

PROPELLER VORTELATOR KIT BY

FLY FASTER AND USE LESS GAS

Aircraft Development has developed a vortelator propeller kit that is capable of **INCREASING YOUR AIRCRAFT SPEED BY 2 TO 4 MPH AND YOUR RPM BY 20 TO 50 RPM.** That's if you have a fixed pitch propeller. If you have a constant speed propeller, for a given RPM and manifold pressure the propeller will be at a slightly larger pitch giving you more speed. This is accomplished by placing vortelators at certain critical locations on the propeller's most inefficient highest air drag areas. The vortelators will cause the boundary layer to stay attached to the propeller surface 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 the parasite drag. Another way to think of it is that the wake behind the aircraft propeller will be smaller, thus requiring less horsepower to turn the propeller through the air for a given RPM. Figure 1 below shows how this is accomplished. Figure 1 shows the flow of black motor oil on a lift strut, with a short strip of Aircraft Development's vortelator attached, during a flight test. The reason a picture of the lift strut is shown, instead of a picture of a propeller, is that the centrifugal force on a rotating propeller distorts the oil flow. However, the mechanism that reduces the air drag on the lift strut is the same mechanism that reduces the air drag on the propeller. 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 and becomes turbulent, 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 turbulent 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.

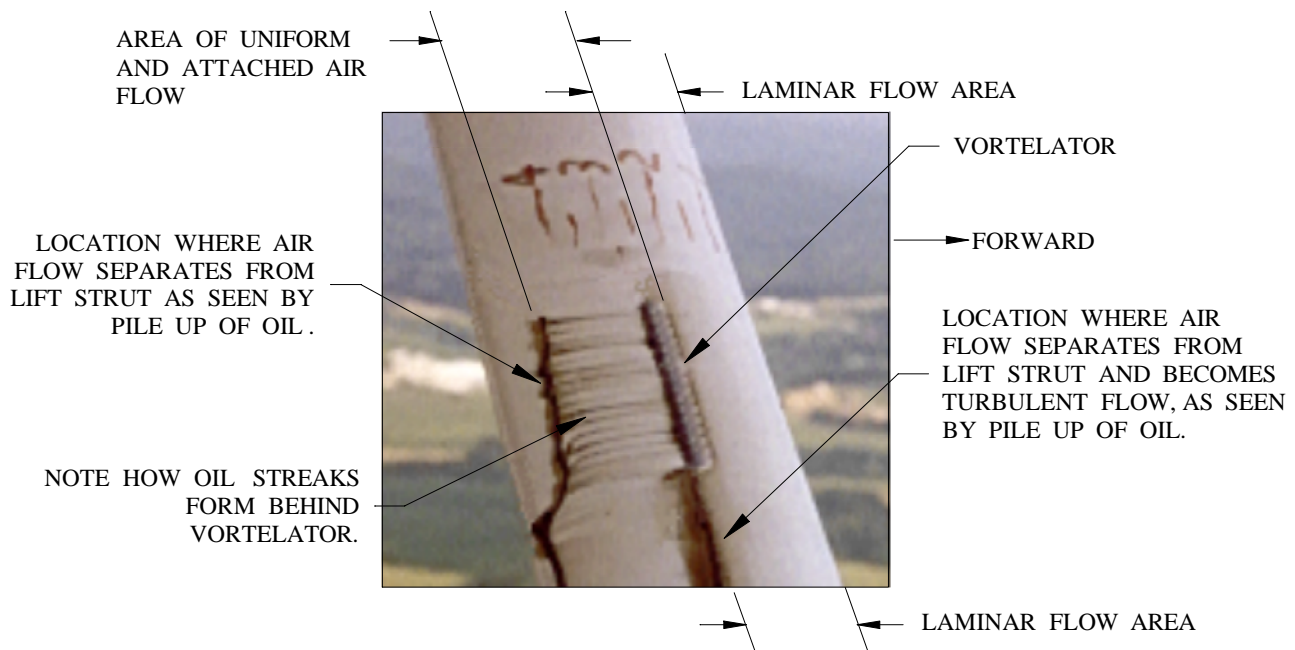


Fig. 1

There are several options the vortelator propeller kit offers to the pilot. The pilot can take advantage of the increased speed thus getting to a location faster, if that is necessary. However, Aircraft Development believes a more important option is that the pilot can throttle back to achieve the same cruising RPM, thus the same air speed, that was being flown prior to the vortelator kit being installed on the propeller. This gives the advantage of less fuel being consumed at that engine cruising RPM. That means less fuel cost per flying hour. But that's not the only advantage, less fuel being consumed by the engine, at the same air speed and RPM means, the engine will be running cooler!

