

PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT-MANUAL

for the

Beechcraft

Sundowner 180

C23

(2250-2350
static RPM)

FAA APPROVED IN NORMAL AND UTILITY CATEGORY BASED ON CAR 3. THIS DOCUMENT MUST BE CARRIED IN THE AIRPLANE AT ALL TIMES AND BE KEPT WITHIN REACH OF THE PILOT DURING ALL FLIGHT OPERATIONS.

THIS HANDBOOK INCLUDES THE MATERIAL REQUIRED TO BE FURNISHED TO THE PILOT BY FAR PART 23.

Mr's Serial No.

Registration No.

FAA Approved by:

For W. H. SCHULTZ
BEECH AIRCRAFT CORPORATION
DOA CE-2

THIS HANDBOOK SUPERSEDES ALL BEECH PUBLISHED OWNERS MANUALS AND CHECK LISTS ISSUED FOR THIS AIRPLANE WITH THE EXCEPTION OF FAA APPROVED AIRPLANE FLIGHT MANUALS.

PUBLISHED BY

COMMERCIAL PRODUCT SUPPORT
BEECH AIRCRAFT CORPORATION
WICHITA KANSAS 67201

U. S. A.

Member of GAMA
General Aviation
Manufacturers Association



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Sundowner 180 C23

PILOT'S OPERATING HANDBOOK

and

FAA APPROVED AIRPLANE FLIGHT MANUAL

LOG OF REVISIONS

A2 October 1979

PAGE	DESCRIPTION
Title Page	Update
Page A (A2)	New
2-1	Update Table of Contents
2-5	Add "Fuel Additives"
2-6	Shift Material
2-7	Revise "Weight Limits" and "Center of Gravity Limits"
2-8	Revise "Maneuver Limits"
4-1	Update Table of Contents
4-8	Revise "After Starting and Before Taxi"
4-10	Shift Material
4-11	Revise "Descent"
4-15	Add "Noise Characteristics"
8-8	Revise "Jacking"
8-35	Revise "Consumable Materials"

A2

Page A

SUNDOWNER 180 C23
Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual

A3 August, 1980

LOG OF REVISIONS

Page	Description
Title Page	Added Revision Date
Page A (A3)	Updated
1-4 and 1-5	Revised "Use of Handbook"
1-6	Shifted Material
1-15	Revised "Engine Controls and Instruments"
2-5	Revised "Power Plant Limitations"
2-12	Revised "Electrical Power"
2-27	Revised "Fuel Selector Panel" Placard
2-28	Shifted Material
3-1	Revised "Table of Contents"
3-3	Revised "Emergency Airspeeds" and Added Note
3-7	Revised "Emergency Descent"
3-8 and 3-9	Added "Starter Engaged Warning Light Illuminated" and Revised "Alternator Out Procedure"
3-10 and 3-11	Shifted Material
4-1	Revised "Table of Contents"
4-5	Shifted Material
4-6	Revised "Before Starting"
4-7	Shifted Material
4-8	Revised "Starting"
4-9	Revised "Before Take-off"
4-10 thru 4-12	Shifted Material
6-5	Revised "Weighing Instructions"
6-11	Revised "Weight and Balance Responsibilities"
7-2	Revised "Table of Contents"
7-15	Revised "Shoulder Harnesses"
7-18 and 7-19	Shifted Material

A3

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98-38307

Supplement to General Section

Beech C23

N9236S

The installed ADS-B OUT system has been shown to meet the equipment performance requirements of 14 CFR 91.227.

LOG OF REVISIONS

Page	Description
7-20	Revised "Starter"
7-21 and 7-23	Revised "Fuel System"
8-15	Revised "Tires"
8-34 and 8-35	Revised "Consumable Materials"
8-41	Revised "Power Plant"

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Page A

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**BEECHCRAFT Sundowner 180
C23 (M-1285 and After)**

**Section I
General**

THANK YOU . . . for displaying confidence in us by selecting a BEECHCRAFT airplane. Our design engineers, assemblers and inspectors have utilized their skills and years of experience to ensure that the BEECHCRAFT meets the high standards of quality and performance for which BEECHCRAFT airplanes have become famous throughout the world.

IMPORTANT NOTICE

This handbook must be read carefully by the owner and operator in order to become familiar with the operation of the airplane. Suggestions and recommendations have been made within it to aid in obtaining maximum performance without sacrificing economy. Be familiar with, and operate the airplane in accordance with the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual, and/or placards which are located in the airplane.

As a further reminder, the owner and operator of this airplane should also be familiar with the Federal Aviation Regulations applicable to the operation and maintenance of the airplane and FAR Part 91 General Operating and Flight Rules. Further, the airplane must be operated and maintained in accordance with FAA Airworthiness Directives which may be issued against it.

The Federal Aviation Regulations place the responsibility for the maintenance of this airplane on the owner and the operator who should ensure that all maintenance is done by qualified mechanics in conformity with all airworthiness requirements established for this airplane.

All limits, procedures, safety practices, time limits, servicing, and maintenance requirements contained in

Section I
General

**BEECHCRAFT Sundowner 180
C23 (M-1285 and After)**

this handbook are considered mandatory for the continued airworthiness of this airplane, in a condition equal to that of its original manufacture.

Authorized BEECHCRAFT Aero or Aviation Centers and International Distributors or Dealers can provide recommended modification, service, and operating procedures issued by both FAA and Beech Aircraft Corporation, which are designed to get maximum utility and safety from this airplane.

USE OF THE HANDBOOK

The Pilot's Operating Handbook is designed so that necessary documents may be maintained for the safe and efficient operation of the airplane. The handbook has been prepared in loose leaf form for ease in maintenance and in a convenient size for storage. The handbook has been arranged with quick reference tabs imprinted with the title of each section and contains ten basic divisions:

- Section I General
- Section II Limitations
- Section III Emergency Procedures
- Section IV Normal Procedures
- Section V Performance
- Section VI Weight and Balance/Equipment List
- Section VII Systems Description
- Section VIII Handling, Servicing and Maintenance
- Section IX Supplements
- Section X Safety Information

NOTES

Except as noted, all airspeeds quoted in this handbook are Indicated Airspeeds (IAS) and assume zero instrument error.

**BEECHCRAFT Sundowner 180
C23 (M-1285 and After)**

Section I
General

Due to the large variety of airplane configurations available through optional equipment, it should be noted that in describing and illustrating the handbook, optional equipment may not be designated as such in every case. Through variations provided by custom designing, the illustrations in this handbook will not be typical of every airplane.

Neither Service Publications, Reissues, nor Revisions are automatically provided to the holder of this handbook. For information on how to obtain "Revision Service" applicable to this handbook, consult any BEECHCRAFT Aero or Aviation Center or International Distributor or Dealer or refer to the latest revision of BEECHCRAFT Service Instructions No. 0250-010.

Beech Aircraft Corporation expressly reserves the right to supersede, cancel and/or declare obsolete any part, part numbers, kits or publication that may be referenced in this handbook without prior notice.

The owner/operator should always refer to all supplements, whether STC Supplements or Beech Supplements, for possible placards, limitations, normal, emergency and other operational procedures for proper operation of the airplane with optional equipment installed.

REVISING THE HANDBOOK

Immediately following the title page is the "Log of Revisions" page(s). The Log of Revisions pages are used for maintaining a listing of all effective pages in the handbook (except the SUPPLEMENTS section), and as a record of revisions to these pages. In the lower right corner of the

BEECHCRAFT Sundowner 180
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Section I
General

Station Pressure Actual atmospheric pressure at field elevation.

Wind The wind velocities recorded as variables on the charts of this handbook are to be understood as the headwind or tailwind components of the reported winds.

POWER TERMINOLOGY

Take off and Maximum Continuous Highest power rating not limited by time.

ENGINE CONTROLS AND INSTRUMENTS

Throttle Control Used to control power by introducing fuel-air mixture into the intake passages of the engine.

Mixture Control This control is used to set fuel flow in all modes of operation and cuts off fuel completely for engine shut down.

EGT (Exhaust Gas Temperature) Indicator This indicator is used to identify the lean and best power fuel flow for various power settings during cruise.

Tachometer Indicates the rpm of the engine/propeller.

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Section I
General

outlined portion of the Log of Revisions is a box containing a capital letter which denotes the issue or reissue of the handbook. This letter may be suffixed by a number which indicates the numerical revision. When a revision to any information in the handbook is made, a new Log of Revisions will be issued. All Logs of Revisions must be retained in the handbook to provide a current record of material status until a reissue is made.

WARNING

When this handbook is used for airplane operational purpose it is the pilot's responsibility to maintain it in current status.

SUPPLEMENTS REVISION RECORD

Section IX contains supplements and a Log of Supplements page. On the "Log" page is a listing of the supplemental equipment available for installation on the BEECHCRAFT airplane.

Upon receipt of a new or revised supplement, compare the "Log" page just received with the existing "Log" page in the manual. Retain the "Log" page with the latest date on the bottom of the page (this log will usually have the greater number of entries) and discard the other log.

VENDOR-ISSUED STC SUPPLEMENTS

When a new airplane is delivered from the factory, the handbook delivered with it contains either an STC (Supplemental Type Certificate) Supplement or a Beech Flight Manual Supplement for every installed item requiring a supplement. If a new handbook for operation of the airplane is obtained at a later date, it is the responsibility of the owner/operator to ensure that all required STC Supplements (as well as weight and balance and other pertinent data) are transferred into the new handbook.

