

**MOONEY INTERNATIONAL CORPORATION
165 Al Mooney Road
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**FAA APPROVED
AIRPLANE FLIGHT MANUAL SUPPLEMENT
FOR**

**MOONEY M20J, M20K, M20M, M20R, M20S, M20TN, M20U, M20V
WITH
PRECISE FLIGHT, INC.
SPEEDBRAKE 2000 SYSTEM
(WITH CONTROL WHEEL SWITCH OPERATION)**

MODEL NO. _____

REG. NO. _____

SERIAL NO. _____

This supplement must be attached to the Pilots Operating Handbook and FAA Approved Airplane Flight Manual when the Precise Flight SpeedBrake 2000 System is installed in accordance with Mooney Drawing 950286.

The information contained herein supplements or supersedes the information in the basic Pilots Operating Handbook and FAA Approved Airplane Flight Manual only in those areas listed herein. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilots Operating Handbook and FAA Approved Airplane Flight Manual.

FAA APPROVED: _____

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SECTION I – GENERAL

This supplement supplies information necessary for the operation of the airplane when the optional Precise Flight SpeedBrake 2000 System is installed in accordance with Mooney International Corporation Approved data. Refer to SECTION VII of this supplement for detailed description of the SpeedBrake 2000 System



SECTION II – OPERATING LIMITATIONS

AIRSPEED LIMITATIONS Same as the basic airplane
ICING CONDITIONS The use of Speedbrakes are PROHIBITED
..... during flight into known or forecast icing conditions.

PLACARDS REQUIRED:

SPEEDBRAKE

150056-(X)1001(Y) M20J, M20K, M20M, M20R, M20S, M20TN Models
150110-(X)1001(Y) M20U, M20V Models (part of Electroluminescent Panel)

Located on the circuit breaker panel (included on the aircraft C/B panel placard when Speedbrake system is installed).

← SPEED
BRAKE

Located on the Pilot's control wheel yoke – engraved on outside left-hand arm, when Speedbrake system is installed.

Electrically Actuated – DO NOT MANUALLY OPERATE

150056-(X)3019(Y) M20J, M20K, M20M, M20R, M20S, M20TN Models
150110-(X)3019(Y) M20U, M20V Models

On each wing, at each SpeedBrake location, in full view.

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SECTION III – EMERGENCY PROCEDURES

FORCED LANDING AFTER ENGINE FAILURE	Speedbrakes OFF
.....	or as required to modulate glidepath with use of SpeedBrakes.
SPIN RECOVERY	Speedbrakes OFF
DITCHING	Speedbrakes OFF
DISABLED ELEVATOR SYSTEM	Speedbrakes OFF
ELECTRICAL FAILURE	Speedbrakes OFF
.....	PULL Speedbrake Circuit Breaker
SPEEDBRAKE SWITCH FAILURE	PULL Speedbrake Circuit Breaker

-NOTE-

If use of the circuit breaker is required for SpeedBrake retraction, leave the circuit breaker in the PULLED position, and have maintenance personnel inspect system per Precise Flight SpeedBrake 2000 Maintenance procedures.

SECTION IV – NORMAL PROCEDURES

The SpeedBrake system should be functionally checked for proper operation prior to flight. The independent electrical clutches need to be synchronized by SpeedBrake activation before flight and/or after SpeedBrake Circuit Breaker has been Pulled.



BEFORE TAKEOFF: (M20J, M20K, M20M, M20R, M20S, M20TN MODELS)

SPEEDBRAKE SWITCH Depress SpeedBrake Switch ONCE
..... (ON) to extend SpeedBrakes

Verify Annunciator AMBER light/annunciation – ILLUMINATED, both
..... SpeedBrakes extended.

SPEEDBRAKE SWITCH Depress SpeedBrake Switch AGAIN
..... (OFF) to retract SpeedBrakes prior to take-off

Verify Annunciator AMBER light/annunciation – OFF, both
..... SpeedBrakes retracted

BEFORE TAKEOFF: (M20U, M20V MODELS)

SPEEDBRAKE SWITCH Depress SpeedBrake Switch ONCE
..... (ON) to extend SpeedBrakes

Verify G1000 Annunciation WHITE light/annunciation – ILLUMINATED, both
..... SpeedBrakes extended.

