

S18-180-EXP



Kit Details

Why use slots?

The short answer is: Because it allows us to fly slower!

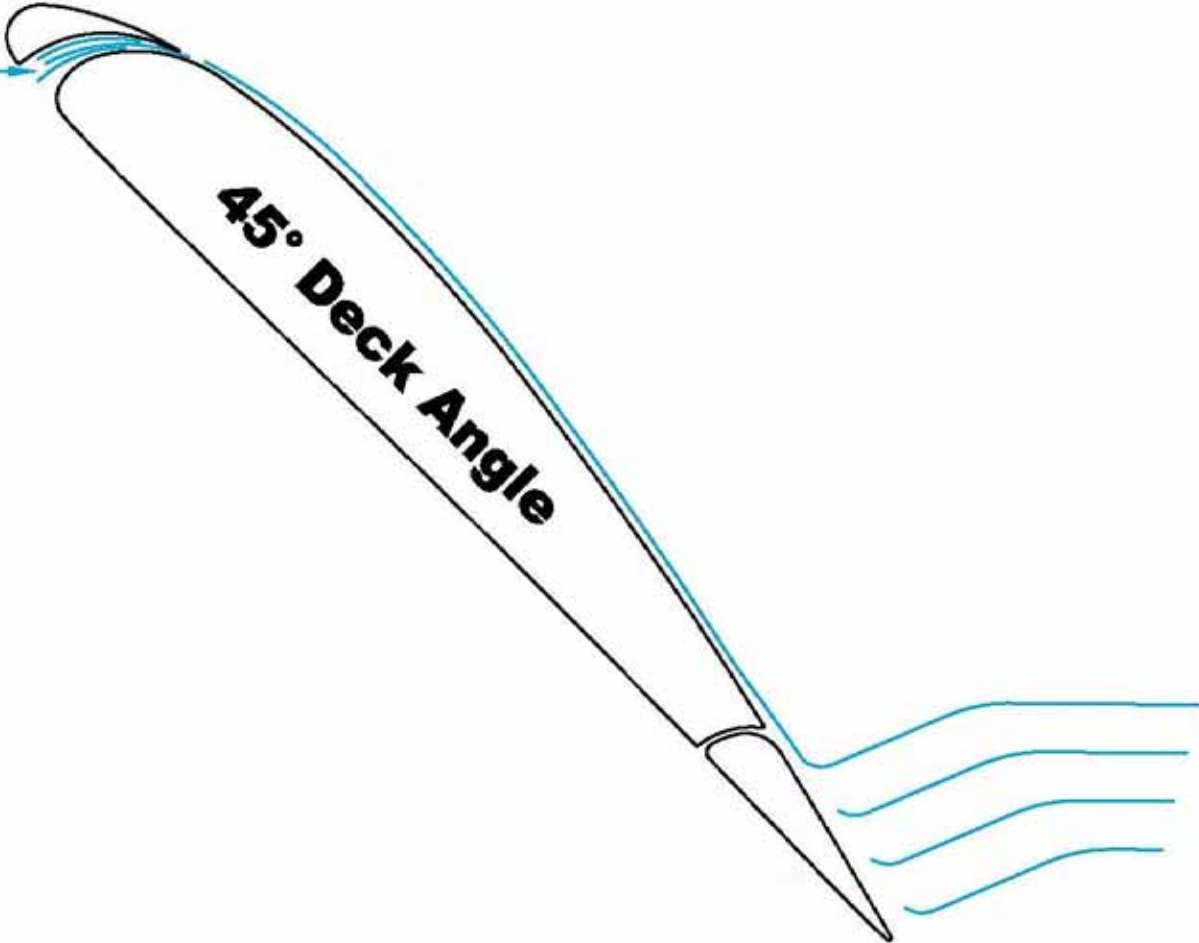
The goal of many high-lift devices (either after-market or factory) is really the same: To delay airflow separation over the aft portion of a lifting surface (in most cases a wing, but sometimes a tail surface). This does a couple of things. It increases airflow over control surfaces, particularly at airspeeds approaching stall, which increases controllability. It also raises the angle of attack at which stall occurs, which in turn lowers the stall speed and increases the lifting capability of the wing.

