Bonanza

K35
M35

Beechcraft

PILOT'S OPERATING HANDBOOK

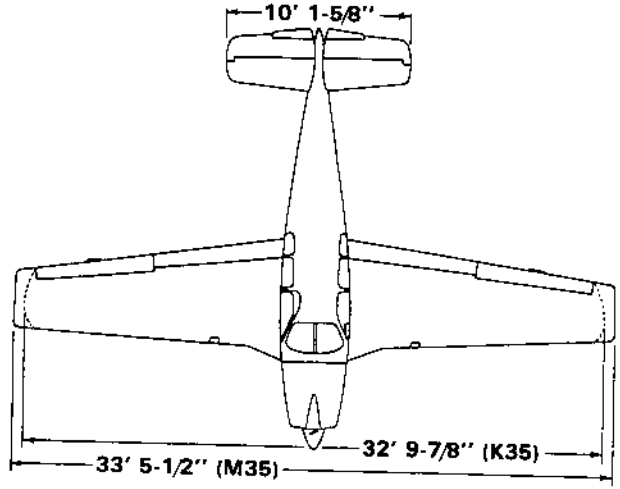
and

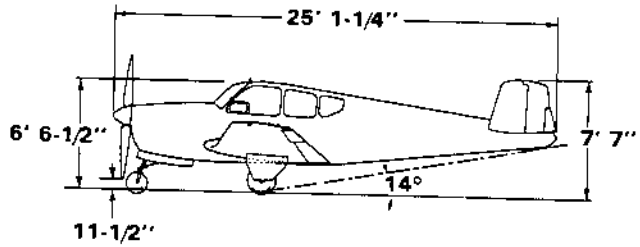
FAA Approved

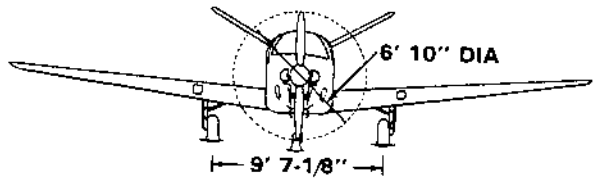
AIRPLANE FLIGHT MANUAL

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

Beech Aircraft Corporation Wichita, Kansas







DESCRIPTIVE DATA

ENGINE

Continental IO-470-C fuel injected engine.

Take-off and maximum continuous operation rated at 250 hp at 2600 rpm.

PROPELLER

Beech constant speed two-blade propeller using Beech 278-100-7 hub with 278-214-82 or 278-213-82 blades.

NOTE

Other propellers are approved for the Bonanza K35 or M35 but not installed as original equipment. These are listed in the FAA Aircraft Specification 3A15 or approved by Supplemental Type Certificate.

FUEL

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

Standard fuel system: Two 25-gallon tanks in wings. Total 44 gallons usable.

Optional fuel system: Two 25-gallon main tanks and two interconnected 10-gallon auxiliary tanks in wings. Total 63 gallons usable.

OIL CAPACITY

The oil capacity is 10 quarts.

WEIGHTS

Maximum Ramp Weight	2960 lbs
Maximum Take-Off Weight	2950 lbs
Maximum Landing Weight	2950 lbs

CABIN DIMENSIONS

Length	6 ft 11 in.
Height	4 ft 2 in.
Width	3 ft 6 in.
Entrance Door	36 in. x 37 in.

BAGGAGE

Volume	16.5 cu ft
Capacity	270 lbs
Baggage Door	22.5 in. x 18.5 in.

SPECIFIC LOADINGS

Wing Loading at gross weight	16.6 lbs/sq ft
Power Loading at gross weight	11.8 lbs/hp

GENERAL AIRSPEED TERMINOLOGY AND SYMBOLS

CAS Calibrated Airspeed 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.

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.

KCAS Calibrated Airspeed expressed in "knots".

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 overstress 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.

SECTION II

LIMITATIONS

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The limitations included in this section have been approved by the Federal Aviation Administration.

The following limitations must be observed in the operation of this airplane.

AIRSPEED LIMITATIONS

SPEED	CAS		IAS		REMARKS
	KNOTS	MPH	KNOTS	MPH	
Never Exceed V_{NE}	195	225	197	227	Do not exceed this speed in any operation
Maximum Structural Cruising V_{NO} or V_C	161	185	162	187	Do not exceed this speed except in smooth air and then only with caution
Maneuvering V_A	123	142	125	144	Do not make full or abrupt control movements above this speed
Maximum Flap Extension/ Extended V_{FE}	104	120	105	121	Do not extend flaps or operate with flaps extended above this speed
Maximum Landing Gear Operating/ Extended V_{LO} & V_{LE}	122	140	123	142	Do not extend, retract or operate with landing gear extended above this speed

*AIRSPEED INDICATOR MARKINGS

MARKING	CAS KNOTS	CAS MPH	IAS KNOTS	IAS MPH	SIGNIFICANCE
White Arc	52-104	60-120	52-105	60-121	Full Flap Operating Range
Green Arc	60-161	69-185	62-162	71-187	Normal Operating Range
Yellow Arc	161-195	185-225	162-197	187-227	Operate with caution only in smooth air
Red Line	195	225	197	227	Maximum speed for ALL operations

*The Airspeed Indicator is marked in CAS values

POWER PLANT LIMITATIONS

ENGINE

Continental IO-470-C fuel injected engine.

Take-off and maximum continuous operation 2600 rpm, full throttle.

OIL SPECIFICATIONS

Ashless dispersant oils must meet Teledyne Continental Motors Corporation Specification MHS-24B. Refer to APPROVED ENGINE OILS in the Handling, Servicing, and Maintenance section

PROPELLER

Beech constant speed two blade propeller using Beech 278-100-7 hub with 278-214-82 or 278-213-82 blades. Diameter is maximum 82 in., minimum 81.5 in. Pitch settings at 33 in. sta.: low 13.5°, high not under 30°.

NOTE

Other propellers are approved for the Bonanza K35 or M35 but not installed as original equipment. These are listed in the FAA Aircraft Specification 3A15 or approved by Supplemental Type Certificate.

ENGINE INSTRUMENT MARKINGS

OIL TEMPERATURE

Caution (Yellow Radial) ..... 100°F/38°C
Operating Range
(Green Arc) ..... 100° to 225°F/38° to 107°C
Maximum (Red Radial) ..... 225°F/107°C

OIL PRESSURE
- Minimum Pressure (Red Radial) ..... 30 psi
- Operating Range (Green Arc) ..... 30 to 60 psi
- Maximum Pressure (Red Radial) ..... 80 psi

TACHOMETER
- Operating Range (Green Arc) ... 1750 to 2600 rpm
- Maximum RPM (Red Radial) ..... 2600 rpm

CYLINDER HEAD TEMPERATURE
- Operating Range (Green Arc) ..... 200° to 460°F/93° to 238°C
- Maximum Temperature (Red Radial) ..... 460°F/238°C

MANIFOLD PRESSURE
- Operating Range (Green Arc) ..... 15 to 29.6 in. Hg
- Maximum (Red Radial) ..... 29.6 in. Hg

INSTRUMENT VACUUM
- With Autopilot;
- Minimum (Red Radial) ..... 3.75 in. Hg
- Operating Range (Green Arc) .. 3.75 to 4.25 in. Hg
- Maximum (Red Radial) ..... 4.6 in. Hg

- Without Autopilot;
- Minimum (Red Radial) ..... 4.4 in. Hg
- Operating Range (Green Arc) ..... 4.8 to 5.2 in. Hg
- Maximum (Red Radial) ..... 5.5 in. Hg

FUEL PRESSURE
- Minimum (Red Radial) ..... 1.5 psi
- Operating Range (Green Arc) ..... 4 to 17 psi
- Maximum (Red Radial) ..... 17.5 psi

FUEL QUANTITY
- Yellow Band (44-gallon system).....E to 1/2 full

WEIGHT AND CENTER OF GRAVITY

- Maximum Take-off Weight .....2950 lbs
- Maximum Ramp Weight .....2960 lbs
- Zero Fuel Weight .....No Structural Limitation
- Maximum Baggage Compartment Load.....Refer to Weight and Balance Section

REFERENCE DATUM

Datum is 83.1 inches forward of center line through forward jack points.

MAC leading edge is 66.7 inches aft of datum.
MAC length is 65.3 inches.

CG LIMITS (Gear Down)

Loading calculations shall be checked before each flight to ensure that the Weight and Center of Gravity remain within the approved limits during flight.

Forward: 77.0 inches aft of datum to 2475 lbs with straight line variation to 82.1 inches at 2950 lbs.

Aft: 85.7 inches aft of datum to 2525 lbs with straight line variation to 84.7 inches at 2950 lbs.

MANEUVER LIMITS

This is a utility category airplane. Spins are prohibited. No acrobatic maneuvers are approved except those listed below. Maximum slip duration is 30 seconds for airplanes with baffled main fuel cells in both wings and 20 seconds for airplanes with unbaffled main fuel cells in either wing.

APPROVED MANEUVERS (2950 POUNDS)

MANEUVER	ENTRY SPEED (CAS)
Chandelle	123 knots/142 mph
Steep Turn	123 knots/142 mph
Lazy Eight	123 knots/142 mph
Stall (Except Whip)	Use slow deceleration

Minimum fuel for above maneuvers - 10 gallons each tank.

Spins are prohibited.

FLIGHT LOAD FACTORS (2950 POUNDS)

Positive Maneuvering Load Factors

Flaps Up	4.4G
Flaps Down	2.0G

MINIMUM FLIGHT CREW ..... One (1) Pilot

KINDS OF OPERATION LIMITS

This airplane is approved for the following type operations when the required equipment is installed and operational as defined herein:

1. VFR day and night
2. IFR day and night
3. FAR 91 operations when all pertinent limitations and performance considerations are complied with.

WARNING

FLIGHT IN ICING CONDITIONS IS PROHIBITED.

NOTE

Refer to "REQUIRED EQUIPMENT FOR VARIOUS CONDITIONS OF FLIGHT" at the end of this Section.

the airplane such as galley equipment, 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 his airplane, will limit the conditions under which he may operate the airplane.

WARNING

FLIGHT IN KNOWN ICING CONDITIONS PROHIBITED.

LEGEND

(-) Indicates that the item may be inoperative for the specified condition.
(*) Refer to the REMARKS AND/OR EXCEPTIONS column for explicit information or reference.

SECTION III

EMERGENCY PROCEDURES

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EMERGENCY AIRSPEEDS

Emergency Descent	123 Knots/142 MPH
Glide	105 Knots/122 MPH
Emergency Landing Approach	78 Knots/90 MPH

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

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 FIRE (GROUND)

1. Mixture - IDLE CUT-OFF
2. Fuel Selector Valve - OFF
3. Battery, Generator and Magneto Switches - OFF
4. Extinguish with Fire Extinguisher.

ENGINE FAILURE ON TAKE-OFF

DURING GROUND ROLL

1. Throttle - CLOSED
2. Braking - MAXIMUM
3. Fuel Selector Valve - OFF
4. Battery and Generator Switches - OFF

If airborne and insufficient runway remains for landing:

1. Fuel Selector Valve - SELECT OTHER MAIN TANK
2. Auxiliary Fuel Pump - ON
3. Mixture - FULL RICH
4. Magnetos - CHECK, ON BOTH

IF NO RESTART

1. Select most favorable landing site.
2. The use of landing gear is dependent on the terrain where landing must be made.

ENGINE MALFUNCTION IN FLIGHT

ENGINE FAILURE

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

DISCREPANCY CHECKS

(Rough running engine, loss of engine power, loss of fuel flow, etc.)

1. Rough Running Engine
   a. Mixture - FULL RICH, then lean as required
   b. Magneto Switch - CHECK on BOTH position
2. Loss of Power
   a. Fuel Pressure Gage - CHECK (fuel pressure abnormally low)
      (1) Mixture - FULL RICH
      (2) Auxiliary Fuel Pump - ON
      (3) Auxiliary Fuel Pump - OFF if performance does not improve in a few moments
   b. Fuel Quantity Indicator - CHECK (fuel tank being used is empty)
      (1) Select other tank (check to feel detent)

3. Propeller Overspeed
   a. Retard throttle to reduce RPM to red line.
   b. Check oil pressure.
   c. Reduce speed to assist in maintaining altitude.
   d. Select nearest landing site, follow emergency landing procedures. (If loss of oil pressure was cause of overspeed, the engine will seize after a short period of operation.)

AIR START PROCEDURE

a. Fuel Selector Valve - SELECT MAIN TANK MORE NEARLY FULL (check to feel detent)
b. Throttle - RETARD
c. Mixture - FULL RICH
d. Auxiliary Fuel Pump - ON until power is regained, then off. (Leave on if engine driven fuel pump is inoperative.)
e. Throttle - ADVANCE to desired power
f. Mixture - LEAN as required

ENGINE FIRE (FLIGHT)

The red VENT SHUTOFF control on the outboard side of the right lower subpanel is used to close off all heating system outlets so that smoke and fumes will not enter the cabin. In the event of engine fire, shut down the engine as follows and make a landing:

1. Vent Shutoff Control - PULL TO CLOSE
2. Mixture - IDLE CUT-OFF
3. Fuel Selector Valve - OFF
4. Battery, Generator, and Magneto Switches - OFF (Extending the landing gear can be accomplished manually if desired.)
5. Do not attempt to restart engine.

EMERGENCY DESCENT

1. Power - IDLE
2. Propeller - HIGH RPM
3. Landing Gear - DOWN
4. Airspeed - ESTABLISH 123 kts/142 mph

MAXIMUM GLIDE CONFIGURATION

1. Landing Gear - UP
2. Flaps - UP
3. Cowl Flaps - CLOSED
4. Propeller - PULL for LOW RPM
5. Airspeed - 105 KTS/122 MPH

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

LANDING GEAR MANUAL EXTENSION

Manual extension of the landing gear can be facilitated by first reducing airspeed. Then proceed as follows:

1. LDG GEAR Circuit Breaker (Right Subpanel) - OFF (PULL OUT)
2. Landing Gear Switch Handle - DOWN position
3. Remove Safety Boot or Cover from handcrank handle at rear of front seats.
4. Engage handcrank and turn counterclockwise as far as possible (approximately 50 turns).
5. If electrical system is operative, check landing gear position lights and warning horn (check LDG GEAR INDICATOR and LDG GEAR WARNING circuit breakers engaged).
6. Check mechanical landing gear indicator - DOWN
7. Disengage handcrank.

EMERGENCY DESCENT

1. Power - IDLE
2. Propeller - HIGH RPM
3. Landing Gear - DOWN
4. Airspeed - ESTABLISH 123 kts/142 mph

LANDING EMERGENCIES

LANDING WITHOUT POWER

The approach speed is higher than normal to assure the availability of control during flare without power. When assured of reaching the landing site selected, and on final approach:

1. Airpeed - 78 kts/90 mph
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, Generator and Igniton Switches - OFF

LANDING GEAR RETRACTED - WITH POWER

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

1. Throttle - CLOSED
2. Mixture - IDLE CUT-OFF
3. Battery, Generator and Ignition Switches - OFF
4. Fuel Selector Valve - OFF
5. Keep wings level during touchdown.
6. Get clear of the airplane as soon as possible after it stops.

SYSTEMS EMERGENCIES

PROPELLER OVERSPEED

1. Throttle - RETARD TO RPM RED LINE
2. Airspeed - REDUCE
3. Oil Pressure - CHECK

WARNING

If loss of oil pressure was the cause of overspeed, the engine will seize after a short period of operation.

4. Land - SELECT NEAREST SUITABLE SITE and follow LANDING EMERGENCIES procedure.

GENERATOR-OUT PROCEDURE

A failure of the generator will place the entire electrical operation of the aircraft on the battery. Generator failure may be indicated by the ammeter. When a generator failure occurs in flight, all non-essential electrical load should be discontinued to conserve the battery.

LANDING GEAR MANUAL EXTENSION

Manual extension of the landing gear can be facilitated by first reducing airspeed. Then proceed as follows:

1. LDG GEAR Circuit Breaker - OFF (PULL OUT)
2. Landing Gear Switch Handle - DOWN position
3. Handcrank Handle Cover (at rear of front seats) - REMOVE
4. Handcrank - ENGAGE and TURN COUNTERCLOCKWISE AS FAR AS POSSIBLE (approximately 50 turns)

CAUTION

The manual extension system is designed to lower the landing gear only. DO NOT ATTEMPT TO RETRACT THE GEAR MANUALLY.

5. If electrical system is operative, check landing gear warning horn (check LDG GEAR WARNING circuit breaker engaged).
6. Check mechanical landing gear indicator - DOWN
7. Handcrank - DISENGAGE. Always keep it stowed when not in use.

WARNING

Do not operate the landing gear electrically with the handcrank engaged, as damage to the mechanism could occur. After emergency landing gear extension, do not move any landing gear controls or reset any switches or circuit breakers until airplane is on jacks as failure may have been in the gear up circuit and gear might retract on the ground.

LANDING GEAR RETRACTION AFTER PRACTICE MANUAL EXTENSION

After practice manual extension of the landing gear, the gear may be retracted electrically, as follows:

1. Handcrank - CHECK, STOWED
2. Landing Gear Motor Circuit Breaker - IN
3. Landing Gear - RETRACT

UNLATCHED DOOR IN FLIGHT

If the cabin door is not locked it may come unlatched in flight. This may occur during or just after take-off. The door will trail in a position approximately 3 inches open, but the flight characteristics of the airplane will not be affected, except that rate of climb will be reduced. 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.

EMERGENCY EXITS

Emergency exits, provided by the openable window on each side of the cabin, may be used for egress in addition to the cabin door. An emergency exit placard is installed below the left and right openable windows.

To open each emergency exit:

1. Lift the latch.
2. Pull out the emergency release pin and push the window out.

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.

SECTION IV

NORMAL PROCEDURES

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

SPEEDS FOR SAFE OPERATION

Take-off	
Lift-off	66 Knots/76 mph
50 Ft.	72 Knots/83 mph
Maximum Climb	
Best Rate	90 Knots/104 mph
Best Angle	83 Knots/95 mph
Cruise Climb	104 Knots/120 mph
Maximum Turbulent Air Penetration	125/Knots/144 mph
Balked Landing	70 Knots/80 mph
Landing Approach	70 Knots/80 mph
Maximum Demonstrated Crosswind	17 Knots/20 mph

PREFLIGHT INSPECTION

1. CABIN:
   a. Parking Brake - SET
   b. Control Lock - REMOVE
   c. All Switches - OFF
   d. Emergency Locator Transmitter - ARMED

2. RIGHT FUSELAGE:
   a. Baggage Compartment Door - SECURE
   b. Static Pressure Button - UNOBSTRUCTED

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

4. LEFT FUSELAGE:
   a. Static Pressure Button - UNOBSTRUCTED
   b. All Antennas - CHECK

5. LEFT WING TRAILING EDGE:
   a. Flap - CHECK
   b. Aileron - CHECK
   c. Wing Tip - CHECK
   d. Position Light - CHECK

6. LEFT WING LEADING EDGE:
   a. Stall Warning - CHECK
   b. Pitot Tube - CHECK, (Remove Cover)
   c. Landing Light - CHECK
   d. Fuel Tank(s) - CHECK QUANTITY; Filler Cap(s) - SECURE.
   e. Cabin Air Intake - CHECK
   f. Tie Down and Chocks - REMOVE

7. LEFT LANDING GEAR:
   a. Wheel Well Door, Tire and Strut - CHECK
   b. Fuel Vent - CHECK
   c. Fuel Sump(s) - DRAIN
   d. Fuel Selector Valve Sump and Auxiliary Fuel Cell Interconnect Line - DRAIN; Cover - SECURE

8. NOSE SECTION:
   a. Left Cowl Flap - CHECK
   b. Engine Oil - CHECK, Cap and Dipstick - SECURE
   c. Left Cowl - SECURE
   d. Propeller - CHECK, General Condition, Nicks and etc.
   e. Wheel Well Doors, Tire and Strut - CHECK
   f. Induction Air Intake - CLEAR
   g. Engine - CHECK GENERAL CONDITION
   h. Right Cowl - SECURE
   i. Right Cowl Flap - CHECK
   j. Chocks - REMOVE

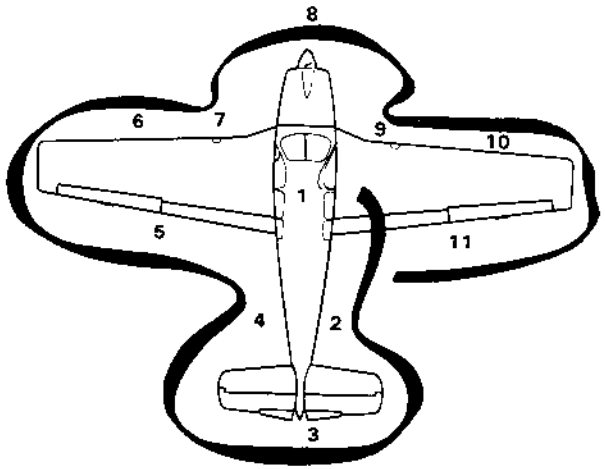
9. RIGHT LANDING GEAR:
   a. Fuel Vent - CHECK
   b. Fuel Sump(s) - DRAIN
   c. Wheel Well Door, Tire and Strut - CHECK

10. RIGHT WING LEADING EDGE:
   a. Cabin Air Intake - CHECK
   b. Tie Down and Chocks - REMOVE
   c. Fuel Tank(s) - CHECK QUANTITY; Filler Cap(s) - SECURE
   d. Landing Light - CHECK

11. RIGHT WING TRAILING EDGE:
   a. Position Light - CHECK
   b. Wing Tip - CHECK
   c. Aileron - CHECK
   d. Flap - CHECK

CAUTION

NEVER TAXI IF ANY STRUT IS FLAT.



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 Handle - DOWN
7. Flaps - UP
8. Cowl Flaps - OPEN
9. Light Switches - As Required
10. Battery and Generator Switches - ON (If external power is used, turn Generator Switch - OFF) (See Section 7)
11. Ignition Switch - BATTERY
12. Fuel Quantity Indicators - CHECK QUANTITY

WARNING

Do not take off if gages indicate in yellow arc or with less than 13 gallons in each main tank.

13. Fuel Selector Valve - CHECK OPERATION; SELECT LEFT MAIN TANK

STARTING

CAUTION

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

1. Mixture - FULL RICH
2. Propeller - HIGH RPM
3. Throttle - Approximately 1/2 inch open
4. Magneto Switch - BOTH
5. Auxiliary Fuel Pump momentarily ON until fuel pressure stabilizes.
6. Starter Button - Press until engine starts.

NOTE

If starting fuel pressure is low, switch auxiliary fuel pump to ON, then back to MOMENTARY ON when pressure stabilizes.

7. Auxiliary Fuel Pump - OFF when engine runs smoothly.
8. In the Event of Overprime Condition:
   a. Mixture - IDLE CUT-OFF
   b. Throttle - OPEN
   c. Starter Button - PRESS
   d. As engine starts reduce throttle to IDLE and advance mixture to FULL RICH

NOTE

During hot starts, if there is an indication of vapor in the fuel system (fluctuating fuel pressure), hold the auxiliary fuel pump to MOMENTARY ON to purge the system. Then turn it OFF.

9. Oil Pressure - CHECK
10. External Power (if used) - DISCONNECT. Battery and Generator Switches ON.
11. Warm up - 1000 to 1200 rpm.

NOTE

Do not operate engine above warm-up speed until oil temperature reaches 75°F (24°C).

12. All Engine Indicators - CHECK
13. Avionics Equipment - AS REQUIRED
14. Lights - AS REQUIRED

BEFORE TAKEOFF

1. Seat Belts and Shoulder Harnesses - CHECK

NOTE

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

2. Parking Brake - SET
3. Radios - CHECK
4. Engine Instruments - CHECK
5. Flight Instruments - CHECK AND SET
6. Auxiliary Fuel Pump - CHECK OFF
7. Throttle - 1900 RPM
8. Propeller - EXERCISE to obtain 300 to 400 rpm drop; return to high rpm
9. Magnetos - CHECK at 1900 rpm on each magneto (variance between individual magnetos should not exceed 50 rpm, maximum drop not to exceed 100 rpm.)
10. Trim - SET
    a. Aileron - NEUTRAL
    b. Elevator - 0° (3° nose up if only front seats are occupied)
11. Flaps - UP
12. Door and Windows - SECURE
13. Controls - CHECK FREEDOM OF MOVEMENT
14. Mixture - FULL RICH (or as required by field elevation)
15. Brakes - RELEASED
16. Instruments - CHECK (Make final check of manifold pressure, fuel pressure, and rpm at the start of the take-off run.)

TAKE-OFF

Take-Off and Maximum Continuous ..... full throttle, 2600 rpm

1. Power - SET TAKE-OFF POWER AND RELEASE BRAKE
2. Airspeed - ACCELERATE TO RECOMMENDED SPEED
3. Landing Gear - RETRACT (when positive rate of climb is established)
4. Airspeed - ESTABLISH DESIRED CLIMB SPEED (when clear of obstacles)

CLIMB

Maximum Climb ..... Full throttle, 2600 rpm
Cruise Climb ..... 25 in. Hg (or full throttle) 2500 rpm

1. Engine Temperatures - MONITOR
2. Power - SET AS DESIRED.

CRUISE

See Cruise Power Setting Tables, SECTION V.

1. Cowl Flaps - CLOSED
2. Power - SET
3. Fuel Pressure - SET

DESCENT

1. Fuel Pressure - MONITOR
   (Increase as required during descent.)

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 MAIN TANK MORE NEARLY FULL
3. Cowl Flaps - AS REQUIRED
4. Mixture - FULL RICH (or as required by field elevation)
5. Landing Gear - DOWN and CHECK. (Observe maximum extension speed)
6. Landing and Taxi Lights - AS REQUIRED
7. Flaps - DOWN (Observe maximum extension speed)
8. Airspeed - ESTABLISH LANDING APPROACH SPEED.
9. Propeller - HIGH RPM

SHUTDOWN

1. Cowl Flaps - OPEN
2. Brakes - SET
3. Electrical and Radio Equipment - OFF
4. Flaps - UP
5. Propeller - HIGH RPM
6. Throttle - CLOSE
7. Mixture - IDLE CUT-OFF
8. Magneto Switch - OFF, after engine stops
9. Battery and Generator Switches - OFF
10. Control Lock - INSTALL, if conditions warrant.
11. Install wheel chocks and release brakes if the airplane is to be left unattended.

COLD WEATHER OPERATION

See Section 7, Systems

ICING CONDITIONS

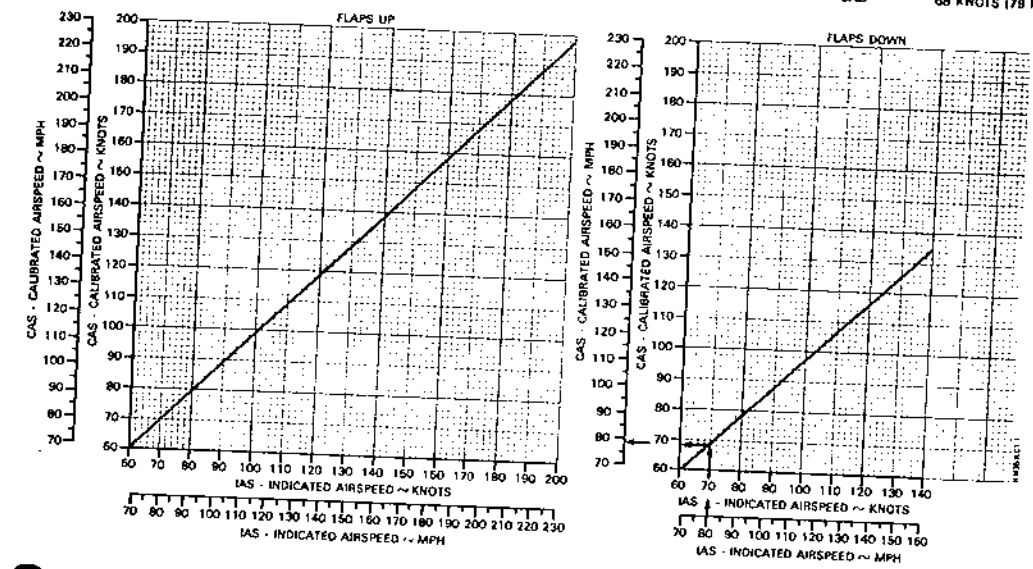
Flight in Known Icing Conditions Prohibited.

AIRSPEED CALIBRATION - NORMAL SYSTEM

NOTE: INDICATED AIRSPEED ASSUMES ZERO INSTRUMENT ERROR

EXAMPLE

IAS	70 KNOTS (81 MPH)
FLAPS	DOWN
CAS	68 KNOTS (79 MPH)



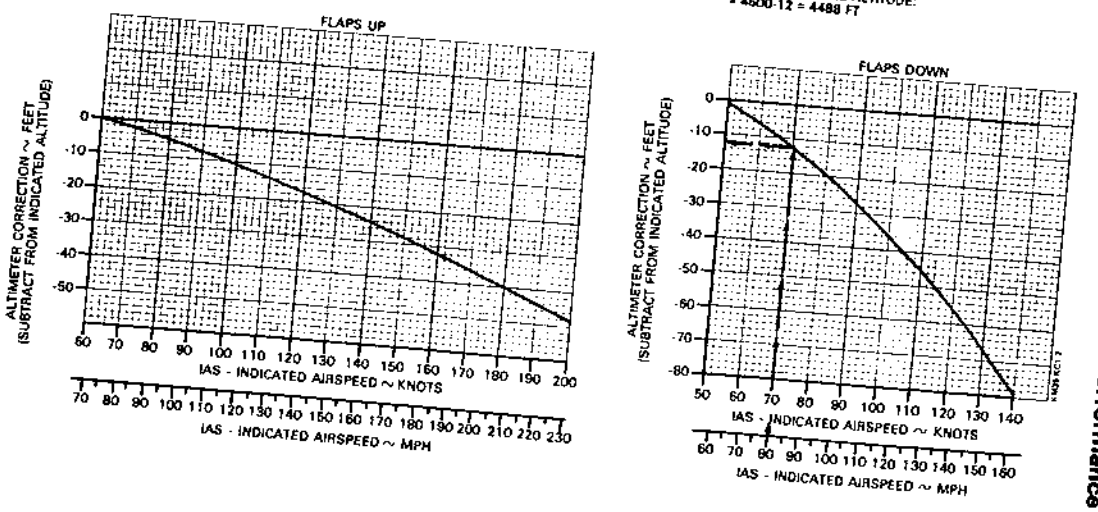
ALTIMETER CORRECTION - NORMAL SYSTEM

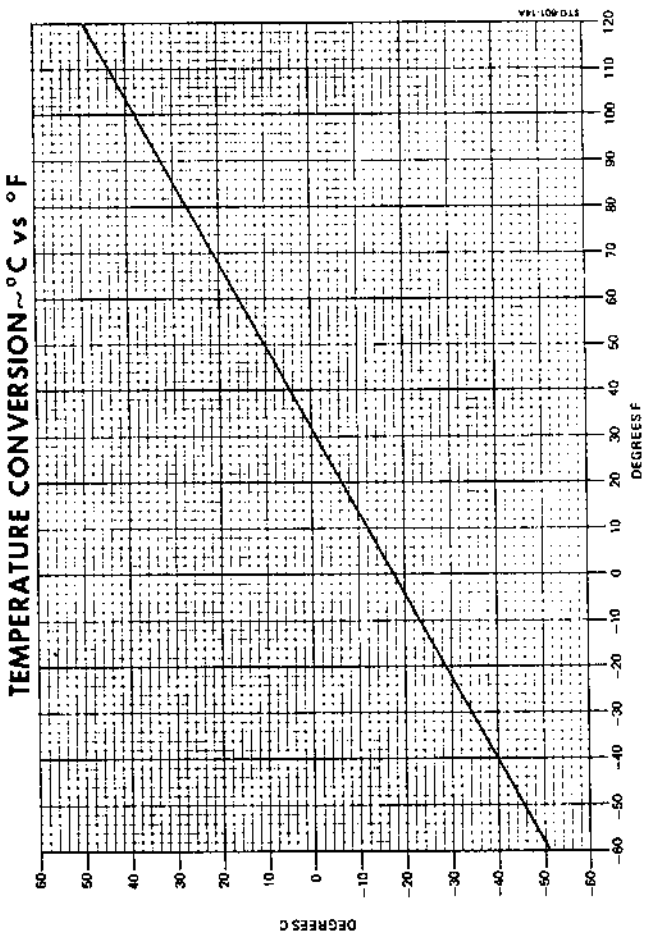
NOTE: INDICATED AIRSPEED AND INDICATED ALTITUDE ASSUME ZERO INSTRUMENT ERROR

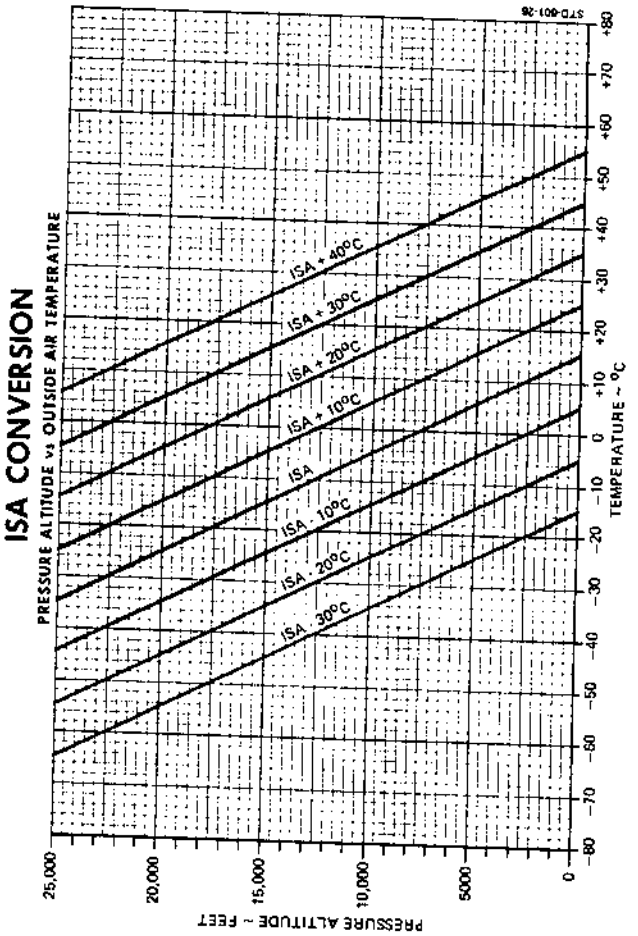
EXAMPLE

IAS	70 KNOTS (80 MPH)
FLAPS	DOWN
INDICATED PRESSURE ALTITUDE	4500 FT
ALTIMETER CORRECTION	-12 FT

ACTUAL PRESSURE ALTITUDE: = 4500-12 = 4488 FT

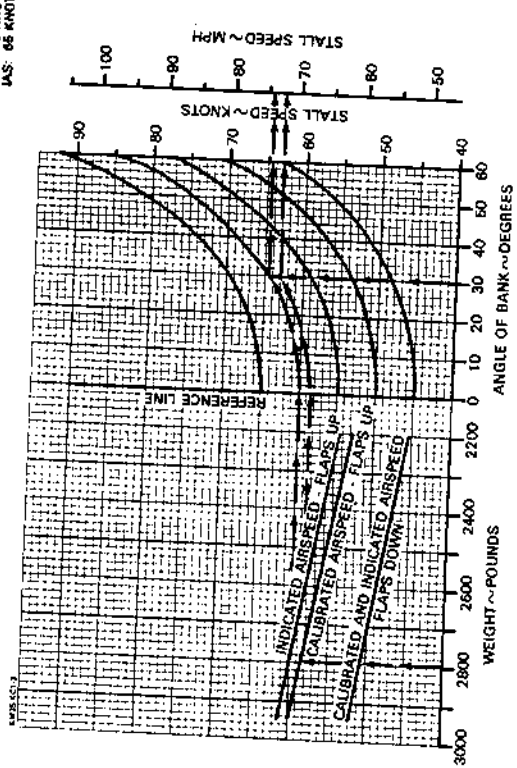



TEMPERATURE CONVERSION ~ °C vs °F
DEGREES C
DEGREES F
STD-601-18A


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
TEMPERATURE ~ °C
STD-601-26

STALL SPEEDS - POWER IDLE

EXAMPLE:
WEIGHT 2800 LBS
FLAPS UP
ANGLE OF BANK 30°
STALL SPEED CAS: 83 KNOTS (73 MPH)
IAS: 86 KNOTS (76 MPH)



NOTES: 1. THE MAXIMUM ALTITUDE LOSS EXPERIENCED WHILE CONDUCTING STALLS IN ACCORDANCE WITH CAM 3 120 WAS 200 FT

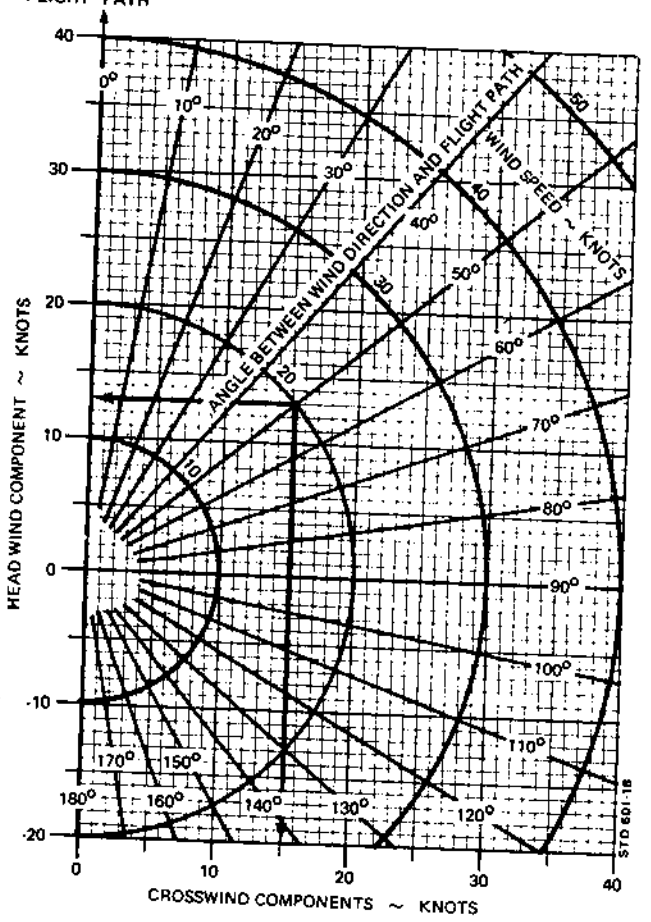
2. A NORMAL STALL RECOVERY TECHNIQUE MAY BE USED

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

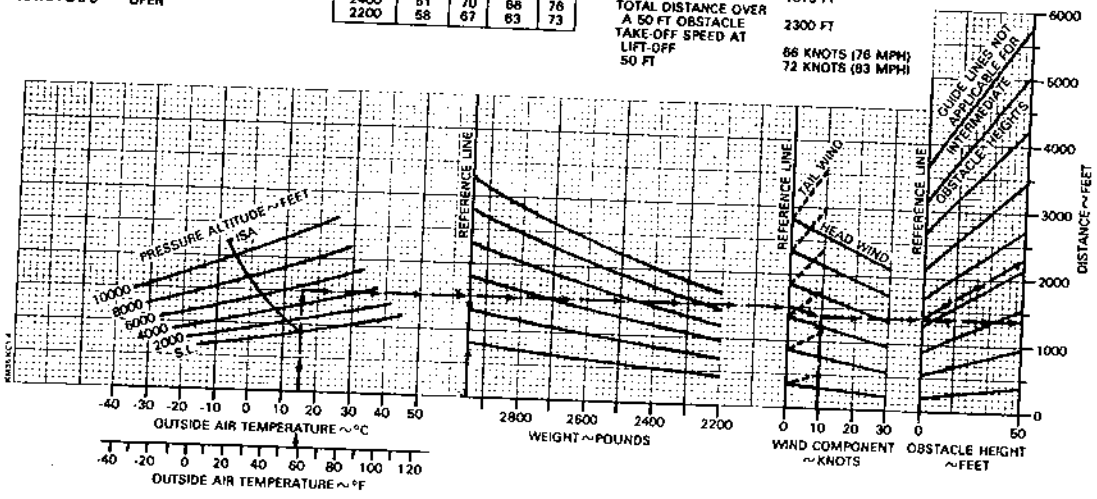
ASSOCIATED CONDITIONS:

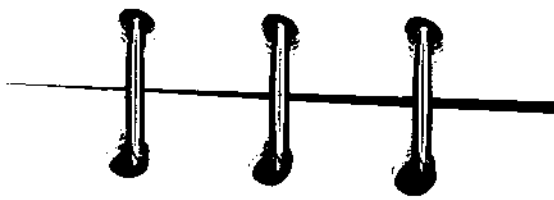
POWER	FULL THROTTLE 2600 RPM
MIXTURE	LEAN TO APPROPRIATE FUEL PRESSURE
FLAPS	UP
LANDING GEAR	RETRACT AFTER POSITIVE CLIMB ESTABLISHED
COWL FLAPS	OPEN

WEIGHT ~ POUNDS	TAKE-OFF SPEED LIFT-OFF KNOTS	LIFT-OFF MPH	50 FT KNOTS	50 FT MPH
2950	66	76	72	83
2800	64	74	70	81
2600	63	72	68	78
2400	61	70	66	76
2200	58	67	63	73

EXAMPLE

OAT	15°C (59°F)
PRESSURE ALTITUDE	6650 FT
TAKE-OFF WEIGHT	2950 LBS
HEAD WIND COMP.	9.5 KNOTS
GROUND ROLL	1375 FT
TOTAL DISTANCE OVER A 50 FT OBSTACLE	2300 FT
TAKE-OFF SPEED AT LIFT-OFF	66 KNOTS (76 MPH)
50 FT	72 KNOTS (83 MPH)





CLIMB

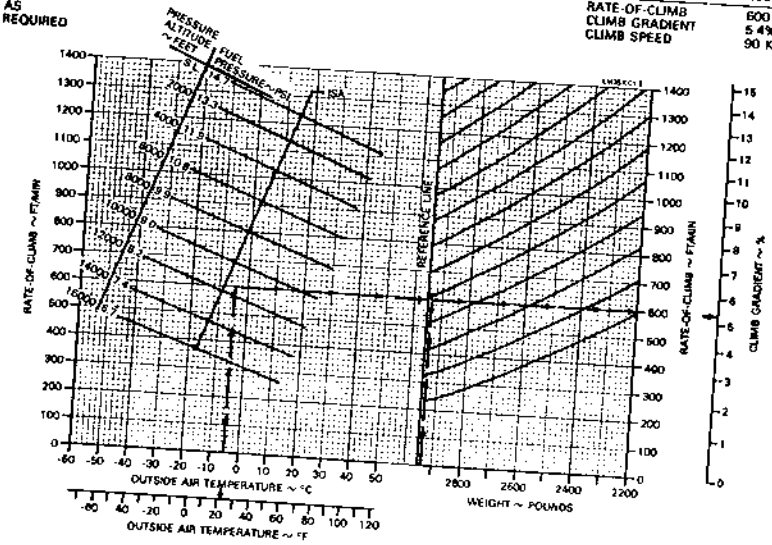
ASSOCIATED CONDITIONS:

POWER	FULL THROTTLE AT 2600 RPM
MIXTURE	LEAN TO APPROPRIATE FUEL PRESSURE
FLAPS	UP
LANDING GEAR	UP
COWL FLAPS	AS REQUIRED

CLIMB SPEED 90 KNOTS IAS (ALL WEIGHTS)
104 MPH IAS

EXAMPLE

OAT	-5°C (23°F)
PRESSURE ALTITUDE	11500 FT
WEIGHT	2937 LBS
RATE-OF-CLIMB	600 FT/MIN
CLIMB GRADIENT	5.4%
CLIMB SPEED	90 KNOTS (104 MPH)



CRUISE CLIMB

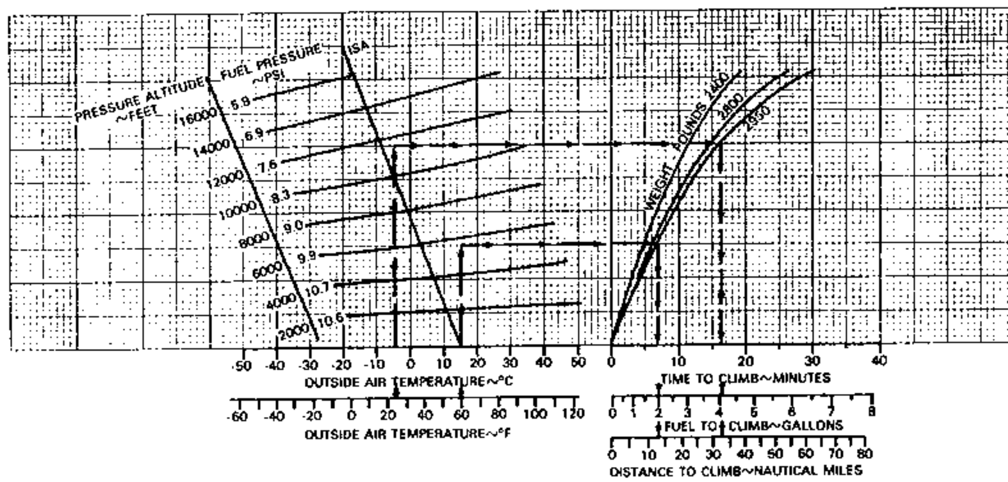
ASSOCIATED CONDITIONS

POWER	25 IN. HG. OR FULL THROTTLE 2500 RPM
FUEL DENSITY	6.0 LB/GAL
MIXTURE	LEAN TO APPROPRIATE FUEL PRESSURE
COWL FLAPS	CLOSED

CLIMB SPEED - 104 KNOTS (120 MPH)

EXAMPLE:

OAT AT TAKE-OFF	16°C (59°F)
OAT AT CRUISE	-5°C (23°F)
AIRPORT PRESSURE ALTITUDE	5650 FT
CRUISE PRESSURE ALTITUDE	11500 FT
INITIAL CLIMB WEIGHT	2950 LBS
TIME TO CLIMB (16-7)	9 MIN
FUEL TO CLIMB (4.1 - 2.0)	2.1 GAL
DISTANCE TO CLIMB (32-13)	19 NM



CRUISE POWER SETTINGS

75% MAXIMUM CONTINUOUS POWER (OR FULL THROTTLE)
2800 LBS

PRESS ALT.	ISA −20°C (−36°F)								STANDARD DAY (ISA)								ISA +20°C (+36°F)							
	IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW		TAS		IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW		TAS		IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW		TAS	
FEET	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH
SL	27	−3	2450	23.1	8.2	13.6	156	180	63	17	2450	23.8	8.2	13.6	159	183	99	37	2450	24.4	8.2	13.6	162	186
2000	19	−7	2450	22.8	8.2	13.6	158	182	55	13	2450	23.5	8.2	13.6	162	186	93	34	2450	24.2	8.2	13.6	165	190
4000	12	−11	2450	22.6	8.2	13.6	161	185	50	10	2450	23.3	8.2	13.6	165	190	86	30	2450	23.9	8.2	13.6	168	193
6000	7	−14	2450	22.3	8.2	13.6	164	189	43	6	2450	23.0	8.2	13.6	167	192	79	26	2450	23.4	8.0	13.4	170	196
[illegible]	[illegible]	−18	2450	21.8	8.0	13.3	166	191	36	2	2450	21.8	7.8	12.8	167	192	72	22	2450	21.8	7.2	12.3	166	193
[illegible]	[illegible]	−22	2450	20.3	7.2	12.3	164	189	28	−2	2450	20.3	6.8	11.8	165	190	64	18	2450	20.3	6.5	11.4	166	191
[illegible]	[illegible]	−26	2450	18.8	6.4	11.2	162	186	21	−6	2450	18.8	6.2	10.9	163	188	57	14	2450	18.8	6.0	10.4	163	189
[illegible]	[illegible]	−30	2450	17.4	5.9	10.6	160	183	14	−10	2450	17.4	5.6	10.1	160	184	50	10	2450	17.4	5.3	9.8	160	184
[illegible]	[illegible]	−34	2450	16.1	5.5	9.7	156	180	7	−14	2450	16.1	5.1	9.4	155	180	43	6	2450	16.1	4.9	9.1	155	178

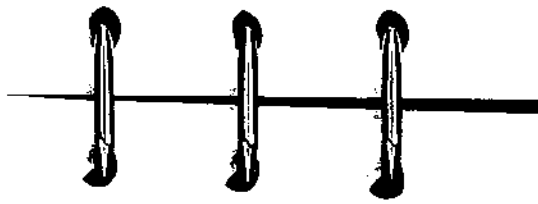
NOTES: 1. Full throttle manifold pressure settings are approximate.
2. Shaded area represents operation with full throttle.

CRUISE POWER SETTINGS

65% MAXIMUM CONTINUOUS POWER (OR FULL THROTTLE)
2800 LBS

PRESS ALT.	ISA −20°C (−36°F)								STANDARD DAY (ISA)								ISA +20°C (+36°F)							
	IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW		TAS		IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW		TAS		IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW		TAS	
FEET	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH
SL	27	−3	2450	20.7	6.6	11.5	147	169	63	17	2450	21.2	6.6	11.5	150	173	99	37	2450	21.8	6.6	11.5	153	176
2000	19	−7	2450	20.4	6.6	11.5	149	171	55	13	2450	21.0	6.6	11.5	153	176	91	33	2450	21.5	6.6	11.5	156	180
4000	12	−11	2450	20.1	6.6	11.5	152	175	48	9	2450	20.7	6.6	11.5	156	180	84	29	2450	21.3	6.6	11.5	159	183
6000	5	−15	2450	19.8	6.6	11.5	155	178	41	5	2450	20.4	6.6	11.5	158	182	79	26	2450	21.0	6.6	11.5	161	185
8000	−2	−19	2450	19.5	6.6	11.5	157	181	36	2	2450	20.2	6.6	11.5	161	185	72	22	2450	20.8	6.6	11.5	164	189
10000	−8	−22	2450	19.2	6.6	11.5	160	184	28	−2	2450	19.9	6.6	11.5	163	188	64	18	2450	20.5	6.6	11.4	166	191
[illegible]			[illegible]	18.8	6.4	11.2	162	186	21	−6	2450	19.6	6.1	10.9	163	188	57	14	2450	18.9	5.9	10.8	163	188
[illegible]			[illegible]	17.9	5.8	10.5	160	183	14	−10	2450	17.4	5.6	10.1	160	184	50	10	2450	17.4	5.4	9.8	160	184
[illegible]			[illegible]	16.1	5.3	9.7	156	180	7	−14	2450	16.1	5.1	9.4	156	180	43	6	2450	16.1	4.9	9.1	155	178

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



CRUISE POWER SETTINGS

55% MAXIMUM CONTINUOUS POWER (OR FULL THROTTLE)
2800 LBS

PRESS ALT.	ISA −20°C (−36°F)								STANDARD DAY (ISA)								ISA +20°C (+36°F)							
	IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW		TAS		IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW		TAS		IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW		TAS	
FEET	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH
SL	27	−3	2300	19.8	5.3	9.7	137	158	63	17	2300	20.3	5.3	9.7	140	161	99	37	2300	20.8	5.3	9.7	142	163
2000	19	−7	2300	19.5	5.3	9.7	139	160	55	13	2300	20.0	5.3	9.7	142	163	91	33	2300	20.5	5.3	9.7	145	167
4000	12	−11	2300	19.2	5.3	9.7	142	163	48	9	2300	19.8	5.3	9.7	144	166	84	29	2300	20.3	5.3	9.7	147	169
6000	5	−15	2300	19.0	5.3	9.7	144	166	41	5	2300	19.5	5.3	9.7	147	169	77	25	2300	20.0	5.3	9.7	149	171
8000	−2	−19	2300	18.7	5.3	9.7	146	168	34	1	2300	19.2	5.3	9.7	149	171	70	21	2300	19.7	5.3	9.7	152	175
10000	−9	−23	2300	18.5	5.3	9.7	149	171	27	−3	2300	18.9	5.3	9.7	151	174	63	17	2300	19.4	5.3	9.7	154	177
12000	−17	−27	2300	18.2	5.3	9.7	151	174	19	−7	2300	18.7	5.3	9.7	153	176	55	13	2300	19.2	5.3	9.7	156	179
[illegible]	[illegible]	[illegible]	[illegible]	17.8	5.2	9.6	152	175	12	−11	2300	17.8	5.0	9.3	152	175	48	9	2300	17.8	4.8	9.2	155	178
[illegible]	[illegible]	[illegible]	[illegible]	16.3	4.7	8.9	148	170	5	−15	2300	16.3	4.5	8.7	149	172	41	5	2300	16.3	4.4	8.4	149	172

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

CRUISE POWER SETTINGS

45% MAXIMUM CONTINUOUS POWER (OR FULL THROTTLE)
2800 LBS

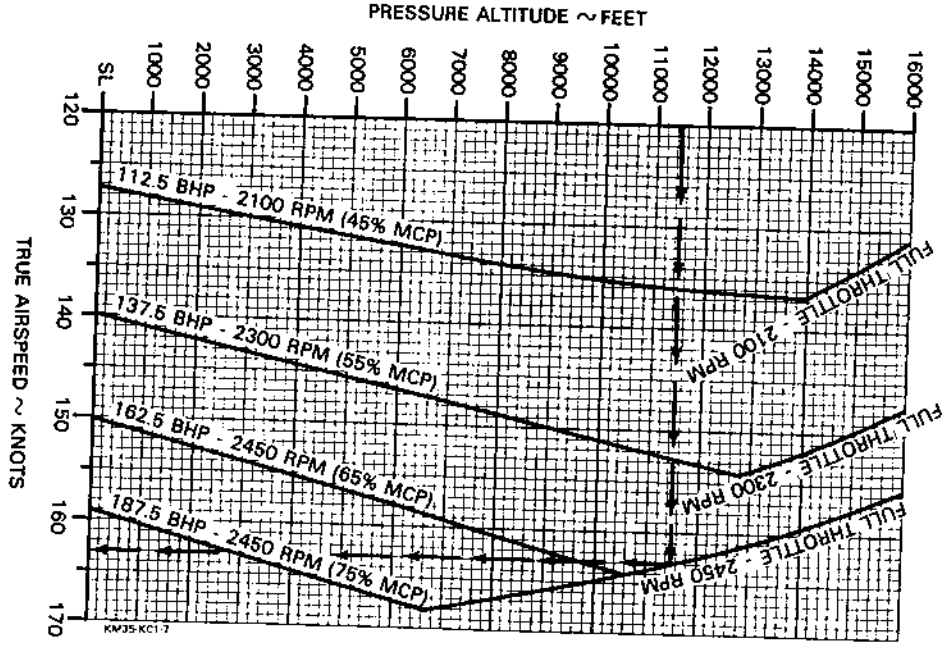
PRESS ALT.	ISA −20°C (−36°F) IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW		TAS		STANDARD DAY (ISA) IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW		TAS		ISA +20°C (+36°F) IOAT		ENGINE SPEED	MAN. PRESS	FUEL FLOW		TAS	
FEET	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH	°F	°C	RPM	IN HG	PSI	GPH	KTS	MPH
SL	25	−4	2100	20.0	4.2	8.2	125	144	63	17	2100	20.4	4.2	8.2	127	146	99	37	2100	20.9	4.2	8.2	129	148
2000	19	−7	2100	19.6	4.2	8.2	127	146	55	13	2100	20.0	4.2	8.2	129	148	91	33	2100	20.5	4.2	8.2	131	151
4000	12	−11	2100	19.2	4.2	8.2	129	148	48	9	2100	19.6	4.2	8.2	131	151	84	29	2100	20.1	4.2	8.2	133	153
6000	5	−15	2100	18.8	4.2	8.2	131	151	41	5	2100	19.2	4.2	8.2	133	153	77	25	2100	19.7	4.2	8.2	134	154
8000	−2	−19	2100	18.4	4.2	8.2	132	152	34	1	2100	18.8	4.2	8.2	134	154	70	21	2100	19.3	4.2	8.2	136	157
10000	−9	−23	2100	17.9	4.2	8.2	134	154	27	−3	2100	18.4	4.2	8.2	136	157	63	17	2100	18.9	4.2	8.2	136	157
12000	−17	−27	2100	17.5	4.2	8.2	135	155	19	−7	2100	18.0	4.2	8.2	136	157	55	13	2100	18.5	4.2	8.2	137	158
14000	−24	−31	2100	17.1	4.2	8.2	136	157	12	−11	2100	17.6	4.2	8.2	137	158	48	9	2100	18.1	4.2	8.2	138	159
16000	−31	−35	2100	16.3	4.2	8.1	134	154	5	−15	2100	16.9	4.0	7.9	131	151	41	5	2100	16.4	4.0	7.8	129	148

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

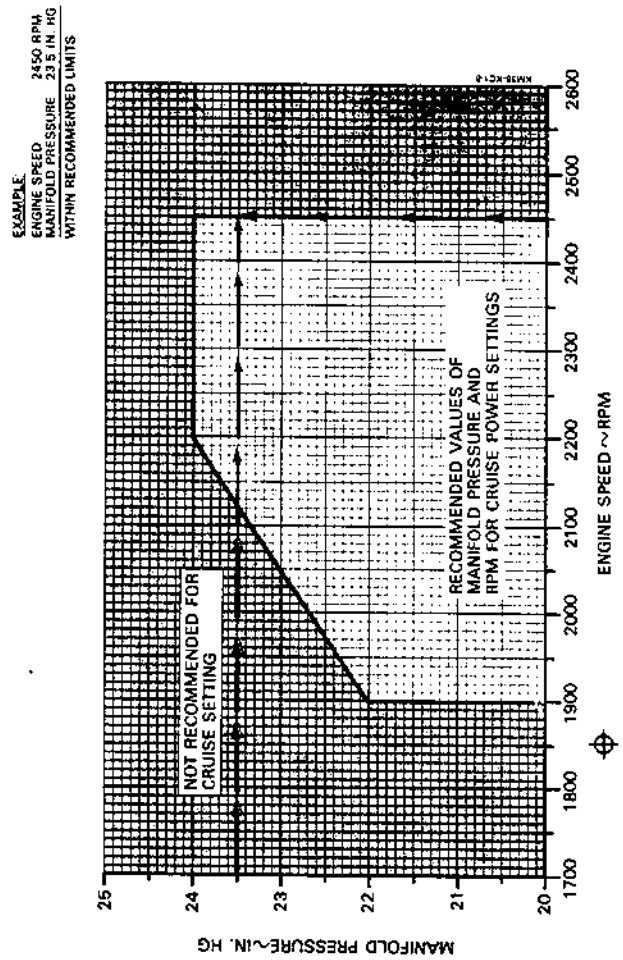
CRUISE SPEEDS

ASSOCIATED CONDITIONS:
AVERAGE CRUISE WEIGHT: 2800 LBS
TEMPERATURE: STANDARD DAY (ISA)

EXAMPLE:
PRESSURE ALTITUDE: 11,500 FT
POWER SETTING: FULL THROTTLE 2450 RPM
TRUE AIRSPEED: 163 KNOTS

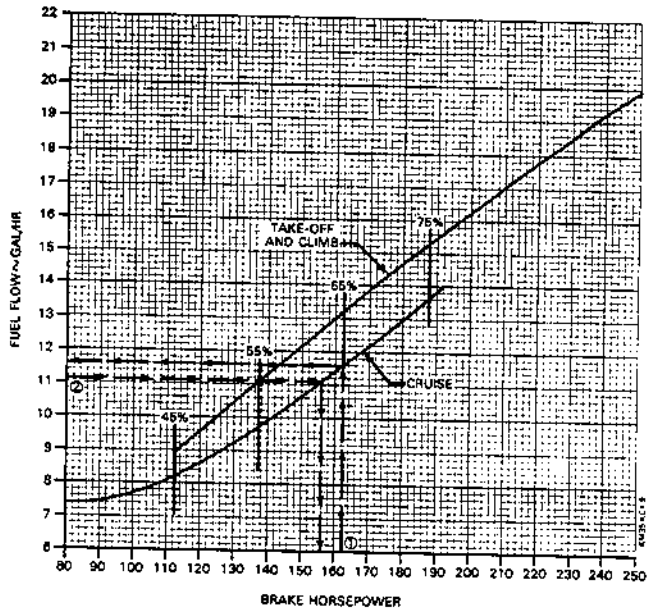


MANIFOLD PRESSURE vs RPM



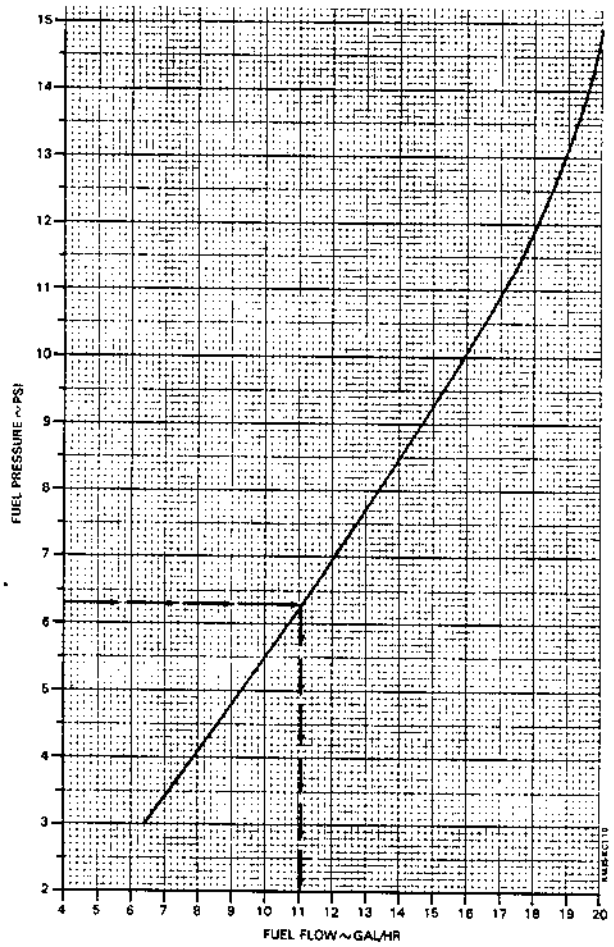
FUEL FLOW vs BRAKE HORSEPOWER

EXAMPLE:	
① BRAKE HORSEPOWER	162.5 (65% MCP) LEVEL FLIGHT CRUISE LEAN
CONDITION	
FUEL FLOW	11.6 GAL/HR
② FUEL FLOW CONDITION	11.1 GAL/HR LEVEL FLIGHT CRUISE LEAN
BRAKE HORSEPOWER	158



FUEL FLOW vs FUEL PRESSURE

EXAMPLE:
FUEL PRESSURE 6.3 PSI
FUEL FLOW 11.1 GAL/HR (GPH)



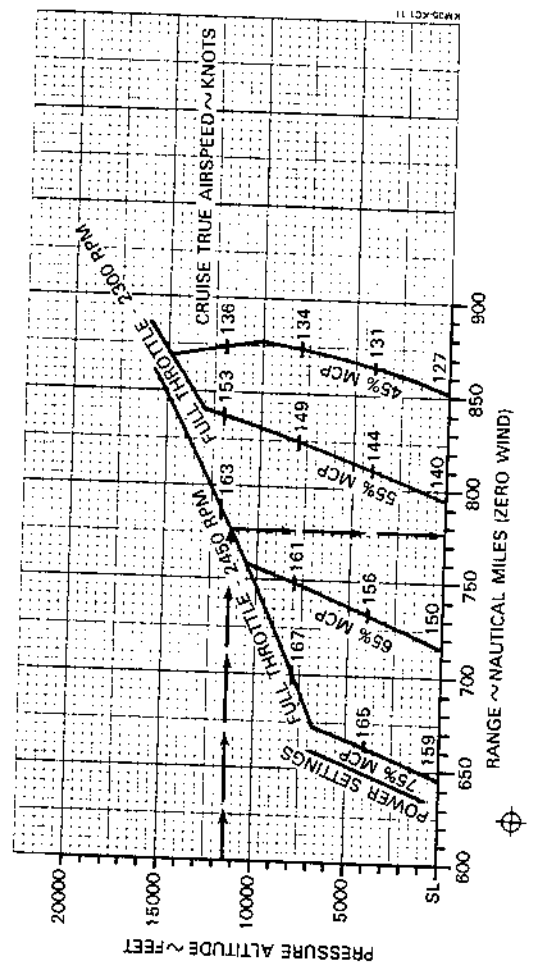
RANGE PROFILE - 63 GALLONS

STANDARD DRY (ISA)

EXAMPLE
PRESSURE ALTITUDE 11500 FT
POWER SETTING FULL THROTTLE
2450 RPM
RANGE 778 NM

ASSOCIATED CONDITIONS
WEIGHT 2950 LBS BEFORE ENGINE START
FUEL AVIATION GASOLINE
FUEL DENSITY 6.0 LBS/GAL
INITIAL FUEL LOADING 63 U.S. GAL (378 LBS)

NOTE
RANGE INCLUDES START, TAXI AND CLIMB WITH
45 MINUTES RESERVE FUEL AT 45% MCP



RANGE PROFILE - 44 GALLONS

STANDARD DAY (ISA)

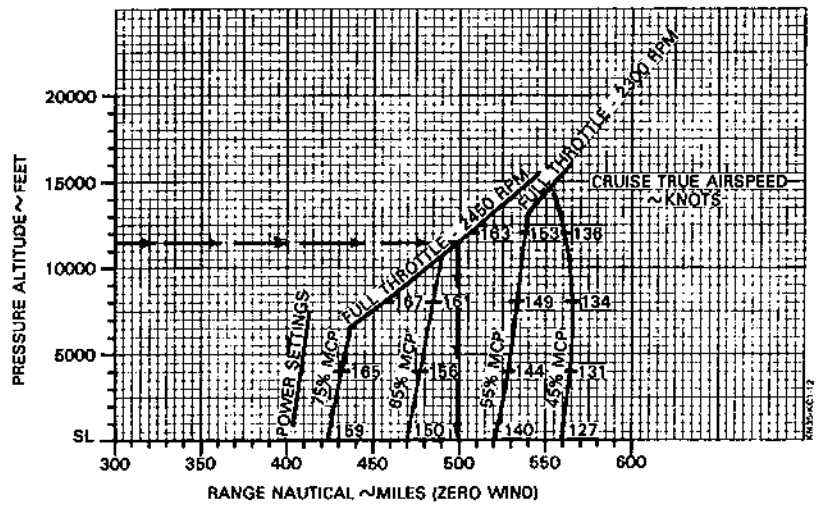
ASSOCIATED CONDITIONS:

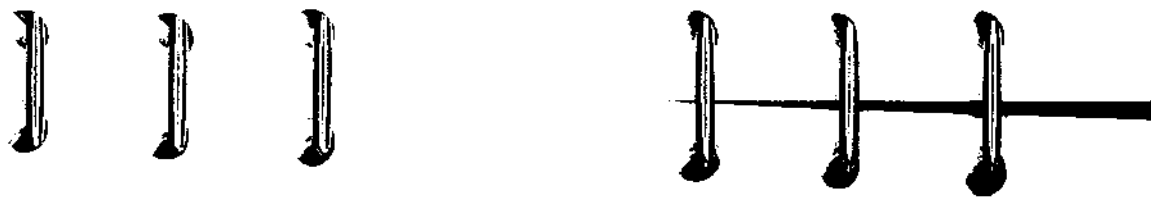
WEIGHT	2960 LBS. BEFORE ENGINE START
FUEL	AVIATION GASOLINE
FUEL DENSITY	6.0 LBS/GAL
INITIAL FUEL LOADING	44 U.S. GAL (264 LBS)

NOTE:
RANGE INCLUDES START, TAXI AND CLIMB WITH 45 MINUTES RESERVE FUEL AT 45% MCP

EXAMPLE:

PRESSURE ALTITUDE	11500 FT
POWER SETTING	FULL THROTTLE 2450 RPM
RANGE	498 NM





ENDURANCE PROFILE - 63 GALLONS

STANDARD DAY (ISA)

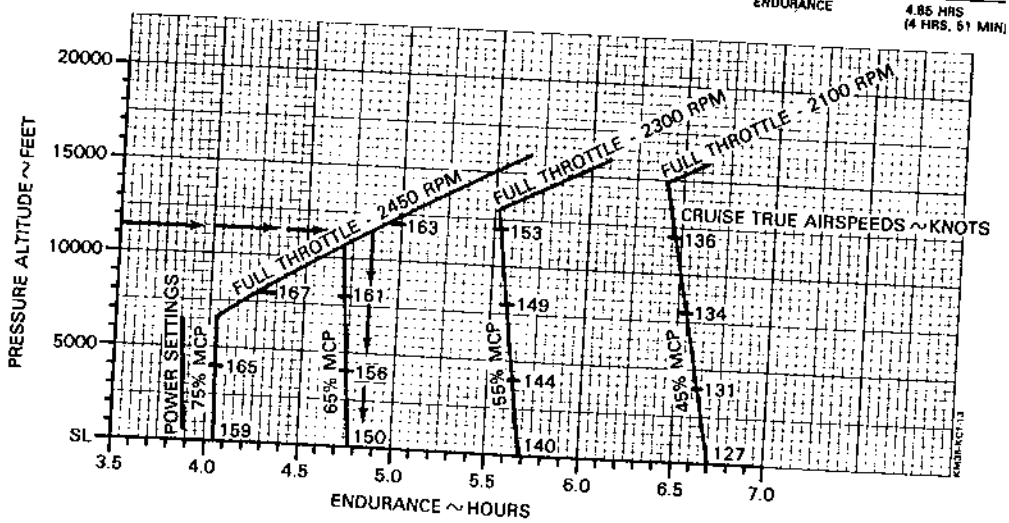
ASSOCIATED CONDITIONS:

WEIGHT	2960 LBS BEFORE ENGINE START
FUEL	AVIATION GASOLINE
FUEL DENSITY	6.0 LBS/GAL
INITIAL FUEL LOADING	63 U.S. GAL (378 LBS)

NOTE:
ENDURANCE INCLUDES START, TAXI, AND CLIMB WITH 45 MINUTES RESERVE FUEL AT 45% MCP

EXAMPLE:

PRESSURE ALTITUDE	11500 FT
POWER SETTING	FULL THROTTLE 2450 RPM
ENDURANCE	4.85 HRS (4 HRS, 51 MIN)



ENDURANCE PROFILE - 44 GALLONS

STANDARD DAY (ISA)

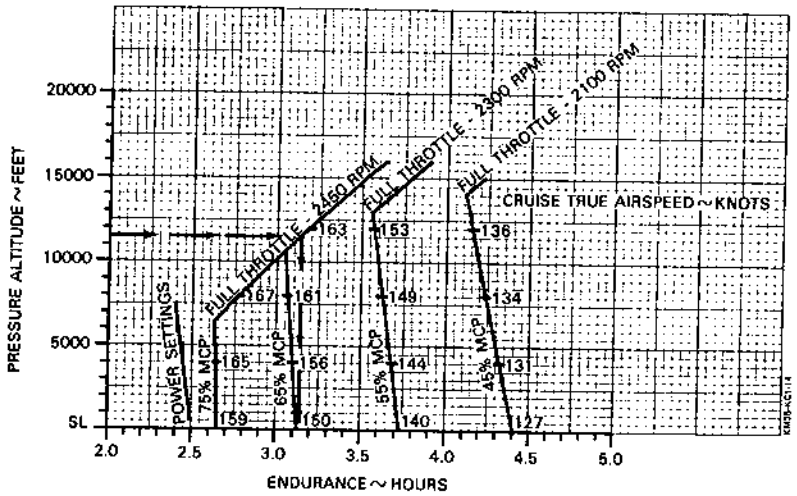
ASSOCIATED CONDITIONS:

WEIGHT	2960 LBS BEFORE ENGINE START
FUEL	AVIATION GASOLINE
FUEL DENSITY	6.0 LBS/GAL
INITIAL FUEL LOADING	44 U.S. GAL (264 LBS)

NOTE
ENDURANCE INCLUDES START, TAXI, AND CLIMB WITH 45 MINUTES RESERVE FUEL AT 45% MCP

EXAMPLE:

PRESSURE ALTITUDE	11500 FT
POWER SETTING	FULL THROTTLE 2450 RPM
ENDURANCE	3 14 HRS



LANDING DISTANCE

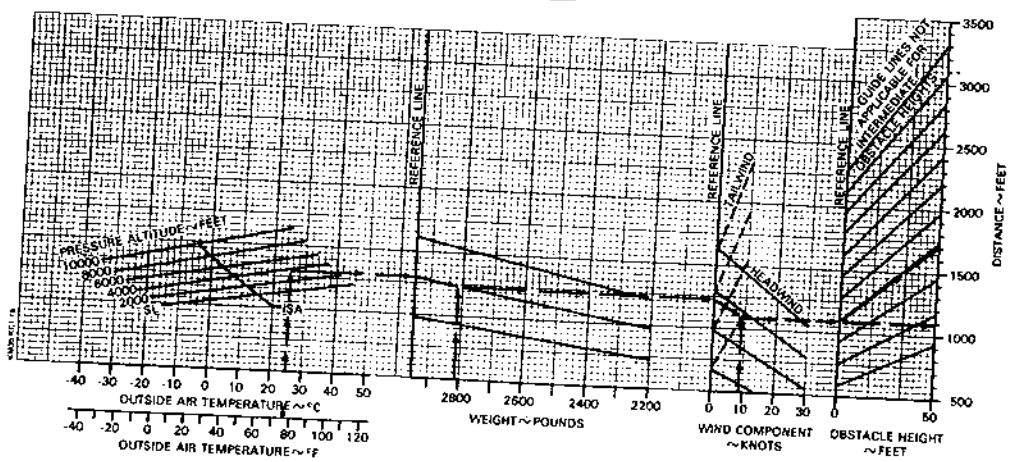
ASSOCIATED CONDITIONS:

POWER	RETARDED TO MAINTAIN 900 FT/ on FINAL APPROACH
FLAPS	DOWN
LANDING GEAR	DOWN
RUNWAY	PAVED, LEVEL, DRY SURFACE
APPROACH SPEED	IAS AS TABULATED
BRAKING	MAXIMUM

WEIGHT ~ POUNDS	SPEED AT 50 FT KNOTS	SPEED AT 50 FT MPH
2950	70	80
2800	68	78
2600	65	75
2400	63	72
2200	60	69

EXAMPLE:

OAT	25°C (77°F)
PRESSURE ALTITUDE	3965 FT
WEIGHT	2814 LBS
WIND COMPONENT	9 0 KNOTS (HEADWIND)
GROUND ROLL	1080 FT
TOTAL OVER 50 FT OBSTACLE	1700 FT
APPROACH SPEED	68 KNOTS (78 MPH)



SECTION VII

SYSTEMS DESCRIPTION

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AIRFRAME

The BEECHCRAFT K35 and M35 Bonanzas are four-place all-metal, low-wing, single-engine monoplanes with fully retractable tricycle landing gear.

The Bonanza has "Vee" tail control surfaces which are arranged to act as both elevator and rudder. The two surfaces work together for elevator action and opposite each other in rudder action. The "Vee" tail operates like a conventional tail in response to elevator and rudder control action.

DOORS, WINDOWS AND EXITS

The outside cabin door handle is spring loaded to fit into a recess in the door to create a flat aerodynamically clean surface. To open the door from the outside, lift the handle from its recess and pull until the door opens.

To close the cabin door from the inside, observe that the door handle is in the unlocked position. In this position, the latch handle is free to move approximately one inch in either direction before engagement of the locking mechanism. Then grasp the door and firmly pull the door closed. Rotate the door handle fully counterclockwise into the locked position. When the door is properly locked, the door latch handle is free to move approximately one inch in either direction.

NOTE

When checking the door latch handle, do not move it far enough to engage the door latch release mechanism.

Press firmly outward at the top rear corner 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, depress the lock button and rotate the handle clockwise.

OPENABLE CABIN WINDOWS

To Open Window For Ventilation (Only On Ground):

Release latch front of bar, pull bar at the bottom of the window out and upward. Window will open approximately two inches.

To Close Window:

Pull inward and down on the bar at the bottom of the window. Resistance will be felt as the bar moves downward. Continue moving bar downward to its lowest position. Check that bar is locked by the latch.

NOTE

Window is to be closed before and during flight. While closing window, ascertain that the emergency release pin (which allows the window to open fully for emergency exit) is securely in place.

EMERGENCY EXITS

To open the emergency exit provided by the openable window on each side of the cabin:

1. Lift the latch.
2. Pull out the emergency release pin and push the window out.

The above procedure is described on a placard installed below the left and right openable windows.

SEAT ADJUSTMENTS

Both of the individual front seats are adjustable fore-and-aft, by pulling up on the small lever just to the right of each seat cushion and pulling or pushing on the seat. In addition, the front seat backs are adjustable to three angles off vertical, providing a welcome change of position on long flights. The right hand set of rudder pedals are stubs, and fold forward against the floorboards when they are not in use, giving the occupant of that seat the maximum available leg room.

On both the standard seating arrangement and the optional five-place seating configuration the rear seat incorporates a divided adjustable back. The individually adjustable backs have a wide range of adjustment and may be reclined as far as baggage will allow, or until restrained by the recline mechanism stop.

ARMRESTS AND HEADRESTS

Armrests for both front and rear seat passengers are built into the cabin sidewalls and the door; a cup in the door armrest forms a convenient handle for pulling the door closed. In addition, a generously-proportioned armrest between the two front seats may be raised into position on a pedestal or lowered flush with the seat cushions, and a center armrest for rear seat occupants (standard seating configuration only) fits into sockets in the rear seat frame. When not in use, the rear seat armrest may be stowed in the pocket under the seat.

In the standard seating arrangement the two front seats have sockets for attaching large, neck-pillow style headrests, and one headrest is provided as standard equipment. The individual reclining backs on the rear seat are provided with built-in headrests. With the optional fifth seat installation, the special rear seat backs have headrest attachment sockets as well as the front seat backs, and two neck-pillow style headrests are provided as standard equipment. Used in connection with the shoulder harness (offered on front seats only with fifth seat installation) the headrests will permit a passenger to doze comfortably on a long flight and lessen the discomfort of flying through rough air.

SHOULDER HARNESS AND SEAT BELTS

The BEECHCRAFT High-Strength Shoulder Harness, by distributing loads evenly between the shoulders and hips, will keep its occupants snugly in their seats in turbulent air or under rapid deceleration. Tests have proved that, properly worn, the shoulder harness will protect its wearer in sudden straight-ahead decelerations approaching 20 Gs. It is mechanically simple, comfortable and permits sufficient freedom of movement to operate all the controls. The shoulder harness is standard equipment on all seats except on the optional five-place seating installation which provides only regular seat belts for the rear seat and jump seat.

The BEECHCRAFT Bonanza has quick-release harness buckles which are easily adjusted and fastened. The nylon webbing, in colors complementing the upholstery, is strong, light, soil-resistant and easily cleaned.

BAGGAGE COMPARTMENTS

Access to the baggage compartment may be obtained either through the baggage door on right side of the fuselage or by reaching over or around the rear seats.

WARNING

DO NOT CARRY CHILDREN IN THE BAGGAGE COMPARTMENT.

WARNING

DO NOT CARRY HAZARDOUS MATERIAL.

CAUTION

To prevent shifting of baggage or other objects in turbulent air they should be secured by straps or other suitable means.

FLIGHT CONTROLS

CONTROL SURFACES

Control surfaces are operated through push-pull rods and conventional cable systems terminating in bellcranks.

CONTROL COLUMN

The throw-over type control column for elevator and aileron control can be placed in front of either front seat. Pull the T-handle latch at the back of the control arm and position the control wheel as desired. The aileron trimmer on the control column hub should be held until the column is repositioned. Check for full freedom of movement after repositioning the control.

RUDDER PEDALS

To adjust the rudder pedals, press the spring-loaded lever on each pedal arm and move the pedal forward or aft. The adjustment lever can also be used to place the right set of rudder pedals against the floor when not in use.

TRIM CONTROLS

Elevator trim is controlled by a handwheel located to the left of the throttle. An elevator tab indicator dial is located above and to the right of the trim control handwheel.

The aileron trimmer on the control column hub displaces the ailerons; displacement is maintained by cable loads imposed by the trimmer.

CONTROL COLUMN LOCK PIN

1. Rotate control wheel and move column so the hole in the bracket and the column align to accept pin.

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

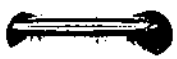
3. Ensure positive retention of the lock pin by positioning the attached red plate on top of the throttle and propeller controls.

WING FLAPS

The flaps are raised and lowered electrically by jackscrew actuators driven through flexible shafts from a single motor and gearbox under the front seat.

CONTROL SWITCH

The flaps are controlled by a three-position switch on the left side of the subpanel. A latch on the control switch must be moved aside to place the switch in the up position.



POSITION INDICATORS

The flap position lights on the left side of the control console show green for the up position and red for the full-down landing position— intermediate 20-degree and 10-degree positions are indicated by lines painted on the leading edge of the left flap. The intermediate positions are reached when the marks are aligned with the trailing edge of the wing. Limit switches for the up and down positions stop the flaps automatically at the proper point. Intermediate flap positions may be set by moving the control switch to off when the desired setting is reached.

INSTRUMENT PANEL

The instrument panel for this airplane consists of fixed and floating instrument panels, an engine instrument cluster on the center of the instrument panel above the control column, a radio grouping on the left side of the instrument panel, and subpanels which provide a compact circuit breaker group on the right side, and switch panels on both sides.

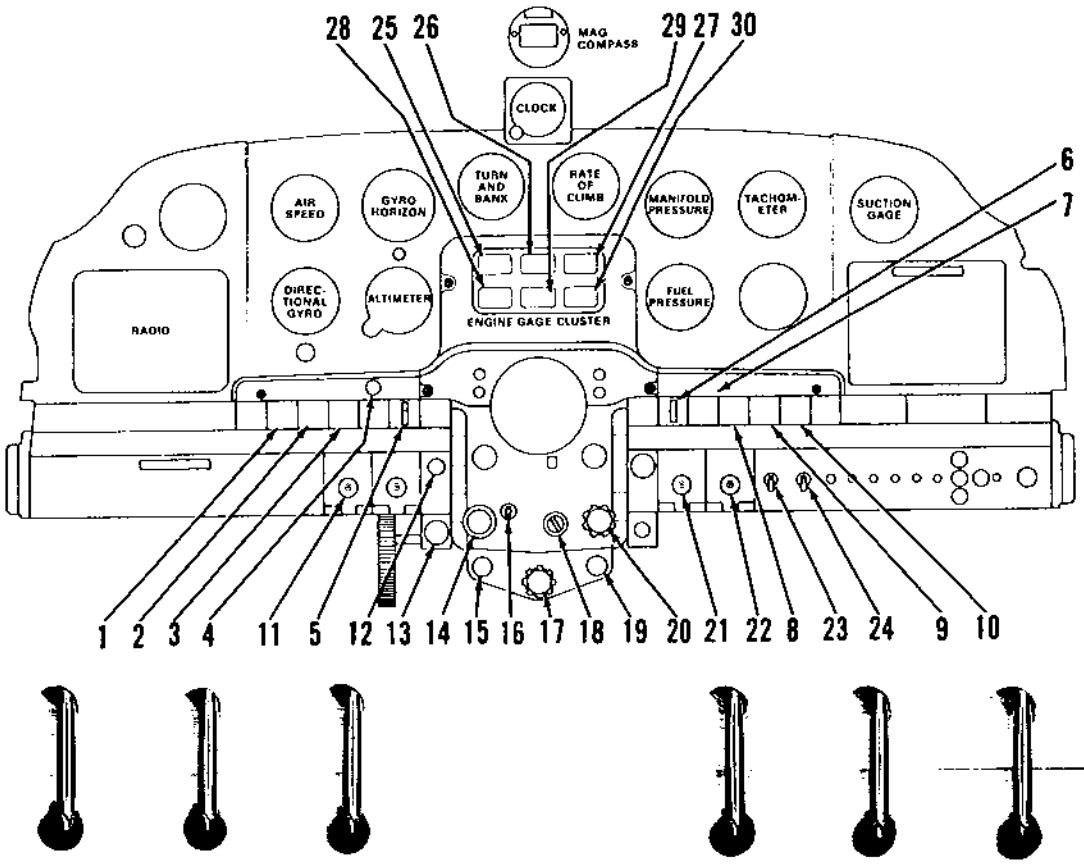
Standard instrumentation on the Bonanza includes an airspeed indicator, altimeter and electric turn-and-bank indicator mounted in the instrument panel; magnetic compass mounted on the windshield divider; a clock built into the instrument cowl pad, and outside air thermometer at the top of the divider.

In addition to several radio-navigation combinations, optional instruments for which openings are provided in the instrument panel include a vacuum-operated directional gyro and attitude gyro, and the suction gage necessary when these instruments are installed.

The battery master switch and generator switches are located under a door in a panel under the right side of the instrument panel. The key operated battery/ignition switch is located below the control column and the push button starter switch to the left of the control column.

Piano type key switches on the right and left subpanels operate landing gear, flaps, exterior lighting, auxiliary fuel pump and radios. Attached to the lower center section of the subpanel are the powerplant controls and interior lighting rheostats. Flap indicator lights are to the left of the control column and landing gear indicator lights to the right.

All configurations of the instrument panel are similar in grouping and convenient arrangement.



INSTRUMENT PANEL

1. Main Fuel Gage Switch
2. Aux Fuel Gage Switch
3. Aux Fuel Pump Switch (K35)
4. Aux Fuel Pump Indicator
5. Flap Switch
6. Landing Gear Switch
7. Landing Light Switch - Left
8. Landing Light Switch - Right
9. Nav Lights Switch
10. Beacon Switch
11. Cowl Flaps Control
12. Starter Switch
13. Defroster Control
14. Throttle
15. Cabin Vent Control Left
16. Aux Fuel Pump Switch (M35)
17. Mixture Control
18. Battery/Magneto Key Switch
19. Cabin Vent Control - Right
20. Propeller Control
21. Parking Brake Control
22. Cabin Heat Control
23. Battery Switch
24. Generator Switch
25. Main Fuel
26. Oil Temperature
27. Ammeter
28. Aux Fuel
29. Cylinder Head Temperature
30. Oil Pressure

POWER PLANT - DESCRIPTION

The BEECHCRAFT Bonanza K35 and M35 are powered by a Continental IO-470-C six-cylinder, horizontally opposed, fuel injected engine rated at 250 horsepower at 2600 rpm.

ENGINE INSTRUMENTS

The engine instruments include: cylinder head temperature, oil temperature, oil pressure indicators, tachometer, manifold pressure, fuel pressure, and fuel quantity indicators and an ammeter.

CLUSTER TYPE ENGINE INSTRUMENTS

Except for the tachometer, manifold pressure gage and fuel pressure gage, the power plant instruments are grouped together immediately above the control console. The engine gage cluster includes the fuel quantity gages, oil pressure gage, the oil temperature and cylinder head temperature indicators and ammeter. The fuel quantity gage is a single instrument; a switch on the left subpanel selects the cell on which a reading is desired. When the two ten-gallon auxiliary wing tanks are installed, an auxiliary fuel quantity gage is added to the cluster. Like the main cell system, a switch on the subpanel selects the auxiliary cell to which the gage is connected.

MANIFOLD PRESSURE, TACHOMETER AND FUEL PRESSURE GAGE

The manifold pressure gage, fuel pressure gage and tachometer are mounted in the instrument panel proper. The tachometer is driven by a flexible shaft from the engine accessory section. Incorporated in the tachometer is an engine hour meter which automatically records the total engine operating time.

The fuel pressure gage is calibrated in psi and marked for recommended pressure settings for various power requirements. The dial, marked in green, is divided into two portions. The upper portion has segments marked for various percentages of power, for cruising flight; the pressures indicated represent best-power mixture strengths. The lower part of the dial is marked to indicate the best mixture settings for take-off power at various altitudes.

ENGINE CONTROLS

THROTTLE, PROPELLER, AND MIXTURE

The push-pull throttle, propeller and mixture controls are located on the control console. These controls are released for repositioning by pushing a button on the knob. With the button extended, fine adjustments are accomplished by rotating the knob, clockwise to increase and counterclockwise to decrease. Do not rotate clockwise with control fully advanced.

COWL FLAPS

The push-pull cowl flap control is located above and to the left of the control console on the subpanel. Except in extremely low temperatures, the cowl flaps should be open during ground operation, take-off, and climb.

OIL SYSTEM

The engine oil system is the full pressure, wet sump type and has a 10-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 Bonanza's fuel injected engine and the automatic alternate air source. The only possible ice accumulation is impact ice at the air intake and filter. If the air intake or filter becomes clogged with ice, a spring-loaded door in the air intake duct will open automatically and the induction system will operate on alternate air.

STARTER

The starter is relay-controlled to minimize the length of heavy cable required to carry the high amperage of the starter circuit. The starter is actuated by a push button type, momentary-on switch located on the left of the control column. To energize the starter circuit, rotate the magneto switch to the BOTH position, then press the starter button.

PROPELLER

Installed as standard equipment on the Bonanza is a constant speed, variable pitch, 82-inch diameter propeller with two aluminum alloy blades. The pitch setting at 33 inch station is 13.5° low and not under 30° high pitch.

NOTE

Other propellers are approved for the Bonanza K35 or M35 but not installed as original equipment. These are listed in the FAA Aircraft Specification 3A15 or approved by Supplemental Type Certificate.

Propeller rpm is controlled by a Woodward governor which regulates hydraulic oil pressure to the blades. A push-pull knob on the control console allows the pilot to select the governor's rpm range.

If oil pressure is lost, the propeller will go to the full high rpm position. This is because propeller low rpm is obtained by governor boosted engine oil pressure working against the centrifugal twisting moment of the blades.

FUEL SYSTEM

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

CAUTION

The grounding jack is located just above the leading edge of the wing in the fuselage. Before refueling, make certain the airplane and fuel dispensing unit are properly grounded. Failure to do so creates a fire hazard.

FUEL CELLS

Fuel supply is carried in two bladder-type cells with a total capacity of 25 gallons each, located in the wings just outboard of the fuselage. Usable fuel of each 25 gallon main tank is 22 gallons.

Fuel is fed from the cells to a selector valve just forward of the front seat, on the left side, then through a strainer to the fuel pump and the engine. The fuel tank fillers are located in the wing leading edges.

AUXILIARY FUEL CELLS

If installed an additional 19 gallons of usable fuel is available in two auxiliary 10 gallon fuel cells in the wings, outboard of the wheel wells. Both auxiliary cells are connected to a common port in the fuel selector valve, so that both feed simultaneously when the selector valve is set to AUX.

The two optional 10-gallon auxiliary tanks may be filled after removing the pressure-type filler caps, located aft and outboard of the main tank filler caps. Do not overfill the tanks.

Individual liquidometer units in each auxiliary cell transmit fuel quantity information to the auxiliary fuel cell gage. The fuel level of either cell may be read by switching the auxiliary fuel gage selector switch on the left subpanel to the desired position, R (right) or L (left).

CAUTION

Do not allow the fuel cells to remain completely empty for any length of time, since this may result in cracking and checking of the inner liner of the cell. If fuel cells are to be left empty for longer than a week, a thin coating of light engine oil should be sprayed, flushed or rubbed on the inner liner of the cells.

FUEL QUANTITY

Fuel quantity is measured by float operated sensors, located in each wing tank system. These transmit electrical signals to the individual indicators that indicate fuel remaining in the tank. There are sensors in each wing tank system connected to the individual wing tank indicator.

AUXILIARY FUEL PUMP

The electric auxiliary fuel pump is controlled by a 3 position switch on the left subpanel. It provides pressure for starting and emergency operation. Immediately after starting, the auxiliary fuel pump can be used to purge the system of vapor caused by an extremely high ambient temperature or a start with the engine hot. The auxiliary fuel pump HI POSITION provides for near maximum engine performance should the engine driven pump fail.

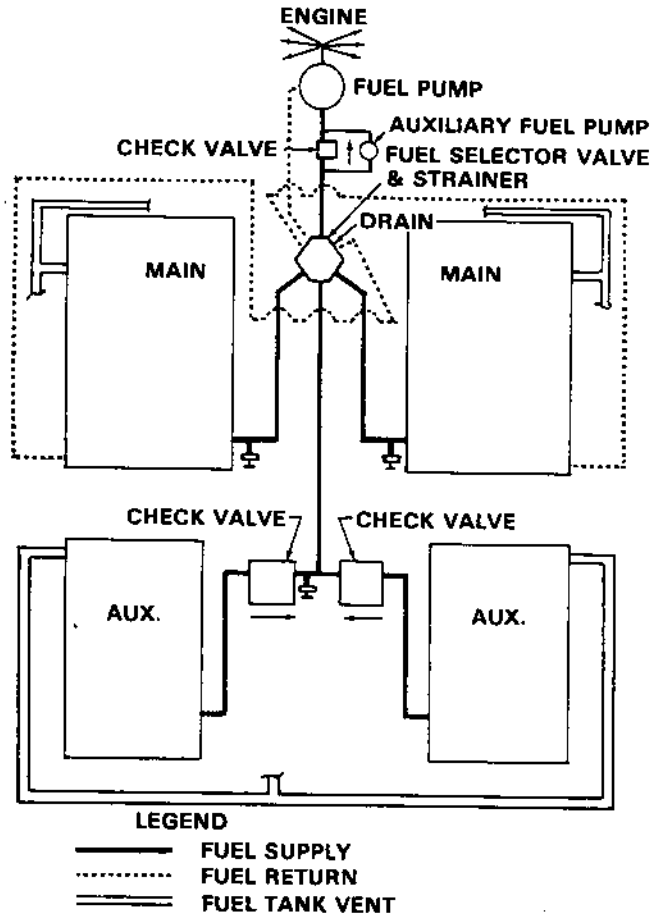
FUEL TANK SELECTION

The fuel selector valve handle is located forward and to the left of the pilot's seat. Take-offs should be made using the left main tank and landings should be made using the main tank that is more nearly full. In no case should a take-off be made if the fuel indicators are in the yellow band or, with less than 13 gallons of fuel in each main tank.

The fuel injection system returns about 10 gallons per hour of excess fuel, fuel return lines are routed through the selector valve to each main cell; except the auxiliary cells, fuel is returned to the cell from which it is drawn. The auxiliary cells return fuel to the left main cell only. To provide space for the returned fuel from the auxiliary cells, the left main cell should be used to approximately half full before switching to auxiliary.

If the engine is allowed to stop firing, due to insufficient fuel, refer to the EMERGENCY PROCEDURES section for the Air Start procedures.

FUEL SYSTEM SCHEMATIC



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 be certain of ample fuel for a flight. Takeoff is prohibited if the fuel quantity indicators do not indicate above the yellow arc. An inaccurate indicator could give an erroneous indication of fuel quantity. A minimum of 13 gallons of fuel is required in each main tank before takeoff.

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. If the pilot is not sure that at least 13 gallons are in each tank, add necessary fuel so that the amount of fuel will be not less than 13 gallons per tank at takeoff. Plan for an ample margin of fuel for any flight.

LANDING GEAR SYSTEM

CAUTION

Never taxi with a flat strut.

The landing gears are operated through adjustable linkage connected to an actuator assembly mounted beneath the front seats. The actuator assembly is driven by an electric motor. The landing gears may be electrically retracted and extended, and in an emergency may be lowered manually.

CONTROL SWITCH

The landing gear is controlled by a two-position switch on the right side of the subpanel. A latch on the control switch must be moved aside to place the switch in the up position.

POSITION INDICATORS

Landing gear position indicator lights on the right side of the control console show red when the gear is up, or green when it is down, illuminating only when the actuator assembly reaches either extreme. In addition, a mechanical indicator on the floorboard beneath the control console shows the position of the nose gear. Its pointer is linked by a cable to the actuating mechanism and moves simultaneously with it. Limit switches and a dynamic brake automatically stop the retract mechanism when the gear reaches its full up or full down position.

SAFETY SWITCH

To prevent inadvertent retraction of the landing gear on the ground, a main strut safety switch opens the control circuit when the strut is compressed.

CAUTION

Never rely on the safety switch to keep the gear down during taxi or on take-off, landing roll, or in a static position. 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 in. Hg manifold pressure, a warning horn will sound intermittently.

CIRCUIT BREAKER

The landing gear circuit breaker is located on the right subpanel. This circuit breaker is a pull-and-reset type breaker. The breaker will pop out under overload conditions.

MANUAL EXTENSION

The landing gear can be manually extended by operating a handcrank at the rear of the front seats. This procedure is described in the EMERGENCY PROCEDURES section.

BRAKES

The brakes on the main landing gear wheels are operated by applying toe pressure to the rudder pedals. The parking brake push-pull control is located on the right subpanel. To set the parking brakes, pull control out and depress both toe pedals until firm. Push the control in to release the brakes.

CAUTION

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

GROUND CONTROL

Steering is accomplished by use of the rudder pedals through a linkage arrangement which connect the nose strut to the rudder pedal shaft. Nose wheel straightening is accomplished by engagement of a roller with a track as the nose wheel is retracted. The steering link attaches to the steering mechanism on the nose strut with a swivel connection which permits the mechanism to disengage when the nose gear is retracted and operation of the rudder pedals will have no tendency to turn the nose wheel with the gear retracted.

ELECTRICAL SYSTEM

The system circuitry is the single wire, ground return type, with the aircraft structure used as the ground return. The battery ON-OFF switch and the generator ON-OFF switch are located on the right subpanel. The BATTERY-MAGNETO key switch is located below the control column. The circuit breaker panel is located on the right subpanel and contains the protective circuit breakers for the various electrical systems.

BATTERY

A 33 ampere-hour, 12-volt battery is located on the right aft side of the firewall. Battery servicing procedures are described in the SERVICING section.

EXTERNAL POWER RECEPTACLE

The external power receptacle accepts a standard AN type plug. Before connecting an external power unit turn generator switch and avionic equipment OFF.

CAUTION

A negative ground external power source is required. Check polarity before using external power.

If the external power unit does not have a standard AN type plug, connect the positive lead from the external power source to the positive battery terminal and the negative lead to the negative battery terminal.

GENERATOR

Direct-current electric power is supplied by a 12-volt engine-driven generator of 50 ampere capacity, controlled by a voltage-current regulator which automatically adjusts generator output to its load, including recharging the battery.

The ammeter is of the conventional charge-discharge type, showing the rate of charge or discharge of the battery. A zero reading, which should be the normal condition in cruising flight, indicates that the battery is fully charged and the generator output has been adjusted by the regulator to balance the load of electrical equipment then in use.

LIGHTING SYSTEM

INTERIOR LIGHTING

Lighting for the instrument panel is furnished by a light in the cabin ceiling. It is controlled by the INSTRUMENT LIGHTS rheostat control located below and to the right of the control column.

A RADIO LIGHTS control rheostat is located to the left of the instrument light rheostat. It controls the internal lights in the radio installation.

The cabin dome light is operated by an ON-OFF switch next to the light.

EXTERIOR LIGHTING

The switches for all of the exterior lights are located on the pilot's right subpanel.

The exterior lights consist of navigation lights on the wing tips and tail cone, and landing lights in the wing leading edges. For longer battery and lamp life, use the landing lights sparingly; avoid prolonged operation which could cause overheating during ground maneuvering.

NOTE

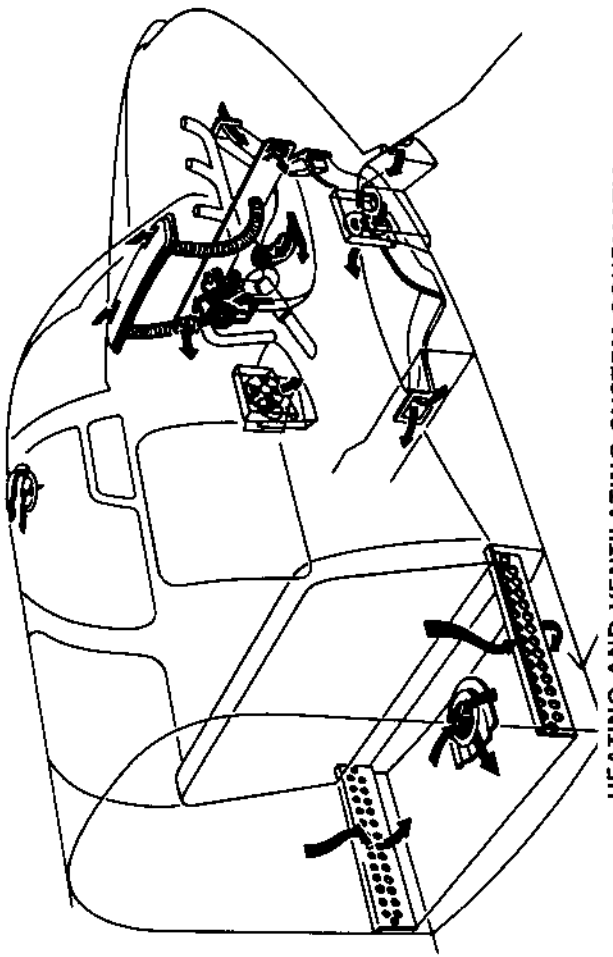
Particularly at night, reflections from anti-collision lights on clouds, dense haze or dust can produce optical illusions and intense vertigo. Such lights, when installed, should be turned off before entering an overcast; their use may not be advisable under instrument or limited VFR conditions.

HEATING AND VENTILATION SYSTEM

CABIN HEATING

A heater muffler on the left exhaust stack provides for heated air to five outlets in forward and aft areas of the cabin. Two forward outlets are located above and forward of each set of rudder pedals. One aft outlet is installed behind the right front seat. Two outlets provide heated air for windshield defrosting.

In flight, ram air enters an intake on the left side of the nose, passes through the heater muffler, then into a mixer valve on the forward side of the firewall. In the mixer valve, the heated air is combined with a controlled quantity of unheated ram air. Air of the desired temperature is then ducted from the mixer valve to the outlets in the cabin.



HEATING AND VENTILATING SYSTEM SCHEMATIC

HEATER OPERATION

The cabin heat control is located on the lower right pilot's subpanel. To obtain heated air to the cabin outlets, pull the CABIN HEAT control. The control regulates the amount of cold air that is mixed with the air from the heater muff. When the control is pulled fully out, the cold air is shut off and only heated air enters the cabin.

The forward vents, located on the firewall forward of the rudder pedals, deliver heated air to the forward cabin when the CABIN HEAT control is pulled out. For maximum heat the control is pulled fully out.

To obtain heated air for defrosting the windshield pull the DEFROST control out. The defrost control is on the pilot's left subpanel. To close off all air from the heater system, pull the red VENT SHUT-OFF control located to the extreme right of the pilot's lower subpanel.

CABIN VENTILATION

In moderate temperatures, ventilation air can be obtained from the same outlets used for heating, by pushing the CABIN HEAT control full forward. However, in extremely high temperatures, it may be desirable to pull the VENT SHUT-OFF control and use only the fresh air outlets described in the following paragraphs.

CABIN FRESH AIR OUTLETS

A duct in each wing root is connected directly to an adjustable outlet in the upholstery panel forward of each front seat. Airflow from the right outlet is controlled by a center knob. The volume of air from the left outlet is regulated by a center knob, and the direction of airflow is controlled by rotating the louvered cover with the small knob on the rim.

EXHAUST VENTS

Air is exhausted from the cabin through two vents in the sides of the baggage compartment which flows to an exhaust vent in the belly, and through an adjustable vent in the overhead panel above the front seat. For additional ventilation on the ground, the rear cabin windows may be opened; these windows, however, must be closed and latched before the take-off run is started, and must not be opened in flight.

PITOT AND STATIC SYSTEM

The pitot and static system provides a source of impact and static air for the operation of the altimeter, rate of climb and airspeed indicator. The pitot mast is located on the leading edge of the left wing. The static system provides a source of static air to the flight instruments through a flush static fitting on each side of the airplane fuselage.

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. The relief valve and an oil separator, which removes oil from the air, are located on the forward side of the firewall.

A suction gage indicates system vacuum in inches Hg. This instrument is located in the upper right corner of the instrument panel. The vacuum should be maintained within the green arc for proper operation of the air driven instruments.

STALL WARNING INDICATOR

To prevent accidental stalls, a stall warning indicator sounds a warning horn and flashes a red light on the instrument panel as an incipient stall develops, while there is ample time for the pilot to correct the attitude. The stall warning indicator, triggered by a sensing vane on the leading edge of the left wing, is equally effective in all flight attitudes and at all weights and airspeeds. Irregular and intermittent at first, the warning signal will become steady as the airplane approaches a complete stall.

COLD WEATHER OPERATION

PREFLIGHT INSPECTION

In addition to the normal preflight exterior inspection, remove ice, snow and frost from the wings, tail, control surfaces and hinges, propeller, windshield, pitot, fuel vents, and engine breather line. If you have no way of removing these formations of ice, snow, and frost leave the airplane on the ground, as these deposits will not blow off. The wing contour may be changed by these formations sufficiently that its lift qualities are considerably disturbed and sometimes completely destroyed. Complete your normal preflight procedures. Check the flight controls for complete freedom of movement, including trim tab controls.

Under very cold conditions, it may be necessary to preheat the engine prior to a start. Particular attention should be applied to the oil cooler and engine sump to insure 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 the airplane is equipped with the optional external power receptacle, it is advisable to use external power for starting, when available. Normal engine starting procedures will ordinarily be used, except it may be necesary to leave the auxiliary fuel pump on until the engine starts. Moisture forms quickly on the spark plug electrodes during cold weather starts; if the engine fails to start after three or four attempts, remove at least one spark plug from each cylinder, heat the plugs to dry the electrodes, then attempt a start immediately after reinstalling the plugs.

ENGINE BREAK-IN INFORMATION

Use a straight mineral oil as recommended by the engine manufacturer throughout the break-in period. Drain the initial oil at 20 to 30 hours, replace with new mineral oil which is to be used until oil consumption stabilizes, usually a total of about 50 hours.

Drain and replace the engine oil as recommended in HANDLING, SERVICING AND MAINTENANCE. If operating conditions are unusually dusty or dirty, more frequent oil changes may be necessary. Oil changes are more critical during the break-in period than at any other time.

Use full throttle at recommended rpm for every take-off and maintain until at least 400 feet AGL, then reduce as necessary for cruise climb or cruise. Maintain the highest power recommended for cruise operations during the

break-in period, avoiding altitudes above 8000 feet. Interrupt cruise power every 30 minutes or so by smoothly advancing to take-off power settings for about 30 seconds, then returning to cruise power settings.

Avoid long power-off descents especially during the break-in period. Maintain sufficient power during descent to permit cylinder head temperatures to remain in the green arc.

Minimize ground operation time, especially during warm weather. During the break-in period, avoid engine idling in excess of 15 minutes, especially in high ambient temperatures.

SECTION VIII

HANDLING, SERVICING AND MAINTENANCE

TABLE OF CONTENTS

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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 for periodic servicing or preventive maintenance.

The Federal Aviation Regulations place the responsibility for the maintenance of this airplane on the owner and operator of the airplane 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 will have recommended modification, service, and operating procedures issued by both FAA and Beech Aircraft Corporation, designed to get maximum utility and safety from the airplane.

If there is a question concerning the care of the airplane, it is important to include the airplane serial number in any correspondence. The serial number appears on the model designation placard attached to the underside of the fuselage just forward of the tiedown.

PUBLICATIONS

The following publications are available through BEECHCRAFT Aero or Aviation Centers:

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 manual. For information on how to obtain "Revision Service" applicable to this manual, consult any BEECHCRAFT Aero or Aviation Center 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.

NOTE

In event of emergency gear or flap extension at speeds above the respective normal extension speeds and before the next flight, inspect gear retract rods, gear doors and flaps for damage or distortion.

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 proper procedures are followed, obtain a BEECHCRAFT Shop Manual for performing preventative maintenance.

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 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 in Section 1 shows the minimum hangar clearances for a standard airplane. Allowances must be made for any special radio antennas.

CAUTION

To ensure adequate propeller clearance, always observe recommended shock strut servicing procedures and tire inflation pressures.

TOWING

One man can move the airplane on a smooth and level surface using a hand tow bar. Attach the tow bar to the tow lugs on the nose gear lower torque knee.

Where movement is restricted, two men can pivot the airplane on the main wheels. One man 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 stabilizers to raise the nose wheel. When towing with a tug, limit turns to prevent damage to the nose gear. Do not attempt to tow airplane backward by the tail tie down ring.

Care should be used when removing the tow bar to prevent damage to the lubrication fittings on the landing gear.

PARKING

The parking brake push-pull control is located to the right of the control console. To set the parking brakes, pull control out and depress both toe pedals until firm. Push the control in to release the brakes.

CAUTION

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

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 OVER TIGHTEN; if the line at the rear of the fuselage is excessively tight, the nose may rise and produce lift due to the angle of attack of the wings.
4. Release the parking brake.

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

MAIN WHEEL JACKING

1. Check the shock strut for proper inflation to prevent damage to the landing gear door by the jack adapter and to facilitate installation of the adapter.

CAUTION

Persons should not be in or on the airplane while it is on a main wheel jack.

2. Insert the main wheel jack adapter into the main wheel axle.

3. A scissors-type jack is recommended for raising and lowering the wheel.

PROLONGED OUT OF SERVICE CARE

Storage procedures 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.

Flyable Storage (7-30 days) has been considered here. For more extended storage periods, consult the Beech Airplane Shop Manual and Continental Service Bulletin M 74-9 or later issue.

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 compress the nose strut and reduce the angle of attack of the wings. Attach a line to the nose gear.

ENGINE PREPARATION FOR STORAGE

Engines in airplanes that are flown only occasionally tend to exhibit cylinder wall corrosion much more than engines that are flown frequently.

Run engine at least five minutes at 1200 to 1500 rpm with oil and cylinder head temperatures in the normal operating range.

Check for correct oil level and add oil if necessary to bring level to full mark.

FUEL CELLS

Fill to capacity to minimize fuel vapor and protect cell inner liners.

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 windshield and windows.

DURING FLYABLE STORAGE

Each seven days during flyable storage, the propeller shall be rotated by hand. After rotating the engine six revolutions, stop the propeller 60° or 120° from the position it was in.

WARNING

Before rotation of propeller blades, ascertain magneto switch is OFF, throttle in CLOSED position, and mixture control is in the IDLE CUT-OFF position. Always stand in the clear while turning propeller.

If at the end of 30 days airplane will not be removed from storage, the engine shall be started and run. The preferred method will be to fly the airplane for 30 minutes, and up to, but not exceeding normal oil and cylinder temperatures.

PREPARATION FOR SERVICE

Remove all covers and tape, clean the airplane and give it a thorough inspection, particularly wheel wells, flaps, and control openings.

If the engine has a total time of more than 25 hours drain the break-in oil after a ground warm-up and install straight mineral oil, which is to be used until oil consumption stabilizes. After break-in, install Teledyne Continental Motors recommended oil.

Preflight the airplane.

EXTERNAL POWER

When using external power, it is very important that the following precautions be observed:

1. The airplane has a negative ground system. Exercise care to avoid reversed polarity. Be sure to connect the positive lead of the external power unit to the positive terminal of the airplane's external power receptacle and the negative lead to the negative terminal of the external power receptacle.
2. To prevent arcing, make certain no power is being supplied when the connection is made.
3. Make certain that the battery switch is ON, all avionics and electrical switches OFF, and a battery is in the system before connecting an external power unit. This protects the voltage regulators and associated electrical equipment from voltage transients (power fluctuations).

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

FUEL CELLS

See Consumable Materials for recommended fuel grades.

CAUTION

Never leave the fuel cells completely empty for more than a few days, as the cell inner liners may dry out and crack, permitting fuel to diffuse through the walls of the cell after refueling. If the cells are to be left empty for a week or more, a thin coating of light engine oil should be sprayed or flushed onto the inner liner of the cells.

FUEL DRAINS

On the standard fuel system open the three snap-type fuel drains daily to purge any water from the system. Each fuel cell drain is located on the bottom of the wing just outboard of the fuselage. The system low spot drain is at the bottom of the fuel selector valve. The drain is accessible through a door in the fuselage adjacent to the wing. When the optional auxiliary fuel system is installed, also open the snap-type fuel drains on the auxiliary tanks, and a drain on the auxiliary cell interconnect line at the selector valve.

FUEL STRAINERS

At each 50 hour inspection the strainer plug should be removed from the fuel injection control valve and the fuel injection control valve screen washed in fresh cleaning solvent. After the strainer plug has been reinstalled and safetied, the installation should be checked for leakage. The strainer at the bottom of the fuel selector valve should also be removed and cleaned with solvent every 100 hours. To reduce the possibility of contaminated fuel, always cap any disconnected fuel lines or fittings.

Ordinarily the finger strainers in the fuel cell outlets should not require cleaning unless there is a definite indication of solid foreign material in the cells or the airplane has been stored for an extended period.

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.

The engine oil filler cap and the dipstick are accessible by opening the access door on the left upper engine cowl. The sump capacity is 10 quarts. Normal operating level should be 8 to 10 quarts.

The oil should be changed and the oil screen should be cleaned every 50 hours under normal operating conditions. To assure complete drainage, the engine should be at operating temperature.

OIL CHANGE PROCEDURE

1. Remove the access plate from the engine cowl on the lower right side.
2. Locate the oil sump drain plug at the low point of the engine sump.
3. Remove the plug button below the sump drain and insert the oil drain duct.
4. Remove the oil sump drain plug.
5. Remove the oil screen and flush thoroughly. Replace the screen.
6. Replace the oil sump drain plug and fill the engine with oil.

See Consumable Materials and Approved Engine Oils for specified oils.

The engine manufacturer recommends ashless dispersant oils. In order to promote faster ring seating and oil control, a straight mineral oil should be used for the first oil change period or until oil consumption stabilizes. Oils must meet Continental Motors Corporation Specification MHS-24B. Refer to APPROVED ENGINE OILS.

BATTERY

The battery is accessible by opening the right door of the engine cowling then through the access door on the firewall. Check the electrolyte level after each 25 hours of operation and add distilled water as necessary. Do not overfill the battery.

Excessive water consumption may be an indication that the voltage regulator requires resetting. The specific gravity of the electrolyte should be checked periodically and maintained within the limits placarded on the battery.

The battery box is vented overboard to dispose of electrolyte and hydrogen gas fumes discharged during the normal charging operation. To ensure disposal of these fumes the vent tube should be checked frequently for obstructions and should be kept open.

RECHARGING THE BATTERY (USING EXTERNAL POWER)

CAUTION

A negative ground external power source is required. Check polarity before using external power.

1. Battery, Generator and Avionics Switches - OFF.
2. Auxiliary Power Unit (set for output of 13.75 to 14.25 volts) - OFF.
3. Connect auxiliary power unit to the external power receptacle of the airplane or to the battery terminals.
4. Battery Master Switch - ON.
5. Ignition Key Switch - ON BATT.
6. Auxiliary Power Unit - ON.
7. After battery has been charged, turn off the auxiliary power unit and disconnect it from the airplane.
8. Battery Switch - OFF.
9. Ignition Key Switch - OFF.

TIRES

An inflation pressure of 30 psi should be maintained on the 5.00 x 5 nose wheel tire on serials prior to D-5986. Serials D-5986 and after inflate the nose tire to 40 psi. The 6.50 x 8 main wheel tires should be inflated to 30 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.

NOTE

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 doors and retract mechanism.

SHOCK STRUTS

The following procedures may be used for servicing both the main and the nose gear shock struts.

TO INFLATE STRUTS:

1. Check to see that the airplane is empty except for full fuel and oil.
2. While rocking the airplane gently to prevent possible binding of the piston in the barrel, inflate the shock strut until the main gear piston is extended 3 inches (3-1/16 inches on the nose gear).

CAUTION

If a compressed air bottle containing air under extremely high pressure is used, exercise care to avoid over-inflating the shock strut.

WARNING

NEVER FILL SHOCK STRUTS WITH OXYGEN.

3. Remove all foreign material from the exposed piston with a soft cloth moistened with hydraulic fluid.

TO REPLENISH STRUT HYDRAULIC FLUID:

1. Support the airplane on jacks at the wing jack points.
2. Remove the air valve cap, depress the valve core, and allow the strut to fully deflate.
3. Raise and block the strut 1/4 inch from the compressed position.

WARNING

Do not remove the valve body assembly until all air pressure has been released or it may blow off, causing injury to personnel or damage to equipment.

4. Carefully remove the valve body assembly.
5. Fill the strut to the level of the valve body assembly with hydraulic fluid (see Consumable Materials).
6. Slowly extend the strut from the blocked position and replace the valve body assembly.
7. Depress the valve core and completely compress the strut to release excess air and oil.
8. Remove airplane from jacks and inflate the strut as described in the preceding inflation procedure.

SHOCK STRUT SHIMMY DAMPER

The shimmy damper has a reservoir of fluid carried in the piston rod. Two coil springs installed in the piston rod keep fluid in the shimmy damper under pressure. As fluid is lost through leakage it is automatically replenished from the reservoir until the reservoir supply is exhausted.

To check the fluid level in the shimmy damper, insert a wire, approximately 1/32 inch in diameter, through the hole in the disc at the aft end of the piston rod until it touches the bottom of the hole in the floating piston. Mark the wire, remove it, and measure the depth of the insertion. When the shimmy damper is full, insertion depth is 2-3/16 inches, when empty, 3-1/16 inches.

NOTE

The measuring wire should be inserted in the hole in the floating piston rather than against the piston face to give a more accurate reading. To determine if the wire is inserted in the hole in the floating piston, insert the wire several times, noting insertion depth each time. When the wire is inserted in the hole, the depth will be about 1/4 inch greater than when it rests against the piston face.

When the shimmy damper is found empty or nearly empty, it should be refilled. See Shop Manual.

BRAKES

The brake hydraulic fluid reservoir is located on the firewall in the engine compartment. A dipstick is attached to the reservoir cap. Refer to Consumable Materials for hydraulic fluid specification.

The brakes require no adjustments since the pistons move to compensate for lining wear.

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 fuselage nose section grill.
2. Remove the wing nuts securing the filter and remove the filter.
3. Clean as described in the manufacturer's instructions on the filter.

VACUUM SYSTEM

The vacuum system incorporates two screens; a relief valve screen and an oil separator screen. These screens should be cleaned every 100 hours. If the airplane is operated in dusty conditions, the screens should be cleaned more frequently.

Clean the suction relief valve screen by removing and washing in cleaning solvent. Remove and clean the oil separator screen by backflushing or submerging the unit in cleaning fluid. Blow dry with air pressure.

The filter assemblies on the air driven instruments should be replaced every 100 hours under normal operating conditions, and more often if operated under dusty conditions.

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. The BEECHCRAFT Aero or Aviation Center will be glad to answer any questions concerning propeller blade repair.

WARNING

When servicing a propeller, always make certain the ignition 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 windows, doors, and engine cowling, the seals should be coated with Oakite 6 compound. The compound is noninjurious to paint and can be removed by employing normal cleaning methods.

GENERATOR

Since the generator and 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 generator 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.

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 PAINTED SURFACES

WARNING

Do not expose control surface trim tab hinge lines and their pushrod systems to the direct stream or spray of high-pressure, soap-and-water washing equipment. Fluid dispensed at high pressure could remove the protective lubricant, allowing moisture from heavy or prolonged rain to collect at hinge lines, and then to freeze at low temperatures. After high-pressure or hand washing, and at each periodic inspection, lubricate trim tab hinge lines and trim tab pushrod end fittings (Brayco 300 per Federal Specification VV-L-800 preferred). See Consumable Materials.

CAUTION

When cleaning landing gear areas with solvent, especially if high-pressure equipment is used, exercise care to avoid washing away grease from landing gear components. After washing the landing gear areas with solvent, lubricate all lubrication points, or premature wear may result.

Do not apply wax, polish, rubbing compound, or abrasive cleaner to any uncured painted surface. Use of such items can permanently damage the surface finish. Also, waxes and polishes seal the paint from the air and prevent curing.

CAUTION

Alkyd enamel (sometimes called "automotive enamel"), acrylic enamel, lacquer, and dope finishes require a curing period of approximately 90 days; Acrylic urethane, polyester urethane, and epoxy finishes undergo a curing process for a period of 30 days after application. Wash uncured painted surfaces with a mild non-detergent soap (MILD detergents can be used on urethane finishes) and cold or lukewarm water only. Use soft cloths, keeping them free of dirt and grime. Any rubbing of the surface should be done gently and held to a minimum to avoid damaging the paint film. Rinse thoroughly with clear water. Stubborn oil or soot deposits may be removed with automotive tar removers.

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 all static air buttons before washing or waxing. Use special care to avoid removing lubricant from lubricated areas.

When using high-pressure washing equipment, keep the spray or stream clear of wheel bearings, propeller hub bearings, etc., and openings such as pitot tubes, static air buttons, and battery and avionics equipment cooling ducts, which should be securely covered or masked off. Avoid directing high-pressure sprays toward the fuselage, wings, and empennage from the rear, where moisture and chemicals might more easily enter the structure, causing corrosion damage to structural members and moving parts.

Hand washing may be accomplished by flushing away loose dirt with clean water, then washing with a mild soap and water, using soft cleaning cloths or a chamois. Avoid harsh, abrasive, or alkaline soaps or detergents which could cause corrosion or scratches. Thorough clear-water rinsing pre-

vents buildup of cleaning agent residue, which can dull the paint's appearance. To remove oily residue or exhaust soot, use a cloth dampened with an automotive tar remover. Wax or polish the affected area, if necessary.

There is some variation in the procedures required for proper care of the several types of exterior paint. During the curing period, do not make prolonged flights in heavy rain or sleet, and avoid all operating conditions which might cause abrasion or premature finish deterioration. Alkyd enamel, lacquer, and dope finishes must be polished and waxed periodically to maintain luster, and to assure protection from the weather. Acrylic enamel should be waxed, and may be polished, if desired. Acrylic urethane may be waxed for protection from the elements, but should not be polished unless polishing or buffing is required to restore a damaged area. Waxing of polyester urethane finishes, although not required, is permitted; however, never use abrasive cleaner type waxes, polishes, or rubbing compounds, as these products cause eventual deterioration of the characteristic urethane gloss. Epoxy finishes should be waxed on a regular basis, and may be polished and buffed to restore appearance should "chalking" occur. For waxing, select a high quality automotive or aircraft waxing product. Do not use a wax containing silicones, as silicone polishes are difficult to remove from surfaces. A buildup of wax on any exterior paint finish will yellow with age; therefore, wax should be removed periodically. Generally, alphatic naptha (see Consumable Materials) is adequate and safe for this purpose.

NOTE

Before returning the airplane to service, remove all maskings and coverings, and re-lubricate as necessary.

BULB REPLACEMENT GUIDE

LOCATION	NUMBER
Compass light	330
Dome light, cabin	89
Elevator tab position indicator light	53R
Fuel pump placard light	1813
Instrument flood light, overhead	89
Landing gear position light	1813
Landing gear visual position light	53
Landing light	4522
Navigation light, tail cone	93
Navigation light, wing	1512
Rotating beacon (Grimes)	A7079-12
Stall warning light	1813

RECOMMENDED SERVICING SCHEDULE

Revised: June 1978

INTERVAL	ITEM	LOCATION (Letters refer to Lubrication Points Diagram)	LUBRICANT (Number refers to item on Consumable Materials)
Pre-flight	Check engine oil level	Upper left side of engine	5
	Drain fuel cell drains	Bottom of wing near wing root	-
	Drain fuel system low spot drain	Bottom of fuselage, left side	-
	Drain auxiliary fuel cells drain	Bottom of fuselage, left side	-
	Service fuel cells, main	Top of wings, leading edge	6
	Service auxiliary fuel cells	Aft and outboard of main cells	6
25 Hrs.	Check battery electrolyte	Under right cowling door and thru access door in firewall	See Shop Manual
50 Hrs.	Change engine oil	Lower side of engine	5

Revised: June 1978

50 Hrs. (Cont.)	Clean fuel injection control valve screen	Lower engine compartment	7
	Clean induction air filter	Behind nose section grill	-
	Drain static air lines	Behind aft cabin bulkhead	-
	Lubricate landing gear retract mechanism and uplock rollers	Wheel wells (L)	4
100 Hrs.	Clean fuel selector valve strainer	Left side belly	7
	Clean vacuum pump regulator screen	Engine compartment	7
	Lubricate aileron control linkage	Each wing (K)	4
	Lubricate cabin door mechanism	Aft edge of cabin door (E)	4
	Lubricate control column linkage	Forward of instrument panel (D)	4
	Lubricate cowl flap hinges	Bottom of cowl (O)	4

RECOMMENDED SERVICING SCHEDULE

INTERVAL	ITEM	LOCATION (Letters refer to Lubrication Points Diagram)	LUBRICANT (Number refers to item on Consumable Materials)
100 Hrs. (Cont.)	Lubricate cable attachment	Ruddervator tab horn	4
	Lubricate differential control mechanism	Forward of tail bulkhead (H)	3, 4
	Lubricate elevator tab mechanism	Forward of tail bulkhead (I)	3, 4
	Lubricate landing gear door hinges	Edge of wheel well (P) (M)	4
	Lubricate landing gear retract mechanism and uplock rollers	Wheel wells (L)	3, 4
	Lubricate nose gear retract mechanism	Nose wheel well (A)	3
	Lubricate nose wheel steering mechanism	Nose wheel well (B)	3
	Lubricate rudder pedals	Cockpit (N)	4
	Lubricate trim tab control	Control pedestal (C)	4
	Lubricate wheel bearings	Nose and main wheels (A, L)	1
300 Hrs.	Flap motor (brushes)	Under front seats in cabin (G)	
	Service flap motor gear box	Under front seats in cabin (G)	10
	Service landing gear actuator gear box	Under front seats in cabin (F)	8
500 Hrs.	Service landing gear motor-reduction gears	Under front seats in cabin (F)	3
1000 Hrs.	Lubricate flap actuators	Inside wing aft of wheel well (J)	9, 10
As Req.	Clean spark plugs mechanism	Engine compartment	-
	Service main and nose shock struts	Landing gear	2
	Service shimmy damper	Nose gear	2
	Drain static air lines	Behind aft cabin bulkhead	-
	Remove one end of the hose which forms the static line drain and permit the system to drain.		

Revised: June 1978

RECOMMENDED SERVICING SCHEDULE

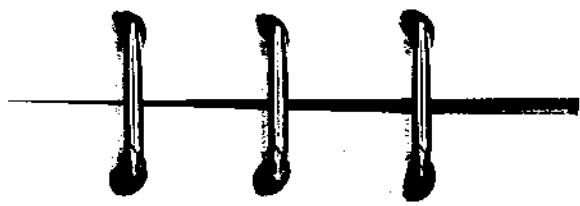
INTERVAL	ITEM	LOCATION (Letters refer to Lubrication Points Diagram)	LUBRICANT (Number refers to item on Consumable Materials)
AS Req. (Cont.)	NOTE The static air line should be drained frequently during periods of high humidity. Also drain the line each time the airplane is flown through heavy rain or is washed down.		
Note 3	Replace emergency locator transmitter battery	At emergency locator	-

Revised: June 1978

NOTES:

1. Anytime the control surfaces are altered, repaired, or repainted, they must be re-balanced per the Shop 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.

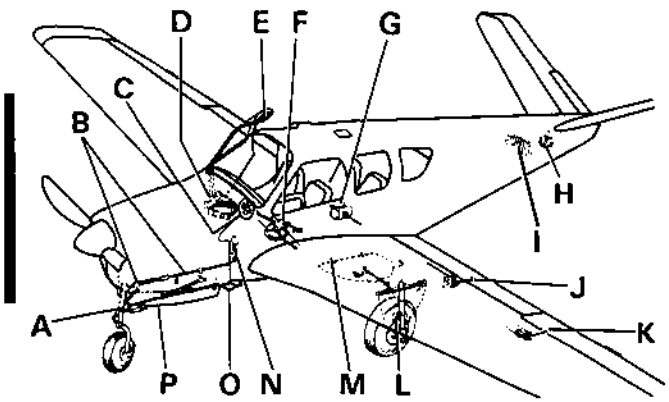


3. Rechargeable Batteries: Recharge after one cumulative hour of use or after 50% of the useful charge life.

   Non-rechargeable Batteries: Replace after one cumulative hour or as noted on the battery.

Revised: June 1978

LUBRICATION POINTS



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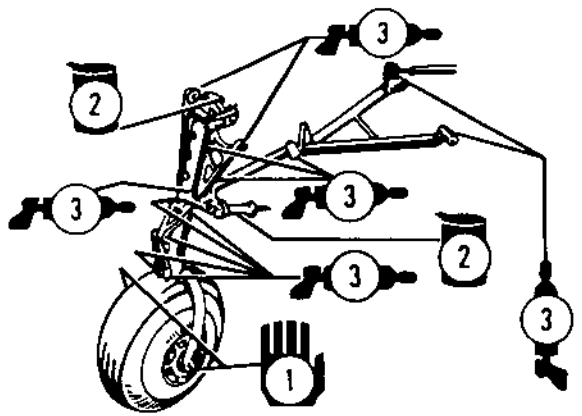
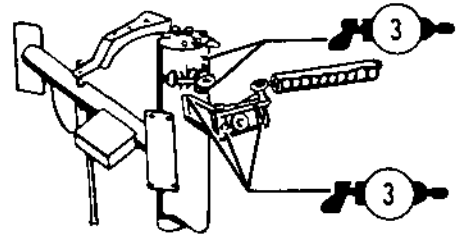


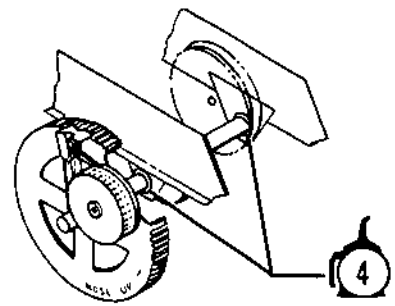
LANDING GEAR RETRACT

B



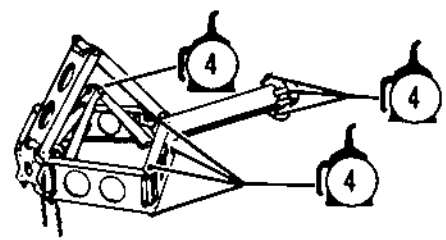
NOSE WHEEL STEERING

C



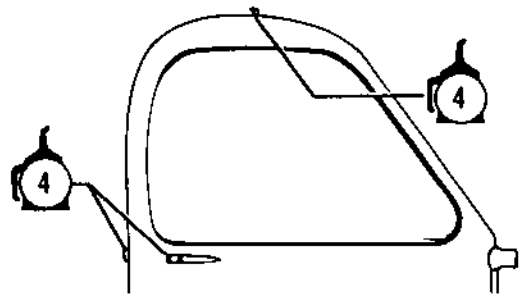
ELEVATOR TRIM CONTROL

D



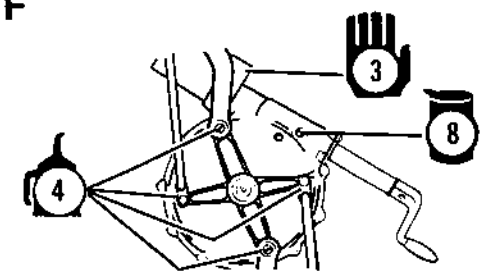
CONTROL COLUMN LINKAGE

E



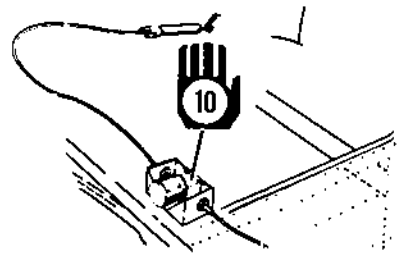
CABIN DOOR

F



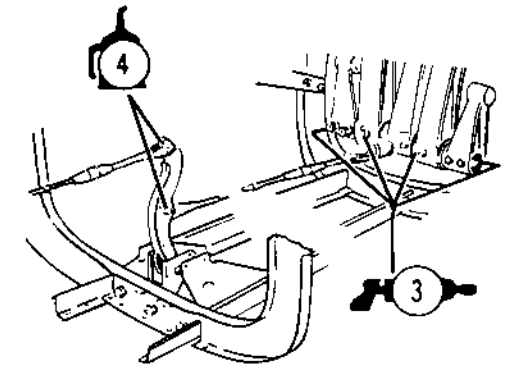
LANDING GEAR ACTUATOR GEAR BOX

G



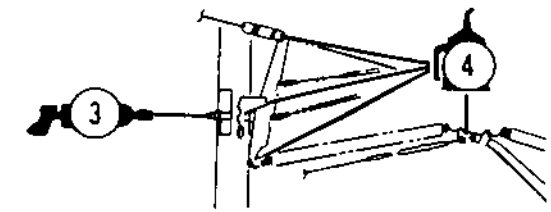
FLAP MOTOR GEAR BOX

H



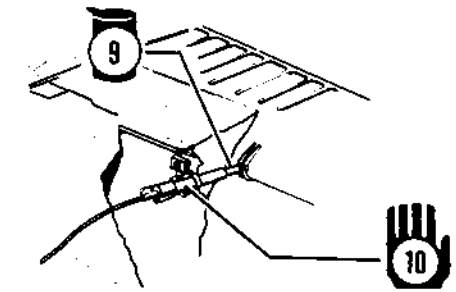
DIFFERENTIAL CONTROL MECHANISM

I



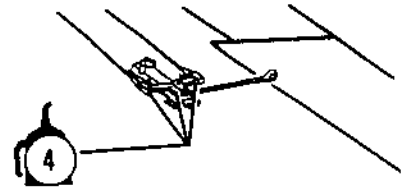
ELEVATOR TAB MECHANISM

J



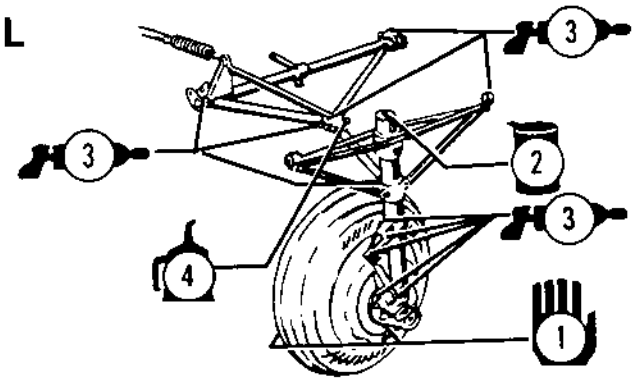
FLAP ACTUATOR

K



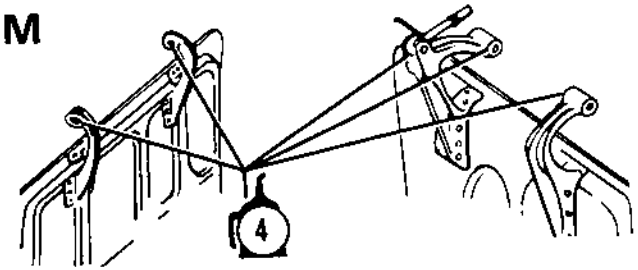
AILERON BELL CRANKS

L



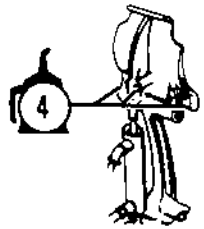
LANDING GEAR RETRACT

M



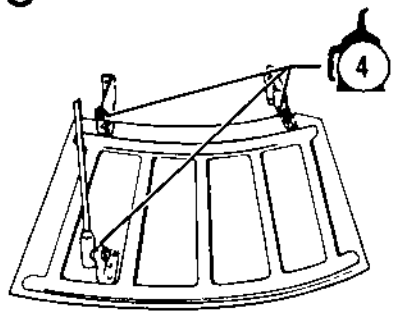
LANDING GEAR DOOR HINGES

N



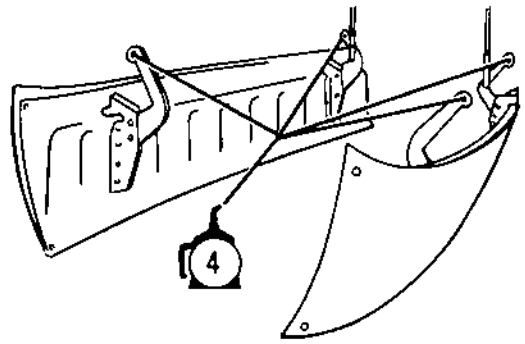
RUDDER PEDALS

O



COWL FLAP HINGES

P



LANDING GEAR DOORS

HAND OR PACK

ZERK FITTING

FLUID CONTAINER

SQUIRT CAN

NOTE: Letters are keyed to the Service Schedule; Numbers refer to items in the Consumable Materials Chart.

CONSUMABLE MATERIALS

ITEM	MATERIAL	SPECIFICATION
1.	Lubricating Grease High Temperature	MIL-G-3545
2.	Hydraulic Fluid	MIL-H-5606
*3.	Lubricating Grease, General Purpose	MIL-G-81322
4.	Lubricating Oil	SAE No. 20 or SAE10W-30
**5.	Engine Oil	SAE No. 30 (Below 40°F) SAE No. 50 (Above 40°F)
***6.	Engine Fuel	100LL (Blue)
7.	Solvent	Federal Specification, PD680
8.	Lubricant	Mobil Compound GG
9.	Lubricating Oil, Gear	MIL-L-6086, Grade M
10.	Grease, Aircraft and Instrument	MIL-G-23827
†11.	Lubricant, Rubber Seal	Oakite 6 Compound
12.	Naptha, Aliphatic	Federal Specification, TT-N-95

* In extremely cold climates use MIL-G-23827 grease in place of MIL-G-81322. (These greases harmful to paint.)

** Ashless dispersant oil (Teledyne Continental Motors Corp. Spec. MHS-24B) recommended; straight mineral oils recommended during break-in period. See servicing data.

*** 100LL (Blue) preferred, or 100 (Green).

† Product of Oakite Products, Inc., New York, New York 10006.

OVERHAUL OR 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 inspection noted in this handbook 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 that the item will reach the period without malfunction, as the aforementioned factors cannot be controlled by the manufacturer.

COMPONENT	OVERHAUL OR REPLACE
LANDING GEAR	
Main gear	Every 2000 hours
Nose gear	Every 2000 hours
Actuator assembly	
All except -13	Every 2000 hours
P/N 35-810075-13	Every 4000 hours
Retract motor	Every 1000 hours
Retract motor brushes	Every 500 hours or on condition
Shimmy damper	Every 1000 hours
Wheels and tires	On condition
Brake assembly	On condition
Brake lining	On condition
Master cylinder	On condition
Shuttle valve assembly	On condition
Parking brake valve	On condition
All hose	On condition
POWER PLANT	
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.	
Engine	*Every 1500 hours
Engine controls	On condition
Engine vibration isolator mounts	Engine change or on condition
Exhaust system	On condition
Starter	Inspect at engine overhaul, overhaul or replace on condition

ITEM	MATERIAL	SPECIFICATION
2.	Hydraulic Fluid	MIL-H-5606
*3.	Lubricating Grease, General Purpose, Wide Temperature	MIL-G-81322
4.	Lubricating Oil	SAE No. 20 or SAE10W-30
**5.	Engine Oil	SAE No. 30 (Below 40°F) SAE No. 50 (Above 40°F) Approved Multiviscosity Oils
***6.	Engine Fuel	100LL (Blue)
7.	Solvent	Federal Specification, PD680
8.	Lubricant	Mobil Compound GG or Mobil 636
9.	Lubricating Oil, Gear	MIL-L-10324 or MIL-L-2105C, Grade 75W
10.	Grease, Aircraft and Instrument	MIL-G-23827
†11.	Lubricant, Rubber Seal	Oakite 6 Compound
12.	Naptha, Aliphatic	Federal Specification, TT-N-95

ITEM	MATERIAL	SPECIFICATION
13.	Lubricating Oil, General Purpose, Preservative (Water-Displacing, Low Temperature)	●Brayco 300 per Federal Specification VV-L-800 (Preferred)
	Alternates for Brayco 300:	
	Lubricant	●●CRC 3-36 ●●●LPS No. 1 ●●●●WD-40

* In extremely cold climates use MIL-G-23827 grease in place of MIL-G-81322. (These greases harmful to paint.)

** Ashless dispersant oil (latest revision of Teledyne Continental Motors Corp. Spec. MHS-24) recommended; straight mineral oils recommended during break-in period. See servicing data.

*** 100LL (Blue) preferred, or 100 (Green).

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

● Product of Bray Oil Co.,
1925 North Marianna
Los Angeles, Calif. 90032

●● Product of CRC Chemicals, Inc.,
Warminster, Pa. 18974

●●● Product of LPS Research Laboratories, Inc.,
2050 Cotner Ave,
W. Los Angeles, Calif. 90025

●●●● Product of WD-40 Company,
1061 Cudahy Place,
San Diego, Calif. 92110

COMPONENT	OVERHAUL OR REPLACE
FLAPS AND FLIGHT CONTROLS	
Flight controls	On condition
Elevator tab actuator	On condition
Flap motor and drives	Every 2000 hours
Flap motor brushes	On condition
Flap gear box	Every 2000 hours
Flap actuators	Every 2000 hours
Flap flexible shaft	Every 2000 hours
MISCELLANEOUS	
Seat belts	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

*Reference Teledyne Continental Motors Corporation Service Bulletin M74-20, Rev. 1, dated November 7, 1974 or later issue.

With particular attention to throttle response, smooth power and oil consumption, a qualified certificated mechanic must determine that the engine is operating normally at the time of each periodic inspection.

APPROVED ENGINE OILS

COMPANY	BRAND AND WEIGHT
BP Oil Corporation	B/P Aero Oil D65/80
Castrol Limited (Australia)	Grade 40, Castrolaero AD, Type III Grade 50, Castrolaero AD, Type II
Continental Oil Co.	Conoco Aero S
Delta Petroleum Co.	Delta Avoil - Grades 30, 40 - 50
Gulf Oil Corporation	Gulfpride Aviation AD
Humble Oil & Refining Company	Esso Aviation Oil Enco Aviation Oil
Pennzoil Company	Pennzoil Aircraft Engine Oil, Heavy Duty Dispersant, Grades 30, 40, 50
Phillips Petroleum Co.	Phillips 66 Aviation Oil Type A (Replaced HD Aviation Oil)
Quaker State Oil Refining Corp.	Quaker State AD Aviation Engine Oil Grades 20W/30, 40 - 50
Sinclair Refining Co.	Sinclair Avoil 20W-40
Socony-Mobil	Mobil (Aero Oil 65) (Ashless Mobil (Aero Oil 80) Dispersant Mobil (Aero Oil 100) Aviation Mobil (Aero Oil 120) Engine Oil)

COMPANY	BRAND AND WEIGHT
Shell Oil Company	Aeroshell Oil W Aeroshell Oil W (in 4 grades) Grade 120 (Nominal SAE 60) - Military Grade 1120 Grade 100 (Nominal SAE 50) - Military Grade 1100 Grade 80 (Nominal SAE 40) - Military Grade 1080 Grade 65 (Nominal SAE 20 or 30) - Military Grade 1065
Texaco, Inc.	Texaco Aircraft Engine Oil - Premium AD, Grades 65, 80, 100
Union Oil Co. of California	Union Aircraft Engine Oil HD Grades 80 - 100

NOTE

This chart lists all oils which were certified as meeting the requirements of Teledyne Continental Motors Specification MHS-24B at the time this handbook was published. Any other oil which conforms to this specification may be used.