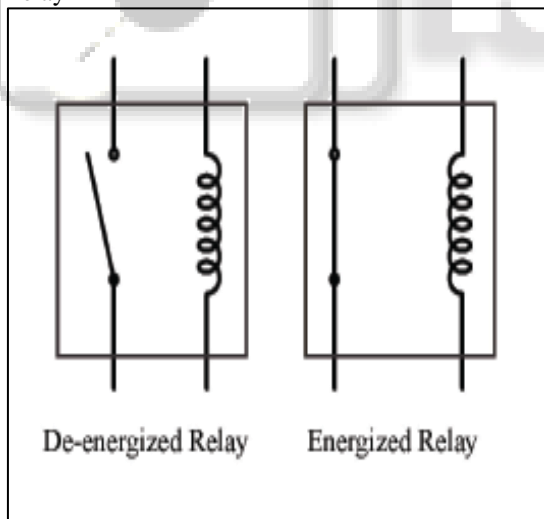


Fig. 4: Relay Construction

Relay control force provided for electromagnets. Numerous transfers utilized electromagnets for exactly works as switch, though additional operational standard is moreover utilize, examples- solid states relay. Relay is utilized when a circuit is important to control through dissimilar low power signal, and when limited circuit require constrain through single signal. Main relays remained utilized elongated parting broadcasts circuit by way of amplifiers: they reused signal coming from main circuit or then retransmitted that one to another circuit.

3) Electromagnet

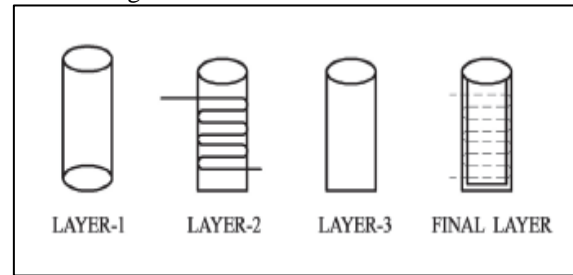


Fig. 5: Electromagnet Construction

These parts are progressively essential for the hybrid engines. In figure E L-1 is impermanent magnet is completely of different generous materials - nebulous corer. This is extra effective as compared to other corer. Similarly L-2 nebulous corers are wounded with copper wire. L-2 is wound by 5000 turn for container main corer or 2500 turn for piston main corer. Likewise L-3, corers are covered through defensive coating.

It's completed so that to withstand the inordinate warmth created inside the engine in light of the fact that high temperature motor is around 700°C (approx.) that may causes harm above twisting to corer. In L-4 last layers that mix totally things considered. Some additional advantages of this Electromagnet is extra proficient for generating magnetic fields.

II. MATERIAL USED

Sr.no	Parts Name	Materials Used
	Cylinders	Iron Cast, Aluminum Cast
	Pistons	Iron Cast, Aluminum alloys
	Pistons Ring	Iron cast, steel alloys(Pressed)
	Corer	Nebulous Corer
	Windings	26 gauge (Copper wire)
	Crankshafts	Steel Forged, Steel Cast
	Fly Wheels	Iron Cast

A. ESC

Speed controllers are the gadget that are utilize for changing the stream through electric current in this way shifting rate for the engine. An Electronic Speed Controller can be utilized to direct the flow of current. It is electrical circuits utilized through reason toward change of speediness of the engines or furthermore goes about as per dynamic brakes. Electronic speed controller is independent units that connects to collectors regulate controller station and combined collector to switch speediness of engines.

B. Equation

Power applied by electromagnet, $f1 = (n^2 i^2 k a) / 2g^2$

n- No. of turns

i- Coil Current

k- Free space permeability

g- Gap between the piston and top magnets

a- Area of cross section

Voltage- 420 V

Current-50A

Power= current*voltage
=50*420

=21000
 $f_1 = (n^2 i^2 k a) / 2g^2$
 Here,
 No. of turns, $n=5000$
 Coil Current, $i=50A$
 Free space permeability, $k= 4\pi \times 10^{-7}$
 Area of cross section, $a=78.5$ (radius=5)
 Gap between two electromagnet, $g=0.025$ m
 Substitute the value, we get
 $f_1 = (n^2 i^2 k a) / 2g^2$
 $f_1 = 4932.3 \times 10^6$ N
 Electro-piston:
 $f_2 = (n^2 i^2 k a) / 2g^2$
 Here,
 No. of turns, $n=2500$
 Coil Current, $i=50A$
 Free Space permeability, $k=4\pi \times 10^{-7}$
 Area of cross section, a (radius=5)
 Gap between two electromagnet, $g=0.025$ m

