

**AVIAT AIRCRAFT INC.**

**AIRPLANE FLIGHT MANUAL**

**MODEL PITTS S-2SP AIRPLANE**



SECTION 1  
GENERAL

**Preliminary!**

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## OVERALL DIMENSIONS

Wing Span:	20 ft. (6.1m)
Length:	17 ft 9 in (5.5m)
Height:	6 ft 5 in (1.9m)

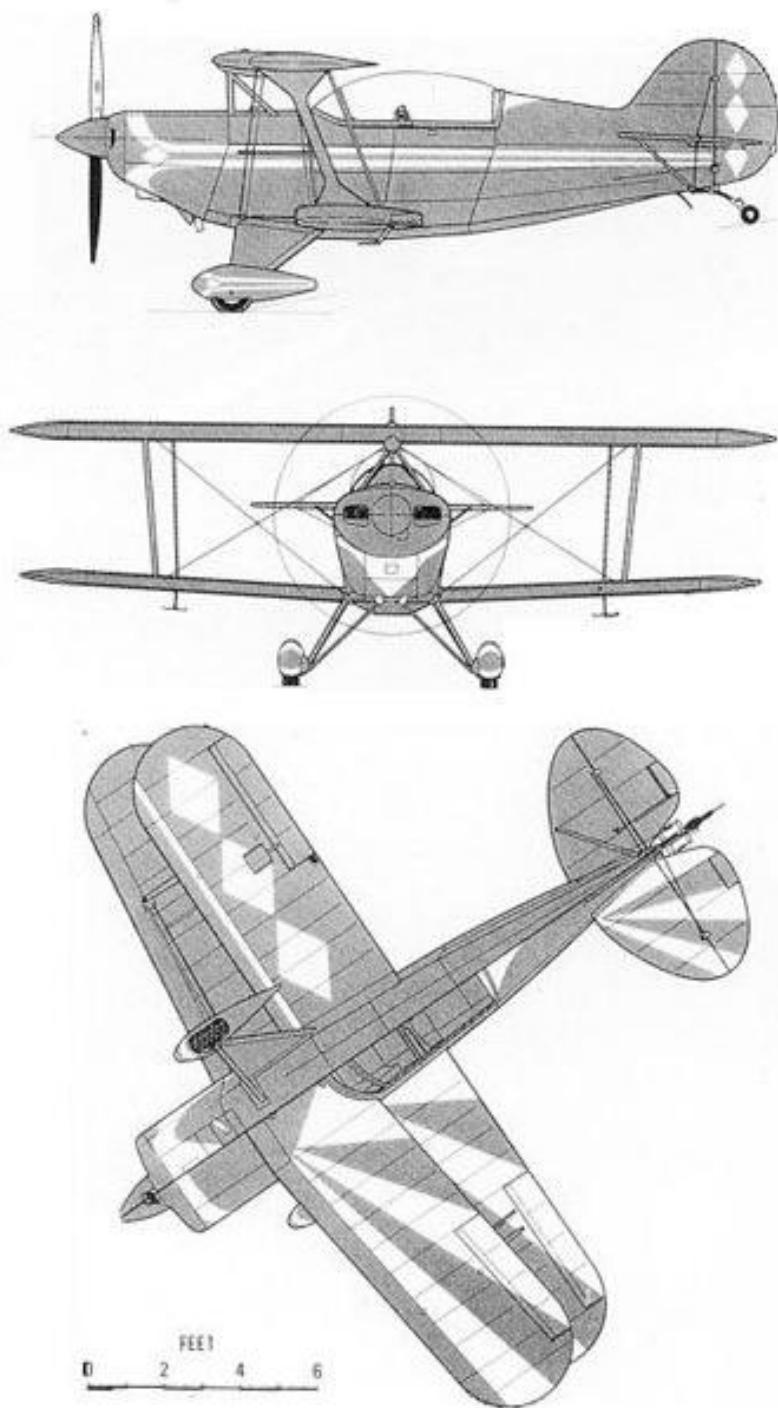


Figure 1-1 Three View

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## INTRODUCTION

This Airplane Flight Manual contains 10 4 Sections, and includes the material required to be furnished to the pilot by FAR Part 23. It also contains supplemental data supplied by Aviat Aircraft Inc.

Section 1 provides basic data and information of general interest. It also contains definitions or explanations of symbols, abbreviations, and terminology commonly used.

## DESCRIPTIVE DATA

### ENGINE

Number of Engines:	1
Engine Manufacturer:	Textron Lycoming
Engine Model Number:	AEIO-540-EXP
Engine Type:	Normally aspirated, Direct-drive, air- Cooled, horizontally- opposed, fuel injected, aerobatic with inverted oil, six-cylinder engine with 588 cu. in displacement.
Horsepower Rating & Engine Speed:	310HP @ 2800RPM

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## PROPELLERS

### Standard

Manufacturer:	Hartzell
Model Number:	HC-C3YR-4AX
Number of Blades:	3 Composite
Diameter	Maximum
	Minimum
Propeller Pitch settings:	80 inches (2.03 m)
	78 inches (1.98 m)
High:	32° to 34°
Low:	11° + or - .1° @ 30 inch station.
Propeller Type:	Constant speed, Hydraulically actuated, Counter balanced with Hartzell governor, Approved for aerobatic flight.

### Optional

Optional propeller installed in new aircraft at Aviat Aircraft per TC, also for retrofit when installed in accordance with serialized Aviat Aircraft Kit.

