F.A.A. APPROVED

# AIRPLANE FLIGHT MANUAL

## MOONEY M20D

MOONEY AIRCRAFT, INC.
Louis Schreiner Field
Kerrville, Texas

Serial No._____

Registration No. _____

APPROVED _____
for Chief, Engineering & Mfg. Branch
Federal Aviation Agency
Southwest Region

DATE OF APPROVAL _____

MOONEY M20D
FLIGHT MANUAL
Mooney Aircraft, Inc.

## LOG OF REVISIONS

| Revisions | Page | Date | FAA Approval |
|---|---|---|---|
| A | 1 | 11-9-62 | /s/ J.D. Ludwig |
| B | 5 | 4/17/63 | |

# FOREWORD

This Manual has been prepared for the guidance of flight personnel who operate the Mooney M20D. It is hoped that all pilots will read the Manual thoroughly and use it as a ready reference.

It should be pointed out that the limitations in the Manual are mandatory and that the Manual must be kept in the airplane at all times.

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# OPERATING LIMITATIONS

## Power Plant Limitations

Engine - Lycoming Model O-360-A1D
Lycoming Model O-360-A1A
Limit for all Operations - 2700 RPM, 180 HP
No continuous operation in the range of 2000 RPM to 2250 RPM
Maximum Allowable Cylinder Head Temperature - 500 Degrees F.

Fuel - 91/96 Octane Aviation Gasoline, 48 Gal. Usable Capacity;
24 gal. each tank.
Full Rich Mixture required for prolonged M/C power operation at S/L in climb.
Auxiliary Electric Fuel Pump Provided (Use for take-off and landing)

Oil - 8 Quart Capacity
Maximum Allowable Oil Temperature 245 Degrees F.

Propeller - Hartzell

| | |
|---|---|
| Hub | HC-C2YK-1 |
| Blades | 7666-2 |
| Diameter | 74 inches |

Propeller - McCauley

| | |
|---|---|
| Hub | 2D34C53-A |
| Blades | 74E-0 |
| Diameter | 74 inches |

Stall warning indicator is inoperative with master switch off.

## Airspeed Limitations

| | |
|---|---|
| Never Exceed Speed | 189 MPH C.A.S. |
| Maximum Structural Cruising Speed | 147 MPH C.A.S. |
| Maximum Maneuvering Speed | 132 MPH C.A.S. |
| Maximum Flap Operating Speed | 100 MPH C.A.S. |

## Instrument Dial Markings

### Airspeed

Radial Red Line - 189 MPH
(Never Exceed Speed Which is the Maximum Safe Airspeed)
Yellow Arc - 147 MPH to 189 MPH
(Denotes Range of Speeds in Which Operations Should be Conducted with Caution and Only in Smooth Air)
Green Arc - 70 MPH to 147 MPH
(Denotes Normal Operating Speed Range)
White Arc - 61 MPH to 100 MPH
(Denotes Speed Range in Which Flaps May be Safely Lowered)

### Tachometer

| | |
|---|---|
| Radial Red Line (Rated) | 2700 RPM |
| Green Arc - Narrow (Rated Operating Range) | 2300 to 2700 RPM |
| Green Arc - Wide (Recommended Operating Range) | 2300 to 2500 RPM |
| Red Arc - Narrow (No Continuous Operation in this Range) | 2000 to 2250 RPM |

### Cylinder Head Temperature

| | |
|---|---|
| Radial Red Line (Maximum) | 500 Degrees F. |
| Green Arc (Operating Range) | 350 to 500 Degrees F. |

### Oil Pressure

| | |
|---|---|
| Radial Red Line (Minimum) | 60 PSI |
| Radial Red Line (Maximum) | 85 PSI |
| Green Arc (Operating Range) | 60 to 85 PSI |

### Turn & Bank Voltmeter

| | |
|---|---|
| Red Radial Line (Minimum) | 10 volts |
| Green Arc (Operating Range) | 10 to 14 volts |

### Vacuum Warning Lights in Artificial Horizon

| | |
|---|---|
| "High" light | 5.0 inches of Hg. |
| "Low" light | 3.5 inches of Hg. |

Fuel Pressure

| | |
|---|---|
| Radial Red Line (Minimum) | 0.5 PSI |
| Radial Red Line (Maximum) | 6.0 PSI |
| Green Arc-Wide (Desired Range) | 2.5 to 3.5 PSI |
| Green Arc-Narrow (Normal Operating Range) | .5 to 6.0 PSI |

Oil Temperature

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

Flight Load Factors

Maximum Positive Load Factor - 3.8
Maximum Negative Load Factor - No inverted maneuvers approved

Gross Weight and Center of Gravity Limitations

Maximum Weight - 2575 pounds
Center of Gravity
Most Forward - 42 Inches (15% MAC) 2100 Pounds .
Forward Gross - 46.5 Inches (22.6% MAC) 2575 Pounds
Rear Gross - 49.0 Inches (26.8% MAC) 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: The front seat positions can adversely effect C.G. limitations at most rearward loading. Allowable baggage weight dictated by seat positions.

Placards

(1) This Airplane Must Be Operated As A Normal Category Airplane In Compliance With The Approved Airplane Flight Manual. All Acrobatics, Including Spins, Are Prohibited.
(2) (On Storm Window) Do Not Open Above 150 MPH
(3) Load In Accordance With Loading Schedule
Maximum Baggage Limit - 120 Pounds
(4) Cowl Flap-Pull To Open-Do Not Open Above 150 MPH
(5) In Case of Engine Fire Turn Cabin Heater OFF
(6) Pull To Retract Flaps
(7) Retract Flaps After Landing

General

Landings when 90° crosswind component is more than 17 MPH not recommended.

## OPERATING PROCEDURES

### Pre-Flight

Check Oil (6 Qts. Minimum)
Check Fuel & Secure Filler Caps
Drain Gascolator and 3 Quick Drains
Inspect Airplane for Defects

### Starting

Fasten Seat Belts
Fuel Valve ON (Right or Left Main)
Master Switch ON
Mixture Rich
Auxiliary Fuel Pump ON for Pressure Build Up, Then OFF
Brakes Set
Clear Prop Visually & Verbally
Pump Throttle to Prime
Engage Starter-Return Magneto Switch to Both After Start
Check Oil Pressure After Engine Starts
Open Cowl Flaps

### Take-Off

Check Controls for Freedom and Proper Operation
Check Fuel Quantity & Pressure Gauges
Check Instruments
Set Trim to Take-off Position
Check Cowl Flaps
Turn ON Auxiliary Fuel Pump
Check Mags at 1500 RPM
Check Carb. Heat-Return to OFF
Check Governor & Prop Operation at 2200 RPM
Governor Control Full Forward
Secure Window & Door
Apply Full Throttle

### After Take-Off

Initial Climb-out at 91 MPH IAS (Speed For Best Rate of Climb-Decrease Approximately 1 MPH Per 1000 Ft. Altitude)
Turn OFF Auxiliary Fuel Pump
Normal Cruise 2400 RPM and 24" Manifold Pressure
Close Cowl Flaps When Cruise Speed is Attained

### Cruise

After Reaching Cruise Altitude Mixture May Be Leaned
Monitor Cylinder Head Temperature

Before Landing

Fuel Selector to Tank with Most Fuel
Turn ON Auxiliary Fuel Pump
Mixture Rich
Carb. Heat ON (When Needed)
Governor Control Full Forward
Apply Flaps at 100 MPH
Trim As Necessary

After Landing

Open Cowl Flaps
Retract Flaps After Clearing Runway

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 retraded spark to the engine.

2. When the engine starts, release the switch to the "both" position.