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# Modification Of CDI Ac Honda Astrea Grand Into Cdi Shogun 110 Cc On Fuel Flow On The Supra X vehicle

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**Abstract.** Black carbon from PET plastic bottles has been successfully synthesized by heating methods. Six gram sample of PET plastic bottle were heated by furnace for 2 hours with various heating temperature as 300°C, 350°C, 400°C, and 450°C. Black carbon then mixed with methylene blue in aqueous solution with various masses as 20 mg, 40 mg, 60 mg, 80 mg, and 100 mg. This study shows that the black carbon which synthesized at temperature of 450°C performs as the most effective absorbent. The solution of methylene blue changed its color significantly and became clearer after the adsorption process. The absorbance spectra of methylene blue lies at the wavelength of 550-700 nm and decreasing the absorbance intensity. It indicates that the concentration of methylene blue is decreased during adsorption process which predicted due to the oxygen molecule and the porosity. The analysis of carbon morphology showed that black carbon which synthesized at temperature of 450°C has more pores, while the black carbon which heated at temperature of 400°C has few pores. The EDX analysis shows that black carbon that heated at temperature of 450°C contains 32,4% oxygen, whereas black carbon that heated at temperature of 400°C contains 24,3% oxygen.

**Keywords :** Modifications, Engine rotation, CDI AC, CDI DC, Fuel flow discharge

## 1. Introduction

Ignition will affect the maximum combustion of fuel in the combustion chamber. Improper ignition will cause engine performance to decrease and engine sound to limp (Kageyama et al., 1984)

A four-stroke motor is a motor in which each cycle of work is completed in four alternating motions of the piston or two revolutions of the crankshaft. The piston stroke is the highest piston motion or TDC to the lowest TMB. In a four-stroke gasoline engine there are four working steps of the piston, namely the intake stroke, compression stroke, work stroke, and exhaust stroke. The following will discuss the steps of the piston work.(Daryanto, 2013)(Nugraha, 2005)

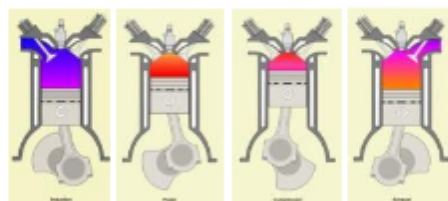


Figure 1. The working principle of a 4 stroke motor

There are several ignition systems including conventional ignition systems, CDI ignition systems, and full transistor ignition systems. CDI ignition is divided into two, CDI AC and CDI DC systems.

The AC CDI ignition system as the current input source used is alternating current (AC) from the generator, in the CDI unit this current will be converted to DC or direct current before entering the ignition coil. Ignition with the AC system is very dependent on the engine speed to produce the size of the electric current that enters the CDI unit (capacitor discharge ignition).

Ignition with CDI DC as the input current source of the CDI unit is the current from the battery which is direct current, with this DC CDI ignition it will produce a more stable voltage on ignition compared to AC CDI ignition whose voltage source will vary according to engine speed. The use of this DC CDI will make the engine power that is built more stable, both at low, medium or high engine speeds.

## 2. Methods

Capacitor Discharge Ignition (CDI) is a motorcycle engine ignition system. The machine utilizes energy previously stored at its use. The energy is then used to generate a high voltage on the ignition coil. Until finally the high pressure produces a spar in the spark plug. support all tools and materials, turn on the engine of the supra x motor vehicle until the working temperature is met with the engine temperature control of 32 degrees, after the supra x engine is running, install the tacho meter on the ( + ) battery, pulser and mass ( - ) adjust the engine speed on the gas adjusting bolt and determine the engine speed of 3500 rpm, 4000 rpm, 4500 rpm, 5000 rpm and 5500 rpm then test the fuel flow discharge according to the engine speed.

