# Limitations

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# General Limitations

## Cabin Emergency Overwing Exits

- Do not open or check security by moving door handle while aircraft is pressurized and/or in flight.
- Handle is in locked position when arm is around the plunger.
- The lock-levers must be in the up or unlocked position prior to flight.
- See AFM Supplements section for limitations with Airstair door removed.

## Cabin Airstair Door

- Do not open or check door security by moving door handle while aircraft is pressurized and/or in flight.
- Handle is in the locked position when the arm is around the plunger.
- Only a crewmember should close and lock the door.
- Only one person on the Airstair door at a time.

## Crew Seats

- Both crew seats shall be locked in position during takeoff and landing.

## Kinds of Operation

**WARNING:** Unless authorized by applicable Department of Transportation regulations, do not carry hazardous material anywhere in the aircraft.

The King Air is approved for the following operations when required equipment is installed and operational. Refer to Kinds of Operations Equipment List in the Aircraft Operating Manual.

- VFR Day
- VFR Night
- IFR Day
- IFR Night
- Known Icing Conditions

## Minimum Flight Crew

- Minimum flight crew is one pilot.

## Number of Occupants

- The total number of persons carried shall not exceed 15 or that for which approved seating accommodation is provided.

## Inter-Compartment Door

- When a door is provided between the crew and passenger compartments, it shall be secured in the open position during takeoff and landing.

## Maximum Permissible Altitude

- Maximum permissible operating altitude is 35,000 ft.

## Pressure Cabin

- The cabin shall not be pressurized during takeoff and landing. Maximum pressure differential for normal operation is 6.6 PSI.

## Smoking

- Smoking is not permitted when No Smoking/Fasten Seat Belt sign is illuminated.
- Smoking is prohibited when oxygen is in use.

# Operational Limitations

## Air Temperature

Sea Level to 25,000 ft Pressure Altitude . . . . . ISA + 37ºC

Above 25,000 ft Pressure Altitude . . . . . ISA + 31ºC

## Airplane Configurations

- The airplane configurations should as stated in AFM section 6.

**CAUTION:** For turbulent air penetration, use an airspeed of 170 knots. Avoid over-action on power levers. Turn off autopilot altitude hold. Keep wings level, maintain attitude and avoid use of trim. Do not chase altitude and altitude. Penetration should be at an altitude which provides adequate maneuvering margins when severe turbulence is encountered.

# Airspeed Limitations

| SPEED | KCAS | KIAS | REMARKS |
|---|---|---|---|
| Maneuvering Speed $V_A$ | 182 | 184 | Do not make full or abrupt control movements above this speed. |
| Maximum Flap Extension/Extended Speed ($V_{FE}$)<br>Approach<br>Full Down | <br>200<br>155 | <br>202<br>158 | Do not extend flaps or operate with flaps extended above these speeds. |
| Maximum Landing Gear Operating Speed ($V_{LO}$)<br>Extension<br>Retraction | <br>182<br>164 | <br>184<br>166 | Do not extend or retract landing gear above these speeds. |
| Maximum Landing Gear Extended Speed ($V_{LE}$) | 182 | 184 | Do not exceed this speed with landing gear extended. |
| Air Minimum Control Speed ($V_{MCA}$)<br>Propeller Feathered<br><br>Flaps Up<br>Flaps Approach | <br><br><br>96<br>94 | <br><br><br>94<br>93 | These are the lowest airspeeds at which the airplane is directionally controllable when one engine suddenly becomes inoperative, with autofeather armed, and the other engine at takeoff power. |
| Maximum Operating Speed ($V_{MO}$)<br>Sea Level to 21,000 ft<br>21,000 ft to 35,000 ft | <br>260<br>260-192* | <br>263<br>263-194* | These speeds may not be deliberately exceeded in any flight regime. Red pointer reflects $V_{MO}$/$M_{MO}$ limits. |

*0.58 Mach

**Table 3-A; Speed Limitations**

## All Models (at 15,000 lb)

Two-Engine Best Angle-of-Climb ($V_X$) . . . . . 125 KIAS

Two-Engine Best Rate-of-Climb ($V_Y$) . . . . . 140 KIAS

Cruise Climb:

- Sea Level to 10,000 ft . . . . . 170 KIAS
- 10,000 to 15,000 ft . . . . . 160 KIAS
- 15,000 to 20,000 ft . . . . . 150 KIAS
- 20,000 to 25,000 ft . . . . . 140 KIAS
- 25,000 to 30,000 ft . . . . . 130 KIAS
- 30,000 to 35,000 ft . . . . . 120 KIAS
- Maneuvering Speed ($V_A$) . . . . . 184 KIAS
- Turbulent Air Penetration . . . . . 170 KIAS

