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NOTE

Where Beech Aircraft Corporation or Beechcraft is referred to in this publication, it will be taken to read Raytheon Aircraft Company.

Raytheon Aircraft

Beech
Hawker

Member of GAMA
GAMA General Aviation Manufacturers Association

Beechcraft®

SIERRA®

C24R

Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual

FAA Approved in Normal 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 CAR 3.

Airplane Serial Number: MC-741

Airplane Registration Number: N3824R

FAA Approved: _____

A. C. Jackson
Beech Aircraft Corporation
DOA CE-2

This handbook supersedes all BEECH published owner's manuals, flight manuals, and check lists issued for this airplane with the exception of FAA Approved Airplane Flight Manuals.

P/N 169-590025-15B
Reissued: November, 1980

P/N 169-590025-15B4
Revised: July, 1994

Raytheon Aircraft

C24R
Log of Temporary Changes to the Pilot's Operating Handbook *and* FAA Approved Airplane Flight Manual P/N 169-590025-15B

Changes to this Pilot's Operating Handbook and FAA Approved Airplane Flight Manual must be in the airplane for all flight operations.

Part Number	Subject	Date
169-590025 -15BTC1	Fuel Selector Placard Installation	8/26/97

Note: This page should be filed in the front of the *Pilot's Operating Handbook and FAA Approved Airplane Flight Manual* immediately following the *Title* page. This page replaces any *Log of Temporary Changes* page dated prior to the date in the lower right corner of this page.

SIERRA C24R
(MC-449, MC-452 AND AFTER)
PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

B4 Revision . . . . . July, 1994

LOG OF REVISIONS

Page	Description
Title Page	Updated
Page A (B4)	New
10-1 thru 10-48	Revised Section X, Safety Information (May, 1994)

B4

SIERRA
C24R
(MC-449, MC-452 AND AFTER)

PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

B3 Revision . . . . . October, 1990

LOG OF REVISIONS

Page	Description
Title Page	Updated
Page A (B3)	New
10-1 thru 10-48	Revised Section X, Safety Information (October, 1990)

B3

B2 ..... June, 1984

LOG OF REVISIONS

Page	Description
Title Page	Revised
Page A (B2)	New
"a" and "b" Pages	Revised "Introduction" and Shifted Material
"c" Page	Added New Page
1-1	Revised "Table of Contents"
1-2	Revised Folio
1-5, 1-6, 1-6A and 1-6B	Revised "Use of the Handbook" and Shifted Material
4-1	Revised "Table of Contents"
4-10	Revised "Before Takeoff" and "Takeoff" and Shifted Material
4-11	Revised "Cruise" and "Leaning Mixture Using the Exhaust Gas Temperature Indicator (EGT)" and Shifted Material
4-12	Revised "Before Landing" and Shifted Material
4-12A and 4-12B	Revised "Shutdown" and Shifted Material
4-13	Shifted Material

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LOG OF REVISIONS

Page	Description
Title Page	Added Revision Date
Logo Page	Added
Page A (B1)	Updated
5-1	Revised "Table of Contents"
5-22	Added "Cruise Power Settings - 2700 RPM-Full Throttle" Table
5-23	Revised Shaded Area on "Cruise Power Settings - 2700 RPM-75% MCP (or Full Throttle)" Table
5-24 thru 5-26	Shifted Material
5-27	Revised "Cruise Speeds"
5-28	Deleted "Fuel Flow vs Brake Horsepower" and Shifted Material
7-1	Revised "Table of Contents"
7-3	Revised "Table of Contents"
7-10 & 7-11	Revised "Flight Instruments", "Ground Control", and Shifted Material
7-12	Shifted Material
7-29	Revised "Alternator" and Shifted Material
7-30	Revised "External Power Receptacle" and Shifted Material
7-31	Revised "Interior Lighting" and Shifted Material
7-33	Shifted Material

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B1

LOG OF REVISIONS

Page	Description
7-34	Revised "Ventilation"
7-35	Shifted Material
7-36	Added New Page and Shifted Material
8-11	Revised "External Power Receptacle"

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B1

SIERRA C24R

PILOT'S OPERATING HANDBOOK
and
FAA APPROVED AIRPLANE FLIGHT MANUAL

LOG OF REVISIONS

B Reissue ..... November, 1980

Page	Description
Title Page	Reissue
"A" Page	Reissue
a and b	Reissue
1-1 thru 1-19	Reissue
2-1 thru 2-29	Reissue
3-1 thru 3-13	Reissue
4-1 thru 4-16	Reissue
5-1 thru 5-34	Reissue
6-1 thru 6-19	Reissue
7-1 thru 7-35	Reissue
8-1 thru 8-43	Reissue
Section 9	See Log of Supplements
10-1 thru 10-30	Reissue

10-1 Thru 10-67
Revised Safety Section
Dated March 1981.

98-38307

B

INTRODUCTION

The format and contents of this Pilot's Operating Handbook and FAA Approved Airplane Flight Manual conform to GAMA (General Aviation Manufacturers Association) Handbook Specification Number 1. Use of this specification by all manufacturers will provide the pilot with the same type of data in the same place in all handbooks.

In recent years, BEECHCRAFT handbooks contained most of the data now provided. However, the new handbooks contain more detailed data and some entirely new data.

For example, attention is called to Section X (SAFETY INFORMATION). BEECHCRAFT feels that it is highly important to have Safety Information in a condensed form in the hands of the pilots. The Safety Information should be read and studied. Periodic review will serve as a reminder of good piloting techniques.

WARNING

Use only genuine BEECHCRAFT or BEECHCRAFT approved parts obtained from BEECHCRAFT approved sources, in connection with the maintenance and repair of Beech airplanes.

Genuine BEECHCRAFT parts are produced and inspected under rigorous procedures to insure airworthiness and suitability for use in Beech airplane applications. Parts purchased from sources other than BEECHCRAFT, even though outwardly identical in appearance, may not have had the required tests and inspections performed, may be different in fabrication techniques and materials, and may be dangerous when installed in an airplane.

Salvaged airplane parts, reworked parts obtained from non-BEECHCRAFT approved sources, or parts, components, or structural assemblies, the service history of which is unknown or cannot be authenticated, may have been subjected to unacceptable stresses or temperatures or have other hidden damage, not discernible through routine visual or usual nondestructive testing techniques. This may render the part, component or structural assembly, even though originally manufactured by BEECHCRAFT, unsuitable and unsafe for airplane use.

BEECHCRAFT expressly disclaims any responsibility for malfunctions, failures, damage or injury caused by use of non-BEECHCRAFT approved parts.

SIERRA C24R

PILOT'S OPERATING HANDBOOK

AND

FAA APPROVED AIRPLANE FLIGHT MANUAL

TABLE OF CONTENTS

June, 1984 **c**

SECTION I

GENERAL

TABLE OF CONTENTS

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

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

USE OF THE HANDBOOK

The Pilot's Operating Handbook is designed to maintain documents necessary 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.

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.

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.

NOTICE

The following information may be provided to the holder of this manual automatically:

1. Original issues and revisions of BEECHCRAFT Service Bulletins

2. Original issues and revisions of FAA Approved Airplane Flight Manual Supplements

3. Reissues and Revisions of FAA Approved Airplane Flight Manuals, Flight Handbooks, Owner's Manuals, Pilot's Operating Manuals, and Pilot's Operating Handbooks

This service is free and will be provided only to holders of this handbook who are listed on the FAA Aircraft Registration Branch List or the BEECHCRAFT International Owner's Notification Service List, and then only if you are listed by airplane serial number for the model for which this handbook is applicable. For detailed information on how to obtain "Revision

Service" applicable to this handbook or other BEECHCRAFT Service Publications, consult a BEECHCRAFT Aero or Aviation Center or International Distributor or Dealer, or refer to the latest revision of BEECHCRAFT Service Bulletin No. 2001.

NOTICE

Beech Aircraft Corporation expressly reserves the right to supersede, cancel, and/or declare obsolete, without prior notice, any part, part number, kit, or publication referenced in this manual.

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 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 purposes 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 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 will contain either an STC (Supplemental Type Certificate) Supplement or a Beech Flight Manual Supplement for all items requiring a supplement. If a new handbook is purchased at a later date for operation of the airplane, it is the responsibility of the owner/operator to see that all required STC Supplements (as well as weight and balance and other pertinent data) are retained for use in the new handbook.

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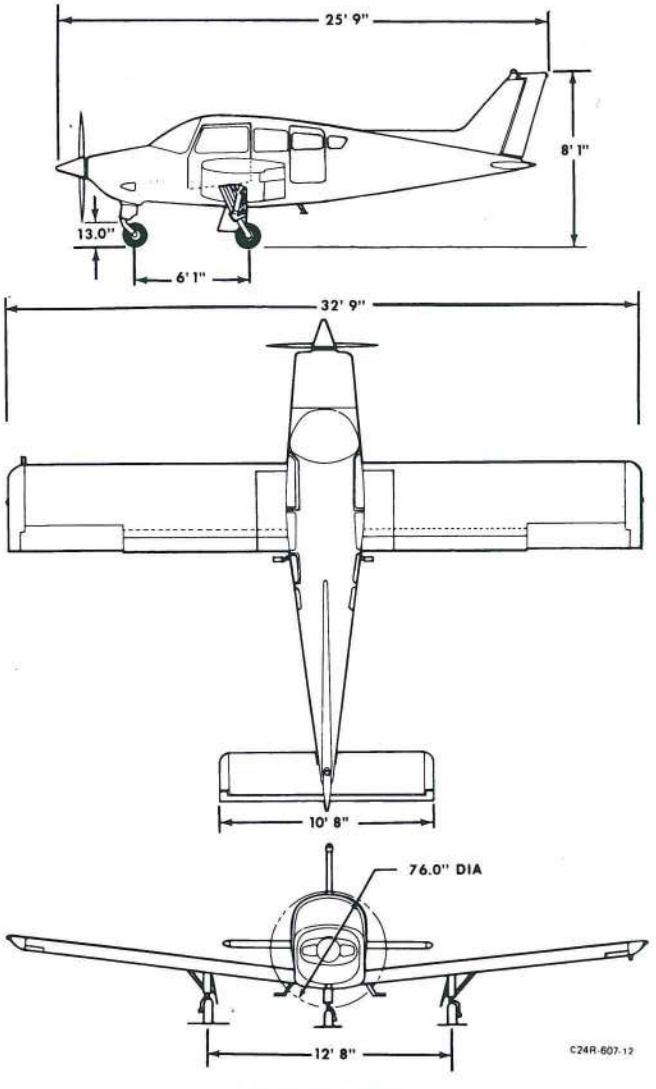
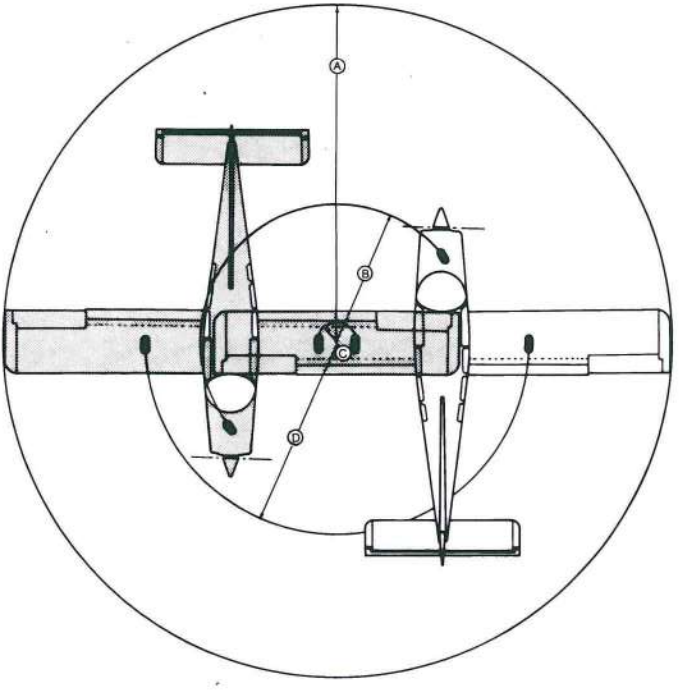


THREE VIEW



Ⓐ Radius for Wing Tip..... 26 feet 10 inches
Ⓑ Radius for Nose Wheel ..... 12 feet 1 inch
Ⓒ Radius for Inside Gear ..... 4 feet 1 inch
Ⓓ Radius for Outside Gear ..... 16 feet 9 inches

TURNING RADII ARE CALCULATED USING FULL STEERING, ONE BRAKE AND PARTIAL POWER

GROUND TURNING CLEARANCE

DESCRIPTIVE DATA

NOTE

MC-449, MC-452 thru MC-673 are 14-volt systems. The battery switch is placarded BATTERY & ALT and the alternator switch is placarded ALT (or ALT FIELD). 28-volt systems MC-674 and after, are placarded BATTERY for the battery switch and ALT FIELD for the alternator switch. All items throughout this handbook that refer to battery switch refer to either BATTERY & ALT switch or BATTERY switch depending upon configuration.

ENGINE

One Avco Lycoming engine model IO-360-A1B6. It is a fuel-injected, direct-drive, air-cooled, horizontally opposed, 4-cylinder, 200-horsepower-rated engine.

Take-off and Maximum Continuous
Power..... Full Throttle at 2700 RPM

PROPELLER

Hartzell constant-speed, two-blade, aluminum-alloy propeller using HC-M2YR-1BF hub with F7666A blades and an A2298-2P spinner. Diameter is 76 inches, no cutoff permitted.

FUEL

Aviation Gasoline Grade 100 (green), or 100LL (blue) minimum.

FUEL TANKS

Total Capacity ..... 59.8 Gallons*
Total Usable ..... 57.2 Gallons
Each tank has provisions for partial filling to:

20 gallons each tank ..... 37.4 gallons usable

15 gallons each tank ..... 27.4 gallons usable

*Value given is nominal. Tank capacity will vary with temperature and manufacturing tolerances.

OIL

OIL CAPACITY

Total ..... 8 Quarts

APPROVED OIL TYPES

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.

MAXIMUM CERTIFICATED WEIGHTS

Maximum Ramp Weight ..... 2758 lbs
Maximum Take-off Weight ..... 2750 lbs
Maximum Landing Weight ..... 2750 lbs
Maximum Zero Fuel Weight ..... No Structural Limit
Maximum Weight in Baggage Compartment ..... 270 lbs

CABIN AND ENTRY DIMENSIONS

Cabin Width (maximum)	3 ft 8 in.
Cabin Length (maximum)	7 ft 11 in.
Cabin Height (maximum)	4 ft
Cabin Door	36 in. x 38 in.

BAGGAGE SPACE AND ENTRY DIMENSIONS

Compartment Volume	19.5 cu ft
Door Width (minimum)	22 in.
Door Height (minimum)	33 in.

SPECIFIC LOADINGS

Wing Loading at Maximum Take-off Weight	18.84 lbs/sq ft
Power Loading at Maximum Take-off Weight	13.75 lbs/hp

SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

The following Abbreviations and Terminologies have been listed for convenience and ready interpretation where used within this handbook. Whenever possible, they have been categorized for ready reference.

GENERAL AIRSPEED

CAS — Calibrated Airspeeds is the indicated speed of an airplane, corrected for position and instrument error. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level.

KCAS — Calibrated Airspeed expressed in knots.

GS — Ground Speed is the speed of an airplane relative to the ground.

IAS — Indicated Airspeed is the speed of an airplane as shown on the airspeed indicator when corrected for instrument error. IAS values published in this handbook assume zero instrument error.

KIAS — Indicated Airspeed expressed in knots.

TAS — True Airspeed is the airspeed of an airplane relative to undisturbed air, which is the CAS corrected for altitude, temperature, and compressibility.

V_A	Maneuvering Speed is the maximum speed at which application of full available aerodynamic control will not over-stress the airplane.
V_{FE}	Maximum Flap Extended Speed is the highest speed permissible with wing flaps in a prescribed extended position.
V_{LE}	Maximum Landing Gear Extended Speed is the maximum speed at which an airplane can be safely flown with the landing gear extended.
V_{LO}	Maximum Landing Gear Operating Speed is the maximum speed at which the landing gear can be safely extended or retracted.
V_{NE}	Never Exceed Speed is the speed limit that may not be exceeded at any time.
V_{NO} or V_C	Maximum Structural Cruising Speed is the speed that should not be exceeded except in smooth air and then only with caution.
V_S	Stalling Speed or the minimum steady flight speed at which the airplane is controllable.
V_{SO}	Stalling Speed or the minimum steady flight speed at which the airplane is controllable in the landing configuration.

V_X — Best Angle-of-Climb Speed is the airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance.

V_Y — Best Rate-of-Climb Speed is the airspeed which delivers the greatest gain in altitude in the shortest possible time.

Cruise Climb — Recommended Climb Speed for enroute climb.

METEOROLOGICAL

ISA — International Standard Atmosphere in which:
(1) The air is a dry perfect gas;
(2) The temperature at sea level is 15° Celsius (59° Fahrenheit);
(3) The pressure at sea level is 29.92 inches Hg (1013.2 millibars);
(4) The temperature gradient from sea level to the altitude at which the temperature is − 56.5°C (−69.7°F) is −0.00198°C (−0.003566°F) per foot and zero above that altitude.

OAT — Outside Air Temperature is the free air static temperature, obtained either from inflight temperature indications adjusted for instrument error and compressibility effects, or ground meteorological sources.

Indicated Pressure Altitude — The number actually read from an altimeter when the barometric subscale has been set to 29.92 inches of mercury (1013.2 millibars).

Pressure Altitude — Altitude measured from standard sea level pressure (29.92 in. Hg) by a pressure (barometric) altimeter. It is the indicated pressure altitude corrected for position and instrument error. In this handbook, altimeter instrument errors are assumed to be zero. Position errors may be obtained from the Altimeter Correction graph.

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

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. Settings are reflected by readings on the manifold pressure gage.

Propeller Control — This control requests the propeller governor to maintain engine/propeller rpm at a selected value by controlling propeller blade angle.

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 mixtures for various power settings.

Tachometer — Indicates the rpm of the engine/propeller.

Propeller Governor — Regulates the rpm of the engine/propeller by increasing or decreasing the propeller pitch through a pitch change mechanism in the propeller hub.

AIRPLANE PERFORMANCE AND FLIGHT PLANNING

Climb Gradient — The ratio of the change in height during a portion of 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 & BALANCE

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.

Arm — The horizontal distance from the reference datum to the center of gravity (C.G.) of an item.

Moment — The product of the weight of an item multiplied by its arm (Moment divided by a constant is used to simplify balance calculations by reducing the number of digits.)

Airplane Center of Gravity (CG) — The point at which an airplane would balance if suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane.

CG Arm	The arm obtained by adding the airplane's individual moments and dividing the sum by the total weight.
CG Limits	The extreme center of gravity locations within which the airplane must be operated at a given weight.
Usable Fuel	Fuel available for flight planning.
Unusable Fuel	Fuel remaining after a runout test has been completed in accordance with governmental regulations.
Standard Empty Weight	Weight of a standard airplane including unusable fuel, full operating fluids and full oil.
Basic Empty Weight	Standard Empty Weight plus optional equipment.
Payload	Weight of occupants, cargo and baggage.
Useful Load	Difference between Take-off Weight (or Ramp Weight, if applicable) and Basic Empty Weight.
Maximum Ramp Weight	Maximum weight approved for ground maneuvering. (It includes weight of start, taxi, and take-off fuel.)
Maximum Take-off Weight	Maximum weight approved for liftoff.
Maximum Landing Weight	Maximum weight approved for the landing touchdown.

Maximum Zero Fuel Weight — Maximum weight exclusive of usable fuel.

Tare — The weight of chocks, blocks, stands, etc., used on the scales when weighing an airplane.

Jack Points — Points on the airplane identified by the manufacturer as suitable for supporting the airplane for weighing or other purposes.

SECTION II

LIMITATIONS

TABLE OF CONTENTS

The limitations included in this section have been approved by the Federal Aviation Administration and must be observed in the operation of this airplane.

AIRSPEED LIMITATIONS

SPEED	CAS		IAS		REMARKS
	KTS	MPH	KTS	MPH	
Never Exceed V_{NE}	168	193	168	193	Do Not Exceed This Speed in Any Operation.
Maximum Structural Cruising V_{NO} or V_C	143	165	143	165	Do Not Exceed This Speed Except in Smooth Air and Then Only With Caution.
Maneuvering V_A	125	144	125	144	Do Not Make Full or Abrupt Control Movements Above This Speed.
Maximum Flap Extension/ Extended V_{FE}	96	110	96	110	Do Not Extend Flaps or Operate With Flaps Extended Above This Speed.
Maximum Landing Gear Operating/Extended V_{LO}/V_{LE}	135	155	135	155	Do Not Extend, or Operate With Gear Extended Above This Speed, except in Emergency.
Maximum Landing Gear Retraction	113	130	113	130	Do Not Retract Landing Gear Above This Speed.

***AIRSPEED INDICATOR MARKINGS**

MARK-ING	CAS		IAS		SIGNIFI-CANCE
	KTS	MPH	KTS	MPH	
White Arc	55-96	63-110	60-96	69-110	Full Flap Operating Range
Green Arc	62-143	71-165	65-143	75-165	Normal Operating Range
Yellow Arc	143-168	165-193	143-168	165-193	Operate With Caution, Only In Smooth Air
Red Line	168	193	168	193	Maximum Speed For ALL Operations

*The limits of the arcs on the airspeed indicator are marked in CAS values.

POWER PLANT LIMITATIONS

ENGINE

One Avco Lycoming engine model IO-360-A1B6

Take-off and Maximum Continuous
Power..... Full Throttle at 2700 RPM

OPERATING LIMITATIONS

Oil Temperature ..... 245°F
Oil Pressure
Minimum ..... 25 psi
Maximum ..... 100 psi
Fuel Pressure
Minimum ..... 0.5 psi
Maximum ..... 12.0 psi
Mixture - set per leaning instructions on Performance Graphs.

FUEL GRADES

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

FUEL ADDITIVES

ALCOR TCP concentrate, or equivalent, mixed according to 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

Hartzell constant speed, two-blade aluminum alloy propeller using HC-M2YR-1BF hub with F7666A blades and A2298-2P spinner. Pitch settings at 30-inch station, Low 13° ± .1°, High 27° to 31°. Diameter is 76 inches, no cutoff permitted. No extended operation is permitted between 2100 and 2350 rpm.

POWER PLANT INSTRUMENT MARKINGS

OIL TEMPERATURE

Caution (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 FLOW

Minimum (Red Line)	0.5 psi
Operating Range (Green Arc)	4.0 to 16.6 gph
Maximum (Red Line)	12.0 psi

TACHOMETER

No Extended Operation (Red Arc)	2100 to 2350 rpm
Operating Range (Green Arc)	2350 to 2700 rpm
Maximum RPM (Red Line)	2700 rpm

MANIFOLD PRESSURE

Operating Range (Green Arc)	15 to 28.7 in. Hg

MISCELLANEOUS INSTRUMENT MARKINGS

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

FUEL QUANTITY
Yellow Arc ..... E to 3/8 Full

WEIGHT LIMITS

Maximum Ramp Weight..... 2758 lbs
Maximum Take-off Weight..... 2750 lbs
Maximum Landing Weight ..... 2750 lbs
Zero Fuel Weight .....No Structural Limitation
Maximum Baggage Compartment Load ..... 270 lbs

CG LIMITS (Gear Down)

Forward: 110 inches aft of datum to 2375 pounds with straight line variation to 113 inches at 2750 pounds

Aft: 118.3 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 is a normal category airplane. Spins are prohibited. No acrobatic maneuvers are approved except those listed below. Maximum slip duration is 30 seconds.

APPROVED MANEUVERS (2750 POUNDS)

MANEUVER	*ENTRY SPEED*
(Bank angles, no more than 60°)	
Chandelle	125 knots/144 mph
Steep Turn	125 knots/144 mph
Lazy Eight	125 knots/144 mph
Stall (Except Whip)	Use slow deceleration

FLIGHT LOAD FACTORS (2750 POUNDS)

Flight maneuvering load factor, flaps up..... + 3.8 - 1.9G
Flight maneuvering load factor, flaps down..... + 1.9G

TAKEOFF

Set 15° Flaps for Takeoff.

MINIMUM FLIGHT CREW

One (1) Pilot

KINDS OF OPERATION LIMITS

1. VFR day and night
2. IFR day and night

EQUIPMENT REQUIRED FOR VARIOUS CONDITIONS OF FLIGHT

Federal Aviation Regulations (91.3(a), 91.24, 91.25, 91.32, 91.33, 91.52, 91.90, 91.97, 91.170) specify the minimum numbers and types of airplane instruments and equipment which must be installed and operable for various kinds of flight conditions. This includes VFR day, VFR night, IFR day, and IFR night.

Regulations also required that all airplanes be certificated by the manufacturer for operations under various flight conditions. At certification, all required equipment must be in operating condition and should be maintained to assure continued airworthiness. If deviations from the installed equipment were not permitted, or if the operating rules did not provide for various flight conditions, the airplane could not be flown unless all equipment was operable. With appropriate limitations, the operation of every system or component installed in the airplane is not necessary, when remaining operative instruments and equipment provide for continued safe operation. Operation in accordance with limitations established to maintain airworthiness can permit continued or uninterrupted operation of the airplane temporarily.

For the sake of brevity, the Required Equipment Listing does not include obviously required items such as wings, rudders, flaps, engine, landing gear, etc. Also the list does not include items which do not affect the airworthiness of the airplane such as entertainment systems, passenger convenience items, etc. However, it is important to note that ALL ITEMS WHICH ARE RELATED TO THE AIRWORTHINESS OF THE AIRPLANE AND NOT INCLUDED ON THE LIST ARE AUTOMATICALLY REQUIRED TO BE OPERATIVE.

To enable the pilot to rapidly determine the FAA equipment requirements necessary for a flight into specific conditions, the following equipment requirements and exceptions are presented. It is the final responsibility of the pilot to determine whether the lack of, or inoperative status of a piece of equipment on the airplane, will limit the conditions under which the pilot may operate the airplane.

WARNING

FLIGHT IN KNOWN ICING CONDITIONS IS PROHIBITED.

LEGEND

Numbers refer to quantities required

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

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

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SYSTEM and/or COMPONENT	VFR Day	VFR Night	IFR Day	IFR Night	Remarks and/or Exceptions
GENERAL					
OVERWATER FLIGHT	*	*	*	*	*Per FAR 91.33
COMMUNICATIONS					
VHF communications system	*	*	*	*	*Per FAR 91.33
ELECTRICAL POWER					
Battery System	1	1	1	1	
Alternator	1	1	1	1	
Starter Engaged Warning Light (MC-731 and after)	1	1	1	1	May be inoperative provided ammeter is operative and monitored

EQUIPMENT AND FURNISHING						
Seat belts and Shoulder harnesses	1	1	1	1	- Per Person or Per FAR 91.33	
Emergency locator transmitter	1	1	1	1	- Per FAR 91.52	
FIRE PROTECTION						
Portable fire extinguisher	*	*	*	*	- *Optional	

SYSTEM and/or COMPONENT	VFR Day	VFR Night	IFR Day	IFR Night	Remarks and/or Exceptions
FLIGHT CONTROLS					
Stabilator trim tab indicator	1	1	1	1	- May be inoperative for ferry flight provided tabs are visually checked in the neutral position prior to takeoff and checked for full range of operation.
Flap position indicator (On electric flap system)	1	1	1	1	- May be inoperative providing flap travel is visually inspected prior to takeoff.
Stall warning	1	1	1	1	-

FUEL EQUIPMENT						
Auxiliary fuel pump	1	1	1	1	-	
Engine driven fuel pump	1	1	1	1	-	
Fuel quantity indicator	2	2	2	2	-	One may be inoperative provided other side is operational and amount of fuel on board can be established to be adequate for the intended flight.
Fuel flow indicator	1	1	1	1	-	
ICE AND RAIN PROTECTION						
Emergency static air source	*	*	*	*	-	*Optional
Pitot heater	*	*	1	1	-	*Optional

SYSTEM and/or COMPONENT	VFR Day	VFR Night	IFR Day	IFR Night	Remarks and/or Exceptions
LANDING GEAR					
Landing gear motor	1	1	1	1	- May be inoperative provided operations are continued only to a point where repairs can be accomplished. Gear must be left down.
Landing gear position lights	4	4	4	4	-
Landing gear warning horn	1	1	1	1	-

LIGHTS					
Cockpit and instrument lights	-	*	-	*	- *Lights must be operative.
Taxi light	-	-	-	-	-
Landing light	-	*	-	*	- *Per FAR 91.33
Rotating beacon	*	1	*	1	- *Optional
Position light	-	3	-	3	
NAVIGATION INSTRUMENTS					
Altimeter	1	1	1	1	-
Airspeed indicator	1	1	1	1	-
Vertical speed	-	-	-	-	-
Magnetic compass	1	1	1	1	-
Attitude indicator	-	-	1	1	-
Turn and slip indicator	-	-	1	1	-
Directional gyro	-	-	1	1	-
Clock	-	-	1	1	-
Transponder	*	*	*	*	- *Per FAR 91.24, 91.90, 91.97
Navigation equipment	-	-	*	*	- *Per FAR 91.33

SYSTEM and/or COMPONENT	VFR Day	VFR Night	IFR Day	IFR Night	Remarks and/or Exceptions
PNEUMATIC					
Vacuum system for instrument air	-	-	1	1	-
Vacuum gage	-	-	1	1	-
ENGINE INDICATING INSTRUMENTS					
Engine tachometer indicator	1	1	1	1	-
Exhaust gas temperature indicator	*	*	*	*	- *Optional
Manifold pressure indicator	1	1	1	1	-

ENGINE OIL INSTRUMENTS						
Oil pressure indicator	1	1	1	1	-	
Oil temperature indicator	1	1	1	1	-	

FUEL

TOTAL FUEL with left and right wing fuel systems full:

Capacity..... 59.8 gallons*
Usable ..... 57.2 gallons

*Value given is nominal. Tank capacity will vary with temperature and manufacturing tolerances.

FUEL MANAGEMENT

Do not take off when Fuel Quantity indicators indicate in the yellow band on either indicator.

Maximum slip duration is 30 seconds.

