

PILOTS OPERATING MANUAL

MURPHY SR 3500 MOOSE (LYCOMING)

This manual is intended as a guide only. Amateur built aircraft vary a great deal in their construction standard, equipment and handling. If you intend to fly any aircraft with which you are unfamiliar ***you must undertake a thorough checkout with a suitably qualified pilot.***

This manual refers specifically to the Murphy SR3500 (MOOSE) with a maximum gross weight of 3500 lbs.

Fixed tailwheel landing gear and powered by the Lycoming 540 series 6 cylinder engine.

All information is given assuming a factory standard Super Rebel with no modifications.

KIT No.



SECTION 1

LIMITATIONS

Maximum gross weight 3500 lbs.

This aircraft is not approved for aerobatics or spins.

ENGINE

LYCOMING 540 series 6 cyl. 250 to 300 H.P.

Refer to Lycoming Operators Manual.

AIRSPEEDS FOR EMERGENCY OPERATION

Engine failure after takeoff.....	75 mph.
Maximum glide.....	75 mph.
Landing without engine power.....	75 mph.
Short final.....full flap.....	65 mph.

OPERATIONAL CHECKLIST

Engine Failure During Takeoff

- a) Throttle.....idle.
- b) Brakes.....apply.
- c) Flaps.....retract.
- d) Mixture.....idle cut off.
- e) Mags.....off.
- f) Master switch.....off.
- g) Door.....unlatch.

Engine Failure Right After Takeoff

- a) Airspeed.....75 mph.
- b) Mixture.....idle cut off.
- c) Fuel valves.....off.
- d) Mags.....off.
- e) Flaps.....as required.
- f) Master.....off.
- g) Door.....unlatch.

Engine Failure During Flight

- a) Airspeed, trim to.....75-80 mph.
- b) Carb heat, alt. air.....on.
- c) Primer (carb engine).....in & locked.
- d) Boost pump.....on.
- e) Electrics.....on.
- f) Left fuel.....on.
- g) Right fuel.....on.
- h) Mixture.....rich.
- i) Restart.....attempt.

FORCED LANDING

Emergency Landing Without Engine Power

- a) Trim.....flaps up 75 mph.
flaps dn 65 mph.
- b) Mixture.....off.
- c) Fuel valves.....off.
- d) Mags.....off.
- e) Flaps.....full.
- f) Master.....off.
- g) Doors.....unlatch.

FIRE

Engine Fire On Start

- a) Continue cranking to suck fire & fuel into engine.
If engine starts, run at 1800 for 1 min. then shut fuel off.
- b) Engine.....shut down inspect for damage.
- c) If engine fails to start continue cranking while shutting off fuel,
Mixture, mags and master.
- d) Obtain fire extinguisher.
- d) Evacuate aircraft.
- e) Extinguish fire.

Engine Fire In Flight

- a) Fuel.....off.
- b) Cabin air/heat.....close.

WHEN ENGINE STOPS

- c) Throttle.....close.
- d) Mags.....off.
- e) Mixture.....off.
- f) Airspeed.....increase to find incombustable mixture.
- g) Forced landing.....execute.

Electrical Fire In Flight

- a) Master.....off.
- b) Cabin air/heat.....close.
- c) Extinguisher.....activate.
- d) Ventilate Cabin

AIRSPEED LIMITATIONS

Arc colour	KTS.	M.P.H.	Operating range
White arc	46-75	53-86	Full flap operating range
Green arc	52-130	60-150	Normal operating range
Yellow arc	130-164	150-189	Operate with caution, only in smooth air
Red line	164	189	NEVER EXCEED

Speed	KTS	M.P.H.	Remarks
Never exceed V_{ne}	164	189	Do not exceed
Max. structural cruising V_{no} or V_c	130	150	Do not exceed except in smooth air.
Manoeuvring V_a	109	125	no full or abrupt control movements above this speed.
Max. flap ext. V_f / V_{fe}	75	86	No full flaps above this speed.