Substitute the value, we get

$f_2 = (n^2 i^2 k a) / 2g^2$
 $f_2 = 1233 \times 10^6$ newton

Force,

$f = f_1 + f_2$
 $f = (4932.3 \times 10^6) + (1233 \times 10^6)$
 $f = 6165.3 \times 10^6$ N

Total torque,

$t = r * f$

Where,

t- Total torque

f- Force

r – radius (Crank)

Force, $F=123.33 \times 10^6$ Newton

Radius (Crank), $r=0.05$ m

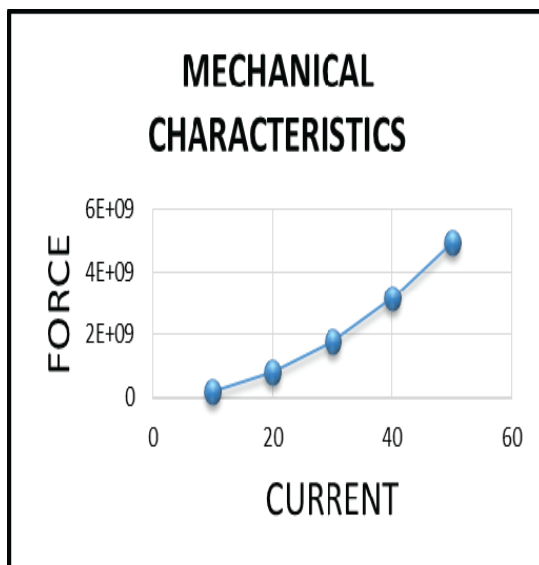
Substituting the value,

$t = r * f$

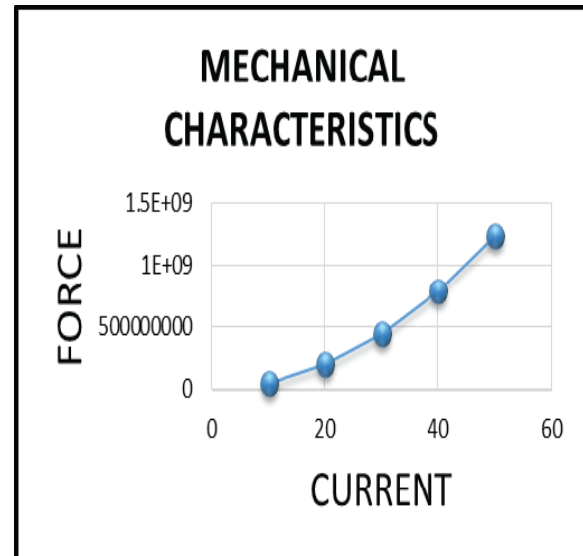
$t = 0.05 * 6165.3 \times 10^6$

$t = 308.265 \times 10^6$ newton-meter

III. RESULTS



Along these lines diagram shows power delivered through main corer of engine Where the electric mode works.



Accordingly, the chart shows the power delivered through electro-piston corer of a motor where the electric mode works. These two powers are required power for run the two-feed motor effectively in electrical mode.

IV. MERIT:

Hybrid engines are Eco's-accommodating that there is two methods of activities. It can on the other hand utilize for effective utilization. The utilization of nebulous corer of engine will helps effectiveness for producing power in the electric method. Controls by changing engines through electric method and fuel method are easy.

V. CONCLUSION

People in the upcoming time, ecosphere will truly confront an incredible rare fuel. During similar period, we saw vehicle frameworks are actuality changed rapidly adjusting the flow situation. Hybrid engines are unique creation which can run in fuel and electric methods of activity. The activity of methods is similarly effective through ordinary IC Engine or proceeds by way of productive IC Engine. In this way hybrid engines are additionally Eco's-accommodating that it expands a lesser amount of measure of fuels.

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