

Installation Instructions,

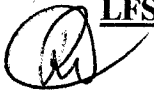
Weight & Balance,

and

Instructions For Continued Airworthiness

LAMINAR FLOW SYSTEMS, INC.
Speed Pants

APPROVAL

 LFS DATE: 7-13-05
FAA DATE:

For application on:

PA-28-140, -150, -151, -160, -161, -180, -181, -201T, -235, -236
PA-32-260, -300, -301, -301T

LAMINAR FLOW SYSTEMS, INC.
1585 Aviation Center Pkwy
Hanger 804
Daytona Beach, FL 32114

Submitted to FAA ACO

TO BE SUBMITTED AS MINOR CHANGE

Date:

12/19/05

By:

Paul Hays

Revision Status:

Revision	Description	Date	Replaces Pages
IR	Initial Release	05/08/02	N/A
A	Transfer to LFS, Inc.	03/19/03	ALL
B	Changed hardware	04/28/03	2,4
C	Changed hardware	04/30/03	2,5
D	Added Attach Clip, Changed Strut Fairing Instructions	01/19/04	2,4,5
E	Made PN 4001 same L & R	05/14/04	2,3
F	Use of hole finders	06/14/05	ALL

LAMINAR FLOW SYSTEMS, INC.
SPEED PANTS INSTALLATION & ICAW

1.0 Introduction

These ICAW are intended for use on Laminar Flow Systems, Inc. Parts that are made from composite materials and are installed on Piper PA28 and PA32 fixed gear aircraft. These instructions also cover metal attach brackets and associated hardware.

1.1 Kit Contents

(Actual kit contents may vary based on the parts ordered. Please be sure all the parts needed for your installation are included before beginning. Additional hardware may be included as spares.) Equivalent hardware may be supplied, and much of the hardware may already be installed.

<u>Qty</u>	<u>Part Number</u>	<u>Part Description</u>
2	4001	Inboard Support Bracket
2	4002	Outboard Support Bracket
1	4003-1	Center Support Bracket, Left Side
1	4003-2	Center Support Bracket, Right Side
1	4004-1	Inspection Cover, Left Side
1	4004-2	Inspection Cover, Right Side
1	4005-1	Inner Wheel Pant Door, Left Side
1	4005-2	Inner Wheel Pant Door, Right Side
1	4006-1	Main Wheel Pant, Left Side
1	4006-2	Main Wheel Pant, Right Side
1	4007-1	Inner Strut Fairing, Left Side
1	4007-2	Inner Strut Fairing, Right Side
1	4008-1	Outer Strut Fairing, Left Side
1	4008-2	Outer Strut Fairing, Right Side
2	4014	Clips (Already Attached to 4006-1 and 4006-2)
2	AN960-416L	¼" Light Washers
6	AN970-6	Large Area Washers
2	AN4-6A	¼" Bolts
6	NAS1169C416	Countersunk Washers
6	MS24693C296	Stainless Steel Screws, ¼"
34	130008	Clipnuts
54	NAS1169C8	Countersunk Washers
A/R	MS24693CXX	Stainless Steel Screws of varying length
A/R	CCCP-32 or AB3-2A	Blind Rivets
14	MS21059L08	Nutplates
1	Aluminum Hole Finder	
1	Cardboard Hole Finder	

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1.0 General Maintenance Instructions

1.1 The Laminar Flow Systems, Inc. Parts do not require any periodic maintenance after installation is complete. The parts must be visually inspected during the airframe inspection (Annual, 100 hour or other program) for cracks, other damage, fit and for abrasions (rubbing).

1.2 If a defect is found, repair in accordance with the latest revision of FAA AC 43.13.

2.0 Installation and Removal (Procedures are the same for both left and right sides)

2.1 If the aircraft is equipped with strut fairings and/or wheel pants, remove them per their respective removal instructions before proceeding. If the installed strut fairings are in good condition, and compatible with the new Speedpants, (post 1978 aircraft) they may remain in place.

