



FAA Approved - THRUSH

Model S2R-R1340

Airplane Flight Manual

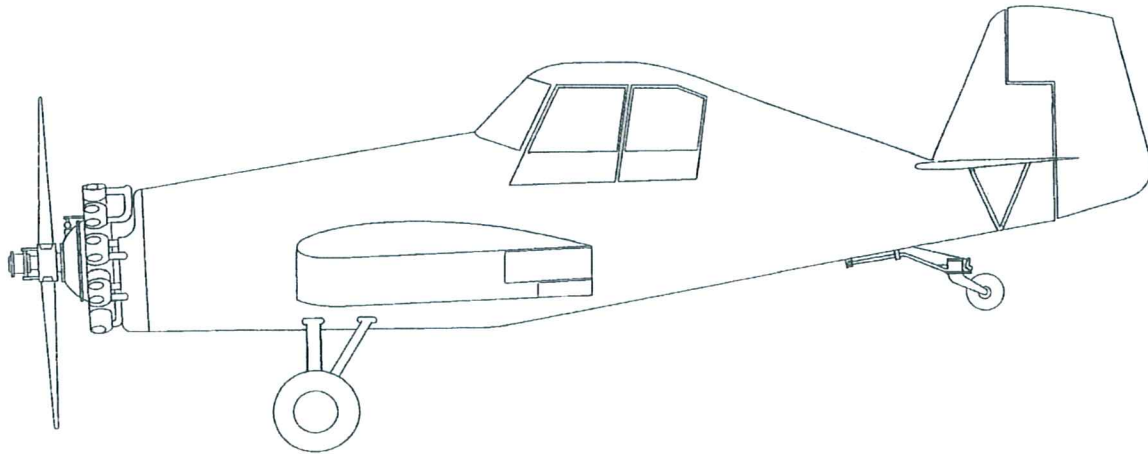
Single and Dual Cockpit

Serial Number R1340-036 and Subsequent

NOTE:

This airplane must be operated in compliance with the operating limits set forth herein.

Restricted Category



FAA Approved: _____

David Crew
for Manager, Federal Aviation Administration
Aircraft Certification Office
Atlanta, Georgia

Date of Approval: NOV 29 2007

Registration Number: _____

Manufacturer's Serial Number: _____

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Model S2R-R1340
AIRPLANE FLIGHT MANUAL

SECTION I ----- LIMITATIONS

SECTION II ----- NORMAL PROCEDURES

SECTION III ----- EMERGENCY PROCEDURES

SECTION IV ----- PERFORMANCE

Model S2R-R1340
AIRPLANE FLIGHT MANUAL

LOG OF PAGES

ONLY THE PAGES LISTED ON THIS PAGE ARE APPLICABLE
TO THE THRUSH AIRCRAFT INC. MODEL S2R-R1340
SERIAL NUMBER R1340-036 & UP; SINGLE OR DUAL COCKPIT

SERIAL NUMBER: S2R-R1340-_____

PAGE	DATE	PAGE	DATE
i	11/29/2007		
ii	11/29/2007		
iii	11/29/2007		
Section I		Section III	
Limitations		Emergency Procedures	
I-1	11/29/2007	III-1	11/29/2007
I-2	11/29/2007	III-2	11/29/2007
I-3	11/29/2007	III-3	11/29/2007
I-4	11/29/2007	III-4	11/29/2007
I-5	11/29/2007	Section IV	
I-6	11/29/2007	Performance	
I-7	11/29/2007	IV-1	11/29/2007
Section II		IV-2	11/29/2007
Normal Procedures		IV-3	11/29/2007
II-1	11/29/2007		
II-2	11/29/2007		
II-3	11/29/2007		
II-4	11/29/2007		
II-5	11/29/2007		
II-6	11/29/2007		
II-7	11/29/2007		
II-8	11/29/2007		
II-9	11/29/2007		
II-10	11/29/2007		

Model S2R-R1340
AIRPLANE FLIGHT MANUAL

LOG OF REVISIONS

Revision Number	Page	Description of Revision	FAA Approved
NC			Nov. 29, 2007

Model S2R-R1340

AIRPLANE FLIGHT MANUAL

SECTION I LIMITATIONS

TABLE OF CONTENTS

Subject	page	Subject	page
POWER PLANT.....	I-1	WEIGHT AND CENTER OF GRAVITY	I-3
INSTRUMENT MARKINGS	I-2	MANEUVERS	I-4
AIRSPPEED LIMITATIONS.....	I-3	TYPES OF OPERATION	I-4
ALTITUDE LIMITATIONS	I-3	REQUIRED EQUIPMENT	I-4
FLIGHT LOAD FACTORS	I-3	PLACARDS	I-4
NOISE ABATEMENT	I-3		

POWERPLANT:

ENGINE:

STANDARD: Pratt & Whitney R1340 AN1
OPTIONAL: Pratt & Whitney R1340 S1H1
 Pratt & Whitney R1340 S3H1

ENGINE OPERATING LIMITATIONS:

POWER LIMITS:

AN-1 or S3H1

CONDITION	HP	RPM	MANIFOLD PRESS. (in Hg)	ALTITUDE (feet)
Takeoff (5 minutes)	600	2250	36.0	Sea Level
Max Continuous	550	2200	34.0	Sea Level
Max Continuous	550	2200	32.5	5,000

S1H1

CONDITION	HP	RPM	MANIFOLD PRESS. (in Hg)	ALTITUDE (feet)
Takeoff (5 minutes)	600	2250	36.5	Sea Level
Max Continuous	550	2200	35.0	Sea Level
Max Continuous	550	2200	33.0	8,000

Model S2R-R1340

AIRPLANE FLIGHT MANUAL

OIL TEMPERATURE:

The maximum oil temperature is 93 °C.