This vortelator kit is FAA STC'd and manufactured under a FAA PMA. Virtually all propellers that are attached to engines of less than 500 HP be they metal, composite, or wood are approved for the installation of vortelator kits. This kit is not recommended for propellers that are equipped with anti-icing devices. This propeller kit 260-100 contains a three foot strip of vortelator, more than enough to vortelate up to a three bladed propeller. Plus clear instructions with pictures on where to place the vortelators on the propeller. The propeller kit is an outstanding value when one considers that if one takes the average cost of modification kits per gain in MPH, it is approximately \$205.00 per MPH. The propeller vortelator kit will give an increase in speed of about \$30.00 per MPH increase in speed. And don't forget the savings of less gas being consumed per hour of flight will help pay for the kit. The vortelator kit weighs less than .05 ounces and takes less than a half hour to install. The vortelators have a pressure sensitive adhesive backing so the installation process is simply to clean the area of the propeller where the vortelators will be placed and stick them on to the propeller. It's that simple.

Below figures 2 and 3 show vortelators installed on wood and metal propellers. Note that the vortelators are clear and take on the color of the surface to which they are attached.



FIG. 2



FIG. 3

See customer comments on the propeller vortelator kits at the end of the table of propeller vortelator kit/FAA model approval.

TABLE OF PROPELLER VORTELETOR KIT/FAA MODEL APPROVAL

PROPELLER MAKE	PROPELLER MODEL (SERIES)	PROPELLER MAKE	PROPELLER MODEL (SERIES)
Sensenich	69CK, 72CK, 72CC	Hartzell Propeller Inc.	HC-B3M
Sensenich	70CM6, 70CM7	Hartzell Propeller Inc.	HC-B3T
Sensenich	74CK, 76AK-2, 76AM6-2	Hartzell Propeller Inc.	HC-B3Z
Sensenich	74DM6, 74DM7, 74DR, 74DC	Hartzell Propeller Inc.	HC-A3V, HC-A3MY, PH C-A3V, PHC-A3MV, EH C-A3V, EHC-A3MV
Sensenich	76EM8	Hartzell Propeller Inc.	HC-C3Y, PHC-C3Y, EHC-C3Y
Sensenich	80BM8	Hartzell Propeller Inc.	HC-E2Y, DHC-E2Y
Univair	F1A76, F1C76	Hartzell Propeller Inc.	HC-12X, HC-13X
McCauley	1C160, 1C172	Hartzell Propeller Inc.	()HC-G3YF
McCauley	1A103/TCM	Hartzell Propeller Inc.	HC-42XF
McCauley	1B235, 1P235, 1A230, 1C235	Hartzell Propeller Inc.	HC-E3Y, HC-13Y, PHC-13Y
McCauley	1A200, 1B200, 1C200, 1D200	Hartzell Propeller Inc.	HC-52X20
McCauley	1A100, 1A101, 1A102, 1A105, 1A106	Hartzell Propeller Inc.	HC-82X, HC83X
McCauley	1A90, 1B90, 1C90, 1A135	Hartzell Propeller Inc.	HC-C2Y, BHC-C2Y, CHC-C2Y, DHC-C2Y
McCauley	1A180/SEM, 1A280/SEM	Hartzell Propeller Inc.	HC-92W, BHC-92W
McCauley	1A170, 1A175, 1B175	Hartzell Propeller Inc.	HC-92Z, BHC-92Z
Beech Aircraft Corp.	215	Hartzell Propeller Inc.	HC-93Z
Beech Aircraft Corp.	272	Hartzell Propeller Inc.	HC-102Y
Beech Aircraft Corp.	278	Hartzell Propeller Inc.	HC-12Y, BHC-12Y
Beech Aircraft Corp.	279	Hartzell Propeller Inc.	EHC-L3Y, PHC-L3Y
Beech Aircraft Corp.	B200	Hartzell Propeller Inc.	HC-M2Y
Beech Aircraft Corp.	R201, R202, R203	Hartzell Propeller Inc.	HC-12V, HC-83V
Beech Aircraft Corp.	214	Hartzell Propeller Inc.	HC-D2V, HC-D2MV
Centrum Naukowo-Produkeyine	AW-2	Hartzell Propeller Inc.	BHC-L2Y, BHC-G2Y, HC-L2Y
Hamilton Standard	2B	Hartzell Propeller Inc.	HC-D3V, HC-D3MV
Hamilton Standard	2D	Hartzell Propeller Inc.	HC-C4Y
Hamilton Standard	12D	Hartzell Propeller Inc.	HC-F2Y, HC-F4Y
Hamilton Standard	22D	Hartzell Propeller Inc.	HC-B3W, BHC-B3W
Hamilton Standard	23LF	Hartzell Propeller Inc.	HC-E5, HC-G3YF
Hartzell Propeller Inc.	HA-B3Z	Hartzell Propeller Inc.	BHC-J2Y
Hartzell Propeller Inc.	HA-12U	Hartzell Propeller Inc.	HC-3DF
Hartzell Propeller Inc.	HC-A2X, BHC-A2X	Hartzell Propeller Inc.	HC-J3Y, PHC-J3Y
Hartzell Propeller Inc.	HC-A3X, PHC-A3X	Hartzell Propeller Inc.	HA-A2V, HA-A2MV
Hartzell Propeller Inc.	HC-B3R	Hawker Siddeley	PD-/212/