Manufacturer:	MT-Propeller
Model Number:	MTV-9-B-C/C190-18a
Number of Blades:	3 Composite
Diameter	Maximum
	Minimum
Propeller Pitch settings:	75 inches (190 cm)
	75 inches (190 cm)
High:	30° + or - 1°
Low:	13° + or - .2° @ 26.18 in (6.5 cm) station.
Propeller Type:	Constant speed and Hydraulically actuated.

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## FUEL

### Approved Fuel Grades (and Colors):

100 (Formerly 100/130) Grade Aviation Fuel (Green)  
100LL Grade Aviation Fuel (Blue)

### Fuel Capacity

#### Standard Tanks Normal Flight:

Total Capacity:	35 US gal (132.5 L)
Total Capacity	
main:	20 US gal (75.7L)
wing:	15 US gal (56.8 L)
Total Useable:	34 US gal (128.7 L)
	During normal flight conditions.

#### Standard Tanks Aerobatic Flight:

Total Capacity:	20 US gal (75.7 L)
Total Capacity	
main:	20 US gal (75.7L)
wing:	0 US gal (0.0 L)
Total Useable:	19 US gal (71.9 L)

## WARNING NOTE

**Do not perform low altitude aerobatics with less than  $\frac{1}{4}$  tank of fuel in the main tank. Wing tank is for ferry use only.**

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## MAXIMUM CERTIFIED WEIGHTS

Takeoff

Normal Category: 1325 lbs (601.7 kg)

Aerobatic Category: 1250 lbs (567.0 kg)

Landing:

1325 lbs (601.7 kg)

Baggage Compartment:

20 lbs (9.01 kg)

## WARNING NOTE

The maximum weight capacity for baggage area is 20 lbs (9.01 kg).

NO AEROBATIC MANEUVERS WITH BAGGAGE.

## STANDARD AIRPLANE WEIGHTS

Standard Empty Weight: 950 lbs (430.9 kg)

Maximum Useful Load

Normal Category: 375 lbs (215.5 kg)

Aerobatics: 300 lbs (136.1 kg)

## SPECIFIC LOADINGS

Wing Loading

Normal: 13.6 lb./sp.ft.

Aerobatic: 13 lb./sp.ft.

Power Loading

Normal: 6.5 lb./hp

Aerobatic: 6.25 lb./hp

## SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

### GENERAL AIRSPEED TERMINOLOGY AND SYMBOLS

KTCAS	<b>Knots Calibrated Airspeed</b> is indicated airspeed corrected for position and instrument error and expressed in knots. Knots calibrated airspeed is equal to KTAS in standard atmosphere at sea level.
KTIAS	<b>Knots Indicated Airspeed</b> is the speed shown on the airspeed indicator and expressed in knots.
KTAS	<b>Knots True Airspeed</b> is the airspeed expressed in knots relative to undisturbed air which is KTCAS corrected for altitude and temperature.
MPHCAS	<b>MPH Calibrated Airspeed</b> is indicated airspeed corrected for position and instrument error and expressed in mph. MPH calibrated airspeed is equal to MPHAS in standard atmosphere at sea level.
MPIIAS	<b>MPH Indicated Airspeed</b> is the speed shown on the airspeed indicator and expressed in knots.
MPHTAS	<b>MPH True Airspeed</b> is the airspeed expressed in mph relative to undisturbed air which is MPHCAS corrected for altitude and temperature.
$V_A$	<b>Maneuvering Speed</b> is the maximum speed at which you may use abrupt control travel.
$V_{NO}$	<b>Maximum Structural Cruising Speed</b> is the speed that should not be exceeded except in smooth air, then only with caution.
$V_{NE}$	<b>Never Exceed Speed</b> is the speed limit that may not be exceeded at any time.
$V_s$	<b>Stalling Speed</b> is the minimum steady flight speed at which the airplane is controllable.
$V_x$	<b>Best Angle-of-Climb Speed</b> is the speed which results in the greatest gain of altitude in a given horizontal distance.
$V_y$	<b>Best Rate-of-Climb Speed</b> is the speed which results in the greatest gain in altitude in a given time.

## GENERAL AIRSPEED TERMINOLOGY AND SYMBOLS

OAT	<b>Outside Air Temperature</b> is the free air static temperature. It is expressed in either degrees Celsius (formerly Centigrade) or degrees Fahrenheit.
Standard Temperature	<b>Standard Temperature</b> is 59° F (15°C) at sea level pressure altitude and decreases by 3.6° F (2°C) for each 1000 feet of altitude.
Pressure Altitude	<b>Pressure Altitude</b> is the altitude read from the altimeter when the altimeter's barometric scale has been set to 29.92 inches of mercury (1013 mb).

## ENGINE POWER TERMINOLOGY

BHP	<b>Brake Horsepower</b> is the power developed by the engine.
RPM	<b>Revolutions Per Minute</b> is engine speed.
MP	<b>Manifold Pressure</b> is a pressure measured in the engine induction system and is expressed in inches of mercury (Hg).

## AIRPLANE PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

Demonstrated Crosswind Velocity	<b>Demonstrated Crosswind Velocity</b> is the velocity of the crosswind component for which adequate control of the airplane during takeoff and landing was demonstrated during certification tests. The value shown is not considered to be limiting.
Usable Fuel	<b>Usable Fuel</b> is the fuel available for flight planning.
Unusable Fuel	<b>Unusable Fuel</b> is the quantity of fuel that cannot safely used in flight.
GPH	<b>Gallons per Hour</b> is the amount of fuel (in gallons) consumed per hour.
NMPG	<b>Nautical Miles Per Gallon</b> is the distance (in nautical miles) which can be expected per gallon of fuel consumed at a specific engine power setting and/or flight configuration.
SMPG	<b>Statute Mile Per Gallon</b> is the distance (in statute miles) which can be expected per gallon of fuel consumed at a specific engine power setting and/or flight configuration.
g	g is acceleration due to gravity.