Maximum Airspeed for Effective Windshield Anti-Icing . . . . . 226 KIAS

Intentional One-Engine Inoperative Speed ($V_{SSE}$) . . . 110 KIAS

Air Minimum Control Speed ($V_{MCA}$):

- Flaps Up . . . . . 94 KIAS
- Flaps Approach . . . . . 93 KIAS

# Altitude Limitation

Normal Operation . . . . . 35,000 FT

Yaw Damper System:

Inoperative . . . . . 5,000 FT

Operative. . . . . ON ABOVE 5,000 FT EXCEPT FOR TAKEOFF OR LANDING

Operation with Aviation Gasoline:

Both Standby Fuel Pumps Operative . . . . . 35,000 FT
Either Standby Fuel

Pumps Inoperative . . . . . FLIGHT PROHIBITED

Climbs Without Crossfeed Capability . . . . . 20,000 FT

# Compartment Loading Limitations

The cabin flooring can withstand loads of 200 pounds per square foot supported on the seat tracks. Floor area where seat tracks are not present (walkways and aft baggage area) supports loads of 100 pounds per square foot, secured by furnished baggage net, webbing or straps.

- All cargo shall be properly secured by an FAA-approved cargo restraint system.
- Cargo must be arranged to permit free access to all exits and emergency exits.

## Baggage Limitation

Maximum Weight in Baggage Compartment

B300

When equipped with fold-up seats. . . . . 510 lb (231 kg)

When not equipped with fold-up seats. . . . . 550 lb (250 kg)

B300C

When equipped with toilet
and fold-up seat . . . . . 510 lb (231 kg)

When equipped with toilet . . . . . 550 lb (250 kg)

## Center of Gravity Limits

- The reference datum is located 83.5 inches forward of the center of the front jack point.
- Aft Limit - 208 inches aft of datum at all weights.
- Forward at 11,800 lb - 191.4 inches aft of datum with straight line variation to 199.4 inches aft of datum at 15,000 lb.
- Forward at 11,800 lb or less - 191.4 inches aft of datum.

## Maneuvering Load Factor Limitations

The Beechcraft Super King Air B300 and B300C normal category airplane. Aerobatic maneuvers, including spins are prohibited.

FLAPS UP

Positive . . . . . .3.1 G

Negative . . . . . .1.24 G

FLAPS DOWN

Positive . . . . . 2 G

Negative . . . . . 0 G

## Takeoff Field Lengths

- The takeoff weight shall not exceed the maximum permitted by field length considerations as calculated by the method described in section 5 of the AFM. Consider the following factors determining take field length: takeoff flap setting, anti-icing setting, airport altitude, runway to be used, runway slope, wind component and air temperature.

## Weight Limitation

Maximum Ramp. . . . . .15,100 LB

Maximum Takeoff. . . . . .15,000 LB

Except for the following limitations:

- Takeoff Climb Requirements
- Tire Speed
- Takeoff Field Length
- Brake Energy

For FAR Operations:

- Takeoff Flight Path Requirements to 1,500 ft AGL
- Service Ceiling - One Engine Inoperative

Maximum landing. . . . . .15,000 LB

Except for the following limitations:

- Maximum Landing Weight to Achieve Climb Requirements
- Normal Landing Distance - Flaps Down

Maximum Zero Fuel. . . . . .12,500 LB

## Wind Component

- The maximum tailwind component for takeoff and landing is 10 kt.

## Maximum Demonstrated Crosswind

- The maximum crosswind component in which the aircraft has been demonstrated to be satisfactory for takeoff and landing is 20 kt.

# System Limitations

## Avionics Systems

### FAR Part 91 Operations

- Refer to the applicable FAA-approved Flight Manual Supplement in the AFM Supplements section.

### FAR Part 135 Operations

- Refer to the applicable FAA-approved Flight Manual Supplement in the AFM Supplements Section for your particular autopilot installation except for Minimum Altitude which is established by FAR Part 135.93.

