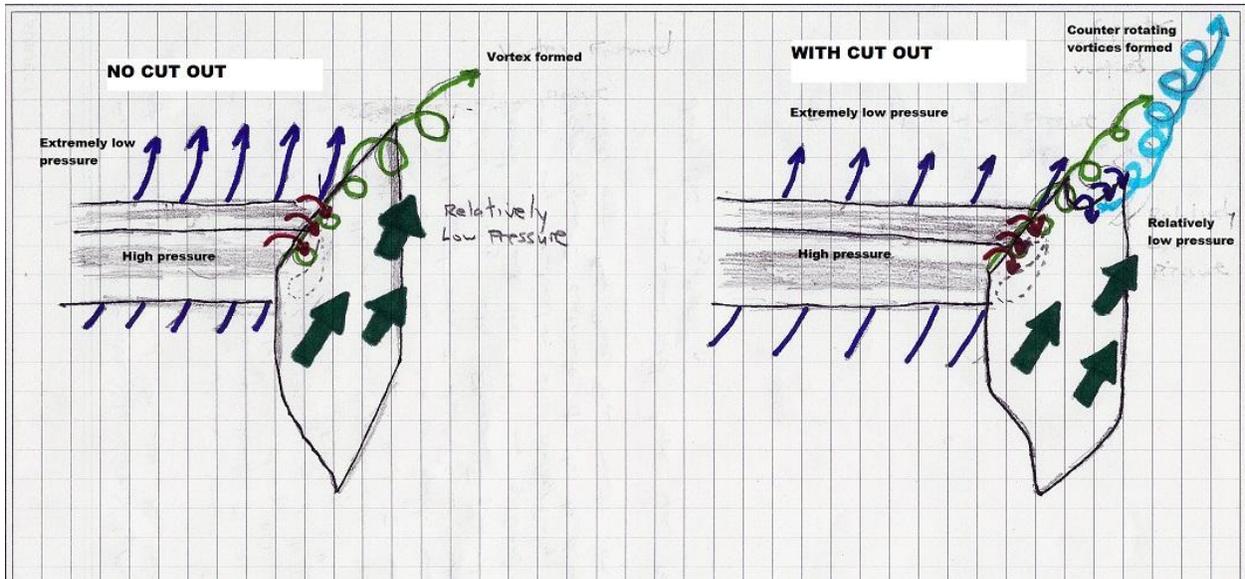


AERO 101

I've decided to cover a topic that many people have been inquiring about. Lately I have had the opportunity to explain this topic to a few people. Here is the question posed: what is the purpose of the cut outs I put into my endplate designs?



I've taken the time to draw up what goes on at the rear wing. To understand why cut outs are important, we must understand what is going on at the rear wing. We already know that high pressure exists on top of the wing, and low pressure exists underneath it. On a wing without endplates, this high pressure migrates over to the low pressure side, and a vortex is formed. The vortex is shed at the wingtips, and because the car is moving through the air, the vortex is allowed to expand. Endplates are used to reduce this effect, and they help greatly. However, because of the need to run wings very high in order to subject them to clean air, the high pressure can still migrate over the endplate. The high pressure cannot reach the low pressure under the wing due to the endplate. The ambient air flowing outside the endplate is

relatively low pressure, compared to the air flowing over the wing. This results in a vortex as well.

Now take a look at the diagram with the cut out. Cut outs are not new; Formula 1 has been using them for quite some time. The same situation happens here, but something else occurs. Because the cut out happens behind the wing, where the low pressure is exiting, this airflow is allowed to bleed out over the endplate. Remember the ambient airflow being relatively low pressure? Well, in comparison to the extremely low pressure underneath the wing, this airflow is now relatively high. This means that the ambient airflow now wants to migrate over the low pressure bleeding out of the wing. This creates a counter-rotating vortex, counter-clockwise, as opposed to the wingtip vortex which rotates clockwise. These two vortices diffuse each other, reducing their affects. Vortices create induced drag, so in conclusion, the cut outs help to reduce the drag created, resulting in a more efficient wing.