Section I General

BEECHCRAFT Sundowner 180 C23 (M-1285 and After)

AIRPLANE PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

Climb Gradient

The ratio of the change in height during a climb, to the horizontal distance traversed in the same time interval.

Demonstrated Crosswind Velocity

The demonstrated crosswind velocity is the velocity of the crosswind component for which adequate control of the airplane during take-off and landing was actually demonstrated during certification tests.

MEA

Minimum enroute IFR altitude.

Route Segment

A part of a route. Each end of that part is identified by: (1) a geographical location; or (2) a point at which a definite radio fix can be established.

GPH

U.S. Gallons per hour.

PPH

Pounds per hour.

WEIGHT AND BALANCE TERMINOLOGY

Reference Datum

An imaginary vertical plane from which all horizontal distances are measured for balance purposes.

Station

A location along the airplane fuselage usually given in terms of distance from the reference datum.

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SECTION I

LIMITATIONS

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INTENTIONALLY LEFT BLANK

LIMITATIONS

Airspeeds quoted in this section are calibrated airspeeds (CAS)

ENGINE

Airplane equipped with a Lycoming O-360-A2G, O-360-A4G, or O-360-A4J engine rated at 180 horsepower.

Take-off and maximum continuous operation (sea level): 2700 rpm, full throttle.

FUEL

Aviation Gasoline 91/96 (Blue) minimum grade.

M-1285 through M-1516:

Two *29-gallon tanks in wings with a total of *58 gallons usable.

M-1517 and after or previous airplanes after compliance with Service Instructions No. 0624-281:

Two *29 gallon tanks in wings with a total of *52 gallons usable.

Do not take off when Fuel Quantity Gages indicate in the Yellow Band or with less than 11 gallons in each tank.

Maximum slip duration is 30 seconds.

PROPELLER

Sensenich M76EMMS-0-60 or 76EM8S5-0-60 fixed pitch, two blade propeller. Static rpm at maximum permissible throttle settings: Not over 2350 rpm and not under 2250 rpm. No additional tolerance permitted.

**Values given are nominal*

ENGINE INSTRUMENT MARKINGS

Oil Temperature	
Caution (Yellow Band)	60° to 120° F
Operating Range (Green Band)	120° to 245° F
Maximum (Red Line)	245° F
Oil Pressure	
Minimum Pressure (Red Line)	25 psi
Caution Range (Yellow Band)	25 to 60 psi
Operating Range (Green Band)	60 to 90 psi
Maximum Pressure (Red Line)	100 psi

Tachometer

Engine Warm-up	1000 to 1200 rpm
Restricted operation for 0-360-A2G engine only (Red Band)	2150 to 2350 rpm
Normal Operating Range all engines (Green Band)	1800 to 2700 rpm
Maximum RPM (Red Line)	2700 rpm

Fuel Pressure

Operating Range (Green Band)	0.5 to 6.0 psi
------------------------------	----------------

Fuel Quantity (On M-1517 and after, or after compliance with Service Instructions No. 0624-281)
Yellow Arc E to 3/8 Full

AIRSPEED LIMITATIONS

Never Exceed (Glide or Dive, Smooth Air) (Red Line)	175 mph/152 kts
Caution Range (Yellow Arc)	156 to 175 mph/136 to 152 kts
Operating Range (Green Arc)	72 to 156 mph/63 to 136 kts
Flap Operating Range (White Arc)	59 to 110 mph/51 to 96 kts
Maximum Design Maneuvering Speed	136 mph/118 kts
Maximum Structural Cruising Speed	156 mph/136 kts

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APPROVED MANEUVERS (2030 POUNDS)

MANEUVER	ENTRY SPEED
Chandelle	133 mph/116 knots
Steep Turn	133 mph/116 knots
Lazy Eight	133 mph/116 knots
Stall (Except Whip)	Slow Deceleration
Spins (Acrobatic Only; M-1494 and after, or prior airplanes modified by Kit No. 23-4007-1S per Service Instructions No. 0619-090.)	Slow Deceleration

FLIGHT LOAD FACTORS

Normal Category (2450 lbs)	Flaps up +3.8, -1.9 Flaps down +1.9
Utility Category (2030 lbs)	flaps up +4.4, -2.2 flaps down +2.2
Acrobatic Category (2030 lbs)	flaps up +6.0, -3.0 flaps down +2.0

CATEGORY

This airplane is approved for 4 place in the Normal Category and for 2 place in the Utility and Acrobatic Category.

WEIGHT

Normal Category	2450 lbs
Utility/Acrobatic Category	2030 lbs

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CENTER OF GRAVITY

Normal Category

Forward: 107.8 in. aft of datum to 1800 lbs. with straight line variation to 114.5 in. aft of datum at 2450 lbs.

Aft: 118.3 in. aft of datum at all weights.

Utility/Acrobat Category

Forward: 107.8 in. aft of datum to 1800 lbs. with straight line variation to 110.2 in. aft of datum at 2030 lbs.

Aft: 114.0 in. aft of datum at all weights.

PLACARDS

On Left Cabin Door or Left Side Panel:

THIS AIRPLANE MUST BE OPERATED IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS.

NORMAL CATEGORY

MAXIMUM DESIGN WEIGHT
REFER TO WEIGHT AND BALANCE DATA
FOR LOADING INSTRUCTIONS
FLIGHT MANEUVERING LOAD FACTOR

2450 LBS
FLAPS UP +3.8 -1.9
DOWN +1.9

MAXIMUM MANEUVERING SPEED
136 MPH

NO ACROBATIC MANEUVERS INCLUDING SPINS APPROVED

UTILITY CATEGORY

MAXIMUM DESIGN WEIGHT
REFER TO WEIGHT AND BALANCE DATA
FOR LOADING INSTRUCTIONS
FLIGHT MANEUVERING LOAD FACTOR

2030 LBS
FLAPS UP +4.4 -2.2
DOWN +2.2

MAXIMUM MANEUVERING SPEED
133 MPH

NO ACROBATIC MANEUVERS APPROVED EXCEPT THOSE LISTED BELOW:

MANEUVER
CHANDLLES
LAZY EIGHTS
STEEL TURNS
STALLS (EXCEPT WHIP STALLS)
NOTE: MAXIMUM ALTITUDE LOSS DURING STALL
300 FT

RECOMMENDED ENTRY SPEED
133 MPH
133 MPH
133 MPH
SLOW DECELERATION
300 FT

On Instrument Panel in Full View of Pilot (M-1285 through M-1493, unless modified by Kit No. 23-4007-1S and Service Instructions No. 0619-090):

"THIS AIRPLANE MUST BE OPERATED AS A NORMAL OR UTILITY CATEGORY AIRPLANE. INTENTIONAL SPINS ARE PROHIBITED. NO ACROBATIC MANEUVERS APPROVED EXCEPT: CHANDELLES, LAZY EIGHTS, STEEL TURNS, AND STALLS (EXCEPT WHIP STALLS)."

On Left Cabin Door or Left Side Panel (Acrobatic):

THIS AIRPLANE MUST BE OPERATED IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS.

NORMAL CATEGORY

MAXIMUM DESIGN WEIGHT
REFER TO WEIGHT AND BALANCE DATA
FOR LOADING INSTRUCTIONS
FLIGHT MANEUVERING LOAD FACTOR

2450 LBS
FLAPS UP +3.8 -1.9
DOWN +1.9

MAXIMUM MANEUVERING SPEED
136 MPH

NO ACROBATIC MANEUVERS INCLUDING SPINS APPROVED

UTILITY & ACROBATIC CATEGORY

MAXIMUM DESIGN WEIGHT
REFER TO WEIGHT AND BALANCE DATA
FOR LOADING INSTRUCTIONS
FLIGHT MANEUVERING LOAD FACTOR

2030 LBS
FLAPS UP +6.0 -3.0
DOWN +2.0

MAXIMUM MANEUVERING SPEED
133 MPH

NO ACROBATIC MANEUVERS APPROVED EXCEPT THOSE LISTED BELOW:

MANEUVER
CHANDLLES
LAZY EIGHTS
STEEL TURNS
STALLS (EXCEPT WHIP STALLS)
NOTE: MAXIMUM ALTITUDE LOSS DURING STALL
300 FT

RECOMMENDED ENTRY SPEED
133 MPH
133 MPH
133 MPH
SLOW DECELERATION
300 FT

BARREL ROLL
AILERON ROLL
SNAP ROLL
SPLIT S
IMMELMANN
LOOP

On Sunvisor Above Pilot's Seat (Acrobatic):

OPERATIONAL LIMITATIONS

ENTRY: Shall the crewman with the control column board throttle in life position from an intermediate down position?

[illegible]

If the fall back stick is not applied and held, the airplane may spin. Again recovery must be initiated by the second crew.

RECOVERY
If ejection is required, the airplane will not rotate and merely remain in a straight stalled condition. Immediately move the control column full forward and simultaneously apply full rudder opposite to the direction of the spin. Continue to hold this control position until rotation stops and then neutralize all controls and execute a smooth pullout. Ailerons should be neutral and throttle in idle position at all times during recovery.

On Right Side of Instrument Panel (Acrobatic):

CAUTION

CONTINUOUS INVERTED FLIGHT WILL CAUSE LOSS OF OIL AND OIL PRESSURE. REAR CG LIMITED AND CARRYING OF BAGGAGE OR REAR SEAT PASSENGERS AND USE OF FLAPS PROHIBITED DURING AEROBATIC MANEUVERS.

