

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION

T00009LA  
Revision 1  
California Department of  
Forestry and Fire Protection  
  
S-2F3AT  
  
January 23, 2002

TYPE CERTIFICATE DATA SHEET NO. T00009LA

This data sheet, which is a part of Type Certificate No. T00009LA, prescribes the conditions and limitations under which the product for which the Type Certificate was issued meets the Airworthiness Requirements of the Federal Aviation Regulations.

Type Certificate Holder: California Department of Forestry and Fire Protection  
1416 Ninth Street  
Sacramento, CA 95814

Type Certificate Ownership Record: Marsh Aviation transferred ownership of TC T00009LA to California Department of Forestry and Fire Protection on January 23 2002

I - Model S-2F3AT (Restricted Category) Approved November 30, 2001

Engine 2, Honeywell/AlliedSignal/Garrett 331-14GR  
TC E18NE

Fuel Engine operation is approved with the following fuels:

Garrett EMS53111 (Type A)  
Garrett EMS53112 (Type A1) (JP-8)  
(British D. Eng. R.D. 2494 Issue 7)  
Garrett EMS53113 (Class A-JP4)  
Class B-type (British D. Eng. R.D. 2486 Issue 8)  
Garrett EMS53116 (Type JP-5)  
Garrett EMS53122 (Grade 100 LL)

Anti-icing additive conforming to PFA-55MB or MIL-I-27686 must be used when operating in conditions where the fuel temperature is 40° F or less.

Shell ASA-3 anti-static additive, or equivalent, to bring fuel up to 300 conductivity units and no more than 1 ppm.

Sohio Biobor JF Biocide additive or equivalent not to exceed 270 ppm maximum (220 ppm of elemental boron), for pesticide purposes.

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Fuel (cont'd)

Aviation gasoline MIL-G-5572D, Grade 100/130 (low lead), not in excess of 50 gallons per 100 hours of operation (per engine), may be used for emergency operation. Total usage must be limited to 7000 gallons during any 3000 hour period. Aviation gasoline MIL-G-5572D, Grade 80/87 not in excess of 1000 gallons per 100 hours of operation, may be used for emergency operation. If 25% or more Avgas is used at any time, one quart of Aviation grade 120 mineral oil must be added to mixture per 100 gallons of Avgas. (Aviation grade oil to MIL-L-6082).

If combinations of aviation gasoline are used, the following formula is required for establishing proportions of combinations during any 3000 hour period:

$$\frac{\text{Gals. 100/130 (low lead)}}{7000 \text{ Gals}} + \frac{\text{Gals. 80/87}}{30,000 \text{ Gals}} \leq 1$$

Fuel Type	Avgas, JP-4, Jet-B	JP-5/I, JetA/A-1	JP-8
Min. Temp for Starting	-50°C	-44°C	-42°C

Alcohol Water Injection fluid:

A mixture of 70% distilled water and 30% Methyl alcohol (methanol) complying to EMS53123 is approved for use in the Alcohol Water Injection (AWI) system.

Methyl alcohol (methanol) having a minimum purity of 99.8 weight percent and nonvolatile content of <0.001 weight percent shall be used.

Water shall conform to the following requirements; it shall be treated by a demineralization process or shall be distilled if necessary to ensure conformance to the following table:

	MIN	MAX
Total Solids, ppm		10
pH	6.0	8.0
Chlorides, ppm		1
Sulfates, ppm		1
Sulfates, ppm		1

Engine Limits

Engine Ratings and Operating Limits:

Takeoff and Maximum Continuous SHP	1650
Takeoff and Maximum Continuous SHP	4534 Ft - Lb (100%)
Takeoff and Maximum Continuous RPM	1552 (101%)
Ground Idle - Minimum RPM	992 (64%)

## Engine Limits (Cont'd)

CONDITION	TORQUE	RPM % MIN/MAX	OIL PRESS MIN/MAX	EGT	OIL TEMP MIN/MAX
Takeoff	100%	100/101	45/70	100% (2)	55/110°C
Max. Cont.	100%	96/101	45/70	100% (2)	55/110°C
Ground Idle	---	64 (Min)	15/70	---	55/100°C
Starting	---	---	---	770°C	44/110°C
Transient	104% (Max) 30 Sec.	104% (Max) (1)	---	37 Above	---

- (1) Do not exceed 106% RPM at any time. Transient engine speed maximum limit is from 101% to 104% RPM. Engine speed for Overspeed Governor (OSG) check is limited to 30 seconds from 104% to 105% RPM and seconds from 105% to 106% RPM.
- (2) Maximum limits for EGT during all operations, including Automatic Power Reserve (APR) and Continuous Power Reserve (CPR) is 100% with single redline system EGT (SRL) operative, see approved Flight Manual Supplement/Pilot's Operating Handbook 4DE6105 dated November 20, 2001, for EGT values with SRL system inoperative.