PLACARDS

On Left Cabin Door (MC-533, MC-537 and after, CAS):

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	2750 LBS
REFER TO WEIGHT AND BALANCE DATA FOR LOADING INSTRUCTIONS	
FLIGHT MANEUVERING LOAD FACTOR	FLAPS UP +3.8 −1.9 DOWN +1.9
MAXIMUM MANEUVERING SPEED	125 KTS/144 MPH

NO ACROBATIC MANEUVERS
INCLUDING SPINS APPROVED

NO ACROBATIC MANEUVERS APPROVED
EXCEPT THOSE LISTED BELOW:

MANEUVER, BANK ANGLES NO MORE THAN 60°

	MAXIMUM ENTRY SPEED
CHANDELLES	125 KTS/144 MPH
LAZY EIGHTS	125 KTS/144 MPH
STEEP TURNS	125 KTS/144 MPH
STALLS (EXCEPT WHIP STALLS)	SLOW DECELERATION
NOTE: MAXIMUM ALTITUDE LOSS DURING STALL	300 FT

LANDING GEAR

MAXIMUM GEAR EXTENDED SPEED	135 KTS/155 MPH
MAXIMUM GEAR OPERATING SPEED EXTENSION	135 KTS/155 MPH
RETRACTION	113 KTS/130 MPH

On Flap Extension Handle (MC-533, MC-537 and after, CAS):

FLAPS PULL TO EXTEND, MAX SPEED 96 KTS/110 MPH

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

On Left Cabin Door (CAS):
(MC-449, MC-452 thru MC-536, except MC-533)

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		2750 LBS
REFER TO WEIGHT AND BALANCE DATA FOR LOADING INSTRUCTIONS		
FLIGHT MANEUVERING LOAD FACTOR	FLAPS UP	+3.8 −1.9
	DOWN	+1.9
MAXIMUM MANEUVERING SPEED		144 MPH

NO ACROBATIC MANEUVERS INCLUDING SPINS APPROVED

NO ACROBATIC MANEUVERS APPROVED EXCEPT THOSE LISTED BELOW:

MANEUVER. BANK ANGLES NO MORE THAN 60

	MAXIMUM ENTRY SPEED
CHANDELLES	144 MPH
LAZY EIGHTS	144 MPH
STEEP TURNS	144 MPH
STALLS (EXCEPT WHIP STALLS)	SLOW DECELERATION
NOTE: MAXIMUM ALTITUDE LOSS DURING STALL	300 FT

LANDING GEAR

MAXIMUM GEAR EXTENDED SPEED		155 MPH
MAXIMUM GEAR OPERATING SPEED	EXTENSION	155 MPH
	RETRACTION	130 MPH

On Flap Extension Handle (CAS):
(MC-449, MC-452 thru MC-536, except MC-533)

FLAPS PULL TO EXTEND, MAX SPEED 110 MPH

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

On Inside of Emergency Gear Extension Access Door:

(MC-533, MC-537 and after)

EMERGENCY LANDING GEAR EXTENSION

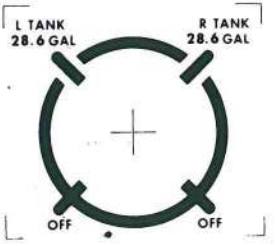
1. Landing Gear Motor Circuit Breaker—OFF(Pull)
2. Gear Position Switch—DOWN
3. Throttle—MAXIMUM 12 inches of mercury (Manifold Press.)
4. Indicated Airspeed—87 KTS/100 MPH
5. Emergency Extension Valve—OPEN (Use Handle—Turn Counter Clockwise)

(MC-449, MC-452 thru MC-536, except MC-533)

EMERGENCY LANDING GEAR EXTENSION

1. Landing Gear Motor Circuit Breaker—OFF (Pull)
2. Gear Position Switch—DOWN
3. Throttle—MAXIMUM 12 inches of mercury (Manifold Press)
4. Indicated Airspeed—100 MPH
5. Emergency Extension Valve—OPEN (Use Handle—Turn Counter Clockwise)

On Fuel Selector Panel (prior to MC-696):



OR

On Fuel Selector Panel (Serials MC-696 and after, or earlier airplane serials which have complied with BEECHCRAFT Service Instructions No. 1095):

Adjacent to Engine Instrument Cluster:

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

On Upper Right Instrument Panel:

RAISE FLAPS

TO INCREASE BRAKE EFFECTIVENESS

Temporary Change to the Pilot's Operating Handbook *and* FAA Approved Airplane Flight Manual

P/N 169-590025-15BTC1

Publication Affected	C24R Pilot's Operating Handbook and FAA Approved Airplane Flight Manual (P/N 169-590025-15B, Reissued November, 1980 or Subsequent)
Airplane Serial Numbers Affected	MC-449, MC-452 and After
Description of Change	The addition of a placard to the fuel selector to warn of the no-flow condition that exists between the fuel selector detents.
Filing Instructions	Insert this temporary change into the C24R Pilot's Operating Handbook and FAA Approved Airplane Flight Manual immediately following page 2-24 (Section II, LIMITATIONS) and retain until rescinded or replaced.

LIMITATIONS

PLACARDS

Located On The Face Of The Fuel Selector Valve, For Those Airplanes In Compliance With S.B. 2670:

WARNING - POSITION SELECTOR IN DETENTS ONLY - NO FUEL FLOW TO ENGINE BETWEEN DETENTS

Approved:

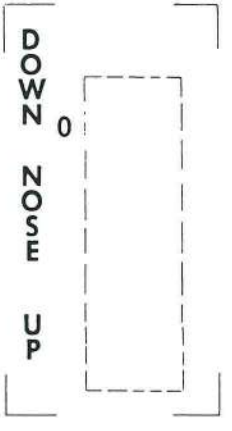
A. C. Jackson

A.C. Jackson
Raytheon Aircraft Company
DOA CE-2

Adjacent to Flap Switch or Left of Quadrant Control Panel:

USE 15° FLAPS
FOR TAKE OFF

On Pedestal Between Front Seats:



On Floorboard in Front of Pilot's Seat:

EMERGENCY
GEAR EXTENSION
—ACCESS DOOR—

On Left Cabin Door:

EMERGENCY GEAR
EXTENSION HANDLE

Lower Sidewall Adjacent to Pilot (when installed):

On Upper Right Instrument Panel:

IN CASE OF FIRE IN ENGINE
COMPARTMENT CLOSE
DEFROST & CABIN AIR VALVE

On Lower Left Sidewall Panel:

TO LEVEL AIRCRAFT – LEVEL
BAGGAGE COMPARTMENT FLOOR

On Baggage Compartment Door:

BAGGAGE COMPARTMENT

270 POUNDS

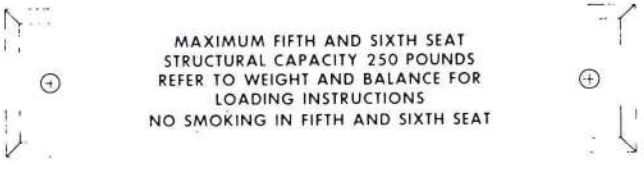
MAXIMUM CAPACITY

On Aft Cabin Bulkhead:

HAT SHELF

NO HEAVY OBJECTS

On Bulkhead Below Hat Shelf When 5th and 6th Seats are Installed:



On Upper Aft Corner of Each Cabin Door (Prior to MC-633), or on window (MC-633 and after):

INSTRUCTION-SHOULDER STRAP

1. OCCUPANTS SHORTER THAN 4 FT. 7 IN. **DO NOT** USE SHOULDER STRAP.
2. PLACE SEAT BACK IN THE UPRIGHT POSITION DURING TAKEOFF AND LANDING.

Adjacent to 5th and 6th Seats When Installed:

INSTRUCTION-SHOULDER STRAP

1. OCCUPANTS SHORTER THAN 4 FT. 7 IN. **DO NOT** USE SHOULDER STRAP.

On Right Sidewall Below Third Window:

NO SMOKING IN FIFTH AND SIXTH SEAT

On Second Window Frame on Right Side When Required by Weight and Balance Data:

BAGGAGE, CARGO OR FAMILY SEATS
LOAD IN ACCORDANCE
WITH WEIGHT & BALANCE DATA
MAXIMUM SEAT CAPACITY _____ POUNDS

On Baggage Door Adjacent to Handle:

SECTION III

EMERGENCY PROCEDURES

TABLE OF CONTENTS

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

EMERGENCY AIRSPEEDS

Emergency Descent ..... 135 KTS/155 MPH

Glide ..... 91 KTS/105 MPH

Emergency Landing Approach..... 74 KTS/85 MPH

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

NOTE

On serials MC-696 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.

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 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
2. Fuel Boost Pump - ON
3. Fuel Selector Valve - SELECT OTHER TANK (feel for 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.

If No Restart:

1. Establish Maximum Glide Configuration
2. Throttle - CLOSED
3. Fuel Selector Valve - OFF
4. Mixture - IDLE CUT-OFF
5. Magneto/Start Switch - OFF

When certain of reaching the selected landing site:

6. Airspeed - NORMAL APPROACH SPEED
7. Flaps - AS REQUIRED
8. Landing Gear - DOWN or UP (depending on terrain)
9. Battery switch, alternator switch, and Fuel Boost Switch - OFF

ENGINE DISCREPANCY CHECKS

CONDITION: ROUGH RUNNING ENGINE

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

CONDITION: LOSS OF ENGINE POWER

1. Fuel Flow Gage - CHECK

If fuel flow is abnormally low:

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

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

If tank being used is empty:

Fuel Selector Valve - SELECT OTHER FUEL TANK (feel for detent, and check visually)

AIR START PROCEDURE

1. Fuel Selector Valve - SELECT TANK MORE NEARLY FULL (Check to feel detent and check visually.)
2. Throttle - AS REQUIRED
3. Mixture - FULL RICH
4. Propeller - AS REQUIRED
5. Fuel Boost Pump - ON OR OFF as required
6. Magneto/Start Switch - BOTH

NOTE

When engine starts, adjust throttle, propeller, and mixture controls.

ENGINE FIRE

IN FLIGHT

The red FIREWALL AIR 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, on the left of the power control quadrant, must be pulled aft to close. The control labeled DEFROST, to the right of the power control quadrant, must be pushed forward 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. Propeller - FULL FORWARD (High rpm position)
4. Throttle - CLOSE
5. Cabin Air Control (Red Knob) - pull OFF
6. Defrost Valve (Red Knob) - push OFF
7. Alternator Switch - OFF
8. Battery Switch - OFF (Extending the gear can be accomplished manually if desired)
9. Magneto/Start Switch - OFF
10. Do not attempt to restart engine

ON THE GROUND

1. Fuel Selector Valve - OFF
2. Throttle - CLOSE
3. Mixture - IDLE CUT-OFF
4. Battery Switch and Alternator Switch - OFF
5. Magneto/Start Switch - OFF
6. Fire Extinguisher - USE TO EXTINGUISH FIRE

EMERGENCY DESCENT

1. Propeller - FULL FORWARD (High rpm position)
2. Throttle - IDLE
3. Landing Gear - DOWN
4. Airspeed - ESTABLISH 135 KTS/155 MPH

MAXIMUM GLIDE CONFIGURATION

1. Landing Gear - UP (Landing gear safety switch OFF if system is installed)
2. Flaps - UP
3. Propeller - FULL AFT (Low rpm position)
4. Airspeed - Establish 91 KTS/105 MPH

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

LANDING EMERGENCIES

LANDING WITHOUT POWER

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

1. Airspeed - EMERGENCY APPROACH SPEED
2. Fuel Selector Valve - OFF
3. Mixture - IDLE CUT-OFF
4. Flaps - AS REQUIRED
5. Landing Gear - DOWN or UP, DEPENDING ON TERRAIN
6. Battery Switch and Alternator Switch - OFF

LANDING GEAR RETRACTED - WITH POWER

If possible, choose firm sod or foamed runway. Make a normal approach, using flaps as necessary. When sure of reaching the selected landing spot:

1. Throttle - CLOSED
2. Airspeed - NORMAL APPROACH SPEED
3. Fuel Selector Valve - OFF
4. Mixture - IDLE CUT-OFF
5. Flaps - AS REQUIRED
6. Battery Switch and Alternator Switch - OFF
7. Keep wings level during touchdown
8. Get clear of airplane as soon as possible after it stops:

SYSTEMS EMERGENCIES

PROPELLER OVERSPEED

1. Throttle - RETARD TO MINIMUM CRUISE RPM
2. Airspeed - REDUCE (Initiate climb to load propeller if time permits.)
3. Oil Pressure - CHECK

WARNING

If loss of oil pressure was the cause of overspeed, the engine may seize after a short period of operation. IF ENGINE FAILS:

4. Land - SELECT NEAREST SUITABLE SITE and follow ENGINE FAILURE AFTER LIFTOFF AND IN FLIGHT procedures.

STARTER ENGAGED WARNING LIGHT ILLUMINATED (If Installed)

The STARTER ENGAGED warning light illuminates whenever the starter is engaged. If this light remains illuminated after the 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 & ALT and ALT Switches - OFF
2. Do Not Take Off.

If light remains illuminated in flight after air start:

1. BATTERY & ALT and ALT Switches - 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:

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

If alternator-out condition persists:

2. ALT Switch - OFF
3. Nonessential Electrical Equipment - OFF to conserve battery power.

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) - DEPRESS AND MOVE IN DIRECTION OPPOSITE UNSCHEDULED PITCH TRIM.
3. Stabilator Trim ON-OFF Switch (on instrument panel) - OFF
4. Manual Stabilator Trim Control Wheel - RETRIM AS DESIRED

NOTE

Do not attempt to operate the electric trim system until the cause of the malfunction has been determined and corrected.

LANDING GEAR EMERGENCY EXTENSION

Emergency extension of the landing gear can be facilitated by first reducing airspeed to 87 KTS/100 MPH.

Then proceed as follows:

1. LDG GEAR MOTOR Circuit Breaker - OFF (PULL OUT)
2. Landing Gear Switch Handle - DOWN position
3. Throttle - 12 in. Hg (or less) of manifold pressure
4. Indicated Airspeed - 87 KTS/100 MPH
5. Emergency Extension Valve - OPEN (Use Emergency Gear Extension Wrench - Turn Counterclockwise)

WARNING

After landing do not move any landing gear controls or reset any switches or circuit breakers until airplane is on jacks, since failure may have been in the GEAR UP circuit and gear might retract on ground.

RETRACTING LANDING GEAR AFTER PRACTICE EMERGENCY EXTENSION

1. Emergency Extension Valve - CLOSE (Use Emergency Extension Wrench - Turn Clockwise)
2. LDG GEAR MOTOR Circuit Breaker - PUSH IN
3. Landing Gear Switch Handle - UP

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 (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.

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 PERFORMANCE Section

NOTE

The Emergency Static Air valve should be in the OFF-NORMAL position except in an emergency.

UNLATCHED DOOR IN FLIGHT

If the cabin door latch is not fully engaged, it may come unlatched in flight. This usually occurs during or just after takeoff. 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

SPINS ARE PROHIBITED. 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.

EMERGENCY SPEED REDUCTION

In an emergency, the landing gear may be used to create additional drag. Should disorientation occur under instrument conditions, the lowering of the landing gear will

reduce the tendency for excessive speed buildup. This procedure would also be appropriate for a non-instrument rated pilot who unavoidably encounters instrument conditions or in other emergencies such as severe turbulence.

If the landing gear is used at speeds higher than the maximum extension speed, the gear should be left down until landing. Inspection of the gear doors is required, in accordance with maintenance procedures, with repair if necessary.

SECTION IV
NORMAL PROCEDURES

TABLE OF CONTENTS

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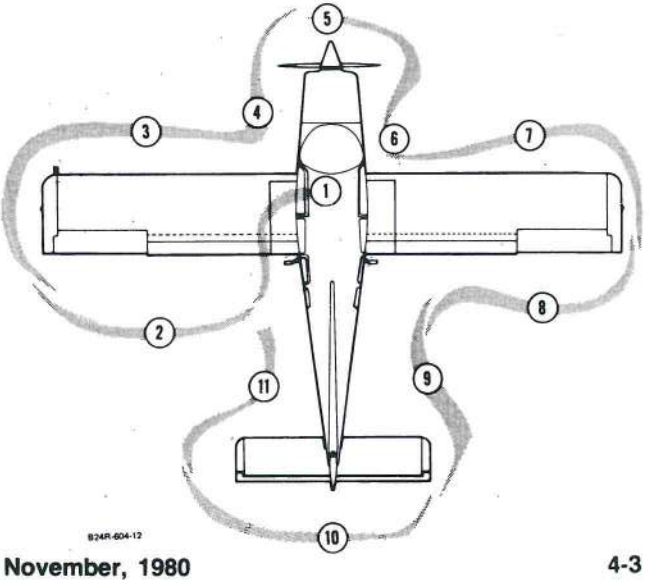
Airspeeds quoted in this section are indicated airspeeds (IAS)

SPEEDS FOR SAFE OPERATION

Cruise Climb	96 KTS/110 MPH
Best Angle-of-Climb (V_X)	71 KTS/82 MPH
Best Rate-of-Climb (V_Y)	85 KTS/98 MPH
Landing Approach	70 KTS/81 MPH
Balked Landing Climb	70 KTS/81 MPH
Maximum Demonstrated Crosswind Component	17 KTS/20 MPH
Maximum Turbulent Air Penetration Speed	125 KTS/144 MPH
Take-off Speeds	
Liftoff	66 KTS/76 MPH
50 Feet Above Runway	71 KTS/82 MPH

PREFLIGHT INSPECTION



1. *CABIN:*
   a. Parking Brake - SET
   b. Control Lock - REMOVE
   c. Landing Gear Handle - DOWN
   d. All Switches - OFF
   e. Flush-type Fuel Drain Tool - OBTAIN (refer to SYSTEMS DESCRIPTION Section for information pertaining to flush-type fuel drains)

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; Cap - SECURE

4. *LEFT LANDING GEAR:*
   a. Tire, Wheel and Brake - CHECK
   b. Fuel Sump - DRAIN (use fuel-drain tool)

5. *NOSE SECTION:*
   a. Left Cowl - SECURE
   b. Induction Air Intake - CLEAR; Filter - CHECK condition and security of attachment.
   c. Propeller - CHECK
   d. Tire and Nose Gear - CHECK
   e. Engine Oil - CHECK, Cap - SECURE
   f. Right Cowl - SECURE
   g. Fuel Strainer - DRAIN
   h. Nose Wheel Chocks - REMOVE

6. *RIGHT LANDING GEAR:*
   a. Fuel Sump - DRAIN (use fuel-drain tool)
   b. Wheel Well, Tire and Brake - CHECK

7. *RIGHT WING LEADING EDGE:*
   a. Fuel Tank - CHECK QUANTITY; Cap - SECURE
   b. Tie Down and Chocks - REMOVE
   c. Wing Tip - CHECK
   d. 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 - SECURE

BEFORE STARTING

1. Seats - POSITION AND LOCK; Seat Backs - UPRIGHT
2. Seat Belts and Shoulder Harnesses - FASTEN
3. Parking Brake - SET
4. All Avionics - OFF
5. Circuit Breakers - IN

6. Landing Gear Switch Handle - DOWN
7. Flaps - UP
8. Light Switches - AS REQUIRED
9. Electric Trim Switch - OFF
10. Battery Switch - ON
11. Alternator Switch - ON (If external power is used, turn Alternator Switch - 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 MC-696 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 quanity 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 regulator and associated electrical equipment from power fluctuations.

2. The airplane has a negative ground system. Connect the positive and negative leads of the external power cable to the corresponding positive and negative terminals of the auxiliary power source.
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

*NOTE - MC-449, MC-452 thru MC-673 are 14-volt systems. MC-674 and after are 28-volt systems.

ENGINE STARTING

1. Propeller - FULL FORWARD (high rpm)
2. Engine Start

CAUTION

Starter cranking period should be limited to a maximum of 30 seconds, with at least 2 minutes between cranking periods.

Cold Start:

a. Mixture - FULL RICH

b. Throttle - FAST IDLE position
c. Fuel Boost Pump - ON (Maximum 3 seconds, then OFF)
d. Magneto/Start Switch - START position (release to BOTH position when engine fires)

Hot Start:

a. Mixture - IDLE CUT-OFF
b. Throttle - FAST IDLE position
c. Magneto/Start Switch - ENGAGE
d. Mixture - ADVANCE MIXTURE SLOWLY until engine starts firing regularly.

Flooded Engine:

a. Mixture - IDLE CUT-OFF
b. Throttle - FULL OPEN
c. Magneto/Start Switch - ENGAGE
d. Mixture - ADVANCE MIXTURE SLOWLY as engine starts firing regularly.
e. Throttle - RETARD (to fast idle position)

3. External Power (if used) - DISCONNECT
4. Alternator Switch - ON
5. Oil Pressure - ABOVE RED RADIAL WITHIN THIRTY SECONDS
6. Warm-up - 1000 to 1200 RPM
7. Starter Engaged Warning Light (if installed) - 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 or 1200 rpm within two minutes with no additional electrical equipment on. If not, turn off the BATTERY & ALT and ALT Switches and do not take off.

8. Engine Instruments - CHECK
9. Throttle - IDLE
10. Parking Brakes - RELEASE

AFTER STARTING, AND TAXI

1. Brakes - RELEASE AND CHECK
2. Avionics Equipment - ON, AS REQUIRED
3. Lights - AS REQUIRED

CAUTION

Detuning the counterweight system of the engine can occur by rapid throttle operation, high rpm (low pitch) and low manifold pressure, or propeller feathering. (See latest revision of Lycoming Service Bulletin No. 245.)

BEFORE TAKEOFF

1. Parking Brake - SET
2. Seat Belts and Shoulder Harnesses - CHECK
3. Avionics - CHECK
4. Engine Instruments - CHECK
5. Flight Instruments - CHECK and SET
6. 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.
7. Throttle - 2000 RPM
8. Magnetos - CHECK at 2000 rpm, maximum drop of 100 rpm on each magneto, variance between individual magnetos should not exceed 25 rpm.

9. Propeller - EXERCISE to obtain 300 to 400 rpm drop; return to high rpm.
10. Throttle - FAST IDLE
11. Stabilator Trim - TAKE-OFF RANGE (within indicator band)
12. Flaps - CHECK and SET (15°)
13. Controls - CHECK FREE and for proper direction of travel
14. Mixture - FULL RICH (or as required by field elevation)
15. Doors and Window - SECURE
16. Parking Brake - RELEASE
17. Instruments - CHECK (Make final check of manifold pressure, fuel flow, and rpm at the start of the take-off run.)

TAKEOFF

Take-Off..... Full Throttle - 2700 RPM
Cruise Climb ..... Full Throttle - 2700 RPM

NOTE

Do not take off or land with the Fuel Boost Pump ON. The Fuel Boost Pump should be used only for starting and in the event of an emergency.

1. Power - SET take-off power and mixture before brake release.
2. Airspeed - ACCELERATE to and maintain take-off speed.
3. Landing Gear - RETRACT when airplane is positively airborne and insufficient runway remains for a landing.
4. Airspeed - ESTABLISH DESIRED CLIMB SPEED when clear of obstacles.

CLIMB

1. Flaps - UP
2. Power - AS REQUIRED
3. Mixture - LEAN AS REQUIRED
4. Temperature - MONITOR

CRUISE

1. Power - SET AS DESIRED (Use tables in Performance Section)
2. Mixture - LEAN AS REQUIRED

LEANING MIXTURE 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 at which the temperature peaks and starts to fall.

   a. CRUISE (LEAN) MIXTURE - Enrich mixture (push mixture control forward) until EGT indicator shows a drop of 25°F to 50°F on rich side of peak.

   b. BEST POWER MIXTURE - Enrich mixture (push mixture control forward) until EGT indicator shows a drop of 75°F to 100°F on rich side of peak.

CAUTION

Do not continue to lean mixture beyond the point necessary to establish peak temperature. Continuous operation is recommended at 25°F or below peak EGT only on rich side of peak.

2. Changes in altitude and power setting require EGT to be rechecked and mixture reset.

3. A mixture resulting in an EGT 25°F on the rich side of peak should also result in fuel flow and TAS values approximately equal to those presented in the Cruise Power Settings tables in the PERFORMANCE Section. If not, the values derived from the Range, Endurance, and Cruise Speeds charts must be revised accordingly. In very cold weather, EGT's 25°F rich of peak may not be obtainable.

DESCENT

1. Altimeter - SET
2. Power - AS REQUIRED (avoid prolonged idle settings and low cylinder head temperatures)
3. 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)
4. Landing Gear - DOWN and CHECK. (Observe maximum extension speed.)
5. Landing and Taxi Lights - AS REQUIRED
6. Flaps - DOWN (Observe maximum extension speed)

WARNING

The distance for a flaps-up landing will be greater than for a flaps-down landing.

7. Airspeed - ESTABLISH LANDING APPROACH SPEED
8. Propeller - FULL FORWARD (High rpm position)

BALKED LANDING

1. Mixture - FULL RICH (or as required by field elevation).
2. Propeller - FULL FORWARD (High rpm)
3. Power - FULL THROTTLE, 2700 RPM
4. Landing Gear - UP
5. Airspeed - 70 KTS/81 MPH until clear of obstacles, then TRIM TO BEST RATE-OF-CLIMB SPEED
6. Flaps - UP

AFTER LANDING

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

SHUTDOWN

1. Parking Brakes - SET
2. Electrical and Avionics Equipment - OFF
3. Throttle - CLOSE
4. Mixture - IDLE CUT-OFF
5. Magneto/Start Switch - OFF, after engine stops
6. BATTERY & ALT Switch - OFF
7. ALT Switch - OFF
8. Control Lock - INSTALL
9. Install wheel chocks and release parking brakes if the airplane is to be left unattended.

INTENTIONALLY LEFT BLANK

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, 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.

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, engine sump and propeller hub 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. Exercise the propeller several times to remove cold oil from the pitch change mechanism. The propeller should also be cycled occasionally in flight.

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:

71.7 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 V

PERFORMANCE

TABLE OF CONTENTS

SUBJECT *PAGE*

INTRODUCTION TO PERFORMANCE AND FLIGHT PLANNING

The graphs and tables in this section present performance information for flight planning at various parameters of weight, power, altitude and temperature. Examples have been presented on all performance graphs. In addition, the calculations for flight time, block speed and fuel required for a proposed flight are detailed below. All examples and calculations utilize the following conditions:

CONDITIONS

At Denver:

Outside Air Temperature ..... 15°C (59°F)
Field Elevation ..... 5330 ft
Altimeter Setting ..... 29.60 in. Hg
Wind ..... 270° at 10 kts
Runway 26L length ..... 10,010 ft

Route of Trip

★DEN-V81-AMA

For VFR Cruise at 11,500 feet

ROUTE SEGMENT	MAGNETIC COURSE	DIST NM	WIND 11,500 FEET DIR/KTS	OAT 11,500 FEET °C	ALT SETTING IN. HG
DEN-COS	161°	55	010/30	-5	29.60
COS-PUB	153°	40	010/30	-5	29.60
PUB-TBE	134°	74	100/20	0	29.56
TBE-DHT	132°	87	200/20	9	29.56
DHT-AMA	125°	65	200/20	10	29.56

★REFERENCE: Enroute Low Altitude Chart L-6

At Amarillo:

Outside Air Temperature	25°C (77°F)
Field Elevation	3605 ft
Altimeter Setting	29.56 in. Hg
Wind	180° at 14 kts
Runway 21 Length	13,500 ft

To determine pressure altitude at origin and destination airports, add 100 feet to field elevation for each .1 in. Hg below 29.92, and subtract 100 feet from field elevation for each .1 in. Hg above 29.92.

Pressure Altitude at DEN:

29.92 - 29.60 = .32 in. Hg
The pressure altitude at DEN is 320 feet above the field elevation.
5330 + 320 = 5650 ft

Pressure Altitude at AMA:

29.92 - 29.56 = .36 in. Hg
The pressure altitude at AMA is 360 feet above the field elevation.
3605 + 360 = 3965 ft

NOTE

For flight planning, the difference between cruise altitude and cruise pressure altitude has been ignored.

Calculations for flight time, block speed and fuel requirement:

Cruise Climb:

Enter the graph for TIME, FUEL, AND DISTANCE TO CLIMB at 15°C to 5650 ft and to 2750 lbs. Enter at −5°C to 11,500 ft and to 2750 lbs. Read:

Time to Climb = 23-8 = 15 min
Fuel Used to Climb = 28.5-11.5 = 17.0 lbs
Distance Traveled = 40-13 = 27 N.M.

The temperatures for cruise are presented for a standard day (ISA); 20°C (36°F) above a standard day (ISA + 20°C); and 20°C (36°F) below a standard day (ISA − 20°C). These should be used for flight planning. The IOAT values are true temperature values which have been adjusted for the compressibility effects. IOAT should be used for setting cruise power while enroute.

Enter the graph for ISA CONVERSION at 11,500 feet and the temperature for the route segment:

DEN-PUB	OAT	=	−5°C
	ISA Condition	=	ISA + 3°C
PUB-TBE	OAT	=	0°C
	ISA Condition	=	ISA + 8°C
TBE-DHT	OAT	=	9°C
	ISA Condition	=	ISA + 17°C
DHT-AMA	OAT	=	10°C
	ISA Condition	=	ISA + 18°C

Enter the CRUISE POWER SETTINGS table for 75 percent maximum continuous power (or full throttle) – 2700 RPM, at 11,000 ft, 12,000 ft, ISA and ISA + 20°C

	TEMPERATURE					
	ISA			ISA + 20°C		
ALTITUDE FEET	MAN. PRESS. IN. HG	FUEL FLOW GPH	TAS KNOTS	MAN. PRESS. IN. HG	FUEL FLOW GPH	TAS KNOTS
11000	20.0	9.8	136	20.0	9.5	136
12000	19.2	9.7	134	19.2	9.3	134

Interpolate for 11,500 feet and the temperature for the appropriate route segment. Results of the interpolations are:

ROUTE SEGMENT	MAN. PRESS. IN. HG	FUEL FLOW GPH	TAS KNOTS
DEN-PUB	19.6	9.7	135
PUB-TBE	19.6	9.6	135
TBE-DHT	19.6	9.5	135
DHT-AMA	19.6	9.4	135

NOTE

The above are exact values for the assumed conditions.

Time and fuel used were calculated as follows:

$$\text{Time} = \frac{\text{Distance}}{\text{Ground Speed}}$$

Fuel Used = (Time) (Fuel Flow)

Results are:

ROUTE SEGMENT	DISTANCE NM	EST GROUND SPEED KNOTS	TIME AT CRUISE ALTITUDE HRS: MIN	FUEL USED FOR CRUISE GAL
DEN-COS	*28	163	:10	1.6
COS-PUB	40	162	:15	2.4
PUB-TBE	74	121	:37	5.9
TBE-DHT	87	123	:42	6.7
DHT-AMA	65	125	:31	4.9

* Distance required to climb has been subtracted from segment distance.

TIME - FUEL - DISTANCE			
ITEM	TIME HRS: MINS	FUEL GAL	DISTANCE NM
Start, Runup, Taxi and Take-off acceleration	0:00	1.3	0
Climb	:15	2.8	27
Cruise	2:15	21.5	294
Total	2:30	25.6	321

Total Flight Time: 2 hours, 30 minutes

Block Speed: 321 NM ÷ 2 hours, 30 minutes = 128 knots

Reserve Fuel (45 minutes at 55 percent maximum continuous power)

> Enter the CRUISE POWER SETTINGS table for 55 percent MCP @ 2400 RPM. The fuel flow of 55 percent MCP is 8 gallons per hour.
> Reserve Fuel = (45 min) (8 GPH) = 6 gallons

Total Fuel = 25.6 + 6 = 31.6 gallons

The estimated landing weight is determined by subtracting the fuel required for the trip from the ramp weight:

> Assumed ramp weight = 2758 lbs
>
> Estimated fuel from DEN to AMA = (25.6 gal) (6 lbs/gal) = 153.6 lbs
>
> Estimated landing weight = 2758 − 154 = 2604 lbs

Examples have been provided on the performance graphs. The above conditions have been used throughout. Rate of climb was determined for the initial cruise altitude conditions.

COMMENTS PERTINENT TO THE USE OF PERFORMANCE GRAPHS

1. The example, in addition to presenting an answer for a particular set of conditions, also presents the order in which the graphs should normally be used, i.e., if the first item in the example is OAT, then enter the graph at the known OAT.

2. The reference lines indicate where to begin following guide lines. Always project to the reference line first, then follow the guide lines to the next known item.

3. Indicated airspeeds (IAS) were obtained by using the AIRSPEED CALIBRATION-NORMAL SYSTEM Graph.

4. The associated conditions define the specific conditions from which performance parameters have been determined. They are not intended to be used as instructions; however, performance values determined from charts can only be achieved if the specified conditions exist.

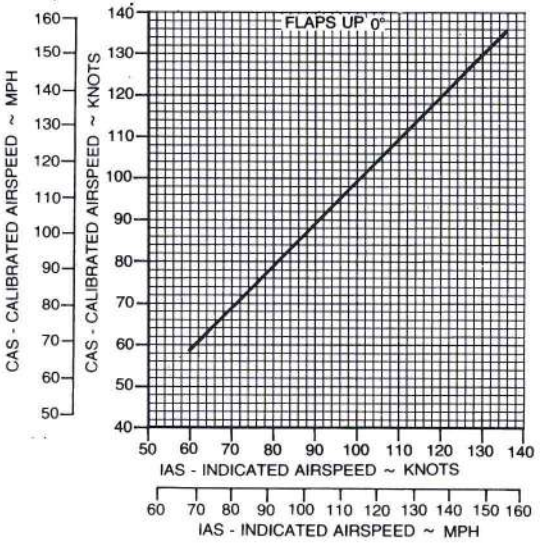
5. The full amount of usable fuel is available for all approved flight conditions.

6. Engine and component cooling has been demonstrated for temperatures up to 100°F at sea level with a 3.67°F per 1000 ft lapse rate. (ISA + 41°F).