## WEIGHT AND BALANCE TERMINOLOGY

Reference Datum	<b>Demonstrated</b> is an imaginary vertical plane from which all horizontal distances are measured for balance purposes.
Station	<b>Station</b> is a location along the airplane fuselage given in terms of the distance from the reference datum.
Arm	<b>Arm</b> is the horizontal distance from the reference datum to the center of gravity (C.G.) of an item.
Moment	<b>Moment</b> is the product of the weight of an item multiplied by its arm.
Center of Gravity	<b>Center of Gravity</b> is the point at which an airplane, or equivalent, would balance if suspended. It's distance from the reference datum is found by dividing the total moment by the total weight of the airplane.
C.G. Arm	<b>Center of Gravity Arm</b> is the arm obtained by adding the airplane's individual moments and dividing the sum by the total weight.
C.G. Limits	<b>Center of Gravity Limits</b> are the extreme center of gravity locations within which the airplane must be operated at a given weight.
Standard Empty Weight	<b>Standard Empty Weight</b> is the weight of a standard airplane including unusable fuel, full operating fluids and full engine oil.
Basic Empty Weight	<b>Basic Empty Weight</b> is the standard empty weight plus the weight of optional equipment.
Useful Load	<b>Useful Load</b> is the difference between ramp weight and the basic empty weight.
Maximum Ramp Weight	<b>Maximum Ramp Weight</b> is the maximum weight approved for ground maneuver. (It includes the weight of start, taxi and run up fuel.)
Gross (Loaded) Weight	<b>Gross (Loaded) Weight</b> is the loaded weight of the airplane.
Maximum Takeoff Weight	<b>Maximum Takeoff Weight</b> is the maximum weight approved for the start of the takeoff run.
Maximum Landing Weight	<b>Maximum Landing Weight</b> is the maximum weight approved for the landing touchdown.
Tare	<b>Tare</b> is the weight of chocks, blocks, stands, etc. used when weighing an airplane, and is included in the scale readings. Tare is deducted from the scale reading to obtain the actual (net) airplane weight.

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## CONVERSIONS

Miles Per Hour	X	0.8690	=	Knots
Nautical Miles	X	1.852	=	Kilometers
Feet	X	0.305	=	Meters
Inches	X	0.0254	=	Meters
Inches	X	2.54	=	Centimeters
Inches	X	25.4	=	Millimeters
Feet/Minute	X	0.00508	=	Meter/sec
Gallons (US)	X	3.785	=	Liters
Gallons (Imp)	X	4.546	=	Liters
Quarts (US)	X	0.946	=	Liters
Knots	X	1.852	=	km/h
PSI	X	0.0689	=	Bar
In.Hg	X	33.86	=	Mbar
lb	X	0.453	=	Kg
(°F-32)	X	5/9	=	°C
Knots	X	1.1508	=	MPH
Kilometers	X	0.539	=	Nautical mile
Meters	X	3.281	=	Feet
Meters	X	39.37	=	Inches
Centimeters	X	3.937	=	Inches
Millimeters	X	0.03937	=	Inches
Meter/sec	X	197	=	Feet/minute
Liters	X	0.264	=	Gallons (US)
Liters	X	0.220	=	Gallons (Imp)
Liters	X	1.057	=	Quarts (US)
Km/h	X	0.539	=	Knots
Bar	X	14.51	=	PSI
Mbar	X	0.02953	=	In.Hg
Kg	X	2.205	=	lb
°C	X	9/5+32	=	°F

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## INTRODUCTION

Section 2 includes operating limitations, instrument markings, and basic placards necessary for safe operation of the airplane, its engine, standard systems and standard equipment. The limitations included in this section have been approved by the Federal Aviation Administration. When applicable, limitations associated with optional systems or equipment will be included in Section 9.

### Note

The airspeeds listed in the Airspeed Limitation chart and the Airspeed Indicator Markings chart are based on Airspeed Calibration data shown in Section 5 with the normal static source, with the exception of the bottom of the green arc on the airspeed indicator. If the alternate static source is being used, ample airspeed margins should be observed to allow for the airspeed calibration variations between the normal and alternate static sources shown in Section 5.\*

\* Note from the author: Section 5 will not be covered!

Your Pitts is certified under FAA Type Certificate # A8S0 as Pitts Model S-2SP.

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## **FUEL LIMITATIONS**

### **Standard Tanks**

#### **Main Tank**

Total Fuel:	20 US gal (75.7 L)
Usable Fuel:	19 US gal (71.9 L)
Unusable Fuel:	1 US gal (3.7L)

#### **Auxiliary Tank**

Total Fuel:	15 US gal (56.8 L)
Usable Fuel:	15 US gal (56.8 L)
Unusable Fuel:	0 US gallons level flight only (Normal Category)
Unusable Fuel:	15 US gallons level flight only (Aerobatic Category)

### **Note**

The auxiliary tank is usable for cross country flight ONLY. Before draining auxiliary tank into main tank, burn enough fuel in main tank to hold auxiliary fuel or fuel will be transferred overboard.

### **WARNING**

**DO NOT PERFORM LOW ALTITUDE AEROBATICS WITH  
LESS THAN  $\frac{1}{4}$  TANK OF FUEL IN MAIN TANK.**

Approved Fuel Grades (and Colors):

- 100LL Grade Aviation Fuel (Blue)
- 100 (Formerly 100/130) Grade Aviation Fuel (Green)

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## **PLACARDS**

The following information is displayed in the form of composite or individual placards.

