



Department of Transport

Supplemental Type Certificate

This approval is issued to:

Kelowna Flightcraft Ltd.
#1 - 5655 Kelowna Airport
Kelowna, BRITISH COLUMBIA
V1V 1S1 CANADA

Number: SA00-140

Issue No.: 1

Approval Date: January 1, 2001

Issue Date: January 15, 2001

Effective January 1, 2001 design responsibility for all models listed below is transferred from Allison Engine Company, Inc. and the FAA to Kelowna Flightcraft Ltd. and Transport Canada. Information on this Supplemental Type Certificate Issue 1 has been obtained from FAA Supplemental Type Certificate SA4-1100 reissued on March 28, 1994.

Responsible Office: Headquarters

Aircraft/Engine Type or Model: CONVAIR 340, 440

Canadian Type Certificate or Equivalent: A-220

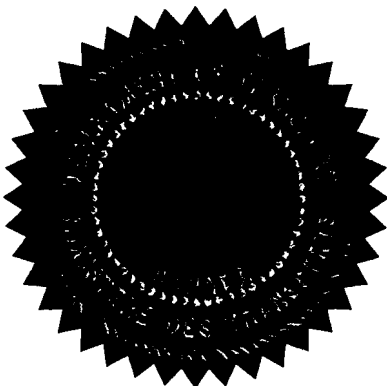
Description of Type Design Change: Installation of Allison 501 -D13D, 501-D13H or 501-D22G engines and related changes.

**Installation/Operating Data,
Required Equipment and Limitations:**

Installation of Allison 501 -D13D, 501-D13H or 501-D22G engines and related changes in accordance with FAA Sealed Allison Convair Conversion Master Drawing List Report No. APR-100. Revision Z-137 dated March 20, 1984, or later approved revision to this document is required for the "580" configuration with 501-D22G engines.

The limitations and conditions of Canadian Type Certificate A-220 (previously FAA Type Certificate 6A6) apply except as outlined on pages 2 through 10 of this STC.

(See Continuation Sheet)



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

F.R. DAVIES
For Minister of Transport

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NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

1. Convair 340 or 440 as modified by this STC ("580" configuration - see NOTE 11)

Engines	Two Allison 501-D13D or 501-D13H
Fuel	Allison Specification EMS-64 (kerosene), ASTM D-1655 Jet A, Jet A-1 or Jet B, or MIL-T-5624 Grade JP-4. See NOTE 5 concerning additives, intermixing of fuel and emergency use of aviation gasoline.
Engine Ratings	Takeoff (5 min.) Equivalent shaft horsepower 501-D13D or 501-D13H dry 3,750 501-D13H with water/methanol 3,880 Shaft horsepower 501-D13D or 501-D13H dry 3,460 501-D13H with water/methanol 3,630 Jet thrust (lbs.) 501-D13D or 501-D13H dry 726 501-D13H with water/methanol 625 Maximum Continuous Equivalent shaft horsepower 3,420 Shaft horsepower 3,138 Jet thrust (lbs.) 705
	The above ratings are based on static sea level conditions, dry air, 59°F. (501-D13D or 501-D13H dry) or 100°F. (501-D13H with water/methanol), 29.92 in. Hg. No external accessory loads, and no air bleed.
Engine Limits Power	As measured by the torquemeter at maximum r.p.m.: Takeoff (5 min.) 4,000 s.h.p. Maximum Continuous 3,400 s.h.p.
RPM	13,820 r.p.m. for all operations (which corresponds to 1,020 propeller r.p.m.)
Turbine Inlet Temperature	Takeoff 1,790°F (977°C) Maximum Continuous 1,710°F (932°C) Transient (2 sec.) 2,040°F (1,116°C)
Augmentation Fluid Oil Grade	Water/methanol solution (see NOTE 6) Allison Specification EMS-35 or EMS-53

