Raytheon Aircraft

Beech® Starship 1
(Model 2000)

(NC-29 and After and NC-4 thru NC-28
Modified By BEECHCRAFT Kit 122-9002)

FAA APPROVED AIRPLANE FLIGHT MANUAL

P/N 122-590013-37B

LOG OF REVISIONS

"B6" REVISION . . . . . .SEPTEMBER, 1998

Page	Description
Title Page	Updated
Page A (B6)	New
2-1, 2-2	Revised Table of Contents
2-14B	Revised "Limitations When Encountering Severe Icing Conditions (Required By FAA AD 98-04-25)"
3A-1, 3A-2	Revised Table of Contents
3A-20	Revised "Severe Icing Conditions (Alternate Method Of Compliance With FAA AD 98-04-25)"
4-38	Revised "Icing Flight"
Supplements	Revised Log of Supplements

B6

BEECHCRAFT®
MODEL 2000
FAA APPROVED
AIRPLANE FLIGHT MANUAL

P/N 122-590013-37B

LOG OF REVISIONS

"B5" Revision . . . . . October, 1996

Page	Description
Title Page	Updated
Page A (B5) 1 of 2 2 of 2	 New New
2-2	Revised Table of Contents
2-7	Revised Data (APPROVED FUEL ADDITIVES)
2-14B	Added Data (LIMITATIONS WHEN ENCOUNTERING SEVERE ICING CONDITIONS)
3-1, 3-2	Revised Table of Contents
3-11	Revised Procedure (PITCH TRIM FAIL (PITCH TRIM FAIL ANNUNCIATOR))
3-12	Revised Procedure (ROLL OR RUDDER TRIM FAIL (ROLL OR RUD TRIM FAIL ANNUNCIATOR))
3-13 thru 3-22	Shifted Data
3A-1, 3A-2	Revised Table of Contents
3A-3	Revised Procedure (STARTER ASSIST)
3A-4, 3A-4A	Shifted Data

B5

LOG OF REVISIONS

"B5" Revision . . . . . October, 1996

Page	Description
3A-11, 3A-12	Revised Data (LANDING GEAR ALTERNATE EXTENSION)
3A-12A, 3A-12B	Shifted Data
3A-20	Added Data (SEVERE ICING CONDITIONS)
3A-21 thru 3A-24	Shifted Data
4-2	Revised Table of Contents
4-32	Added Data (BLENDING ANTI-ICING ADDITIVE TO FUEL, USE OF JET B, JP-4, AND AVIATION GASOLINE)
4-33	Shifted Data
4-38	Revised Data (ICING FLIGHT)
6-1	Revised Table of Contents
6-16	Revised Graph (DENSITY VARIATION OF AVIATION FUEL)
6-17	Shifted Data
98-30543/1096	Multifunction Display Checklist

B5

BEECHCRAFT®

Model 2000

FAA Approved
Airplane Flight Manual

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Log of Revisions

"B4" Revision..... March, 1995

Page	Description
Title Page	Updated
Page A (B4)	New
2-14A	Added Cabin Lighting Limitations

B4

BEECHCRAFT®

MODEL 2000

FAA Approved
Airplane Flight Manual

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Log of Revisions

"B3" Revision . . . . . December, 1994

Page	Description	
Title Page	Updated	
Page A (B3)	New	
3A-1, 3A-2	Revised Table of Contents	
3A-3 thru 3A-4B	Revised Procedure (AIR START), Shifted Data	
		B3

BEECHCRAFT®

Model 2000

FAA Approved
Airplane Flight Manual

P/N 122-590013-37B

Log of Revisions

"B2" Revision ..... August, 1994

Page	Description
Title Page	Updated
Page A (B2)	New
2-14 thru 2-14B	Revised ICING LIMITATIONS (added Data)
4-3	Revised Table of Contents
4-44 thru 4-46	Revised COLD WEATHER PROCEDURES

B2

BEECHCRAFT®

Model 2000

FAA Approved
Airplane Flight Manual

P/N 122-590013-37B

Log of Revisions

"B1" Revision ..... February, 1994

Page	Description
Title Page	Updated
Page A (B1)	New
2-2	Revised Table of Contents
2-12	Revised SYSTEM AND EQUIPMENT LIMITS (AUTOPILOT)
2-13, 2-14	Shifted Data

B1

BEECHCRAFT®

Model 2000

FAA Approved
Airplane Flight Manual

P/N 122-590013-37B

Log of Revisions

Original Issue..... April, 1992

"B" Reissue ..... November, 1993

Page	Description
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Page A	
1-1 thru 1-12	
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3A-1 thru 3A-34	
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5-1 thru 5-72	
6-1 thru 6-32	
98-30543/1193	Multifunction Display Checklist **NOTE** The Multifunction Display Checklist disk is issued with the FAA Approved Airplane FLight Manual at delivery of the airplane only. The disk will be updated as required and issued as a revision to the FAA Approved Airplane FLight Manual. For additional disks and/or replacement disks, please contact Beech Commercial Publications.
7-1 thru 7-2 Supplements	See Log of Supplements

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SECTION I
GENERAL
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THANK YOU....

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

IMPORTANT NOTICE

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

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

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

All limits, procedures, safety practices, time limits, servicing, and maintenance requirements contained in this manual are considered mandatory for continued airworthiness and to maintain the airplane in a condition equal to that of its original manufacture.

BEECHCRAFT authorized outlets can provide recommended modification, service, and operating procedures issued by both the FAA and Beech Aircraft Corporation, which are designed to get maximum utility and safety from the airplane.

USE OF THE MANUAL

WARNINGS, CAUTIONS, AND NOTES

The following definitions apply to (WARNINGS), (CAUTIONS), and (NOTES) found throughout the handbook:

WARNING

Operating procedures, techniques, etc., which could result in personal injury or loss of life if not carefully followed.

CAUTION

Operating procedures, techniques, etc., which could result in damage to equipment if not carefully followed.

NOTE

An operating procedure, technique, etc., which is considered essential to emphasize.

The FAA Approved Airplane Flight Manual is designed to facilitate maintaining the documents necessary for the safe and efficient operation of the airplane. The handbook has been prepared in loose leaf form for ease in maintenance. It incorporates quick-reference tabs imprinted with the title of each section.

NOTE

In an effort to provide as complete coverage as possible, applicable to any configuration of the airplane, some optional equipment has been included in the scope of the manual. However, due to the variety of airplane appointments and arrangements available, optional equipment described or depicted here may not be designated as such in every case.

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

1. Original issues and revisions of BEECHCRAFT Service Bulletins.

2. Reissues and Revisions of the FAA Approved Airplane Flight Manual.

This service is free and will be provided only to holders of this manual who are listed on the FAA Aircraft Registration Branch List or the BEECHCRAFT International Owners Notification Service List, and then only if listed by airplane serial number for the model for which this manual is applicable. For detailed information on how to obtain "Revision Service" applicable to this manual or other BEECHCRAFT Service Publications, consult any Authorized Outlet or refer to the latest revision of BEECHCRAFT Service Bulletin No. 2001.

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

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

REVISING THE MANUAL

When the manual is originally issued, and each time it is revised or reissued, a new Log of Revisions page is provided. All Log pages must be retained until the manual is reissued. A capital letter in the lower right corner of the Log page designates the Original Issue ("A") or reissue("B","C", etc.) covered by the Log page. If a number follows the letter, it designates the sequential revision (1st, 2nd, 3rd, etc,) to the Original Issue or reissue covered by the Log page. Reference to the Log page(s) enables the user to determine the current issue, revision, or reissue in effect for each page in the manual, and provides a record of changes made since the Original Issue or the latest reissue.

WARNING

It shall be the responsibility of the owner/operator to ensure that the latest revisions of publications referenced in this manual are utilized during operation, servicing, and maintenance of the airplane.

VENDOR-ISSUED STC SUPPLEMENTS

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

MULTIFUNCTION DISPLAY CHECKLIST DISK

When a new airplane is delivered from the factory, the FAA Approved Airplane Flight Manual delivered with it contains the Beechcraft 2000 Multifunction Display Checklist disk required to load and/or update the MFD checklist. If a new manual is obtained for operation of the airplane, the owner/operator of the airplane should ensure that this disk is transferred into the new manual. If a revision to the FAA Approved Airplane Flight Manual effects the MFD checklist, a new MFD checklist number will be listed in the FAA Approved Airplane Flight Manual Log of Revisions. If a replacement disk is required, please contact Beech Commercial Publications. The MFD checklist is not FAA Approved.

SYMBOLS, ABBREVIATIONS, AND TERMINOLOGY

The following glossary is applicable within this manual.

GENERAL AIRSPEED TERMINOLOGY

CAS	*Calibrated Airspeed* is the indicated airspeed 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. IAS values published in this manual assume zero instrument error.
KCAS	*Calibrated Airspeed* expressed in knots.
KIAS	*Indicated Airspeed* expressed in knots.
M	*Mach Number* is the ratio of true airspeed to the speed of sound.
TAS	*True Airspeed* is the airspeed of an airplane relative to undisturbed air, which is the CAS corrected for altitude, temperature, and compressibility.
V_1	*Take-off Decision Speed.*
V_2	*Take-off Safety Speed* is the speed at 35 feet AGL assuming an engine failure recognized at V_1
V_{35}	*Take-off Safety Speed* at 35 feet AGL with both engines operating.
V_A	*Maneuvering Speed* is the maximum speed at which application of full available aerodynamic control will not overstress the airplane.
V_F	*Design Flap Speed* is the highest speed permissible at which wing flaps may be actuated.
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_{MCA}	*Air Minimum Control Speed* is the minimum flight speed at which the airplane is directionally controllable as determined in accordance with Federal Aviation Regulations. The airplane certification conditions include one engine becoming inoperative with

	autofeather armed, a 5° bank towards the operative engine, take-off power on operative engine, landing gear up, flaps in the takeoff position, and most rearward C.G. For some conditions of weight and altitude, stall can be encountered at speeds above V_{MCA} as established by the certification procedure described above, in which event stall speed must be regarded as the limit of effective directional control.
V_{MO}	*Maximum Operating Limit Speed* is the speed limit that may not be deliberately exceeded in normal flight operations. V is expressed in knots.
V_R	*Rotation Speed.*
V_{REF}	*Reference Landing Approach Speed.*
V_S	*Stalling Speed* or the minimum steady flight speed at which the airplane is controllable.
V_{SO}	*Stalling Speed* or the minimum steady flight speed at which the airplane is controllable in the landing configuration.
V_{SSE}	*Intentional One-Engine-Inoperative Speed* is a speed above both V_{MCA} and stall speed, selected to provide a margin of lateral and directional control, when one engine is suddenly rendered inoperative.
V_X	*Best Angle-of-Climb Speed* is the airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance.
V_{XSE}	*One-Engine-Inoperative Best Angle-of-Climb Speed* is the airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance with one engine inoperative.
V_Y	*Best Rate-of-Climb Speed* is the airspeed which delivers the greatest gain in altitude in the shortest possible time.
V_{YSE}	*One-Engine-Inoperative Best Rate-of-Climb Speed* is the airspeed which delivers the greatest gain in altitude in the shortest possible time with one engine inoperative.

METEOROLOGICAL TERMINOLOGY

Altimeter Setting	Barometric Pressure corrected to sea level.
Indicated Pressure Altitude	The number actually read from an altimeter when the barometric subscale has been set to 29.92 inches of mercury (1013.2 millibars).
IOAT	*Indicated Outside Air Temperature* is the temperature value read from an indicator.
ISA	International Standard Atmosphere in which: (1) The air is a dry perfect gas; (2) The temperature at sea level is 15 ° Celsius (59°

Fahrenheit);
(3) The pressure at sea level is 29.92 inches of mercury (1013.2 millibars);
(4) The temperature gradient from sea level to the altitude at which the temperature is -56.5 °C (-69.7 °F) is -0.00198 °C (0.003566 °F) per foot and zero above that altitude.

OAT — *Outside Air Temperature* is the free air static temperature obtained either from the temperature indicator (IOAT) and adjusted for compressibility effects, or from ground meteorological sources.

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

Station Pressure — Actual atmospheric pressure at field elevation.

Temperature Compressibility Effects — An error in the indication of temperature caused by airflow over the temperature probe. The error varies, depending on altitude and airspeed.

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

POWER TERMINOLOGY

Beta Range — The region of the Power Lever control which is aft of the Idle Stop and forward of reversing range where blade pitch angle can be changed without a change of gas generator rpm.

Maximum Climb and Maximum Cruise — Is the maximum power approved for normal climb and cruise. These powers are torque or temperature (ITT) limited.

Propeller Ground Fine — Propeller ground fine operation is used to provide deceleration on the ground during landing and accelerate-stop conditions by taking advantage of the maximum available propeller drag without creating negative thrust.

Maximum Continuous Power — Is the highest power rating not limited by time. Use of this rating is at the discretion of the pilot.

Maximum Normal Operating Power (MNOP) — Is the highest power setting approved that demonstrates compliance with FAR Part 36 noise level requirements.

Minimum Take-off Power — Is the minimum power which must be available for take-off without exceeding the engine limitations.

Reverse	Reverse thrust is obtained by lifting the Power Levers and moving them aft of the Beta and Ground Fine range.
SHP	*Shaft Horsepower*
Take-off Power	Is the maximum power rating and is limited to a maximum of 5 minutes operation. Use of this rating should be limited to normal take-off operations and emergency situations.

CONTROL AND INSTRUMENT TERMINOLOGY

Condition Lever (Fuel Cut-off Lever)	The fuel cut-off lever actuates a valve in the fuel control unit which controls the flow of fuel at the fuel control outlet.
ITT (Interstage Turbine Temperature)	Ten probes wired in parallel indicate the temperature between the compressor and power turbines.
N_1 Tachometer (Gas Generator RPM)	The tachometer registers the rpm of the gas generator in percent.
Power Lever (Gas Generator N_1 RPM)	This lever serves to modulate engine power from full reverse thrust to take-off. The position for idle represents the lowest recommended level of power for flight operation.
Propeller Control Lever (N_2 RPM)	This lever is used to control the rpm setting of the propeller governor. Movement of the lever results in an increase or decrease in propeller rpm. Propeller feathering is the result of lever movement beyond the detent at the low rpm (high pitch) end of the lever travel.
Propeller Governor	The propeller governor senses changes in rpm and hydraulically changes propeller blade angle to compensate for the changes in rpm. Constant propeller rpm is thereby maintained at the selected setting.
Torquemeter	The torquemeter system indicates the shaft output torque. Instrument readout is in percent.

GRAPH AND TABULAR TERMINOLOGY

AGL	*Above Ground Level*
Best Angle of Climb	The best angle-of-climb speed is the airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance with gear and flaps retracted.
Best Rate of Climb	The best rate-of-climb speed is the airspeed which delivers the greatest gain of altitude in the shortest possible time with gear and flaps retracted.
Clearway	A clearway is an area beyond the airport runway not less than 500 feet wide, centrally located about the extended centerline of the runway, and under the

control of the airport authorities. The clearway is expressed in terms for a clear plane, extending from the edge of the runway with an upward slope not exceeding 1.25 percent, above which no object nor any terrain protrudes. However, threshold lights may protrude above the plane if their height above the end of the runway is 26 inches or less and if they are located to each side of the runway.

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

Demonstrated Crosswind — The maximum 90° crosswind component for which adequate control of the airplane during takeoff and landing was actually demonstrated during certification. The value shown is not limiting.

Landing Distance — The distance from a point 50 feet above the runway surface to the point at which the airplane would come to a full stop utilizing the technique in Performance Section V. The distances do not include landing factors which may be required by the operating regulations for destination or alternate airports.

MEA — *Minimum Enroute Altitude.*

Net Gradient of Climb — The gradient of climb with the flaps in the take-off position, and the landing gear retracted. "Net" indicates that the actual gradients of climb have been reduced by .8% to allow for turbulence and pilot technique. The Net Gradient of Climb graphs are constructed so that the value(s) obtained using the airport pressure altitude and outside air temperature will be the average gradient from 35 ft above the runway up to 1500 ft above the runway.

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

Take-off Field Length — The minimum runway length required for departure. This distance is the longest of:
a. The distance to accelerate and recognize an engine failure at V_1, accelerate to and rotate at V_R, then climb and accelerate in order to achieve V_2 at 35 feet above the runway, OR
b. The distance to accelerate to V_1, with an engine failure occuring just prior to V_1, recognize the engine failure and take the first action to stop at V_1, then bring the airplane to a complete stop, OR
c. The all-engines-operating distance to accelerate to and rotate at V_R, then climb and accelerate in order to achieve V_{35} at 35 feet above the runway, increased by 15%.

Take-off Flight Path — The minimum gradient of climb required to clear obstacles in excess of 35 feet, measured horizontally from reference zero and vertically at the altitude above the runway. Reference zero is the point where the airplane has reached 35 feet above the runway as determined from the Accelerate-Go graphs.

WEIGHT AND BALANCE TERMINOLOGY

Approved Loading Envelope — Those combinations of airplane weight and center of gravity which define the limits beyond which loading is not approved.

Arm — The distance from the center of gravity of an object to a line about which moments are to be computed.

Basic Empty Weight — The weight of an empty airplane including full engine oil and unusable fuel. This equals empty weight plus the weight of unusable fuel, and the weight of all the engine oil required to fill the lines and tanks. Basic empty weight is the basic configuration from which loading data is determined.

Center of Gravity — A point at which the weight of an object may be considered concentrated for weight and balance purposes.

CG Limits — The extreme center of gravity locations within which the airplane must be operated at a given weight.

Datum — A vertical plane perpendicular to the airplane longitudinal axis from which fore and aft (usually aft) measurements are made for weight and balance purposes.

Empty Weight — The weight of an empty airplane before any oil or fuel has been added. This includes all permanently installed equipment, fixed ballast, full hydraulic fluid, full chemical toilet fluid, and all other operating fluids full, except that the engines, tanks, and lines do not contain oil or fuel.

Engine Oil — That portion of the engine oil which can be drained from the engine.

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

Landing Weight — The weight of the airplane at landing touchdown.

Leveling Points — Those points which are used during the weighing process to level the airplane.

Maximum Weight — The greatest weight allowed by design, structural, performance or other limitations.

Moment — A measure of the rotational tendency of a weight, about a specified line, mathematically equal to the product of the weight and the arm.

Payload	Weight of occupants, cargo and baggage.
Ramp Weight	The airplane weight at engine start assuming all loading is completed.
Station	The longitudinal distance from some point to the zero datum.
Take-off Weight	The weight of the airplane at lift-off from the runway.
Tare	The weight which may be indicated by a set of scales before any load is applied.
Unusable Fuel	The fuel remaining after consumption of usable fuel.
Usable Fuel	That portion of the total fuel which is available for consumption as determined in accordance with applicable regulatory standards. All usable fuel is available for all approved flight conditions.
Useful Load	The difference between the airplane ramp weight and the basic empty weight.
Zero Fuel Weight	The airplane ramp weight minus the weight of usable fuel on board.

LIMITATIONS SECTION (AD 09-04-24)

WARNING

Severe icing may result from environmental conditions outside of those for which the airplane is certificated. Flight in freezing rain, freezing drizzle, or mixed icing conditions (supercooled liquid water and ice crystals) may result in ice build-up on protected surfaces exceeding the capability of the ice protection system, or may result in ice forming aft of the protected surfaces. This ice may not be shed using the ice protection systems, and may seriously degrade the performance and controllability of the airplane.

• During flight, severe icing conditions that exceed those for which the airplane is certificated shall be determined by the following visual cures. If one or more of these visual cues exists, immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the icing conditions.

- Unusually extensive ice accumulation on the airframe and windshield in areas not normally observed to collect ice.

- Accumulation of ice on the engine nacelles and propeller spinners farther aft than normally observed.

• Since the autopilot, when installed and operating, may mask tactile cues that indicate adverse changes in handling characteristics, use of the autopilot is prohibited when any of the visual cues specified above exist, or when unusual lateral trim requirements or autopilot trim warnings are encountered while the airplane is in icing conditions.

• All wing icing inspection lights must be operative prior to flight into known or forecast icing conditions at night.

[NOTE: This supersedes any relief provided by the Master Minimum Equipment List (MMEL).]'

"WARNING

Severe icing may result from environmental conditions outside of those for which the airplane is certificated. Flight in freezing rain, freezing drizzle, or mixed icing conditions (supercooled liquid water and ice crystals) may result in ice build-up on protected surfaces exceeding the capability of the ice protection system, or may result in ice forming aft of the protected surfaces. This ice may not be shed using the ice protection systems, and may seriously degrade the performance and controllability of the airplane.

• During flight, severe icing conditions that exceed those for which the airplane is certificated shall be determined by the following visual cues. If one or more of these visual cues exists, immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the icing conditions.

- Unusually extensive ice accumulation on the airframe and windshield in areas not normally observed to collect ice.

- Accumulation of ice on the upper surface of the wing, aft of the protected area.

• Since the autopilot, when installed and operating, may mask tactile cues that indicate adverse changes in handling characteristics, use of the autopilot is prohibited when any of the visual cues specified above exist, or when unusual lateral trim requirements or autopilot trim warnings are encountered while the airplane is in icing conditions.

• All wing icing inspection lights must be operative prior to flight into known or forecast icing conditions at night. [NOTE: This supersedes any relief provided by the Master Minimum Equipment List (MMEL).]"

THIS STATEMENT COMPLIES WITH AD 98-04-25

"THE FOLLOWING WEATHER CONDITIONS MAY BE CONDUCIVE TO SEVERE IN-FLIGHT ICING:

- Visible rain at temperatures below 0 degrees Celsius ambient air temperature.
- Droplets that splash or splatter on impact at temperatures below 0 degrees Celsius ambient air temperature.

PROCEDURES FOR EXITING THE SEVERE ICING ENVIRONMENT:

These procedures are applicable to all flight phases from takeoff to landing. Monitor the ambient air temperature. While severe icing may form at temperatures as cold as -18 degrees Celsius, increased vigilance is warranted at temperatures around freezing with visible moisture present. If the visual cues specified in the Limitations Section of the AFM for identifying severe icing conditions are observed, accomplish the following:

- Immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the severe icing conditions in order to avoid extended exposure to flight conditions more severe than those for which the airplane has been certificated.
- Avoid abrupt and excessive maneuvering that may exacerbate control difficulties.
- Do not engage the autopilot.
- If the autopilot is engaged, hold the control wheel firmly and disengage the autopilot.
- If an unusual roll response or uncommanded roll control movement is observed, reduce the angle-of-attack.
- Do not extend flaps when holding in icing conditions. Operation with flaps extended can result in a reduced wing angle-of-attack, with the possibility of ice forming on the upper surface further aft on the wing than normal, possibly aft of the protected area.
- If the flaps are extended, do not retract them until the airframe is clear of ice.
- Report these weather conditions to Air Traffic Control."

THIS STATEMENT COMPLIES WITH AD 98-04-25

Temporary Change to the FAA Approved Airplane Flight Manual

P/N 122-590013-37BTC2

Publication Affected	Beech Starship 2000 FAA Approved Airplane Flight Manual (P/N 122-590013-37B, Reissued November, 1993 or Subsequent)
Airplane Serial Numbers Affected	NC-4 and after
Description of Change	Provides a Limitation prohibiting the selection of Beta Range in flight.
Filing Instructions	Insert this temporary change into the Beech Starship 2000 FAA Approved Airplane Flight Manual following page 2-4 (LIMITATIONS Section), and retain until rescinded or replaced.

LIMITATIONS

POWER PLANT LIMITATIONS

POWER LEVERS

Do not lift the power levers in flight. Lifting the power levers in flight, or moving the power levers in flight below the flight idle position, could result in a nose-down pitch and a descent rate leading to aircraft damage and injury to personnel.

FAA Approved by:

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

AIRPLANE FLIGHT MANUAL LIMITATION SUPPLEMENT

DO NOT LIFT THE POWER LEVERS IN FLIGHT. LIFTING THE POWER LEVERS IN FLIGHT BELOW THE FLIGHT IDLE POSITION COULD RESULT IN NOSE DOWN PITCH AND A DESCENT RATE LEADING TO AIRCRAFT DAMAGE AND INJURY TO PERSONNEL.

THIS STATEMENT COMPLIES WITH FAA AIRWORTHINESS DIRECTIVE 97-25-03.

SECTION II
LIMITATIONS
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SECTION II
LIMITATIONS
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The limitations included in this section have been approved by the Federal Aviation Administration and must be observed in the operation of the BEECHCRAFT 2000

AIRSPEED LIMITATIONS (14,900 POUNDS)

SPEED	KCAS	KIAS	REMARKS
Maneuvering Speed (V_A)	180	181	Do not make full or abrupt control movements above this speed.
Maximum Flap Extension/ Extended Speed (V_{FE})			Do not extend flaps or operate with flaps extended above this speed.
Full Extended Position	179	180	
Maximum Landing Gear Operating Speed (V_{LO})			Do not extend or retract landing gear above these speeds.
Extension	199	200	
Retraction	179	180	
Maximum Landing Gear Extended Speed (V_{LE})	199	200	Do not exceed this speed with landing gear extended.
Air Minimum Control Speed (V_{MCA})			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 is at take-off power.
Propeller Feathered			
Flaps Extended	88	89	
Flaps Retracted	91	94	
Maximum Operating Speed (V_{MO})			
Sea Level to 10,000 feet	242	245	These speeds may not be deliberately exceeded in any flight regime. Red pointer reflects V_{MO} limit.
10,000 to 12,000 feet	242-261*	245-265*	
12,000 to 21,900 feet	261	265	
21,900 to 41,000 feet	261-173**	265-173**	
*Linear variation between points shown.			** 0.60 Mach

BT04015

AIRSPEED INDICATOR MARKINGS (ASI)

MARKING OR RANGE	KIAS VALUE OR RANGE	SIGNIFICANCE
Red Line	94	Air Minimum Control Speed (V_{MCA})
White Arc	92 to 180	Full-flap Operating Range.
Dual White Arc	92 to 97	Lower limit is Stalling Speed (V_{SO}) at maximum weight with flaps extended and idle power.
Single White Arc	97 to 180	Lower limit is Stalling Speed (V_S) at maximum weight with flaps retracted and idle power. Upper limit is the maximum speed permissible with flaps extended.
White Line	200	Maximum Landing Gear Extension Speed.
Blue Line	130	One-Engine-Inoperative Best Rate-of-Climb Speed. Decreases with altitude. (0.55 KIAS/1000 feet)
Red Pointer (V_{MO}) Sea Level - 10,000 feet 10,000 - 12,000 feet 12,000 - 21,900 feet 21,900 - 41,000 feet *Linear variation between points shown	 245 245-265* 265 265-173**	Maximum Operating Speed These speeds may not be deliberately exceeded in any flight regime. ** 0.60 Mach
		BT03566

POWER PLANT LIMITATIONS

NUMBER OF ENGINES

2

ENGINE MANUFACTURER

Pratt & Whitney of Canada Inc. (Longueuil, Quebec, Can.)

ENGINE MODEL NUMBER

PT6A-67A

ENGINE OPERATING LIMITS

The following limitations shall be observed. Each column presents limitations. The limits presented do not necessarily occur simultaneously. Refer to the Pratt & Whitney Engine Maintenance Manual for specific actions required if limits are exceeded.

OPERATING CONDITION	SHP	TORQUE % (1)	MAXIMUM ITT °C	GAS GEN RPM % N_1	PROP RPM N_2	OIL PRESSURE PSI (2)	OIL TEMP °C
STARTING	---	---	1000 (3)	---	---	200 (max)	-40 (min)
IDLE	---	---	750 (4)	65 (min)	1000 (min)	60 (min)	-40 to 110
TAKEOFF	1200	100	850 (5)	104	1700	90 to 135	10 to 110
MAX CONT	1193	100	840	104	1690	90 to 135	10 to 105
MAX CLIMB	1000	(6)	840	104	1690	90 to 135	10 to 105
MAX CRUISE	1100	97	840	104	1600	90 to 135	10 to 105
MAX REVERSE	900	---	760	---	1650	90 to 135	10 to 105
TRANSIENT	---	138 (7)	870 (7)	104	1870 (7)	40 to 200	-40 to 110

FOOTNOTES:

(1) Torque limit applies within range of 1000 - 1700 propeller rpm (N_2). Below 1000 propeller rpm, torque is limited to 54%

(2) Normal oil pressure is 90 to 135 psig at gas generator speeds above 72%. With engine torque below 81%, minimum oil pressure is 85 psig at normal oil temperature (60 to 70°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 exceeding 54% 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.

(3) These values are time limited to 5 seconds.

(4) High ITT at ground idle may be corrected by reducing accessory load and/or increasing N_1 rpm.

(5) This value is time limited to 5 minutes.

(6) 84% torque at 1690 RPM or 89% torque at 1600 RPM.

(7) These values are time limited to 20 seconds.

BT03955

STARTER LIMITS

Use of the starter is limited to 30 seconds ON, 5 minutes OFF, 30 seconds ON, 5 minutes OFF, 30 seconds ON, then 30 minutes OFF.

EXTERNAL POWER LIMITS

External power carts will be set to 28.0 - 28.4 volts and be capable of generating a minimum of 1000 amps momentarily and 300 amps continually.

GENERATOR LIMITS

Maximum sustained generator load limits are as follows:

GROUND OPERATION

Generator Load %	Minimum N_1 %
50 and below	65
Above 50	72
BT01388	

INFLIGHT OPERATION

Except for approach and landing

Generator Load %	Altitude Feet	Minimum N_1 %
Above 50	S.L. to 25,000	80
Above 50	Above 25,000	90
BT01159		

FUEL LIMITS

APPROVED ENGINE FUELS

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
- 100 Green
- 100LL Blue

MILITARY AVIATION GASOLINE GRADES

- 80/87 Red
- 100/130 Green
- 115/145 Purple

LIMITATIONS ON THE USE OF AVIATION GASOLINE

1. Left and Right standby fuel pumps must be ON for takeoff and landing.
2. Operation is limited to 150 hours between engine overhauls.

APPROVED FUEL ADDITIVES

Anti-icing additive conforming to Specification MIL-I-27686 or MIL-I-85470 must be blended with the fuel.

CAUTION

Anti-icing additive must be properly blended with the fuel to avoid deterioration of the fuel cells. The additive concentration shall be a minimum of 0.10% and a maximum of 0.15% by volume. Approved procedure for adding anti-icing concentrate is contained in Section IV.

Some fuel suppliers blend anti-icing additive in their storage tanks. Prior to refueling, check with the fuel supplier to determine whether or not the fuel has been blended. To assure proper concentration by volume of fuel on board, blend only enough additive for the unblended fuel.

FUEL MANAGEMENT

USABLE FUEL

Maximum usuable fuel quantity is 565 gallons (3785 pounds at 6.7 pounds/gallon fuel density). Each main fuel system equals 282.5 gallons (1892.5 pounds).

FUEL IMBALANCE

Maximum allowable fuel imbalance between wing fuel systems is 150 pounds.

FUEL TRANSFER

Cross-transferring of fuel is permitted only during ground and cruise flight operation.

MINIMUM FUEL FOR TAKEOFF

Do not takeoff if fuel quantity gages indicate less than 270 pounds per side.

MINIMUM FUEL TEMPERATURE

The minimum fuel temperature is -27° C.

STANDBY FUEL PUMPS

The left and right standby pumps must be operative for takeoff.

OIL SPECIFICATION

Any oil specified by brand name in the latest revision of Pratt & Whitney Service Bulletin Number 14001 is approved for use in the PT6A-67A engine.

NUMBER OF PROPELLERS

2

PROPELLER MANUFACTURER

McCauley Propeller (Vandalia, Ohio)

PROPELLER HUB AND BLADE MODEL NUMBERS

HUBS: 5JFR36C1003/

BLADES: D-L104DSZ-0

PROPELLER DIAMETER

104.0 inches

PROPELLER BLADE ANGLES AT 30-INCH STATION

Left Feathered: +90.9° - Reverse -8°

Right Feathered: +91.7° - Reverse -8°

PROPELLER ROTATIONAL SPEED LIMITS

Transients not exceeding 20 seconds . . . . . 1870 rpm

All other conditions . . . . . 1700 rpm

Minimum idle speed . . . . . 1000 rpm

Red Arc Ground Operation Prohibited Range . . . . . 700 - 1000 rpm

Red Arc Inflight Operation Prohibited Range . . . . . 1450 - 1580 rpm

PROPELLER ROTATIONAL OVERSPEED LIMITS

Sustained propeller overspeeds higher than 1700 rpm indicate failure of the primary governor. Flight may be continued at propeller overspeeds up to 1768 rpm, provided torque is limited to 96%. Sustained propeller overspeeds above 1768 rpm indicate failure of both the primary governor and the secondary governor.

PROPELLER AUTOFEATHER

The propeller autofeather system must be operable for all flights and must be armed for takeoff, climb, approach and landing.

POWER PLANT DISPLAY MARKINGS (EICAS)

	RED: MINIMUM OR PROHIBITED RANGE	GREEN: NORMAL OPERATING RANGE	CYAN: ABOVE MNOP	CYAN POINTER: (MNOP) (2)	YELLOW: CAUTION RANGE	YELLOW POINTER: (MCP)	RED LINE
ITT	---	---	---	-----	840-850	840	850 (3)
TORQUE METER	---	0-80%	80%-100%	80%	---	--	100
PROPELLER TACHOMETER	700-1000 1450-1580 (1)	1580-1600	1600-1690	1600	1690-1700	--	1700
GAS GENERATOR TACHOMETER	---	65-104	---	---	---	--	104
OIL TEMPERATURE	---	0-110°C	---	---	---	--	110°C
OIL PRESSURE	0-60 PSI	90-135 PSI	---	---	60-90 PSI	--	200 PSI

NOTES:
1. In flight only.
2. Maximum Normal Operating Power: These values provide compliance with FAR Part 36 noise level requirements.
3. The starting limit is an extended scale with a red triangle at the 1000 deg. limit.

BT02180

WEIGHT LIMITS

Maximum Ramp Weight . . . . . 15,010 pounds

Maximum Take-off Weight is 14,900 pounds, or as limited by the following performance graphs or criteria (Refer to Section V):

- Maximum Take-off Weight to Achieve Takeoff Climb Requirements
- Takeoff Field Length
- Maximum Take-off Weight as Limited by Tire Speed

Additionally, for FAR 135 Operations:

- Service Ceiling - One Engine Inoperative
- Take-off Flight Path Requirements to 1500 feet AGL

Maximum Landing Weight is 13,680 pounds or as limited by the following performance graphs (Refer to Section V):

- Maximum Landing Weight to Achieve Landing Climb Requirements
- Landing Distance

Maximum Zero Fuel Weight . . . . . 12,600 pounds

Maximum Weight in Baggage Compartments:

Forward . . . . . 160 pounds

Aft . . . . . 525 pounds

CENTER OF GRAVITY LIMITS

AFT LIMIT

320.0 inches aft of datum at all weights

FORWARD LIMITS

310.9 inches aft of datum at 14,900 pounds, with straight line variation to 307.0 inches aft of datum at 13,450 pounds. 307.0 inches aft of datum at 13,450 pounds or less.

DATUM

The reference datum is located 86.2 inches forward of the center of the front jack point.

MANEUVER LIMITS

The BEECHCRAFT 2000 is a commuter category airplane. Acrobatic maneuvers, including spins, are prohibited.

FLIGHT LOAD FACTOR LIMITS

FLAPS RETRACTED	FLAPS EXTENDED
3.06 positive g's	2.0 positive g's
1.22 negative g's	0.0 negative g's

MINIMUM FLIGHT CREW

The minimum crew is one pilot for NC-23 and after, and airplanes prior to NC-23 that have been modified by Beechcraft Kit P/N 122-3001. See the Kinds of Operations Equipment List in this section for required equipment.

or;

The minimum crew is one pilot and one copilot for airplanes prior to NC-23 that have not been modified by Beechcraft Kit P/N 122-3001.

MAXIMUM OCCUPANCY LIMITS

Nine passengers plus crew with approved passenger seating configuration

MAXIMUM OPERATING PRESSURE-ALTITUDE LIMITS

Normal Operation . . . . . 41,000 feet

Operation with Flaps/Fwd Wing Extended . . . . . 20,000 feet

Intentional Stalls . . . . . 20,000 feet

OUTSIDE AIR TEMPERATURE LIMITS

MAXIMUM LIMITS

Sea Level to 41,000 feet pressure altitude . . . . . ISA +37°C

CABIN PRESSURIZATION LIMITS

Maximum Cabin Pressure Differential . . . . . 8.4 psi

MISCELLANEOUS INSTRUMENT MARKINGS

CABIN DIFFERENTIAL PRESSURE GAGE

Green Arc (Normal Operating Range) . . . . . 0 to 8.4 psi

Red Line (Maximum Operating Range) 8.4

OXYGEN LIMITS

Oxygen supply must be adequate for the flight. Quick donning crew masks must be checked, set to 100%, and properly stowed prior to flight. When passengers are carried, all oxygen dispensing units must be operable.

Service oxygen only with aviators breathing oxygen, MIL-O-27210.

SYSTEMS AND EQUIPMENT LIMITS

AVIONICS

Ground operation of integrated avionics with cabin temperature exceeding 95°F shall be limited to 30 minutes.

GENERAL

1. This avionic system is intended for use with Collins FMS Program Number 613-5470-013, dated 09 NOV 89 or later approved version.
2. The following Starship Pilot's Operating Manual must be immediately available to the flight crew: P/N 122-590013-39 or later version.

AUTOPILOT

1. Maximum speed for operation of the autopilot is V_{MO}.
2. The minimum speed for autopilot operation on a coupled approach is 125 KIAS.
3. Disconnect the autopilot at or above 200 feet AGL when on a coupled ILS approach.
4. The autopilot and yaw damper must be disengaged for takeoff and landing.
5. Pilot must be seated at the controls with the seatbelt fastened during autopilot operations.
6. Nav captures, including localizer captures, must be accomplished with an intercept angle of 90° or less.
7. Altitude Hold must not be selected when the vertical speed exceeds ±3000 FPM.
8. Both AHRS are required for autopilot operation.
9. 1/2 BANK mode must be used when operating above 30,000 feet with the autopilot engaged.

In addition, the following limits apply to airplanes that have not been modified by Beechcraft Kit P/N 122-3020:

10. Coupled and Flight Director guided Back-Course approaches are prohibited.
11. Coupled VOR approaches are prohibited at airports with field elevations above 3000 feet.

FLIGHT MANAGEMENT SYSTEM LIMITATIONS (FMS)

1. IFR navigation is prohibited unless the pilot verifies each selected waypoint and navaid for accuracy by reference to current approved data.
2. When using the Multi-Sensor Area Navigation System, additional equipment required for the specific type of operation must be installed and operable. Minimum equipment for enroute FMS operation is 1 VOR, 1 DME, valid heading and TAS inputs or 3 VLF and/or Omega stations and

valid heading and TAS inputs. Minimum equipment for FMS approach operation is 1 VOR, 1 DME and valid heading and TAS inputs.

3. The Multi-Sensor system position must be checked for accuracy prior to use as a means of navigation and under the following conditions:
   a. At or prior to arrival at each enroute waypoint during FMS navigation along approved RNAV routes.
   b. Prior to requesting off-airway routing, and at hourly intervals thereafter during FMS navigation off approved RNAV routes.
   c. Prior to each compulsory reporting point during IFR operation when not under radar surveillance or control.
4. Following a period of dead reckoning navigation, the system position should be verified and updated, as required, by visually sighting a ground reference point and/or by using other installed navigation equipment, such as VOR, DME, TACAN, or a combination of such equipment.
5. During periods of dead reckoning operation, the FMS Multi-Sensor Area Navigation System should be used with caution.
6. Acute angle FMS navigation course changes of ±135 degrees or more will result in a turn which departs significantly from both the old and the new desired tracks. The direction of this turn will depend upon airplane heading when the leg change is initiated.
7. Monthly updates of the FMS navigation data base must be loaded on or after the effective date. Changes loaded prior to their effective date will be lost.
8. Published routes and procedures must be flown as point-to-point legs when FMS is the active navigation source (i.e., AUTO LEG or MAN LEG with a FROM and TO waypoint shown in the flight plan).
9. Operation is degraded by magnetic heading errors near the magnetic poles. Operation is acceptable between 60 degrees north latitude and 60 degrees south latitude at any longitude.
   Operation to 70 degrees north latitude is acceptable east of 75 degrees west longitude and west of 120 degrees west longitude. Operation to 80 degrees north latitude is acceptable east of 50 degrees west longitude and west of 70 degrees east longitude.
   Operation to 70 degrees south latitude is acceptable except for the 45 degrees between 120 degrees east and 165 degrees east longitude.
10. The FMS is approved for RNAV approaches under the following conditions:
    a. Either VHF navigation receiver must be tuned to the reference VOR.
    b. The FMS must be programmed with data from current published instrument approach procedures only.
11. Fuel management parameters are advisory only, and do not replace the primary fuel quantity and fuel flow indicators.
12. For the FMS program number 613-5470-011, do not attempt to load or inspect a waypoint that is more than 8000 NM from the FMS present position. Attempting to do so will result in a condition that will require the FMS-NO 1 circuit breaker to be cycled.
13. Provided the Multi-Sensor Area Navigation System is receiving adequate usable sensor inputs, it has been demonstrated capable of and has been shown to meet the accuracy specifications of: VFR/IFR enroute RNAV operation worldwide in accordance with the criteria of AC 20-130.

LANDING GEAR CYCLE LIMIT

Landing gear operation is limited to 3 cycles (3 up - 3 down) every 5 minutes.

ICING LIMITATIONS

Minimum Airspeed for Icing Flight
(Except for Takeoff, Approach, and Landing) . . . . . 160 KIAS

Minimum Airspeed in Non-icing Conditions with a Failed Main Wing Boot with Accumulated Ice Attached (Except for Landing) . . . . . 130 KIAS

Icing Flight With Gear Down and Flaps Extended
(Except for Approach) . . . . . PROHIBITED

Minimum Ambient Temperature for Operation of Deicing Boots . . . . -53°C OAT

Engine Ice Protection (Inertial Separators) shall be ON for operation in ambient temperatures of +5°C OAT or below when flight free of visible moisture cannot be assured.

Engine Ice Protection shall be OFF for takeoff in ambient temperatures above +10° C and for flight operations in ambient temperatures above +10°C OAT.

Flaps/Forward Wing Retracted takeoffs are prohibited with the use of SAE AMS 1428 and ISO 11078 Type II Deice/Anti-ice fluids.

APPROVED AIRPLANE DEICE AND ANTI-ICE FLUIDS

SAE AMS 1424 Type I

ISO 11075 Type I

SAE AMS 1428 Type II

ISO 11078 Type II

CARGO LIMITATIONS

1. All cargo shall be properly secured by an FAA-approved cargo restraint system.
2. Areas beneath seats must remain free from hard, solid articles.
3. Cargo must be arranged to permit free access to all exits and emergency exits.
4. Cockpit and Lavatory doors must be latched in the open position (aisleway clear) before takeoff and landing.

ALL OPERATIONS

1. The following systems must be checked and operable in accordance with procedures in Section IV, Normal Procedures section of this manual.
   a. Flap/Forward Wing monitors (left and right)
   b. Stall Warning
   c. Trim (normal/standby pitch, roll, and rudder)
   d. Standby Attitude Gyro and AUX BATT test

e. Electrical power distribution system. See "Before Engine Starting" and "Engine Starting (Battery)" checklists in the Normal Procedures section.

2. Crew seat and rudder pedals shall be positioned prior to flight to allow operation of the flight controls throughout their full range of travel. Flight is prohibited if the flight controls cannot be operated through the full range of travel.
3. A crew member must close and lock the airstair door.

Airplanes NC-4 through NC-12 not modified by Beechcraft Kit P/N 122-3013

4. Fluorescent cabin lighting must be inspected prior to flight. If any bulb is inoperative, flickering, or not installed, the bulb must be replaced or the lights shall be rendered inoperative by pulling the READ/TABLE LIGHTS circuit breaker located on the auxiliary circuit breaker panel.

Airplanes NC-13 through NC-20 not modified by Beechcraft Kit P/N 122-3013

5. Fluorescent cabin lighting must be inspected prior to flight. If any bulb is inoperative, flickering, or not installed, the bulb must be replaced or the lights shall be rendered inoperative by pulling the RDG/TAB LIGHTS circuit breaker located on the right circuit breaker panel.

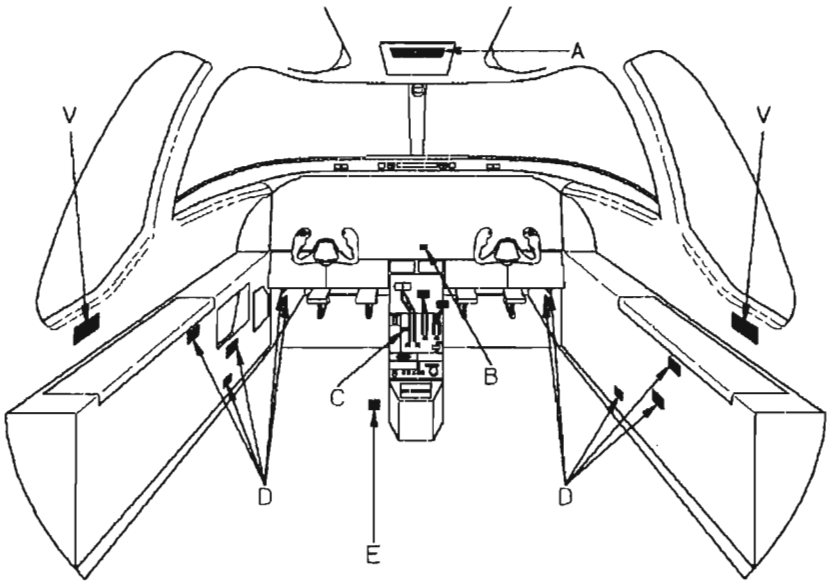
LIMITATIONS WHEN ENCOUNTERING SEVERE ICING CONDITIONS (Required By FAA AD 98-04-25)

WARNING

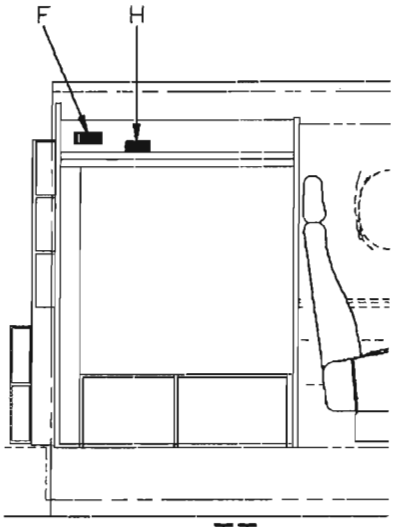
Severe icing may result from environmental conditions outside of those for which the airplane is certificated. Flight in freezing rain, freezing drizzle, or mixed icing conditions (supercooled liquid water and ice crystals) may result in ice build-up on protected surfaces exceeding the capability of the ice protection system, or may result in ice forming aft of the protected surfaces. This ice may not be shed using the ice protection systems, and may seriously degrade the performance and controllability of the airplane.

1. During flight, severe icing conditions that exceed those for which the airplane is certificated shall be determined by the following visual cues. If one or more of these visual cues exists, immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the icing conditions.
   a. Unusually extensive ice accumulation on the airframe and windshield in areas not normally observed to collect ice.
   b. Accumulation of ice on the upper surface of the wing, aft of the protected area.
2. Since the autopilot, when installed and operating, may mask tactile cues that indicate adverse changes in handling characteristics, use of the autopilot is prohibited when any of the visual cues specified above exist, or when unusual lateral trim requirements or autopilot trim warnings are encountered while the airplane is in icing conditions.
3. All wing icing inspection lights must be operative prior to flight into known or forecast icing conditions at night. [NOTE: This supersedes any relief provided by the Master Minimum Equipment List (MMEL).]

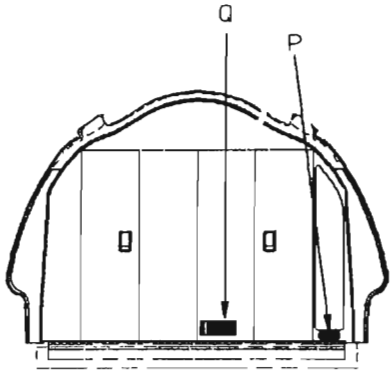
PLACARDS
SIX PASSENGER SEATING



VIEW I

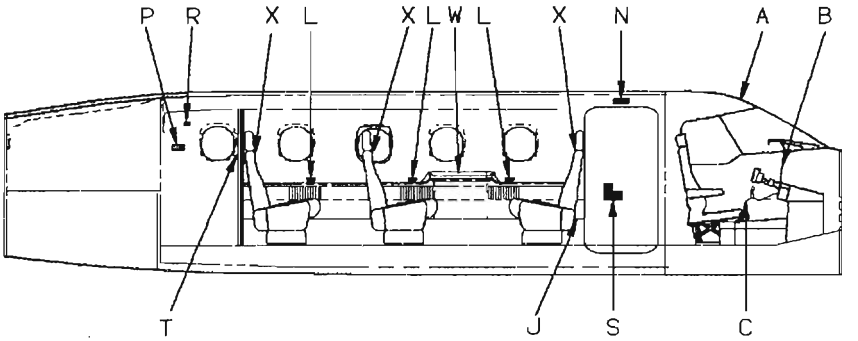


VIEW II

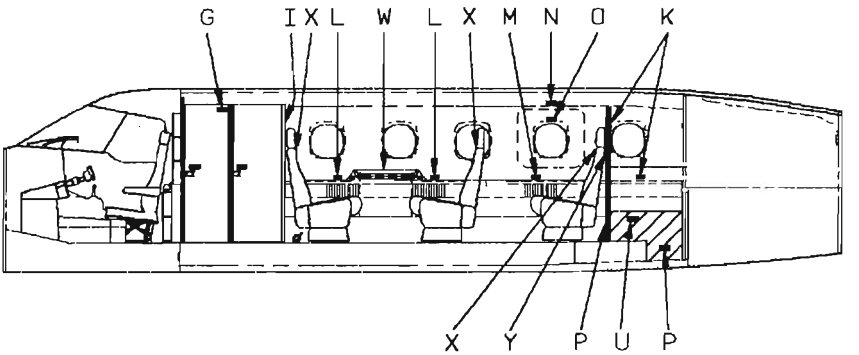


VIEW III

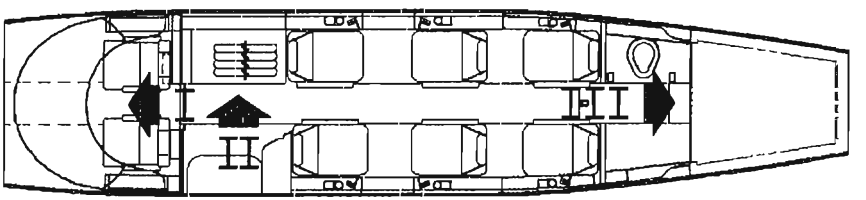
C9200769



LEFT SIDE VIEW



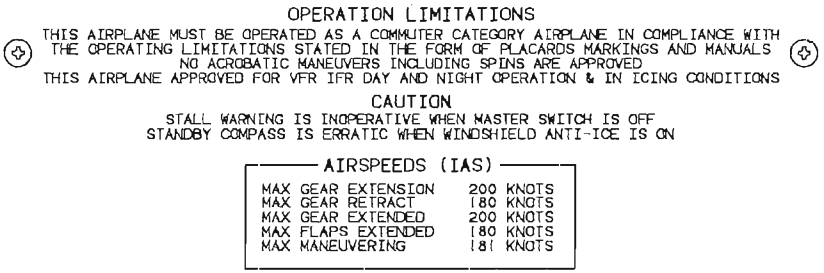
RIGHT SIDE VIEW



TOP VIEW

C9200882

ON OVERHEAD PANEL IN PILOT'S COMPARTMENT:

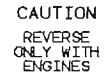


DETAIL A

ON PRESSURIZATION PANEL:

DETAIL B

ON PEDESTAL ADJACENT TO POWER LEVERS:



DETAIL C

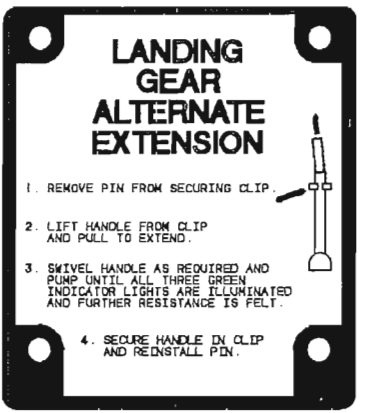
2000-016-16

ON WIRE TRAY ACCESS COVERS AND CIRCUIT BREAKER PANEL SUPPORTS OF PILOT AND COPILOT CONSOLES:

WARNING
WIRE TRAY DOOR
MUST BE SECURED WHILE
AIRCRAFT IS IN FLIGHT

DETAIL D

ON COCKPIT FLOOR BETWEEN PILOT'S SEAT AND PEDESTAL, ADJACENT TO LANDING GEAR PUMP HANDLE:



DETAIL E

ON FORWARD BAGGAGE COMPARTMENT DOOR, VISIBLE WHEN DOORS ARE OPEN:

MAXIMUM COMPARTMENT CAPACITY
160 LBS

WITH BAGGAGE NET RESTRAINT INSTALLED AND SECURED FOR TAKE OFF AND LANDING

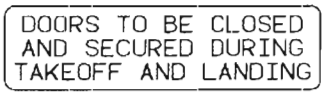
THIS TOTAL INCLUDES BAGGAGE AND/OR OPTIONAL EQUIPMENT/FURNISHINGS

SEE WEIGHT AND BALANCE INSTRUCTIONS.

DETAIL F

2000-016-17

ON FORWARD BAGGAGE COMPARTMENT DOOR:

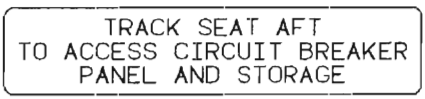


DETAIL G

ON FORWARD BAGGAGE COMPARTMENT, VISIBLE WHEN DOORS ARE OPEN:

DETAIL H

ON AFT SURFACE OF FORWARD CABIN PARTITION, LEFT SIDE:

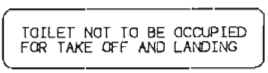


DETAIL I

BESIDE TRASH CONTAINER, LH FORWARD CABINET:

DETAIL J

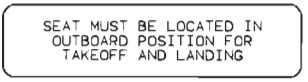
ON AFT SURFACE OF AFT CABIN PARTITION AND ON SIDEWALL ADJACENT TO TOILET:



DETAIL K

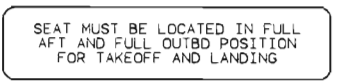
2000-016-025

ON CABIN SIDE WALL UPHOLSTERY ADJACENT TO PASSENGER SEATS (EXCEPT RIGHT AFT SEAT):



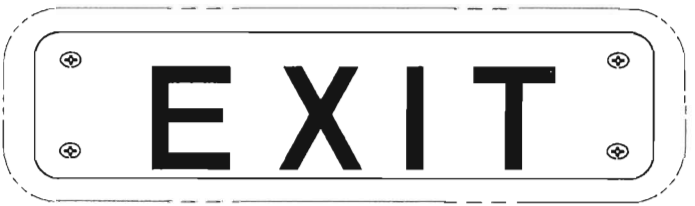
DETAIL L

ON CABIN SIDE WALL UPHOLSTERY ADJACENT TO RIGHT AFT SEAT ONLY:



DETAIL M

ABOVE CABIN DOOR AND EMERGENCY EXIT DOOR:



DETAIL N

2000-016-026

ON EMERGENCY EXIT DOOR HANDLE:

EXIT - PULL

DETAIL O

IN AFT BAGGAGE COMPARTMENT AND
ON AFT PARTITION ADJACENT TO VENT:

RETURN AIR DUCT
DO NOT BLOCK
AIR FLOW

DETAIL P

ON OUTSIDE SURFACE OF AFT BAGGAGE
COMPARTMENT DOORS:

MAXIMUM COMPARTMENT CAPACITY
525 LBS

WITH BAGGAGE NET RESTRAINT INSTALLED
AND SECURED FOR TAKE OFF AND LANDING

THIS TOTAL INCLUDES BAGGAGE AND/OR
OPTIONAL EQUIPMENT/FURNISHINGS

SEE WEIGHT AND BALANCE INSTRUCTIONS.

DETAIL Q

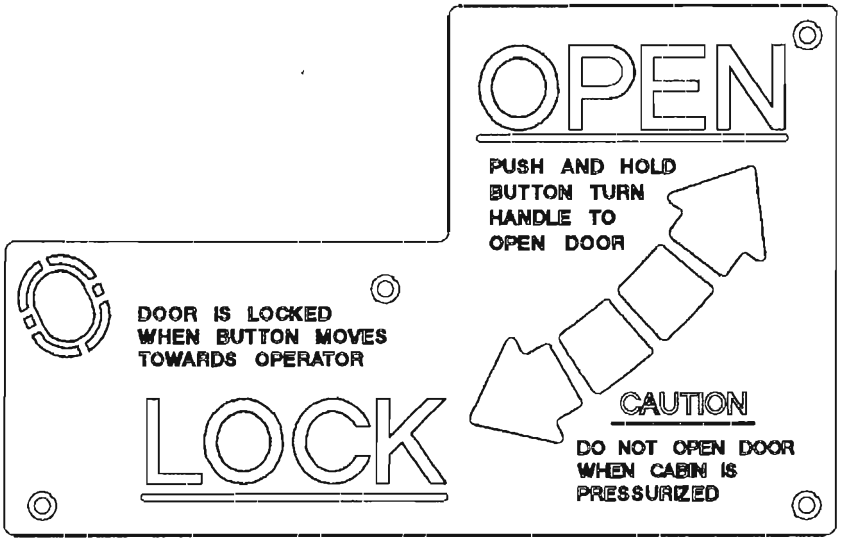
2000-016-027

ON COAT HOOK IN AFT TOILET:

COAT HANGER
MAX WEIGHT CAPACITY 25 LBS

DETAIL R

ON AIRSTAIR DOOR ADJACENT TO DOOR HANDLE:



DETAIL S

ON FORWARD WALL IN AFT TOILET:

NO SMOKING

DETAIL T

ON INBOARD SURFACE OF TOILET:

PUSH

DETAIL U

2000-016-028

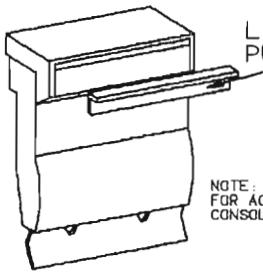
BELOW COCKPIT SIDE WINDOW,
L AND R SIDE:

SEAT BACK MUST BE
IN UPRIGHT POSITION FOR
TAKEOFF AND LANDING

DETAIL V

ON LOWER SURFACE OF CABIN TABLES:

FOR ACCESS TO UPPER
ATTACHMENT SCREWS



DETAIL W

ON SHOULDER HARNESS OF EACH
PASSENGER SEAT:

SHOULDER HARNESS MUST
BE WORN DURING TAKE-
OFF AND LANDING WITH
SEAT IN OUTBD POSITION,
SEAT BACK UPRIGHT AND
HEADREST FULLY EXTENDED

DETAIL X

ON FORWARD SIDE OF AFT CABIN PARTITION:

NO SMOKING
IN LAVATORY

DETAIL Y

C9300422 C

KINDS OF OPERATIONS

The BEECHCRAFT 2000 is approved for the following types of operations when the required equipment is installed and operational as defined within the KINDS OF OPERATIONS EQUIPMENT LIST.

1. VFR Day
2. VFR Night
3. IFR Day
4. IFR Night
5. Icing Conditions

KINDS OF OPERATIONS EQUIPMENT LIST

This airplane may be operated in day or night VFR, IFR, or icing conditions when the appropriate equipment is installed and operable.

The following equipment list identifies the systems and equipment upon which type certification for each kind of operation was predicated. The systems and items of equipment listed must be installed and operable for the particular kind of operation indicated unless:

1. The airplane is approved to be operated in accordance with a current Minimum Equipment List (MEL) issued by the FAA.

or;

2. An alternate procedure is provided in the FAA Approved Airplane Flight Manual for the inoperative state of the listed equipment and all limitations are complied with.