2.2 Support Bracket Installation

Note: Aircraft built after 1978 with factory wheel pants may reuse their existing center support and inboard support brackets. If reusing these brackets, make note of the hardware that connects them to the wheel pants, as your new Laminar Flow Systems Speedpants and brackets may use different size hardware. For example, many factory center support brackets are attached to the wheel pant using number 10 screws. Since the Laminar Flow Systems, Inc. Speedpants use 1/4" screws, you may need to use a series of dimpled washers with your number 10 hardware.

2.2.1 Remove the wheel in accordance with the last approved revision of the aircraft service manual (necessary for inboard and center support bracket installation only).

2.2.2 Following the aircraft service manual's instructions, remove the lower torque link bolt (careful to support the lower strut). Install the Laminar Flow Systems, Inc. inner bracket PN LFS-4001 (Not necessary for aircraft built after 1978). Use a longer bolt if necessary. Install with the nut on the inboard side for ease of installation, torque IAW the latest approved revision of the aircraft service manual. Repeat for the other side of the aircraft.

2.2.3 If your installation requires Laminar Flow Systems Center Support Brackets, install the Laminar Flow Systems, Inc. wheel pant center bracket assembly (LFS-4003-1, -2) to the inboard side of the brake caliper mount flange using existing hardware. Torque IAW the latest approved revision of the aircraft service manual.

2.2.4 Install the wheel in accordance with the latest approved revision of the aircraft service manual. Install the Laminar Flow Systems, Inc. outer support bracket before inserting cotter pin. The stub axle provided is a little shorter than the original one, and it may be necessary to use this shorter one if there is a space problem. It is designed to use washers to adjust the spacing. Once the correct number of washers is determined, they should be held in place with adhesive.

2.2.5 Support brackets can be removed by reversing the above instructions.

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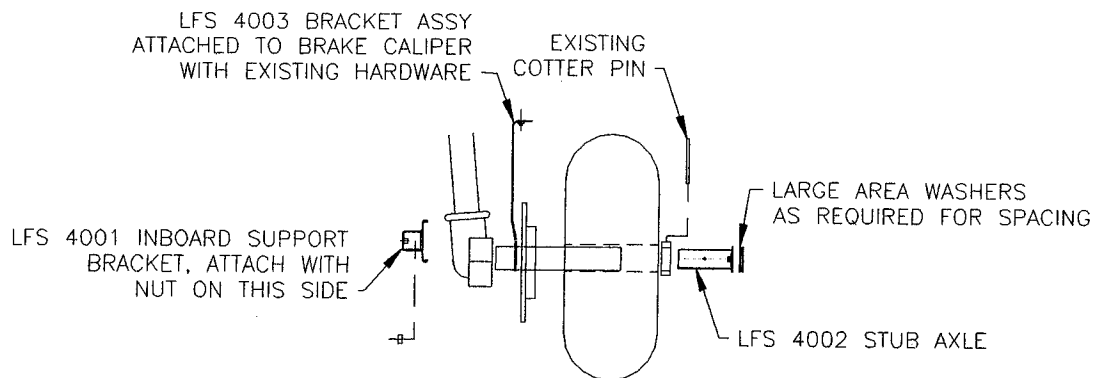


FIGURE 1-1 BRACKET INSTALLATION

2.3 Strut Fairing Installation

- 2.3.1 Install the fairing over the strut and install the screws and washers to fasten the forward and rear halves together. On some aircraft it may be necessary to bend or remove the tabs on the forward part of the strut to clear the fairing.
- 2.3.2 Align the fairing forward and aft and transfer the existing attachment holes in the wings to the fairing. Be sure to maintain at least $\frac{1}{2}$ " edge distance.
- 2.3.3 If your aircraft only has the forward six holes in the wing skin, drill new holes (drill for a $\frac{1}{4}$ " nut plate) through the fairing into the wing skin for the seven aft fasteners. Again, be sure to maintain at least $\frac{1}{2}$ " edge distance and space the fasteners evenly. There are dimples in the fairing to serve as a guide for where to drill, they are for reference only and the installer should verify proper hole locations before drilling.
- 2.3.4 Install the supplied nut plates with the supplied rivets to the inside of the wing skin. (Not necessary on aircraft built after 1978)
- 2.3.5 Install the fairing to the wing with screws and washers.
- 2.3.6 The fairing can be removed by removing the screws and washers.