## Electrical Systems

### External Power Unit

- 28 to 28.4V DC output
- 300 continuous
- 1,000 amp surge

### Generator Limits

Maximum Sustained Generator Load is limited as follow:

In-flight Sea Level to 34,000 ft Altitude . . . . . 100%

In-flight Above 34,000 ft Altitude . . . . . 95%

Ground Operation:

| $N_1$ | Maximum Generator Load |
|---|---|
| 62% to 70% | 75% |
| 70% to 100% | 100% |

**Table 3-B; Generator Ground Operation Limits**

# Starter Limitations

Standard Start Cycle:

30 seconds ON, 5 minutes OFF

30 seconds ON, 5 minutes OFF

30 seconds ON, 30 minutes OFF.

# Flight Controls

## Flaps

Flaps movement is limited to three positions:

- UP
- APPROACH
- DOWN

## Rudder Boost

The rudder boost must be operational for all phases of flight.

# Fuel System

**CAUTION:** Anti-icing additive must be properly blended with the fuel to avoid deterioration of the fuel cells. The additive concentration by volume shall be a minimum of 0.050% and a maximum of 0.150%.

## Minimum Temperature Limits

| Commercial Grades | | Military Grades | |
|---|---|---|---|
| **Fuel** | **Temperature** | **Fuel** | **Temperature** |
| Jet A | -40ºC | JP-4 | -58ºC |
| Jet A-1 | -47ºC | JP-5 | -46ºC |
| Jet B | -50ºC | JP-8 | -50ºC |

**Table 3-C; Fuel Minimum Temperature Limits**

## Anti-Icing Additive

- Anti-icing additive conforming to Specification MIL-I-27686 is the only approved fuel anti-icing additive.
- Engine oil is used to heat fuel entering the fuel control unit. Since no temperature measurement is available for the fuel at this point, It must be assumed to be the same as OAT. If known or forecast temperatures are below minimum temperature limits **Table 3-C**, anti-icing additive per MIL-I-27686 must be mixed with the fuel at refueling to ensure safe operation.

## Fuel Biocide Additive

Fuel biocide-fungicide BIOBOR JF in concentrations of 135 PPM or 270 PPM, may be used in the fuel, BIOBOR JF may be used as the only fuel additive or it may be used with the anti-icing additive conforming to MIL-I-27686 specifications. Used together, the additives have no detrimental effect on the fuel system components.

Refer to the appropriate maintenance manual for appropriate concentrations and for procedures for adding additives to the fuel.

## Approved Engine Fuel

Commercial Grades . . . . . Jet A, Jet A-1, Jet B

Military Grades . . . . . JP-4, JP-5, JP-8

## Emergency Engine Fuels

Commercial Aviation
Gasoline Grades . . . . . 80 RED, 91/96, 100 GREEN
100 LL BLUE*, 115/145 PURPLE

Military Aviation
Gasoline Grades . . . . . 80/87 RED,100/130 GREEN
115/145 PURPLE

* In some countries, this fuel is colored Green and designated “100L”.

### Limitations on the Use of Aviation Gasoline

- Operation is limited to 150 hours between engine overhauls.
- Both standby fuel pumps must be capable of operation.
- Crossfeed capability is required for flight above 20,000 ft pressure altitude (FL200).

### Fuel Management

**WARNING:** One operative standby fuel pump is required for takeoff when using recommended engine fuels, but in such cases, crossfeed of fuel will not be available from the side of the inoperative standby fuel pump.

- Do not put any fuel into the auxiliary tanks unless the main tanks are full.
- Maximum allowable fuel imbalance for wing fuel systems is 300 pounds.
- Do not take off if fuel quantity gages indicate in the yellow arc.
- Crossfeeding of fuel is permitted only when one engine is inoperative.
- Operation with low fuel pressure is limited to 10 hours before overhaul of the engine driven pump (windmilling time is not counted against the time).

### Capacities

Maximum Usable Fuel Quantity. . . . . 3,611 LB (539 GALLON)

Each Main Fuel Tank system. . . . . 1,273 LB (190 GALLON)

Each Auxiliary Fuel Tank . . . . . 533 LB (79.5 GALLON)

## Ice and Rain Protection Systems

Sustained Icing Condition Airspeed . . . . . 140 KNOT MINIMUM

Windshield Icing Condition . . . . . 226 KNOT MAXIMUM

Prior to landing approach, cycle the deicing boots to shed any accumulated ice.

## Landing Gear Limitations

Landing gear cycles (1 up and 1 down) are limited to one every 5 minutes for a total of 6 cycles, followed by a 15-minute cool-down period.