AIRSPEED CALIBRATION - NORMAL SYSTEM

NOTE:

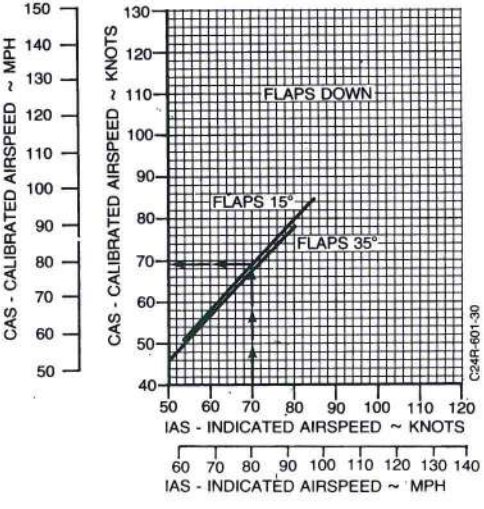
INDICATED AIRSPEED ASSUMES ZERO INSTRUMENT ERROR.



EXAMPLE:

IAS ..... 70 KTS (81MPH)
FLAPS ..... 15°

CAS ..... 69 KNOTS (79MPH)



AIRSPEED CALIBRATION-EMERGENCY SYSTEM

NOTE:
INDICATED AIRSPEED ASSUMES ZERO INSTRUMENT ERROR.

EXAMPLE:

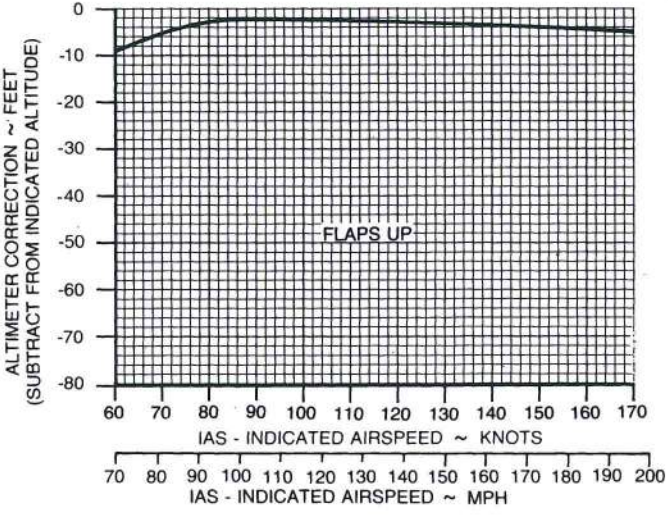
FLAPS	UP
IAS - EMERGENCY SYSTEM	125 KTS (144 MPH)
IAS - NORMAL SYSTEM	120 KTS (138 MPH)
CAS - (SEE AIRSPEED CALIBRATION NORMAL SYSTEM)	120 KTS (138 MPH)
FLAPS	UP
IAS - NORMAL SYSTEM	80 KTS (92 MPH)
IAS - EMERGENCY SYSTEM	85 KTS (98 MPH)

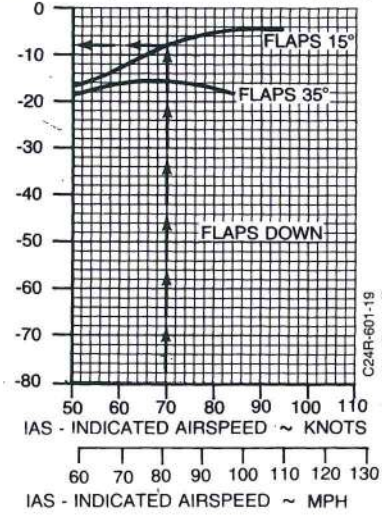
ALTIMETER CORRECTION—NORMAL SYSTEM

NOTE:
INDICATED AIRSPEED ASSUMES ZERO INSTRUMENT ERROR

EXAMPLE:

IAS	70 KTS (81 MPH)
FLAPS	15°
PRESSURE ALTITUDE	6000 FT
ALTIMETER CORRECTION	-8 FT
CORRECTED ALTITUDE	5992 FT



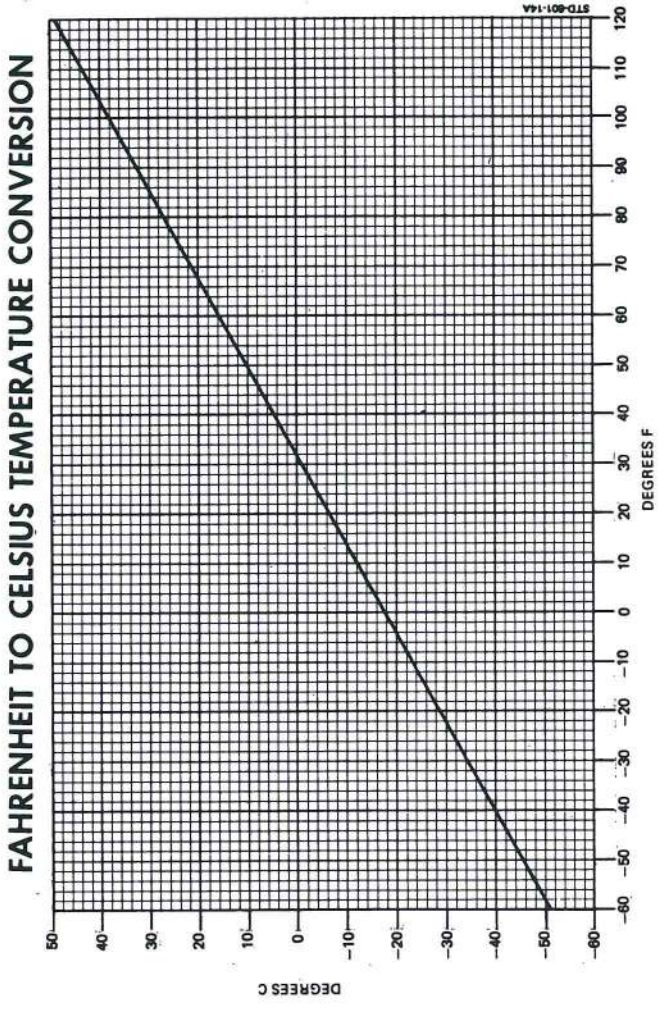


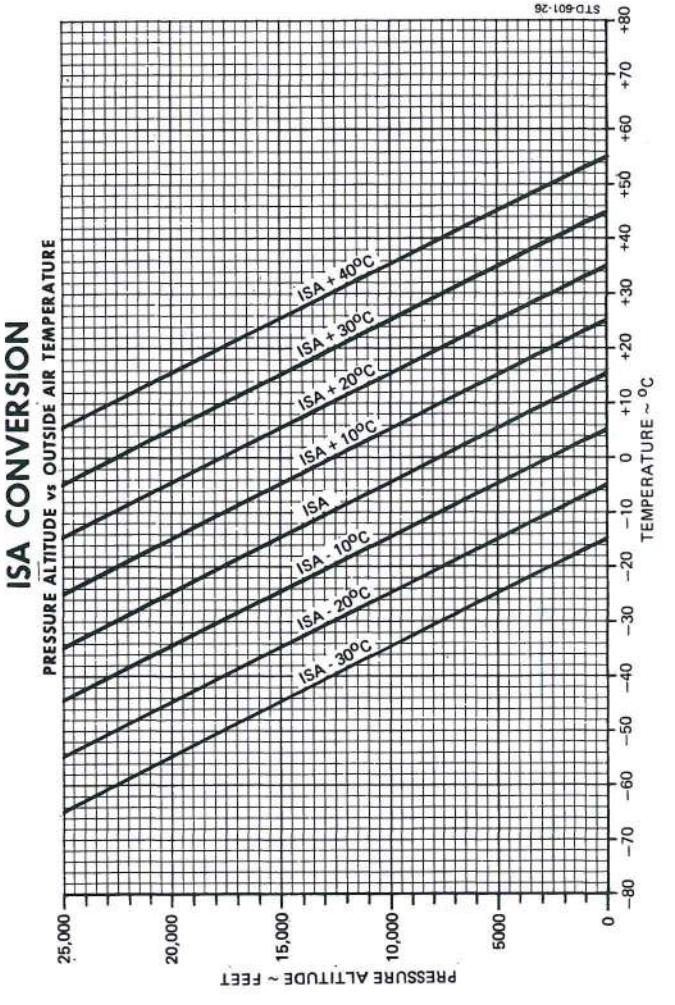
ALTIMETER CORRECTION - EMERGENCY SYSTEM

NOTE:
INDICATED AIRSPEED AND INDICATED ALTITUDE ASSUME ZERO INSTRUMENT ERROR.

EXAMPLE:

IAS	80 KTS (92 MPH)
FLAPS	DOWN (35°)
INDICATED ALTITUDE	6256 FT
ALTIMETER CORRECTION	-46 FT
CORRECTED ALTITUDE	6210 FT


FAHRENHEIT TO CELSIUS TEMPERATURE CONVERSION
STD-801-14A
DEGREES F
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
DEGREES C
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60


STD-601-26
ISA CONVERSION
PRESSURE ALTITUDE vs OUTSIDE AIR TEMPERATURE
ISA + 40°C
ISA + 30°C
ISA + 20°C
ISA + 10°C
ISA
ISA - 10°C
ISA - 20°C
ISA - 30°C
PRESSURE ALTITUDE ~ FEET
25,000
20,000
15,000
10,000
5000
0
TEMPERATURE ~ °C
+80
+70
+60
+50
+40
+30
+20
+10
0
−10
−20
−30
−40
−50
−60
−70
−80

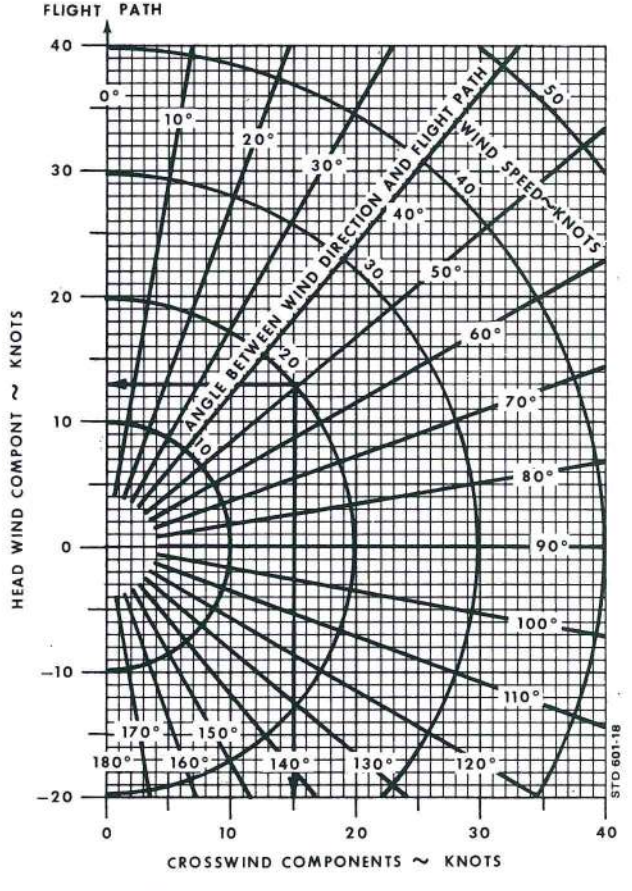
STALL SPEEDS
POWER IDLE
EXAMPLE:
WEIGHT . . . . . 2606 LBS
FLAPS . . . . . DN (35°)
ANGLE OF BANK . . . . . 15°
STALL SPEED (IAS) . . . . . 59 KTS (68 MPH)
NOTE:
MAXIMUM ALTITUDE LOSS EXPERIENCED WHILE CONDUCTING STALLS IN ACCORDANCE WITH CAM 3.120 WAS 300 FEET.
INDICATED AIRSPEED
CALIBRATED AIRSPEED
REFERENCE LINE
GEAR UP FLAPS UP
GEAR UP FLAPS UP
GEAR DOWN FLAPS 15°
GEAR DOWN FLAPS 15°
GEAR DOWN FLAPS 35°
GEAR DOWN FLAPS 35°
STALL SPEED ~ MPH
STALL SPEED ~ KNOTS
WEIGHT ~ POUNDS
ANGLE OF BANK ~ DEGREES
C24R-601-25

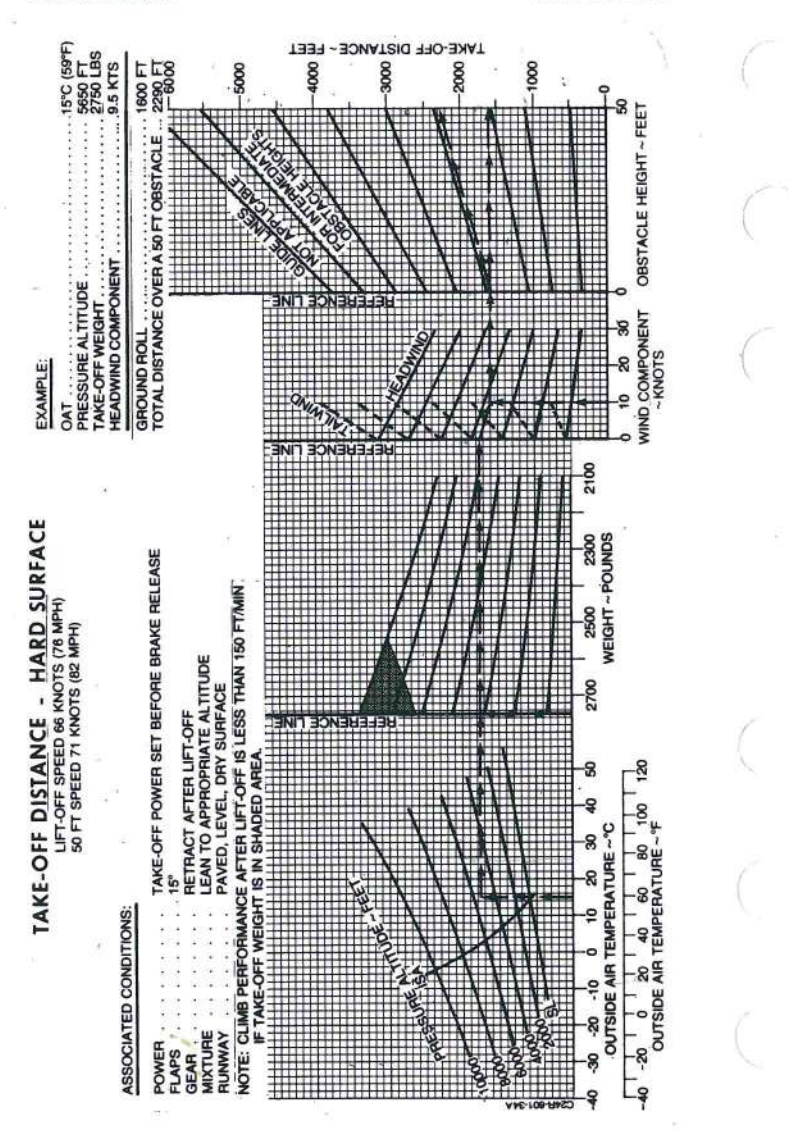
WIND COMPONENTS

Demonstrated Crosswind Component is 17 kts

EXAMPLE:

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




TAKE-OFF DISTANCE - HARD SURFACE
LIFT-OFF SPEED 66 KNOTS (76 MPH)
50 FT SPEED 71 KNOTS (82 MPH)
ASSOCIATED CONDITIONS:
POWER ..... TAKE-OFF POWER SET BEFORE BRAKE RELEASE
FLAPS ..... 15°
GEAR ..... RETRACT AFTER LIFT-OFF
MIXTURE ..... LEAN TO APPROPRIATE ALTITUDE
RUNWAY ..... PAVED, LEVEL, DRY SURFACE
NOTE: CLIMB PERFORMANCE AFTER LIFT-OFF IS LESS THAN 150 FT/MIN IF TAKE-OFF WEIGHT IS IN SHADED AREA.
EXAMPLE:
OAT ..... 15°C (59°F)
PRESSURE ALTITUDE ..... 5550 FT
TAKE-OFF WEIGHT ..... 2750 LBS
HEADWIND COMPONENT ..... 9.5 KTS
GROUND ROLL ..... 1800 FT
TOTAL DISTANCE OVER A 50 FT OBSTACLE ..... 2290 FT
PRESSURE ALTITUDE - FEET
OUTSIDE AIR TEMPERATURE - °C
OUTSIDE AIR TEMPERATURE - °F
WEIGHT - POUNDS
REFERENCE LINE
TAILWIND
HEADWIND
WIND COMPONENT - KNOTS
OBSTACLE HEIGHT - FEET
TAKE-OFF DISTANCE - FEET
GUIDE LINES
NOT APPLICABLE
FOR INTERMEDIATE
OBSTACLE HEIGHTS
C24R-801-3A

TAKE-OFF DISTANCE - GRASS SURFACE

LIFT-OFF SPEED 66 KNOTS (76 MPH)
50 FT SPEED 71 KNOTS (82 MPH)

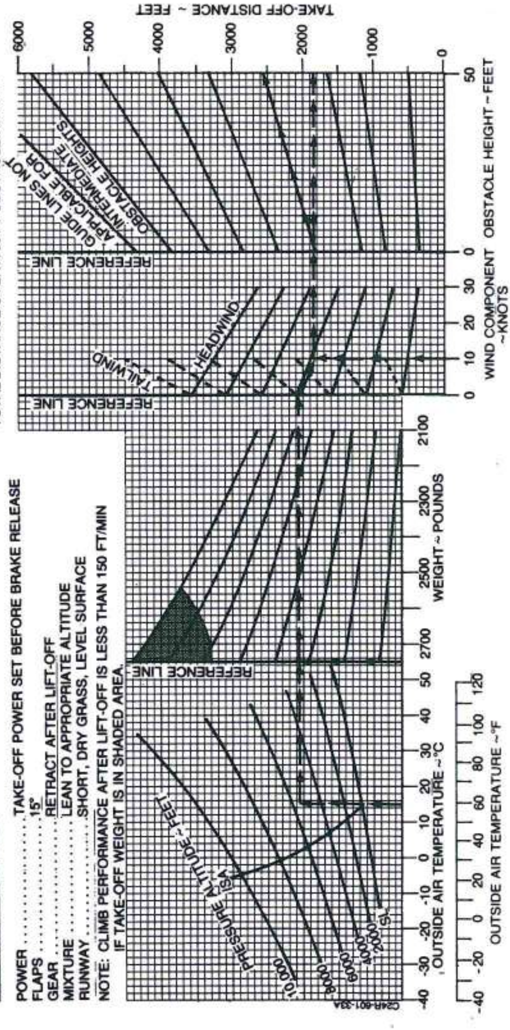
ASSOCIATED CONDITIONS:

POWER .... TAKE-OFF POWER SET BEFORE BRAKE RELEASE
FLAPS .... 15°
GEAR .... RETRACT AFTER LIFT-OFF
MIXTURE .... LEAN TO APPROPRIATE ALTITUDE
RUNWAY .... SHORT, DRY GRASS, LEVEL SURFACE

NOTE: CLIMB PERFORMANCE AFTER LIFT-OFF IS LESS THAN 150 FT/MIN IF TAKE-OFF WEIGHT IS IN SHADED AREA.

EXAMPLE:

OAT	15°C (59°F)
PRESSURE ALTITUDE	5650 FT
TAKE-OFF WEIGHT	2750 LBS
HEADWIND COMPONENT	9.5KTS
GROUND ROLL	1850 FT
TOTAL DISTANCE OVER A 50 FT OBSTACLE	2580 FT



NORMAL CLIMB
CLIMB SPEED - 85 KNOTS (98 MPH)
ASSOCIATED CONDITIONS:
POWER . . . . . FULL THROTTLE AT 2700 RPM
FLAPS . . . . . UP (0°)
LANDING GEAR. . . . . UP
MIXTURE . . . . . LEAN TO APPROPRIATE FUEL FLOW
EXAMPLE:
OAT . . . . . 15°C (59°F)
PRESSURE ALTITUDE. 5650 FT
WEIGHT . . . . . 2750 LBS
RATE OF CLIMB . . . . . 570 FT/MIN
CLIMB GRADIENT 6.2%
CLIMB SPEED. . . 85 KTS (98 MPH)
REFERENCE LINE
PRESSURE ALTITUDE ~ FEET
FUEL FLOW ~ GPH
SL
2000
4000
6000
8000
10,000
12,000
14,000
16,000
15.7
14.9
14.0
13.2
12.5
11.9
11.2
10.6
10.1
ISA
OUTSIDE AIR TEMPERATURE ~ °C
OUTSIDE AIR TEMPERATURE ~ °F
RATE OF CLIMB ~ FT/MIN
CLIMB GRADIENT ~ %
WEIGHT ~ POUNDS
C24R-601-17

TIME, FUEL AND DISTANCE TO CLIMB

CLIMB SPEED - 96 KNOTS (110 MPH)

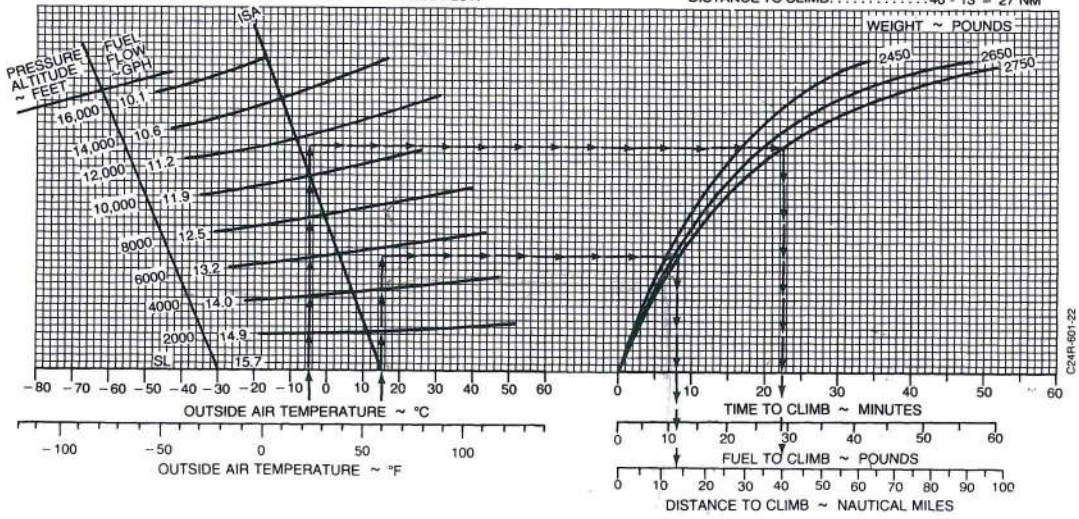
ASSOCIATED CONDITIONS:

PROPELLER SPEED.....2700 RPM
POWER.....FULL THROTTLE
FUEL DENSITY.....6.0 LBS PER GALLON
FLAPS.....UP
GEAR.....UP
MIXTURE.....LEAN TO APPROPRIATE FUEL FLOW

EXAMPLE:

OAT AT TAKE-OFF.....15°C (59°F)
OAT AT CRUISE.....-5°C (23°F)
AIRPORT PRESSURE ALTITUDE...5650 FT
CRUISE ALTITUDE.....11,500 FT
INITIAL CLIMB WEIGHT.....2750 LBS

TIME TO CLIMB.....23 - 8 = 15 MIN
FUEL TO CLIMB.....28.5 - 11.5 = 17 LBS
DISTANCE TO CLIMB.....40 - 13 = 27 NM



CRUISE POWER SETTINGS - 2700 RPM

FULL THROTTLE - 2600 POUNDS

PRESS. ALT	ISA -36°F (-20°C)							STANDARD DAY (ISA)							ISA +36°F (+20°C)						
	IOAT		MAN. PRESS.	FUEL FLOW		TAS		IOAT		MAN. PRESS.	FUEL FLOW		TAS		IOAT		MAN. PRESS.	FUEL FLOW		TAS	
FEET	°F	°C	IN. HG	PPH	GPH	KTS	MPH	°F	°C	IN. HG	PPH	GPH	KTS	MPH	°F	°C	IN. HG	PPH	GPH	KTS	MPH
SL (3)	27	-3	29.7	102	16.9	144	166	63	17	29.7	98	16.4	145	167	99	37	29.7	95	15.8	146	168
1000	23	-5	28.6	99	16.5	143	165	59	15	28.6	96	15.9	144	166	95	35	28.6	92	15.4	145	167
2000	19	-7	27.6	96	16.0	143	165	56	13	27.6	93	15.4	144	166	92	33	27.6	89	14.9	145	167
3000	16	-9	26.6	93	15.5	142	163	52	11	26.6	90	15.0	143	165	88	31	26.6	86	14.4	144	166
4000	12	-11	25.7	90	14.9	141	162	48	9	25.7	87	14.4	142	163	84	29	25.7	83	13.9	143	165
5000	9	-13	24.7	87	14.5	141	162	45	7	24.7	84	14.0	142	163	81	27	24.7	81	13.5	142	163
6000	5	-15	23.9	84	14.0	140	161	41	5	23.9	81	13.5	141	162	77	25	23.9	78	13.0	141	162
7000	1	-17	23.0	81	13.5	139	160	37	3	23.0	79	13.0	140	161	74	23	23.0	75	12.6	140	161
8000	-2	-19	22.2	78	13.1	138	159	34	1	22.2	76	12.6	139	160	70	21	22.2	68	11.4	139	160
9000	-6	-21	21.5	73	12.2	137	158	30	-1	21.5	68	11.4	138	159	66	19	21.5	64	10.6	137	158
10,000	-9	-23	20.7	69	11.4	136	157	27	-3	20.7	61	10.2	137	158	63	17	20.7	59	9.8	137	158
11,000	-13	-25	20.0	64	10.7	134	154	23	-5	20.0	59	9.8	135	157	59	15	20.0	57	9.5	136	157
12,000	-17	-27	19.2	59	9.8	134	154	19	-7	19.2	58	9.7	134	154	55	13	19.2	56	9.3	134	154
13,000	-20	-29	18.5	58	9.7	133	153	16	-9	18.5	56	9.3	133	153	52	11	18.5	54	9.0	132	152
14,000	-24	-31	17.9	56	9.3	131	151	12	-11	17.9	54	9.0	131	151	48	9	17.9	53	8.8	130	150

NOTES: 1) Shaded area represents operation with full throttle.

2) Manifold Pressure values are approximate.

3) Engine will be operating at 5% above rated power, based on a manifold pressure increase of 1 in. Hg due to ram rise.

★Leaning not approved in dashed area; use full-rich only.

CRUISE POWER SETTINGS - 2700 RPM

75% MCP (or FULL THROTTLE) - 2600 POUNDS

	ISA -36°F (-20°C)							STANDARD DAY (ISA)							ISA +36°F (+20°C)						
PRESS ALT	IOAT		MAN. PRESS.	FUEL FLOW		TAS		IOAT		MAN. PRESS.	FUEL FLOW		TAS		IOAT		MAN. PRESS.	FUEL FLOW		TAS	
FEET	°F	°C	IN. HG	PPH	GPH	KTS	MPH	°F	°C	IN. HG	PPH	GPH	KTS	MPH	°F	°C	IN. HG	PPH	GPH	KTS	MPH
SL	25	-4	22.4	61	10.2	123	142	61	16	23.0	61	10.2	125	144	99	37	23.6	61	10.2	128	147
1000	21	-6	22.1	61	10.2	124	143	57	14	22.7	61	10.2	126	145	95	35	23.3	61	10.2	129	148
2000	18	-8	21.8	61	10.2	125	144	55	13	22.4	61	10.2	128	147	91	33	23.0	61	10.2	130	150
3000	14	-10	21.6	61	10.2	126	145	52	11	22.2	61	10.2	129	148	88	31	22.8	61	10.2	131	151
4000	12	-11	21.3	61	10.2	127	146	48	9	22.0	61	10.2	130	150	84	29	22.5	61	10.2	133	153
5000	9	-13	21.1	61	10.2	128	147	45	7	21.7	61	10.2	131	151	81	27	22.3	61	10.2	134	154
6000	5	-15	20.9	61	10.2	129	148	41	5	21.5	61	10.2	132	152	77	25	22.1	61	10.2	135	155
7000	1	-17	20.7	61	10.2	131	151	37	3	21.3	61	10.2	133	153	73	23	21.9	61	10.2	136	157
8000	-2	-19	20.5	61	10.2	132	152	34	1	21.1	61	10.2	135	155	70	21	21.8	61	10.2	137	158
9000	-6	-21	20.3	61	10.2	133	153	30	-1	20.9	61	10.2	136	157	66	19	21.5	60	10.2	137	158
10,000	-9	-23	20.2	61	10.2	134	154	27	-3	20.7	61	10.2	137	158	63	17	20.7	59	9.8	137	158
11,000	-13	-25	20.0	60	10.2	134	154	23	-5	20.0	59	9.8	136	157	59	15	20.0	57	9.5	136	157
12,000	-17	-27	19.2	59	9.8	134	154	19	-7	19.2	58	9.7	134	154	55	13	19.2	56	9.3	134	154
13,000	-20	-29	18.5	58	9.7	133	153	16	-9	18.5	56	9.3	133	153	52	11	18.5	54	9.0	132	152
14,000	-24	-31	17.9	56	9.3	131	151	12	-11	17.9	54	9.0	131	151	48	9	17.9	53	8.8	130	150

NOTES: 1. Shaded area represents operation with full throttle.
2. Full throttle manifold settings are approximate.

CRUISE POWER SETTINGS - 2500 RPM

75% MCP (or FULL THROTTLE) - 2600 POUNDS

	ISA −36°F (−20°C)							STANDARD DAY (ISA)							ISA +36°F (+20°C)						
PRESS ALT	IOAT		MAN. PRESS.	FUEL FLOW		TAS		IOAT		MAN. PRESS.	FUEL FLOW		TAS		IOAT		MAN. PRESS.	FUEL FLOW		TAS	
FEET	°F	°C	IN. HG	PPH	GPH	KTS	MPH	°F	°C	IN. HG	PPH	GPH	KTS	MPH	°F	°C	IN. HG	PPH	GPH	KTS	MPH
SL	25	-4	23.8	61	10.2	123	142	61	16	24.4	61	10.2	126	145	99	37	25.1	61	10.2	129	148
1000	21	-6	23.5	61	10.2	124	143	59	15	24.1	61	10.2	127	146	95	35	24.8	61	10.2	130	150
2000	18	-8	23.3	61	10.2	125	144	55	13	23.9	61	10.2	128	147	91	33	24.5	61	10.2	131	151
3000	16	-9	23.0	61	10.2	127	146	52	11	23.6	61	10.2	129	148	83	31	24.2	61	10.2	132	152
4000	12	-11	22.7	61	10.2	128	147	48	9	23.4	61	10.2	130	150	84	29	24.0	61	10.2	133	153
5000	9	-13	22.5	61	10.2	129	148	45	7	23.1	61	10.2	131	151	81	27	23.7	61	10.2	134	154
6000	5	-15	22.3	61	10.2	130	150	41	5	22.9	61	10.2	132	152	77	25	23.5	61	10.2	135	155
7000	1	-17	22.1	61	10.2	131	151	37	3	22.7	61	10.2	134	154	73	23	23.2	60	10.0	135	155
8000	-2	-19	21.8	61	10.2	132	152	34	1	22.4	60	10.0	134	154	70	21	22.4	59	9.8	134	154
9000	-6	-21	21.6	60	10.0	132	152	30	-1	21.6	59	9.8	133	153	66	19	21.6	57	9.5	133	153
10,000	-9	-23	20.8	59	9.8	131	151	27	-3	20.8	57	9.5	132	152	63	17	20.8	56	9.3	131	151
11,000	-13	-25	20.1	57	9.5	130	150	23	-5	20.1	56	9.3	130	150	59	15	20.1	54	9.0	130	150
12,000	-17	-27	19.3	55	9.2	129	148	19	-7	19.3	54	9.0	128	147	55	13	19.3	53	8.8	127	146
13,000	-20	-29	18.6	54	9.0	127	146	16	-9	18.6	53	8.8	127	146	52	11	18.6	51	8.5	125	144
14,000	-24	-31	17.9	53	8.8	126	145	12	-11	17.9	52	8.7	125	144	48	9	17.9	50	8.3	123	142

NOTES: 1. Shaded area represents operation with full throttle.
2. Full throttle manifold settings are approximate.