OIL PRESSURE:

The minimum oil pressure is 70 PSI; maximum is 90 PSI

FUEL:

The minimum grade of aviation gasoline is 80/87 octane

Total useable fuel capacity is 133 gallons; 66.5 gallons per wing

PROPELLER:

Hamilton Standard constant speed 12D40 hub with 6101-12 blades:

Maximum diameter is 109 inches and minimum is 107 inches. Pitch settings at 42 inch station are 11.5° low to 27° high. Alternate settings at 42 inch station are 11.5° low to 21.5° high.

Alternate propeller blades are AG100-2 by EAC.

Maximum diameter is 106 inches, with 2% (1.06 inches per blade) cut-off permitted. Pitch settings at 42 inch station are 11.5° low to 20° high.

INSTRUMENT MARKINGS:

	Limits	Features	Meaning
OIL TEMP (°C)	40 40 to 93 93	Red Radial Green Arc Red Radial	MINIMUM NORMAL MAXIMUM
OIL PRESSURE (PSI)	70 70 to 90 90	Red Radial Green Arc Red Radial	MINIMUM NORMAL MAXIMUM
FUEL PRESSURE (PSI)	3 3 to 6 6	Red Radial Green Arc Red Radial	MINIMUM NORMAL MAXIMUM
TACHOMETER (RPM)	1400 – 2200 2200-2250 2250	Green Arc Yellow Arc Red Radial	NORMAL CAUTION MAXIMUM
MANIFOLD PRESSURE (in. Hg): AN1 & S3H1	19 – 33.5 33.5 – 36.0 36.0	Green Arc Yellow Arc Red Radial	NORMAL CAUTION MAXIMUM
MANIFOLD PRESSURE (in. Hg): S1H1	19 – 35.0 35.0 – 36.5 36.5	Green Arc Yellow Arc Red Radial	NORMAL CAUTION MAXIMUM

Model S2R-R1340

AIRPLANE FLIGHT MANUAL

INSTRUMENT MARKINGS (Continued)

	Limits	Features	Meaning
VOLTAGE (volts)	16.0 – 22.5	Red Arc	MINIMUM
	22.5 – 24.0	Yellow Arc	CAUTION
	24.0 – 30.5	Green Arc	NORMAL
	30.5 – 36.0	Red Arc	MAXIMUM
AIRSPEED (CAS)	66 to 123 MPH	White Arc	Flap Operating Range
	70 to 126 MPH	Green Arc	Normal Operating Range
	126 to 159 MPH	Yellow Arc	Caution Range
	159 MPH CAS	Red Radial	Never Exceed

AIRSPEED LIMITATIONS: All airspeeds are given in Calibrated Air Speeds (CAS).

Never Exceed Speed (Vne).....	159 MPH
Maximum Structural Cruising Speed (Vno).....	126 MPH
Maneuvering Speed (Va)	126 MPH
Flap Extended Speed (Vfe).....	123 MPH
Maximum Dump Speed	120 MPH
Maximum Crosswind Velocity	15 MPH

ALTITUDE LIMITATIONS:

Maximum approved altitude is 12,000 feet.

FLIGHT LOAD FACTORS:

- Design Load Factors - Flap Up; 3.5 Positive, 1.9 Negative
- Design Load Factors - Flap Down; 2.4 Positive, 0.0 Negative
- No inverted maneuvers are approved

NOISE ABATEMENT:

This airplane has not been shown to comply with the noise limits in FAR 36 and must be operated in accordance with the noise operating limitation prescribed under FAR §91.815.

WEIGHT AND CENTER OF GRAVITY:

NOTE

Datum is the leading edge of the wing.

Maximum Weight: – 7,860 pounds (Restricted Category),
6,000 pounds (Normal Category).

Center of Gravity:

*FORWARD Limit is 22.5 inches AFT of Datum.

*AFT Limit is 30.0 inches AFT of Datum.

Model S2R-R1340
AIRPLANE FLIGHT MANUAL

NOTE

It is the responsibility of the airplane owner and the pilot to insure that the airplane is properly loaded. See the aircraft's Weight and Balance Sheet for loading information.

MANEUVERS:

RESTRICTED CATEGORY

Restricted category flight maneuvers shall be limited to those normally performed in special purpose operations and approved by the administrator.

TYPES OF OPERATION:

The Model S2R-R1340 aircraft is approved for day or night VMC flight conditions. Flight into known icing conditions is PROHIBITED.

REQUIRED EQUIPMENT:

The following equipment must be installed and operating for flying in day VMC:

1. Airspeed indicator
2. Altimeter
3. Magnetic Direction Indicator (Magnetic Compass)
4. Fuel quantity indicator for each tank
5. Fuel pressure indicator
6. Oil pressure indicator
7. Oil temperature indicator
8. Tachometer
9. Manifold pressure gauge
10. Battery and alternator
11. Battery and alternator switch
12. Circuit breakers or fuses
13. Safety belt and shoulder harness

The following equipment must be installed, in addition to the above items, for night flying:

14. Position Lights
15. Anti-collision Lights

Model S2R-R1340
AIRPLANE FLIGHT MANUAL

PLACARDS:

- A. Located on Right Hand lower instrument panel:

“THIS AIRPLANE MUST BE OPERATED AS A RESTRICTED CATEGORY AIRPLANE IN ACCORDANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS AND THE AIRPLANE FLIGHT MANUAL. NO ACROBATIC MANEUVERS, INCLUDING SPINS, ARE APPROVED. DESIGN MANEUVERING SPEED - 126 MPH. MAX. FLAP-DOWN SPEED - 123 MPH. MAX. CROSSWIND VELOCITY, LANDING - 15 MPH. USABLE TANK CAPACITY 66.5 GALLONS EACH SIDE.”