## Powerplant Limitations

- Number of Engines – two
- Engine Manufacturer – Pratt & Whitney of Canada (Longueuil, Quebec, Canada).
- Engine Model Number PT6A-60A.
- Do not lift power levers in flight

## Engine Operating Limits

- The following limitations presented in **Table 3-D** shall be observed. Each column presents limitations. The limits represented do not occur simultaneously. Refer to Pratt & Whitney Engine Maintenance Manual for specific actions required if limits are exceeded.

| Operating Condition | Torque (ft-lbs)[1] | Max ITT °C | Gas Generator RPM % $N_1$ | Prop RPM $N_2$ | Oil Pressure (OSI)[2] | Oil Temp °C[3, 4] |
|---|---|---|---|---|---|---|
| Starting | – | 1000[5] | – | – | 0 to 200 | -40 (min) |
| Idle | – | 750[6] | 62 (min) | 1050 (min) | 60 (min) | -40 to +110 |
| Takeoff | 100 [10] | 820 | 104 | 1700[9] | 90 to 135 | 0 to 110 |
| Max Cont | 100 [10] | 820 | 104 | 1700[9] | 90 to 135 | 0 to 110 |
| Cruise Climb | Notes[7, 10] | 785 | 104 | 1700[9] | 90 to 135 | 0 to 110 |
| Max Cruise | Notes[7, 10] | 820 | 104 | 1700[9] | 90 to 135 | 0 to 110 |
| Max Reverse | – | 760 | – | 1650 | 90 to 135 | 0 to 99 |
| Transient | 156[8] | 850[8] | 104 | 1870[8] | 200 | 0 to 110 |

[1] Torque limit applies within range of 1,000 - 1,700 propeller rpm ($N_2$). Below 1000 propeller rpm, torque is limited to 62%.

[2] Normal oil pressure is 90 to 135 PSIG at gas generator speeds above 72%. With engine torque below 62%, minimum oil pressure is 60 PSIG at normal oil temperature (60º to 70º C). Oil pressures under 90 PSIG are undesirable. Under emergency conditions, to complete a flight, a lower oil pressure limit of 60 PSIG is permissible at reduced power level not to exceed 62% torque. Oil pressures below 60 PSIG are unsafe and require that either the engine be shut down or a landing be made at the nearest suitable airport, using the minimum power required to sustain flight. Fluctuation of plus or minus 10 PSI are acceptable.

[3] A minimum oil temperature of 55ºC is recommended for fuel heater operation at takeoff power.

[4] Oil temperature limits are –40ºC and +110ºC. However, temperatures between 99º and 110ºC are limited to a maximum of 10 minutes.

[5] This value is time-limited to 5 seconds.

[6] High ITT at ground idle may be corrected by reducing accessory load and/or Increasing $N_1$ rpm.

[7] Cruise torque values with altitude and temperature.

[8] These values are time-limited to 20 seconds.

[9] To account for power setting accuracy and steady state flucuations, inadvertent propeller RPM excursions up to 1735 RPM are time limited to 7 minutes.

[10] To account for power setting accuracy and steady state flucuations, inadvertent torque excursions up to 102% is time limited to 7 minutes.

**Table 3-D; Engine Operating Limits**

# Oil Specifications

Any oil specified by brand name in the latest revision of Pratt & Whitney SB 13001 is approved for use in the PT6A-60A engine.

# Oxygen

- If the oxygen system drops below 50 PSI, system purge is required

# Propeller

## Manufacturer

Hartzell Propeller, Inc.

Each aircraft has two full-feathering, reversing, constant speed four blade propellers, consisting of M10476 blades and HC-B4MP-3C hubs. Propeller diameter is 105 inches with blade angles at the 42 inch station.

## Propeller Blade Angles

Feather . . . . . +79.3 degrees

Flight Low Pitch Stop . . . . . + 12 degrees

Ground Low Pitch Stop . . . . . +2 degrees

Ground fine . . . . . -3 degrees

Reverse . . . . . -14 degrees

## Propeller Rotational Speed Limits

Transients Not Exceeding 20 seconds . . . . . 1,870 RPM

Reverse . . . . . 1,650 RPM

All Other Conditions . . . . . 1,700 RPM

Minimum Idle Speed . . . . . 1,050 RPM

## Propeller Rotational Overspeed Limits

Sustained propeller overspeeds faster that 1,700 rpm indicate failure of the primary governor. Flight may be continued at propeller overspeeds up to 1,768 rpm provided torque is limited to 95%. Sustained overspeeds faster than 1,768 rpm are not approved.

## Propeller Autofeather

Must be operational for all flights and armed for takeoff, climb and approach.