On Flap Extension Handle:

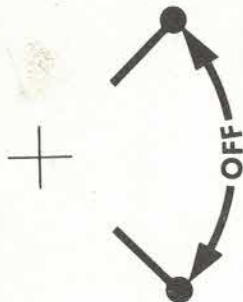
FLAPS PULL TO EXTEND, MAX SPEED 110 MPH

RETRACTED	0°
FIRST NOTCH	15°
SECOND NOTCH	25°
THIRD NOTCH	35°

On Fuel Selector Panel:

**L TANK
29 GAL**

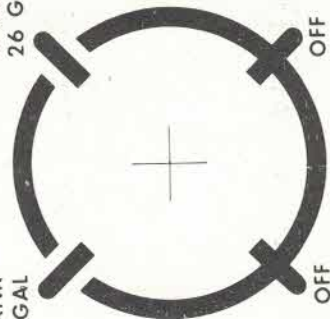
**R TANK
29 GAL**



On Fuel Selector Panel (M-1517 and after, or after compliance with Service Instructions No. 0624-281):

L TANK
26 GAL

R TANK
26 GAL



Adjacent to Engine Instrument Cluster (M-1517 and after,
or after compliance with Service Instructions No.
0624-281):

DO NOT TAKE OFF WHEN FUEL QUANTITY GAUGE INDICATES IN YELLOW OR WITH LESS THAN 11 GALLONS IN EACH MAIN TANK. MAXIMUM SLIP DURATION IS 30 SECONDS.

PLACARDS (Continued)

Above Right and Left Cabin Doors:



On Left Cabin Door (Acrobatic):



TURN HANDLE CLOCKWISE
& PULL LATCH ABOVE ARM
REST, THEN KICK-OUT TO
JETTISON DOOR



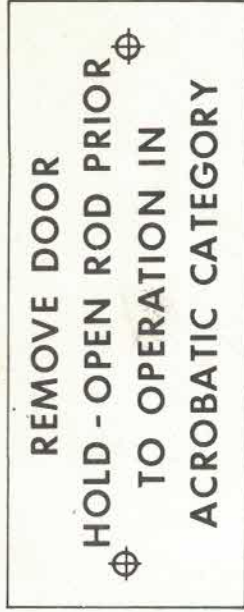
On Right Cabin Door (Acrobatic):



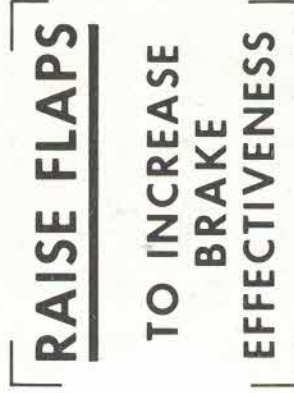
TURN HANDLE COUNTER-
CLOCKWISE & PULL LATCH
ABOVE ARM REST, THEN
KICK-OUT TO JETTISON DOOR



On Right and Left Cabin Doors (Acrobatic):



On Upper Right Instrument Panel:



TO INCREASE
BRAKE
EFFECTIVENESS

On Pedestal Between Front Seats:



PLACARDS (Continued)

On Upper Aft Corner of Each Cabin Door (when installed):

INSTRUCTIONS — SHOULDER STRAP

1. OCCUPANT SHORTER THAN
4FT 7IN. DO NOT USE
SHOULDER STRAP
2. NEVER USE SHOULDER STRAP
WITH OUT LAP BELTS

On Lower Sidewall Adjacent to Pilot (when installed):

WARNING

EMERGENCY AIRSPEED STATIC SOURCE
SEE FLIGHT MANUAL
EMERGENCY PROCEDURES
FOR AIRSPEED ALTIMETER
CALIBRATION ERROR



or;

WARNING

EMERGENCY AIRSPEED STATIC SOURCE

SEE PILOTS CHECK LIST
OR FLIGHT MANUAL
EMERGENCY PROCEDURES
FOR AIRSPEED & ALTIMETER
CALIBRATION ERROR



On Aft Cabin Bulkhead:

HAT SHELF

NO HEAVY OBJECTS

On Baggage Compartment Door:

BAGGAGE COMPARTMENT

270 POUNDS

MAXIMUM CAPACITY

On Baggage Compartment Door:

TO LEVEL AIRCRAFT — LEVEL

BAGGAGE COMPARTMENT FLOOR

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SECTION II

LIMITATIONS

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OPERATING LIMITATIONS

Engine Speed	2700 rpm
Oil Temperature	245°F
Oil Pressure	
Minimum	25 psi
Maximum	100 psi
Fuel Pressure	
Minimum	0.5 psi
Maximum	6.0 psi
Mixture - Set per leaning instructions on performance charts.	

FUEL GRADES

Aviation Gasoline 91/96 (blue) minimum grade or 100 (green) or 100LL (blue).

FUEL ADDITIVES

Alcor TCP Concentrate, mixed according to the instructions provided by Alcor, Inc.

OIL SPECIFICATIONS

Avco Lycoming Specification Number 301E approves for use lubricating oils which conform to both MIL-L-6082B straight mineral type and MIL-L-22851 ashless dispersant lubricants for airplane engines. Refer to the Approved Engine Oils table in the HANDLING, SERVICING AND MAINTENANCE section for a list of approved products.

PROPELLER SPECIFICATIONS

Sensenich M76EMMS-O-60 or 76EM8S5-O-60 fixed

Section II
Limitations

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pitch, two blade propeller. Static rpm at maximum permissible throttle settings: Not over 2350 rpm and not under 2250 rpm. No additional tolerance permitted.

POWER PLANT INSTRUMENT MARKINGS

OIL TEMPERATURE

Cauton (Yellow Arc) 60° to 120°F
Operating Range
(Green Arc) 120° to 245°F
Maximum (Red Line) 245°F

OIL PRESSURE

Minimum Pressure (Red Line) 25 psi
Minimum Pressure (Yellow Arc) 25 to 60 psi
Operating Range (Green Arc) 60 to 90 psi
Maximum Pressure (Red Line) 100 psi

FUEL PRESSURE

Operating Range (Green Arc) 0.5 to 6.0 psi

TACHOMETER

Engine Warm-up 1000 to 1200 rpm
Restricted Operation for O-360-A2G
engine only (Red Arc) 2150 to 2350 rpm
Normal Operating Range
all engines (Green Arc) 1800 to 2700 rpm
Maximum RPM (Red Radial) 2700 rpm

MISCELLANEOUS INSTRUMENT MARKINGS

INSTRUMENT AIR

Operating Range (Green Arc) 4.3 to 5.9 in. Hg

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Section II
Limitations

FUEL QUANTITY

On M-1517 thru M-1879 except M-1875, or prior airplanes after compliance with S.I. No. 0624-281 Yellow Band E to 3/8 full

On M-1875, M-1880 and after
Yellow Band E to 1/3 full

WEIGHT LIMITS

NORMAL CATEGORY

Maximum Ramp Weight 2455 lbs
Maximum Take-off
and Landing Weight 2450 lbs
Zero Fuel Weight No Structural Limitation
Maximum Baggage Compartment
Load 270 lbs

UTILITY/ACROBATIC CATEGORY

Maximum Ramp Weight 2035 lbs
Maximum Take-off
and Landing Weight 2030 lbs
Zero Fuel Weight No Structural Limitation
Maximum Baggage Compartment
Load (Utility Category Only): 270 lbs

CENTER OF GRAVITY LIMITS

NORMAL CATEGORY

Forward: 107.8 inches aft of datum to 1800 lbs with
straight line variation to 114.5 inches at 2450
lbs.
Aft: 118.3 inches aft of datum at all weights.

Section II
Limitations

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

WARNING

FLIGHT IN KNOWN ICING CONDITIONS
PROHIBITED.

Section II
Limitations

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

UTILITY/ACROBATIC CATEGORY

Forward: 107.8 inches aft of datum to 1800 lbs with
straight line variation to 110.2 inches aft of
datum at 2030 lbs.

Aft: 114.0 inches aft of datum at all weights.

REFERENCE DATUM

Datum is 103 inches forward of wing leading edge.
MAC length is 52.7 inches.

MANEUVER LIMITS

This airplane is approved for 4 place in the Normal
Category and for 2 place in the Utility and Acrobatic
Category. Maximum slip duration is 30 seconds.

NORMAL CATEGORY (2450 POUNDS)
No acrobatic maneuvers approved.

UTILITY CATEGORY (2030 POUNDS)
No acrobatic maneuvers are approved except those listed
below.

MANEUVER	ENTRY SPEED (CAS)
Chandelle	116 kts/133 mph
Steep Turn	116 kts/133 mph
Lazy Eight	116 kts/133 mph
Stall (Except Whip)	Use slow deceleration

Intentional Spins M-1494 and after (only if certificated as
Acrobatic) or prior airplanes modified by
Kit No. 23-4007-1S per
S.I. No. 0619-090 Use slow deceleration

ACROBATIC CATEGORY (2030 POUNDS)
For additional approved acrobatic maneuvers, see FAA
Approved Airplane Flight Manual Supplement.

Section II
Limitations

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

WARNING

FLIGHT IN KNOWN ICING CONDITIONS
PROHIBITED.

LEGEND

Numbers refer to quantities required to be operative for a
specified condition.

