

Fuel Cut-Off System for Vehicle Safety

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Abstract— In today's world saving fuel has become very important as the fuel prices are increasing rapidly. Due to this there is increase in thieves who remove petrol from various motorcycles. As the motorcycle gets older then we experience leakage of fuel. Wastage of fuel can even reduce economy of the vehicle. There are motorcycles in market without petcock, these motorcycles have MPFI engines and use an electronic pump which is controlled by the ECU to supply fuel. But the price of such systems is high and is available in costly motorcycles. Therefore we have made a system which is affordable and can be used by common man to save fuel.

Keywords-petcock safety;motorecycle;anti-theft

I. INTRODUCTION

Most older motorcycles have a fuel petcock valve mounted on or nearby the fuel tank to control the supply of gasoline. In the United Kingdom it is known as a petrol tap. Meriden Triumph Bonneville's have two petrol taps, one on each side of the tank. The petcock typically has three positions: on, off, and reserve. The reserve position accesses the bottom portion of the fuel tank. Its functionality is especially useful on older or more basic motorcycles, which may not possess a fuel gauge. Many motorcycles now have an automatic, vacuum operated, petcock, with on and reserve as well as sometimes a prime position, which bypasses the vacuum operation and allows fuel to flow to the carburetor without the engine turning over. Another common option is to have a vacuum operated petcock with no reserve, and instead use a sensor in the tank to turn a light on when low on fuel. In most cases these will not have an off option either, and the petcock will be entirely transparent to the rider and not accessible without removing the fuel tank.

II. OBJECTIVE OF RESEARCH WORK

The main objective of this research work is to incorporate the petcock used for scooters in motorcycles. The idea is to drill a hole in the intake manifold of the motorcycle engine. A brass pipe will be attached to that hole using araldite. This will be connected to the vacuum port of the scooter petcock. The fuel port of this petcock will be connected directly to the fuel port of carburetor.

III. OPERATING CONDITIONS

A. Motorcycycle Used

Kawasaki BAJAJ Caliber 115

B. Welding Machine

Oxygen-acetylene welding Machine.

C. Araldite

Araldite is used to join together the two sections of carbon fiber which make up the monocoque of the Lamborghini Aventador.

IV. DESIGN AND EXPERIMENTAL WORK

- 1) The old manual fuel cock was removed that was available with the motorcycle.
- 2) A steel pipe with threading is welded to the fuel tank.
- 3) The pipe was selected such that the petcock can be easily attached to it using a nut.
- 4) A hole is drilled on the inlet manifold of carburettor.
- 5) A brass pipe of 4 mm diameter and 20 mm in length is attached normal to the hole with help of araldite.
- 6) The petcock has two outlets.
- 7) The suction pipe connects the outlet at the bottom and the brass pipe.

The upper outlet is for flow of the fuel and it is connected to the fuel inlet at the carburettor.



Fig.1 Original petcock



Fig.3 Vacuum petcock used on the motorcycle after modification



Fig.2 Brass pipe attached over the hole drilled on the inlet manifold

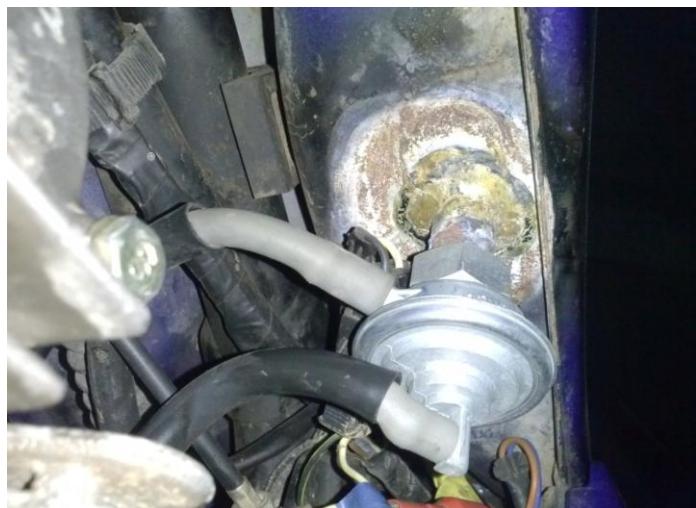
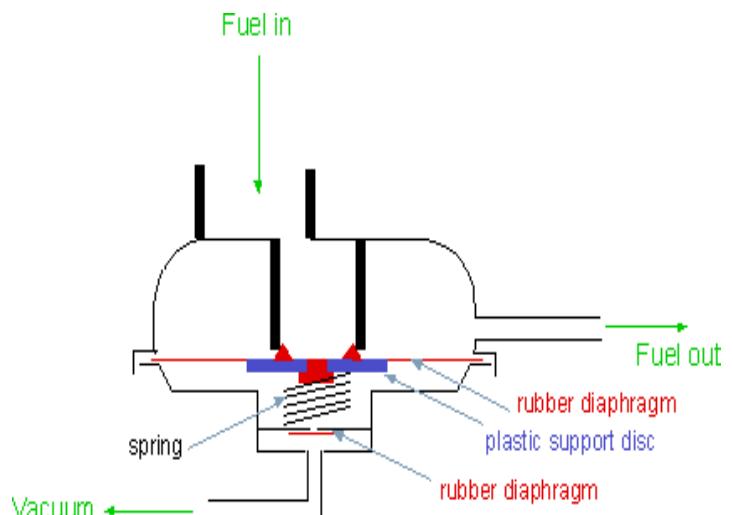


Fig. 3 Mild steel pipe welded on the tank

V. WORKING



- 1) The petcock has two pipes connected to it.
- 2) One is the flow pipe carrying fuel from the fuel tank to the carburettor.
- 3) Other pipe is the suction pipe that provides a little amount of suction from the intake manifold that pulls down the diaphragm and the fuel flows through flow pipe.
- 4) When the engine is cranked, the suction stroke takes place.
- 5) Due to this, the air-fuel mixture flows from the carburettor to the engine through the inlet manifold.
- 6) This suction is used to pull down the diaphragm in the petcock with help of the suction pipe.
- 7) When the diaphragm is pulled down, the fuel flows through the flow pipe to the carburettor.
- 8) Carburettor then supplies the air-fuel mixture to the engine through the inlet manifold.
- 9) When the engine is shut down, there is no suction.

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- 10) Thus the diaphragm in the petcock gets back to its original position with help of a spring situated below it.

VI. RESULT

- 1) We have seen that most of the fuel cocks have leakage problems.
- 2) Even when the vehicle is parked, one can smell the odour of petrol.
- 3) The reason behind this is the defective manual fuel cock.
- 4) This vacuum operated fuel petcock will supply fuel only when engine cranks.
- 5) The fuel supply will stop as the engine stops.
- 6) Due to this there won't be any leakage of fuel.
- 7) Also the fuel cannot be stolen even after removing the fuel pipe.

VII. LIMITATIONS

If the fuel indicator is not working properly then it is difficult to know the amount of fuel left in the tank as there is no reserve position for the petcock.

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