

8103

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

*Number* SA4502NM

*This certificate, issued to* Paul E. Loewen  
4725 Highland Springs Road  
Lakeport, California 95453

*certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 of the Civil Air*

*Regulations.* Effective November 1, 1949, as amended to May 18, 1954, with paragraph

FAR 23.1351(c)(4).

*Original Product — Type Certificate Number:* 2A3  
*Make:* Mooney  
*Model:* M20C, D, E, F, G

*Description of Type Design Change:* Installation of Lycoming IO-360-A1A, -A1B, -A1B6, -A1B6D, -A3B6, or -A3B6D engine and Hartzell HC-C2YK-1B/7666A-2 or HC-C2YR-1B/7666A-2 propeller in accordance with FAA approved Lake Aero Styling and Repair Report No. 127 dated February 12, 1985 or later FAA approved revision.

*Limitations and Conditions:* The approval of this change in the type design applies to the above aircraft model(s) only. This approval should not be extended to aircraft of this model on which other previously approved modifications are incorporated unless it is determined that the interrelationship 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. 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. See Continuation pages 3 through 5 for further Limitations and Conditions.

*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:* February 12, 1985

*Date issued:*

*Date of issuance:* August 29, 1988

*Date amended:* June 30, 1993  
February 20, 1998

*By direction of the Administrator*



*Person*  
(Signature)

Manager, Propulsion Branch  
Los Angeles 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.*

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(Continuation Sheet)

*Number* SA4502NM

Date Issued: August 29, 1988  
Date Amended: June 30, 1993  
Date Amended: February 20, 1998

**LIMITATIONS AND CONDITIONS:** (cont.)

A copy of this Certificate and FAA approved Lake Aero Styling and Repair Report No, 127 dated February 12, 1985 or later FAA approved revisions must be maintained as part of the permanent records for the modified aircraft.

MODELS M20C, D, G (NORMAL CATEGORY)

ENGINE Lycoming IO-360-A1A, -A1B, -A1B6, -A1B6D, -A3B6, or -A3B6D

MODELS M20E, F (NORMAL CATEGORY)

ENGINE Lycoming IO-360-A1B6, -A1B6D, -A3B6, -A3B6D

THE FOLLOWING LIMITATIONS APPLY TO ALL MODELS AND ENGINES LISTED ABOVE

ENGINE LIMITS For all operations: 200 HP at 2700 RPM

PROPELLER Hartzell Constant Speed

Hub Model HC-C2YK-1B or HC-C2YR-1B

Blade model 7666A-2

Diameter Maximum 74.0 inches

Minimum 72.5 inches

No further reductions allowed.

Pitch Low 14.0 Deg  $\pm$  0, High 29.0 Deg.  $\pm$  2.0

Measured at 30 inch station

Spinner Mooney 835-20, -20P, -33, -33P, 1904-3, -3P, or 940087-501

Governor Models M20C, D, G (IO-360-A1A, or -A1B engine)

Hartzell: H-1

McCauley: DC290D5/T24 or DC290D1/T24

Woodward: B210452

Sigma-Tek\*: 34828014

Models M20C, D, E, F, G (IO-360-A1B6, -A3B6 engine)

Hartzell: H-1

McCauley: DC290D5/T24 or DC290D1/T24

Woodward: B210452

Sigma-Tek\*: 34828014

Models M20C, D, E, F, G (IO-360-A1B6D or -A3B6D engine)

McCauley: DC290D5/T17 or DC290D1/T5

Woodward: E210490

Sigma-Tek\*: 34-828-014-11

(\* Sigma-Tek formerly EDO Aire and Garwin.)

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**LIMITATIONS AND CONDITIONS:** (cont.)

FUEL	100LL or 100 minimum grade aviation gasoline.		
OIL CAPACITY	M20C, D, E	2 gals. (-6.5)	
	M20F, G	2 gals. (-11.5)	
COWL FLAPS	Open for takeoff and landing. (Note: Do not open above 150 MPH airspeed)		
ENGINE	Engine Tachometer (RPM)		
INSTRUMENT MARKINGS	Maximum	2700	Red Radial
	Rated Operations	2500-2700	Green Arc - Narrow
	Recommended Operations	2350-2500	Green Arc - Wide
	No Continuous Operation	2000-2350	Red Arc
	(Note: Red arc "Warning" is only applicable to the A1A and A1B engines)		
	Oil Temperature (°F)		
	Maximum	245	Red Radial
	Normal Operating	100-225	Green Arc
	Oil Pressure (PSI)		
	Maximum	100	Red Radial
	Starting	90-100	Yellow Arc
	Normal Operating	60-90	Green Arc
	Idle	25-60	Yellow Arc
	Minimum (Idle)	25	Red Radial
	Metered Fuel Pressure (PSI)		
	Maximum	30	Red Radial
	Operating Range	14-30	Green Arc
	Minimum	14	Red Radial
	Cylinder Head Temperature (°F)		
	Maximum	475	Red Radial
	Operating Range	300-475	Green Arc
	(Note: Well-Type Thermocouple on Number 3 cylinder)		

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**LIMITATIONS AND CONDITIONS:** (cont.)

Noise Compliance For models M20C, D, and G compliance with FAR 36, Appendix F, was shown using the following procedures:  
Submission of Mooney Aircraft Corporation Report No. N-20J-1, dated July 16, 1979. The certificated noise levels are published in the appropriate airplane flight manual supplement.  
For models M20E and F this modification has been determined a no acoustic change per FAR 21.93(b) due to no change in the installed power.

AIRPLANE FLIGHT MANUALS For airplane models M20C, D, and G modified with either Lycoming IO-360-A1A or -A1B engine, FAA Approved Lake Aero Styling & Repair Supplement No M20C/D/G-1, dated August 2, 1988, or later FAA Approved revision, must be used.  
For airplane models M20C, D, E, F, and G modified with either Lycoming IO-360-A1B6, -A3B6, -A1B6D, or -A3B6D engine, FAA Approved Lake Aero Styling & Repair Supplement No M20C/D/E/F/G-2A, dated June 30, 1993, or later FAA Approved revision, must be used.

NOTES Note 1. Current weight and balance report including equipment included in certificated empty weight, and loading instructions when necessary, must be in the aircraft.  
Note 2. The following placards must be installed:  
a) At the RAM AIR Control:  
"RAM AIR" "PUSH ON" "PULL POWER BOOST"  
delete the existing carburetor heat placard.  
b) At power boost warning light:  
"UNFILTERED RAM AIR"  
c) At Fuel Fillers:  
"FUEL - 100LL or 100 MINIMUM GRADE AVIATION GASOLINE"

- END -

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