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Oil Inlet Temperature	Maximum	
	At or below flight idle	212°F (100°C)
	Above flight idle for 5 min.	212°F (100°C)
	All other operations	185°F (85°C)
	Minimum	
	EMS-35	-25°F (-32°C)
	EMS-53	-40°F (-40°C)
Propeller and Propeller Limits	Two Aeroproducts A6441FN-606A	
	Diameter	13 ft. 6 in.
	No reduction in diameter permitted	
	Pitch settings at the 42 in. station:	
	Hydraulic low pitch stop (flight idle)	+20.0 ± .1°
	Start	+7.0
	Reverse	-4.0 ± .3°
	Feather	+94.9 ± .1°, .2°
	Beta follow-up	31.25 ± .75°
	Mechanical low pitch stop	+18.25 - 0, +.25°
	Ground idle	+1.5°
	Placard required:	“Avoid Continuous Operations of Propellers on the Ground below 9,900 Engine RPM for Low RPM Idle and Above 14,500 Engine RPM for Overspeed Fuel Governor Checks.”
	Oil	MIL-L-7870
2. <u>Convair 340 or 440 as modified by this STC</u>		(“580A” configuration - see NOTE 11)
Engines	Two Allison 501-D22G	
Fuel	Allison Specification EMS-64 (kerosene), ASTM D-1655 Jet A, Jet A-1 or Jet B, or MIL-T-5624 Grade JP-4. See NOTE 5 concerning additives, intermixing of fuel and emergency use of aviation gasoline.	
Engine Ratings	Takeoff (5 min.)	
	Equivalent shaft horsepower	4,269
	Shaft horsepower	4,000
	Jet thrust (lbs.)	672
	Maximum Continuous	
	Equivalent shaft horsepower	4,243
	Shaft horsepower	3,950
	Jet thrust (lbs.)	732

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Engine Ratings (Cont'd)	The above ratings are based on static sea level conditions, dry air, 100°F. (takeoff) or 69°F (maximum continuous, 29.92 in Hg, no external accessory loads, and no air bleed).	
Engine Limits Power	As measured by the torquemeter at maximum r.p.m.:	
	Takeoff	4,000 s.h.p.
	Maximum Continuous	3,950 s.h.p.
RPM	13,820 r.p.m. for all operations (which corresponds to 1,020 propeller r.p.m.)	
Turbine Inlet Temperature	Takeoff (5 min.)	1,970°F (1077°C)
	Maximum Continuous	1,850°F (1010°C)
	Transient (5 sec.)	2,147°F (1,175°C)
Oil Grade	Allison Specification EMS-53	
Oil Inlet Temperature	Maximum	
	At or below flight idle	212°F (100°C)
	Above flight idle for 5 min.	212°F (100°C)
	All other operations	185°F (85°C)
	Minimum	-40°F (-40°C)
Propeller and Propeller Limits	Two Hamilton Standard 54H60-117 / A7121B-2 or A7109B-2 installed in accordance with FAA STC SA1825NM.	
	Diameter	13 ft. 6 in.
	A maximum 3.25 in. reductions in diameter is permitted	
	Pitch settings - see FAA STC SA1825NM	
	Oil - MIL-H-6083B Type I, MIL-H-5606 or MIL-H-82387	
Alternate Propeller and Propeller Limits	Two Hamilton Standard 54H60-117 / A7111D-2 installed in accordance with Canadian STC SA00-140 (previously FAA STC SA4-1100).	
	Diameter	13 ft. 6 in.
	A maximum 3.25 in. reductions in diameter is permitted.	
	Pitch settings at 42 inch station:	
	Flight Idle (Hydraulic low pitch stop - Top of Beta)	+17.5 ± .5°
	Reverse	- 6.5 ± 1°
	Feather	+ 92.5 ± .5°
	Flight Idle (Mechanical low pitch stop)	20 ± .5°
	Ground idle (Start)	+ 5.5° ± .5°
	(See NOTE 13 for additional data on alternate propeller)	

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Data Pertinent to both configurations

Airspeed Limits (IAS)	V ^{NE} (Never exceed)			
	Sea level	309 knots	(356 mph)	
	10,000 ft.	313 knots	(360 mph)	
	Reduce V ^{NE} 6 knots per 1,000 ft. above 10,000 ft.			
	V ^{MO} (Maximum Operating)			
	At or below 45,000 lbs.	zero fuel weight		
	Sea level	278 knots	(320 mph)	
	10,000 ft.	282 knots	(325 mph)	
	Reduce V ^{MO} 5 knots per 1,000 ft. above 10,000 ft.			
	Zero fuel weight between 45,000 and 47,000 lbs.			
	Sea level	258 knots	(297 mph)	
	13,400 ft.	263 knots	(303 mph)	
	Reduce V ^{MO} 5 knots per 1,000 ft. above 13,400 ft.			
	Maneuvering (V _A - See Approved Airplane Flight Manual)			
	V ^{FE} (Flaps extended)			
	0 to 20°	173 knots	(200 mph)	
	20 to 30°	157 knots	(180 mph)	
	30 to 40°	150 knots	(171 mph)	
	V ^{LO} (Landing gear retraction)	146 knots	(167 mph)	
	V ^{LE} (Landing gear extension)	173 knots	(200 mph)	

CG Range	Gross Weight (lbs.)	Forward		Aft	
		% MAC Sta.		% MAC Sta.	
Landing gear retracted	39,500 or less	8.5	360.6	35	390.9
	45,000	13.7	366.6	35	390.9
	54,600	19.27	372.9	35	390.9
	58,156	21.21	375.2	35	390.9
Landing gear extended	39,500 or less	13.0	365.8	34	389.8
	45,000	18.0	371.5	34	389.8
	52,000	21.5	375.5	34	389.8
	54,600	22.8	377.0	34	389.8
	58,156	24.6	379.0	34	389.8

Straight line variation between points given.

