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MEASUREMENT OF FUEL CONSUMPTION IN INTERNAL COMBUSTION ENGINES

In the modern world the most popular means of transport is a car. The commonest problem for car owners is fuel consumption precise measuring. Those measuring systems that are installed in ICE (here & forward – internal combustion engine) of most vehicles can give us very approximate values.

There are two questions which our topic arises: What is the use of precise fuel consumption measuring? What flow meter meets the requirements of our research?

Answering the first question let us consider the situation when you are almost out of fuel and you don't know whether you will be able to get to the nearest gas station. With the device that we offer you will know what distance your car can go exactly.

Before describing our project we must consider the definition of flow measurement devices.

Flow measurement is the quantification of bulk fluid movement. Flow can be measured in a variety of ways. Positive-displacement flow meters accumulate a fixed volume of fluid and then count the number of times the volume is filled to measure flow. Other flow measurement methods rely on forces produced by the flowing stream as it overcomes a known constriction, to indirectly calculate flow. Flow may be measured by measuring the velocity of fluid over a known area [1].

Our research is dedicated to measuring the most popular type of fuels – petrol. While studying various types of liquid flow meters we took into account the fact that not all of them can measure petrol consumption because of viscosity. After the detailed analysis of the topic, the examples of using flow meters in ICE were given: volumetric counters of direct influence, ultrasonic flow meters, vortex flow meters, coriolis flow meters, level to flow counters. We compared all above mentioned devices and made an inference that coriolis flow meter better suits our requirements.

A mass or coriolis flow meter, also known as an inertial flow meter, is a device that measures mass flow rate of the fluid traveling through a tube [2]. Using the Coriolis effect that causes a laterally vibrating tube to distort, the direct measurement of mass flow can be obtained in this type of flow meter [1]. This device has lots of advantages including high accuracy and long duration of usage without calibrating. Also there is a huge variety of sizes and volumes that gives us possibility to plug it into ICE.

Next step in our research was to carry out an experiment with ICE that can give us real results. We found the coriolis flow meter that can be installed into the fuel supply system of the chosen ICE. Using special software we made simulation of ICE work and generated ten random meanings of the flow meter in the set range for

subsequent calculations. The results that we obtained confirmed nominal accuracy of the chosen flow meter.

All investigations that were done made us conclude that usage of coriolis flow meter is expedient and profitable.

REFERENCES

1. Flow measurement [Электронный ресурс] Access mode https://en.wikipedia.org/wiki/Flow_measurement
2. Flow measurement [Электронный ресурс] Access mode https://en.wikipedia.org/wiki/Flow_measurement