SPEEDBRAKE SWITCH Depress SpeedBrake Switch AGAIN
..... (OFF) to retract SpeedBrakes prior to take-off

Verify G1000 Annunciation WHITE light/annunciation – OFF, both
..... SpeedBrakes retracted

DURING TAKEOFF

SPEEDBRAKES RETRACTED during TakeOff roll

-WARNING-

If SpeedBrakes do not fully extend or do not operate simultaneously (extend or retract), place SpeedBrake circuit breaker in the PULLED position, and have maintenance personnel inspect system per Precise Flight SpeedBrake 2000 Maintenance procedures.

EMERGENCY DECENTS

Select 2200 RPM and approximately 22 inches Manifold Pressure.

SpeedBrake switch ON to extend SpeedBrakes.

With Landing Gear Extended:

- Maintain 165 KIAS (M20J [for S/N's 24–3000 thru 24–3078], M20K, M20M, M20R, M20S, M20TN, M20U, M20V).
- Maintain 132 KIAS (M20J [all other S/N's]).

SpeedBrake switch OFF to retract SpeedBrakes (as needed during descent).

FINAL APPROACH

Fly a high base leg and final approach. Extend wing flaps as desired. Depress SpeedBrake switch – ON – to extend the SpeedBrakes.

-NOTE-

The SpeedBrakes may be operated intermittently – as required – to modulate glide path. Maintain an 85 KIAS approach speed by establishing a moderately steep, nose-down attitude.

-NOTE-

Increase the aircraft nose down attitude in anticipation of increased drag as the SpeedBrakes are extended



LANDING

Initiate landing flare at a slightly higher altitude above runway.
Rotate aircraft more rapidly than usual to perform a tail-low touchdown.

-CAUTION-

If the landing rate of sink is excessive, place the SpeedBrake System switch OFF to retract the SpeedBrakes; add power as required to reduce the rate of descent.

BALKED LANDING (Go Around)

Advance throttle; SpeedBrakes – Retracted; Wing flaps – Retracted;
Landing Gear – Retracted.

SECTION V – PERFORMANCE

Inadvertent takeoff with SpeedBrakes extended expect an
..... extended takeoff roll and reduction in rate of
..... climb until SpeedBrakes are retracted
Cruise flight with SpeedBrakes extended expect cruise
..... speed and range to be reduced approximately the
..... same amount as flight with landing gear extended.

In the unlikely event of one SpeedBrake Cartridge extending while the other remains retracted, a maximum of 10% of corrective aileron travel and 5 lbs. of rudder pressure are required for coordinated flight from stall through V_{NE} . Indication of this condition will be noted by the lack of a cockpit annunciator light/annunciation display with the SpeedBrake Switch in the ON mode.

SECTION VI – WEIGHT AND BALANCE

Factory installed optional equipment is included in the licensed weight and balance data of the Pilots Operating Handbook

SECTION VII – SYSTEM DESCRIPTIONS

DESCRIPTION AND OPERATION OF THE PRECISE FLIGHT SPEEDBRAKE 2000 SYSTEM

The Precise Flight SpeedBrake 2000 System is installed to provide expedited descents at low cruise power, glide path control on final approach, airspeed reduction and an aid to the prevention of excessive engine cooling in descent. The SpeedBrakes can be extended at aircraft speeds up to V_{NE} .

-WARNING-

If icing is encountered with the SpeedBrakes extended, retract the SpeedBrakes immediately.

The Series 2000 SpeedBrake System (Optional) consists of a wing mounted, electrically actuated, SpeedBrake Cartridge, left & right side of wing. Each SpeedBrake Cartridge is interconnected electronically by a central logic-switching unit and the yoke mounted SpeedBrake actuator switch. The SpeedBrake Cartridges receive electrical power from the aircraft electrical buss through a disconnect type circuit breaker.