PROPELLER MAKE	PROPELLER MODEL (SERIES)	PROPELLER MAKE	PROPELLER MODEL (SERIES)
Hawker Siddeley	PD-/312/	McCauley Acc. Div.	D3A32D, 3A32C,
Hawker Siddeley	PD-/323/	McCauley Acc. Div.	3AF32C(5-), 3AF34C(5-) 3AF36C(5-), 3AF37C(5-)
Hoffman Gmbh & Co.	137-H, 150HMES	McCauley Acc. Div.	3A32C(4-), D3A32C(4-) 3A34C(4-), D3A34C(4-) 3A36C(4-), D3A36C(4-)
Hoffman Gmbh & Co.	HO29HM, HO27HM, HO23HM	MT-Propeller Entwicklung Co. KG	MTV-9-()
Hoffman Gmbh & Co.	HO-V72, HO-V123,	Grumman/ Schweizer	J-5404/MA96K, SR5404/ MA96K,SR5404r/MA96K
Hoffman Gmbh & Co.	HO-V62, HO-V62-R	S&S Canadian Mfg.	210E
Hoffman Gmbh & Co.	HO4/27(), HO4/27()HM HO4/23(), HO/23()HM HO4/14(), HO4/14()HM HO4/50(), HO4/50()HM	S&S Canadian Mfg.	220 issue D or E
Hoffman Gmbh & Co.	HO	Tarver Propeller	F-200
Hoffman Gmbh & Co.	HO-V343, HO-V352	Tarver Propeller	F200H
McCauley Acc. Div.	1A110	Tarver Propeller	220, 220-1, 220-H
McCauley Acc. Div.	C-1000	Tarver Propeller	R200, R2003
McCauley Acc. Div.	D-1093	Tarver Propeller	FA-200, FA203 Replacement Blanks
McCauley Acc. Div.	MAC20 41D5926	Tarver Propeller	R100
McCauley Acc. Div.	2C36	TRW Harzell	HA-B3P
McCauley Acc. Div.	2A31C, B2A31C	TRW Harzell	HC-B3W, BHC-B3W
McCauley Acc. Div.	2A34C, B2A34C,C2A34C D2A34C, E2A34C,2A37C B2A37C, D2A37C, E2A37C, F2A34C	TRW Harzell	HC-D2X, HC-D3X
McCauley Acc. Div.	2A36, B2A36, C2A36, D2A36	TRW Harzell	HC-82V, HC-83V
McCauley Acc. Div.	2AF31C, 2AF34C, D2AF34C	TRW Harzell	HC-B3R
McCauley Acc. Div.	2AF36C, D2AF36C, 2B36	TRW Harzell	HC-A2V, HC-A2MV, BHC-A2V, BHC-A2MV
McCauley Acc. Div.	3AF32C, 3AF34C, D3AF32C	TRW Harzell	HC-F3Y, HC-M3Y
McCauley Acc. Div.	2D34C, B2D34C, B2D37C	TRW Harzell	HC-H3Y, PHC-H3Y
McCauley Acc. Div.	2D34CT, B2D34CT	TRW Harzell	HA-A2V, HA-A2MV
McCauley Acc. Div.	2E34C	Univar Aircraft Corp.	FH250
McCauley Acc. Div.	2DF36C, 2D36	Sensenich wood Propeller Co. Inc.	W46FN, W46FNL
McCauley Acc. Div.	3FF32C	Sensenich wood	W58LKL, W60GM, W60MY

