

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

*Number* SA00047SE

*This certificate, issued to*

**BLR Aerospace, LLC  
11002 29<sup>th</sup> Ave. West  
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 AA1187, no revision, dated October 19, 1993, or later Federal Aviation Administration (FAA) approved revision, and installed in accordance with Document BL1130, Revision B, dated September 15, 1993, or later FAA-approved revisions.

*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 and the Flight Manual Supplement (FMS) specified on the continuation sheet must be maintained as part of the permanent records for the modified aircraft.

(See Continuation Sheets Pages 3 through 5)

*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:* October 11, 1994

*Date reissued:* November 23, 2009; August 23, 2018

*Date of issuance:* April 21, 1995

*Date amended:* March 04, 1996; May 30, 2013



*By direction of the Administrator*

(Signature)

Manager, Seattle ACO Branch

(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 or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120). This certificate may be transferred in accordance with FAR 21.47.

Department of Transportation - Federal Aviation Administration

# Supplemental Type Certificate

## (Continuation Sheet)

*Number* SA00047SE

### BLR Aerospace, LLC

*Issued:* April 21, 1995

*Reissued:* November 23, 2009; August 23, 2018

*Amended:* March 04, 1996; May 30, 2013

*Limitations and Conditions continued:*

This Continuation Sheet, which is part of Supplemental Type Certificate (STC) SA00047SE, 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 apply except where superseded by the following:

1. The system consists of eighty-six vortex generators on the wing and vertical tail of the airplane and four strakes (two on each nacelle).
2. There may be a maximum combined total of four vortex generators missing from the wing and/or vertical tail before replacements must be installed.
3. 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.

### STC

**Compatibility:** This increased gross weight STC has **not been shown compatible** with **any wing extension** or **winglet** modifications and is only valid to the weights specified on this modification. The installer is responsible for assessing the impact of concurrently installed STCs which may affect wing loads, particularly fatigue and static requirements. Additional analysis, FAA approved data, and FAA approved inspections may be needed to meet these requirements.

**Eligibility:** Piper Model PA-31 aircraft with serial numbers 31-2 and on are eligible for this modification provided the aircraft was either originally certified with a maximum landing weight of 6500 pounds or has Piper Kit 763 801 installed.

**Required Flight Manual Supplement:**

Aircraft without wing lockers:  
Document No. AFMS-NAV-7, Revision "A," dated January 21, 1994, or later FAA-approved revision.

Aircraft with wing lockers:  
Document Number AFMS-NAV-8, Revision "A," dated January 21, 1994, or later FAA-approved revision.

(See Continuation Sheets Pages 4 and 5)

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# Supplemental Type Certificate

(Continuation Sheet)

*Number* SA00047SE

**BLR Aerospace, LLC**

*Issued:* April 21, 1995

*Reissued:* November 23, 2009; August 23, 2018

*Amended:* March 04, 1996; May 30, 2013

*Limitations and Conditions continued:*

**Engine Limits:**

(Aircraft serial Numbers 31-2 through 31-751, equipped with TIO-540-A1A, -A1B, -A2A, or -A2B engines)

Maximum Take-off Power

Maximum of 3 minutes except in emergency.  
2575 RPM, 43 inches Hg manifold pressure below 15,000 feet MSL. Reduce manifold pressure by 1.6 inches Hg for every 1,000 feet of altitude above 15,000 feet MSL up to maximum operating altitude of 24,000 feet MSL.

Maximum Continuous Power

2400 RPM, 36.5 inches Hg manifold pressure below 19,000 feet MSL. Reduce manifold pressure by 1.6 inches Hg of every 1,000 feet of altitude above 19,000 feet MSL up to maximum operating altitude of 24,000 feet MSL.

**Engine Limits:**

(Aircraft serial numbers 31-712 and on, equipped with TIO-540-A2C engines)

Maximum Take-off Power

Maximum of 3 minutes except in emergency.  
2575 RPM, 46 inches Hg manifold pressure below 15,800 feet MSL. Reduce manifold pressure by 1.6 inches Hg for every 1,000 feet of altitude above 15,800 feet MSL up to maximum operating altitude of 24,000 feet MSL.

Maximum Continuous Power

2400 RPM, 39.5 inches Hg manifold pressure below 19,700 feet MSL. Reduce manifold pressure by 1.6 inches Hg for every 1,000 feet of altitude above 19,700 feet MSL up to maximum operating altitude of 24,000 feet MSL.

**Airspeed Indicator Markings (IAS):**

Aircraft without wing lockers:

Normal Operating Range (green arc) ..... 78 to 188 knots  
Flaps Operating Range (white arc) ..... 71 to 140 knots  
Best Single-Engine Rate-of-Climb Speed (blue radial) 97 knots

Aircraft with wing lockers:

Normal Operating Range (green arc) ..... 77 to 188 knots  
Flaps Operating Range (white arc) ..... 71 to 140 knots  
Best Single-Engine Rate-of-Climb Speed (blue radial) 100 knots

(See Continuation Sheet Page 5)

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*Limitations and Conditions continued:*

**Maximum Weights:** Aircraft without wing lockers:  
 Ramp ..... 6880 pounds  
 Takeoff..... 6840 pounds  
 Landing..... 6500 pounds  
 Zero Fuel ..... 6200 pounds

Aircraft with wing lockers:  
 Ramp ..... 6770 pounds  
 Takeoff..... 6730 pounds  
 Landing..... 6500 pounds  
 Zero Fuel ..... 6200 pounds

**CG Range** Aircraft without wing lockers:  
**(Landing Gear** +135.6 inches to +138.0 inches at 6840 pounds  
**Extended):** +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.

Aircraft with wing lockers:  
 +135.1 inches to +138.0 inches at 6730 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.

**Load Factor Limits** Positive Maneuvers: +3.53  
**(g's):** Negative Maneuvers: -1.41

**Required Placards:** Change all references to maneuver speed (V<sub>P</sub>) values on placards to 158 KIAS (182 MPH IAS)

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