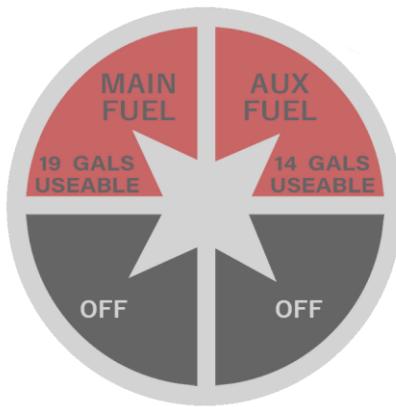
1. In the view of the pilot on the left hand side of the cockpit fairing:

THIS AIRPLANE MUST BE OPERATED AS A NORMAL OR AN ACROBATIC CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS. All markings and placards on this airplane apply to its operation as an acrobatic category airplane. For normal category operations refer to the approved Airplane Flight Manual. **OPERATIONS LIMITED TO DAY VFR CONDITIONS. FLIGHT INTO KNOWN ICING CONDITIONS PROHIBITED.**

**APPROVED MANEUVERS AND RECOMMENDED ENTRY SPEEDS:**

MANEUVER	INSIDE		OUTSIDE	
	MAX.	MIN.	MAX.	MIN.
LOOP, (UP)	180	130	180	130
LOOP, (DOWN)	100	70	100	70
SLOW ROLL	180	100	180	100
BARREL ROLL	180	130	180	130
SNAP ROLL	140	90	110	90
HAMMERHEAD	180	130	180	130
LAZY EIGHT	180	140	180	140
CHANDELLE	180	140	180	140
STALLS AND SPINS	(SLOW DECELERATION)			

2. At the fuel selector handle:



3. Adjacent to airspeed indicator:

**DESIGN MANEUVER SPEED: 170 KTS**  
**DEMONSTRATED CROSSWIND VELOCITY 20 MPH**

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4. Adjacent to mixture control:

**PULL FOR  
LEAN  
MIXTURE.**

5. Adjacent to engine alternate air control;

**PULL FOR  
ALTERNATE  
AIR.**

6. Adjacent to elevator trim control:

**NOSE UP  
NOSE DOWN**

7. Throttle quadrant:

**THROTTLE**

8. Adjacent to appropriate switches:

ARM	OFF	REFILL	
SMOKE SYSTEM		AVIONIQUE	
MASTER SWITCH	ALT. FIELD SWITCH	BOOST PUMP SWITCH	<b>OFF</b> BST. PMP. ALT FLD
ON	ON	ON	

9. Adjacent to appropriate circuit breakers:

**BST. PMP.  
ALT FLD**

10. On instrument panel:

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11. Adjacent to propeller governor control:

**PROP  
PUSH  
HIGH  
R.P.M.**

12. Adjacent to cowl flap control:

**COWL  
FLAP  
PULL  
OPEN**

13. In view of pilot on cockpit fairing:

**FOR FLAT SPINS USE AILERON  
WITH THE SPIN FOR RECOVERY**

14. In view of pilot on cockpit panel:

**NO ACROBATIC MANEUVERS [ INCLUDING SPINS ] ARE  
APPROVED FOR NORMAL CATEGORY OPERATIONS.**

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## AIRSPEED LIMITATIONS

Airspeed Limitations and their operational significance are shown in Figure 2-1.

	SPEED	MPH CAS	KTS CAS	REMARKS
$V_{NE}$	Never Exceed	218	190	Do not exceed in any operation.
$V_{NO}$	Normal operation	172	150	Do not exceed except in smooth air.
$V_A$	Maneuvering	172	150	Do not make full or abrupt control movements above this speed.

Figure 2-1 Airspeed Limitations

## AIRSPEED INDICATOR MARKINGS

Airspeed Indicator markings and their color code significance are shown in Figure 2-2.

MARKING	AIRSPEED RANGE	SIGNIFICANCE
GREEN ARC	40 TO 172 MPH 46 TO 150 KTS	Normal operating range. Lower limit is maximum weight VS at most forward C.G.. Upper limit is maximum structural cruising speed.
YELLOW ARC	172 TO 218 MPH 150 TO 90 KTS	Operations must be conducted with caution and only in smooth air.
RED LINE	219 MPH 191 KTS	Maximum speed for all operations.

Figure 2-2 Airspeed Indicator Markings

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## **POWER PLANT LIMITATIONS**

Engine Manufacturer:	Textron Lycoming
Engine Model Number:	AEIO-540-EXP
Engine Operating Limits for takeoff and continuous operations:	
Maximum Power:	315 BHP
Maximum Engine Speed:	3000 RPM
Maximum Cylinder Head Temperature:	500°F (260°C)
Maximum Oil Temperature:	245°F (118°C)
Oil Pressure:	
Minimum:	25 PSI (1.7 bar)
Maximum:	100 PSI (6.89 bar)

### **Standard Propeller**

Manufacturer:	Hartzell
Model Number:	HC-C3YR-4AX
Number of Blades:	3 Composite
Diameter	
Maximum	80 inches (2.03 m)
Minimum	78 inches (1.98 m)
Propeller Blade Angle at 30 in (76.2cm) Station	
High:	32° to 34°
Low:	11° + or - .1° @ 30 inch station.