CRUISE POWER SETTINGS - 2400 RPM

65% MCP (or FULL THROTTLE) - 2600 POUNDS

	ISA −36°F (−20°C)							STANDARD DAY (ISA)							ISA +36°F (+20°C)						
PRESS. ALT	IOAT		MAN. PRESS.	FUEL FLOW		TAS		IOAT		MAN. PRESS.	FUEL FLOW		TAS		IOAT		MAN. PRESS.	FUEL FLOW		TAS	
FEET	°F	°C	IN. HG	PPH	GPH	KTS	MPH	°F	°C	IN. HG	PPH	GPH	KTS	MPH	°F	°C	IN. HG	PPH	GPH	KTS	MPH
SL	25	-4	22.3	54	9.0	116	134	61	16	22.9	54	9.0	118	136	97	36	23.5	54	9.0	120	138
1000	21	-6	22.0	54	9.0	117	135	57	14	22.6	54	9.0	119	137	93	34	23.2	54	9.0	121	139
2000	18	-8	21.7	54	9.0	118	136	54	12	22.3	54	9.0	120	138	90	32	23.0	54	9.0	122	140
3000	14	-10	21.5	54	9.0	118	136	50	10	22.1	54	9.0	121	139	86	30	22.7	54	9.0	123	142
4000	10	-12	21.2	54	9.0	119	137	46	8	21.8	54	9.0	122	140	84	29	22.4	54	9.0	124	143
5000	7	-14	20.9	54	9.0	120	138	43	6	21.5	54	9.0	123	142	81	27	22.2	54	9.0	125	144
6000	3	-16	20.7	54	9.0	121	139	41	5	21.3	54	9.0	124	143	77	25	22.0	54	9.0	126	145
7000	1	-17	20.5	54	9.0	122	140	37	3	21.1	54	9.0	125	144	73	23	21.7	54	9.0	126	145
8000	-2	-19	20.3	54	9.0	123	142	34	1	20.9	54	9.0	125	144	70	21	21.5	54	9.0	127	146
9000	-6	-21	20.1	54	9.0	124	143	30	-1	20.7	54	9.0	126	145	66	19	21.3	54	9.0	127	146
10,000	-9	-23	19.9	54	9.0	125	144	27	-3	20.5	54	9.0	127	146	63	17	20.8	53	8.8	127	146
11,000	-13	-25	19.8	54	9.0	125	144	23	-5	20.1	53	8.8	126	145	59	15	20.1	52	8.7	126	145
12,000	-17	-27	19.3	54	9.0	125	144	19	-7	19.3	52	8.7	125	144	55	13	19.3	51	8.5	123	142
13,000	-20	-29	18.6	52	8.7	124	143	16	-9	18.6	51	8.5	123	142	52	11	18.6	49	8.2	120	138
14,000	-24	-31	17.9	51	8.5	121	139	12	-11	17.9	49	8.2	120	138	48	9	17.9	48	8.0	117	135

NOTES: 1. Shaded area represents operation with full throttle.
2. Full throttle manifold settings are approximate.

CRUISE POWER SETTINGS - 2400 RPM

55% MCP - 2600 POUNDS

	ISA −36°F (−20°C)							STANDARD DAY (ISA)							ISA +36°F (+20°C)						
PRESS. ALT	IOAT		MAN. PRESS.	FUEL FLOW		TAS		IOAT		MAN. PRESS.	FUEL FLOW		TAS		IOAT		MAN. PRESS.	FUEL FLOW		TAS	
FEET	°F	°C	IN. HG	PPH	GPH	KTS	MPH	°F	°C	IN. HG	PPH	GPH	KTS	MPH	°F	°C	IN. HG	PPH	GPH	KTS	MPH
SL	25	-4	19.7	48	8.0	106	122	61	16	20.3	48	8.0	108	124	97	36	20.8	48	8.0	110	127
1000	21	-6	19.6	48	8.0	107	123	57	14	20.1	48	8.0	108	124	93	34	20.6	48	8.0	110	127
2000	18	-8	19.3	48	8.0	107	123	54	12	19.8	48	8.0	109	125	90	32	20.3	48	8.0	111	128
3000	14	-10	19.1	48	8.0	108	124	50	10	19.6	48	8.0	110	127	86	30	20.1	48	8.0	112	129
4000	10	-12	18.9	48	8.0	109	125	46	8	19.4	48	8.0	111	128	82	28	19.9	48	8.0	113	130
5000	7	-14	18.6	48	8.0	110	127	43	6	19.1	48	8.0	112	129	79	26	19.7	48	8.0	113	130
6000	3	-16	18.4	48	8.0	111	128	39	4	18.9	48	8.0	113	130	75	24	19.4	48	8.0	114	131
7000	0	-18	18.2	48	8.0	111	128	36	2	18.7	48	8.0	113	130	72	22	19.2	48	8.0	115	132
8000	-4	-20	18.0	48	8.0	112	129	32	0	18.5	48	8.0	114	131	68	20	19.1	48	8.0	115	132
9000	-8	-22	17.8	48	8.0	113	130	28	-2	18.3	48	8.0	114	131	64	18	18.9	48	8.0	116	134
10,000	-11	-24	17.6	48	8.0	114	131	25	-4	18.1	48	8.0	115	132	61	16	18.7	48	8.0	116	134
11,000	-15	-26	17.5	48	8.0	114	131	21	-6	18.0	48	8.0	116	134	57	14	18.5	48	8.0	117	135
12,000	-18	-28	17.3	48	8.0	115	132	18	-8	17.8	48	8.0	116	134	55	13	18.3	48	8.0	117	135
13,000	-22	-30	17.1	48	8.0	115	132	14	-10	17.6	48	8.0	116	134	50	10	18.1	48	8.0	117	135
14,000	-26	-32	16.8	48	8.0	116	134	10	-12	17.4	48	8.0	117	135	46	8	18.0	48	8.0	117	135

CRUISE SPEEDS

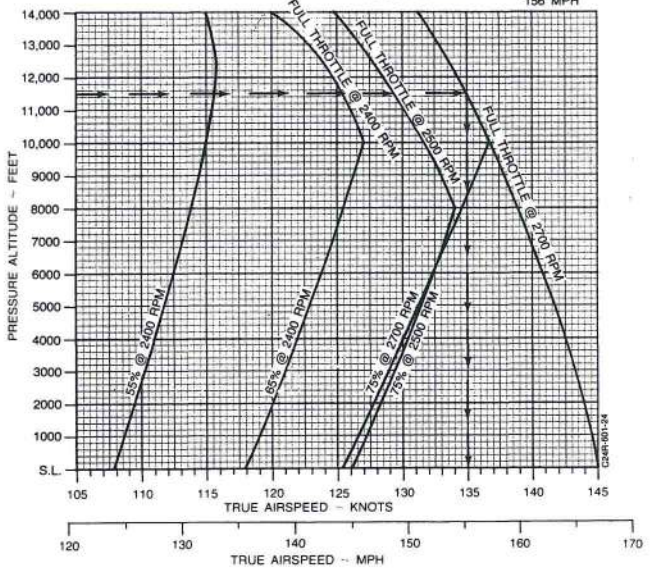
ASSOCIATED CONDITIONS:

AVERAGE CRUISE
WEIGHT..... 2600 LBS
TEMPERATURE..... STANDARD DAY (ISA)

EXAMPLE:

PRESSURE ALTITUDE ... 11,500 FT
POWER SETTING ..... FULL THROTTLE
2700 RPM

TRUE AIRSPEED ..... 135 KNOTS
156 MPH



MANIFOLD PRESSURE vs RPM

EXAMPLE:
ENGINE SPEED ..... 2700 RPM
MANIFOLD PRESSURE ..... 23 IN. HG
WITHIN RECOMMENDED LIMITS

RANGE PROFILE - 37 GALLONS

STANDARD DAY

ASSOCIATED CONDITIONS:

WEIGHT.....2758 LBS BEFORE ENGINE START
FUEL.....100 OCTANE AVIATION GASOLINE
FUEL DENSITY.. 6.0 LBS/GAL
INITIAL FUEL LOADING..... 37 U.S. GAL (222 LBS)

NOTE:
RANGE INCLUDES START, TAXI, CLIMB, WITH 45 MINUTES RESERVE FUEL AT 55% MAXIMUM CONTINUOUS POWER

RANGE PROFILE—57 GALLONS

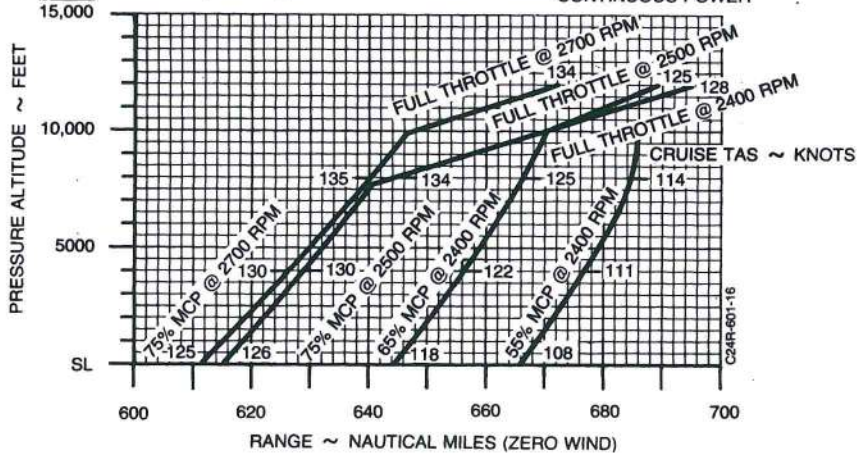
STANDARD DAY

ASSOCIATED CONDITIONS:

WEIGHT	2758 LBS BEFORE ENGINE START
FUEL	100 OCTANE AVIATION GASOLINE
FUEL DENSITY	6.0 LBS/GAL
INITIAL FUEL LOADING	57 U.S. GAL (342 LBS)

NOTE:

RANGE INCLUDES START, TAXI, AND CLIMB, WITH 45 MINUTES RESERVE FUEL AT 55% MAXIMUM CONTINUOUS POWER



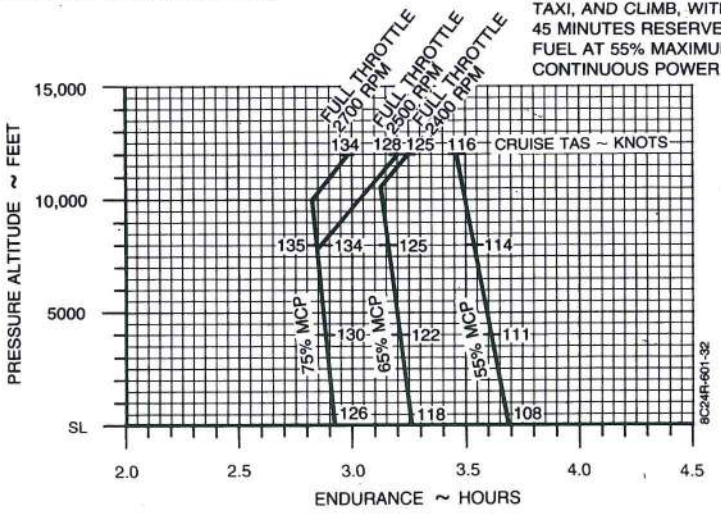
ENDURANCE PROFILE—37 GALLONS

STANDARD DAY

ASSOCIATED CONDITIONS:

WEIGHT . . . . . 2758 LBS BEFORE ENGINE START
FUEL . . . . . 100 OCTANE AVIATION GASOLINE
FUEL DENSITY . . . . 6.0 LBS/GAL
INITIAL FUEL
LOADING . . . . . 37 U.S. GALS (222 LBS)

NOTE:
RANGE INCLUDES START, TAXI, AND CLIMB, WITH 45 MINUTES RESERVE FUEL AT 55% MAXIMUM CONTINUOUS POWER



ENDURANCE PROFILE—57 GALLONS
STANDARD DAY (ISA)

ASSOCIATED CONDITIONS:

WEIGHT	2758 LBS BEFORE ENGINE START
FUEL	100 OCTANE AVIATION GASOLINE
FUEL DENSITY	6.0 LBS/GAL
INITIAL FUEL LOADING	57 U.S. GAL (342 LBS)

NOTE:
RANGE INCLUDES START, TAXI, AND CLIMB, WITH 45 MINUTES RESERVE FUEL AT 55% MAXIMUM CONTINUOUS POWER

LANDING DISTANCE–HARD SURFACE

ASSOCIATED CONDITIONS:

POWER . . . . . RETARD TO MAINTAIN 800 FT/MIN. ON FINAL APPROACH
FLAPS . . . . . DOWN (35°)
RUNWAY . . . . . PAVED, HARD, DRY SURFACE
APPROACH SPEED . . IAS AS TABULATED
BRAKING . . . . . MAXIMUM

WEIGHT ~ POUNDS	APPROACH SPEED KNOTS	APPROACH SPEED MPH
2750	70	81
2500	66	75
2300	62	71
2100	58	67

EXAMPLE:
OAT . . . . . 25°C (77°F)
PRESSURE ALTITUDE . . . . . 3925 FT
LANDING WEIGHT . . . . . 2606 LBS
HEADWIND COMPONENT . . . . . 12 KTS

GROUND ROLL . . . . . 750 FT
TOTAL OVER 50 FT OBSTACLE . . . . 1400 FT
APPROACH SPEED . . . . . 68 KTS (78 MPH)

LANDING DISTANCE—GRASS SURFACE

ASSOCIATED CONDITIONS:

POWER ..... RETARD TO MAINTAIN 800 FT/MIN ON FINAL APPROACH
FLAPS ..... DOWN (35°)
RUNWAY ..... SHORT, DRY, GRASS
APPROACH SPEED .. IAS AS TABULATED
BRAKING ..... MAXIMUM

WEIGHT ~ POUNDS	APPROACH SPEED	
	KNOTS	MPH
2750	70	81
2500	66	75
2300	62	71
2100	58	67

EXAMPLE:

OAT	25°C (77°F)
PRESSURE ALTITUDE	3925 FT
LANDING WEIGHT	2606 LBS
HEAD WIND COMPONENT	8.7 KTS
GROUND ROLL	1080 FT
TOTAL OVER 50 FT OBSTACLE	1730 FT
APPROACH SPEED	68 KTS (78 MPH)

SECTION VI

WEIGHT AND BALANCE/ EQUIPMENT LIST

TABLE OF CONTENTS

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INTRODUCTION TO WEIGHT AND BALANCE

The necessity for proper computation of the airplane's weight and balance cannot be overemphasized. In the basic design, it is planned that under normal loading the weight distribution of pilot, passengers, baggage, and fuel will balance the airplane for flight. Since these items are all variables, it is possible to concentrate weight in such a way as to make the airplane unsafe for flight. The factors which must be considered in the weight and balance of the airplane are the installation of equipment after the airplane has been weighed, trapped or unusable fuel, engine oil, usable fuel, pilot and passenger weights, and baggage or cargo.

In order to simplify the computation of the weight and balance, Beech Aircraft Corporation has devised a form called Basic Empty Weight and Balance. When the airplane is delivered from the factory it will first be weighed and the data recorded on this form. Provision has been made on the form for listing additions of items to be installed before the delivery or subtractions of items to be removed before delivery from the "as weighed" condition. This then represents the empty weight of the airplane.

When the airplane is first fueled, a certain amount of fuel is trapped in the fuel lines and cells which cannot be drained. Also, in some regimes of flight there are certain amounts of fuel that cannot be used. The combination of these fuel amounts is classified as unusable fuel. Also, it has been found that all operators bring the oil level near full before each flight. Thus, these items are computed along with the empty weight, giving a Basic Empty Weight as a starting point to the pilot for each flight computation.

Once the Basic Empty Weight for a given airplane has been established, the pilot is then only concerned with the

variable items which will comprise his useful load. These items which are of a changing nature are: Pilot and Passengers (computed on an individual weight and the seat occupied), Baggage and/or Cargo (computed on weight and location within the airplane), and Usable Fuel (the remaining fuel after subtracting the unusable fuel from the measured fuel on board).

WEIGHING INSTRUCTIONS

Periodic weighing of the airplane may be required to keep the Basic Empty Weight current. All changes to the airplane affecting weight and balance are the responsibility of the airplane's operator.

1. Three jack points are provided for weighing: two on the wing front spar at Fuselage Station 129.2 and one on the aft fuselage at Fuselage Station 285.9 (tail tie-down ring).

2. Fuel should be drained preparatory to weighing. Tanks are drained from the regular drain ports with the airplane in static ground attitude. The unusable fuel to be added to a Basic Empty Weight is 15.6 pounds at Fuselage Station 125.0.

3. Engine oil must be at the full level or completely drained. Total engine oil when full is 15 pounds at Fuselage Station 50.

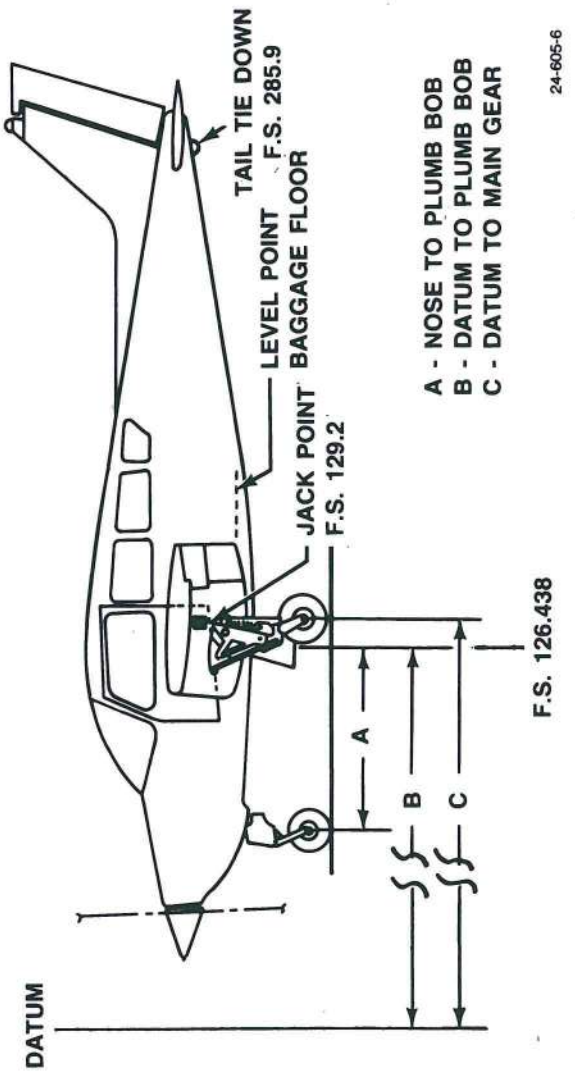
4. To determine airplane configuration at time of weighing, installed equipment is checked against the airplane equipment list or superseding forms. All installed equipment must be in its proper place during weighing.

5. At the time of weighing, the airplane must be level both longitudinally and laterally, and the landing gear must be fully extended. Longitudinal and lateral level is determined with a level on the baggage compartment floor.

6. Measurement of the reaction arms for a wheel weighing is made using a steel measuring tape. Measurements are taken, with the airplane level on the scales, from the reference (a plumb bob dropped from centerline of airplane at F. S. 126.438, forward screw in spar access cover, approximately 8 to 10 inches forward of centerline drain hole) to the axle centerline of the main gear and then to the nose wheel axle centerline. The main wheel axle centerline is best located by stretching a string across from one main wheel to the other. All measurements are to be taken with the tape level with the hangar floor and parallel to the fuselage centerline. The locations of the wheel reactions will be approximately at Fuselage Station 129.5 for main wheels and Fuselage Station 57.6 for the nose wheel.

7. Jack point weighings are accomplished by placing scales on the jack points specified in step 1 above. Since the center of gravity of the airplane is forward of Fuselage Station 129.2 the tail reaction of the airplane will be in an up direction. This can be measured on regular scales by placing ballast of approximately 200 pounds on the scales to which the aft weighing point is attached by cable of adjustable length. The up reaction will then be total ballast weight minus the scale reading and is entered in the weighing form as a negative quantity.

8. Weighing should always be performed in an enclosed area which is free from air currents. The scales used should be properly calibrated and certified.


TAIL TIE DOWN
F.S. 285.9
LEVEL POINT
BAGGAGE FLOOR
JACK POINT
F.S. 129.2
A - NOSE TO PLUMB BOB
B - DATUM TO PLUMB BOB
C - DATUM TO MAIN GEAR
24-605-6
F.S. 126.438
A
B
C
DATUM

BASIC EMPTY WEIGHT AND BALANCE

SIERRA 200 C24R SER. NO. _____ REG. NO. _____ DATE _____

JACK POINT LOCATION

FORWARD 129.2
AFT 285.9

PREPARED BY

Company _____
Signature _____

REACTION WHEEL - JACK POINTS	SCALE READING	TARE	NET WEIGHT	ARM	MOMENT
LEFT MAIN					
RIGHT MAIN					
NOSE OR TAIL					
TOTAL (AS WEIGHED)					
Space below provided for additions and subtractions to as - weighed condition					
LESS 8 QT OIL			−15.0	50	−750
EMPTY WEIGHT					
ENGINE OIL			15.0	50.0	750
UNUSABLE FUEL			15.6	125.0	1950
BASIC EMPTY WEIGHT					

NOTE

Each new airplane is delivered with a completed sample loading, basic empty weight and center of gravity, and equipment list, all pertinent to that specific airplane. It is the owner's responsibility to ensure that changes in equipment are reflected in a new weight and balance and in an addendum to the equipment list. There are many ways of doing this; it is suggested that a running tally of equipment changes and their effect on basic empty weight and CG is a suitable means for meeting both requirements.

The current equipment list and basic empty weight and CG information must be retained with the airplane when it changes ownership. Beech Aircraft Corporation cannot maintain this information; the current status is known only to the owner. If these papers become lost, the FAA will require that the airplane be re-weighed to establish the basic empty weight and CG and that an inventory of installed equipment be conducted to create a new equipment list.

It is recommended that duplicate copies of the Basic Empty Weight and Balance sheet and the Equipment List be made and kept in an alternate location in the event the original handbook is misplaced.

WEIGHT AND BALANCE RECORD

SERIAL NO. _____ REGISTRATION NO. _____ PAGE NO. _____

DATE	ITEM NO.		DESCRIPTION OF ARTICLE OR CHANGE	WEIGHT CHANGE ADDED (+) OR REMOVED (-)			RUNNING BASIC EMPTY WEIGHT	
	IN	OUT		WT (LBS)	ARM (IN.)	MOM 100	WT (LBS)	MOM 100

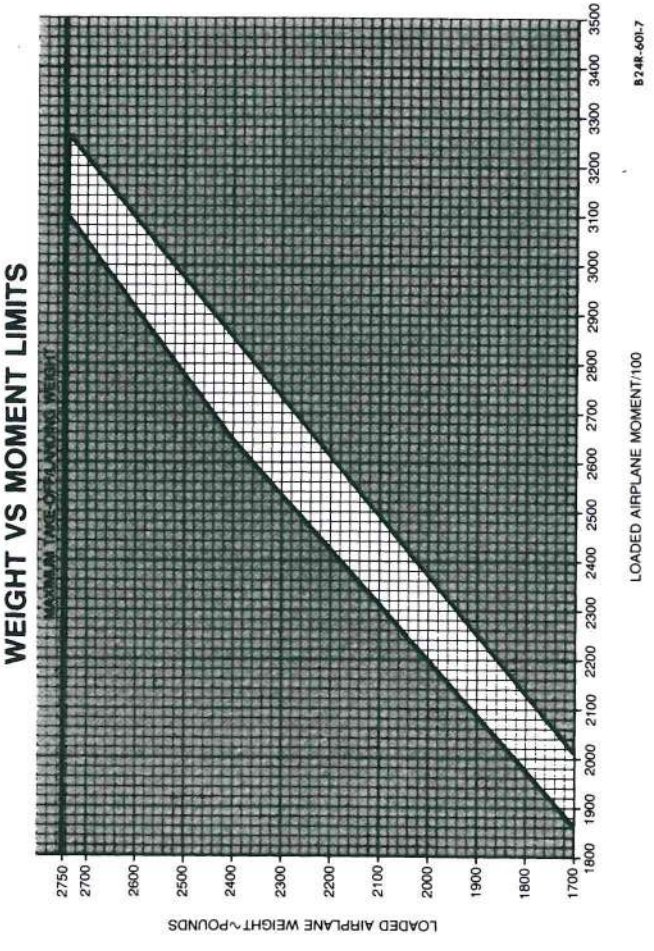
WEIGHT AND BALANCE RECORD

SERIAL NO. _____ REGISTRATION NO. _____ PAGE NO. _____

DATE	ITEM NO.		DESCRIPTION OF ARTICLE OR CHANGE	WEIGHT CHANGE ADDED (+) OR REMOVED (-)			RUNNING BASIC EMPTY WEIGHT	
	IN	OUT		WT (LBS)	ARM (IN.)	MOM / 100	WT (LBS)	MOM / 100

WEIGHT AND BALANCE RESPONSIBILITIES

The Basic Empty Weight and Moment of the airplane at the time of delivery are shown on the Aircraft Basic Empty Weight and Balance form. Useful load items which may be loaded into the airplane are shown on the Useful Load Weights and Moments tables. The minimum and maximum moments are shown on the Moment Limits vs Weight table and can also be plotted on the Moment Limits vs Weight graph as visual indication that the limit is within the operational envelope. These moments correspond to the forward and aft center-of-gravity flight limits for a particular weight. The airplane must be loaded in such a manner to keep the center of gravity within these limits.


WEIGHT VS MOMENT LIMITS
LOADED AIRPLANE WEIGHT-POUNDS
2750
2700
2600
2500
2400
2300
2200
2100
2000
1900
1800
1700
1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800 2900 3000 3100 3200 3300 3400 3500
LOADED AIRPLANE MOMENT/100
B24R-601-7

MOMENT LIMITS vs WEIGHT

Weight	Minimum Moment / 100	Maximum Moment / 100	Weight	Minimum Moment / 100	Maximum Moment / 100	Weight	Minimum Moment / 100	Maximum Moment / 100
1700	1870	2011	2100	2310	2484	2500	2775	2958
1710	1881	2023	2110	2321	2496	2510	2788	2969
1720	1892	2035	2120	2332	2508	2520	2801	2981
1730	1903	2047	2130	2343	2520	2530	2814	2993
1740	1914	2058	2140	2354	2532	2540	2828	3005
1750	1925	2070	2150	2365	2543	2550	2841	3017
1760	1936	2082	2160	2376	2555	2560	2854	3028
1770	1947	2094	2170	2387	2567	2570	2867	3040
1780	1958	2106	2180	2398	2579	2580	2880	3052
1790	1969	2118	2190	2409	2591	2590	2894	3064
1800	1980	2129	2200	2420	2603	2600	2907	3076
1810	1991	2141	2210	2431	2614	2610	2920	3088
1820	2002	2153	2220	2442	2626	2620	2933	3099
1830	2013	2165	2230	2453	2638	2630	2947	3111
1840	2024	2177	2240	2464	2650	2640	2960	3123
1850	2035	2189	2250	2475	2662	2650	2973	3135
1860	2046	2200	2260	2486	2674	2660	2987	3147
1870	2057	2212	2270	2497	2685	2670	3000	3159
1880	2068	2224	2280	2508	2697	2680	3013	3170
1890	2079	2236	2290	2519	2709	2690	3027	3182
1900	2090	2248	2300	2530	2721	2700	3040	3194
1910	2101	2260	2310	2541	2733	2710	3054	3206
1920	2112	2271	2320	2552	2745	2720	3067	3218
1930	2123	2283	2330	2563	2756	2730	3081	3230
1940	2134	2295	2340	2574	2768	2740	3094	3241
1950	2145	2307	2350	2585	2780	2750	3108	3253
1960	2156	2319	2360	2596	2792			
1970	2167	2331	2370	2607	2804			
1980	2178	2342	2380	2619	2815			
1990	2189	2354	2390	2632	2827			
2000	2200	2366	2400	2645	2839			
2010	2211	2378	2410	2658	2851			
2020	2222	2390	2420	2671	2863			
2030	2233	2401	2430	2684	2875			
2040	2244	2413	2440	2697	2887			
2050	2255	2425	2450	2710	2898			
2060	2266	2437	2460	2723	2910			
2070	2277	2449	2470	2736	2922			
2080	2288	2461	2480	2749	2934			
2090	2299	2472	2490	2762	2946			

The above weight and moment limits are based on the following weight and center of gravity limit data:

NORMAL CATEGORY

WEIGHT CONDITION	FWD CG LIMIT	AFT CG LIMIT
2750 lb (Max. Take-Off or Landing)	113.0	118.3
2375 lb or less	110.0	118.3

COMPUTING PROCEDURE

1. Record the Basic Empty Weight and Moment from the Basic Empty Weight and Balance form (or from the latest superseding form) under the Basic Empty Condition block. The moment must be divided by 100 to correspond to Useful Load Weights and Moments tables.

2. Record the weight and corresponding moment from the appropriate table of each of the useful load items (except fuel) to be carried in the airplane.

3. Total the weight column and moment column. The SUB-TOTALS are the ZERO FUEL CONDITION.

4. Determine the weight and corresponding moment for the fuel loading to be used. This fuel loading includes fuel for the flight, plus that required for start, taxi, and takeoff. Add the Fuel Loading Condition to Zero Fuel Condition to obtain the SUB-TOTAL Ramp Condition.

5. Subtract the fuel to be used for start, taxi, and takeoff to arrive at the SUB-TOTAL Take-off Condition.

6. Subtract the weight and moment of fuel to be used from the take-off weight and moment. The SUB-TOTAL Condition of No. 3 and No. 5, as well as the landing condition moment, must be within the minimum and maximum moments shown on the Moment Limits vs Weight graph for that weight. If the total moment is less than the minimum moment allowed, useful load items must be shifted aft, or forward load items reduced. If the total moment is greater than the maximum moment allowed, useful load items must be shifted forward, or aft load items reduced. If the quantity or location of load items is changed, the calculations must be revised and the moments rechecked.

WEIGHT AND BALANCE LOADING FORM

MODEL *SIERRA C24R* DATE *X-X-XX*

SERIAL NO. *XXX* REG. NO. *NXXXXX*

	ITEM	WEIGHT	MOM/100
1.	BASIC EMPTY CONDITION	*1720*	*1912*
2.	FRONT SEAT OCCUPANTS	*340*	*374*
3.	3rd & 4th SEAT OCCUPANTS	*340*	*482*
4.	5th & 6th SEAT OCCUPANTS	*130*	*222*
5.	BAGGAGE	—	—
6.	CARGO		—
7.	**SUB TOTAL**	*2530*	*2990*
8.	FUEL LOADING *(32 gal)*	*192*	*225*
9.	**SUB TOTAL** RAMP CONDITION	*2722*	*3215*
10.	*LESS FUEL FOR START, TAXI, and TAKE-OFF	*- 8*	*-9*
11.	**SUB TOTAL** TAKE-OFF CONDITION	*2714*	*3206*
12.	LESS FUEL TO DESTINATION *(25 gal)*	*- 150*	*- 176*
13.	**LANDING CONDITION**	*2564*	*3030*

*Fuel for start, taxi and take-off is normally 8 lbs at an average mom/100 of 9.

WEIGHT AND BALANCE LOADING FORM

MODEL *SIERRA C24R* DATE _____

SERIAL NO. _____ REG. NO. _____

ITEM	WEIGHT	MOM/100
1. BASIC EMPTY CONDITION		
2. FRONT SEAT OCCUPANTS		
3. 3rd & 4th SEAT OCCUPANTS		
4. 5th & 6th SEAT OCCUPANTS		
5. BAGGAGE		
6. CARGO		
7. **SUB TOTAL**		
8. FUEL LOADING		
9. **SUB TOTAL** RAMP CONDITION		
10. *LESS FUEL FOR START, TAXI, AND TAKE-OFF		
11. **SUB TOTAL** TAKE-OFF CONDITION		
12. LESS FUEL TO DESTINATION		
13. **LANDING CONDITION**		

*Fuel for start, taxi and take-off is normally 8 lbs at an average mom/100 of 9.

