PILOT'S OPERATING HANDBOOK
and FAA Approved
Airplane Flight Manual

for the
Beechcraft

SUPER KING AIR

MODEL 200 & 200C

(Serials BB-2, BB-6 and after, BL-1 and after)

FAA APPROVED IN NORMAL CATEGORY BASED ON FAR 23. THIS DOCUMENT MUST BE CARRIED IN THE AIRPLANE AT ALL TIMES, AND BE KEPT WITHIN REACH OF THE PILOT DURING ALL FLIGHT OPERATIONS. THIS HANDBOOK INCLUDES THE MATERIAL REQUIRED TO BE FURNISHED TO THE PILOT BY FAR PART 23.

AIRPLANE SERIAL NUMBER ____________ AIRPLANE REGISTRATION NUMBER ____________

FAA Approved by

Donald St Petro
for W. H. Schultz
Beech Aircraft Corporation
DOA CE-2

PUBLISHED BY
COMMERCIAL PRODUCT SUPPORT
BEECH AIRCRAFT CORPORATION
WICHITA, KANSAS 67201
U. S. A.

Part Number 101-590010-127
(Supersedes P/N 101-590010-5)
Issued: October, 1978

Part Number 101-590010-127A2
Revised: October, 1979

P/N 101-590010-127A2
A2 REVISION, OCTOBER, 1979
to the
BEECHCRAFT SUPER KING AIR 200 / 200C
PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

INSTRUCTION SHEET

PAGE	REMOVE EXISTING PAGE	INSERT NEW PAGE
Title	Feb. 1979	Oct. 1979
Blank	----	----
Page A(A2)	----	Oct. 1979
Blank	----	----
1-11	Oct. 1978	Oct. 1979
1-12	Oct. 1978	Oct. 1979
2-3	Feb. 1979	Oct. 1978
2-4	Feb. 1979	Oct. 1979
2-7	Oct. 1978	Oct. 1979
2-8	Oct. 1978	Oct. 1979
2-13	Oct. 1978	Oct. 1979
2-14	Oct. 1978	Oct. 1979
2-15	Oct. 1978	Oct. 1979
2-16	Oct. 1978	Oct. 1978
2-17	Oct. 1978	Oct. 1979
2-18	Oct. 1978	Oct. 1979
2-19	Feb. 1979	Oct. 1979
2-20	Feb. 1979	Feb. 1979
2-23	Oct. 1978	Oct. 1978
2-24	Oct. 1978	Oct. 1979
2-25	Oct. 1978	Oct. 1979
2-26	Oct. 1978	Oct. 1978
3-9	Oct. 1978	Oct. 1978
3-10	Oct. 1978	Oct. 1979

PAGE	REMOVE EXISTING PAGE	INSERT NEW PAGE
4-1	Feb. 1979	Oct. 1979
4-2	Feb. 1979	Feb. 1979
4-9	Oct. 1978	Oct. 1979
4-10	Oct. 1978	Oct. 1978
4-11	Oct. 1978	Oct. 1979
4-12	Oct. 1978	Oct. 1978
4-19	Oct. 1978	Oct. 1979
4-20	Oct. 1978	Oct. 1978
4-21	Feb. 1979	Oct. 1979
Blank	----	----
5-23	Oct. 1978	Oct. 1978
5-24	Oct. 1978	Oct. 1979
5-109	Oct. 1978	Oct. 1979
5-110	Oct. 1978	Oct. 1978
6-5	Oct. 1978	Oct. 1978
6-6	Oct. 1978	Oct. 1979
7-13	Oct. 1978	Oct. 1979
7-14	Feb. 1979	Feb. 1979
7-49	Oct. 1978	Oct. 1979
7-50	Oct. 1978	Oct. 1978
8-27	Oct. 1978	Oct. 1979
8-28	Oct. 1978	Oct. 1978

After compliance, this Instruction Sheet may be discarded.

98-37516A

P/N 101-590010-127A2
A2 REVISION, OCTOBER, 1979
to the
BEECHCRAFT SUPER KING AIR 200 / 200C
PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

INSTRUCTION SHEET

PAGE	REMOVE EXISTING PAGE	INSERT NEW PAGE
Title	Feb. 1979	Oct. 1979
Blank	----	----
Page A (A2)	----	Oct. 1979
Blank	----	----
1-11	Oct. 1978	Oct. 1979
1-12	Oct. 1978	Oct. 1979
2-3	Feb. 1979	Oct. 1979
2-4	Feb. 1979	Oct. 1979
2-7	Oct. 1978	Oct. 1979
2-8	Oct. 1978	Oct. 1979
2-13	Oct. 1978	Oct. 1979
2-14	Oct. 1978	Oct. 1979
2-15	Oct. 1978	Oct. 1979
2-16	Oct. 1978	Oct. 1979
2-17	Oct. 1978	Oct. 1979
2-18	Oct. 1978	Oct. 1979
2-19	Feb. 1979	Oct. 1979
2-20	Feb. 1979	Feb. 1979
2-23	Oct. 1978	Oct. 1979
2-24	Oct. 1978	Oct. 1978
2-25	Oct. 1978	Oct. 1979
2-26	Oct. 1978	Oct. 1978
3-9	Oct. 1978	Oct. 1978
3-10	Oct. 1978	Oct. 1979

PAGE	REMOVE EXISTING PAGE	INSERT NEW PAGE
4-1	Feb. 1979	Oct. 1979
4-2	Feb. 1979	Feb. 1979
4-9	Oct. 1978	Oct. 1979
4-10	Oct. 1978	Oct. 1978
4-11	Oct. 1978	Oct. 1979
4-12	Oct. 1978	Oct. 1978
4-19	Oct. 1978	Oct. 1979
4-20	Oct. 1978	Oct. 1978
4-21	Feb. 1979	Oct. 1979
Blank	----	----
5-23	Oct. 1978	Oct. 1978
5-24	Oct. 1978	Oct. 1979
5-109	Oct. 1978	Oct. 1979
5-110	Oct. 1978	Oct. 1978
6-5	Oct. 1978	Oct. 1978
6-6	Oct. 1978	Oct. 1979
[illegible]	Oct. 1978	Oct. 1979
[illegible]	Feb. 1979	Feb. 1979
[illegible]	Oct. 1978	Oct. 1979
[illegible]	Oct. 1978	Oct. 1978
8-27	Oct. 1978	Oct. 1979
8-28	Oct. 1978	Oct. 1978

After compliance, this Instruction Sheet may be discarded.

LOG OF REVISIONS

A2 Revision .... October, 1979

Page	Description
Title Page	Update
Page A(A2)	New
1-11	Revised "General Airspeed Terminology (V_1)"
1-12	Revised "Meteorological Terminology (Pressure Altitude)"
2-4	Revised "Airspeed Indicator Markings"
2-7	Revised "Approved Fuel Grades and Additive"
2-8	Revised "Fuel Management"
2-13, 2-14, 2-15, 2-17 and 2-18	Revised "Required Equipment For Various Conditions of Flight"
2-19	Revised "Maximum Operating Pressure Altitude Limits (Normal Operations)"
2-24	Shifted Material
2-25	Revised "Placards (Exit Lock)"
3-10	Revised "Flight Controls (Uncheduled Electric Elevator Trim)"
4-1	Revised "Table of Contents"
4-9	Revised "Before Takeoff (Runup)"
4-11	Revised "Approach"
4-19	Revised "Icing Flight"
4-21	Revised "Noise Characteristics"
5-24	Revised Graph (Note)
5-109	Revised "Time, Fuel and Distance To Descend"
6-6	Revised "Loading Data Cargo Configuration"
7-13	Revised "Annunciator System"
7-49	Revised Schematic
8-27	Revised "Consumable Materials"

A2

SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

The following glossary is applicable within this handbook.

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 when corrected for instrument error. IAS values published in this handbook assume zero instrument error.

KCAS — *Calibrated Airspeed* expressed in *knots.*

KIAS — *Indicated Airspeed* expressed in *knots.*

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.*

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_{LOF} — *Lift-off Speed.*

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 and windmilling, a 5-degree bank towards the operative engine, take-off power on operative engine, landing gear up, flaps in take-off 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_{MCG} — *Ground Minimum Control Speed.*

V_{MO}/M_{MO} — *Maximum Operating Limit Speed* is the speed limit that may not be deliberately exceeded in normal flight operations. V is expressed in knots and M in Mach Number.

V_R *Rotation 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. Intentional failing of one engine below this speed is not recommended.

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

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

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) adjusted for compressibility effects, or from ground meterological 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 handbook, 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 handbook 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.

The limitations included in this Section have been approved by the Federal Aviation Administration, and they must be observed in the operation of the Beechcraft Super King Air 200.

AIRSPEED LIMITATIONS			
SPEED	**KCAS**	**KIAS**	**REMARKS**
Maneuvering Speed VA (12,500 pounds)	182	181	Do not make full or abrupt control movements above this speed.
Maximum Flap Extension/ Extended Speed VFE Approach Position - 40% Full Down Position - 100%	 200 144	 200 146	Do not extend flaps or operate with flaps in prescribed position above these speeds.
Maximum Landing Gear Operating Speed VLO Extension Retraction	 182 164	 181 163	Do not extend or retract landing gear above the speeds given.
Maximum Landing Gear Extended Speed VLE	182	181	Do not exceed this speed with landing gear extended.
Air Minimum Control Speed VMCA	91	86	This is the lowest airspeed at which the airplane is directionally controllable when one engine suddenly becomes inoperative and the other engine is at take-off power. (See definition in Section I.)
*Maximum Operating Speed VMO MMO	 270 .48 Mach	 269	Do not exceed this airspeed or Mach Number in any operation.
**Maximum Operating Speed VMO MMO	 260 .52 Mach	 259	Do not exceed this airspeed or Mach Number in any operation.

* *BB-2 thru BB-198, except airplanes modified by Beechcraft Kit Number 101-5033-1 S in compliance with Beechcraft* Service Instruction Number 0894.

**BB-199 and after, BL-1 and after, and any earlier airplanes modified by Beechcraft Kit Number 101-5033-1 S in compliance with Beechcraft Service Instruction Number 0894.

AIRSPEED INDICATOR MARKINGS*			
MARKING	KCAS VALUE OR RANGE	KIAS VALUE OR RANGE	SIGNIFICANCE
Red Line	91	86	Air Minimum Control Speed (V_{MCA})
White Arc	80 to 144	75 to 146	Full-flap Operating Range
Wide White Arc	80 to 102	75 to 99	Lower Limit is the Stalling Speed (V_{SO}) at maximum weight with Full Flaps (100%) and idle power.
Narrow White Arc	102 to 144	99 to 146	Lower Limit is the Stalling Speed (V_S) at maximum weight with Flaps Up (0%) and idle power. Upper limit is the maximum speed permissible with flaps extended beyond Approach (more than 40%).
White Triangle	200	200	Maximum Flaps-to/at-Approach (40%) Speed
Blue Line	122	121	One-Engine-Inoperative Best Rate-of-Climb Speed
**Red & White Hash-Marked Pointer	270 KCAS (269 KIAS) or value equal to .48 Mach, whichever is lower.		Maximum Speed for any operation.
***Red & White Hash-Marked Pointer	260 KCAS (259 KIAS) or value equal to .52 Mach, whichever is lower.		Maximum Speed for any operation.

** The airspeed indicator is marked in CAS values.*
*** BB-2 thru BB-198, except airplanes modified by Beechcraft Kit Number 101-5033-1 S in compliance with Beechcraft Service Instructions Number 0894.*
****BB-199 and after, BL-1 and after and any earlier airplanes modified by Beechcraft Kit Number 101-5033-1 S in compliance with Beechcraft Service Instructions Number 0894.*

POWER PLANT LIMITATIONS

NUMBER OF ENGINES

2

ENGINE MANUFACTURER

Pratt & Whitney Aircraft of Canada Ltd.

ENGINE MODEL NUMBER

PT6A-41

MILITARY AVIATION GASOLINE GRADES

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

LIMITATIONS ON THE USE OF AVIATION GASOLINE

1. Operation is limited to 150 hours between engine overhauls.
2. Operation is limited to 20,000 feet pressure altitude (FL 200) or below if either standby boost pump is inoperative.
3. Crossfeed capability is required for climbs above 20,000 feet pressure altitude (FL 200).

APPROVED FUEL ADDITIVE

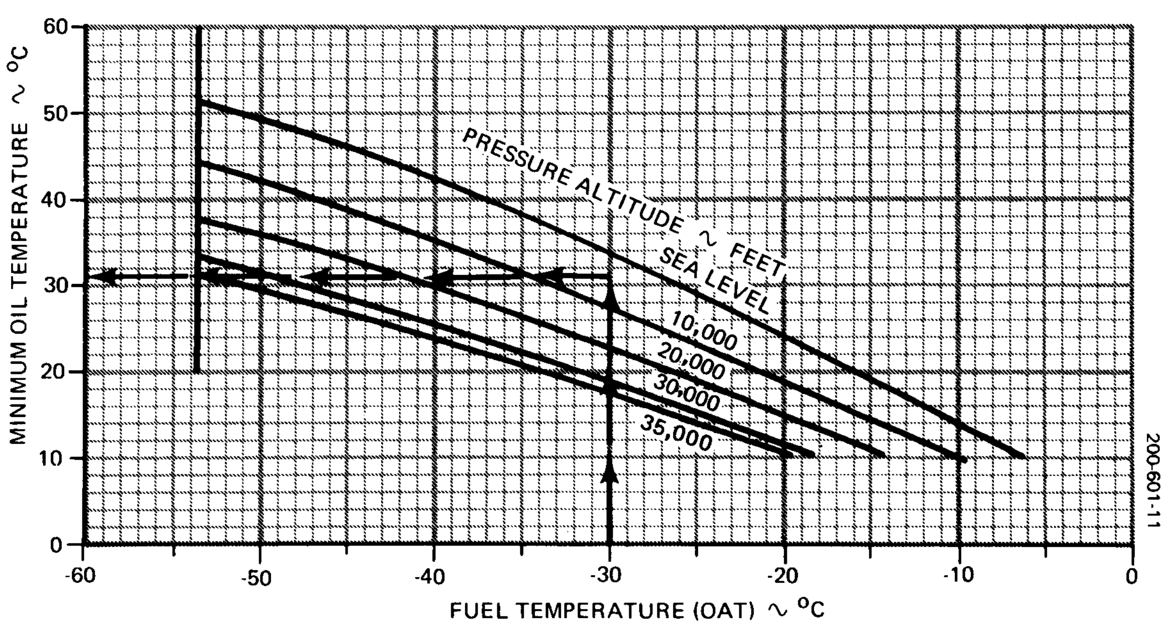
Anti-icing additive conforming to Specification MIL-I-27686 is the only approved fuel additive.

Engine oil is used to heat the fuel on entering the fuel control. Since no temperature measurement is available for the fuel at this point, it must be assumed to be the same as the OAT. The graph below is supplied for use as a guide in preflight planning, based on known or forecast operating conditions, to allow the operator to become aware of operating temperatures where icing at the fuel control could occur. If the plot should indicate that oil temperature versus OAT is such that ice formation could occur during takeoff or in flight, anti-icing additive per MIL-I-27686 must be mixed with the fuel at refueling to ensure safe operation.

CAUTION

Anti-icing additive must be properly blended with the fuel to avoid deterioration of the fuel cells. The additive concentration by volume shall be a minimum of 0.060% and a maximum of 0.15%. Approved procedure for adding anti-icing concentrate is contained in Section IV.

JP-4 fuel per MIL-T-5624 has anti-icing additive per MIL-I-27686 blended in the fuel at the refinery, and no further treatment is necessary. 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

1. Do not put any fuel into the auxiliary tanks unless the main tanks are full.
2. Maximum allowable fuel imbalance between wing fuel systems is 1000 pounds.
3. Do not take off if fuel quantity gages indicate in yellow arc or less than 265 pounds of fuel in each main tank.
4. Crossfeeding of fuel is permitted only when one engine is inoperative.

WARNING

The airplane is approved for takeoff with one standby boost pump inoperative, but in such a case, crossfeed of fuel will not be available from the side of the inoperative standby boost pump.

OIL SPECIFICATION

Any oil specified by brand name in the latest revision of *Pratt & Whitney Service Bulletin Number 3001* is approved for use in the PT6A-41 engine.

NUMBER OF PROPELLERS

2

PROPELLER MANUFACTURER

Hartzell Propeller, Inc.

PROPELLER HUB AND BLADE MODEL NUMBERS

HUBS

HC-B3TN-3G

BLADES

T10178B-3R

PROPELLER DIAMETER

98.5 inches only

PROPELLER BLADE ANGLES AT 30-INCH STATION

Feathered: + 90°
Reverse: − 9°

REQUIRED EQUIPMENT FOR VARIOUS CONDITIONS OF FLIGHT

Federal Aviation Regulations Part 23 and Part 91 specify the minimum numbers and types of airplane instruments and equipment which must be installed and operable for various kinds of flight conditions. This includes VFR day, VFR night, IFR day, IFR night, and flight into known icing conditions.

The operator who desires to function under FAR Part 135 will find certain additional items of required equipment, which will be prefaced in the Required Equipment Listing below by "**(FAR 135)**". These items must be considered in addition to the normal listed requirements, in order to comply with the appropriate regulations.

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

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

No distinction is made between standard and optional equipment. The "Number Installed" column indicates the number of items normally found on the airplane when that item is installed; however, in some cases the actual number may vary due to customized installations.

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

LEGEND

Numbers refer to quantities required to be operative for the specified condition.

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

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

(V) Indicates that the number of items installed varies.

(L) Indicates that the item on the left side of the airplane is required to be operative.