### **Optional Propeller**

Optional propeller installed in new aircraft at Aviat Aircraft per TC, also for retrofit when installed in accordance with serialized Aviat Aircraft Kit.

Manufacturer:	MT-Propeller
Model Number:	MTV-9-B-C/C190-18a
Number of Blades:	3 Composite
Diameter	
Maximum	75 inches (190 cm)
Minimum	75 inches (190 cm)
Propeller Blade Angle at 26.18 in (6.5 cm) station	
High:	30° + or - 1°
Low:	13° + or - .2°

## Note

For European operations only, in the interest of noise abatement or where local noise ordinances may apply the following RPM limitations should be followed:

“2700 RPM max takeoff for five minutes followed by a reduction to 2500 RPM, for continuous cruise power”.

## WARNING

**It is the responsibility of the pilot to check on performance differences in Section 5 of this manual when the optional propeller is installed. \***

\* Note from the author: Section 5 will not be covered!

## POWER PLANT INSTRUMENT MARKINGS

Power plant instrument markings and their color code significance are shown in Figure 2-3.

INSTRUMENT	RED LINE MIN. LIMIT	GREEN ARC NORMAL OPERATING	YELLOW ARC CAUTION RANGE	RED LINE MAX. LIMIT
TACHOMETER		500 – 3000 RPM		3000 RPM
OIL TEMPERATURE		100°F (38°C) 245°F (118°C)		245°F (118°C)
CYLINDER HEAD				500°F (260°C)
FUEL PRESSURE		0-9 PSI (0-.62 bar)		9 PSI (.62 bar)
OIL PRESSURE	25 PSI	60 – 90 PSI	25 – 60 PSI 90 – 100 PSI	100 PSI

Figure 2-3 Power Plant Instrument Markings

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## **WEIGHT LIMITS**

Maximum Takeoff Weight:	1325 lbs (601.0 kg)(Normal Category)
Maximum Landing Weight:	1325 lbs (601.0 kg)(Normal Category)
Maximum Gross Weight:	1325 lbs (601.0 kg)(Normal Category)
	1250 lbs (567.0 kg)(Aerobatic Category)
Maximum Weight in Baggage Compartment:	20 lbs (9.01 kg)

## **WARNING**

**NO AEROBATIC MANEUVERS WITH BAGGAGE.**

## **CENTER OF GRAVITY LIMITS**

### **Center of Gravity Range**

Normal category	
Forward:	FS 86.35 at 1125 lbs. or less, with straight line variation to FS 88.5 at 1325 lbs.
Aft:	FS 90.20 at 1325 lbs. or less

<b>Aerobic category</b>	
Forward:	FS 86.35 at 1125 lbs. or less, with straight line variation to FS 88.5 at 1250 lbs.
Aft:	FS 90.20 at 1250 lbs. or less

## **MANEUVER LIMITS**

This airplane is certified in the normal category and the aerobatic category. The normal category is applicable to aircraft intended for non-aerobatic operations.

These include any maneuvers incidental to normal flying, stalls, lazy eights, chandelles, and steep turns in which the angle of bank is not more than 60°. The aerobatic category is applicable to aircraft intended for aerobatic operations. These include all maneuvers listed on the approved maneuvers and recommended entry speeds placard and listed in this flight manual.

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## FLIGHT LOAD FACTOR LIMITS

Normal Category

Positive +3.8 G., Negative -1.52 G.

Aerobic Category

Positive +6.0 G., Negative -3.0 G.

## KINDS OF OPERATIONS

This airplane must be operated as a DAY VFR airplane. FAR Part 91 establishes the minimum required instrumentation and equipment for these operations. The reference to types of flight operations on the operation limitations placard reflects equipment installed at the time of Airworthiness Certificated issuance.

Flight into known icing conditions is prohibited. In cold weather operation and freezing temperatures it is the pilot's duty to make sure that the engine alternate breather is open.

## KINDS OF OPERATION EQUIPMENT (KOEL)

		VFR DAY
<b>Electrical Power</b>		
1.	Battery	1
2.	Alternator	1
3.	Ammeter	1
<b>Fire Protection</b>		
1.	Firewall Fuel Shutoff Valve	1
<b>Flight Controls</b>		
1.	Trim Tab Indicator (Elevator)	1
2.	Stall Warn Horn	1
<b>Fuel</b>		
1.	Fuel Quantity Indicator	1
2.	Electric Fuel Boost Pump	1
3.	Engine Fuel Flow Gauge	1
4.	Upper Wing Fuel Tank Valve	1
<b>Ice and Rain Protection</b>		
1.	Alternate Static Air Source	1

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<b>Navigation</b>		
1.	Sensitive Altimeter	1
2.	Airspeed Indicator	1
3.	Magnetic Compass	1
<b>Instruments</b>		
1.	“G” Meter (Aerobatic flight only)	0
<b>Engine Indicating</b>		
1.	Tachometer	1
2.	Manifold Pressure Gauge	1
3.	Cylinder Head Temperature Gauge (CHT)	1
<b>Engine Oil</b>		
1.	Oil Pressure Indicator	1
2.	Oil Temperature Indicator	1

1. A zero (0) used in the above list means that the equipment and/or system was not required for type certification for that kind of operation.
2. The above equipment list is predicated on a crew of one pilot.
3. Equipment and/or systems in addition to those listed above may be required by the operating regulations.
4. The above list does not include all specific instruments, communications and navigations equipment required by FAR Parts 91 and 135.