USEFUL LOAD WEIGHTS AND MOMENTS

OCCUPANTS

	FRONT SEATS				3RD AND 4TH SEATS	
	*FWD POS.		*AFT POS.		BENCH SEAT	SPLIT SEAT
	††ARM **104	†ARM **105	ARM **112		ARM **142	ARM **144
WEIGHT	MOM / 100	MOM / 100	MOM / 100		MOM / 100	MOM / 100
120	125	126	134		170	173
130	135	137	146		185	187
140	146	147	157		199	202
150	156	158	168		213	216
160	166	168	179		227	230
170	177	179	190		241	245
180	187	189	202		256	259
190	198	200	213		270	274
200	208	210	224		284	288

†Effective MC-449, MC-452 thru MC-555

††Effective MC-556 and after

*Reclining seat with back in full-up position

**Values computed from a C.G. criterion based on a 170 pound male. Differences in physical characteristics can cause variation in center of gravity location.

USEFUL LOAD WEIGHTS AND MOMENTS

5th & 6th SEATS ARM 171			
Weight	Moment / 100	Weight	Moment / 100
80	137	140	239
90	154	150	257
100	171	160	274
110	188	170	291
120	205	180	308
130	222	190	325
		200	342

USABLE FUEL
ARM 117

GALLONS	WEIGHT	MOMENT/100
5	30	35
10	60	70
15	90	105
20	120	140
22	132	154
25	150	176
27	162	189
30	180	211
32	192	225
35	210	246
37	222	259
40	240	281
45	270	316
50	300	351
52	312	365
57	342	400

USEFUL LOAD WEIGHTS AND MOMENTS

BAGGAGE

ARM 167

Weight	Moment / 100	Weight	Moment / 100
10	17	140	234
20	33	150	251
30	50	160	267
40	67	170	284
50	84	180	301
60	100	190	317
70	117	200	334
80	134	210	351
90	150	220	367
100	167	230	384
110	184	240	401
120	200	250	418
130	217	260	434
		270	451

SECTION VII

SYSTEMS DESCRIPTION

TABLE OF CONTENTS

SUBJECT PAGE

SUBJECT *PAGE*

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AIRFRAME

The Sierra C24R is a 4-place airplane with an optional bench-type children's seat in the area otherwise used for baggage. It is an all-metal, single-engine airplane with retractable tricycle landing gear. It utilizes conventional flight control surfaces except for a stabilator for the horizontal empennage surface.

SEATING ARRANGEMENTS

In the standard configuration two adjustable seats and one fixed-bench seat are installed. Optional split 3rd and 4th seats and a fixed-bench children's seat are available. To adjust either of the front seats, pull the release knob below the left forward seat corner (pull to the right, then up) and slide the seat forward or aft, as desired. Make certain the seat is locked securely in place after adjustment. The backs of all individual seats can be placed in any of three positions. Outboard armrests for the front seats are attached to the cabin doors.

FLIGHT CONTROLS

CONTROL SURFACES

The control surfaces are operated with conventional cable systems terminating in bell cranks.

CONTROL COLUMN

A single control column/wheel is installed as standard equipment on the left side. The optional control column/wheel may be installed on the right side. These are provided for stabilator and aileron control.

RUDDER PEDALS

The standard installation provides pedals for rudder control on the left side only. The optional installation provides a set of rudder pedals on each side.

STABILATOR TRIM SYSTEM

MANUAL TRIM

The manual stabilator trim is actuated by a handwheel located between the front seats. A stabilator tab position indicator is located adjacent to the trim control handwheel. Forward movement of the wheel trims the airplane's nose down, aft movement of the wheel trims the airplane's nose up.

ELECTRIC TRIM

The optional electric stabilator trim system controls include the ON-OFF circuit-breaker type switch located on the instrument panel, and a thumb switch on the control wheel. The ON-OFF switch must be in the ON position to operate the system. The thumb switch must be depressed and moved forward for nose down, aft for nose up, and when released returned to the center OFF position. When the system is not being electrically actuated, the manual trim control wheel may be used.

INSTRUMENT PANEL

The standard instrument panel consists of flight and navigation instruments on the left, and an avionics section on the right. The switching panel and the engine gages are

TYPICAL INSTRUMENT PANEL (MC-449, MC-452 thru MC-536, except MC-533)

TYPICAL INSTRUMENT PANEL (MC-533, MC-537 through MC-570)

TYPICAL INSTRUMENT PANEL (MC-571 and after)

located on the left subpanel, and the circuit breaker grouping is on the right subpanel.

SWITCHES

The magneto/start switch, and switches for the battery, alternator, pitot heat, auxiliary fuel pump, and landing gear are located on the left subpanel.

CIRCUIT BREAKERS

The circuit breakers are located on the right subpanel.

FLIGHT INSTRUMENTS

The standard flight instruments are grouped in a "T" pattern on the main panel for the best presentation for the pilot. The magnetic compass is attached to the upper center of the windshield.

Ram air pressure for the airspeed indicator enters through the pitot tube under the left wing. Static air pressure for the altimeter, vertical speed, and airspeed indicator is supplied by a static port on each side of the fuselage, just aft of the baggage area.

MC-449, MC-452 through MC-536 except MC-533:

The instruments are illuminated either by an overhead flood light or post lights. The flood light is controlled by a rheostat switch located below the power quadrant on the pedestal, while the post light installation is controlled by a rheostat switch on the left subpanel.

MC-533, MC-537 and after:

The instruments are illuminated either by an overhead

flood light or post lights. The rheostat switches controlling these lights are located on the pedestal, below the power quadrant.

GROUND CONTROL

Steering is accomplished by the use of rudder pedals through a spring-loaded linkage connecting the nose gear to the rudder pedals. The nose-gear maximum travel is 28° ± 2° left and right. A hydraulic shimmy damper on the nose gear yoke compensates for any tendency to shimmy. Toe brakes may be used to aid in steering the airplane on the ground.

The minimum wing-tip turning radius, using full steering, one brake, and partial power, is 26 feet 10 inches.

WING FLAPS

MANUAL

The four-position flaps are operated by a manual lever located between the front seats. As the handle is raised to lower the flaps, a definite detent and click of the thumb release button will be felt at the 15°, 25°, and 35° flap extended positions. To retract the flaps, depress the thumb button and lower the handle to the floor. The thumb button does not need to be depressed, nor should it be, to extend the flaps.

ELECTRIC

The electric wing flaps are controlled by a three-position switch, UP, OFF, and DOWN, located to the right of the power quadrant. The switch must be pulled out of detent

before it can be repositioned. An indicator, located adjacent to the flap handle switch, has markings for UP, 10 DEGREES, 15° (green radial), 20 DEGREES, and DOWN. The green radial is placed on the indicator at the 15° position to denote flap position for takeoffs.

Limit switches automatically interrupt power to the electric motor when the flaps reach the extremes of travel. Intermediate flap positions can be obtained by placing the three-position switch in the OFF position during flap extension or retraction.

EFFECT OF FLAPS ON FLIGHT

TAKEOFF

Retraction of take-off flaps (15° for takeoff), during climb-out, requires no change in trim and only light changes in control forces. The light forces dissipate without change in trim or significant change in airspeed.

CAUTION

Establish recovery altitude and recovery power before retracting flaps during slow flight, particularly during recoveries from approach configurations.

LANDING GEAR

The retractable tricycle landing gear, fabricated from magnesium casting and aluminum forgings, uses rubber disks for shock absorption. The gears are identical except for the pivoting action during retraction and the steering provisions of the nose gear. Retraction and extension of the gear is accomplished through the use of an electric-driven hydraulic pump and hydraulic system. The landing gear may be hydraulically extended or retracted, and may be lowered manually. (See Emergency Extension Procedures.)

CONTROL SWITCH

The landing gear is controlled by a two-position switch on the left side of the subpanel. The switch handle must be pulled out of the safety detent before it can be moved to the opposite position.

POSITION INDICATORS

The landing gear position indicator lights are located below the landing gear switch handle. Three green lights, one for each gear, are illuminated whenever the landing gears are down. The red light illuminates any time one or all of the landing gears are in transit or in any intermediate position. All of the lights will be out when the gears are up and locked. Pressing the warning light test button on the instrument panel will verify the landing gear lamps are illuminating. The intensity of the lamps can be controlled by turning the lens holder on each lamp.

TIME-DELAY RELAY (MC-674 and after)

Landing gear retraction operation is protected by a time-delay relay which will disengage electrical power to the hydraulic pump motor after 30 seconds of continuous pump operation. If the landing gear in-transit light remains illuminated, it indicates improper response of the landing gear. The time-delay relay can be reset by moving the landing gear switch handle to the down position. The landing gear and retract system should be checked before the next flight.

SAFETY RETRACTION SWITCH

To prevent inadvertent retraction of the landing gear on the ground, a safety pressure switch located in the pitot system,

deactivates the hydraulic pressure pump circuit when the impact air pressure is below 68 to 72 mph, (59 to 63 kts).

WARNING

Never rely on the safety switch to keep the gear down during taxi, take-off roll, or landing roll. Always make certain that the landing gear switch is in the down position during these operations.

WARNING HORN

With the landing gear retracted, if the throttle is retarded below approximately 12 inches mercury manifold pressure, a warning horn will sound continuously.

CIRCUIT BREAKER

The landing GEAR MOTOR circuit breaker is located on the right subpanel. This circuit breaker is a pull-and-reset type breaker. A white circle identifies this circuit breaker. The breaker will pop out under overload conditions. The remainder of the landing gear circuitry is protected by a push-to-reset circuit breaker marked GEAR IND.

WARNING

The landing gear system will be inoperative if the GEAR IND circuit breaker is pulled.

EMERGENCY EXTENSION

The landing gear can be extended by turning the hydraulic pressure bypass valve 90° counterclockwise. The valve is located on the floor in front of the pilot's seat. When the system pressure is released the gear will fall into the down-

and-locked position. This extension procedure is outlined in EMERGENCY PROCEDURES Section.

NOTE

Repeated emergency extension of the landing gear may deplete the hydraulic fluid reservoir supply.

BRAKES

The brakes on the main landing gear wheels are operated by applying toe pressure to the top of the rudder pedals. The parking brake push-pull control is located on the left subpanel. To set the parking brakes, pull the control out and pump both toe pedals until solid resistance is felt. Push the control in to release the brakes.

CAUTION

Install wheel chocks and release the parking brake if the airplane is to be left unattended. Changes in ambient temperature can cause the brakes to release or to exert excessive pressures.

LANDING GEAR SAFETY EXTENSION SYSTEM

The landing gear safety system is designed to prevent "gear up" landings. The system is to be used as a safety device only; normal usage of the landing gear position switch is mandatory.

To extend the landing gear, place the landing gear safety system ON-OFF switch in the ON position. The landing gear will be automatically extended when: (1) the airspeed is below approximately 115 mph (100 kts) IAS and (2) the engine is operating at a throttle position corresponding to

approximately 18 inches or less of manifold pressure.

To retract the landing gear, place the landing gear safety system ON-OFF switch in the ON position. The landing gear will not retract unless: (1) the landing gear position switch is in the UP position, (2) the airspeed is above approximately 72 mph (63 kts) IAS and (3) the engine is operating at a throttle position corresponding to approximately 20 inches or more of manifold pressure.

If landing gear retraction is desired when the throttle position corresponds to 20 inches of manifold pressure or less, the landing gear safety system ON-OFF switch must be placed in the OFF position before placing the landing gear position switch in the UP position.

In the event of an emergency, automatic extension of the landing gear may be prevented by placing the landing gear safety system ON-OFF switch in the OFF position, thus deactivating the safety system.

BAGGAGE COMPARTMENT

A 19.5-cubic-foot baggage space is located behind the 3rd and 4th seats. In addition, a hat shelf, near the top of the cabin enclosure provides an out-of-the-way space for light miscellaneous articles. Both the baggage compartment and hat shelf are accessible in flight.

WARNING

Do not carry hazardous material anywhere in the airplane.

Do not carry children in the baggage compartment unless secured in a seat.

SEATS, SEAT BELTS, AND SHOULDER HARNESSES

SEAT ADJUSTMENT

To adjust either of the front seats, pull to the right and up on the release knob below the left seat corner and slide the seat forward or aft, as desired. Make certain the seat is locked securely in place after adjustment. The backs of the 1st, 2nd, 3rd, and 4th seats can be placed in any of 3 positions. The 5th and 6th bench-type children's seat is not adjustable. Outboard armrests for the front seats are attached to the cabin doors.

SEAT BELTS

All seats are provided with seat belts having a lever-action, quick-release, metal buckle. The seat belt length can be shortened or lengthened by allowing the excess belt to pull through the end of the buckle. Holding the buckle at a right angle to the belt releases the binding action, allowing the belt to slip.

SHOULDER HARNESSES

The shoulder harness is a standard installation for all seats and should be used with the seats in the upright position. The spring loading at the inertia reel keeps the harness snug, but will allow normal movement during flight operations. The inertia reel is designed with a locking device that will secure the harness in the event of sudden forward movement or an impact action. The strap is worn over the shoulder and down across the body, where it is fastened by a metal loop to the seat belt buckle. The inertia reels for the front and middle seats are attached to the lower cabin sidewall structure at the aft edge of the respective seat. The inertia reel is covered with an escutcheon, and the strap runs up from the reel to a looped fitting attached to the

window frame just aft of the seat. For stowing these shoulder harness straps, stowage attach points are provided adjacent to the inertia reel on the cabin sidewall. For the 5th and 6th seats the strap is contained in an inertia reel attached to the aft cabin bulkhead structure behind the hat shelf.

WARNING

The seat belt is independent of the shoulder harness. However, the shoulder harness may be used only when the seat belt is fastened.

Occupants shorter than 4'7 are not to use shoulder harness.

DOORS AND EXITS

FORWARD CABIN DOORS

The airplane has a conventional cabin door on each side of the fuselage adjacent to the forward seats. When closed, the outside cabin door handle is spring-loaded to fit into a recess in the door. The door may be locked with a key. To open the door from the outside, grasp the flush handle and pull until the door opens. To close the cabin doors from the inside, grasp the armrest attached to the door and firmly pull the door closed. Opening the storm window will alleviate pressure inside the cabin as the door is being closed. Press firmly outward at the aft edge of the door. If any movement of the door is detected, completely open the door and close again following the above instructions. To open the door from the inside, grasp the flush door release handle and pull until door latch releases.

AFT UTILITY DOOR

A utility door, aft of the cabin door on the left side of the fuselage, is provided for loading cargo or passengers in the aft cabin. This door can be opened from both inside and out. To open the door from the outside, grasp the flush handle and pull until door opens. To open from the inside pull out on the pin adjacent to the door handle, then rotate the handle counterclockwise until the door opens. This door can be locked with a key.

EMERGENCY EXITS

An emergency exit can be accomplished through any of the three doors.

CONTROL LOCKS

A control lock is provided, with the loose tools, to prevent movement of the control column and impairs access to the magneto/start switch.

To install the Control Lock:

1. Rotate control wheel and move control column so the holes in the control column hanger and the control column will align to accept the pin.

2. Push the control column lock pin through the hole provided in the control column hanger and into the hole in the underside of the control column tube assembly.

3. Ensure positive retention of the lock pin by positioning the hook over the control column.

WARNING

Before starting engine, remove the control lock by reversing the above procedure.

ENGINE

The BEECHCRAFT Sierra 200 C24R is powered by a Lycoming IO-360-A1B6 four-cylinder, horizontally opposed, fuel-injected engine rated at 200 horsepower. Normal operating engine speed range is 2350 to 2700 rpm with a restricted operating range between 2100 and 2350 rpm.

ENGINE CONTROLS

The control levers are grouped along the upper face of the power quadrant. Pushing forward on a control increases, while pulling back decreases the control's appropriate function. Their knobs are shaped to government standard configuration so they can be identified by touch. The controls are centrally located for ease of operation from either the pilot's or copilot's seat. A controllable friction lever, located to the right of the control levers, is provided to prevent creeping.

ENGINE INSTRUMENTS

The engine instrument cluster is located on the lower left subpanel and includes the left fuel quantity indicator, an ammeter, oil temperature, oil pressure and the right fuel quantity indicator. The tachometer and manifold pressure/fuel flow indicators are located above the engine controls.

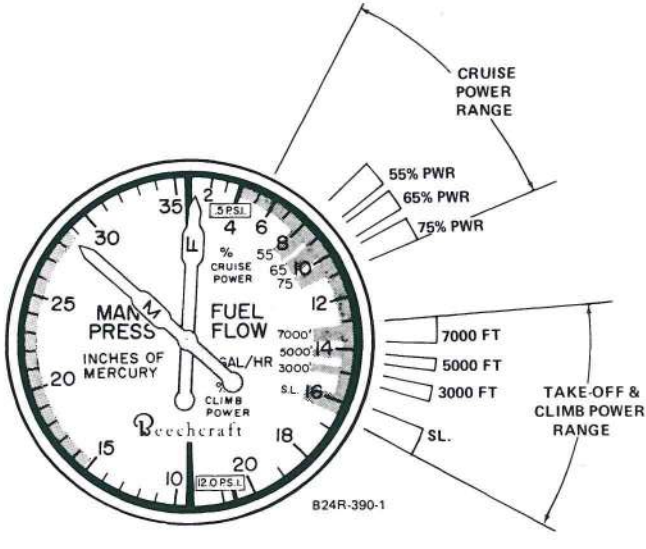
MANIFOLD PRESSURE AND FUEL FLOW INDICATOR

The manifold pressure portion of this instrument indicates the pressure of the fuel-air mixture entering the engine cylinders and is calibrated in inches of mercury. By observing the manifold pressure gage and adjusting the propeller and throttle controls, the power output of the engine can be adjusted to any of the power settings designated in the Cruise Power Setting tables in the PERFORMANCE Section.

The fuel flow portion of the indicator is calibrated in gallons per hour, the green arc indicating fuel flow for normal operating limits. Red radials are placed at the minimum and maximum allowable fuel pressures, as indicated at the fuel injection manifold valve.

In the cruise power range the green sectors cover the fuel flow required from 55% to 75% power. The lowest value of a given sector is the lean limit setting and the highest value of the sector is the best-power setting for that particular power range.

The take-off and climb range is covered by green sectors for full power at various altitudes. The full power markings represent the maximum performance mixtures for the altitudes shown, permitting leaning of the mixture for maximum power and performance during high-altitude takeoffs and full-power climbs.



EXHAUST GAS TEMPERATURE INDICATOR (EGT)

This installation provides for sensitive and rapid indication of exhaust gas temperature to assist in adjusting the fuel/air mixture during cruise.

ENGINE BREAK-IN INFORMATION

New engines have been carefully run-in by the engine manufacturer. However, the engine should be operated on straight mineral oil for a minimum of 50 hours or until oil consumption stabilizes. After the first 25 hours of operation, drain and replace the mineral oil. A change to an approved engine oil should be made after the break-in period. Refer to Lycoming Engine Operator's Manual.

NOTE

In order to promote proper ring seating, cruise power settings of 65% to 75% should be used until a total of 50 hours has accumulated or until oil consumption has stabilized. This recommendation is applicable to in-service engines following cylinder replacement or top-overhaul of one or more cylinders, as well as to new engines.

COWLING

The cowling is the split-type and is removable to expose the engine and mount assemblies.

LUBRICATION SYSTEM

The engine oil system is the wet-sump type and has an 8-quart capacity. Oil operating temperatures are controlled by an automatic thermostat bypass control. The bypass control will limit oil flow through the oil cooler when operating temperatures are below normal, and will permit the oil to bypass the cooler if it should become blocked.

INDUCTION SYSTEM ICING

The possibility of induction system icing is reduced by the non-icing characteristics of the fuel-injected engine and automatic alternate air source. The alternate air door will open automatically if the air intake or filter becomes obstructed.

STARTER

A magneto/start switch, located on the subpanel to the left of the pilot's control column, incorporates R(right), L(left) and BOTH magneto positions in addition to the normal OFF and START positions. After activation of the starter the spring-loaded switch returns to the BOTH position when released. Battery switch and alternator switch are grouped on the subpanel to the right of the pilot's control column.

The warning light placarded STARTER ENGAGED (MC-731 and after) illuminates whenever electrical power is being supplied to the starter. If the light remains illuminated after starting, the starter relay has remained engaged, and loss of electrical power and possible equipment damage will eventually result. Turn the BATTERY & ALT and ALT Switches OFF. If in flight, land as soon as practical. If the light does not illuminate during starting, the indicator system is inoperative and the ammeter must be monitored

to ensure that the starter does not remain energized after releasing the magneto/start switch.

PROPELLER

Installed as standard equipment is a constant-speed, variable-pitch, 76 -diameter propeller with two aluminum alloy blades. The pitch setting at the 30-inch station is 14.4° low and 27.0° to 31.0° high pitch. Normal operating range is 2350 to 2700 rpm with a restricted operating range between 2100 and 2350 rpm.

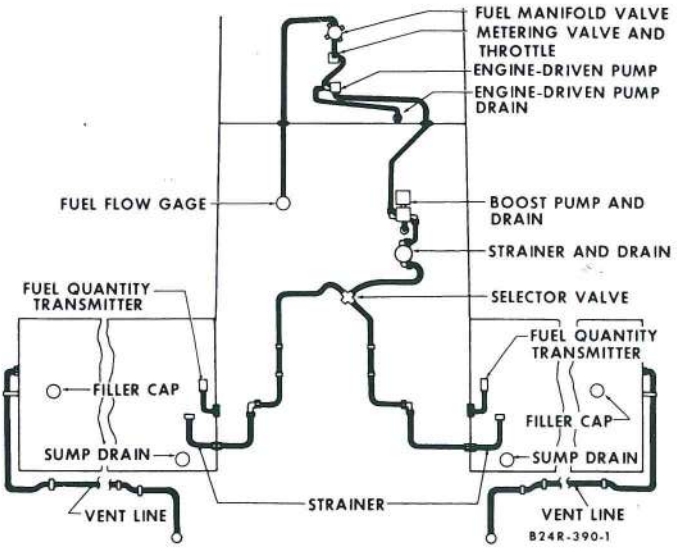
Propeller rpm is controlled by a single-action, engine-driven propeller governor which regulates hydraulic oil pressure to the hub. The propeller control on the power quadrant allows the pilot to select the governor's rpm range. Governor-boosted oil pressure holds the propeller blades in a high pitch (low rpm) position during normal cruise operation. If oil pressure is lost, the propeller will go to the full high rpm (low pitch) position.

FUEL SYSTEM

The airplane is designed for operation on grade 100 (green) or 100LL (blue) aviation gasoline.

FUEL TANKS

Fuel tanks located in each wing have a nominal capacity of 29.9 gallons each for a total of 59.8 gallons. In the filler neck of each tank is a visual measuring tab which facilitates partial filling of the fuel system. When the fuel touches the bottom of the tab it indicates 15 gallons of fuel, and when filled to the slot in the tab it indicates 20 gallons. The pilot must visually check the fuel level during preflight



FUEL SYSTEM SCHEMATIC

to ascertain desired level. Fuel is fed from the desired tank through a fuel selector valve in the center floorboard and then through a strainer to the engine-driven fuel pump.

FUEL QUANTITY INDICATORS

Fuel quantity is measured by float-operated sensors, located in each wing tank system. These transmit electrical signals to the individual indicators, which indicate fuel remaining in each tank. The indicating system reads full at 20 gallons.

FUEL DRAINS

The fuel system drains should be opened regularly to prevent the accumulation of condensation in the fuel,

especially during periods of warm days and cool nights. They should also be opened before each flight not only to check for condensation but also to inspect for fuel contamination.

Wing Drains

Wing sump drains on MC-449, MC-452 through MC-536 except MC-533, protrude through the wing skin and are opened by pushing them upward to release the fuel. This type of valve can be locked open by pushing upward to open it, then rotating it clockwise to lock it. To close the valve, press upward and rotate counterclockwise. When released, the valve will close. Check for proper seating to prevent fuel loss.

On MC-533, MC-537 and after, the wing drains have flush-type valves and are opened by using the combination fuel drain/emergency landing gear extension tool provided with the loose tools. It is normally kept in the pocket on the pilot's door. To open the drain valve, insert the tab end of the tool into the opening in the center of the valve and push upward. Removing the tool will close the valve. This type of drain can be locked open by pushing upward with the tool and rotating counterclockwise. To close the valve, press upward with the tool in place and rotate clockwise before removing the tool. Make certain the valve is seated to prevent loss of fuel.

Low Spot Drain

The fuel system low spot drain in the bottom of the fuel filter should also be drained frequently. It is located on the lower portion of the firewall on the forward side and protrudes through the lower skin. This drain can be locked open by turning clockwise until it locks. To close the drain, rotate counterclockwise and the valve will snap shut.

FUEL BOOST PUMP

The electric fuel boost pump, controlled by an ON-OFF toggle switch on the pilot's subpanel, provides pressure for starting and emergency operation. The fuel boost pump provides sufficient pressure for engine operation, should the engine-driven pump fail.

FUEL TANK SELECTION

The fuel selector valve handle is located on the floorboards between the pilot and copilot seats. Takeoffs and landings should be made using the tank that is more nearly full.

NOTE

On serials MC-696 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.

If the engine stops because of insufficient fuel, refer to the EMERGENCY PROCEDURES Section for the Air Start procedures.

FUEL REQUIRED FOR FLIGHT

It is the pilot's responsibility to ascertain that the fuel quantity indicators are functioning and maintaining a reasonable degree of accuracy, and to be certain of ample fuel for a flight. Takeoff is prohibited if the fuel quantity indicators do not indicate above the yellow arc. The caps should be removed and fuel quantity checked to give the pilot an indication of fuel on board. The airplane must be

approximately level for visual inspection of the tank. Fuel should be added so that the amount of fuel will be not less than is required for takeoff. Plan for an ample margin of fuel for any flight.

ELECTRICAL SYSTEM

The system circuitry is the single-wire, ground-return type, with the airplane structure used as the ground return. The battery, alternator, fuel boost, and magneto/start switches are located on the left subpanel. The circuit breaker panel, located on the right subpanel, contains the protective circuit breakers for the various electrical systems. Some switch-type circuit breakers are located on the left subpanel.

In addition, there is an in-line fuse in the rotating beacon wire and in the strobe light wire forward of the left subpanel, with spare fuses adjacent to the fuse holder. There is also a fuse on the left side of the quadrant pedestal for the electric clock (if installed), or an in-line fuse near the battery box.

BATTERY

14-VOLT SYSTEM

A 12-volt battery is located in the aft fuselage. Battery servicing procedures are described in the LANDING, SERVICING AND MAINTENANCE Section.

28-VOLT SYSTEM

One 24-volt battery, or two 12-volt batteries in series, are located in the aft fuselage. The two 12-volt batteries in series are of a shape and size that they will both fit in the same battery compartment which is provided for the 24-volt battery. Battery servicing procedures are described in the HANDLING, SERVICING AND MAINTENANCE Section.

ALTERNATOR

14-VOLT SYSTEM

The alternator maintains its full-rated 60-ampere output at cruise engine rpm, and uses a voltage regulator to adjust alternator output.

Since the alternator is not self-exciting, dual switches are required to activate the circuit. The switch placarded BATTERY & ALT, when placed in the ON position, will only activate the battery circuit. When this switch is on and the ALT (FIELD) switch is placed in the ON position, the alternator is excited by power from the airplane battery. When the BATTERY & ALT switch is in the OFF position, the alternator will be off regardless of the ALT (FIELD) switch position. The alternator-field circuit breaker and alternator-output circuit breaker are located on the right subpanel (MC-449, MC-452 through MC-642). On airplanes MC-643 through MC-673 (and airplanes MC-449, MC-452 through MC-642 with installation of Beech Kit No. 23-3009-1 S) the alternator circuit is protected by an alternator-field circuit breaker on the right subpanel, and an alternator-output current limiter on the firewall.

28-VOLT SYSTEM (MC-674 and after)

The 28-volt alternator is rated at 60 amps nominal output at cruise engine rpm. A self-exciting feature provides for activation of the alternator independent of battery power when the engine reaches a speed of 1200 to 1500 rpm. A switch on the pilot's subpanel placarded ALT FIELD controls the alternator circuit. Circuit breakers for the alternator are located on the right subpanel.

EXTERNAL POWER RECEPTACLE

The external power receptacle is optional on this airplane. If installed, it is located on the right side of the fuselage (MC-449, MC-452 through MC-772) or on the left side of the fuselage (MC-773 and after), aft of the wing. Airplanes equipped with a 14-volt electrical system require a power unit set to 13.75 to 14.25 volts, while those equipped with a 28-volt electrical system require a setting of 27.75 to 28.25 volts.

CAUTION

On 14-volt airplanes, the power pin for external power is connected directly to the battery and continually energized. Turn off battery and alternator switches and all electrical and avionics switches when connecting the auxiliary power unit plug. Assure correct polarity (negative ground) before connecting auxiliary power unit. Turn on the battery switch before turning on the auxiliary power unit.

On 28-volt airplanes, a reverse polarity diode protection system is between the external power receptacle and the main bus. With external power applied, the bus is powered. Turn on the battery switch only, with all other switches including avionics switches off, when connecting the auxiliary power unit. Assure correct polarity before connecting external power.

When auxiliary power is desired, connect the clamps of the power cable to the remote power source, ensuring proper polarity. Turn OFF the ALT switches and ensure that all

avionics equipment is OFF, and then turn ON the BATT switch. Insert the power cable plug into the receptacle, turn on auxiliary power unit, and start engine using the normal starting procedures.

LIGHTING SYSTEMS

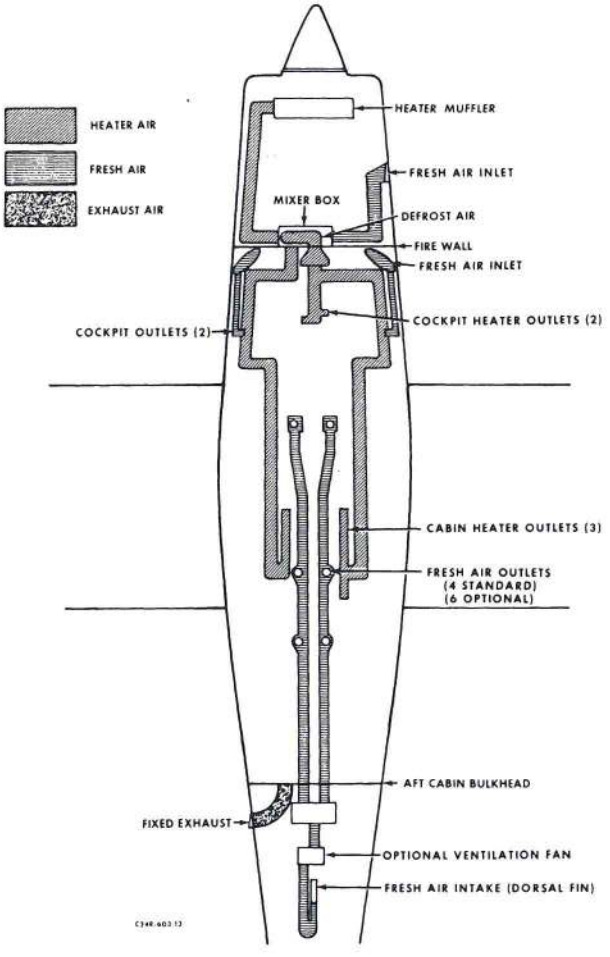
INTERIOR LIGHTING

Lighting for the instrument panel is controlled by a rheostat switch located on the pilot's subpanel to the left of the control column (MC-449, MC-452 through MC-536 except MC-533), or on the pedestal below the power quadrant (MC-533, MC-537 and after). The cabin dome light is operated by an ON-OFF switch adjacent to the light. The overhead instrument lighting and the map light (MC-689, MC-702 and after do not have a map light installed) are controlled by a rheostat switch located on the pedestal, below the power quadrant.

EXTERIOR LIGHTING

The switches for all of the exterior lights are located on the pilot's left subpanel. Each circuit is protected by a circuit breaker switch, circuit breaker, or fuse.