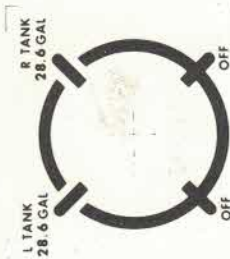
(-) Indicates that the item may be inoperative for the
specified condition.

(*) Refer to the REMARKS AND/OR EXCEPTIONS column
for explicit information or reference.

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

Section II
Limitations

On Fuel Selector Panel (M-1875, M-1880 thru M-2224):



OR



On Fuel Selector Panel (Serials M-2225 and after, or earlier airplane serials which have complied with BEECHCRAFT Service Instructions No. 1095):

Adjacent to Engine Instrument Cluster (M-1517 through M-1879 except M-1875 or prior airplanes after compliance with Service Instructions No. 0624-281):

[DO NOT TAKE OFF WHEN FUEL QUANTITY GAUGE INDICATES IN YELLOW OR WITH LESS THAN 11 GALLONS IN EACH MAIN TANK. MAXIMUM SLIP DURATION IS 30 SECONDS]

Adjacent to Engine Instrument Cluster (M-1875, M-1880 and after):

[DO NOT TAKE OFF WHEN FUEL QUANTITY GAUGE INDICATES IN YELLOW ON EITHER GAUGE. MAXIMUM SLIP DURATION 30 SEC.]

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Section II
Limitations

SYSTEM and/or COMPONENT	Remarks and/or Exceptions			
	VFR Day	VFR Night	IFR Day	IFR Night
GENERAL	Overwater flight	*	*	*
COMMUNICATIONS	VHF communications system	*	*	*
ELECTRICAL POWER	DC alternator	1	1	1
	Starter Engaged	1	1	1
(M-2278 and after)	Warning Light	1	1	1
	May be inoperative			
	provided ammeter is			
	operative and monitored			

Section II
Limitations

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PLACARDS

Above Right and Left Cabin Doors: (M-1285 thru M-1412
and M-1415, M-1419, M-1423, M-1439 and M-1447):



On Left Cabin Door (Acrobatic):



TURN HANDLE CLOCKWISE
& PULL LATCH ABOVE ARM
REST, THEN KICK-OUT TO
JETTISON DOOR



On Right Cabin Door (Acrobatic):



TURN HANDLE COUNTER-
CLOCKWISE & PULL LATCH
ABOVE ARM REST, THEN
KICK-OUT TO JETTISON DOOR



BEECHCRAFT Sundowner 180
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SECTION III

EMERGENCY PROCEDURES

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

EMERGENCY AIRSPEEDS

Emergency Descent 152 kts/175 mph
Glide 78 kts/90 mph
Emergency Landing Approach 68 kts/78 mph

Stall warning horn is inoperative when the battery and alternator switches are turned off.

NOTE

On serials M-2225 and after, or on airplanes which have complied with BEECHCRAFT S.I. No. 1095, a fuel selector stop has been added to the selector valve guard. The fuel selector stop minimizes the possibility of inadvertently turning the fuel selector valve to the OFF detent position. The stop is a spring which must be depressed before the selector valve handle can be rotated to the OFF position.

The following information is presented to enable the pilot to form, in advance, a definite plan of action for coping with the most probable emergency situations which could occur in the operation of the airplane. Where practicable, the emergencies requiring immediate corrective action are treated in check list form for easy reference and familiarization. Other situations, in which more time is usually permitted to decide on and execute a plan of action, are discussed at some length.

Section III
Emergency Procedures

BEECHCRAFT Sundowner 180
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ENGINE FAILURE

DURING TAKE-OFF GROUND ROLL

1. Throttle - CLOSED
2. Braking - MAXIMUM

NOTE

Conduct the following procedures immediately if it appears certain that the airplane will run off the runway. (Otherwise conduct these procedures at the pilot's discretion.)

3. Fuel Selector Valve - OFF
4. Battery Switch, Alternator Switch, and Fuel Boost Switch - OFF
5. Magneto/Start Switch - OFF

AFTER LIFTOFF AND IN FLIGHT

Landing straight ahead is usually advisable. If sufficient altitude is available for maneuvering, accomplish the following:

1. Mixture - FULL RICH, then LEAN as required
2. Fuel Boost Pump - ON
3. Fuel Selector Valve - SELECT OTHER TANK (Check to feel detent and check visually)
4. Magnetos - CHECK LEFT and RIGHT, then BOTH

NOTE

The most probable cause of engine failure would be loss of fuel flow or improper functioning of the ignition system.

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Section III
Emergency Procedures

IF NO RESTART:

1. Establish maximum glide
2. Throttle - CLOSE
3. Fuel Selector Valve - OFF
4. Mixture - IDLE CUT-OFF
5. Magneto/Start Switch - OFF
6. BATTERY & ALT, ALT, and FUEL BOOST switches - OFF (With electric flaps installed, it will be necessary to set desired flaps before securing battery.)

When certain of reaching the selected landing site:

7. Airspeed - 68 kts/78 mph
8. Flaps - AS REQUIRED

ENGINE DISCREPANCY CHECKS

CONDITION: ROUGH RUNNING ENGINE

1. Mixture - FULL RICH, then LEAN as required
2. Magneto/Start Switch - CHECK LEFT and RIGHT, then BOTH

CONDITION: LOSS OF ENGINE POWER

1. Fuel Pressure Gage - CHECK

If fuel flow is abnormally low:

- a. Mixture - FULL RICH
- b. Fuel Boost Pump - ON (Lean as required)
- c. Fuel Boost Pump - OFF if performance does not improve in a few moments

Section III
Emergency Procedures

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C23 (M-1285 and After)

2. Fuel Quantity Indicator - CHECK for fuel supply in tank being used

If tank being used is empty:

- a. Fuel Tank Selector Valve - SELECT OTHER FUEL TANK (feel for detent and check visually)
- b. Fuel Boost Pump - ON

AIR START PROCEDURE

1. Fuel Selector Valve - SELECT TANK MORE NEARLY FULL (check to feel detent and check visually)
2. Throttle - FULL FORWARD
3. Mixture - FULL RICH
4. Fuel Boost Pump - ON until power is regained, then OFF. (Leave on if engine driven fuel pump is inoperative.)
5. Throttle - ADJUST to desired power
6. Mixture - LEAN as required

ENGINE FIRE

IN FLIGHT

The red ventilation controls must be closed to shut off all heating system outlets so that smoke and fumes will not enter the cabin. The control labeled CABIN AIR must be pulled out to close. The control labeled DEFROST must be pushed in to close. In the event of an engine fire, shut down the engine as follows and make a landing:

1. Fuel Selector Valve - OFF
2. Mixture - IDLE CUT-OFF
3. Throttle - CLOSE
4. Cabin Air Control (Red Knob) - pull OFF

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Section III
Emergency Procedures

5. Defrost Valve (Red Knob) - push OFF
6. Battery Switch - OFF
7. Alternator Switch - OFF
8. Magneto/Start Switch - OFF
9. Do not attempt to restart engine

ON THE GROUND

1. Fuel Selector Valve - OFF
2. Throttle - CLOSED
3. Mixture - IDLE CUT-OFF
4. BATTERY & ALT and Magneto/Start Switches - OFF
5. Extinguish with Fire Extinguisher.

EMERGENCY DESCENT

1. Throttle - IDLE
2. Airspeed - ESTABLISH 152 kts/175 mph

MAXIMUM GLIDE CONFIGURATION

1. Flaps - UP
2. Airspeed - 78 kts/90 mph

Glide distance is approximately 1.7 nautical miles (2 statute miles) per 1000 feet of altitude above the terrain.

LANDING EMERGENCIES

LANDING WITHOUT POWER

When assured of reaching the landing site selected, and on final approach:

1. Airspeed - 68 kts/78 mph
2. Fuel Selector Valve - OFF
3. Mixture - IDLE CUT-OFF
4. Magneto/Start Switch - OFF
5. Flaps - AS REQUIRED

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Emergency Procedures

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Emergency Procedures

6. Battery Switch, Alternator Switch, and Fuel Boost Switch - OFF
7. Upper Cabin Door Latch - OPEN (if installed)

1. Alternator Switch - OFF MOMENTARILY, THEN ON (this resets overvoltage relay)

If alternator-out condition persists:

SYSTEMS EMERGENCIES

STARTER ENGAGED WARNING LIGHT ILLUMINATED
(If Installed)

The STARTER ENGAGED warning light illuminates whenever the starter is engaged. If this light remains illuminated after Magneto/Start Switch is released from the START position, the starter relay is still energized. Consequently, electrical power is still being supplied to the starter, and it remains engaged. Continuing to supply power to the starter will eventually result in the complete loss of electrical system power, substantial starter damage, and possible damage to other electrical system components.

If light remains illuminated on the ground:

1. Battery Switch and Alternator Switch - OFF
2. Do Not Take Off.

If light remains illuminated in flight after air start:

1. Battery Switch and Alternator Switch - OFF
2. Land As Soon As Practical.

ALTERNATOR-OUT PROCEDURE

An inoperative alternator will place the entire electrical operation of the airplane on the battery. Alternator malfunction will be indicated by a fluctuation of the ammeter needle, or by a discharge indication. If this condition develops:

WARNING

Deactivation of the battery switch, alternator switch, or alternator circuit breaker during flight is prohibited, except as required by an actual emergency.