Best angle climb V_x 56-60 65-70 3 notch flap.
Best rate climb V_y 70 80 2 notch flap.
Max cross wind.....16 mph.

CENTRE OF GRAVITY
CONVENTIONAL GEAR

Datum line = Main Wheel Axle

Basic distances : Pilot/ front passenger15"
Rear passenger.....51"
Baggage70"
Fuel 29"

The allowable center of gravity ranges for all Super Rebels and Moose models is from 10.8" to 20.4" aft of the datum line.

Forward limit = 10.8" A.O.D.

Aft limit = 20.4" A.O.D.

To determine empty weight center of gravity:

- 1/ Place aircraft in level flight attitude, with a suitable scale under each wheel.
- 2/ Record weight on each wheel.
- 3/ Measure the distance from main wheel center to tail wheel center, 90° to main axle.

Sample Empty Weight:

Scale position	<u>Wt.lbs.</u>	Arm,inches	<u>Moment</u>
Left main	810	- 1.5"	-1215
Right main	806	- 1.5"	-1209
Tail wheel	74	242"	17908
Totals	1690	9.16"	15484

15484 divided by 1690 = 9.16 inches aft of datum.

THIS IS THE EMPTY WEIGHT CENTER OF GRAVITY

Forward sample loading:

	Wt.lbs	Arm,inches	Moment
Empty Weight	1690	9.16"	15484
Front Seat, pilot	176	15"	2640
Rear seat	0	50"	0
Fuel, 20 gal.	120	29"	3480
Baggage	0	70"	0
Totals	1986	10.88"	21604

Total moment 21604 divided by total weight 1986 = 10.88" aft of datum. This is between the limits of 10.8" and 20.4". The aircraft is at an acceptable weight and balance for flight.

Rear sample loading:

	Wt. Lbs	Arm, inches	Moment
Empty weight	1690	9.16"	15484
Front seats	400	15"	6000
Rear seats	300	50"	15000
Fuel	480	29"	13920
Baggage	130	70"	9100
Totals	3000	19.83"	59504

Total moment 59504 divided by total weight 3000 = 19.83" aft of datum. This is between the limits of 10.8" and 20.4". The aircraft is at an acceptable weight and balance for flight.

GENERAL SPECIFICATIONS

GROSS WEIGHT.....	3500 lbs.
EMPTY WEIGHT.....	1750 lbs.
USEFUL LOAD.....	1750 lbs.
G – LOADING (ultimate).....	+ 5.7 – 3.8
FUEL CAPACITY.....	80 US gal.
WING SPAN.....	36 ft.
WING AREA... ..	182 sq.ft.
WING LOADING.....	16.48 lbs./sq.ft.
LENGTH.....	23 ft.
FUSELAGE WIDTH.....	44"
WIND CORD.....	60"
TAIL SPAN	130"
TAIL CORD.....	33.5"
AIRFOIL.....	modified 4415
FLAP AREA.....	22.5 sq.ft.
FLAP DROOP(degrees)...3 notches.....	14..27..40.
AILERON AREA.....	25.5 sq.ft.
Ailerons aerodynamic and mass balanced	
Simple Flaps	

PERFORMANCE SPECIFICATIONS AT GROSS WEIGHT (3000 lbs)

NOTE: Based on standard temperature 15 C at sea level

ENGINE, Lycoming IO-540-D4A5.....	260 H.P.
POWER LOADING.....	11.54 lbs.hp
TAKE OFF RUN.....	600 ft.
LANDING ROLL.....	600 ft.
RATE OF CLIMB.....	1200 ft. min.
FULL FLAP STALL, power off.....	53 mph.
NO FLAP STALL, power off.....	60 mph.
CRUISE (75% power).....	147 mph.
TOP SPEED.....	155 mph.
FUEL BURN (75% power).....	13.5 US gal/hr.
ENDURANCE.....	6 hrs.
RANGE.....	870 st mi.
FUEL CAPACITY (standard).....	80 US gal.