The exterior lights consist of navigation lights on the wing tips and rudder, a landing light on the left outboard wing, optional taxi lights on both outboard wings, and a rotating beacon on the vertical stabilizer. The landing light should be used for approach only, and the taxi lights should be used for ground maneuvering only. For longer battery and lamp life, use the landing light and taxi lights sparingly; avoid prolonged operation which could cause overheating during ground maneuvering.



ENVIRONMENTAL SCHEMATIC

NOTE

Particularly at night, reflections from rotating anti-collision lights or strobe lights on clouds, dense haze or dust can produce optical illusions and intense vertigo. Such lights, when installed, should be turned off before entering an overcast; their use may not be advisable under instrument or limited VFR conditions.

ENVIRONMENTAL SYSTEMS

CABIN HEATING

Air for warming the cabin and defrosting the windshield enters through an intake on the forward engine baffle, passes through the heater and into a mixer box where it is blended with cold air to obtain the desired cabin temperature. Hot or cold air may enter the cabin through the firewall outlets. The knob marked CABIN AIR regulates the quantity of air entering the cabin through this firewall outlet. With the CABIN AIR knob in, pull out the CABIN HEAT knob for heated air and push it in for fresh air. There are 4 outlets for cabin heat distribution in the standard installation; however, 5 outlets are provided when the optional children's seat is installed. Pull out the DEFROST knob for maximum defrost. Under extremely cold conditions, heating in the back seats can be improved by partially pulling the defrost knob.

VENTILATION

Fresh air for the cabin enters through two grill-type inlets immediately forward of the windshield and a scoop-type inlet on the dorsal fin. The two grill-type inlets supply air to the eyeball outlets on the cabin sidewalls between the

instrument panel and cabin doors. The scoop-type inlet supplies air to the four or six overhead eyeball outlets. Air flow through the eyeball outlets is regulated by rotating the outlet. An optional fan, controlled by a switch below the power quadrant (MC-449, MC-452 thru MC-536, except MC-533) or on the left subpanel (MC-533, MC-537 and after), facilitates ventilation for ground operation. The fan should be off when the airplane is airborne.

EXHAUST VENT

A fixed exhaust vent is located in the aft cabin for flow-through ventilation.

PITOT AND STATIC SYSTEMS

PITOT SYSTEM

The pitot system provides a source of impact air for operation of the airspeed indicator. The pitot mast is located on the leading edge of the left wing.

PITOT HEAT

The pitot mast is provided with an electric heating element which is turned on and off with a switch on the instrument panel. The switch should be ON when flying in visible moisture. It is not advisable to operate the pitot heating element on the ground except for testing or for short intervals of time to remove ice or snow.

NORMAL STATIC AIR SYSTEM

The normal static air system provides a source of static air to the flight instruments through a flush static fitting on each

side of the aft fuselage. A union located inside a cover plate on the belly of the airplane provides a drain point to remove moisture from the system.

EMERGENCY STATIC AIR SYSTEM

An emergency static air source may be installed to provide air for instrument operation should the static ports become blocked. Refer to the EMERGENCY PROCEDURES Section for procedures describing how and when to use this system.

VACUUM SYSTEM

Vacuum for air-driven gyroscopic flight instruments and other air-driven equipment is supplied by an engine-driven vacuum pump. An adjustable relief valve controls suction by bleeding outside air into the vacuum pump.

A suction gage indicates system vacuum in inches of mercury. This instrument is located on the pilot's side of the instrument panel. The vacuum should be maintained within the green arc for proper operation of the air-driven instruments.

STALL WARNING SYSTEM

WARNING

With the BATTERY & ALT switch in the OFF position the stall warning horn is inoperative. Airplane certification requires the stall warning system to be on during flight except in emergency conditions as stated in Section III.

A stall warning horn located in the overhead speaker console is factory set to sound a warning 5 to 7 mph above a stall condition and continues steadily as the airplane approaches a complete stall. The stall warning horn, triggered by a sensing vane on the leading edge of the left wing, is equally effective in all flight configurations and at all weights.

SECTION VIII

HANDLING, SERVICING AND MAINTENANCE

TABLE OF CONTENTS

INTRODUCTION

The purpose of this section is to outline the requirements for maintaining the airplane in a condition equal to that of its original manufacture. This information sets the time frequency intervals at which the airplane should be taken to a BEECHCRAFT Aero or Aviation Center or International Distributor or Dealer for periodic servicing or preventive maintenance.

The Federal Aviation Regulations place the responsibility for the maintenance of this airplane on the owner and operator, who must 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 this handbook are considered mandatory.

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

If a question should arise concerning the care of the airplane, it should be directed to Beech Aircraft Corporation, Liberal Division, Box 300, Liberal, Kansas 67901. Correspondence should contain the airplane serial number, which can be found on the manufacturer's placard, located on the right side of the fuselage adjacent to the inboard end of the flap. The placard is visible when the flaps are lowered.

PUBLICATIONS

The following publications are available through BEECHCRAFT Aero or Aviation Centers or International Distributors or Dealers.

1. Shop Manual
2. Parts Catalog
3. Service Instructions
4. Various Inspection Forms

NOTE

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 a BEECHCRAFT Aero or Aviation Center, or International Distributor or Dealer, or refer to the latest revision of BEECHCRAFT Service Instructions No. 0250-010.

AIRPLANE INSPECTION PERIODS

1. FAA Required Annual Inspections.
2. BEECHCRAFT Recommended Inspection Guide.
3. Continuing Care Inspection Guide.
4. See "Recommended Servicing Schedule" and "Overhaul or Replacement Schedule" for further inspection schedules.

PREVENTATIVE MAINTENANCE THAT MAY BE ACCOMPLISHED BY A CERTIFICATED PILOT

1. A certificated pilot may perform limited maintenance. Refer to FAR Part 43 for the items which may be accomplished.

To ensure that proper procedures are followed, obtain a BEECHCRAFT Shop Manual before performing any maintenance operation.

2. All other maintenance must be performed by licensed personnel.

NOTE

Pilots operating airplanes of other than U.S. registry should refer to the regulations of the registering authority for information concerning preventative maintenance that may be performed by pilots.

ALTERATIONS OR REPAIRS TO AIRPLANE

The FAA should be contacted prior to any alterations on the airplane to ensure that the airworthiness of the airplane is not violated.

NOTE

Alterations and repairs to the airplane must be made by properly licensed personnel.

GROUND HANDLING

The three-view drawing shows the minimum hangar clearances for a standard airplane. Allowances must be made for any special radio antennas and the possibility of an under inflated nose tire.

TOWING

CAUTION

Extreme care should be used when moving with power equipment. Should the nose gear be turned in excess of the red limit marks, there is a very good possibility the nose gear steering yoke and/or linkage may be damaged.

One person can move the airplane on a smooth and level surface, using the hand tow bar furnished with the loose equipment. Attach the tow bar to the tow lugs on the nose gear lower torque knee.

Where movement is restricted, two people can pivot the airplane on the main wheels. One person should push on the wing leading edge or hold the wing tip, while the other operates the tow bar.

CAUTION

Do not exert force on the propeller or control surfaces. Do not place weight on the stabilator to raise the nose wheel. Do not attempt to tow the airplane backward by the tail tie-down ring.

PARKING

The parking brake push-pull control is located on the left side of the lower subpanel. To set the parking brakes, pull the control out and depress each toe pedal until firm. Push the control in to release the brakes.

NOTE

The parking brake should be left off and wheel chocks installed if the airplane is to remain unattended. Changes in ambient temperature can cause the brakes to release or to exert excessive pressures.

CONTROL COLUMN LOCK PIN

1. Rotate the control wheel and move control column so the holes in the control column hanger and the control column will align to accept the pin.

2. Push the control column lock pin through the hole provided in the control column hanger and into the hole in the underside of the control column tube assembly.

3. Ensure positive retention of the lock pin by positioning the hook over the control column.

TIE-DOWN

It is advisable to nose the airplane into the wind. Three tie-down lugs are provided: one on the lower side of each wing and a third at the rear of the fuselage.

1. Install the control column lock pin.

2. Chock the main wheels fore and aft.

3. Using nylon line or chain of sufficient strength, secure the airplane at the three points provided. DO NOT OVERTIGHTEN the line at the rear of the fuselage excessively tight, because the nose may rise and produce lift due to the angle of attack of the wings.

4. Release the parking brake.

If extremely high winds are anticipated, a vertical tail post can be installed at the rear tie-down lug, and a tie-down line attached to the nose gear.

JACKING

Raise the individual gear for wheel and tire removal with a scissors jack under the axle. Also, jack pads are installed to facilitate landing gear retraction checks. Refer to the BEECHCRAFT Shop Manual for proper procedures.

CAUTION

The landing gear circuit breaker should be pulled and the emergency gear extension valve should be open to relieve pressure in the hydraulic system, in order to prevent inadvertent retraction of the landing gear when the airplane is jacked.

FLYABLE STORAGE - 7 to 30 DAYS

MOORING

If airplane cannot be placed in a hangar, tie down securely at the three points provided. Do not use hemp or manila rope. It is recommended a tail support be used to lightly compress the nose gear and reduce the angle of attack of the wings. Attach a line to the nose gear for additional tie-down.

FUEL CELLS

Fill to capacity to minimize fuel vapor.

FLIGHT CONTROL SURFACES

Lock with internal and external locks.

GROUNDING

Static-ground airplane securely and effectively.

PITOT TUBE

Install cover.

WINDSHIELD AND WINDOWS

Close all windows and window vents. It is recommended that covers be installed over the windshield and windows.

DURING FLYABLE STORAGE

WARNING

Be sure the magneto/start switch is OFF, the throttle CLOSED, and mixture control in the IDLE CUT-OFF position before turning the propeller. Do not stand in the path of propeller blades. Also, ground running the engine for brief periods of time is not a substitute for turning the engine over by hand. In fact, the practice of ground running will tend to aggravate rather than minimize corrosion formation in the engine.

In a favorable atmospheric environment the engine of an airplane that is flown intermittently can be adequately protected from corrosion by turning the engine over five revolutions by means of the propeller. This will dispel any beads of moisture that may have accumulated and spread the residual lubricating oil around the cylinder walls. Unless the airplane is flown, repeat this procedure every five days.

After 30 days, the airplane should be flown for 30 minutes or a ground runup should be made long enough to produce an oil temperature within the lower green arc range. Excessive ground runup should be avoided.

PREPARATION FOR SERVICE

Remove all covers, clean the airplane, and give it a thorough inspection, particularly landing gear, wheel wells, flaps, control surfaces, and pitot and static pressure openings.

Preflight the airplane.

PROLONGED OUT OF SERVICE CARE

The storage procedures listed are intended to protect the airplane from deterioration while it is not in use. The primary

objectives of these measures are to prevent corrosion and damage from exposure to the elements.

If the airplane is to be stored longer than 30 days refer to the appropriate airplane shop manual and Avco Lycoming Service Letter L180.

EXTERNAL POWER RECEPTACLE

The external power receptacle is optional on this airplane. If installed, it is located on the right side of the fuselage (MC-449, MC-452 through MC-772) or on the left side of the fuselage (MC-773 and after), aft of the wing. Airplanes equipped with a 14-volt electrical system require a power unit set to 13.75 to 14.25 volts, while those equipped with a 28-volt electrical system require a setting of 27.75 to 28.25 volts.

CAUTION

On 14-volt airplanes, the power pin for external power is connected directly to the battery and continually energized. Turn off battery and alternator switches and all electrical and avionics switches when connecting the auxiliary power unit plug. Assure correct polarity (negative ground) before connecting auxiliary power unit. Turn on the battery switch before turning on the auxiliary power unit.

On 28-volt airplanes, a reverse polarity diode protection system is between the external power receptacle and the main bus. With external power applied, the bus is powered. Turn on the battery switch only, with all other switches including avionics switches off, when connecting the auxiliary power unit. Assure correct polarity before connecting external power.

CHECKING ELECTRICAL EQUIPMENT

Connect an auxiliary power unit as outlined above. Ensure that the current is stabilized prior to making any electrical equipment or avionics check.

CAUTION

If the auxiliary power unit has poor voltage regulation or produces voltage transients, the equipment connected to the unit may be damaged.

SERVICING

FUEL SYSTEM

Use aviation gasoline grades 100 (green) or 100LL (blue).

CAUTION

See Avco Lycoming Service Letter No. L185A or later revision for operation on alternate fuels.

Two 29.9-gallon fuel tanks are located in the wings just outboard of the wing root. A visual measuring tab located below the tank filler neck facilitates a fuel load of 15 gallons when the fuel reaches the bottom of the tab, or 20 gallons when the fuel reaches the top of the slot. This partial filling of the fuel tanks allows an increase in the payload. The fuel indicators on the instrument panel will indicate fuel tanks even though each tank contains only 20 gallons of fuel.

WARNING

Connect a grounding cable from the fuel service unit to the airframe, and connect grounding cables from both the fuel service unit and the airplane to ground during fueling operations. This procedure reduces fire hazard.

Open each of the fuel drains during preflight to check for fuel contamination and to remove any condensation from the system. Large daily temperature variations in cool weather are favorable for the formation of condensation, and the valves should be opened more frequently during these periods. For description and operation of the drains, refer to FUEL DRAINS in SYSTEMS DESCRIPTION. If water is suspected to be in the fuel after the fuel system has been filled, allow at least one hour settling time before opening the drains to make an inspection.

Inspection and cleaning of the fuel strainers should be considered of the utmost importance as a regular part of preventative maintenance. The following inspection and cleaning intervals are recommendations only, since the frequency will depend upon service conditions and fuel handling cleanliness. When operating in localities where there is an excessive amount of sand or dirt, the strainers should be inspected at more frequent intervals.

The screen in the fuel strainer at the system low spot on the bottom of the fuselage should be removed and washed in fresh cleaning solvent at each 100-hour inspection of the airplane. Ordinarily, the finger strainers in the fuel tank outlets should not require cleaning unless there is a definite indication of solid foreign material in the tanks, or the airplane has been stored for an extended period.

After the fuel strainers have been reinstalled, the installations should be checked for leakage. Any fuel lines or fittings disconnected for maintenance purposes should be capped.

Frequently inspect the O-rings on the fuel filler caps for condition. Replace as required to prevent contamination of the fuel from precipitation.

OIL SYSTEM

CAUTION

During break-in periods on new engines, oil consumption tends to be higher, therefore, maximum range flights should be avoided and oil level brought to full after each flight during this period.

Check engine oil quantity before each flight. Under normal operating conditions, the oil should be changed after each 50 hours of engine operation. More frequent changes may be required under adverse operating conditions. Use engine oil as indicated in Consumable Materials in this section. The engine oil sump capacity is eight quarts. The normal operating range is six to eight quarts.

BATTERY

14-VOLT SYSTEM

A 12-volt, 25 amp-hour, lead-acid battery, located directly aft of the cabin area may be reached by removing the rear panel.

28-VOLT SYSTEM

One 24-volt, 15.5 amp hour, lead-acid battery, or two 12-volt 25 amp hour, lead-acid batteries connected in series, are located directly aft of the cabin area and may be reached by removing the rear panel.

Check the battery regularly for fluid level and add distilled water as required. Clean, tight connections should be

maintained at all times. Battery vents on Serials MC-449, MC-452 thru MC-532, MC-534 thru MC-536 should be checked periodically for obstructions and for proper protrusion (3 inches from top of chamfer to skin line). Serials MC-533, MC-537 and after have a flush vent system.

External power should be used for checking airplane electrical systems to prevent excess battery power loss, and for starting the engine during cold weather when more power is needed for cranking. Charging batteries in the airplane is discouraged. If the battery is low and needs charging and servicing, it should be removed from the airplane and serviced and charged in the manner prescribed in the shop manual.

WARNING

Always connect charging cables at the battery terminals first, then to the charging unit, to avoid sparks near the battery fumes since explosion could occur.

TIRES

The airplane is equipped with tube-type tires. Inflate the 17.50 x 6.00-6 main gear tires to 32 psi and the 14.20 x 5.00-5 nose gear tire to 35 psi. Maintaining proper tire inflation will minimize tread wear and aid in preventing tire failure caused from running over sharp stones. When inflating tires, visually inspect them for cracks and breaks.

CAUTION

Beech Aircraft Corporation cannot recommend the use of recapped tires. Recapped tires have a tendency to swell as a result of the increased temperature generated during takeoff. Increased tire size can jeopardize proper function of the landing gear retract system, with the possibility of damage to the landing gear retract mechanism, or jamming of the tire in the wheel well.

SHIMMY DAMPER

A hydraulic shimmy damper is mounted on the nose wheel strut yoke. Whenever this component develops an external leak or a skip in the damping action, it should be replaced.

BRAKES

The brake hydraulic fluid reservoir is located on the firewall in the engine compartment. Refer to Consumable Materials in this section for hydraulic fluid specification.

Since the pistons move to compensate for lining wear, the brakes require no adjustment. Complete information on brake, wheel, and tire maintenance is contained in the appropriate manual included in the loose tools and accessories kit.

INDUCTION AIR FILTER

This filter should be inspected for foreign matter at least once during each 50-hour operating period. In adverse climatic conditions, or if the airplane is stored, preflight inspection is recommended.

To remove and clean the filter:

1. Remove the filter retaining screws.
2. Remove the filter.
3. Clean and service as described in the manufacturer's instructions on the filter.
4. Reinstall the filter.

VACUUM SYSTEM

The foam-rubber suction-relief valve filter may be removed for cleaning by slipping the filter off the bottom of the valve. The filter may be cleaned with soap and water.

In addition, the airplane is equipped with a replaceable paper filter, mounted under the instrument panel on the upper left side of the firewall or mounted on the left instrument panel brace immediately under the glareshield.

PROPELLER BLADES

The daily preflight inspection should include a careful examination of the propeller blades for nicks and scratches. Each blade leading edge should receive particular attention. It is very important that all nicks and scratches be smoothed out and polished. Any BEECHCRAFT Aero or Aviation Center or International Distributor or Dealer will answer questions concerning propeller blade repair.

WARNING

When working on a propeller, always make certain that the magneto/start switch is OFF and that the engine has cooled completely. WHEN MOVING A PROPELLER, STAND IN THE CLEAR; there is always some danger of a cylinder firing when a propeller is moved.

MINOR MAINTENANCE

RUBBER SEALS

To prevent sticking of the rubber seals around the doors, the seals should be coated with Oakite 6 compound or powdered soapstone or equivalent.

ALTERNATOR

Since the alternator and electronic voltage regulator are designed for use on only one polarity system, the following precautionary measures must be observed when working on the charging circuit, or serious damage to the electrical equipment will result:

1. When installing a battery, make certain that the ground polarity of the battery and the ground polarity of the alternator are the same.

2. When connecting a booster battery, be sure to connect the negative battery terminals together and the positive battery terminals together.

3. When using a battery charger, connect the positive lead of the charger to the positive battery terminal and the negative lead of the charger to the negative battery terminal.

4. Do not operate an alternator on open circuit. Be sure all circuit connections are secure.

5. Do not short across or ground any of the terminals on the alternator or electronic voltage regulator.

6. Do not attempt to polarize an alternator.

MAGNETOS

Ordinarily, the magnetos will require only occasional adjustment, lubrication, and breaker point replacement. This work should be done by a BEECHCRAFT Aero or Aviation Center or International Distributor or Dealer.

WARNING

To be safe, treat the magnetos as hot whenever a switch lead is disconnected at any point; they do not have an internal automatic grounding device. The magnetos can be grounded by replacing the switch lead at the noise filter capacitor with a wire which is grounded to the engine case. Otherwise, all spark plug leads should be disconnected or the cable outlet plate on the rear of the magneto should be removed.

CLEANING

EXTERIOR PAINT FINISHES

In the standard configuration the BEECHCRAFT Sierra C24R is painted with a lacquer paint finish. Optional urethane paint finishes are available.

LACQUER PAINT FINISHES

Because wax seals the paint from the outside air, a new lacquer paint finish should not be waxed for a period of 90 days to allow the paint to cure. Wash uncured painted surfaces with only cold or lukewarm (never hot) water and a mild non-detergent soap. Any rubbing of the painted surface should be done gently and held to a minimum to avoid cracking the paint film.

CAUTION

When washing the airplane with mild soap and water, use special care to avoid washing away grease from any lubricated area. After washing with solvent, lubricate all lubrication points. Premature wear of lubricated surfaces may result if the above precautions are not taken.

Prior to cleaning, cover the wheels, making certain the brake discs are covered. Attach the pitot cover securely, and plug or mask off all other openings. Be particularly careful to mask off the static air buttons before washing or waxing.

After the paint cures, a thorough waxing will protect painted and unpainted metal surfaces from a variety of highly corrosive elements. Flush loose dirt away first with clear water, then wash the airplane with a mild soap and water. Harsh, abrasive, or alkaline soaps or detergents should never be used. Use a soft cleaning cloth or chamois to prevent scratches when cleaning and polishing. Any good grade automobile wax may be used to preserve painted surfaces. To remove stubborn oil and grease, use a soft cloth dampened with naphtha. After cleaning with naphtha, the surface should be polished or waxed.

URETHANE PAINT FINISHES

The same procedure should be followed for cleaning urethane paint finishes as for lacquer paint finishes; however, urethane paint finishes are fully cured at the time of delivery.

WINDSHIELD AND WINDOWS

Exercise extreme care to prevent scratches when cleaning the Plexiglas windshield and windows. Never wipe them when dry. Flush the surface with clean water or a mild soap solution, then rub lightly with a grit-free soft cloth, sponge, or chamois. Use trisodium phosphate completely dissolved in water to remove oil and grease film. To remove stubborn grease and oil deposits, use hexane, aliphatic naphtha, or methanol. Rinse with clean water; avoid prolonged rubbing.

CAUTION

Do not use gasoline, benzene, acetone, carbon tetrachloride, fire extinguisher fluid, deice fluid, or lacquer thinners on the windshield or windows, as these substances have a tendency to soften and craze the surface.

INTERIOR

The seats, rugs, upholstery panels, and headliner should be vacuum-cleaned frequently. Do not use water to clean fabric surfaces. Commercial foam-type cleaners or shampoos can be used to clean rugs, fabrics, and upholstery; however, the instructions on the container should be followed carefully.

Some plastic interior trim may be affected by ultra-violet rays from the sun over a period of time. The results of this exposure is a yellow stain that accumulates on the plastic.

It has been found that a commercial type scouring powder cleanser, used with a wet cloth, will successfully remove this stain without damaging the trim.

It must be noted that this type cleanser contains a high bleach content and should not be allowed to come in contact with any other interior material.

ENGINE

Clean the engine with kerosene, solvent, or any standard engine cleaning fluid. Spray or brush the fluid over the engine, then wash off with water and allow to dry.

LUBRICATION

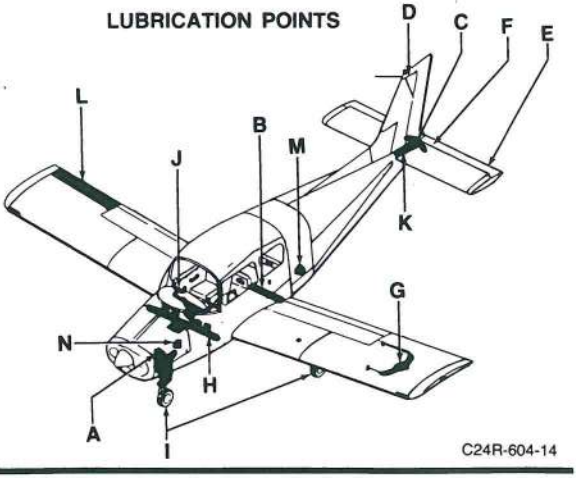
Proper lubrication is essential in keeping the airplane components in top condition. If this operation is performed thoroughly, general maintenance will be reduced and the service life of the airplane will be greatly increased.

The grease fittings or parts must be wiped clean to make sure that no dirt is carried into the part when lubricated. Apply lubricant sparingly, but with assurance that the bearing surfaces are adequately covered. Wipe off excess lubricant to prevent the accumulation of dust and foreign material.

NOTE

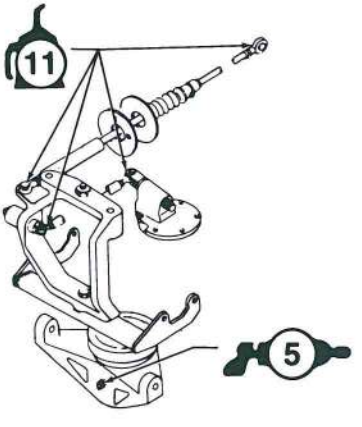
Lubricate all pivotal points as shown on the Lubrication Diagram in the Shop Manual to ensure freedom of movement and proper functioning. More frequent lubrication may be required because of climate, or frequent usage of the airplane.

LUBRICATION POINTS



C24R-604-14

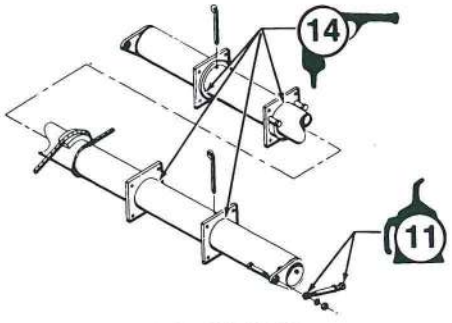
DETAIL A



NOSE GEAR STEERING

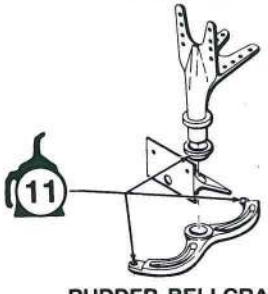
C24R-604-15

DETAIL B



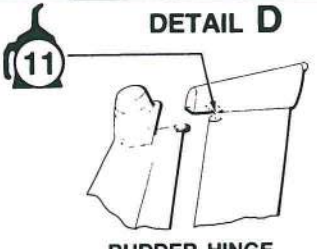
FLAP MECHANISM C24R-604-16

DETAIL C



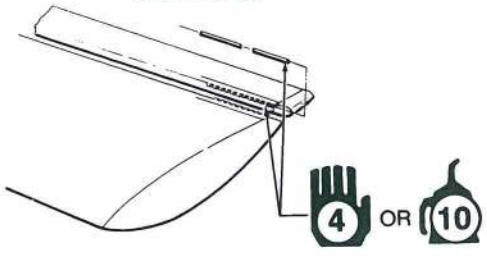
RUDDER BELLCRANK C24R-604-17

DETAIL D



RUDDER HINGE C24R-604-18

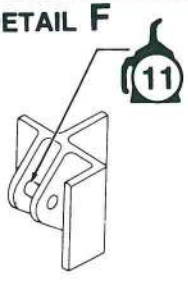
DETAIL E



ELEVATOR HINGE

C24R-604-19

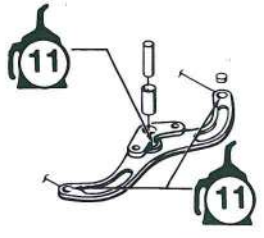
DETAIL F



STABILATOR HINGE BRACKET

C24R-604-20

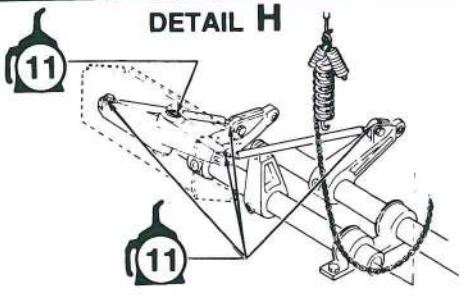
DETAIL G



AILERON BELLCRANK

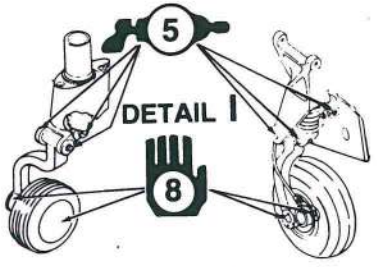
C24R-604-21

DETAIL H



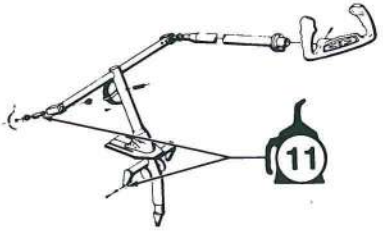
RUDDER MECHANISM

C24R-604-22



LANDING GEAR C24R-604-23

DETAIL J

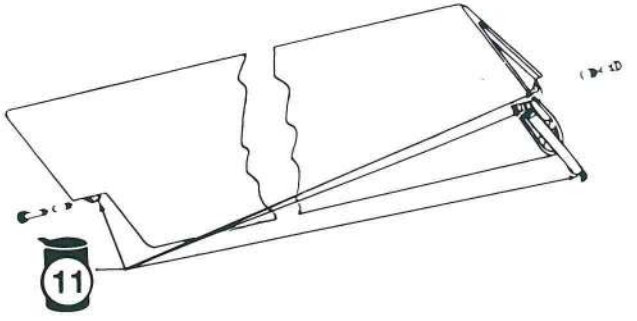


CENTRAL COLUMN LINKAGE C24R-604-24

DETAIL K

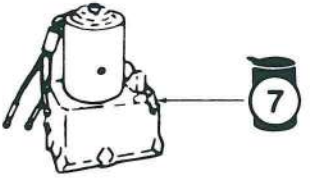
TRIM TAB ACTUATOR C24R-604-25

DETAIL L



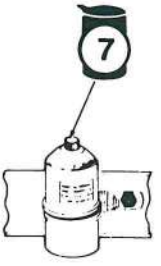
AILERON HINGE AND ROD ENDS C24R-604-26

DETAIL M



LANDING GEAR RESERVOIR C24R-604-27

DETAIL N



BRAKE FLUID RESERVOIR

C24R-604-28

SPRAY

GREASE GUN

HAND OR PACK

OIL CAN

BRUSH

HYDRAULIC FLUID

NOTE

NUMBERS REFER TO ITEMS IN THE CONSUMABLE MATERIALS CHART.
LUBRICATE ALL PLAIN BEARING BUSHINGS AS REQUIRED OR EVERY 500 HOURS WITH SAE NO. 30 OIL.
APPLY SAE NO. 20 OIL TO PUSH-PULL CONTROL HOUSINGS AS REQUIRED.
LUBRICATE FLIGHT CONTROL PULLY BUSHINGS WITH SAE NO. 30 OIL EVERY 1000 HOURS.

SAE 10W/30 OIL IS AN ACCEPTABLE REPLACEMENT FOR SAE 20 OR SAE 30 OIL.

C24R-604-29

RECOMMENDED SERVICING SCHEDULE

INTERVAL	ITEM	LOCATION (Letters refer to Lubrication Points Diagram)	MATERIALS (Numbers refer to item on Consumable Materials)
Pre-flight	Check engine oil level	Upper right side of engine	1
	Drain fuel tank drains	Inboard bottom of wings	–
	Drain fuel system low spot	Bottom of fuselage	–
	Service fuel tanks	Top of wings	3
25 Hrs.	Check battery electrolyte	Behind aft cabin bulkhead	See Shop Manual
	Clean induction air filter	In lower forward cowl	–
	Lubricate landing gear knee pins	On landing gear (I)	5
50 Hrs.	Change engine oil	Lower side of engine	1
	Clean oil screens	Aft right side of accessory case and bottom of sump	2
	Central brake reservoir	On firewall (N)	7
	Hydraulic gear pump reservoir	Aft of rear seat bulkhead (O)	7
100 Hrs.	Clean fuel system screens and strainers	Bottom of wings and fuselage	2
	Clean suction relief valve screen	Forward of firewall	–

INTERVAL	ITEM	LOCATION (Letters refer to Lubrication Points Diagram)	MATERIALS (Numbers refer to item on Consumable Materials)
100 Hrs. (Cont'd)	Lubricate wheel bearings	Landing gear (I)	8
	Lubricate nose gear rod end bearings	On top of nose gear (A)	11
	Lubricate nose gear swivel	On aft side of nose gear (A)	5
	Lubricate flap torque tubes	Under floorboards (B)	14
	Lubricate flap rod end bearings	Under floorboards (B)	11
	Lubricate rudder bellcrank pivot points	Bottom of rudder (C)	11
	Lubricate rudder hinges	On rudder leading edge (D)	11
	Lubricate stabilator trim tab hinge and pin	On trailing edge of stabilator (E)	4, 10
	Lubricate stabilator hinge pivot point	In aft tail section (F)	11
	Lubricate aileron bell-crank	In wing forward of aileron (G)	11
	Lubricate aileron pivotal points and rod ends	Outboard trailing edge of wings (L)	11
300 Hrs.	Replace induction air filter	In front nose cowl	–

500 Hrs.	Lubricate rudder pedal bell-crank	Forward cabin floor (H)	11
	Lubricate rudder pedal rod ends	Forward cabin floor (H)	11
	Replace gyro instrument central paper filter	Behind instrument panel	–
1000 Hrs.	Lubricate control column pivot points	Behind instrument panel (J)	11
1200 Hrs.	Lubricate trim tab actuator	In aft tail section (K)	9
As Required	Clean spark plugs	In engine compartment	–

NOTES
1. Anytime the control surfaces are altered, repaired, or repainted, they must be rebalanced per the Maintenance Manual.
2. Check the wing bolts for proper torque at the first 100-hour inspection and at the first 100-hour inspection after each reinstallation of the wing attach bolts.
3. Emergency Locator Transmitter Batteries (right side of aft fuselage):

   Non-rechargeable Batteries: Replace after one cumulative hour or after 50% of the useful life.