Reverse; Landing		93% RPM Minimum	Maximum airspeed (on ground) for reverse operation is 90 KIAS
Reverse; Static		64% RPM Minimum	If Beta light is inoperative, do not use reverse
Windmilling	5-20% Above 20%	5 Minute maximum 10 Minute maximum	
Backward Rotation	Not recommended		

## Propeller &amp; Propeller Limits

Hartzell Five Blade Single Acting  
TC No. P44GL Rev 8 December 1999

Hub Model - HC-B5MA-5H

Blade Model - M11692N

Diameter – 118.7 inches

Blade Angle (measured at Station 42 inches):

Reverse	-11.5° ± 0.5°
Start Lock	-1.8° ± 0.1°
Feather	80° ± 0.5°
Flight Idle	5.5° to 6.5°
Counterweight	100° (Fixed)

Limitations – None

Airspeed Limits (IAS)	V <sub>D</sub> (Dive)	280 KIAS
	V <sub>MO</sub> (Maximum Operating ) (1)	235 KIAS
	V <sub>A</sub> (Maneuvering)	175 KIAS
	V <sub>FE</sub> (Flaps Extended)	150 KIAS
	V <sub>LE</sub> (Landing Gear Extended)	150 KIAS
	Maximum speed for retardant release	150 KIAS
	(1) V <sub>MO</sub> is 250 KCAS 17,000 feet and below. Above 17,000 feet straightline variation to 215 KCAS at 25,000 feet.	
Center of Gravity (C.G.) Range	Landing Gear Extended (all flight weights)	
	Forward Limit	213.41 in. aft of Datum (21.0% MAC)
	Aft Limit	221.22 in. aft of Datum (29.85 MAC)
	Landing Gear Retracted (all flight weights)	
	Forward Limit	215.35 in. aft of Datum (23.2% MAC)
	Aft Limit .	223.16 in. aft of Datum (32.0% MAC)
Empty Weight C. G. Range	None.	
Datum	The Datum is a point 24 inches forward of the most forward structure of the aircraft.	
Leveling Means	Floor inside cabin entrance door at Station No. 189.	
Maximum Weights	Takeoff	29,150 lbs
	Landing	24,800 lbs
Minimum Crew	One pilot at Station No. 104.7 left side.	
Number of Seats	Two at Station No. 104.7.	
Fuel Capacity	Two wing tanks total 765 U.S. gallons at Station No. 228.9.	
Oil Capacity	One tank each engine of 7 quart capacity. Oil tank is supplied with engine and forms an integral part of engine.	
	Engine is approved for Type II oils meeting MIL-L-23699B or EMS53110.	
	Operating oil temperature range is as follows:	
	Ground Start Minimum	-40°C
	Ground Idle Maximum	127°C
Cruise Maximum	110°C	
Takeoff Maximum	127°C	
	(5 minute limit above 110°C for takeoff)	

Maximum Operation Altitude 25,000 Feet

Control Surface Movements

CONTROL SURFACE	DIRECTION	DEGREES ALLOWABLE
Left Aileron	Up	18 + 1/-2
	Down	15 +1/-2
Right Aileron	Up	18 +1/-2
	Down	15 +1/-2
Left Elevator	Up	25 ± 1
	Down	15 ± 1
Right Elevator	Up	25 ± 1
	Down	15 ± 1
Rudder	Left	21 ± 1
	Right	21 ± 1
Rudder Trimmer (Hydraulic @ Electric Actuator Extended)	Left	15
	Right	25
Rudder Trimmer (Hydraulic @ Electric Actuator Retracted)	Left	25
	Right	15
Rudder Trimmer (Hydraulic Actuator Only)	Left	20 ± 1
	Right	20 ± 1
Rudder Trimmer (Electric Actuator Only)	Left	5 ± 0.10'
	Right	5 ± 0.10'
Left Elevator Trim Tab	Up	20 ± 1
	Down	20 ± 1
Right Elevator Trim Tab	Up	20 ± 1
	Down	20 ± 1
Aileron Trim Tab (L. Only)	Up	20 ± 1
	Down	20 ± 1
Rudder Tab	Left	14 ± 2
Left Elevator Geared Tab	Down Elevator	5 ± 1
	Up Elevator	20 ± 2
Right Elevator Geared Tab	Down Elevator	5 ± 1
	Up Elevator	20 ± 2
Left Elevator Spring Tab	Up	15 ± 1
	Down	20 ± 2
Right Elevator Spring Tab	Up	15 ± 1
	Down	20 ± 2
Left Outboard Flap	Down	30 ± 2
Right Outboard Flap	Down	30 ± 2
Left Inboard Flap	Down	40 ± 2
Right Inboard Flat	Down	40 ± 2
Left Outboard Spoiler	Up	52 ± 3
Right Outboard Spoiler	Up	52 ± 3
Left Inboard Spoiler	Up	37 ± 2
Right Inboard Spoiler	Up	37 ± 2