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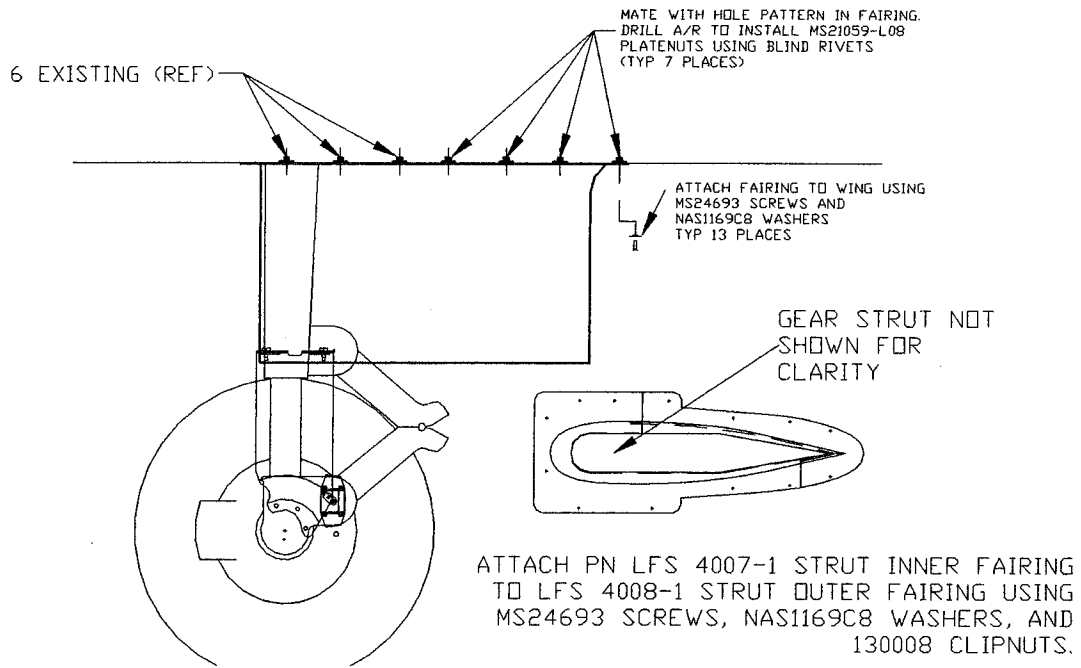


FIGURE 1-2 STRUT FAIRING INSTALLATION

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2.4 Speed Pants Installation

- 2.4.1 Attach the fairing to the center support bracket using two ¼” screws and dimpled washers. Screw the screws in but do not tighten the screws yet.
- 2.4.2 Using the large cardboard hole-duplicator provided, mark the position of the hole where the door will be attached to the inboard mount (attach the hole duplicator to the strut fairing with tape).
- 2.4.3 Slide the large door into the retaining clip on the back of the larger half. Attach the door in a few spots using the #8 screws and countersunk washers.
- 2.4.4 Carefully align the assembled pant so that it fits correctly around the strut fairing, and drill the ¼ inch hole for the inboard mount where indicated by the hole duplicator.
- 2.4.5 Attach the door to the inboard mount with a ¼” screw (temporary installation).
- 2.4.6 Using the aluminum hole finder provided, locate the correct position for the axle bolt and drill a ¼” hole for it. Any space between the axle and the door pocket should be filled with the washers provided. Attach the pant to the stub axle using the AN4-6A bolt and light washer.
- 2.4.7 Tighten the two screws on the top of the main pant that attach it to the center support.
- 2.4.8 Remove inboard mount screw and check that the hole remains centered to the mount. If all is well, drill out the hole to ½ inch and re-install the countersunk ¼” screw, this time with the dimpled washer. This is the last opportunity for adjustments, so check clearances between the strut fairing and the pant carefully to reduce any interference.
- 2.4.9 Check the fairing for alignment and for chafing of the landing gear and the strut fairing. Make sure there is at least ½” clearance to the tire in all positions, and one inch to the rear part of the tire. Trim the pant as necessary
- 2.4.10 Install the remaining countersunk screws and washers into the fairing.
- 2.4.11 Tighten the attachment bolts of the fairing.
- 2.4.12 Install the tire inflation access cover on the outboard side (PN LFS 4004-1 and 4004-2).
- 2.4.13 To remove pants, repeat the above instructions in reverse order