SYSTEM and/or COMPONENT	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING
ELECTRICAL POWER					
1. Battery	1	1	1	1	1
2. Battery Monitor System (Including Annunciator	1	1	1	1	1
3. DC Generator	2	2	2	2	2
4. DC Loadmeter	2	2	2	2	2
5. DC Voltmeter and Selectors	1	1	1	1	1
6. Battery Ammeter and Selectors	1	1	1	1	1
7. Loadmeter and Selectors	1	1	1	1	1
8. Nose Mounted Sealed Battery Packs (Avionics)	2	2	2	2	2
ENGINE INDICATIONS					
1. Engine Indicating and Crew Alerting System (EICAS)	1	1	1	1	1
2. Multi-function Display (MFD) (EICAS Reversion)	1	1	1	1	1
3. Radio Tuning Unit (RTU) (Backup Engine Display)	1	1	1	1	1
ENGINE OIL					
1. Low Oil Pressure Annunciator	2	2	2	2	2
ENVIRONMENTAL					
1. Bleed Air Fail Annunciators	3	3	3	3	3
2. Cabin Altitude High Annunciator	1	1	1	1	1
3. Cabin Rate of Climb Indicator	1	1	1	1	1
4. Engine Bleed Air Shutoff Valve	2	2	2	2	2
5. Outflow/Safety Valve	2	2	2	2	2
6. Pressurization Controller	1	1	1	1	1
7. Differential Pressure High Annunciator	1	1	1	1	1
8. Cabin Pressure Altitude Indicator	1	1	1	1	1
9. Ventilation Blowers	2	2	2	2	2
10. Avionics Alternate Blower	1	1	1	1	1
11. Pneumatic System	1	1	1	1	1

SYSTEM and/or COMPONENT	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	
EQUIPMENT/FURNISHINGS						
1. Exit Signs Self-Illuminating	4	4	4	4	4	
FIRE PROTECTION						
1. Engine Fire Detector System	2	2	2	2	2	
2. Engine Fire Extinguisher	2	2	2	2	2	
3. Portable Fire Extinguisher	2	2	2	2	2	
FLIGHT CONTROLS						
1. Flap/FWD Wing TRANS/EXTEND Lights	1	1	1	1	1	
2. Flap/FWD Wing System	1	1	1	1	1	
3. Trim Tab Position Indicator (Pitch, Roll, Rudder)	3	3	3	3	3	
4. Stall Warning System	1	1	1	1	1	
5. Trim Monitor (All Axes)	3	3	3	3	3	
FUEL						
1. Standby Electric Fuel Pump	2	2	2	2	2	
2. Low Fuel Pressure Annunciator	2	2	2	2	2	
3. Fuel Quantity Indicating System	2	2	2	2	2	
4. Firewall Fuel Shutoff System (Including Annunciators)	2	2	2	2	2	
5. Engine Driven Boost Pump	2	2	2	2	2	
6. Fuel Cross Transfer System	1	1	1	1	1	
7. Jet Boost Pumps	2	2	2	2	2	

SYSTEM and/or COMPONENT	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING	
ICE AND RAIN PROTECTION						
1. Isolated Static System	1	1	1	1	1	
2. Engine Auto Ignition System	2	2	2	2	2	
3. Engine Anti-Ice System	2	2	2	2	2	
4. Heated Fuel Vent	0	0	0	0	2	
5. Heated Windshield	2	2	2	2	2	
6. Pitot Heat	2	2	2	2	2	
7. Stall Warning Heat	2	2	2	2	2	
8. Wing Ice Light (Left)	0	0	0	0	1	
9. Windshield Wiper	2	2	2	2	2	
10. Ice Detector	0	0	0	0	2	
11. Pneumatic Boot System	0	0	0	0	1	
LANDING GEAR						
1. Landing Gear Position Indicator Light	3	3	3	3	3	
2. Landing Gear Handle Light	1	1	1	1	1	
3. Landing Gear Aural Warning	1	1	1	1	1	
4. Landing Gear Hydraulic Power Pack	1	1	1	1	1	
5. Alternate Extension Hand Pump	1	1	1	1	1	
LIGHTS						
1. Cockpit and Instrument Lighting System	0	1	0	1	1	
2. Airstair Door	1	1	1	1	1	
3. Position Light Note: Left; Red with White. Right; Green with White.	0	4	0	4	4	
4. Anti-collision Light	0	2	0	2	2	
5. Passenger Notice System	1	1	1	1	1	

SYSTEM and/or COMPONENT	VFR DAY	VFR NIGHT	IFR DAY	IFR NIGHT	ICING
MISCELLANEOUS EQUIPMENT					
(Single Pilot Operation Only) (NC-4 thru NC-22 modified by Beechcraft Kit P/N 122-3001; NC-23, and after					
1. Headset with Boom Mic	1	1	1	1	1
2. Autopilot/Flight Director	1	1	1	1	1
3. Abbreviated Emergency, Abnormal and Normal Procedures Checklist	1	1	1	1	1
NAVIGATION INSTRUMENTS					
1. Airspeed Indicator (ASI)	2	2	2	2	2
2. Sensitive Altimeter (ALI)	2	2	2	2	2
3. Magnetic Compass	1	1	1	1	1
4. Vertical Speed (Part of Sensitive Altimeter)	0	0	2	2	2
5. Gyroscopic Bank & Pitch Indicator (PFD)	2	2	2	2	2
6. Gyroscopic Direction Indicator (ND)	2	2	2	2	2
7. Sensor Display Unit (SDU)	1	1	1	1	1
8. Standby Attitude Gyro	1	1	1	1	1
9. Standby Altimeter	1	1	1	1	1
10. Standby Airspeed Indicator	1	1	1	1	1
11. AHRS Comparator System	1	1	1	1	1
OXYGEN					
1. Oxygen System	1	1	1	1	1
PROPELLER					
1. Autofeather System	1	1	1	1	1
2. Propeller Governor Test Switch	1	1	1	1	1
3. Propeller Overspeed Governor	2	2	2	2	2
4. Propeller Electric Ground Idle Stop	2	2	2	2	2

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SECTION III
EMERGENCY PROCEDURES
TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

All airspeeds quoted in this section are *indicated airspeeds (IAS)* and assume zero instrument error.

NOTE

Immediate action procedures are delineated by bold type with the remaining procedures following.

EMERGENCY AIRSPEEDS (14,900 POUNDS)

One-Engine-Inoperative Best Angle-of-Climb (V_{XSE}) . . . . . 115 Knots

One-Engine-Inoperative Best Rate-of-Climb (V_{YSE}) . . . . . 130 Knots
(Decreases 0.55 KIAS/1000 feet above sea level, Blue Line)

Air Minimum Control Speeds (V_{MCA}):

Propeller Feathered

Flaps Retracted . . . . . 94 Knots

Flaps Extended . . . . . 89 Knots

Propeller Windmilling

Flaps Retracted . . . . . 135 Knots

Flaps Extended . . . . . 135 Knots

Emergency Descent . . . . . 200 Knots

Maximum Range Glide . . . . . 130 Knots

ENGINE FAILURE

ENGINE FIRE OR FAILURE IN FLIGHT

Affected Engine:

1. **Condition Lever . . . . . FUEL CUTOFF**
2. **Propeller Lever . . . . . FEATHER**
3. **Firewall Fuel Valve . . . . . PUSHED CLOSED**
   (EXTINGUISHER PUSH AND F/W VALVE CLOSED annunciators ILLUMINATED)
4. **Extinguisher** (if fire warning persists) . . . . . **PUSH**
   (DISCH annunciator ILLUMINATED)
5. Engine Auto-ignition . . . . . OFF
6. Autofeather . . . . . OFF
7. Propeller Sync . . . . . OFF
8. Generator . . . . . OFF
9. Electrical Load . . . . . MONITOR
10. Bleed Air Valves . . . . . SELECT L ENG OR R ENG TO CORRESPOND TO OPERATING ENGINE

ENGINE FIRE ON GROUND

Affected Engine:

1. **Condition Lever** . . . . . **FUEL CUTOFF**
2. **Firewall Fuel Valve** . . . . . **PUSH CLOSED**
   (EXTINGUISHER PUSH and F/W VALVE CLOSED annunciators ILLUMINATED)
3. **Ignition and Engine Start Switch** . . . . . **STARTER ONLY**
4. **Extinguisher** (if fire warning persists) . . . . . **PUSH**
   (DISCH annunciator ILLUMINATED)

ENGINE FAILURE DURING TAKEOFF (AT OR BELOW V_1) - TAKEOFF ABORTED

1. **Power Levers** . . . . . **GROUND FINE**
2. **Brakes** . . . . . **MAXIMUM**
   (or as required to achieve stopping distance)

NOTE

Single-engine taxi operations can be treated as normal taxi operations.

ENGINE FAILURE DURING TAKEOFF (AT OR ABOVE V_1) - TAKEOFF CONTINUED

1. **Power** . . . . . **MAXIMUM ALLOWABLE**
2. **V_R Speed** . . . . . **ROTATE TO APPROXIMATELY 8° PITCH ATTITUDE**
3. **Landing Gear** (when positive climb established) . . . . . **UP**
4. **Airspeed** . . . . . **MAINTAIN V_2**
5. **Propeller** (inoperative engine) . . . . . **VERIFY FEATHERED**

WARNING

Do not retard the failed engine power lever until the autofeather system has completely stopped propeller rotation.

6. Flap/Fwd Wing (at 400 feet AGL) . . . . . RETRACT
7. Airspeed . . . . . ACCELERATE TO V_{YSE} (BLUE LINE)
8. Power . . . . . MAXIMUM CONTINUOUS
9. Clean-up (inoperative engine after reaching 1500 feet AGL):
   a. Condition Lever . . . . . FUEL CUTOFF
   b. Firewall Fuel Valve . . . . . PUSH CLOSED
      (EXTINGUISHER PUSH and F/W VALVE CLOSED annunciators ILLUMINATED)
   c. Engine Auto-ignition . . . . . OFF
   d. Autofeather . . . . . OFF
   e. Propeller Sync . . . . . OFF

f. Generator . . . . . .OFF
10. Electrical Load . . . . . MONITOR
11. Bleed Air Valves . . . . . .SELECT L ENG OR R ENG TO CORRESPOND TO OPERATING ENGINE

ENGINE FAILURE IN FLIGHT BELOW AIR MINIMUM CONTROL SPEED (V_{MCA})

1. **Reduce power on operative engine as required to maintain control.**
2. **Lower nose to accelerate above V_{MCA}.**
3. Adjust power as required.
4. Secure affected engine as in ENGINE FIRE OR FAILURE IN FLIGHT.

OIL PRESSURE LOW (L OR R OIL PRES LO ANNUNCIATOR)

1. Oil Pressure Display . . . . . CONFIRM BELOW 60 PSI
2. If Confirmed . . . . . SECURE ENGINE OR LAND AT THE NEAREST SUITABLE AIRPORT USING THE MINIMUM POWER REQUIRED TO SUSTAIN FLIGHT

FUEL SYSTEM

FUEL PRESSURE LOW (L OR R FUEL PRES LO ANNUNCIATOR)

1. **Standby Pump** (Failed Side) . . . . . **ON**
2. Check FUEL PRES LO annunciator . . . . . .EXTINGUISHED

If FUEL PRES LO annunciator does not extinguish:

3. Altitude . . . . . .MAINTAIN MINIMUM SAFE ALTITUDE
4. Land at nearest suitable airport

SMOKE AND FUME ELIMINATION

Attempt to identify the source of smoke or fumes. Smoke associated with electrical failures is usually gray or tan in color, and irritating to the nose and eyes. Smoke produced by environmental system failures is generally white in color, and much less irritating. If smoke is prevalent in the cabin, cabin oxygen masks should not be deployed unless the cabin altitude exceeds 15,000 feet, and then they should be used only until the cabin altitude is reduced to 15,000 feet or lower.

ELECTRICAL SMOKE OR FIRE

1. **Oxygen**
   - **a. Crew (Diluter Demand Masks) . . . . . .DON MASK (Mask Selector Switch - EMERG Position)**
   - **b. Mic Selector Switch . . . . . OXY MASK**
   - **c. Audio Speaker . . . . . ON**
2. Panel/Overhead Air Vents . . . . . OPEN
3. Pilot Air . . . . . .PULL ON

4. Defrost Air . . . . . PULL ON
5. Bleed Air Valves . . . . . HIGH FLOW
6. Auto Temp . . . . . CKPT FULL INCR
7. L Gen and R Gen . . . . . OFF

NOTE

Maintain airplane control using standby instruments.

8. Cockpit and Lavatory Door (aisleway clear) . . . . . OPEN
9. Nonessential Electrical Equipment . . . . . OFF

If Fire or Smoke Ceases:

10. Individually restore generators and equipment previously turned off.
11. Isolate defective equipment.

WARNING

Dissipation of smoke is not sufficient evidence that a fire has been extinguished. If it cannot be visually confirmed that no fire exists, land at the nearest suitable airport.

If Smoke Persists Or If Extinguishing Of Fire Is Not Visually Confirmed:

12. Manual Cabin Altitude Control . . . . . TURN CLOCKWISE TO INCREASE CABIN ALTITUDE
13. Land at the nearest suitable airport.

ENVIRONMENTAL SYSTEM SMOKE OR FUMES

1. Oxygen
   a. Crew (Diluter Demand Masks) . . . . . DON MASK (Mask Selector Switch - EMERG Position)
   b. Mic Selector Switch . . . . . OXY MASK
   c. Audio Speaker . . . . . ON
2. Panel/Overhead Air Vents . . . . . OPEN
3. Pilot Air . . . . . PULL ON
4. Defrost Air . . . . . PULL ON
5. Bleed Air Valves . . . . . SELECT L ENG
6. Cabin/Cockpit Blowers . . . . . HIGH
7. Cockpit and Lavatory Doors (aisleway clear) . . . . . OPEN

If Smoke Decreases:

8. Continue operation with left engine bleed air ON.

If Smoke Persists:

9. Bleed Air Valves . . . . . SELECT R ENG
10. If smoke decreases, continue operation with right engine bleed air on.

NOTE

Each engine bleed air valve must remain off long enough to allow time for smoke purging, to positively identify the smoke source.

AIRSTAIR DOOR

AIRSTAIR DOOR UNLOCKED (DOOR UNLOCKED ANNUNCIATOR)

WARNING

Do not attempt to check the security of the airstair door in flight. Remain as far from the door as possible with seatbelts securely fastened.

If the DOOR UNLOCKED annunciator illuminates, or if an unlocked airstair door is suspected:

1. **All Occupants . . . .SEATED WITH SEAT BELTS SECURELY FASTENED**
2. No Smoke/Seatbelts . . . . . ON
3. Cabin Differential Pressure . . . . . REDUCE TO LOWEST VALUE PRACTICAL (zero preferred) by descending and/or selecting higher cabin altitude.

NOTE

The Manual Cabin Altitude Control can be used to decrease cabin differential pressure more rapidly.

4. Oxygen . . . . . AS REQUIRED
5. Land at nearest suitable airport

EMERGENCY DESCENT

1. **Oxygen (Passengers - AS REQUIRED) . . . . . .CREW REQUIRED**
2. **Power Levers . . . . . IDLE**
3. **Propeller Levers . . . . . FULL FORWARD**
4. **Airspeed . . . . . MAINTAIN THE LOWER OF 200 KNOTS OR V_{MO}**
5. **Landing Gear . . . . . .DN**

GLIDE

1. Landing Gear . . . . . UP
2. Flap/Fwd Wing . . . . . .RETRACT
3. Propellers . . . . . .FEATHERED

NOTE

Do not feather second engine propeller until airstart procedures have proven to be unsuccessful. Airstarts with a windmilling propeller will result in lower start temperatures. Refer to Section IIIA, Abnormal Procedures section, for Airstart procedures.

4. Airspeed . . . . . 130 KNOTS

NOTE

The zero-wind glide ratio in this configuration is 1.7 nautical miles of glide distance for each 1000 feet of altitude. Decrease the glide ratio by 0.1 nautical miles per 1000 feet for each 10 knots of headwind.

ELECTRICAL

DUAL GENERATOR FAILURE

NOTE

Maintain airplane control using the standby instruments.

1. Generators . . . . . .RESET, THEN ON

If either generator will reset:

2. Do not exceed 100% load on the operating generator

Generator Load %	Altitude Feet	Minimum N_1 %
Above 50	S.L. to 25,000	80
Above 50	Above 25,000	90

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If neither generator will reset:

3. Non-essential Equipment . . . . . .OFF
4. No. 1 or No. 2 Radio Tuning Unit (RTU) . . . . . .ENG DATA
5. Pilot Sensor Display Unit (SDU) . . . . . SELECT REQUIRED NAVIGATION DISPLAY
6. Refer to . . . . . LOAD MANAGEMENT

Land at the nearest suitable airport:

NOTE

Power Brakes and Anti-Skid will not be available for landing

7. Landing Gear . . . . . EXTEND MANUALLY
8. Flap/Fwd Wing . . . . . DO NOT EXTEND
9. Taxi Light . . . . . AS REQUIRED

LOAD MANAGEMENT

The equipment listed below will remain operable after a dual generator failure. With only the equipment operating listed as "continuous" in the "OPERATING TIME" column, the battery duration will be approximately 35 minutes (based upon a 42.5-amp load and a 75% battery capacity).

Use of the equipment with prescribed operating times will reduce the battery duration by the approximate times listed. Multiple usage of this equipment is additive.

WARNING

Do not place the GEN TIES switch in the MAN CLOSED position. This action reconnects the left and right generator bus loads and severely limits the battery duration. All EICAS messages will be unavailable due to loss of the EICAS display.

EQUIPMENT	OPERATING TIME (Minutes)	REDUCTION IN MAIN BATTERY DURATION (Minutes)
Standby Attitude Gyro	Continuous	None*
Standby Altimeter	Continuous	—
Standby Airspeed Indicator	Continuous	—
Standby Indicator Lighting	Continuous	None*
Comm 1 Xmit	2.0	0.5
Nav 1	Continuous	—
Transponder 1	Continuous	—
AHRS 2	Continuous	—
SDU 1	Continuous	—
RTU 1 and 2	Continuous	—
Pilot Audio	Continuous	—
Cabin Audio	Continuous	—
Annunciator Panel	As Required	—

EQUIPMENT	OPERATING TIME (Minutes)	REDUCTION IN MAIN BATTERY DURATION (Minutes)
Pitch/Roll/Rudder Trim	2.0	0.5
Flap/Fwd Wing	Single Operation	0.5
Landing Gear	Single Operation	1.0
Instrument Indirect Lights	Continuous	—
Cockpit Area Lights	5.0	0.5
Subpanel Display Lights	5.0	0.5
Cabin Lights	5.0	1.0
Anti-collision Lights	Continuous	—
Wing Inspection Light	5.0	0.5
Taxi Light	1.0	0.1
Left Pitot/Static Heat	Continuous	—
Single Standby Fuel Pump	5.0	2.0
Fuel Quantity/Temperature	Continuous	—
Left and Right Engine Ice Protection (Main)	Single Operation	0.1
Engine Auto Ignition	0.5	0.1
Left Bleed Air/Pressurization Controller	Continuous	—

*Powered by auxiliary battery.

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BATTERY CHARGE RATE (BATT CHG RATE ANNUNCIATOR)

In Flight:

BATT CHG RATE annunciator indicates a possible battery malfunction.

1. Battery Switch . . . . . .OFF
2. BATT CHG RATE Annunciator . . . . . .EXTINGUISHED

If BATT CHG RATE annunciator does not extinguish:

3. Land at the nearest suitable airport

FLIGHT CONTROLS

PITCH TRIM FAIL (PITCH TRIM FAIL ANNUNCIATOR)

If the autopilot is not engaged, a trim failure has been detected by the manual trim system:

1. Pitch Trim Power Switch . . OFF/RESET (PITCH TRIM FAIL annunciator EXTINGUISHED)
2. Pitch Trim Power Switch . . . . . NORM TO RESET SYSTEM

If the PITCH TRIM FAIL annunciator illuminates again:

3. Pitch Trim Power Switch . . . . . .STBY
4. Pitch Trim Standby Switches . . . . . .RETRIM

If the autopilot is engaged, a trim failure has been detected by the autopilot system or by the manual trim system:

5. Autopilot . . . . . .DISENGAGE

If the PITCH TRIM FAIL annunciator is still illuminated, a trim failure has been detected by the manual trim system. See steps 1-4 above.

If the PITCH TRIM FAIL annunciator extinguishes, a trim failure has been detected by the autopilot system:

6. Autopilot . . . . . .RE-ENGAGE

If the PITCH TRIM FAIL annunciator illuminates again:

7. Autopilot . . . . . .DISENGAGE

PITCH AXIS RUNAWAY

1. **Airplane Attitude (using pitch control) . . . . . .MAINTAIN**
2. **Control Wheel Interrupt Button . . . . . DEPRESS AND HOLD**
3. **Determine Cause of Malfunction:**

If L STALL WRN FAIL message illuminates after the Control Wheel Interrupt Button has been depressed (8-10 seconds), the Control Column Pusher has malfunctioned; power has been removed from the Control Column Pusher.

4. **Release Control Wheel Interrupt Button.**
5. Land at the nearest suitable airport.

If L STALL WRN FAIL message does not illuminate after the control wheel interrupt button has been depressed (8-10 seconds), the Pitch Trim has run away.

6. **Pitch Trim Power Switch . . . . . .STBY**
7. **Control Wheel Interrupt Button . . . . . RELEASE**
8. **Pitch Trim Standby Switches . . . . . RETRIM**

ROLL OR RUDDER TRIM FAIL (ROLL OR RUD TRIM FAIL ANNUNCIATOR)

If the autopilot is not engaged, a trim failure has been detected by the manual trim system:

1. Roll or Rudder Trim Power Switch . . . OFF/RESET (ROLL or RUD TRIM FAIL annunciator EXTINGUISHED)
2. Roll or Rudder Trim Power Switch . . . . . NORM TO RESET SYSTEM

If the ROLL or RUD TRIM FAIL annunciator illuminates again:

3. Roll or Rudder Trim Power Switch . . . . . OFF/RESET
4. Airspeed . . REDUCE SPEED BELOW 160 KNOTS (If required to reduce roll or yaw forces caused by a trim run-a-way)

NOTE

Resultant mistrim in one airplane axis may be partially offset by retrimming in the other axis.

If the autopilot is engaged, a trim failure has been detected by the autopilot system or by the manual trim system:

5. Autopilot . . . . . DISENGAGE

If the ROLL or RUD TRIM FAIL annunciator is still illuminated, a trim failure has been detected by the manual trim system. See steps 1-4 above.

If the ROLL or RUD TRIM FAIL annunciator extinguishes, a trim failure has been detected by the autopilot system:

6. Autopilot . . . . . RE-ENGAGE

If the ROLL or RUD TRIM FAIL annunciator illuminates again:

7. Autopilot . . . . . DISENGAGE

ROLL OR RUDDER TRIM RUNAWAY

1. **Airplane Attitude (using roll / rudder control) . . . . . MAINTAIN**
2. **Control Wheel Interrupt Button . . . . . DEPRESS AND HOLD**
3. **Roll or Rudder Trim Power Switch . . . . . OFF/RESET**
4. **Airspeed . . . . . REDUCE SPEED BELOW 160 KNOTS**

NOTE

Resultant mistrim in one airplane axis may be partially offset by retrimming in the other axis.

FLAP/FORWARD WING ASYMMETRY

A failure of the system is indicated if the airplane's pitch or roll attitude changes abnormally or if the forward wing is observed not to be moving while extending or

retracting the flaps. The FLAP/FWD WING TRANS annunciator will remain illuminated.

1. **Airplane Attitude (using pitch/roll control)** . . . . . **MAINTAIN**
2. **Control Wheel Interrupt Button** . . . . . **DEPRESS AND HOLD**
3. **Flap Control Circuit Breaker** (left circuit breaker panel) . . . . . **PULL**
4. **Control Wheel Interrupt Button** . . . . . **RELEASE**
5. Airplane Trim . . . . . AS REQUIRED
6. Airspeed . . . . . 180 KNOTS MAXIMUM
7. Approach . . . . . .USE FLAPS-RETRACTED LANDING PROCEDURE

Additional Procedures with Airframe Ice:

8. Cycle boots prior to landing.
9. Approach Speed . . . . . .V_{REF} +15 KIAS
   (Increase Landing Distance by 18% or 400 feet, whichever is less)

NOTE

Expect the control column shaker to activate on final approach.

AUTOPILOT

AUTOPILOT DISENGAGEMENT

The autopilot can be disengaged by:

1. Depressing the trim button on either control wheel
2. Operation of trim in any axis
3. Manual disengagement of the autopilot switch
4. Depressing the go-around button on either power lever
5. Depressing the control wheel disconnect button on either control wheel

NOTE

The autopilot disconnect tone can be silenced by depressing the trim button or the disconnect button a second time.

The control wheel disconnect button will disengage the yaw damper as well as the autopilot. Activation of the control column shaker will disengage the autopilot automatically.

FLIGHT DIRECTOR MALFUNCTIONS

NOTE

Symptoms of this type failure include departure from the intended flight path, failure to follow NAV, LOC or GS commands, and attitudes exceeding previously defined limits. Attitude information on the PFD should remain usable. The automatic trim system will operate correctly, such that no excessive control wheel loads will be present upon disconnect. Due to the level of redundancy and monitoring in the autopilot, only Flight Director malfunctions can occur.

1. **Control Wheel Disconnect Button . . . . . DEPRESS**
2. Airplane Attitude . . . . . RECOVER
3. On An Instrument Approach . . . . . EXECUTE MISSED APPROACH

MAXIMUM ALTITUDE LOSSES

The maximum altitude losses observed during malfunction tests were:

Cruise . . . . . 455 feet

Maneuvering . . . . . 80 feet

Approach . . . . . 86 feet

ENGINE FAILURE (AUTOPILOT COUPLED)

The autopilot is able to satisfactorily control the airplane in the event of an engine failure. If on an instrument approach, maintain speed and advance both power levers so that the autofeather system can feather the inoperative propeller. Do not attempt to verify the failed engine with the power lever, as this will disarm the autofeather system.

1. **Power Levers . . . AS REQUIRED TO MAINTAIN AIRSPEED OR ALTITUDE**
2. **Inoperative Engine . . . . . VERIFY**
3. **Propeller Lever (Inoperative Engine) . . . . . FEATHER**
4. Follow the Engine Failure Procedures in this section.

NOTE

The automatic rudder trim may drive the rudder trim to the extreme position. If the trim is at full deflection and additional trim is requested by the autopilot/yaw damper, the RUD TRIM FAIL annunciator will illuminate. The yaw damper will continue to operate but the yaw damper must be disengaged to clear the annunciator.

OVERSPEED RECOVERY

If the airspeed exceeds V_{MO} +5 KIAS, the autopilot will enter overspeed recovery mode. Overspeed recovery mode commands a pitch up to decelerate and maintain V_{MO} -5 KIAS. If an overspeed occurs while the autopilot is engaged:

1. Power Levers . . . . . ADJUST TO DECELERATE BELOW V_{MO}
2. Vertical Mode . . . . . RESELECT AS REQUIRED

BRAKE SYSTEM

Loss of braking effectiveness may be caused by an anti-skid system malfunction. If this occurs, turning the anti-skid system off will restore normal power brake only braking action.

1. **Anti-skid Switch . . . . . .OFF**
2. Brakes . . . . . AS REQUIRED
3. Power Levers . . . . . .GROUND FINE OR REVERSE AS REQUIRED

ENVIRONMENTAL SYSTEMS

USE OF OXYGEN

WARNING

The following table sets forth the average time of useful consciousness (TUC) (time from onset of hypoxia until loss of effective performance) at various altitudes.

Cabin Pressure Altitude	TUC
40,000 feet	15-20 seconds
35,000 feet	30-60 seconds
30,000 feet	1 to 2 minutes
25,000 feet	3 to 5 minutes
22,000 feet	5 to 10 minutes
12-18,000 feet	30 minutes or more

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1. **Crew (Diluter Demand Masks) . . . . . DON MASK**
2. **MIC Selector Switch . . . . . OXY MASK**
3. **Audio Speaker . . . . . ON**
4. **Passenger Manual Deploy . . . . . PULL ON**
   (OXY ON message illuminated)
5. Passengers . . . . . PULL LANYARD PIN,DON MASK
6. Oxygen Duration . . . . . .CONFIRM
   (See OXYGEN SYSTEM in Section IV for Duration Tables)

NOTE

Hats and 'ear muff' type headsets must be removed prior to donning crew oxygen masks. Headsets and eyeglasses worn by crew members may interfere with quick-donning capabilities. The interphone system should be turned off when communicating with ATC because of the sidetone interference caused by crew breathing.

NOTE

OXYGEN NOT ARMED caution message is illuminated if the SYS READY knob is not pulled ON. OXYGEN PRES LO caution message is illuminated if the oxygen tank pressure is less than approximately 500 psi and the oxygen SYS READY knob is pulled ON.

AUTO-DEPLOYMENT OXYGEN SYSTEM FAILURE

1. In the event the PASS OXYGEN ON message does not illuminate at a cabin altitude above 12,500 feet, pull the PASS MAN DEPLOY knob to deploy passenger masks and confirm deployment.
2. If oxygen quantity is insufficient to sustain both passengers and crew, the supply can be isolated to the crew by pulling the OXY CONTROL circuit breaker located in the Environmental Section of the left circuit breaker panel. PASS MAN DEPLOY must be in the OFF position.

CABIN DECOMPRESSION (CAB ALT HI ANNUNCIATOR)

If CAB ALT HI annunciator illuminates, indicating that cabin altitude has exceeded approximately 10,000 feet:

1. Oxygen (crew and passengers) . . . . . AS REQUIRED
2. Determine Cause of Pressure Loss
   a. Bleed Air Valves . . . . . CHECK PROPER POSITION
   b. Manual Cabin Altitude Control Knob . . CHECK NORM (FULL CCW)
3. Cockpit Blower (for avionics cooling) . . . . . HIGH

If unable to correct problem and cabin altitude approaches 15,000 feet, or if decompression is rapid:

4. Execute Emergency Descent Procedure

NOTE

Descent from 41,000 feet to 15,000 feet can be accomplished in 4 minutes or less when using the EMERGENCY DESCENT procedure.

5. Range . . . . . DETERMINE FOR FINAL CRUISE ALTITUDE
6. Oxygen Duration . . . . . CONFIRM FOR THE EXISTING CABIN ALTITUDE

(See OXYGEN SYSTEM in Section IV for Duration Tables)

WARNING

Adequate oxygen pressure is not provided to the passengers for sustained flight at cabin altitudes above 34,000 feet. The highest recommended cabin altitude for sustained flight is 25,000 feet.

HIGH DIFFERENTIAL PRESSURE (CABIN DIFF HI ANNUNCIATOR)

1. **Bleed Air Valves . . . . . .OFF**
2. Cabin Differential . . . . . MONITOR

After the cabin differential pressure decreases to a safe level, attempt to control cabin altitude using the Manual Cabin Altitude control knob as follows:

3. Bleed Air Valves . . . . . BOTH
4. Manual Cabin Altitude Control Knob . . . . . ROTATE CLOCKWISE UNTIL CABIN RATE OF DESCENT STABILIZES AT ZERO
5. Cabin Altitude . . . . . .ADJUST AS REQUIRED USING THE MANUAL CABIN ALTITUDE CONTROL KNOB

NOTE

Airplane altitude vs. cabin altitude for different cabin differential pressures can be obtained from Section IV of the POM.

6. Bleed Air Valves (prior to landing) . . . . . .OFF

CAUTION

Ensure cabin is depressurized prior to landing.

If the cabin rate of descent fails to respond to the Manual Cabin Altitude control knob in step 4, proceed as follows:

7. Bleed Air Valves . . . . . OFF
8. Oxygen (crew and passengers) . . . . . AS REQUIRED
9. Descend . . . . . AS REQUIRED

LEFT BLEED FAIL OR RIGHT BLEED FAIL (L OR R BLEED FAIL ANNUNCIATOR)

1. **Bleed Air Valves . . . . SELECT OPPOSITE ENGINE BLEED AIR POSITION**
2. Engine ITT . . . . . MONITOR

NOTE

The BLEED FAIL annunciator will extinguish after the failed bleed air source has been deselected and the bleed air detect system has been allowed to cool below the trip-off temperature.

NOTE

Operation on one bleed air source will not provide engine inlet ice protection on the side deselected. If in icing conditions with a bleed valve off, exit icing conditions.

FUSELAGE BLEED FAIL (FUS BLEED FAIL ANNUNCIATOR)

1. **Bleed Air Valves** . . . . . EMER
2. Cabin Blower . . . . . HIGH
3. Engine ITT . . . . . MONITOR

NOTE

EMER position of Bleed Air Valves selector is intended for only short duration use. Prolonged use will cause cabin temperature to become uncomfortably warm. Cabin temperature heat rise can be minimized by retarding the right power lever to IDLE.

NOTE

With the bleed air valves in the EMER position, engine inlet ice protection will not be available on the left engine. If in icing conditions with the bleed valves in the EMER position, exit icing conditions.

EMERGENCY EXIT

- Escape Hatch Handle . . . . . PULL

NOTE

This is a plug-type hatch and opens into the cabin. The hatch can either be set aside inside the cabin, or placed outside the cabin through the hatch opening.

GROUND EMERGENCY

1. Condition Levers . . . . . FUEL CUTOFF
2. Firewall Fuel Valves . . . . . PUSH CLOSED
3. Extinguisher(s)(as appropriate) . . . . . PUSH
4. Lights . . . . . AS REQUIRED
5. Master Switch . . . . . OFF (GANG BAR DOWN)
6. Emergency Evacuation . . . . . DIRECT AS REQUIRED

STALL/SPINS

If the control column pusher and/or stall recovery horn are activated:

Immediately move the control column forward, neutralize the rudder and roll inputs, and apply maximum allowable power. These actions should be done as nearly simultaneously as possible. Continue to hold these control positions until both the pusher and/or stall recovery horn have ceased operation; then, execute a smooth pullout.

NOTE

Federal Aviation Administration Regulations do not require spin demonstration of airplanes of this category; therefore no spin tests have been conducted. The recovery technique is based on the best available information.

LIGHTNING STRIKE

The airframe structure and essential systems are designed to maintain their integrity after a lightning attachment. However, the functions of all airplane systems and flight displays should be carefully assessed. Use appropriate backup modes in the event any functions are disabled or impaired.

The following equipment is protected from failure in the event of a lightning attachment and provides the primary functions required for continued safe flight and landing.

REQUIRED FUNCTION	EQUIPMENT
Attitude	Standby Attitude Gyro
Airspeed	Standby Airspeed Indicator (pitot/static heat will remain functional)
Altitude	Standby Altimeter
Heading	Pilot's Sensor Display Unit (SDU); Magnetic Compass
Engine Data	Radio Turning Unit (ENG DATA mode)
Communications	Radio Tuning Unit
Navigation	Pilot's Sensor Display Unit (SDU); Radio Tuning Unit

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The following systems should continue to function after a lightning attachment; however, a reduced level of capability may be experienced.

Trim — The trim system is hardened to prevent trim runaway. In the event the NORM trim system is disabled, the pitch trim function will be available in the STBY mode.

Flap/Fwd Wing — The flap/forward wing system is hardened to prevent runaway. The function of moving the flaps and forward wing may be impaired requiring a landing in the RETRACT position.

28V Power — The battery and a minimum of one generator should be available. Pilot discretion should be used to reduce the power requirements of the airplane.

Fuel System — The engine driven pumps and electric standby pumps are designed to remain operational. The fuel quantity indicating system may become impaired.

Pressurization — The controllers for the outflow systems may become inoperable and require the use of manual backup functions.

Annunciation — The Crew Alerting System may become inoperative for the yellow, white, and green messages. The red warning annunciations are designed to remain operable.

Landing Gear — The electrically driven, hydraulically operated extension system may become inoperable and require the use of the alternate extension system. If the green GEAR DOWN annunciators do not illuminate, continue pumping until sufficient resistance is felt to ensure the gear is down and locked (70-80 strokes). Do not stow pump handle.

Brakes — The anti-skid braking system may become inoperable and require the use of power or manual braking systems. Refer to Landing Gear System in the Abnormal Procedures Section.

Stall Warning

The stall warning and control column shaker system may become inoperable. Refer to Stall Warning in the Abnormal Procedures Section.

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SECTION IIIA
ABNORMAL PROCEDURES
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SECTION IIIA
ABNORMAL PROCEDURES
TABLE OF CONTENTS (CONT'D)

SUBJECT *PAGE*

All airspeeds quoted in this section are *indicated airspeeds (IAS)* and assume zero instrument error.

AIR START

CAUTION

The pilot should determine the reason for an engine failure before attempting an airstart. Do not attempt an airstart if the N_1 indicates zero.

STARTER ASSIST (PROPELLER FEATHERED OR WINDMILLING)

Beech Kit P/N's 122-3019 and 122-3016-13 must be installed prior to performing this procedure.

1. Power Lever . . . . . IDLE
2. Propeller Lever . . . . . LOW RPM
3. Condition Lever . . . . . FUEL CUTOFF
4. Firewall Fuel Valve . . . . . PUSH OPEN (EXTINGUISHER PUSH AND F/W VALVE CLOSED annunciators - EXTINGUISHED)
5. Engine Anti-ice . . . . . OFF
6. Autofeather . . . . . OFF
7. Propeller Sync . . . . . OFF
8. Generator (Inoperative Engine) . . . . . OFF
9. Gen Ties . . . . . MAN CLOSED (MAN TIES CLOSED Message Illuminated)

CAUTION

Failure to manually close the generator ties may cause the loss of the EICAS and partial loss of the flight instruments.

10. Bleed Air Valves . . . . . SELECT OPERATING ENGINE
11. Altitude . . . . . 30,000 FEET MAXIMUM
12. Airspeed . . . . . 120 KIAS MINIMUM
13. Ignition and Engine Start . . . . . ON (BATTERY TIE OPEN Message Illuminated)
14. Condition Lever (12% N_1 minimum) . . . . . START
15. N_1 and ITT . . . . . MONITOR (1000°C maximum)
16. Ignition and Engine Start (50% N_1 minimum) . OFF (BATTERY TIE OPEN Message Extinguished)
17. Condition Lever (after ITT has peaked) . . . . . RUN
18. Power . . . . . AS REQUIRED
19. Generator . . . . . RESET, THEN ON
20. Generator Ties . . . NORM (MAN TIES CLOSED Message Extinguished)

21. Propeller Sync . . . . . ON
22. Autofeather . . . . . AS REQUIRED
23. Electrical Equipment . . . . . AS REQUIRED
24. Bleed Air Valves . . . . . BOTH
25. Engine Anti-ice . . . . . AS REQUIRED

NO STARTER ASSIST (PROPELLER FEATHERED OR WINDMILLING)

CAUTION

During no starter assist air starts with less than 13% N_1, ITT start temperatures tend to be higher. No starter assist air starts with less than 8% N_1 are at the discretion of the pilot.

1. Power Lever . . . . . IDLE
2. Propeller Lever . . . . . LOW RPM
3. Condition Lever . . . . . FUEL CUTOFF
4. Firewall Fuel Valve . . . . . PUSH OPEN
   (EXTINGUISHER PUSH AND F/W VALVE CLOSED annunciators - EXTINGUISHED)
5. Engine Anti-ice . . . . . OFF
6. Engine Auto-Ignition . . . . . ARM
7. Autofeather . . . . . OFF
8. Propeller Sync . . . . . OFF
9. Generator (Inoperative Engine) . . . . . OFF
10. Standby Pump (Inoperative Engine) . . . . . ON
11. Bleed Air Valves . . . . . SELECT OPERATING ENGINE
12. Altitude . . . . . 20,000 FEET MAXIMUM
13. Engine N_1 . . . . . 8% OR ABOVE

NOTE

Increasing airspeed will increase N_1.
As altitude decreases, a higher airspeed will be required to achieve a given N_1.

14. Airspeed . . . . . 180 KNOTS MINIMUM

NOTE

Airspeeds of 220 to 245 KIAS may be required to obtain an N_1 of 8% or more as altitude decreases.

15. Condition Lever . . . . . START
16. N_1 and ITT . . . . . MONITOR (1000°C maximum)
17. Condition Lever (After ITT has peaked) . . . . . RUN
18. Power . . . . . AS REQUIRED
19. Generator . . . . . RESET, THEN ON
20. Propeller Sync . . . . . ON

21. Autofeather . . . . . AS REQUIRED
22. Standby Pump . . . . . OFF
23. Electrical Equipment . . . . . AS REQUIRED
24. Engine Auto-Ignition . . . . . AS REQUIRED
25. Bleed Air Valves . . . . . BOTH
26. Engine Anti-ice . . . . . AS REQUIRED

LANDING

FLAPS-RETRACTED LANDING

NOTE

To determine Landing Distance - Flaps Retracted, multiply Landing Distance by 1.02.

1. Approach Speed . . . . . V_{REF} +5 KIAS
2. Cockpit and Lavatory Doors (aisleway clear) . . . . . OPEN
3. Pressurization . . . . . CHECK
4. No Smoke/Seatbelts . . . . . ON
5. Autofeather . . . . . ARM
6. Column Pusher Motor Circuit Breaker . . . . . PULL

CAUTION

Do not silence the landing gear warning horn, since the flap actuated portion of the landing gear warning system will not be actuated during a flaps-retracted landing.

7. Landing Gear . . . . . DN
8. Lights . . . . . AS REQUIRED
9. Autopilot . . . . . DISCONNECT
10. Propeller Sync . . . . . AS DESIRED
11. Radar . . . . . AS REQUIRED
12. Yaw Damp . . . . . OFF
13. Execute Normal Landing

NOTE

The control column shaker may activate prior to initiating the landing flare.

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MANUAL BRAKING LANDING (POWER BRAKES/ANTI-SKID INOPERATIVE)

NOTE

To determine landing distance with the power brakes/anti-skid inoperative, multiply Landing Distance by 1.29.

1. Approach Speed . . . . . CONFIRM
2. Cockpit and Lavatory Doors (aisleway clear) . . . . . OPEN
3. Pressurization . . . . . CHECK
4. No Smoke/Seatbelts . . . . . ON
5. Autofeather . . . . . ARM
6. Landing Gear . . . . . DN
7. POWER BRAKE INOP Message . . . . . ILLUMINATED
8. Brake Pedals . . . . . DEPRESS AND VERIFY SPONGY FEEL
9. Anti-skid Switch . . . . . OFF
10. ANTI-SKID INOP Message . . . . . ILLUMINATED
11. Flap/Forward Wing . . . . . EXTEND
12. Lights . . . . . AS REQUIRED
13. Autopilot . . . . . DISCONNECT
14. Propeller Sync . . . . . AS DESIRED
15. Radar . . . . . AS REQUIRED
16. Yaw Damp . . . . . OFF
17. Execute Normal Landing

NOTE

The brake pedals will appear to be soft and spongy and may need to be pumped to obtain desired stopping performance. The anti-skid function will not operate when the power brakes are inoperative, therefore, care must be taken when pumping up the brakes to avoid skidding the tires. Use brakes only as much as necessary to achieve required stopping distance.

ONE-ENGINE-INOPERATIVE APPROACH AND LANDING

NOTE

To determine Landing Distance - One Engine Inoperative - Flaps Extended, increase Landing Distance by 30% or 850 feet whichever is less.

1. Approach Speed . . . . . CONFIRM (USE V_{REF})
2. Cockpit and Lavatory Doors (aisleway clear) . . . . . OPEN
3. Pressurization . . . . . CHECK
4. No Smoke/Seatbelts . . . . . ON

When it is certain that the field can be reached:

5. Landing Gear . . . . . DN

6. Flap/Fwd Wing . . . . . .EXTEND
7. Lights . . . . . AS REQUIRED
8. Autopilot . . . . . .DISCONNECT
9. Radar . . . . . AS REQUIRED
10. Yaw Damp . . . . . .OFF
11. Execute Normal Landing

WARNING

Care must be exercised when using single-engine GROUND FINE on surfaces with reduced traction.

NOTE

Single-engine taxi operations can be treated as normal taxi operations.

ONE-ENGINE-INOPERATIVE GO-AROUND

1. Power . . . . . MAXIMUM ALLOWABLE
2. Flap/Fwd Wing . . . . . .RETRACT
3. Landing Gear (when positive climb established) . . . . . UP
4. Airspeed . . . . . SEE APPROACH CLIMB GRADIENT GRAPH

SYSTEMS

AUTOFEATHER DISABLED (YELLOW AFX DISABLED MESSAGE)

Illumination of the AFX DISABLED message indicates a loss of the autofeather "ARM" signal with the autofeather switch selected to ARM, and power set for takeoff while the airplane is on the ground. Do not takeoff until the condition has been corrected.

ENGINE OIL SYSTEM

LOW OIL PRESSURE INDICATION

Normal oil pressure is 90 to 135 psig at gas generator speeds above 72%. With engine torque below 81%, minimum oil pressure is 85 psig at normal oil temperature (60 to 70°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 exceeding 54% 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. Fluctuations of plus or minus 10 psig are acceptable.

FUEL SYSTEM

FUEL LEVEL LOW (L OR R FUEL LEVEL LO MESSAGE)

1. Fuel Quantity . . . . . CHECK

If fuel quantity is above 135 pounds:

2. Standby Pump . . . . . ON
3. Aft Tank Fuel Quantity . . . . . CHECK

If message does not extinguish within 5 minutes:

4. Aft Tank Fuel Quantity . . . . . CHECK

CAUTION

If fuel is not transferring out of the aft tank, the aft tank transfer jet pump is malfunctioning. Some aft tank fuel may gravity feed, but plan the remainder of the flight without the indicated aft tank fuel. Continue to monitor the aft tank quantity.

If fuel is transferring out of the aft tank, the forward tank transfer jet pump is malfunctioning. All forward tank fuel will gravity feed, but will not extinguish the FUEL LEVEL LO message.

FIREWALL FUEL VALVE FAILURE (L OR R F/W VALVE FAIL MESSAGE)

Illumination of the L or R F/W VALVE FAIL message indicates that the firewall fuel valve has not reached its proper position within 2 seconds. If the message illuminates during the "Before Engine Starting" procedure, recycle the firewall fuel valve and check for message illumination. If the message is still illuminated, do not takeoff. If the message illuminates during engine shutdown as a part of any emergency procedure, recycle the firewall fuel valve and check for message illumination. If the message remains illuminated, the firewall fuel valve may not be fully closed.

ELECTRICAL SYSTEM

GENERATOR INOPERATIVE (L OR R GEN INOP MESSAGE)

1. Generator Switch . . . . . GEN RESET; then ON

If generator will not reset:

2. Generator Switch . . . . . OFF
3. Electrical Load . . . . . MONITOR

Generator Load %	Altitude Feet	Minimum N_1 %
Above 50	S.L. to 25,000	80
Above 50	Above 25,000	90
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GENERATOR TIE OPEN (L OR R GEN TIE OPEN MESSAGE)

1. Monitor Appropriate Loadmeter:
   a. If less than 100% . . . . . GEN TIES switch to OPEN; then NORM
   b. If greater than 100% . Turn appropriate generator OFF and monitor opposite loadmeter; not to exceed 100%.

Generator Load %	Altitude Feet	Minimum N_1 %
Above 50	S.L. to 25,000	80
Above 50	Above 25,000	90
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BOTH GENERATOR TIES OPEN (L AND R GEN TIE OPEN MESSAGES)

NOTE

If L and R GEN TIE OPEN messages are illuminated because of a dual generator failure, do not attempt to reset the generator ties. See the Emergency Procedures section.

1. Monitor Loadmeters:
   a. If less than 100% . . . . . GEN TIES switch to OPEN; then NORM
   b. If greater than 100% . Turn appropriate generator OFF and monitor opposite loadmeter; not to exceed 100%.

Generator Load %	Altitude Feet	Minimum N_1 %
Above 50	S.L. to 25,000	80
Above 50	Above 25,000	90
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   c. Center bus will be powered only by the battery. Battery will be depleted (battery not charging) if equipment used is fed by the center bus.

2. Refer to . . . . . LOAD MANAGEMENT

BATTERY TIE OPEN (BATTERY TIE OPEN MESSAGE)

1. Monitor Center Bus Voltage
   a. If Voltage is Normal (24-28 Volts) . . . . .GEN TIES switch to OPEN; then NORM
   b. If Voltage is Zero, GEN TIES SWITCH . . . . . OPEN
   (Battery will not charge and systems powered by the center bus will not be operational)

If message is still illuminated and center bus voltage is zero:

2. Continue flight to a suitable airport using the minimum battery power practicable.

NOTE

A flaps retracted landing will be required because the flaps are powered by the center bus.

CIRCUIT BREAKER TRIPPED

1. Nonessential Circuit . . . . . DO NOT RESET IN FLIGHT
2. Essential Circuit:
   a. Circuit Breaker . . . . . PUSH TO RESET
   b. If circuit breaker trips again . . . . . DO NOT RESET

FLIGHT CONTROLS

PITCH TRIM SYNCHRONIZATION (PITCH TRIM SYNC MESSAGE)

Message indicates a malfunction of the left or right elevator trim tab system. The flight may be continued in the NORM pitch trim mode with the possibility of reduced pitch trim effectiveness. Full pitch trim effectiveness may be regained by placing the pedestal pitch trim power switch in the STBY position and using the dual element switches to trim the airplane. Rate of trim will be at the lowest speed.

ROLL TRIM SYNCHRONIZATION (ROLL TRIM SYNC MESSAGE)

Message indicates a malfunction of the left or right elevon trim tab system. The flight may be continued with the possibility of reduced roll trim effectiveness.

RUDDER TRIM SYNCHRONIZATION (RUDDER TRIM SYNC MESSAGE)

Message indicates a malfunction of the left or right rudder trim tab system. The flight may be continued with the possibility of reduced rudder trim effectiveness.

FLAP MONITOR FAILURE (L OR R FLAP MON FAIL MESSAGE)

Continuous display of either L FLAP MON FAIL or R FLAP MON FAIL message after the preflight test of the FLAP/FWD WING MONITOR indicates a failure of the monitor system. Flight should not be attempted until the fault is corrected.

Inflight illumination of either L FLAP MON FAIL or R FLAP MON FAIL message indicates a failure of the monitor system. The flight must be completed without operation of the flap/forward wing system. Landing must be accomplished with the flaps retracted. (See "Flaps-Retracted Landing" Procedure).

AUTOPILOT

MISTRIM ANNUNCIATION

NOTE

Steady illumination of the ELEV, AIL, or RUD messages on the PFD alerts the pilot that the indicated servo is maintaining residual torque. Monitor the EICAS for annunciation of trim out-of-sync or trim failure conditions. Upon disconnect, be prepared to accept the out of trim forces.

1. Trim Indicators . . . . . CHECK FOR PROPER POSITION FOR FLIGHT CONDITION
2. Control Wheel Disconnect Button . . . . . .DEPRESS
3. Trim . . . . . .RETRIM AS NECESSARY

AUTOPILOT FAILURE

If the autopilot fails in flight, the pilot will be required to manually fly the remainder of the flight. Depending upon the nature of the failure, the Yaw Damper may or may not be available. If the Yaw Damper is not available, automatic rudder trim will not be operative and the pilot will have to adjust rudder trim as required. If the Flight Director is still available but the Autopilot will not engage, the pilot may use the Flight Director as desired. In any case, the following checklist should be accomplished upon Autopilot failure (failure to engage or uncommanded disengagement):

1. Airplane Attitude . . . . . MAINTAIN
2. Airplane Trim . . . . . .RETRIM AS REQUIRED
3. AP/YD Engagement Switches . . . . . .ATTEMPT RE-ENGAGEMENT

If autopilot re-engages, monitor autopilot operation and continue flight with autopilot as desired.

If autopilot will not re-engage:

4. YD Engagement Switch . . . . . .ATTEMPT TO ENGAGE
5. Flight Director Modes . . . . . .USE AS DESIRED (if available)
6. Advise ATC of situation and assistance desired (as necessary).

7. Land at a suitable airport.

LANDING GEAR SYSTEM

ANTI-SKID INOPERATIVE (ANTI-SKID INOP MESSAGE)

Illumination of the ANTI-SKID INOP message indicates that the anti-skid system is not operative because the anti-skid switch has been selected OFF or the system has had some other failure. Pilot action should be:

1. ANTI-SKID Circuit Breaker . . . . . CHECK IN
2. ANTI-SKID Switch . . . . . ANTI-SKID

If message fails to extinguish:

3. ANTI-SKID Switch . . . . . .OFF

NOTE

Landing must be accomplished using the "Anti-Skid Off Landing" procedure in Section IV, Normal Procedures.

POWER BRAKES INOPERATIVE (POWER BRAKE INOP MESSAGE)

Illumination of the POWER BRAKE INOP message indicates that the power brake system is inoperative. Without power brakes, the anti-skid system will also be inoperative. Pilot action should be:

- ANTI-SKID Circuit Breaker . . . . . CHECK IN

NOTE

Landing must be accomplished using the "Manual Braking Landing" procedure in this section.

HYDRAULIC FLUID LOW (HYD FLUID LO MESSAGE)

If the HYD FLUID LO message illuminates during flight, attempt to extend the landing gear normally upon reaching destination. If landing gear fails to extend, follow LANDING GEAR ALTERNATE EXTENSION procedures.

LANDING GEAR ALTERNATE EXTENSION

If landing gear fails to extend after placing the Landing Gear Control down, perform the following:

1. Landing Gear Control Circuit Breaker (left circuit breaker panel) . . . . . .PULL
2. Landing Gear Control . . . . . DN
3. Alternate Extension Handle Securing Clip . . . . . REMOVE PIN

4. Alternate Extension Handle . . . . . LIFT FROM CLIP AND PULL TO EXTEND HANDLE. SWIVEL AS REQUIRED AND PUMP UP AND DOWN UNTIL THE THREE GREEN GEAR-DOWN ANNUNCIATORS ARE ILLUMINATED. WHILE PUMPING, DO NOT LOWER HANDLE TO THE LEVEL OF THE SECURING CLIP DURING THE DOWN STROKE AS THIS WILL RESULT IN LOSS OF PRESSURE.

If all three green gear-down annunciators are illuminated:

5. Alternate Extension Handle . . . . . SECURE IN CLIP AND REINSTALL PIN
6. Landing Gear Controls . . . . . DO NOT ACTIVATE (The Landing Gear Control and the Landing Gear Control circuit breaker must not be activated. The landing gear should be considered UNSAFE until the system is cycled and checked with the airplane on jacks.)

If one or more green gear-down annunciators do not illuminate for any reason and a decision is made to land in this condition:

7. Alternate Extension Handle . . . . . CONTINUE PUMPING UNTIL MAXIMUM RESISTANCE IS FELT.
8. Alternate Extension Handle . . . . . DO NOT LOWER. LEAVE AT THE TOP OF THE UP STROKE.

Prior to Landing:

9. Alternate Extension Handle . . . . . PUMP UNTIL MAXIMUM RESISTANCE IS FELT. DO NOT STOW.

After Landing:

10. Alternate Extension Handle . . . . . CONTINUE PUMPING, WHEN CONDITIONS PERMIT, TO MAINTAIN HYDRAULIC PRESSURE UNTIL THE GEAR CAN BE MECHANICALLY SECURED. DO NOT STOW HANDLE. DO NOT ACTIVATE THE LANDING GEAR CONTROL OR THE LANDING GEAR CONTROL CIRCUIT BREAKER. THE LANDING GEAR SHOULD BE CONSIDERED UNLOCKED UNTIL THE SYSTEM IS CYCLED AND CHECKED WITH THE AIRPLANE ON JACKS.

NOTE

The following white EICAS messages are available to aid in the monitoring of the gear position during an alternate extension.

After raising the alternate extension handle with all gear retracted.

L GEAR UP

R GEAR UP

NS GEAR UP

During alternate extension when the individual gear is neither up and locked nor down and locked.

L GEAR IN TRANS

R GEAR IN TRANS

NS GEAR IN TRANS

NOSE GEAR STEERING FAILURE

Failure of the nosegear steering to engage after touchdown can be detected by noting very little resistance to rudder pedal movement and failure of the nosegear steering to respond to rudder inputs. Maintain directional control as follows:

1. Above 70 KIAS . . . . . .USE RUDDERS
2. Below 70 KIAS . . . . . USE DIFFERENTIAL BRAKING
3. Taxi Speeds . . . . . USE DIFFERENTIAL BRAKING/POWER

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ENVIRONMENTAL SYSTEMS

PRESSURIZATION CONTROLLER FAILURE

(Cabin Altitude Below The Preset Value)

If the cabin continues to pressurize below the value set in the controller, manual control may be available using the Manual Cabin Altitude Control.

1. Manual Cabin Altitude Control . . . Rotate clockwise until cabin begins to climb at the desired rate.
2. When desired cabin altitude is reached . . Rotate Manual Cabin Altitude control knob counterclockwise until cabin rate-of-climb returns to zero.
3. Manual Cabin Altitude Control . .Rotate clockwise or counterclockwise to increase or decrease cabin altitude as the airplane altitude changes.

CAUTION

Ensure cabin is depressurized prior to landing.

If the Manual Cabin Altitude control is inoperative in Step **1**, the outflow/safety valves should prevent the cabin from exceeding 8.4 psid: however, if the safety valves fail to control the pressure, the following procedures should be followed to prevent the cabin from exceeding 8.4 psid and to prevent a landing with a pressurized cabin.

4. Bleed Air Valves . . . . . Cycle between OFF and BOTH to keep cabin pressure below 8.4 psid and below an altitude requiring oxygen.
5. Descend to an altitude not requiring oxygen masks for crew and passengers.
6. Bleed Air Valves . . . . . .OFF
7. Land as soon as practical.

DUCT OVERTEMPERATURE (DUCT OVERTEMP MESSAGE)

1. Cabin/Cockpit Blowers . . . . . .HIGH

If condition persists:

2. Temp Mode Selector . . . . . MAN
3. Man Temp Switch . . . . . .DECR (Hold for 60 seconds)

If condition continues:

4. Bleed Air Valves . . . . . .R ENG

OXYGEN PRESSURE LOW (OXYGEN PRES LO MESSAGE)

Illumination of the OXYGEN PRES LO message indicates that the oxygen system is armed and the oxygen tank pressure is below approximately 500 psi.

ICE PROTECTION SYSTEM

ENGINE ICE PROTECTION shall be on for operation in ambient temperatures of +5°C OAT or below when flight free of visible moisture cannot be assured. Visible moisture is moisture in any form: clouds, ice crystals, snow, rain, sleet, hail, or any combination of these. Operation of strobe lights will sometimes show ice crystals not normally visible.

WARNING

If the automatic surface deice system activates the deice boots below -53°C OAT, the boots must be inspected for damage prior to the next flight in icing or possible icing conditions.

ICING ENCOUNTER (ICING MESSAGE)

A yellow message indicates that the ice detector is sensing icing conditions and all ice protection systems are not selected ON, follow the checklist below. If the message is white, all ice protection systems are on and the pilot need only verify that Engine Auto Ignition is ARMED.

1. Stall Warn Heat . . . . . ON
2. Pilot and Copilot Pitot/Static Heat . . . . . ON
3. Pilot and Copilot Windshield Heat . . . . . LOW/HIGH
4. Left and Right Engine Ice Protection . . . . . ON
5. Left and Right Vent/Cable Heat . . . . . ON
6. Engine Auto Ignition . . . . . ARM

NOTE

If the optional Ground Icing Detector System is installed, see the appropriate supplement in Section VII for additional definitions and procedures applicable to the ICING message.

ENGINE ANTI-ICE FAILURE (L OR R ICE VANE FAIL MESSAGE)

1. Engine Ice Protection Actuator . . . . . .STBY

If ICE VANE FAIL message does not extinguish and the L or R ENG ANTICE ON message fails to appear:

2. Exit icing conditions
3. Assume engine anti-ice is ON for performance calculations.

PNEUMATIC PRESSURE LOW (PNEU PRESS LOW MESSAGE)

This message indicates that either the left or right bleed air firewall shutoff valve is closed or that the pressure in the left or right pneumatic pressure line is below 10 psig.

1. Bleed Air Valves . . . . . Check on BOTH

CAUTION

Flight in icing conditions with the bleed air valves in any position other than BOTH or HIGH is not approved.

2. Pneumatic Pressure Displays . . . . . CHECK

NOTE

If low pressure message is due to low pneumatic pressure on one side, proper boot operation will be available; however reliability of the system will be reduced due to a malfunction of one pneumatic system. Flight in icing conditions is not recommended.

CAUTION

If both pressure gages are low, proper boot operation will not occur. Icing flight is prohibited.

CAUTION

If a failure of one or more boot pneumatic lines occurs, producing a boot FAIL message, proper operation of the boots may not be possible with a PNEU PRESS LOW situation. Exit icing conditions. Maintain N_1 as high as possible until icing conditions no longer are present.