“THE OPERATION OF THIS AIRPLANE IS LIMITED TO DAY VFR CONDITIONS. FLIGHT INTO KNOWN ICING CONDITIONS IS PROHIBITED.”

“NO SMOKING”

“SULFUR DUSTING IS PROHIBITED UNLESS SPECIAL FIRE PREVENTION MEASURES HAVE BEEN INCORPORATED IN AIRCRAFT.”

“PUSH STICK FORWARD TO UNLOCK TAILWHEEL.”

“TAKING OFF IN VISIBLE MOISTURE BELOW 40°F IS PROHIBITED.”

- B. Located near Park Brake Valves:

“PARK BRAKE – ON, DEPRESS PEDALS AND PULL LEVER. OFF, DEPRESS PEDALS”

- C. Located on Forward Lower Corner of Each Door Side Window:

“DO NOT OPEN DOOR IN FLIGHT”

- D. Located on Throttle Quadrant:

“DO NOT TURN OFF ALTERNATOR IN FLIGHT, EXCEPT IN CASE OF EMERGENCY”

- E. At both fuel filler caps:

“FUEL – 68 GAL. CAP. 80/87 MIN OCTANE AVIATION GASOLINE”

Model S2R-R1340

AIRPLANE FLIGHT MANUAL

- F. Located externally near door

“RESTRICTED”

- G. Located on top of hopper

“HOPPER STRUCTURAL CAPACITY 3336 LBS.”

- H. Located on the fuel gauge:

“USABLE FUEL 66.5 U.S. GAL. EACH WING”

- I. Located in front of the pilot:

“ENGINE OPERATING LIMITS:

TAKEOFF ONLY (5 minutes):

600 HP, 2250 RPM, 36.0 in. Hg MANIFOLD PRESSURE AT SEA LEVEL.

MAXIMUM CONTINUOUS:

550 HP 2200 RPM, 34.0 in. Hg MANIFOLD PRESSURE AT SEA LEVEL

550 HP 2200 RPM, 32.5 in. Hg MANIFOLD PRESSURE AT 5000 FEET

STRAIGHT LINE VARIATION BETWEEN POINTS GIVEN.

80/87 MINIMUM OCTANE AVIATION GASOLINE”

“AVOID CONTINUOUS GROUND OPERATION BETWEEN 1280 AND 1900 RPM.”

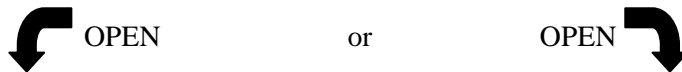
(Dual Cockpit Only)

“SOLO
FRONT SEAT ONLY”

- L. Located on right hand side panel, rear cockpit: (Dual Cockpit Only)

“PASSENGER OR CARGO 200 LBS MAXIMUM”

- M. Located at each door latch:



- N. Located on the Outside of the rear cockpit door: (Dual Cockpit Only)



- O. Located at each door knockout panel:

“PUSH OUT AND LIFT HINGE PIN FOR EMERGENCY EXIT”

- P. Located (inverted) at each door hinge pin:

“PULL HINGE PIN ↓ FOR EMERGENCY EXIT”

Model S2R-R1340
AIRPLANE FLIGHT MANUAL

Q. Located on face of Fuel Shut-off Valve handle bracket:

“FUEL, 133 GAL USEABLE
ON OFF
PUSH BUTTON TO TURN”

R. Located on rear cockpit instrument panel: (Dual Control Only)

“ENGINE OPERATING LIMITS:
TAKEOFF ONLY (5 minutes):
600 HP, 2250 RPM, 36.0 in. Hg MANIFOLD PRESSURE AT SEA LEVEL.
MAXIMUM CONTINUOUS:
550 HP 2200 RPM, 34.0 in. Hg MANIFOLD PRESSURE AT SEA LEVEL
550 HP 2200 RPM, 32.5 in. Hg MANIFOLD PRESSURE AT 5000 FEET
STRAIGHT LINE VARIATION BETWEEN POINTS GIVEN.
80/87 MINIMUM OCTANE AVIATION GASOLINE”

“AVOID CONTINUOUS GROUND OPERATION BETWEEN 1280 AND 1900 RPM.”

S. Located on rear cockpit instrument panel in front of pilot: (Dual Control Only)

“SOLO
FRONT SEAT ONLY”

Model S2R-R1340

AIRPLANE FLIGHT MANUAL

SECTION II

NORMAL PROCEDURES

TABLE OF CONTENTS

Subject	page	Subject	page
DEFINITIONS.....	II-1	TAKE-OFF.....	II-8
VISUAL INSPECTION.....	II-1	CLIMB	II-9
BEFORE STARTING ENGINE.....	II-5	GLIDE AND APPROACH	II-9
STARTING ENGINE.....	II-6	GO AROUND	II-9
WARM UP and GROUND CHECK	II-6	LANDING.....	II-9
BEFORE TAXI.....	II-8	AFTER CLEARING THE RUNWAY.....	II-9
TAXI.....	II-8	ENGINE SHUTDOWN	II-10
BEFORE TAKE-OFF.....	II-8	SECURING THE AIRCRAFT.....	II-10

DEFINITIONS:

WARNING

Personal injury or loss of life could result if the operating procedures and techniques are not followed carefully.

CAUTION

Damage to equipment could result if the operating procedures and techniques are not followed carefully.

NOTE

This is used when it is essential to emphasize an operating procedure or technique.

