
Type Acceptance Report

TAR 98/04 Rev 2

PIPER PA-44-180

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Executive Summary

New Zealand Type Acceptance has been granted to the Piper PA-44-180/180T Seminole and Turbo-Seminole models based on validation of FAA Type Certificate number A19SO. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Appendix 1, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.177, subject to any outstanding New Zealand operational requirements being met. (See Section 5 of this report for a review of compliance of the basic type design with the operating Rules.) Additional variants or serial numbers approved under the foreign type certificate can become type accepted after supply of the applicable documentation, in accordance with the provisions of NZCAR §21.43(c).

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 98/04 was granted in the Standard Category in accordance with NZCAR Part 21 Subpart B.

Specifically the report aims to:

- (a) Specify the foreign type certificate and associated airworthiness design standard used for type acceptance of the models in New Zealand; and
- (b) Identify any special conditions for import applicable to any model covered by the Type Acceptance Certificate; and
- (c) Identify any additional requirements which must be complied with prior to the issue of a NZ Airworthiness Certificate or for any subsequent operations.

The report also notes the status of all models included under the foreign type certificate which have been granted type acceptance in New Zealand, which are listed in Appendix 1 of this report.

2. ICAO Type Certificate Details

Type Certificate:	A19SO
Issued by:	Federal Aviation Administration
Manufacturer:	Piper Aircraft, Incorporated The New Piper Aircraft, Inc. (Prior to August 2006) Piper Aircraft Corporation (prior to July 14, 1995)
Model(s):	PA-44-180
MCTOW	3800 lbs
Max. No. of Seats:	4
Noise Standard:	FAR Part 36, through Amendment 36-4

Engine: Lycoming (L)O-360-A1H6 (s/n 4496001 and up)
Lycoming (L)O-360-E1A6D
Type Certificate: E-286
Issued by: FAA

Propeller: Hartzell HC-C2(K,R)-2CEUF, FC7666A-2R – LHS
Hartzell HC-C2(K,R)-2CLEUF, FJC7666A-2R – RHS
Type Certificate: P-920
Issued by: FAA

HC-C3YR-2(L)EUF, F(J)C7663-5R optional for early aircraft
Type Certificate: P25EA
Issued by: FAA

3. Type Acceptance Details

The application for New Zealand type acceptance of the new production series was from the manufacturer dated 22 September 1997. The first-of-type example was serial number 4496017, registered ZK-MBP. The Seminole is a four-seat all-metal low wing T-tail light training aircraft with twin 180 hp engines, basically developed from the Arrow IV.

Type Acceptance Certificate No. 98/04 was granted on 24 November 1997 to the Piper PA-44-180 serial numbers 4496001 and up, based on validation of FAA Type Certificate A19SO. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

This report was raised to Revision 1 to include the earlier PA-44-180 serial numbers, after application by CTC Aviation Training (NZ) Ltd dated 20 December 2004. The first-of-type example was serial number 44-7995156, registered ZK-MBV. Although this is the first original production Seminole in New Zealand there have been four previous examples of the PA-44-180T Turbo Seminole, beginning with ZK-EQY delivered new in 1980.

Revision 2 was raised to include PA-44-180 models fitted with Avidyne Entegra EFIS systems which use a different flight manual. The first example was serial number 4496274 registered as ZK-NNN. The report was also updated to the latest format.

4. NZCAR §21.43 Data Requirements

The type data requirements of NZCAR Part 21B Para §21.43 have been satisfied by supply of the following documents:

(1) ICAO Type certificate:

FAA Type Certificate A19SO issued March 10 1976, re-issued July 14 1995
FAA Type Certificate Data Sheet A19SO Rev 10 dated August 7, 2006

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the PA-44-180 is:

FAR Part 23 effective February 1, 1965, through Amendment 23-16 effective February 14, 1975, plus FAR 23.1557(c)(1) at Amendment 23-18. An equivalent safety finding was made against FAR 23.1545(a), which was reviewed and accepted by the CAA.

For the installation of the Avidyne Entegra EFIS system, the certification basis was updated with selected FAR 23 paragraphs at later amendment states up to 23-52. See the TCDS listing for full details.

These are acceptable certification bases in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1A, as FAR 23 is the basic standard for Normal Category Airplanes called up under Part 21 Appendix C. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

(ii) *Special Conditions:*

(Avidyne Entegra equipped aircraft only) Docket No CE238, Special Condition 23-178-SC High Intensity Radiated Fields (HIRF) – Provides additional requirements for the effects of high intensity radiated fields on aircraft fitted with digital systems which perform critical or essential functions.

