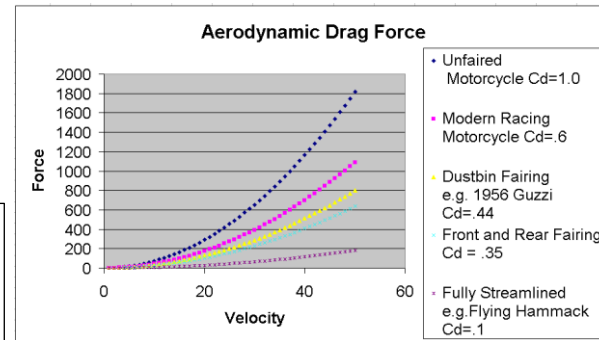


Motorcycle Aerodynamics

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As you can see from the graph the faster the motorcycle travels the more the drag increases. Using aerodynamics such as fairings etc the drag forces are reduced at higher speed.

Modern bikes still use aerodynamic devices but not only for rider comfort. Adventure bikes, touring bikes and some naked bikes all utilise aerodynamic devices such as large fairings and tall screens to keep the wind and the elements away from the rider. As these bikes are not designed for speed there is no need for them to be particularly aerodynamic as they do not reach as high top speeds as frequently therefore the aerodynamics of the bike isn't a priority.

Modern super bikes take inspiration from their thoroughbred racing cousins in MotoGP through using similar aerodynamic devices such as winglets and turning vanes. These allow the airflow to be deflected around the riders and maintain laminar flow around the motorcycle reducing drag caused by turbulence. The winglets seen on the MotoGP bikes, typically used on fast tracks with long straights where high top speeds are achieved are used to prevent the bikes from wheelieing and ensure the front tyre remains loaded by using the downforce created to force the tyre into the track. The Ducati GP15 first used winglets which were then banned by the FIA in racing, however we see them show up on the Ducati V4R a few years later, a road going race bike.



Motorcycle fairings are used to manage the airflow around the rider in such a way that the airflow is not disturbed by them, turning vanes allow this to happen by directing the air away from them.

Air stagnation points are created at inlets such as radiators creates low pressure at outlets, thus helping to reduce drag as well as providing cooling for the engine as well as directing air into the intake boxes.

References: Kraig Schultz's Opinions on Aerodynamics and Electric Motorcycles, 2016

This poster will be about motorcycle aerodynamics and how they are used in modern day motorcycles, as well as how they have developed over time. I will also be highlighting their use in high end motorcycles such as those in MotoGP and how that technology trickles down into mainstream motorcycles that any customer can purchase

Larger 'Double Bubble' windscreens allow the airflow to better travel over the rider and prevent it being interfered by the rider, this allows the airflow to remain laminar over the rider where it travels to the rear of the motorcycle over the tail section, these are designed in such a way it allows the airflow to remain laminar where it tapers off behind the motorcycle. Seen here, the airflow hits the nose of the motorcycle and flows over the bike and rider maintaining its flow where it tapers off over the tail in a smooth manner.



Drag increases exponentially with speed and therefore more power is needed to increase the speed further. However, by increasing the aerodynamics of the motorcycle the need to increase power to increase speed is reduced as it doesn't need as much power to push the motorcycle through the air.