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### Operational Checklists

#### Engine Failures

- Engine Failure During Takeoff Run
- Engine Failure Immediately After Takeoff
- Engine Failure During Flight

#### Forced Landings

- Emergency Landing Without Engine Power
- Precautionary Landing With Engine Power
- Ditching

#### Fires

- During Start On Ground
- Engine Fire In Flight

#### Inadvertent Icing Encounter

#### ELT Operation

#### Amplified Procedures

- Engine Failure
- Forced Landing
- Landing without Elevator Control
- Fires
- Emergency Operations in Clouds
- Flight in Icing Conditions
- Static Source Blocked
- Spins

#### Rough Engine Operation or Loss of Power

- Icing
- Low Oil Pressure

#### ELT Operation

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**EMERGENCY OPERATIONS**

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PITTS S-2SP**

**Revised by Ensi Ferrum**

## INTRODUCTION

Section 3 provides checklist and amplified procedures for coping with emergencies that may occur. Emergencies caused by airplane or engine malfunctions are extremely rare if proper preflight inspections and maintenance are practiced. En route weather emergencies can be minimized or eliminated by careful flight planning and good judgement when unexpected weather is encountered. However, should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem. Emergency procedures associated with ELT and other optional systems can be found in Section 9.

### SPEEDS FOR NORMAL OPERATIONS

Engine Failure After Takeoff:	95 MPH (83KTS)
Maneuvering Speed:	154 MPH (134KTS)
Maximum Glide Speed:	95 MPH (83KTS)
Precautionary landing with Engine Power:	95 MPH (83KTS)
Landing Without Engine Power:	95 MPH (83KTS)

### OPERATIONAL CHECKLIST

#### ENGINE FAILURES

##### ENGINE FAILURE DURING TAKEOFF RUN

1. Throttle:	Idle
2. Brakes:	Apply
3. Mixture:	Idle Cut-off
4. Ignition Switch:	Off
5. Master Switch:	Off

##### ENGINE FAILURE IMMEDIATELY AFTER TAKEOFF

1. Airspeed:	95 MPH (83KTS)
2. Mixture:	Idle Cut-off
3. Fuel Selector Valve:	Off
4. Ignition Switch:	Off
5. Master Switch:	Off

**SECTION 3  
EMERGENCY OPERATIONS**

**Preliminary!**

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**ENGINE FAILURE DURING FLIGHT**

- |                         |   |
|-------------------------|---|
| 1. Airspeed:            | 95 MPH (83KTS)                          |
| 2. Fuel Selector Valve: | On                                      |
| 3. Fuel Boost Pump:     | On                                      |
| 4. Mixture:             | Rich                                    |
| 5. Ignition Switch:     | Both<br>(Start if propeller is stopped) |

**ENGINE FAILURES**

**EMERGENCY LANDING WITHOUT ENGINE POWER**

- |                         |   |
|-------------------------|---|
| 1. Airspeed:            | 95 MPH (83KTS)                            |
| 2. Mixture:             | Idle Cut-off                              |
| 3. Fuel Selector Valve: | Off                                       |
| 4. Ignition Switch:     | Off                                       |
| 5. Canopy:              | Jettison (at pilot's option)              |
| 6. Master Switch:       | Off when landing is assured               |
| 7. Touchdown:           | Tail wheel first                          |
| 8. Brakes:              | Apply as needed but control the aircraft. |

**PRECAUTIONARY LANDING WITH ENGINE POWER**

- |                         |  |
|-------------------------|--|
| 1. Airspeed:            | 95 MPH (83KTS)   |
| 2. Selected Field:      | Fly Over,<br>noting terrain and obstructions,<br>then upon reaching a safe<br>altitude and airspeed. |
| 3. Electrical Switches: | Off  |
| 4. Airspeed:            | 95 MPH (83KTS)   |
| 5. Canopy:              | Jettison (at pilot's option)   |
| 6. Master Switch:       | Off  |
| 7. Touchdown:           | Tail wheel first   |
| 8. Ignition Switches:   | Off  |
| 9. Brakes:              | Apply as needed but control the aircraft.  |

**SECTION 3  
EMERGENCY OPERATIONS**

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**DITCHING**

1. Radio: Transmit Mayday on 121.5 mhz, giving location and intentions
2. Power: Establish 300 ft/min descent at 95 MPH (83KTS).
3. Approach: High Winds, Heavy seas INTO WIND  
Light Wind, Heavy Swells, PARALLEL TO SWELLS.
4. Canopy: Jettison
5. Touchdown: Level Attitude at established descent.
6. Airplane: Evacuate

**FIREs**

**DURING START ON GROUND**

1. Cranking: Continue to crank the engine in an attempt to start the engine and use any fuel in the lines.  
Do not use the boost pump.  
Leave the MIXTURE control in idle cutoff and set the fuel selector to OFF.
2. Mixture: Idle Cut-off
3. Fire Extinguisher: Obtain (have ground attendants obtain)
4. Engine:
  - A. Master Switch: Secure
  - B. Ignition Switch: Off
  - C. Fuel Selector: Off
5. Fire: Extinguish using fire extinguisher, wool blanket, or dirt
6. Fire Damage: Inspect, repair or replace damaged components or wiring before conducting flight.

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EMERGENCY OPERATIONS**

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**ENGINE FIRE IN FLIGHT**

1. Mixture: Idle Cut-off
2. Fuel Selector Valve: Off
3. Master Switch: Off
4. Airspeed: 95 MPH (83KTS)  
(If fire is not extinguished,  
increase glide speed to find  
an airspeed which will  
provide an incombustible mixture.  
If fire is not extinguished and you have a  
parachute jettison canopy and leave  
aircraft if you have proper altitude.)
5. Forced Landing: Execute  
(as described in Emergency Landing  
Without Engine Power).