SYSTEM and/or COMPONENT	Number of items installed	VFR Day	VFR Night	IFR Day	IFR Night	Known Icing Conditions	REMARKS and/or EXCEPTIONS
COMMUNICATIONS							
Static Discharge Wicks	15	-	-	6*	6*	6*	– *Minimum required - one wick at the outboard end of each control surface plus top of vertical stabilizer.
VHF Communications System	2	*	*	*	*	*	– *Per FAR 91.33, 135.161, 135.417
ELECTRICAL POWER							
AC Volt/Frequency Meter	1	-	-	-	-	-	–
Battery	1	1	1	1	1	1	–
Battery Charge Annunciator	1	1	1	1	1	1	–
DC Generator	2	1	1	2	2	2	–
DC Generator Caution Annunciator	2	2	2	2	2	2	– One may be inoperative provided corresponding loadmeter is monitored.
DC Loadmeter	2	2	2	2	2	2	– One may be inoperative provided corresponding generator caution light is monitored.
Inverter	2	1	1	2	2	2	–
Inverter Warning Annunciator	1	-	-	1	1	1	–
ENGINE INDICATING INSTRUMENTS							
Chip Detector Annunciator	2	2	2	2	2	2	–
Fuel Flow Indicator	2	2	2	2	2	2	– One may be inoperative provided fuel quantity gages are operative.
Gas Generator Tachometer	2	2	2	2	2	2	–
ITT Indicator	2	2	2	2	2	2	–
Oil Pressure Indicator	2	2	2	2	2	2	–
Oil Temperature Indicator	2	2	2	2	2	2	–
Propeller Synchroscope	1	-	-	-	-	-	–
Propeller Tachometer	2	1	1	1	1	1	–
Torque Indicator	2	2	2	2	2	2	–
ENVIRONMENTAL SYSTEMS							
Altitude Warning Annunciator	1	1	1	1	1	1	– May be inoperative provided airplane remains unpressurized.
Bleed Air Fail Annunciator	2	0*	0*	1*	1*	2	– *Use of bleed air from side with inoperative annunciator is prohibited.
Cabin Rate of Climb Indicator	1	1	1	1	1	1	– } May be inoperative provided airplane remains unpressurized.
Differential Pressure/Cabin Altitude	1	1	1	1	1	1	– }
Duct Overtemp Caution Annunciator	1	-	-	-	-	-	–
Outflow Valve	1	1	1	1	1	1	– } May be inoperative provided airplane remains unpressurized.
Pressurization Air Source	2	1	1	1	1	1	}
Pressurization Controller	1	1	1	1	1	1	}
Safety Valve	1	1	1	1	1	1	– }

SYSTEM and/or COMPONENT	Number of items installed	VFR Day	VFR Night	IFR Day	IFR Night	Known Icing Conditions	REMARKS and/or EXCEPTIONS
EQUIPMENT/FURNISHINGS							
Emergency Locator Transmitter	1	*	*	*	*	*	– *Per FAR 91.52
(FAR 135) Over Water Emergency Equipment	**0**	*	*	*	*	*	– ***Per FAR 135.167**
Seat Belts	V	*	*	*	*	*	– *Per FAR 91.33
Shoulder Harness	V	*	*	*	*	*	– *Required for pilot and copilot. Required for each additional forward-facing occupant if seat is so-equipped.
FIRE PROTECTION							
Engine Fire Extinguisher	2	-	-	-	-	-	–
Fire Detector System	2	2	2	2	2	2	–
Portable Fire Extinguisher	2	-	-	-	-	-	–
(FAR 135) Portable Fire Extinguisher	**2**	**2**	**2**	**2**	**2**	**2**	**–**
FLIGHT CONTROLS							
Flap Position Indicator	1	1	1	1	1	1	– May be inoperative provided that the flap travel is visually inspected prior to takeoff.
Flap System	1	-	-	-	-	-	–
Rudder Boost	1	-	-	-	-	-	–
Stall Warning Horn	1	1	1	1	1	1	–
Trim Tab Indicator - Rudder, Aileron, and Elevator	3	3	3	3	3	3	– May be inoperative provided that the tabs are visually checked in the neutral position prior to each takeoff and checked for full range of operation.
Yaw Damp	1	1	1	1	1	1	– May be inoperative for flight at and below 17,000 feet.
FUEL							
Crossfeed Annunciator	1	1	1	1	1	1	– May be inoperative provided proper operation of crossfeed system is checked prior to takeoff. Both fuel pressure lights must be operative.
Crossfeed Valve	1	*	*	*	*	*	– *Required for: (1) Operation with aviation gasoline above 20,000 feet; or (2) When operating with aviation kerosene when one standby boost pump is inoperative.
Engine Driven Boost Pump	2	2	2	2	2	2	–
Firewall Shutoff Valve	2	2	2	2	2	2	–

SYSTEM and/or COMPONENT	Number of items installed	VFR Day	VFR Night	IFR Day	IFR Night	Known Icing Conditions	REMARKS and/or EXCEPTIONS
FUEL (Continued)							
Fuel Pressure Warning Annunciator	2	2	2	2	2	2	– One may be inoperative provided standby boost pump operation is ascertained using opposite light with crossfeed prior to engine start. Standby boost pump on side of failed light must be operated in flight, to assure fuel pressure if the engine driven pump should fail.
Fuel Quantity Gage Selector Switch	1	1	1	1	1	1	– May be inoperative provided MAIN quantity indicators are operational.
Fuel Quantity Indicator	2	2	2	2	2	2	– One may be inoperative provided other side is operational and amount of fuel on board can be established to be adequate for intended flight. Fuel flow indicator on affected side must be operational and monitored.
Jet Transfer Pump	2	*	*	*	*	*	– *Required only if Aux Tanks contain fuel.
Motive Flow Valve	2	*	*	*	*	*	– *Required only if Aux Tanks contain fuel.
Standby Fuel Boost Pump	2	1*	1*	1*	1*	1*	– *Both required for operation on Aviation Gasoline above 20,000 feet.
ICE AND RAIN PROTECTION							
Airfoil Deice System (Wing and Horizontal Stabilizer)	1	-	-	-	-	1	–
Alternate Static Air Source	1	1	1	1	1	1	–
Auto Ignition System and Annunciators	2	2	2	2	2	2	–
Engine Inertial Ice Vanes	2	2	2	2	2	2	–
Heated Fuel Vent	2	-	-	-	-	2	–
Ice Vane Annunciators	4	4	4	4	4	4	– May be inoperative provided manual ice vane controls are used.
Pitot Heater	2	-	-	L	L	L	–
(FAR 135) Pitot Heater	**2**	**-**	**-**	**2***	**2***	**2***	**– *Right side may be inoperative if second crew member is not required.**
Propeller Deice System (Auto)	1	-	-	-	-	1	–
Propeller Deice System (Manual)	1	-	-	-	-	1	–
Stall Warning Heater	1	-	-	-	-	1	–
Windshield Heat (Left and Right)	2	-	-	-	-	L	–
Windshield Wiper	2	-	-	-	-	-	–
LANDING GEAR							
Gear Handle Lights	2	1	1	1	1	1	–
Landing Gear Aural Warning	1	1	1	1	1	1	–

SYSTEM and/or COMPONENT	Number of items installed	VFR Day	VFR Night	IFR Day	IFR Night	Known Icing Conditions	REMARKS and/or EXCEPTIONS
LANDING GEAR (Continued)							
Landing Gear Motor	1	1	1	1	1	1	– May be inoperative provided operations are continued only to a point where repairs can be accomplished.
Landing Gear Position Indication Lights	3	3	3	3	3	3	– One of three may be inoperative provided gear handle light is monitored.
LIGHTS							
Cabin Door Caution Annunciator	1	1	1	1	1	1	– May be inoperative provided visual indicators are checked prior to each takeoff.
Caution Flasher Lights	2	-	-	-	-	-	–
Cockpit and Instrument Lights	V	-	*	-	*	-	– *Lights must illuminate all instruments and controls.
(FAR 135) Flashlight	**0**	**–**	*****	**–**	*****	**–**	**– *Per FAR 135.159**
Landing Light	2	-	*	-	*	-	– *One required for night flight if operated for hire.
Passenger Notice System (Fasten Seat Belt and No Smoking)	1	1	1	1	1	1	– May be inoperative provided adequate passenger briefing has been accomplished.
Position Lights	3	-	3	-	3	-	–
Rotating Beacon	2	-	2	-	2	-	–
Strobe Lights	3	-	-	-	-	-	–
Taxi Light	1	-	-	-	-	-	–
Warning Flasher Lights	2	-	-	-	-	-	–
Wing Ice Lights	2	-	-	-	-	*	– *One required for night icing flight.
NAVIGATION INSTRUMENTS							
Airspeed Indicator	2	L	L	L	L	L	–
(FAR 135) Airspeed Indicator	**2**	**L**	**L**	**2***	**2***	**2***	**– *Right side may be inoperative if second crew member is not required.**
Clock	2	-	-	1	1	1	–
Directional Gyro	2	-	-	L	L	L	–
(FAR 135) Directional Gyro	**2**	**L**	**L**	**2***	**2***	**2***	**– *Right side may be inoperative if second crew member is not required.**
Distance Measuring Equipment	V	*	*	*	*	*	– *Per FAR 91.33
Horizon Indicator	2	-	-	L	L	L	–
(FAR 135) Horizon Indicator	**2**	**L**	**L**	**2***	**2***	**2***	**– *Right side may be inoperative if second crew member is not required.**
Magnetic Compass	1	1	1	1	1	1	–
(FAR 135) Marker Beacon	**V**	*****	*****	*****	*****	*****	**– *Per FAR 135.165**
Navigation Equipment	V	-	-	*	*	*	– *Per FAR 91.33, 135.161

SYSTEM and/or COMPONENT	Number of items installed	VFR Day	VFR Night	IFR Day	IFR Night	Known Icing Conditions	REMARKS and/or EXCEPTIONS
NAVIGATION INSTRUMENTS (Continued)							
Outside Air Temperature	1	1	1	1	1	1	–
Sensitive Aitimeter	2	L	L	L	L	L	–
(FAR 135) Sensitive Altimeter	**2**	**L**	**L**	**2***	**2***	**2***	**– *Right side may be inoperative if second crew member is not required.**
Transponder	V	*	*	*	*	*	– *Per FAR 91.24, 91.90, 91.97
Turn and Bank Indicator	2	-	-	L	L	L	–
(FAR 135) Turn and Bank Indicator	**2**	**L**	**L**	**2***	**2***	**2***	**– *Right side may be inoperative if second crew member is not required.**
Vertical Speed Indicator	2	-	-	-	-	-	–
(FAR 135) Vertical Speed Indicator	**2**	**-**	**-**	**2***	**2***	**2***	**– *Right side may be inoperative if second crew member is not required.**
OXYGEN							
Oxygen System	1	*	*	*	*	*	– *Per FAR 91.32, 135.89, 135.157, 23.1447(b)
PROPELLERS							
Autofeathering Armed Light	2	-	-	-	-	-	–
Autofeathering System	1	-	-	-	-	-	–
Propeller Governor Test Switch:							
(BB-2 thru BB-162)	2	2	2	2	2	2	–
(BB-163 and after, BL-1 and after)	1	1	1	1	1	1	–
Propeller Overspeed Governor	2	2	2	2	2	2	–
Propeller Primary Low-Pitch Stop	2	2	2	2	2	2	–
Propeller Synchrophaser	1	-	-	-	-	-	–
Reverse Not Ready Annunciator	1	1	1	1	1	1	– May be inoperative provided propeller controls are in FULL INCREASE RPM position for reversing.
VACUUM							
Instrument Bleed Air Source	2	-	-	1	1	2	–
Instrument Bleed Air Valve	2	2	2	2	2	2	– One may be inoperative provided the engine on the affected side is secured in the event of a bleed air fail warning.
Suction Gage	1	*	*	1	1	1	– *May be inoperative provided airplane remains unpressurized.
Vacuum System	1	*	*	1	1	1	– *May be inoperative provided airplane remains unpressurized.

MAXIMUM OPERATING PRESSURE-ALTITUDE LIMITS

Normal Operation:

Serials BB-38, BB-39, BB-42, BB-44, BB-54 and after*; BL-1 and after .... 35,000 feet
Serials prior to BB-54 except BB-38, BB-39, BB-42 and BB-44 .... 31,000 feet

* And any earlier airplanes modified by BEECHCRAFT Kits 101-5007 and 101-5008 in compliance with BEECHCRAFT Service Instruction number 0776-341.

Operation with Aviation Gasoline:
Both Standby Boost Pumps Operative .... 31,000 feet
Either Standby Boost Pump Inoperative .... 20,000 feet
Climbs without Crossfeed Capability .... 20,000 feet

Operation with Yaw Damp System Inoperative .... 17,000 feet

OUTSIDE AIR TEMPERATURE LIMITS

Do not operate the airplane when the outside air temperature is outside the limits specified below.

MINIMUM LIMIT

All Altitudes .... −53.9°C

MAXIMUM LIMIT

Sea Level to 25,000 feet pressure altitude .... ISA + 37°C

Above 25,000 feet pressure altitude .... ISA + 31°C

CABIN PRESSURIZATION LIMIT

Maximum Cabin Pressure Differential .... 6.1 psi

MAXIMUM OCCUPANCY LIMIT

FAR Part 91 Operations .... Fifteen (15)

FAR Part 135 Operations .... Nine (9) Passengers Plus Crew

ICE VANES (INERTIAL SEPARATOR SYSTEM) LIMITATIONS

The ice vanes shall be extended for operations in ambient temperatures of +5°C or below when flight free of visible moisture cannot be assured.

The ice vanes shall be retracted for operations in ambient temperatures of +15°C or above.

Once the manual override system is activated (i.e., anytime the ICE VANE EMERGENCY MANUAL EXTENSION handle has been pulled out), do not attempt to operate the ice vanes electrically until the override assembly inside the engine cowling has been properly reset on the ground. Even after the manual extension handle has been pushed back in, the manual override system is still engaged.

STARTERS

Use of the starter is limited to 40 seconds ON, 60 seconds OFF, 40 seconds ON, 60 seconds OFF, 40 seconds ON, then 30 minutes OFF.

FLIGHT IDLE STOP

The flight idle stop shall be set so that 800 ± 60 foot-pounds torque is obtained at 1800 rpm (N_2) at Sea Level, Standard Day conditions.

AUTOPILOT LIMITATIONS

FAR PART 91 OPERATIONS

Refer to the applicable FAA Approved Airplane Flight Manual Supplement in the SUPPLEMENTS Section.

FAR PART 135 OPERATIONS

Refer to the applicable FAA Approved Airplane Flight Manual Supplement in the SUPPLEMENTS Section, except for Minimum Altitude, which is established by FAR Part 135 as follows:

1. Enroute - 500 feet above terrain
2. Coupled Approach - Observe Decision Height (DH) or Minimum Descent Altitude (MDA).

AFT-FACING SEATS

Only aft-facing seats (placarded as such on the leg crossmember) are authorized in the aft-facing position. The headrest and seatback of each occupied aft-facing seat must be in the fully raised position for takeoff and landing.

STRUCTURAL LIMITATIONS

Maximum Cabin Pressure Differential .... 6.1 psi
Cabin Door Upper Forward and Aft Latch Bolts Safelife (200) .... 5000 hrs
Cabin Window Safelife .... 5000 hrs
Wing and Associated Structure Fatigue Safelife .... 20,000 hrs

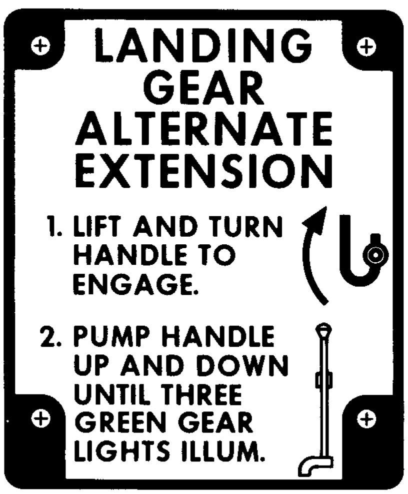
On Curved Pedestal Adjacent to Power Levers:

CAUTION
REVERSE
ONLY WITH
ENGINES
RUNNING

On Pedestal Forward of Cabin Pressurization Controller:

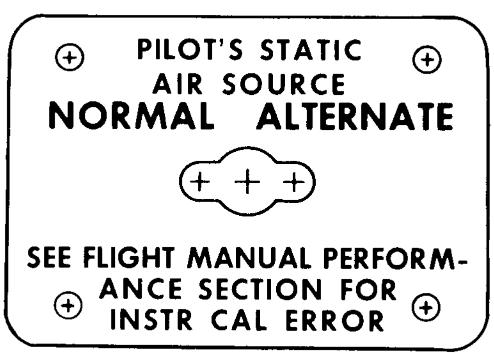
WARNING DE-PRESSURIZE CABIN BEFORE LANDING

On Floor Aft of Pedestal:



Or

Below Right Circuit Breaker Panel:



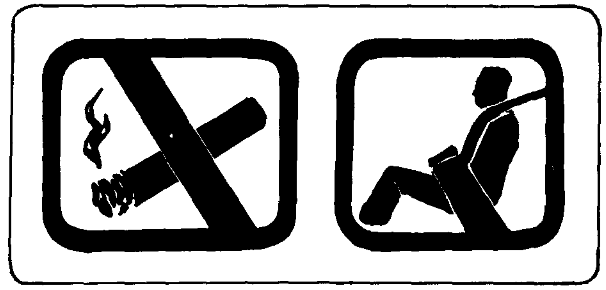
Below Latch on Forward Side of Forward and Aft Partitions:

KICK HERE
FOR
EMERGENCY
EVACUATION

Center of Cabin on Passenger Servicing Unit or on Cabin Side of Forward and Aft Partition:

NO SMOKING
FASTEN SEAT BELT

Or:



On Outside of Each Oxygen Access Door (Manual Plug-in System):

OXYGEN—PUSH

On Inside Surface of Each Oxygen Access Door (Manual Plug-in System):

WARNING — DO NOT SMOKE WHILE OXYGEN IS IN USE

HOSE PLUG MUST BE DISCONNECTED TO STOP FLOW OF OXYGEN

On Inside Surface of Each Passenger Oxygen Access Door (Auto-deployment System):

WARNING - DO NOT SMOKE WHILE OXYGEN IS IN USE

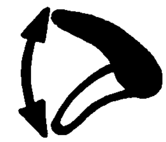
TO USE
- PULL LANYARD PIN
- DON MASK

On Emergency Exit Handle:

EXIT-PULL

Adjacent to Emergency Exit Handle (BB-310, BB-343, BB-383, BB-415, BB-416, BB-418 thru BB-448, BB-450 and after):

MUST BE
UNLOCKED
BEFORE TAKEOFF



LOCKED

EXIT
LOCK

On Window Frame Escutcheon Adjacent to Front Seats:

COUCH

NOT TO BE OCCUPIED AS CHAISE LONGUE DURING TAKE-OFF AND LANDING.

On Cabin Sidewall Adjacent to Front Seats (Prior to Shoulder-Harness-Equipped Chairs):

ALL AFT FACING SEATS MUST HAVE BACK UPRIGHT AND HEADREST FULLY RAISED DURING TAKEOFF AND LANDING

On Center Front of 2-Place Couch:

COUCH LIMITATIONS
TOTAL WEIGHT OF OCCUPANTS
NOT TO EXCEED 340 LBS
MAX WT OF DRAWER CONTENTS
30 LBS PER DRAWER

On Window Frame Adjacent to Lateral-Tracking Seats When Installed:

(Forward Facing) Seats With and Without Shoulder Harness:

SEAT MUST BE LOCATED IN OUTBOARD POSITION FOR TAKEOFF AND LANDING

(Aft Facing) Seats Without Shoulder Harness:

ALL AFT FACING SEATS MUST BE IN OUTBOARD POSITION BACK UPRIGHT AND HEADREST FULLY RAISED DURING TAKEOFF AND LANDING

On Shoulder Harness Assembly For All Cabin Chairs:

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

On Outside Surface of First Aid Oxygen Access Door (Auto-Deploy System):

FIRST AID OXYGEN
— PULL —

On Inside Surface of First Aid Oxygen Access Door (Auto-deployment System):

WARNING - DO NOT SMOKE WHILE OXYGEN IS IN USE

TO USE
- TURN VALVE ON
- DON MASK

NOTE: CREW SYS MUST BE ON

On Cupholders and Tables When Installed:

STOW BEFORE TAKE - OFF AND LANDING

In Lavatory:

NOTICE
FASTEN SAFETY BELT DURING TAKEOFF AND LANDING

On Aft Compartment Sidewall Adjacent to Fold-Up Seats:

NOTICE
FASTEN SHOULDER HARNESS AND SEAT BELT DURING TAKEOFF AND LANDING

TO DISCONTINUE CROSSFEED:

- Crossfeed Flow Switch - OFF (Centered)

ENGINE DRIVEN BOOST PUMP FAILURE

- Standby Boost Pump (Failed Side) - ON; Check FUEL PRESS Light - OFF

ELECTRICAL SYSTEM FAILURE

GENERATOR INOPERATIVE (DC GEN annunciator light on)

1. Generator Switch:
   Prior to BB-88: OFF then ON
   BB-88 and After: OFF, then to RESET for a minimum of 1 second, then release to ON

If generator will not reset:

2. Generator Switch - OFF
3. Operating Generator - DO NOT EXCEED 1.0 LOAD

EXCESSIVE LOADMETER INDICATION (over 1.0)

1. Battery Switch - OFF (Monitor Loadmeter)

If loadmeter still indicates above 1.0:

2. Nonessential Electrical Equipment - OFF

If loadmeter indicates 1.0 or below:

3. Battery Switch - ON

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

BUS FEEDER CIRCUIT BREAKER TRIPPED (fuel panel bus feeders and right circuit breaker panel bus feeders)

- A short is indicated, do not reset in flight.

NOTE

The items that may be inoperative can be determined from the power distribution schematic.

INVERTER INOPERATIVE

- Select the other inverter

FLIGHT CONTROLS

UNSCHEDULED ELECTRIC ELEVATOR TRIM

1. Airplane Attitude - MAINTAIN (using elevator control)
2. Control Wheel Disconnect Switch - DEPRESS FULLY (2nd level)

NOTE

Autopilot will disengage when the disconnect switch is depressed.

3. Manually Retrim Airplane
4. ELEV TAB Control Switch (Pedestal) - OFF

CAUTION

DO NOT reactivate electric trim system until cause of malfunction has been determined.

UNSCHEDULED RUDDER BOOST ACTIVATION

Rudder boost operation without a large variation of power between the engines indicates a failure of the system.

1. Rudder Boost Switch - OFF

If condition persists:

2. Rudder Trim - ADJUST
3. Bleed Air Valves (2) - INSTR & ENVIR OFF (during approach, landing assured)
4. Conduct normal landing

LANDING GEAR MANUAL EXTENSION

1. Airspeed - ESTABLISH 130 KNOTS.
2. Landing Gear Relay Circuit Breaker (pilot's subpanel) - PULL
3. Landing Gear Switch Handle - DOWN
4. Emergency Engage Handle - LIFT AND TURN CLOCKWISE TO THE STOP TO ENGAGE.
5. Extension Lever - PUMP up and down until the 3 green GEAR DOWN lights are illuminated.

CAUTION

Stop pumping when the 3 green GEAR DOWN lights illuminate. Further movement of the handle could damage the drive mechanism and prevent subsequent electrical gear retraction.

WARNING

If for any reason the green GEAR DOWN lights do not illuminate (e.g., in case of an electrical system failure), continue pumping until sufficient resistance is felt to ensure that the gear is down and locked, even though this procedure may damage the drive mechanism.

