CESSNA VORTELATOR KIT BY AD

FLY FASTER AND USE LESS GAS

Aircraft Development has developed a vortelator kit that can ***increase Cessna speeds by up to 6 MPH***. This is accomplished by placing vortelators at certain critical locations which cause the boundary layer to stay attached to flying surfaces for a greater distance, and to keep the boundary layer thinner. The net result of these two actions is that it reduces both the profile drag and skin friction drag components of parasite drag. Another way to think of it is that the wake behind the aircraft will be smaller thus requiring less horsepower to propel the aircraft through the air. Figure 1 below shows how this is accomplished. Figure 1 shows the flow of black motor oil on a Cessna lift strut with, a short strip of vortelator attached, during a flight test. Notice that behind the vortelator mini vortices are created as can be seen by the lines of oil that form behind the vortelator. These mini vortices sweep the oil to a point in between the mini vortices, and that's how the oil lines are formed. Whenever one sees these characteristic oil lines forming behind the vortelator one knows the vortelator is working. The vortelator allows the air flow to stay attached to the lift strut for approximately 80% of the lift strut's chord. In the area where there is no vortelator the air flow separates from the lift strut at approximately 40% of the lift strut's chord, as can be seen from the pile up of oil at the 40% chord position. At the 40% chord position the lift strut is 2.01" thick, and at the 80% chord position the lift strut is 1.18" thick. That means the wake coming off the lift strut is only 59% as thick with the vortelator attached as without the vortelator attached. That also means with a narrower wake less horsepower is required to propel the lift strut through the air.

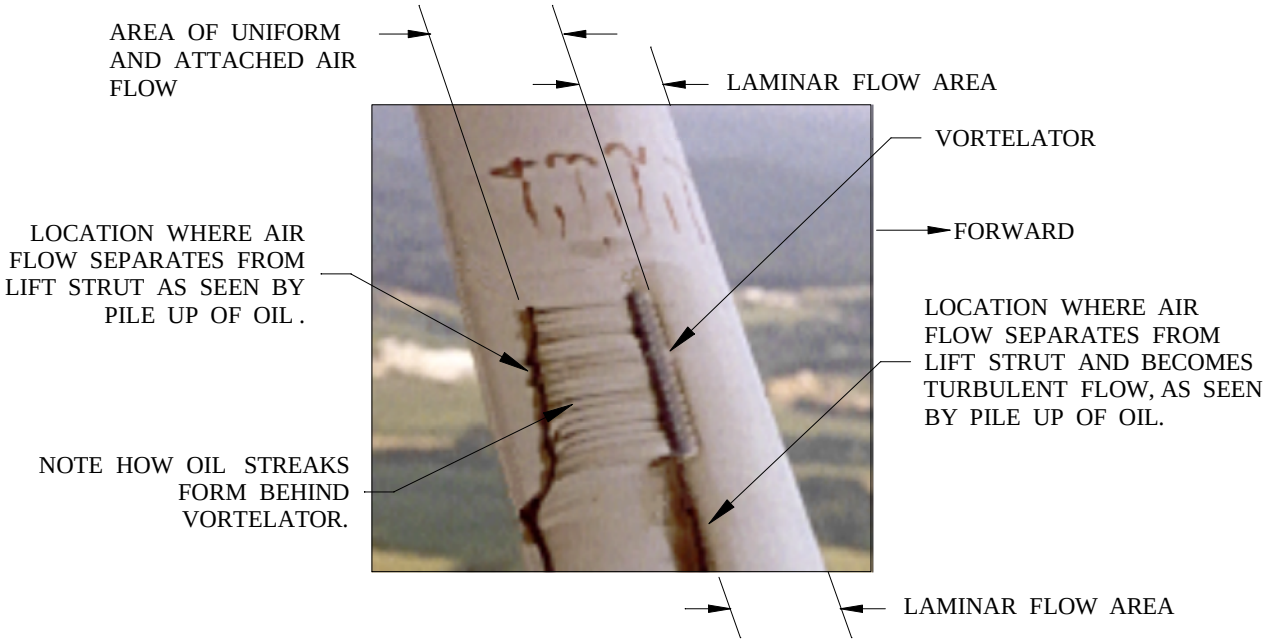

Fig. 1

Figure 2 shows how the oil flow behind short strips of vortelator are uniform until it comes in contact with the first sheet metal seam at which point the uniform boundary layer is destroyed. That means the air flow is laminar until it reaches the first sheet metal seam at which point it becomes turbulent high drag airflow. Figure 3 shows that when a vortelator is placed immediately behind a sheet metal seam it reattaches the boundary layer as a uniform flow. This can be seen by the oil lines that form behind the vortelator.

Fig. 2

Fig. 3

The basic procedure for installing the kit is to prepare the surface to which the vortelator is going to be applied by thoroughly cleaning the surface. Then simply peel the liner backing off the adhesive back vortelator and apply it to the cleaned surface. The vortelator is clear and therefore takes on the color of the surface to which it is applied. We believe this kit can have a pay back in gas savings that will help offset the cost of the kit. This vortelator kit is FAA STCd and manufactured under a FAA PMA approval. The kit comes with 200 feet of vortelator, more than enough for one airplane, and clear simple instructions on how to install the kit. The kit can easily be installed in one day and will add about 5 ounces of weight to the aircraft and not change the handling qualities of the aircraft. To be more specific the cruising speed increases one can expect from this vortelator kit is about 4 MPH for the 140, 150, 152, 170 aircraft. About 4.75 MPH for the 172, 175, and about 5.50 for the 180, 182,185,205, and 206 aircraft. The top speed increases will be slightly higher than those listed.

TABLE OF VORTELATOR KIT / FAA CESSNA MODEL APPROVAL

KIT NO.	VORTELATOR KIT GOOD FOR CESSNA MODEL
246-100	140A
246-100	150, 150A, 150B, 150C, 150D, 150E, 150F, 150G, 150H, 150J, 150K, A150K, 150L, A150L, 150M, A150M
246-100	152, A152
246-100	170A, 170B
246-100	172, 172A, 172B, 172C, 172D, 172E, 172F, (USAF T-41A) 172G, 172H, (USAF T-41A), 172I, 172K, 172L, 172M, 172N, 172P, 172Q, 172R, 172S
246-100	175, 175A, 175B, 175C, P172D, R172E (USAF T-41B), (USAF T-41C &D), R172F (USAF T-41D), R172G (USAF T-41C or D), R172H (USAF T-41D), R172J, R172K Known as 172XP, 172RG
246-100	180, 180A, 180B, 180C, 180D, 180E, 180F, 180G, 180H, 180J, 180K
246-100	182, 182A, 182B, 182C, 182D, 182E, 182F, 182G, 182H, 182J, 182K, 182L, 182M, 182N, 182P, 182Q, 182R, R182, T182, TR182, 182S, 182T, T182T
246-100	185, 185A, 185B, 185C, 185D, 185E, A185E, A185F
246-100	210-5 (205), 210-5A (205A)
246-100	206, P206, P206A, P206B, P206C, P206D, P206E, U206, U206A, U206B, U206C, U206D, U206E, U206F, U206G, TP206A, TP206B, TP206C, TP206D, TP206E, TU206A, TU206B, TU206C, TU206D, TU206F, TU206G, 206H, T206H
246-100	305A (USAF O-1A), 305C (USAF O-1E), 305D (USAF O-1G), 305F, 305B (Military TO-1D, O-1D, O-1F), 305E (Military TO-1D, O-1D, O-1F) All known as L-19