

AIRPLANE FLIGHT MANUAL

MOONEY MOOE
(Super 21)

MOONEY AIRCRAFT, INC.

Louis Schreiner Field
Kerrville, Texas

Serial No. _____

- Registration No. _____

THIS DOCUMENT MUST BE KEPT IN THE AIRPLANE
AT ALL TIMES.

APPROVED

C. W. Miller
Chief, Engineering & Mfg. Branch
Federal Aviation Agency
Southwest Region

DATE OF APPROVAL

Sept 3, 1963

LOG OF REVISIONS

<u>Letter</u>	<u>Page</u>	<u>Date</u>	<u>Approval</u>
A	2	2-27-64	/s/ J. D. Ludwig
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B	3	7-10-64	/s/ J. D. Ludwig
B	5	7-10-64	/s/ J. D. Ludwig
C	1	4-7-65	/s/ Ralph M. Harmon
D	1	9-22-65	/s/ Ralph M. Harmon
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D	5	9-22-65	/s/ Ralph M. Harmon
E	6	1-31-66	/s/ Ralph M. Harmon

1. LIMITATIONS

The following limitations must be observed in the operation of this airplane.

Engine	Lycoming Model IO-360-A1A
Engine Limits	Limits for all operations - 2700 RPM, 200 HP Initial climb-out at 95 MPH (minimum speed for Cooling and Speed for Best R/C at Sea Level with Gear Up and Flaps in Take-off Position)
Fuel	100/130 Octane Aviation Gasoline, 52 Gal.
Propeller	Hartzell Constant Speed Hub HC-C2YK-1 (1964 Model S/N 101-399, 401-469) Hub CHC-C2YK-1 (1965 Model S/N 400, 470-831) Hub HC-C2YK-1 (1966 Model S/N 832 and on) Blade 7666-2
Cowl Flaps	Pitch Setting at 30 inch station High $29^{\circ} \pm 2^{\circ}$, Low $14^{\circ} \pm 0^{\circ}$ Open for Take-off and Landing (Do Not Open Above 150 MPH)

Power Instruments

Tachometer

Radial Red Line (Rated)	2700 RPM
Green Arc-Narrow (Rated Operating Range)	2500-2700 RPM
Green Arc-Wide (Recommended Operating Range)	2350-2500 RPM
Red Arc -Wide (No continuous operation in this range)	2100-2350 RPM

Cylinder Head Temperature

Radial Red Line (Maximum)	475 Degrees F.
Green Arc (Operating Range)	300 to 450 Degrees F.

Oil Pressure

Radial Red Line (Minimum Idling)	25 PSI
Radial Red Line (Maximum)	100 PSI
Green Arc (Operating Range)	60 to 90 PSI
Yellow Arc (Idling Range)	25 to 60 PSI
Yellow Arc (Starting & Warm-up Range)	90 to 100 PSI

Fuel Pressure

Radial Red Line (Minimum)	14 PSI
Radial Red Line (Maximum)	30 PSI
Green Arc (Operating Range)	14 to 30 PSI

Oil Temperature

Radial Red Line (Maximum)	245 Degrees F.
Green Arc (Operating Range)	100 to 225 Degrees F.

Rev. C, Dated 4-7-65
Rev. D, Dated 9-22-65

Airspeed Limitations

Never Exceed Speed	189 MPH C.A.S.
Maximum Structural Cruising Speed	150 MPH C.A.S.
Maximum Maneuvering Speed	132 MPH C.A.S.
Maximum Gear Operating Speed	120 MPH C.A.S.
Maximum Gear Extended Speed	120 MPH C.A.S.
Maximum Flap Operating Speed	100 MPH C.A.S.

Flight Load Factors

Maximum Positive Load Factors - 3.8
 Maximum Negative Load Factors - 1.5 (No inverted maneuvers approved)

Maximum Weight C.G. Range

Maximum Weight - 2575 Pounds
 Center of Gravity
 Most Forward - 42 Inches (15% MAC) Gear Down, 2100 Pounds
 Forward Gross - 46.5 Inches (22.6% MAC) Gear Down, 2575 Pounds
 Rear Gross - 49.0 Inches (26.8% MAC) Gear Down, 2575 Pounds

Datum - Center Line of Nose Gear Attachment Bolts. (Airplane Sta. 0)
 33 Inches Forward of Wing Leading Edge at Wing Sta. 59.25
 (Inboard Edge of Stall Strip)

Warning: See Weight and Balance Section for Loading Schedule

- Note:
- a. The front seat positions can adversely affect C.G. limitations at most rearward loading. Allowable baggage weight dictated by seat positions.
 - b. It is the responsibility of the airplane owner and the pilot to insure that the airplane is properly loaded.
 - c. No acrobatic maneuvers approved for this aircraft.

Placards

- (1) This airplane must be operated as a normal category airplane in compliance with the operating limitations stated in the form of placards, markings, and manuals. No acrobatic maneuvers, including spins, are approved. Maximum speed landing gear extended, 120 mph. Maximum speed for operation of gear, 120 mph. Maximum maneuvering flight load factor: flaps up +3.8 -1.5; flaps down +2.0.
- (2) (On Storm Window) Do Not Open Above 150 MPH.

Rev. A, Dated 2-27-64

- (3) Load In Accordance With Loading Schedule
Maximum Baggage Limit - 120 Pounds
- (4) In Case of Engine Fire Turn Cabin Heater OFF
- (5) Retract Flaps After Landing
- (6) WARNING: Do Not Exceed 10 Pounds in This Compartment.
See Aircraft Loading Schedule Data for Baggage Compartment Allowable.