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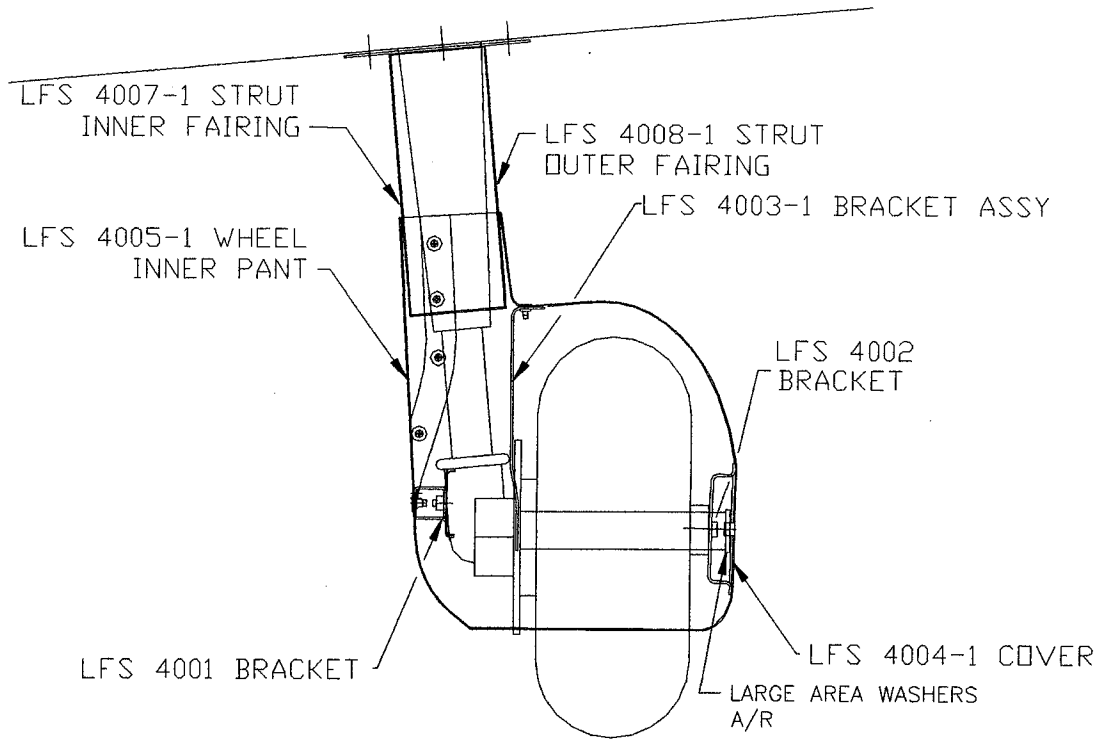


FIGURE 1-3 INSTALLATION OVERVIEW

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3.0 Airworthiness Limitations

“The Airworthiness Limitations section is FAA approved and specifies maintenance required under §§43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.”

3.1 Mandatory Replacement Time – None

3.2 Structural Inspection Interval – At 100 hour or Annual intervals, depending on the service regime of the aircraft.

3.3 The part must be considered unairworthy if the parts are cracked at or near attachment points, if the part is in a position to interfere with the normal operation of the landing gear strut, or if the inspecting person determines that there is damage that could compromise the safety of flight of that aircraft.

3.4 Upon repair of the part it may be returned to service if when installed on the aircraft it allows the landing gear assembly to operate normally.

4.0 Weight & Balance Information

The Laminar Flow Systems, Inc. Speed Pants and Strut Fairings (with all necessary attach brackets) weigh 17.5 lbs total centered at a point 3.28 inches aft of the main wheel centerline. Please see the latest approved revision of the aircraft service manual or latest aircraft weight and balance to determine how this translates into a fuselage station.

***Please note that this weight includes the Speedpants, Strut Fairings, All Attach Brackets, and hardware. If your installation does not use all of these parts, or if you have removed some parts for your aircraft and replaced them with these parts, please adjust the weight and balance accordingly.