PROPELLER MAKE	PROPELLER MODEL (SERIES)	PROPELLER MAKE	PROPELLER MODEL (SERIES)
Sensenich wood	W63AB	Sensenich wood	W74FM
Sensenich wood	W65CK	Sensenich wood	W74RR
Sensenich wood	W66CB	Sensenich wood	W74LN
Sensenich wood	W68T6EM	Sensenich wood	W76B
Sensenich wood	W69A	Sensenich wood	W76C
Sensenich wood	W69C	Sensenich wood	W76CK
Sensenich wood	W69J	Sensenich wood	W76D
Sensenich wood	W70A	Sensenich wood	W76HZ
Sensenich wood	W70AB	Sensenich wood	W76JA
Sensenich wood	W70AF	Sensenich wood	W76JB
Sensenich wood	W70AK	Sensenich wood	W76JR
Sensenich wood	W70D	Sensenich wood	W76KY
Sensenich wood	W70DF	Sensenich wood	W76KZ
Sensenich wood	W70DK	Sensenich wood	W76L
Sensenich wood	W70F	Sensenich wood	W76RK
Sensenich wood	W70L	Sensenich wood	W76RM
Sensenich wood	W70LY	Sensenich wood	W78LY
Sensenich wood	W71T5HZ	Sensenich wood	W78R
Sensenich wood	W72C	Sensenich wood	W79CFL
Sensenich wood	W72CK	Sensenich wood	W80DM
Sensenich wood	W72DF	Sensenich wood	W80DR
Sensenich wood	W72F	Sensenich wood	W80EY
Sensenich wood	W72GA	Sensenich wood	W80R
Sensenich wood	W72GK	Sensenich wood	W80W
Sensenich wood	W72GKL	Sensenich wood	W82R
Sensenich wood	W72L	Sensenich wood	W82RA
Sensenich wood	W72T2FC	Sensenich wood	W82RS
Sensenich wood	W72T2FK	Sensenich wood	W85RB
Sensenich wood	W72T2FM	Sensenich wood	W85RW
Sensenich wood	W72KZL	Sensenich wood	W86AB
Sensenich wood	W73BE	Sensenich wood	W86B
Sensenich wood	W73BG	Sensenich wood	W86BAS
Sensenich wood	W73BR	Sensenich wood	W86BS
Sensenich wood	W73FG	Sensenich wood	W86C
Sensenich wood	W73FM	Sensenich wood	W86CA
Sensenich wood	W74B	Sensenich wood	W86CB
Sensenich wood	W74CF	Sensenich wood	W86R
Sensenich wood	W74FC	Sensenich wood	W86RA
Sensenich wood	W74FCT	Sensenich wood	W86RB
Sensenich wood	W74FD	Sensenich wood	W90BA
Sensenich wood	W74FDS	Sensenich wood	W90BAL
Sensenich wood	W74FE	Sensenich wood	W90D
Sensenich wood	W74FK	Sensenich wood	W90DA
Sensenich wood	W74FKT	Sensenich wood	W90DH

PROPELLER MAKE	PROPELLER MODEL (SERIES)	PROPELLER MAKE	PROPELLER MODEL (SERIES)
Sensenich wood	W90H	Sensenich wood	W98AA
Sensenich wood	W90HA	Sensenich wood	W98AB
Sensenich wood	W90HAK	Sensenich wood	W98AC
Sensenich wood	W90HASP	Sensenich wood	W98C
Sensenich wood	W90JA	Sensenich wood	W100CC
Sensenich wood	W90LA	Sensenich wood	W100CD
Sensenich wood	W90T6JA	Sensenich wood	W102
Sensenich wood	W90T6JB	Sensenich wood	W102A
Sensenich wood	W92H	Sensenich wood	W755CF
Sensenich wood	W92HA	Sensenich wood	W69EK
Sensenich wood	W96JA	Sensenich wood	W69EK7
Sensenich wood	W96JB		

Ultimately our propeller kits will pay for themselves in fuel savings and better aircraft performance, below are some excerpts from letters that we have received

I ordered a set of vortelators for my Ivoprop 3 blade fitted to a Rotax 582 on a Top Dog Trike some months ago. I think I gained about ½ gallon/hour less fuel consumption. Meanwhile I have had problems with the prop and replaced it-therefore need another set. From S.H.

Hi Richard as far as I could tell I picked up 30RPM on my 150 hp Cardinal. From S.J.

I have a 3 blade Ivoprop and would like to order some vortelators. Had them previously on another plane. From B.H.

I ordered your prop vortelator kit for my 150 HP Cessna 172. I was impressed with a 40 RPM increase at full throttle and 2,000 feet asl. From S.C.

Before we installed the propeller vortelator kit we did static run ups and then stabilized climbs at 40, 50, 60, 70, 80 MPH and wrote down the RPM's. We fly in a high altitude density environment in the mountains and were interested in an RPM increase. After installation we repeated the test and across the board came up with a 25 RPM increase. On the first take off my son looked over and said "their worth it". On take off we normally would have a slight lag in RPM, now the transition is very smooth and in cruise we can now go to red line, 2,600 RPM very easily. When you fly in high density altitude and short strips 25 RPM's means something! Other potential assets would be some increase in speed, better cooling and gas mileage. Vortelators won't make a C-85 into an O470 but if you're looking for just a little help in performance then it's worth the money. Thanks for a good product-it works! From J.H.