UNSCHEDULED ELECTRIC STABILATOR TRIM

1. Airplane Attitude - MAINTAIN using stabilator control.
2. Stabilator Trim Thumb Switch (On Control Wheel) - MOVE IN DIRECTION OPPOSITE UNSCHEDULED PITCH TRIM to open circuit breaker.
3. Stabilator Trim ON-OFF Switch (On Instrument Panel) - OFF
4. Manual Stabilator Trim Control Wheel - RETRIM AS DESIRED.

EMERGENCY STATIC AIR SOURCE SYSTEM

THE EMERGENCY STATIC AIR SOURCE SHOULD BE USED FOR CONDITIONS WHERE THE NORMAL STATIC SOURCE HAS BEEN OBSTRUCTED. When the airplane has been exposed to moisture and/or icing conditions (especially on the ground), the possibility of obstructed static ports should be considered. Partial obstructions will result in the rate of climb indication being sluggish during a climb or descent. Verification of suspected obstruction is possible by switching to the emergency system and noting

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Emergency Procedures

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a sudden sustained change in rate of climb. This may be accompanied by abnormal indicated airspeed and altitude changes beyond normal calibration differences.

Whenever any obstruction exists in the Normal Static Air System or the Emergency Static Air System is desired for use:

1. Pilot's Emergency Static Air Source - Switch to ON EMERGENCY.
2. For Airspeed Calibration and Altimeter Correction, refer to PERFORMANCE section.

CAUTION

Be certain the emergency static air valve is in the NORMAL position when system is not needed.

UNLATCHED DOOR IN FLIGHT

If the cabin door is not locked it may come unlatched in flight. This may occur during or just after take-off. The door will trail in a position approximately 3 inches open. A buffet may be encountered with the door open in flight. Return to the field in a normal manner. If practicable, during the landing flare-out have a passenger hold the door to prevent it from swinging open.

SPINS

WARNING

Intentional spins are prohibited when operating in the Normal Category. Intentional spins are also prohibited in the Utility Category unless the airplane is approved for spins and equipped with a spin kit, or if the airplane is approved for operation in the Acrobatic Category. Refer to Service Instructions No. 0619-090.

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The airplane will not spin if orthodox entry is used, but will enter a spiral dive. Speed builds rapidly in a spiral dive, requiring high pullout loads. Therefore, if a spiral is inadvertently entered recovery from the spiral is to be initiated within two turns.

ENTRY

Stall the airplane with the control column hard back, throttle in idle position, flaps up, carburetor heat as required and with the nose about 15° above the horizon. At the stall, apply full rudder in the direction required to spin. A slight rudder application immediately before the stall will assure the direction of spin. The airplane nose will drop and rotate towards the applied rudder. When the wings are 90° to the horizon, apply full aileron against the intended direction of spin. The airplane will go slightly inverted and enter a normal spin.

If aileron against the direction of spin is not applied or applied too late, the airplane will enter a rapid spiral dive, and recovery must be initiated by the second turn.

If the full back stick is not applied and held, the airplane may spiral. Again recovery must be initiated not later than the second turn.

If aileron is applied too early, the airplane will not rotate and merely remain in a straight stalled condition.

RECOVERY

If a spin is entered inadvertently:

Immediately move the control column full forward and simultaneously apply full rudder opposite to the direction of the spin; continue to hold this control position until rotation stops and then neutralize all controls and execute a smooth pullout. Ailerons should be neutral and throttle in idle position at all times during recovery.

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SECTION IV

NORMAL PROCEDURES

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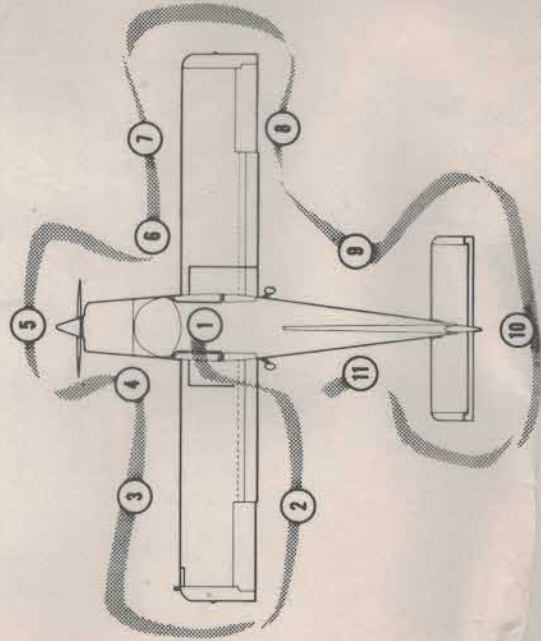
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All airspeeds quoted in this section are indicated airspeeds (IAS)

SPEEDS FOR SAFE OPERATION

Take-off	65 Knots/75 mph
Lift-off	74 Knots/85 mph
50 Ft.	
Maximum Climb	
Best Rate (V_y)	75 Knots/86 mph
Best Angle (V_x)	69 Knots/79 mph
Cruise Climb	82 Knots/95 mph
Maximum Turbulent Air Penetration	118 Knots/136 mph
Balked Landing	64 Knots/74 mph
Landing Approach	68 Knots/78 mph
Maximum Demonstrated Crosswind	17 Knots/20 mph



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Normal Procedures

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PREFLIGHT INSPECTION

1. CABIN:

- a. Parking Brake - SET
- b. Control Lock - REMOVE
- c. All Switches - OFF
- d. Fuel Drain Tool (M-1971, M-1980 and after) - OBTAIN (See Section VIII for use) (See cabin door side pocket. This tool can be used for opening the oil and fuel filler caps.)

2. LEFT WING TRAILING EDGE:

- a. Flap - CHECK
- b. Fuel Vent Line - UNOBSTRUCTED
- c. Aileron - CHECK
- d. Wing Tip - CHECK
- e. Position Light - CHECK

3. LEFT WING LEADING EDGE:

- a. Pitot Tube - CHECK, (Remove Cover)
- b. Landing Light - CHECK
- c. Tie Down and Chocks - REMOVE
- d. Stall Warning - CHECK for movement of vane
- e. Fuel Tank - CHECK QUANTITY; Filler Cap - SECURE.

4. LEFT LANDING GEAR:

- a. Tire and Brake - CHECK
- b. Fuel Sump - DRAIN

5. NOSE SECTION:

- a. Left Cowl - SECURE
- b. Induction Air Intake - CLEAR, Filter - CHECK for condition and security of attachment.
- c. Propeller - CHECK, General Condition, Nicks, etc.
- d. Tire and Nose Gear - CHECK
- e. Engine Oil - CHECK (See Servicing, Section 8) Cap and Dipstick - SECURE

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Normal Procedures

- f. Right Cowl - SECURE
- g. Fuel Strainer - DRAIN
- h. Chocks - REMOVE

6. RIGHT LANDING GEAR:

- a. Fuel Sump - DRAIN
- b. Tire and Brake - CHECK

7. RIGHT WING LEADING EDGE:

- a. Fuel Tank - CHECK QUANTITY; Filler Cap - SECURE
- b. Tie Down and Chocks - REMOVE
- c. Taxi Light - CHECK
- d. Wing Tip - CHECK
- e. Position Light - CHECK

8. RIGHT WING TRAILING EDGE:

- a. Aileron - CHECK
- b. Flap - CHECK
- c. Fuel Tank Vent Line - UNOBSTRUCTED

9. RIGHT FUSELAGE:

- a. Static Pressure Button - UNOBSTRUCTED
- b. Emergency Locator Transmitter - ARMED

10. EMPENNAGE:

- a. Control Surfaces - CHECK
- b. Tie Down - REMOVE
- c. Position Light - CHECK

11. LEFT FUSELAGE:

- a. Static Pressure Button - UNOBSTRUCTED
- b. All Antennas - CHECK
- c. Baggage Door - CHECK

BEFORE STARTING

1. Seats - POSITION AND LOCK; Seat Backs - UPRIGHT
2. Seat Belts and Shoulder Harnesses - FASTEN

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Normal Procedures

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3. Parking Brake - SET
4. All Avionics - OFF
5. Circuit Breakers - IN
6. Flaps - UP
7. Light Switches - AS REQUIRED
8. Electric Stabilator Trim Switch - OFF (if installed)
9. Battery Switch - ON
10. Alternator Switch - ON (If external power is used, turn Alternator Switch - OFF)
11. Fuel Boost Pump - ON (Check for operation, then OFF)
12. Fuel Selector Valve - ROTATE thru 360° and check for freedom of movement; set on tank more nearly full (feel for detent and check visually)

NOTE

On serials M-2225 and after, or on airplanes which have complied with BEECHCRAFT S.I. No. 1095, a fuel selector stop has been added to the selector valve guard. The fuel selector stop minimizes the possibility of inadvertently turning the fuel selector valve to the OFF detent position. The stop is a spring which must be depressed before the selector valve handle can be rotated to the OFF position.

WARNING

Do not take off if either fuel quantity gage indicates in yellow arc.

EXTERNAL POWER

The following precautions shall be observed while using external power:

1. The Battery Switch shall be ON and all avionics and electrical switches OFF. This protects the voltage regulators and associated electrical equipment from voltage transients (power fluctuations):

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2. The airplane has a negative ground system. Connect the positive and negative leads of the external power unit to the corresponding positive and negative terminals of the airplane's external power receptacle.
3. In order to prevent arcing, no power shall be supplied while the connection is being made.