Airspeeds

All airspeeds in this Section are Indicated Airspeeds (IAS) in Miles per Hour (MPH), unless otherwise noted.

VISUAL INSPECTION:

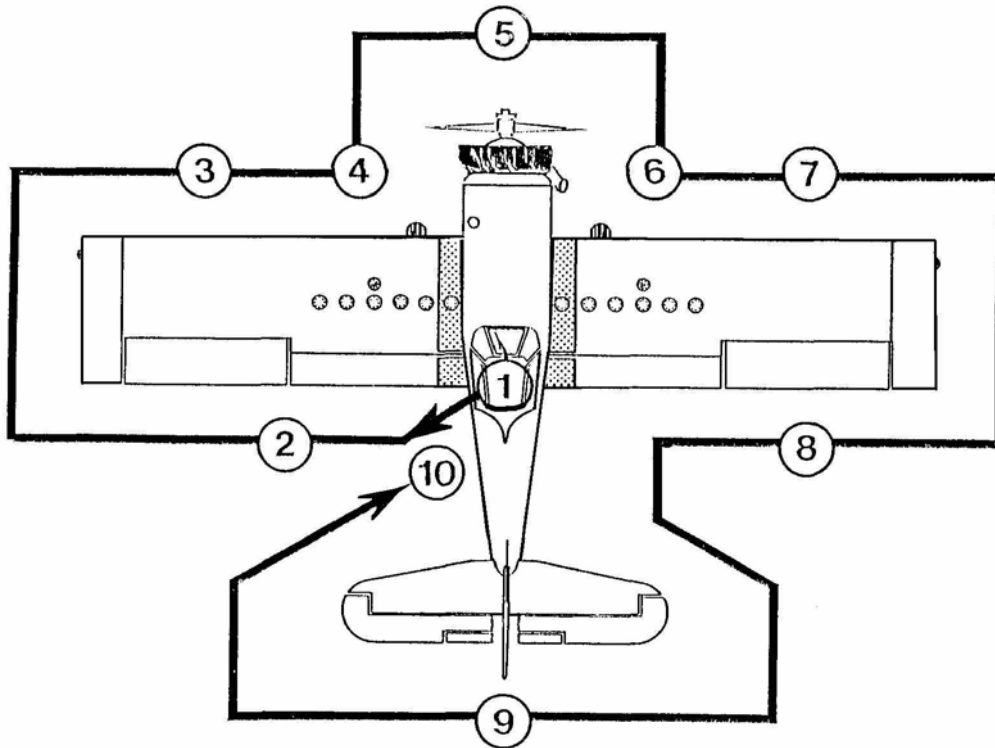
NOTE

Visually check the aircraft for general condition during the walk around inspection. Verify that all skin panel Camlocs are fastened. In cold weather remove all accumulations of frost, ice, or snow from wing, tail and control surfaces. Check that control surfaces contain no internal accumulations of ice. If a night flight is planned, check operation of all lights and assure a flashlight is available.

Model S2R-R1340

AIRPLANE FLIGHT MANUAL

EXTERIOR INSPECTION ROUTE



Exterior Inspection Route - Figure II-1

(POSITION)

①

1. Internal Control Lock – REMOVE
2. Magneto Switch - OFF
3. Throttle – CLOSED
4. Mixture – IDLE CUTOFF
5. Fuel Valve – ON
6. Parking Brake – TEST and SET
7. Battery Switch – ON
8. Fuel Quantity – CHECK Each Tank Indication
9. Battery Switch – OFF
10. Elevator Trim Tab – SET, for takeoff (T.O. Arc)
11. Oil Quantity – CHECK dipstick and SECURE cap

Model S2R-R1340
AIRPLANE FLIGHT MANUAL

NOTE

**Do not operate with less than 5 gallons of oil.
Fill to 10 gallons for extended flights.**

②

12. Wing Flap – CHECK, for security
13. Spray Boom (if installed) – CHECK, for leaks and security
14. Aileron Gust Lock (if installed) - REMOVE
15. Aileron – CHECK, for free and correct movement
16. Aileron hinges – CHECK, for looseness. Use a brisk UP and DOWN motion but use caution so as not to damage control or stops.
17. Wing Tip – CHECK, for damage

③

18. Wing Leading Edge – CHECK, for damage

NOTE

Keep the wing leading edge clean. An excessive build-up of dirt, bugs, and chemicals can have the same negative effect on lift as an accumulation of ice or frost.

19. Wing Tie Down – REMOVE.
20. Stall Vane – CHECK, condition and freedom of movement.

④

21. Fuel Quantity – CHECK, visually and secure cap.
22. Main Wheel Tire – CHECK, for inflation, damage, and wear.
23. Fuel Tank Sump – DRAIN.
24. Gascolator – DRAIN
25. Header Tank Sump – DRAIN.
26. Left fuel Vent Sump – DRAIN.
27. Fuel Vent – CHECK for obstruction.
28. Oil Cooler – CHECK, for leaks and stoppage.
29. Accessory Section – CHECK, for debris, oil leaks, fuel leaks or any other irregularities (open hinged door in accessory cowling).

Model S2R-R1340
AIRPLANE FLIGHT MANUAL

30. Air Filters – CHECK, for cleanliness and condition.
31. Dispersal Equipment (if installed) – CHECK, the windmill, the pump, the hose, the spreader, the mounting, and so forth.

⑤

32. Engine – CHECK, for oil leaks, fuel leaks, loose fittings, cracked exhaust stacks, and excessive dirt or corrosion.
33. Propeller – CHECK, for blade damage or oil leaks.
34. Propeller – PULL THROUGH, by hand at least 2 complete revolutions (4 blades) with the ignition switch off, in order to prevent oil pooled in the lower cylinders from causing hydraulic lock.