DEICE BOOT FAILURE (L OR R FWD BOOT FAIL, L OR R WING BOOT FAIL MESSAGE)

Illumination of one or more of the above messages indicates that a boot has failed to inflate or deflate properly.

1. Power . . . . . .80% N_1 (Minimum)

NOTE

If Bleed Air is on L ENG, R ENG, or EMER, or Engine Anti-Ice is ON, set power at 85% minimum N_1.

2. SURF DEICE MAIN or STBY Test Button . . . . PUSH AND HOLD FOR 3 SECONDS MINIMUM
3. If Boot Fail Message Is Still Illuminated After Test Cycle Is Complete . . . . . EXIT ICING CONDITIONS
4. If Main Wing Boot Has Failed and has Accumulated Ice:
   a. Maintain a Minimum Speed of 130 KIAS (except for landing) while ice remains on the failed boot.
   b. Increase Normal Approach Speeds by 15 KIAS (increase Landing Distance by 25% or 650 feet, whichever is less.)
5. If either Forward Wing Boot Has Failed and has accumulated ice:
   a. Flaps Retracted Stalling Speed May Increase By 15 KIAS (Increase Flaps Retracted Approach Speed 25 KIAS and increase Landing Distance by 35% or 850 feet, whichever is less.)
   b. Flaps Extended Stalling Speed May Increase By 18 KIAS. (Increase Flaps Extended Approach Speed 30 KIAS and increase Landing Distance by 52% or 1350 feet, whichever is less.)

NOTE

The control column shaker may activate when the power is retarded to idle during landing.

MAIN DEICE SYSTEM FAILURE (MAIN DEICE FAIL MESSAGE)

1. The boot deice controller will automatically switch to the standby controller and all boots will inflate in sequence.
2. Press the MAIN SURF DEICE test button if the OAT is above -53°C. If the message is still illuminated after the test cycle is complete, the main deice boot controller or the left ice detector has failed.
3. The standby deice boot controller will continue to automatically actuate the boots when required.
4. Exit icing conditions, if practical.

STANDBY DEICE SYSTEM FAILURE (STBY DEICE FAIL MESSAGE)

NOTE

If the optional Ground Icing Detector System is installed, see the appropriate supplement in Section VII for additional definitions and procedures applicable to the STBY DEICE FAIL message.

1. Press the STBY SURF DEICE test button if the OAT is above -53°C. If the message is still illuminated after the test cycle is complete, the standby deice boot controller has failed or the right ice detector has failed.
2. The main deice boot controller will continue to automatically actuate the boots when required.

3. Exit icing conditions, if practical.

MAIN AND STANDBY DEICE SYSTEM FAILURE (MAIN DEICE FAIL AND STBY DEICE FAIL MESSAGES)

Illumination of both messages indicates one of the following conditions:

1. A comparator in the boot controller has sensed a difference of 3 counts between the main and standby ice detectors. Use the following procedure to determine which ice detector is not functioning properly.
   a. Pull the ICE DETR MAIN and STBY circuit breakers (located on the left Circuit Breaker Panel) and reset them if the ICING message is illuminated. This will extinguish the ICING message.
   b. SURF DEICE STBY Test Button . . . . . PUSH AND HOLD FOR 3 SECONDS MINIMUM
      1) ICING Message - Check for illumination while the test button is being pushed. If the message is not illuminated, the standby ice detector has failed.
      2) STBY DEICE FAIL Message - Extinguished at end of the test cycle. If the message remains illuminated, the standby controller has failed.
      3) ICE DETR STBY Circuit Breaker - Pull if the standby ice detector or standby controller has failed.
   c. Repeat step 1a if the ICING message is illuminated prior to testing the MAIN deice system.
   d. SURF DEICE MAIN Test Button . . . . . PUSH AND HOLD FOR 3 SECONDS MINIMUM
      1) ICING Message - Check for illumination while the test button is being pushed. If the message is not illuminated, the main ice detector has failed.
      2) MAIN DEICE FAIL Message - Extinguished at the end of the test cycle. If the message remains illuminated, the main controller has failed.
      3) ICE DETR MAIN Circuit Breaker - Pull if the main ice detector or main controller has failed.
2. The second cause for the illumination of both messages is a failure of both ice detectors, both deice boot controllers, or a combination of either. Automatic operation of the boot system is no longer possible. Refer to Manual Inflation of Wing Deice Boots in this section.

MANUAL INFLATION OF WING DEICE BOOTS

Use of the following procedure will be required if both deice boot controllers fail (MAIN DEICE FAIL and STBY DEICE FAIL) or at the discretion of the pilot. Boots should be inflated with no more than 1/8 to 1/4 inch of ice accumulation. Some types of ice are difficult to see on the silver deice boots. If in doubt, cycle the deice boots. As a guide, cycle the deice boots every 1 to 5 minutes depending on whether the rate of accumulation is fast or slow. These times may be shortened or extended depending on the specific conditions. Use of any manual deice switch will reset the ice detector counter to zero.

CAUTION

Boot inflation or natural ice shedding with ice accumulation exceeding 1/4 inch may cause damage to the propellers.

CAUTION

Annunciation of improper boot deflation is not provided when using manual switches. When possible, visually confirm that deice boots are deflated.

1. FWD WG MAN Switch . . . . . HOLD FOR 6 SECONDS MINIMUM (L and R FWD BOOT FAIL messages ILLUMINATED, then EXTINGUISHED)
2. MAIN WG INBD MAN Switch . . . . HOLD FOR 6 SECONDS MINIMUM (L and R WING BOOT FAIL messages ILLUMINATED, then EXTINGUISHED)
3. MAIN WG OUTBD MAN Switch . . . HOLD FOR 6 SECONDS MINIMUM (L and R WING BOOT FAIL messages ILLUMINATED, then EXTINGUISHED)

NOTE

Some controller failures may prevent the illumination of the boot failure messages when the manual switches are used. This will not prevent the boots from inflating. Hold the switch for 6 seconds minimum, whether or not the boot failure messages appear. A momentary drop in the pneumatic pressure displays indicates that the boots are inflating.

NOTE

If a boot fail message is displayed as a result of a boot failing to deflate during an automatic cycle, or a cycle initiated with the SEQuence switch, use of the appropriate manual switch will extinguish the message even though the deice boot remains inflated.

If a boot failure message fails to extinguish within the 6-second time period:

4. Power . . . . ENSURE 80% N_1 MINIMUM AND REACTIVATE SWITCHES

If message is still illuminated:

5. Assume boots have failed and exit icing conditions as soon as possible.

FAILURE OF A DEICE BOOT TO DEFLATE (L OR R FWD BOOT FAIL, L OR R WING BOOT FAIL MESSAGE)

If one or more boots fail to deflate as determined by visual inspection:

1. SURFACE DEICE MAIN, SURFACE DEICE STBY, AND SURFACE DEICE MONITOR Circuit Breakers
   (Located on Left Circuit Breaker Panel) . . . . . PULL
2. Use the manual switches to inflate the boots when ice accumulates to 1/8 to 1/4 inch.

FLIGHT PROCEDURES WITH EXCESSIVE ICE ACCUMULATIONS

Excessive ice is considered to be 3 - 4 inches or more of accumulated ice on the unprotected surfaces shown below, plus any residual ice that may remain on normally functioning boots.

Windshield wipers
Unheated edges of windshields
Forward wing tips
Boot intersections
Vortilons
Main Wing Tips
Vertical stabilizers
Top of nacelles

The following characteristics are associated with excessive ice accumulations.

1. Cruise and Climb Performance that may be less than the performance shown in Section V for normal ice accumulations.
2. Reduced lifting capability of the forward wing which results in:
   a. Increased stall speeds
      1) Flaps retracted: 15 KIAS or more
      2) Flaps extended: 18 KIAS or more
   b. Increased nose up trim requirements
   c. Pitch changes greater than 5° when the forward wing boot activates
   d. Increased exposure of the bottom of the elevator to ice accumulation.
3. Rudder pedal vibrations.
4. Potential for damaging propellers due to shed ice.

The following procedures apply with excessive ice accumulations.

1. Exit icing conditions as soon as possible.
2. Be prepared for noticeable pitch changes when the forward wing boots inflate during icing flight.
3. Rudder pedal vibrations are not hazardous. These will cease when the ice is shed from the vertical stabilizers.
4. If a landing is required with excessive residual ice, increase approach speeds as shown below:
   a. Flaps extended landing: 35 KIAS (increase Landing Distance by 63% or 1700 feet, whichever is less)

b. Flaps retracted landing: 30 KIAS (increase Landing Distance by 43% or 1025 feet, whichever is less)

NOTE

The control column shaker may activate when the power is retarded to idle during landing.

PITOT OVERHEAT (PITOT OVERHEAT MESSAGE)

Illumination of the PITOT OVERHEAT message indicates that the pilot and/or copilot pitot/static probe heat has been on for more than 2 minutes while on the ground. No pilot action is required.

SEVERE ICING CONDITIONS (Alternate Method Of Compliance With FAA AD 98-04-25)

THE FOLLOWING WEATHER CONDITIONS MAY BE CONDUCIVE TO SEVERE IN-FLIGHT ICING:

- Visible rain at temperatures below 0 degrees Celsius ambient air temperature.
- Droplets that splash or splatter on impact at temperatures below 0 degrees Celsius ambient air temperature.

PROCEDURES FOR EXITING THE SEVERE ICING ENVIRONMENT:

These procedures are applicable to all flight phases from takeoff to landing. Monitor the ambient air temperature. While severe icing may form at temperatures as cold as -18 degrees Celsius, increased vigilance is warranted at temperatures around freezing with visible moisture present. If the visual cues specified in the Limitations Section of the AFM for identifying severe icing conditions are observed, accomplish the following:

1. Immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the severe icing conditions in order to avoid extended exposure to flight conditions more severe than those for which the airplane has been certificated.
2. Avoid abrupt and excessive maneuvering that may exacerbate control difficulties.
3. Do not engage the autopilot.
4. If the autopilot is engaged, hold the control wheel firmly and disengage the autopilot.
5. If an unusual roll response or uncommanded roll control movement is observed, reduce the angle-of-attack.
6. Do not extend flaps when holding in icing conditions. Operation with flaps extended can result in a reduced wing angle-of-attack with the possibility of ice forming on the upper surface further aft on the wing than normal, possibly aft of the protected area.
7. If the flaps are extended, do not retract them until the airframe is clear of ice.
8. Report these weather conditions to Air Traffic Control.

PITOT/STATIC AIR SYSTEM

The isolated static air source should be used when the normal static air source has been obstructed. When the airplane has been exposed to moisture, the possibility of obstructed static ports should be considered. Partial obstructions will result in the rate of climb indication being sluggish during a climb or descent. Verification of suspected obstruction is possible by switching to the isolated system and noting a sudden sustained change in the rate of climb. This may be accompanied by abnormal airspeed and altitude changes beyond normal calibration differences.

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

1. Static Source . . . . . ISOLATED

NOTE

Be certain the static source switch is in the NORM position when the isolated system is not needed.

STALL WARNING SYSTEM

STALL WARNING FAILURE (L OR R STALL WRN FAIL MESSAGE)

Message indicates the left or right stall warning system has failed. Intentional stalls are prohibited. Maintain V_{REF} or higher. Bank angles of 30° must not be exceeded.

COLUMN PUSHER INOPERATIVE (PUSHER INOP MESSAGE)

Illumination of the PUSHER INOP message indicates that the column pusher system is inoperative.

1. Left and Right Stall Warning Circuit Breakers . . . . . CHECK IN
2. Control Column Pusher Motor and Clutch Circuit Breakers . . CHECK IN

Intentional stalls are prohibited. Maintain V_{REF} or higher. Bank angles of 30° must not be exceeded.

COLUMN PUSHER MOTOR ON (PUSHER MOTOR ON MESSAGE)

Illumination of the PUSHER MOTOR ON message indicates that the pusher motor is energized, but the column pusher clutch is not energized.

1. Pusher Interrupt Control Wheel Button . . . . . .DEPRESS
2. Airplane Attitude . . . . . RECOVER AS REQUIRED
3. Control Column Pusher Clutch Circuit Breaker . . . . . CHECK IN
4. Left and Right Stall Warning Circuit Breakers . . . . . CHECK IN

If PUSHER MOTOR ON message remains illuminated:

5. Control COLUMN PUSHER MOTOR Circuit Breaker . . . . . .PULL

The control column pusher system will be inoperative. Intentional stalls are prohibited. Maintain V_{REF} or higher. Bank angles of 30° must not be exceeded.

COLUMN PUSHER CLUTCH ON (PUSHER CLUTCH ON MESSAGE)

Illumination of the PUSHER CLUTCH ON message indicates that the column pusher clutch is energized, but the column pusher motor is not energized.

1. Pusher Interrupt Control Wheel Button . . . . . .DEPRESS
2. Airplane Attitude . . . . . RECOVER AS REQUIRED
3. Control Column Pusher Motor Circuit Breaker . . . . . CHECK IN
4. Left and Right Stall Warning Circuit Breakers . . . . . CHECK IN

If PUSHER CLUTCH ON message remains illuminated:

5. Control COLUMN PUSHER CLUTCH Circuit Breaker . . . . . .PULL

The control column pusher system will be inoperative. Intentional stalls are prohibited. Maintain V_{REF} or higher. Bank angles of 30°must not be exceeded.

CRACKED WINDSHIELD

If It Has Been Determined That a Crack Has Developed In The Windshield:

1. Airspeed . . . . . .Maintain 200 KIAS or Less
2. Altitude . . . . . Maintain 25,000 Ft or less
3. Pressurization Controller . . . . . .Reset to maintain a cabin differential pressure of 4.0 PSI or less, as required.
4. Windshield Heat . . . . . OFF AFFECTED SIDE

NOTE

Maintain a positive cabin pressure as long as practical prior to landing.

Visibility through the windshield may be significantly impaired. Windshield wipers may be damaged if used on cracked surface. Heating elements may be inoperative in the area of the crack

CAUTION

Prior to next flight, maintenance actions are required. Refer to Airworthiness Limitations in Chapter 4 of the Maintenance Manual.

AVIONICS/FLIGHT INSTRUMENTS

SINGLE RADIO TUNING UNIT (RTU) FAILURE

1. Failed RTU Switch (Center Reversionary Panel) . . . . . .X-SIDE
2. Tune All Radios . . . . . .USE X-SIDE RTU OR EITHER CDU

DUAL RADIO TUNING UNIT (RTU) FAILURE

1. Both RTU Switches (Center Reversionary Panel) . . . . . .X-SIDE
2. COM 1 and NAV 1 . . . . . .TUNE USING THE PILOT'S CDU

NOTE

COM 2 and NAV 2 radios cannot be retuned. ADF frequencies and ATC (transponder) codes cannot be retuned. DME frequencies cannot be retuned. Frequencies and codes that were tuned at the time of the failure will remain active.

TUNING RADIOS WITH RADIO REMOTE TUNING DISABLED (RAD RMT TUN DSBL)

If a malfunction occurs that causes any radios to tune themselves (other than NAV auto-tuning) or radio tuning is unsuccessful through the CDU's:

1. RAD RMT Switch . . . . . .TUN DSBL
2. Tune all radios by using the RTU's.

NOTE

When not required, the RAD RMT switch should be in the NORM position. NAV auto-tuning is disabled when the switch is in the TUN DSBL position.

AVIONIC COOLING AIR FAILURE (AVIONIC AIR FAIL MESSAGE)

1. CKPT/CABIN Blower . . . . . .HIGH

If message does not extinguish within 2 minutes:

2. Avionics Alternate Blower . . . . . ON
3. AV ALTN BLWR ON Message . . . . . .ILLUMINATED

STANDBY ATTITUDE GYRO BATTERY LOW (STBY ATT BAT LO MESSAGE)

Display of the STBY ATT BAT LO message during the preflight AUX BATT test indicates the battery pack for the standby attitude gyro and airspeed/altimeter/magnetic compass lighting is not charged to an adequate level.

PITCH ATTITUDE DISAGREEMENT (PITCH DISAGREE MESSAGE)

Message indicates pilot's and copilot's AHRS disagree in pitch attitude.

1. Standby Attitude Gyro . . . . . MONITOR
2. AHRS . . . . . SELECT X-SIDE ON REVERSIONARY PANEL WITH FAILED AHRS

ROLL ATTITUDE DISAGREEMENT (ROLL DISAGREE MESSAGE)

Message indicates pilot's and copilot's AHRS disagree in roll attitude.

1. Standby Attitude Gyro . . . . . MONITOR
2. AHRS . . . . . SELECT X-SIDE ON REVERSIONARY PANEL WITH FAILED AHRS

HEADING DISAGREEMENT (HDG DISAGREE MESSAGE)

Message indicates pilot's and copilot's AHRS disagree in magnetic heading.

1. Windshield Heat . . . . . .OFF
2. Magnetic Compass . . . . . MONITOR
3. AHRS . . . . . SELECT X-SIDE ON REVERSIONARY PANEL WITH FAILED AHRS
4. Windshield Heat . . . . . LOW

LOCALIZER DISAGREEMENT (LOC DISAGREE MESSAGE)

Message indicates NAV 1 and NAV 2 displayed localizer deviations are not in agreement. The approach should be discontinued until the airplane position can be confirmed by another source.

GLIDESLOPE DISAGREEMENT (GS DISAGREE MESSAGE)

Message indicates NAV 1 and NAV 2 displayed glideslope deviations are not in agreement. The approach may be continued using non-precision localizer approach landing procedures.

EICAS FAILURE

1. EICAS Switch (Center Reversionary Panel) . . . . . .REV
2. MFD . . . . . Check for proper EICAS information

If MFD does not display EICAS information

3. Pull and reset the following EICAS circuit breakers located on the right circuit breaker panel.
   FLIGHT DAU A
   FLIGHT DAU B
   FLIGHT DISPLAY
4. If MFD now displays the proper EICAS information, attempt to regain the EICAS display by returning the EICAS switch (center reversionary panel) to NORM.

ELECTRONIC FLIGHT DISPLAY MESSAGES

Each of the Electronic Flight Displays (EFD) are programmed with messages to indicate specific faults within that system. Those messages are summarized as follows:

AIRSPEED DISPLAY (ASI)			
MESSAGE	**COLOR**	**CAUSE**	**ACTION REQUIRED**
ADC	Red	Air Data Computer Failure	Monitor Standby Airspeed or Cross-side Display. Failure On Pilot's Side: 1. Pitch trim speed reduced to lowest speed. 2. Altitude preselect display will turn magenta while preset altitude is being changed. Failure On Copilot's Side: - Only item 2 above applies.
Flashing airspeed digits	Red/Off	Airspeed exceeds V_{MO}	Reduce airspeed.
TAS dashes	Green	Normal display when TAS is below 40 knots	None
TAS dashes	Red	No temperature probe data	Use cross-side display.
IOAT/ OAT/ISA dashes	Red	No temperature probe data	Use cross-side display.
BT00736			

ALTITUDE/VERTICAL SPEED DISPLAY (ALI)			
MESSAGE	**COLOR**	**CAUSE**	**ACTION REQUIRED**
ADC	Red	Air Data Computer Failure	Monitor Standby Altimeter or Cross-side Display. Failure On Pilot's Side: 1. Pitch trim speed reduced to lowest speed. 2. Altitude preselect display will turn to magenta while preset altitude is being changed. Failure On Copilot's Side: - Only item 2 above applies.
Flashing presel alt digits	Yellow/ Off	More than 200 foot deviation from preselected altitude	Cancel or fly towards preselected altitude.
Flashing presel alt digits	Cyan/ Off	Within 1000 feet but more than 200 feet from preselected altitude	Cancel alert or fly towards preselected altitude.
V_S	Yellow	Vertical speed information is missing	Monitor cross-side display.
BT00737			

CONTROL DISPLAY UNIT (CDU)			
MESSAGE	**COLOR**	**CAUSE**	**ACTION REQUIRED**
CDU FAULT	Red	CDU has a fault	Select CDU X-SIDE 1. Failed CDU will blank and all CDU functions should be controlled from operative CDU. 2. Altitude Awareness Panel (AAP) - Inoperative. Make selections from AAP on the side with the operative CDU. 3. Course/Heading Panel (CHP) - course knob inoperative. Make course selections using CRS knob on the side with the operative CDU.
FMS FAULT	Red	FMS has a fault	Select CDU X-SIDE
SELF-TEST IN PROGRESS	Yellow	Normal cold start test	None
SELF-TEST IN PROGRESS NO DATA BASE CONTINUE>	Yellow	Normal cold start test. Some portion of the data base is corrupted	Press CONTINUE> (data base will need to be reloaded).
MSG	Yellow	New message to read	Press the MSG key and review messages.
Active frequency numerals	Red	Failed radio	Use other radio.
			BT00738

ENGINE INSTRUMENT CREW ALERTING SYSTEM (EICAS)			
MESSAGE	**COLOR**	**CAUSE**	**ACTION REQUIRED**
None	None	Display Failure	Set EICAS switch on center reversionary panel to REV. EICAS display will blank and data will be transferred to the MFD. **NOTE** If MFD subsequently fails, engine parameters can be displayed in abbreviated digital form on either RTU. Place either RTU switch on the center reversionary panel to ENG DATA. Radios on side of the RTU displaying engine data will not be able to be tuned from the corresponding CDU.
CAS	Red boxed	Crew alerts failed	Be aware of loss of crew alerting functions.
DISPLAY TEMP	Red boxed	EICAS overtemp	Select AVIONICS ALTN BLOWER to ON. Be prepared to select EICAS to REV on Center Reversionary Panel.
BT00739			

MULTI-FUNCTION DISPLAY (MFD)			
MESSAGE	**COLOR**	**CAUSE**	**ACTION REQUIRED**
None	None	Display Failure	None. If required, display weather radar on ND.
DISPLAY TEMP	Red boxed	MFD Overtemp	Select AVIONICS ALTN BLOWER to ON. Be prepared for loss of MFD display.
RDR FAIL	Red	Radar failed	Use alternate display or be aware of loss of weather radar.
STAB	Yellow	Radar stabilization selected OFF	Be aware of loss of radar antenna stabilization. Check stab ON/OFF on CDU.
RDR CTL FAULT	Yellow	Display radar control failed	Use alternate display or be aware of loss of weather radar control from CDU.
MAP CTL FAULT	Yellow	Map range control failed	Be aware of loss of map presentations.
NO DATA AVAILABLE	Yellow	No text data from FMS for maps or text	Be aware of loss of maps and text data.
BT00740			

NAVIGATION DISPLAY (ND)			
MESSAGE	**COLOR**	**CAUSE**	**ACTION REQUIRED**
None	None	Display Failure	Select CMPST UP on outboard reversionary panel.
DISPLAY TEMP	Red Boxed	ND Overtemp	Monitor Sensor Display Unit. Select AVIONICS ALTN BLOWER to ON. Be prepared for loss of display.
HDG	Red boxed	Displayed heading failed	Select AHRS X-SIDE.
XHDG	Yellow	X-side heading displayed	None. Heading comparators are OFF.
LOC1/2	Red boxed	Displayed localizer failed	Select another source or use alternate display.
VOR1/2	Red boxed	Displayed VOR failed	Select another source or use alternate display.
FMS	Red boxed	FMS navigator failed	Select another NAV source.
GS	Red boxed	Displayed glideslope failed	Select another source or use alternate display.
-----NM (Only dashes red)	Red	Displayed distance failed	Select another source or use alternate display.
GS---(Only dashes red)	Red	Displayed groundspeed failed	Select another source or use alternate display.
TTG -:-- (Only dashes)	Red	Displayed time-to-go failed	Select another source or use alternate display.
BRG VOR1/2 (Only VOR1/2 in red; boxed)	Red	Displayed VOR failed	Select another source or use alternate display.
BRG FMS (Only FMS in red; boxed)	Red	FMS navigator failed	Select another source or use alternate display.

NAVIGATION DISPLAY (ND)			
BRG ADF (Only ADF in red; boxed)	Red	Displayed ADF failed	Select another source or use alternate display.
DR	Yellow	FMS navigator is in dead reckoning mode	Be aware FMS navigator in DR mode.
CDU	Red boxed	On-side CDU or FMS failed	Select CDU X-SIDE for display control.
XCDU	Yellow	X-side CDU selected	Control display with X-Side CDU.
XCDU	Red boxed	X-side CDU failed	Select on-side CDU if on-side CDU not failed.
RDR FAIL	Red	Displayed radar failed	Use alternate display or be aware of loss of weather radar.
RDR CTL FAULT	Yellow	Displayed radar control failed	Use alternate display or be aware of loss of weather radar control from CDU.
STAB	Yellow	Radar stabilization selected OFF	Be aware of loss of radar antenna stabilization. Check stab ON/OFF on CDU.
BT00741			

PRIMARY FLIGHT DISPLAY (PFD)			
MESSAGE	**COLOR**	**CAUSE**	**ACTION REQUIRED**
None	None	Display Failure	Select CMPST DN on outboard reversionary panel.
DISPLAY TEMP	Red boxed	PFD overtemp	Monitor standby instruments. Select AVIONICS ALTN BLOWER to ON. Be prepared for loss of display.
ATT	Red	On-side attitude failed	Select AHRS X-SIDE, and monitor standby instruments.
XATT	Yellow	X-side attitude displayed	None. Comparators are OFF.
LOC	Red boxed	Displayed localizer failed	Select another source or use alternate display.
VOR	Red boxed	Displayed VOR failed	Select another source or use alternate display.
FMS	Red	FMS navigator failed	Select other NAV source.
GS	Red boxed	Displayed glideslope failed	Select another source or use alternate display.
RA	Red boxed	Displayed radio altitude failed	Use cross-side display or be aware decision height function is not available.
MDA/RPT ---(Only dashes red)	Red	MDA/RPT function failed	Use cross-side display or be aware MDA/RPT function is not available.
DH ----- (Only dashes red)	Red	Decision height function failed	Use cross-side display or be aware decision height function is not available.
CDU	Red boxed	On-side CDU failed or FMS failed	Select CDU X-SIDE for display control.
XCDU	Yellow	CDU X-SIDE selected	Control display with cross-side CDU.
XCDU	Red boxed	X-side CDU failed	Select on-side CDU if on-side CDU not failed.
ELEV	Yellow	Servo is applying residual force to the indicated control surface.	Be prepared to hold residual force in the event of a manual or automatic disconnect.

PRIMARY FLIGHT DISPLAY (PFD)			
AIL	Yellow	Servo is applying residual force to the indicated controls surface.	Be prepared to hold residual force in the event of a manual or automatic disconnect.
RUD	Yellow	Servo is applying residual force to the indicated control surface.	Be prepared to hold residual force in the event of a manual or automatic disconnect.
			BT00742

SENSOR DISPLAY UNIT (SDU)			
MESSAGE	**COLOR**	**CAUSE**	**ACTION REQUIRED**
HDG	Crossed Out and boxed	Displayed heading failed	Be aware no heading information is available on SDU.
Bearing Source	Crossed Out and Pointer Removed	Displayed bearing failed	Select another source or use alternate display.
DME Source	Crossed Out and boxed	Displayed DME failed	Select another source or use alternate display.
VOR 1 VOR 2 ← → ADF 1 ADF 2 ← → FMS ←	Crossed Out	No usable signal	Select another source or use alternate display.
VOR Source	Crossed Out Scale and Deviation Bar Removed	Displayed VOR failed	Select another source or use alternate display.
Deviation Bar	Deviation Bar Removed	No usable VOR signal	Select another source or station.
BT00743			

NORMAL PROCEDURES (AD 98-04-24)

THE FOLLOWING WEATHER CONDITIONS MAY BE CONDUCIVE TO SEVERE IN-FLIGHT ICING:

- Visible rain at temperatures below 0 degrees Celsius ambient air temperature

- Droplets that splash or splatter on impact at temperatures below 0 degrees Celsius ambient air temperature.

PROCEDURES FOR EXITING THE SEVERE ICING ENVIRONMENT

These procedures are applicable to all flight phases from takeoff to landing. Monitor the ambient air temperature. While severe icing may form at temperatures as cold as -18 degrees Celsius, increased vigilance is warranted at temperatures around freezing with visible moisture present. If the visual cues specified in the Limitations Section of the AFM for identifying severe icing conditions are observed, accomplish the following:

- Immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the severe icing conditions in order to avoid extended exposure to flight conditions more severe than those for which the airplane has been certificated.

- Avoid abrupt and excessive maneuvering that may exacerbate control difficulties.

- Do not engage the auto pilot

- If the autopilot is engaged, hold the control wheel firmly and disengage the autopilot.

- If an unusual roll response or uncommanded roll control movement is observed, reduce the angle-of-attack.

- Do not extend flaps when holding in icing conditions. Operation with flaps extended can result in a reduced wing angle-of-attack, with the possibility of ice forming on the upper surface further aft on the wing than normal, possibly aft of the protected area.

- If the flaps are extended, do not retract them until the airframe is clear of ice.

- Report these weather conditions to Air Traffic Control.

SECTION IV
NORMAL PROCEDURES
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All airspeeds quoted in this section are *indicated airspeeds* (IAS) and assume zero instrument error.

AIRSPEEDS FOR SAFE OPERATION (14,900 POUNDS)

Maximum Demonstrated Crosswind Component . . . . . 21 Knots

Takeoff
- Rotation . . . . . See Appropriate Chart
- 35-ft Speed . . . . . See Appropriate Chart

Two-Engine Best Angle-of-Climb (V_X) . . . . . 115 Knots

Two-Engine Best Rate-of-Climb (V_Y) . . . . . 140 Knots
(Decreases 0.55 KIAS/1000 feet above sea level, Blue Line+10 knots)

Cruise Climb:
- Sea Level to 10,000 feet . . . . . 180 Knots
- 10,000 to 20,000 feet . . . . . 160 Knots
- 20,000 to 30,000 feet . . . . . 140 Knots
- 30,000 to 41,000 feet . . . . . 130 Knots

Maneuvering Speed (V_A) . . . . . 181 Knots

Turbulent Air Penetration . . . . . 170 Knots

CAUTION

Do not use controls abruptly above 181 knots.

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

Landing Approach Speed (V_{REF}):
- Flaps Extended . . . . . See Chart

Balked Landing Climb . . . . . See Chart

Air Minimum Control Speeds (V_{MCA}):
- Propeller Feathered
  - Flaps Retracted . . . . . 94 Knots
  - Flaps Extended . . . . . 89 Knots
- Propeller Windmilling
  - Flaps Retracted . . . . . 135 Knots
  - Flaps Extended . . . . . 135 Knots

PROCEDURES BY FLIGHT PHASE

NOTE

Refer to applicable Beech and STC Supplements for flight phase procedures for optional equipment installed in the airplane.

PREFLIGHT INSPECTION

After the first flight of each day, the Preflight Inspection may be omitted except for items marked with a *. Fuel caps need not be checked unless fuel is serviced.

COCKPIT

1. Parking Brake . . . . . SET
2. Control Lock . . . . . REMOVE
3. Landing Gear Control . . . . . DN
4. Battery . . . . . ON
5. Pitch/Roll/Rudder Trim . . . . . SET TO "0" (NEUTRAL)
6. Fuel Quantity . . . . . CHECK
7. Oxygen Pressure . . . . . CHECK
8. Battery . . . . . OFF
9. Oxygen System Preflight Inspection . . . . COMPLETE (See Other Normal Procedures)

LEFT FORWARD WING

1. Windshield Wiper . . . . . CHECK
2. Cabin Air Discharge Exit . . . . . CLEAR
3. Elevator . . . . . CHECK
4. Elevator Trim Tab . . . . . VERIFY "0" (NEUTRAL) POSITION
   a. Elevator Hinge Ice Shields (3) . . . . . CHECK
   b. Elevator Tab Ice Shield (1) . . . . . CHECK

NOTE

The elevator trim tab "0" (neutral) position is determined by observing that the trailing edge of the elevator trim tab aligns with the trailing edge of the elevator.

5. Leading Edge . . . . . CHECK
   (Inspect deice boots for cuts, abrasions, and security)
6. Vortex Generators . . . . . CHECK

NOSE SECTION

1. Access Panels . . . . . SECURE
*2. Nose Gear and Doors . . . . . CHECK
*3. Gear Pin . . . . . REMOVE
4. Landing and Taxi Lights . . . . . CHECK

*5. Chocks . . . . . REMOVE
6. Pitot/Static Ports . . . . . .CLEAR
7. AOA Probes . . . . . .CLEAR; ROTATES
8. OAT Probe . . . . . CHECK
9. Ice Detectors . . . . . CHECK

RIGHT FORWARD WING

1. Vortex Generators . . . . . CHECK
2. Leading Edge . . . . . CHECK
(Inspect deice boots for cuts, abrasions, and security)
3. Elevator . . . . . CHECK
4. Elevator Trim Tab . . . . . .VERIFY "0" (NEUTRAL) POSITION
   a. Elevator Tab Ice Shield (1) . . . . . CHECK
   b. Elevator Hinge Ice Shields (3) . . . . . CHECK

NOTE

The elevator trim tab "0" (neutral) position is determined by observing that the trailing edge of the elevator trim tab aligns with the trailing edge of the elevator.

5. Windshield Wiper . . . . . CHECK

RIGHT AFT WING

*1. Fuel Cap . . . . . SECURE
2. Engine Air Intake . . . . . .CLEAR
3. Fuselage/Wing Fairings . . . . . SECURE
*4. Landing Gear Wheel Well . . . . . CHECK
5. Aft Tank Vent . . . . . .CLEAR
6. Fuel Drains (two forward and one aft of wheel well) . . . . . DRAIN
*7. Landing Gear and Door:
   a. Hubcaps . . . . . CHECK FOR PROPER INSTALLATION, SECURITY, AND CONDITION
   b. Wheel Speed Transducer Wire . . . . . CHECK SECURITY AND CONDITION
   c. Gear Pin . . . . . REMOVE
*8. Chocks . . . . . REMOVE
9. Heated Fuel Vent . . . . . .CLEAR
10. Flush Fuel Vent . . . . . .CLEAR
11. Leading Edge . . . . . CHECK
(Inspect deice boots for cuts, abrasions, and security)
12. Vortilons . . . . . CHECK
13. Landing Light . . . . . CHECK
14. Navigation and Anti-collision Lights . . . . . CHECK
15. Vertical Stabilizer . . . . . CHECK
16. Vortex Generators . . . . . CHECK
17. Rudder/Elevon . . . . . CHECK
18. Trim Tabs Position . . . . . VERIFY
   a. Rudder . . . . . "0" (NEUTRAL)

b. Elevon ..... SLIGHTLY TRAILING EDGE UP
19. Underside Access Panels ..... SECURE
20. Flaps ..... CHECK
21. Engine Cowling and Panels ..... CHECK
22. Fuel Strainer ..... DRAIN
*23. Electronic Dipstick ..... PUSH BUTTON FOR GREEN LIGHT; DOOR - SECURE
24. Oil Cooler Inlet and Exit ..... CLEAR
25. Exhaust Stacks ..... CHECK
*26. Propeller ..... CHECK

AFT FUSELAGE

1. Heat Exchanger Exits ..... CLEAR
2. Environmental Air Intake ..... CLEAR
3. Ventral Stabilizer ..... CHECK
4. Navigation Antennas ..... CHECK
5. Navigation Light ..... CHECK
6. Emergency Locator Transmitter ..... VERIFY ARMED
7. Access Panels ..... SECURE

LEFT AFT WING

*1. Propeller ..... CHECK
2. Exhaust Stacks ..... CHECK
3. Oil Cooler Inlet and Exit ..... CLEAR
*4. Electronic Dipstick ..... PUSH BUTTON FOR GREEN LIGHT; DOOR - SECURE
5. Fuel Strainer ..... DRAIN
6. Engine Cowling and Panels ..... CHECK
7. Flaps ..... CHECK
8. Underside Access Panels ..... SECURE
9. Trim Tabs Position ..... VERIFY
   a. Elevon ..... SLIGHTLY TRAILING EDGE UP
   b. Rudder ..... "0" (NEUTRAL)
10. Rudder/Elevon ..... CHECK
11. Vortex Generators ..... CHECK
12. Vertical Stabilizer ..... CHECK
13. Navigation and Anti-collision Lights ..... CHECK
14. Landing Light ..... CHECK
15. Vortilons ..... CHECK
16. Leading Edge ..... CHECK
    (Inspect deice boots for cuts, abrasions, and security)
17. Flush Fuel Vent ..... CLEAR
18. Heated Fuel Vent ..... CLEAR
*19. Landing Gear and Door:
   a. Hubcaps ..... CHECK FOR PROPER INSTALLATION, SECURITY, AND CONDITION
   b. Wheel Speed Transducer Wire ..... CHECK SECURITY AND CONDITION
   c. Gear Pin ..... REMOVE
*20. Chocks ..... REMOVE

21. Fuel Drains (two forward and one aft of wheel well) . . . . . DRAIN
22. Aft Tank Vent . . . . . .CLEAR
*23. Landing Gear Wheel Well . . . . . CHECK
24. Fuselage/Wing Fairings . . . . . SECURE
25. Engine Air Intake . . . . . .CLEAR
*26. Fuel Cap . . . . . SECURE

FORWARD FUSELAGE

1. Upper Antennas . . . . . CHECK
2. Lower Antennas . . . . . CHECK

BEFORE ENGINE STARTING

* Must be accomplished for the first flight of the day. May be omitted for quick turn-around at the pilot's discretion on subsequent flights.

Φ Expanded procedures exist for this item later in this section.

*Φ1. Airstair Door Annunciator Circuity Check . . . . . COMPLETE
Φ2. Airstair Door . . . . . LOCKED
(See Airstair Door Annunciator Circuits Checks, In Other Normal Procedures)

WARNING

A crew member must close and lock the door.

3. Gear Pins . . . . . STOW
4. Cockpit and Lavatory Doors (aisleway clear) . . . . . OPEN
5. Load and Baggage . . . . . SECURE
6. Weight and CG . . . . . CHECKED
*7. Emergency Exit . . . . . SECURE
8. Cabin Seats . . . . . POSITIONED
   a. Seatbacks . . . . . .UPRIGHT
   b. Lateral-tracking Seats . . . . . OUTBOARD POSITION
9. Passenger Briefing . . . . . COMPLETE
10. Circuit Breakers (Left, Right, Aux) . . . . . IN
*11. Outboard Reversionary Panels . . . . . AS REQUIRED
12. Seats and Rudder Pedals . . . . . .ADJUSTED
13. Seatbelts and Shoulder Harnesses . . . . . .FASTENED
14. Parking Brake . . . . . .SET
15. Control Lock . . . . . REMOVED
*16. Audio Panels and MIC . . . . . AS REQUIRED
*17. Static Source . . . . . .NORM
18. Oxygen Supply . . . . . SYS READY - PULL ON - CONFIRM
19. Oxygen System Preflight Inspection . . . . . .CONFIRM COMPLETE
20. Ice Protection . . . . . .OFF
21. Landing Gear Control . . . . . DN
22. Anti-Skid Switch . . . . . ANTI-SKID

*23. Center Reversionary Panel . . . . . AS REQUIRED
24. Standby Indicators . . . . . ON
• Check BATT PWR ON annunciator . . . . . ILLUMINATED, then OFF
25. Power Levers . . . . . IDLE
26. Propeller Levers . . . . . FULL FORWARD
27. Condition Levers . . . . . FUEL CUTOFF
28. Bleed Air Valves . . . . . OFF
29. Temp Mode . . . . . OFF
30. Battery . . . . . ON
31. Volts Bus Select:
a. TRIP FED BUS . . . . . 22 VOLTS MINIMUM
b. CTR BUS . . . . . 23 VOLTS MINIMUM
32. EICAS . . . . . ON
*33. Fuel System Checks:
a. Firewall Fuel Valves . . . . . PUSH CLOSED
EXTINGUISHER PUSH and F/W VALVE CLOSED annunciators . . . . . ILLUMINATED
b. Standby Pumps . . . . . ON
FUEL PRES LO annunciators . . . . . ILLUMINATED
c. Firewall Fuel Valves . . . . . PUSH OPEN
EXTINGUISHER PUSH and F/W VALVE CLOSED annunciators . . . . . EXTINGUISHED
FUEL PRES LO annunciators . . . . . EXTINGUISHED
d. Standby Pumps . . . . . OFF
FUEL PRES LO annunciators . . . . . ILLUMINATED
e. Transfer Flow . . . . . ALTERNATELY LEFT AND RIGHT
FUEL TRANSFER message . . . . . ILLUMINATED
FUEL PRES LO annunciator (supplying side) . . EXTINGUISHED
f. Transfer Flow . . . . . OFF
*34. Avionics Alternate Blower Checks:
a. AVIONIC AIR FAIL Message . . . . . ILLUMINATED
b. Avionics Alternate Blower . . . . . ON
c. AV ALT BLWR ON Message . . . . . ILLUMINATED
d. AVIONIC AIR FAIL Message . . . . (in approximately 10-20 seconds) EXTINGUISHED
e. Avionics Alternate Blower . . . . . OFF
35. Fuel Quantity (Total and Aft) . . . . . CHECK
36. Oxygen Pressure . . . . . CONFIRM
37. Lights . . . . . AS REQUIRED

ENGINE STARTING (BATTERY)

NOTE

This checklist must be accomplished in the sequence shown.

CAUTION

Avoid sustained propeller operation below 1000 rpm, except when propeller is feathered.

1. Right Ignition and Engine Start . . . . . ON
2. Right Condition Lever (12% N_1 minimum) . . . . . .START
3. N_1 and ITT (1000°C maximum) . . . . . MONITOR

CAUTION

If no ITT rise is observed within 10 seconds after moving the Condition Lever to START, move the Condition Lever to FUEL CUTOFF and move the Ignition and Engine Start Switch to OFF. Allow 5 minutes for fuel to drain and starter to cool, then follow ENGINE CLEARING procedures.

4. Right Oil Pressure . . . . . CHECK
5. Right Ignition and Engine Start (50% N_1 minimum) . . . . . .OFF
6. Right Condition Lever . . . . . .RUN (65% N_1 Minimum)
7. Right Generator . . . . . .RESET; then ON
8. Volts Bus Select . . . . . L GEN
   (Confirm 27.5 - 29.0 Volts)
9. Charge Battery Until Loadmeter Reads 50% or Less
10. Left Ignition and Engine Start . . . . . ON
11. Left Condition Lever (12% N_1 minimum) . . . . . .START
12. N_1 and ITT (1000°C maximum) . . . . . MONITOR
13. Left Oil Pressure . . . . . CHECK
14. Left Ignition and Engine Start (50% N_1 minimum) . . . . . .OFF
15. Left Condition Lever . . . . . .RUN (65% N_1 minimum)
16. Left Generator . . . . . .RESET; then ON
17. Gen Ties . . . . . OPEN
    - L GEN TIE OPEN and R GEN TIE OPEN Messages .ILLUMINATED
18. Volts Bus Select . . . . . .TRIP FED
    (Confirm 26.5 - 28.0 Volts)
19. Gen Ties . . . . . .NORM
    - L GEN TIE OPEN and R GEN TIE OPEN Messages (for approximately 2 seconds) . . . . . .EXTINGUISHED
    - L GEN TIE OPEN, R GEN TIE OPEN, BATTERY TIE OPEN Messages (for approximately 2 seconds) . . . . .ILLUMINATED, then EXTINGUISHED

NOTE

AVIONIC AIR FAIL will illuminate during this two second time period and the Number 1 RTU will blank momentarily.

20. Generator Load (paralleled within 10%) . . . . . CHECK

ENGINE STARTING (EXTERNAL POWER)

NOTE

This checklist must be accomplished in the sequence shown.

CAUTION

NEVER CONNECT AN EXTERNAL POWER SOURCE TO THE AIRPLANE UNLESS A BATTERY INDICATING A CHARGE OF AT LEAST 20 VOLTS IS IN THE AIRPLANE. If the battery voltage is less than 20 volts, the battery must be replaced with a battery indicating at least 20 volts, before connecting external power. Use only an external power source fitted with an AN-type plug.

When an external power source is used, ascertain that it has the capability of generating a minimum of 1000 amps momentarily and 300 amps continually. The output voltage must be set to 28.0 - 28.4 volts.

CAUTION

Avoid sustained propeller operation below 1000 rpm, except when propeller is feathered.

1. Propeller Levers . . . . . FEATHER
2. EICAS, Pilot and Copilot Avionics . . . . . OFF
3. L Gen and R Gen . . . . . OFF
4. Battery . . . . . ON
5. External Power Source . . . . TURN OFF; then CONNECT TO AIRPLANE
6. External Power Source . . . . . TURN ON
7. Volts Bus Select . . . . . EXT PWR
   (Confirm 28.0 - 28.4 Volts)
8. EXT PWR Switch . . . . . ON

NOTE

The bus ties will close and associated systems will be powered when external power is properly connected to the airplane.

9. EICAS . . . . . ON

10. Right Ignition and Engine Start . . . . . ON
11. Right Condition Lever (12% N_1 minimum) . . . . . .START
12. N_1 and ITT (1000°C maximum) . . . . . MONITOR

CAUTION

If no ITT rise is observed within 10 seconds after moving the Right Condition Lever to START, move the Condition Lever to FUEL CUTOFF and move the Ignition and Engine Start Switch to OFF. Allow 5 minutes for fuel to drain and starter to cool, then follow ENGINE CLEARING procedures.

13. Right Oil Pressure . . . . . CHECK
14. Right Ignition and Engine Start (50% N_1 minimum) . . . . . .OFF
15. Right Condition Lever . . . . . .RUN (65% N_1 minimum)
16. Left Ignition and Engine Start . . . . . ON
17. Left Condition Lever (12% N_1 minimum) . . . . . .START
18. N_1 and ITT (1000°C maximum) . . . . . MONITOR
19. Left Oil Pressure . . . . . CHECK
20. Left Ignition and Engine Start (50% N_1 minimum) . . . . . .OFF
21. Left Condition Lever . . . . . .RUN (65% N_1 minimum)
22. EXT PWR Switch . . . . . OFF-RESET
23. External Power Source . . . . . .TURN OFF; then DISCONNECT
24. Right Generator . . . . . .RESET; then ON
25. Volts Bus Select . . . . . .L GEN
    (Confirm 27.5 - 29.0 Volts)
26. Left Generator . . . . . .RESET; then ON
27. Gen Ties . . . . . OPEN
    - L GEN TIE OPEN and R GEN TIE OPEN Messages .ILLUMINATED
28. Volts Bus Select . . . . . .TRIP FED
    (Confirm 26.5 - 28.0 Volts)
29. Gen Ties . . . . . .NORM
    - L GEN TIE OPEN and R GEN TIE OPEN Messages (for approximately 2 seconds) . . . . . .EXTINGUISHED
    - L GEN TIE OPEN, R GEN TIE OPEN, BATTERY TIE OPEN Messages (for approximagtely 2 seconds) . . . .ILLUMINATED, then EXTINGUISHED

NOTE

AVIONIC AIR FAIL will illuminate during this two second time period and the Number 1 RTU will blank momentarily.

30. Generator Load (paralleled within 10%) . . . . . CHECK
31. Propeller Levers . . . . . .FULL FORWARD

ENGINE CLEARING

The following procedure is used to clear an engine at any time when it is deemed necessary to remove internally trapped fuel and vapor, or if there is evidence of a fire within the engine. Air passing through the engine serves to purge fuel, vapor, or fire from the combustion section, gas generator turbine, power turbines and exhaust system.

1. Condition Lever . . . . . FUEL CUTOFF
2. Ignition and Engine Start (maximum of 30 seconds) . . . STARTER ONLY

CAUTION

Do not exceed starter time limits; see Section II, LIMITATIONS Section.

3. Ignition and Engine Start . . . . . .OFF

BEFORE TAXI

NOTE

Time, date and position must be verified on the CDU during FMS initialization for proper system operation.

1. Pilot and Copilot Avionics . . . . . ON
2. Standby Indicators . . . . . ON
3. Bleed Air Valves . . . . . BOTH
4. Blowers/Temperature . . . . . .SET
5. Temp Mode Selector . . . . . AUTO
6. Lights . . . . . AS REQUIRED
7. Cabin Lights and/or Furnishings . . . . . AS REQUIRED
8. No Smoke and Seatbelts . . . . . ON
9. Pilot and Copilot Flight Instruments . . . . . .OPERATING
10. Flap/Forward Wing . . . . . .RETRACT
11. AHRS ALIGNING - DO NOT TAXI Message . . . . . .EXTINGUISHED
12. Standby Attitude Gyro . . . . . UNCAGE

CAUTION

Do not taxi with a caged gyro

13. Brakes . . . . . .RELEASED and CHECKED

CAUTION

If brakes feel soft or "spongy", or exhibit asymmetric or "jerky" operation, it is likely that air is trapped in the system. If this condition is not corrected, reduced directional control and braking response could result in a hazardous situation.

NOTE

Propeller Beta Range may be used during taxi with minimum blade erosion up to the point where N_1 increases. Care must be exercised when taxiing on unimproved surfaces. If possible, conduct RUNUP on a hard surface free of sand and gravel, to preclude pitting of the propeller blades and airplane surfaces.

BEFORE TAKEOFF (RUNUP)

* Must be accomplished for the first flight of the day. May be omitted for quick turn-around at the pilot's discretion on subsequent flights.

Φ Expanded procedures exist for these items later in this section.

1. Press To Test: (Press, check for reaction, then release unless otherwise stated.)
   - a. FIRE EXT (DISCH and OK annunciators) . . . . . .ILLUMINATED
   - b. FIRE DETR (ENG FIRE annunciators) . . . . . .ILLUMINATED
   - c. FLAP/FWD WING MONITOR (release within 5 seconds) . . . . . CHECK EICAS
   - d. AUX BATT (hold for 5 seconds) . . . . . CHECK EICAS
   - *e. BATT MONITOR (Press and Release) . . . . . BATT CHG RATE annunciator ILLUMINATED FOR 2 SECONDS
   - *f. PRESS . . . . . CHECK FOR CABIN RATE-OF-DESCENT
   - *g. FUEL LO WARN . . . . . CHECK EICAS
   - Φh. STALL WARN (Press and Release) . . . . . CHECK
   - *i. V_{MO}/M_{MO} . . . . . HORN
   - *j. LDG GR . . . . . HANDLE LIGHT ILLUMINATED AND HORN
   - k. ANNUN . . . . . ALL LIGHTS ILLUMINATED
   - *l. BLEED AIR (L, FUS, R BLEED FAIL Ann) . . . . . .ILLUMINATED
2. *Φ Surface Deice System and Ice Protection . . . . . CHECK AS REQUIRED
3. Φ Pressurization:
   - a. Controller - Adjust so that the inner scale (airplane altitude) indicates 1,000 feet above cruise altitude or the outer scale (cabin altitude) indicates 500 feet above takeoff field pressure altitude, whichever yields the higher cabin altitude.
   - b. Rate Knob . . . . . SET AT 10:00 POSITION
   - c. Manual Cabin Altitude Control . . . . . .NORM (FULL CCW)
4. Avionics . . . . . CHECK AND SET
5. *Φ Autopilot . . . . . CHECK
6. Φ Pitch, Roll and Rudder Trim Systems . CHECK AND SET FOR TAKEOFF
7. Engine Controls Friction Locks . . . . . .SET
8. Flap/Fwd Wing . . . . . AS DESIRED

9. Flight Controls . PROPER DIRECTION AND FREEDOM OF MOVEMENT
*10. Low Pitch Test:
    a. Power Levers (note propeller rpm) . . . . . IDLE
    b. Propeller Test Switch (note propeller rpm decrease) . . . . HOLD TO LOW PITCH
    c. Propeller Test Switch . . . . . RELEASE
    (Note rpm increase to value in step a, above)
*11. Overspeed Governor Test:
    a. Propeller Levers . . . . . FULL FORWARD
    b. Propeller Test Switch . . . . . HOLD TO OVERSPEED GOV
    c. Power Levers . . . INCREASE UNTIL PROPS ARE STABILIZED AT 1520 TO 1610 RPM
    d. Propeller Test Switch . . . . . RELEASE
    (Propeller RPM increases above value in step c)
    e. Power Levers . . . . . IDLE
12. Propeller Autofeather Test:
    a. Propeller Levers . . . . . SET AT LOW RPM POSITION
    b. Autofeather Switch . . . . . HOLD TO TEST
    c. Power Levers . . . . . SET APPROXIMATELY 17%TORQUE
    (AFX message illuminated on EICAS)
    d. Left Power Lever . . RETARD UNTIL PROPELLER FEATHERS then, RESET 17% TORQUE
    e. Right Power Lever . . . . RETARD UNTIL PROPELLER FEATHERS
    f. Power Levers . . . . . RETARD TO IDLE
13. Autofeather . . . . . ARM
14. Propeller Manual Feathering . . . . . CHECK
15. Standby Altimeter . . . . . SET
16. Flight and Engine Displays . . . . . CHECK

BEFORE TAKEOFF (FINAL ITEMS)

ΦExpanded procedures exist for this item later in this section.

1. Stall Warning Heat . . . . . ON
2. Pitot/Static Heat . . . . . ON
3. Engine Ice Protection . . . . . AS REQUIRED
4. Vent/Cable Heat . . . . . ON
5. Bleed Air Valves . . . . . BOTH
6. Transponder . . . . . ON
7. Annunciators and EICAS Messages . . . . . EXTINGUISHED or CONSIDERED
8. Lights . . . . . AS REQUIRED
Φ9. Windshield Heat . . . . . LOW
10. Engine Auto-ignition . . . . . AS REQUIRED
11. Generator Load . . . . . CHECK
12. Pitch, Roll and Rudder Trim . . . . . CHECK

WARNING

Pitch and roll trim must be set within the green band and rudder trim must be set at the center index prior to takeoff.

13. V_1, V_R, V_2, Static Take-off Power . . . . . .CONFIRM

TAKEOFF

1. Brakes . . . . . HOLD

CAUTION

If brakes feel soft or "spongy", or exhibit asymmetric or "jerky" operation, it is likely that air is trapped in the system. If this condition is not corrected, reduced directional control and braking response could result in a hazardous situation.

2. Power Levers . . . . . .SET STATIC TAKE-OFF POWER
3. Autofeather Messages . . . . . .ILLUMINATED
4. Brakes . . . . . .RELEASE

NOTE

Increasing airspeed will cause torque and ITT to increase.

5. V_R Speed . . . . . .ROTATE TO APPROXIMATELY 8° PITCH ATTITUDE
6. Landing Gear (when positive climb established) . . . . . UP
7. Airspeed (until clear of obstacles) . . . . . MAINTAIN V_2 + 5 KIAS (Flaps Extended) V_2 + 11 KIAS (Flaps Retracted)
8. Flap/Fwd Wing . . . . . .RETRACT

ROLLING TAKEOFF

When in take-off position:

1. Brakes . . . . . .RELEASE
2. Power Levers . . . . . .SET STATIC TAKE-OFF POWER (within 10 seconds of brake release)
3. Autofeather Messages . . . . . .ILLUMINATED
4. V_R Speed . . . . . .ROTATE TO APPROXIMATELY 8° PITCH ATTITUDE
5. Landing Gear (when positive climb established) . . . . . UP
6. Airspeed (until clear of obstacles) . . . . . MAINTAIN V_2 + 5 KIAS (Flaps Extended) V_2 + 11 KIAS (Flaps Retracted)

7. Flap/Fwd Wing . . . . . .RETRACT

CLIMB

1. Yaw Damp . . . . . ON
2. Climb Power . . . . . .SET
3. Propeller . . . . . 1600 RPM
4. Propeller Sync . . . . . ON
5. Engine Display . . . . . MONITOR
6. Cabin Pressurization . . . . . MONITOR
7. No Smoke/Seatbelts . . . . . AS REQUIRED
8. Lights . . . . . AS REQUIRED

CRUISE

WARNING

Do not lift Power Levers in flight.

1. Cruise Power . . . . . .SET
2. Autofeather . . . . . .OFF
3. Lights . . . . . AS REQUIRED
4. Engine Display . . . . . MONITOR
5. Fuel Gages (Total and Aft Quantity) . . . . . MONITOR

DESCENT

1. Pressurization Controller . . . . . .SET
   a. Controller - SET per PRESSURIZATION CONTROLLER SETTING FOR LANDING graph, or so that "CABIN ALT" dial indicates landing field pressure altitude plus 500 feet
   b. Rate Knob . . . . . AS DESIRED
2. Standby Altimeter . . . . . .SET
3. No Smoke/Seatbelts . . . . . AS REQUIRED
4. Power . . . . . AS REQUIRED
5. Lights . . . . . AS REQUIRED

BEFORE LANDING

1. Approach Speed . . . . . .CONFIRM
2. Cockpit and Lavatory Doors (aisleway clear) . . . . . OPEN
3. Pressurization . . . . . CHECK
4. No Smoke/Seatbelts . . . . . ON
5. Autofeather . . . . . ARM
6. Landing Gear . . . . . DN
7. Flap/Fwd Wing . . . . . .EXTEND
8. Lights . . . . . AS REQUIRED
9. Autopilot . . . . . .DISCONNECT
10. Propeller Sync . . . . . AS DESIRED

11. Radar . . . . . AS REQUIRED
12. Yaw Damp . . . . . .OFF

NOTE

If crosswind landing is anticipated, determine Crosswind Component from Section V, Performance Section. Immediately prior to touchdown, lower up-wind wing and align the fuselage with the runway by use of rudder. During rollout, hold roll control into the wind and maintain directional control with rudder and brakes.

NORMAL LANDING

When Landing Assured:

1. Power Levers . . . . . IDLE
2. Propeller Levers . . . . . .FULL FORWARD

After Touchdown:

3. Power Levers . . . . . LIFT AND SELECT GROUND FINE
4. Brakes . . . . . AS REQUIRED

CAUTION

If brakes feel soft or "spongy", or exhibit asymmetric or "jerky" operation, it is likely that air is trapped in the system. If this condition is not corrected, reduced directional control and braking response could result in a hazardous situation.

MAXIMUM REVERSE THRUST LANDING

When Landing Assured:

1. Power Levers . . . . . IDLE
2. Propeller Levers . . . . . .FULL FORWARD

After Touchdown:

CAUTION

To ensure constant reversing characteristics, the propeller control must be in the FULL INCREASE RPM position.

3. Power Levers . . . . . LIFT AND SELECT GROUND FINE, then LIFT AND SELECT REVERSE AS REQUIRED
4. Brakes . . . . . AS REQUIRED

CAUTION

If possible, propellers should be moved out of reverse at approximately 40 knots to minimize blade erosion. Care must be exercised when reversing on runways with gravel, sand, dust or snow on the surface. Flying gravel may damage propeller blades, fuselage or control surfaces and dust, sand or snow may impair the pilot's visibility.

BALKED LANDING

1. Power ..... MAXIMUM ALLOWABLE
2. Airspeed ..... ESTABLISH BALKED LANDING CLIMB SPEED
3. Flap/Fwd Wing ..... RETRACT
4. Landing Gear (When positive climb established) ..... UP

AFTER LANDING

1. Stall Warning Heat ..... OFF
2. Pitot/Static Heat ..... OFF
3. Windshield Heat ..... AS REQUIRED
4. Vent/Cable Heat ..... OFF
5. Engine Auto-ignition ..... OFF
6. Transponder ..... STBY
7. Lights ..... AS REQUIRED
8. Trim ..... SET
9. Flap/Forward Wing ..... RETRACT

SHUTDOWN AND SECURING

1. Parking Brake ..... SET
2. Standby Attitude Gyro ..... CAGE
3. Oxygen Supply ..... PUSH OFF
4. Engine Ice Protection ..... OFF
5. Windshield Heat ..... OFF
6. Pilot and Copilot Avionics ..... OFF
7. Standby Indicator ..... OFF
8. Bleed Air Valves ..... OFF
9. Temp Mode ..... OFF
10. Battery ..... CHARGED
11. ITT ..... STABILIZED AT MINIMUM TEMPERATURE FOR ONE MINUTE
12. Condition Levers ..... FUEL CUTOFF
13. Propellers ..... FEATHERED

CAUTION

Monitor ITT during shutdown. If sustained combustion is observed, proceed immediately to the ENGINE CLEARING procedure. During shutdown, ensure that the compressors decelerate freely. Do not close the firewall fuel valves for normal engine shutdown.

14. Overhead Panel Switches . . . . . OFF
15. EICAS . . . . . OFF
16. Battery and Generators . . . . . OFF
17. Control Lock . . . . . INSTALL
18. Chocks . . . . . INSTALL
19. Gear Pins . . . . . INSTALL

WARNING

Anytime the airplane is on the ground (whether on jacks or on wheels), the nose and main landing gear MUST be pinned in the down and locked position. The only exceptions to this would be landing gear operational checks, during the removal or installation of the landing gear components, and during taxiing operations prior to takeoff or after landing. When any work is being performed in the nose gear wheel well, the nose gear doors MUST be pinned in the open position.