**ELECTRICAL FIRE IN FLIGHT**

1. Master Switch: Off
2. All Avionic Switches: Off
3. Vents/Cabin Air: Closed
4. Fire Extinguisher: Activate  
(if available)

**WARNING**

**After discharging an extinguisher within a closed cabin, ventilate the cabin.**

If fire appears out and electrical power is necessary for continuance of flight:

6. Master Switch: On
7. Circuit Breakers: Check for faulty circuit,  
do not reset.
8. Radio/Electrical Switches: On one at a time,  
with delay after each  
until short circuit is localized.
9. Vents/Cabin Air: Open when it is ascertain that  
fire is completely extinguished.

## INADVERTENT ICING ENCOUNTER

1. Turn back or change altitude to obtain an outside air temperature that is less conducive to icing.
2. Increase engine speed to minimize ice build-up on propeller blades.
3. Watch for signs of air intake ice and apply alternate air as required. An unexplained loss in manifold pressure could be caused by air intake screen ice.
4. Plan a landing at the nearest airport.
5. With any ice accumulation on the wing leading edges, be prepared for significantly slower stall speed.
6. Approach at 110 to 115 mph depending upon the amount of ice accumulation.
7. Touchdown tail wheel first.

## INADVERTENT ICING ENCOUNTER

(Erroneous Instrument Reading Suspected)

- |                                  |                                 |
|----------------------------------|---------------------------------|
| 1. Alternate Static Source Valve | ON                              |
| 2. Airspeed:                     | Consult placard and AFM Sect 2. |
| 3. Altitude:                     | Consult placard and AFM Sect 2. |

### **WARNING**

**BEFORE ANY FLIGHT INTO TEMPERATURES BELOW FREEZING CHECK THAT THE ENGINE ALTERNATE BREATHER HOLE IS OPEN AND CLEAR OF OIL OR OTHER FOREIGN MATERIAL.**

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EMERGENCY OPERATIONS

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## AMPLIFIED PROCEDURES

Will be added in a later version!

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## INTRODUCTION

Section 4 provides checklist and amplified procedures for the conduct of normal operation. Normal procedures associated with optional systems can be found in Section 9.

### SPEEDS FOR NORMAL OPERATIONS

Unless otherwise noted, the following speeds are based on a maximum weight of 1325 lbs (601.0 kg) and may be used for any lesser weight.

#### Takeoff

Normal Climb Out: 100 MPH (87KTS)

#### En route Climb

Normal:	120 MPH (104 KTS)
Best Rate:	95 MPH (83 KTS)
Best Angle:	82 MPH (71 KTS)

#### Landing Approach

Normal Approach:	95 MPH (83 KTS)
Short Field Approach:	95 MPH (83 KTS)

#### Balked Landing

Maximum Power: 95 MPH (83 KTS)

#### Maximum Demonstrated Crosswind Velocity

Takeoff or landing: 20 MPH (17 KTS)

Demonstrated flight-time inverted is: 10 minutes

#### Engine inverted oil system operation

Refer to the Textron Lycoming Operator's manual.

SECTION 4  
NORMAL OPERATIONS

**Preliminary!**

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CHECKLIST PROCEDURES

PREFLIGHT INSPECTION

COCKPIT

1. Control locks:	Remove (if installed)
2. Ignition Switch:	Off
3. Master Switch:	Off
4. Seat Belt:	Check for Wear and security
5. Loose items:	Secure or remove for aerobatics
6. Baggage:	Secure
7. Baggage Door:	Closed and Secure
8. Battery:	Secure and no leaks
9. Parking Brake:	On

EMPENAGE

1. Fabric:	No holes, general condition
2. Tail surfaces:	Secure and general condition
3. Tail wheel & springs:	Secure and general condition
4. Tie-Down:	Disconnect
5. Control Surfaces:	Check freedom of movement and security
6. Aux Tank Valve Drain:	Drain, check for water and sediment

RIGHT WINGS

1. Fabric:	No holes, general condition
2. Aileron:	Check freedom of movement and security
3. Spade:	Check security
4. I Strut:	Check security
5. Stall Vane:	Check operation
6. Flying Landing Wires:	No Nicks, and secure
7. Tie down:	Disconnect

**SECTION 4  
NORMAL OPERATIONS**

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**NOSE**

- |                           |  |
|---------------------------|--|
| 1. Main wheels:           | Proper inflation, wear   |
| 2. Brakes:                | Security and line clearance  |
| 3. Alternate Engine       | Open and clean   |
| Breather Hole:            |  |
| 4. Propeller and Spinner: | No Nicks, secure and no oil leaks  |
| 5. Air Inlet Screen:      | Check for restrictions   |
| 6. Engine Oil Level:      | Check; do not operate with less than 9 quarts. Fill to 12 quarts for extended flight |
| 7. Main Fuel Strainer:    | Drain, check for water and sediment  |

**LEFT WINGS**

- |                          |  |
|--------------------------|--|
| 1. Pitot tube:           |  |
| 2. Flying Landing Wires: | No Nicks, and secure                   |
| 3. I Struts:             | Check security                         |
| 4. Aileron:              | Check freedom of movement and security |
| 5. Spades:               | Check security                         |
| 6. Fabric                | No holes, general condition            |
| 7. Tie down:             | Disconnect                             |