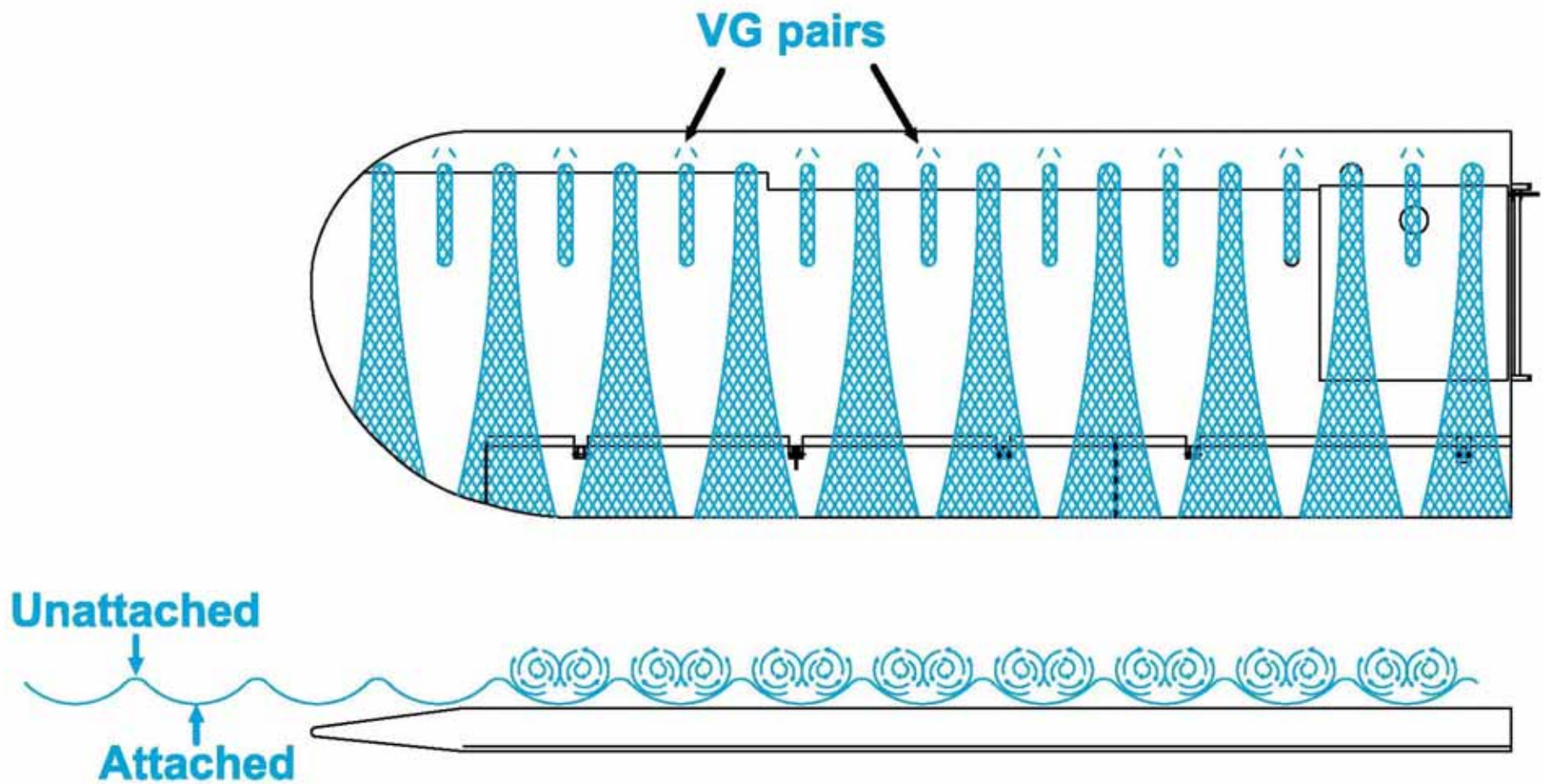
Vortex generators (“VGs”) do this by adding many tiny surfaces along the top of the wing. These create small vortices (the exact same type of vortices that occur off of an airplane’s wing tips), which mix high-energy airflow from well above the wing with low-energy airflow located right against the top surface of the wing. This results in a higher-energy airflow along the surface of the wing, which delays airflow separation.

Slots do the same thing, but they do a better job, and they do it more efficiently. The slot takes high-energy air from in the area just in front of and below the leading edge. It accelerates this air and deposits it on the forward top surface of the wing. The slot covers most of the leading edge of the wing, unlike VGs, which are spaced out over most of the wing but still produce separate, localized areas of attached airflow. (See the diagrams on the following pages)

The result of the slotted wing is an aircraft with awesome low-speed performance, awesome short-field performance, and the added safety of being extremely difficult to spin.

**High-energy
airflow**





As can be seen, there are areas of boundary layer air behind each VG which do not receive any benefit from the vortices.

History of the aircraft

A slotted wing, nearly identical to the one you will build with this kit, was first offered by Dakota Cub Aircraft as an STC for certified PA-18s. This configuration went through flight test and was certified in 1999.