20. Parking Brake . . . . . OFF
21. External Covers . . . . . INSTALL

OTHER NORMAL PROCEDURES

AIRSTAIR DOOR ANNUNCIATOR CIRCUITRY CHECK

The following test shall be performed prior to the first flight of the day:

1. Perform the following annunciator circuity check:
   a. Battery Switch . . . . . ON
   b. With door open and mechanism in locked position, ensure DOOR UNLOCKED annunciator is ILLUMINATED
   c. With door closed but not locked, ensure the DOOR UNLOCKED annunciator remains illuminated.
   d. With the door closed and locked, ensure that the DOOR UNLOCKED ANNUNCIATOR is EXTINGUISHED.
   e. Battery Switch . . . . . OFF
2. Ensure that the airstair door is closed and locked using the following procedure:
   a. Ensure that the door handle will not move out of the locked position without depressing the release button.

b. Ensure that the green index mark on each of the six side-locking bolts aligns with the pointers in the viewing ports.
c. Ensure that the top center locking bolt is protruding through the door frame by observing the green index mark on the locking bolt through the viewing port.

STALL WARNING SYSTEM PREFLIGHT

The stall warning system requires a preflight test prior to each flight.

1. STALL WARN Test button . . . . . PUSH AND RELEASE
2. Pilot's Control Wheel . . . . . PULL FULL NOSE UP
3. Control Column Shaker . . . . . CHECK FOR OPERATION
4. Pilot's Control Wheel . . . . . NEUTRAL (shaker goes off)
5. AOA Indicator . . . . . SELECT OPPOSITE PROBE AND MONITOR MOVEMENT
6. Control Column Shaker . . . . . VERIFY ACTIVATION AT APPROXIMATELY .6 AOA
7. Control Column Pusher . . . . . VERIFY ACTIVATION AT APPROXIMATELY 1.0 AOA
8. PUSHER INTER Button . . . . . PRESS AND VERIFY PUSHER INTERRUPT
9. Stall Warning Horn . . . . . VERIFY AURAL TONE AFTER PUSHER ACTIVATION
10. L AND R STALL WARN FAIL EICAS Messages . . . . . EXTINGUISHED

AUTOPILOT AND FLIGHT DIRECTOR

PREFLIGHT CHECKS

NOTE

TRIM FAIL annunciations may occur during this preflight test if the autopilot drives the trim to full travel. If this occurs, disengage the autopilot, neutralize the trim and continue the preflight check.

1. Engage the autopilot. Verify that the pilot's PFD displays the following messages:

   ROLL (Green)
   PTCH (Green)
   ALTS (White)
   AP ← (Green)

2. Operate the pilot's pitch trim switch. Verify AP disconnect with YD remaining engaged; re-engage the autopilot.
3. Operate the pilot's roll trim switch. Verify AP disconnect with YD remaining engaged; re-engage the autopilot.
4. Depress the pilot's AP/YD DISC pushbutton. Verify AP and YD disconnect; re-engage the autopilot.
5. Operate the copilot's pitch trim switch. Verify AP disconnect with YD remaining engaged; re-engage the autopilot.

6. Operate the copilot's roll trim switch. Verify AP disconnect with YD remaining engaged; re-engage the autopilot.
7. Depress the copilot's AP/YD DISC pushbutton. Verify AP and YD disconnect; re-engage the autopilot.
8. Operate the rudder trim. Verify AP and YD disconnect.
9. Reset all trims to the takeoff position.

WARNING

During normal preflight checks, it is likely that trims will be run to the extreme positions, therefore pitch and roll trim must be set within the green band and rudder trim must be set at the center index prior to takeoff.

10. Move the primary flight controls through the full range of travel in pitch, roll and yaw axes. Verify proper movement and freedom of travel.

INFLIGHT OPERATION

An automatic autopilot pre-engagement test is performed upon avionics power-up. The autopilot will not engage unless this pre-engagement test is satisfactorily completed.

To engage the autopilot, raise the AP handle on the pedestal. The autopilot will follow commands from the pilot's Mode Select Panel (MSP) unless the autopilot transfer (XFER) has been selected. The autopilot may be engaged in any reasonable attitude.

The autopilot may be disconnected by depressing the trim button on either control wheel, operation of electric trim in any axis, manual disengagement of the autopilot switch, depressing the go-around button on either power lever, or depressing the control wheel disconnect button on either control wheel.

The autopilot may be disengaged without disengaging the yaw damper by depressing the trim button on either control wheel, operation of pitch or roll trim, manual disengagement of the autopilot switch or depressing the go-around button on either power lever.

The autopilot disconnect aural tone and flashing PFD disconnect annunciation can be cancelled by depressing the trim button on either control wheel a second time. The tone and annunciation can also be cancelled by depressing the disconnect button. However, this method of tone cancellation will also cause the yaw damper to be disconnected.

AUTOMATIC TRIM OPERATION

The autopilot incorporates three axis trim capability. Whenever the autopilot is engaged, the system will trim out residual forces on the autopilot servos. The rudder trim system also works whenever the yaw damper is engaged. If the automatic trim system is not able to trim the forces out of the servo, the autopilot

will annunciate ELE, AIL, or RUD in yellow on the PFD to tell the pilot which axis is carrying residual force. The pilot should be prepared to accept these control loads upon disengagement. Operation of airplane trim while the autopilot is engaged will disengage the autopilot. In addition, operation of the rudder trim will disengage the yaw damper.

MODE SELECTION

All modes of operation (except ALTS and GA) are selected by depressing the appropriate button on the Mode Select Panel. Integral lights on the MSP and PFD annunciations indicate the selected mode of operation.

Altitude preselect (ALTS) is armed automatically when the altitude select knob is turned, GA is cleared or when the flight director command bars come into view except when ALT mode is selected or the GS is captured in the APPR mode.

YAW DAMPER OPERATION

The yaw damper may be engaged by raising the YD handle on the Autopilot Panel. The yaw damper is automatically engaged whenever the autopilot is engaged. The yaw damper may be disengaged by depressing the disconnect button on either control wheel or by actuating rudder trim. Yaw damper disengagement is annunciated by a yellow YD on the PFD, which may be cancelled by depressing the disconnect button a second time.

PITCH KNOB

The pitch knob is used for direct control of the airplane pitch attitude. Activating the pitch knob for more than one second with a vertical mode selected causes the vertical mode to be cancelled (except GA and GS). The autopilot will maintain the pitch attitude that was attained when the pitch knob was released.

ROLL KNOB

The roll knob is used for direct control of the airplanes turn rate and bank angle. To command a turn, rotate the turn knob out of the detent to the desired angle. Bank angle is proportional to the amount of turn knob rotation. If turn knob is out of the detent when the autopilot is engaged, it must first be returned to the detent before the autopilot will respond to turn knob commands. The maximum bank angle in this mode is 32°. Operation of the roll knob when a lateral mode is selected causes that mode to be cancelled (except APPR and NAV).

AUTOPILOT TRANSFER (AP XFER)

The autopilot transfer button may be used to control the autopilot using the copilot's mode select panel (MSP). This is indicated by the integral light in the AP XFER switch and is annunciated "AP >" on the pilot's PFD and AP on the copilot's PFD. When autopilot transfer is selected, the autopilot synchronizes to the new commands.

TURBULENCE MODE (TURB)

Turbulence mode may be used to reduce the autopilot response to flight path deviations caused by turbulent conditions. Autopilot gains are reduced in this mode, reducing the magnitude of the return-to-flight-path commands. TURB mode is cancelled in APPR mode.

HEADING (HDG)

Set the desired heading with the heading bug on the Course Heading Panel. Select heading mode on the MSP. The autopilot will turn the airplane to the selected heading. Maximum bank angle in this mode is 27°. Do not command turns greater than 170° in HDG mode.

HALF BANK (1/2 BANK)

In half bank mode, the bank limit in HDG or NAV mode is reduced to half the normal value (13° maximum). Half bank is disengaged in the APPR mode. Care must be taken when operating in half bank mode with NAV mode selected, as the radius of the turn may exceed the airway limits. Half bank is annunciated on the PFD in white. The half bank mode must be used when the autopilot is engaged above 30,000 feet.

APPROACH (APPR)

Approach mode is available with either LOC or FMS navigation sources. Set the desired heading prior to selecting APPR. The localizer should be intercepted at an angle less than 90°. The annunciation LOC or FMS will appear on the PFD in white. When the localizer is captured, the annunciation changes to green. If an RNAV approach is being performed, FMS will be annunciated on the PFD in green. When the glideslope is intercepted, GS will be annunciated on the PFD in green. Any selected vertical modes will clear at glideslope capture. The autopilot should not be used less than 200 feet above the terrain.

NAVIGATION (NAV)

Navigation mode is available with either VOR or FMS navigation sources. Set the desired course and heading prior to selecting NAV mode. When NAV mode is selected, the appropriate navigation source (VOR or FMS) is annunciated on the PFD in white. The airplane will follow the selected heading until the course centerline is approached. Heading mode will then clear and the navigation source on the PFD will turn green. The airplane will track course centerline and will make necessary crosswind corrections. When operating in the AUTOLG mode, the navigator will compute the required turn radius and commence a turn prior to reaching a waypoint to intercept the outbound course from that waypoint. When operating in MAN LEG, the autopilot will correct to the course centerline after the waypoint is advanced. When operating in SEL TRK, the autopilot will maintain the selected course until a new one is selected.

VERTICAL SPEED (VS)

The vertical speed mode (VS) may be selected during all modes of operation except after glideslope capture in APPR mode. Select VS on the MSP and the vertical speed reference bug on the ALI sets to the current vertical speed. The vertical speed reference should then be reset to the desired value with the knob on the ALI. The vertical speed should not be set beyond ± 4000 FPM.

IAS PROFILE

The Indicated Airspeed Profile mode (IASP) may be selected during all modes of operation except after glideslope capture in APPR mode. Select IASP on the MSP and the reference bug on the ASI will set to the current IAS. The reference bug should then be set to the desired initial speed value using the knob on the ASI. The speed will change by -2 KIAS for each 1000 feet of altitude gain (+2 KIAS for each 1000 feet of altitude decrease). In this mode, the airspeed will not decrease below 130 KIAS unless a lower speed is selected. If a lower speed is selected, this speed will not decrease despite an increase in altitude.

ALTITUDE HOLD (ALT)

Altitude Hold (ALT) mode may be selected during all modes of operation except after glideslope capture in APPR mode. ALT mode will maintain the airplane altitude at the time of ALT selection. If the barometric pressure setting is changed while operating in ALT mode, the autopilot will maintain the altitude (ambient pressure) which existed when ALT was selected. The pilot must re-establish the airplane back on the proper indicated altitude.

FLIGHT DIRECTOR OFF

The FD OFF button can be used to clear the Flight Director command bars with a single button push. This button is only active when the autopilot is disengaged and cannot be used to disengage the autopilot.

DESCEND

The DESCEND mode may be selected during all modes of operation except after glideslope capture in APPR mode. DESCEND is the recommended mode for descent. DESCEND maintains V_{MO} minus 25 KIAS when initially selected. Power should be adjusted to maintain desired vertical speed. The speed reference may be set to any value with the ASI knob, and this fixed speed difference from V_{MO} will be maintained during the descent. Below 5000 feet DESCEND mode commands a 1000 FPM descent rate. This vertical speed may be changed to other negative, i.e., descent values using the VS reference knob on the ALI.

INDICATED AIRSPEED HOLD (IAS)

The IAS hold mode may be selected during all modes of operation except after glideslope capture in APPR mode. Select IAS on the MSP and the reference bug on the ASI sets to the current IAS. The reference bug should then be reset to the

desired value with the knob on the ASI. The maximum speed which may be selected is 269 KIAS.

GO AROUND

Go around mode (GA) may be selected with the buttons on each power lever. The go around mode commands a 7° pitch up, wings level attitude on the Flight Director. If the autopilot is engaged when GA is selected, the autopilot will disconnect and the aural alert will sound. The tone may be cancelled by depressing the GA button a second time or depressing either disconnect button. Re-engagement of the autopilot in GA clears GA and synchronizes the autopilot commands to the airplane pitch attitude at the time of engagement and continues to maintain wings level.

VERTICAL SYNCHRONIZATION (VERT SYNC)

Autopilot and Flight Director synchronization is controlled by the VERT SYNC button on each control wheel.

TRIM SYSTEM

1. Pitch Trim System . . . . . CHECK
   a. Pitch Trim Switch . . . . . STBY
   b. Individual Dual Element Switches . MOVE NOSE UP AND NOSE DN (Verify no movement on indicator)
   c. Both Dual Element Switches . . . . MOVE NOSE UP AND NOSE DN (Verify indicator moves in proper direction)
   d. Pitch Trim Switch . . . . . OFF/RESET (Confirm STBY and NORM trim systems are deactivated)
   e. Pitch Trim Switch . . . . . NORM
   f. Pilot's Thumb Switch . . . DEPRESS; MOVE NOSE UP AND NOSE DOWN (Verify indicator moves in proper direction)
   g. Pilot's Trim Interrupt Button . . . . . DEPRESS WHILE TRIM IS IN MOTION TO INTERRUPT SYSTEM

NOTE

Depressing the INTERRUPT Button for 2 seconds or more while commanding trim, will cause a TRIM FAIL annunciation. The appropriate trim switch will have to be moved to RESET, then NORM.

   h. Copilot's Control Wheel . . . . . REPEAT STEPS "f" AND "g"
   i. Pitch Trim . . . . . SET FOR TAKEOFF
2. Roll Trim System . . . . . CHECK
   a. Roll Trim Switch . . . . . NORM
   b. Pilot's Thumb Switch . . . . DEPRESS AND MOVE LWD AND RWD (Verify indicator moves in proper direction)
   c. Pilot's Trim Interrupt Button . . . . . DEPRESS WHILE TRIM IS IN MOTION TO INTERRUPT SYSTEM

d. Copilot's Control Wheel . . . . . REPEAT STEPS "b" AND "c"
e. Roll Trim Switch . . . . . OFF/RESET
(Confirm trim deactivated)
f. Roll Trim Switch . . . . . NORM
g. Roll Trim . . . . . SET FOR TAKEOFF
3. Rudder Trim System . . . . . CHECK
a. Rudder Trim Switch . . . . . NORM
b. Rudder Trim Knob . . . . . MOVE NOSE LEFT AND NOSE RIGHT
(Verify indicator moves in proper direction)
c. Pilot's Trim Interrupt Button . . . . . DEPRESS WHILE TRIM IS IN MOTION TO INTERRUPT SYSTEM
d. Rudder Trim Switch . . . . . OFF/RESET
(Confirm trim deactivated)
e. Rudder Trim Switch . . . . . NORM
f. Rudder Trim . . . . . SET FOR TAKEOFF

FLIGHT MANAGEMENT SYSTEM (FMS)

PROGRAMMING

Pertinent information (station identifier, waypoint, bearing, and waypoint distance) is entered into the flight plan from either CDU. Programming may be accomplished before takeoff or during flight. To enter RNAV approach waypoints:

1. Enter the flight plan page on the CDU.
2. Select ADD WPTS.
3. Enter the navaid associated with the RNAV approach and verify the navaid position.
4. Select ADD RAD/DIS OFFSET.
5. Key in the radial and distance offset of the initial approach fix and select OFFSET COMPLETE.
6. The CDU will display the initial approach fix position and offers the select RNAV APCH. Verify the initial approach position and select RNAV APCH.
7. Enter a waypoint name of up to 5 alphanumeric characters and select NAME COMPLETE.
8. Enter the radial and distance offset of the next RNAV approach fix.
9. Enter the waypoint name for the next RNAV approach fix.
10. Repeat steps 8 and 9 for as many waypoints as required.
11. After keying in the radial distance offset of the missed approach fix, select END RNAV APCH.
12. Enter the waypoint name for the missed approach fix. The flight plan shows the last waypoint followed by the message END RNAV APCH.

INFLIGHT OPERATION

Prior to commencing the approach, verify that the flight plan is properly loaded. The NAV tuning mode will change to Manual mode prior to using an RNAV waypoint. The Navigator mode will change to MAN LEG advance if using AUTO LEG or SEL TRK.

Prior to the first RNAV waypoint:

1. Verify that either NAV is tuned to RNAV reference facility.
2. Manually advance the waypoint when over the existing TO waypoint (DME = 0.0).
3. Due to the earth's magnetic field drift, the course displayed on the ND may differ from the published course slightly. Manually changing the course to match the published course is not approved.

The airplane course will be direct to the initial approach fix from the previous waypoint. It may be necessary to intercept the final approach course outside the initial approach fix or to hold outside the initial approach fix. To accomplish this:

4. Enter the SYS CTRL page and select SEL TRK.
5. Rotate the OBS to the desired course.
6. Re-select MAN LEG advance on the SYS CTRL page.

ANTI-SKID OFF LANDING (POWER BRAKING ONLY)

NOTE

Use of the power brake and anti-skid systems is recommended for a normal landing. When anti-skid is not available, the following procedure should be used. Refer to the Landing Distance chart in Section V to determine the landing distance corrected for Anti-Skid OFF.

1. Approach Speed ..... CONFIRM
2. Cockpit and Lavatory Doors (aisleway clear) ..... OPEN
3. Pressurization ..... CHECK
4. No Smoke/Seatbelts ..... ON
5. Autofeather ..... ARM
6. Anti-skid Switch ..... OFF
7. ANTI-SKID INOP Message ..... ILLUMINATED
8. Landing Gear ..... DN
9. Brake Pedals ..... DEPRESS AND VERIFY FIRM FEEL
10. Flap/Forward Wing ..... EXTEND
11. Lights ..... AS REQUIRED
12. Autopilot ..... DISCONNECT
13. Propeller Sync ..... AS DESIRED
14. Radar ..... AS REQUIRED
15. Yaw Damp ..... OFF

When Landing Assured:

16. Power Levers ..... IDLE
17. Propeller Levers ..... FULL FORWARD

After Touchdown:

18. Power Levers ..... LIFT AND SELECT GROUND FINE
19. Brakes ..... AS REQUIRED

CAUTION

If brakes feel soft or "spongy", or exhibit asymmetric or "jerky" operation, it is likely that air is trapped in the system. If this condition is not corrected, reduced directional control and braking response could result in a hazardous situation.

NOTE

Care must be taken when using power brakes without anti-skid. Above approximately 10 - 15 knots, use brakes only as much as necessary to achieve required stopping distance. Avoid heavy brake pedal pressures and release pressure if tire squeal is heard. Below approximately 10 -15 knots full braking may be used.

PRACTICE LANDING GEAR ALTERNATE EXTENSION

1. Airspeed . . . . . BELOW 200 KNOTS
2. Landing Gear Control Circuit Breaker (Left Circuit Breaker Panel) . . . . . PULL
3. Landing Gear Control . . . . . DN
4. Alternate Extension Handle Securing Clip . . . . . REMOVE PIN
5. Alternate Extension Handle . . . . LIFT AND PULL TO EXTEND HANDLE; then SWIVEL HANDLE as required and PUMP until all three green indicators are illuminated
6. Alternate Extension Handle . . . . . SECURE in clip and REINSTALL PIN

LANDING GEAR RETRACTION AFTER PRACTICE ALTERNATE EXTENSION

After a practice alternate extension of the landing gear, the gear may be retracted as follows:

1. Landing Gear Control Circuit Breaker (Left Circuit Breaker Panel) . . . . . RESET
2. Landing Gear Control . . . . . UP

SIMULATING ONE-ENGINE-INOPERATIVE (ZERO THRUST)

When establishing zero thrust operation, use the power setting listed below. By using this power setting to establish zero thrust, one avoids the inherent delays of restarting a shut down engine and preserves almost instant power to counter any attendant hazard.

CAUTION

When simulating engine failures, use zero thrust setting.

1. Propeller . . . . . 1700 RPM
2. Power Lever . . . . . 5% TORQUE

PRACTICE DEMONSTRATION OF V_{MCA}

V_{MCA} demonstration may be required for multi-engine pilot certification. The following procedure shall be used at a safe altitude of at least 5000 feet above the ground in clear air only.

WARNING

IN-FLIGHT ENGINE CUTS BELOW V_{SSE} SPEED OF 110 KNOTS ARE PROHIBITED.

1. Landing Gear . . . . . UP
2. Flap/Fwd Wing . . . . . EXTEND
3. Airspeed . . . . . ABOVE 110 KNOTS (V_{SSE})
4. Propeller Levers . . . . . HIGH RPM
5. Power Lever (simulated inoperative engine) . . . . . ZERO THRUST (5% TORQUE)
6. Power Lever (other engine) . . . . . MAXIMUM ALLOWABLE
7. Airspeed . . . . . Reduce approximately 1 knot per second until either V_{MCA} or stall warning is obtained

NOTE

Use rudder to maintain directional control (heading) and roll control to maintain 5° bank towards the operative engine (lateral attitude). At the first sign of either V_{MCA} or stall warning (which may be evidenced by: inability to maintain heading or lateral attitude, aerodynamic stall buffet, or stall warning shaker) immediately initiate recovery. Reduce power to idle on the operative engine and immediately lower the nose to regain V_{SSE}.

FUEL TRANSFER

1. Standby Pumps . . . . . OFF
2. Transfer Flow (as required) . . . . . LEFT or RIGHT
   (Check FUEL TRANSFER message on EICAS)
   (FUEL PRES LO annunciator on supplying side - EXTINGUISHED)

NOTE

Fuel may be transferred only during ground and cruise flight operations. Maximum lateral fuel imbalance is 150 pounds. During two-engine operation, discontinue fuel transfer if either FUEL LEVEL LO message or the FUEL PRES LO annunciator illuminates on the supplying side.

To Discontinue Fuel Transfer:

- Transfer Flow . . . . . .OFF

BLENDING ANTI-ICING ADDITIVE TO FUEL

The following procedures must be observed when blending anti-icing additive with the fuel.

1. The additive must conform to specification MIL-I-27686 or MIL-I-85470.
2. The concentration of the additive must be a minimum of 0.10% and a maximum of 0.15% by volume. Thus, a 20 oz. can of additive is sufficient for 105 to 155 gallons of fuel.
3. When blending the additive as the airplane is being refueled, use the following precautions:
   a. Refuel at a rate of 30 - 45 gallons per minute. A rate of less than 30 gallons per minute may be used when topping off the tanks.
   b. Start additive flow after fuel flow starts, and stop before fuel flow stops.
   c. Ensure additive is directed into the flowing fuel stream.
   d. Do not allow concentrated additive to contact coated interior of fuel cells or airplane surfaces.

USE OF JET B, JP-4, AND AVIATION GASOLINE

Fuel quantity indicators will not indicate correctly when using Jet B, JP-4, or aviation gasoline due to the differences in their density and dielectric constants. The indicated fuel quantity should be corrected using the factors shown below. These factors have been generalized in some cases for simplicity, thus results should be considered as approximations.

When using Jet B or JP-4 multiply the indicated fuel quantity by .96 to obtain the corrected fuel quantity.

When using aviation gasoline, multiply the indicated fuel quantity by .94 to obtain the corrected fuel quantity.

NOISE CHARACTERISTICS

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

For VFR operations over outdoor assemblies of persons, recreational and park areas, and other noise-sensitive areas, the pilot should make every effort to fly not

less than 2000 feet above the surface, weather permitting, even though flight at lower level may be consistent with the provisions of government regulations.

NOTE

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

The noise level established in compliance with FAR Part 36 is demonstrated using Maximum Normal Operating Power (80% torque and 1600 propeller rpm). The noise level value is:

79.3 dB(A)

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

ENVIRONMENTAL PROCEDURES

PRESSURIZATION SYSTEM

FUNCTIONAL CHECK DURING RUNUP

1. Bleed Air Valves . . . . . BOTH
2. Pressurization Test . . . . . PRESS AND HOLD TO TEST
3. Cabin Rate Gage . . . . . CHECK FOR RATE OF DESCENT
4. Pressurization Test . . . . . RELEASE WHEN PRESSURIZATION IS CONFIRMED

MANUAL CABIN ALTITUDE CONTROL

For cabin rates-of-climb greater than 1500 feet per minute:

1. Set controller at desired cabin altitude
2. Manual Cabin Altitude Control . . . . ROTATE CLOCKWISE FROM NORM TO INCREASE CABIN ALTITUDE. (The further the knob is rotated, the faster the cabin altitude will increase)
3. Manual Cabin Attitude Control . . . . . RETURN TO NORM (FULL CCW) POSITION WHEN DESIRED CABIN ALTITUDE IS REACHED

WINDSHIELD DEFROST

NOTE

Use of Defrost Air during ground operations and climb will help prevent windshield fogging.

BEFORE TAKEOFF (FINAL ITEMS)

1. Pilot and Copilot Windshield Heat . . . . . LOW
2. Defrost Air . . . . . AS REQUIRED

IN FLIGHT

1. Pilot and Copilot Windshield Heat . . . . . LOW or HIGH
2. Defrost Air . . . . . AS REQUIRED
3. Pilot WSHD Control . . . . . STBY
   (In the event pilot's center panel continues to ice or fog-over with HIGH selected. Verify WSHLD STBY POWER message is ILLUMINATED.)

NOTE

Pilot's windshield switch must be in LOW or HIGH for STBY control to function. See the following table for operation.

	PILOT OR COPILOT WINDSHIELD		PILOT WINDSHIELD ONLY
	LOW	HIGH	STBY
Outer Triangle	NORM	NORM	OFF
Outer Panel	NORM	OFF	OFF
Center Panel	NORM	HIGH	HIGH
Inboard Panel	NORM	NORM	OFF
Side Window	NORM	NORM	OFF
BT01443			

OXYGEN SYSTEM

NOTE

Descent from 41,000 feet to 15,000 feet can be accomplished in 4 minutes or less when using the EMERGENCY DESCENT procedure.

PREFLIGHT INSPECTION

1. Oxygen Supply . . . . . SYS READY - PULL ON (OXYGEN NOT ARMED AND OXYGEN PRES LO Annunciators extinguished)
2. Crew Diluter Demand Masks . . . . . DON MASK, CHECK FIT AND OPERATION, SET TO 100%, STOW

WARNING

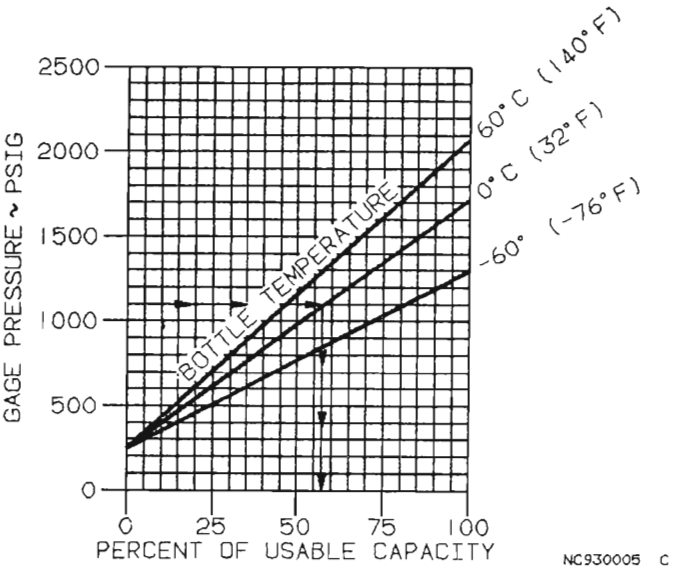
Beards and mustaches should be carefully trimmed so that they will not interfere with the proper seating of an oxygen mask. The fit of the oxygen mask around the beard or mustache should be checked on the ground for proper sealing. Studies conducted by the Military and FAA conclude that oxygen masks do not seal over beards and mustaches.

3. Oxygen Duration . . . . . DETERMINE

NOTE

A bottle pressure of 1850 psig at 15° C is fully charged (100% capacity). Read duration directly from table.

a. Read the oxygen pressure from gage.
b. Obtain the IOAT.
c. Determine the percent of usable capacity from the following graph (e.g., 1100 psig at 0°C equals 57%)



OXYGEN AVAILABLE WITH PARTIALLY FULL BOTTLE

d. Compute the oxygen duration in minutes from the appropriate table by multiplying the full bottle duration by the percent of usable capacity, eg;
   1) Pilot and copliot plus four passengers.
   2) Cabin pressure altitude = 30,000 feet.
   3) Duration with full bottle (77 Cubic Feet) = 62 minutes.
   4) Duration with 57% capacity = .57 x 62 = 35 minutes.

OXYGEN DURATION (MINUTES)
77 CUBIC FOOT CYLINDER

	CABIN PRESSURE ALTITUDE (FT)					
NUMBER OF USERS	10,000	20,000	25,000	30,000	35,000	41,000
PILOT	768	604	390	438	580	778
COPILOT	384	302	195	219	285	389
PSGR's						
1	174	158	124	134	157	185
2	113	107	91	96	108	121
3	83	81	71	75	82	90
4	66	65	59	62	67	72
5	55	55	50	52	56	60
6	47	47	44	45	48	51
7	41	41	39	40	42	45
8	36	36	35	36	38	40
9	32	33	32	33	34	36

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OXYGEN DURATION (MINUTES)
115 CUBIC FOOT CYLINDER

	CABIN PRESSURE ALTITUDE (FT)					
NUMBER OF USERS	10,000	20,000	25,000	30,000	35,000	41,000
PILOT	1152	908	584	658	854	1166
COPILOT	576	454	292	329	427	583
PSGR's						
1	262	238	185	201	235	277
2	169	161	136	145	162	182
3	125	122	107	113	124	135
4	99	98	89	93	100	108
5	82	82	75	79	84	89
6	70	70	66	68	72	76
7	61	62	58	60	64	67
8	54	55	52	54	57	59
9	49	49	47	49	51	53

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AFTER USING OXYGEN

1. Crew Masks . . . . . .RETURN TO CONSOLE CONTAINER
2. MIC Selector Switch . . . . . HAND OR BOOM
3. Passenger Manual Deploy . . . . . .PUSH OFF
4. Passengers:
   a. Lanyard Pin . . . . . INSERT
   b. Masks . . . . . .RETURN TO OVERHEAD CONTAINER

NOTE

To close overhead doors, the following conditions must be met: Cabin altitude must be below the range requiring oxygen, and the PASS MAN DEPLOY control must be in the OFF position.

ICING FLIGHT

NOTE

This airplane is approved for flight in icing conditions as defined in FAR 25, Appendix C. These conditions do not include, nor were tests conducted in, all icing conditions that may be encountered (e.g., freezing rain, drizzle, mixed conditions, or conditions defined as severe). Some icing conditions not defined in FAR 25 have the potential of producing hazardous ice accumulations, which: 1) exceed the capabilities of the airplane's ice protection equipment; and/or 2) create unacceptable airplane performance. Flight into conditions which lie outside the FAR-defined conditions is not prohibited; however, pilots must be prepared to divert the flight promptly if hazardous ice accumulations occur.

Refer to Section II for limitations relating to icing flight, Section IIIA for abnormal procedures associated with icing equipment malfunctions, flight with excessive amounts of ice accumulation, and procedures required for severe icing conditions, and Section V for performance degradations associated with icing flight.

BEFORE TAKEOFF (RUNUP)

NOTE

This checklist must be accomplished in the sequence shown.

1. Surface Deice System and Ice Protection . . . . . CHECK
   a. Power Levers . . . . . .AS REQUIRED FOR PNEU PRESSURE OF 23-25 PSI
   b. Pressure and vacuum:
      1) Bleed Air Valves Selector . . . . . .OFF
         (PNEU PRESS LOW message illuminated)
      2) SURF DEICE VAC Test Button . . . . . PUSH AND HOLD
         (Check that L FWD BOOT FAIL, R FWD BOOT FAIL, L WING BOOT FAIL, and R WING BOOT FAIL messages illuminate)

3) Bleed Air Valves Selector . . . . . L ENG, R ENG THEN BOTH
(Check that all BOOT FAIL messages extinguish and PNEU PRESS LOW message is illuminated with L ENG and R ENG selected. Verify pneumatic pressure is zero on the side deselected.)
4) SURF DEICE VAC Test Button . . . . . RELEASE
5) Left and Right Pneumatic Pressure Displays . . . 23 to 25 PSI.
(Verify PNEU PRESS LOW message extinguished)

c. Manual Boot System . . . . . TEST
1) FWD WG MAN Switch . . . . . HOLD
(approximately 6 seconds)
(Check that L and R FWD BOOT FAIL messages illuminate, then extinguish as boots inflate)
2) MAIN WG INBD MAN Switch . . . . . HOLD
(approximately 6 seconds)
(Check that L and R WING BOOT FAIL messages illuminate, then extinguish as boots inflate)
3) MAIN WG OUTBD MAN Switch . . . . . HOLD
(approximately 6 seconds)
(Check that L and R WING BOOT FAIL messages illuminate, then extinguish as boots inflate)

d. Standby Boot System . . . . . TEST
1) SURF DEICE STBY Test Button . . . . . PUSH AND HOLD
(3 seconds minimum)
2) Yellow ICING Message . . . . . ILLUMINATED
(while TEST button is depressed)
3) STBY DEICE FAIL, MAIN DEICE FAIL
L and R FWD BOOT FAIL, L and R WING BOOT FAIL
Messages . . . . . ILLUMINATED
(within 2 seconds)
4) L and R FWD BOOT FAIL Messages . . . . . EXTINGUISHED
(After forward wing boots have inflated)
5) MAIN DEICE FAIL Message . . . . . EXTINGUISHED
(after approximately 6 seconds)
(When outboard boots start to inflate)
6) L and R WING BOOT FAIL Messages . . . . . EXTINGUISHED
(after all main wing boots have inflated)
7) STBY DEICE FAIL Message . . . . . EXTINGUISHED
(When standby controller test is complete)
(STBY DEICE FAIL message may extinguish before L and R WING BOOT FAIL messages extinguish)

e. Engine Ice Protection:
1) Both Engine Actuator Switches . . . . . STBY
2) Both Engine Ice Protection Switches . . . . . ON
(Check L and R ENG ANTICE ON Messages: ILLUMINATED in less than 30 seconds)

f. Stall Warn Heat . . . . . ON
(Check for loadmeter increase)

g. Pilot and Copilot Pitot/Static Heat . . . . . ON
(Check for loadmeter increase)
h. Pilot and Copilot Windshield Heat . . . . . LOW
(Check for loadmeter increase)
i. Left and Right Vent/Cable Heat . . . . . ON
j. Main Boot System . . . . . .TEST
1) SURF DEICE MAIN Test Button . . . . . PUSH AND HOLD
(3 seconds minimum)
2) White ICING Message . . . . . .ILLUMINATED
(while TEST button is depressed)
3) MAIN DEICE FAIL, STBY DEICE FAIL
L and R FWD BOOT FAIL, L and R WING BOOT FAIL
Messages . . . . . .ILLUMINATED
(within 2 seconds)
4) L and R FWD BOOT FAIL Messages . . . . . .EXTINGUISHED
(After forward wing boots have inflated)
5) STBY DEICE FAIL Message . . . . . .EXTINGUISHED
(after approximately 6 seconds)
(When outboard boot starts to inflate)
6) L and R WING BOOT FAIL Messages . . . . . .EXTINGUISHED
(After all main wing boots have inflated)
7) MAIN DEICE FAIL Message . . . . . .EXTINGUISHED
(When main controller test cycle is complete)
k. Engine Ice Protection:
1) Both Engine Actuator Switches . . . . . .MAIN
2) Both Engine Ice Protection Switches . . . . . .OFF
(Check L and R ENG ANTICE ON Messages EXTINGUISHED)
l. Stall Warn Heat . . . . . .OFF
m. Pilot and Copilot Pitot/Static Heat . . . . . .OFF
n. Pilot and Copilot Windshield Heat . . . . . .OFF
o. Left and Right Vent/Cable Heat . . . . . .OFF
p. SEQuence Switch . . . . . ACTIVATE
(All boots should inflate in normal
sequence. No failure message should illuminate)

BEFORE TAKEOFF (FINAL ITEMS)

1. Stall Warn Heat . . . . . ON
2. Pitot/Static Heat . . . . . ON
3. Engine Ice Protection . . . . . ON
4. Vent/Cable Heat . . . . . ON
5. Bleed Air Valves . . . . . BOTH
6. Transponder . . . . . ON
7. Annunciators and EICAS Messages . . EXTINGUISHED or CONSIDERED
8. Lights . . . . . AS REQUIRED
9. Windshield Heat . . . . . LOW OR HIGH AS REQUIRED
10. Engine Auto Ignition . . . . . ARM
a. L and R IGNITION ON Messages . . . . . .ILLUMINATED
b. L and R IGNITION ON Messages . . . . . .EXTINGUISHED
(above 17% torque)
11. Generator Load . . . . . CHECK
12. Pitch, Roll, and Rudder Trim . . . . . CHECK

13. V_1, V_R, V_2, Static Take-off Power (Engine Anti-ice ON) . . . . . .CONFIRM

IN FLIGHT

PERFORMANCE DEGRADATIONS

CAUTION

The following degradations in performance were determined with simulated ice shapes installed on the airplane to represent "Normal Ice Accumulations" as described in Section V. Speed reductions include the effects of engine anti-ice. Climb performance and maximum landing weight include the effects of increasing the normal approach speed by 5 KIAS.

1. One-Engine Inoperative Maximum Cruise Speed . . . . . DECREASED BY 50 KTAS
2. Two-Engine Cruise Speed . . . . . DECREASED BY 80 KTAS
3. Approach Climb Gradient . . . . . DECREASED BY 4.0 PERCENTAGE POINTS
4. Balked Landing Climb . . . . . DECREASED BY 500 FT/MIN
5. Maximum Landing Weight . . . . . .SEE GRAPH, SECTION V
6. Flaps Extended Landing . . . . . .INCREASE APPROACH SPEED BY 15 KIAS AND INCREASE LANDING DISTANCE BY 25% OR 650 FT, WHICHEVER IS LESS.

CAUTION

In addition "Normal Ice Accumulations" can cause stall speeds to increase by the amounts shown below. The control column shaker will provide a warning prior to a stall but the speed at which the warning occurs may be higher or lower than normal.

7. Flaps Retracted Stalling Speed . . . . . INCREASED BY 15 KNOTS
8. Flaps Extended Stalling Speed . . . . . INCREASED BY 18 KNOTS

NORMAL ICING OPERATIONS

1. Engine Ice Protection

Before visible moisture is encountered at +5°C OAT and below or at night when freedom from visible moisture is not assured at +5°C OAT or below:

a. Both Engine Ice Protection Switches . . . . . ON
b. Check for proper operation by noting torque drop, ITT increase and green L and R ENG ANTICE ON messages illuminated.

NOTE

Illumination of L or R ICE VANE FAIL caution message indicates failure of the ice vanes to reach the selected position. Select the other actuator(s) (MAIN or STBY).

NOTE

If in doubt, actuate the engine ice protection system. Engine icing can occur even though no surface icing is present. If freedom from visible moisture cannot be assured, engine ice protection should be activated. Visible moisture is moisture in any form: clouds, ice crystals, snow, rain, sleet, hail, or any combination of these. Operation of strobe lights will sometimes show ice crystals not normally visible.

2. Engine Auto Ignition
   - Left and Right Engine Auto Ignition Switches . . . . . ARM

NOTE

Engine auto-ignition switches must be in the ARM position for icing flight, precipitation, and operation during turbulence. To prevent prolonged operation of the igniters with the system armed, do not reduce power levers below 17% torque.

3. Surface Deice System
   a. If time permits, test the STBY and MAIN deice systems prior to entering icing conditions using the SURF DEICE STBY and MAIN test buttons. The STBY system should be tested first and then the MAIN system. Wait at least 10 seconds after the STBY test is complete before testing the MAIN system. If the MAIN system does not test properly, recheck the STBY system.

NOTE

Inflation of the forward wing boot will cause a slight nose down pitching tendency and up to a 5 knot increase in the flaps extended stalling speed. Inflation of the center and outboard main wing boots will cause a slight right roll tendency.

NOTE

The reliability of the surface deice system is based on the proper functioning of the main and standby boot deice systems. Icing encounters are not recommended if either system is inoperative.

   b. The automatic deice boot system will cycle all boots in the sequence of forward wing, center and outboard main wing, and inboard main wing in approximately 25 seconds with no action required by the pilot. This sequence will occur each time the counter in the deice boot controller registers 8 cycles of the ice detector.

c. Boot inflation may be accomplished manually by the pilot as follows:

1) All Boots in Sequence
SEQuence Switch - Activate and Release (All boots will inflate in normal sequence: forward wing, center and outboard main wing, and inboard main wing. The boot controller will monitor the inflation and deflation and annunciate any failures. The counter in the deice boot controller is reset to zero.)

2) Individual Boots
The following switches may be activated in any order. Hold each switch for a minimum of 6 seconds. The appropriate BOOT FAIL message will illuminate and then extinguish when proper boot inflation pressure is reached. The boot will remain inflated as long as the switch is activated. See Manual Inflation of Wing Deice Boots in the Abnormal Procedures section for additional information.

CAUTION

A failure of a deice boot to deflate will not be annunciated when using the manual switches. When possible, visually confirm that the deice boots are deflated.

a) FWD WG MAN Switch . . . . . HOLD (6 seconds minimum)
(L and R FWD BOOT FAIL messages illuminated, then extinguished)

b) MAIN WG INBD MAN Switch . . . . . HOLD (6 seconds minimum)
(L and R WING BOOT FAIL messages illuminated, then extinguished)

c) MAIN WG OUTBD MAN Switch . . . . . HOLD (6 seconds minimum)
(L and R WING BOOT FAIL messages illuminated, then extinguished)

NOTE

Using any of the manual switches resets the counter in the deice boot controller to zero. Therefore, if one manual switch is used, the other two switches should also be activated to ensure all boots are in the same state as the controller.

d. If one or more boot fail messages appear during any type of boot activation, increase N_1 to 80% or above and push the SURF DEICE MAIN or STBY test switch. If messages remain on after the test cycle is complete, refer to the Abnormal Procedures section.

e. If the MAIN DEICE FAIL or STBY DEICE FAIL messages appear, the appropriate test button should be pushed. If the message clears after the test cycle is complete, no action is required. If the message remains illuminated, refer to the Abnormal Procedures section.

f. After exiting icing conditions, clear all residual ice from the boots using the SEQuence switch. This will also reset the counter in the deice boot controller to zero.

BEFORE LANDING

1. Surface Deice Switch . . . . . SEQ
2. Flaps Extended Approach Speed . . . . . .INCREASE 15 KIAS

NOTE

To determine landing distance with normal residual ice, increase Landing Distance by 25% or 650 feet, whichever is less.

NOTE

Prior to the landing approach, cycle the wing deice boots to shed as much residual ice as possible, regardless of the amount of ice remaining on the boots. Be ready for the slight nose down pitching tendency and the slight right rolling tendency that occurs during the boot inflation cycle. Stall speeds can be expected to increase by 7 knots flaps retracted and by 10 knots flaps extended with ice on the forward wing. After cycling the boots, the flaps extended stall speed may still be increased by approximately 5 knots.

NOTE

If flaps are actuated during a boot cycle, the cycle will be interrupted for approximately 40 seconds and all boots will deflate to prevent damage to the forward wing boot. At the end of 40 seconds the deice boot cycle will begin again.

AFTER LANDING

If additional flights are to be conducted, ensure that residual ice is removed from the entire airplane prior to takeoff. Critical areas include:

1. Leading edges of wings and vertical stabilizers
2. Vortilons
3. Bottom of the forward wing
4. Radome and antennas
5. OAT probe
6. Tops of Nacelles
7. Generator NACA inlet throats

COLD WEATHER PROCEDURES

PREFLIGHT INSPECTION

Check the brakes and tire-to-ground contact for freeze lock-up. Deice or anti-ice solutions may be used on the brakes or tires if freeze-up occurs. No deice or anti-

ice solution which contains a lubricant, such as oil, should be used on the brakes. It will decrease the effectiveness of the brake friction areas.

In addition to the normal exterior preflight inspection, special attention should be given all vents, openings, control surfaces, hinge points and wings, vertical stabilizers and fuselage surfaces for accumulations of ice and/or snow. Snow and/or ice on an airplane will seriously affect its performance. The wing contour may be sufficiently altered by the ice and/or snow that its lift qualities are seriously impaired. Snow may be removed with a soft mop. Chipping or mechanical removal of frozen deposits is not recommended. The use of glycol-based deicing fluids is recommended. Materials conforming to MIL-A-8243, Anti-icing and Deicing-Defrosting Fluids, are acceptable.

Inspect the propeller blades and hubs for ice and snow. Unless engine inlet covers have been installed during snow and freezing rain conditions, the propellers should be turned (in the direction of normal rotation) by hand to make sure they are free to rotate prior to starting engines. Complete the normal preflight procedures, including a check of the flight controls, for complete freedom of movement. After engine start, exercise the propellers through low and high pitch, beta range, and ground fine range, to circulate any congealed oil through the system.

If use of SAE or ISO Type I Deice and/or SAE or ISO Type II Deice/Anti-ice solution is required to produce a clean airplane, special attention must be given to ensure that the pitot/static masts, fuel vents, cockpit windows and the area forward of the cockpit windows are free of deice and/or anti-ice solution. The forward wing and main wing must receive the same complete treatment.

NOTE

The type and concentration of deice or anti-ice solution being applied and the rate of precipitation will affect the length of time the treatment will be effective. Refer to Chapter 12 of the *Starship 1 Maintenance Manual* for recommended suppliers of deice/anti-ice solutions and instructions for the removal of ice, snow, and frost.

TAXIING

When possible, taxiing in deep snow or slush should be avoided. Under these conditions the snow and slush can be forced into brake assemblies. Keep flaps retracted during taxiing to avoid throwing snow or slush into flap mechanisms and to minimize damage to flap surfaces.

When parking the airplane, it will be of some help to refrain from setting the parking brake immediately. Chocks or sandbags can be used to prevent the airplane from rolling.

Spotty ice cover is difficult to see, therefore taxi slowly and allow more clearance in maneuvering the airplane.

Before takeoff, ensure the runway is free from hazards, such as snow drifts, glazed ice and ruts.

BEFORE TAKEOFF

After completion of the normal Before Takeoff checklist, verify that the airplane is free of frozen contaminants.

WARNING

Ice, frost, or snow on top of deicing or anti-icing solutions must be considered as adhering to the airplane. Takeoff should NOT be attempted.

TAKEOFF AND FLIGHT

Allow additional take-off distance when snow or slush is on the runway. Extra cycling of the landing gear retraction system, when above 500 feet AGL, may help dislodge any moisture on moving parts of the retraction system.

If encountering any visible moisture during takeoff, the engine ice protection should be selected ON to protect against ice entering the engine air inlet.

When using SAE AMS 1428 Type II or ISO 11078 Type II Deice/Anti-ice Fluid in the concentrated form, the rotation of the airplane may be slightly delayed but the take-off field length will not be affected. Also, intermittent stick shaker activation may be encountered during the initial climbout. The cruise, descent, approach, and landing phases of flight are not affected by the use of deicing/anti-icing fluids.

LANDING

Braking and steering are less effective on slick runways. Also, hydroplaning may occur under wet runway conditions at higher speeds. Use of the rudder to maintain directional control until the tires make solid contact with the runway surface may be necessary.

SECTION V
PERFORMANCE
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INTRODUCTION TO PERFORMANCE

REGULATORY COMPLIANCE

Information in this section is presented for the purpose of compliance with the appropriate performance criteria and certification requirements of FAR 23.

PERFORMANCE LIMITATIONS

The maximum operating weights are limited by the following performance graphs, or criteria, and compliance therewith is mandatory:

FOR ALL FAR 91 AND FAR 135 OPERATIONS

1. Maximum Take-off Weight to Achieve Take-off Climb Requirements
2. Maximum Take-off Weight as Limited by Tire Speed
3. Take-off Field Length
4. Maximum Landing Weight to Achieve Landing Climb Requirements
5. Landing Distance

FOR FAR 135 OPERATIONS ONLY

1. Take-off Flight Path Requirements to 1500 feet AGL
2. Service Ceiling - One Engine Inoperative

FLIGHT TEST PERFORMANCE CONDITIONS

All performance in this manual is based on flight test data and the following conditions:

1. Power ratings include the installation, bleed air, and accessory losses.
2. Full temperature accountability within the operational limits for which the airplane is certified.

NOTE

Should ambient air temperature or altitude be below the lowest temperature or altitude shown on the performance charts, use the performance at the lowest value shown.

3. All take-off and landing performance is based on a paved, dry runway.
4. Runway or take-off and landing performance was obtained using the following procedures and conditions:
   a. ONE-ENGINE-INOPERATIVE TAKEOFF (ACCELERATE-GO)
      1) Static take-off power was set and brakes released or static take-off power was set within 10 seconds of brake release.
      2) The critical engine was shut down with the condition lever just prior to V_1. The auto-feather system was allowed to feather the inoperative-engine propeller.
      3) The acceleration was continued to V_R and the airplane was rotated to an initial attitude of approximately 8° nose up. Pitch

attitude was adjusted as required to achieve and maintain V_2 by 35 feet AGL.

4) The landing gear was retracted when a positive rate-of-climb was established.
5) V_2 was attained by 35 feet AGL and maintained until 400 feet AGL.

b. ONE-ENGINE-INOPERATIVE TAKEOFF (ACCELERATE-STOP)
   1) Static take-off power was set and the brakes released or static take-off power was set within 10 seconds of brake release.
   2) The critical engine was shut down with the condition lever just prior to V_1.
   3) Both power levers were rapidly moved to the ground fine position at V_1.
   4) Maximum braking was immediately initiated and maintained until the airplane came to a complete stop.

c. ALL-ENGINES TAKEOFF
   1) Static take-off power was set and the brakes released or static take-off power was set within 10 seconds of brake release.
   2) The airplane was accelerated to V_R and a positive rotation to approximately 8° nose up was made and adjusted as required to attain V_{35} by 35 feet AGL.
   3) The landing gear was retracted when positive rate-of-climb was established.

d. LANDING
   1) Power was set to maintain a 3° approach with the airspeed stabilized at V_{REF} with propeller levers set at 1600 RPM.
   2) Both power levers were moved to the idle position when the airplane reached 50 feet AGL.
   3) The propeller levers were moved to the full forward position.
   4) Ground fine was selected immediately upon touchdown.
   5) Maximum braking was immediately initiated and maintained until the airplane came to a complete stop.

VARIABLE FACTORS AFFECTING PERFORMANCE

CONFIGURATIONS

Details of variables affecting performance are given with tables to which they apply. Assumptions which relate to all performance calculations, unless otherwise stated, are:

1. Cabin pressurized.
2. Humidity corrections to power have been applied according to the applicable regulations.
3. Winds, for which graphical correction information is presented on the charts, are to be taken as the tower winds (10 meters above runway surface). Factors have been applied as prescribed in the applicable regulations.

	No. of Operating Engines	Power	Flap Setting	Landing Gear
1st Segment Take-off Climb	1	Takeoff	Extended or Retracted	Down
2nd Segment Take-off Climb	1	Takeoff	Extended or Retracted	Up
3rd Segment Horizontal Acceleration	1	Takeoff	Retracted	Up
Final Segment Climb	1	Maximum Continuous	Retracted	Up
Approach Climb	1	Takeoff	Retracted	Up
Balked Landing	2	Takeoff	Extended	Down
BT03688				

ICING FLIGHT

Degradations in performance were determined for selected conditions. This performance is shown for reference only and was determined under controlled conditions with the simulated ice shapes listed below attached to the airplane. These accumulations are referred to as "Normal Ice Accumulations."

1. Leading edges of boots to simulate the ice that may accumulate up to the time the boots are activated by the automatic controller.
2. On the following unprotected surfaces to simulate the ice that may accumulate during a 45-minute holding condition in icing conditions defined by FAR 25, Appendix C:
   a. Vertical Stabilizers
   b. Landing Lights
   c. Vortilons
   d. Boot Intersections
   e. Forward Wing Tips
   f. Bottom of Forward Wing/Elevator
   g. Nose Cone
   h. Top of Nacelles

Actual performance degradations may be more or less than the values quoted herein, depending on the type and duration of the icing encounter.

Refer to the icing notes on the following graphs or which appear in Sections III and IIIA:

3. Stall Speeds - Power Idle
4. Maximum Landing Weight With Normal Ice Accumulations
5. Approach Climb Gradient
6. Climb - Balked Landing

HOW TO USE GRAPHS

1. In addition to presenting the answer for a particular set of conditions, the example on a graph also presents the order in which the various scales on that graph should be used. For instance, if the first item in the example is OAT, then enter the graph at the existing OAT.
2. The reference lines indicate where to begin following the guidelines. Always project to the reference line first, then follow the guidelines to the next known item by maintaining the same PROPORTIONAL DISTANCE between the guideline above and the guideline below the projected line. For instance, if the projected line intersects the reference line in the ratio of 30% down/70% up between the guidelines, then maintain this same 30%/70% relationship between the guidelines all the way to the next item.
3. The associated conditions define the specified conditions from which performance parameters have been determined. They are not intended to be used as instructions; however, performance values determined from charts can only be achieved if the specified conditions exist.
4. All airspeeds presented in this section are indicated airspeeds (IAS) unless otherwise noted, and assume zero instrument error, (except for V_1, V_R, and the take-off ground roll airspeed calibration), and with the exception of the stall speeds presented, were derived from calibrated airspeeds corrected per either the Airspeed Calibration - Take-off Ground Roll graph or the Airspeed Calibration graph.
5. The full amount of usable fuel is available for all approved flight conditions.
6. Notes have been provided on various graphs and tables to approximate performance with engine anti-ice ON. The effect will vary, depending upon airspeed, temperature, altitude, and ambient conditions.
7. The Maximum Take-off Weight to Achieve Take-off Climb Requirements graph presents the most restrictive maximum take-off weight with:
   a. The airplane in the take-off configuration, with the most critical center of gravity, the critical engine inoperative, the remaining engine at maximum take-off power, and the propeller feathered, which:
      1) With landing gear extended, will result in a steady gradient of climb, between lift-off and the point where the landing gear is retracted, that is measurable positive; and
      2) With landing gear retracted, will result in a steady gradient of climb of 2 percent.
   b. The airplane in the enroute configuration at an altitude 1500 feet above the take-off surface, with the critical engine inoperative, the remaining engine at maximum continuous power, and the most unfavorable CG, which will result in a steady gradient of climb of 1.2 percent.
   c. The airplane in the approach configuration, the critical engine inoperative, remaining engine at maximum take-off power, and the propeller feathered, which will result in a steady gradient of climb of 2.1 percent.
   d. The airplane in the landing configuration, with the most critical center of gravity, all engines operating at maximum take-off power, which will result in a steady gradient of climb of 3.3 percent.
8. To calculate the Take-off Flight Path, which determines whether or not an obstacle can be cleared in the event of an engine failure during a continued takeoff, perform the following procedure:

a. Determine the height of the obstacle above the airplane before brake release.
b. Add to the actual obstacle height the desired margin of clearance (which must be a MINIMUM OF 35 FEET for Part 135 operation). This new value is the Obstacle Clearance Height.
c. Add to the Obstacle Clearance Height any decrease in airplane altitude during the takeoff resulting from a downhill runway gradient as follows (conservative take-off flight path planning does not take any credit for an uphill runway gradient):

$$\text{Runway Drop (ft)} = \frac{\text{Runway Gradient (\%)} \times \text{TOFL (ft)}}{100}$$

Total Height Required = Obstacle Clearance Height Before Brake Release (step 8.b.) + Runway Drop

BT03702

d. Determine the Distance of the obstacle from the airplane before brake release.
e. Obtain the Take-off Field Length (TOFL) from the "Take-off Speeds and Field Length" tables.
f. Enter the applicable "Take-off Field Length Corrected for Runway Gradient and Wind Component and Anti-Skid' graph with the value obtained in step 8.e. above, and find the corrected take-off field length.
g. Subtract the corrected TOFL value (step 8.f.) from the obstacle distance before brake release value (step 8.d.) to obtain the Horizontal Distance to the Obstacle from Reference Zero.
h. If the Total Height Required (step 8.c.) is:
    1) Not greater than 100 feet and the Horizontal Distance to the Obstacle from Reference Zero (step 8.g.) is 1000 feet or less:
        a) Enter the applicable "Close-in Take-off Flight Path" graph with the Total Height Required (step 8.c.) and trace right.
        b) Enter the same graph again with the Horizontal Distance from Reference Zero to the Obstacle (step 8.g.) and trace up.
        c) Where the two tracings intersect, read the First Segment or Second Segment Net climb Gradient Required in percent. Interpolate for intersections between labeled lines.
        d) If intersection is:
            i. In shaded area, refer to applicable "Net Take-off Flight Path - First Segment" graph and ensure that the net climb gradient available is equal to or greater than the "Net Climb Gradient Required.
            ii. Not in shaded area, refer to applicable "Net Take-off Flight Path - Second Segment" graph and ensure that the net climb gradient available is equal to or greater than the net Climb Gradient Required.
    2) less than 400 feet, and the Horizontal Distance from Reference Zero (step 8.g.) is greater than 1000 feet:
        a) Enter the applicable "Take-off Flight Path" graph with the Total Height Required (step 8.g.) and trace right.

b) Enter the same graph again the Horizontal Distance from reference Zero to the Obstacle (step 8.g) and trace up.
c) Where the two tracings intersect, read the Second Segment Net Climb Gradient Required in percent. Interpolate for intersections between labeled lines.
d) Refer to the applicable "Net Take-off Flight Path - Second Segment" and ensure that the net climb gradient available is equal to or greater than the Net Climb Gradient Required (step 8.h.2.c.)

3) Equal to 400 feet:
a) Enter the applicable "Net Take-off Flight Path - Second Segment" graph and determine climb gradient available.
b) Enter "Take-off Flight Path" graph at 400 feet Total Height Required, and trace right to the Climb gradient available (step 8.h.3.a.).
c) Then trace down to read Horizontal Distance from Reference Zero.
d) This distance must be less than Distance from Reference Zero to the Obstacle (step 8.g., to provide proper clearance).

4) Greater than 400 feet and less than or equal to 1500 feet:
a) Find the Distance from Brake Release to the Beginning of Third Segment Acceleration by adding the Corrected Take-off Field length (step 7.f.) to the Horizontal Distance from Reference Zero, as determined in steps 8.h.3.-a., -b., and -c.
b) Enter the applicable "Third Segment Acceleration" graph and determine the Third Segment Acceleration Distance.
c) From the obstacle distance determined in step 8.d. above, subtract the values found in steps 8.h.4.a. and 7.h.4.b. above to determine the Distance from the beginning of Final-Segment Climb to the Obstacle. (Ensure that all values are converted to common units first, such as feet or NM, and that the final answer is in NM.)
d) Use the following formula to compute the Final-Segment Climb Gradient Required to clear the obstacle.