⑥

35. Wheel Chocks – REMOVE
36. Main Wheel Tire – CHECK, for inflation, damage, and wear.
37. Fuel Tank Sump – DRAIN.
38. Right Fuel Vent Sump – DRAIN.
39. Battery Vent – CHECK for obstruction.
40. Fuel Quantity – CHECK, visually and secure the cap.

⑦

41. Wing Leading Edge – CHECK, for damage.

NOTE

Keep the wing leading edge clean. An excessive build-up of dirt, bugs, and chemicals can have the same negative effect on lift as an accumulation of ice or frost.

42. Pitot Mast – CHECK, for blockage of opening.
43. Wing Tie Down – REMOVE.
44. Wing Tip – CHECK, for damage.

⑧

45. Aileron – CHECK, for free and correct movement.
46. Aileron Hinges – CHECK, for looseness. Use a brisk UP and DOWN motion but use caution so as not to damage control or stops.
47. Spray Boom (if installed) – CHECK, for leaks and security.

Model S2R-R1340
AIRPLANE FLIGHT MANUAL

48. Wing Flap – CHECK, for security.
49. Static Port Opening – CHECK for blockage.
50. Rudder Gust Lock (if installed) – REMOVE.

⑨

51. Empennage – CHECK, for condition
52. Struts – CHECK, for condition and security.

53. Tail Wheel Tire – CHECK, for inflation, damage, and wear.
54. Tail Wheel Spring – CHECK, for condition.
55. Tail Wheel Assembly – CHECK, for condition.
56. Rudder and Elevator – CHECK, for freedom of movement and security.
57. Elevator Trim Tabs – CHECK, for near neutral position (take-off) and excessive play
58. Tail Tie-Down – REMOVE.

⑩

59. Static Port Opening – CHECK, for blockage
60. Rear Cockpit – CHECK, cargo secure (Dual Cockpit Only)
61. Rear Cockpit Door – CHECK, closed and secure (Dual Cockpit Only)

BEFORE STARTING ENGINE:

1. Visual Inspection – COMPLETE
2. Seat – ADJUST
3. Rudder Pedals – ADJUST and LOCK

NOTE

Adjust the seat and rudder pedals to a comfortable position. Check to ensure that the seat and pedal mechanisms are secure.

4. Seat Belt and Shoulder harness – ADJUST and LOCK
5. Inertial Reel – CHECK automatic locking by giving the shoulder harness a quick jerk.
6. Altimeter – SET barometric pressure
7. Door Latches – CHECK
8. Parking Brake – CHECK and set
9. Magneto Switch - OFF

10. Rear Cockpit Occupant – STRAPPED IN and ready (Dual Cockpit Only)

STARTING ENGINE:

1. Propeller – PULL THROUGH two revolutions, if not already done.
2. Fuel Valve – ON
3. Mixture Control – FULL RICH
4. Propeller Control – FULL INCREASE.
5. Carburetor Heat – OFF
6. Throttle – IDLE
7. Battery and Magneto Switches – ON
8. Aux. Fuel. Pump Switch – ON
9. Fuel Inlet pressure Indicator – CHECK, 3 psig Minimum
10. Advance Throttle – FULL OPEN, then back to idle.
11. Primer – ON Momentarily, 3 to 7 times.
12. Propeller – CLEAR Area
13. Magneto Switch - BOTH:
14. Starter – PRESS. When engine fires, release starter
15. Primer – ON as needed (1 to 3 times)
16. Throttle – SET to 600 RPM
17. Oil Pressure – CHECK



If no oil pressure is indicated within 15 to 20 seconds, STOP the engine and investigate.

18. Aux. Fuel Pump - OFF

WARM UP and GROUND CHECK:

Engine warm up is done at 800 to 1000 RPM. The following tests must be made with a minimum oil inlet temperature of at least 40 °C

1. Power – CHECK

Model S2R-R1340
AIRPLANE FLIGHT MANUAL

NOTE

Open the throttle until the manifold pressure is equal to the field barometric pressure (field barometric pressure should be read from the manifold pressure gauge before starting). The RPM will be approximately 2000 RPM. Variations in the altitude of different airfields will not change the RPM obtained from opening the throttle to the manifold pressure equal to equal to the field barometric pressure. If this check RPM cannot be obtained by this procedure then the engine is not delivering the correct power, or the propeller is not set properly. An investigation should be made to determine the cause.

2. Magnetos – CHECK as follows
 - a. Switch the ignition from Both to Right and then back to Both.
 - b. Switch the ignition from Both to Left and then back to Both
 - c. Maximum Magneto Drop is 100 RPM
 - d. Maximum Difference between Left and Right drops is 40 RPM
 - e. Normal Magneto Drop is 50 to 75 RPM.
3. Temperatures – CHECK to ensure that the engine oil temperature is between 40 °C and 93 °C.
4. Oil Pressure – CHECK for 70 psi minimum at 2000 RPM
5. Fuel Pressure – CHECK for 5 ± 1 psi at 2000 RPM
6. Propeller Governor Check – AS FOLLOWS
 - a. Set engine power to 1900 RPM
 - b. Move the propeller control to LOW RPM (Aft)
 - c. A substantial drop in RPM indicates satisfactory operation
7. Carburetor Heat Check – AS FOLLOWS
 - a. Set engine power to 1900 RPM
 - b. Place Carburetor Heat Full ON Position
 - c. A noticeable momentary drop in RPM indicates satisfactory operation.
8. Ammeter Check – AS FOLLOWS
 - a. Set engine power to 1900 RPM
 - b. Check Ammeter for definite indication of charging
 - c. If there is no definite indication of charging, STOP the engine and investigate
9. Carburetor Idling Mixture Strength Check
 - a. Set engine power to 450-600 RPM
 - b. While observing the tachometer, slowly move the mixture control toward the lean position
 - c. Return the mixture control to the full RICH position before the engine dies

Model S2R-R1340
AIRPLANE FLIGHT MANUAL

NOTE

If a momentary rise of no more than 20 RPM is observed before normal drop-off, the mixture strength is correct. If a greater rise in RPM is noted, the mixture is too rich. If no rise in RPM is noted or an immediate drop-off in RPM occurs, the mixture is too lean.