This led to the development of the S18 aircraft. Many of the usual modifications often incorporated into cub type aircraft were made standard on the S18:

- 4 inch wider fuselage
- 3 inch extended gear (with supporting structure approved for use with up to 31" tundra tires)
- High-Performance brake master cylinders
- High-visibility fuel sight gauges
- Adjustable rear seat
- 2300 Lb gross weight
- High-Capacity gascolator
- Fuel valve
- 3 piece boot cowl w/ battery box
- Metal headliner
- Extended baggage with side access door

In addition, many parts had to be strengthened to support the 2300 Lb gross weight. This aircraft completed flight test and received certification in 2009.

Why build this kit instead of the other guy's?

→It's on the approved kit list

First and foremost, the S18-180-EXP is on the FAA's "Approved Kit List." This means that, provided you follow the instructions, don't pay someone else to do too much of the work, keep reasonably accurate records, and demonstrate reasonable craftsmanship a Designated Airworthiness Representative (DAR) will grant you an experimental—amateur built airworthiness certificate.

Many of our competitors provide a quality product, but some of them are NOT on the list of approved kits. This means that if you buy one of their kits and the DAR finds out you didn't build more than 50% of the aircraft you risk not being able to get an airworthiness certificate. Before considering ANY aircraft kit, make sure it is on the approved kit list!

Why build this kit instead of the other guy's?

→It's very complete

Your S18-180-EXP kit will come with nearly everything needed to finish the airplane. In addition to the main components (fuselage, wing ribs, tail surfaces, etc.), all hardware, nuts, bolts, rivets, fittings, glass, raw aluminum, etc. will be provided. The following items are the only items NOT included with your kit, but may be purchased through us at attractive rates:

- Engine / engine accessories
- Propeller
- Primer / paint / fabric covering materials
- Wheels / brakes / tires
- Avionics / instruments
- Seat upholstery

→The design has been proven, and the quality has been proven

The S18-180-EXP is nearly identical to its sister ship, the certified S18-180. The vast majority of the parts are interchangeable, and most of the parts included with your kit are **FAA / PMA approved**. In addition to making them more valuable on the open market (because they're approved for use on many certified airplanes), you know that the quality of workmanship required in an aircraft is present.

Why build this kit instead of the other guy's?

→**The performance is awesome!**

See the performance numbers on our information banner. The best thing about these numbers is you know they've been tested by proven methods, because they have been accepted by the FAA as fact on the certified S18-180. This also means they're conservative. Many experienced pilots will be able to fly this airplane and produce numbers much better than what the FAA requires we publish for the certified S18-180. This is because all performance numbers are published for max gross weight, and are obtained by following fairly strict, conservative guidelines.

Most experimental airplanes have little, if any, approved testing done on them, which means you don't know how they got the performance numbers they did, or at what conditions they were achieved. More importantly, this means that you as a pilot might NOT be able to achieve the advertised numbers, which is a bad situation to be in if you're looking at a row of trees towering above and ahead of you, wondering how accurate you were in estimating the length of the runway.

The S18-180-EXP provides the best of both worlds—the freedom of an experimental aircraft, with the proven record of a certified aircraft.

What do the drawings look like?