Required Gradient (%) =

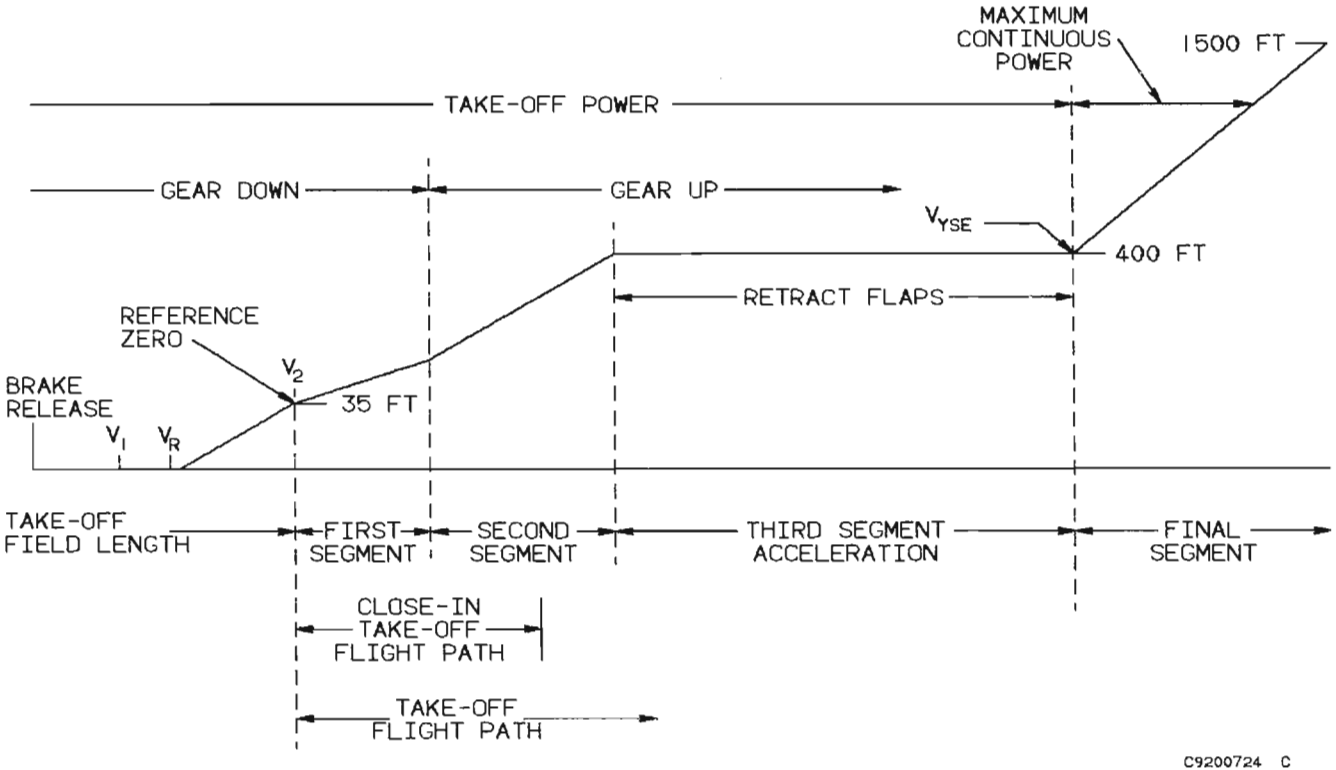
$$\frac{[\text{Total Height Required (ft, step 8.c.)} - 400\text{ ft}] \times 0.0165}{\text{Final-Segment to Obstacle Dist. (8.h.4.c.) (NM)}}$$

BT03703

9. The Maximum Landing Weight to Achieve Landing Climb Requirements graph presents the most restrictive maximum landing weight which:
a. With the airplane in the discontinued approach configuration (i.e., gear up and flaps retracted) at normal approach speed, the critical engine inoperative, and the other engine at available take-off power, will result in a steady gradient of climb of 2.1 percent; and
b. With the landing gear extended, flaps extended, and both engines operating at take-off power, will result in a steady gradient of climb of 3.3 percent at the most critical CG and the normal approach speed.

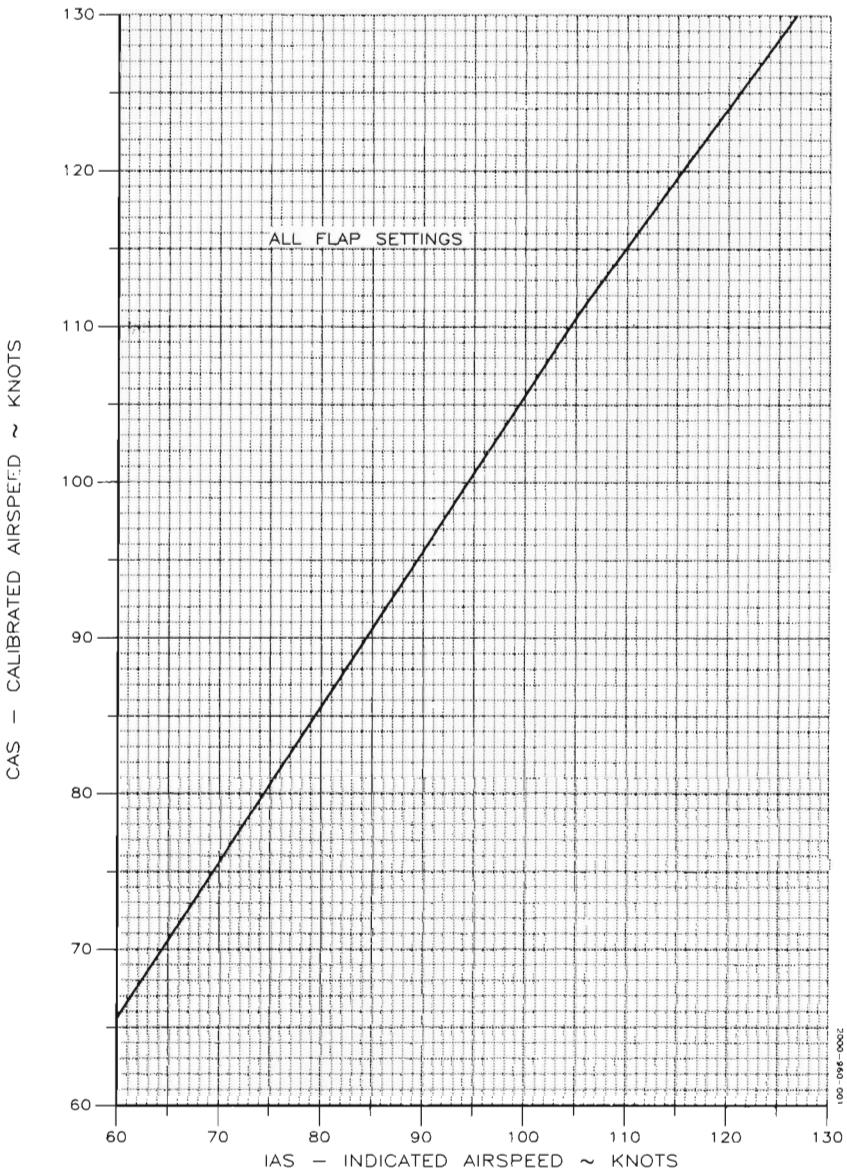
10. The examples provided are illustrative in nature only, and therefore may provide answers for torque setting, fuel flow, and airspeed to a higher degree of accuracy than can be read from the instrument displays.

TAKE-OFF PATH PROFILE



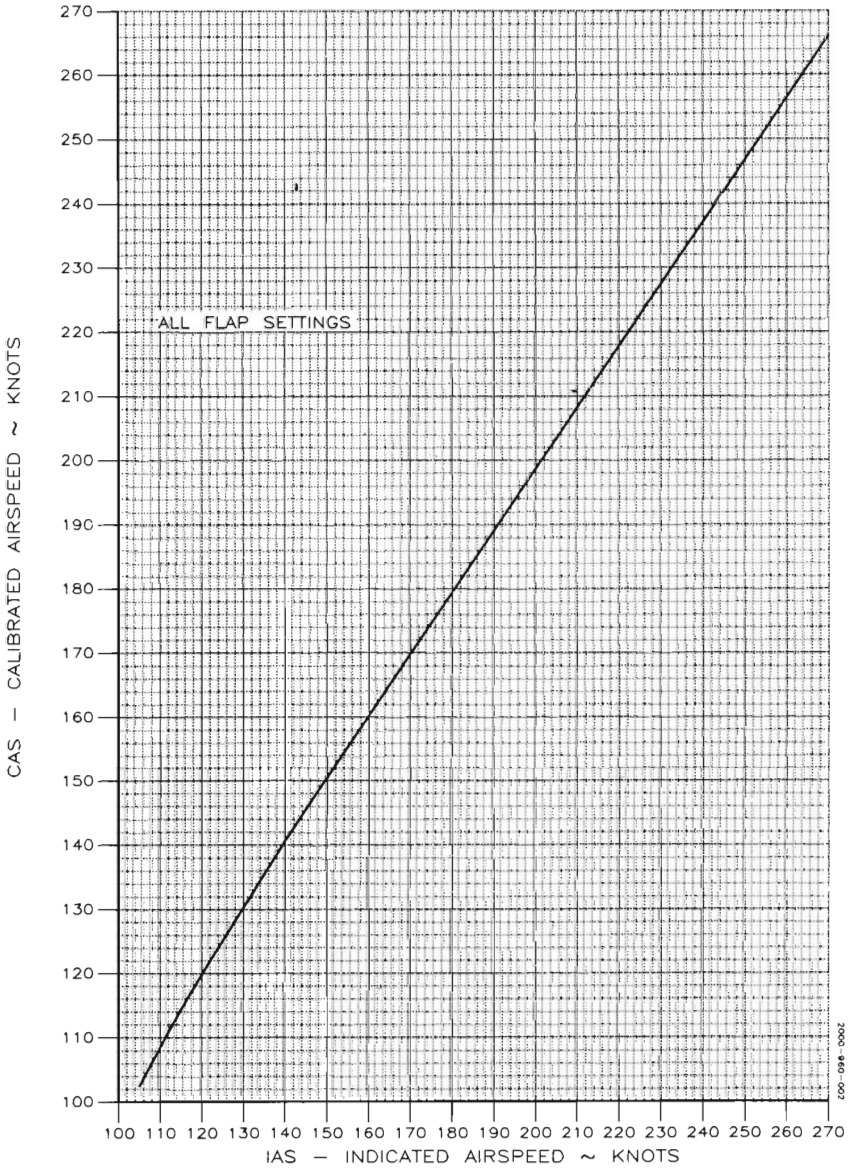
AIRSPEED CALIBRATION

TAKE-OFF GROUND ROLL



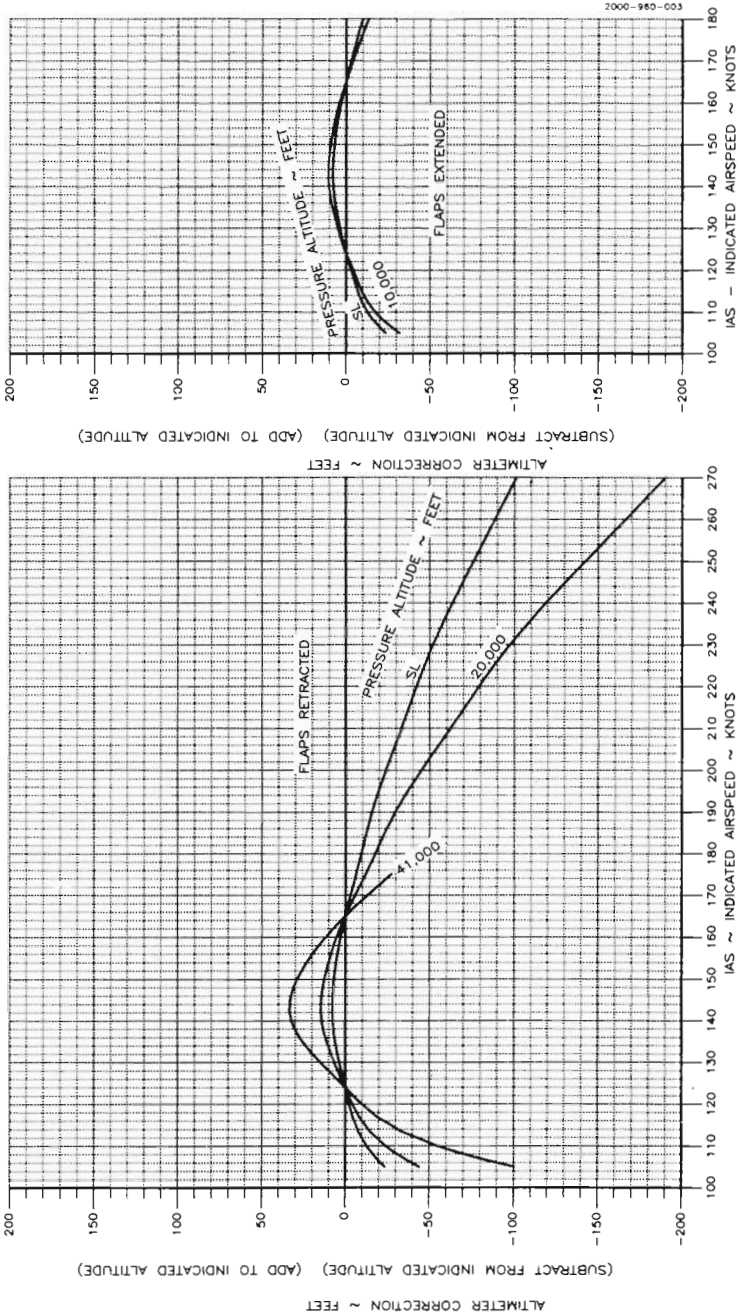
AIRSPEED CALIBRATION

NOTE: INDICATED AIRSPEED ASSUMES ZERO INSTRUMENT ERROR.



ALTIMETER CORRECTION

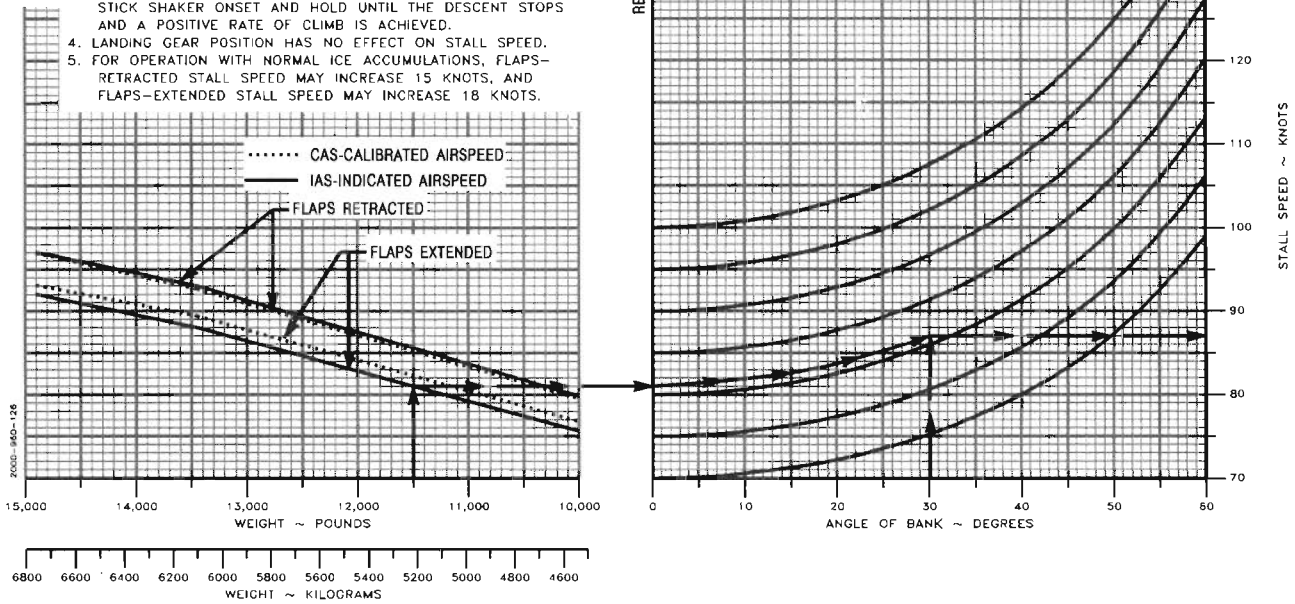
NOTE: INDICATED AIRSPEED ASSUMES ZERO INSTRUMENT ERROR.



STALL SPEEDS - POWER IDLE

EXAMPLE:
WEIGHT . . . . . 11,500 LBS
FLAPS . . . . . EXTENDED
ANGLE OF BANK . . . 30°
STALL SPEED . . . . . 87.0 KIAS

NOTES:
1. ALTITUDE LOSS EXPERIENCED WHILE CONDUCTING STALLS IN ACCORDANCE WITH FAR 23.201 WAS 1850 FEET.
2. WHEN AT OR BELOW THE ONE-ENGINE-INOPERATIVE SERVICE CEILING, THE MAXIMUM NOSE-DOWN PITCH ATTITUDE AND ALTITUDE LOSS DURING RECOVERY FROM ONE-ENGINE-INOPERATIVE STALL PER FAR 23.205 ARE APPROXIMATELY 9° AND 600 FEET RESPECTIVELY.
3. FOR STALL RECOVERY, APPLY MAXIMUM POWER. LOWER NOSE APPROXIMATELY 5° BELOW THE STALL ATTITUDE. AS THE AIRSPEED INCREASES, RAISE THE AIRPLANE NOSE TO THE STICK SHAKER ONSET AND HOLD UNTIL THE DESCENT STOPS AND A POSITIVE RATE OF CLIMB IS ACHIEVED.
4. LANDING GEAR POSITION HAS NO EFFECT ON STALL SPEED.
5. FOR OPERATION WITH NORMAL ICE ACCUMULATIONS, FLAPS-RETRACTED STALL SPEED MAY INCREASE 15 KNOTS, AND FLAPS-EXTENDED STALL SPEED MAY INCREASE 18 KNOTS.



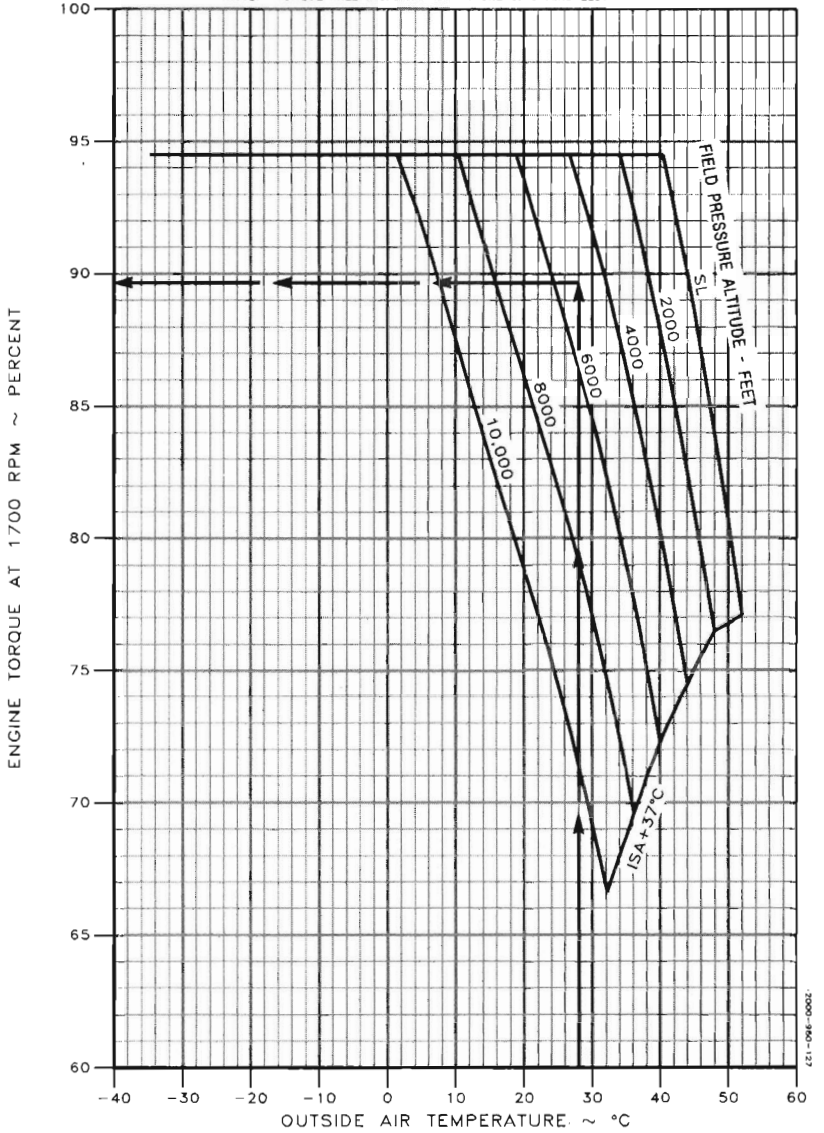
STATIC TAKE-OFF POWER AT 1700 RPM

WITH ENGINE ANTI-ICE OFF

ASSOCIATED CONDITIONS:
BLEED AIR VALVES..... BOTH
TORQUE..... SET BEFORE BRAKE RELEASE

EXAMPLE:
OAT..... 28°C
FIELD PRESSURE ALTITUDE..... 5003 FT
TAKE-OFF POWER..... 89.7 %

NOTE: TORQUE WILL INCREASE WITH INCREASING AIRSPEED.



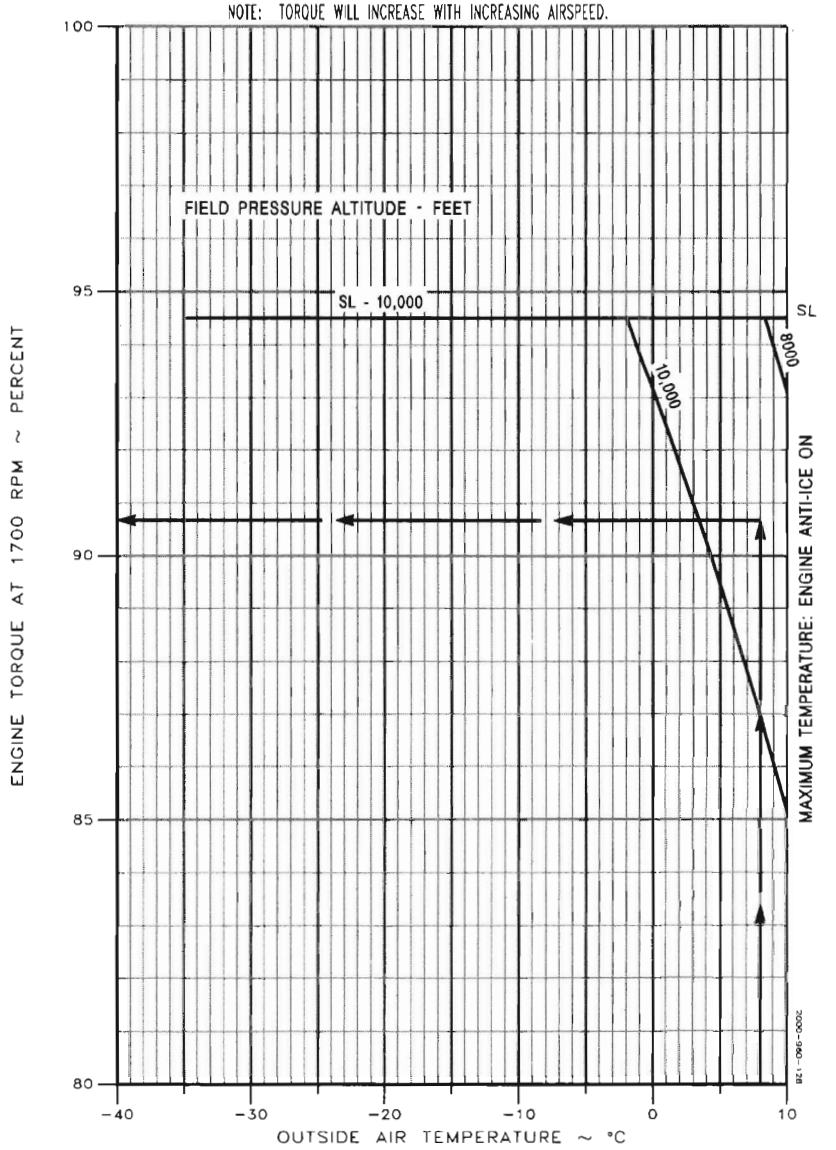
STATIC TAKE-OFF POWER AT 1700 RPM

WITH ENGINE ANTI-ICE ON

ASSOCIATED CONDITIONS:
BLEED AIR VALVES..... BOTH
TORQUE..... SET BEFORE BRAKE RELEASE

EXAMPLE:
OAT..... 8°C
FIELD PRESSURE ALTITUDE..... 9000 FT
TAKE-OFF POWER..... 90.7 %

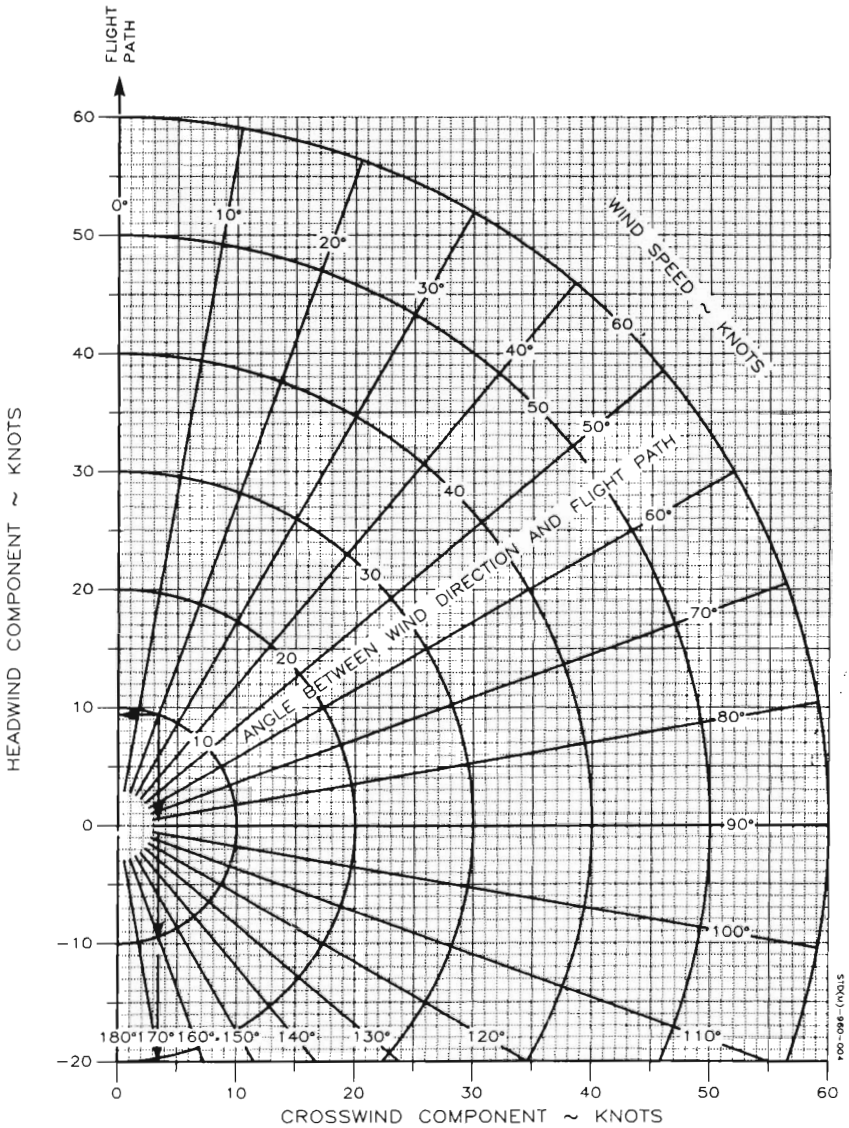
NOTE: TORQUE WILL INCREASE WITH INCREASING AIRSPEED.



WIND COMPONENTS

EXAMPLE:

WIND SPEED	10 KNOTS
ANGLE BETWEEN WIND DIRECTION AND FLIGHT PATH	20°
HEADWIND COMPONENT	9.4 KNOTS
CROSSWIND COMPONENT	3.4 KNOTS

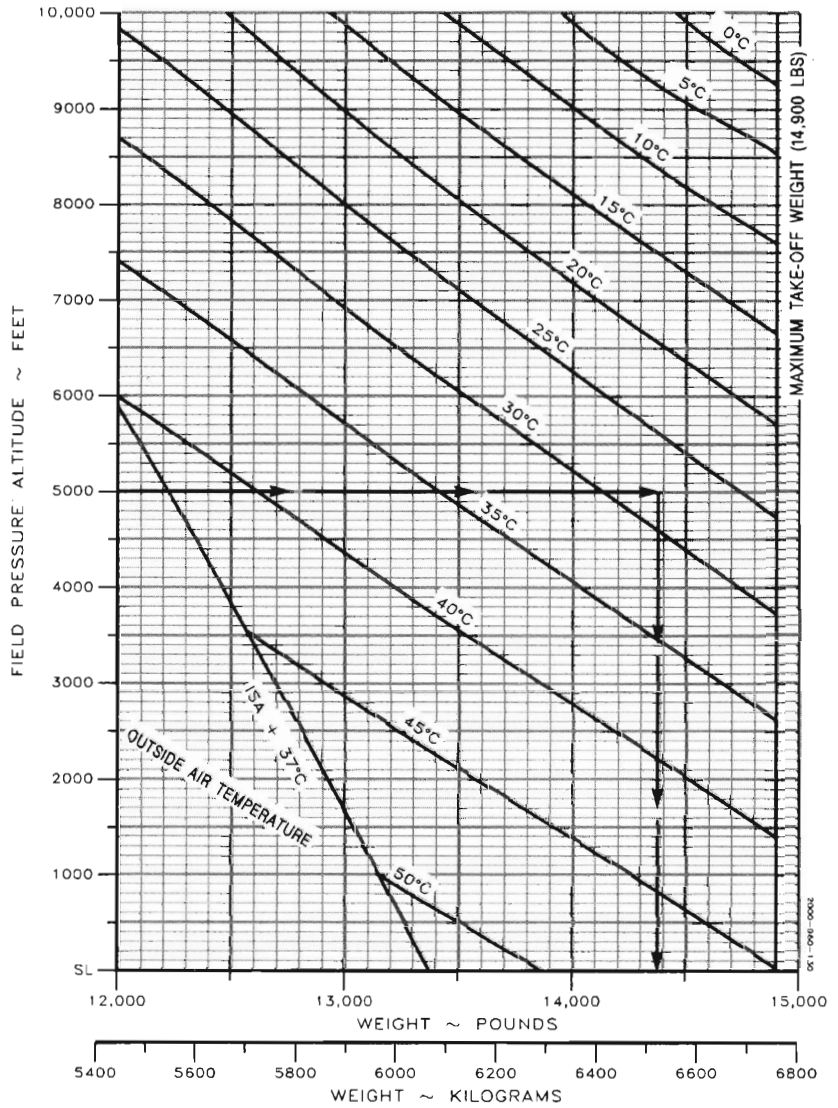


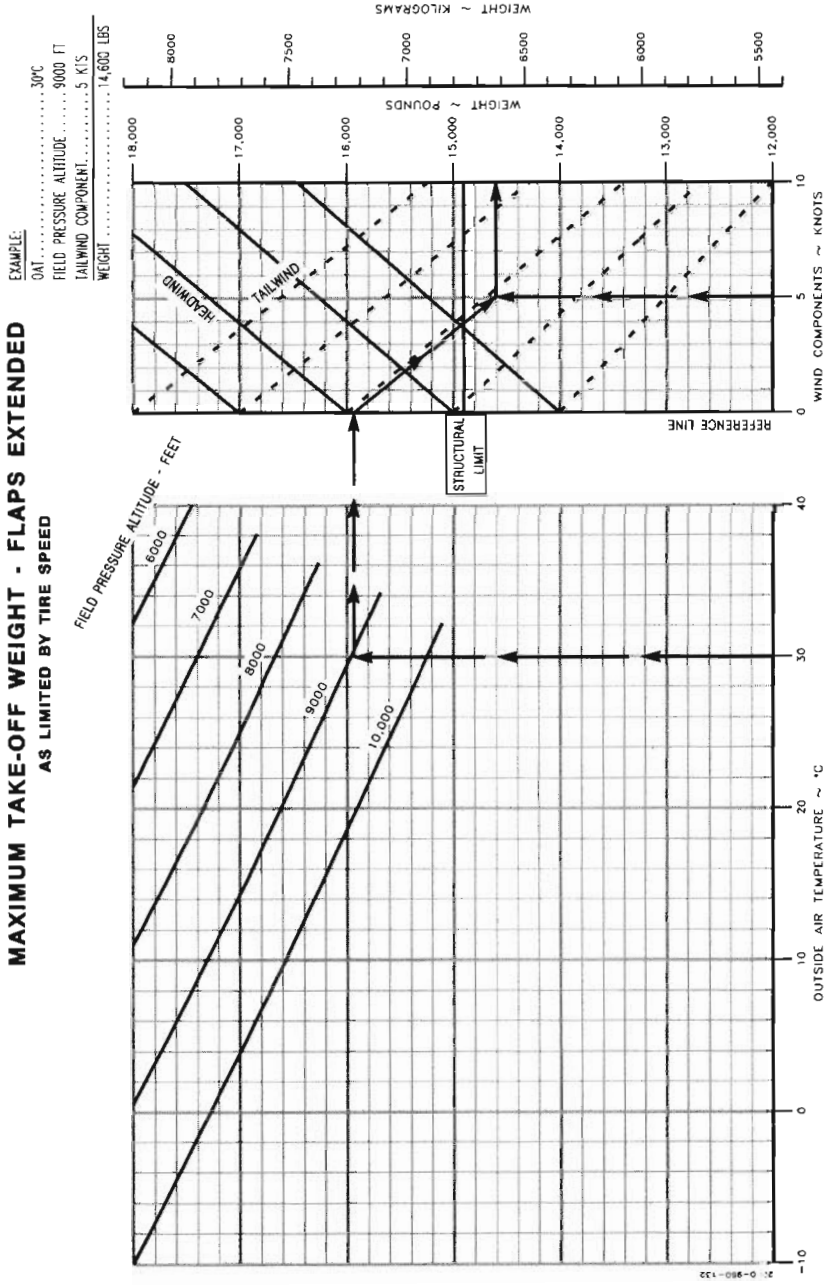
MAXIMUM TAKE-OFF WEIGHT - FLAPS EXTENDED

TO ACHIEVE TAKE-OFF CLIMB REQUIREMENTS

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, INCREASE THE OAT BY 7°C BEFORE ENTERING THIS CHART.

EXAMPLE:
FIELD PRESSURE ALTITUDE.....5003 FT
OAT.....28°C
TAKE-OFF WEIGHT.....14,378 LBS




MAXIMUM TAKE-OFF WEIGHT - FLAPS EXTENDED
AS LIMITED BY TIRE SPEED
EXAMPLE:
OAT ..... 30°C
FIELD PRESSURE ALTITUDE ..... 9000 FT
TAILWIND COMPONENT ..... 5 KTS
WEIGHT ..... 14,600 LBS
WEIGHT ~ KILOGRAMS
8000
7500
7000
6500
6000
5500
WEIGHT ~ POUNDS
18,000
17,000
16,000
15,000
14,000
13,000
12,000
HEADWIND
TAILWIND
REFERENCE LINE
STRUCTURAL LIMIT
WIND COMPONENTS ~ KNOTS
0
5
10
FIELD PRESSURE ALTITUDE - FEET
6000
7000
8000
9000
10,000
OUTSIDE AIR TEMPERATURE ~ °C
40
30
20
10
0
-10

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS EXTENDED

ASSOCIATED CONDITIONS:

1. POWER ..... STATIC TAKE-OFF POWER SET
2. AUTOFEATHER ..... ARMED
3. V_1 V_R , V_2 ..... AS TABULATED
4. RUNWAY ..... PAVED, DRY SURFACE
5. LANDING GEAR ..... RETRACTED AFTER LIFT-OFF
6. OBSTACLE HEIGHT ..... 35 FEET
7. ANTI-SKID ..... ON

IF ACCELERATE-STOP:

a. POWER LEVER ..... GROUND FINE AT OR BELOW V_1
b. BRAKING ..... MAXIMUM

NOTE

If one or more of the following conditions are true:

1) Runway gradient is not zero.
2) Headwind/tailwind component is not zero.
3) Anti-skid is OFF.
4) Engine Anti-ice ON.

Refer to the following graphs for the runway gradient, headwind/tailwind component and anti-skid corrections as applicable.

- TAKE-OFF FIELD LENGTH CORRECTED FOR RUNWAY GRADIENT, WIND GRADIENT, AND ANTI-SKID.
- TAKE-OFF DECISION SPEED (V_1) CORRECTED FOR RUNWAY, WIND GRADIENT, AND ANTI-SKID.

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS EXTENDED
FIELD PRESSURE ALTITUDE: SEA LEVEL
$V_{35} = V_2 + 5$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	97	98	99	99	100	100	100	—
(6758)	V_R - KIAS	101	101	101	101	101	102	102	—
	V_2 - KIAS	113	113	113	113	113	113	113	—
	TOFL - FT	3087	3397	3565	3755	3953	4163	4366	—
14,000	V_1 - KIAS	94	94	94	94	95	95	96	100
(6350)	V_R - KIAS	97	98	98	98	98	98	99	100
	V_2 - KIAS	110	110	110	110	110	110	110	110
	TOFL - FT	2858	3086	3203	3339	3500	3680	3864	4797
13,450	V_1 - KIAS	93	93	93	93	93	93	93	97
(6101)	V_R - KIAS	96	96	96	96	96	96	96	98
	V_2 - KIAS	109	109	109	109	109	109	109	109
	TOFL - FT	2727	2941	3051	3179	3312	3447	3586	4346
13,000	V_1 - KIAS	91	91	91	91	91	91	91	94
(5897)	V_R - KIAS	94	94	94	94	94	94	94	95
	V_2 - KIAS	107	107	107	107	107	107	107	107
	TOFL - FT	2620	2823	2927	3049	3175	3304	3436	4029
12,000	V_1 - KIAS	91	91	91	91	91	91	91	91
(5443)	V_R - KIAS	91	91	91	91	91	91	91	91
AND	V_2 - KIAS	105	105	105	105	105	105	105	104
UNDER	TOFL - FT	2535	2730	2830	2945	3065	3188	3313	3653

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TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS EXTENDED
FIELD PRESSURE ALTITUDE: 1000 FT
$V_{35} = V_2 + 5$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	97	99	99	100	100	101	102	—
(6758)	V_R - KIAS	101	101	101	101	102	102	102	—
	V_2 - KIAS	113	113	113	113	113	113	113	—
	TOFL - FT	3218	3559	3755	3961	4180	4390	4711	—
14,000	V_1 - KIAS	94	94	94	95	95	96	97	—
(6350)	V_R - KIAS	98	98	98	98	98	99	99	—
	V_2 - KIAS	110	110	110	110	110	110	110	—
	TOFL - FT	2959	3199	3339	3507	3695	3885	4159	—
13,450	V_1 - KIAS	93	93	93	93	93	93	94	98
(6101)	V_R - KIAS	96	96	96	96	96	96	97	98
	V_2 - KIAS	109	109	109	109	109	109	109	109
	TOFL - FT	2821	3047	3179	3317	3458	3602	3867	4826
13,000	V_1 - KIAS	91	91	91	91	91	91	91	96
(5897)	V_R - KIAS	94	94	94	94	94	94	95	96
	V_2 - KIAS	107	107	107	107	107	107	107	107
	TOFL - FT	2710	2924	3049	3180	3314	3451	3619	4384
12,000	V_1 - KIAS	91	91	91	91	91	91	91	91
(5443)	V_R - KIAS	91	91	91	91	91	91	91	92
AND	V_2 - KIAS	105	105	105	105	105	105	104	104
UNDER	TOFL - FT	2621	2827	2946	3070	3197	3327	3485	3867

NC000136B

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS EXTENDED
FIELD PRESSURE ALTITUDE: 2000 FT
$V_{35} = V_2 + 5$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900 (6758)	V_1 - KIAS	98	99	100	100	101	101	102	—
	V_R - KIAS	101	101	101	102	102	102	102	—
	V_2 - KIAS	113	113	113	113	113	113	113	—
	TOFL - FT	3366	3750	3962	4191	4408	4642	5216	—
14,000 (6350)	V_1 - KIAS	94	94	95	95	96	96	98	—
	V_R - KIAS	98	98	98	98	99	99	99	—
	V_2 - KIAS	110	110	110	110	110	110	110	—
	TOFL - FT	3066	3336	3509	3704	3901	4105	4521	—
13,450 (6101)	V_1 - KIAS	93	93	93	93	93	93	95	—
	V_R - KIAS	96	96	96	96	96	97	97	—
	V_2 - KIAS	109	109	109	109	109	109	109	—
	TOFL - FT	2922	3176	3319	3465	3615	3800	4172	—
13,000 (5897)	V_1 - KIAS	91	91	91	91	91	91	92	96
	V_R - KIAS	94	94	94	94	94	95	95	96
	V_2 - KIAS	107	107	107	107	107	107	107	107
	TOFL - FT	2805	3046	3182	3321	3463	3608	3886	4902
12,000 (5443) AND UNDER	V_1 - KIAS	91	91	91	91	91	91	91	91
	V_R - KIAS	91	91	91	91	91	91	91	92
	V_2 - KIAS	105	105	105	105	105	105	104	104
	TOFL - FT	2713	2943	3072	3203	3338	3475	3676	4101

NC000136C

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS EXTENDED
FIELD PRESSURE ALTITUDE: 3000 FT
$V_{35} = V_2 + 5$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	98	100	100	101	101	102	—	—
(6758)	V_R - KIAS	101	101	102	102	102	102	—	—
	V_2 - KIAS	113	113	113	113	113	113	—	—
	TOFL - FT	3530	3958	4194	4420	4664	4914	—	—
14,000	V_1 - KIAS	94	95	95	96	96	97	99	—
(6350)	V_R - KIAS	98	98	98	99	99	99	99	—
	V_2 - KIAS	110	110	110	110	110	110	110	—
	TOFL - FT	3179	3505	3707	3911	4124	4337	4923	—
13,450	V_1 - KIAS	93	93	93	93	93	94	96	—
(6101)	V_R - KIAS	96	96	96	97	97	97	97	—
	V_2 - KIAS	109	109	109	109	109	109	109	—
	TOFL - FT	3029	3316	3467	3625	3818	4023	4544	—
13,000	V_1 - KIAS	91	91	91	91	91	91	93	—
(5897)	V_R - KIAS	94	94	94	94	95	95	95	—
	V_2 - KIAS	107	107	107	107	107	107	107	—
	TOFL - FT	2906	3179	3323	3470	3621	3776	4215	—
12,000	V_1 - KIAS	91	91	91	91	91	91	91	92
(5443)	V_R - KIAS	91	91	91	91	91	91	91	92
AND	V_2 - KIAS	105	105	105	105	105	104	104	104
UNDER	TOFL - FT	2810	3069	3206	3345	3488	3634	3886	4436

NC000136D

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS EXTENDED
FIELD PRESSURE ALTITUDE: 4000 FT
$V_{35} = V_2 + 5$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	99	100	101	101	102	102	—	—
(6758)	V_R - KIAS	101	102	102	102	102	102	—	—
	V_2 - KIAS	113	113	113	113	113	113	—	—
	TOFL - FT	3717	4190	4424	4678	4941	5364	—	—
14,000	V_1 - KIAS	94	95	96	96	97	98	100	—
(6350)	V_R - KIAS	98	98	99	99	99	99	100	—
	V_2 - KIAS	110	110	110	110	110	110	110	—
	TOFL - FT	3313	3704	3915	4136	4390	4686	5546	—
13,450	V_1 - KIAS	93	93	93	93	94	95	98	—
(6101)	V_R - KIAS	96	96	97	97	97	97	98	—
	V_2 - KIAS	109	109	109	109	109	109	109	—
	TOFL - FT	3154	3465	3629	3831	4043	4334	4957	—
13,000	V_1 - KIAS	91	91	91	91	91	92	95	—
(5897)	V_R - KIAS	94	94	94	95	95	95	96	—
	V_2 - KIAS	107	107	107	107	107	107	107	—
	TOFL - FT	3026	3321	3474	3631	3791	4038	4594	—
12,000	V_1 - KIAS	91	91	91	91	91	91	91	93
(5443)	V_R - KIAS	91	91	91	91	91	91	91	93
AND	V_2 - KIAS	105	105	105	105	105	104	104	104
UNDER	TOFL - FT	2924	3204	3349	3497	3649	3828	4116	5022

NC000136E

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS EXTENDED
FIELD PRESSURE ALTITUDE: 5000 FT
$V_{35} = V_2 + 5$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	100	101	101	102	102	—	—	—
(6758)	V_R - KIAS	101	102	102	102	102	—	—	—
	V_2 - KIAS	113	113	113	113	113	—	—	—
	TOFL - FT	3926	4422	4685	4960	5243	—	—	—
14,000	V_1 - KIAS	95	96	96	97	97	99	—	—
(6350)	V_R - KIAS	98	99	99	99	99	99	—	—
	V_2 - KIAS	110	110	110	110	110	110	—	—
	TOFL - FT	3477	3914	4143	4376	4627	5090	—	—
13,450	V_1 - KIAS	93	93	93	94	94	96	98	—
(6101)	V_R - KIAS	96	97	97	97	97	97	98	—
	V_2 - KIAS	109	109	109	109	109	109	109	—
	TOFL - FT	3295	3627	3837	4057	4283	4700	5608	—
13,000	V_1 - KIAS	91	91	91	91	92	93	96	—
(5897)	V_R - KIAS	94	94	95	95	95	95	96	—
	V_2 - KIAS	107	107	107	107	107	107	107	—
	TOFL - FT	3160	3473	3636	3802	3982	4364	5045	—
12,000	V_1 - KIAS	91	91	91	91	91	91	91	—
(5443)	V_R - KIAS	91	91	91	91	91	91	92	—
AND	V_2 - KIAS	105	105	105	105	104	104	104	—
UNDER	TOFL - FT	3051	3348	3502	3660	3821	4045	4370	—

NC000136F

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS EXTENDED
FIELD PRESSURE ALTITUDE: 6000 FT
$V_{35} = V_2 + 5$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	100	101	102	102	102	—	—	—
(6758)	V_R - KIAS	102	102	102	102	102	—	—	—
	V_2 - KIAS	113	113	113	113	113	—	—	—
	TOFL - FT	4156	4685	4971	5264	5658	—	—	—
14,000	V_1 - KIAS	95	96	97	97	98	100	—	—
(6350)	V_R - KIAS	98	99	99	99	99	100	—	—
	V_2 - KIAS	110	110	110	110	110	110	—	—
	TOFL - FT	3675	4142	4386	4645	4931	5637	—	—
13,450	V_1 - KIAS	93	93	94	94	95	97	—	—
(6101)	V_R - KIAS	96	97	97	97	97	98	—	—
	V_2 - KIAS	109	109	109	109	109	109	—	—
	TOFL - FT	3445	3836	4064	4299	4558	5121	—	—
13,000	V_1 - KIAS	91	91	91	92	92	94	—	—
(5897)	V_R - KIAS	94	95	95	95	95	96	—	—
	V_2 - KIAS	107	107	107	107	107	107	—	—
	TOFL - FT	3302	3636	3809	3998	4238	4738	—	—
12,000	V_1 - KIAS	91	91	91	91	91	91	91	—
(5443)	V_R - KIAS	91	91	91	91	91	91	92	—
AND	V_2 - KIAS	105	105	105	105	104	104	104	—
UNDER	TOFL - FT	3186	3502	3665	3833	4008	4280	4651	—

NC000136G

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS EXTENDED
FIELD PRESSURE ALTITUDE: 7000 FT
$V_{35} = V_2 + 5$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900 (6758)	V_1 - KIAS	101	102	102	102	—	—	—	—
	V_R - KIAS	102	102	102	102	—	—	—	—
	V_2 - KIAS	113	113	113	113	—	—	—	—
	TOFL - FT	4392	4971	5276	5636	—	—	—	—
14,000 (6350)	V_1 - KIAS	96	97	97	98	99	—	—	—
	V_R - KIAS	99	99	99	99	100	—	—	—
	V_2 - KIAS	110	110	110	110	110	—	—	—
	TOFL - FT	3887	4386	4656	4926	5365	—	—	—
13,450 (6101)	V_1 - KIAS	93	94	94	95	96	98	—	—
	V_R - KIAS	96	97	97	97	97	98	—	—
	V_2 - KIAS	109	109	109	109	109	109	—	—
	TOFL - FT	3606	4065	4309	4552	4956	5667	—	—
13,000 (5897)	V_1 - KIAS	91	91	92	92	93	96	—	—
	V_R - KIAS	94	95	95	95	95	96	—	—
	V_2 - KIAS	107	107	107	107	107	107	—	—
	TOFL - FT	3455	3810	4008	4237	4604	5162	—	—
12,000 (5443) AND UNDER	V_1 - KIAS	91	91	91	91	91	91	92	—
	V_R - KIAS	91	91	91	91	91	91	92	—
	V_2 - KIAS	105	105	105	104	104	104	104	—
	TOFL - FT	3331	3667	3841	4014	4241	4538	5148	—

NC000136H

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS EXTENDED
FIELD PRESSURE ALTITUDE: 8000 FT
$V_{35} = V_2 + 5$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900 (6758)	V_1 - KIAS	101	102	102	102	—	—	—	—
	V_R - KIAS	102	102	102	102	—	—	—	—
	V_2 - KIAS	113	113	113	113	—	—	—	—
	TOFL - FT	4655	5278	5652	6059	—	—	—	—
14,000 (6350)	V_1 - KIAS	96	97	98	99	100	—	—	—
	V_R - KIAS	99	99	99	99	100	—	—	—
	V_2 - KIAS	110	110	110	110	110	—	—	—
	TOFL - FT	4116	4658	4939	5229	5982	—	—	—
13,450 (6101)	V_1 - KIAS	93	94	95	96	98	—	—	—
	V_R - KIAS	97	97	97	97	98	—	—	—
	V_2 - KIAS	109	109	109	109	109	—	—	—
	TOFL - FT	3811	4312	4564	4836	5393	—	—	—
13,000 (5897)	V_1 - KIAS	91	92	92	93	95	96	—	—
	V_R - KIAS	95	95	95	95	96	96	—	—
	V_2 - KIAS	107	107	107	107	107	107	—	—
	TOFL - FT	3619	4010	4248	4494	5003	5792	—	—
12,000 (5443) AND UNDER	V_1 - KIAS	91	91	91	91	91	91	—	—
	V_R - KIAS	91	91	91	91	91	92	—	—
	V_2 - KIAS	105	105	104	104	104	104	—	—
	TOFL - FT	3486	3843	4023	4208	4493	4827	—	—

NC000136I

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS EXTENDED
FIELD PRESSURE ALTITUDE: 9000 FT
$V_{35} = V_2 + 5$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	102	102	102	—	—	—	—	—
(6758)	V_R - KIAS	102	102	102	—	—	—	—	—
	V_2 - KIAS	113	113	113	—	—	—	—	—
	TOFL - FT	4939	5657	6080	—	—	—	—	—
14,000	V_1 - KIAS	97	98	98	100	—	—	—	—
(6350)	V_R - KIAS	99	99	99	100	—	—	—	—
	V_2 - KIAS	110	110	110	110	—	—	—	—
	TOFL - FT	4359	4943	5235	5662	—	—	—	—
13,450	V_1 - KIAS	94	95	96	97	98	—	—	—
(6101)	V_R - KIAS	97	97	97	98	98	—	—	—
	V_2 - KIAS	109	109	109	109	109	—	—	—
	TOFL - FT	4043	4568	4850	5233	5998	—	—	—
13,000	V_1 - KIAS	91	92	93	94	96	—	—	—
(5897)	V_R - KIAS	95	95	95	96	96	—	—	—
	V_2 - KIAS	107	107	107	107	107	—	—	—
	TOFL - FT	3794	4251	4508	4860	5445	—	—	—
12,000	V_1 - KIAS	91	91	91	91	91	92	—	—
(5443)	V_R - KIAS	91	91	91	91	91	92	—	—
AND	V_2 - KIAS	105	104	104	104	104	104	—	—
UNDER	TOFL - FT	3652	4027	4218	4449	4767	5196	—	—

NC000136J

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS EXTENDED
FIELD PRESSURE ALTITUDE: 10,000 FT
$V_{35} = V_2 + 5$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900 (6758)	V_1 - KIAS	102	102	—	—	—	—	—	—
	V_R - KIAS	102	102	—	—	—	—	—	—
	V_2 - KIAS	113	113	—	—	—	—	—	—
	TOFL - FT	5252	6088	—	—	—	—	—	—
14,000 (6350)	V_1 - KIAS	97	98	99	—	—	—	—	—
	V_R - KIAS	99	99	99	—	—	—	—	—
	V_2 - KIAS	110	110	110	—	—	—	—	—
	TOFL - FT	4636	5242	5574	—	—	—	—	—
13,450 (6101)	V_1 - KIAS	94	96	96	98	—	—	—	—
	V_R - KIAS	97	97	97	98	—	—	—	—
	V_2 - KIAS	109	109	109	109	—	—	—	—
	TOFL - FT	4291	4856	5154	5702	—	—	—	—
13,000 (5897)	V_1 - KIAS	92	93	93	95	96	—	—	—
	V_R - KIAS	95	95	95	96	96	—	—	—
	V_2 - KIAS	107	107	107	107	107	—	—	—
	TOFL - FT	3990	4513	4790	5282	6078	—	—	—
12,000 (5443) AND UNDER	V_1 - KIAS	91	91	91	91	91	92	—	—
	V_R - KIAS	91	91	91	91	92	92	—	—
	V_2 - KIAS	105	104	104	104	104	104	—	—
	TOFL - FT	3830	4224	4429	4720	5068	5895	—	—

NC000136K

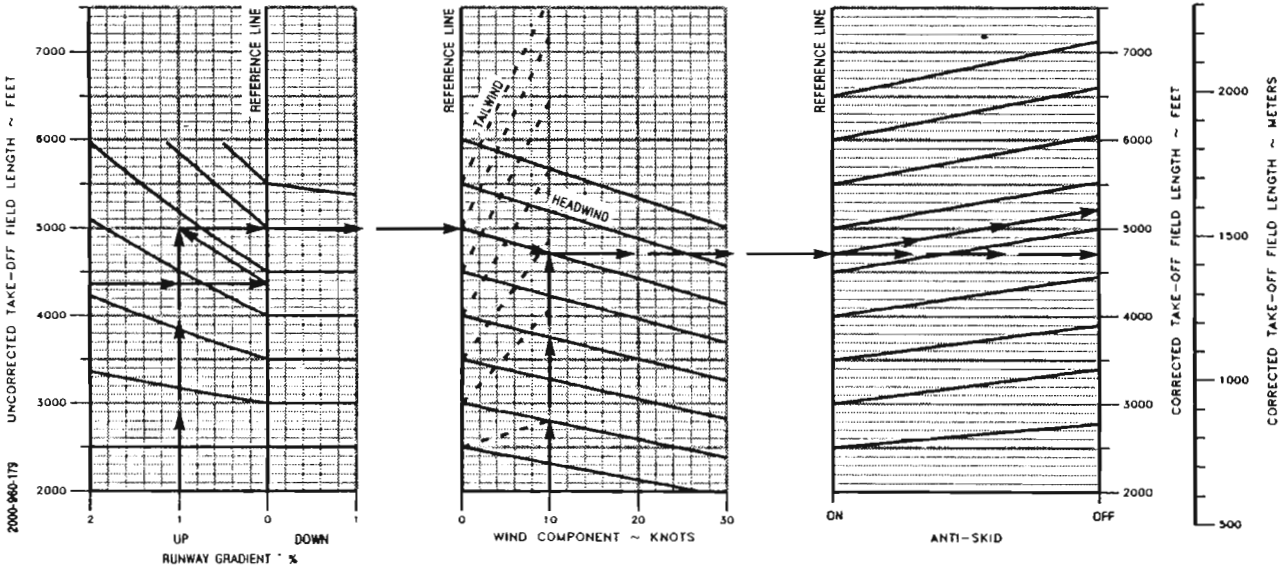
TAKE-OFF FIELD LENGTH - FLAPS EXTENDED
CORRECTED FOR RUNWAY GRADIENT, WIND COMPONENT AND ANTI-SKID

NOTES: 1. OBTAIN THE TAKE-OFF FIELD LENGTH FROM THE APPROPRIATE "TAKE-OFF SPEEDS AND FIELD LENGTH" TABLE. ENTER THE GRAPH BELOW WITH THAT VALUE, AND DETERMINE THE FIELD LENGTH CORRECTED FOR RUNWAY GRADIENT, WIND COMPONENT AND ANTI-SKID.

2. THE WIND GRIDS INCLUDE FACTORS OF 50% FOR HEADWINDS AND 150% FOR TAILWINDS. COMPONENTS OF REPORTED WINDS MAY THEREFORE BE USED DIRETLY IN THE GRAPH.
3. FOR OPERATION WITH ENGINE ANTI-ICE ON, INCREASE THE DISTANCE OBTAINED FROM THIS GRAPH BY 4%.

EXAMPLE:

UNCORRECTED TAKE-OFF FIELD LENGTH	4363 FT
RUNWAY GRADIENT	1.0% UP
HEADWIND COMPONENT	10 KTS
TAKE-OFF FIELD LENGTH:	
ANTI-SKID (ON)	4708 FT
ANTI-SKID (OFF)	5218 FT



TAKE-OFF DECISION SPEED (V_1) - FLAPS EXTENDED
CORRECTED FOR RUNWAY GRADIENT, WIND COMPONENT AND ANTI-SKID

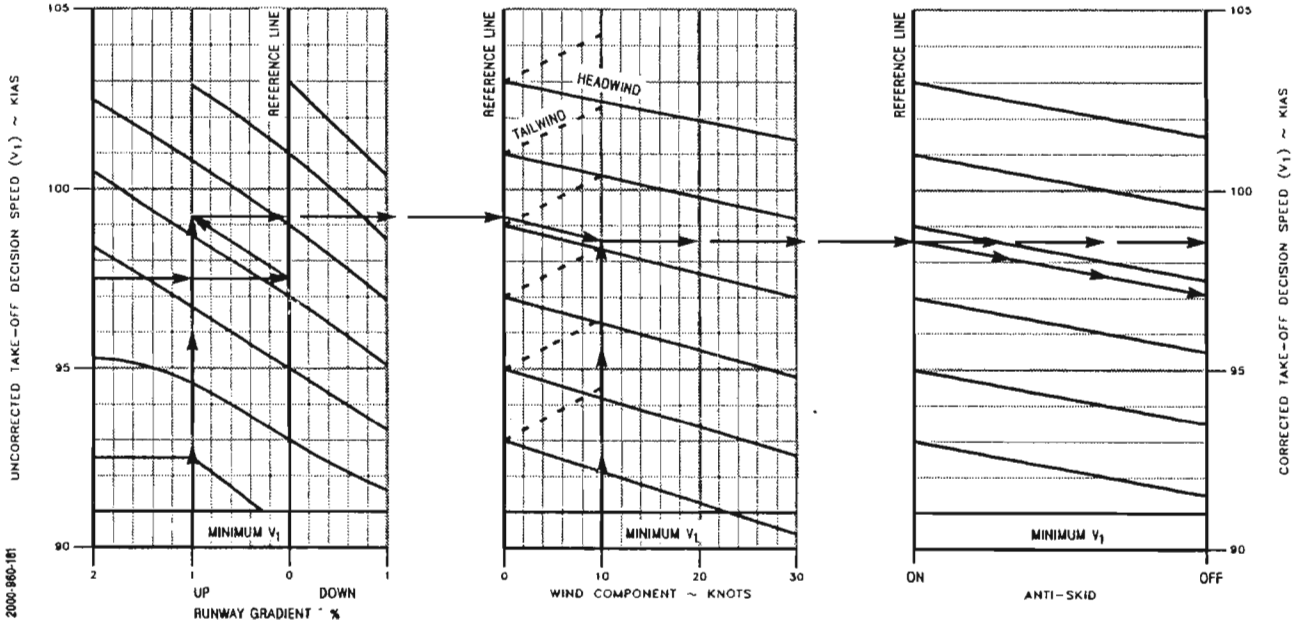
NOTES: 1. OBTAIN THE UNCORRECTED TAKE-OFF DECISION SPEED (V_1) FROM THE APPROPRIATE "TAKE-OFF SPEEDS AND FIELD LENGTH" TABLE. ENTER THE GRAPH BELOW WITH THAT VALUE, AND DETERMINE THE DECISION SPEED CORRECTED FOR RUNWAY GRADIENT, WIND COMPONENT AND ANTI-SKID.

2. THE WIND GRIDS INCLUDE FACTORS OF 50% FOR HEADWINDS AND 150% FOR TAILWINDS. COMPONENTS OF REPORTED WINDS MAY THEREFORE BE USED DIRECTLY IN THE GRAPH.