STARTING ENGINE USING AUXILIARY POWER UNIT

1. Alternator, Electrical, and Avionics Equipment - OFF
2. Auxiliary Power Unit - CONNECT
3. Auxiliary Power Unit - SET OUTPUT (*13.75 to 14.25 volts for 14-volt system and 27.75 to 28.25 volts for 28-volt system)
4. Auxiliary Power Unit - ON
5. Engine - START using normal procedures
6. Auxiliary Power Unit - OFF (after engine has been started)
7. Auxiliary Power Unit - DISCONNECT
8. Alternator Switch - ON

STARTING

CAUTION

Vernier-type engine controls should not be rotated clockwise after being advanced to the full forward position.

1. Mixture - FULL RICH
2. Throttle - FAST IDLE position
3. Fuel Boost Pump - ON (cold weather starts, use eight to ten strokes of engine prime, as required)
4. Magneto/Start Switch - START position (release to BOTH position when engine fires)

CAUTION

DO NOT PUMP THROTTLE TO START

*NOTE - M-1285 thru M-2178 are 14-volt systems. M-2179 and after are 28-volt systems.

Section IV
Normal Procedures

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Flooded Engine:

- Mixture - IDLE CUT-OFF
- Throttle - FULL OPEN
- Starter - ENGAGE (retard throttle to fast idle when engine fires)
- Mixture - ADVANCE TO FULL RICH

- Starter Engaged Warning Light (if installed) EXTINGUISHED - CHECK; should be illuminated during start, and extinguished after start.

CAUTION

If the STARTER ENGAGED Warning Light is inoperative (or not installed), ensure that the ammeter indication is less than 25% of full charge at 1000 to 1200 rpm within two minutes with no additional electrical equipment on. If not, turn off the Battery Switch and Alternator Switch and do not take off.

- External Power (if used) - OFF - DISCONNECT
- ALT (alternator) switch - ON
- Oil Pressure - ABOVE RED RADIAL WITHIN 30 SECONDS
- Warm-up - 1000 to 1200 RPM
- All Engine Indicators - CHECK
- Fuel Boost Pump - OFF (for test of engine driven pump)
- Parking Brakes - RELEASE

AFTER STARTING, AND BEFORE TAXI

- Lights - AS REQUIRED
- Avionics Equipment - ON, AS REQUIRED
- Brakes - RELEASE AND CHECK

BEFORE TAKEOFF

- Seat Belts and Shoulder Harnesses - CHECK

NOTE

All reclining seats must be in the upright position during take-off.

- Parking Brake - SET
- Avionics - CHECK
- Engine Instruments - CHECK
- Flight Instruments - CHECK AND SET
- Starter Engaged Warning Light (if installed) - CHECK (should not be illuminated). If light is not installed or is inoperative, the ammeter indication should be less than 25% of full charge at 1000 to 1200 rpm and should show some decrease from the initial indication.
- Throttle - 2200 RPM
- Magnetos - CHECK at 2200 rpm, maximum drop of 125 rpm on each magneto, variance between individual magnetos should not exceed 50 rpm.
- Carburetor Heat - CHECK (Set cold for takeoff)
- Throttle - FAST IDLE
- Stabilator Trim - TAKE-OFF RANGE (Green, White or Black Band)
- Flaps - CHECK and SET
- Controls - CHECK FREE and for proper direction of travel
- Fuel Boost Pump - ON
- Mixture - FULL RICH (or as required by field elevation) (tighten friction on push-pull type control)
- Doors and Window - SECURE
- Parking Brake - RELEASE
- Instruments - CHECK (engine instruments in green range at the start of the takeoff run)

TAKEOFF

Takeoff Full Throttle - 2700 RPM

- Power - SET takeoff power and mixture before brake release.

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Normal Procedures

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2. Airspeed - ACCELERATE to and maintain takeoff speed.
3. Airspeed - ESTABLISH DESIRED CLIMB SPEED when clear of obstacles.

CLIMB

NOTE

Do not turn Fuel Boost Pump off during climb.

1. Throttle - FULL FORWARD
2. Temperature - MONITOR
3. Mixture - LEAN AS REQUIRED FOR SMOOTH OPERATION

CRUISE

1. Power - SET AS DESIRED (Use tables in PERFORMANCE Section)
2. Fuel Boost Pump - OFF
3. Mixture - LEAN AS REQUIRED (tighten friction on push-pull type control)

LEANING USING THE EXHAUST GAS
TEMPERATURE INDICATOR (EGT)

For level flight at 75% power or less, the EGT unit should be used in the following manner:

1. Lean the mixture and note the point on the indicator that the temperature peaks and starts to fall.
 - a. CRUISE (LEAN) MIXTURE - Enrich mixture until the EGT shows a drop of 25°F below peak on the rich side of peak.
 - b. BEST POWER MIXTURE - Enrich mixture until the EGT shows a drop of 75°F below peak on the rich side of peak.

CAUTION

Do not continue to lean mixture beyond that necessary to establish peak temperature.

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2. Continuous operation is recommended at 25°F or more below peak EGT only on the rich side of peak.
3. Changes in altitude and power settings require the peak EGT to be rechecked and the mixture reset.

DESCENT

1. Altimeter - SET
2. Carburetor Heat - FULL ON or FULL OFF, AS REQUIRED
3. Power - AS REQUIRED (avoid prolonged idle settings which may cause low cylinder head temperatures).
4. Mixture - ENRICH AS REQUIRED

BEFORE LANDING

1. Seat Belts and Shoulder Harnesses - SECURE

NOTE

All reclining seats must be in the upright position during landing.

2. Fuel Selector Valve - SELECT TANK MORE NEARLY FULL (feel for detent and check visually).
3. Mixture - FULL RICH (or as required by field elevation) (tighten friction on push-pull type control)
4. Landing Light - AS REQUIRED
5. Flaps - DOWN (maximum extension speed, 96 kts/110 mph)

NOTE

The Flaps Up landing procedure will increase the Flaps Down landing distances (total over 50 foot obstacle) by 50%.

6. Airspeed - ESTABLISH LANDING APPROACH SPEED
Flaps Down - 68 kts/78 mph
Flaps Up - 80 kts/92 mph
7. Carburetor Heat - AS REQUIRED

NOTE

Carburetor heat should be in the full COLD (IN) position before full throttle application in the event of a go-around.

8. Fuel Boost Pump - ON

BALKED LANDING

1. Carburetor Heat - COLD
2. Power - FULL THROTTLE, 2700 RPM
3. Airspeed - 64 kts/74 mph until clear of obstacles, then trim to BEST RATE-OF-CLIMB
4. Flaps - UP

AFTER LANDING

1. Landing and Taxi Lights - AS REQUIRED
2. Flaps - UP
3. Trim Tab - SET TO 0°

SHUTDOWN

1. Brakes - SET
2. Fuel Boost Pump - OFF
3. Electrical and Avionics Equipment - OFF
4. Throttle - CLOSE
5. Mixture - IDLE CUT-OFF
6. Magneto/Start Switch - OFF, after engine stops
7. Battery Switch - OFF
8. Alternator Switch - OFF
9. Control Lock - INSTALL, if conditions warrant.
10. Install wheel chocks and release brakes if the airplane is to be left unattended.

ENVIRONMENTAL SYSTEMS

HEATING AND VENTILATION

Refer to the SYSTEMS DESCRIPTION Section for operation of heating and ventilation controls.

COLD WEATHER OPERATION

PREFLIGHT INSPECTION

All accumulations of ice, snow and frost must be removed from the wings, tail, control surfaces and hinges, propeller, windshield, pitot tube, static ports, antennas, fuel cell filler caps, crankcase vents, and fuel vents. If such accumulations are not removed completely, the airplane shall not be flown. The deposits will not blow off in flight. While an adverse weight factor is clearly involved in the case of heavy deposits, it is less obvious that even slight accumulations will disturb or completely destroy the designed aerodynamic properties of the airfoils.

The normal preflight procedures should then be completed, with particular attention given to check of flight controls for complete freedom of movement.

ENGINE

Use engine oil in accordance with Consumable Materials in the HANDLING, SERVICING AND MAINTENANCE Section.

WARNING

Ascertain that magneto switch and battery master switch are off before moving propeller by hand.

Always pull the propeller through by hand, opposite the direction of rotation, several times to clear the engine and "limber up" the cold, heavy oil before using the starter. This will also lessen the load on the battery if external power is not used.

During cold weather starts, use 8 to 10 strokes of engine primer, as required.

CAUTION

Do not pump throttle to start.

Under very cold conditions, it may be necessary to preheat the engine prior to a start. Particular attention should be given to the oil cooler and engine sump to ensure proper preheat. A start with congealed oil in the system may produce an indication of normal pressure immediately after the start, but then the oil pressure may decrease when residual oil in the engine is pumped back with the congealed oil in the sump. If an engine heater capable of heating both the engine sump and cooler is not available, the oil should be drained while the engine is hot and stored in a warm area until the next flight.

If there is no oil pressure within the first 30 seconds of running, or if oil pressure drops after a few minutes of ground operation, shut down and check for broken oil lines, oil cooler leaks or the possibility of congealed oil.

NOTE

It is advisable to use external power for starting in cold weather.

During warm-up, monitor engine temperatures closely, since it is quite possible to exceed the cylinder head temperature limit in trying to bring up the oil temperature.

During letdown and landing, give special attention to engine temperatures, since the engine will have a tendency toward overcooling.

