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THE APPLICATION KIT INCREASE TORQUE IN THE DIESEL ENGINE BY APPLIED IONIC ENERGY

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Abstract

This research presents the application kit for increase torque in the diesel engine by applied ionic energy using high voltage power supply which relies on the principle of mini converter using the IC number SG3525 as the pulse signal generator and adjusting the duty cycle at 10 percent, 20 percent and 30 percent. By maintaining the switching frequency at 20 kHz to drive the power MOSFET number IRF710 to work to control the operation of the high frequency high voltage switching transformer#TLF4T98001 to obtain a high voltage voltage greater than or equal to 1 kVp, using a load cell as an electrode for changing other gases In the air is oxygen gas and then put into the air intake pipe well to increase the amount of oxygen which will make the combustion in the engine room better. The test result is when the duty cycle is increased will increase the high voltage and will increase the reaction in the electrolyte cells respectively which, when testing the torque measurements while connecting the electrodes will see that the duty cycle at 30 percent has the highest voltage which causes the highest reaction. Thus resulting in the highest amount of oxygen resulting in the highest torque of the engine compared to the torque of the engine that has not yet been connected to the electrodes.

Keywords*: diesel engine, torque increase, ionic energy*.

Introduction

At present, countries around the world are in an energy crisis. Oil prices rose above 60 dollars / barrel. Is a serious problem in the development of the country In addition to campaigning for people to help save energy In the transportation sector still need to develop other energy As an alternative energy and trying to find a way to save fuel energy Regardless of biodiesel (Nakorn Thipyawong and Faculty, 2003), palm oil waxing (Kunthol Thongsri, 2004) Gasohol mixed butanol (Wichai Kanok Phittayathorn and Faculty, 2005) Kerosene (Surachai Subthanaboon and Faculty, 2005) or using liquefied petroleum gas, both LPG and NGV, all of which are new alternative energy that can be used to replace fuel in the future. And if able to be used to have more complete combustion will be energy saving Cost effective and efficient To completely burn the fuel, one important factor is The correct mixture of air and fuel rates is that there is a sufficient amount of air or oxygen to burn with the fuel, resulting in complete combustion of the engine. Reduce air pollution It is also a fuel economy. And increase the performance of the engine as well.

Therefore, this research has studied the experiment to put the amount of electric charge produced by the ionic high voltage electric field in the engine intake manifold. To compare torque rates and to check the results of the engine acceleration performance between engines that put the amount of electric charge and that does not put the amount of electric charge in the intake manifold.

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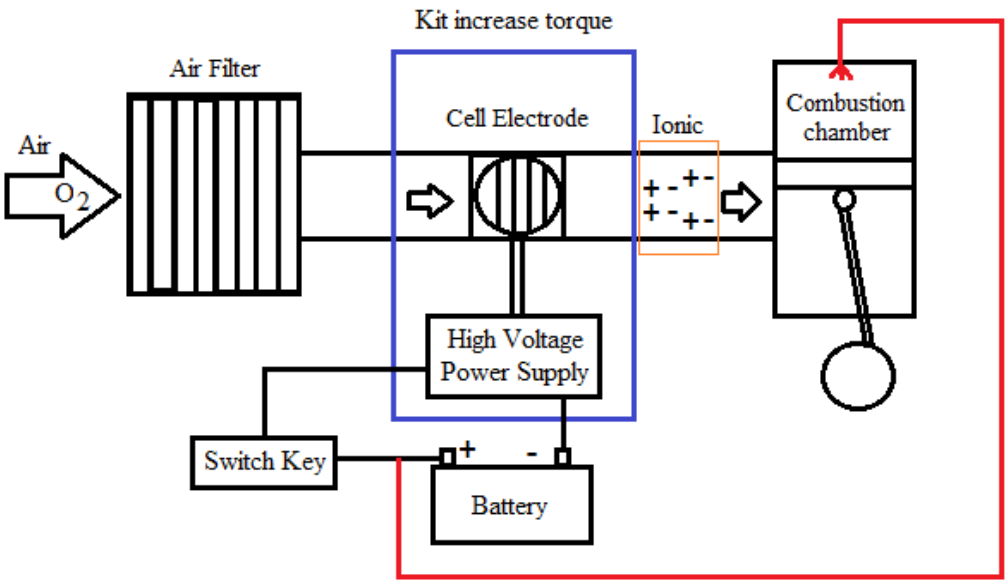

Fig. 1. Map of the installation of equipment kit for increasing torque of car designed

Materials and Methods

Concepts and guidelines for designing and building equipment kit for increasing torque

It is an electronic device (Electronics) used to install with cars to help increasing torque and also help increase engine performance to work more efficiently Which will help increase the efficiency of fuel oil combustion to be more complete Resulting in more energy and power, which increases the performance of the engine Resulting in increased torque, etc.

The works based on physical chemistry principles by creating a high voltage (low voltage) at a low amperage using 12 volts of power to create an electric charge causing combustion causing the combustion of the engine to be cleaner.

