

## **46ESS-29: Engine Air Mass Flow Measurement Techniques**

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*In an engine a very important issue is to determine the air mass flow that enters and leaves our engine, in order to determine many issues such as power input/output or even how well our combustion process is happening. There are many ways to measure the air mass flow in an engine. An engineer has to select the best choice for each application, each type of measurement has advantages and disadvantages so bibliography may be used to make the final decision. The most common way to measure the mass flow is by using differential pressure techniques. Of course there are other techniques such as electromagnetic flow meters, turbine meters, thermal flow meters, etc. The differential pressure techniques introduce many methods such as the orifice plates, venture tubes and nozzles and pitot tubes. Their main disadvantages are their accuracy range and the need of a separate transmitter. On our engines we can also determine the mass flow by using the rotating speed of the turbine blades by using a linear relationship between the rotational speed and the flow rate; this method offers a very fast speed response and most importantly it is easy to be applied but the main disadvantage is that because of the air's low density the driving torque may not be descent. In the following paper, all these methods are being analysed and it is provided how each an every of them fits an application.*