Airspeed Instrumentation Markings and their Significance

- (2) Radial Red Line - 189 MPH
(Never Exceed Speed which is the Maximum Safe Airspeed)
- (b) Yellow Arc - 150 to 189 MPH
(Denotes Range of Speeds in which Operations should be Conducted with Caution and Only in Smooth Air)
- (c) Green Arc - 70 to 150 MPH
(Denotes Normal Operating Speed Range)
- (d) White Arc - 63 to 100 MPH
(Denotes Speed Range in which Flaps may be Safely Lowered)

NOTE: Maneuvers involving approach to stalling angle or full application of elevator rudder or aileron should be confined to speeds below maneuvering speed.

Instrument Markings (Except Power Plant)

Vacuum Warning Lights

"High" light	5.0 inches of Hg.
"Low" light	4.25 inches of Hg.

Types of Operation

VFR, IFR, Day and Night Operations.
Do Not Fly in Icing Conditions.

Rev. A, Dated 2-27-64
Rev. B, Dated 7-10-64
Rev. D, Dated 9-22-65

Required Instruments and Equipment

Basic

1. Airspeed Indicator
2. Altimeter
3. Magnetic Dir. Ind. (Mag Compass)
4. Fuel Quantity
5. Oil Pressure
6. Oil Temperature
7. Tachometer
8. Cylinder Head Temperature
9. Fuel Pressure Indicator
10. Master Switch
11. Battery and Generator
12. Fuses or Circuit Breakers
13. Safety Belts

I.F.R. and Night (in addition to above)

14. Position Lights
15. Elec. Landing Light (if used for hire)
- *16. 2 Way Radio Communications & Navigation
Appropriate to Ground Facilities to be Used
17. Gyro Rate of Turn
18. Bank Indicator
19. Sensitive Altimeter (covered by Item 2)
20. Clock with Sweep Second Hand
21. Gyro Horizon
22. Gyro Compass
23. Power Adequacy for Each Gyro Instrument

*Caution should be exercised when conducting approaches and departures under I.F.R. conditions when communications equipment installed interrupts the navigation signal during transmissions.

2. PROCEDURES

Normal Operating Procedures

Pre-FLIGHT

Check Oil (6 Qts. Minimum)
Check Fuel & Secure Filler Caps
Drain Two Wing Tank Drains and Selector Valve Drain
Inspect Airplane for Defects

Starting

Check to Assure Gear is LOCKED
Fasten Seat Belts
Fuel Valve ON (Right or Left Main)
Open Cowl Flaps
Master Switch ON
Filtered Air ON
Mixture in Idle Cut-Off
Auxiliary Fuel Pump ON for Pressure Build Up, Then OFF
Brakes Set
Clear Prop Visually & Verbally
Crack Throttle
Engage Starter & Advance Mixture to Full Rich - Return Magneto Switch to "Both" After Starts

Check Oil Pressure After Engine Starts

Prior to Take-Off

Filtered Air ON
Check Controls for Freedom and Proper Operation
Check Fuel Quantity & Pressure Gauges
Check Instruments - Flight and Engine
Set Trim to Take-off Position
Check Cowl Flaps
Set Wing Flaps to 15°
Turn ON Auxiliary Fuel Pump
Check Magnetos at 1700 RPM for Smooth Operation and Maximum Drop of 125 RPM.
-Exercise the Propeller at 1800-2000 RPM by Pulling the Propeller Control to the "Full-Out" Position. After the Tachometer has shown a Drop-Off of 100 RPM, Push the Propeller Control to the "Full-In" Position.
Prop Control Full Forward
Secure Window & Door
Apply Full Throttle

After Take-off

Gear UP
Initial Climb-out at 95 MPH (minimum Speed for Cooling and Speed for Best R/C at Seat Level with Gear Up and Flaps in Take-Off Position)
Turn OFF Auxiliary Fuel Pump
Unfiltered Ram Air ON
Normal Cruise 2400 RPM and 24" Mainfold Pressure

Climb

Full Rich Mixture

Rev. B, Dated 7/10/64

Rev. D Dated 9/22/65

Cruise

After reaching cruise altitude, mixture may be leaned
Monitor cylinder head temperature
Close Cowl Flaps when cruise speed is attained

Before Landing

Fuel selector to tank with most fuel
Turn ON auxiliary fuel pump
Mixture rich
Filtered air ON
Reduce speed to 120 MPH
Gear DOWN and LOCKED
Prop control full forward
Apply flaps at 100 MPH or less
Trim as necessary

After Landing

Open cowl flaps
Retract flaps after clearing runway
Trim for take-off

Stopping

Reduce RPM to 1000
Mixture full lean (idle cut-off)
Magneto switches OFF (after engine stops)
Master switch OFF

Manually Starting the Engine

In the event it becomes necessary to prop start the engine due to low battery, the following procedure is to be followed:

1. As the engine is "propped", hold the magneto switch in the "start" position, but do not push the magneto switch. This operates the starter vibrator and furnishes retarded spark to the engine.
2. When the engine starts, release the switch to the "both" position.

Operating Instructions - Exhaust Gas Temperature Indicator

This indicator is to be used only as an aid in setting the mixture during cruise at powers up to 75% power, but not take-off, climb, or descent. For lean-out procedures at 75% power or lower, lean to peak temperature, then enrich until temperature drops 25°F minimum.

Circuit Breakers Operation

Trip-free circuit breakers are located on the lower right-hand side of the copilot's instrument panel. Push to reset.