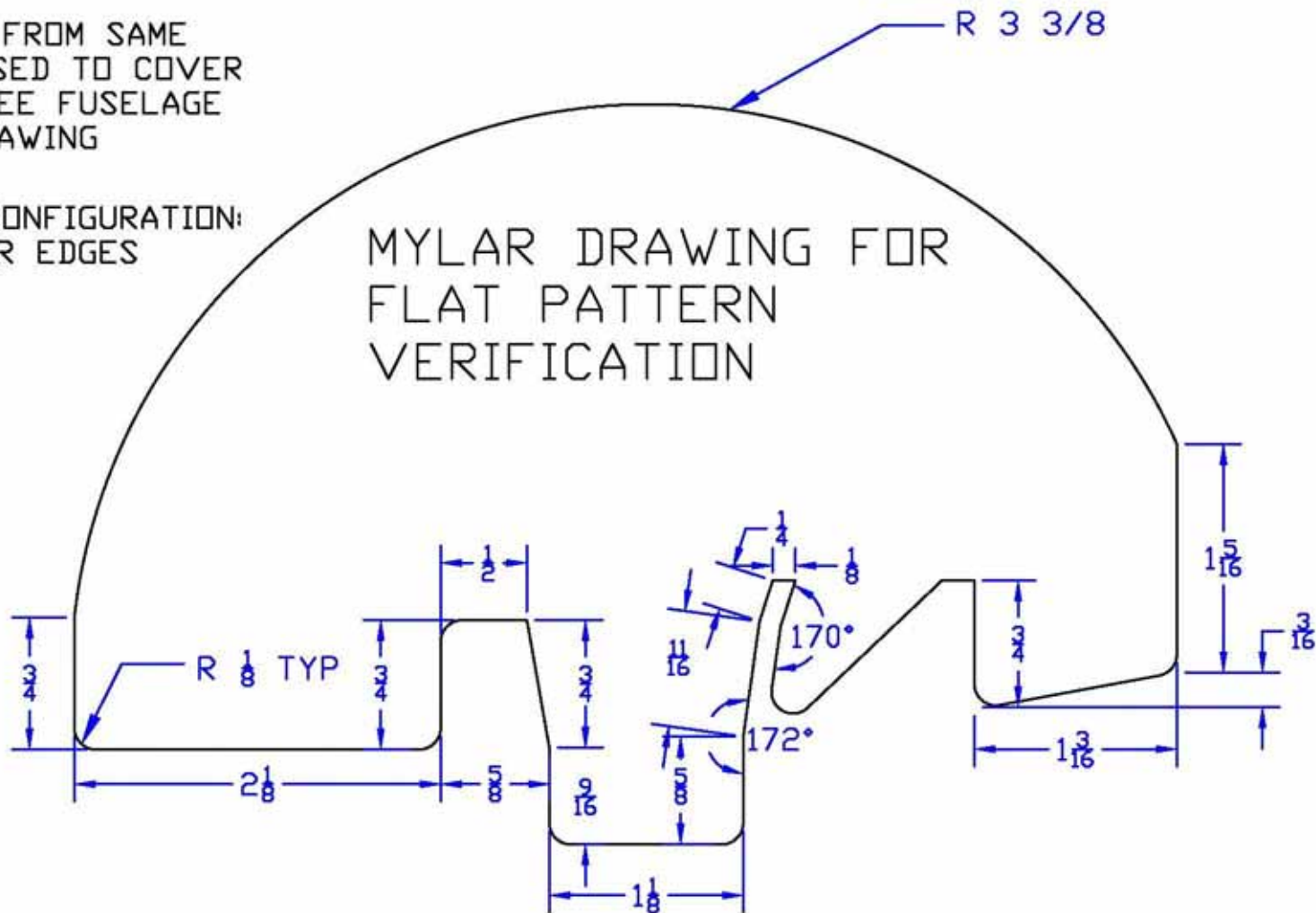
EXAMPLES:

1. This is a piece of fabric which reinforces the area just above the front landing gear fittings. While the shape is fairly complicated, it is drawn full-size. This means that the drawing itself may be used as a pattern to cut the piece.
2. This is a part of the engine baffle, which the oil cooler is mounted to. While this one has been shrunk to fit on the page, the version included in the kit is full-sized.
3. This is the installation drawing, depicting the hardware necessary to mount the oil cooler to the engine baffle plate shown previously. This drawing has also been reduced in size from the version you will receive with the kit.

NOTE: MADE FROM SAME FABRIC AS USED TO COVER AIRCRAFT. SEE FUSELAGE COVERING DRAWING

ALTERNATE CONFIGURATION: PINKED OUTER EDGES

MYLAR DRAWING FOR FLAT PATTERN VERIFICATION



EXAMPLE 1

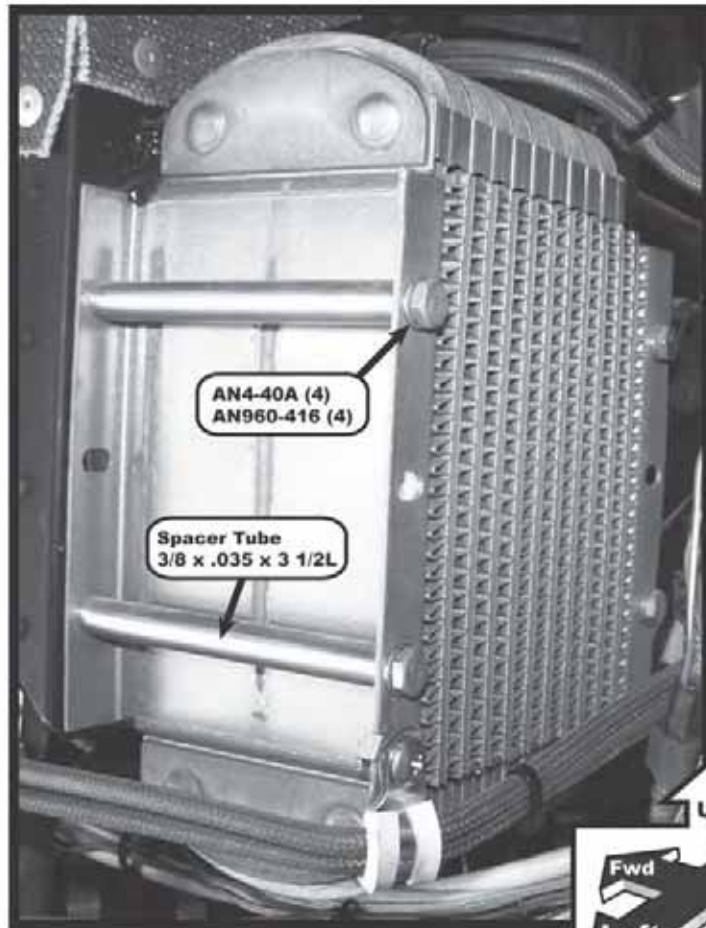
		6 11/16 X 4 5/16	FABRIC COVERING
Part No.		Size	Description
Part No.	No. Req.	Material	