BEFORE TAXI

Engine Instruments:

- a. Check the oil temperature is 40 °C minimum
- b. Check that the oil pressure is 70 psi min.

TAXI

Push the control stick full forward to unlock the tail wheel. With the tail wheel unlocked, steering is accomplished with the brakes.

BEFORE TAKE-OFF:

1. Flight Controls – FREE and full travel
2. Elevator Tab – VERIFY set for take-off
3. Flaps – AS REQUIRED

NOTE

Depending on the load and the airfield conditions, flap extension for take-off should be limited to 15 degrees or less. The flaps should not be used as a turning aid.

4. Propeller Control – FULL INCREASE
5. Carburetor Heat – OFF
6. Aux. Fuel Pump – ON
7. Mixture Control – FULL RICH

TAKE-OFF:

1. Throttle – ADVANCE smoothly and do not exceed the engine operating limitations (See Section II)
2. Brakes – RELEASE
3. After breaking ground, allow airspeed to build up to best-rate-of-climb speed of 85 MPH before starting to climb

CLIMB:

1. Establish the Best-Rate-of-Climb speed (85 MPH)
2. Reduce power to maximum continuous power setting or lower
3. Flaps – RETRACT
4. Aux. Fuel Pump – OFF

GLIDE AND APPROACH:

1. Propeller Control – FULL INCREASE
2. Carburetor Heat – PULL ON
3. Mixture Control – FULL RICH
4. Aux. Fuel Pump – ON
5. Flaps – AS REQUIRED
6. Rear Seat Occupant – CONFIRM ready (Dual Cockpit Only)

GO AROUND:

1. Power – INCREASE to the take-off setting.
2. Carburetor Heat - OFF
3. Flaps – RETRACT slowly to 0° while maintaining altitude.
4. Airspeed – MAINTAIN best-rate-of-climb speed (85 MPH)

LANDING:

1. Airspeed on Final – 130% of Power-Off stall speed (depends on aircraft weight)
2. Wing Flaps – FULL Extended (15°)
3. Touchdown – MAIN Wheels.
4. Landing Roll - LOWER Tail Smoothly and Close the throttle.

NOTE

Care should be taken not to unlock the tail-wheel prematurely. A crosswind or the initiation of a turn could cause loss of control.

5. Brakes – MINIMUM Required

AFTER CLEARING THE RUNWAY:

1. Wing Flaps – RETRACT.
2. Carburetor Heat. – OFF.
3. Aux. Fuel Pump – OFF.

ENGINE SHUTDOWN:

1. Parking Brake – SET.

NOTE

Idle the engine for a minimum of one minute to cool the engine and stabilize temperature

2. Throttle – 1500 RPM Momentarily to clean plugs off prior to shutdown then return to idle position
3. Propeller Control – LOW RPM
4. Mixture Control – FULL LEAN
5. Throttle – Open slowly and continue opening the throttle slowly to full open position after the engine starts to cut off.
6. Magnetos – OFF after the propeller stops turning
7. Battery and Alternator Switches – OFF
8. Fuel Selector - OFF

SECURING THE AIRCRAFT:

1. Parking Brake – RELEASE and INSTALL the wheel chocks.
2. Control Stick Lock – ENGAGE.
3. Aileron and Rudder gust locks- INSTALLED AND SECURE.
4. Tie Downs - SECURE

SECTION III

EMERGENCY PROCEDURES

TABLE OF CONTENTS

<u>Subject</u>	<u>page</u>	<u>Subject</u>	<u>page</u>
ENGINE FIRE IN FLIGHT -----	III-1	SPINS-----	III-3
ELECTRICAL FIRE IN FLIGHT-----	III-1	FORCED LANDING-----	III-3
ROUGH ENGINE or LOSS of POWER -----	III-2	ELECTRICAL SYSTEM FAILURE-----	III-4
CARBURETOR ICING PROCEDURES -----	III-2	EMERGENCY EGRESS -----	III-4

NOTE

All airspeeds in this section are indicated airspeeds (IAS) in MPH.

ENGINE FIRE IN FLIGHT:

1. Throttle – CLOSED
2. Mixture – CUT OFF.
3. Fuel Selector Valve – OFF.
4. Cabin Ventilation Controls – CLOSED
5. Wing Flaps – EXTEND as necessary

NOTE

If the fire is not extinguished, try to increase the airflow over the engine by increasing the glide speed. Plan a forced landing as described in this section. DO NOT attempt an engine start.

ELECTRICAL FIRE IN FLIGHT:

1. Battery and Alternator Switches – OFF.
2. All other Electrical Switches – OFF.
3. Cabin Ventilation Controls – CLOSED
4. Circuit Breakers – CHECK to identify faulty circuit, if possible.

If electrical power is essential for the flight, try to identify and isolate the faulty circuit by doing the following:

1. Battery and Alternator Switches – ON.
2. If the Alternator Switch is defective, or if it causes battery discharge, MOVE the Alternator Switch to the OFF position and then MOVE the Battery Switch to the ON position. Let a short period of time elapse before activating additional circuits. If a switch causes arcing, short circuit or fire, turn OFF

ROUGH ENGINE or LOSS OF POWER:

The following checks should be carried out immediately, if time and altitude permit, after noting any condition that could lead to an engine failure (loss of oil pressure, loss of fuel pressure, or rough engine operation).