WARNING

After an emergency landing gear extension has been made, do not stow pump handle, move any landing gear controls, or reset any switches or circuit breakers until the airplane is on jacks, since the failure may have been in the gear-up circuit and the gear might retract on the ground. The landing gear cannot be retracted manually.

SECTION IV

NORMAL PROCEDURES

TABLE OF CONTENTS

SUBJECT *PAGE*

*4. Electric Elevator Trim Control - CHECK

   a. Tab Control Switch - ON
   b. Pilot's and Copilot's Switches - CHECK OPERATION
   c. Trim Disconnect - DEACTIVATION OF SYSTEM
   d. Tab Control Switch - OFF, then ON

WARNING

Operation of the electric trim system should occur only by movement of pairs of switches. Any movement of the elevator trim wheel while depressing only one switch denotes a system malfunction. The elevator tab control switch must then be turned OFF and flight conducted only by manual operation of the trim wheel.

5. Trim Tabs - SET
6. Flaps - CHECK AND SET
7. Flight Controls - CHECK FOR FREEDOM AND PROPER DIRECTION OF TRAVEL
*8. Overspeed Governors and Rudder Boost - TEST

   a. Rudder Boost Control Switch - ON
   b. Propeller Controls - FULL FORWARD (Balance of test is performed on individual engines.)
   c. Prop Test Switch - HOLD TO PROP GOV TEST
   d. Power Lever - INCREASE UNTIL PROP IS STABILIZED AT 1830 TO 1910 RPM. CONTINUE TO INCREASE UNTIL RUDDER MOVEMENT IS NOTED. (Observe ITT and Torque Limits.)
   e. Power Lever - IDLE
   f. Prop Test Switch - RELEASE. Repeat steps c, d, e, and f on the opposite engine.

*9. Primary Governors - EXERCISE AT 1800 RPM.
*10. Instrument Vacuum/Deice Pressure System - CHECK (at 1800 rpm):

   a. Both Bleed Air Valves - INSTR & ENVIR OFF

      (1) Pneumatic Pressure Gage - SHOULD INDICATE ZERO PRESSURE
      (2) Both BL AIR FAIL Annunciators - SHOULD ILLUMINATE

   b. Both Bleed Air Valves - ENVIR OFF or OPEN as desired

      (1) Pneumatic Pressure Gage - SHOULD INDICATE IN GREEN ARC
      (2) Gyro Suction Gage - SHOULD INDICATE IN WIDE GREEN ARC
      (3) Both BL AIR FAIL Annunciators - EXTINGUISHED

*11. Engine Ice Vanes - CHECK (at 1800 rpm): EXTEND (Check torque drop): RETRACT (Retain original torque): MONITOR Ice Vane annunciators during check.
*12. Autofeather - CHECK

   a. Power Levers - APPROXIMATELY 500 FT-LBS TORQUE
   b. Autofeather Switch - HOLD TO TEST (both autofeather annunciators illuminated)
   c. Power Levers - RETARD INDIVIDUALLY:

      (1) At Approximately 400 ft-lbs - OPPOSITE LIGHT OUT
      (2) At Approximately 220 ft-lbs - BOTH LIGHTS OUT (propeller starts to feather)

NOTE

Autofeather annunciator lights will cycle on and off with each fluctuation of torque as the propeller feathers.

   d. Power Levers - BOTH RETARDED (both lights out, neither propeller feathers)

**May be omitted for quick turn-around at pilot's discretion.*

13. Autofeather Switch - ARM
14. Propeller Feathering (manual) - CHECK
15. Fuel Quantity, Flight and Engine Instruments - CHECK (See LIMITATIONS Section for Minimum Oil Temperature Required For Flight.)

BEFORE TAKEOFF (FINAL ITEMS)

1. Bleed Air Valves - OPEN
2. Annunciator Lights - EXTINGUISHED or considered
3. Transponder - ON
4. Ice Protection - AS REQUIRED
5. Engine Auto-ignition - ARM

ON TAKE-OFF ROLL

1. AUTOFEATHER Annunciators - ILLUMINATED
2. IGNITION ON Annunciators - EXTINGUISHED

TAKEOFF

- Refer to PERFORMANCE Section for minimum take-off power, take-off speed, distance and climb data.
- Monitor ITT and engine torque. Increasing airspeed will cause torque and ITT to increase.
- Rotating beacons, strobe lights, and tail flood lights should be turned off, at the pilot's discretion, when encountering haze, fog, or clouds.

CLIMB

1. Landing Gear - UP
2. Flaps - UP
3. Yaw Damp - ON
4. Climb Power - SET (Observe maximum ITT, torque, and N_1 rpm limits.)
5. Propeller - 1900 RPM
6. Propeller Synchrophaser - ON
7. Autofeather - OFF
8. Engine Instruments - MONITOR
9. Cabin Sign - AS REQUIRED
10. Cabin Pressurization - CHECK
11. Aft Blower - OFF

CRUISE

WARNING

Do not lift Power Levers in flight.

1. Cruise Power - SET per CRUISE POWER TABLES OR GRAPHS
2. Engine Instruments - MONITOR
3. Auxiliary Fuel Gage - MONITOR (to ensure fuel is being transferred from auxiliary tanks)

CABIN PRESSURIZATION FOR CRUISE

If revised flight plan calls for an altitude increase of 1000 feet or more, select the new cruise altitude plus 1000 feet on the ACFT ALT dial of the cabin pressurization controller.

DESCENT

1. Cabin Pressurization Controller - SET
   a. Cabin Altitude Selector Knob - SET per PRESSURIZATION CONTROLLER SETTING FOR LANDING graph, or so that "CABIN ALT" DIAL INDICATES LANDING FIELD PRESSURE ALTITUDE PLUS 500 FEET.
   b. Rate Control Selector Knob - SET INDEX AT 12-O'CLOCK POSITION.
2. Altimeter - SET
3. Cabin Sign - AS REQUIRED
4. Windshield Anti-Ice - AS REQUIRED (NORMAL or HI well before descent into warm, moist air, to aid in defogging)
5. Power - AS REQUIRED to give desired rate of descent.

NOTE

Approximately 75% N_1 is required to maintain the pressurization schedule during descent.

APPROACH

CAUTION

Propeller operation in the range of 1750-1850 rpm should be avoided as it may cause ILS glide slope interference.

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

NOTE

Under low visibility conditions, landing and taxi lights should be left off due to light reflections. If crosswind landing is anticipated, determine Crosswind Component from FAA PERFORMANCE Section. Immediately prior to touchdown, lower up-wind wing and align the fuselage with the runway. During rollout, hold aileron control into the wind and maintain directional control with rudder and brakes. Use propeller reverse as desired.

1. Pressurization - CHECK
2. Cabin Sign - ON
3. Autofeather Switch - ARM
4. Flaps - APPROACH
5. Landing Gear - DOWN
6. Landing and Taxi Lights - AS REQUIRED
7. Propeller Synchrophaser - OFF
8. Radar - STANDBY

WHEN LANDING ASSURED

1. Flaps - DOWN (100%)
2. Yaw Damp - OFF
3. Propeller Levers - FULL FORWARD AFTER TOUCHDOWN
4. Power Levers - BETA RANGE OR REVERSE (AS REQUIRED)

MAXIMUM REVERSE THRUST LANDING

1. Condition Levers - HIGH IDLE
2. Propeller Levers - FULL FORWARD
3. Power Levers - LIFT AND REVERSE AFTER TOUCHDOWN
4. Condition Levers - LOW IDLE

CAUTION

If possible, propellers should be moved out of reverse at approximately 40 knots, to minimize propeller blade erosion. Care must be exercised when reversing on runways with loose sand or dust on the surface. Flying gravel will damage propeller blades, and dust may impair the pilot's forward field of vision at low airplane speeds.

BALKED LANDING

1. Power - MAXIMUM ALLOWABLE
2. Airspeed - ESTABLISH 100 KNOTS (When clear of obstacles, establish normal climb.)
3. Flaps - UP
4. Landing Gear - UP

AFTER LANDING

1. Landing and Taxi Lights - AS REQUIRED
2. Ice Protection - OFF
3. Engine Auto-ignition - OFF
4. Electrical Load - OBSERVE LIMITS
5. Trim - SET
6. Flaps - UP

SHUTDOWN AND SECURING

1. Parking Brake - SET
2. Inverter - OFF
3. Avionics Master - OFF

b. Before takeoff: Deice Switch - CHECK BOTH POSITIONS (SINGLE - Up, MANUAL - Down)

   (1) Check deice pressure gage
   (2) Check boots visually for inflation and hold down. (Inflation is 6 seconds for wings, then 4 seconds for horizontal stabilizer.)

c. In flight: (When ice accumulates 1/2 to 1 inch) - Deice Switch - SINGLE (repeat as required)

NOTE

Either engine will supply sufficient air pressure for deice operation. In the event of failure of SINGLE cycle, use MANUAL cycle.

2. Engine Anti-Ice

   a. Before takeoff: 1800 RPM

      (1) Engine Ice Vane Controls

         (a) Extend - Check for torque drop, indicating vane extension. Monitor ice vane annunciators.
         (b) Retract - Check for torque increase to previous reading, indicating vane retraction.

      (2) Power - REDUCE TO IDLE

   b. In Flight:

      (1) Before visible moisture is encountered at +5°C and below or;
      (2) At night when freedom from visible moisture is not assured at +5°C and below.

         (a) Engine Ice Vanes - EXTEND (Monitor Ice Vane annunciators.)

NOTE

If yellow ICE VANE annunciators illuminate after 15 seconds, ice vanes have not extended to proper position. Use manual control to retract or extend.

         (b) Check proper operation by noting torque drop.

   c. Regain torque with power levers if desired (observe ITT limits).

CAUTION

If in doubt, extend the vanes. Engine icing can occur even though no surface icing is present. If freedom from visible moisture can not 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. Ice vanes should be retracted at +15°C and above to assure adequate engine oil cooling. Operation of strobe lights will sometimes show ice crystals not normally visible.

3. Electrothermal Propeller Deice

CAUTION

Do not operate propeller deice when the propellers are static.

a. Before Takeoff:

(1) Automatic Propeller Deice Switch - AUTO
(2) Deice Ammeter - 14 to 18 AMPERES
(3) To check the automatic timer, watch the deice ammeter closely for at least two minutes. A small momentary needle deflection approximately every 30 seconds shows that the timer is switching properly and indicates normal system operation.
(4) Manual Propeller Deice Switch - MOMENTARILY HOLD IN INNER POSITION, THEN OUTER (Small deflection in airplane's loadmeters with switch in each position indicates the manual system is operating.)

NOTE

Use of current for the manual (backup) system is not registered on the propeller deice ammeter, however, it will be indicated as part of the airplane's load on the loadmeter (small needle deflection) when the system is switched on.

(5) Automatic Propeller Deice Switch - OFF

b. In Flight:

(1) Automatic Propeller Deice Switch - AUTO. The system may be operated continuously in flight, and will function automatically until the switch is turned off.
(2) Relieve propeller imbalance due to ice by increasing rpm briefly and returning to the desired setting. Repeat as necessary.

CAUTION

If the deice ammeter does not indicate 14 to 18 amperes, or the automatic timer fails to switch, refer to the EMERGENCY PROCEDURES Section.

4. Fuel Vent Heat - ON
5. Pitot Heat - ON
6. Stall Warning Heat - ON

CAUTION

Prolonged use of pitot and stall warning heat on the ground will damage the heating elements.

7. Windshield Anti-Ice - AS REQUIRED (before ice forms)
8. Wing Ice Lights - AS REQUIRED
9. Alternate Static Air Source - REFER to EMERGENCY PROCEDURES Section.

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 104 KNOTS ARE PROHIBITED.

1. Landing Gear - UP
2. Flaps - UP
3. Airspeed - ABOVE 104 KNOTS (V_{SSE})
4. Propeller Levers - HIGH RPM
5. Power Lever (Simulated inoperative engine) - IDLE
6. Power Lever (Other engine) - MAXIMUM ALLOWABLE
7. Airspeed - Reduce approximately 1 knot per second until either V_{MCA} or stall warning is obtained.

CAUTION

Use rudder to maintain directional control (heading) and ailerons 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 horn sound) immediately initiate recovery: reduce power to idle on the operative engine and immediately lower the nose to regain V_{SSE}.

NOISE CHARACTERISTICS

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

For VFR operations over outdoor assemblies of persons, recreational and park areas, and other noise-sensitive areas, pilots should make every effort to fly not less than 2000 feet above the surface, weather permitting, even though flight at a lower level may be consistent with the provisions of government regulations.

NOTE

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

The flyover noise level established in compliance with FAR 36 is:

79.2 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.

CABIN/CARGO DOOR ANNUNCIATOR CIRCUITRY CHECK (200C)

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

1. Ensure that the cargo door is closed and latched.
2. Ensure that the battery switch is OFF.
3. Check that, with the cabin door closed but not latched, the CABIN DOOR annunciator light illuminates.
4. Open the cabin door and check that the CABIN DOOR annunciator light extinguishes.
5. Turn the battery switch ON and check that the CABIN DOOR annunciator light illuminates.
6. Close and latch the cabin door. Check that the CABIN DOOR annunciator light extinguishes.

NOTE

The above listed procedures check both the cargo door and cabin door annunciator circuitry.

TAKE-OFF WEIGHT — FLAPS 40%

TO ACHIEVE POSITIVE ONE-ENGINE INOPERATIVE RATE OF CLIMB AT LIFT-OFF

ASSOCIATED CONDITIONS:

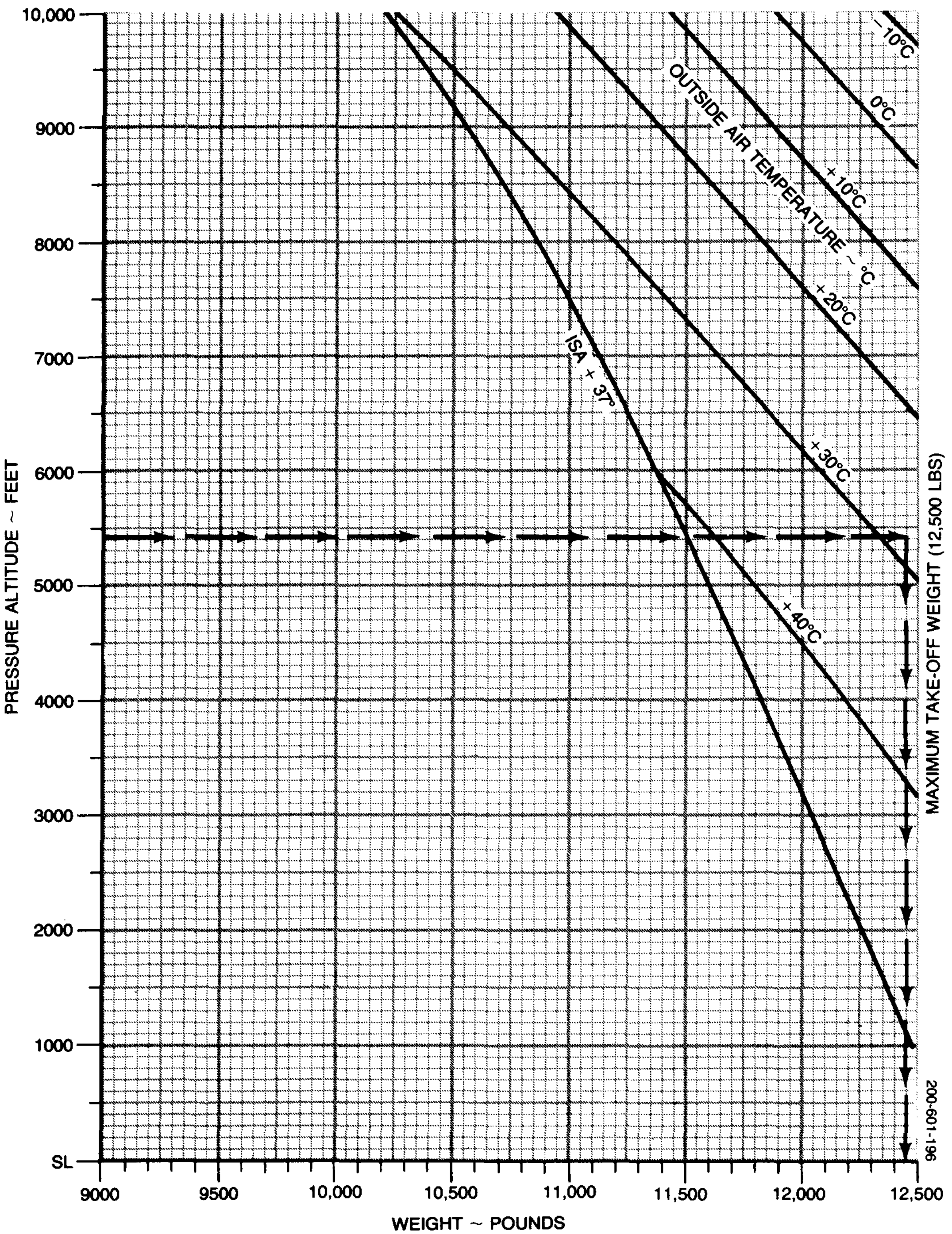
POWER . . . . TAKE-OFF
FLAPS 40%
LANDING GEAR . . . . DOWN

EXAMPLE:

PRESSURE ALTITUDE . . . . 5430 FT
OAT . . . . 28°C

TAKE-OFF WEIGHT . . . . 12,450 LBS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10°C TO THE ACTUAL OAT BEFORE ENTERING THE GRAPH.



MAXIMUM ENROUTE WEIGHT
(FAR PART 135 OPERATIONS)

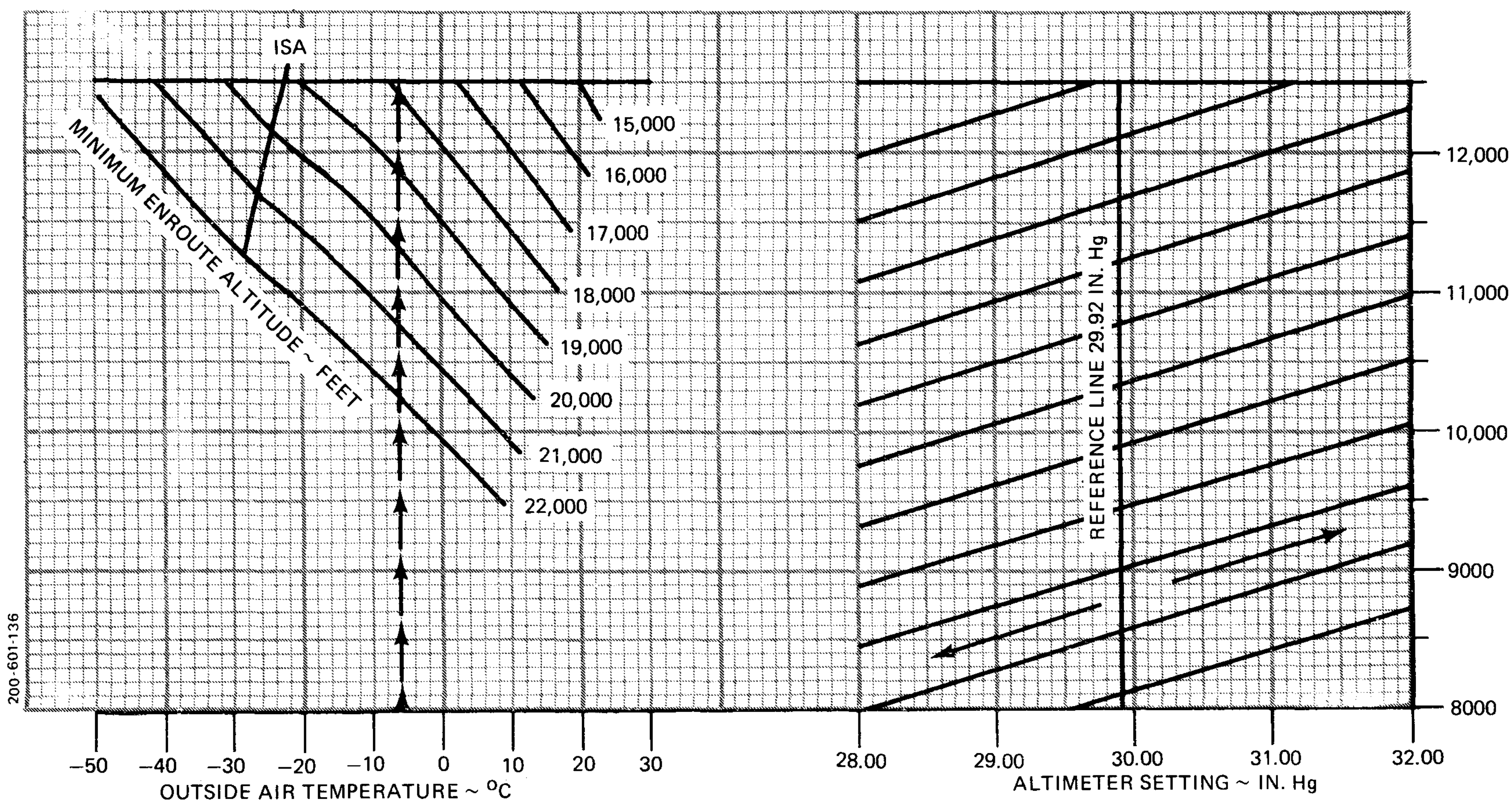
ASSOCIATED CONDITIONS:

POWER	MAXIMUM CONTINUOUS
FLAPS	0%
LANDING GEAR	UP
INOPERATIVE PROPELLER	FEATHERED

EXAMPLE:

OAT	−6°C
MINIMUM ENROUTE ALTITUDE	16,000 FEET
ALTIMETER SETTING	29.82 IN. Hg
MAXIMUM ALLOWABLE WEIGHT	12,500 LBS

NOTE: PER FAR 135.181, OPERATIONS OVER THE TOP OR IN IFR CONDITIONS REQUIRE THAT THE AIRPLANE BE CAPABLE OF CLIMBING 50 FT/MIN AT THE MEAs OF THE PROPOSED ROUTE OR 5000 FEET MSL, WHICHEVER IS HIGHER.



TIME, FUEL, AND DISTANCE TO DESCEND

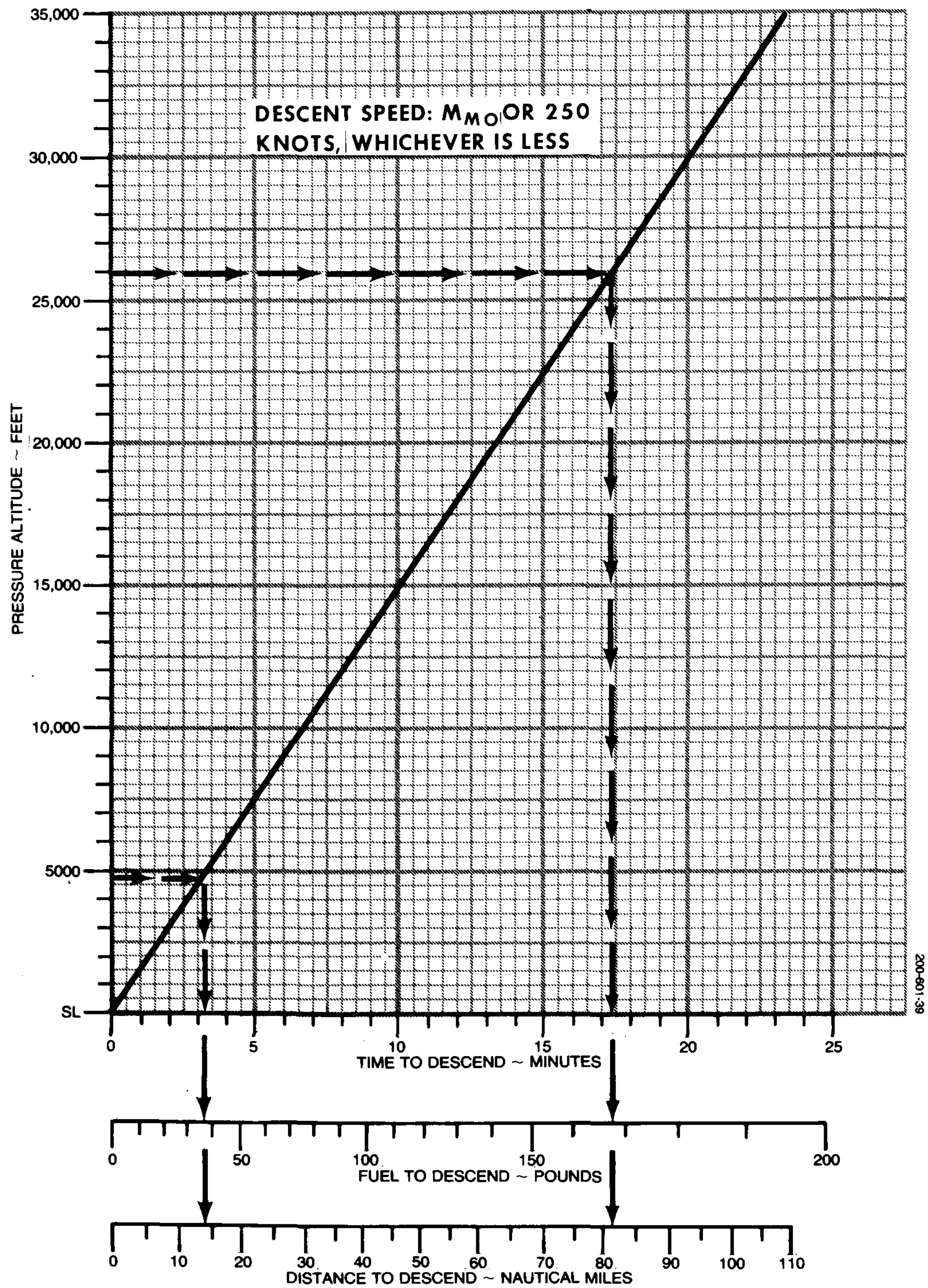
ASSOCIATED CONDITIONS:

POWER .... AS REQUIRED TO DESCEND AT 1500 FT/MIN
GEAR............ UP
FLAPS........... 0%

EXAMPLE:

INITIAL ALTITUDE .... 26,000 FEET
FINAL ALTITUDE .... 4730 FEET

TIME TO DESCEND (17-3) .... 14 MINUTES
FUEL TO DESCEND (168-36)............... 132 POUNDS
DISTANCE TO DESCEND (81-14)........ 67 NM



LANDING DISTANCE WITHOUT PROPELLER REVERSING — FLAPS 100%

ASSOCIATED CONDITIONS:

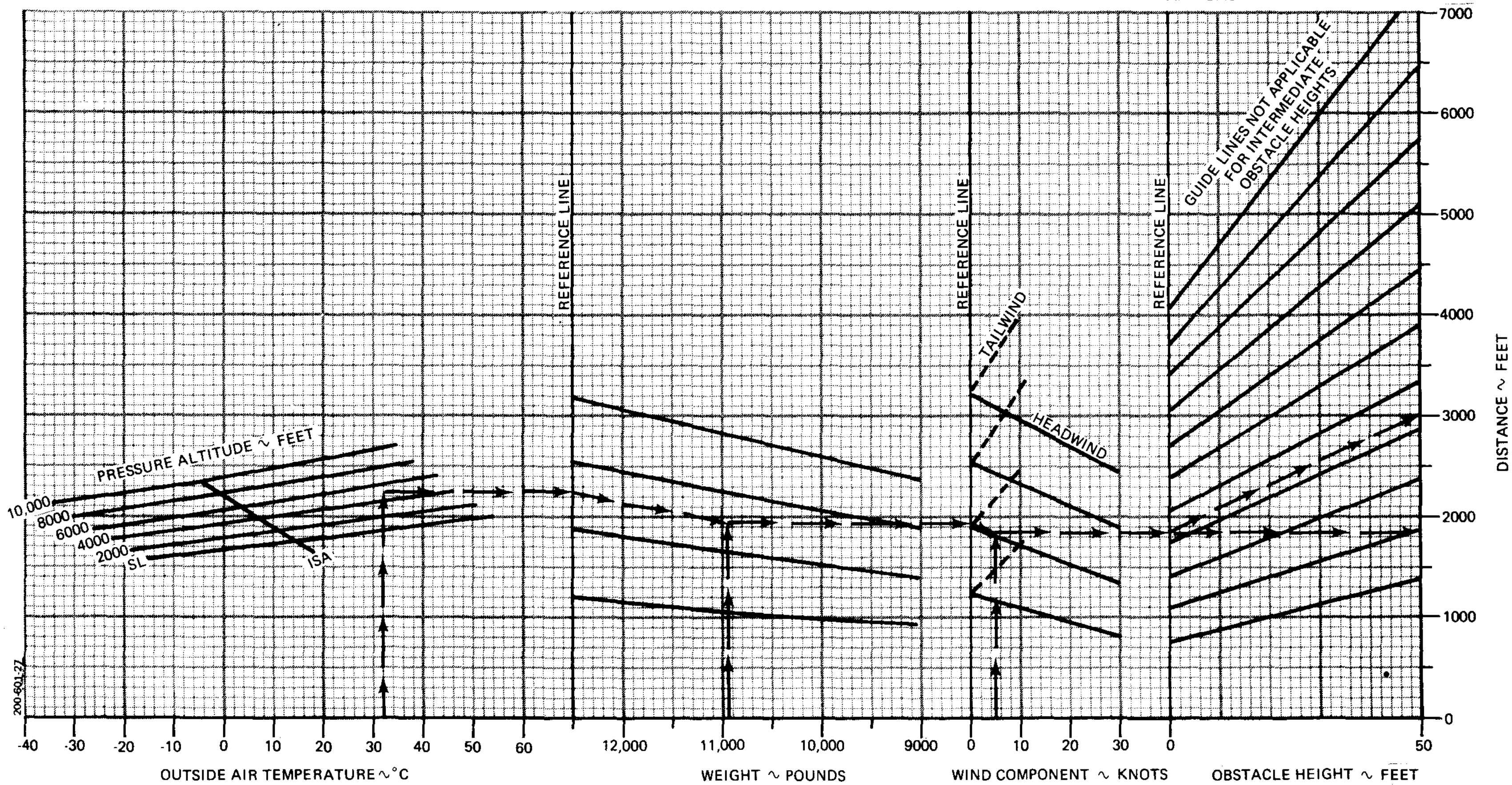
POWER . . . . RETARDED TO MAINTAIN 800 FT/MIN ON FINAL APPROACH
FLAPS 100%
RUNWAY . . . . PAVED, LEVEL, DRY SURFACE
APPROACH SPEED . . IAS AS TABULATED
BRAKING . . . . MAXIMUM

WEIGHT ~ POUNDS	APPROACH SPEED ~ KNOTS
12,500	103
12,000	102
11,000	99
10,000	96
9000	93

EXAMPLE:

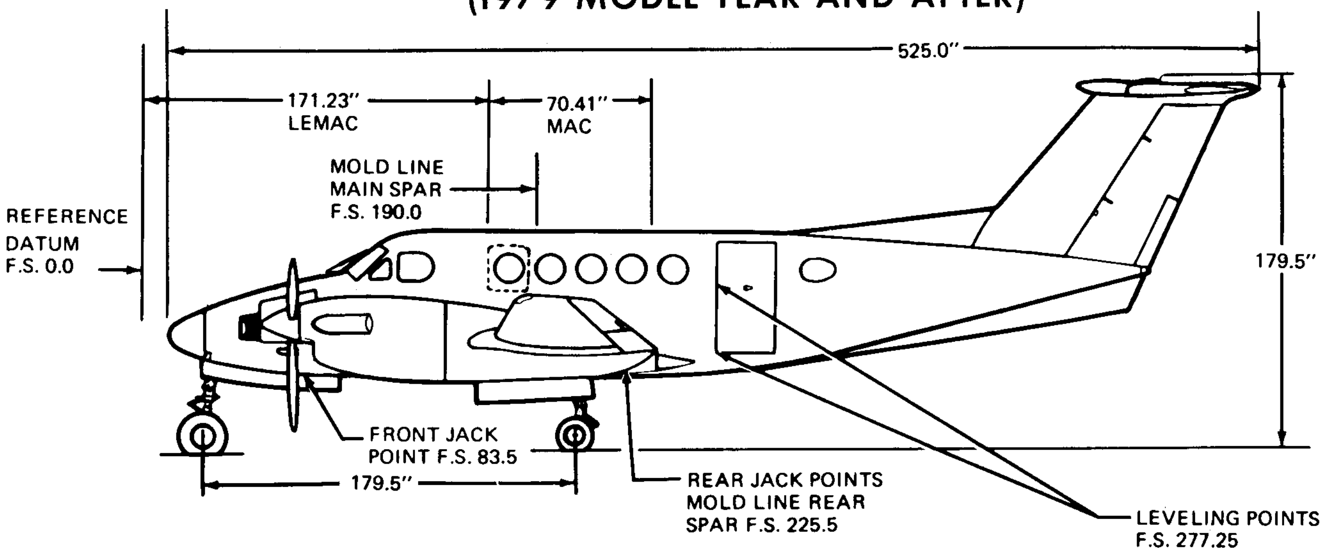
OAT . . . . 32°C
PRESSURE ALTITUDE . . . . 4730 FT
LANDING WEIGHT . . . . 10,937 LBS
HEADWIND COMPONENT . . . . 4.7 KTS

GROUND ROLL . . . . 1850 FT
TOTAL OVER 50 FT OBSTACLE . . . 3000 FT
APPROACH SPEED . . . . 99 KNOTS

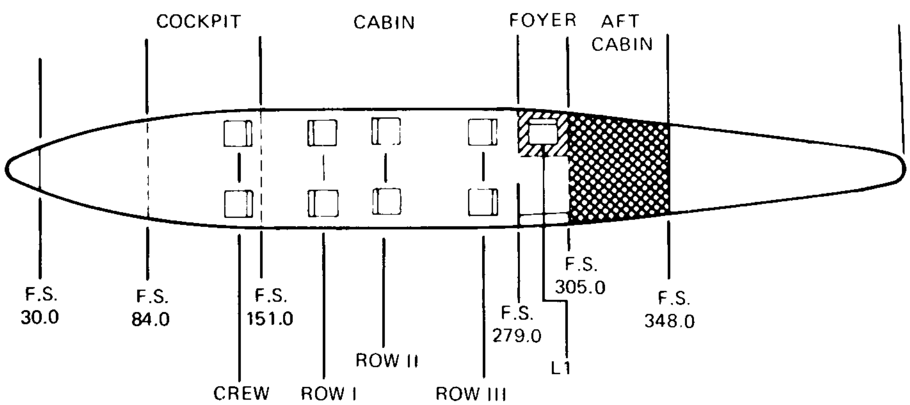


DIMENSIONAL AND LOADING DATA

(1979 MODEL YEAR AND AFTER)



STANDARD SEATING



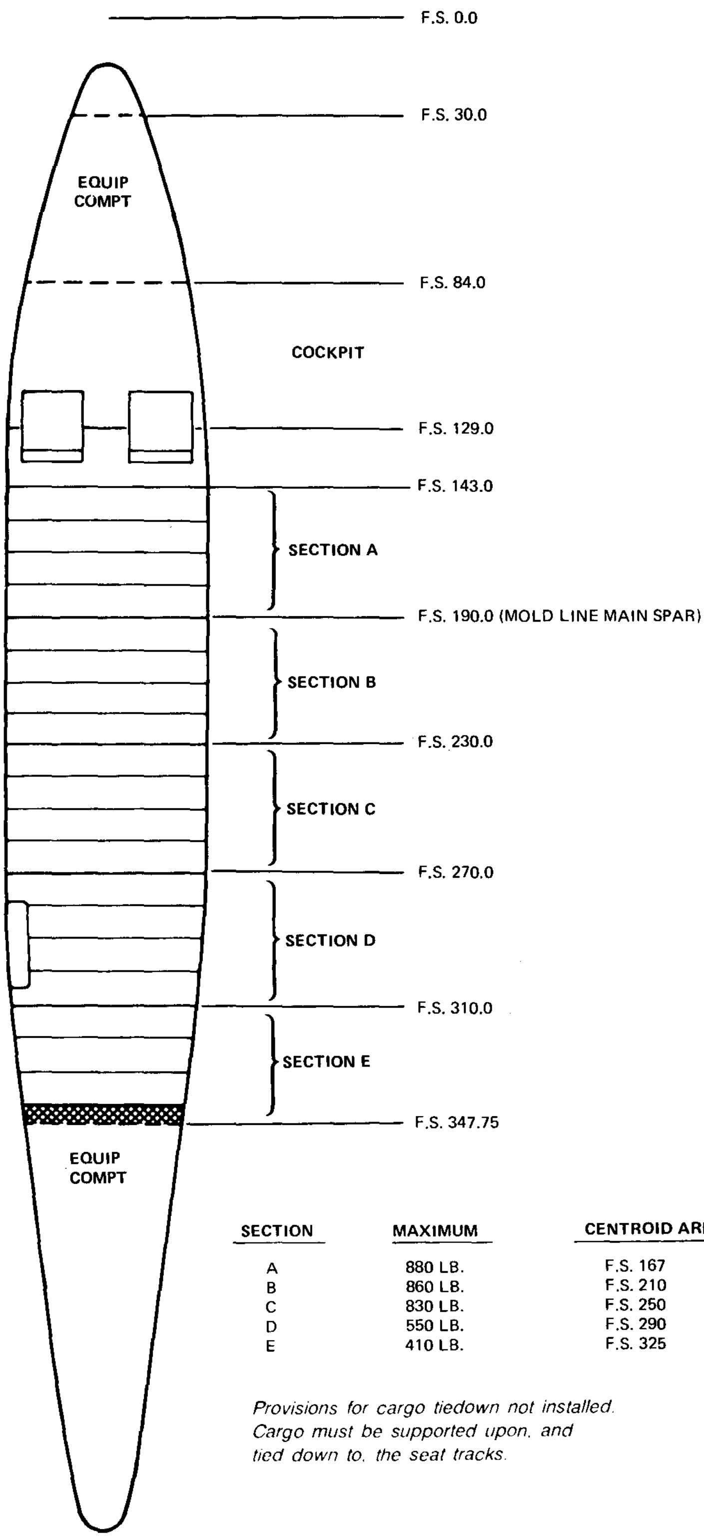
OCCUPANT	CENTROID
CREW	F.S. 129.0
ROW I	F.S. 176 0
ROW II	F.S. 215.0
ROW III	F.S. 259.0
L1	F.S. 292.0

CONFIGURATION	BAGGAGE COMPARTMENT	BAGGAGE CAPACITY	CENTROID
SIDE PASSENGER SEAT AND TOILET	*FOYER	150	F.S. 292.0
	AFT CABIN	410	F.S. 325.0

*NOTE: *Loading data for standard configurations only.*
Foyer is not equipped for loose baggage; clothing on hangers may be hung from the rod provided.

200-603-28

LOADING DATA
CARGO CONFIGURATION



SECTION	MAXIMUM	CENTROID ARM
A	880 LB.	F.S. 167
B	860 LB.	F.S. 210
C	830 LB.	F.S. 250
D	550 LB.	F.S. 290
E	410 LB.	F.S. 325

Provisions for cargo tiedown not installed. Cargo must be supported upon, and tied down to, the seat tracks.

200-603-7

ANNUNCIATOR SYSTEM

The annunciator system consists of a warning annunciator panel (with red readout) centrally located in the glareshield, a caution/advisory annunciator panel (caution - yellow; advisory - green) located on the center subpanel, two yellow MASTER CAUTION flashers (located just inboard of the MASTER WARNING flashers), a CAUTION - ON - OFF switch located on the copilot's left subpanel, and a PRESS TO TEST switch located immediately to the right of the warning annunciator panel.

The annunciators are of the word-readout type. Whenever a fault condition covered by the annunciator system occurs, a signal is generated and the appropriate annunciator is illuminated.

If the fault requires the immediate attention and reaction of the pilot, the appropriate red warning annunciator in the warning annunciator panel illuminates and both MASTER WARNING flashers begin flashing. Any illuminated lens in the warning annunciator panel will remain on until the fault is corrected. However, the MASTER WARNING flashers can be extinguished by depressing the face of either MASTER WARNING flasher, even if the fault is not corrected. In such a case, the MASTER WARNING flashers will again be activated if an additional warning annunciator illuminates. When a warning fault is corrected, the affected warning annunciator will extinguish, but the MASTER WARNING flashers will continue flashing until one of them is depressed.

Whenever an annunciator-covered fault occurs that requires the pilot's attention but not his immediate reaction, the appropriate yellow caution annunciator in the caution/advisory panel illuminates, and both MASTER CAUTION flashers begin flashing. The flashing MASTER CAUTION lights can be extinguished by pressing the face of either of the flashing lights to reset the circuit. Subsequently, when any caution annunciator illuminates, the MASTER CAUTION flashers will be activated again. Normally, an illuminated caution annunciator on the caution/advisory annunciator panel will remain on until the fault condition is corrected, at which time it will extinguish. The MASTER CAUTION flashers will continue flashing until one of them is depressed.

If the fault indicated by an illuminated caution annunciator is not corrected, the pilot can still extinguish the annunciator by momentarily moving the spring-loaded CAUTION toggle switch down to the OFF position, then releasing it to the center position. This action will extinguish all illuminated caution annunciators, and will illuminate the green CAUT LGND OFF advisory annunciator in the caution/advisory annunciator panel, to remind the pilot that an uncorrected fault condition exists, but that the caution legends have all been extinguished. The annunciator(s) previously extinguished with the CAUTION switch can be re-illuminated anytime by momentarily moving the switch up to the ON position. This action will also extinguish the green CAUT LGND OFF annunciator. If an additional fault covered by the caution annunciators occurs after the caution legends have been extinguished with the CAUTION switch, the appropriate caution annunciator for the new fault will illuminate, and all previously extinguished annunciators will re-illuminate.

The caution/advisory annunciator panel also contains the green advisory annunciators. There are no master flashers associated with these annunciators, since they are only advisory in nature, indicating functional situations which do not demand the immediate attention or reaction of the pilot. An advisory annunciator can be extinguished only by correcting the condition indicated on the illuminated lens.

The warning annunciators, caution annunciators, advisory annunciators and yellow MASTER CAUTION flashers feature both a "bright" and a "dim" mode of illumination intensity. The "dim" mode will be selected automatically whenever all of the following conditions are met: a generator is on the line; the OVERHEAD FLOOD LIGHTS are OFF; the PILOT FLIGHT LIGHTS are ON; and the ambient light level in the cockpit (as sensed by a photoelectric cell located in the overhead light control panel) is below a preset value. Unless all these conditions are met, the "bright" mode will be selected automatically. The MASTER WARNING flasher does not have a "dim" mode.

The lamps in the annunciator system should be tested before every flight, and anytime the integrity of a lamp is in question. Depressing the PRESS TO TEST button, located to the right of the warning annunciator panel in the glareshield, illuminates all the annunciator lights, MASTER WARNING flashers, and MASTER CAUTION flashers. Any lamp that fails to illuminate when tested should be replaced (refer to LAMP REPLACEMENT GUIDE in Section VIII, HANDLING, SERVICING AND MAINTENANCE).

ANNUNCIATOR PANELS

NOMENCLATURE	COLOR	CAUSE FOR ILLUMINATION
	WARNING ANNUNCIATOR	
FIRE L ENG	*Red*	*Fire in left engine compartment*
ALT WARN	*Red*	*Cabin altitude exceeds 12,500 feet*
FIRE R ENG	*Red*	*Fire in right engine compartment*
L FUEL PRESS	*Red*	*Fuel pressure failure on left side*
INST INV	*Red*	*The inverter selected is inoperative*
R FUEL PRESS	*Red*	*Fuel pressure failure on right side*
L BL AIR FAIL	*Red*	*Melted or failed plastic left bleed air failure warning line*
R BL AIR FAIL	*Red*	*Melted or failed plastic right bleed air failure warning line*
L CHIP DETECT	*Red*	*Contamination in left engine oil is detected*
R CHIP DETECT	*Red*	*Contamination in right engine oil is detected*
	CAUTION/ADVISORY ANNUNCIATOR	
L DC GEN	*Yellow*	*Left generator off the line*
L ICE VANE	*Yellow*	*Left ice vane malfunction. Ice vane has not attained proper position.*
RVS NOT READY	*Yellow*	*Propeller levers are not in the high rpm, low pitch position with landing gear extended*
R ICE VANE	*Yellow*	*Right ice vane malfunction. Ice vane has not attained proper position.*
R DC GEN	*Yellow*	*Right generator off the line*
CABIN DOOR	*Yellow*	*Cabin/cargo door open or not secure*
PROP SYNC ON	*Yellow*	*Synchrophaser turned on with landing gear extended*
EXT PWR	*Yellow*	*External power connector is plugged in*
BATTERY CHG	*Yellow*	*Excessive charge rate on battery*
DUCT OVERTEMP	*Yellow*	*Duct air too hot*

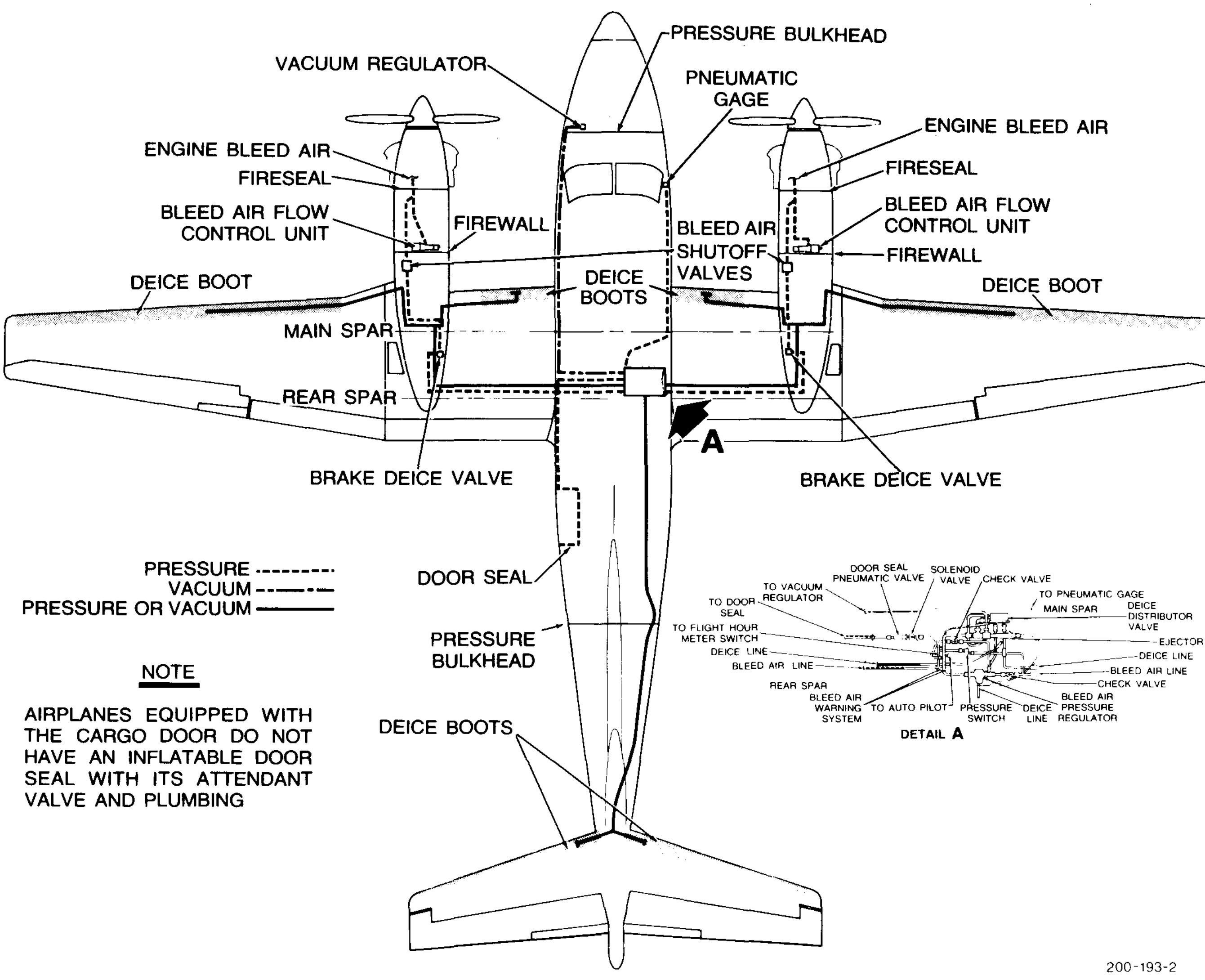
Proper operation can be checked by noting the correct level of current usage on the ammeter. An intermittent flicker of the needle approximately every 30 seconds indicates switching to the next group of heating elements by the timer.

The manual prop deice system is provided as a backup to the automatic system. A control switch located on the left subpanel, placarded PROP - INNER - OUTER, controls the manual override relays. When the switch is in the OUTER position, the automatic timer is overriden and power is supplied to the outer heating elements of both propellers simultaneously. The switch is of the momentary type and must be held in position until the ice has been dislodged from the propeller surface. After deicing with the outer elements, the switch is to be held in the INNER position to perform the same function for the inner elements of both propellers. The loadmeters will indicate approximately a .05 increase of load per meter when manual prop deice is operating. The prop deice ammeter will not indicate any load in the manual mode of operation.

SURFACE DEICE SYSTEM

The surface deice system removes ice accumulations from the leading edges of the wings and horizontal stabilizers. Ice removal is accomplished by alternately inflating and deflating the deice boots. Pressure-regulated bleed air from the engines supplies pressure to inflate the boots. A venturi ejector, operated by bleed air, creates vacuum to deflate the boots and hold them down while not in use. To assure operation of the system in the event of failure of one engine, a check valve is incorporated in the bleed air line from each engine to prevent loss of pressure through the compressor of the inoperative engine. Inflation and deflation phases are controlled by a distributor valve.

A three-position switch on the pilot's subpanel, placarded DEICE CYCLE - SINGLE - OFF - MANUAL, controls the deicing operation. The switch is spring-loaded to return to the OFF position from SINGLE or MANUAL. When the SINGLE position is selected, the distributor valve opens to inflate the



SURFACE DEICE SYSTEM SCHEMATIC

wing boots. After an inflation period of approximately 6 seconds, an electronic timer switches the distributor to deflate the wing boots, and a 4-second inflation begins in the horizontal stabilizer boots. When these boots have inflated and deflated, the cycle is complete.

When the switch is held in the MANUAL position, all the boots will inflate simultaneously and remain inflated until the switch is released. The switch will return to the OFF position when released. After the cycle, the boots will remain in the vacuum hold down condition until again actuated by the switch.

For most effective deicing operation, allow at least 1/2 inch of ice to form before attempting ice removal. Very thin ice may crack and cling to the boots instead of shedding. Subsequent cyclings of the boots will then have a tendency to build up a shell of ice outside the contour of the leading edge, thus making ice removal efforts ineffective.

PITOT MAST

Heating elements are installed in the pitot masts located on the nose. Each heating element is controlled by an individual circuit breaker switch placarded PITOT - LEFT - RIGHT, located on the pilot's subpanel. It is not advisable to operate the pitot heat system on the ground except for testing or for short intervals of time to remove ice or snow from the mast.

STALL WARNING VANE

The lift transducer is equipped with anti-icing capability on both the mounting plate and the vane. The heat is controlled by a switch located on the pilot's subpanel placarded STALL WARN. The level of heat is minimal for ground operation, but is automatically increased for flight operation through the left landing gear safety switch.

WARNING

The heating elements protect the lift transducer vane and face plate from ice. However, a build-up of ice on the wing may change or disrupt the airflow and prevent the system from accurately indicating an imminent stall. Remember that the stall speed increases whenever ice accumulates on any airplane.

FUEL

An oil-to-fuel heat exchanger, located on the engine accessory case, operates continuously and automatically to heat the fuel sufficiently to prevent ice from collecting in the fuel control unit.

Each pneumatic fuel control line is protected against ice by an electrically heated jacket. Power is supplied to each fuel control air line jacket heater by two switches actuated by moving the condition levers in the pedestal out of the fuel cutoff range. Fuel control heat is automatically turned on for all flight operations.

COMFORT FEATURES

TOILET

The toilet is installed in the foyer and faces the airstair door. The foyer can be closed off from the cabin by sliding the two partition-type door panels to the center of the fuselage, where they are held closed by magnetic strips. The toilet may be either the chemical type or the electrically flushing type. In either case, the two hinged lid half-sections must be raised to gain access to the toilet. A toilet tissue dispenser is contained in a slide-out compartment on the forward side of the toilet cabinet.

CAUTION

If a Monogram electrically flushing toilet is installed, the sliding knife valve should be open at all times, except when actually servicing the unit. The cabinet below the toilet must be opened in order to gain access to the knife valve actuator handle.

RELIEF TUBES

A relief tube is contained in a special tilt-out compartment at the aft side of the toilet cabinet. A relief tube may also be installed in the cockpit, and stowed under the pilot or copilot chair. The hose on the cockpit relief tube is of sufficient length to permit use by both pilot and copilot.

A valve lever is located on the side of the relief tube horn. This valve lever must be depressed at all times while the relief tube is in use. Each tube drains into the atmosphere through its own special drain port, which protrudes from the bottom of the fuselage. Each drain port is designed to atomize the discharge and keep it away from the skin of the airplane.

NOTE

The relief tubes are designed for use during flight only.

CABIN FEATURES

FIRE EXTINGUISHERS

An optional portable fire extinguisher may be installed on the floor on the left side of the airplane forward of the airstair entrance door, just aft of the rearmost seat. Another one may also be installed underneath the copilot's seat.

CONSUMABLE MATERIALS (Cont'd)

MATERIAL	SPECIFICATION	PRODUCT	VENDOR
Lubricating Oil, General Purpose, Low Temperature	MIL-L-7870	Caltex Low Temp Oil	Caltex Oil Products Co.
		Sinclair Aircraft Orbitlube	Sinclair Refining Co.
		1692 Low Temp Oil	Texaco , Inc.
Lubricating Oil, Gear, Sub Zero	MIL-L-10324 (Replaces MIL-O-6086 Grade M)	Ace-Lube K-24	Ace-Lube Oil Company
		Gear Lubricant SZ 9285	American Oil Company
		ILCO Lubricant Gear Universal Sub Zero	International Lubricants Corporation
		RP 95-X*	Mobil Oil Corporation
Lubricating Oil Special Preservative	VV-L-800	Brayco 300	Bray Oil Co.
		Nox Rust 518, (Code R-62-203-1)	Daubert Chemical Co.
		Royco 308	Royal Lubricants Co.
Lubricating Oil		Aeroshell No. 12	Shell Oil Co.
Marvel Mystery Oil			Marvel Oil Company, Inc.
Lubricating Grease		Lubriplate No. 130A	Fiske Bros. Refining Co.
Lubricating Grease Aircraft and Instrument, Gear and Actuator Screw	MIL-G-23827	Aeroshell Grease 7	Shell Oil Co.
		BP Aero Grease 31B	BP Trading Limited
		Castrolease A1	Castrol Oils Inc.
		Royco 27A	Royal Lubricants Co.
		Supermil Grease No. A72832	Amoco Oil Company
Lubricant, Powdered Graphite	SS-659		Superior Graphite Co.
Chain Lubricant		Petrochem Chain Life	Ashland Chemical Co.
Metal Protector		LPS No. 3	LPS Research Laboratories or, William F. Hurst Company
Hydraulic Fluid (Brakes and Shock Struts)	MIL-H-5606	Aeroshell Fluid 4	Shell Oil Co.
		PED 3337	Standard Oil of California
		3126 Hydraulic Oil	Exxon Company USA

CONSUMABLE MATERIALS (Cont'd)

MATERIAL	SPECIFICATION	PRODUCT	VENDOR
Solvent	PD680	Stoddard Solvent	
Solvent		Varsol*	Exxon Company, USA
Oil (Air Conditioner)		Frigidaire Refrigerant Oil (Viscosity 525)	Frigidaire Division of General Motors Corp.
Air Conditioning Refrigerant (Charging)	Dichlorodifluoromethane	Freon 12	DuPont Inc., Freon Products Division
		Genetron 12	Allied Chemicals, Speciality Chemicals Division
		Racon 12	Racon Inc.
Leak Detector, Oxygen System Leak Testing	MIL-L-25567		
Aviator's Breathing Oxygen	MIL-O-27210		
Door-Ease			American Grease Stick Co.
Anti-Ice Additive	MIL-I-27686		
Toilet (Flush Type) Cleaner		Monogram Solution DG-19	Monogram Solution Division
Tire Sealant		Consult a Beechcraft Aviation Center for approved product.	

VENDOR ADDRESSES

Ace-Lube Oil Co.
3983 Pacific Blvd.
San Mateo, California
94403

Allied Chemicals,
Speciality Chemicals Div.
Columbia Road & Park Ave.
Morristown, New Jersey
07960

Alpha-Molykote Corp.
65 Harvard Ave.
Stamford, Connecticut
06902

American Grease Stick Co.
2651 Hoyt
Muskegon, Michigan
49443

American Oil Co.
910 South Michigan Ave.
Chicago, Illinois
60680

Amoco Oil Co.
200 E. Randolf
Chicago, Illinois
60606

Ashland Chemical Co.
P. O. Box 2260
Santa Fe Springs, Calif.
90607

BP (North America) Ltd.
620 Fifth Avenue
New York, New York
10020

BP Trading Ltd.
Britannic House, Moore Lane
London E.C.2, England

Bray Oil Co.
1925 No. Marianna Ave.
Los Angeles, California
90063

California Texas Oil Corp.
380 Madison Ave.
New York, New York
10017

Caltex Oil Products Co.
380 Madison Ave
New York, New York
10017

PILOT'S OPERATING HANDBOOK
and FAA Approved
Airplane Flight Manual

for the

Beechcraft

SUPER KING AIR

MODEL 200 & 200C

(Serials BB-2, BB-6 and after, BL-1 and after)

FAA APPROVED IN NORMAL CATEGORY BASED ON FAR 23. THIS DOCUMENT MUST BE CARRIED IN THE AIRPLANE AT ALL TIMES, AND BE KEPT WITHIN REACH OF THE PILOT DURING ALL FLIGHT OPERATIONS. THIS HANDBOOK INCLUDES THE MATERIAL REQUIRED TO BE FURNISHED TO THE PILOT BY FAR PART 23.

AIRPLANE SERIAL NUMBER ____________ AIRPLANE REGISTRATION NUMBER ____________

FAA Approved by

Member of GAMA
General Aviation
Manufacturers Association

W. H. Schultz
Beech Aircraft Corporation
DOA CE-2

PUBLISHED BY
PARTS AND SERVICE OPERATIONS
BEECH AIRCRAFT CORPORATION
WICHITA, KANSAS 67201
U. S. A.

Part Number 101-590010-127
(Supersedes P/N 101-590010-5)
Issued: October, 1978

Part Number 101-590010-127A1
Revised: February, 1979

BEECHCRAFT SUPER KING AIR 200
PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

LOG OF REVISIONS

Original Issue (A) ....October, 1978

Page	Description
Title Page	
a and b	
1-1 thru 1-16	
2-1 thru 2-28	
3-1 thru 3-14	
4-1 thru 4-21	
5-1 thru 5-113	
6-1 thru 6-24	
7-1 thru 7-51	
8-1 thru 8-40	
9-1 and 9-2	
Supplements	See Log of Supplements
10-1 thru 10-12	

BEECHCRAFT SUPER KING AIR 200
PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

LOG OF REVISIONS

A1 Revision... February, 1979

Page	Description
Title Page	Update
"A" Page	Update
1-10	Revise "Cabin Entry Dimensions"
2-2	Update
2-3	Revise Serialization
2-4	Revise Serialization
2-11	Revise "Maneuver Limits"
2-12	Revise "Kinds of Operation Limits"
2-18	Revise Serialization
2-19	Revise Serialization
2-20	Revise "FAR Part 135 Operations" and "Structural Limtations"
2-21	Add "Cargo Limitations"
2-28	Revise Placard Call-Outs
2-29	Add New Placards
2-30	Add New Placards
2-31	Add New Placards
3-2	Update
3-13	Revise Title
3-14	Add "Illumination of Cabin/Cargo Door Warning Light (200C)"
3-15	Shifted Data
4-1	Update
4-2	Update
4-3	Shifted Data
4-4	Shifted Data
4-5	Revise "Before Engine Starting"
4-7	Revise Serialization
4-17	Revise Serialization
4-21	Add "Cabin/Cargo Door Annunciator Circuitry Check (200C)"
6-25	Shifted Data
6-26	Shifted Data
6-27	Add New "Table of Contents"
6-28 thru 6-50	Add 200C Weight and Balance Information
7-1	Update
7-2	Update
7-3	Update
7-14	Revise "Cause for Illumination"
7-18	Revise Serialization
7-21	Add "Airstair Entrance Door (200C)"
7-22	Add "Cargo Door (200C)"
7-23	Revise Serialization
7-35	Revise Serialization
7-37	Revise "External Power"
7-42	Revise "Radiant Heating" and Serialization
7-44	Revise Serialization
7-48	Revise Serialization
7-51	Add "Cargo Restraint (200C)"
8-2	Update
8-10	Revise Serialization
8-13	Revise Serialization
8-36A	Add "Lubrication Points"
8-36B	Shifted Data

INTRODUCTION

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

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

For example, attention is called to Section X (SAFETY INFORMATION). While little of the information is new – and every pilot has been exposed to the fundamentals – Beechcraft feels that it is highly important to have Safety Information in a condensed form in the hands of the pilots. The Safety Information should be read and studied. Periodic review will serve as a reminder of good piloting techniques.

SUPER KING AIR 200
PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

TABLE OF DIVISIONS

SECTION I
GENERAL

TABLE OF CONTENTS

SUBJECT *PAGE*

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 handbook 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 *Pilot's Operating Handbook and FAA Approved Airplane Flight Manual,* and/or placards which are located in the airplane.

As a further reminder, the owner and 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 handbook are considered mandatory for continued airworthiness to maintain the airplane in a condition equal to that of its original manufacture.

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

USE OF THE HANDBOOK

The *Pilot's Operating Handbook* is designed to 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.

NOTES

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 handbook. However, due to the variety of airplane appointments and arrangements available, optional equipment described or depicted herein may not be designated as such in every case.

Neither Service Publications, Reissues, nor Revisions are automatically provided to the holder of this handbook. For information on how to obtain "Revision Service" applicable to this handbook, consult any Beechcraft Aero or

Aviation Center, or refer to the latest revision of Beechcraft Service Instructions No. 0250-010.

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 handbook.

REVISING THE HANDBOOK

When the handbook 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 handbook 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 handbook (except for the SUPPLEMENTS Section), and provides a record of changes made since the Original Issue or the latest reissue.

WARNING

When this handbook is used for airplane operational purposes, it is the pilot's responsibility to maintain it in current status.

AIRPLANE FLIGHT MANUAL SUPPLEMENTS REVISION RECORD

Section IX contains the FAA Approved Airplane Flight Manual Supplements headed by a Log of Supplements page. On the "Log" page is a listing of the FAA Approved Supplemental Equipment available for installation on the airplane. When new supplements are received or existing supplements are revised, a new "Log" page will replace the previous one, since it contains a listing of all previous approvals, plus the new approval. The supplemental material will be added to the grouping in accordance with the descriptive listing.

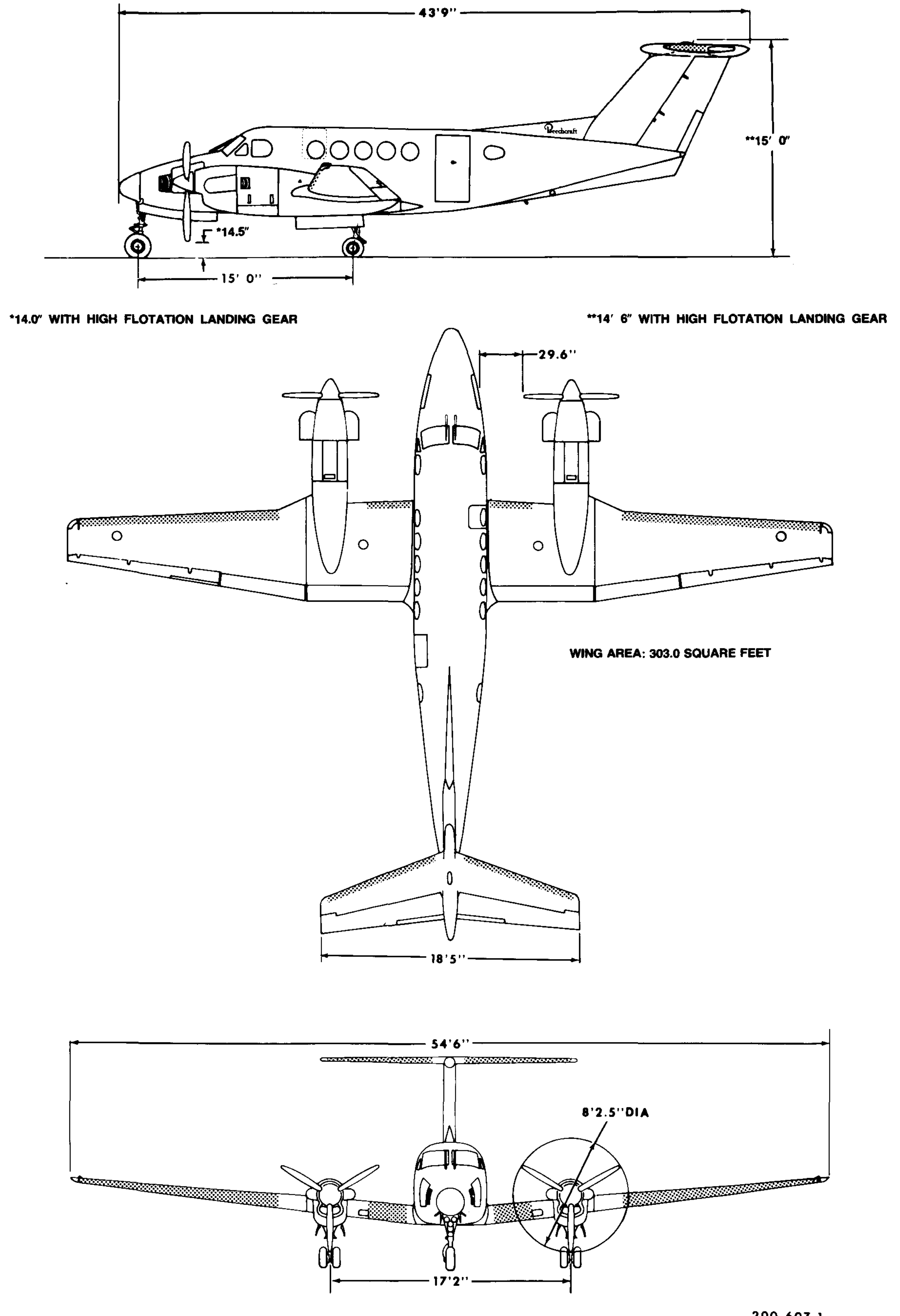
NOTE

Upon receipt of a new or revised supplement, compare the existing Log of Supplements in the handbook with the corresponding applicable Log page accompanying the new or revised supplement. It may occur that the Log page already in the handbook is dated later than the Log page accompanying the new or revised supplement. In any case, retain the Log page having the later date in the folio at the bottom-left corner of the page, and discard the older Log page.

VENDOR-ISSUED STC SUPPLEMENTS

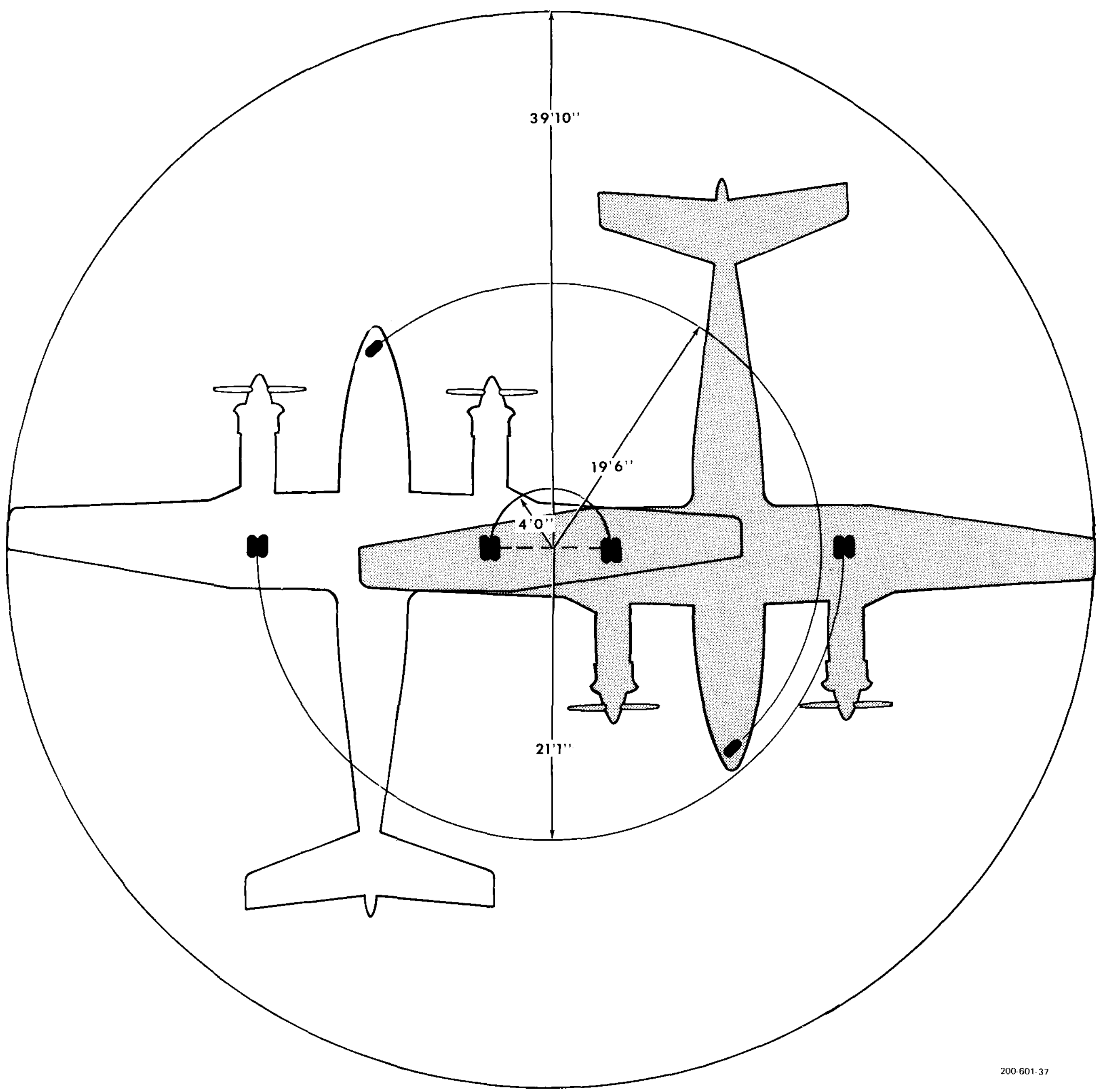
When a new airplane is delivered from the factory, the handbook delivered with it contains either an STC (Supplemental Type Certificate) Supplement or a Beech Flight Manual Supplement for every installed item requiring a supplement. If a new handbook for operation of the airplane is obtained at a later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

INTENTIONALLY LEFT BLANK


43'9"
**15' 0"
*14.5"
15' 0"
*14.0" WITH HIGH FLOTATION LANDING GEAR
**14' 6" WITH HIGH FLOTATION LANDING GEAR
29.6"
WING AREA: 303.0 SQUARE FEET
18'5"
54'6"
8'2.5"DIA
17'2"
200-607-1

THREE VIEW

GROUND TURNING CLEARANCE



Radius for Inside Gear	4 feet	0 inches
Radius for Nose Wheel	19 feet	6 inches
Radius for Outside Gear	21 feet	1 inch
Radius for Wing Tip	39 feet	10 inches

TURNING RADII ARE PREDICATED ON THE USE OF PARTIAL BRAKING ACTION AND DIFFERENTIAL POWER

DESCRIPTIVE DATA

ENGINES

NUMBER OF ENGINES: 2

ENGINE MANUFACTURER: Pratt & Whitney Aircraft of Canada Ltd. (Longueuil, Quebec, CANADA)

ENGINE MODEL NUMBER: PT6A-41

ENGINE TYPE: Turbo-propeller Engine

NUMBER OF DRIVE SHAFTS: 2

1 Compressor (Gas Generator) Shaft
1 Power Turbine Shaft

COMPRESSOR STAGES AND TYPES

3 Axial-flow Stages
1 Centrifugal-flow Stage

COMBUSTION CHAMBER TYPE: Annular

TURBINE STAGES AND TYPES

COMPRESSOR (GAS GENERATOR) TURBINE

Single-stage Axial-flow Reaction Turbine

POWER TURBINE

Two-stage Axial-flow Reaction Turbine

ENGINE SHAFT-HORSEPOWER RATING: 850 SHP

COMPRESSOR (GAS GENERATOR) SHAFT ROTATIONAL SPEED (N_1) LIMITS

Maximum Take-off/Maximum Continuous/Cruise Climb Power: 101.5% N_1 (38,100 rpm)

PROPELLER ROTATIONAL SPEED (N_2) LIMITS

Maximum Take-off/Maximum Continuous/Cruise Climb Power: 2000 rpm

PROPELLERS

NUMBER OF PROPELLERS: 2

PROPELLER MANUFACTURER: Hartzell Propeller, Inc. (Piqua, Ohio)

NUMBER OF BLADES: 3

PROPELLER DIAMETER: 98.5 inches

PROPELLER TYPE

Constant-speed, Full-feathering, Reversing, Counter-weighted, Hydraulically Actuated

PITCH RANGE (30-INCH STATION)

Feathered: +90°
Reverse: −9°

FUEL

RECOMMENDED ENGINE FUELS

COMMERCIAL GRADES

Jet A, Jet A-1, Jet B

MILITARY GRADES

JP-4, JP-5

EMERGENCY ENGINE FUELS (See LIMITATIONS Section for limitations.)

COMMERCIAL AVIATION GASOLINE GRADES

80 Red (Formerly 80/87)
100LL Blue*
100 Green (Formerly 100/130)

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

MILITARY AVIATION GASOLINE GRADES

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

USABLE FUEL

Main Fuel System .... 386 gallons
Auxiliary Fuel System .... 158 gallons
Maximum Usable Fuel Quantity .... 544 gallons

APPROVED FUEL ADDITIVE

Anti-ice Additive conforming to Specification MIL-I-27686

ENGINE OIL

SPECIFICATION

Any oil specified by brand name in the latest revision of Pratt & Whitney Service Bulletin Number 3001.

TOTAL OIL CAPACITY

14 quarts per engine

DRAIN AND REFILL QUANTITY

Approximately 12.5 quarts per engine

OIL QUANTITY OPERATING RANGE

MAX to 4 QUARTS LOW on dipstick

MAXIMUM CERTIFICATED WEIGHTS

Maximum Ramp Weight .... 12,590 pounds

Maximum Take-off Weight .... 12,500 pounds

Maximum Landing Weight .... 12,500 pounds

Maximum Zero-fuel Weight .... 10,400 pounds

Maximum Weight in Baggage Compartment:
When Equipped with Fold-up Seats .... 370 pounds
When Not Equipped with Fold-up Seats .... 410 pounds

CABIN AND ENTRY DIMENSIONS

Cabin Width (Maximum) .... 54 inches

Cabin Length (Maximum between pressure bulkheads) .... 22 feet

Cabin Height (Maximum) .... 57 inches

Airstair Entrance Door Width (Minimum) (200) .... 26.75 inches

Airstair Entrance Door Height (Minimum) (200) .... 51.5 inches

Airstair Entrance Door Width (Minimum) (200C) .... 20.2 inches

Airstair Entrance Door Height (Minimum) (200C) .... 46 inches

Cargo Door Width (Minimum) (200C) .... 49 inches

Cargo Door Height (Minimum) (200C) .... 52 inches

Pressure Vessel Volume .... 393 cubic feet

Potential Cargo-area Volume .... 253 cubic feet

SPECIFIC LOADINGS

WING LOADING: 41.3 pounds per square foot

POWER LOADING: 7.4 pounds per horsepower

SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

The following glossary is applicable within this handbook.

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 when corrected for instrument error. IAS values published in this handbook assume zero instrument error.

KCAS — *Calibrated Airspeed* expressed in *knots.*

KIAS — *Indicated Airspeed* expressed in *knots.*

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 — *Speed at Engine Failure.*

V_2 — *Take-off Safety Speed.*

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_{LOF} — *Lift-off Speed.*

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 and windmilling, a 5-degree bank towards the operative engine, take-off power on operative engine, landing gear up, flaps in take-off 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_{MCG} — *Ground Minimum Control Speed.*

V_{MO}/M_{MO} — *Maximum Operating Limit Speed* is the speed limit that may not be deliberately exceeded in normal flight operations. V is expressed in knots and M in Mach Number.

V_R *Rotation 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. Intentional failing of one engine below this speed is not recommended.

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

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

METEROLOGICAL 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). Position errors may be obtained from the Altimeter Correction graph.

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) adjusted for compressibility effects, or from ground meterological 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 handbook, altimeter instrument errors are assumed to be zero.

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 handbook 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.

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

High Idle Obtained by placing the Condition Lever in the High Idle position. This limits the power operation to a minimum of 70% of N_1 rpm.

Low Idle Obtained by placing the Condition Lever in the Low Idle position. This limits the power operation to a minimum of 52% of N_1 rpm.

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

Maximum Cruise Power Is the highest power rating for cruise and is not time limited.

Reverse Reverse thrust is obtained by lifting the Power Levers and moving them aft of the Beta 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 Shut-off Lever) The fuel shut-off lever actuates a valve in the fuel control unit which controls the flow of fuel at the fuel control outlet and regulates the idle range from Low to High idle.

ITT (Interstage Turbine Temperature) Eight 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 with 100% representing a gas generator speed of 37,500 rpm.

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 requests the control to maintain rpm at a selected value and, in the maximum decrease rpm position, feathers the propeller.

Propeller Governor This governor will maintain the selected speed requested by the propeller control lever, except on reverse selection where the power lever interconnection to the integral pneumatic area of the governor will select a lower speed. The pneumatic area during normal selection will act as an overspeed limiter.

Torquemeter The torquemeter system determines the shaft output torque. Torque values are obtained by tapping into two outlets on the reduction gear case and recording the differential pressure from the outlets. The relationship between torquemeter pressure and propeller shaft power is shown in LIMITATIONS Section. Instrument readout is in foot-pounds.

GRAPH AND TABULAR TERMINOLOGY

Accelerate-Go — The distance to accelerate to Engine Failure Speed (V_1), experience an engine failure, continue accelerating to lift-off speed (V_{LOF}) then climb and accelerate in order to achieve climb speed (V_2) at 35 feet above the runway.

Accelerate-Stop — The distance to accelerate to Engine Failure Speed (V_1) and stop, using brakes and propeller reversing on the operative engine. V_1 speed is equal to the take-off rotation speed (V_r).

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 up.

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 up

Clearway — A clearway is an area beyond the airport runway not less than 300 feet on either side of the extended center line of the runway, at an elevation no higher than the elevation at the end of the runway, clear of all fixed obstacles, and under the control of the airport authorities.

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 test.

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

Maximum Zero Fuel Weight — Any weight above the value given must be loaded as fuel.

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.

Ramp Weight — The weight of the airplane before engine start. Included is the take-off weight plus a fuel allowance for start, taxi, run-up and take-off ground roll to liftoff.

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 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.

Take-off Weight — The weight of the airplane at lift-off from the runway.

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 any engine 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 largest 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.
PPH	*Pounds Per Hour*
Ramp Weight	The airplane weight at engine start assuming all loading is completed.
Standard Empty Weight	The *basic empty weight* of a standard airplane as specified by the manufacturer.
Station	The longitudinal distance from some point to the zero datum or zero fuselage station.
Take-off Weight	The weight of the airplane at lift-off from the runway.
Tare	The apparent weight which may be indicated by a 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.
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 fuel on board.

SECTION II

LIMITATIONS

TABLE OF CONTENTS

SUBJECT *PAGE*

The limitations included in this Section have been approved by the Federal Aviation Administration, and they must be observed in the operation of the Beechcraft Super King Air 200.

AIRSPEED LIMITATIONS			
SPEED	**KCAS**	**KIAS**	**REMARKS**
Maneuvering Speed V_A (12,500 pounds)	182	181	Do not make full or abrupt control movements above this speed.
Maximum Flap Extension/ Extended Speed V_{FE} Approach Position - 40% Full Down Position - 100%	 200 144	 200 146	Do not extend flaps or operate with flaps in prescribed position above these speeds.
Maximum Landing Gear Operating Speed V_{LO} Extension Retraction	 182 164	 181 163	Do not extend or retract landing gear above the speeds given.
Maximum Landing Gear Extended Speed V_{LE}	182	181	Do not exceed this speed with landing gear extended.
Air Minimum Control Speed V_{MCA}	91	86	This is the lowest airspeed at which the airplane is directionally controllable when one engine suddenly becomes inoperative and the other engine is at take-off power. (See definition in Section I.)
*Maximum Operating Speed V_{MO} M_{MO}	 270 .48 Mach	 269	Do not exceed this airspeed or Mach Number in any operation.
**Maximum Operating Speed V_{MO} M_{MO}	 260 .52 Mach	 259	Do not exceed this airspeed or Mach Number in any operation.

* *BB-2 thru BB-198, except airplanes modified by Beechcraft Kit Number 101-5033-1 S in compliance with* Beechcraft Service Instruction Number 0894.

****BB-199 and after, BL-1 and after, and any earlier airplanes modified by Beechcraft Kit Number 101-5033-1 S in compliance with Beechcraft Service Instruction Number 0894.**

AIRSPEED INDICATOR MARKINGS*			
MARKING	KCAS VALUE OR RANGE	KIAS VALUE OR RANGE	SIGNIFICANCE
Red Line	91	86	Air Minimum Control Speed (V_{MCA})
White Arc	80 to 144	75 to 146	Full-flap Operating Range
Wide White Arc	80 to 102	75 to 99	Lower Limit is the Stalling Speed (V_{SO}) at maximum weight with Full Flaps (100%) and idle power.
Narrow White Arc	102 to 144	99 to 146	Lower Limit is the Stalling Speed (V_S) at maximum weight with Flaps Up (0%) and idle power. Upper limit is the maximum speed permissible with flaps extended beyond Approach (more than 40%).
White Triangle	200	200	Maximum Flaps-to/at-Approach (40%) Speed
Blue Line	122	121	One-Engine-Inoperative Best Rate-of-Climb Speed
**Red & White Hash-Marked Pointer	270 KCAS (269 KIAS) or value equal to .48 Mach, whichever is lower.		Maximum Speed for any operation.
***Red & White Hash-Marked Pointer	260 KCAS (259 KIAS) or value equal to .52 Mach, whichever is lower.		Maximum Speed for any operation.

** The airspeed indicator is marked in CAS values.*
*** BB-2 thru BB-198, except airplanes modified by Beechcraft Kit Number 101-5033-1 S in compliance with Beechcraft Service Instructions Number 0894.*
****BB-199 and after, BL-1 and after and any earlier airplanes modified by Beechcraft Kit Number 101-5033-1 S in compliance with Beechcraft Service Instructions Number 0894.*

POWER PLANT LIMITATIONS

NUMBER OF ENGINES

2

ENGINE MANUFACTURER

Pratt & Whitney Aircraft of Canada Ltd.

ENGINE MODEL MUMBER

PT6A-41

ENGINE OPERATING LIMITS

The following limitations shall be observed. Each column presents limitations. The limits presented do not necessarily occur simultaneously.

OPERATING CONDITION	SHP	TORQUE FT-LBS (1)	MAXIMUM OBSERVED ITT°C	GAS GENERATOR RPM N_1 (2) RPM	%	PROP RPM N_2	OIL PRESS. PSI(3)	OIL TEMP °C
STARTING	---	---	1000 (4)	---	---	---	---	-40(min)
LOW IDLE	---	---	660 (5)	19,500	52(min)	---	60(min)	-40 to 99
HIGH IDLE	---	---	---	---	(6)	---	---	-40 to 99
TAKEOFF (7)	850	2230	750	38,100	101.5	2000	105 to 135	10 to 99
MAX CONT AND MAX CRUISE	850	2230 (8)	750	38,100	101.5	2000	105 to 135	10 to 99
CRUISE CLIMB AND REC CRUISE	850	2230 (8)	725	38,100	101.5	2000	105 to 135	0 to 99
MAX REVERSE (9)	---	---	750	---	88	1900	105 to 135	0 to 99
TRANSIENT	---	2750 (4)	850	38,500(10)	102.6(10)	2200(4)	---	0 to 104(7)

FOOTNOTES:

(1) Torque limit applies within range of 1600-2000 propeller rpm (N_2). Below 1600 rpm, torque is limited to 1100 ft-lbs.

(2) For every 5°C below −48°C ambient temperature, reduce maximum allowable N_1 by 1.4%.

(3) When gas generator speeds are above 27,000 rpm (72% N_1) and oil temperatures are between 60° and 71°C, normal oil pressures are:

105 to 135 psi below 21,000 feet; 85 to 135 psi at 21,000 feet and above.

During extremely cold starts, oil pressure may reach 200 psi. Oil pressure between 60 and 85 psi is undesirable; it should be tolerated only for the completion of the flight, and then only at a reduced power setting not exceeding 1100 ft-lbs torque. Oil pressure below 60 psi is unsafe; it requires that either the engine be shut down, or that a landing be made as soon as possible, using the minimum power required to sustain flight. Fluctuations of plus or minus 10 psig are acceptable.

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

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

(6) At approximately 70% N_1.

(7) These values are time limited to 5 minutes.

(8) Cruise torque values vary with altitude and temperature.

(9) This operation is time limited to one minute.

(10) These values are time limited to 10 seconds.

FUEL PRESSURE

Operation of either engine with its corresponding fuel pressure light (L FUEL PRESS or R FUEL PRESS annunciator) illuminated is limited to 10 hours before overhaul or replacement of the engine-driven fuel pump.

NOTE

Windmilling time need not be charged against this time limit.

GENERATOR LIMITS

Maximum sustained generator load is limited as follows:

In Flight:
Sea Level to 31,000 feet altitude 1.00
Above 31,000 feet altitude 0.88

Ground Operation 0.85

During ground operation, also observe the following limitations:

GENERATOR LOAD	MINIMUM GAS GENERATOR RPM - N_1	
	WITHOUT AIR CONDITIONING	*WITH AIR CONDITIONING
0 to .70	52%	60%
.70 to .75	55%	60%
.75 to .80	60%	60%
.80 to .85	65%	65%

**Right engine only*

APPROVED FUEL GRADES AND ADDITIVE

RECOMMENDED ENGINE FUELS

COMMERCIAL GRADES

Jet A
Jet A-1
Jet B

MILITARY GRADES

JP-4
JP-5

EMERGENCY ENGINE FUELS

COMMERCIAL AVIATION GASOLINE GRADES

80 Red (Formerly 80/87)
100LL Blue*
100 Green (Formerly 100/130)

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

MILITARY AVIATION GASOLINE GRADES

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

LIMITATIONS ON THE USE OF AVIATION GASOLINE

1. Operation is limited to 150 hours between engine overhauls.
2. Operation is limited to 20,000 feet pressure altitude (FL 200) or below if either standby boost pump is inoperative.
3. Crossfeed capability is required for climbs above 20,000 feet pressure altitude (FL 200).

APPROVED FUEL ADDITIVE

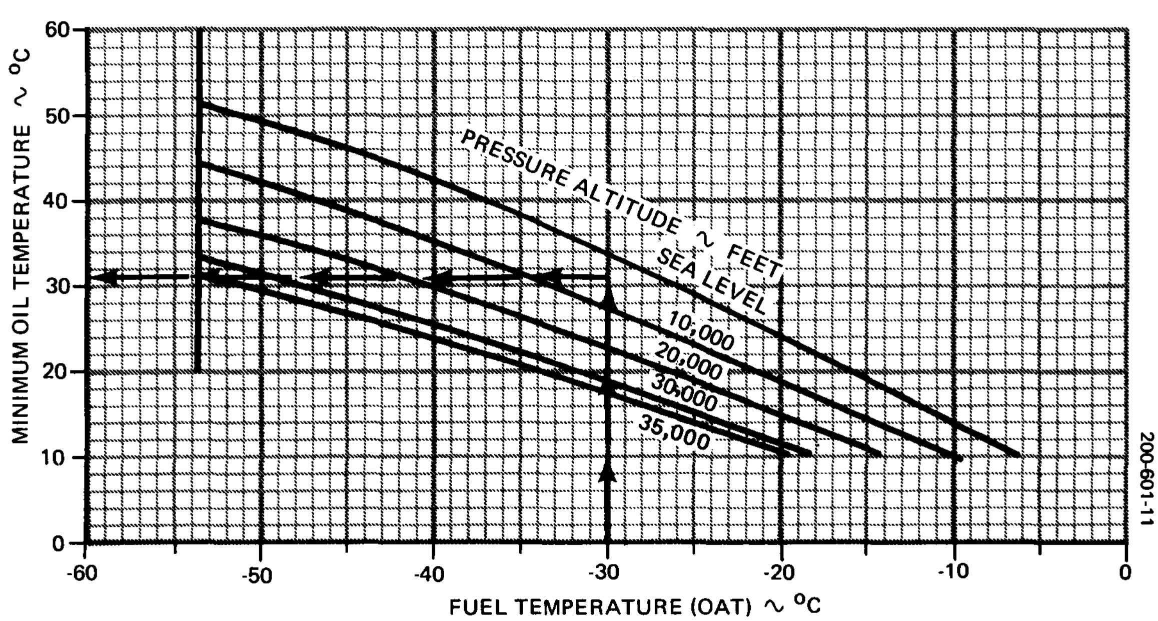
Anti-icing additive conforming to Specification MIL-I-27686 is the only approved fuel additive.

Engine oil is used to heat the fuel on entering the fuel control. Since no temperature measurement is available for the fuel at this point, it must be assumed to be the same as the OAT. The graph below is supplied for use as a guide in preflight planning, based on known or forecast operating conditions, to allow the operator to become aware of operating temperatures where icing at the fuel control could occur. If the plot should indicate that oil temperature versus OAT is such that ice formation could occur during takeoff or in flight, anti-icing additive per MIL-I-27686 should be mixed with the fuel at refueling to ensure safe operation.

CAUTION

Anti-icing additive must be properly blended with the fuel to avoid deterioration of the fuel cells. The additive concentration by volume shall be a minimum of 0.060% and a maximum of 0.15%. Approved procedure for adding anti-icing concentrate is contained in Section VIII.

JP-4 fuel per MIL-T-5624 has anti-icing additive per MIL-I-27686 blended in the fuel at the refinery, and no further treatment is necessary. 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

1. Do not put any fuel into an auxiliary tank unless the main tank system on the same side of the airplane is full.

2. Maximum allowable fuel imbalance between wing fuel systems is 1000 pounds.

3. Do not take off if fuel quantity gages indicate in yellow arc or less than 265 pounds of fuel in each main tank.

4. Crossfeeding of fuel is permitted only when one engine is inoperative.

WARNING

The airplane is approved for takeoff with one standby boost pump inoperative, but in such a case, crossfeed of fuel will not be available from the side of the inoperative standby boost pump.

OIL SPECIFICATION

Any oil specified by brand name in the latest revision of *Pratt & Whitney Service Bulletin Number 3001* is approved for use in the PT6A-41 engine.

NUMBER OF PROPELLERS

2

PROPELLER MANUFACTURER

Hartzell Propeller, Inc.

PROPELLER HUB AND BLADE MODEL NUMBERS

HUBS

HC-B3TN-3G

BLADES

T10178B-3R

PROPELLER DIAMETER

98.5 inches only

PROPELLER BLADE ANGLES AT 30-INCH STATION

Feathered: + 90°
Reverse: − 9°

PROPELLER ROTATIONAL SPEED LIMITS

Transients not exceeding 5-seconds .... 2200 rpm
Reverse .... 1900 rpm
All other conditions........ 2000 rpm

PROPELLER ROTATIONAL OVERSPEED LIMITS

The maximum propeller overspeed limit is 2200 rpm and is time-limited to five-seconds. Sustained propeller overspeeds faster than 2000 rpm indicate failure of the primary governor. Flight may be continued at propeller overspeeds up to 2080 rpm provided torque is limited to 1800 foot-pounds. Sustained propeller overspeeds faster than 2080 rpm indicate failure of both the primary governor and the secondary governor, and such overspeeds are unapproved.

POWER PLANT INSTRUMENT MARKINGS

INSTRUMENT	RED LINE MINIMUM LIMIT	GREEN ARC NORMAL OPERATING	RED LINE MAXIMUM LIMIT
INTERSTAGE TURBINE TEMPERATURE*	---	400°C to 750°C	750°C
TORQUEMETER	---	400 ft-lbs to 2230 ft-lbs	2230 ft-lbs
PROPELLER TACHOMETER (N_2)	---	1600 rpm to 2000 rpm	2000 rpm
GAS GENERATOR TACHOMETER (N_1)	---	---	101.5%
OIL TEMPERATURE	---	10°C to 99°C	99°C
OIL PRESSURE**	60 psi	105 psi to 135 psi	200 psi

**Starting Limit (Dashed Red Line): 1000°C.*
***On some gages a dual-band yellow/green arc extends from 85 to 105 psi, indicating the extended range of normal oil pressures for operation at 21,000 feet or above. The limitations are the same whether or not this range is marked.*

MISCELLANEOUS INSTRUMENT MARKINGS

FUEL QUANTITY INDICATORS

Yellow Arc (No-Takeoff Range) .... 0 to 265 pounds

CABIN DIFFERENTIAL PRESSURE GAGE

Prior to BB-195:
Green Arc (Approved Operating Range) .... 0 to 6.0 psi
Red Arc (Unapproved Operating Range) .... 6.0 psi to end of scale

BB-195 and After:
Green Arc (Approved Operating Range) .... 0 to 6.1 psi
Red Arc (Unapproved Operating Range) .... 6.1 psi to end of scale

PNEUMATIC GAGE

Green Arc (Normal Operating Range) .... 12 to 20 psi
Red Line (Maximum Operating Limit) .... 20 psi

VACUUM (SUCTION) GAGE

Narrow Green Arc (Normal from 15,000 to 30,000 feet MSL) .... 3.0 to 4.3 in. Hg
Wide Green Arc (Normal from Sea Level to 15,000 feet MSL) .... 4.3 to 5.9 in. Hg

PROPELLER DEICE AMMETER

Green Arc (Normal Operating Range) .... 14 to 18 amperes

WEIGHT LIMITS

Maximum Ramp Weight .... 12,590 pounds

Maximum Take-off Weight:
All Except FAR Part 135 Operations .... 12,500 pounds
FAR Part 135 Operations .... As Limited by MAXIMUM ENROUTE WEIGHT Graph in PERFORMANCE Section

Maximum Landing Weight .... 12,500 pounds

Maximum Zero Fuel Weight .... 10,400 pounds

Maximum Weight in Baggage Compartment:
When equipped with Fold-up Seats .... 370 pounds
When Not Equipped with Fold-up Seats .... 410 pounds

CENTER OF GRAVITY LIMITS

AFT LIMIT

196.4 inches aft of datum at all weights

FORWARD LIMITS

185.0 inches aft of datum at 12,500 pounds, with straight line variation to 181.0 inches aft of datum at 11,279 pounds. 181.0 inches aft of datum at 11,279 pounds or less.

DATUM

The reference datum is located 83.5 inches forward of the center of the front jack point.

MEAN AERODYNAMIC CHORD (MAC)

The leading edge of the MAC is 171.23 inches aft of the datum.

The MAC length is 70.41 inches.

MANEUVER LIMITS

The Beechcraft Super King Air 200 and 200C are Normal Category Aircraft. Acrobatic maneuvers, including spins, are prohibited.

FLIGHT LOAD FACTOR LIMITS AT 12,500 POUNDS

FLAPS UP

3.17 positive g's
1.27 negative g's

FLAPS DOWN

2.00 positive g's
1.27 negative g's

MINIMUM FLIGHT CREW

FAR Part 91 Operations .... One Pilot

FAR Part 135 Operations:
VFR .... One Pilot
IFR .... Two Pilots, or One Pilot with an Approved Three-axis Autopilot

KINDS OF OPERATION LIMITS

The Beechcraft Super King Air 200 and 200C are approved for the following types of operations when the required equipment is installed and operational as defined within the listing of REQUIRED EQUIPMENT FOR VARIOUS CONDITIONS OF FLIGHT contained in this LIMITATIONS Section of the handbook:

1. VFR Day
2. VFR Night
3. IFR Day
4. IFR Night
5. Known Icing Conditions
6. FAR Part 91 operations, when all pertinent limitations and performance considerations are complied with.
7. FAR Part 135 operations, when all pertinent limitations and performance considerations are complied with.

REQUIRED EQUIPMENT FOR VARIOUS CONDITIONS OF FLIGHT

Federal Aviation Regulations Part 23 and Part 91 specify the minimum numbers and types of airplane instruments and equipment which must be installed and operable for various kinds of flight conditions. This includes VFR day, VFR night, IFR day, IFR night, and flight into known icing conditions.

The operator who desires to function under FAR Part 135 will find certain additional items of required equipment, which will be prefaced in the Required Equipment Listing below by "**(FAR 135)**". These items must be considered in addition to the normal listed requirements, in order to comply with the appropriate regulations.

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

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

No distinction is made between standard and optional equipment. The "Number Installed" column indicates the number of items normally found on the airplane when that item is installed; however, in some cases the actual number may vary due to customized installations.

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

LEGEND

Numbers refer to quantities required to be operative for the specified condition.

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

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

(V) Indicates that the number of items installed varies.

(L) Indicates that the item on the left side of the airplane is required to be operative.

SYSTEM and/or COMPONENT	Number of items installed	VFR Day	VFR Night	IFR Day	IFR Night	Known Icing Conditions	REMARKS and/or EXCEPTIONS
COMMUNICATIONS							
Static Discharge Wicks	15	-	-	6*	6*	6*	– *Minimum required - one wick at the outboard end of each control surface plus top of vertical stabilizer.
VHF Communications System	2	*	*	*	*	*	– *Per FAR 91.33, 135.157, 135.59
ELECTRICAL POWER							
AC Volt/Frequency Meter	1	-	-	-	-	-	–
Battery	1	1	1	1	1	1	–
Battery Charge Annunciator	1	1	1	1	1	1	–
DC Generator	2	1	1	2	2	2	–
DC Generator Caution Annunciator	2	2	2	2	2	2	– One may be inoperative provided corresponding loadmeter is monitored.
DC Loadmeter	2	2	2	2	2	2	– One may be inoperative provided corresponding generator caution light is monitored.
Inverter	2	1	1	2	2	2	–
Inverter Warning Annunciator	1	-	-	1	1	1	–
ENGINE INDICATING INSTRUMENTS							
Chip Detector Annunciator	2	2	2	2	2	2	–
Fuel Flow Indicator	2	2	2	2	2	2	– One may be inoperative provided fuel quantity gages are operative.
Gas Generator Tachometer	2	2	2	2	2	2	–
ITT Indicator	2	2	2	2	2	2	–
Oil Pressure Indicator	2	2	2	2	2	2	–
Oil Temperature Indicator	2	2	2	2	2	2	–
Propeller Synchroscope	1	-	-	-	-	-	–
Propeller Tachometer	2	1	1	1	1	1	–
Torque Indicator	2	2	2	2	2	2	–
ENVIRONMENTAL SYSTEMS							
Altitude Warning Annunciator	1	1	1	1	1	1	– May be inoperative provided airplane remains unpressurized.
Bleed Air Fail Annunciator	2	0*	0*	1*	1*	2	– *Use of bleed air from side with inoperative annunciator is prohibited.
Cabin Rate of Climb Indicator	1	1	1	1	1	1	– } May be inoperative provided airplane remains unpressurized.
Differential Pressure/Cabin Altitude	1	1	1	1	1	1	– }
Duct Overtemp Caution Annunciator	1	-	-	-	-	-	–
Outflow Valve	1	1	1	1	1	1	– } May be inoperative provided airplane remains unpressurized.
Pressurization Air Source	2	1	1	1	1	1	}
Pressurization Controller	1	1	1	1	1	1	}
Safety Valve	1	1	1	1	1	1	– }

SYSTEM and/or COMPONENT	Number of items installed	VFR Day	VFR Night	IFR Day	IFR Night	Known Icing Conditions	REMARKS and/or EXCEPTIONS
EQUIPMENT/FURNISHINGS							
Emergency Locator Transmitter	1	*	*	*	*	*	– *Per FAR 91.52
(FAR 135) Over Water Emergency Equipment	**0**	*	*	*	*	*	– ***Per FAR 135.163**
Seat Belts	V	*	*	*	*	*	– *Per FAR 91.33
Shoulder Harness	V	*	*	*	*	*	– *Required for pilot and copilot. Required for each additional forward-facing occupant if seat is so-equipped.
FIRE PROTECTION							
Engine Fire Extinguisher	2	-	-	-	-	-	–
Fire Detector System	2	2	2	2	2	2	–
Portable Fire Extinguisher	2	-	-	-	-	-	–
(FAR 135) Portable Fire Extinguisher	**2**	**2**	**2**	**2**	**2**	**2**	**–**
FLIGHT CONTROLS							
Flap Position Indicator	1	1	1	1	1	1	– May be inoperative provided that the flap travel is visually inspected prior to takeoff.
Flap System	1	-	-	-	-	-	–
Rudder Boost	1	-	-	-	-	-	–
Stall Warning Horn	1	1	1	1	1	1	–
Trim Tab Indicator - Rudder, Aileron, and Elevator	3	3	3	3	3	3	– May be inoperative provided that the tabs are visually checked in the neutral position prior to each takeoff and checked for full range of operation.
Yaw Damp	1	1	1	1	1	1	– May be inoperative for flight at and below 17,000 feet.
FUEL							
Crossfeed Annunciator	1	1	1	1	1	1	– May be inoperative provided proper operation of crossfeed system is checked prior to takeoff. Both fuel pressure lights must be operative.
Crossfeed Valve	1	*	*	*	*	*	– *Required for: (1) Operation with aviation gasoline above 20,000 feet; or (2) When operating with aviation kerosene when one standby boost pump is inoperative.
Engine Driven Boost Pump	2	2	2	2	2	2	–
Firewall Shutoff Valve	2	2	2	2	2	2	–