ICING CONDITIONS

Flight in Known Icing Conditions Prohibited.

ENGINE BREAK-IN INFORMATION

See Systems Description section

NOISE CHARACTERISTICS

Approach to and departure from an airport should be made so as to avoid prolonged flight at low altitude near noise-sensitive areas. Avoidance of noise-sensitive areas, if practical, is preferable to overflight at relatively low altitudes.

For VFR operations over outdoor assemblies of persons, recreational and park areas, and other noise-sensitive areas, pilots should make every effort to fly not less than 2000 feet above the surface, weather permitting, even though flight at a lower level may be consistent with the provisions of government regulations.

NOTE

The preceding recommended procedures do not apply where they would conflict with Air Traffic Control clearances or instructions, or where, in the pilot's judgement, an altitude of less than 2000 feet is necessary to adequately exercise his duty to see and avoid other airplanes.

Flyover noise level established in compliance with FAR 36 is:

73.3 dB(A)

No determination has been made by the Federal Aviation Administration that the noise level of this airplane is or should be acceptable or unacceptable for operation at, into, or out of any airport.

SECTION IV

PERFORMANCE

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INTENTIONALLY LEFT BLANK

PERFORMANCE

All airspeeds in this section are indicated airspeeds (IAS) except as noted and assume zero instrument error.

The performance data in this section has been established by flight tests and engineering calculation to assist you in operating your airplane. Flight tests were conducted under normal operating conditions on an airplane equipped with some optional avionics equipment. External equipment, airplane condition, operational technique, humidity, and air turbulence may account for variations in airplane performance. Appropriate allowances should be made for these variables on an individual basis.

AIRSPEEDS (2450 POUNDS)

TAKE-OFF SPEEDS (0° Flaps)

Lift Off	75 mph/65 kts
50 Ft	85 mph/74 kts

CLIMB SPEEDS

Cruising Climb Speed:	95 mph/82 kts
Full throttle	

Best Rate-of-Climb Speed (5000 ft):

Flaps Up	86 mph/75 kts
Flaps Down (35°)	74 mph/64 kts

Best Angle-of-Climb (5000 ft):

Flaps Up	79 mph/69 kts
Flaps Down (35°)	68 mph/59 kts

POWER OFF STALL SPEEDS (Weight 2450 lbs)

Maximum altitude loss during a normal stall recovery is approximately 300 ft.

ANGLE OF BANK			
LEVEL	30°	45°	60°
FLAPS - UP			
72 mph 63 kts	77 mph 67 kts	85 mph 74 kts	101 mph 88 kts
FLAPS - DOWN (35°)			
59 mph 51 kts	63 mph 55 kts	70 mph 61 kts	83 mph 72 kts

LANDING SPEEDS (35° Flaps)

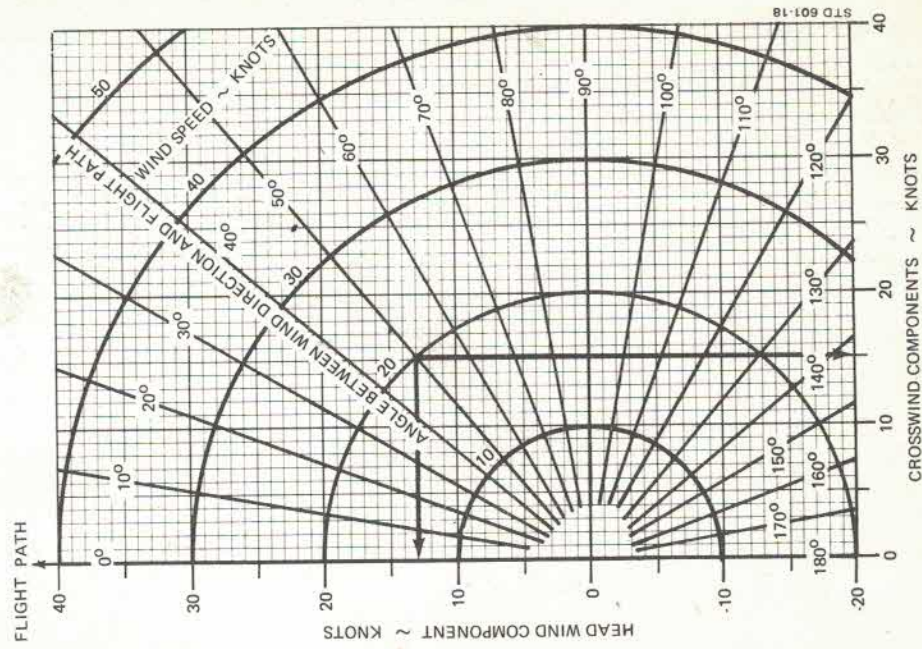
Approach		78 mph/68 kts
Touchdown		70 mph/61 kts

WIND COMPONENTS

Demonstrated Crosswind Component is 20mph/17kts

EXAMPLE:

WIND SPEED	20 KTS
ANGLE BETWEEN WIND DIRECTION AND FLIGHT PATH	50°
HEADWIND COMPONENT	13 KTS
CROSSWIND COMPONENT	15 KTS



ASSOCIATED CONDITIONS:

POWER
FULL THROTTLE
LEAN TO MAXIMUM RPM, THEN ENRICH SLIGHTLY
FLAPS
UP
LEVEL, DRY, HARD SURFACE
WEIGHT
2450 LBS

TAKE-OFF DISTANCE - HARD SURFACE

TAKE-OFF SPEEDS:

LIFT OFF 75 MPH/65 KTS
AT 50 FT 85 MPH/74 KTS

WIND COMPONENT	KNOTS	SEA LEVEL				2000 FT				4000 FT				6000 FT				8000 FT			
		23-5	41-5	59-15	77-25	95-35	23-5	41-5	59-15	77-25	95-35	23-5	41-5	59-15	77-25	95-35	23-5	41-5	59-15	77-25	95-35
0	DOWN RUNWAY	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207
	ROLL	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279
	OAT	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88
	FEET	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88
15	DOWN RUNWAY	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207
	ROLL	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279
	OAT	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88
	FEET	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88
30	DOWN RUNWAY	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207
	ROLL	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279
	OAT	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88
	FEET	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88

ASSOCIATED CONDITIONS:

POWER
FULL THROTTLE
LEAN TO MAXIMUM RPM, THEN ENRICH SLIGHTLY
FLAPS
UP
SHORT, DRY, LEVEL GRASS SURFACE
WEIGHT
2450 LBS

TAKE-OFF DISTANCE - GRASS SURFACE

TAKE-OFF SPEEDS:

LIFT OFF 75 MPH/65 KTS
AT 50 FT 85 MPH/74 KTS

WIND COMPONENT	KNOTS	SEA LEVEL				2000 FT				4000 FT				6000 FT				8000 FT			
		23-5	41-5	59-15	77-25	95-35	23-5	41-5	59-15	77-25	95-35	23-5	41-5	59-15	77-25	95-35	23-5	41-5	59-15	77-25	95-35
0	DOWN RUNWAY	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207
	ROLL	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279
	OAT	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88
	FEET	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88
15	DOWN RUNWAY	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207
	ROLL	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279
	OAT	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88
	FEET	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88
30	DOWN RUNWAY	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207	1512	1490	1337	1289	1207
	ROLL	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279	1655	1618	1454	1380	1279
	OAT	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88
	FEET	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88	16	34	52	70	88

NORMAL CLIMB

NOTE: HIGH HUMIDITY AND OR USE OF RICH MIXTURE HAS BEEN FOUND TO RESULT IN APPROXIMATELY 70 FPM LOSS IN RATE OF CLIMB FROM THAT SHOWN.

POWER FULL THROTTLE
MIXTURE LEAN TO MAXIMUM RPM AND THEN
ENRICH SLIGHTLY
FLAPS UP

ANY AREA WITH LOW CLOUDS OR A DEWPOINT TEMPERATURE OF 60°F (16°C) OR HIGHER IS AN AREA OF HIGH HUMIDITY.