1. Fuel Selector Valve – CHECK ON
2. Low Fuel Pressure – Electric Fuel Pump ON. If there is no improvement, turn OFF.
3. Mixture Control – FULL RICH
4. Carburetor Heat – ON
5. Magneto Switch - BOTH

CARBURETOR ICE PROCEDURES:

Icing Conditions

1. Visible freezing or sub-freezing moisture forms ice on the air scoop and in and on the carburetor, on the metering elements or throttle valve
2. Under certain conditions of high humidity and at carburetor inlet air temperatures as high as 90 °F, ice can form in the carburetor and between the fuel discharge nozzle and the engine impeller. This is due to the refrigerating effect of the fuel and air mixture in this part of the induction system. Be alert for this type of icing, as it can occur at relatively high temperatures and in sultry atmospheric conditions which are not generally associated with ice formation.
3. Carburetor ice is particularly apt to occur during part throttle operation.

Icing Indications

1. Manifold pressure falling with a constant throttle and RPM settings, and rising manifold pressure after the application of carburetor heat.
2. Throttle jamming in one position.
3. At low or idle power settings, a loss of power and airspeed, with or without a loss of manifold pressure.

Icing Prevention

1. Monitor the manifold pressure at cruise power setting or greater. If a drop in manifold pressure is noted, apply full carburetor heat.
2. At low or idle power settings, use full carburetor heat when icing conditions are suspected. Move the throttle frequently and note the engine response.

De-icing Procedures

1. Apply FULL CARBURETOR HEAT, and leave it on for 30 seconds.
2. Check repeatedly to see if the manifold pressure is restored by slowly returning the carburetor heat control toward OFF. If the rise in manifold pressure from full hot to full cold is consistent over several cycles from hot to cold and back, the ice is gone.

Model S2R-R1340
AIRPLANE FLIGHT MANUAL

CAUTION

If heavy icing has occurred, the loss in power will be accompanied by a loss of carburetor heat capacity, and full carburetor heat may be required for longer periods. The effectiveness of carburetor heat in eliminating the ice may be sharply reduced due to the reduction of exhaust gas temperature at low power.

3. For low or idle power operation, apply full carburetor heat as in ice prevention BEFORE retarding the throttle. Return carburetor heat control to the full cold position AFTER applying cruise power or greater.

SPINS:

INTENTIONAL SPINS ARE NOT APPROVED. In the event of an inadvertent spin, the following recovery technique should be used:

1. Throttle – RETARD to idle
2. Rudder – FULL rudder in the OPPOSITE direction of the spin
3. Control Stick – FORWARD of neutral in a brisk motion as the rotation stops
4. Rudder – NEUTRAL as you pull out of the dive
5. Flaps – RETRACT if they have been extended

FORCED LANDING:

If the engine fails, accomplish the following procedures as time and altitude permit:

1. Hopper Load – JETTISON as required
2. Airspeed – MAINTAIN 80 to 90 MPH with flaps retracted
3. Attempt to re-start the engine. If this fails, prepare for a forced landing as follows:
 - a. Seat Belt & Shoulder Harness – CHECK secure
 - b. Magneto Switch – OFF
 - c. Wing Flaps – EXTEND to full down
 - d. Airspeed – 75 to 85 MPH.
 - e. Electrical Switches – ALL OFF prior to landing, unless landing lights are needed

NOTE

Land in a three-point attitude and use heavy braking during the roll-out.

ELECTRICAL SYSTEM FAILURE:

Excessive Charge

After periods of heavy electrical usage, such as prolonged cold weather starts or extended periods of taxiing, the battery charge level will have dropped low enough to accept higher than normal charge rates during the initial part of the flight. However, after a reasonable length of time (30 to 60 minutes) the ammeter indication should decrease steadily to a point less than two needle-widths on the charge side of zero and the voltmeter should indicate approximately 28 volts. If the charging rate remains above this value for an extended period of time, there is a possibility that the battery may overheat and evaporate electrolyte at an excessive rate. To preclude the possibility of an overcharging condition affecting the battery, the Alternator Switch should be turned OFF and the flight terminated. Reduce electrical load to an essential minimum if an immediate landing is impractical.

Insufficient Charge

A continuous discharge rate (noted on the ammeter during flight) generally indicates an alternator circuit malfunction and the Alternator Switch should be turned OFF. With the Alternator Switch OFF, the entire accessory load is placed on the battery, and all nonessential electrical equipment should be turned off to reduce the discharge rate on the battery.

EMERGENCY EGRESS:

1. Rear Occupant – COMMUNICATE intentions (Dual Cockpit Only)

If it is necessary to remove the cockpit door from its hinges, do the following:

2. KNOCK OUT the oval panel below the window.
3. REACH through the hole and PULL the flexible hinge pin in and down until it disengages from the door hinges.
4. PUSH the door clear of the aircraft and EXIT.

Model S2R-R1340

AIRPLANE FLIGHT MANUAL

SECTION IV

PERFORMANCE

TABLE OF CONTENTS

<u>SUBJECT</u>	<u>PAGE</u>
INTRODUCTION	IV-1
PERFORMANCE DEFINITIONS	IV-1
POWER OFF STALL SPEEDS	IV-1
SPEEDS FOR BEST-RATE-OF-CLIMB	IV-2
AIR SPEED CALIBRATION	IV-2
FIGURE IV-1	IV-3
MISCELLANEOUS	IV-3

INTRODUCTION:

The information in this section is presented in compliance with the appropriate performance criteria and certification requirements of CAR Part 3.