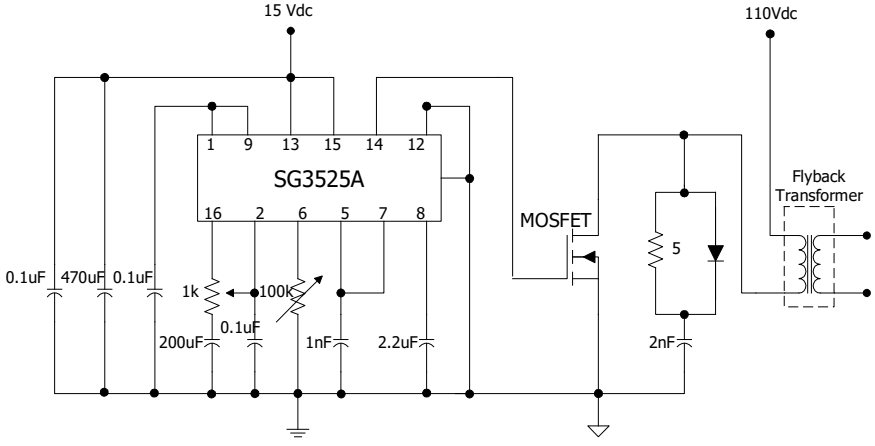

Fig. 2. High voltage power supply designed

Therefore, the device increases torque in the engine to be designed for easy installation the box is entirely sealed. Molded by casting to prevent water and impact there is a system to prevent various malfunctions. No need to customize the engine. Compatible with all types of engines and has a long service life can be used to check the car service center as usual.

High voltage power supply circuit designed

The high voltage power supply circuit designed for this equipment is presented in Fig. 2.

Design and build electrode by using the principle of the electric field highly irregular

Electrode cells consist of a stainless grating placed between the electrodes which has opposite high voltage if considering the electric field stress will be based on equation (1).

$$E = \frac{V}{d \times \eta^*} \tag{1}$$

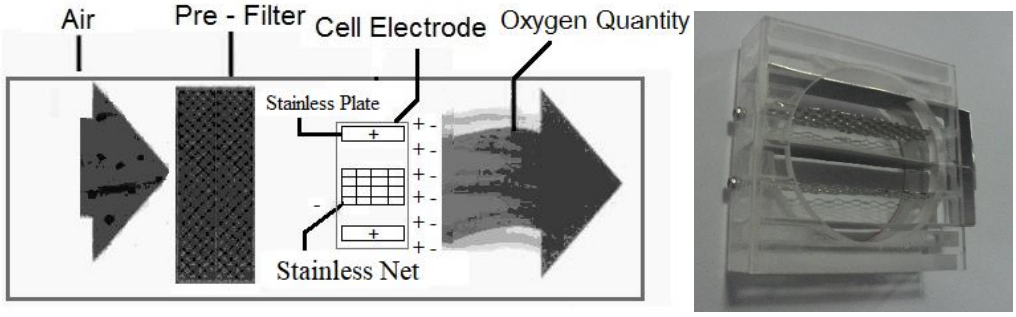

Fig. 3. Cell electrode for equipment kit for increasing torque in the diesel engine

Therefore, the set of electrodes choose aluminum mesh because it has good electrical conductivity and when electric power is supplied, it can create a highly uneven electric field. With the distance between stainless plate and stainless net equal to 2 cm.

Results and Discussions

The output signal measurement test is a high voltage voltage signal.

The output (V_{OUT}) of the switching transformer While connecting the electrode as shown in Fig. 4.

Table 1. Test results measure electrical parameters of high voltage power supply

V_{OUT} (kV)	Electric Charge (V), (Ionic)
1.14	+1.57 and -1.59
2.16	+2.26 and -2.38
3.25	+2.93 and -2.95

Definition of parameters in Table 1.

V_{OUT} is the high voltage output power of the high voltage power supply (volt), (V).

Electric Charge (V) is the amount of electric charge (ionic) produced by cell electrode, (V).