3. IF THE CORRECTED V_1 IS GREATER THAN V_R, THE VALUE OF V_R MUST BE USED FOR V_1.

EXAMPLE:

UNCORRECTED TAKE-OFF DECISION SPEED (V_1)	97.5 KIAS
RUNWAY GRADIENT	1.0% UP
HEADWIND COMPONENT	10 KTS
CORRECTED TAKE-OFF DECISION SPEED (V_1)	
ANTI-SKID (ON)	98.6 KIAS
ANTI-SKID (OFF)	97.1 KIAS



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NET TAKE-OFF FLIGHT PATH - FIRST SEGMENT - FLAPS EXTENDED

ONE ENGINE INOPERATIVE

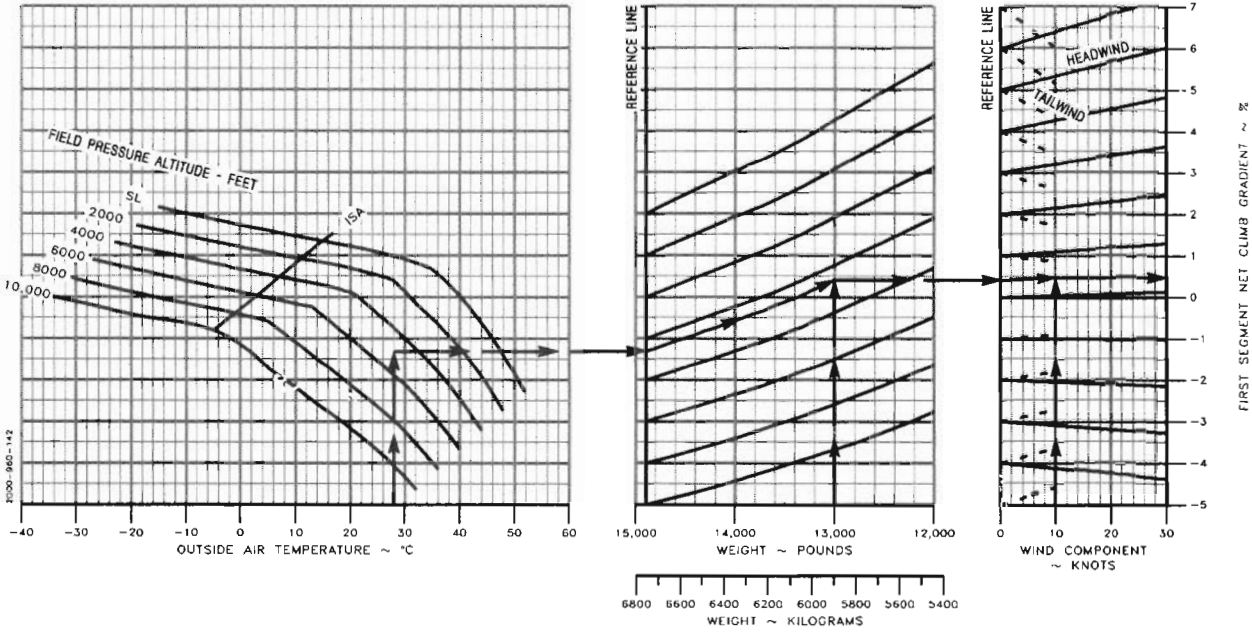
ASSOCIATED CONDITIONS:

POWER.....NO ADJUSTMENT SINCE SETTING
STATIC TAKE-OFF POWER
INOPERATIVE PROPELLER.....FEATHERED
LANDING GEAR.....DOWN OR IN TRANSIT
AIRSPEED.....V_2

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, DECREASE THE NET CLIMB GRADIENT BY 0.80 PERCENTAGE POINT.

EXAMPLE:

OAT.....28°C
FIELD PRESSURE ALTITUDE.....5003 FT
WEIGHT.....13,000 LBS
HEADWIND COMPONENT.....10 KTS
NET CLIMB GRADIENT.....0.47 %



NET TAKE-OFF FLIGHT PATH - SECOND SEGMENT - FLAPS EXTENDED

ONE ENGINE INOPERATIVE

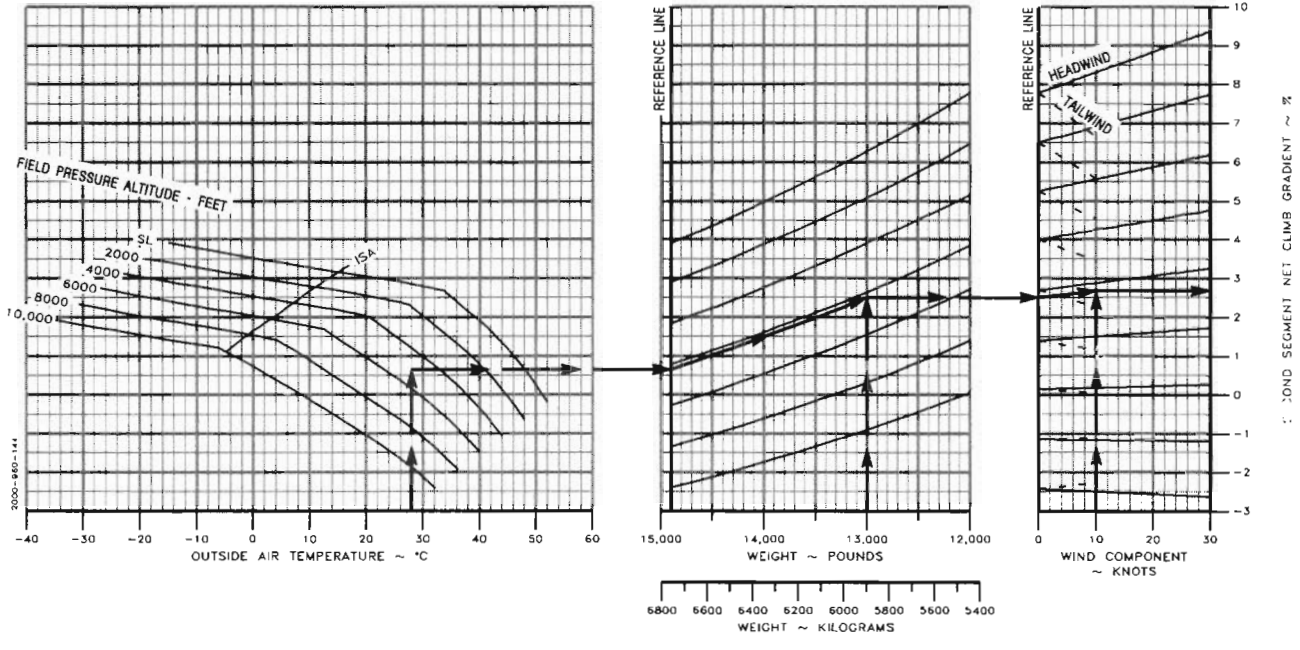
ASSOCIATED CONDITIONS:

POWER..... NO ADJUSTMENT SINCE SETTING STATIC TAKE-OFF POWER
INOPERATIVE PROPELLER..... FEATHERED
LANDING GEAR..... UP
AIRSPEED..... V_2

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, DECREASE THE NET CLIMB GRADIENT BY 1.0 PERCENTAGE POINT.

EXAMPLE:

OAT..... 28°C
FIELD PRESSURE ALTITUDE..... 5003 FT
WEIGHT..... 13,000 LBS
HEADWIND COMPONENT..... 10 KTS
NET CLIMB GRADIENT..... 2.68 %



THIRD SEGMENT ACCELERATION - FLAPS EXTENDED

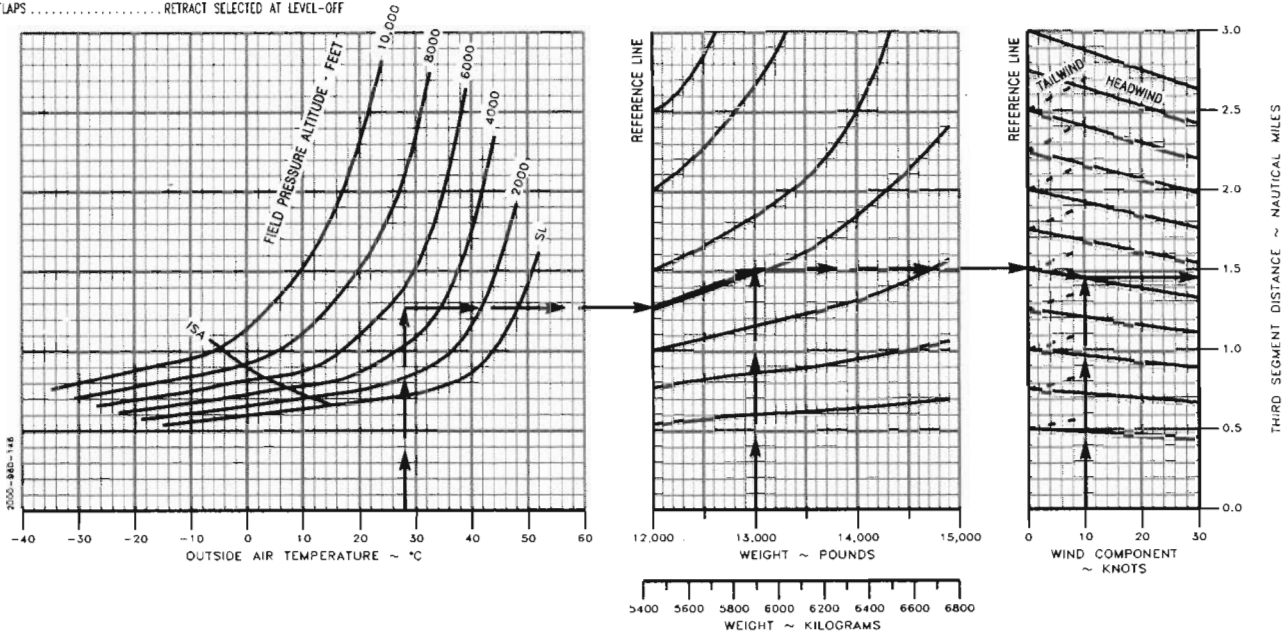
ONE ENGINE INOPERATIVE

ASSOCIATED CONDITIONS:
POWER:
TO 400 FT AGL..... NO ADJUSTMENTS SINCE SETTING STATIC TAKE-OFF POWER
AT 400 FT AGL..... TAKEOFF
AIRSPEED:
TO 400 FT AGL..... V_2
AT 400 FT AGL..... ACCELERATE TO BLUE LINE
INOPERATIVE PROPELLER..... FEATHERED
LANDING GEAR..... RETRACTED AFTER LIFT-OFF
FLAPS..... RETRACT SELECTED AT LEVEL-OFF

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, INCREASE THE THIRD SEGMENT DISTANCE BY 26%.

EXAMPLE:

OAT	28°C
FIELD PRESSURE ALTITUDE	5003 FT
WEIGHT	13,000 LBS
HEADWIND COMPONENT	10 KTS
THIRD SEGMENT DISTANCE	1.45 NM

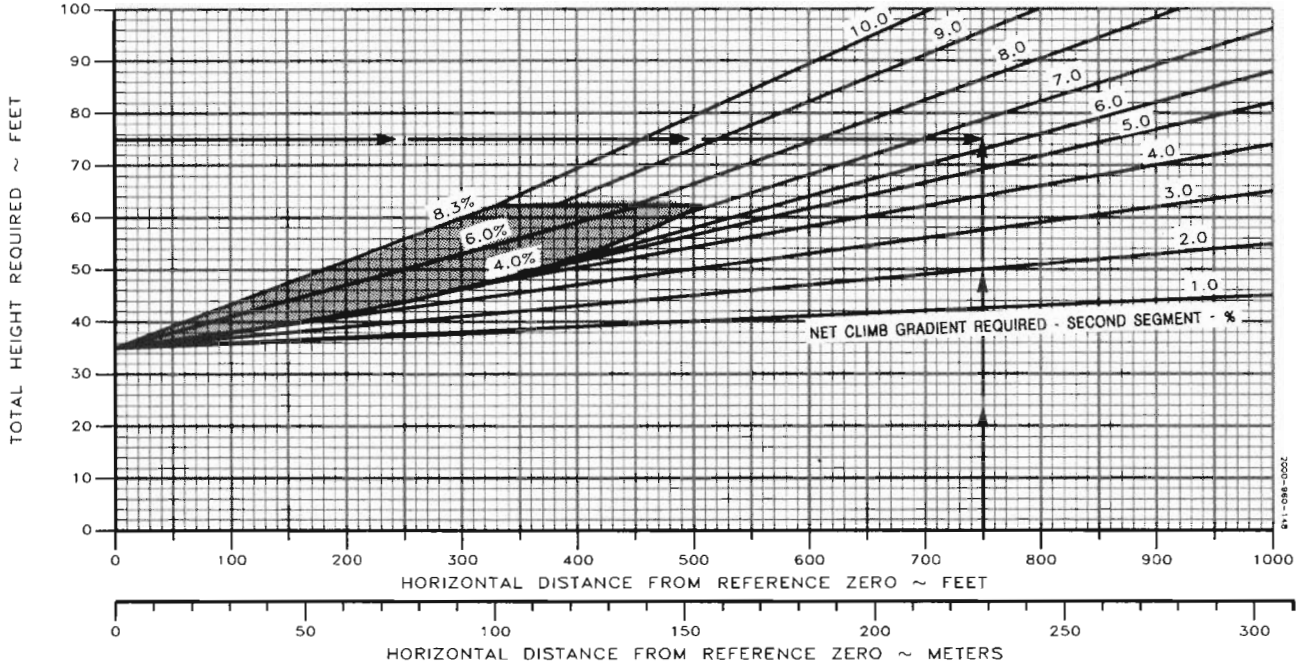


CLOSE-IN TAKE-OFF FLIGHT PATH - FLAPS EXTENDED

FIRST - OR SECOND - SEGMENT REQUIREMENT

NOTES: 1. SHADED AREA IS THE REQUIRED FIRST-SEGMENT NET CLIMB GRADIENT.
2. TOTAL HEIGHT REQUIRED SHOULD BE EQUAL TO THE OBSTACLE HEIGHT PLUS THE DESIRED MARGIN OF CLEARANCE.
3. THIS GRAPH ASSUMES A ZERO RUNWAY GRADIENT.

EXAMPLE:
TOTAL HEIGHT REQUIRED ..... 75 FT
HORIZONTAL DISTANCE FROM REFERANCE ZERO..... 750 FT
NET CLIMB GRADIENT REQUIRED 6.3%

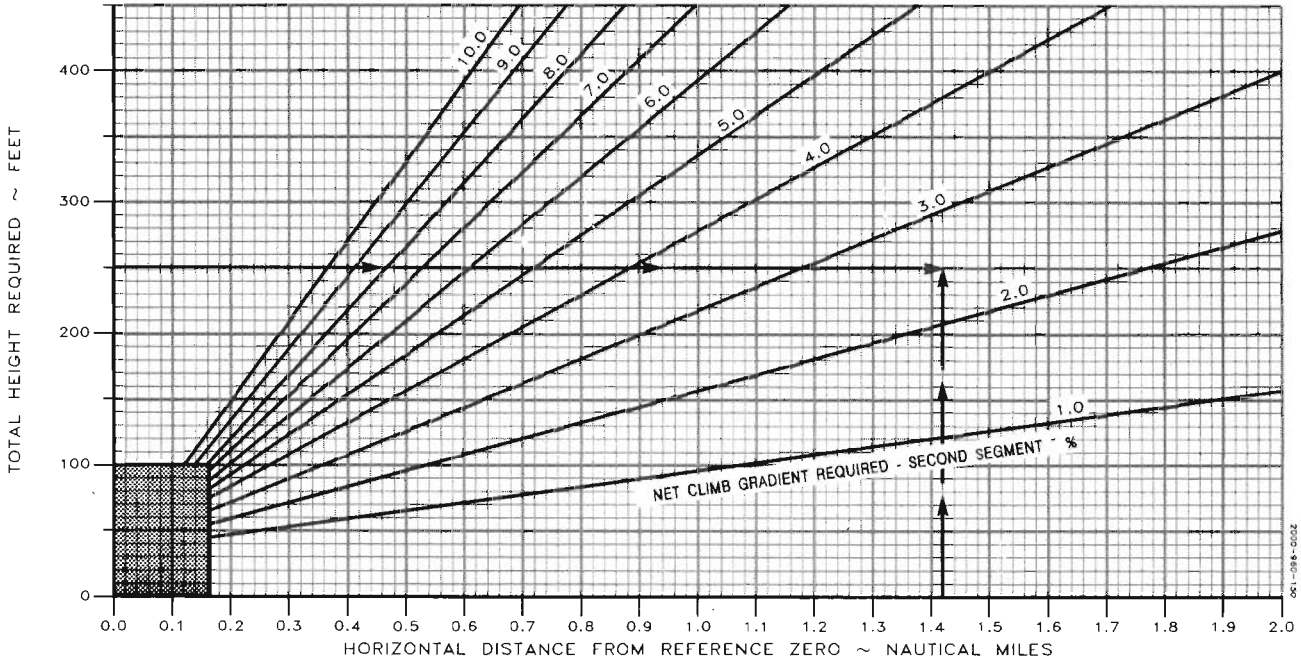


TAKE-OFF FLIGHT PATH - FLAPS EXTENDED

SECOND-SEGMENT REQUIREMENT

NOTES: 1. FOR SHADED AREA USE "CLOSE-IN TAKE-OFF FLIGHT PATH - FLAPS EXTENDED" GRAPH.
2. TOTAL HEIGHT REQUIRED SHOULD BE EQUAL TO THE OBSTACLE HEIGHT PLUS DESIRED MARGIN OF CLEARANCE.
3. THIS GRAPH ASSUMES A ZERO RUNWAY GRADIENT.

EXAMPLE:
TOTAL HEIGHT REQUIRED ..... 250 FT
OBSTACLE DISTANCE FROM REFERENCE ZERO..... 1.42 NM
NET CLIMB GRADIENT REQUIRED..... 2.50%



NET TAKE-OFF FLIGHT PATH - FINAL SEGMENT

ONE ENGINE INOPERATIVE

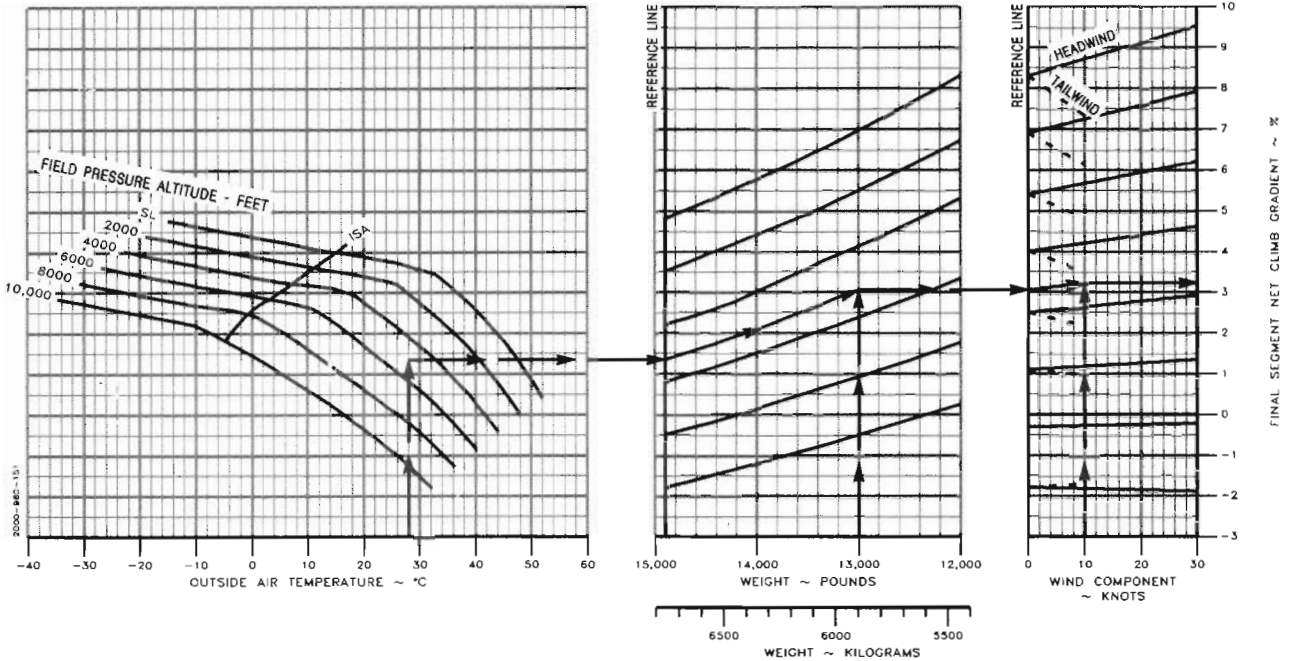
ASSOCIATED CONDITIONS:

POWER	MAXIMUM CONTINUOUS
INOPERATIVE PROPELLER	FEATHERED
LANDING GEAR	UP
FLAPS	RETRACTED
AIRSPEED	V_{YSE} (BLUE LINE)

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, DECREASE THE NET CLIMB GRADIENT BY 1.1 PERCENTAGE POINTS.

EXAMPLE:

OAT	28°C
FIELD PRESSURE ALTITUDE	5003 FT
WEIGHT	13,000 LBS
HEADWIND COMPONENT	10 KTS
FINAL SEGMENT NET CLIMB GRADIENT	3.22 %

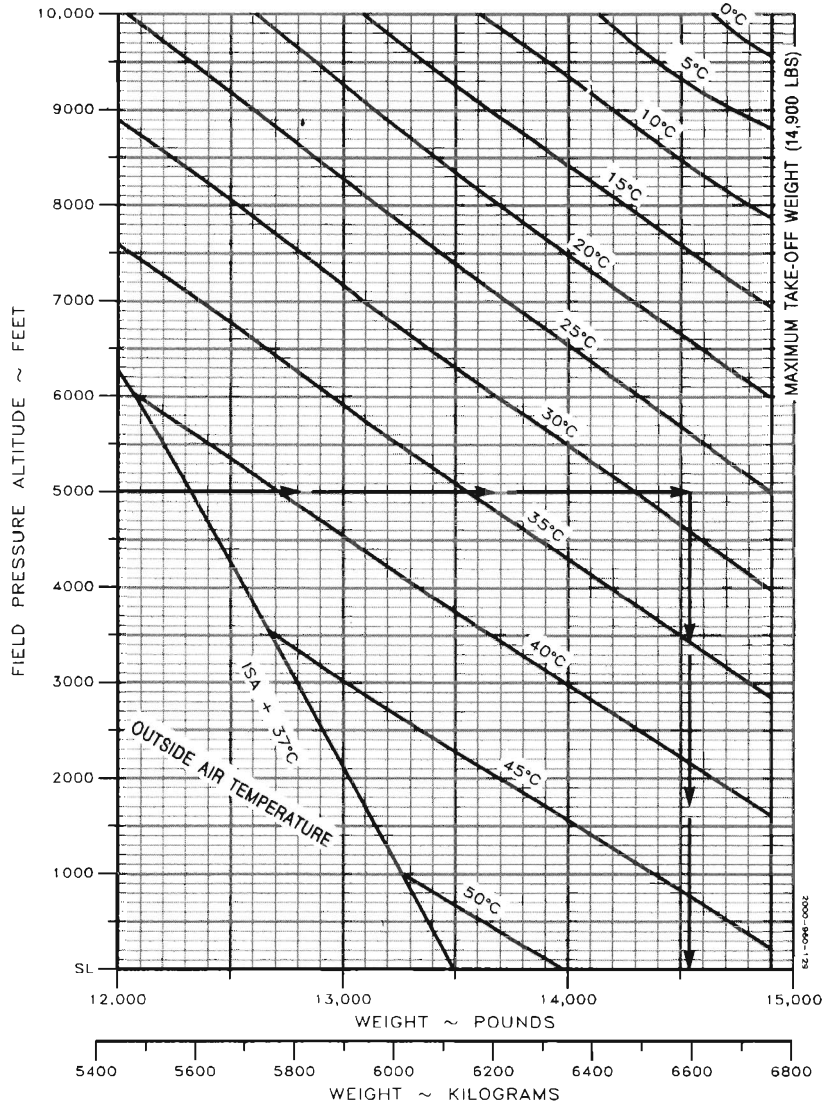


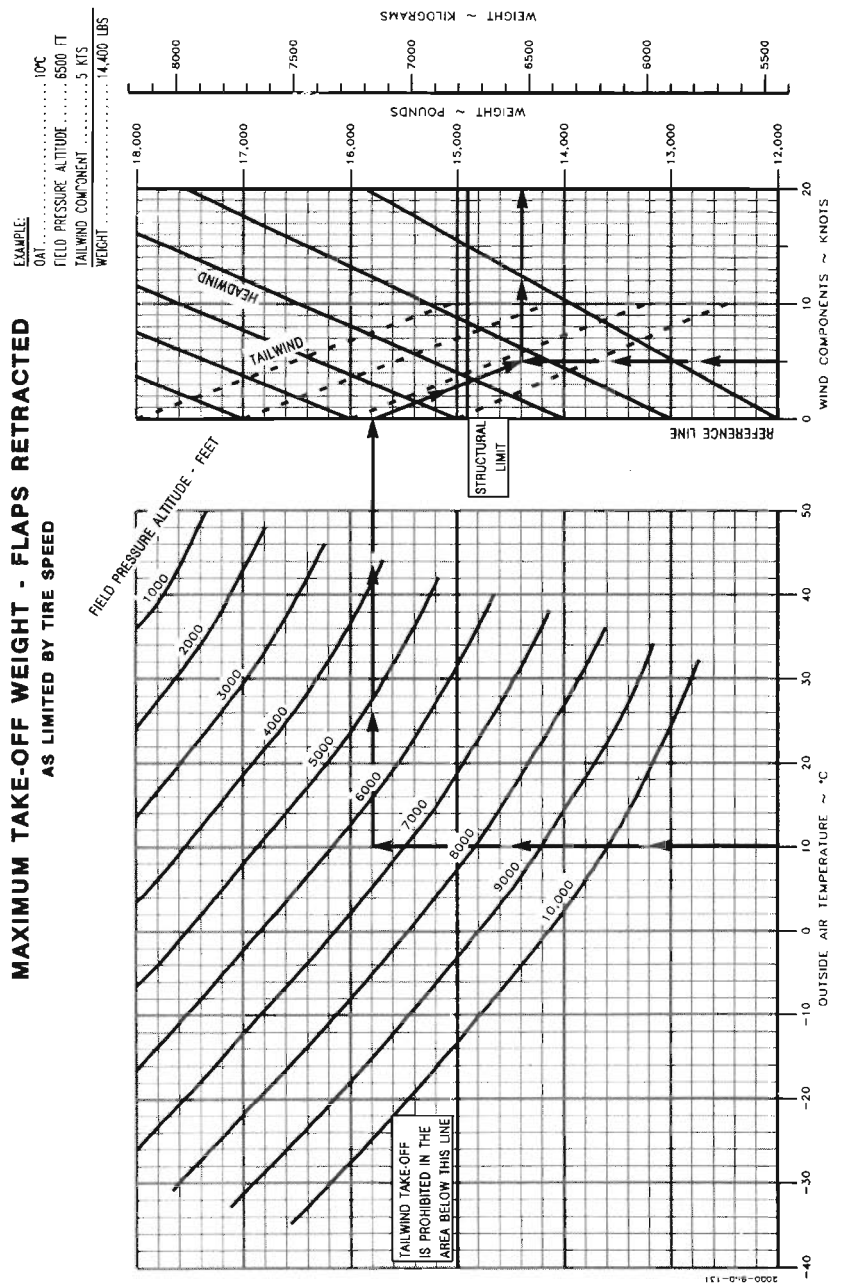
MAXIMUM TAKE-OFF WEIGHT - FLAPS RETRACTED

TO ACHIEVE TAKE-OFF CLIMB REQUIREMENTS

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, INCREASE THE OAT BY 7°C BEFORE ENTERING THIS CHART.

EXAMPLE:
FIELD PRESSURE ALTITUDE.....5003 FT
OAT.....28°C
TAKE-OFF WEIGHT.....14,538 LBS




MAXIMUM TAKE-OFF WEIGHT - FLAPS RETRACTED
AS LIMITED BY TIRE SPEED
EXAMPLE:
OAT ..... 10°C
FIELD PRESSURE ALTITUDE ..... 8500 FT
TAILWIND COMPONENT ..... 5 KTS
WEIGHT ..... 14,400 LBS
WEIGHT ~ KILOGRAMS
8000
7500
7000
6500
6000
5500
WEIGHT ~ POUNDS
18,000
17,000
16,000
15,000
14,000
13,000
12,000
HEADWIND
TAILWIND
REFERENCE LINE
STRUCTURAL LIMIT
WIND COMPONENTS ~ KNOTS
20
10
0
FIELD PRESSURE ALTITUDE - FEET
1000
2000
3000
4000
5000
6000
7000
8000
9000
10,000
TAILWIND TAKE-OFF IS PROHIBITED IN THE AREA BELOW THIS LINE
OUTSIDE AIR TEMPERATURE ~ °C
50
40
30
20
10
0
-10
-20
-30
-40
2000-8%0-131

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS RETRACTED

ASSOCIATED CONDITIONS:

1. POWER . . . . . STATIC TAKE-OFF POWER SET
2. AUTOFEATHER . . . . . ARMED
3. V_1 V_R , V_2 . . . . . AS TABULATED
4. RUNWAY . . . . . PAVED, DRY SURFACE
5. LANDING GEAR . . . . . RETRACTED AFTER LIFT-OFF
6. OBSTACLE HEIGHT . . . . . 35 FEET
7. ANTI-SKID . . . . . ON

IF ACCELERATE-STOP:

a. POWER LEVER . . . . . GROUND FINE AT OR BELOW V_1
b. BRAKING . . . . . MAXIMUM

NOTE

If one or more of the following conditions are true:

1) Runway gradient is not zero.
2) Headwind/tailwind component is not zero.
3) Anti-skid is OFF.
4) Engine Anti-ice ON.

Refer to the following graphs for the runway gradient, headwind/tailwind component and anti-skid corrections as applicable.

- TAKE-OFF FIELD LENGTH CORRECTED FOR RUNWAY GRADIENT, WIND GRADIENT, AND ANTI-SKID.
- TAKE-OFF DECISION SPEED (V_1) CORRECTED FOR RUNWAY, WIND GRADIENT, AND ANTI-SKID.

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS RETRACTED
FIELD PRESSURE ALTITUDE: SEA LEVEL
$V_{35} = V_2 + 11$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	101	102	103	103	104	105	105	—
(6758)	V_R - KIAS	107	108	108	108	108	108	108	—
	V_2 - KIAS	117	117	117	117	117	117	117	—
	TOFL - FT	3128	3468	3648	3853	4069	4298	4539	—
14,000	V_1 - KIAS	98	99	99	100	100	100	100	104
(6350)	V_R - KIAS	106	106	106	106	106	106	106	106
	V_2 - KIAS	116	116	116	115	115	115	115	114
	TOFL - FT	2894	3166	3308	3470	3639	3815	3992	4873
13,450	V_1 - KIAS	98	98	99	99	99	100	100	104
(6101)	V_R - KIAS	106	106	106	106	106	106	106	106
	V_2 - KIAS	117	116	116	116	116	115	115	114
	TOFL - FT	2808	3070	3206	3362	3524	3692	3831	4702
13,000	V_1 - KIAS	97	98	98	99	99	99	99	103
(5897)	V_R - KIAS	106	106	106	106	106	106	106	106
	V_2 - KIAS	117	117	116	116	116	116	115	114
	TOFL - FT	2739	2993	3125	3276	3433	3595	3709	4554
12,000	V_1 - KIAS	96	97	97	97	98	98	98	101
(5443)	V_R - KIAS	106	106	106	106	106	106	106	106
AND	V_2 - KIAS	118	117	117	117	117	117	116	114
UNDER	TOFL - FT	2589	2828	2952	3093	3239	3391	3496	4180

NC000135A

TAKEOFF SPEEDS AND FIELD LENGTH - FLAPS RETRACTED
PRESSURE ALTITUDE: 1000 FT
$V_{35} = V_2 + 11$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	102	103	103	104	105	106	107	—
(6758)	V_R - KIAS	108	108	108	108	108	108	109	—
	V_2 - KIAS	117	117	117	117	117	117	117	—
	TOFL - FT	3276	3641	3853	4077	4315	4566	4905	—
14,000	V_1 - KIAS	99	99	100	100	100	101	102	—
(6350)	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	116	116	115	115	115	115	114	—
	TOFL - FT	3013	3303	3470	3645	3829	4033	4328	—
13,450	V_1 - KIAS	98	99	99	99	100	100	101	104
(6101)	V_R - KIAS	106	106	106	106	106	106	106	106
	V_2 - KIAS	117	116	116	116	115	115	115	114
	TOFL - FT	2923	3201	3362	3530	3704	3886	4142	5075
13,000	V_1 - KIAS	98	98	99	99	99	99	100	104
(5897)	V_R - KIAS	106	106	106	106	106	106	106	106
	V_2 - KIAS	117	116	116	116	116	115	115	114
	TOFL - FT	2850	3120	3276	3439	3608	3782	4001	4927
12,000	V_1 - KIAS	97	97	97	98	98	98	98	103
(5443)	V_R - KIAS	106	106	106	106	106	106	106	106
AND	V_2 - KIAS	118	117	117	117	116	116	115	114
UNDER	TOFL - FT	2694	2947	3093	3245	3403	3565	3732	4585

NC000135B

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS RETRACTED
FIELD PRESSURE ALTITUDE: 2000 FT
$V_{35} = V_2 + 11$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	102	103	104	105	106	106	107	—
(6758)	V_R - KIAS	108	108	108	108	108	108	109	—
	V_2 - KIAS	117	117	117	117	117	117	117	—
	TOFL - FT	3436	3846	4079	4326	4586	4821	5304	—
14,000	V_1 - KIAS	99	100	100	100	101	101	103	—
(6350)	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	116	115	115	115	115	115	114	—
	TOFL - FT	3141	3465	3647	3838	4050	4262	4722	—
13,450	V_1 - KIAS	98	99	99	100	100	100	102	—
(6101)	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	116	116	116	115	115	115	114	—
	TOFL - FT	3046	3357	3531	3712	3900	4085	4514	—
13,000	V_1 - KIAS	98	99	99	99	99	99	101	105
(5897)	V_R - KIAS	106	106	106	106	106	106	106	106
	V_2 - KIAS	117	116	116	116	115	115	114	114
	TOFL - FT	2970	3271	3440	3615	3797	3958	4348	5336
12,000	V_1 - KIAS	97	97	98	98	98	98	99	104
(5443)	V_R - KIAS	106	106	106	106	106	106	106	106
AND	V_2 - KIAS	118	117	117	116	116	116	115	114
UNDER	TOFL - FT	2806	3088	3246	3410	3578	3727	4018	4992

NC000135C

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS RETRACTED
FIELD PRESSURE ALTITUDE: 3000 FT
$V_{35} = V_2 + 11$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	103	104	105	106	106	106	—	—
(6758)	V_R - KIAS	108	108	108	108	109	109	—	—
	V_2 - KIAS	117	117	117	117	117	117	—	—
	TOFL - FT	3609	4073	4329	4599	4843	5101	—	—
14,000	V_1 - KIAS	99	100	100	101	101	102	104	—
(6350)	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	116	115	115	115	115	115	114	—
	TOFL - FT	3278	3642	3841	4061	4290	4511	5101	—
13,450	V_1 - KIAS	99	99	100	100	100	101	103	—
(6101)	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	116	116	115	115	115	115	114	—
	TOFL - FT	3177	3527	3715	3910	4111	4318	4924	—
13,000	V_1 - KIAS	98	99	99	99	100	100	102	—
(5897)	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	116	116	116	115	115	115	114	—
	TOFL - FT	3097	3436	3618	3806	3998	4171	4755	—
12,000	V_1 - KIAS	97	98	98	98	99	99	100	104
(5443)	V_R - KIAS	106	106	106	106	106	106	106	106
AND	V_2 - KIAS	117	117	116	116	116	115	114	114
UNDER	TOFL - FT	2925	3242	3412	3587	3765	3901	4370	5424

NC000135D

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS RETRACTED
FIELD PRESSURE ALTITUDE: 4000 FT
$V_{35} = V_2 + 11$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	103	105	106	106	106	107	—	—
(6758)	V_R - KIAS	108	108	108	109	109	109	—	—
	V_2 - KIAS	117	117	117	117	117	117	—	—
	TOFL - FT	3811	4324	4605	4857	5129	5496	—	—
14,000	V_1 - KIAS	100	100	101	101	102	103	105	—
(6350)	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	115	115	115	115	115	114	114	—
	TOFL - FT	3437	3837	4066	4303	4553	4902	5521	—
13,450	V_1 - KIAS	99	100	100	100	101	102	104	—
(6101)	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	116	115	115	115	115	114	114	—
	TOFL - FT	3330	3712	3914	4124	4357	4674	5329	—
13,000	V_1 - KIAS	98	99	99	100	100	101	103	—
(5897)	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	116	116	115	115	115	115	114	—
	TOFL - FT	3245	3615	3810	4010	4216	4505	5167	—
12,000	V_1 - KIAS	97	98	98	99	99	99	102	—
(5443)	V_R - KIAS	106	106	106	106	106	106	106	—
AND	V_2 - KIAS	117	116	116	116	116	115	114	—
UNDER	TOFL - FT	3064	3409	3590	3775	3966	4167	4778	—

NC000135E

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS RETRACTED
FIELD PRESSURE ALTITUDE: 5000 FT
$V_{35} = V_2 + 11$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900 (6758)	V_1 - KIAS	104	106	106	107	107	108	—	—
	V_R - KIAS	108	108	109	109	109	109	—	—
	V_2 - KIAS	117	117	117	117	117	117	—	—
	TOFL - FT	4037	4601	4864	5149	5422	5953	—	—
14,000 (6350)	V_1 - KIAS	100	101	101	102	102	104	—	—
	V_R - KIAS	106	106	106	106	106	106	—	—
	V_2 - KIAS	115	115	115	115	115	114	—	—
	TOFL - FT	3615	4063	4309	4569	4831	5281	—	—
13,450 (6101)	V_1 - KIAS	99	100	100	101	101	103	105	—
	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	116	115	115	115	115	114	114	—
	TOFL - FT	3501	3912	4130	4372	4615	5111	5778	—
13,000 (5897)	V_1 - KIAS	99	99	100	100	100	102	104	—
	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	116	115	115	115	115	114	114	—
	TOFL - FT	3411	3808	4015	4229	4453	4908	5610	—
12,000 (5443) AND UNDER	V_1 - KIAS	98	98	99	99	99	100	103	—
	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	117	116	116	116	115	115	114	—
	TOFL - FT	3218	3588	3781	3979	4160	4518	5245	—

NC000135F

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS RETRACTED
FIELD PRESSURE ALTITUDE: 6000 FT
$V_{35} = V_2 + 11$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	105	106	107	107	107	—	—	—
(6758)	V_R - KIAS	108	109	109	109	109	—	—	—
	V_2 - KIAS	117	117	117	117	117	—	—	—
	TOFL - FT	4288	4862	5159	5441	5769	—	—	—
14,000	V_1 - KIAS	100	101	102	103	103	104	—	—
(6350)	V_R - KIAS	106	106	106	106	106	106	—	—
	V_2 - KIAS	115	115	115	115	114	114	—	—
	TOFL - FT	3808	4308	4577	4859	5146	5700	—	—
13,450	V_1 - KIAS	100	100	101	101	102	104	—	—
(6101)	V_R - KIAS	106	106	106	106	106	106	—	—
	V_2 - KIAS	115	115	115	115	114	114	—	—
	TOFL - FT	3686	4129	4380	4641	4921	5501	—	—
13,000	V_1 - KIAS	99	100	100	101	101	103	—	—
(5897)	V_R - KIAS	106	106	106	106	106	106	—	—
	V_2 - KIAS	116	115	115	115	115	114	—	—
	TOFL - FT	3589	4014	4237	4478	4742	5341	—	—
12,000	V_1 - KIAS	98	99	99	99	99	101	104	—
(5443)	V_R - KIAS	106	106	106	106	106	106	106	—
AND	V_2 - KIAS	117	116	116	115	115	114	114	—
UNDER	TOFL - FT	3385	3780	3985	4198	4383	4917	5704	—

NC000135G

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS RETRACTED
FIELD PRESSURE ALTITUDE: 7000 FT
$V_{35} = V_2 + 11$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900 (6758)	V_1 - KIAS	105	107	107	107	—	—	—	—
	V_R - KIAS	108	109	109	109	—	—	—	—
	V_2 - KIAS	117	117	117	117	—	—	—	—
	TOFL - FT	4565	5159	5453	5770	—	—	—	—
14,000 (6350)	V_1 - KIAS	101	102	103	103	104	—	—	—
	V_R - KIAS	106	106	106	106	106	—	—	—
	V_2 - KIAS	115	115	115	114	114	—	—	—
	TOFL - FT	4034	4578	4870	5151	5558	—	—	—
13,450 (6101)	V_1 - KIAS	100	101	101	102	103	104	—	—
	V_R - KIAS	106	106	106	106	106	106	—	—
	V_2 - KIAS	115	115	115	115	114	114	—	—
	TOFL - FT	3887	4380	4652	4926	5364	5951	—	—
13,000 (5897)	V_1 - KIAS	99	100	101	101	102	104	—	—
	V_R - KIAS	106	106	106	106	106	106	—	—
	V_2 - KIAS	115	115	115	115	114	114	—	—
	TOFL - FT	3784	4237	4488	4748	5178	5778	—	—
12,000 (5443) AND UNDER	V_1 - KIAS	98	99	99	100	100	103	105	—
	V_R - KIAS	106	106	106	106	106	106	106	—
	V_2 - KIAS	116	116	115	115	115	114	114	—
	TOFL - FT	3566	3986	4207	4422	4762	5389	6223	—

NC000135H

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS RETRACTED
FIELD PRESSURE ALTITUDE: 8000 FT
$V_{35} = V_2 + 11$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900 (6758)	V_1 - KIAS	106	107	107	108	—	—	—	—
	V_R - KIAS	108	109	109	109	—	—	—	—
	V_2 - KIAS	117	117	117	117	—	—	—	—
	TOFL - FT	4832	5455	5785	6100	—	—	—	—
14,000 (6350)	V_1 - KIAS	101	103	103	103	104	—	—	—
	V_R - KIAS	106	106	106	106	106	—	—	—
	V_2 - KIAS	115	115	115	114	114	—	—	—
	TOFL - FT	4280	4872	5166	5438	6006	—	—	—
13,450 (6101)	V_1 - KIAS	100	101	102	102	104	—	—	—
	V_R - KIAS	106	106	106	106	106	—	—	—
	V_2 - KIAS	115	115	115	114	114	—	—	—
	TOFL - FT	4102	4654	4942	5225	5797	—	—	—
13,000 (5897)	V_1 - KIAS	100	101	101	101	103	105	—	—
	V_R - KIAS	106	106	106	106	106	106	—	—
	V_2 - KIAS	115	115	115	114	114	114	—	—
	TOFL - FT	3991	4490	4762	5029	5628	6290	—	—
12,000 (5443) AND UNDER	V_1 - KIAS	99	99	100	100	102	104	—	—
	V_R - KIAS	106	106	106	106	106	106	—	—
	V_2 - KIAS	116	115	115	115	114	114	—	—
	TOFL - FT	3758	4209	4440	4642	5193	5864	—	—

NC000135I

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS RETRACTED
FIELD PRESSURE ALTITUDE: 9000 FT
$V_{35} = V_2 + 11$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	106	107	108	—	—	—	—	—
(6758)	V_R - KIAS	109	109	109	—	—	—	—	—
	V_2 - KIAS	117	117	117	—	—	—	—	—
	TOFL - FT	5124	5790	6117	—	—	—	—	—
14,000	V_1 - KIAS	102	103	103	104	—	—	—	—
(6350)	V_R - KIAS	106	106	106	106	—	—	—	—
	V_2 - KIAS	115	115	114	114	—	—	—	—
	TOFL - FT	4550	5170	5465	5853	—	—	—	—
13,450	V_1 - KIAS	101	102	103	103	104	—	—	—
(6101)	V_R - KIAS	106	106	106	106	106	—	—	—
	V_2 - KIAS	115	115	115	114	114	—	—	—
	TOFL - FT	4355	4945	5256	5649	6267	—	—	—
13,000	V_1 - KIAS	100	101	102	103	104	—	—	—
(5897)	V_R - KIAS	106	106	106	106	106	—	—	—
	V_2 - KIAS	115	115	115	114	114	—	—	—
	TOFL - FT	4215	4766	5058	5471	6088	—	—	—
12,000	V_1 - KIAS	99	100	100	101	103	104	—	—
(5443)	V_R - KIAS	106	106	106	106	106	106	—	—
AND	V_2 - KIAS	116	115	115	115	114	114	—	—
UNDER	TOFL - FT	3965	4443	4691	5024	5689	6380	—	—

NC000135J

TAKE-OFF SPEEDS AND FIELD LENGTH - FLAPS RETRACTED
FIELD PRESSURE ALTITUDE: 10,000 FT
$V_{35} = V_2 + 11$ KIAS

T.O. WEIGHT - LBS (KGS)	ITEM	OUTSIDE AIR TEMPERATURE - °C							
		-30	-10	0	10	20	30	40	52
14,900	V_1 - KIAS	107	108	108	—	—	—	—	—
(6758)	V_R - KIAS	109	109	109	—	—	—	—	—
	V_2 - KIAS	117	117	117	—	—	—	—	—
	TOFL - FT	5428	6124	6504	—	—	—	—	—
14,000	V_1 - KIAS	103	103	104	105	—	—	—	—
(6350)	V_R - KIAS	106	106	106	106	—	—	—	—
	V_2 - KIAS	115	114	114	114	—	—	—	—
	TOFL - FT	4846	5471	5780	6338	—	—	—	—
13,450	V_1 - KIAS	101	103	103	104	—	—	—	—
(6101)	V_R - KIAS	106	106	106	106	—	—	—	—
	V_2 - KIAS	115	115	114	114	—	—	—	—
	TOFL - FT	4629	5262	5578	6111	—	—	—	—
13,000	V_1 - KIAS	100	102	102	104	105	—	—	—
(5897)	V_R - KIAS	106	106	106	106	106	—	—	—
	V_2 - KIAS	115	115	114	114	114	—	—	—
	TOFL - FT	4467	5064	5374	5948	6589	—	—	—
12,000	V_1 - KIAS	99	100	100	102	104	—	—	—
(5443)	V_R - KIAS	106	106	106	106	106	—	—	—
AND	V_2 - KIAS	115	115	115	114	114	—	—	—
UNDER	TOFL - FT	4189	4696	4949	5492	6158	—	—	—

NC000135K

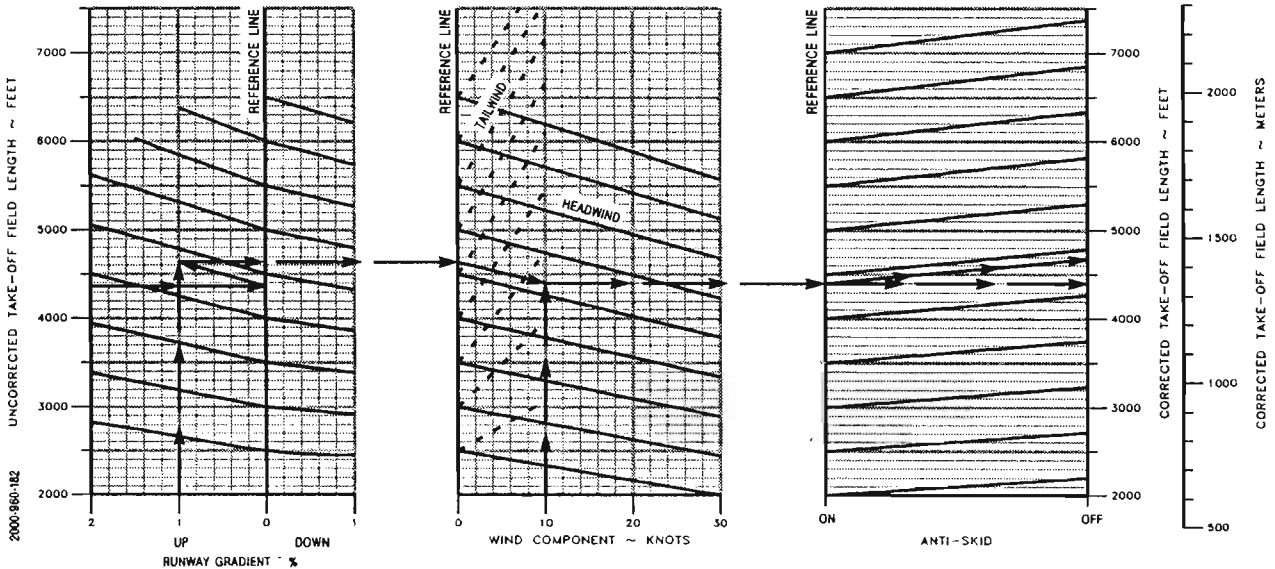
TAKE-OFF FIELD LENGTH - FLAPS RETRACTED
CORRECTED FOR RUNWAY GRADIENT, WIND COMPONENT AND ANTI-SKID

NOTES: 1. OBTAIN THE TAKE-OFF FIELD LENGTH FROM THE APPROPRIATE "TAKE-OFF SPEEDS AND FIELD LENGTH" TABLE. ENTER THE GRAPH BELOW WITH THAT VALUE, AND DETERMINE THE FIELD LENGTH CORRECTED FOR RUNWAY GRADIENT, WIND COMPONENT AND ANTI-SKID.

2. THE WIND GRIDS INCLUDE FACTORS OF 50% FOR HEADWINDS AND 150% FOR TAILWINDS. COMPONENTS OF REPORTED WINDS MAY THEREFORE BE USED DIRETLY IN THE GRAPH.
3. FOR OPERATION WITH ENGINE ANTI-ICE ON, INCREASE THE DISTANCE OBTAINED FROM THIS GRAPH BY 3%.

EXAMPLE:

UNCORRECTED TAKE-OFF FIELD LENGTH	4363 FT
RUNWAY GRADIENT	1.0% UP
HEADWIND COMPONENT	10 KTS
TAKE-OFF FIELD LENGTH:	
ANTI-SKID (ON)	4398 FT
ANTI-SKID (OFF)	4677 FT



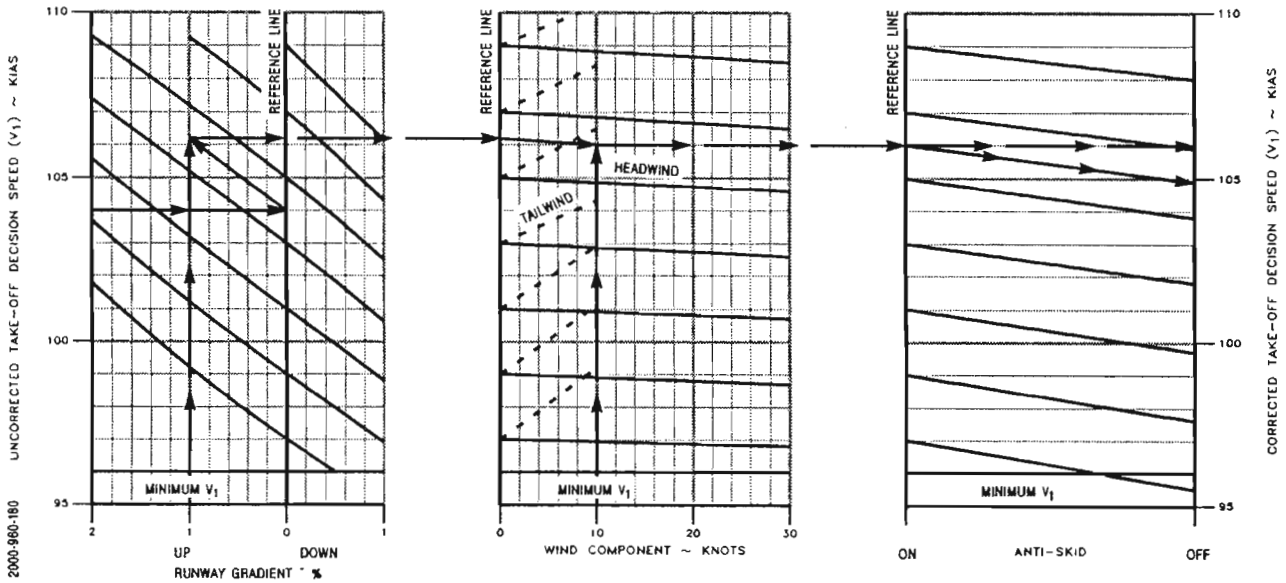
TAKE-OFF DECISION SPEED (V_1) - FLAPS RETRACTED
CORRECTED FOR RUNWAY GRADIENT, WIND COMPONENT AND ANTI-SKID

NOTES: 1. OBTAIN THE UNCORRECTED TAKE-OFF DECISION SPEED (V_1) FROM THE APPROPRIATE "TAKE-OFF SPEEDS AND FIELD LENGTH" TABLE. ENTER THE GRAPH BELOW WITH THAT VALUE, AND DETERMINE THE DECISION SPEED CORRECTED FOR RUNWAY GRADIENT, WIND COMPONENT AND ANTI-SKID.

2. THE WIND GRIDS INCLUDE FACTORS OF 50% FOR HEADWINDS AND 150% FOR TAILWINDS. COMPONENTS OF REPORTED WINDS MAY THEREFORE BE USED DIRECTLY IN THE GRAPH.
3. IF THE CORRECTED V_1 IS GREATER THAN V_R, THE VALUE OF V_R MUST BE USED FOR V_1.

EXAMPLE:

UNCORRECTED TAKE-OFF DECISION SPEED (V_1)	104.0 KIAS
RUNWAY GRADIENT	1.0% UP
HEADWIND COMPONENT	10 KTS
TAKE-OFF FIELD LENGTH:	
ANTI-SKID (ON)	106.0 KIAS
ANTI-SKID (OFF)	104.9 KIAS



2000-960-180

NET TAKE-OFF FLIGHT PATH - FIRST SEGMENT - FLAPS RETRACTED

ONE ENGINE INOPERATIVE

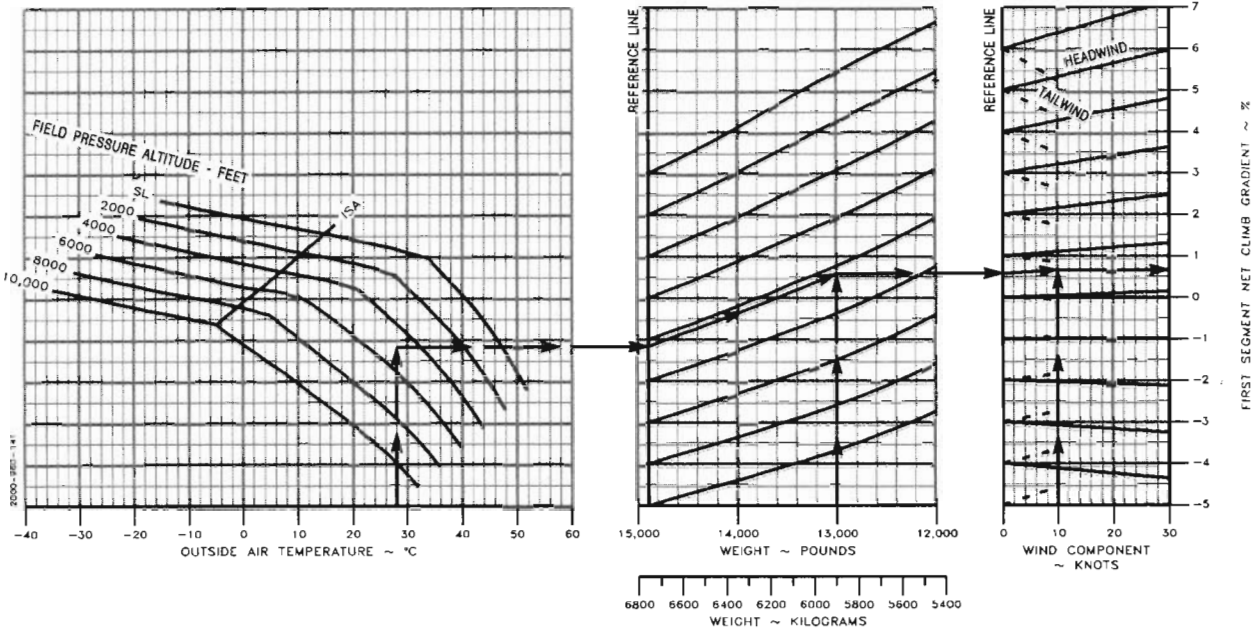
ASSOCIATED CONDITIONS:

POWER.....NO ADJUSTMENT SINCE SETTING
STATIC TAKE-OFF POWER
INOPERATIVE PROPELLER.....FEATHERED
LANDING GEAR.....DOWN OR IN TRANSIT
AIRSPEED.....V_2

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, DECREASE THE NET CLIMB GRADIENT BY 0.70 PERCENTAGE POINT.

EXAMPLE:

OAT.....28°C
FIELD PRESSURE ALTITUDE.....5003 FT
WEIGHT.....13,000 LBS
HEADWIND COMPONENT.....10 KTS
NET CLIMB GRADIENT.....0.66 %



NET TAKE-OFF FLIGHT PATH - SECOND SEGMENT - FLAPS RETRACTED

ONE ENGINE INOPERATIVE

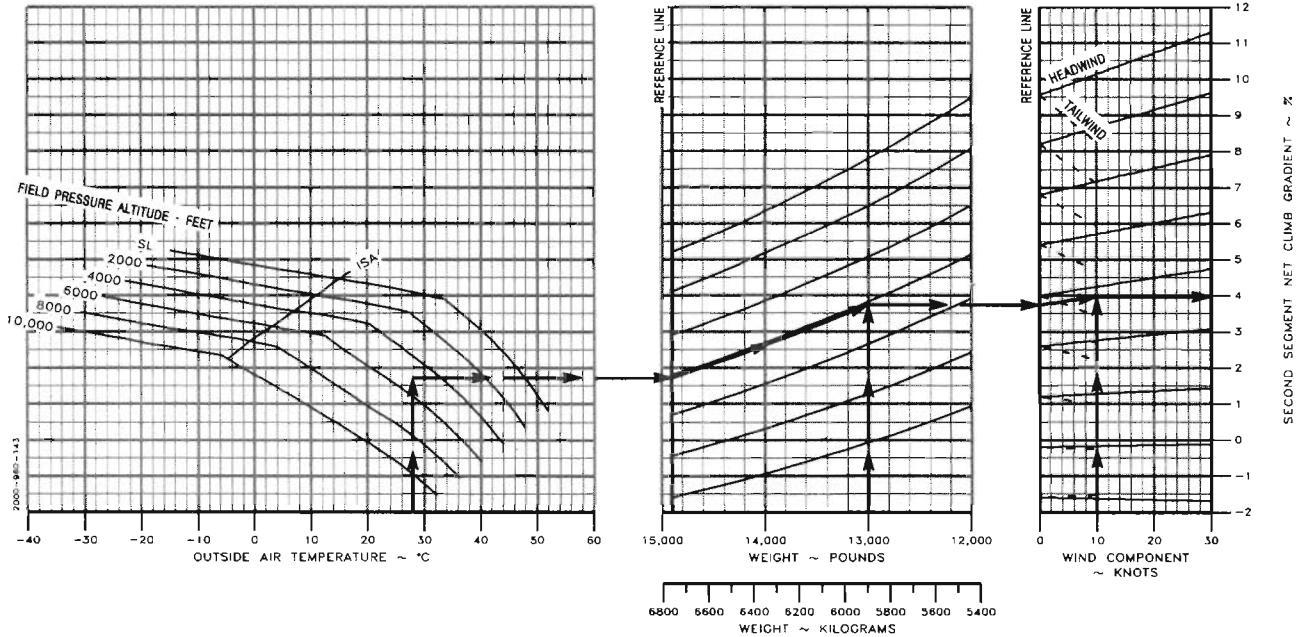
ASSOCIATED CONDITIONS:

POWER.....NO ADJUSTMENT SINCE SETTING STATIC TAKE-OFF POWER
INOPERATIVE PROPELLER.....FEATHERED
LANDING GEAR.....UP
AIRSPEED.....V_2

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, DECREASE THE NET CLIMB GRADIENT BY 1.0 PERCENTAGE POINT.

