

United States of America
Department of Transportation Federal Aviation Administration
Supplemental Type Certificate

Number **SA00037SE**

This certificate, issued to:

**BLR Aerospace, LLC
3102 100th Street SW
Everett, WA 98204**

certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air Regulations.

Original Product—Type Certificate Number: A20SO
Make: Piper
Model: PA-31

Description of the Type Design Change: Vortex generators manufactured in accordance with Document AA1161, Revision B, dated November 15, 1993, and installed in accordance with Document BL1162, Revision A, dated August 31, 1993, or later FAA-approved revisions.

In order to be eligible for this modification aircraft must have Supplemental Type Certificate (STC) SA970SO installed.

Eligible Serial Numbers: 31-2 and on.

Limitations and Conditions: Approval of this change in type design applies to the above model aircraft only. This approval should not be extended to other aircraft of this model on which other previously approved modifications are incorporated unless it is determined that the relationship between this change and any of those other previously approved modifications, including changes in type design, will introduce no adverse effect upon the airworthiness of that aircraft.

A copy of this certificate, continuation sheets, and the Flight Manual Supplement (FMS) specified on page 3, must be maintained as part of the permanent records for the modified aircraft.

(See Continuation Sheets on Pages 3 and 4)..

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: June 30, 1993
Date of issuance: November 18, 1993

Date reissued: November 23, 2009
Date amended:



By direction of the Administrator

(Signature)
Acting Manager, Seattle Aircraft Certification Office
(Title)

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.

Supplemental Type Certificate

(Continuation Sheet)

Number SA00037SE

BLR Aerospace, LLC

Issued: November 18, 1993

Reissued: November 23, 2009

Limitations and Conditions continued:

This continuation sheet, which is part of STC SA00037SE, prescribes the conditions and limitations under which the product for which the STC was issued meets the standards for airworthiness of the Federal Aviation Regulations.

The conditions and limitations of Type Certificate Data Sheet No. A20SO and Supplemental Type Certificate SA970SO apply except where superseded by the following:

The system consists of eighty-six vortex generators on the wing and vertical tail of the airplane and four strakes (two on each nacelle).

There may be a maximum combined total of four vortex generators missing from the wing and/or vertical tail before replacements must be installed.

If any of the eighty-six vortex generators are missing, the airplane must be operated within the limitations of the basic airplane flight manual until replacements are installed.

Flight Manual Supplement: Document AFMS-NAV-3, dated November 18, 1993, or later
FAA-approved revision.
(in addition to the supplement required by STC SA970SO)

Engine Limits: Maximum Take-off Power
Maximum of 3 minutes except in emergency.
2575 RPM, 49.0 inches Hg manifold pressure below 15,000 feet MSL.
Reduce manifold pressure by 0.64 inches for every 1000 feet of altitude above 15,000 feet MSL up to 22,300 feet MSL. Reduce manifold pressure by an additional 2.2 inches for every 1000 feet of altitude above 22,300 feet MSL up to the maximum operating altitude of 24,000 feet MSL.

Maximum Continuous Power
2400 RPM, 35.0 inches Hg manifold pressure below 21,100 feet MSL.
Reduce manifold pressure by 1.7 inches for every 1000 feet of altitude above 21,100 feet MSL up to maximum operating altitude of 24,000 feet MSL.

(See Continuation Sheet on Page 4)..

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Supplemental Type Certificate

(Continuation Sheet)

Number SA00037SE

BLR Aerospace, LLC

Issued: November 18, 1993

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Limitations and Conditions continued:

Airspeed Indicator Markings (IAS):	Normal operating range (green arc).....	78 to 183 knots
	Flaps operating range (white arc)	71 to 140 knots
	Caution range (yellow arc)	183 to 219 knots
	Minimum single-engine control speed (red radial)	76 knots
	Best single-engine rate-of-climb speed (blue radial)	108 knots
	Never exceed speed (red radial).....	219 knots
Maximum Weights:	Ramp.....	6740 pounds
	Takeoff	6700 pounds (see loading limitations below)
	Landing.....	6500 pounds
	Zero Fuel	6200 pounds
	(Note: Aircraft must have been originally certificated for a maximum landing weight of 6500 pounds, or must have Piper Kit 763 801 installed to be eligible for this modification.)	
CG Range (Landing Gear Extended):	+136.0 inches to +138.0 inches at 6700 pounds	
	+134.0 inches to +138.0 inches at 6500 pounds	
	+128.5 inches to +138.0 inches at 6000 pounds	
	+120.0 inches to +138.0 inches at 4800 pounds or less	
	Straight line variation between points given	
Loading Limitations:	For aircraft with wingtip extensions: a minimum of 5 gallons of fuel per side must be in the outboard auxiliary fuel tanks when operating at weights above 6500 pounds.	
	For aircraft with winglets: a minimum of 10 gallons of fuel per side must be in the outboard auxiliary fuel tanks when operating at weights above 6500 pounds.	
Load Factor Limits (g's):	Positive maneuvers: +3.54	
	Negative maneuvers: -1.41	
Placards:	Change all references to V_{MCA} values on placards to 76 KIAS.	
	Change all references to maneuver speed values on placards to 158 KIAS.	

- END -

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