

# Study, Design and Fabrication of Single Layer Petrol Filter

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**Abstract**— Petrol filter is a device that removes the dust particle from the petrol. This device is placed before carburettor and after Petrol tank. We are design these device to removes foreign particles such as dust, dirt there by it maintaining the performance of the engine. Also due to this arrangement engine fuel burning efficiency is improved. The previous research on petrol filter has shown that they are replaced pre-maturely device, loading to increasing maintenance costs and to reduced engine protection against abrasive wear. So, in this project we are making automatic cleaning of petrol filter without using manual energy it's completely automatic Engine. If it is done by manually air filter cleaning may be uneven but by this process cleaning should be proper and maintaining the efficiency of air filter as well as engine. It reduces scale formation .Their purpose remains the same to protect the fuel system by removing contaminants (rust, dirt, and other foreign matter) from the fuel. Dust in engine fuel can lock or partially lock jets, and drilled or cored passages in the carburetor, poor starting characteristics.

**Key words:** Automatic Filter, Nozzle, Pressurised Air, Lock Jets, Needle Valve

## I. INTRODUCTION

Petrol filter is a device that remove dust particle from the petrol and also remove water contain in the petrol. Earliest filtering process is done by fiber particle and nanoparticles and filter paper also. In our device the dust is removed by spreading the air on filter. Quite small particles may lodge on the seat of the needle valve, causing the carburetor to flood. Abrasive particles may lock the accelerator pump lock valves or valve seats. There is the further consideration that abrasive particles carried through the carburetor and into the combustion chambers may result in lower the efficiency of the engine.

## II. CONSTRUCTIONAL PARAMETERS

### A. For Air: (All dimensions are in mm)

$$\text{Volume} = \text{Length} \times \text{Width} \times \text{Height}$$

$$\text{Volume} = 100 \times 45 \times 12.5$$

$$\text{Volume} = 56250 \text{ mm}^3.$$

$$\text{Area of Rectangular Box} = \text{Length} \times \text{Width}$$

$$= 100 \times 45$$

$$\text{Area of Rectangular Box} = 4500 \text{ mm}^2.$$

### B. For Nozzle Tube

$$D_1 = 10\text{mm}$$

$$D_2 = 15\text{mm}$$

#### 1) Flow Rate through Nozzle

Calculating flow rate through nozzle in terms of Height.

$$Q = Cd \times A \times \sqrt{\frac{2g \times (h_2 - h_1)}{1 - \frac{D_2}{D_1}}}$$

$$Q = 752.97 \times 10^3 \text{ mm/sec.}$$

## III. IMPROVEMENT AS PER PRACTICALA)

### A. Diameter Difference

As per first data the nozzle diameter is 5mm and area of filter plate is 10mm, so it can't clean whole surface in one time. Because its size is double .So here we enhanced the diameter of nozzle and we take it 10mm.

### B. Height in between Nozzle and Filter Plate

As per first data the height difference is high (i.e. 50mm) so pressure acting on filter is low. Now it reduce to 20mm, so it pressure is under controlled.

### C. Size of Device

Earliest device is big, heavy and when it is damage it comes to change. But our device is small, lightweight and it is automatic cleaner so there is no need to change the device.

## IV. DEVICE & ITS COMPONEN

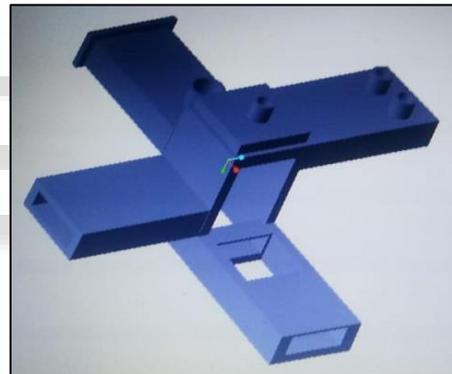


Fig. 1: Fuel Filter

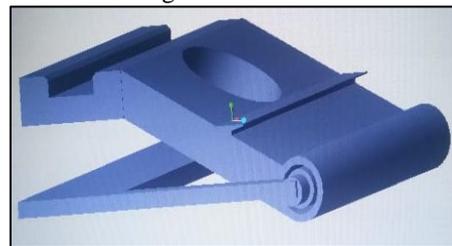


Fig. 2: Filter Plate, Pushing out Mechanism

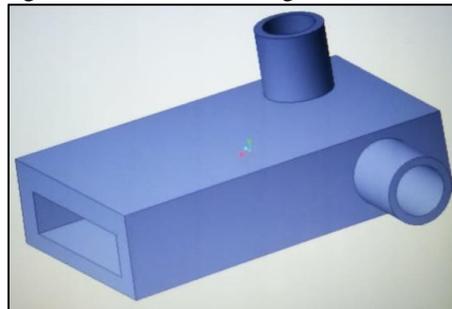


Fig. 3: Cylinder no.4, Air container

## V. METHODOLOGY

When fuel is enter into the device then this will passed through filter plate. Other than fuel is hang on filter plate and petrol passed through it. Now, press the button, to start the device. Button pushes the inclined plane, during that time plane moves inclined downward side. Pushing mechanism consist of one slit and filter paper consist of one extra fin like structure. Both are grabbed to each other. When inclined plane moves downward, that time the filter paper is free from inclined plane. Spring attached to the filter paper, so when filter is released it will throw outside of the device. Now the filter paper comes into the cylinder number 1. Now in cylinder number 2, one DC motor is there, motor creates air and send into next cylinder. Air comes into cylinder number 3 by using channel. Cylinder number 3 stores as well as convert the normal air into pressurised air. Then this pressurised air is passed through nozzle on the filter plate, to remove the dust particle.

## VI. CONCLUSION

We are working to make a device that removes only dust from the fuel, because in carburettor dust particle are found so it result to lower the efficiency of engine, Due to that reason we designed the device and placed it before the carburettor.

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