EXAMPLE:

OAT.....28°C
FIELD PRESSURE ALTITUDE.....5003 FT
WEIGHT.....13,000 LBS
HEADWIND COMPONENT.....10 KTS
NET CLIMB GRADIENT.....3.97 %



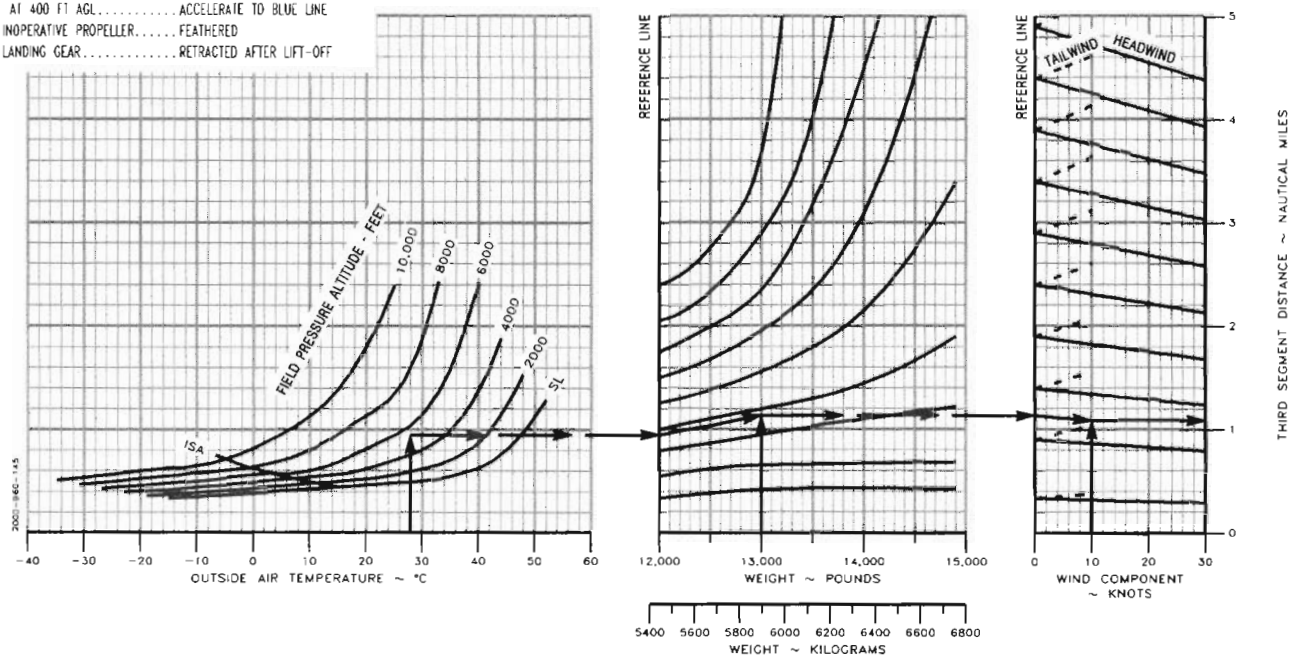
THIRD SEGMENT ACCELERATION - FLAPS RETRACTED

ONE ENGINE INOPERATIVE

ASSOCIATED CONDITIONS:
POWER:
TO 400 FT AGL.....NO ADJUSTMENTS SINCE SETTING STATIC TAKE-OFF POWER
AT 400 FT AGL.....TAKEOFF
AIRSPEED:
TO 400 FT AGL.....V_2
AT 400 FT AGL.....ACCELERATE TO BLUE LINE
INOPERATIVE PROPELLER.....FEATHERED
LANDING GEAR.....RETRACTED AFTER LIFT-OFF

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, INCREASE THE THIRD SEGMENT DISTANCE BY 25%.

EXAMPLE:
OAT.....28°C
FIELD PRESSURE ALTITUDE.....5003 FT
WEIGHT.....13,000 LBS
HEADWIND COMPONENT.....10 KTS
THIRD SEGMENT DISTANCE.....1.09 NM

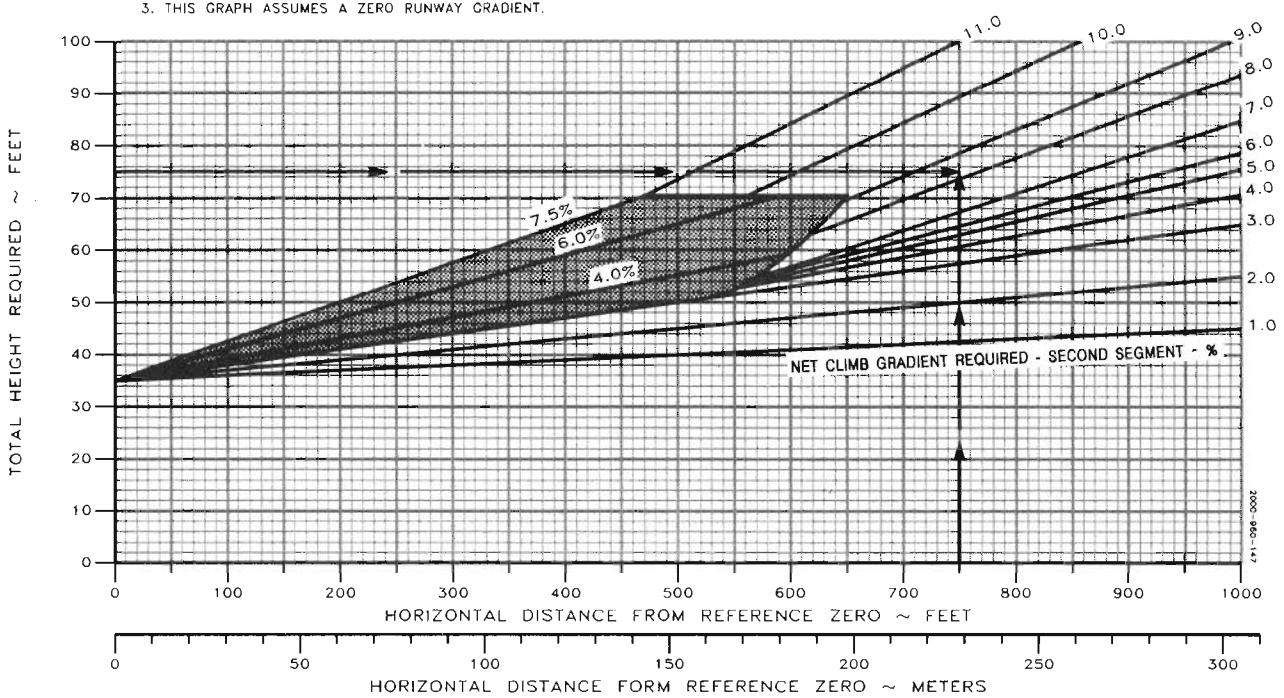


CLOSE-IN TAKE-OFF FLIGHT PATH - FLAPS RETRACTED

FIRST - OR SECOND - SEGMENT REQUIREMENT

NOTES: 1. SHADED AREA IS THE REQUIRED FIRST–SEGMENT NET CLIMB GRADIENT.
2. TOTAL HEIGHT REQUIRED SHOULD BE EQUAL TO THE OBSTACLE HEIGHT PLUS THE DESIRED MARGIN OF CLEARANCE.
3. THIS GRAPH ASSUMES A ZERO RUNWAY GRADIENT.

EXAMPLE:
TOTAL HEIGHT REQUIRED . . . . . 75 FT
HORIZONTAL DISTANCE FROM REFERENCE ZERO . . . . . 750 FT
NET CLIMB GRADIENT REQUIRED 8.3%

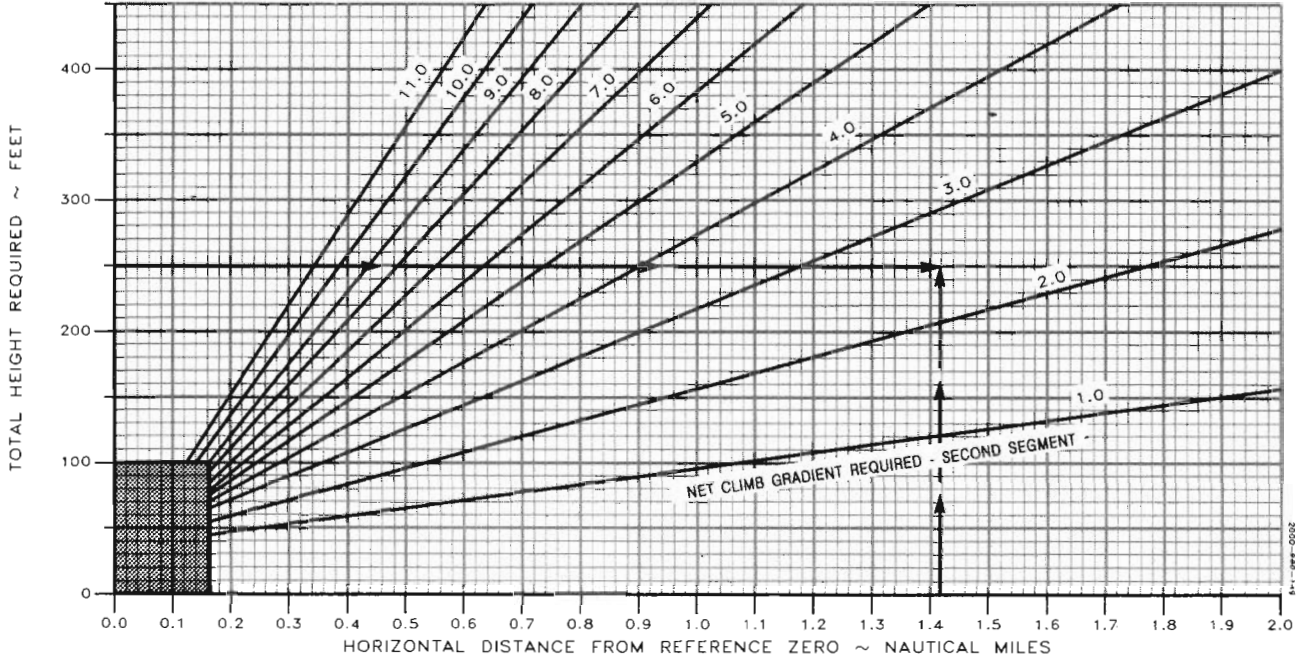


TAKE-OFF FLIGHT PATH - FLAPS RETRACTED

SECOND-SEGMENT REQUIREMENT

NOTES: 1. FOR SHADED AREA USE "CLOSE-IN TAKE-OFF FLIGHT PATH - FLAPS RETRACTED" GRAPH.
2. TOTAL HEIGHT REQUIRED SHOULD BE EQUAL TO THE OBSTACLE HEIGHT PLUS DESIRED MARGIN OF CLEARANCE.
3. THIS GRAPH ASSUMES A ZERO RUNWAY GRADIENT.

EXAMPLE:
TOTAL HEIGHT REQUIRED ..... 250 FT
OBSTACLE DISTANCE FROM REFERENCE ZERO ..... 1.42 NM
NET CLIMB GRADIENT REQUIRED 2.50%



NET TAKE-OFF FLIGHT PATH - FINAL SEGMENT

ONE ENGINE INOPERATIVE

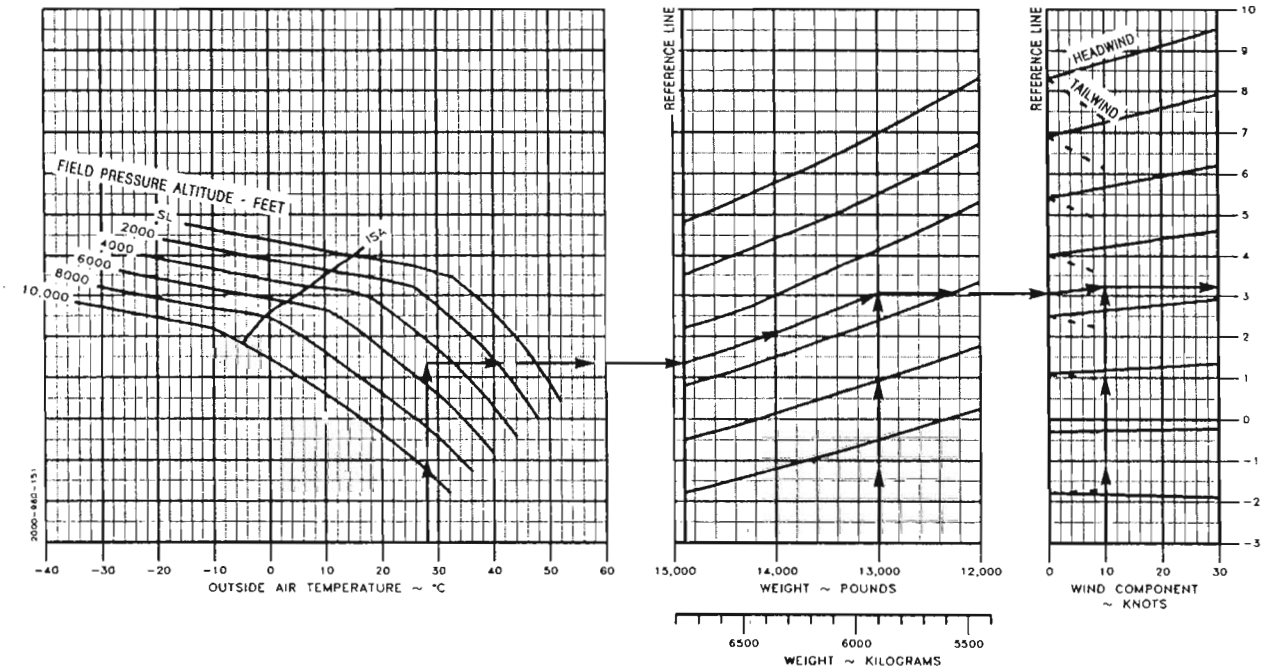
ASSOCIATED CONDITIONS:

POWER.....MAXIMUM CONTINUOUS
INOPERATIVE PROPELLER.....FEATHERED
LANDING GEAR.....UP
FLAPS.....RETRACTED
AIRSPEED.....V_{YSE} (BLUE LINE)

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, DECREASE THE NET CLIMB GRADIENT BY 1.1 PERCENTAGE POINTS.

EXAMPLE:

OAT.....28°C
FIELD PRESSURE ALTITUDE.....5003 FT
WEIGHT.....13,000 LBS
HEADWIND COMPONENT.....10 KTS
FINAL SEGMENT NET CLIMB GRADIENT.....3.22 %



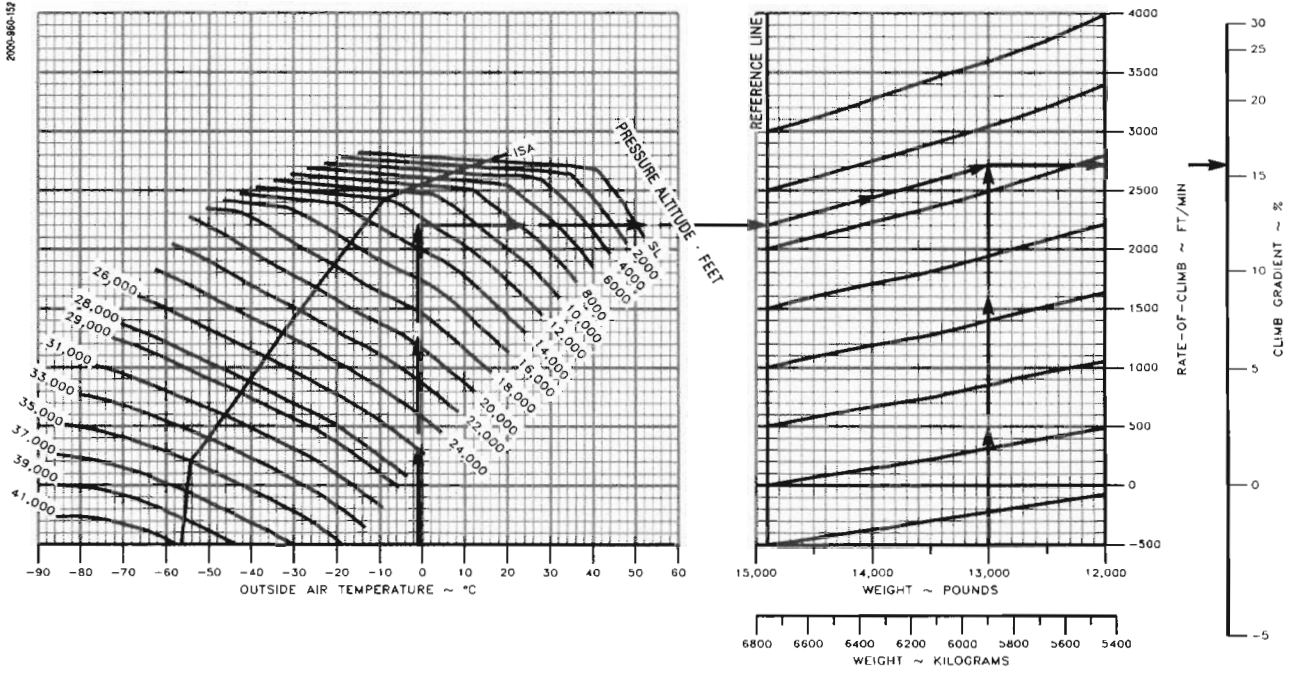
ASSOCIATED CONDITIONS:
LANDING GEAR.... UP
AIRSPEED..... V_Y (BLUE LINE + 10)

CLIMB - TWO ENGINES - FLAPS RETRACTED

MAXIMUM CONTINUOUS POWER

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, RATE OF CLIMB WILL BE REDUCED BY 300 FEET PER MINUTE.

EXAMPLE:
OAT..... -1°C
PRESSURE ALTITUDE..... 12,500 FT
WEIGHT ..... 13,000 LBS
RATE-OF-CLIMB..... 2715 FT/MIN
CLIMB GRADIENT..... 15.7 %



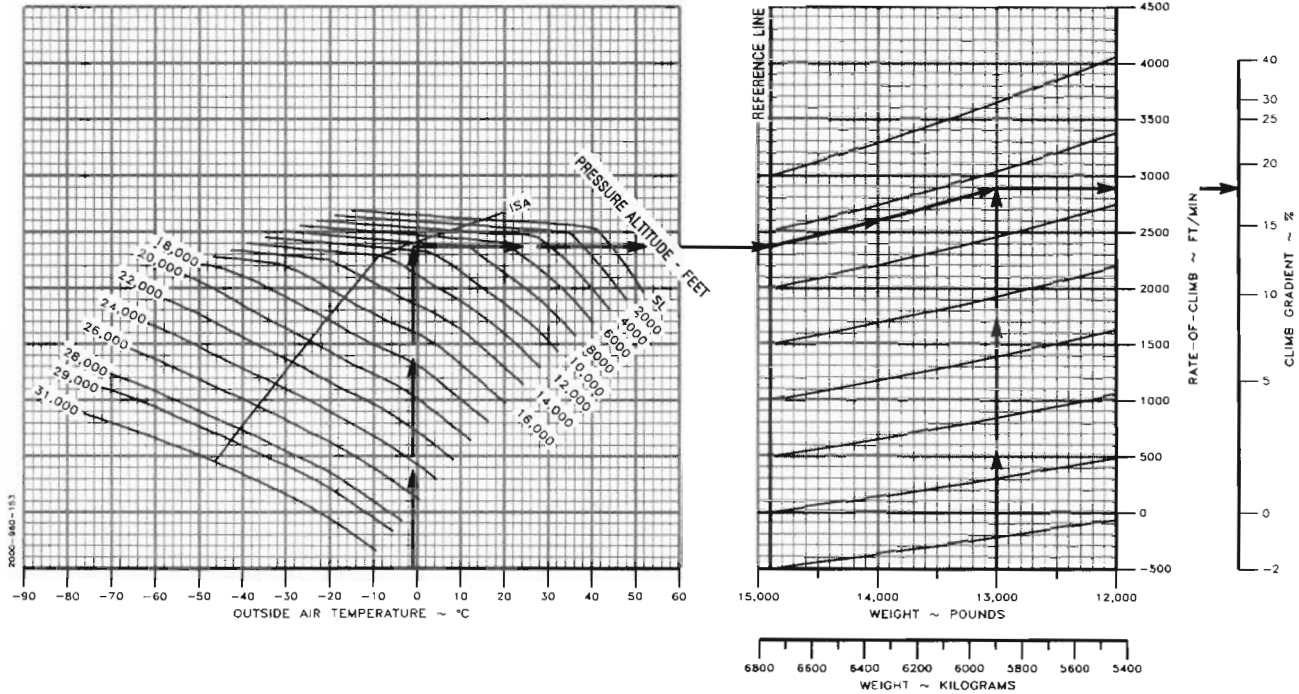
CLIMB - TWO ENGINES - FLAPS EXTENDED

MAXIMUM CONTINUOUS POWER

ASSOCIATED CONDITIONS:
LANDING GEAR....UP
AIRSPEED.....V_Y (BLUE LINE + 10)

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, RATE-OF-CLIMB WILL BE REDUCED BY 300 FEET PER MINUTE.

EXAMPLE:
OAT.....-1°C
PRESSURE ALTITUDE.....9000 FT
WEIGHT.....13,000 LBS
RATE-OF-CLIMB.....2891 FT/MIN
CLIMB GRADIENT.....18.0 %



CLIMB - ONE ENGINE INOPERATIVE

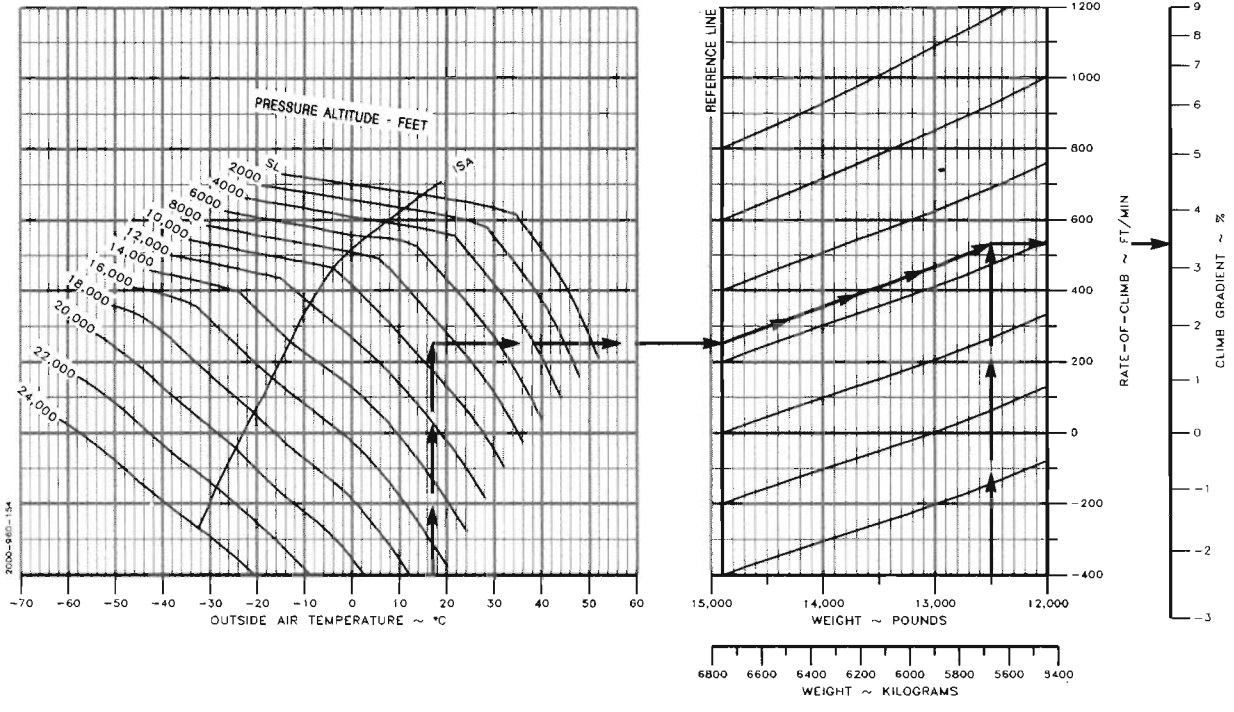
ASSOCIATED CONDITIONS:

POWER	MAXIMUM CONTINUOUS
FLAPS	RETRACTED
LANDING GEAR	UP
INOPERATIVE PROPELLER	FEATHERED
AIRSPEED	V_{YSE} (BLUE LINE)

NOTE: FOR OPERATION WITH ENGINE ANTI-ICE ON, RATE OF CLIMB WILL BE REDUCED BY 160 FEET PER MINUTE.

EXAMPLE:

OAT	17°C
PRESSURE ALTITUDE	9000 FT
WEIGHT	12,500 LBS
RATE-OF-CLIMB	531 FT/MIN
CLIMB GRADIENT	3.4 %



SERVICE CEILING - ONE ENGINE INOPERATIVE

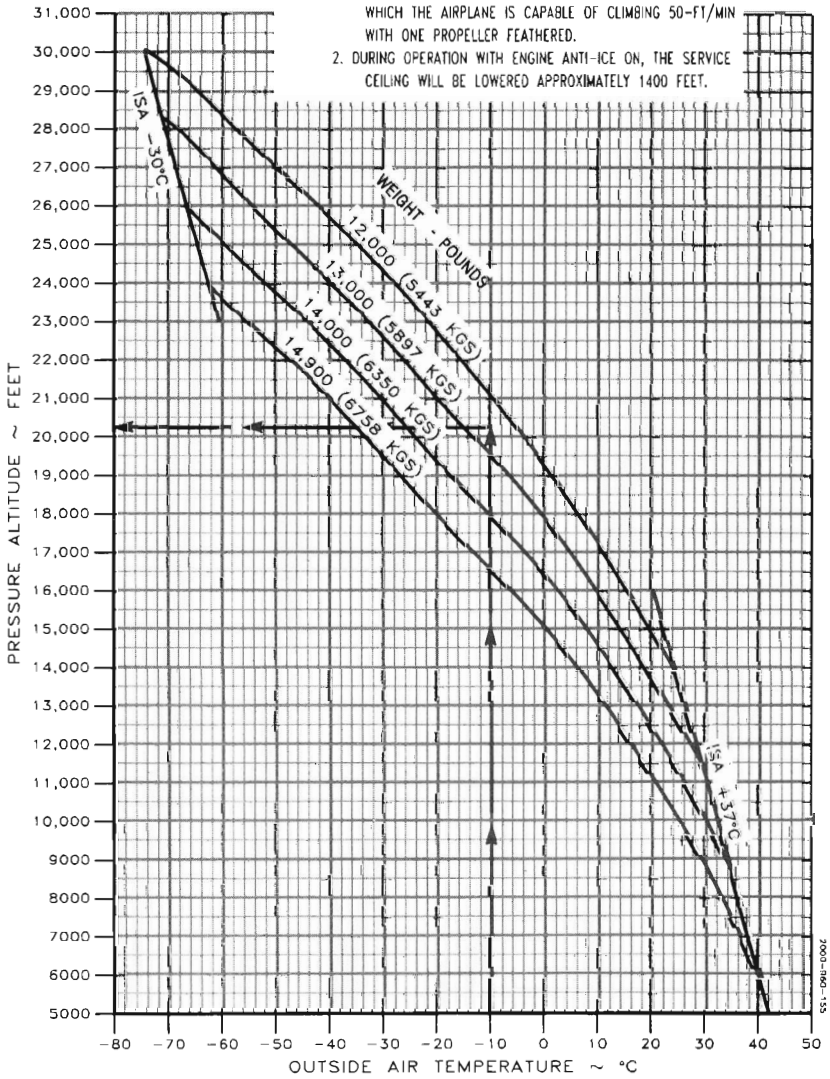
ASSOCIATED CONDITIONS:

POWER..... MAXIMUM CONTINUOUS
FLAPS..... RETRACTED
INOPERATIVE PROPELLER..... FEATHERED
LANDING GEAR..... UP
AIRSPEED..... V_{YSE} (BLUELINE)

EXAMPLE:

OAT..... -10°C
WEIGHT..... 12,500 LBS
SERVICE CEILING..... 20,257 FT

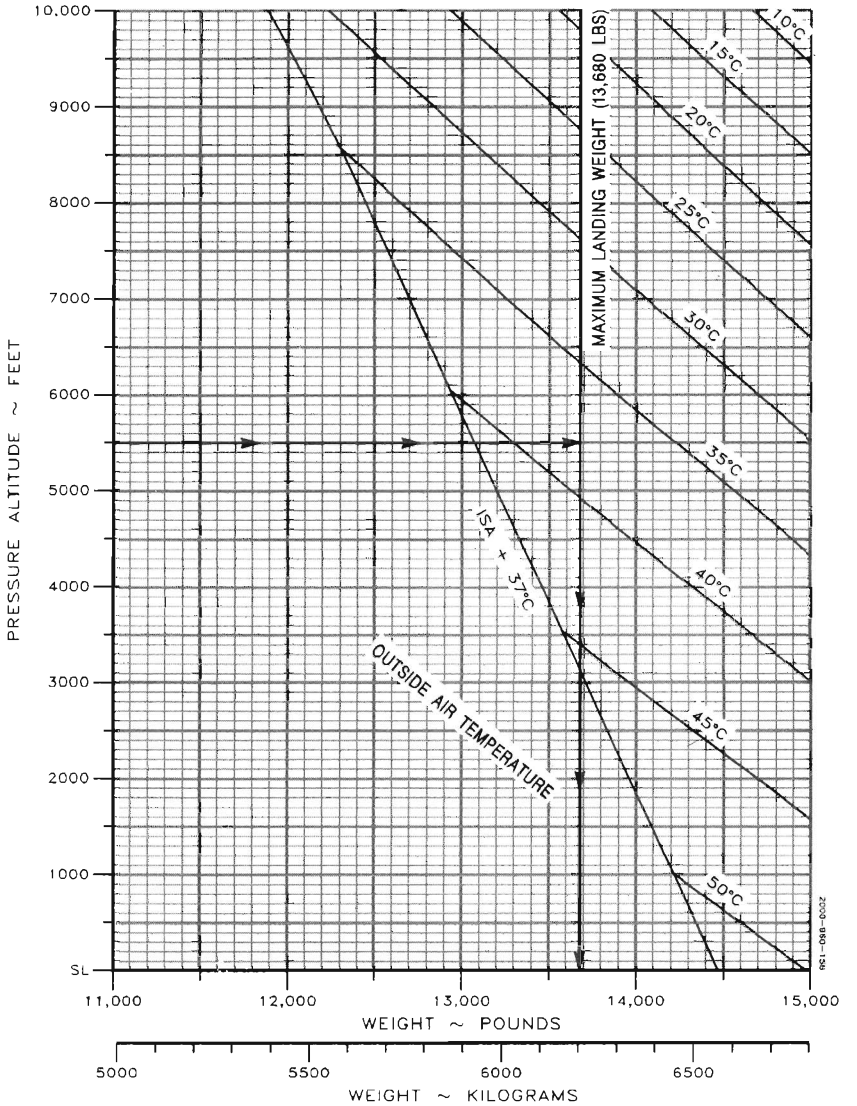
NOTES: 1. SERVICE CEILING IS THE MAXIMUM PRESSURE ALTITUDE AT WHICH THE AIRPLANE IS CAPABLE OF CLIMBING 50-FT/MIN WITH ONE PROPELLER FEATHERED.
2. DURING OPERATION WITH ENGINE ANTI-ICE ON, THE SERVICE CEILING WILL BE LOWERED APPROXIMATELY 1400 FEET.



MAXIMUM LANDING WEIGHT
TO ACHIEVE LANDING CLIMB REQUIREMENTS

NOTES: 1. FOR OPERATION WITH ENGINE ANTI-ICE ON, DECREASE THE WEIGHT READ FROM THE GRAPH BY 800 LBS.
2. ENTER GRAPH AT PRESSURE ALTITUDE AT WHICH LANDING GEAR WOULD BE EXTENDED.

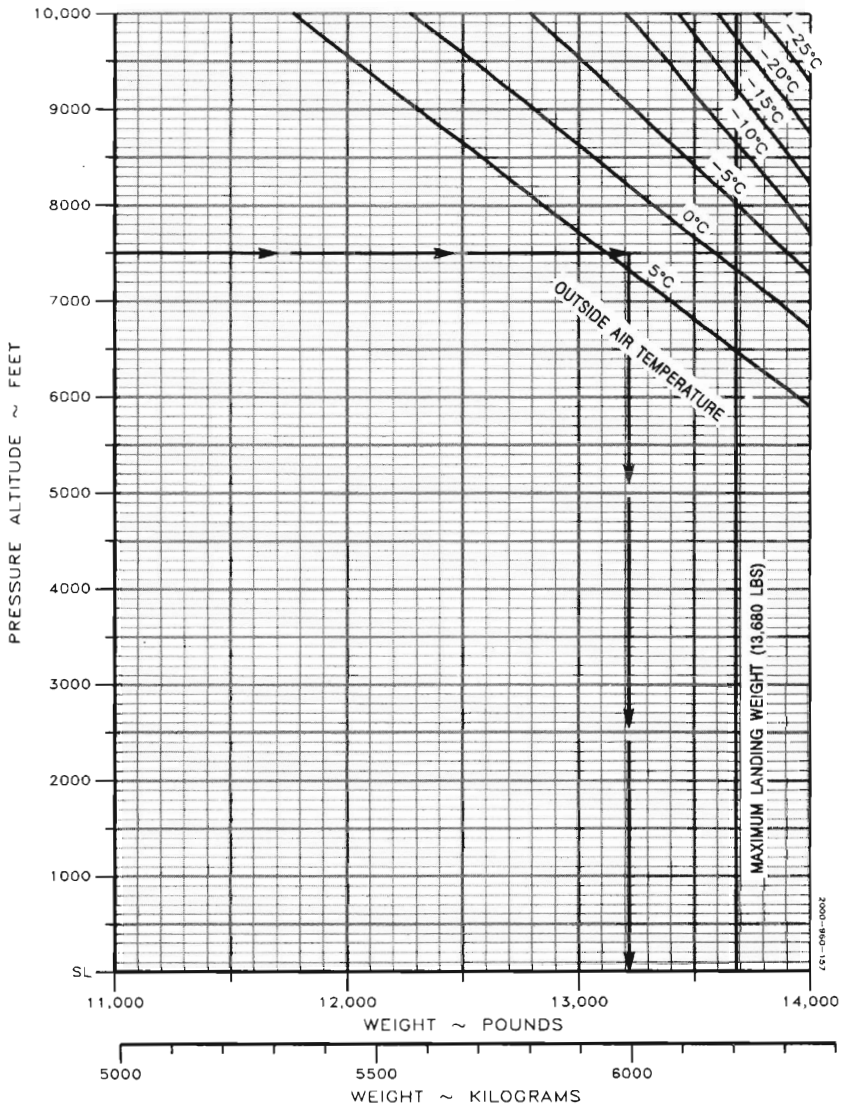
EXAMPLE:
PRESSURE ALTITUDE.....5500 FT
OAT.....32°C
MAXIMUM LANDING WEIGHT.....13,680 LBS



MAXIMUM LANDING WEIGHT
WITH NORMAL ICE ACCUMULATIONS

NOTE: ENTER GRAPH AT PRESSURE ALTITUDE AT WHICH LANDING GEAR WOULD BE EXTENDED.

EXAMPLE:
PRESSURE ALTITUDE..... 7500 FT
OAT..... 4°C
MAXIMUM LANDING WEIGHT..... 13,216 LBS



APPROACH CLIMB GRADIENT

ONE ENGINE INOPERATIVE

ASSOCIATED CONDITIONS:

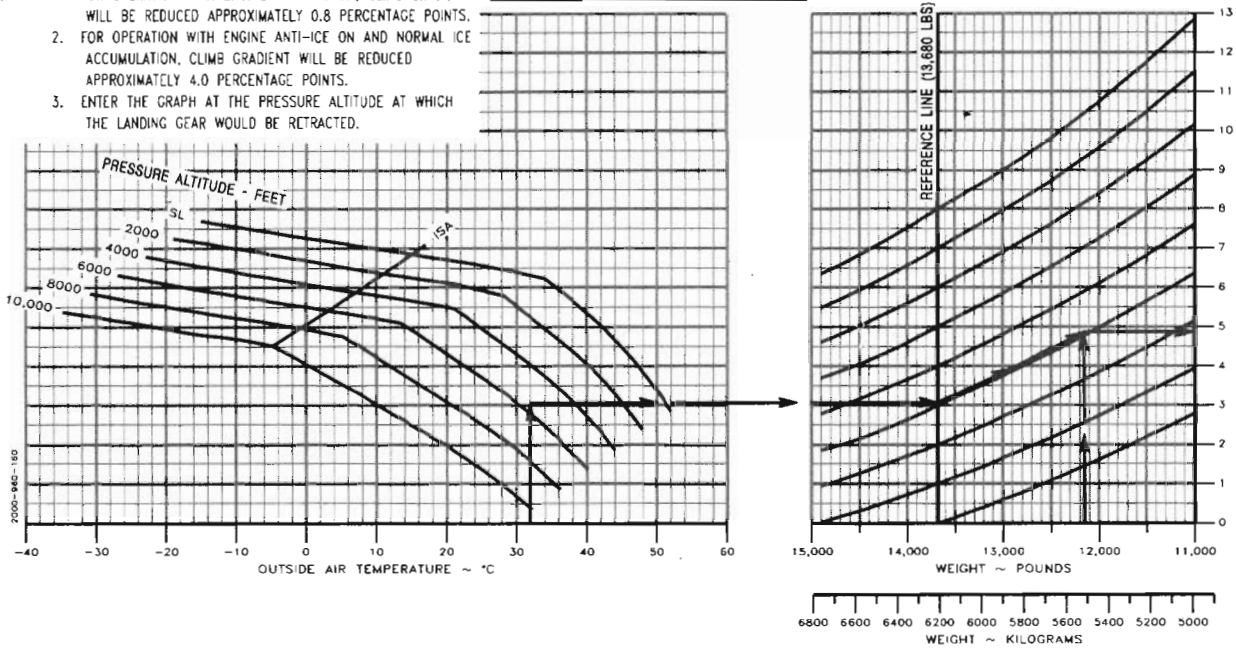
POWER	TAKEOFF
INOPERATIVE PROPELLER	FEATHERED
FLAPS	RETRACTED
LANDING GEAR	UP
AIRSPEED	V_{REF} AS TABULATED

WEIGHT ~ POUNDS	V_{REF} ~ KNOTS
14,900	121
13,680	118
13,000	115
12,000	111
11,000	107

EXAMPLE:

OAT	32°C
PRESSURE ALTITUDE	5500 FT
WEIGHT	12,155 LBS
APPROACH CLIMB GRADIENT	4.86 %
V_{REF}	112 KTS

NOTES:
1. FOR OPERATION WITH ENGINE ANTI-ICE ON, CLIMB GRADIENT WILL BE REDUCED APPROXIMATELY 0.8 PERCENTAGE POINTS.
2. FOR OPERATION WITH ENGINE ANTI-ICE ON AND NORMAL ICE ACCUMULATION, CLIMB GRADIENT WILL BE REDUCED APPROXIMATELY 4.0 PERCENTAGE POINTS.
3. ENTER THE GRAPH AT THE PRESSURE ALTITUDE AT WHICH THE LANDING GEAR WOULD BE RETRACTED.



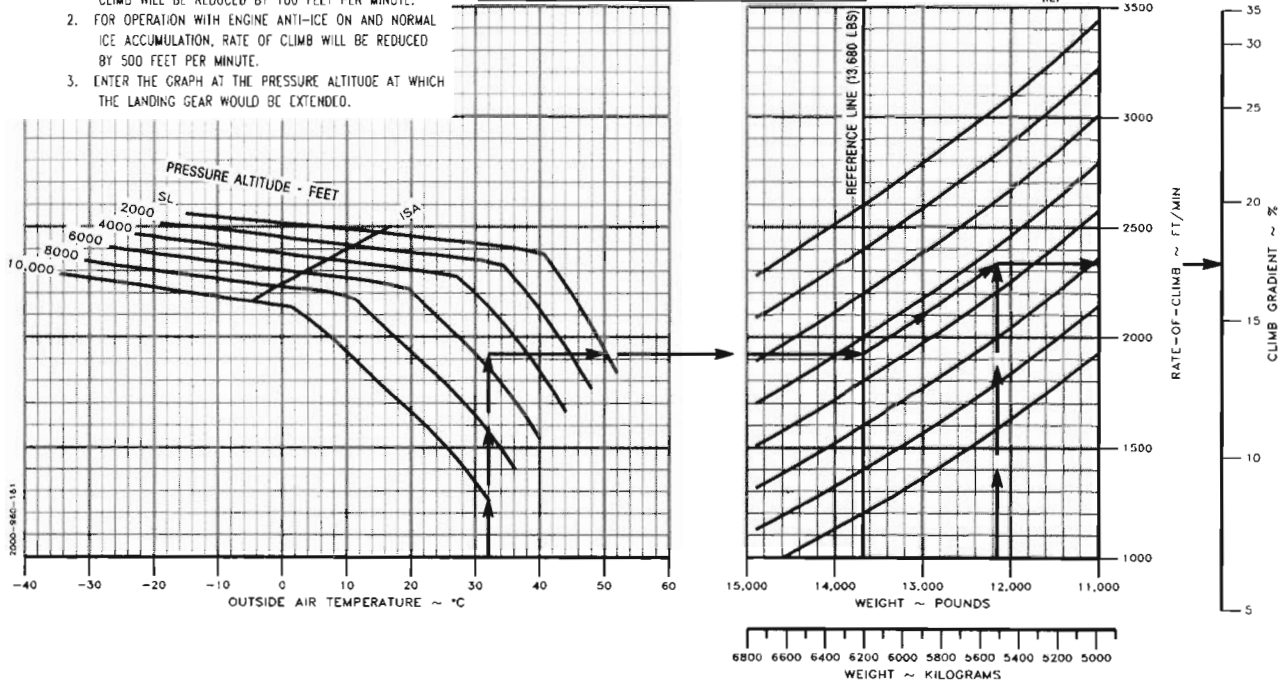
CLIMB - BALKED LANDING

ASSOCIATED CONDITIONS:
POWER.....TAKEOFF
FLAPS.....EXTENDED
LANDING GEAR....DOWN
AIRSPEED.....V_{REF} AS TABULATED

WEIGHT ~ POUNDS	V_{REF} ~ KNOTS
14,900	121
13,680	118
13,000	115
12,000	111
11,000	107

NOTES: 1. FOR OPERATION WITH ENGINE ANTI-ICE ON, RATE OF CLIMB WILL BE REDUCED BY 100 FEET PER MINUTE.
2. FOR OPERATION WITH ENGINE ANTI-ICE ON AND NORMAL ICE ACCUMULATION, RATE OF CLIMB WILL BE REDUCED BY 500 FEET PER MINUTE.
3. ENTER THE GRAPH AT THE PRESSURE ALTITUDE AT WHICH THE LANDING GEAR WOULD BE EXTENDED.

EXAMPLE:
OAT.....32°C
PRESSURE ALTITUDE.....5500 FT
WEIGHT.....12,155 LBS
RATE-OF-CLIMB.....2339 FT/MIN
CLIMB GRADIENT.....17.4 %
V_{REF}.....112 KTS



LANDING DISTANCE

ASSOCIATED CONDITIONS:

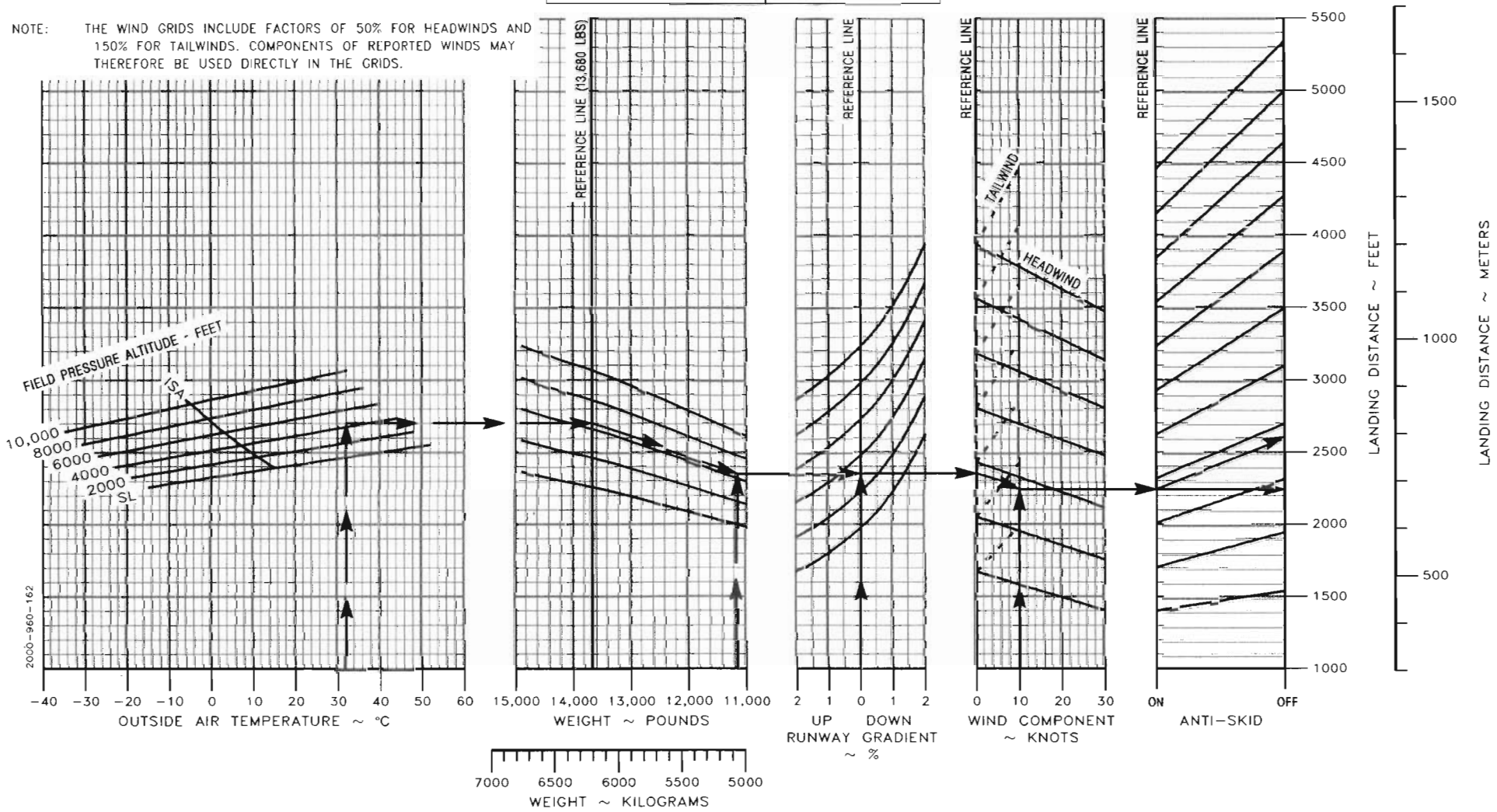
POWER . . . . . RETARDED TO MAINTAIN 3-DEGREE APPROACH ANGLE, THEN IDLE AT 50 FEET AGL
PROPELLER CONTROLS . . . . FULL FORWARD
RUNWAY . . . . . PAVED, DRY SURFACE
APPROACH SPEED . . . . . V_{REF} AS TABULATED
POWER LEVERS . . . . . LIFTED AND GROUND FINE SELECTED AFTER TOUCHDOWN
FLAPS . . . . . EXTENDED
BRAKING . . . . . MAXIMUM
OBSTACLE HEIGHT . . . . . 50 FT

WEIGHT ~ POUNDS	V_{REF} ~ KNOTS
14,900	121
13,680	118
13,000	115
12,000	111
11,000	107

EXAMPLE:

OAT . . . . . 32°C
FIELD PRESSURE ALTITUDE . . . . . 4502 FT
LANDING WEIGHT . . . . . 11,155 LBS
RUNWAY GRADIENT . . . . . ZERO
HEADWIND COMPONENT . . . . . 10 KTS
DISTANCE(ANTI-SKID ON) . . . . . 2240 FT
DISTANCE(ANTI-SKID OFF) . . . . . 2610 FT
V_{REF} . . . . . 108 KTS

NOTE: THE WIND GRIDS INCLUDE FACTORS OF 50% FOR HEADWINDS AND 150% FOR TAILWINDS. COMPONENTS OF REPORTED WINDS MAY THEREFORE BE USED DIRECTLY IN THE GRIDS.



SECTION VI
WT AND BAL/EQUIP LIST
TABLE OF CONTENTS

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Basic Empty Weight and Balance - As Delivered
(This Page To Be Replaced Upon Aircraft Delivery)

Sample Loading - As Delivered
(This Page To Be Replaced Upon Aircraft Delivery)

WEIGHING INSTRUCTIONS

Periodic weighing of the airplane may be required to keep the Basic Empty Weight current. Frequency of weighing is to be determined by the operator. All changes to the airplane affecting weight and/or balance are the responsibility of the airplane operator.

1. Airplane may be weighed on wheels or jacks points. Three jack points are provided: one on the nose section of the fuselage at station 86.2, and one on each wing outer panel rear spar at station 398.3. Wheel reaction locations should be measured as described in paragraph 6 below.
2. Fuel should be drained preparatory to weighing. Tanks are drained from the regular drain ports with the airplane in static ground attitude. When tanks are drained, 10.5 pounds of undrainable fuel remains in the airplane at an arm of 322.8 inches. The moment/100 is 34. The remainder of the unusable fuel (unusable less undrainable) to be added to a drained system is 27.5 pounds at station 327.3. The moment/100 is 90. The total unusable fuel included in empty weight is 38 pounds at station 326.0. The moment/100 is 124.
3. Engine oil must be at the full level in each tank. Total engine oil aboard when both tanks are full is 58.5 pounds at an arm of 447.4 inches. The moment/100 is 262.0.
4. To determine airplane configuration at time of weighing, installed equipment is checked against the airplane Equipment List or superseding forms. All equipment must be in its proper place during weighing.
5. The airplane is placed on the scales and leveled. Jack pad leveling may require the nose gear shock to be secured in the static position to prevent its extension. Wheel weighings can be leveled by varying the amount of air in the shocks and tires. Provisions for determining the level condition are located on the fuselage entrance door frame. Ensure the flaps and forward wings are in the retracted (forward wing aft) position. Level determination is accomplished by hanging a plumb-bob from the upper sill at fuselage station 176.40 using the Support Assembly Plumb-bob. The target is located on the lower sill.
6. Measurement of the reaction arms for a wheel weighing is made using the jig point (center of tie-down ring) at F.S. 86.2. With the airplane level, attach the plumb-bob at the indicated jig point location. Using a steel measuring tape, measure from the ground projection of the jig point to the axle center line of the main gear, and then from the main gear axle center line to the nose gear axle center line. The main wheel axle center line is best located by stretching a string across from one main wheel to the other. All measurements are to be taken with the tape level with the hanger floor and parallel to the fuselage center line. The locations of the wheel reactions will be approximately F.S. 345 for the main wheels and F.S. 74.5 for the nose wheel.
7. The Basic Empty Weight and Moment are determined from the scale readings. Items weighed which are not part of the empty airplane are subtracted, e.g., undrainable fuel. Unusable fuel and engine oil are added if not already in the airplane.
8. Weighing should always be made in a enclosed area which is free from air currents.

NOTE

The certificated maximum weight (15,010 lbs. ramp weight) may not be exceeded with:

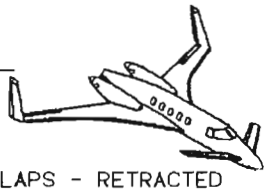
a. Full fuel, full engine oil, and one 170 pound pilot, and/or
b. Each seat occupied at 170 pounds each, full engine oil and enough fuel for one-half hour of operation at maximum continuous power.

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

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

It is strongly recommended that a duplicate copy of the Weight and Balance data and Equipment List be kept in an alternate location in the event the original manual is misplaced. This procedure could prevent the grounding of the airplane.

BEECHCRAFT MODEL 2000 STARSHIP
BASIC EMPTY WEIGHT AND BALANCE



DATE: _____

SERIAL NO: _____

REGISTRATION NO: _____

PREPARED BY: _____

FWD WING & FLAPS - RETRACTED

STRUT POSITION	NOSE	MAIN
EXTENDED	73.9	344.1
COMPRESSED	75.1	345.4

JACK POINT LOCATION	
FORWARD	86.2
AFT	398.3

REACTION WHEEL-JACK POINTS	SCALE READING	TARE	NET WEIGHT	STATION OR ARM	MOMENT
LEFT MAIN					
RIGHT MAIN					
SUB TOTAL					
NOSE					
TOTAL (AS WEIGHED)					

SPACE PROVIDED FOR ADDITIONS AND SUBTRACTIONS TO AS WEIGHED CONDITION

EMPTY WEIGHT			
ENGINE OIL UNUSABLE FUEL			
BASIC EMPTY WEIGHT			

2000-603-09

EMPTY WEIGHT AND BALANCE RECORD

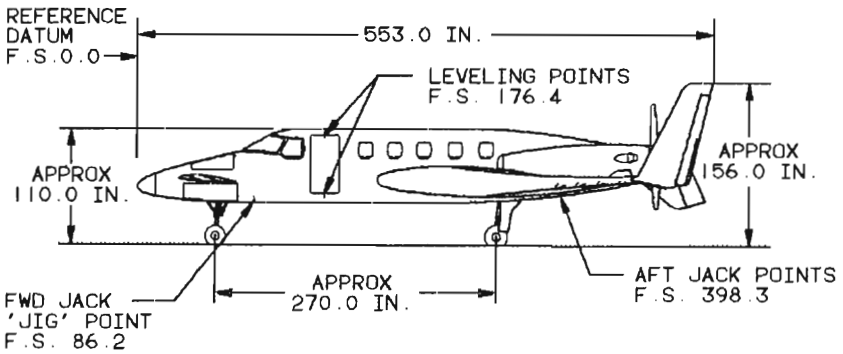
(Continuous History of Changes in Structure or Equipment Affecting Weight and Balance)

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

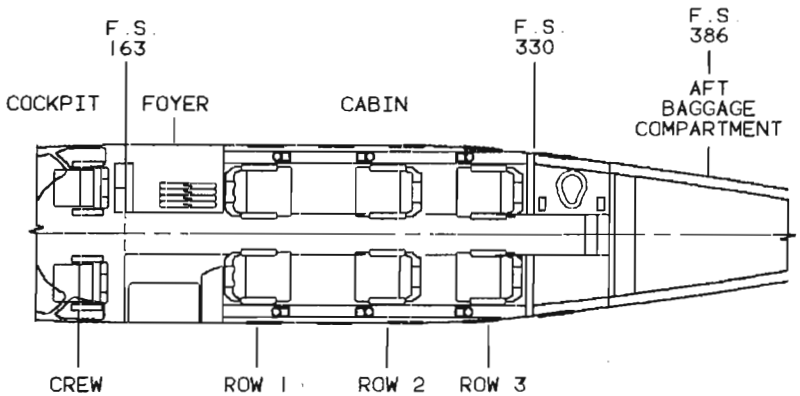
DATE	ITEM NO.		DESCRIPTION OF ARTICLE OR MODIFICATION	WEIGHT CHANGE ADDED(+) OR REMOVED(-)			RUNNING BASIC EMPTY WEIGHT	
	IN	OUT		WT (LBS)	ARM (IN)	MOM. /100	WT (LBS)	MOM. /100

2000-603-10

DIMENSIONAL AND LOADING DATA

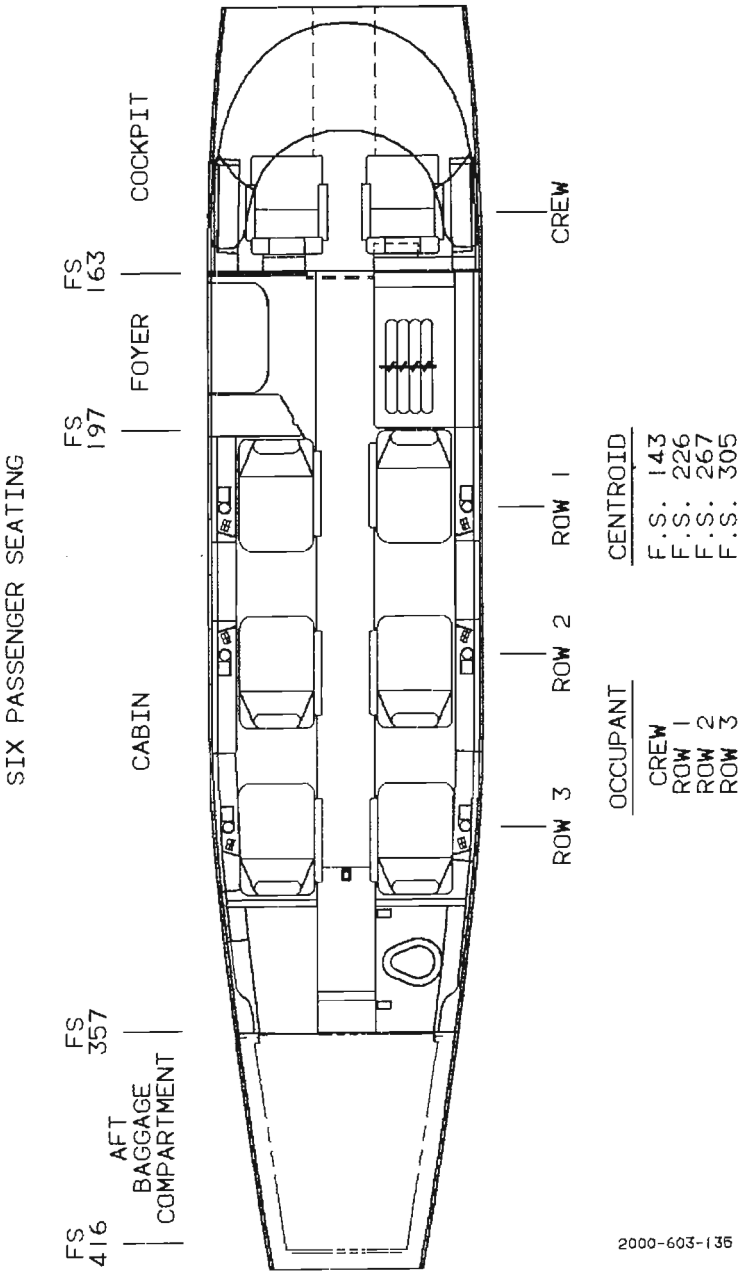


SIX PASSENGER SEATING

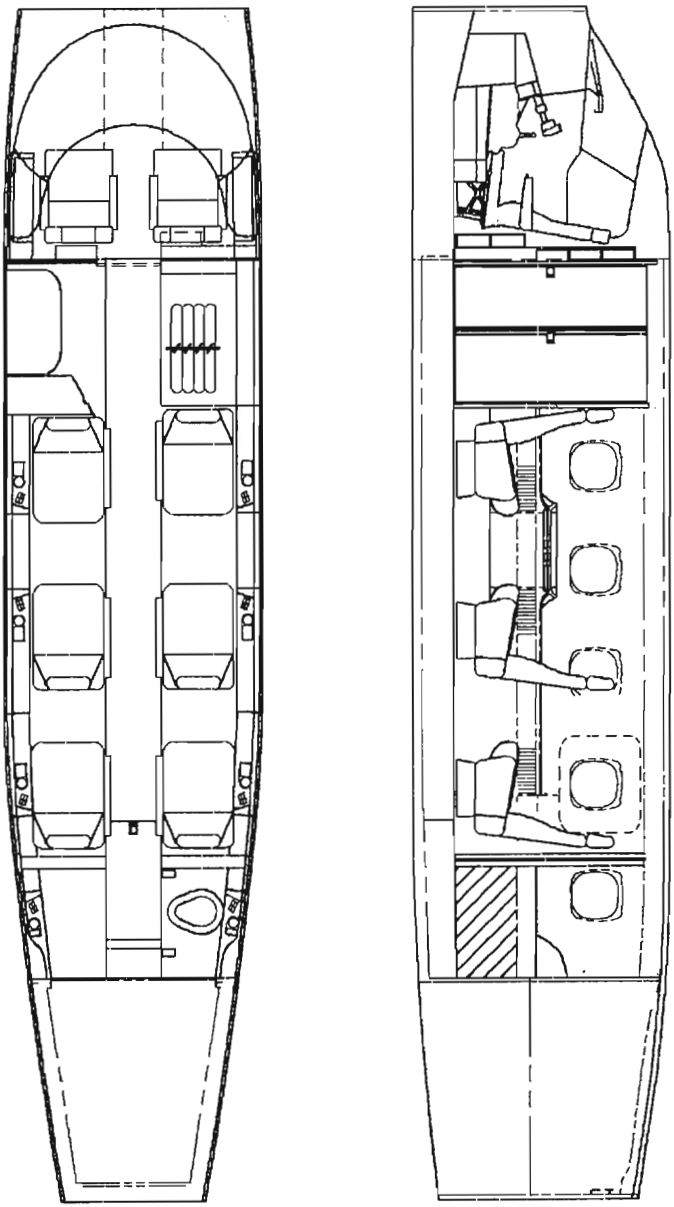


OCCUPANT	CENTROID
CREW	F.S. 143
ROW 1	F.S. 226
ROW 2	F.S. 267
ROW 3	F.S. 305

C9200464 C


SIX PASSENGER SEATING
FS 163
COCKPIT
FS 197
FOYER
CABIN
FS 357
AFT BAGGAGE COMPARTMENT
FS 416
CREW
ROW 1
ROW 2
ROW 3
OCCUPANT
CREW
ROW 1
ROW 2
ROW 3
CENTROID
F.S. 143
F.S. 226
F.S. 267
F.S. 305
2000-603-135

CABIN ARRANGEMENT DIAGRM
SIX PASSENGER SEATING



2000-603-136

USEFUL LOAD WEIGHTS AND MOMENTS

OCCUPANTS
SIX PASSENGER SEATING

WEIGHT	CREW	CABIN CHAIRS		
	F.S. 143	F.S. 226.0	F.S. 267.0	F.S. 305.0
	MOMENT/100			
80	114	181	214	244
90	129	203	240	275
100	143	226	267	305
110	157	249	294	336
120	172	271	320	366
130	186	294	347	397
140	200	316	374	427
150	215	339	401	458
160	229	362	427	488
170	243	384	454	519
180	257	407	481	549
190	272	429	507	580
200	286	452	534	610
210	300	475	561	641
220	315	497	587	671
230	329	520	614	702
240	343	542	641	732
250	358	565	668	763

BT02938

BAGGAGE

BAGGAGE
SIX PASSENGER SEATING

WEIGHT	FORWARD BAGGAGE COMPARTMENT F.S. 182 MOMENT/100	AFT BAGGAGE COMPARTMENT F.S. 386
10	18	39
20	36	77
30	55	116
40	73	154
50	91	193
100	182	386
160	291 (1)	618
200		772
250		965
300		1158
400		1544
500		1930
525		2027 (2)

BT02939

NOTES:

1. Compartment capacity is 160 pounds. This includes clothing on hangers and baggage.
2. Compartment capacity is 525 pounds with baggage net restraint.