**BEFORE STARTING ENGINE**

- |                                   |                     |
|-----------------------------------|---------------------|
| 1. Preflight Inspection:          | Complete            |
| 2. Canopy:                        | Closed and locked   |
| 3. Seat Belts/Shoulder Harnesses: | Adjusted and locked |
| 4. Brakes:                        | Test and on         |
| 5. Cowl Flaps:                    | Open                |
| 6. Circuit Breakers:              | In                  |

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NORMAL OPERATIONS

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STARTING ENGINE

COLD START

- |     |                         |   |
|-----|-------------------------|---|
| 1.  | Mixture:                | Rich  |
| 2.  | Propeller:              | High RPM  |
| 3.  | Throttle:               | $\frac{1}{4}$ open  |
| 4.  | Master Switch:          | On  |
| 5.  | Boost Pump:             | On, 2-3 sec Max   |
| 6.  | Mixture:                | Idle cut off  |
| 7.  | Starter Switch:         | On (Start)  |
| 8.  | Mixture:                | When engine starts, move mixture control slowly and smoothly to Full Rich |
| 9.  | Oil Pressure:           | Check   |
| 10. | Alternator Field Switch | On  |

HOT START

- |    |                         |   |
|----|-------------------------|---|
| 1. | Mixture:                | Idle cut off                                  |
| 2. | Propeller:              | High RPM                                      |
| 3. | Throttle:               | $\frac{1}{2}$ open                            |
| 4. | Master Switch:          | On  |
| 5. | Starter Switch:         | On (Start)                                    |
| 6. | Mixture:                | When engine starts, move mixture to Full Rich |
| 7. | Oil Pressure:           | Check   |
| 8. | Alternator Field Switch | On  |

**SECTION 4  
NORMAL OPERATIONS**

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**BEFORE TAKEOFF**

- |     |  |   |
|-----|--|---|
| 1.  | Canopy:  | Check locked  |
| 2.  | Brakes:  | Set   |
| 3.  | Flight Controls:   | Free and correct  |
| 4.  | Flight Instruments:  | Set and correct   |
| 5.  | Fuel Selector:   | On  |
| 6.  | Mixture:   | Rich if bellow 5000 feet MSL, lean as required above 5000 feet MSL.   |
| 7.  | Elevator Trim:   | Takeoff neutral   |
| 8.  | Throttle:<br>a: Propeller:   | 1700 RPM check:<br>Cycle from high to low RPM,<br>return to high RPM (full in)  |
| 9.  | Throttle:<br>a: Magnetos:<br>b: Engine Instruments:<br>c: Ammeter: | 2200 RPM Check:<br>Check (RPM drop should not exceed<br>175 RPM on either magneto or 60 RPM<br>differential between magnetos)<br>Check<br>Check |
| 10. | Avionics:  | On and set  |

**TAKEOFF**

- |    |                   |                        |
|----|-------------------|------------------------|
| 1. | Power:            | Full Throttle 2800 RPM |
| 2. | Elevator Control: | Lift tail              |
| 3. | Rotate:           | 74 MPH (64 KTS)        |
| 4. | Climb Speed:      | 100 MPH (87 KTS)       |
| 5. | Power:            | As required or desired |

**EN ROUTE CLIMB**

- |    |             |  |
|----|-------------|--|
| 1. | Airspeed:   | 120 MPH (104 KTS)                            |
| 2. | Power:      | As required or desired                       |
| 3. | Mixture:    | Rich or lean as<br>needed for required power |
| 4. | Cowl Flaps: | Open as required for cooling                 |

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NORMAL OPERATIONS**

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**CRUISE**

- |                   |  |
|-------------------|--|
| 1. Power:         | 20-24 Inches Hg, 2200 – 2400 RPM<br>(no more than 75% power) |
| 2. Elevator Trim: | Adjust   |
| 3. Mixture:       | Lean   |
| 4. Cowl Flaps:    | Closed or as needed for cooling                              |

**DESCENT**

- |                |                                 |
|----------------|---------------------------------|
| 1. Power:      | As desired                      |
| 2. Mixture:    | Enrichen as required            |
| 3. Cowl Flaps: | Closed or as needed for cooling |

**BEFORE LANDING**

- |                                   |                          |
|-----------------------------------|--------------------------|
| 1. Seat Belts/Shoulder Harnesses: | Adjust lock              |
| 2. Fuel selector:                 | Check on                 |
| 3. Mixture:                       | Rich below 5000 feet MSL |
| 4. Propeller:                     | High RPM                 |

**LANDING**

**NORMAL LANDING**

- |                      |                         |
|----------------------|-------------------------|
| 1. Airspeed:         | 95 MPH (83 KTS)         |
| 2. Trim:             | Adjust                  |
| 3. Touchdown:        | Tail wheel first        |
| 4. Elevator Control: | Full back (up elevator) |
| 5. Braking           | Minimum required        |

**BALKED LANDING**

- |                 |                          |
|-----------------|--------------------------|
| 1. Power:       | Full Throttle (2800 RPM) |
| 2. Climb Speed: | 95 MPH (83 KTS)          |
| 3. Cowl Flaps:  | Open                     |

**AFTER LANDING**

- |                |      |
|----------------|------|
| 1. Cowl Flaps: | Open |
|----------------|------|

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SECURING AIRPLANE

- |    |                          |                    |
|----|--------------------------|--------------------|
| 1. | Throttle:                | Idle               |
| 2. | Avionics:                | Off                |
| 3. | Mixture:                 | Idle cut off       |
| 4. | Ignition Switch:         | Off                |
| 5. | Master Switch:           | Off                |
| 6. | Alternator Field Switch: | Off                |
| 7. | Aircraft:                | Tie down or Secure |

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## AMPLIFIED PROCEDURES

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