

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

Number SA02414SE

This certificate, issued to

**Cascade Aircraft Conversions, LLC
903 Grinnell Road
Garfield, WA 99130**

*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 **Appendix B, CAM 8 and Part 23** of the **Federal Aviation Regulations**.*

Original Product—Type Certificate Number: A17SW
Make: Air Tractor
Model: AT-502, AT-502B

Description of the Type Design Change: Installation of a Pratt & Whitney PT6A-41, PT6A-42 or PT6A-42A engine and Avia V508H/106B/A propeller, in accordance with Master Drawing List (MDL) CAC-MDL-ATP, Revision IR, or later Federal Aviation Administration (FAA) approved revision.

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 series unless the installer determines that the relationship between this change and any other previously incorporated approved modifications will introduce no adverse effect upon the airworthiness of that aircraft.

Supplemental Type Certificate SA02135SE is required equipment for this modification.

A copy of this certificate and Airplane Flight Manual Supplement CAC-FMS-112, Revision A, dated July 8, 2014, or later FAA-approved revision, must be maintained as part of the permanent records for the modified aircraft.

(See Continuation Sheet Page 3 of 6 Pages)

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: November 20, 2012

Date reissued:

Date of issuance: August 28, 2014

Date amended:



By direction of the Administrator

(Signature)

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.

United States of America
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Supplemental Type Certificate
 (Continuation Sheet)

Number SA02414SE

Cascade Aircraft Conversions, LLC

Issued: August 28, 2014

Reissued:

Amended:

Limitations and Conditions continued:

1. ENGINES

- a) Number of Engines 1
- b) Engine Manufacturer Pratt and Whitney Canada
- c) Engine Model Number PT6A-41, -42, -42A
- d) Operating Limits See following tables

PT6A-41 OPERATION LIMITS

Operating Conditions (2)	Reduction Gearbox Torque (1)		Max. OBS ITT	Gas Gen Speed Ng	Prop Shaft Speed (10)	Oil Pressure (6)	Oil Temp
	(lb.ft)	(psi)	°C	RPM	RPM	psig	°C
Take-off	2230	72.95	750	38100	2000	105 - 135	0 to 99
Max Cont.	-	-	-	-	-	-	-
Minimum Idle (3)	-	-	750 (7)	20000 Minimum	-	60 Minimum	-40 to 99
Starting	-	-	1000 (4)	-	-	0 - 200	-40 Minimum (5)
Transient	2750 (4)	-	850 (11)	38500	2205 (8)	40 - 200	99 to 104 (9)
Reverse	1895	62.97	750	38100		105 - 135	0 to 99

Notes: Gas generator speed of 37468 rpm is defined as 100%, and is equivalent to 4200RPM tacho drive.

- (1) Torque limit applies within range of 1600 to 2000 rpm, below 1600 rpm torque is limited to 1100 lb.ft.
- (2) Engine inlet condition limit for engine operation: (a) temperature: to 57.3°C; (b) altitude ground to 35,000 ft (temperature lapse rate of 2C per 1000 ft. assumed).
- (3) Minimum flight idle is developed by the airframe manufacturer.
- (4) This value is time-limited to 5 seconds.
- (5) Limited by oil pressure.
- (6) Normal oil pressure with gas generator speed above 75% speed. With engine torque below 1970 lb.ft minimum oil pressure is 85 psig at normal oil temperature (60 to 70°C). Under emergency conditions to complete a flight a lower oil pressure limit of 60 psig is permissible at reduced power level, not exceeding 1100 lb.ft torque.
- (7) Applies over gas generator speed range 20000 to 22000 RPM.
- (8) May be employed in an emergency condition, at all rating, to complete a flight.
- (9) Time limited to 10 minutes at any operating condition.
- (10) In flight in absence of a minimum 40 psig oil pressure, continuous steady state propeller rotation must be prevented by propeller feathering. On the ground, with the engine shut down, continuous propeller rotation must be prevented.
- (11) Refer to P&W Canada Installation Manual Figure 2-2, Over temperature limits.

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Supplemental Type Certificate

(Continuation Sheet)

Number SA02414SE

Cascade Aircraft Conversions, LLC

Issued: August 28, 2014

Reissued:

Amended:

Limitations and Conditions continued:

PT6A-42 OPERATION LIMITS

Operating Conditions (2)	Reduction Gearbox Torque (1)		Max. OBS ITT	Gas Gen Speed Ng	Prop Shaft Speed (10)	Oil Pressure (6)	Oil Temp
	(lb.ft)	(psi)	°C	RPM	RPM	psig	°C
Take-off	2230	72.95	800	38100	20000 (12)	100 - 135	0 to 99
Max Cont.	2230	72.95	800	-	-	100 - 135	0 to 99
Minimum Idle (3)	-	-	750 (7)	20000 Minimum	-	60 Minimum	-40 to 99
Starting	-	-	1000 (4)	-	-	0 - 200	-40 Minimum (5)
Transient	2750 (4)	-	880(4) 850(11)	39000 (5)	2205 (8)	40 - 200	99 to 104 (9)
Reverse	1895	62.97	750	38100		100 - 135	0 to 99

Notes: Gas generator speed of 37468 rpm is defined as 100%, and is equivalent to 4200RPM tacho drive.