CONSUMABLE MATERIALS

ITEM	MATERIAL	SPECIFICATION
*1	Engine Oil	SAE No. 30 (0° to 70°F) SAE No. 50 (Above 60°F) SAE No. 20 (Below 10°F)
2	Solvent	PD680
**3	Fuel, Engine	100 (green) or 100LL (blue) Grade
***4	Lubricant, Powdered Graphite	MIL-C-6711
†5	Grease (High & Low Temperature)	Aero Lubriplate
6	Corrosion Preventive, Engine	MIL-C-6529
7	Hydraulic Fluid	MIL-H-5606
††8	Grease (General Purpose, Wide Temperature)	MIL-G-81322
††9	Grease (High & Low Temperature)	MIL-G-23827
10	Lubricating Oil (Low Temperature)	MIL-L-7870
11	Lubricating Oil	SAE No. 20 or 10W/30
****12	Fuel Additive	Alcor TCP Concentrate

†††13	Lubricant, Rubber Seal	Oakite 6 Compound
††††14	Lubricant, Silicone Spray	Krylon No. 1329 (or equivalent)
15	Lubricant, Fluorosilicone	Corning FS-1292

*It is recommended that a straight mineral based (nondetergent) oil be used until the oil consumption has stabilized and then change to an ashless dispersant oil for prolonged engine life.
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.

**If grade 100 (green) fuel is not available, use 100LL (blue).
***Mix with quick-evaporating liquid naphtha and apply with a brush.

†Product of BRC Bearing Company, Wichita, Kansas.

††In extremely cold climates, MIL-G-23827 grease should be used in place of MIL-G-81322 grease. Care should be exercised when using either MIL-G-81322 or MIL-G-23827 grease, as they contain a rust-preventing additive which is harmful to paint.

†††Product of Oakite Products, Inc., 50 Valley Road, Berkley Heights, N.J., 07922

††††Product of Krylon Inc., Norristown, Pa.

****Product of Alcor, Inc., 10130 Jones-Maltsberger Rd., P.O. Box 32516 San Antonio, Texas.

APPROVED ENGINE OILS FOR LYCOMING ENGINES

VENDOR	PRODUCT IDENTIFICATION
Delta Petroleum Co.	*Global Concentrate A
Enjay Chemical Co.	*Paranox 160 and 165
Mobil Oil Corp.	RT-451, RM-173E, RM-180E
Shell Oil Co.	*Shell Concentrate A Code 60068 *Aeroshell W 120 *Aeroshell W 80
Texaco Inc.	*TX-6309 *Aircraft Engine Oil Premium AD120 *Aircraft Engine Oil Premium AD80
American Oil and Supply Co.	*PQ Aviation Lubricant 753
Chevron Oil Co.	*Chevron Aero Oil Grade 120
Exxon Oil Co.	*Exxon Aviation Oil E-120 *Exxon Aviation Oil A-100 *Exxon Aviation Oil E-80
Standard Oil Co. of California	*Chevron Aero Oil Grade 120
Castrol Oils, Inc.	**Castrolaero 113, Grade 1065 **Castrolaero 117, Grade 1100
Champlin Oil and Refining Co.	**Grade 1065 **Grade 1100

Chevron Oil Co.	**Chevron Aviation Oil 65 **Grade 1100
Continental Oil Co.	**Conoco Aero Oil 1065
Mobil Oil Corp.	**Avrex 101/1065 **Avrex 101/1100
Phillips Petroleum Co.	**Phillips 66 Aviation Engine Oil, Grade 1065 **Phillips 66 Aviation Engine Oil, Grade 1100
Shell Oil Co.	**Aeroshell Oil 65 **Aeroshell Oil 100

*Ashless Dispersant Oils

**Straight Mineral Oils

NOTE

A straight mineral oil conforming to MIL-L-6082 may be used until the oil consumption has stabilized.

Vendors listed as meeting Federal and Military Specifications are provided as reference only and are not specifically recommended by Beech Aircraft Corporation. Any product conforming to the specification may be used.

BULB REPLACEMENT GUIDE

LOCATION	NUMBER	
	14-VOLT	28-VOLT
Compass light	330	327
Dome light, cabin	89	303
Instrument flood light, overhead	89	303
Landing gear position light	330	327
Landing light, wing	4313	4596
Navigation light, tail cone	1777	1683
Navigation light, wing	1512	1524
Rotating beacon	WRM-44KA or WRM-1940	WRM-1939
Taxi light	4595	4594

OVERHAUL AND REPLACEMENT SCHEDULE

The first overhaul or replacement should be performed not later than the required period. The condition of the item at the end of the first period can be used as a criterion for determining subsequent periods applicable to the individual airplane or fleet operation, providing the operator has an approved monitoring system.

The time periods for inspections noted in this manual are based on average usage and average environmental conditions.

SPECIAL CONDITIONS CAUTIONARY NOTICE

Airplanes operated for Air Taxi or other than normal operation, and airplanes operated in humid tropics or cold and damp climates, etc., may need more frequent inspections for wear, corrosion and/or lack of lubrication. In these areas periodic inspections should be performed until the operator can set his own inspection periods based on experience.

NOTE

The required periods do not constitute a guarantee the item will reach the period shown as the aforementioned factors cannot be controlled by the manufacturer.

COMPONENT	*OVERHAUL OR REPLACE*
LANDING GEAR	
Hydraulic pump, motor assembly (Brushes)	On Condition Inspect 500 hours, replace on condition.
Brake Assembly	On Condition
Brake Lining	On Condition
Master Cylinder	On Condition
Parking Brake Valve	On Condition
All Hose	On Condition
Retract Actuators	On Condition
Shuttle Valve (gear retract system)	On Condition
Shimmy Damper	On Condition
Wheels and Tires	On Condition
POWER PLANT	
Engine IO-360-A1B6	1600 hours
Engine Controls	On Condition
Engine Vibration Isolator Mounts	Engine Change
Exhaust System	On Condition

NOTE

When an engine has been overhauled, or a new engine installed, it is recommended that low power settings NOT be used until oil consumption has stabilized. The average time for piston ring seating is approximately 50 hours. Refer to Lycoming Engine Operator's Manual.

COMPONENT	*OVERHAUL OR REPLACE*
Starter	Inspect at engine overhaul; overhaul or replace On Condition
Alternator	On Condition
Oil Cooler	On Condition (replace when contaminated)
Propeller (Hartzell) See Hartzell S.L. 61F	At engine overhaul or at unscheduled engine change but not to exceed 1500 hours or 4 years
Propeller Controls	On Condition
Propeller Governor	At engine overhaul but not to exceed 1500 hours or 4 years
Magnetos	On Condition
Engine Driven Fuel Pump	At Engine Overhaul or On Condition
Cabin Heat Muff	Inspect every 100 hours
Flap Position Indicator	On Condition
Free Air Temperature Indicator	On Condition
All hose	Hoses carrying flammable liquids; at engine overhaul or every 5 years. All other hoses on condition.
Vacuum System Filter	Every 300 Hours
Vacuum Regulator Valve	On Condition
Vacuum Pump	At Engine Overhaul or On Condition

COMPONENT	*OVERHAUL OR REPLACE*
FUEL SYSTEM	
Fuel Boost Pump	On Condition
All Hose carrying flammable liquid	At engine overhaul or every 5 years
All Hose not carrying flammable liquid	On Condition
Fuel Selector Valve	Inspect every 100 hours; overhaul on condition
Fuel Cell Drain Valve	On Condition
Wing Fuel Quantity Transmitters	On Condition
INSTRUMENTS	
Turn Coordinator	On Condition
Altimeter	Every 24 months per FAA Directive
Directional Gyro	On Condition
Gyro Pressure	On Condition
Engine Indicator Units	On Condition
Airspeed Indicator	On Condition
Rate-of-Climb Indicator	On Condition
Fuel Quantity Indicator	On Condition
Manifold Pressure/Fuel Flow Indicator	On Condition
Tachometer	On Condition
ELECTRICAL SYSTEM	
Battery Master Relay	On Condition
All other Relays	On Condition
Voltage Regulator	On Condition
Starter Relay	On Condition

COMPONENT	*OVERHAUL OR REPLACE*
FLAPS AND FLIGHT CONTROLS	
Flight Controls	On Condition
Stabilator Tab Actuator	On Condition
Flap Motor and Actuator Drive Assembly	On Condition
Flap Motor Brushes	On Condition
MISCELLANEOUS	
Seat Belts and Shoulder Harness	Inspect every 12 months, replace on condition
Hand Fire Extinguisher	Inspect every 12 months, recharge as necessary
Cabin Heating and Ventilating Ducts	On Condition, Inspect every 12 months

INSPECTIONS

The FAA requires that an airplane used for hire be inspected at each 100 hours of operation by qualified personnel. Airplanes which are not used for hire are required to have an inspection by qualified personnel on an annual basis.

Good operating practice requires that the airplane be preflighted prior to takeoff. Items found during preflight and engine run-up should be corrected on the basis of their importance to the safe operation of the airplane; however, in any event, early correction of items found is good preventative maintenance.

Although it is not a requirement that FAA qualified personnel change the oil and inspect the airplane, except at the 100-hour/annual inspection, as noted above, it is recommended the airplane be given an inspection at the recommended oil change period. Any unsatisfactory items should be corrected, either at that time or as soon as practical, depending on the nature of the item.

The inspection at the recommended oil change interval should include the following:

Operational Inspection

1. Alternator/voltage regulator functioning
2. Engine instruments
3. Flight instruments
4. Idle rpm and mixture
5. Engine controls operation
6. All lights
7. Radio operation
8. Magneto check
9. Brake operation
10. Tank selector operation
11. Heat and vent system operation
12. Starter operation
13. Electrical switches and circuit breakers
14. Power check 2650 to 2700 rpm static

Power Plant

1. Oil screens cleaned
2. Induction air filter cleaned
3. Check engine controls, wiring harness, and plumbing for clearance and security.
4. Check propeller for rock damage and spinner and spinner bulkhead for cracks and security, engine and propeller for oil leaks.

5. Check engine baffles and cowling for cracks and security.
6. Check exhaust system and air ducts for condition and security.
7. Check for indications of oil leaks, condition and security of engine accessories.
8. Check brake system reservoir.
9. Clean and gap spark plugs.

Cabin and Aft Fuselage

1. Flight control operation through full travel and proper direction of travel.
2. Storm window and door operation
3. Check interior furnishings and seat belts.
4. Check battery water level.
5. Check hydraulic pump reservoir

Exterior

1. Check flight control surfaces for condition and security.
2. Check tires, brake pucks and discs.
3. Check static ports, pitot mast and fuel vent lines for obstructions.
4. Check general condition of fuselage and wings.

SECTION IX

SUPPLEMENTS

NOTE

The supplemental data contained in this section is for equipment that was delivered on the airplane, and for standard optional equipment that was available whether or not it was installed. Supplements for equipment for which the vendor obtained a Supplemental Type Certificate were included as loose equipment with the airplane at the time of delivery. These and other Supplements for other equipment that was installed after the airplane was delivered new from the factory should be placed in this SUPPLEMENTS Section of this Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

INTENTIONALLY LEFT BLANK

PILOT'S OPERATING HANDBOOK
and
FAA APPROVED AIRPLANE FLIGHT MANUAL

LOG OF SUPPLEMENTS

FAA Supplements must be in the airplane for flight operation when subject equipment is installed:

Part Number	Subject	Rev. No.	Date

98-38313

SECTION X
SAFETY INFORMATION
TABLE OF CONTENTS

SECTION X
SAFETY INFORMATION
TABLE OF CONTENTS (Continued)

INTRODUCTION

Beech Aircraft Corporation has developed this special summary publication of safety information to refresh pilots' and owners' knowledge of safety related subjects. Topics in this publication are dealt with in more detail in FAA Advisory Circulars and other publications pertaining to the subject of safe flying.

The skilled pilot recognizes that safety consciousness is an integral - and never-ending - part of his or her job. Be thoroughly familiar with your airplane. Know its limitations and your own. Maintain your currency, or fly with a qualified instructor until you are current and proficient. Practice emergency procedures at safe altitudes and airspeeds, preferably with a qualified instructor pilot, until the required action can be accomplished without reference to the manual. Periodically review this safety information as part of your recurrency training regimen.

BEECHCRAFT airplanes are designed and built to provide you with many years of safe and efficient transportation. By maintaining your BEECHCRAFT properly and flying it prudently you will realize its full potential.

. . . . . Beech Aircraft Corporation

WARNING

Because your airplane is a high performance, high speed transportation vehicle, designed for operation in a three-dimensional environment, special safety precautions must be observed to reduce the risk of fatal or serious injuries to the pilot(s) and occupant(s).

It is mandatory that you fully understand the contents of this publication and the other operating and maintenance manuals which accompany the airplane; that FAA requirements for ratings, certifications and review be scrupulously complied with; and that you allow only persons who are properly licensed and rated, and thoroughly familiar with the contents of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual to operate the airplane.

IMPROPER OPERATION OR MAINTENANCE OF AN AIRPLANE, NO MATTER HOW WELL BUILT INITIALLY, CAN RESULT IN CONSIDERABLE DAMAGE OR TOTAL DESTRUCTION OF THE AIRPLANE, ALONG WITH SERIOUS OR FATAL INJURIES TO ALL OCCUPANTS.

GENERAL

As a pilot, you are responsible to yourself and to those who fly with you, to other pilots and their passengers and to people on the ground, to fly wisely and safely.

The following material in this Safety Information publication covers several subjects in limited detail. Here are some condensed Do's and Don'ts.

DO'S

Be thoroughly familiar with your airplane, know its limitations and your own.

Be current in your airplane, or fly with a qualified instructor until you are current. Practice until you are proficient.

Preplan all aspects of your flight - including a proper weather briefing and adequate fuel reserves.

Use services available - weather briefing, inflight weather and Flight Service Station.

Carefully preflight your airplane.

Use the approved checklist.

Have more than enough fuel for takeoff, plus the trip, and an adequate reserve.

Be sure your weight and C.G. are within limits.

Use seatbelts and shoulder harnesses at all times.

Be sure all loose articles and baggage are secured.

Check freedom and proper direction of operation of all controls during preflight inspection.

Maintain the prescribed airspeeds in takeoff, climb, descent, and landing.

Avoid wake turbulence (Vortices).

Preplan fuel and fuel tank management before the actual flight. Utilize auxiliary tanks only in level cruise flight. Take off and land on the fullest main tank, NEVER use auxiliary tanks for takeoff or landing.

Practice emergency procedures at safe altitudes and airspeeds, preferably with a qualified instructor pilot, until the required action can be accomplished without reference to the manual.

Keep your airplane in good mechanical condition.

Stay informed and alert; fly in a sensible manner.

DON'TS

Don't take off with frost, ice or snow on the airplane.

Don't take off with less than minimum recommended fuel, plus adequate reserves, and don't run the tank dry before switching.

Don't fly in a reckless, show-off, or careless manner.

Don't fly into thunderstorms or severe weather.

Don't fly in possible icing conditions.

Don't fly close to mountainous terrain.

Don't apply controls abruptly or with high forces that could exceed design loads of the airplane.

Don't fly into weather conditions that are beyond your ratings or current proficiency.

Don't fly when physically or mentally exhausted or below par.

Don't trust to luck.

SOURCES OF INFORMATION

There is a wealth of information available to the pilot created for the sole purpose of making your flying safer, easier and more efficient. Take advantage of this knowledge and be prepared for an emergency in the event that one should occur.

PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL

You must be thoroughly familiar with the contents of your operating manuals, placards, and check lists to ensure safe utilization of your airplane. When the airplane was manufactured, it was equipped with one or more of the following: placards, Owner's Manual, FAA Approved Airplane Flight Manual, FAA Approved Airplane Flight Manual Supplements, Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. Beech has revised and reissued many of the early manuals for certain models of airplanes in GAMA Standard Format as Pilot's Operating Handbooks and FAA Approved Airplane Flight Manuals. For simplicity and convenience, all official manuals in various models are referred to as the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. If the airplane has changed ownership, the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual may have been misplaced or may not be current. Replacement handbooks may be obtained from any BEECHCRAFT Authorized Outlet.

BEECHCRAFT SERVICE PUBLICATIONS

Beech Aircraft Corporation publishes a wide variety of manuals, service letters, service instructions, service bulletins, safety communiques and other publications for the various models of BEECHCRAFT airplanes. Information on how to obtain publications relating to your airplane is contained in BEECHCRAFT Service Bulletin number 2001, entitled "General - BEECHCRAFT Service Publications - What is Available and How to Obtain It."

Beech Aircraft Corporation automatically mails original issues and revisions of BEECHCRAFT Service Bulletins (Mandatory, Recommended and Optional), FAA Approved Airplane Flight Manual Supplements, reissues and revisions of FAA Approved Airplane Flight Manuals, Flight Handbooks, Owners Manuals, Pilot's Operating Manuals and Pilot's Operating Handbooks, and original issues and revisions of BEECHCRAFT Safety Communiques to BEECHCRAFT Owner addresses as listed by the FAA Aircraft Registration Branch List and the BEECHCRAFT International Owner Notification Service List. While this information is distributed by Beech Aircraft Corporation, Beech can not make changes in the name or address furnished by the FAA. The owner must contact the FAA regarding any changes to name or address. Their address is: FAA Aircraft Registration Branch (AAC250) P.O. Box 25082, Oklahoma City, OK 73125, Phone (405) 680-2131.

It is the responsibility of the FAA owner of record to ensure that any mailings from Beech are forwarded to the proper persons. Often the FAA registered owner is a bank or financing company or an individual not in possession of the airplane. Also, when an airplane is sold, there is a lag in processing the change in registration with the FAA. If you are a new owner, contact your BEECHCRAFT Authorized Outlet and ensure your manuals are up to date.

Beech Aircraft Corporation provides a subscription service which provides for direct factory mailing of BEECHCRAFT

publications applicable to a specific serial number airplane. Details concerning the fees and ordering information for this owner subscription service are contained in Service Bulletin number 2001.

For owners who choose not to apply for a Publications Revision Subscription Service, Beech provides a free Owner Notification Service by which owners are notified by post card of BEECHCRAFT manual reissues, revisions and supplements which are being issued applicable to the airplane owned. On receipt of such notification, the owner may obtain the publication through a BEECHCRAFT Authorized Outlet. This notification service is available when requested by the owner. This request may be made by using the owner notification request card furnished with the loose equipment of each airplane at the time of delivery, or by a letter requesting this service, referencing the specific airplane serial number owned. Write to:

Supervisor, Special Services
Dept. 52
Beech Aircraft Corporation
P.O. Box 85
Wichita, Kansas 67201-0085

From time to time Beech Aircraft Corporation issues BEECHCRAFT Safety Communiques dealing with the safe operation of a specific series of airplanes, or airplanes in general. It is recommended that each owner/operator maintain a current file of these publications. Back issues of BEECHCRAFT Safety Communiques may be obtained without charge by sending a request, including airplane model and serial number, to the Supervisor, Special Services, at the address listed above.

Airworthiness Directives (AD's) are not issued by the manufacturer. They are issued and available from the FAA.

FEDERAL AVIATION REGULATIONS

FAR Part 91, General Operating and Flight Rules, is a document of law governing operation of airplanes and the owner's and pilot's responsibilities. Some of the subjects covered are:

Responsibilities and authority of the pilot-in-command
Certificates required
Liquor and drugs
Flight plans
Preflight action
Fuel requirements
Flight rules
Maintenance, preventive maintenance, alterations, inspection and maintenance records

You, as a pilot, have responsibilities under government regulations. The regulations are designed for your protection and the protection of your passengers and the public. Compliance is mandatory.

AIRWORTHINESS DIRECTIVES

FAR Part 39 specifies that no person may operate a product to which an Airworthiness Directive issued by the FAA applies, except in accordance with the requirements of that Airworthiness Directive.

AIRMAN'S INFORMATION MANUAL

The Airman's Information Manual (AIM) is designed to provide airmen with basic flight information and ATC procedures for use in the national airspace system of the United States. It also contains items of interest to pilots concerning health and medical facts, factors affecting flight safety, a pilot/controller glossary of terms in the Air Traffic Control

system, information on safety, and accident/hazard reporting. It is revised at six-month intervals and can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

This document contains a wealth of pilot information. Among the subjects are:

Controlled Airspace
Emergency Procedures
Services Available to Pilots
Weather and Icing
Radio Phraseology and Technique
Mountain Flying
Airport Operations
Wake Turbulence - Vortices
Clearances and Separations
Medical Facts for Pilots
Preflight
Bird Hazards
Departures - IFR
Good Operating Practices
En route - IFR
Airport Location Directory
Arrival - IFR

All pilots must be thoroughly familiar with and use the information in the AIM.

ADVISORY INFORMATION

NOTAMS (Notices to Airmen) are documents that have information of a time-critical nature that would affect a pilot's decision to make a flight; for example, an airport closed, terminal radar out of service, or enroute navigational aids out of service.

FAA ADVISORY CIRCULARS

The FAA issues Advisory Circulars to inform the aviation public in a systematic way of nonregulatory material of interest. Advisory Circulars contain a wealth of information with which the prudent pilot should be familiar. A complete list of current FAA Advisory Circulars is published in AC 00-2, which lists Advisory Circulars that are for sale, as well as those distributed free of charge by the FAA, and provides ordering information. Many Advisory Circulars which are for sale can be purchased locally in aviation bookstores or at FBO's. These documents are subject to periodic revision. Be certain the Advisory Circular you are using is the latest revision available. Some of the Advisory Circulars of interest to pilots are:

*00-6	Aviation Weather
00-24	Thunderstorms
00-30	Rules of Thumb for Avoiding or Minimizing Encounters with Clear Air Turbulence
*00-45	Aviation Weather Services
00-46	Aviation Safety Reporting Program
20-5	Plane Sense
20-32	Carbon Monoxide (CO) Contamination in Aircraft - Detection and Prevention
20-35	Tie-Down Sense
20-43	Aircraft Fuel Control
20-105	Engine Power-Loss Accident Prevention
20-113	Pilot Precautions and Procedures to be Taken in Preventing Aircraft Reciprocating Engine Induction System & Fuel System Icing Problems
20-125	Water in Aviation Fuel

21-4	Special Flight Permits for Operation of Overweight Aircraft
43-9	Maintenance Records: General Aviation Aircraft
43-12	Preventive Maintenance
60-4	Pilot's Spatial Disorientation
60-6	Airplane Flight Manuals (AFM), Approved Manual Materials, Markings and Placards - Airplanes
60-12	Availability of Industry-Developed Guidelines for the Conduct of the Biennial Flight Review
60-13	The Accident Prevention Counselor Program
*61-9	Pilot Transition Courses for Complex Single-Engine and Light Twin-Engine Airplanes
*61-21	Flight Training Handbook
*61-23	Pilot's Handbook of Aeronautical Knowledge
*61-27	Instrument Flying Handbook
61-67	Hazards Associated with Spins in Airplanes Prohibited from Intentional Spinning.
61-84	Role of Preflight Preparation
*67-2	Medical Handbook for Pilots
90-23	Aircraft Wake Turbulence
90-42	Traffic Advisory Practices at Nontower Airports

90-48	Pilot's Role in Collision Avoidance
90-66	Recommended Standard Traffic Patterns for Airplane Operations at Uncontrolled Airports
90-85	Severe Weather Avoidance Plan (SWAP)
91-6	Water, Slush and Snow on the Runway
91-13	Cold Weather Operation of Aircraft
*91-23	Pilot's Weight and Balance Handbook
91-26	Maintenance and Handling of Air Driven Gyroscopic Instruments
91-33	Use of Alternate Grades of Aviation Gasoline for Grade 80/87 and Use of Automotive Gasoline
91-35	Noise, Hearing Damage, and Fatigue in General Aviation Pilots
91-43	Unreliable Airspeed Indications
91-44	Operational and Maintenance Practices for Emergency Locator Transmitters and Receivers
91-46	Gyroscopic Instruments - Good Operating Practices
91-50	Importance of Transponder Operations and Altitude Reporting
91-51	Airplane Deice and Anti-ice Systems
91-59	Inspection and Care of General Aviation Aircraft Exhaust Systems
91-65	Use of Shoulder Harness in Passenger Seats

103-4	Hazards Associated with Sublimation of Solid Carbon Dioxide (Dry Ice) Aboard Aircraft
210-5A	Military Flying Activities

*** For Sale**

FAA GENERAL AVIATION NEWS

FAA General Aviation News is published by the FAA in the interest of flight safety. The magazine is designed to promote safety in the air by calling the attention of general aviation airmen to current technical, regulatory and procedural matters affecting the safe operation of airplanes. FAA General Aviation News is sold on subscription by the Superintendent of Documents, Government Printing Office, Washington D.C., 20402.

FAA ACCIDENT PREVENTION PROGRAM

The FAA assigns accident prevention specialists to each Flight Standards and General Aviation District Office to organize accident prevention program activities. In addition, there are over 3,000 volunteer airmen serving as accident prevention counselors, sharing their technical expertise and professional knowledge with the general aviation community. The FAA conducts seminars and workshops, and distributes invaluable safety information under this program.

Usually the airport manager, the FAA Flight Service Station (FSS), or Fixed Base Operator (FBO), will have a list of accident prevention counselors and their phone numbers available. All Flight Standards and General Aviation District Offices have a list of the counselors serving the District.

Before flying over unfamiliar territory, such as mountainous terrain or desert areas, it is advisable for transient pilots to consult with local counselors. They will be familiar with the

more desirable routes, the wind and weather conditions, and the service and emergency landing areas that are available along the way. They can also offer advice on the type of emergency equipment you should be carrying.

ADDITIONAL INFORMATION

The National Transportation Safety Board and the Federal Aviation Administration periodically issue, in greater detail, general aviation pamphlets concerning aviation safety. FAA Regional Offices also publish material under the FAA General Aviation Accident Prevention Program. These can be obtained at FAA Offices, Weather Stations, Flight Service Stations or Airport Facilities. Some of these are titled:

12 Golden Rules for Pilots
Weather or Not
Disorientation
Plane Sense
Weather Info Guide for Pilots
Wake Turbulence
Don't Trust to Luck, Trust to Safety
Rain, Fog, Snow
Thunderstorm - TRW
Icing
Pilot's Weather Briefing Guide
Thunderstorms Don't Flirt ... Skirt 'em
IFR-VFR - Either Way Disorientation Can Be Fatal
IFR Pilot Exam-O-Grams
VFR Pilot Exam-O-Grams
Tips on Engine Operation in Small General Aviation Aircraft
Estimating Inflight Visibility
Is the Aircraft Ready for Flight
Tips on Mountain Flying
Tips on Desert Flying
Always Leave Yourself An Out

Safety Guide for Private Aircraft Owners
Tips on How to Use the Flight Planner
Tips on the Use of Ailerons and Rudder
Some Hard Facts About Soft Landings
Propeller Operation and Care
Torque "What it Means to the Pilot"
Weight and Balance. An Important Safety Consideration for Pilots

GENERAL INFORMATION ON SPECIFIC TOPICS

MAINTENANCE

Safety of flight begins with a well maintained airplane. Make it a habit to keep your airplane and all its equipment in airworthy condition. Keep a "squawk list" on board, and see that all discrepancies, however minor, are noted and promptly corrected.

Schedule your maintenance regularly, and have your airplane serviced by a reputable organization. Be suspicious of bargain prices for maintenance, repair and inspections.

It is the responsibility of the owner and the operator to assure that the airplane is maintained in an airworthy condition and that proper maintenance records are kept.

Use only genuine BEECHCRAFT or BEECHCRAFT approved parts obtained from BEECHCRAFT approved sources, in connection with the maintenance and repair of Beech airplanes.

Genuine BEECHCRAFT parts are produced and inspected under rigorous procedures to insure airworthiness and suitability for use in Beech airplane applications. Parts purchased from sources other than BEECHCRAFT, even though outwardly identical in appearance, may not have had

the required tests and inspections performed, may be different in fabrication techniques and materials, and may be dangerous when installed in an airplane.

Salvaged airplane parts, reworked parts obtained from non-BEECHCRAFT approved sources or parts, components, or structural assemblies, the service history of which is unknown or cannot be authenticated, may have been subjected to unacceptable stresses or temperatures or have other hidden damage not discernible through routine visual or usual nondestructive testing techniques. This may render the part, component, or structural assembly, even though originally manufactured by BEECHCRAFT, unsuitable and unsafe for airplane use.

BEECHCRAFT expressly disclaims any responsibility for malfunctions, failures, damage or injury caused by use of non-BEECHCRAFT parts.

Airplanes operated for Air Taxi or other than normal operation, and airplanes operated in humid tropics, or cold and damp climates, etc., may need more frequent inspections for wear, corrosion and/or lack of lubrication. In these areas, periodic inspections should be performed until the operator can set his own inspection periods based on experience.

NOTE

The required periods do not constitute a guarantee that the item will reach the period without malfunction, as the aforementioned factors cannot be controlled by the manufacturer.

Corrosion and its effects must be treated at the earliest possible opportunity. A clean, dry surface is virtually immune to corrosion. Make sure that all drain holes remain unobstructed. Protective films and sealants help to keep corrosive agents from contacting metallic surfaces. Corrosion

inspections should be made most frequently under high-corrosion-risk operating conditions, such as in areas of excessive airborne salt concentrations (e.g., near the sea) and in high-humidity areas (e.g., tropical regions).

If you have purchased a used airplane, have your mechanic inspect the airplane registration records, logbooks and maintenance records carefully. An unexplained period of time for which the airplane has been out of service, or unexplained significant repairs may well indicate the airplane has been seriously damaged in a prior accident. Have your mechanics inspect a used airplane carefully. Take the time to ensure that you really know what you are buying when you buy a used airplane.

HAZARDS OF UNAPPROVED MODIFICATIONS

Many airplane modifications are approved under Supplemental Type Certificates (STC's). Before installing an STC on your airplane, check to make sure that the STC does not conflict with other STC's that have already been installed. Because approval of an STC is obtained by the individual STC holder based upon modification of the original type design, it is possible for STC's to interfere with each other when both are installed. Never install an unapproved modification of any type, however innocent the apparent modification may seem. Always obtain proper FAA approval.

Airplane owners and maintenance personnel are particularly cautioned not to make attachments to, or otherwise modify, seats from original certification without approval from the FAA Engineering and Manufacturing District Office having original certification responsibility for that make and model.

Any unapproved attachment or modification to seat structure may increase load factors and metal stress which could cause failure of seat structure at a lesser "G" force than exhibited for original certification.

Examples of unauthorized attachments found are drilling holes in seat tubing to attach fire extinguishers and drilling holes to attach approach plate book bins to seats.

FLIGHT PLANNING

FAR Part 91 requires that each pilot in command, before beginning a flight, familiarize himself with all available information concerning that flight.