The SpeedBrake push button switch is located on the Pilot's control wheel yoke – outside left-hand arm. The switch is depressed once to fully extend and is depressed again to fully retract the SpeedBrakes. The system features an annunciation legend (Annunciator panel on M20J, M20K, M20M, M20R, M20S, M20TN) or an annunciation (on G1000 screen M20U, M20V) to indicate the status of the SpeedBrake system. Annunciation ON ---- both units extended. Annunciation OFF ---- both units retracted or a possible malfunction exists.

-NOTE-

The failure of either cartridge drive unit to fully extend, will prevent the annunciator legend from illuminating.



SPEEDBRAKE ANNUNCIATOR: (M20J, M20K, M20M, M20R, M20S, M20TN MODELS)

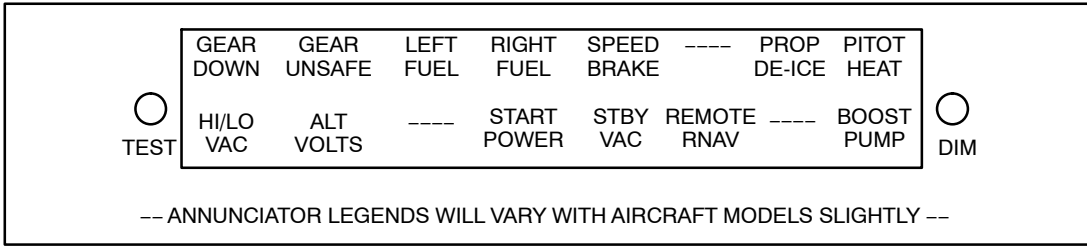


FIGURE 1-1 ANNUNCIATOR PANEL

The Mooney Annunciator Panel is located in the upper, center, right instrument panel (for M20J, M20K, M20M, M20R, M20S, M20TN models). The Annunciator will illuminate after the SpeedBrake switch is depressed ON and both units are in the fully extended position. If the annunciator fails to illuminate and both SpeedBrakes do not extend after the switch is depressed ON, it indicates a failure of one of the SpeedBrake cartridges. The SpeedBrake switch should be depressed OFF. The system may be checked a second time for proper operation, but after the second attempt the SpeedBrake switch should be left OFF. When the SpeedBrake Switch is depressed to the OFF position, the annunciator will extinguish when both SpeedBrakes are fully retracted in the wing.

SPEEDBRAKE G1000 ANNUNCIATION: (M20U, M20V MODELS)



FIGURE 1-2 SPEEDBRAKE G1000 ANNUNCIATION

The Mooney Annunciation is on the G1000 PFD screen see Figure 1-2 (for M20U, M20V models). The Annunciation will illuminate WHITE after the SpeedBrake switch is depressed ON and both units are in the fully extended position. If the annunciation fails to illuminate and both SpeedBrakes do not extend after the switch is depressed ON, it indicates a failure of one of the SpeedBrake cartridges. The SpeedBrake switch should be depressed OFF. The system may be checked a second time for proper operation, but after the second attempt the SpeedBrake switch should be left OFF. When the SpeedBrake Switch is depressed to the OFF position, the annunciation will extinguish when both SpeedBrakes are fully retracted in the wing.

The central - logic unit will disconnect the SpeedBrake clutch power to both SpeedBrake cartridges if one cartridge does not reach full extension. However, the drive motors will continue to operate until the SpeedBrake Switch is depressed OFF. The central - logic unit also disconnects clutch power if SpeedBrakes retract to within 10 degrees of the fully stowed position.



-NOTE-

A SpeedBrake cartridge that operates but does not fully retract flush with the wing surface is an indication of a failed cartridge clutch. Place the Speedbrake circuit breaker in the pulled position and have maintenance personnel inspect the system per Precise Flight SpeedBrake 2000 Maintenance procedures before any subsequent Speedbrake System Operation.

SECTION VIII – HANDLING AND SERVICING

No change.

SECTION IX – SUPPLEMENTAL DATA

Add this supplement to this Section.

SECTION X – SAFETY TIPS

No change.