NORMAL PROCEDURES

PREFLIGHT INSPECTION

COCKPIT

- a) Control locks (if fitted) removed.
- b) Magneto switch OFF keys out.
- c) Master switch ON.
- d) Check strobes, landing light, fuel gauges, nav. lights, and electric trim at neutral (green).
- e) Master Switch **OFF**.
- f) Operate flaps through range. Leave at full flap.
- g) Fuel taps both ON.
- h) First aid kit and fire extinguisher in place.
- i) Req. documents on board.
- j) Record hobbs

FRONT

- a) Cowling secure, intake clear.
- b) Propeller for security and nicks.
- c) Spinner for security and cracks.
- d) Exhaust for security and cracks.
- e) Oil contents 12 qts. Long trip, min 9 qts)
- f) Inspect front sump fuel sample.
- g) Inspect windshield for cracks and security.

LEFT FRONT

- a) Inspect front side panel and lower lift strut area for damage and security.
- b) Inspect landing gear leg for signs of for and aft movement and security.
- c) Inspect brake lines for fraying and leakage.
- d) Inspect brake pads for wear and rotors for security.
- e) Inspect wheels and axle for security.
- f) Inspect tires for proper inflation and wear.

LEFT WING

- A) Inspect left wing leading edge for damage.
- B) Inspect wing tip and lights.
- C) Inspect aileron operation and security.
- D) Inspect flap operation and security.
- E) Inspect upper lift strut for security.
- F) Take and inspect fuel sample from left wing.
- G) Inspect fuel quantity, vent and cap security.
- H) Pitot inlet clear.

LEFT SIDE

- a) Inspect door operation and latch for security.
- b) Inspect window for operation and security.
- c) Baggage securely tied down.
- d) Baggage door secure and locked.
- e) Inspect antennas for security.

TAIL GROUP

- a) Fin and fin fairing secure.
- b) Horizontal stabilizer secure.
- c) Elevator secure.
- d) Elevator hinge bolts and pins secure.
- e) Elevator trim tab secure.
- f) Rudder hinge bolts and pins secure.
- g) Rudder trim secure if applicable.
- h) Rudder horn for freedom of movement and security.
- i) Rudder cables and turnbuckles for safety and security.

TAILWHEEL

- a) Tailwheel stinger for damage and security.
- b) Tailwheel for security and condition.
- c) Tailwheel springs and chains for wear.
- d) Tailwheel swivel for freedom of movement.

RIGHT SIDE

- a) Inspect right side of fuselage.
- b) Inspect window and door for operation and security.
- c) Take and inspect fuel sample from fuselage bottom.
- d) Inspect antennas for security.

RIGHT WING

- a) Take and inspect fuel sample from right wing.
- b) Inspect flap for security and operation.
- c) Inspect aileron for security and operation.
- d) Inspect wing tip and lights.
- e) Inspect leading edge for damage.
- f) Inspect upper lift strut for security.
- g) Check fuel quantity, vent and cap security.

RIGHT FRONT

- a) Inspect front side panel and lower lift strut area for security.
- b) Inspect landing gear leg for signs of for and aft movement.
- c) Inspect brake line for fraying and leakage.
- d) Inspect brake pads for wear and rotors for security.
- e) Inspect wheels and axles for security.
- f) Inspect tires for proper inflation and wear.

BEFORE START

- a) Passengers.....Brief and secure.
- b) Seat and belts..... Adjust & lock.
- c) Loose articles.....Stowed and secured.
- d) Brakes.....Test.
- e) Avionics.....Off.
- f) Fuel.....On.
- g) Flaps.....Up.
- h) Circuit breakers..... In & secure.

START (Lycoming O-540 series)

- a) Carb heat.....close.
- b) Propeller.....full fine.
- c) Fuel.....on.
- d) Mixture.....full rich.
- e) Master.....on.
- f) Boost pump.....on.
- g) Pump throttle to full open and back to idle position 2 or 3 strokes for a cold engine. If engine is equipped with a priming system, cold engine may be primed with 1 to 3 strokes of the priming pump.
- h) Open throttle approx. 1/4 travel.
- i) Controls.....up elevator.
- j) Brakes.....on.
- k) LOOKOUT.....call "CLEAR PROP"
- l) Starter.....engage until engine is started.
- m) Mags.....on both.