ALL DATA PROPRIETARY TO DAKOTA CUB AIRCRAFT

Unless Otherwise Specified
 Tolerances -
 Angles = ±2°
 Fractions = ± 1/32
 .0 = ± .032
 .00 = ± .020
 .000 = ± .010

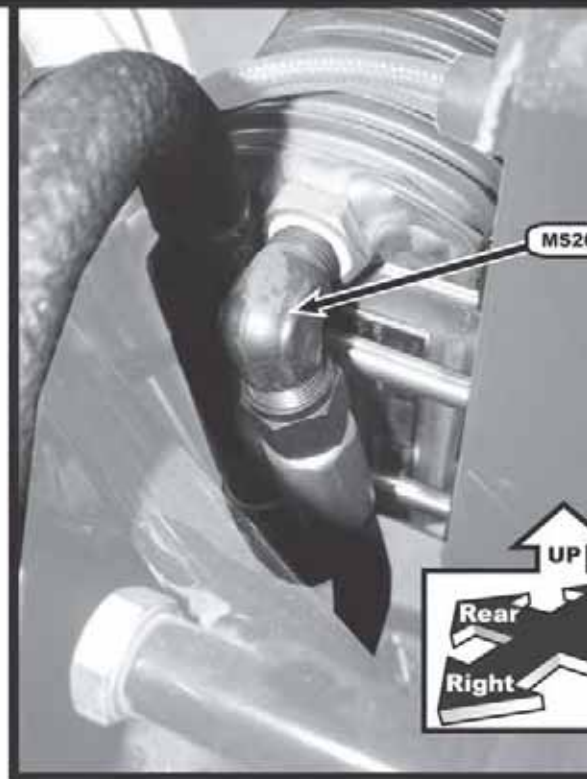
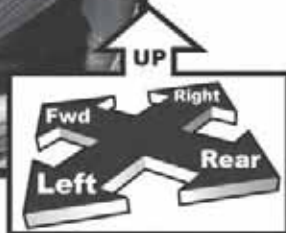
LET.	REVISION	DATE	BY
DAKOTA CUB AIRCRAFT			

Scale: 1=1			
FABRIC REINFORCEMENT - FRONT GEAR FITTING (TOP)			
DRG.	WH	Check-	MDE
DATE	1-25-10	DATE	1-25-10
Drawing No.			EXP-21272-FAB-1



AN4-40A (4)
AN960-416 (4)

Spacer Tube
3/8 x .035 x 3 1/2L



M520822-8-8D



EXAMPLE 3

AMATEUR BUILT AIRCRAFT KIT - IAW 21.191(g)

SUPER 18



DIRECTION OF FLIGHT INDICATOR

ALL DATA PROPRIETARY TO DAKOTA CUB AIRCRAFT

Unless Otherwise Specified
Tolerances -
Angles $\pm .2^\circ$
Fractions $\pm .01$
0 = .032
00 = .020
000 = .010

LET REVISION DATE BY

DAKOTA CUB AIRCRAFT Box 797
Brandon, SD

20				
19				
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12				
11				
10				
9				
8				
7				
6	AN960-416	4		Washer
5	AN4-40A	4		Ron
4				4130N-
3		4	3/8 X .035 wall	Spacer Tube
2				Bushing
1	M520822-8-8D	2	3/8 X 3/8	Elbow
	Part No.	No. Req.	Size	Description
				Material

Scale: 1:1

EXP-AB-OIL RADIATOR INSTALLATION

OWG: MDR: Check: MDE: DATE: 4-1-06 DATE: 4-1-06

Drawing No.: EXP-15531