Obtain a current and complete preflight briefing. This should consist of local, enroute and destination weather and enroute navaid information. Enroute terrain and obstructions, alternate airports, airport runways active, length of runways, and takeoff and landing distances for the airplane for conditions expected should be known.

The prudent pilot will review his planned enroute track and stations and make a list for quick reference. It is strongly recommended a flight plan be filed with Flight Service Stations, even though the flight may be VFR. Also, advise Flight Service Stations of changes or delays of one hour or more and remember to close the flight plan at destination.

The pilot must be completely familiar with the performance of the airplane and performance data in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. The resultant effect of temperature and pressure altitude must be taken into account in performance if not accounted for on the charts. An applicable FAA Approved Airplane Flight Manual must be aboard the airplane at all times and include the weight and balance forms and equipment list.

PASSENGER INFORMATION CARDS

Beech has available, for most current production airplanes, passenger information cards which contain important information on the proper use of restraint systems, oxygen

masks, emergency exits and emergency bracing procedures. Passenger information cards may be obtained at any BEECHCRAFT Authorized Outlet. A pilot should not only be familiar with the information contained in the cards, but should always, prior to flight, inform the passengers of the information contained in the information cards. The pilot should orally brief the passengers on the proper use of restraint systems, doors and emergency exits, and other emergency procedures, as required by Part 91 of the FAR's.

STOWAGE OF ARTICLES

The space between the seat pan and the floor is utilized to provide space for seat displacement. If hard, solid objects are stored beneath seats, the energy absorbing feature is lost and severe spinal injuries can occur to occupants.

Prior to flight, pilots should insure that articles are not stowed beneath seats that would restrict seat pan energy absorption or penetrate the seat in event of a high vertical velocity accident.

FLIGHT OPERATIONS

GENERAL

The pilot MUST be thoroughly familiar with ALL INFORMATION published by the manufacturer concerning the airplane, and is required by law to operate the airplane in accordance with the FAA Approved Airplane Flight Manual and placards installed.

PREFLIGHT INSPECTION

In addition to maintenance inspections and preflight information required by FAR Part 91, a complete, careful preflight inspection is imperative.

Each airplane has a checklist for the preflight inspection which must be followed. USE THE CHECKLIST.

WEIGHT AND BALANCE

Maintaining center of gravity within the approved envelope throughout the planned flight is an important safety consideration.

The airplane must be loaded so as not to exceed the weight and center of gravity (C.G.) limitations. Airplanes that are loaded above the maximum takeoff or landing weight limitations will have an overall lower level of performance compared to that shown in the Performance section of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. If loaded above maximum takeoff weight, takeoff distance and the landing distance will be longer than that shown in the Performance section; the stalling speed will be higher, rate of climb, the cruising speed, and the range of the airplane at any level of fuel will all be lower than shown in the Performance section.

If an airplane is loaded so that the C.G. is forward of the forward limit, it will require additional control movements for maneuvering the airplane with correspondingly higher control forces. The pilot may have difficulty during takeoff and landing because of the elevator control limits.

If an airplane is loaded aft of the aft C.G. limitation, the pilot will experience a lower level of stability. Airplane characteristics that indicate a lower stability level are; lower control forces, difficulty in trimming the airplane, lower control forces for maneuvering with attendant danger of structural overload, decayed stall characteristics, and a lower level of lateral-directional damping.

Ensure that all cargo and baggage is properly secured before takeoff. A sudden shift in balance at rotation can cause controllability problems.

AUTOPILOTS AND ELECTRIC TRIM SYSTEMS

Because there are several different models of autopilots and electric trim systems installed in Beech airplanes and different installations and switch positions are possible from airplane to airplane, it is essential that every owner/operator review his Airplane Flight Manual (AFM) Supplements and ensure that the supplements properly describe the autopilot and trim installations on his specific airplane. Each pilot, prior to flight, must be fully aware of the proper procedures for operation, and particularly disengagement, for the system as installed.

In addition to ensuring compliance with the autopilot manufacturer's maintenance requirements, all owners/operators should thoroughly familiarize themselves with the operation, function and procedures described in the Airplane Flight Manual Supplements. Ensure a full understanding of the methods of engagement and disengagement of the autopilot and trim systems.

Compare the descriptions and procedures contained in the Supplements to the actual installation in the airplane to ensure that the supplement accurately describes your installation. Test that all buttons, switches and circuit breakers function as described in the Supplements. If they do not function as described, have the system repaired by a qualified service agency. If field service advice or assistance is necessary, contact Beech Aircraft Corporation, Customer Support Department.

As stated in all AFM Supplements for autopilot systems and trim systems installed on Beech airplanes, the preflight check must be conducted before every flight. The preflight check assures not only that the systems and all of their features are operating properly, but also that the pilot, before flight, is familiar with the proper means of engagement and disengagement of the autopilot and trim system.

Autopilot Airplane Flight Manual Supplements caution against trying to override the autopilot system during flight without disengaging the autopilot because the autopilot will continue to trim the airplane and oppose the pilot's actions. This could result in a severely out of trim condition. This is a basic feature of all autopilots with electric trim follow-up.

Do not try to manually override the autopilot during flight.

IN CASE OF EMERGENCY, YOU CAN OVERPOWER THE AUTOPILOT TO CORRECT THE ATTITUDE, BUT THE AUTOPILOT AND ELECTRIC TRIM MUST THEN IMMEDIATELY BE DISENGAGED.

It is often difficult to distinguish an autopilot malfunction from an electric trim system malfunction. The safest course is to deactivate both. Do not re-engage either system until after you have safely landed. Then have the systems checked by a qualified service facility prior to further flight.

Depending upon the installation on your airplane, the following additional methods may be available to disengage the autopilot or electric trim in the event that the autopilot or electric trim does not disengage utilizing the disengage methods specified in the Supplements.

CAUTION

Transient control forces may occur when the autopilot is disengaged.

1. Turn off the autopilot master switch, if installed.
2. Pull the autopilot and trim circuit breaker(s) or turn off the autopilot switch breaker, if installed.
3. Turn off the RADIO MASTER SWITCH, if installed, and if the autopilot system and the trim system are wired through this switch.

CAUTION

Radios, including VHF COMM are also disconnected when the radio master switch is off.

4. Turn off the ELECTRIC MASTER SWITCH.

WARNING

Almost all electrically powered systems will be inoperative. Consult the AFM for further information.

5. Push the GA switch on throttle grip, if installed (depending upon the autopilot system).
6. Push TEST EACH FLT switch on the autopilot controller, if installed.

NOTE

After the autopilot is positively disengaged, it may be necessary to restore other electrical functions. Be sure when the master switches are turned on that the autopilot does not re-engage.

The above ways may or may not be available on your autopilot. It is essential that you read your airplane's AFM SUPPLEMENT for your autopilot system and check each function and operation on your system.

The engagement of the autopilot must be done in accordance with the instructions and procedures contained in the AFM SUPPLEMENT.

Particular attention must be paid to the autopilot settings prior to engagement. If you attempt to engage the autopilot when the airplane is out of trim, a large attitude change may occur.

IT IS ESSENTIAL THAT THE PROCEDURES SET FORTH IN THE APPROVED AFM SUPPLEMENTS FOR YOUR SPECIFIC INSTALLATION BE FOLLOWED BEFORE ENGAGING THE AUTOPILOT.

FLUTTER

Flutter is a phenomenon that can occur when an aerodynamic surface begins vibrating. The energy to sustain the vibration is derived from airflow over the surface. The amplitude of the vibration can (1) decrease, if airspeed is reduced; (2) remain constant, if airspeed is held constant and no failures occur; or (3) increase to the point of self-destruction, especially if airspeed is high and/or is allowed to increase. Flutter can lead to an in-flight break up of the airplane. Airplanes are designed so that flutter will not occur in the normal operating envelope of the airplane as long as the airplane is properly maintained. In the case of any airplane, decreasing the damping and stiffness of the structure or increasing the trailing edge weight of control surfaces will tend to cause flutter. If a combination of those factors is sufficient, flutter can occur within the normal operating envelope.

Owners and operators of airplanes have the primary responsibility for maintaining their airplanes. To fulfill that responsibility, it is imperative that all airplanes receive a thorough preflight inspection. Improper tension on the control cables or any other loose condition in the flight control system can also cause or contribute to flutter. Pilot's should pay particular attention to control surface attachment hardware including tab pushrod attachment during preflight inspection. Looseness of fixed surfaces or movement of control surfaces other than in the normal direction of travel should be

rectified before flight. Further, owners should take their airplanes to mechanics who have access to current technical publications and prior experience in properly maintaining that make and model of airplane. The owner should make certain that control cable tension inspections are performed as outlined in the applicable Beech Inspection Guide. Worn control surface attachment hardware must be replaced. Any repainting or repair of a moveable control surface will require a verification of the control surface balance before the airplane is returned to service. Control surface drain holes must be open to prevent freezing of accumulated moisture, which could create an increased trailing-edge-heavy control surface and flutter.

If an excessive vibration, particularly in the control column and rudder pedals, is encountered in flight, this may be the onset of flutter and the procedure to follow is:

1. IMMEDIATELLY REDUCE AIRSPEED (lower the landing gear if necessary).
2. RESTRAIN THE CONTROLS OF THE AIRPLANE UNTIL THE VIBRATION CEASES.
3. FLY AT THE REDUCED AIRSPEED AND LAND AT THE NEAREST SUITABLE AIRPORT.
4. HAVE THE AIRPLANE INSPECTED FOR AIRFRAME DAMAGE, CONTROL SURFACE ATTACHING HARDWARE CONDITION/SECURITY, TRIM TAB FREE PLAY, PROPER CONTROL CABLE TENSION, AND CONTROL SURFACE BALANCE BY ANOTHER MECHANIC WHO IS FULLY QUALIFIED.

TURBULENT WEATHER

A complete and current weather briefing is a requirement for a safe trip.

Updating of weather information enroute is also essential. The wise pilot knows that weather conditions can change

quickly, and treats weather forecasting as professional advice, rather than an absolute fact. He obtains all the advice he can, but stays alert to any sign or report of changing conditions.

Plan the flight to avoid areas of reported severe turbulence. It is not always possible to detect individual storm areas or find the in-between clear areas.

The National Weather Service classifies turbulence as follows:

Class of Turbulence	Effect
Extreme	Airplane is violently tossed about and is practically impossible to control. May cause structural damage.
Severe	Airplane may be momentarily out of control. Occupants are thrown violently against the belts and back into the seat. Unsecured objects are tossed about.
Moderate	Occupants require seat belts and occasionally are thrown against the belt. Unsecured objects move about.
Light	Occupants may be required to use seat belts, but objects in the airplane remain at rest.

Thunderstorms, squall lines and violent turbulence should be regarded as extremely dangerous and must be avoided. Hail and tornadic wind velocities can be encountered in thunderstorms that can destroy any airplane, just as tornadoes destroy nearly everything in their path on the ground.

Thunderstorms also pose the possibility of a lightning strike on an airplane. Any structure or equipment which shows evidence of a lightning strike, or of being subjected to a high

current flow due to a strike, or is a suspected part of a lightning strike path through the airplane should be thoroughly inspected and any damage repaired prior to additional flight.

A roll cloud ahead of a squall line or thunderstorm is visible evidence of extreme turbulence; however, the absence of a roll cloud should not be interpreted as denoting that severe turbulence is not present.

Even though flight in severe turbulence must be avoided, flight in turbulent air may be encountered unexpectedly under certain conditions.

The following recommendations should be observed for airplane operation in turbulent air:

Flying through turbulent air presents two basic problems, the answer to both of which is proper airspeed. On one hand, if you maintain an excessive airspeed, you run the risk of structural damage or failure; on the other hand, if your airspeed is too low, you may stall.

If turbulence is encountered, reduce speed to the turbulent air penetration speed, if given, or to the maneuvering speed, which is listed in the Limitations section of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. These speeds give the best assurance of avoiding excessive stress loads, and at the same time provide the proper margin against inadvertent stalls due to gusts.

Beware of overcontrolling in an attempt to correct for changes in attitude; applying control pressure abruptly will build up G-forces rapidly and could cause structural damage or even failure. You should watch particularly your angle of bank, making turns as wide and shallow as possible. Be equally cautious in applying forward or back pressure to keep the airplane level. Maintain straight and level attitude in either up or down drafts. Use trim sparingly to avoid being

grossly out of trim as the vertical air columns change velocity and direction. If necessary to avoid excessive airspeeds, lower the landing gear.

WIND SHEAR

Wind shears are rapid, localized changes in wind direction, which can occur vertically as well as horizontally. Wind shear can be very dangerous to all airplanes, large and small, particularly on approach to landing when airspeeds are slow.

A horizontal wind shear is a sudden change in wind direction or speed that can, for example, transform a headwind into a tailwind, producing a sudden decrease in indicated airspeed because of the inertia of the airplane. A vertical wind shear, is a sudden updraft or downdraft. Microbursts are intense, highly localized severe downdrafts.

The prediction of wind shears is far from an exact science. Monitor your airspeed carefully when flying near storms, particularly on approach. Be mentally prepared to add power and go around at the first indication that a wind shear is being encountered.

WEATHER RADAR

Airborne weather avoidance radar is, as its name implies, for avoiding severe weather--not for penetrating it. Whether to fly into an area of radar echoes depends on echo intensity, spacing between the echoes, and the capabilities of you and your airplane. Remember that weather radar detects only precipitation drops; it does not detect turbulence. Therefore, the radar scope provides no assurance of avoiding turbulence. The radar scope also does not provide assurance of avoiding instrument weather due to clouds and fog. Your scope may be clear between intense echoes; this clear area does not necessarily mean you can fly between the storms and maintain visual sighting of them.

SECTION II

LIMITATIONS

TABLE OF CONTENTS

The limitations included in this section have been approved by the Federal Aviation Administration and must be observed in the operation of this airplane.

AIRSPEED LIMITATIONS

SPEED	CAS		IAS		REMARKS
	KTS	MPH	KTS	MPH	
Never Exceed V_{NE}	168	193	168	193	Do Not Exceed This Speed in Any Operation.
Maximum Structural Cruising V_{NO} or V_C	143	165	143	165	Do Not Exceed This Speed Except in Smooth Air and Then Only With Caution.
Maneuvering V_A	125	144	125	144	Do Not Make Full or Abrupt Control Movements Above This Speed.
Maximum Flap Extension/ Extended V_{FE}	96	110	96	110	Do Not Extend Flaps or Operate With Flaps Extended Above This Speed.
Maximum Landing Gear Operating/Extended V_{LO}/V_{LE}	135	155	135	155	Do Not Extend, or Operate With Gear Extended Above This Speed, except in Emergency.
Maximum Landing Gear Retraction	113	130	113	130	Do Not Retract Landing Gear Above This Speed.

***AIRSPEED INDICATOR MARKINGS**

MARK-ING	CAS		IAS		SIGNIFI-CANCE
	KTS	MPH	KTS	MPH	
White Arc	55-96	63-110	60-96	69-110	Full Flap Operating Range
Green Arc	62-143	71-165	65-143	75-165	Normal Operating Range
Yellow Arc	143-168	165-193	143-168	165-193	Operate With Caution, Only In Smooth Air
Red Line	168	193	168	193	Maximum Speed For ALL Operations

*The limits of the arcs on the airspeed indicator are marked in CAS values.

POWER PLANT LIMITATIONS

ENGINE

One Avco Lycoming engine model IO-360-A1B6

Take-off and Maximum Continuous
Power..... Full Throttle at 2700 RPM

OPERATING LIMITATIONS

Oil Temperature ..... 245°F
Oil Pressure
Minimum ..... 25 psi
Maximum ..... 100 psi
Fuel Pressure
Minimum ..... 0.5 psi
Maximum ..... 12.0 psi
Mixture - set per leaning instructions on Performance Graphs.

FUEL GRADES

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

FUEL ADDITIVES

ALCOR TCP concentrate, or equivalent, mixed according to 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

Hartzell constant speed, two-blade aluminum alloy propeller using HC-M2YR-1BF hub with F7666A blades and A2298-2P spinner. Pitch settings at 30-inch station, Low 13° ± .1°, High 27° to 31°. Diameter is 76 inches, no cutoff permitted. No extended operation is permitted between 2100 and 2350 rpm.

POWER PLANT INSTRUMENT MARKINGS

OIL TEMPERATURE

Caution (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 FLOW

Minimum (Red Line)	0.5 psi
Operating Range (Green Arc)	4.0 to 16.6 gph
Maximum (Red Line)	12.0 psi

TACHOMETER

No Extended Operation (Red Arc)	2100 to 2350 rpm
Operating Range (Green Arc)	2350 to 2700 rpm
Maximum RPM (Red Line)	2700 rpm

MANIFOLD PRESSURE

Operating Range (Green Arc)	15 to 28.7 in. Hg

MISCELLANEOUS INSTRUMENT MARKINGS

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

FUEL QUANTITY
Yellow Arc ..... E to 3/8 Full

WEIGHT LIMITS

Maximum Ramp Weight..... 2758 lbs
Maximum Take-off Weight..... 2750 lbs
Maximum Landing Weight ..... 2750 lbs
Zero Fuel Weight .....No Structural Limitation
Maximum Baggage Compartment Load ..... 270 lbs

CG LIMITS (Gear Down)

Forward: 110 inches aft of datum to 2375 pounds with straight line variation to 113 inches at 2750 pounds

Aft: 118.3 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 is a normal category airplane. Spins are prohibited. No acrobatic maneuvers are approved except those listed below. Maximum slip duration is 30 seconds.

APPROVED MANEUVERS (2750 POUNDS)

MANEUVER	*ENTRY SPEED*
(Bank angles, no more than 60°)	
Chandelle	125 knots/144 mph
Steep Turn	125 knots/144 mph
Lazy Eight	125 knots/144 mph
Stall (Except Whip)	Use slow deceleration

FLIGHT LOAD FACTORS (2750 POUNDS)

Flight maneuvering load factor, flaps up..... + 3.8 - 1.9G
Flight maneuvering load factor, flaps down..... + 1.9G

TAKEOFF

Set 15° Flaps for Takeoff.

MINIMUM FLIGHT CREW

One (1) Pilot

KINDS OF OPERATION LIMITS

1. VFR day and night
2. IFR day and night

EQUIPMENT REQUIRED FOR VARIOUS CONDITIONS OF FLIGHT

Federal Aviation Regulations (91.3(a), 91.24, 91.25, 91.32, 91.33, 91.52, 91.90, 91.97, 91.170) specify the minimum numbers and types of airplane instruments and equipment which must be installed and operable for various kinds of flight conditions. This includes VFR day, VFR night, IFR day, and IFR night.

Regulations also required that all airplanes be certificated by the manufacturer for operations under various flight conditions. At certification, all required equipment must be in operating condition and should be maintained to assure continued airworthiness. If deviations from the installed equipment were not permitted, or if the operating rules did not provide for various flight conditions, the airplane could not be flown unless all equipment was operable. With appropriate limitations, the operation of every system or component installed in the airplane is not necessary, when remaining operative instruments and equipment provide for continued safe operation. Operation in accordance with limitations established to maintain airworthiness can permit continued or uninterrupted operation of the airplane temporarily.

For the sake of brevity, the Required Equipment Listing does not include obviously required items such as wings, rudders, flaps, engine, landing gear, etc. Also the list does not include items which do not affect the airworthiness of the airplane such as entertainment systems, passenger convenience items, etc. However, it is important to note that ALL ITEMS WHICH ARE RELATED TO THE AIRWORTHINESS OF THE AIRPLANE AND NOT INCLUDED ON THE LIST ARE AUTOMATICALLY REQUIRED TO BE OPERATIVE.

To enable the pilot to rapidly determine the FAA equipment requirements necessary for a flight into specific conditions, the following equipment requirements and exceptions are presented. It is the final responsibility of the pilot to determine whether the lack of, or inoperative status of a piece of equipment on the airplane, will limit the conditions under which the pilot may operate the airplane.

WARNING

FLIGHT IN KNOWN ICING CONDITIONS IS PROHIBITED.

LEGEND

Numbers refer to quantities required

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

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

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INTENTIONALLY LEFT BLANK

SYSTEM and/or COMPONENT	VFR Day	VFR Night	IFR Day	IFR Night	Remarks and/or Exceptions
GENERAL					
OVERWATER FLIGHT	*	*	*	*	*Per FAR 91.33
COMMUNICATIONS					
VHF communications system	*	*	*	*	*Per FAR 91.33
ELECTRICAL POWER					
Battery System	1	1	1	1	
Alternator	1	1	1	1	
Starter Engaged Warning Light (MC-731 and after)	1	1	1	1	May be inoperative provided ammeter is operative and monitored

EQUIPMENT AND FURNISHING						
Seat belts and Shoulder harnesses	1	1	1	1	- Per Person or Per FAR 91.33	
Emergency locator transmitter	1	1	1	1	- Per FAR 91.52	
FIRE PROTECTION						
Portable fire extinguisher	*	*	*	*	- *Optional	

SYSTEM and/or COMPONENT	VFR Day	VFR Night	IFR Day	IFR Night	Remarks and/or Exceptions
FLIGHT CONTROLS					
Stabilator trim tab indicator	1	1	1	1	- May be inoperative for ferry flight provided tabs are visually checked in the neutral position prior to takeoff and checked for full range of operation.
Flap position indicator (On electric flap system)	1	1	1	1	- May be inoperative providing flap travel is visually inspected prior to takeoff.
Stall warning	1	1	1	1	-

FUEL EQUIPMENT						
Auxiliary fuel pump	1	1	1	1	-	
Engine driven fuel pump	1	1	1	1	-	
Fuel quantity indicator	2	2	2	2	-	One may be inoperative provided other side is operational and amount of fuel on board can be established to be adequate for the intended flight.
Fuel flow indicator	1	1	1	1	-	
ICE AND RAIN PROTECTION						
Emergency static air source	*	*	*	*	-	*Optional
Pitot heater	*	*	1	1	-	*Optional

SYSTEM and/or COMPONENT	VFR Day	VFR Night	IFR Day	IFR Night	Remarks and/or Exceptions
LANDING GEAR					
Landing gear motor	1	1	1	1	- May be inoperative provided operations are continued only to a point where repairs can be accomplished. Gear must be left down.
Landing gear position lights	4	4	4	4	-
Landing gear warning horn	1	1	1	1	-

LIGHTS					
Cockpit and instrument lights	-	*	-	*	- *Lights must be operative.
Taxi light	-	-	-	-	-
Landing light	-	*	-	*	- *Per FAR 91.33
Rotating beacon	*	1	*	1	- *Optional
Position light	-	3	-	3	
NAVIGATION INSTRUMENTS					
Altimeter	1	1	1	1	-
Airspeed indicator	1	1	1	1	-
Vertical speed	-	-	-	-	-
Magnetic compass	1	1	1	1	-
Attitude indicator	-	-	1	1	-
Turn and slip indicator	-	-	1	1	-
Directional gyro	-	-	1	1	-
Clock	-	-	1	1	-
Transponder	*	*	*	*	- *Per FAR 91.24, 91.90, 91.97
Navigation equipment	-	-	*	*	- *Per FAR 91.33

SYSTEM and/or COMPONENT	VFR Day	VFR Night	IFR Day	IFR Night	Remarks and/or Exceptions
PNEUMATIC					
Vacuum system for instrument air	-	-	1	1	-
Vacuum gage	-	-	1	1	-
ENGINE INDICATING INSTRUMENTS					
Engine tachometer indicator	1	1	1	1	-
Exhaust gas temperature indicator	*	*	*	*	- *Optional
Manifold pressure indicator	1	1	1	1	-

ENGINE OIL INSTRUMENTS						
Oil pressure indicator	1	1	1	1	-	
Oil temperature indicator	1	1	1	1	-	

FUEL

TOTAL FUEL with left and right wing fuel systems full:

Capacity..... 59.8 gallons*
Usable ..... 57.2 gallons

*Value given is nominal. Tank capacity will vary with temperature and manufacturing tolerances.

FUEL MANAGEMENT

Do not take off when Fuel Quantity indicators indicate in the yellow band on either indicator.

Maximum slip duration is 30 seconds.

PLACARDS

On Left Cabin Door (MC-533, MC-537 and after, CAS):

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	2750 LBS
REFER TO WEIGHT AND BALANCE DATA FOR LOADING INSTRUCTIONS	
FLIGHT MANEUVERING LOAD FACTOR	FLAPS UP +3.8 −1.9 DOWN +1.9
MAXIMUM MANEUVERING SPEED	125 KTS/144 MPH

NO ACROBATIC MANEUVERS
INCLUDING SPINS APPROVED

NO ACROBATIC MANEUVERS APPROVED
EXCEPT THOSE LISTED BELOW:

MANEUVER, BANK ANGLES NO MORE THAN 60°

	MAXIMUM ENTRY SPEED
CHANDELLES	125 KTS/144 MPH
LAZY EIGHTS	125 KTS/144 MPH
STEEP TURNS	125 KTS/144 MPH
STALLS (EXCEPT WHIP STALLS)	SLOW DECELERATION
NOTE: MAXIMUM ALTITUDE LOSS DURING STALL	300 FT

LANDING GEAR

MAXIMUM GEAR EXTENDED SPEED	135 KTS/155 MPH
MAXIMUM GEAR OPERATING SPEED EXTENSION	135 KTS/155 MPH
RETRACTION	113 KTS/130 MPH

On Flap Extension Handle (MC-533, MC-537 and after, CAS):

FLAPS PULL TO EXTEND, MAX SPEED 96 KTS/110 MPH

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

On Left Cabin Door (CAS):
(MC-449, MC-452 thru MC-536, except MC-533)

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		2750 LBS
REFER TO WEIGHT AND BALANCE DATA FOR LOADING INSTRUCTIONS		
FLIGHT MANEUVERING LOAD FACTOR	FLAPS UP	+3.8 −1.9
	DOWN	+1.9
MAXIMUM MANEUVERING SPEED		144 MPH

NO ACROBATIC MANEUVERS INCLUDING SPINS APPROVED

NO ACROBATIC MANEUVERS APPROVED EXCEPT THOSE LISTED BELOW:

MANEUVER. BANK ANGLES NO MORE THAN 60

	MAXIMUM ENTRY SPEED
CHANDELLES	144 MPH
LAZY EIGHTS	144 MPH
STEEP TURNS	144 MPH
STALLS (EXCEPT WHIP STALLS)	SLOW DECELERATION
NOTE: MAXIMUM ALTITUDE LOSS DURING STALL	300 FT

LANDING GEAR

MAXIMUM GEAR EXTENDED SPEED		155 MPH
MAXIMUM GEAR OPERATING SPEED	EXTENSION	155 MPH
	RETRACTION	130 MPH

On Flap Extension Handle (CAS):
(MC-449, MC-452 thru MC-536, except MC-533)

FLAPS PULL TO EXTEND, MAX SPEED 110 MPH

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

On Inside of Emergency Gear Extension Access Door:

(MC-533, MC-537 and after)

EMERGENCY LANDING GEAR EXTENSION

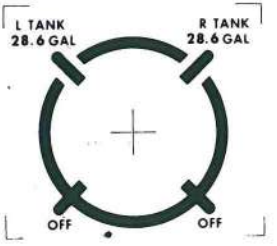
1. Landing Gear Motor Circuit Breaker—OFF(Pull)
2. Gear Position Switch—DOWN
3. Throttle—MAXIMUM 12 inches of mercury (Manifold Press.)
4. Indicated Airspeed—87 KTS/100 MPH
5. Emergency Extension Valve—OPEN (Use Handle—Turn Counter Clockwise)

(MC-449, MC-452 thru MC-536, except MC-533)

EMERGENCY LANDING GEAR EXTENSION

1. Landing Gear Motor Circuit Breaker—OFF (Pull)
2. Gear Position Switch—DOWN
3. Throttle—MAXIMUM 12 inches of mercury (Manifold Press)
4. Indicated Airspeed—100 MPH
5. Emergency Extension Valve—OPEN (Use Handle—Turn Counter Clockwise)

On Fuel Selector Panel (prior to MC-696):



OR

On Fuel Selector Panel (Serials MC-696 and after, or earlier airplane serials which have complied with BEECHCRAFT Service Instructions No. 1095):

Adjacent to Engine Instrument Cluster:

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

On Upper Right Instrument Panel:

RAISE FLAPS

TO INCREASE BRAKE EFFECTIVENESS

Temporary Change to the Pilot's Operating Handbook *and* FAA Approved Airplane Flight Manual

P/N 169-590025-15BTC1

Publication Affected	C24R Pilot's Operating Handbook and FAA Approved Airplane Flight Manual (P/N 169-590025-15B, Reissued November, 1980 or Subsequent)
Airplane Serial Numbers Affected	MC-449, MC-452 and After
Description of Change	The addition of a placard to the fuel selector to warn of the no-flow condition that exists between the fuel selector detents.
Filing Instructions	Insert this temporary change into the C24R Pilot's Operating Handbook and FAA Approved Airplane Flight Manual immediately following page 2-24 (Section II, LIMITATIONS) and retain until rescinded or replaced.

LIMITATIONS

PLACARDS

Located On The Face Of The Fuel Selector Valve, For Those Airplanes In Compliance With S.B. 2670:

WARNING - POSITION SELECTOR IN DETENTS ONLY - NO FUEL FLOW TO ENGINE BETWEEN DETENTS

Approved:

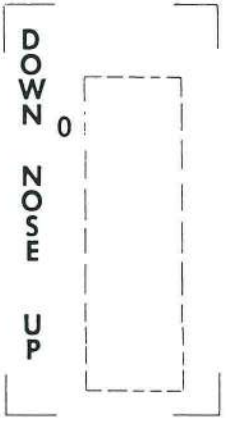
A. C. Jackson

A.C. Jackson
Raytheon Aircraft Company
DOA CE-2

Adjacent to Flap Switch or Left of Quadrant Control Panel:

USE 15° FLAPS
FOR TAKE OFF

On Pedestal Between Front Seats:



On Floorboard in Front of Pilot's Seat:

EMERGENCY
GEAR EXTENSION
—ACCESS DOOR—

On Left Cabin Door:

EMERGENCY GEAR
EXTENSION HANDLE

Lower Sidewall Adjacent to Pilot (when installed):

On Upper Right Instrument Panel:

IN CASE OF FIRE IN ENGINE
COMPARTMENT CLOSE
DEFROST & CABIN AIR VALVE

On Lower Left Sidewall Panel:

TO LEVEL AIRCRAFT – LEVEL
BAGGAGE COMPARTMENT FLOOR

On Baggage Compartment Door:

BAGGAGE COMPARTMENT

270 POUNDS

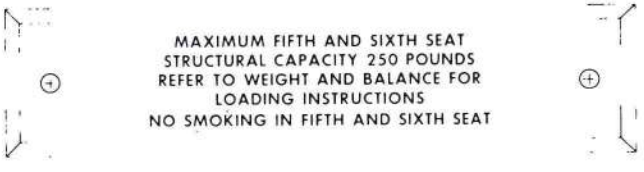
MAXIMUM CAPACITY

On Aft Cabin Bulkhead:

HAT SHELF

NO HEAVY OBJECTS

On Bulkhead Below Hat Shelf When 5th and 6th Seats are Installed:



On Upper Aft Corner of Each Cabin Door (Prior to MC-633), or on window (MC-633 and after):

INSTRUCTION-SHOULDER STRAP

1. OCCUPANTS SHORTER THAN 4 FT. 7 IN. **DO NOT** USE SHOULDER STRAP.
2. PLACE SEAT BACK IN THE UPRIGHT POSITION DURING TAKEOFF AND LANDING.

Adjacent to 5th and 6th Seats When Installed:

INSTRUCTION-SHOULDER STRAP

1. OCCUPANTS SHORTER THAN 4 FT. 7 IN. **DO NOT** USE SHOULDER STRAP.

On Right Sidewall Below Third Window:

NO SMOKING IN FIFTH AND SIXTH SEAT

On Second Window Frame on Right Side When Required by Weight and Balance Data:

BAGGAGE, CARGO OR FAMILY SEATS
LOAD IN ACCORDANCE
WITH WEIGHT & BALANCE DATA
MAXIMUM SEAT CAPACITY _____ POUNDS

On Baggage Door Adjacent to Handle: