

Beechcraft.®

TURBOCHARGED
Bonanza



MODEL **V35TC**
OWNER'S MANUAL

Beech Aircraft Corporation  Wichita, Kansas

IMPORTANT

(Please attach this Owner's Manual Supplement to the inside cover of the Owner's Manual or other suitable location which is readily available to the pilot.)

OWNER'S MANUAL

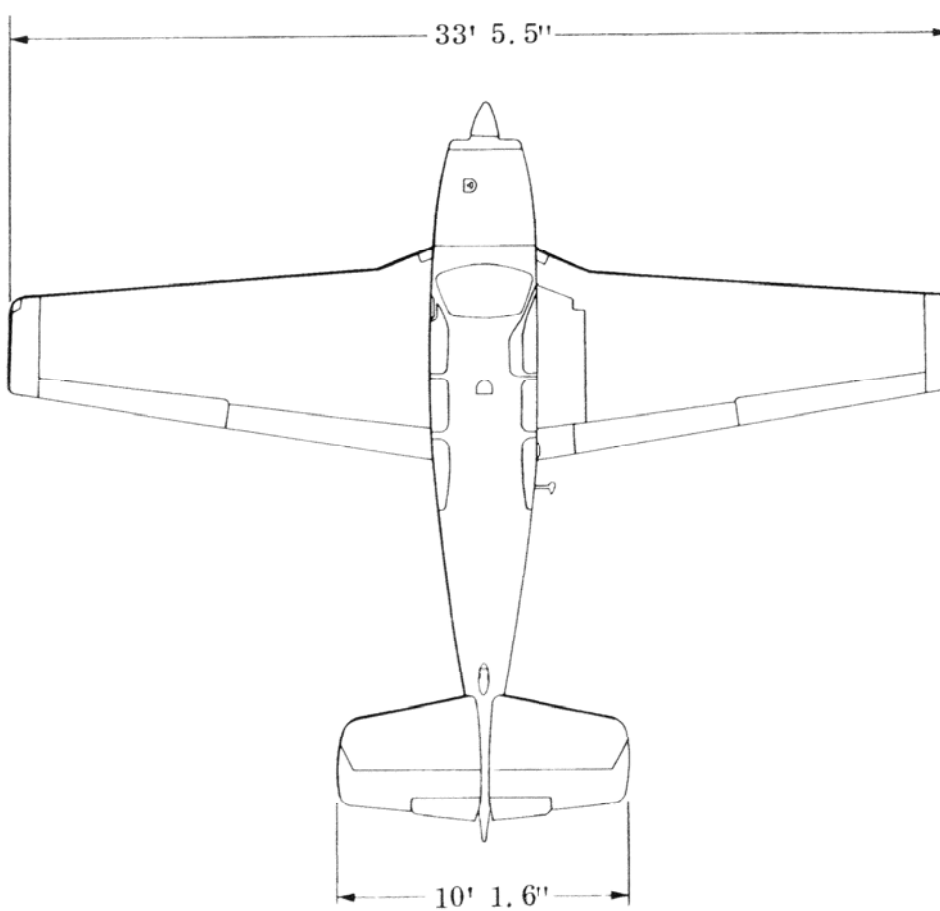
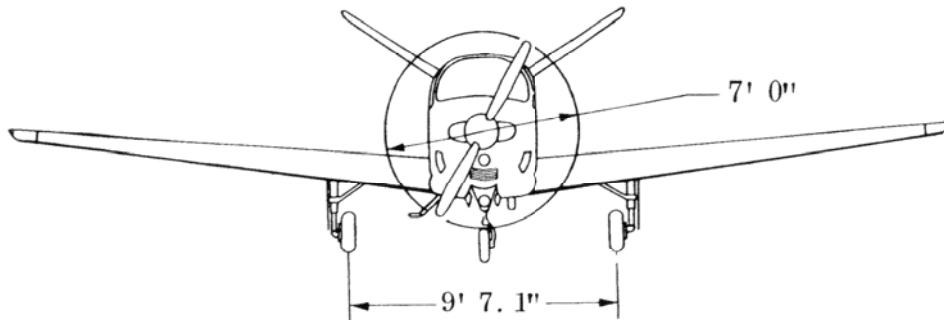
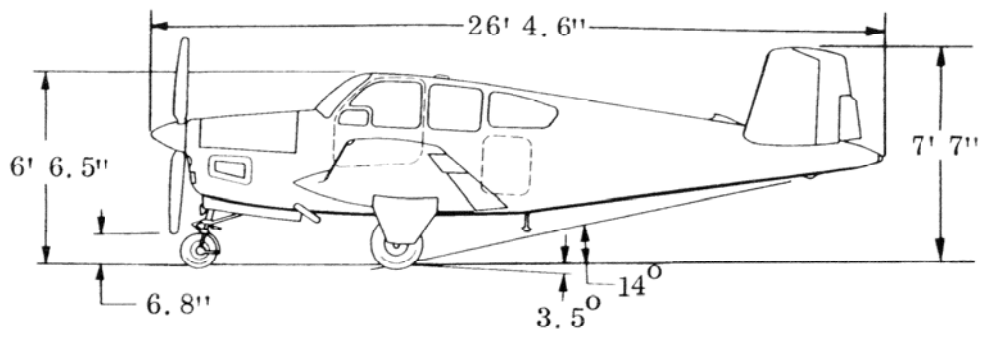
SUPPLEMENT

for

K35, M35, N35, P35, S35, V35, V35TC, V35A, V35A TC, V35B, V35B TC 33, A33, B33, C33, E33, F33, G33, C33A, E33A, F33A, 36, A36.

The following information supersedes the information contained in the Owner's Manuals for the above listed airplanes.

1. Maximum usable fuel of each 25 or 24½ gallon main tank is 22 gallons.
2. Maximum usable fuel of each 39 or 40 gallon main tank is 37 gallons.
3. Approximate reduction in range with full fuel due to change in usable fuel is:
 - a. 13% on 22 gallon main tank system.
 - b. 9% on 37 gallon main tank system.
4. On Models K-35, M-35, 33, and A33 Owners Manuals, reduce range by an additional 190 statute miles to account for climb and 45 minutes reserve at 45% maximum continuous power.



SECTION I

DESCRIPTION AND OPERATION OF SYSTEMS

The BEEHCRAFT V35TC Bonanza is powered by a Continental TSIO-520-D engine, which develops 285 rated sea level hp at 2700 rpm and 32.5 in. Hg. The maximum manifold pressure of 32.5 in. Hg. is available above 19,000 feet.

The turbocharger is an exhaust-gas-driven device, which raises the pressure and density of the induction air delivered to the engine. In order to better understand turbocharging, there are some terms with which the pilot should be familiar. These are:

TURBOCHARGER

The turbocharger consists of two separate components: a compressor and a turbine connected by a common shaft. The compressor supplies pressurized air to the engine for high altitude operation. The compressor and its housing are between the ambient air intake and the induction air manifold. The turbine and its housing are part of the exhaust system and utilize the flow of exhaust gases to drive the compressor.

WASTE GATE AND EXHAUST BYPASS

Waste gate position regulates output of the turbine and therefore, the compressed air available to the engine. The waste gate is a butterfly valve located in the exhaust bypass. When the waste gate is closed all of the exhaust gases pass through and drive the turbine. As the waste gate opens, some of the exhaust gases are routed around the turbine, through the exhaust bypass and overboard through the exhaust pipe.

WASTE GATE ACTUATOR

The waste gate actuator is a spring-loaded piston, operated by engine oil pressure. The actuator adjusts the waste gate position; it is connected to the waste gate by a mechanical linkage.

VARIABLE ABSOLUTE PRESSURE CONTROLLER

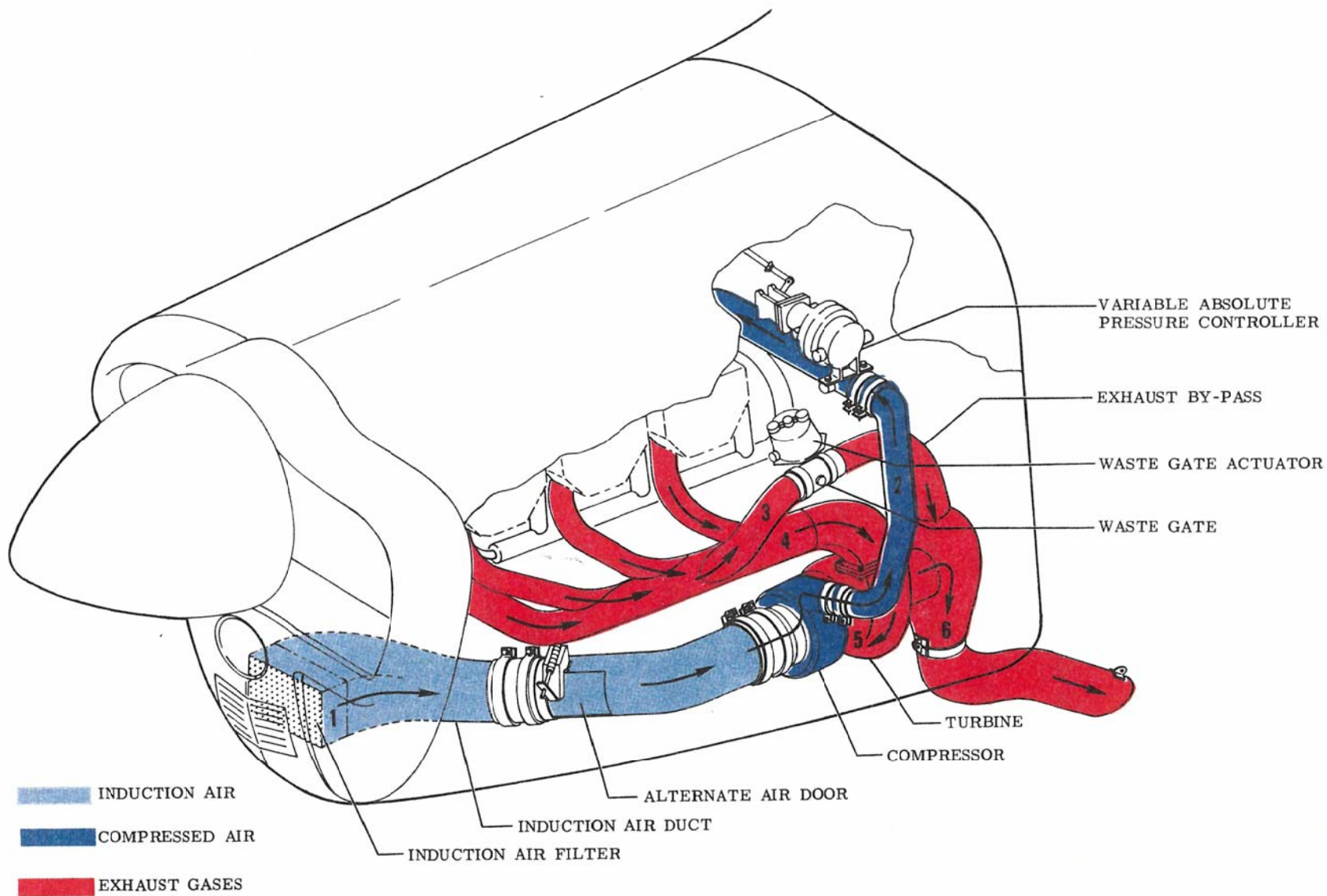
The control center of the turbocharger system is the variable absolute pressure controller. This device simplifies turbocharging to one control; the throttle. Once the pilot has set the desired manifold pressure, virtually no throttle adjustment is required with changes in altitude. The controller senses compressor discharge pressure requirements for various altitudes and controls the oil pressure to the waste gate actuator which adjusts the waste gate accordingly. Thus, the turbocharger maintains only the manifold pressure called for by the throttle setting. This provides an efficient engine - turbocharger combination, due to slower turbine speeds, lower exhaust back pressure, and less compressor heat rise.

CRITICAL ALTITUDE

The critical altitude is that altitude at which the waste gate moves to the fully closed position. It is determined when at full throttle the desired manifold pressure is no longer attainable at a given rpm. This altitude will vary considerably with air temperature, rpm, fuel flow and airspeed.

The following steps illustrate the operation of the system:

1. Induction air is taken in through the air filter and ducted to the compressor.
2. The induction air is then compressed and ducted to the engine.



3. As the waste gate opens, some of the exhaust gases are routed around the turbine, through the exhaust bypass and overboard,

4. When the waste gate is closed, all of the exhaust gases pass through and drive the turbine, which, in turn, drives the compressor.

5. The exhaust gases are dumped overboard.

OPERATIONAL CHARACTERISTICS

Little difference exists between the operating techniques of the V35 turbocharged engine and the normally aspirated engine when operated below the critical altitude.

Above the critical altitude certain operational characteristics must be understood to fully realize the advantages and capabilities of the turbocharged engine. These are as follows:

RPM EFFECT ON MANIFOLD PRESSURE

Above the critical altitude, any change in rpm will result in a like change in manifold pressure. If, on a hot day with full throttle, the desired percent of power is unattainable for a given rpm, a slight increase in rpm will produce a significant increase in manifold pressure.

FUEL FLOW EFFECT ON MANIFOLD PRESSURE

Above the critical altitude, with rpm and manifold pressure established for cruise, leaning will cause a slight drop in manifold pressure. When the mixture reaches the recommended fuel flow, the manifold pressure will increase to its original indication or slightly higher. Therefore, a gradual, smooth leaning technique is recommended.

AIRPEED EFFECT ON MANIFOLD PRESSURE

Above the critical altitude, any change in airspeed will result in a corresponding change in manifold pressure. This is true because the increase in ram air pressure with an increase in airspeed is magnified by the compressor resulting in an increase in manifold pressure. The increase in manifold pressure creates a higher mass flow through the engine, causing higher turbine speeds and thus further increasing manifold pressure. This characteristic may be used to best advantage by allowing the aircraft to accelerate to cruise speed after leveling off and prior to reducing power.

ENGINE RESPONSE AT HIGH ALTITUDE

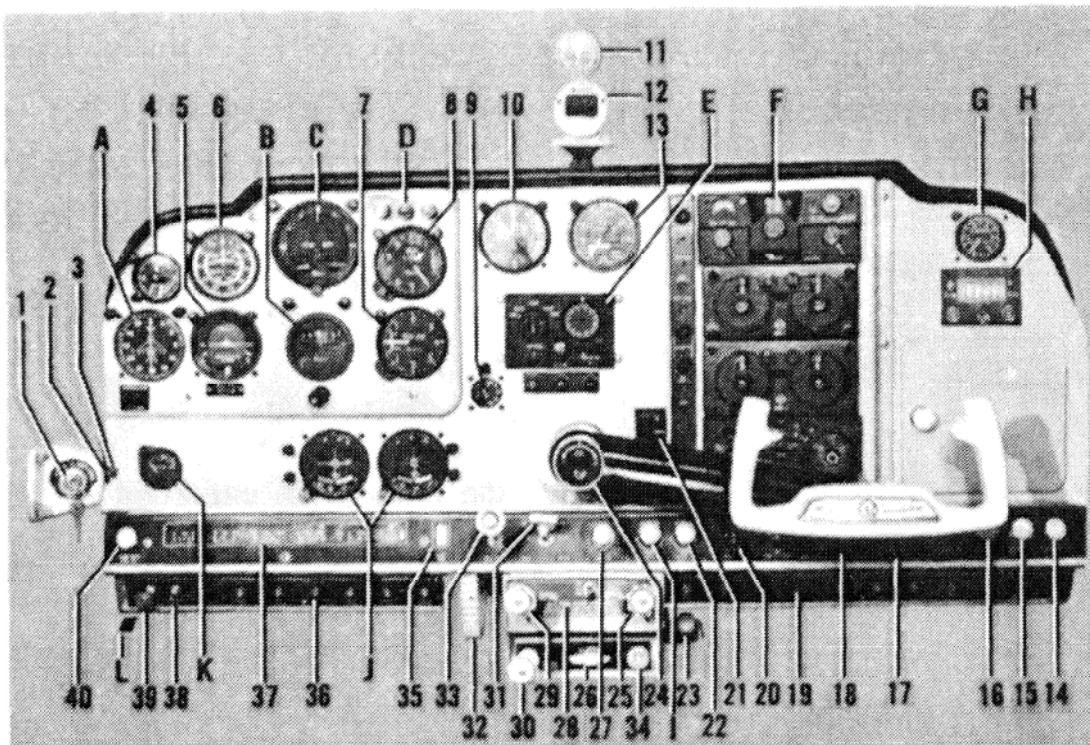
Response from normal cruise power to maximum power is nearly instantaneous at high altitude. In the event the engine is idled, it may be necessary to lean the mixture after application of partial throttle to regain the turbocharger speed.

EFFECT OF AMBIENT TEMPERATURES ON POWER

The V35TC engine will vary its power 1% for every 6°F above or below standard day temperatures, an increase in temperature will result in a decrease in power. To attain a given percent of power will then require increases in manifold pressure with increases in ambient temperature. For power settings, refer to the Horsepower Settings Chart in Section VI.

CAUTION

The engine manufacture limits the manifold pressure to 32.5 in. Hg. Particular care should be taken in cold weather when operating with cold oil to avoid exceeding this limitation. The last 1-1/2 inches of throttle travel should be applied slowly while monitoring the manifold pressure gage.



STANDARD EQUIPMENT

1. Magneto-Starter Switch
2. Battery Switch
3. Alternator Switch
4. Clock
5. Turn Coordinator
6. Airspeed Indicator
7. Vertical Speed Indicator
8. Altimeter
9. Wing Flap Position Indicator.
10. Manifold Pressure and Fuel Flow Gage
11. Outside Air Temperature Gage
12. Magnetic Compass
13. Tachometer
14. R. H. Cabin Vent Control
15. Defroster Control
16. Cabin Heat Control
17. Upper Subpanel
18. Parking Brake Control
19. R. H. Lower Subpanel
20. Landing Gear Position Switch
21. Landing Gear Position Lights
22. Instrument Flood Light Rheostat Switch
23. Aft Cabin Heat Control
24. Aileron Trimmer
25. Propeller Control
26. Alternate Air

27. Lighter
28. Auxiliary Fuel Pumps Switch
29. Throttle
30. Mixture Control
31. Wing Flap Position Switch
32. Elevator Trim Control
33. Cowl Flap Control
34. Forward Cowl Flap Control
35. Elevator Tab Indicator
36. L. H. Lower Subpanel
37. Engine Gage Cluster
38. Landing Gear Circuit Breaker
39. Vent Shutoff Control
40. L. H. Cabin Vent Control

OPTIONAL EQUIPMENT

- A. Automatic Direction Finder Indicator
- B. Directional Gyro
- C. Attitude Gyro
- D. Marker Beacon
- E. Autopilot Control Head
- F. Radio Equipment
- C. Suction Gage
- H. Transponder
- I. Radio and Post Light Rheostat Switch
- J. Omni Indicators
- K. Exhaust Gas Temperature Gage
- L. Emergency Static Air Control

NOTE

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.

INSTRUMENTS

ENGINE INSTRUMENTS

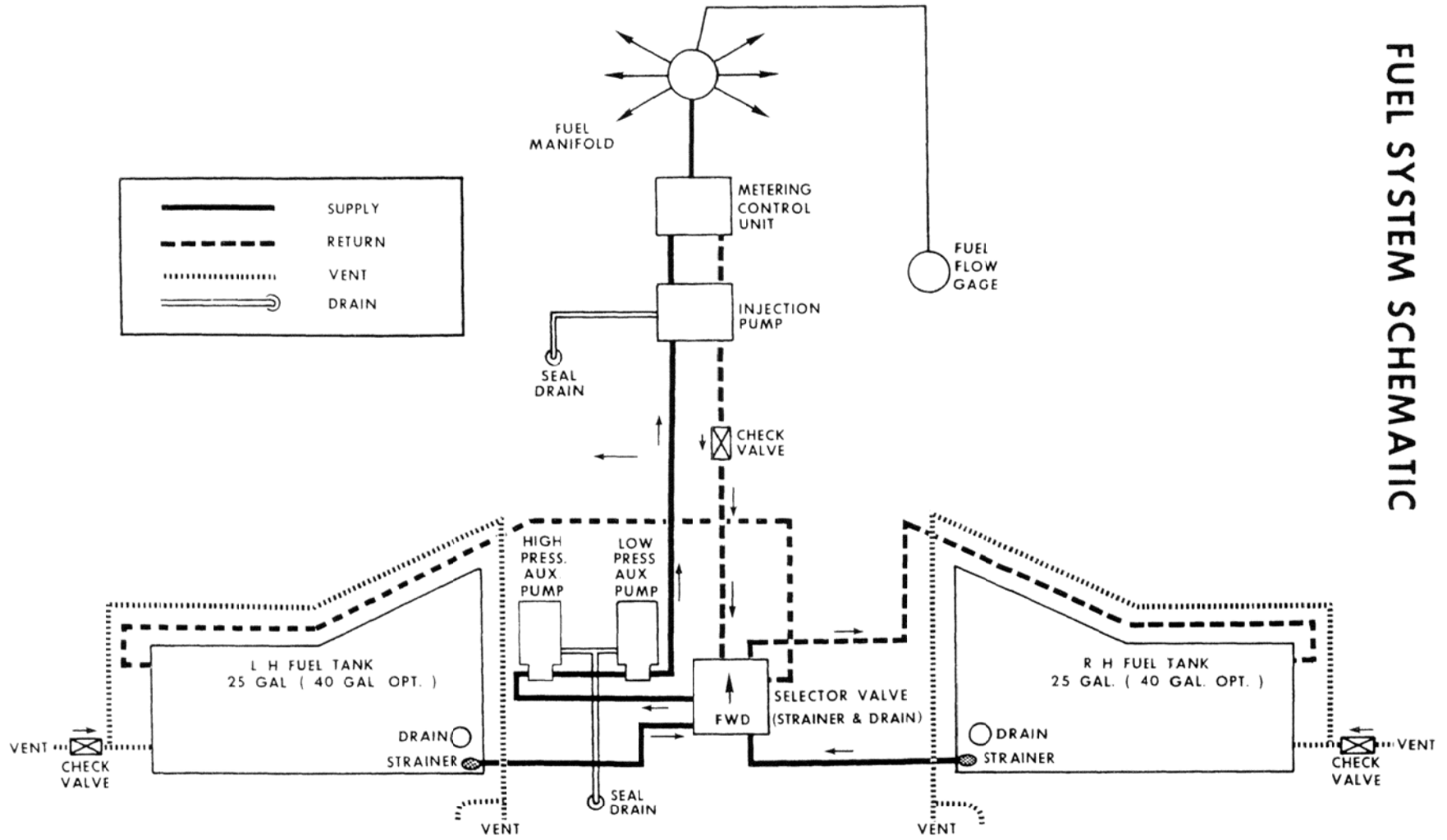
The engine gage cluster on the left side of the upper subpanel contains individual fuel quantity gages for each cell, oil temperature, oil pressure, and cylinder head temperature gages, and an ammeter. The tachometer and a combination manifold pressure and fuel flow indicator are installed in the instrument panel.

FUEL SYSTEM

FUEL CELLS

A 49-gallon standard fuel capacity or an 80-gallon optional fuel capacity is provided by two rubber fuel cells in the leading edges of the wings. The filler neck for each cell is accessible through a flush type filler cap in the wing leading edge. Visual measuring tabs within the optional cells permit the system to be serviced with 60, 70, or 80 gallons of fuel, as desired. The engine-driven fuel injector pump returns approximately 10 gallons of excess fuel per hour to the cell from which fuel is being drawn. The fuel system contains three drains: the fuel cell sump on the underside of each wing and

FUEL SYSTEM SCHEMATIC



the system low spot drain inboard of the left wing root. Only 100/130 grade fuel or higher should be used.

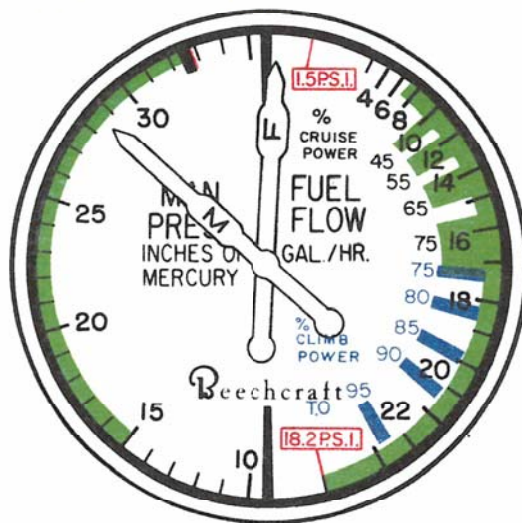
FUEL QUANTITY GAGES

Fuel quantity is measured by float type transmitter units which convey signals to two gages in the engine gage cluster. Each gage indicates fuel quantity for its respective cell.

FUEL FLOW INDICATOR

The fuel flow portion of the combination fuel flow and manifold pressure indicator is calibrated in gallons per hour, the green arc indicates fuel flow for normal operations.

In the cruise power range the green radials indicate the fuel flow



required for cruise power settings of 45% to 75% the lowest value of the sector is the lean setting and the highest value of the sector is the best power setting for that particular power range.

The blue radials indicate the percent of power for climbs.

AUXILIARY FUEL PUMPS

The electric auxiliary fuel pumps are controlled by an HI-OFF-LO toggle switch on the control console. A check valve permits boost pressure from the auxiliary pump to bypass the engine-driven pump for engine starting. Immediately after starting, the "LO" 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.

LO-Boost should also be used during the climb above 8000 feet and at high altitude cruise, if required to stabilize fuel flow. HI-Boost 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. Ordinarily, take-offs and landings should be made using the cell that is more nearly full.

If the engine is allowed to stop firing, due to insufficient fuel it is important that the following procedure be observed.

1. Retard the throttle to prevent an engine overspeed condition.
2. Switch to the other cell, visually checking the fuel selector valve.
3. Turn the auxiliary fuel pump to the LO position until power is regained.

4. Advance the throttle to the desired position.

OIL SYSTEM

The engine oil system is the full-pressure, wet-sump type and has a 12-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. A full-flow, bypass type, integrally mounted oil filter is provided. Regular changing of the oil filter is important to provide clean uncontaminated oil to the turbocharger bearings and seals. (See Section VIII for servicing procedures.)

ELECTRICAL SYSTEM

In general, the circuitry is the single-wire, ground-return type, with the aircraft structure used as the ground return. A panel containing the battery, magneto-starter, and alternator switches is located below the pilot's storm window. Electrical switches are installed on the upper subpanel and the control console. The left-hand and right hand lower subpanels contain protective circuit breakers for various circuits in the system.

BATTERY

A 35-ampere-hour, 12-volt battery is located on the right-hand forward side of the fire wall. Battery servicing procedures are described in Section VIII.

SECTION II

OPERATING CHECK LISTS

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N
II

The following check lists contain information essential for normal operation of your BEEHCRAFT Bonanza. This information is based on the recommendations and data complied by Beech Aircraft Corporation pilots, and is intended to assist you in developing a systematic and safe flying technique. Made carefully, these checks will not only help prevent a mishap or malfunction, but will also aid in reducing maintenance costs.

6. Battery switch - ON.
7. All circuit breakers, switches, and controls - CHECKED.
8. Cowl flaps - OPEN.
9. "Magic Hand" Landing Gear Safety System (if installed) - CHECKED and switch placed in desired position.

STARTING

1. Mixture - FULL RICH.
2. Propeller - HIGH RPM.
3. Throttle - Approximately 1/2 inch open.
4. Auxiliary Fuel Pump - HI position until fuel flow peaks, then OFF.
5. Throttle - Set for 1000 to 1200 rpm.
6. Starter switch - START POSITION: release to BOTH position when engine fires.
7. In Event of Overprime Condition:
 - a. Mixture - IDLE CUT-OFF.
 - b. Throttle - OPEN.
 - c. Starter Switch - START POSITION.
 - d. As engine starts, reduce throttle to IDLE RPM and place mixture control in FULL RICH position.
8. Auxiliary fuel pump - LO after starting, if necessary, to purge system of any remaining vapor.
9. Warm-up - 1000 to 1200 rpm. Oil pressure - CHECKED.
10. All engine gages - CHECKED.
11. External power (if used) - DISCONNECT.
12. Alternator switch - ON.
13. Avionic equipment - ON, if desired.

BEFORE TAKE-OFF

CIGAR

(C) - Controls, I - Instruments, G - Gas, A - Attitude Trim, R - Runup).

1. Auxiliary fuel pump - OFF.
- (C) 2. Full travel and freedom of movement of controls - CHECKED.
- (I) 3. All instruments and radio - CHECKED.
Oil temperature - CHECK 100° .
Landing gear position lights - CHECKED.
Altimeter - SET; directional gyro (if installed) - SET.
- (G) 4. Fuel gages - CHECKED.
- (A) 5. Trim - Aileron; NEUTRAL; Elevator: 0° (3° NOSE UP if only front seats are occupied).
- (R) 6. Propeller - Exercise at 1700 rpm to obtain 300 to 400 rpm drop; return control to high rpm position.
7. Magnetos - With throttle at 1700 rpm on both magnetos, variance between individual magnetos should not exceed 50 rpm.
8. Flaps - As REQUIRED (20° for obstacle take-off).
9. Doors and windows - LOCKED.
10. All seat belts - FASTENED.
11. Parking brakes - OFF.
12. Mixture - FULL RICH.
13. Make final check of manifold pressure, fuel flow, and rpm at start of take-off run.

NOTE

Add last 1-1/2 inches of throttle slowly to avoid over-boost when oil is cold.

BEFORE LANDING

GUMPS

(G) - Gas, U - Undercarriage down, M - Mixture, P - Propeller, S - Seat Belts secure).

(G) 1. Fuel selector valve - Select cell more nearly full.

(U) 2. Landing gear - DOWN.

Landing Gear indicators - DOWN.

(M) 3. Mixture - FULL RICH.

(P) 4. Propeller - HIGH RPM.

(S) 5. Seat belts - SECURE.

6. Flaps - AS REQUIRED: maximum extension speed 130 mph (113 knots).

7. Cowl flaps - AS REQUIRED.

SHUTDOWN

1. Electrical and radio equipment - OFF.

2. Flaps - UP.

3. Propeller - HIGH RPM.

4. Throttle - CLOSED.

5. Mixture - IDLE CUT-OFF.

6. Magnetos switch - OFF after engine stops.

7. Battery and alternator switches - OFF.

8. All switches - OFF.

9. Control column lock pin - INSTALLED if conditions warrant.

10. Install wheel chocks if airplane is to be left unattended.

5. Check mechanical indicator to make certain that gear is down.
6. If electrical system is operative, check landing gear position light and warning horn.
7. Disengage handcrank.

Always keep the handcrank strapped in the disengaged position when not in use. Do not retract the landing gear manually.

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

Immediately upon noting any condition which could indicate eventual engine failure (loss of engine power, loss of fuel flow, rough running engine, etc.), if altitude permits, perform the following checks:

1. Check fuel flow and fuel quantity gages.
 - a. If the fuel cell being used is empty, retard the throttle to prevent an engine overspeed condition before selecting the other cell; check selector visually. Turn on auxiliary fuel pump **MOMENTARILY** until power is regained.
 - b. If the malfunction is not caused by fuel cell depletion but fuel flow is abnormally low, turn on auxiliary fuel pump. **TURN AUXILIARY FUEL PUMP OFF IF ENGINE PERFORMANCE DOES NOT IMPROVE WITHIN A FEW MOMENTS.**
2. Place mixture in **FULL RICH**.

3. Check ignition switch for BOTH position.

FORCED LANDING

If a forced landing appears advisable.

1. Mixture - IDLE CUT-OFF.
2. Throttle - CLOSED.
3. Ignition switch - OFF.
4. Fuel selector valve - OFF.
5. When speed drops, place airplane in maximum glide configuration; lower nose to maintain airspeed for best glide distance. (See maximum glide chart in this section).

ENGINE FIRE

Pull the red VENT SHUTOFF control on the outboard side of the left hand lower subpanel to close off all heating system outlets so that smoke and fumes will not enter the cabin. Shut down the engine as follows and make a forced landing:

1. Mixture - IDLE CUT-OFF.
2. Fuel selector valve - OFF.
3. Battery and alternator switches - OFF. (If it is desired to lower the landing gear, this can be accomplished manually).
4. Ignition switch - OFF.
5. Throttle - CLOSED.
6. Do not attempt to restart engine.

EMERGENCY DESCENT

Reduce power to idle, establish 165 mph-**IAS** gear down; glide. This will allow you a maximum rate of descent.

THIS MANUAL MUST BE KEPT IN THE AIRPLANE AT ALL TIMES

BEECH AIRCRAFT CORPORATION, WICHITA 1, KANSAS

FAA Identification

Airplane Serial

Type Certificate 3A15

FAA Approved, based on CAR 3, Utility Category

MODEL V35 BONANZA LANDPLANE
AIRPLANE FLIGHT MANUAL

(Observance of the limitations listed in Section I is mandatory.)

I. LIMITATIONS.

The following limitations are to be observed in the operation of this airplane equipped with a Continental IO-520-B engine.

- A. Engine Limits: Take-off and maximum continuous operation (sea level) - 2700 rpm, full throttle (285 hp).
- B. Fuel: Aviation gasoline, 100/130 minimum grade. Usable fuel from standard system - 49 gallons; usable fuel from optional installation - 80 gallons.
- C. Propeller:

Manufacturer	Hub	Blades
McCauley Industrial Corporation	2A36C23	Two 84B-0
OR		
Hartzell Propeller, Inc.	PHC-A3VF-4	Three V8433-2R or V8433-4R

- D. Power Plant Instruments:

Oil Temperature: Green Line (normal operating range), 100° to 240° F; Yellow Mark (caution), 100° F; Red Mark (maximum), 240° F.

Oil Pressure: Green Line (normal operating range), 30 to 60 psi; Red Mark (maximum), 100 psi; Red Mark (minimum), 30 psi.

Fuel Flow: Green Arc (operating range), 6.9 to 24.3 gph; Red Radial (maximum), 17.5 psi; Red Radial (minimum), 1.5 psi.

Tachometer: Green Arc (normal operating range), 1800 to 2700 rpm; Red Radial (maximum), 2700 rpm.

Cylinder Head Temperature: Green Line (normal operating range), 200° to 460° F; Red Mark (maximum), 460° F.

Manifold Pressure: Green Arc (normal operating range), 15 to 29.6 in. Hg; Red Radial (maximum at sea level), 29.6 in. Hg.

- E. Airspeed Limits: (Calibrated Airspeed, Utility Category)

Never Exceed (Red Radial)	225 mph (195 knots)
Caution Range (Yellow Arc)	190 to 225 mph (165 to 195 knots)
Normal Operating Range (Green Arc)	74 to 190 mph (64.3 to 165 knots)
Flap Extension Range (White Arc)	63 to 130 mph (54.7 to 113 knots)
Maximum Gear Extension Speed	165 mph (143 knots)
Maximum Design Maneuvering Speed	152 mph (132 knots)
Maximum Structural Cruising Speed	190 mph (165 knots)

FAA Approved

Date: October 13, 1965

Part No. 35-590113-3

F. Approved Maneuvers:

Maneuver	Entry Speed
Chandelle	152 mph (132 knots) CAS
Steep Turn	152 mph (132 knots) CAS
Lazy Eight	152 mph (132 knots) CAS
Stall (except whip)	152 mph (132 knots) CAS

Spins are prohibited. In the event of an inadvertant spin, apply opposite rudder and forward elevator control. Avoid abrupt pullout after rotation has been stopped.

G. Design Structural Load Factor: 4.4G No inverted maneuvers are approved.

NOTE: Apply control pressures with caution at speeds above 152 mph (132 knots) and with extreme caution at speeds above 190 mph (165 knots). Reduce speed to 152 mph (132 knots) or less, in rough or turbulent air.

H. Maximum Gross Weight: 3400 pounds.

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

MAC leading edge is 66.7 inches aft of datum; 65.3 inches long.

CG Limitations (wheels down):

Forward - 77.0 inches aft of datum to weight of 2900 pounds with straight-line variation to 82.1 inches at 3400 pounds.

Rear - 85.7 inches aft of datum to weight of 3000 pounds with straight-line variation to 84.4 inches at 3400 pounds.

I. Placards:

On control console: "AUX FUEL PUMP OPERATION - Take-Off and Land with Aux Fuel Pump off Except in Case of Loss of Fuel Press." "Alternate Air - Pull and Release."

On storm window: "Caution - Do Not Open Above 145 MPH."

In full view of pilot: "AIR SPEED LIMITATION - Maximum Speed with Landing Gear Extended (Normal) 165 MPH (143 KTS). Maximum Design Maneuvering Speed 152 MPH (132 KTS).

UTILITY CATEGORY AIRPLANE - Operate in Accordance with FAA Approved Airplane Flight Manual. INTENTIONAL SPINS PROHIBITED - No Acrobatic Maneuvers Approved Except Those Listed in the Airplane Flight Manual."

On left hand lower subpanel: "Vent Shutoff - Pull to Close."

On fuel selector panel: "Off", "LH Tank 25 Gal.", "RH Tank 25 Gal." (standard system); "Off", "LH Tank 40 Gal.", "RH Tank 40 Gal." (optional system).

On top of front spar carry-through structure between front seats: "EMERGENCY LANDING GEAR INSTRUCTIONS TO EXTEND - Engage Handle in Rear of Front Seat and Turn Counterclockwise as Far as Possible (50 Turns)."

On middle windows: "Latch Window before Take-Off." "Do Not Open in Flight."

Above landing gear mechanical position indicator when winter baffles are installed: "Notice - Remove Winter Baffles when Outside Air Temperature Exceeds 70° F."

On upholstery panel below left hand middle window near emergency release handle when the folding fifth and sixth seats are installed: "EMERGENCY EXIT - PULL PIN - Push Window Out."

On inner side of baggage compartment door: "BAGGAGE AND CARGO COMPARTMENT - Floor Structural Capacity 270 Pounds Maximum. Check Aircraft Flight Manual for Weight and Center of Gravity Limits when Loading Baggage, Cargo or Family Seats."

Above inside door handle: "Rotate Handle to Full Locked Position."

II. PROCEDURES.

A. Normal Procedures.

1. Cabin door latch: Turn inside handle counterclockwise to lock.

2. Fuel System: Excess fuel from the engine is returned to the cell from which fuel is being drawn. Drain fuel sumps and fuel system low spot daily.

To start engine: Place mixture control in full rich position (pull control out 1/4 to 1/2 of its travel above 5000 feet), position propeller control for high rpm, and open throttle approximately 1/2 inch; turn auxiliary fuel pump ON until fuel flow peaks, then OFF; reduce throttle to 1000 to 1200 rpm and engage starter. Hot engine starting: Auxiliary fuel pump ON until fuel flow stabilizes, indicating system is purged of fuel vapor, then OFF. CAUTION: Do not overprime engine. In event of overprime condition, place mixture control in idle cut-off, open throttle, and engage starter; as engine starts, reduce throttle to idle rpm and place mixture control in full rich position. After starting, if necessary, turn auxiliary fuel pump ON to purge system of any remaining vapor, then turn pump OFF. NOTE: Auxiliary fuel pump switch in ON position with engine-driven pump operating may produce over-rich mixture resulting in slight power loss.

CAUTION: When switching cells, if cell is allowed to run completely dry, retard throttle to prevent an engine overspeed condition, switch to the other cell, and turn on auxiliary fuel pump momentarily until power is regained.

3. Wing Flap Settings: Use 0° for normal take-off. Use 30° for landing, or as wind conditions dictate.
4. Circuit Breakers: All circuit breakers except alternator output circuit breaker are located on left hand and right hand lower subpanels; alternator circuit breaker is located on left side of nose wheel well cover. Push circuit breakers to reset. Landing gear circuit breaker on left hand lower subpanel can be pulled off, then pushed to reset.
5. Occupied Seats: Must be in upright position during take-off and landing.

B. Emergency Procedures.

1. Fuel System: Turn auxiliary fuel pump switch to "ON" position in case of loss of fuel pressure.
2. Engine Fire: Ignition switch - OFF; fuel selector - OFF; pull vent shutoff control in left hand lower subpanel.
3. Emergency Landing Gear Extension: Landing gear switch DOWN, circuit breaker OFF. Engage handle at rear of front seats, turn counterclockwise as far as possible. WARNING: Keep handle strapped in disengaged position when not in use.
4. Alternate Air Door Inoperative: Open door manually with "PULL-AND-RELEASE" control until engine air induction system again functions automatically.

NOTE: Particularly at night, reflections from rotating 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 any instrument or limited VFR condition.

III. PERFORMANCE.

The following performance figures were obtained during the official FAA Flight Tests, and may be realized under conditions indicated with the airplane and engine in good condition and with average piloting technique. All performance is given for a gross weight of 3400 pounds. Take-off and landing distances are given for no wind and level, paved runways with IO-520-B engine. In using the following data, allowance for actual conditions must be made.

	ALTITUDE (FEET)	OUTSIDE AIR TEMPERATURE				
		0° F	25° F	50° F	75° F	100° F
Take-Off Distance (Feet).	Sea Level	1474	1636	1808	1988	2177
Distance required to take-off and climb to 50 feet, flaps up, 2700 rpm, full throttle.	2000	1763	1958	2163	2379	2605
	4000	2130	2366	2615	2876	3150
Take-off speed: 80 mph (70 knots) CAS.	6000	2561	2845	3144	3459	3788
	8000	3099	3443	3806	4186	4586

	ALTITUDE (FEET)	OUTSIDE AIR TEMPERATURE				
		0° F	25° F	50° F	75° F	100° F
Landing Distance (Feet).	Sea Level	1356	1418	1479	1539	1599
Distance required to land over 50-foot obstacle and stop, flaps full down.	2000	1442	1507	1571	1634	1696
	4000	1533	1602	1669	1735	1800
Approach at 86 mph (75 knots) CAS.	6000	1631	1703	1773	1842	1910
	8000	1735	1810	1884	1956	2027
Normal Rate of Climb (Feet per Minute).	Sea Level	1229	1190	1150	1110	1071
Flaps up, 2700 rpm, full throttle. Best rate-of-climb speed: 113 mph (98.2 knots) CAS at sea level. Reduce 1.0 mph per 1300-foot increase in altitude.	2000	1104	1063	1021	980	938
	4000	977	934	891	848	806
	6000	850	805	761	716	673
	8000	721	675	629	584	539
Balked Landing Climb (Feet per Minute).	Sea Level	630	605	579	552	526
Gear and flaps down, 2700 rpm, full throttle. Best rate-of-climb speed: 79 mph (68.6 knots) CAS. Reduce 1.0 mph per 2500-foot increase in altitude.	2000	536	509	482	454	426
	4000	441	413	384	355	327
	6000	345	316	286	256	226
	8000	249	218	187	156	126
Stall Speeds (CAS), Power Off.	ANGLE OF BANK	0°	20°	40°	60°	
Gross Weight 3400 Pounds.	Gear and Flaps Down	63 mph (54.7 knots)	65 mph (56.5 knots)	72 mph (62.6 knots)	89 mph (77.3 knots)	
	Gear and Flaps Up	74 mph (64.3 knots)	76 mph (66.0 knots)	85 mph (73.8 knots)	105 mph (91.2 knots)	

Altitude lost during a stall is approximately 250 feet.

Approved:


Chester A. Rembleske
DMCR 3-2

V35 TC PILOTS CHECK LIST

35-590113-15
4/29/66

BEFORE STARTING

1. Brakes - SET.
2. Fuel selector valve - Select cell more nearly full.
3. Landing gear switch - DOWN.
4. All avionic equipment - OFF.
5. Alternator switch - OFF.

CAUTION

Always leave the alternator switch OFF for starting (both with and without external power)

6. Battery switch - ON.
7. All circuit breakers, switches, and controls - CHECKED.
8. Cowl flaps - OPEN.
9. "Magic Hand" Landing Gear Safety System (if installed) - CHECKED and switch placed in desired position.

STARTING

1. Mixture - FULL RICH.
2. Propeller - HIGH RPM.
3. Throttle - Approximately 1/2 inch open.
4. Auxiliary Fuel Pump - HI position until fuel flow peaks, then OFF.
5. Throttle - Set for 1000 to 1200 rpm.
6. Starter switch - START POSITION: release to BOTH position when engine fires.
7. In Event of Overprime Condition:
 - a. Mixture - IDLE CUT-OFF.
 - b. Throttle - OPEN.
 - c. Starter Switch - START POSITION.
 - d. As engine starts, reduce throttle to IDLE RPM and place mixture control in FULL RICH position.
8. Auxiliary fuel pump - LO after starting, if necessary, to purge system of any remaining vapor.
9. Warm-up - 1000 to 1200 rpm. Oil pressure - CHECKED.
10. All engine gages - CHECKED.
11. External power (if used) - DISCONNECT.
12. Alternator switch - ON.
13. Avionic equipment - ON, if desired.

BEFORE TAKE-OFF

CIGAR

(C) - Controls, I - Instruments, G - Gas, A - Attitude Trim, R - Runup).

1. Auxiliary fuel pump - OFF.

- (C) 2. Full travel and freedom of movement of controls - CHECKED.
- (I) 3. All instruments and radio - CHECKED.
Oil temperature - CHECK 100°.
Landing gear position lights - CHECKED.
Altimeter - SET; directional gyro (if installed) - SET.
- (G) 4. Fuel gages - CHECKED.
- (A) 5. Trim - Aileron; NEUTRAL: Elevator: 0° (3° NOSE UP if only front seats are occupied).
- 6. Magnetos - With throttle at 1700 rpm on both magnetos, variance between individual magnetos should not exceed 50 rpm.
- (R) 7. Propeller - Exercise at 1700 rpm to obtain 300 to 400 rpm drop; return control to high rpm position.
- 8. Flaps - As REQUIRED (20° for obstacle take-off).
- 9. Doors and windows - LOCKED. All seat belts - FASTENED.
- 10. Parking brakes - OFF. Mixture - FULL RICH.
- 11. Make final check of manifold pressure, fuel flow, and rpm at start of take-off run.

NOTE

Add last 1-1/2 inches of throttle slowly to avoid overboost when oil is cold.

BEFORE LANDING

GUMPS

- (G) - Gas, U - Undercarriage down, M - Mixture, P - Propeller, S - Seat belts secure).
- (G) 1. Fuel selector valve - Select cell more nearly full.
- (U) 2. Landing gear - DOWN.
Landing gear indicators - DOWN.
- (M) 3. Mixture - FULL RICH.
- (P) 4. Propeller - HIGH RPM.
- (S) 5. Seat belts - SECURE.
- 6. Flaps - AS REQUIRED: maximum extension speed 130 mph (113 knots).
- 7. Cowl flaps - AS REQUIRED.

SHUTDOWN

- 1. Electrical and radio equipment - OFF.
- 2. Flaps - UP.
- 3. Propeller - HIGH RPM.
- 4. Boost pump - OFF.
- 5. Throttle - CLOSED.
- 6. Mixture - IDLE CUT-OFF.
- 7. Magnetos switch - OFF after engine stops.
- 8. Battery and alternator switches - OFF.
- 9. All switches - OFF.
- 10. Control column lock pin - INSTALLED if conditions warrant.
- 11. Install wheel chocks if airplane is to be left unattended.