

Duke Marquis Winglets

Shown left, Duke P-365 after completion of the BLR, Duke Marquis Winglet Modification. The Winglets can be installed on either dry or wet tip models and require 20 - 30 man hours to complete, plus paint.

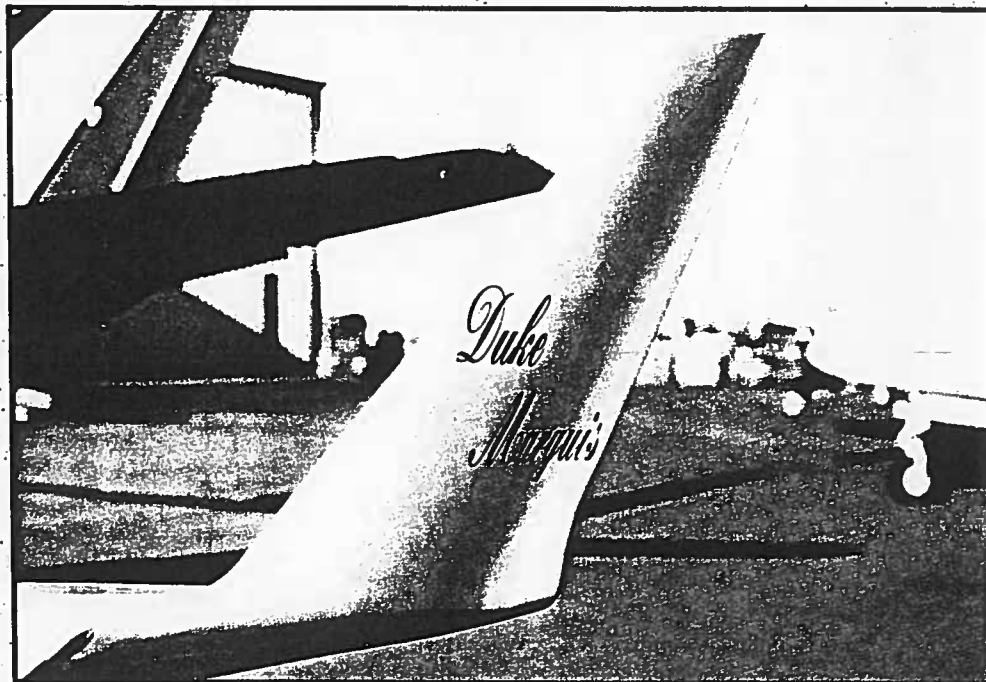


Below, a close up of the winglet as installed (note clean lines). The Winglet is constructed using the latest in composite technologies and incorporates a copper bonding screen for protection against lightning strikes. The Winglet is designed to withstand loads of 3 1/2 times flight test limits.

Flight test results have shown that the Duke Marquis Winglet installation will;

- Improve climb performance
- Improve cruise fuel efficiency
- Reduce lift induced drag
- Lower stall speeds
- Lower Vmc
- Raise single engine ceiling
- Improve stall characteristics
- Improve handling & stability
- Reduce takeoff & landing distance
- Look cool

Winglets must be installed in conjunction with our Vortex Generator kit, and will be completely compatible with our new wet tips, when available.



**Boundary Layer
Research, Inc.**

"Vortex Generator Specialists"

Performance Plus™

BEECHCRAFT DUKE
MARQUIS WINGLET'S
60/A60/B60
PERFORMANCE SPECIFICATIONS

	Stock Baseline P-340	BLR Performance	The BLR Difference
Max. Ramp Wt.	6814	7039	+225
Gross Takeoff Wt.	6775	7000	+225
Min. SE – Vmc	85	72	-13
Min. SE – Flaps 15°	N/A	67	N/A
Stall clean – Vs	82	76	-6
Stall dirty – Vso	76	67	-9
Liftoff – Vlof	94	77	-17
Liftoff – Flaps 15°	N/A	72	N/A
ROC – Twin (fpm)	850	1200	+350
ROC – Single (fpm)	305	370	+65
Short Fld Approach	99	77	-22
TAS @ FL260	205	212	+7

Speed shown in KIAS

Weight shown in pounds

Notes:

1. Company test data and FAA-Approved numbers. See AFMS for certified performance.
2. Stall speeds are certified at new gross weight, forward CG and zero thrust.
3. Vmc is certified at light weight, aft CG and windmilling propeller.
4. Vlof = Vmc + 5 KIAS; Short Field = 1.15 x Vso & Vref = 1.3 x Vso at maximum landing weight.
5. Kit installation time is approximately thirty man-hours on wet tip airplanes, twenty man-hours on late-style dry tip airplanes, plus airspeed dial face change. Winglets not compatible with early style dry wing tips.
6. Kit includes comprehensive installation manual, FAA-Approved Flight Manual Supplement, 2 winglets, hardware, dial faces and all necessary documentation, including Supplemental Type Certificate (STC).
7. BLR gross weight increase vortex generator kit installation is required.
8. Funds quoted in US dollars, plus shipping & handling.

FAA- & CAA-Approved

STC#SA00112SE

Complete Kit

\$10,750



BLR VORTEX GENERATOR TECHNOLOGY

SAFETY ♦ PERFORMANCE ♦ PROFIT

Vortex Generators have become the standard value-added performance modification in general, commercial and military aviation today. Boundary Layer Research, Inc., is the industry leader in the design, testing and certification of this airflow technology and its associated benefits. Additionally, BLR is known for its exceptional worldwide customer service and dealer support.

Discovered over 60 years ago by the British, the benefits of this airflow technology were brought to the commercial market in 1987. Most of the men and women on the engineering and flight test team which pioneered the practical application of this discovery are associated now with Boundary Layer Research. Company President Bob Desroche flew the first Baron-equipped prototype during its initial development, certified the majority of the models now available and is still designing, testing and certifying new models today.

All kits consist of small highly engineered aluminum tabs that are glued onto the wing aft of the leading edge in very precise locations. Installations on twin-engine aircraft incorporate VGs on the vertical tail for improved rudder authority and many kits utilize riveted strakes to improve the airflow around the engine nacelle and wing attach intersections. Various kits incorporate additional aft body strakes and/or small delta fins to create much needed airflow modification.

Each model-specific kit is designed to optimize the airflow over the wing. The VGs energize the airflow by spinning it into tiny vortices which travel over the wing and compress the boundary layer. This compression delays the onset of a stall by forcing airflow separation further aft along the wing chord, thus allowing the wing to achieve a higher angle of attack before actual stall separation occurs. A pronounced stall buffet occurs as a result of controlled separation, and when complete separation does occur it is designed to be docile.

As a result of each kit's installation, operators realize immediate benefits. Many models receive a certified increase in useful loads, each receives much improved aileron response in all flight configurations especially leading into and throughout the stall, as well as a virtual elimination of V_{mc} for twins due to it's being reduced to or below the stall speed. Low speed performance is achieved with no measurable loss of speed in cruise flight on properly rigged aircraft.

- ⇒ Increased useful load (most models)
- Elimination of V_{mc} (most models)
- ⇒ Increased aileron effectiveness in all flight configurations
- ⇒ Shorter takeoffs and landings with steeper climbouts and approaches
- Decreased tire and brake wear
- No speed loss in cruise flight on properly rigged aircraft
- ⇒ Approved for known-icing aircraft
- Easy one-day installation
- ⇒ No Weight and Balance revision required
- No additional maintenance required
- FAA-Approved with an STC for each model

3125 100th St SW, Hangar C75-5
Everett, WA 98204

800 257 4847
425 353 6591
fax 355 3046

CALL 1-800-257-4847

May 1998


**BOUNDARY LAYER
RESEARCH, INC.**
Price List**ENGINE-OUT WARNINGS SYSTEMS: Low Thrust Detector System**

Item#	Model/Description/Highlights	STC#	List Price
101-1100 1	NEW LTDs - All Piston Twins - Notice of impending engine failure	SA1007NW	\$2,995

BEECHCRAFT SERIES: Vortex Generator Kits, Winglets, Wet Tips, Body Strakes, Accessories

Item#	Model/Description/Highlights	STC#	List Price
BD 1V	Duke VG Kit - 8 knot reduction in Vmc	SA5273NM	\$1,950
BD 1VW	Duke 190 Plus VG Kit - 190 lb. Gross Weight Increase	SA5761NM	\$3,750
BD-1W	Duke <i>Marquis</i> Winglets - Increased wing aspect ratio/Climb/Cruise	SA00112SE	\$9,750
BD-1WT	NEW Duke Wet Tip Tank - 30 gallon usable fuel upgrade	SA00479SE	\$15,000
BD-1AB	Duke Dual Aft Body Strakes - Increased Stability/Vmc reduction	SA00370SE	\$2,950
BD-1AS	Duke Boarding Assist Strap - Black, Gold	N/A	\$65
BD-1S	Duke Spring Thing - Baggage Door Assembly	N/A	\$65
BD 1U	Duke VG Kit Upgrade to Gross Weight Increase	SA5761NM	Call
BB 1S	Baron Spring Thing - Baggage Door Assembly	N/A	\$65
BT 1S	TravelAir Spring Thing - Baggage Door Assembly	N/A	\$65

CESSNA SERIES: Operational Weight Increases, Gear Kits, Vortex Generator Kits, Skylights, Accessories

Item#	Model/Description/Highlights	STC#	List Price
CC-2W	NEW Conquest II 441 - 315 lb. Operational Weight Increases	SA00487SE	\$5,995
C-1V	Golden Eagle 421C - 129 lb. Gross Weight Increase	SA00015SE	\$2,950
C-1V	Golden Eagle 421B - 129 lb. Gross Weight Increase (0201 and on)	SA00074SE	\$2,950
C-1VA	Golden Eagle 421, 421A - 14 mph reduction in Vmc	SA00329SE	\$1,750
C-2V	Chancellor 414A - 355 lb. Gross Wt. Incr. w/no Zero Fuel Wt. limit	SA5672NM	\$2,950
C-3V	414 - 40 lb. Ramp Weight Increase	SA5900NM	\$1,995
C-2V	402C - 360 lb. Gross Weight Increase & 355 Lb. Zero Fuel Weight Incr.	SA5673NM	\$2,950
C-3V	402B - 40 lb. Ramp Weight Increase	SA5900NM	\$1,995
C-3VA	402, 402A - 40 lb. Ramp Weight Increase	SA5900NM	\$1,995
C-3VA	401, 401A, 401B - 40 lb. Ramp Weight Increase	SA5900NM	\$1,995
C-4V	340A - 315 lb. Gross Weight Increase & 230 lb. Zero Fuel Weight Incr.	SA5198NM	\$2,950
C-4V	340 - 330 lb. Gross Weight Increase	SA5198NM	\$2,950
C-4VA	335 - 315 lb. Gross Weight Incr. & 230 lb. Zero Fuel Weight Increase	SA5198NM	\$2,250
C-5V	320E, 320F - 279 lb. Gross Weight Increase	SA5757NM	\$1,995
C-5V	320D - 274 lb. Gross Weight Increase	SA5757NM	\$1,995
C-6V	T310R - 184 lb. Gross Weight Incr. & 385 lb. Zero Fuel Weight Incr.	SA5163NM	\$2,495
C-6VA	310R - 150 lb. Gross Weight Increase & 360 lb. Zero Fuel Weight Incr.	SA5163NM	\$2,495
C-7V	T310Q - 184 lb. Gross Weight Increase	SA5756NM	\$2,495

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CESSNA SERIES: Operational Weight Increases, Gear Kits, Vortex Generator Kits, Skylights, Accessories			
Item#	Model/Description/Highlights	STC#	List Price
C-7V	310Q 75 lb. Gross Weight Increase	SA5756NM	\$2,495
C-7V	T310P - 284 lb. Gross Weight Increase	SA5756NM	\$2,495
C-7V	310K, 310L, 310N, 310P - 100 lb. Gross Weight Increase	SA5756NM	\$2,495
C-8V	310E - 8 mph reduction in Vmc	ST00049SE	\$1,200
C-8V	310D, 310F - 3 mph reduction in Vmc	ST00049SE	\$995
C-8V	310C - 11 mph reduction in Vmc	ST00049SE	\$995
C-8V	310A, 310B - 9 mph reduction in Vmc	ST00049SE	\$1,200
C-8V	310 - 20 mph reduction in Vmc	ST00049SE	\$995
CS-1S	300 & 400 Series - Nacelle Baggage Locker Springs	N/A	\$150
C-9V	A185F - 5 knot reduction in stall speeds/Better roll response	SA00165SE	\$1,495
C-9V	180J, 180K - 10 knot reduction in stall speeds/Better roll response	SA00165SE	\$1,495
C-10V	120, 140 - 5 mph reduction in stall speeds	SA00123SE	\$495
C-111	100 Series Tooltote - Baggage Door Storage Unit	N/A	\$99
C-1SLW	100 Series Skylights - Overhead window kit - Greenhouse Style	SA4379NM	Call
C-1S	Spring Thing - Baggage door assembly	N/A	\$65
C-1CC	Cabin Covers - Exterior Protection - All models	N/A	Call
C-1HI	Headliners - Various Styles/Colors - All models	N/A	Call

DeHAVILLAND SERIES: Vortex Generator Kit

Item#	Model/Description/Highlights	STC#	List Price
DB-IV	DHC-2 Mk I Beaver - Greatly Improves Stall Characteristics	SA00200SE	\$1,950

PIPER SERIES: Operational Weight Increases, Vortex Generator Kits, Landing Gear Kits

Item#	Model/Description/Highlights	STC#	List Price
PC-1V	Chieftain PA-31-350, T1020 - 368 lb. Gross Weight Increase VG Kit	SA00192SE	\$3,450
PC-1G	Chieftain PA-31-350, T1020 - 368 lb. Landing Weight Increase	SA00202SE	\$2,500
PN-1V	Navajo PA-31-325 C/R - 340 lb. Gross Weight Increase	SA00048SE	\$3,950
PN-1V	Navajo PA-31-310 - 340 lb. Gross Weight Increase	SA00047SE	\$3,950
PN-1V	Navajo PA-31-310 w/wing lockers - 230 lb. Gross Weight Increase	SA00047SE	\$3,450
CP-1V	Panther II PA-31-350 - 200 lb. Gross Weight Increase	SA00039SE	\$3,950
PC-1GP	Panther II PA-31-350 - 200 lb. Landing Weight Increase	SA00202SE	\$2,500
CP-1V	Panther I PA-31-325 C/R - 200 lb. Gross Weight Increase	SA00038SE	\$3,950
CP-1V	Panther I PA-31-310 - 200 lb. Gross Weight Increase	SA00037SE	\$3,950
CP-1UP	Colemill/BLR Panther - Upgrade existing VG Kit	Various	\$1,000
PA-1S	NEW Acrostar Spring Thing - Baggage door assembly	N/A	\$65
PS-1V	Seneca III, IV PA-34-220T - 3 knot reduction in Vmc	SA00109SE	\$2,950
PS-1V	Seneca II PA-34-200T - 168 lb. Zero Fuel Weight Increase	SA00109SE	\$2,950

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PIPER SERIES: Operational Weight Increases, Vortex Generator Kits, Landing Gear Kits

Item#	Model/Description/Highlights	STC#	List Price
SC 1V	Super Cub PA-18, PA-19 - Shorter Landing/Eliminates "Moose Stall"	SA00275SE	\$1,495
SC-2V	Cruiser J-5, PA-12, PA-14 Shorter Landing/Eliminates "Moose Stall"	SA00467SE	\$1,495

PMA PARTS/REPLACEMENTS/SERVICE

Item#	Model/Description/Highlights	STC#	List Price
RK 1	VG Repaint Kit - Complete replacement VG Kit	PMA	\$250
RK-2	VG Repair Kit Spare VGs, Glue, etc.	PMA	\$100
PUR-1	Documents/Paperwork Upgrades & Replacements	N/A	\$150
1C01530	Delta Fin - Replacement parts Various Models	Various	\$50
DFC-1	Dial Face Change - Per owner supplied instrument Piston Models	New	\$100
DFC-2	Dial Face Change - Per owner supplied instrument Turbine Models	New	\$120
DFC-3	Dial Face - Replacement parts	New	\$50
CH2026-1	Torque Link Replacement - Gear Kit parts	PMA	\$300
CH2021-1	Spacer Tube Replacement Gear Kit parts	PMA	\$100
Various	Low Thrust Detector System Heated Sensor Probes	PMA	\$375
102-2100-1	Low Thrust Detector System - Bench Test & Recalibrate	N/A	\$145
102-3100-1	Low Thrust Detector System Repair & Recalibrate	N/A	\$295
102-4100-1	Low Thrust Detector System - Exchange/Upgrade Unit	N/A	\$500

**BEECHCRAFT
DUKE 60 SERIES
MAINTENANCE MANUAL**

*For right
125 kts min
5000' runway*

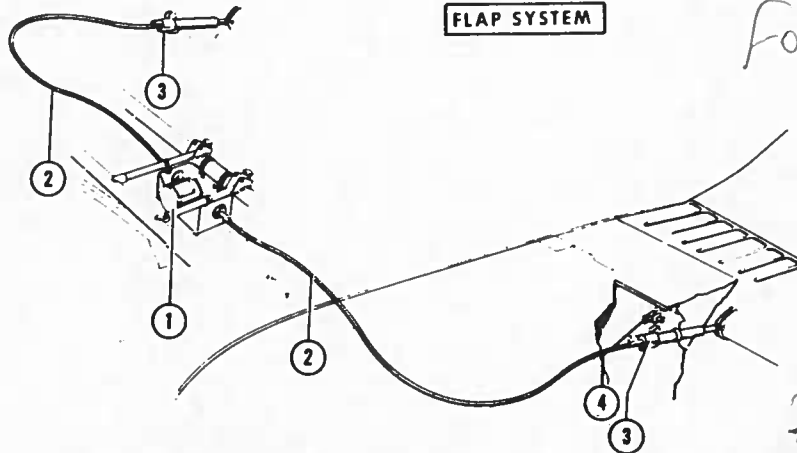
*For left
135 kts*

FLAP SETTINGS

Approach- 15° from Neutral
Full Down- 30° from Neutral

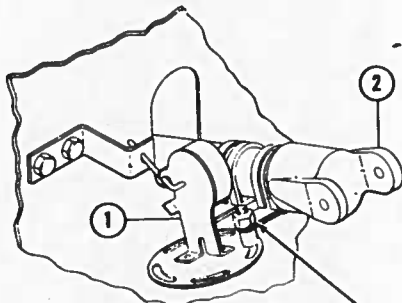
1. Flap Motor Gearbox
2. Flap Shaft and Housing
3. Flap Actuator
4. Limit Switches

FLAP SYSTEM

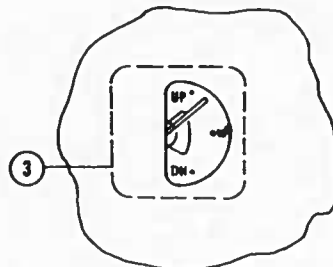


*No flaps in
turn*

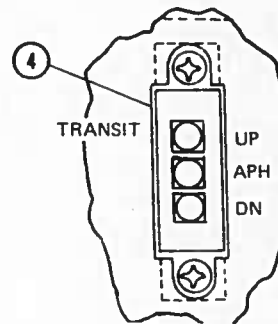
FLAP TRANSMITTER AND POSITION INDICATORS



TO ADJUST, LOOSEN MOUNTING BOLTS AND MOVE FORE AND AFT, OR ROTATE SLIGHTLY.



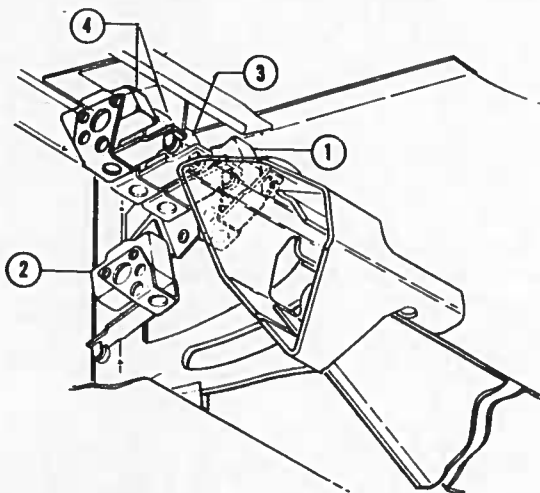
1. Transmitter
2. Flap Actuator



3. Indicator
- *4. Indicator Lights

*Keep hand on
flap handle*

FLAP LIMIT SWITCHES



1. Down Limit Switch
2. Up Limit Switch
3. 14° Limit Switch
- *4. 16° Limit Switches

*- Never fill up or down
- No flap in turn
- Intermediate stop*

*INDICATOR LIGHTS AND (2) 16° LIMIT SWITCHES ARE INSTALLED ON SERIALS P-247 AND AFTER.

80-161-1A

**Flap System
Figure 201**