Datum Same as shown on Canadian Type Certificate A-220 (previously FAA Type Certificate 6A6)

MAC Same as shown on Canadian Type Certificate A-220 (previously FAA Type Certificate 6A6)

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Levelling Means	Same as shown on Canadian Type Certificate A-220 (previously FAA Type Certificate 6A6)	
Maximum Weight	Takeoff	53,200 lbs. or 54,600 lbs. (see NOTE 9), or 58,166 lbs. (see NOTE 4)
	Landing	50,670 lbs., or 52,000 lbs. (see NOTE 9), or 53,000 lbs. (see NOTE 8)
	Zero Fuel	45,000 lbs. or 47,000 lbs. (see airspeed limits) All weight in excess of zero fuel must consist of fuel and oil.
Minimum Crew	Same as shown on Canadian Type Certificate A-220 (previously FAA Type Certificate 6A6)	
Maximum Passengers	Same as shown on Canadian Type Certificate A-220 (previously FAA Type Certificate 6A6)	
Maximum Baggage	Same as shown on Canadian Type Certificate A-220 (previously FAA Type Certificate 6A6)	
Fuel Capacity	1,730 U.S. gal. (one 865 U.S. gal. tank in each wing at Sta. 397), or 2,032 U.S. gal. (see FAA STC SA4-1242), or 2,058 U.S. gal. (see FAA STC SA4-1114), or 2,908 U.S. gal. (see FAA STC SA4-1249) (see NOTE 1 for system fuel)	
Oil Capacity	16.8 U.S. gal. at Sta. 269.6 (see NOTE 1 for system oil)	
Augmentation Fluid Capacity	13 U.S. gal. (one 21.5 U.S. gal. tank in each wing at Sta. 454)	
Maximum Operating Altitude	25,000 feet	

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Control Surface Movements	Same as show on Canadian Type Certificate A-220 (previously FAA Type Certificate 6A6) except: Elevator trim tab (RH) - 9° up, 11° down rigged with tab streamlined with elevator trailing edge.
Serial Numbers Eligible	2 and Up
Applicability	The approval of this change in type design applied to the basic Convair 340 and 440 airplanes that are otherwise unmodified. This approval should not be extended to other airplanes of these models on which other previously approved modifications are incorporated unless it is determined that the interrelationship between this change and any of those previously approved modifications will introduce no adverse effect upon the airworthiness of those airplanes.
Basis of Certification	Part 4b of the Civil Air Regulations effective July 20, 1950, with Amendments 4b-1, 4b-3, and 4b-5 thereto Special Civil Air Regulations No. SR-422B, Special Civil Air Regulation No. SR-423, and Special Federal Aviation Regulations No. 27. The modifications comprising the "580A" configuration were determined to be no "acoustical change" as defined by 21/93(b) of the Federal Aviation Regulations.
Production Basis	None. Before an airplane modified in accordance with the provisions of this Supplemental Type Certificate is returned to service, a check of flight characteristics must be accomplished by a representative of Transport Canada.
Equipment	The basic required equipment as prescribed in the applicable airworthiness regulations must be installed in the airplane for certification. PacAero Report APR-80, "Allison Prop-Jet Convair Equipment List", contains a list of all required equipment, including an Approved Airplane Flight Manual, that must be installed for both the "580" and the "580A" configuration as well as optional equipment installations approved by Transport Canada.

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- NOTE 1 A current weight and balance report, including a list of equipment included in the certificate weight empty and, when necessary, loading instructions, must be in each airplane at the time of return to service after modification and at all times thereafter except in the case of operators having an approved weight control system.
- The certificated empty weight and corresponding center of gravity locations must include the following:
- | | |
|----------------|------------------------|
| a) System Oil | 86.8 lbs. at Sta. 261 |
| b) System fuel | 57.6 lbs. at Sta. 391* |
- * Applies to basic 1,730 U.S. gal capacity configuration. See appropriate fuel tank modification STC for data on other tank configurations.
- NOTE 2 The following placard must be displayed in front of and in clear view of the pilot:
- “This airplane shall be operated in compliance with the Operating Limitations specified in the Approved Airplane Flight Manual”.
- NOTE 3 Deleted
- NOTE 4 Airplanes modified in accordance with Pacific Airmotive Corp. Drawing No. 9000057 are approved for a takeoff weight of 58, 156 lbs. when operated in accordance with the Allison Prop-Jet Convair 340/440 Approved Airplane Flight Manual Supplement dated July 17, 1967. Installation of 2,908 U.S. gallon fuel capacity is required for operation at this higher weight.
- NOTE 5
- a) Aviation gasoline, MIL-G-5572 Grade 115/145 or lower, is approved for limited emergency use. The use of Grade 80/87 (now Grade 80) gasoline is limited to the amount required to operate the engine for 1,000 hours during any overhaul period. The use of grades higher than 80/87 is limited to the amount required to operate the engine for 100 hours during any overhaul period. The average fuel consumption rate may be used to convert the allowable engine operating time to an equivalent gallonage for facilitate record keeping. Gasoline containing tricresyl phosphate, boron or similar additives shall not be used.
 - b) All approved fuels may be used separately or mixed in any proportion without adversely affecting engine operation or power output. No fuel control adjustment or system purging is required when switching fuel types.

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- NOTE 5
(Cont'd)
- c) Anti-icing additives conforming to MIL-F-27686 may be used in fuels in amounts not to exceed 0.15% by volume.
 - d) Shell ASA-3 antistatic additive may be used in a concentration providing no more than 300 conductivity units, which is equivalent to one p.p.m.
 - e) Biocidal fuel additive, Biobor JF, may be used periodically in concentrations that do not exceed 270 p.p.m. Use of fuel with this additive is limited to one fuelling within each engine inspection period specified in the 501-D13 or 501-D22 Engine Maintenance Manual.
- NOTE 6
- The augmentation fluid used in 501-D13H engines must be a water/methanol solution consisting of $67 \pm 5\%$ purified water, Allison Specification EMS-120 or equivalent, and $33 \pm 5\%$ methyl alcohol, Allison Specification EMS-125 or equivalent. The flow rate is 8 U.S. gal. per minute per engine at a pressure of 140 to 200 p.s.i.g. this permits operation at rated takeoff power with ambient temperatures above standard conditions provided other limits are not exceeded.
- NOTE 7
- Deleted
- NOTE 8
- Airplanes modified in accordance with Pacific Airmotive Corp. Drawing No. 9036040 are approved for operation with Hytrol Mark 1E Anti-Skid Brake System in accordance with the Allison Prop-Jet Convair 340/440 Approved Airplane Flight Manual as revised April 24, 1967.
- NOTE 9
- Airplanes modified in accordance with Pacific Airmotive Corp. Drawing No. 9000546 or Allison Pro-Jet Convair Bulletin 11-1 are approved for a maximum takeoff weight of 54,600 lbs. and a maximum landing weight of 52,000 lbs. when operated in accordance with the Allison Prop-Jet Convair 340/440 Approved Airplane Flight Manual Revision dated July 17, 1967.
- NOTE 10
- Airplanes modified in accordance with Pacific Airmotive Corp. Drawing No. 9031157 are approved for operation with a modified cab in heating and ventilation system which provides improved control and ground use capabilities with main engines shut down, an alternate inflight cabin pressurization source and 200 amperes of DC current from the APU generator.
- NOTE 11
- Airplanes modified in accordance with this Supplemental Type Certificate are frequently referred to unofficially as the "580's" or "580A's"; however, for official record purposes, these airplanes retain their original Model 340 or 440 identity.

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NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

NOTE 12 Deleted

NOTE 13 Airplanes with Allison 501-D22G engines and Hamilton Standard 54H60-77/ A7121B-2 or A7109B-2 propellers (airplanes modified per FAA STC SA1825NM) may be modified for alternate propellers, 54H60-117/ A7111D-2, per FAA approved Allison Drawing 9000559, Revision C, dated January 10, 1988 or later approved revisions (Allison Convair Conversion Master Drawing List Report No. APR-100, Revision Z-142 dated January 10, 1988, or later approved revisions). The following Approved Airplane Flight Manual Supplement to the basic Airplane Flight Manual, publication 1CC1-1, is required with this modification; Allison Airplane Flight Manual Supplement A, dated January 20, 1988, or later approved revision.

- END -