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Manufacturer's Serial Numbers	<p>The original Navy designation for the eligible airplanes was S2F-3. Variations in installed mission equipment resulted in new designations for the S2F-3 airframe. These variations were designated S2F-3S, S-2D, ES-2D, S-2E, and S-2G.</p> <p>S2F-3 aircraft eligible for airworthiness certification under this Type Certificate, must be modified for the special purpose forest and wildlife conservation (fire fighting) by installing Honeywell/AlliedSignal/Garrett 331 engines and Hartzell propellers in accordance with the latest FAA approved revision of Marsh Aviation Master Drawing List 4-DE1104.</p> <p>Refer to Marsh Aviation Serial Number Eligible Report Number 4-DE1106 dated October 9, 2001, or later FAA Approved revision. A current copy is on file at the Los Angeles Aircraft Certification Office.</p>
Certification Basis	<p>FAR 21.25 (a) (2), FAR 21.101 (a) (b) (c), and FAR Part 25 dated June, 1964, Amendments 25-1 through 25-79.</p> <p>Restricted Category Type Certificate T00009LA issued November 30, 2001 for the special purpose of forest and wildlife conservation (fire fighting). The application for this Restricted Type Certificate is dated July 16, 1997.</p> <p>A Finding of No Significant Impact (FONSI) for the modified Grumman Model S2F-3 aircraft has been accomplished and approved on February 22, 2001.</p> <p>A finding under the applicable provisions of the Noise Control Act of 1972 has been accomplished and approved on February 22, 2001, for the modified Grumman S2F-3 aircraft (Restricted Category – Military Surplus).</p>
Production Basis	<p>None. Prior to original certification of each aircraft an FAA representative must perform a detailed inspection for workmanship, materials, conformity with approved technical data, and a check of flight characteristics in accordance with the Acceptance Test Procedure for Production Flight Test and System Operational Check 80001 dated April 9, 2001 or later FAA approved revision.</p>
Equipment	<p>S-2F3AT</p> <p>Basic required equipment as prescribed in applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification. Aircraft must be equipped with Honeywell/AlliedSignal/Garrett 331-14GR engines, Hartzell HC-B5MA-5 propellers and retardant delivery system installed in accordance with the latest FAA approved revision of Marsh Aviation Master Drawing List Number 4-DE1104 to be eligible for airworthiness certification under Type Certificate T00009LA.</p>
NOTE 1	<p>Current Weight and Balance report containing a list of equipment included in the certified empty weight, and loading instructions, when necessary, must be provided for each aircraft at time of original certification.</p>
NOTE 2	<p>All required placards listed in the FAA approved S-2F3AT Flight Manual Supplement/Pilot Operating Handbook 4-DE6105 dated November 20, 2001, must be installed in the aircraft.</p>

- NOTE 3 The S-2F3AT must be maintained in accordance with NAVAIR 01-85SAD-2 and the latest revision of Marsh Aviation Maintenance Manual Supplement 4-DE6106 which contain the original minimum scheduled maintenance program required for the S-2F3AT to meet the requirements for continued airworthiness.
- NOTE 4 The S-2F3AT shall be operated in accordance with NATOPS Flight Manual 01-855AE-1, plus the FAA approved S-2F3AT Flight Manual Supplement/Pilot Operating Handbook 4-DE6105 dated November 20, 2001.
- NOTE 5 Prior to issuance of airworthiness certificate for each aircraft:
- A. Each aircraft must pass a conformity inspection in accordance with Marsh Aviation Configuration Report 4-DE1108 dated June 21, 2001, or later FAA Approved revision. Marsh Aviation Report 4-DE1109, dated May 9, 2001, identifies the military MWOs accomplished on the aircraft and the MWOs which have been removed. Additionally each aircraft must pass an inspection for any possible hidden damage and the Military Records reviewed for acceptability of any repairs or alterations.
  - B. The maintenance, overhaul, and modification records of each airplane must be reviewed for military changes that may affect the airworthiness of the aircraft
  - C. After the required inspections, the aircraft must be found to be in a good state of preservation, repair, and in a condition for safe operation.
  - D. Compliance must be shown for each airworthiness directives for the aircraft and engine identified in Marsh Aviation Airworthiness Directives and Service Bulletin List 4-DE1109 dated 05/09/01 or later FAA Approved revision.
  - E. At prescribed intervals all inspections and modifications must be accomplished Marsh Aviation Airworthiness Directives and Service Bulletin List 4-DE1109 dated 05/09/01 or later FAA Approved revision.
- NOTE 6 Upon completion of conversion to certified status in Restricted category, an additional data plate, incorporating the S-2F3AT designation which includes a statement that the aircraft has been modified per TC T00009LA, must be installed near the original data plate. Under no circumstances should the original or any succeeding data plate be removed from the aircraft.
- NOTE 7 Restricted category aircraft may not be operated in a foreign country without the express written approval of that country.
- NOTE 8 Aircraft modified in accordance with TC T00009LA have not been shown to meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation.
- NOTE 9 Any alteration to the type design of this aircraft may require Instructions for Continued Airworthiness. These instructions must be submitted and accepted by LB-AEG, Aircraft Evaluation Group Office, prior to approval for return to service.

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