## 3. Results and Discussion

Table 4.3 Valve Gap Variation Test Results

Table 4.3 comparison of test result of fuel flow

Fuel (ml)	Engine rotation (rpm)	CDI Units	Perio d (Sec ond)	Unit CDI	Perio d (Sec ond)
82	3500	CDI AC	83,9 7	CDI DC	100,1 9
82	4000	CDI AC	72,0 7	CDI DC	89,97
82	4500	CDI AC	65,2 5	CDI DC	80,89
82	5000	CDI AC	54,8 0	CDI DC	75,77
82	5500	CDI AC	50,3 8	CDI DC	63,74

Description :

Data from table 4.3 above is only every 82 ml of fuel at 3500 rpm engine speed using AC CDI takes 83.97 seconds, while DC CDI takes 100,19 seconds. The difference between the use of CDI AC and CDI DC is 16,22 seconds, it more economical to use a DC CDI

Every 82 ml of fuel at 4000 rpm engine speed using AC CDI takes 72.07 seconds, while DCI CDI takes 89.97 seconds. The difference between the use of CDI AC and CDI DC is 17.9 seconds. It's more economical to use CDI D

Every 82 ml of fuel at 4500 rpm engine speed using AC CDI takes 65.25 seconds, while DCI CDI takes 80.89 seconds. The difference between the use of CDI AC and CDI DC is 15.64 seconds. It's more economical to use a DC CDI.

Every 82 ml of fuel at 5000 rpm engine speed using AC CDI takes 54.80 seconds, while DCI CDI takes 75.77 seconds. The difference between the use of CDI AC and CDI DC is 20.97 seconds. It's more economical to use a DC CDI.



Every 82 ml of fuel at 5500 rpm engine speed using AC CDI takes 50.38 seconds, while DCI CDI takes 63.47 seconds. The difference between the use of CDI AC and CDI DC is 13.09 seconds. It's more economical to use a DC CDI.

Based on the data obtained from the research, it shows that by using AC CDI and DC CDI it can be seen the changes to the fuel flow rate. Then obtained a graph like in Figure 2.

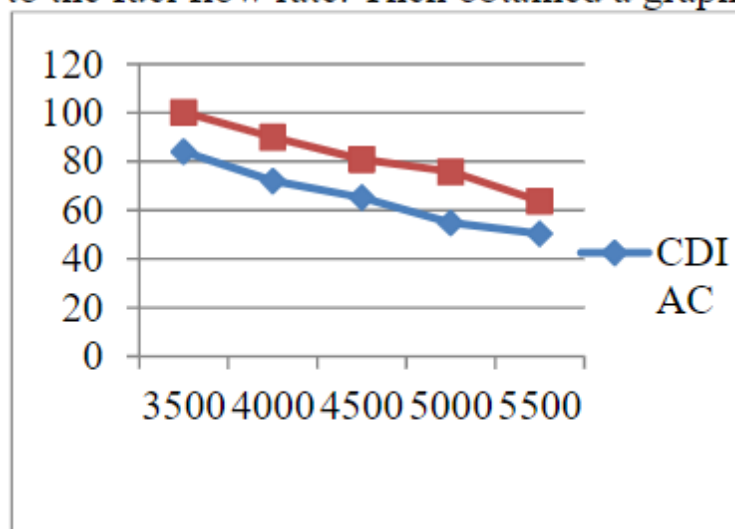


Figure 2. Graph of Calculation of Fuel Discharge Time Against CDI AC and CD DC

From the graph above, it can be seen that there is an effect on the modification of AC CDI to DC CDI with fuel flow. CDI DC tends to be more efficient at fuel flow.

#### 4. Conclusion

Based on the test results data, the effect of the modification of the Honda Astrea Grand AC CDI into a 110 cc Shogun DC CDI on the fuel flow rate, it can be concluded that at 3500 rpm the engine speed difference between AC CDI and DC CDI is 16.22 seconds. At 4000 rpm the engine speed difference between the AC CDI and DC CDI is 17.9 seconds. At the engine speed of 4500 rpm the difference in time between the AC CDI and DC CDI is 15.64 seconds. At 5000 rpm engine speed the difference in time between AC CDI and DC CDI is 20.97 seconds. At the engine speed of 5500 rpm the time difference between the AC CDI and DC CDI is 13.09 seconds.

Using a DC CDI, the fuel flow rate will be more efficient and the engine sound is more stable, because by using a DC CDI a stable ignition is obtained at the lower, middle, and upper rotations..

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