- (1) Torque limit applies within range of 1600 to 2000 rpm. For take-off and max. continuous operating conditions, a variation of +45 lb.ft. is permitted to account for power setting accuracy and steady state fluctuations. Below 1600 rpm torque is limited to 1100 lb.ft.
- (2) Engine inlet condition limit for engine operation: (a) temperature: to 57.3°C; (b) altitude ground to 35,000 ft. (temperature lapse rate of 2C per 1000 ft. assumed).
- (3) Minimum flight idle is developed by the airframe manufacturer.
- (4) This value is time-limited to 5 seconds.
- (5) Limited by oil pressure.
- (6) Normal oil pressure with gas generator speed above 75% speed. With engine torque below 1970 lb.ft. minimum oil pressure is 85 psig at normal oil temperature (60 to 70°C). Under emergency conditions to complete a flight a lower oil pressure limit of 60 psig is permissible at reduced power level, not exceeding 1100 lb.ft torque.
- (7) Applies over gas generator speed range 21000 to 23000 RPM.
- (8) May be employed in an emergency condition, at all rating, to complete a flight.
- (9) Time limited to 10 minutes at any operating condition.
- (10) In flight in absence of a minimum 40 psig oil pressure, continuous steady state propeller rotation must be prevented by propeller feathering. On the ground, with the engine shut down, continuous propeller rotation must be prevented.
- (11) This value limited to 20 seconds. Refer to P&W Canada Installation Manual Figure 2-4, Over temperature limits.
- (12) A variation of +40 rpm is permitted to account for power setting accuracy and steady state fluctuations.

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Supplemental Type Certificate

(Continuation Sheet)

Number SA02414SE

Cascade Aircraft Conversions, LLC

Issued: August 28, 2014

Reissued:

Amended:

Limitations and Conditions continued:

PT6A-42A OPERATION LIMITS

Operating Conditions (2)	Reduction Gearbox Torque (1)		Max. OBS ITT	Gas Gen Speed Ng	Prop Shaft Speed (11)	Oil Pressure (7)	Oil Temp
	(lb.ft)	(psi)	°C	RPM	RPM	psig	°C
Take-off	2230	72.95	800	38100	2000	100 - 135	0 to 99
Max Cont.	2230	72.95	770	-	2000	100 - 135	-
Minimum Idle (3)	-	-	750 (8)	21000 Minimum	-	60 Minimum	-40 to 99
Starting	-	-	1000 (4)	-	-	0 - 200	-40 Minimum (6)
Transient	2750 (4)	-	880(4) 850(12)	39000 (5)	2205 (9)	40 - 200	99 to 104 (10)
Reverse	1895	62.97	750	38100		100 - 135	0 to 99

Notes: Gas generator speed of 37468 rpm is defined as 100%, and is equivalent to 4200RPM tacho drive.

- (1) Torque limit applies within range of 1600 to 2000 rpm, below 1600 rpm torque is limited to 1100 lb.ft.
- (2) Engine inlet condition limit for engine operation: (a) temperature: to 57.3°C; (b) altitude ground to 35,000 ft (temperature lapse rate of 2C per 1000 ft. assumed).
- (3) Minimum flight idle is developed by the airframe manufacturer.
- (4) This value is time-limited to 5 seconds.
- (5) This value is time-limited to 10 seconds.
- (6) Limited by oil pressure.
- (7) Normal oil pressure with gas generator speed above 72% speed. With engine torque below 1970 lb.ft minimum oil pressure is 85 psig at normal oil temperature (60 to 70°C). Under emergency conditions to complete a flight a lower oil pressure limit of 60 psig is permissible at reduced power level, not exceeding 1100 lb.ft. torque.
- (8) Applies over gas generator speed range 21000 to 23000 RPM.
- (9) May be employed in an emergency condition, at all rating, to complete a flight.
- (10) Time limited to 10 minutes at any operating condition.
- (11) In flight in absence of a minimum 40 psig oil pressure, continuous steady state propeller rotation must be prevented by propeller feathering. On the ground, with the engine shut down, continuous propeller rotation must be prevented.
- (12) This value limited to 20 seconds. Refer to P&W Canada Installation Manual Figure 2-2, Over temperature limits,

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Supplemental Type Certificate (Continuation Sheet)

Number SA02414SE

Cascade Aircraft Conversions, LLC

Issued: August 28, 2014

Reissued:

Amended:

Limitations and Conditions continued:

2. PROPELLER AND LIMITS

- a) Number of propellers 1
- b) Propeller Manufacturer Avia Propellers
- c) Blade Model 106B/A
- d) Number of Blades 3
- e) Hub Model V508H
- f) Diameter Maximum 106 inches, Minimum 104 inches
- g) Pitch settings MFA 12 +/- 0.1 degrees
Feather 85 +/- 1 degrees
Reverse -19 +/- 1 degrees

3. Oil Capacity 2.5 gals. (1.5 gals. usable)

4. Leveling Means Main Landing gear leg 5 deg tail down
(alternate leveling point in Air Tractor Instructions for Continued Airworthiness)

The following information on placards pertaining to flight and operating limitations must be displayed:

Leveling Point NEXT TO MAIN LANDING GEAR LEG

If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

- END -

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