(iii) *Equivalent Level of Safety Findings:*

FAR 23.1545(a) – This allowed for use of IAS rather than CAS in the flight manual and aircraft placards, as provided for in the GAMA POH Specification, and an NPRM for FAR 23 (IAS was introduced at amendment 23).

(iv) *Airworthiness Limitations:*

Chapter Four of applicable Maintenance Manual.

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

The PA-44-180 is certificated under FAR Part 36, through Amendment 36-4. (Corrected noise level is 74.7 dB[A] – Flight Manual para 4.51)

Compliance Listing:

Noise Compliance – Report VB-785 Section XIV

(4) Certification Compliance Listing:

Compliance Checklist, PA-44-180, Piper Report VB-913

Final Compliance Checklist, Project Y35024, Avidyne Entegra Option – 6/8/06

(5) Flight manual: Seminole PA-44-180 Pilot's Operating Handbook and FAA approved Airplane Flight Manual, Piper Report VB-1616, applicable to PA-44-180 aircraft S/N 4496001 and up, CAA Accepted as AIR 2597

Seminole PA-44-180 Pilot's Operating Handbook and FAA approved Airplane Flight Manual, Piper Report VB-860 (S/N 44-7995001 through 44-8195026) – CAA Accepted as AIR 2903

Seminole PA-44-180 Pilot's Operating Handbook and FAA approved Airplane Flight Manual, Piper Report VB-1380 (S/N 4495001 thru 4495013) – CAA Accepted as AIR 2904

Seminole PA-44-180 Pilot's Operating Handbook and FAA approved Airplane Flight Manual, Piper Report VB-1942 (S/N 4496174, 4496224 and up equipped with Avidyne Entegra systems) – CAA Accepted as AIR 3184

(6) Operating Data for Aircraft:

(i) *Maintenance Manual:*

Maintenance Manual PA-44-180/180T, Piper reference 761 664 *

Maintenance Manual PA-44-180 S/N 4496001 and up, Piper reference 761 892 *

Current service Information:

Piper Service Bulletins, Service Letters, etc (Piper Index 762-332) *

(ii) *Illustrated Parts Catalogue:*

Parts Catalog, PA-44-180/180T, Piper reference 761 663 *

Parts Catalog, PA-44-180 S/N 4496001 and up, Piper reference 761 891 *

* All these publications available to the CAA via Piper web server

(7) Agreement from manufacturer to supply updates of data in (5), and (6):

CAA 2171 from Peter E Peck, FAA/DOA Coordinator, dated 22-9-97

CAA 2171 from Albert Mill, Director Aircraft Certification Services dated 28-6-11

(8) Other information:

a) Fatigue Analysis PA-44-180 Wing & Carry-thru Structure, Report VB-785

b) Electrical Load Analysis PA-44-180, Report VB-1514

c) Aircraft Model Specification PA-44-180, Report VB-756

d) Structural Substantiation Summary, PA-44-180/180T, Report VB-929

e) Fuselage Model PA-44-180 (Structural Analysis) Report VB-785

f) Certification Model PA-44-180 (Flight Test Report) Report FT-122

g) Antenna location/installation drawing PA-44-180, Dwg 06266

h) Garmin WAAS Flight Test Cert Plan – various Piper models – Report VB-2041

5. Additional New Zealand Requirements

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 is a prerequisite for the grant of a type acceptance certificate.

Civil Aviation Rules Part 26

Subpart B - Additional Airworthiness Requirements

Appendix B - All Aircraft

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
B.1	Marking of Doors and Emergency Exits	<i>To be determined on an individual aircraft basis</i>
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	Not Applicable – Agricultural Aircraft only

Compliance with the following additional NZ operating requirements has been reviewed and were found to be covered by either the original certification requirements or the basic build standard of the aircraft, except as noted:

Civil Aviation Rules Part 91

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Shoulder Harness if Aerobatic; >10 pax; Flight Training	FAR §23.785 (Shoulder harness not required)
91.507	Pax Information Signs - Smoking, safety belts fastened	Not Applicable – Less than 10 passenger seats
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure	FAR §23.1303(a) – Std.Eqpt * N/A – No Mach limitations FAR §23.1303(b) – Std.Eqpt. * FAR §23.1303(c) – Std.Eqpt. * FAR §23.1305(a) – Std.Eqpt. * FAR §23.1305(d) – Std.Eqpt. * FAR §23.1305(b) – Std.Eqpt. *
91.511 Night	(1) Turn and Slip (2) Position Lights	(8) Coolant Temp (9) Oil Temperature (10) Manifold Pressure (11) Cylinder Head Temp. (12) Flap Position (13) U/C Position (14) Ammeter/Voltmeter
91.517 IFR	(1) Gyroscopic AH (2) Gyroscopic DI (3) Gyro Power Supply (4) Sensitive Altimeter	N/A – Air-cooled engines FAR §23.1305(c) – Std.Eqpt. * FAR §23.1305(h) – Std.Eqpt * FAR §23.1305(f) – Std.Eqpt * FAR §23.699(a)(2) Std.Eqpt.* FAR §23.729(e) – Std.Eqpt. * FAR §23.1351(d) Std.Eqpt. *
		(3) Anti-collision Lights (4) Instrument Lighting
		(5) OAT (6) Time in hr/min/sec (7) ASI/Heated Pitot (8) Rate of Climb/Descent
		FAR §23.1401 – Fitted Std. * FAR §23.1381 – Fitted Std. *
		<i>Compliance as applicable</i> Fitted as Standard * Fitted as Standard * Fitted as Standard *
		* See Fig. 7-25 VB-860, Fig. 7-35 VB-1380 and VB-1616 – See Also Equipment List in Section 6 of VB-860 For Avidyne equipped aircraft, see VB-1942 Sect 7.18 and Avidyne PFD Pilot's Guide 600-00104-003
91.519	IFR Communication and Navigation Equipment	<i>Operational requirement – To be determined as applicable</i>
91.523 Emrgcy Eqpmt.	(a) More Than 10 pax - First Aid Kits per Table 7 - Fire Extinguishers per Table 8 (b) More than 20 pax - Axe readily acceptable to crew (c) More than 61 pax - Portable Megaphones per Table 9	<i>To be determined on an individual aircraft basis if used on Air Transport operations</i> Not Applicable – Less than 20 passenger seats Not Applicable – Less than 61 passenger seats
91.529	ELT - TSO C91a or C126 after 1/4/97 (or replacement)	<i>To be determined on an individual aircraft basis</i>
91.531	Oxygen Indicators - Volume/Pressure/Delivery	Not fitted as Standard (Optional equipment for PA-44-180T)
91.533	Oxygen for Non-Pressurized Aircraft	<i>Operational requirement – To be determined as applicable</i>
91.541	SSR Transponder and Altitude Reporting Equipment	<i>Operational requirement – To be determined as applicable</i>
91.543	Altitude Alerting Device - Turbojet or Turbofan	Not Applicable – Not turbojet or turbofan powered
91.545	Assigned Altitude Indicator	<i>Operational requirement – To be determined as applicable</i>
A.15	ELT Installation Requirements	<i>To be determined on an individual aircraft basis</i>

Civil Aviation Rules Part 135

Subpart F - Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
135.355	Seating and Restraints – Shoulder harness flight-crew seats	Shoulder harness with inertial reel are optional for all seats
135.357	Additional Instruments (Powerplant and Propeller)	FAR 23 is an Appendix C airworthiness standard
135.359	Night Flight	Landing light, Pax compartment
135.361	IFR Operations	Speed, Alt, spare bulbs/fuses
135.363	Emergency Equipment (Part 91.523 (a) and (b))	<i>Operational requirement – To be determined as applicable</i> <i>Operational requirement – To be determined as applicable</i>
135.367	Cockpit Voice Recorder	Not Applicable – Fixed-wing with less than 10 passengers
135.369	Flight Data Recorder	Not Applicable – Less than 10 passenger seats
135.371	Additional Attitude Indicator	Not Applicable – Not turbo jet or turbofan powered

Attachments

The following documents form attachments to this report:

Photographs first-of-type example PA-44-180 s/n 4496017 ZK-MBP
Three-view drawing New Piper Model PA-44-180 Seminole
Copy of FAA Type Certificate Data Sheet Number A19SO

Sign off

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Peter Gill
Airworthiness Engineer

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Checked – David Gill
Team Leader Airworthiness

Appendix 1

List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
PA-44-180T	AC 21-1.2/NZCAR Part 21 Appendix A(c)		
PA-44-180 (1996 on)	New Piper Aircraft, Inc.	98/21B/04	24 November 1997
PA-44-180 (1979-95)	CTC Aviation Training (NZ)	5/21B/19	6 January 2005
PA-44-180 (Avidyne)	Hawker Pacific NZ Ltd	11/21B/28	29 June 2011