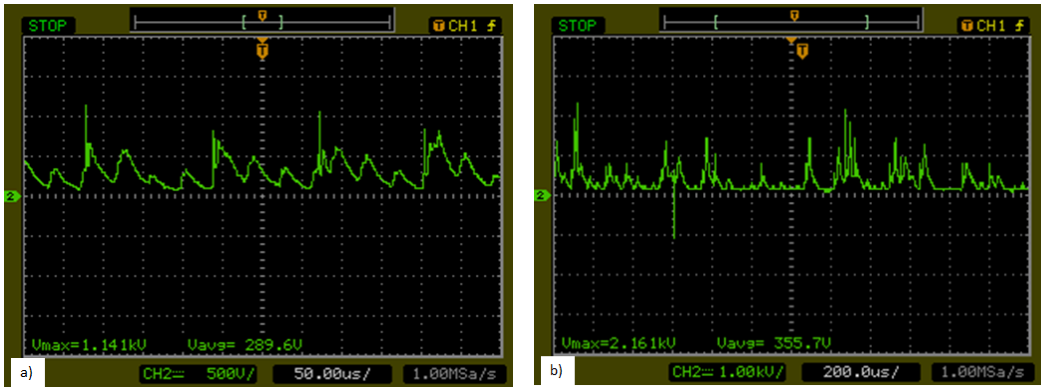

Fig. 4. (a) Output voltage high voltage signal (V_{OUT}) of switching transformer is equal to 1.14 kV_p at duty cycle 10 % and (b) high voltage output signal (V_{OUT}) of switching transformer is equal to 2.16 kV_p at duty cycle 20% while connecting the electrode

Test results of torque measurements as shown in Fig. 5, (Test facility Respec Srinakarin).

The meaning of the color graph line of Fig. 5.

Line Blue Color is when the engine is running using fuel oil. And not connected to the cell.

Line Yellow Color is when the engine is running. By connecting the cell electrode and using V_{OUT} is 1.14 kV (Minimal electrical energy paid into the electrode cell).

Line Pink Color is when the engine is running. By connecting the cell electrodes and using V_{OUT} is 2.16 kV (Medium electric power that is supplied into the electrolyte cell).

Line Green Color is when the engine is running. By connecting the 1-cell electrodes and using V_{OUT} is 3.25 kV (Maximum electric power that is supplied into the electrode cell).

Max Torque is the maximum torque that the wheel unit is lb ft.

Eng Torque is the maximum torque that the machine.

Avg Torque is the average torque between the wheel and the machine.

If you want to calculate the torque to Newton, multiply by 1.35.

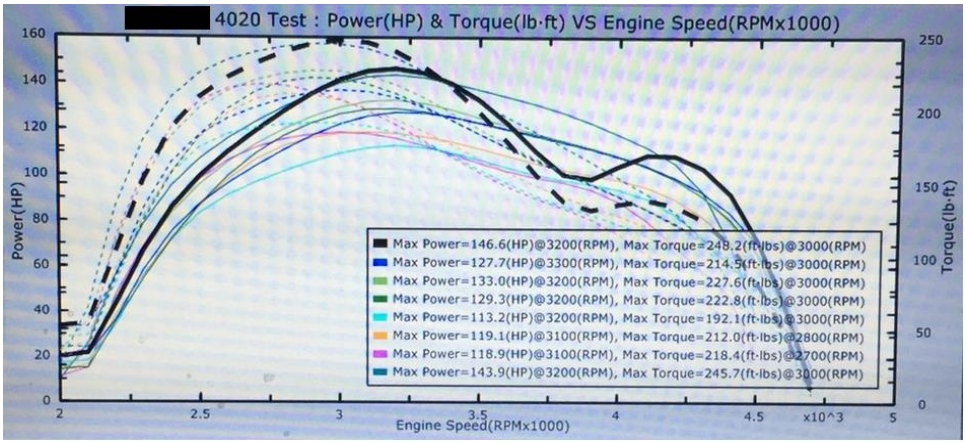

Fig. 5. Test results for torque measurements

Analysis of torque test results in Fig. 5 shows that, determine the Avg Torque value, i.e. the average torque between the wheel and the machine will see that Line Green is while the engine is running. By connecting cell electrode and using V_{OUT} is 3.25 kV, ie the highest high voltage (The maximum power that is supplied to the electrode) will get the average Max Torque of 245.7 ft.lbs when compared to Line Blue is when the engine is running using fuel oil. And not connected to the electrodes, the Max Torque value is equal to 214.5 ft.lbs.

Therefore, the Max Torque value increases to 245.7 – 214.5 = 31.2 ft. lbs.

Conclusions

From the test, the researcher tested the amount of positive and negative electric charge produced in Table 1. The result is when the V_{OUT} is increased. Will increase the high voltage Which results in increased electric field intensity Therefore resulting in an increase in the amount of electric charge, which is when V_{OUT} is 1.14 kV will get electric charge +1.57 V and -1.59 V when V_{OUT} is 2.16 kV will obtain electric charge +2.26 V and -2.38 V and when V_{OUT} is 3.25 kV will be get electric charge amount +2.93 V and -2.95 V.

Summary of torque measurement results

Avg Torque value at Line Green Color will have the highest Max Torque value equal to 245.7 ft.lbs. When compared to Line Blue Color will have an Max Torque value equal to 214.5 ft.lbs. Therefore, the Max Torque value will increase to 245.7 – 214.5 = 31.2ft. lbs.

(Note, compared to other parameters, the Max Torque value that Line Green Color will be the highest value)

Each of which increases the amount of electric charge will result in increased oxygen supply By producing electric charge will react with other gases in the air and will increase the amount of oxygen gas respectively. Therefore, when the amount of oxygen increases will cause clean combustion in the engine room and will result in increased torque as well.

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