

## **Abstract**

The present work has dealt with the effect of the magnetic field on the performance of (S. I. E). The engine performance was observed by examining the engine brake power (bp), thermal efficiency, brake specific fuel consumption (bsfc), for different values of gasoline fuel with values of octane number of (68, 75.83 and 85) and to find out what sample of octane number is affected by a magnetic field significantly more than other. The fuel is subjected to a magnetic field using two magnets with intensity of (1000 Gauss) for each one, which are placed on fuel supply line to magnetize the fuel before admitted to the carburetor. The experimental work was conducted on the (S. I. E), 4 strokes, and 4 cylinders. The displacement volume for the engine is 2 liters. The engine was coupled to a hydraulic dynamometer type [isi lingegneria didattica], under engine speed range between (1300-2100 rpm) at maximum load.

The first experiments were carry out, without magnetic field, then with one magnet with intensity of (1000 Gauss), then with two magnets with intensity of (1000 Gauss) for each one.

The experimental results showed that the fuel has octane number of 75 exhibits a reduction in; fuel consumption (L/h) up to (11.73%) and (21.48%), and brake specific fuel consumption (bsfc) up to (11.11%) and (19.9 %), but the brake thermal efficiency raised by about (10.35%) and (17.52%), respectively, but the exhaust temperature increased by (2.4%) and (4.4%), respectively.

Fuel has octane number of 83 shows a reduction in; fuel consumption (L/h) up to (0.907%) and (2.13%), and brake specific fuel consumption (bsfc) up to (0.96%) and (1.83%), but brake thermal efficiency raised by about (0.94%) and (2%), respectively, but the exhaust temperature increased up to (0.95%) and (1.7%), respectively.

For fuel has octane number of 85, the reduction in; fuel consumption (L/h) was (0.322%), and brake specific fuel consumption (bsfc) was (0.47%), but brake thermal efficiency was increased by (0.34%), for two magnets only, but the exhaust temperature increased by (0.18%) and (0.12%), respectively.