PERFORMANCE DEFINITIONS:

Airspeed Terminology

The air speed terminology is presented below in what is called Normal Air Speed Sequence. This sequence begins with the air speed actually seen by the pilot and progresses through several airspeeds which can be derived from the air speed indicator and other information. All air speed values presented in terms of indicated air speed assume a zero instrument error.

1. Indicated Air Speed (IAS) is the number actually read from the airspeed indicator, assuming no instrument error.
2. Calibrated Air Speed (CAS) is the indicated air speed reading corrected for errors in the aircraft's pitot-static system (position error).

POWER OFF STALL SPEEDS:

The variation of power-off stall speeds with bank angle, flight configuration and airplane weight is shown below for the flaps up and flaps 15 degrees configurations.

ASSOCIATED CONDITIONS

Power - OFF

Configuration	Clean	T.O. / Landing
Wing Flaps	0 degrees	15 degrees
Dispersal Equipment	None	None

- Stall Entry Rate - Uniformly Decreasing
- Gross Weight - 6000 pounds

Model S2R-R1340

AIRPLANE FLIGHT MANUAL

NOTE

If there is knowledge of mechanical error in the air speed indicator instrument, one should apply that error to the Indicated Airspeed BEFORE using Figure IV-1.

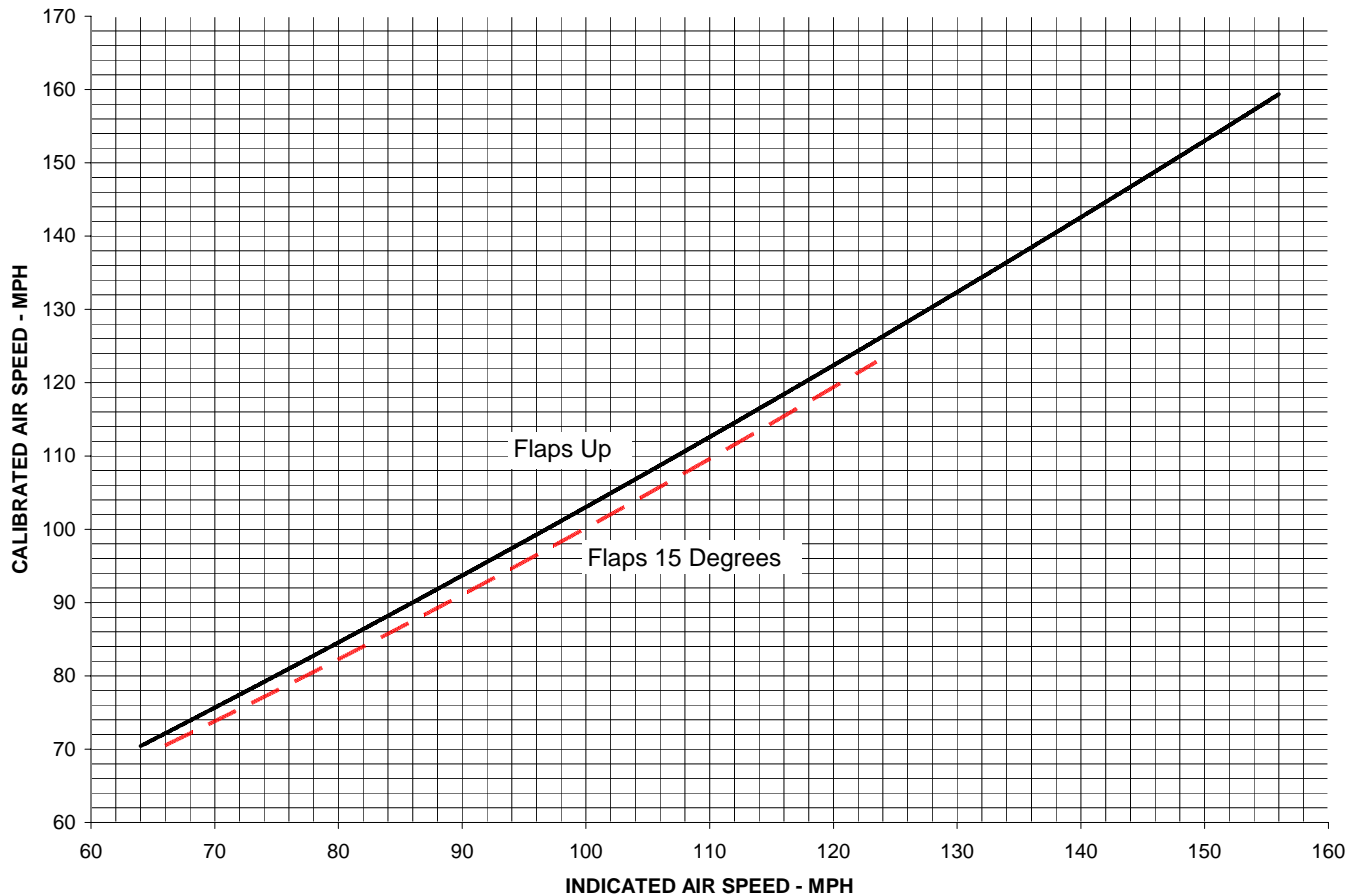


Figure IV-1

MISCELLANEOUS:

USABLE FUEL

The amount of usable fuel in each tank is 66.5 U.S. gallons, for an aircraft total of 133 gallons usable.

ALTITUDE LOSS DURING STALL RECOVERY

The maximum altitude lost in wings level stall recovery is 400 feet at 6000# gross weight.