SEA LEVEL				4000 FEET				8000 FEET				12,000 FEET			
WEIGHT POUNDS	OAT ° F	R/C FT/MIN	IAS MPH/KTS	OAT ° F	R/C FT/MIN	IAS MPH/KTS	OAT ° F	R/C FT/MIN	IAS MPH/KTS	OAT ° F	R/C FT/MIN	IAS MPH/KTS	OAT ° F	R/C FT/MIN	IAS MPH/KTS
2450	23	5	841	9	13	621	6	21	389	6	21	389	6	21	389
	41	5	816	27	3	596	13	11	362	13	11	362	13	11	362
2200	59	15	792	45	7	572	49	9	375	49	9	375	49	9	375
	77	25	769	63	17	549	67	19	293	67	19	293	67	19	293
2000	95	55	747	81	27	527	81	27	293	81	27	293	81	27	293
	1147	95	725	99	55	494	99	55	254	99	55	254	99	55	254
81/70	1243	1217	1169	1243	1217	1169	1243	1217	1169	1243	1217	1169	1243	1217	1169
	1193	1193	1147	1193	1193	1147	1193	1193	1147	1193	1193	1147	1193	1193	1147

CRUISE PERFORMANCE

STANDARD DAY

ALTITUDE FEET	POWER SETTINGS		FUEL FLOW GAL/HR	TAS MPH/KTS	RANGE ST. MILES	
	THROTTLE SETTINGS RPM	% BHP			INITIAL FUEL ONBOARD (USABLE) 32 GAL	52 GAL
2500	2700	88	13.2	137/119	955	463
	2300	60	8.2	124/108	291	530
3500	2700	86	12.8	137/119	322	587
	2300	59	8.1	109/95	291	530
4500	2700	84	12.5	137/119	259	473
	2300	59	8.0	123/107	295	539
5500	2696	82	12.0	136/118	321	586
	2300	58	7.9	122/106	295	539
6500	2688	79	11.6	136/118	265	483
	2300	58	7.9	122/106	300	548
7500	2680	77	11.2	134/116	320	585
	2300	57	7.9	120/104	312	574
8500	2670	75	10.8	133/116	282	518
	2300	57	7.8	119/103	306	564
9500	2662	73	10.5	131/114	287	529
	2300	57	7.8	118/103	309	571
10,500	2654	71	10.2	129/112	291	538
	2300	57	7.9	116/101	308	572
10,500	2654	71	10.2	127/110	291	540
	2300	57	7.9	115/100	305	568
10,500	2654	71	10.2	127/110	291	540
	2300	57	7.9	115/100	305	568

NOTES: 1. Range includes start, taxi, climb, and a 45 minute reserve at 2300 RPM.
2. Cruise performance is based on best power mixture. Lean to maximum RPM for a given throttle setting.
3. If the time remaining in tanks is less than 15 minutes, use of tanks be alternated and that a fuel log be maintained.
4. For a particular RPM the fuel flow and true airspeed will vary with temperature. To determine in-flight fuel flow, enter the table at the nearest altitude corresponding to the density altitude, and the actual true airspeed.

ASSOCIATED CONDITIONS:

Pressure Altitude
OAT
Indicated Airspeed

EXAMPLE:

Density Altitude
Actual True Airspeed
Corresponding Altitude on Table
Interpolating Factor (131 mph is 70% of the difference between 121 and 135 mph)

Fuel Flow (120.9 - 9.6 = 2.4 x 7 = 1.68 + 9.6 = 11.28)

4500 feet
53°F
122 mph

5200 feet
131 mph
560 feet
70%

11.3 gal/hr

WIND COMPONENT	KNOTS	OAT °C	GROUND FEET	ROLL FEET	TOTAL FEET	SEA LEVEL	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	2000 FT	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	4000 FT	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	6000 FT	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	8000 FT
30	23-5	41-5	59-15	66-6	1294	1066	1274	1310	1374	1442	1115	1333	1374	1442	1515	1167	1399	1442	1515	1668	1226	1468	1396	1515	1668	1226
15	23-5	41-5	59-15	66-6	1294	1066	1274	1310	1374	1442	1115	1333	1374	1442	1515	1167	1399	1442	1515	1668	1226	1468	1396	1515	1668	1226
0	23-5	41-5	59-15	66-6	1294	1066	1274	1310	1374	1442	1115	1333	1374	1442	1515	1167	1399	1442	1515	1668	1226	1468	1396	1515	1668	1226
WIND COMPONENT	KNOTS	OAT °C	GROUND FEET	ROLL FEET	TOTAL FEET	SEA LEVEL	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	2000 FT	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	4000 FT	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	6000 FT	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	8000 FT

POWER
MIXTURE
FLAPS
RUNWAY
WEIGHT
2450 LBS
ASSOCIATED CONDITIONS:
IDLE
RICH
35°
SHORT, DRY, LEVEL GRASS SURFACE
LANDING SPEEDS:
AT 50 FT TOUCHDOWN 78 MPH/68 KTS
70 MPH/61 KTS

LANDING DISTANCE - GRASS SURFACE

WIND COMPONENT	KNOTS	OAT °C	GROUND FEET	ROLL FEET	TOTAL FEET	SEA LEVEL	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	2000 FT	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	4000 FT	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	6000 FT	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	8000 FT
30	23-5	41-5	59-15	66-6	1294	1066	1274	1310	1374	1442	1115	1333	1374	1442	1515	1167	1399	1442	1515	1668	1226	1468	1396	1515	1668	1226
15	23-5	41-5	59-15	66-6	1294	1066	1274	1310	1374	1442	1115	1333	1374	1442	1515	1167	1399	1442	1515	1668	1226	1468	1396	1515	1668	1226
0	23-5	41-5	59-15	66-6	1294	1066	1274	1310	1374	1442	1115	1333	1374	1442	1515	1167	1399	1442	1515	1668	1226	1468	1396	1515	1668	1226
WIND COMPONENT	KNOTS	OAT °C	GROUND FEET	ROLL FEET	TOTAL FEET	SEA LEVEL	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	2000 FT	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	4000 FT	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	6000 FT	TOTAL FEET	GROUND FEET	ROLL FEET	TOTAL FEET	8000 FT

POWER
MIXTURE
FLAPS
RUNWAY
WEIGHT
2450 LBS
ASSOCIATED CONDITIONS:
IDLE
RICH
35°
LEVEL, DRY, HARD SURFACE
LANDING SPEEDS:
AT 50 FT TOUCHDOWN 78 MPH/68 KTS
70 MPH/61 KTS

LANDING DISTANCE - HARD SURFACE

ACROBATIC SUPPLEMENT
To The
BEECHCRAFT SUNDOWNER C23
PILOT'S OPERATING MANUAL

The airplane must conform to Drawing Number 169-002001

The following maneuvers are approved **ONLY** when the above modification has been completed and when the airplane is operated in the **UTILITY CATEGORY** at 2030 lbs or less. The pilot and copilot must be wearing approved parachutes before performing these maneuvers.

WARNING

The aircraft cabin area should be clean and free of any loose equipment before attempting these maneuvers.

LOOP

The maneuver is entered at 140 MPH/122 KTS IAS at 2700 RPM. A 3.0 to 3.5 G pull-up is recommended. The airspeed at the top of the loop will be 50 to 60 MPH/43 to 52 KTS IAS which is fast enough to retain positive acceleration and prevent a stall. Completion of the loop is accomplished by keeping the G level just below that where a buffet occurs. The altitude loss is 50 to 100 feet.

IMMELMANN

The maneuver is entered at 150 MPH/130 KTS IAS at 2700 RPM. A 3.5 G pull-up is recommended. The roll to the left should be initiated either just before or just as the airplane inverts. Adverse yaw during the roll will be encountered. A roll to the right will result in the airplane turning sideways and usually stalling.

Date: February 8, 1974
P/N 169-590008-9

SNAP ROLL

The maneuver is entered at 100 MPH/87 KTS IAS for a single roll or 105 to 110 MPH/91 to 96 KTS IAS for double rolls. Ailerons are kept neutral until initiation of recovery.

BARREL AND AILERON ROLL

Both maneuvers are entered at 130 MPH/113 KTS IAS in a shallow dive.

SPLIT-S

The maneuver is entered at 90 MPH/78 KTS IAS. The airplane is rolled either way to invert. The maximum speed is 140 MPH/122 KTS IAS, with acceleration at 3.5 G's. The altitude loss will be 800 feet. The throttle is to be retarded as the nose drops past the horizon in the inverted position.

Date: February 8, 1974
P/N 169-590008-9

BEECHCRAFT B19, C23, A24 LANDPLANE

PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

EMERGENCY STATIC AIR SOURCE

GENERAL

The information in this document is FAA Approved material which, together with the appropriate placards, is applicable and must be carried in the airplane when modified by the installation of the Beechcraft Emergency Static Air Source.

LIMITATIONS

PLACARDS:



or;



FAA Approved
Date: June 2, 1978
P/N MCO C32644-11

or;



EMERGENCY PROCEDURES

Whenever any obstruction exists in the Normal Static Air System, or the Emergency Static Air System is desired for use:

1. Pilot's Emergency Static Air Source - Switch to ON EMERGENCY (lower sidewall adjacent to pilot)
2. For airspeed calibration and altimeter correction, refer to AIRSPEED CALIBRATION-EMERGENCY SYSTEM and ALTITUDE CORRECTION-EMERGENCY SYSTEM graphs in the PERFORMANCE section.

CAUTION

Be certain the emergency static air valve is in the OFF NORMAL position when system is not needed.

NORMAL PROCEDURES - No change.

FAA Approved
Date: June 2, 1978
P/N MCO C32644-11

SYSTEMS DESCRIPTION

EMERGENCY STATIC AIR SOURCE

THE EMERGENCY STATIC AIR SOURCE SHOULD BE USED FOR CONDITIONS WHERE THE NORMAL STATIC SOURCE HAS BEEN OBSTRUCTED. When the airplane has been exposed to moisture and/or icing conditions (ground obstructions not properly corrected may cause inflight obstruction), the possibility of obstructed static ports should be considered. Partial obstruction will result in the rate-of-climb indication being sluggish during a climb or descent. Verification of suspected obstruction is possible by switching to the emergency system and noting a sudden sustained change in rate of climb. This may be accompanied by abnormal indicated airspeed and altitude changes beyond normal calibration differences.

HANDLING, SERVICING, AND MAINTENANCE

EMERGENCY STATIC AIR SOURCE

The system should be drained every 100 hours.

Remove cover plate from the lower middle fuselage under the spar and unscrew knurled nut to disconnect static air lines and drain moisture. Reconnect static air lines.

Approved:

for Donald St Peter
Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

FAA Approved
Date: June 2, 1978
P/N MCO C32644-11