OIL PRESSURE WITHIN 30 sec.or SHUT DOWN

AFTER START

- a) R.P.M..... Set 1000.
- b) Oil pressure..... in the green.
- c) Amps, volts..... in the green.
- d) Suction..... 3" to 5"
- e) Heading..... set.
- f) Clock..... set.
- g) Avionics.....on.
- i) Altimeter..... set.
- j) Strobes.....on.

TAXI

- a) Brakes..... check.
- b) Steering..... check.
- c) Heading.....check.

RUN UP

- a) Position..... Into wind & clear all round.
 - b) Brakes on.
 - c) Doors & windows.....closed.
 - e) Flight controls.....up elevator.
 - f) Flight instruments.....check.
 - g) Fuel.....on.
 - h) Boost pump.....off.
 - i) R.P.M..... 1700
- Magnetos check:
LEFT - RIGHT - BOTH
- Max. drop..... 175 rpm.
 - Max. diff. between mags... ..50 rpm.
 - j) Engine instruments.....in the green.
 - k) Prop.....cycle 500 rpm.
 - l) Carb heat.....hot.....max. drop 75rpm.....set cold.
 - n) R.P.M..... Idle 500 - 700..... Reset 1000

PRE-TAKE OFF AND VITAL ACTIONS

- a) Trim..... set for take off.
- b) Throttle..... friction nut set.
- c) Carb heat.....cold.
- d) Fuel..... on & sufficient.
- e) Prop.....full fine.
- f) Flap..... set 1 to 2 notches.
- g) Instruments.....in the green.
- h) Loose articles.....stowed.

- i) Seatbelts..... secure.
- j) Controls..... free & correct.
- k) Transponder.....on.
- l) Lookout.....proceed when clear.

Normal Takeoff

- a) Flaps..... 2 notch.
- b) Throttle.....smoothly to full, 2400 min.
- c) Elevator.....tail lifts at.....40-45 mph.
- d) Slight back pressure to fly off at.....55 mph.
- e) Climb.....80 mph.
- f) Flaps reduce to 1 notch.....500 ft.
- g) Flaps up.....when level or above 120 mph.

Short Field Take Off

- a) Flaps.....3 notch.
 - b) Carb heat.....cold.
 - c) Brakes.....apply.
 - d) Mixture.....rich below 3000 ft.
 - e) Throttle.....full.
 - f) Brakes.....release.
 - g) Elevator.....slightly lift tail.
 - h) Slight back pressure to fly off at.....55 mph.
 - i) Climb, (best angle).....65-70 mph.
- (Flaps up slowly after all obstacles cleared.)

Enroute Climb

- a) Airspeed.....90-100 mph.
- b) Flap.....(up to 120 mph)..... 1 notch.
- c) Throttle.....full.
- d) Mixture.....rich below 3000 ft.

LANDING CHECKS

- a) Mixture..... rich.
- b) Fuel.....on.
- c) Prop.....fine.
- d) Hatches & harness's.....secure.
- e) Brakes.....off.

Airspeed and flaps

- a) Downwind....flaps 1.....85 mph.
- b) Base leg.....flaps 2.....70-75 mph.
- c) Final.....flaps 3.....60-65 mph.

Crosswind technique - Wing low, use aileron to keep wing down, USE BRAKES TO KEEP STRAIGHT.

AFTER LANDING

- a) Carb heat..... Cold.
- b) Flaps..... Up.
- c) Trim..... Neutral (green).
- d) Non essential electrics..... Off.

SHUT DOWN

- a) Brakes..... on.
- b) R.P.M. 1500 for 20 secs.
- c) Radios & electrics..... off.
- d) Mixture.....lean for 10 secs → idle cut off.
- e) Magnetos.....off.
- e) Master Switch.....off.
- f) Control locks.....in place.

NOTES