USEFUL LOAD WEIGHTS AND MOMENTS - USABLE FUEL

GAL	ARM	5.7 LB/GAL. WT.MOM/100		5.9 LB/GAL. WT.MOM/100		6.1 LB/GAL WT.MOM/100		6.3 LB/GAL WT.MOM/100		6.5 LB/GAL WT.MOM/100	
10	314.6	57	179	59	186	61	192	63	198	65	204
20	314.6	114	359	118	371	122	384	126	396	130	409
30	314.6	171	538	177	557	188	576	189	595	195	613
40	314.6	228	717	236	743	244	768	252	793	260	818
50	314.6	285	897	295	928	305	960	315	991	325	1022
60	306.9	342	1050	354	1086	366	1123	378	1160	390	1197
70	306.2	399	1222	413	1265	427	1307	441	1350	455	1393
80	305.9	456	1395	472	1444	488	1493	504	1542	520	1591
90	305.7	513	1568	531	1623	549	1678	567	1733	585	1788
100	305.5	570	1741	590	1803	610	1864	630	1925	650	1986
110	305.3	627	1914	649	1981	671	2049	693	2116	715	2183
120	305.1	684	2087	708	2160	732	2233	756	2307	780	2380
130	304.9	741	2259	767	2339	793	2418	819	2497	845	2576
140	304.7	798	2432	826	2517	854	2602	882	2687	910	2773
150	304.5	855	2604	885	2695	915	2786	945	2878	975	2969
160	304.3	912	2775	944	2873	976	2970	1008	3067	1040	3165
170	304.1	969	2947	1003	3050	1037	3154	1071	3257	1105	3360
180	303.9	1026	3118	1062	3227	1098	3337	1134	3446	1170	3556
190	303.8	1083	3290	1121	3406	1159	3521	1197	3636	1235	3752
200	303.6	1140	3461	1180	3583	1220	3704	1260	3825	1300	3947
210	303.4	1197	3632	1239	3759	1281	3887	1323	4014	1365	4141
220	303.2	1254	3802	1298	3936	1342	4069	1386	4202	1430	4336
230	303.1	1311	3974	1357	4113	1403	4252	1449	4392	1495	4531
240	303.0	1368	4145	1416	4291	1464	4436	1512	4581	1560	4727
250	302.9	1425	4316	1475	4468	1525	4619	1575	4771	1625	4922
260	302.8	1482	4488	1534	4645	1586	4802	1638	4960	1690	5117
270	302.8	1539	4660	1593	4824	1647	4987	1701	5151	1755	5314
280	302.8	1596	4833	1652	5002	1708	5172	1764	5341	1820	5511
290	302.7	1653	5004	1711	5179	1769	5355	1827	5530	1885	5706
300	302.7	1710	5176	1770	5358	1830	5539	1890	5721	1950	5903
310	302.7	1767	5349	1829	5536	1891	5724	1953	5912	2015	6099
320	302.7	1824	5521	1888	5715	1952	5909	2016	6102	2080	6296
330	302.7	1881	5694	1947	5894	2013	6093	2079	6293	2145	6493
340	302.7	1938	5866	2006	6072	2074	6278	2142	6484	2210	6690
350	302.7	1995	6039	2065	6251	2135	6463	2205	6675	2275	6886
360	302.7	2052	6211	2124	6429	2196	6647	2268	6865	2340	7083
365	302.7	2081	6309	2154	6531	2227	6752	2300	6974	2373	7195
370	303.8	2109	6407	2183	6632	2257	6857	2331	7082	2405	7306
380	305.8	2166	6624	2242	6856	2318	7088	2394	7321	2470	7553
390	307.7	2223	6840	2301	7080	2379	7320	2457	7560	2535	7800
400	309.3	2280	7052	2360	7300	2440	7547	2520	7794	2600	8042
410	310.9	2337	7266	2419	7521	2501	7776	2583	8031	2665	8285
420	312.2	2394	7474	2478	7736	2562	7999	2646	8261	2730	8523
430	313.5	2451	7684	2537	7954	2623	8223	2709	8493	2795	8762
440	314.9	2508	7898	2596	8175	2684	8452	2772	8729	2860	9006
450	315.9	2565	8103	2655	8387	2745	8671	2835	8956	2925	9240
460	317.3	2622	8320	2714	8612	2806	8903	2898	9195	2990	9487
470	318.5	2679	8533	2773	8832	2867	9131	2961	9431	3055	9730
480	319.5	2736	8742	2832	9048	2928	9355	3024	9662	3120	9968
490	320.5	2793	8952	2891	9266	2989	9580	3087	9894	3185	10208
500	321.8	2850	9171	2950	9493	3050	9815	3150	10137	3250	10459
510	322.8	2907	9384	3009	9713	3111	10042	3213	10372	3315	10701
520	323.0	2964	9574	3068	9910	3172	10246	3276	10581	3380	10917
530	322.5	3021	9743	3127	10085	3233	10426	3339	10768	3445	11110
540	322.1	3078	9914	3186	10262	3294	10610	3402	10958	3510	11306
550	321.7	3135	10085	3245	10439	3355	10793	3465	11147	3575	11501
560	321.2	3192	10253	3304	10612	3416	10972	3528	11332	3640	11692
565	321.0	3221	10339	3334	10702	3447	11065	3560	11428	3673	11790

BT03557

USEFUL LOAD WEIGHTS AND MOMENTS - USABLE FUEL

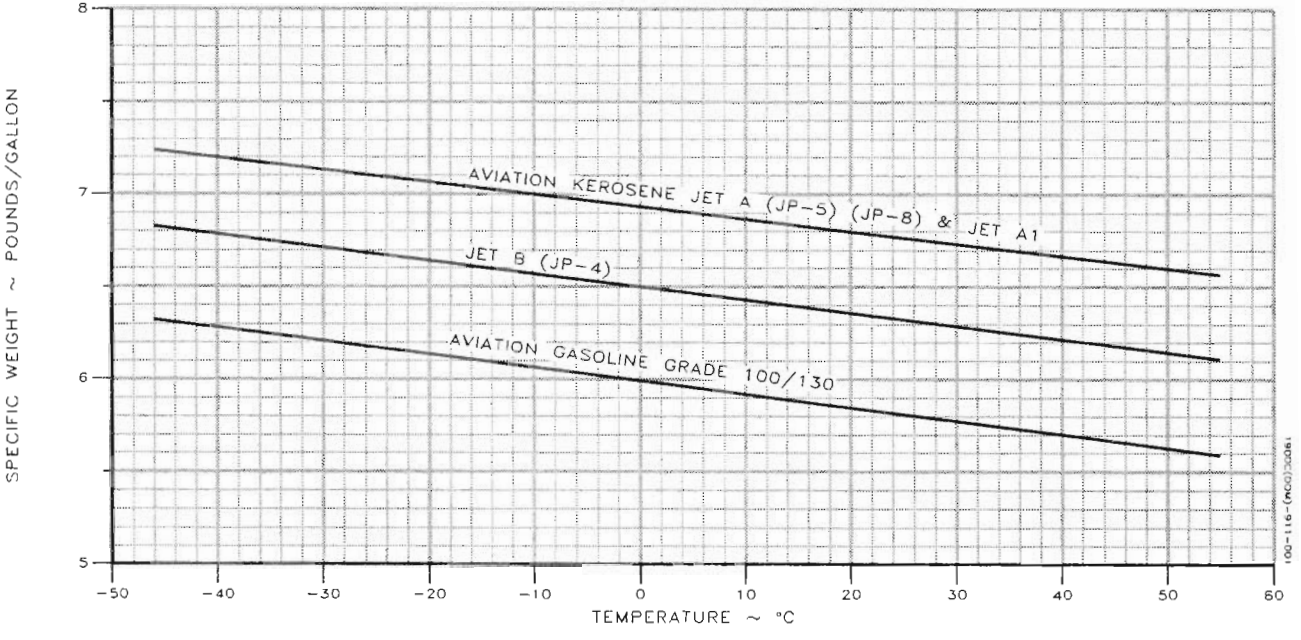
GAL	ARM	6.6 LB/GAL. WT.	MOM/100	6.7 LB/GAL. WT.	MOM/100	6.8 LB/GAL WT.	MOM/100	6.9 LB/GAL WT.	MOM/100	7.1 LB/GAL WT.	MOM/100
10	314.6	66	208	67	211	68	214	69	217	71	223
20	314.6	132	415	134	422	136	428	138	434	142	447
30	314.6	198	623	201	632	204	642	207	651	213	670
40	314.6	264	831	268	843	272	856	276	868	284	893
50	314.6	330	1038	335	1054	340	1070	345	1085	355	1117
60	306.9	396	1215	402	1234	408	1252	414	1271	426	1307
70	306.2	462	1415	469	1436	476	1458	483	1479	497	1522
80	305.9	528	1615	536	1640	544	1664	552	1689	568	1738
90	305.7	594	1816	603	1843	612	1871	621	1898	639	1953
100	305.5	660	2016	670	2047	680	2077	690	2108	710	2169
110	305.3	726	2216	737	2250	748	2284	759	2317	781	2384
120	305.1	792	2416	804	2453	816	2490	828	2526	852	2599
130	304.9	858	2616	871	2656	884	2695	897	2735	923	2814
140	304.7	924	2815	938	2858	952	2901	966	2943	994	3029
150	304.5	990	3015	1005	3060	1020	3106	1035	3152	1065	3243
160	304.3	1056	3213	1072	3262	1088	3311	1104	3359	1136	3457
170	304.1	1122	3412	1139	3464	1156	3515	1173	3567	1207	3671
180	303.9	1188	3610	1206	3665	1224	3720	1242	3774	1278	3884
190	303.8	1254	3810	1273	3867	1292	3925	1311	3983	1349	4098
200	303.6	1320	4008	1340	4068	1360	4129	1380	4190	1420	4311
210	303.4	1386	4205	1407	4269	1428	4333	1449	4396	1491	4524
220	303.2	1452	4402	1474	4469	1496	4536	1518	4603	1562	4736
230	303.1	1518	4601	1541	4671	1564	4740	1587	4810	1633	4950
240	303.0	1584	4800	1608	4872	1632	4945	1656	5018	1704	5163
250	302.9	1650	4998	1675	5074	1700	5149	1725	5225	1775	5376
260	302.8	1716	5196	1742	5275	1768	5354	1794	5432	1846	5590
270	302.8	1782	5396	1809	5478	1836	5559	1863	5641	1917	5805
280	302.8	1848	5596	1876	5681	1904	5765	1932	5850	1988	6020
290	302.7	1914	5794	1943	5881	1972	5969	2001	6057	2059	6233
300	302.7	1980	5993	2010	6084	2040	6175	2070	6266	2130	6448
310	302.7	2046	6193	2077	6287	2108	6381	2139	6475	2201	6662
320	302.7	2112	6393	2144	6490	2176	6587	2208	6684	2272	6877
330	302.7	2178	6593	2211	6693	2244	6793	2277	6892	2343	7092
340	302.7	2244	6793	2278	6896	2312	6998	2346	7101	2414	7307
350	302.7	2310	6992	2345	7098	2380	7204	2415	7310	2485	7522
360	302.7	2376	7192	2412	7301	2448	7410	2484	7519	2556	7737
365	302.7	2409	7306	2446	7416	2482	7527	2519	7638	2592	7859
370	303.8	2442	7419	2479	7531	2516	7644	2553	7756	2627	7981
380	305.8	2508	7669	2546	7786	2584	7902	2622	8018	2698	8251
390	307.7	2574	7920	2613	8040	2652	8160	2691	8280	2769	8520
400	309.3	2640	8166	2680	8289	2720	8413	2760	8537	2840	8784
410	310.9	2706	8413	2747	8540	2788	8668	2829	8795	2911	9050
420	312.2	2772	8654	2814	8785	2856	8916	2898	9048	2982	9310
430	313.5	2838	8897	2881	9032	2924	9167	2967	9302	3053	9571
440	314.9	2904	9145	2948	9283	2992	9422	3036	9560	3124	9838
450	315.9	2970	9382	3015	9524	3060	9667	3105	9809	3195	10093
460	317.3	3036	9633	3082	9779	3128	9925	3174	10071	3266	10363
470	318.5	3102	9880	3149	10030	3196	10179	3243	10329	3337	10628
480	319.5	3168	10122	3216	10275	3264	10428	3312	10582	3408	10889
490	320.5	3234	10365	3283	10522	3332	10679	3381	10836	3479	11150
500	321.8	3300	10619	3350	10780	3400	10941	3450	11102	3550	11424
510	322.8	3366	10865	3417	11030	3468	11195	3519	11359	3621	11689
520	323.0	3432	11085	3484	11253	3536	11421	3588	11589	3692	11925
530	322.5	3498	11281	3551	11452	3604	11623	3657	11794	3763	12136
540	322.1	3564	11480	3618	11654	3672	11828	3726	12001	3834	12349
550	321.7	3630	11678	3685	11855	3740	12032	3795	12209	3905	12562
560	321.2	3696	11872	3752	12051	3808	12231	3864	12411	3976	12771
565	321.0	3729	11970	3785	12150	3842	12333	3899	12516	4012	12879

BT03556

DENSITY VARIATION OF AVIATION FUEL

BASED ON AVERAGE SPECIFIC GRAVITY

FUEL	AVERAGE SPECIFIC GRAVITY
JET A (JP-5) (JP-8) AND JET A1	.819 AT 15°C
JET B (JP-4)	.764 AT 15°C
AV GAS GRADE 100/130	.706 AT 15°C



LOADING INSTRUCTIONS

It is the responsibility of the airplane operator to ensure that the airplane is properly loaded. At the time of delivery, Beech Aircraft Corporation provides the necessary weight and balance data to compute the individual loadings. All subsequent changes in airplane weight and balance are the responsibility of the airplane owner and/or operator.

The basic empty weight and moment of the airplane at the time of delivery are shown on the Basic Empty Weight and Balance and on the Empty Weight and Balance Record forms. Useful load items which may loaded into the airplane are shown on the Useful Load Weight and Moment tables. All moments are divided by 100 to simplify computations.

COMPUTING PROCEDURE

1. Record the basic empty weight and moment from the Basic Empty Weight and Balance form (or from the latest superseding forms). The moment must be divided by 100 to correspond to Useful Load Moments.
2. Record the weight and corresponding moment of each item to be carried. These values are found on the Useful Load Weight and Moment tables.
3. Total the weight column and moment column. The total weight without usable fuel must not exceed the Maximum Zero Fuel Weight limitation of 12,600 pounds. All weight in excess of this limitation must be fuel. The total take-off weight must not exceed the maximum allowable take-off weight of 14,900 pounds, and the total moment must be within the minimum and maximum moments shown on the Moment Limits Vs. Weight table or graph for that weight.
4. Determine the fuel remaining at destination by subtracting the fuel used to destination, plus the start, taxi, and take off fuel, from the fuel loading. Refer to the usable fuel weights and moments table for the remaining fuel corresponding moment.
5. To compute the landing condition, add the fuel remaining at destination to the zero fuel weight. The landing moment must be within the minimum and maximum moments shown on Weight and Moment Limits table for that weight. If the total moment is less than the minimum moment allowed, useful load items must be shifted aft, or forward load items reduced. If the total moment is greater than the maximum moment allowed, useful load items must be shifted forward, or aft load items reduced. If the quantity or location of load items is changed, the calculations must be revised and the moments rechecked.
6. Two additional balance checks must be made, with forward fuel and with aft fuel. To compute the forward balance check, add the forward fuel (365 gal.) to the zero fuel weight. The moment must be within the minimum and maximum moments shown on the Weight and Moment Limits table for that weight. To compute the aft balance check, add the aft fuel (565 gal.) to the zero fuel weight. The moment must be within the minimum and maximum moments shown on the Weight and Moment Limits table for that weight.
7. Loadings may be made on the Weight and Balance Loading form for clarity and ease of calculations.

WEIGHT AND BALANCE LOADING FORM

LINE	SERIAL NO:_____ ITEM	REGISTRATION NO:_____ WEIGHT	DATE:_____ MOM/100
1.	Basic Empty Condition		
2.	Crew		
3.	Passengers or Cargo		
4.	Baggage		
5.	Cabinet Contents		
6.	Sub Total Zero Fuel Condition. Do Not Exceed 12,600 Lbs.		
7.	Total Fuel Loading		
8.	Sub Total Ramp Condition. Do Not Exceed 15,010 Lbs.		
9.	*Less Fuel For Start, Taxi, and Takeoff		
10.	Total Take-Off Condition		
11.	Fuel Loading (From Line 7)		
12.	Minus Total Fuel Used to Destination. Including Start, Taxi, and Takeoff		
13.	Fuel Remaining (Transfer to Line 15)		
14.	Zero Fuel Condition (From Line 6)		
15.	Plus Fuel Remaining		
16.	Landing Condition. Do Not Exceed 13,680 Lbs.		
17.	Zero Fuel Condition (From Line 6)		
18.	**Add First 365 Gal Fuel @ ____ #/Gal		
19.	Forward Balance Check		
20.	Zero Fuel Condition (From Line 6)		
21.	***Add Forward and Aft Fuel (520 Gal @ ____ #/Gal)		
22.	Aft Balance Check		

* Fuel for Start, Taxi, and Takeoff is Normally 110 lbs at an Average Moment/100 of 335.
** If Total Fuel is less than 365 Gallons, Disregard Check.
*** If Total Fuel is less than 520 Gallons, Disregard Check.

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WEIGHT AND BALANCE LOADING FORM

PASSENGERS OR CARGO ITEMS LOCATION (ROW, F.S., ETC)	WEIGHT	MOM/100
TOTAL PASSENGERS OR CARGO		

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WEIGHT AND BALANCE LOADING FORM

	SERIAL NO:_____	REGISTRATION NO:_____	DATE: _____
LINE	ITEM	WEIGHT	MOM/100
1.	Basic Empty Condition		
2.	Crew		
3.	Passengers or Cargo		
4.	Baggage		
5.	Cabinet Contents		
6.	Sub Total Zero Fuel Condition. Do Not Exceed 12,600 Lbs.		
7.	Total Fuel Loading		
8.	Sub Total Ramp Condition. Do Not Exceed 15,010 Lbs.		
9.	*Less Fuel For Start, Taxi, and Takeoff		
10.	Total Take-Off Condition		
11.	Fuel Loading (From Line 7)		
12.	Minus Total Fuel Used to Destination. Including Start, Taxi, and Takeoff		
13.	Fuel Remaining (Transfer to Line 15)		
14.	Zero Fuel Condition (From Line 6)		
15.	Plus Fuel Remaining		
16.	Landing Condition. Do Not Exceed 13,680 Lbs.		
17.	Zero Fuel Condition (From Line 6)		
18.	**Add First 365 Gal Fuel @ ____ #/Gal		
19.	Forward Balance Check		
20.	Zero Fuel Condition (From Line 6)		
21.	***Add Forward and Aft Fuel (520 Gal @ ____ #/Gal)		
22.	Aft Balance Check		

* Fuel for Start, Taxi, and Takeoff is Normally 110 lbs at an Average Moment/100 of 335.
** If Total Fuel is less than 365 Gallons, Disregard Check.
*** If Total Fuel is less than 520 Gallons, Disregard Check.

BT03554

WEIGHT AND BALANCE LOADING FORM

PASSENGERS OR CARGO ITEMS LOCATION (ROW, F.S., ETC)	WEIGHT	MOM/100
TOTAL PASSENGERS OR CARGO		

BT01375

WEIGHT AND BALANCE LOADING FORM

	SERIAL NO:_____	REGISTRATION NO:_____	DATE: _____
LINE	ITEM	WEIGHT	MOM/100
1.	Basic Empty Condition		
2.	Crew		
3.	Passengers or Cargo		
4.	Baggage		
5.	Cabinet Contents		
6.	Sub Total Zero Fuel Condition. Do Not Exceed 12,600 Lbs.		
7.	Total Fuel Loading		
8.	Sub Total Ramp Condition. Do Not Exceed 15,010 Lbs.		
9.	*Less Fuel For Start, Taxi, and Takeoff		
10.	Total Take-Off Condition		
11.	Fuel Loading (From Line 7)		
12.	Minus Total Fuel Used to Destination. Including Start, Taxi, and Takeoff		
13.	Fuel Remaining (Transfer to Line 15)		
14.	Zero Fuel Condition (From Line 6)		
15.	Plus Fuel Remaining		
16.	Landing Condition. Do Not Exceed 13,680 Lbs.		
17.	Zero Fuel Condition (From Line 6)		
18.	**Add First 365 Gal Fuel @ ____ #/Gal		
19.	Forward Balance Check		
20.	Zero Fuel Condition (From Line 6)		
21.	***Add Forward and Aft Fuel (520 Gal @ ____ #/Gal)		
22.	Aft Balance Check		

* Fuel for Start, Taxi, and Takeoff is Normally 110 lbs at an Average Moment/100 of 335.
** If Total Fuel is less than 365 Gallons, Disregard Check.
*** If Total Fuel is less than 520 Gallons, Disregard Check.

BT03554

WEIGHT AND BALANCE LOADING FORM

PASSENGERS OR CARGO ITEMS LOCATION (ROW, F.S., ETC)	WEIGHT	MOM/100
TOTAL PASSENGERS OR CARGO		

BT01375

WEIGHT AND BALANCE LOADING FORM

LINE	ITEM	WEIGHT	MOM/100
	SERIAL NO:_____	REGISTRATION NO:_____	DATE: _____
1.	Basic Empty Condition		
2.	Crew		
3.	Passengers or Cargo		
4.	Baggage		
5.	Cabinet Contents		
6.	Sub Total Zero Fuel Condition. Do Not Exceed 12,600 Lbs.		
7.	Total Fuel Loading		
8.	Sub Total Ramp Condition. Do Not Exceed 15,010 Lbs.		
9.	*Less Fuel For Start, Taxi, and Takeoff		
10.	Total Take-Off Condition		
11.	Fuel Loading (From Line 7)		
12.	Minus Total Fuel Used to Destination. Including Start, Taxi, and Takeoff		
13.	Fuel Remaining (Transfer to Line 15)		
14.	Zero Fuel Condition (From Line 6)		
15.	Plus Fuel Remaining		
16.	Landing Condition. Do Not Exceed 13,680 Lbs.		
17.	Zero Fuel Condition (From Line 6)		
18.	**Add First 365 Gal Fuel @ ____ #/Gal		
19.	Forward Balance Check		
20.	Zero Fuel Condition (From Line 6)		
21.	***Add Forward and Aft Fuel (520 Gal @ ____ #/Gal)		
22.	Aft Balance Check		

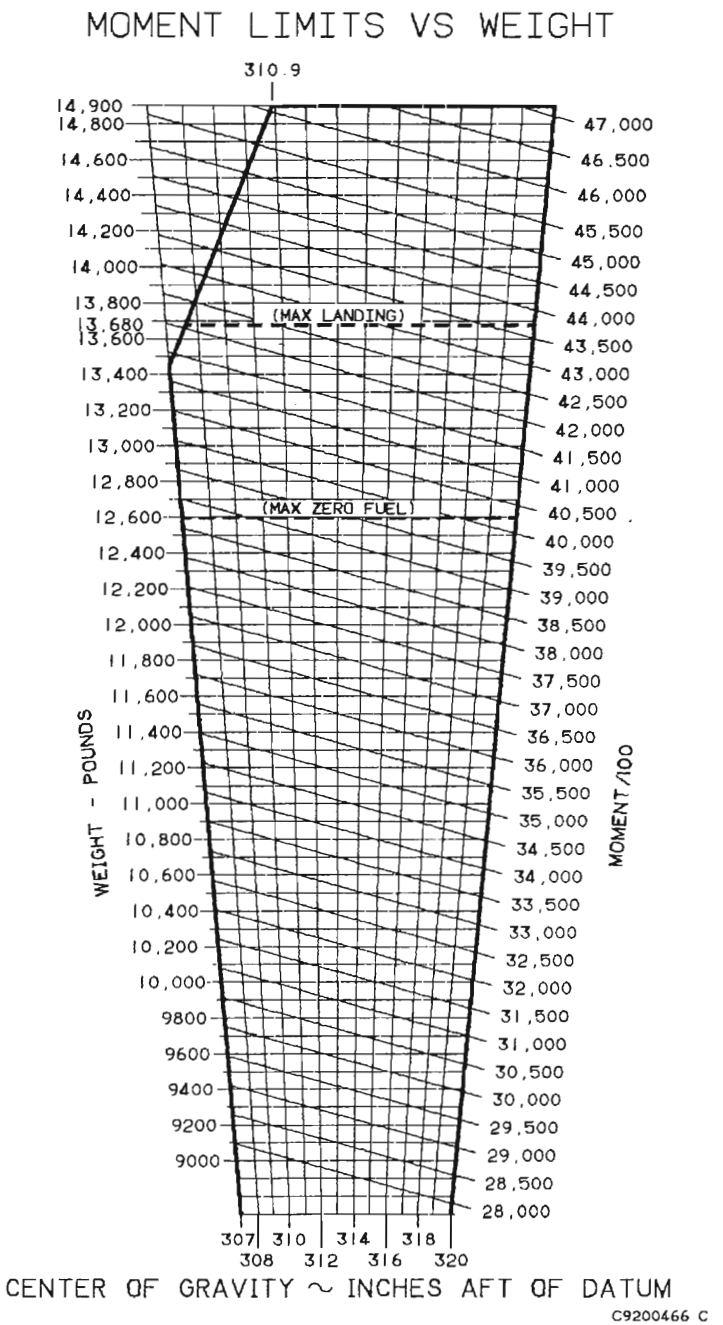
* Fuel for Start, Taxi, and Takeoff is Normally 110 lbs at an Average Moment/100 of 335.
** If Total Fuel is less than 365 Gallons, Disregard Check.
*** If Total Fuel is less than 520 Gallons, Disregard Check.

BT03554

WEIGHT AND BALANCE LOADING FORM

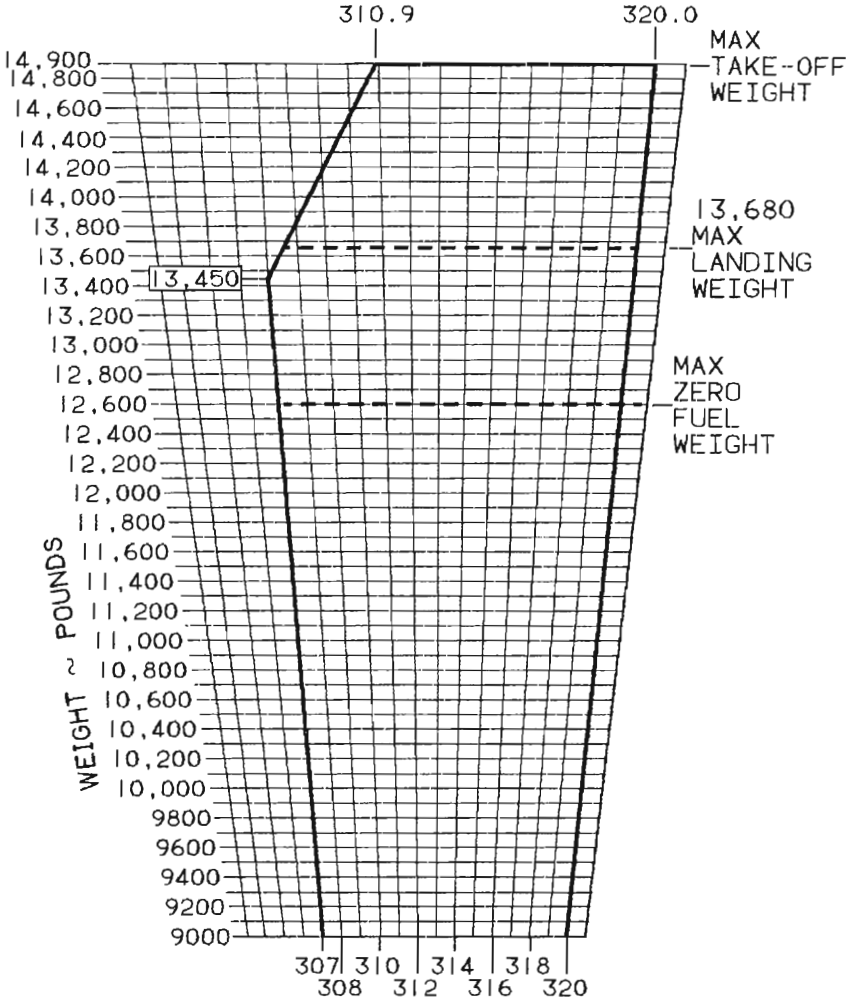
PASSENGERS OR CARGO ITEMS LOCATION (ROW, F.S., ETC)	WEIGHT	MOM/100
TOTAL PASSENGERS OR CARGO		

BT01375


MOMENT LIMITS VS WEIGHT
310.9
14,900
14,800
14,600
14,400
14,200
14,000
13,800
13,680
13,600
13,400
13,200
13,000
12,800
12,600
12,400
12,200
12,000
11,800
11,600
11,400
11,200
11,000
10,800
10,600
10,400
10,200
10,000
9800
9600
9400
9200
9000
(MAX LANDING)
(MAX ZERO FUEL)
WEIGHT - POUNDS
47,000
46,500
46,000
45,500
45,000
44,500
44,000
43,500
43,000
42,500
42,000
41,500
41,000
40,500
40,000
39,500
39,000
38,500
38,000
37,500
37,000
36,500
36,000
35,500
35,000
34,500
34,000
33,500
33,000
32,500
32,000
31,500
31,000
30,500
30,000
29,500
29,000
28,500
28,000
MOMENT/100
307
308
310
312
314
316
318
320
CENTER OF GRAVITY ~ INCHES AFT OF DATUM

C9200466 C

WEIGHT AND BALANCE DIAGRAM



C9200465 C

MOMENT LIMITS VS WEIGHT

WEIGHT	MINIMUM MOMENT/100	MAXIMUM MOMENT/100	WEIGHT	MINIMUM MOMENT/100	MAXIMUM MOMENT/100
9000	27630	28800	10950	33617	35040
9050	27784	28960	11000	33770	35200
9100	27937	29120	11050	33924	35360
9150	28091	29280	11100	34077	35520
9200	28244	29440	11150	34231	35680
9250	28398	29600	11200	34384	35840
9300	28551	29760	11250	34538	36000
9350	28705	29920	11300	34691	36160
9400	28858	30080	11350	34845	36320
9450	29012	30240	11400	34998	36480
9500	29165	30400	11450	35152	36640
9550	29319	30560	11500	35305	36800
9600	29472	30720	11550	35459	36960
9650	29626	30880	11600	35612	37120
9700	29779	31040	11650	35766	37280
9750	29933	31200	11700	35919	37440
9800	30086	31360	11750	36073	37600
9850	30240	31520	11800	36226	37760
9900	30393	31680	11850	36380	37920
9950	30547	31840	11900	36533	38080
10000	30700	32000	11950	36687	38240
10050	30854	32160	12000	36840	38400
10100	31007	32320	12050	36994	38560
10150	31161	32480	12100	37147	38720
10200	31314	32640	12150	37301	38880
10250	31468	32800	12200	37454	39040
10300	31621	32960	12250	37608	39200
10350	31775	33120	12300	37761	39360
10400	31928	33280	12350	37915	39520
10450	32082	33440	12400	38068	39680
10500	32235	33600	12450	38222	39840
10550	32389	33760	12500	38375	40000
10600	32542	33920	12550	38529	40160
10650	32696	34080	12600	38682	40320 (1)
10700	32849	34240	12650	38836	40480
10750	33003	34400	12700	38989	40640
10800	33156	34560	12750	39143	40800
10850	33310	34720	12800	39296	40960
10900	33463	34880	12850	39450	41120

BT03559

MOMENT LIMITS VS WEIGHT

WEIGHT	MINIMUM MOMENT/100	MAXIMUM MOMENT/100	WEIGHT	MINIMUM MOMENT/100	MAXIMUM MOMENT/100
12900	39603	41280	13900	42841	44480
12950	39757	41440	13950	43014	44640
13000	39910	41600	14000	43187	44800
13050	40064	41760	14050	43360	44960
13100	40217	41920	14100	43534	45120
13150	40371	42080	14150	43707	45280
13200	40524	42240	14200	43880	45440
13250	40678	42400	14250	44054	45600
13300	40831	42560	14300	44228	45760
13350	40985	42720	14350	44402	45920
13400	41138	42880	14400	44576	46080
13450	41292	43040	14450	44750	46240
13500	41463	43200	14500	44925	46400
13550	41635	43360	14550	45010	46560
13600	41807	43520	14600	45274	46720
13650	41979	43680	14650	45448	46880
13680	42082	43776 (2)	14700	45623	47040
13700	42151	43840	14750	45798	47200
13750	42323	44000	14800	45973	47360
13800	42496	44160	14850	46149	47520
13850	42669	44320	14900	46324	47680 (3)

(1) 12,600 Pounds Maximum Zero Fuel Weight
(2) 13,680 Pounds Maximum Landing Weight
(3) 14,900 Pounds Maximum Take-Off Weight

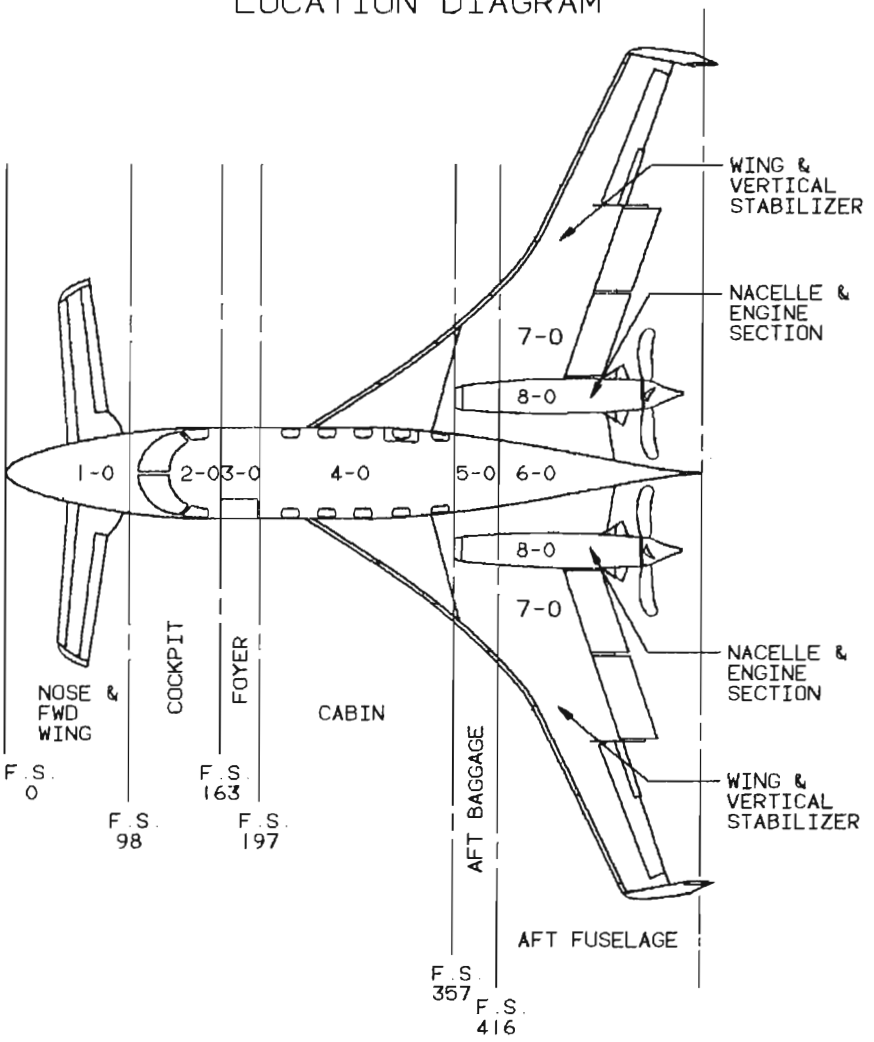
BT03559 (cont'd)

CENTER OF GRAVITY LIMITS (LANDING GEAR DOWN, FLAPS AND FORWARD WINGS RETRACTED)

WEIGHT CONDITION	FORWARD CG LIMIT	AFT CG LIMIT
14,900 Pounds (Maximum Takeoff)	310.90	320.00
13,680 Pounds (Maximum Landing)	307.60	320.00
13,450 Pounds (or Less)	307.00	320.00
12,600 Pounds (Maximum Zero Fuel)	307.00	320.00

BT03555

EQUIPMENT ITEM NUMBER LOCATION DIAGRAM



EQUIPMENT LIST

THIS LIST ITEMIZES THE EQUIPMENT IN THE BASIC EMPTY CONDITION SPECIFIED TO BE INSTALLED WHEN THE AIRPLANE IS DELIVERED.

LOCATIONS SHOWN FOR AVIONIC ITEMS INSTALLED IN THE NOSE AND AFT BAYS ARE APPROXIMATELY THE CENTER OF THE BAY WHEN REPLACING OR RELOCATING EQUIPMENT. ACTUAL LOCATION DIMENSIONS SHOULD BE USED.

2000-603-16

EQUIPMENT LIST

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ITEM NO.	ATA NO.	ITEM DESCRIPTION AND PART NUMBER	QUAN.	TOTAL WEIGHT LB.	ARM IN.	MOMENT LB-IN
01-001	34-40-02	ANT INSTL RADAR ANT-312	1	2.1	9.0	18
01-002	34-40-01	WEATHER RADAR REC/XMITTER RTA-854	1	18.7	14.3	267
01-003	34-50-06	ANTENNA INSTL GLIDESLOPE 100-384128	1	0.6	18.0	10
01-004	34-50-01	VHF NAV RECEIVER NO 1 VIR-432 & MOUNT	1	4.5	23.0	103
01-005	34-50-02	VHF NAV RECEIVER NO 2 VIR-432 & MOUNT	1	4.5	23.0	103
01-006	22-10-04	AUTOMATIC TRIM COMPUTER COLLINS ATC-81	1	1.4	39.0	54
01-007	23-10-03	VHF COMM TRANSCEIVER COLLINS VHF-422A	1	4.7	40.0	188
01-008	30-10-04	FWD WING DEICE BOOT S35-7D5220-01/02 (BOOT)	2	20.0	47.0	940
01-009	22-10-03	POWER SERVO COLLINS SVO-85C	1	5.3	50.0	265
01-010	35-00-01	OXYGEN BOTTLE - 77 CU. FT. 101-384200-5 OR 101-384207-5	1	20.2	67.0	1353
01-011	34-54-05	TRANSPONDER RADIO ADAPTER NO 1 CAD-870	1	0.8	71.0	56
01-012	34-54-06	TRANSPONDER RADIO ADAPTER NO 2 CAD-870	1	0.8	71.0	56
01-013	34-54-07	ATC TRANSPONDER NO 1 TDR-90 AND MOUNT	1	3.9	72.0	280
01-014	34-54-08	ATC TRANSPONDER NO 2 TDR-90 AND MOUNT	1	3.9	72.0	280
01-015	32-40-03	NOSE GEAR WHEEL AND TIRE - 19.5 X 6.75-8 122-820000	1	29.0	74.0	2146
01-016	33-40-02	TAXI LIGHT, NOSE LDG LIGHT 122-364016-1	2	2.0	74.0	148
01-017	31-50-02	POWER SUPPLY	1	1.2	75.2	90
01-018	34-52-01	VLF/OMEGA RECEIVER CMA 764	1	7.0	78.0	546
01-019	34-54-01	DME TRANSCEIVER NO 1 DME-442 & MOUNT	1	5.2	82.0	426
01-020	34-54-02	DME TRANSCEIVER NO 2 DME-442 & MOUNT	1	5.2	82.0	426
01-021	34-10-01	AIR DATA COMPUTER NO 1 ADC-850 AND MOUNT	1	2.8	83.0	232
01-022	34-10-02	AIR DATA COMPUTER NO 2 ADC-850 AND MOUNT	1	2.8	83.0	232
01-023	34-10-03	AIR DATA MODULE ADM-850	2	0.2	83.0	16
01-024	34-20-01	ALTITUDE HEADING COMPUTER NO 1 AHC-85D	1	14.5	83.0	1203
01-025	34-20-02	ALTITUDE HEADING COMPUTER NO 2 AHC-85D	1	14.5	83.0	1203
01-026	34-10-05	INTERNAL COMPENSATION UNIT ICU-85	2	0.4	88.0	35
02-001	31-30-01	FLIGHT HOUR RECORDER 58-380043-1	1	1.0	102.0	102
02-002	34-21-01	PRIMARY FLIGHT DISPLAY NO 1 PFD-870 LH	1	16.6	110.4	1832
02-003	34-21-02	PRIMARY FLIGHT DISPLAY NO 2 PFD-870 RH	1	16.6	110.4	1832
02-004	34-51-01	NAVIGATION DISPLAY NO 1 ND-870 & MOUNT	1	16.7	110.4	1843
02-005	34-51-02	NAVIGATION DISPLAY NO 2 ND-870 & MOUNT	1	16.7	110.4	1843
02-006	34-41-01	MULTIFUNCTION DISPLAY MFD-870 AND MOUNT	1	16.8	111.0	1864
02-007	22-10-01	AUTOPILOT MODE PANEL COLLINS MSP850	2	1.2	111.4	133
02-008	30-10-03	DEICE PRESSURE DISPLAY 122-382143	1	1.2	111.4	133
02-009	31-50-01	ENGINE INDICATION, CAUTION ADVISORY SYSTEM EICAS	1	16.8	111.4	1871

ITEM NO.	ATA NO.	ITEM DESCRIPTION AND PART NUMBER	QUAN.	TOTAL WEIGHT LB.	ARM IN.	MOMENT LB-IN
02-010	34-13-01	RADIO ALTIMETER PNEUMATIC 2" 122-382114 8047-700	1	2.5	111.4	278
02-011	34-14-01	AIRSPEED INDICATOR STANDBY 2 " 122-382107	1	1.8	111.4	200
02-012	34-24-01	MAGNETIC COMPASS 122-382050 C-2400-L4VSS-24-B	1	0.7	111.4	77
02-013	39-14-01	ATTITUDE AWARENESS PANEL NO 1 622-7398-002	1	0.4	111.4	44
02-014	39-14-02	ATTITUDE AWARENESS PANEL NO 2 622-7398-002	1	0.4	111.4	44
02-015	39-15-01	PILOT REVERSIONARY SWITCHING PANEL 122-322229	1	0.4	111.4	44
02-016	39-15-02	CO/PILOT REVERSIONARY SWITCHING PANEL 122-322229	1	0.4	111.4	44
02-017	39-16-01	CENTER REVERSIONARY PANEL 122-322229	1	0.8	111.4	89
02-018	39-13-01	COURSE, HEADING, AND MFD 622-7397-002	1	0.8	113.0	90
02-019	34-11-02	AIRSPEED INDICATOR NO 2 ASI-850A	1	5.6	113.2	633
02-020	34-12-01	ALTITUDE INDICATOR ALI-850	2	11.6	113.2	1313
02-021	34-22-01	SENSOR DISPLAY UNIT NO 1 SDU-640A	1	4.6	114.5	526
02-022	34-22-02	SENSOR DISPLAY UNIT NO 2 SDU-640A	1	4.6	114.5	526
02-023	39-12-01	RADIO TUNING UNIT NO 1 RTU-870A	1	2.4	114.7	275
02-024	39-12-02	RADIO TUNING UNIT NO21 RTU-870A	1	2.4	114.7	275
02-025	39-11-01	CONTROL DISPLAY UNIT NO 1 CDU-850A	1	6.4	115.0	736
02-026	39-11-02	CONTROL DISPLAY UNIT NO 2 CDU-850A	1	6.4	115.0	736
02-027	23-10-01	ANT INSTL VHF COMM #1 COLLINS CI12111	1	1.3	116.0	150
02-028	25-13-01	PILOT LCD CLOCK 122-382011	1	1.1	116.0	127
02-029	25-13-02	CO-PILOT LCD CLOCK 122-382011	1	1.1	116.0	127
02-030	21-30-02	CABIN ALTITUDE 122-382036-35	1	1.5	118.0	177
02-031	21-30-01	CABIN PRESSURE CONTROLLER 130365-17	1	4.0	118.6	474
02-032	25-10-01	PILOT CONTROL WHEEL 96-650-520	1	2.5	129.0	322
02-033	25-10-02	CO-PILOT CONTROL WHEEL 96-650-521	1	2.5	129.0	322
02-034	25-15-01	SUNVISOR INSTL COCKPIT PILOT 122-530208-1	1	1.3	134.0	174
02-035	25-15-02	SUNVISOR INSTL COCKPIT CO-PILOT 122-530208-2	1	1.3	134.0	174
02-036	33-10-01	THUNDERSTORM LIGHT 122-384083-3	1	0.7	140.0	98
02-037	38-30-50	COCKPIT RELIEF TUBE 122-530180 INSTL.	1	0.6	141.8	85
02-038	22-10-02	AUTOPILOT ENGAGE PANEL COLLINS APP-85D	1	1.4	143.0	200
02-039	23-14-03	HANDSET (COCKPIT) WULFSBERG WH-10-114	1	1.4	143.0	200
02-040	25-11-01	PILOT'S CHAIR W/ SHOULDER HARNESS 122-530073	1	37.9	143.0	5419
02-041	25-11-02	COPILOT'S CHAIR W/ SHOULDER HARNESS 122-530073	1	37.9	143.0	5419
02-042	25-12-01	PILOT'S CONSOLE INSTL 122-530026-3	1	5.2	143.0	743
02-043	25-12-02	CO PILOT'S CONSOLE INSTL 122-530026-5	1	5.2	143.0	743
02-044	25-22-02	COVER ASSY CHAIR-CREW 122-530346-1/-2	2	4.3	143.0	614

ITEM NO.	ATA NO.	ITEM DESCRIPTION AND PART NUMBER	QUAN.	TOTAL WEIGHT LB.	ARM IN.	MOMENT LB-IN
02-045	31-40-01	DATA ACQUISITION UNIT DAU-850 W/ 4 CONNNECTORS	1	5.3	158.4	839
02-046	25-28-02	CABIN PARTITION - FORWARD RH W/IAAPS (122-384125-3 INSTL) 3 COMPARTMENT	1	26.0	161.0	4186
02-047	25-12-03	PILOT'S MAP CASE - 2 COMPARTMENT 122-530075-1	1	2.0	161.5	323
02-048	26-20-02	FIRE EXTINGUISHER - COCKPIT AMEREX 352TS	1	5.2	161.5	839
02-049	91-00-01	POH - MODEL 2000 122-590013-19	2	5.0	161.5	807
03-001	35-10-01	OXYGEN MASK 101-384220-1 MC1015-12	2	2.3	120.0	276
03-002	22-10-05	IAPS CARD CAGE COLLINS ICC-850A	1	24.0	163.0	3912
03-003	22-10-06	IAPS PWR SUPPLY COLLINS PWR-851A	4	5.2	163.0	847
03-004	22-10-07	IAPS INPUT OUTPUT MODULE COLLINS IOC-851	4	0.9	163.0	146
03-005	22-10-08	FLIGHT CONTROL COMPUTER COLLINS FCC-850	2	4.6	163.0	749
03-006	22-10-09	FLIGHT MANAGEMENT COMPUTER #1 COLLINS FMC-851A	1	1.6	163.0	260
03-007	22-10-10	FLIGHT MANAGEMENT COMPUTER #2 COLLINS FMC-852A	1	1.0	163.0	163
03-008	22-10-11	COU/IOC COUPLER UNIT RT SIDE COLLINS CDC-850A	1	0.9	163.0	146
03-009	25-28-01	CABIN PARTITION - FORWARD LH (122-384032 INSTL)	1	9.5	163.0	1548
03-010	25-12-04	COPILOT'S MAP CASE - 2 COMPARTMENT 122-530075-2	1	2.0	165.5	331
03-011	34-54-03	DME ANTENNA INSTL NO 1 S65-5366-10L	1	0.7	176.0	123
03-012	34-54-04	DME ANTENNA INSTL NO 2 S65-5366-10L	1	0.7	176.0	123
03-013	25-50-01	FWD BAGGAGE COMPT. RH W/TOILET & AMENITIES 122-384125	1	117.0	180.0	21060
03-014	38-30-01	TOILET ASSY 122-384020 HOLDING TANK	1	30.0	189.0	5670
03-015	38-30-02	TOILET FLUID	1	4.0	189.0	756
03-016	35-20-03	OXYGEN MASK AND CONTAINER - SINGLE 122-382051-13	1	1.0	194.5	194
04-001	25-29-03	DISPLAY-FLIGHT DATA CABIN 122-382123	1	1.2	197.0	236
04-002	26-20-03	FIRE EXTINGUISHER - CABIN AMEREX 352TS	1	5.2	197.0	1024
04-003	23-14-04	FLITEFONE ANTENNA RADIOPHONE WULFSBERG AT-461	1	0.5	199.0	99
04-004	25-33-01	CABINET - FWD RH W/ 4 DRAWERS, 4 DECANTERS & ICE CHEST, HOT CUP, 122-530265-1	1	75.0	205.0	15375
04-005	30-10-01	WING ICE LIGHT LH 122-364020-1	1	0.8	206.0	164
04-006	30-10-02	WING ICE LIGHT RH 122-364020-2	0	0.8	206.0	164
04-007	25-21-01	CABIN CHAIR - W/ STO FWD LH, AFT FACING 122-530264	1	52.1	219.0	11409
04-008	25-21-02	CABIN CHAIR - W/ STO FWD RH, AFT FACING 122-530264	1	52.1	219.0	11409
04-009	34-54-09	TRANSPONDER ANTENNA INSTL NO 1 S65-5366-10L	1	0.4	223.0	89
04-010	25-26-01	CABIN TABLE - FWD LH 122-530235-1	1	11.8	241.7	2852
04-011	25-26-02	CABIN TABLE - FWD RH 122-530235-2	1	11.8	241.7	2852
04-012	34-53-01	ADF RECEIVER ADF-462 & MOUNT	1	3.6	242.5	873
04-013	34-53-02	ADF ANTENNA 622-7383-001	1	0.4	247.0	98
04-014	25-23-01	CABIN CHAIR STORAGE COMPARTMENTS 122-384107	6	13.2	258.5	3412

ITEM NO.	ATA NO.	ITEM DESCRIPTION AND PART NUMBER	QUAN.	TOTAL WEIGHT LB.	ARM IN.	MOMENT LB-IN
04-015	25-29-01	CARPET PROTECTOR 122-530299	1	4.7	260.0	1222
04-016	25-22-01	COVER ASSY CHAIR 122-530346-1/-2	6	12.9	263.0	3392
04-017	34-54-10	TRANSPONDER ANTENNA INSTL NO 2 S65-5366-10L	1	0.4	271.0	108
04-018	25-21-03	CABIN CHAIR - W/ STO CTR LH, FWD FACING 122-530264	1	52.1	272.0	14171
04-019	25-21-04	CABIN CHAIR - W/ STO CTR RH, FWD FACING 122-530264	1	52.1	272.0	14171
04-020	56-20-01	POLARIOD MOTORIZED WINDOWS 122-530217	10	37.7	275.5	10386
04-021	35-20-01	OXYGEN MASKS AND CONTAINER - DOUBLE 122-380071-1 WITH COUCH (NO SINGLE)	4	4.6	279.8	1287
04-022	35-20-02	OXYGEN MASKS AND CONTAINER - DOUBLE 122-380071-1 WITH OUT COUCH	2	2.3	279.8	643
04-023	23-14-02	HANDSET (CABIN) WULFSBERG WH-10-114	1	1.4	280.0	392
04-024	23-30-04	AUDIO AMP & HARNESS	1	2.7	280.0	756
04-025	23-10-02	ANT INSTL VHF COMM #2 COLLINS CI12111	1	1.3	291.0	378
04-026	34-42-03	TRANSMITTER ANT S67-2002-14	1	0.4	295.0	118
04-027	25-21-05	CABIN CHAIR - W/ STO CTR LH, AFT FACING 122-530264	1	52.1	298.0	15525
04-028	25-21-06	CABIN CHAIR - W/ STO CTR RH, AFT FACING 122-530264	1	52.1	298.0	15525
04-029	34-42-04	RECEIVER ANTENNA S67-2002-14	1	0.4	323.0	129
04-030	25-24-03	COUCH DECORATIVE FRONT 122-384124	1	10.9	335.0	3651
04-031	25-29-02	ASHTRAY & CUPHOLDER ASSY 122-384123	2	1.1	335.0	368
04-032	30-90-01	DE-ICE KIT-WHEEL BRAKE MAIN 122-970070-1	2	24.0	344.0	8256
04-033	32-40-01	MAIN GEAR WHEEL AND TIRE - 19.5 X 6.75-10 122-810078-1	4	81.0	344.0	27864
04-034	32-40-02	DUAL-DISC BRAKE 5007573-2	4	72.0	344.0	24768
04-035	25-24-01	COUCH 122-530216	1	78.0	345.0	26910
04-036	25-24-02	COVER ASSY COUCH 122-530246-5	1	2.9	345.0	1000
05-001	25-50-02	BAGGAGE WEBBING 101-531188-5 OR -7	1	1.4	364.0	509
05-002	23-14-01	TRANSCEIVER AND MOUNT - FLITEFONE VI WULFSBERG RT-18D	1	7.8	365.0	2847
05-003	34-42-01	RADIO ALTIMETER TRANSCEIVER ALT-55B	1	5.6	372.0	2083
05-004	34-42-01	RADIO ALTIMETER TRANSCEIVER ALT-55B	1	5.6	372.0	2083
05-005	34-50-05	MARKER BEACON ANTENNA 31-10-01	1	0.7	372.0	260
05-006	25-28-07	AFT BAGGAGE CARPET 122-530278-1	1	4.2	386.5	1623
05-007	34-52-02	VLF ANTENNA INSTL 270-1306-000	1	3.2	396.0	1267
05-008	23-30-05	ANT INSTL-FM CI-222	1	0.8	405.0	324
06-001	25-28-06	AFT BAGGAGE PARTITION 122-384118	1	11.7	357.0	4176
06-002	34-50-03	VHF NAV ANTENNA NO 1 S65-247-12	1	1.8	518.7	933
06-003	34-50-04	VHF NAV ANTENNA NO 2 S65-247-12	1	1.8	518.7	933
06-004	25-60-01	EMERGENCY LOCATOR TRANSMITTER 122-342004	1	2.8	526.0	1472
06-005	25-60-02	ELT ANTENNA 122-342060-3	1	0.3	526.0	157

ITEM NO.	ATA NO.	ITEM DESCRIPTION AND PART NUMBER	QUAN.	TOTAL WEIGHT LB.	ARM IN.	MOMENT LB-IN
07-001	28-00-01	UNUSABLE FUEL	1	38.0	326.0	12388
07-002	30-10-05	AFT WING DEICE BOOT S35-7D5220-03 THRU -08	2	49.1	354.7	17415
07-003	34-20-03	FLUX DETECTOR NO 1 LH COLLINS FDU-70	1	0.9	470.0	423
07-004	34-20-04	FLUX DETECTOR NO 2 RH COLLINS FDU-70	1	0.9	470.0	423
07-005	33-40-01	LANDING LIGHT WING 122-364210-1	2	2.3	479.0	1101
07-006	33-40-03	WING TIP LIGHT - POSITION/STROBE/RECOGNITION 122-364179	2	7.0	504.0	3528
07-007	33-40-05	STROBE LIGHT POWER SUPPLY WHELEN 01-0770347-00	2	3.6	504.0	1814
07-008	33-40-04	TAIL LIGHT - POSITION/STROBE 101-361159-5	1	0.6	526.0	315
08-001	26-20-01	FIRE EXTINGUISHER CONTAINER - ENGINE 30300102 WALTER KIDDE 472438-1	2	12.1	374.0	4525
08-002	72-00-01	ENGINE - TURBO-PROP UACL PT6A-67A	2	1302.0	425.0	553350
08-003	80-10-01	STARTER-GENERATOR AND MOUNTING KIT 90-389000-9 23085-001	2	66.0	426.0	28116
08-004	77-10-04	TACHOMETER GENERATOR 122-389057-1	2	2.8	427.4	1196
08-005	73-30-01	FUEL FLOW TRANSMITTER 101-384153-1	2	1.3	434.5	564
08-006	79-00-01	ENGINE OIL	1	58.5	447.4	26172
08-007	61-20-03	OVERSPEED GOVERNOR - PROPELLER 122-389037	2	5.8	486.2	2819
08-008	77-10-01	TORQUE TRANSMITTER 122-389028	2	1.6	486.2	777
08-009	61-10-01	PROPELLERS AND SPINNER - 5-BLADED 5JFR36C1003/C-L104DS MCCAULEY	2	476.0	530.0	252280

SECTION VII

SUPPLEMENTS

NOTE

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

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RAYTHEON AIRCRAFT
BEECH® STARSHIP 1 MODEL 2000
FAA APPROVED AIRPLANE FLIGHT MANUAL
P/N 122-590013-37
LOG OF SUPPLEMENTS

FAA Supplement must be in the airplane for flight operation when subject equipment is installed.

Part Number	Subject	Rev No.	Date
122-590013-31	Fairchild A100A Cockpit Voice Recorder (CVR) and Fairchild A100S Cockpit Voice Recorder (CVR)	3	July, 1994
122-590013-33	Fairchild F1000 Series Flight Data Recorder (FDR)	1	April, 1994
122-590013-43	Airplanes Modified by Beechcraft Kit P/N 122-9002 (Increased Gross Weight To 14,900 lbs)		Sept, 1992
122-590013-45	Ground Icing Detector System (NC-10, NC-44 and after, if installed and airplanes modified by Beechcraft Kit P/N 122-5024)		August, 1992
*122-590013-51	Airplanes Configured as Starship Cameraships modified by Beechcraft Kit P/N 122-4014		Nov, 1995
*122-590013-53	Airplanes Configured with Portable Flight Inspection System modified by Beechcraft Kit P/N 122-3025		August, 1995

NOTE: Supplements applicable to equipment other than that installed may, at the discretion of the owner/operator, be removed from the manual.

** Supplements marked with an asterisk will not be supplied with handbooks sold through Authorized Beech Outlets due to their limited applicability. If a document is required for your airplane, please order the document through normal channels.*

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*122-590013-53	Airplanes Configured with Portable Flight Inspection System modified by Beechcraft Kit P/N 122-3025		August, 1995
FMS-RAF98K3	Concord Aircraft Battery	ER	07-24-98
ACC-97-21	Dual Collins AMS-850 with NAA		Oct 10, 1997

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