SYSTEM and/or COMPONENT	Number of items installed	VFR Day	VFR Night	IFR Day	IFR Night	Known Icing Conditions	REMARKS and/or EXCEPTIONS
FUEL (Continued)							
Fuel Pressure Warning Annunciator	2	2	2	2	2	2	– One may be inoperative provided standby boost pump operation is ascertained using opposite light with crossfeed prior to engine start. Standby boost pump on side of failed light must be operated in flight, to assure fuel pressure if the engine driven pump should fail.
Fuel Quantity Gage Selector Switch	1	1	1	1	1	1	– May be inoperative provided MAIN quantity indicators are operational.
Fuel Quantity Indicator	2	2	2	2	2	2	– One may be inoperative provided other side is operational and amount of fuel on board can be established to be adequate for intended flight. Fuel flow indicator on affected side must be operational and monitored.
Jet Transfer Pump	2	*	*	*	*	*	– *Required only if Aux Tanks contain fuel.
Motive Flow Valve	2	*	*	*	*	*	– *Required only if Aux Tanks contain fuel.
Standby Fuel Boost Pump	2	1*	1*	1*	1*	1*	– *Both required for operation on Aviation Gasoline above 20,000 feet.
ICE AND RAIN PROTECTION							
Airfoil Deice System (Wing and Horizontal Stabilizer)	1	-	-	-	-	1	–
Alternate Static Air Source	1	1	1	1	1	1	–
Auto Ignition System and Annunciators	2	2	2	2	2	2	–
Engine Inertial Ice Vanes	2	2	2	2	2	2	–
Heated Fuel Vent	2	-	-	-	-	2	–
Ice Vane Annunciators	4	4	4	4	4	4	– May be inoperative provided manual ice vane controls are used.
Pitot Heater	2	-	-	L	L	L	–
(FAR 135) Pitot Heater	**2**	**-**	**-**	**2***	**2***	**2***	**– *Right side may be inoperative if second crew member is not required.**
Propeller Deice System (Auto)	1	-	-	-	-	1	–
Propeller Deice System (Manual)	1	-	-	-	-	1	–
Stall Warning Heater	1	-	-	-	-	1	–
Windshield Heat (Left and Right)	2	-	-	-	-	L	–
Windshield Wiper	2	-	-	-	-	-	–
LANDING GEAR							
Gear Handle Lights	2	1	1	1	1	1	–
Landing Gear Aural Warning	1	1	1	1	1	1	–

SYSTEM and/or COMPONENT	Number of items installed	VFR Day	VFR Night	IFR Day	IFR Night	Known Icing Conditions	REMARKS and/or EXCEPTIONS
LANDING GEAR (Continued)							
Landing Gear Motor	1	1	1	1	1	1	– May be inoperative provided operations are continued only to a point where repairs can be accomplished.
Landing Gear Position Indication Lights	3	3	3	3	3	3	– One of three may be inoperative provided gear handle light is monitored.
LIGHTS							
Cabin Door Caution Annunciator	1	1	1	1	1	1	– May be inoperative provided visual indicators are checked prior to each takeoff.
Caution Flasher Lights	2	-	-	-	-	-	–
Cockpit and Instrument Lights	V	-	*	-	*	-	– *Lights must illuminate all instruments and controls.
(FAR 135) Flashlight	**0**	–	*	–	*	–	– ***Per FAR 135.153**
Landing Light	2	-	*	-	*	-	– *One required for night flight if operated for hire.
Passenger Notice System (Fasten Seat Belt and No Smoking)	1	1	1	1	1	1	– May be inoperative provided adequate passenger briefing has been accomplished.
Position Lights	3	-	3	-	3	-	–
Rotating Beacon	2	-	2	-	2	-	–
Strobe Lights	3	-	-	-	-	-	–
Taxi Light	1	-	-	-	-	-	–
Warning Flasher Lights	2	-	-	-	-	-	–
Wing Ice Lights	2	-	-	-	-	*	– *One required for night icing flight.
NAVIGATION INSTRUMENTS							
Airspeed Indicator	2	L	L	L	L	L	–
(FAR 135) Airspeed Indicator	**2**	**L**	**L**	**2***	**2***	**2***	– ***Right side may be inoperative if second crew member is not required.**
Clock	2	-	-	1	1	1	–
Directional Gyro	2	-	-	L	L	L	–
(FAR 135) Directional Gyro	**2**	**L**	**L**	**2***	**2***	**2***	– ***Right side may be inoperative if second crew member is not required.**
Distance Measuring Equipment	V	*	*	*	*	*	– *Per FAR 91.33
Horizon Indicator	2	-	-	L	L	L	–
(FAR 135) Horizon Indicator	**2**	**L**	**L**	**2***	**2***	**2***	– ***Right side may be inoperative if second crew member is not required.**
Magnetic Compass	1	1	1	1	1	1	–
(FAR 135) Marker Beacon	**V**	*	*	*	*	*	– ***Per FAR 135.159**
Navigation Equipment	V	-	-	*	*	*	– *Per FAR 91.33, FAR 135.157

SYSTEM and/or COMPONENT	Number of items installed	VFR Day	VFR Night	IFR Day	IFR Night	Known Icing Conditions	REMARKS and/or EXCEPTIONS
NAVIGATION INSTRUMENTS (Continued)							
Outside Air Temperature	1	1	1	1	1	1	–
Sensitive Altimeter	2	L	L	L	L	L	–
(FAR 135) Sensitive Altimeter	**2**	**L**	**L**	**2***	**2***	**2***	– ***Right side may be inoperative if second crew member is not required.**
Transponder	V	*	*	*	*	*	– *Per FAR 91.24, 91.90, 91.97
Turn and Bank Indicator	2	-	-	L	L	L	–
(FAR 135) Turn and Bank Indicator	**2**	**L**	**L**	**2***	**2***	**2***	– ***Right side may be inoperative if second crew member is not required.**
Vertical Speed Indicator	2	-	-	-	-	-	–
(FAR 135) Vertical Speed Indicator	**2**	-	-	**2***	**2***	**2***	– ***Right side may be inoperative if second crew member is not required.**
OXYGEN							
Oxygen System	1	*	*	*	*	*	– *Per FAR 91.32, 135.83, 135.165, 23.1447(b)
PROPELLERS							
Autofeathering Armed Light	2	-	-	-	-	-	–
Autofeathering System	1	-	-	-	-	-	–
Propeller Governor Test Switch:							
(BB-2 thru BB-162)	2	2	2	2	2	2	–
(BB-163 and after, BL-1 and after)	1	1	1	1	1	1	–
Propeller Overspeed Governor	2	2	2	2	2	2	–
Propeller Primary Low-Pitch Stop	2	2	2	2	2	2	–
Propeller Synchrophaser	1	-	-	-	-	-	–
Reverse Not Ready Annunciator	1	1	1	1	1	1	– May be inoperative provided propeller controls are in FULL INCREASE RPM position for reversing.
VACUUM							
Instrument Bleed Air Source	2	-	-	1	1	2	–
Instrument Bleed Air Valve	2	2	2	2	2	2	– One may be inoperative provided the engine on the affected side is secured in the event of a bleed air fail warning.
Suction Gage	1	*	*	1	1	1	– *May be inoperative provided airplane remains unpressurized.
Vacuum System	1	*	*	1	1	1	– *May be inoperative provided airplane remains unpressurized.

MAXIMUM OPERATING PRESSURE-ALTITUDE LIMITS

Normal Operation:
Serials BB-310, BB-343, BB-383, BB-415, BB-416, BB-418 thru BB-448, BB-450 and after .... 35,000 feet

Serials BL-1 and after and serials prior to BB-450 except BB-310, BB-343, BB-383, BB-415, BB-416, BB-418 thru BB-448 .... 31,000 feet

Operation with Aviation Gasoline:
Both Standby Boost Pumps Operative .... 31,000 feet
Either Standby Boost Pump Inoperative .... 20,000 feet
Climbs without Crossfeed Capability .... 20,000 feet

Operation with Yaw Damp System Inoperative .... 17,000 feet

OUTSIDE AIR TEMPERATURE LIMITS

Do not operate the airplane when the outside air temperature is outside the limits specified below.

MINIMUM LIMIT

All Altitudes .... −53.9°C

MAXIMUM LIMIT

Sea Level to 25,000 feet pressure altitude .... ISA + 37°C

Above 25,000 feet pressure altitude .... ISA + 31°C

CABIN PRESSURIZATION LIMIT

Maximum Cabin Pressure Differential .... 6.1 psi

MAXIMUM OCCUPANCY LIMIT

FAR Part 91 Operations .... Fifteen (15)

FAR Part 135 Operations .... Nine (9) Passengers Plus Crew

ICE VANES (INERTIAL SEPARATOR SYSTEM) LIMITATIONS

The ice vanes shall be extended for operations in ambient temperatures of +5°C or below when flight free of visible moisture cannot be assured.

The ice vanes shall be retracted for operations in ambient temperatures of +15°C or above.

Once the manual override system is activated (i.e., anytime the ICE VANE EMERGENCY MANUAL EXTENSION handle has been pulled out), do not attempt to operate the ice vanes electrically until the override assembly inside the engine cowling has been properly reset on the ground. Even after the manual extension handle has been pushed back in, the manual override system is still engaged.

STARTERS

Use of the starter is limited to 40 seconds ON, 60 seconds OFF, 40 seconds ON, 60 seconds OFF, 40 seconds ON, then 30 minutes OFF.

FLIGHT IDLE STOP

The flight idle stop shall be set so that 800 ± 60 foot-pounds torque is obtained at 1800 rpm (N_2) at Sea Level, Standard Day conditions.

AUTOPILOT LIMITATIONS

FAR PART 91 OPERATIONS

Refer to the applicable FAA Approved Airplane Flight Manual Supplement in the SUPPLEMENTS Section.

FAR PART 135 OPERATIONS

Refer to the applicable FAA Approved Airplane Flight Manual Supplement in the SUPPLEMENTS Section, except for Minimum Altitude, which is established by FAR Part 135 as follows:

1. Enroute - 500 feet above terrain
2. Coupled Approach - Observe Decision Height (DH) or Minimum Descent Altitude (MDA).

AFT-FACING SEATS

Only aft-facing seats (placarded as such on the leg crossmember) are authorized in the aft-facing position. The headrest and seatback of each occupied aft-facing seat must be in the fully raised position for takeoff and landing.

STRUCTURAL LIMITATIONS

Maximum Cabin Pressure Differential .... 6.1 psi
Cabin Door Upper Forward and Aft Latch Bolts Safelife (200) .... 5000 hrs
Cabin Window Safelife .... 5000 hrs
Wing and Associated Structure Fatigue Safelife .... 20,000 hrs

Fuselage Pressure Vessel Safelife (cabin windows excluded)..12,500 hrs

If cracking occurs in the outer ply of one or more cabin windows, pressurized operation may be continued only if all the following limitations are complied with:

1. No cracking in the inner ply is perceptible;
2. Cracking in the outer ply is in a generally circumferential direction and is approximately 2 inches from the edge of the window frame;
3. Maximum operating altitude is 25,000 feet;
4. Maximum cabin differential pressure is 4.6 psi; and
5. Not more than 20 hours of operation are allowed after the outer ply cracks.

CARGO LIMITATIONS

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

PLACARDS

On Overhead Panels in Pilot's Compartment:

OPERATION LIMITATIONS

THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS MARKINGS AND MANUALS
NO ACROBATIC MANEUVERS INCLUDING SPINS ARE APPROVED
THIS AIRPLANE APPROVED FOR VFR IFR DAY & NIGHT OPERATION & IN ICING CONDITIONS

CAUTION
STALL WARNING IS INOPERATIVE WHEN MASTER SWITCH IS OFF
STANDBY COMPASS IS ERRATIC WHEN WINDSHIELD ANTI-ICE AND/OR AIR-CONDITIONING IS ON

AIRSPEEDS

MAX GEAR EXTENSION	182 KNOTS	MAX APPROACH FLAP	200	KNOTS
MAX GEAR RETRACT	164 KNOTS	MAX FULL DOWN FLAP	144	KNOTS
MAX GEAR EXTENDED	182 KNOTS	MAX MANEUVERING	182	KNOTS

Aft of Overhead Light Control Panel (Manual Plug-in System):

OXYGEN
PULL-ON

Aft of Overhead Light Control Panel (Auto-deployment System):

OXYGEN
PASSENGER MANUAL O'RIDE — PULL ON SYS READY

Or:

PASSENGER
MANUAL ORIDE
OXYGEN
PULL ON
SYS READY

On Pilot's & Copilot's Window Sills (Diluter Demand System):

WARNING
DO NOT SMOKE WHILE OXYGEN IS IN USE.
WITH DILUTER-DEMAND CREW MASK
FLOW STOPS WHEN BREATHING STOPS.

On Upper Fuel Control Panel:

SEE MANUAL FOR
FUEL CAPACITY

On Instrument Panel Adjacent to Each Gyroscopic Instrument (Depending on Gyro's Power Source):

AIR   AC   DC

On Curved Pedestal Adjacent to Power Levers:

CAUTION
REVERSE
ONLY WITH
ENGINES
RUNNING

On Pedestal Forward of Cabin Pressurization Controller:

WARNING DE-PRESSURIZE CABIN BEFORE LANDING

On Floor Aft of Pedestal:

LANDING GEAR ALTERNATE EXTENSION

1. LIFT AND TURN HANDLE TO ENGAGE.
2. PUMP HANDLE UP AND DOWN UNTIL THREE GREEN GEAR LIGHTS ILLUM.

Or

LANDING GEAR EMERGENCY EXTENSION

1. PULL UP HANDLE AND TURN CLOCKWISE TO LOCK
2. REMOVE LEVER FROM SECURING CLIP AND PUMP

Below Right Circuit Breaker Panel:

PILOT'S STATIC AIR SOURCE
NORMAL ALTERNATE

SEE FLIGHT MANUAL PERFORMANCE SECTION FOR INSTR CAL ERROR

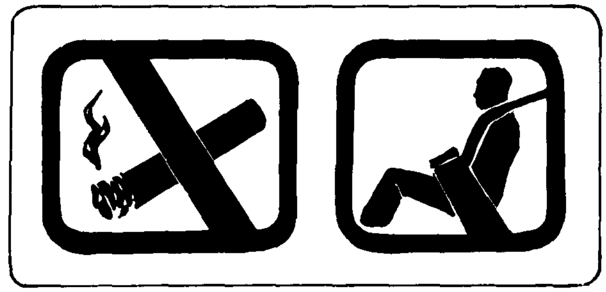
Below Latch on Forward Side of Forward and Aft Partitions:

KICK HERE
FOR
EMERGENCY
EVACUATION

Center of Cabin on Passenger Servicing Unit or on Cabin Side of Forward and Aft Partition:

NO SMOKING
FASTEN SEAT BELT

Or:



On Outside of Each Oxygen Access Door (Manual Plug-in System):

OXYGEN—PUSH

On Inside Surface of Each Oxygen Access Door (Manual Plug-in System):

WARNING — DO NOT
SMOKE WHILE OXYGEN
IS IN USE
HOSE PLUG MUST BE
DISCONNECTED
TO STOP FLOW OF OXYGEN

On Inside Surface of Each Passenger Oxygen Access Door (Auto-deployment System):

WARNING - DO NOT SMOKE WHILE OXYGEN IS IN USE

TO USE
- PULL LANYARD PIN
- DON MASK

On Emergency Exit Handle:

EXIT-PULL

On Window Frame Escutcheon Adjacent to Front Seats:

COUCH

NOT TO BE OCCUPIED AS CHAISE LONGUE DURING TAKE-OFF AND LANDING.

On Cabin Sidewall Adjacent to Front Seats (Prior to Shoulder-Harness-Equipped Chairs):

ALL AFT FACING SEATS MUST HAVE BACK UPRIGHT AND HEADREST FULLY RAISED DURING TAKEOFF AND LANDING

On Center Front of 2-Place Couch:

COUCH LIMITATIONS

TOTAL WEIGHT OF OCCUPANTS NOT TO EXCEED 340 LBS
MAX WT OF DRAWER CONTENTS 30 LBS PER DRAWER

On Window Frame Adjacent to Lateral-Tracking Seats When Installed:

(Forward Facing) Seats With and Without Shoulder Harness:

SEAT MUST BE LOCATED IN OUTBOARD POSITION FOR TAKEOFF AND LANDING

(Aft Facing) Seats Without Shoulder Harness:

ALL AFT FACING SEATS MUST BE IN OUTBOARD POSITION BACK UPRIGHT AND HEADREST FULLY RAISED DURING TAKEOFF AND LANDING

On Shoulder Harness Assembly For All Cabin Chairs:

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

On Outside Surface of First Aid Oxygen Access Door (Auto-Deploy System):

FIRST AID OXYGEN
— PULL —

On Inside Surface of First Aid Oxygen Access Door (Auto-deployment System):

WARNING - DO NOT SMOKE WHILE OXYGEN IS IN USE

TO USE
- TURN VALVE ON
- DON MASK

NOTE: CREW SYS MUST BE ON

On Cupholders and Tables When Installed:

STOW BEFORE TAKE - OFF AND LANDING

In Lavatory:

NOTICE
FASTEN SAFETY BELT DURING TAKEOFF AND LANDING

On Aft Compartment Sidewall Adjacent to Fold-Up Seats:

NOTICE
FASTEN SHOULDER HARNESS AND SEAT BELT DURING TAKEOFF AND LANDING

On Center of Aft Bulkhead (When Not Equipped with Fold-up Seats):

MAXIMUM COMPARTMENT

CAPACITY 410 LBS

Or:

**COMPARTMENT CAPACITY
410 LBS**

THIS INCLUDES BAGGAGE AND/OR
EQUIPMENT AND/OR OPTIONAL FURNISHINGS

SEE WEIGHT AND BALANCE SECTION OF
FLIGHT MANUAL FOR LOADING INSTRUCTIONS

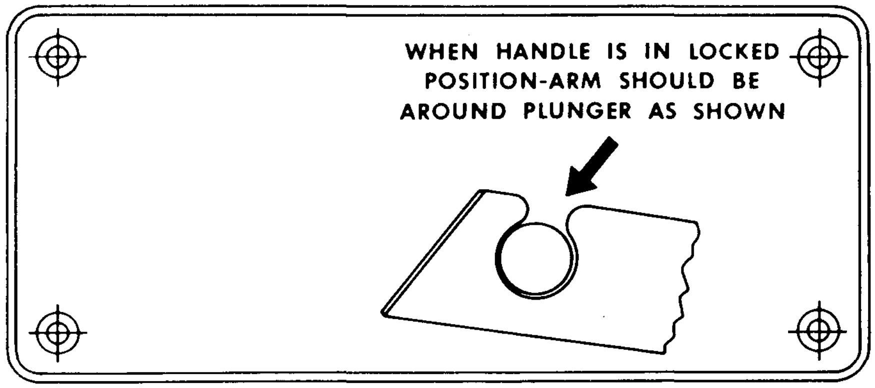
On Center of Aft Bulkhead (When Equipped with Fold-up Seats):

COMPARTMENT CAPACITY

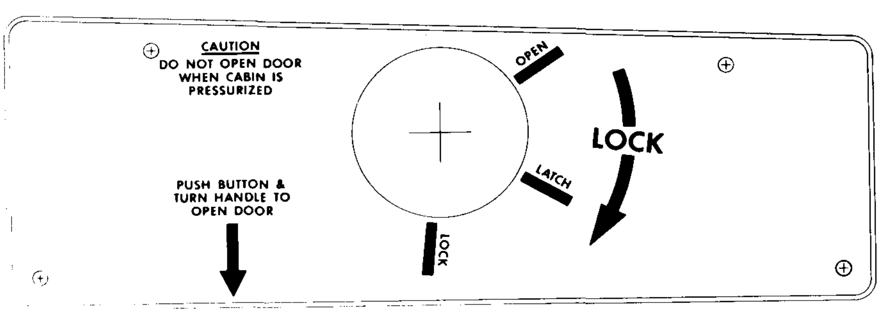
TOTAL COMPARTMENT CAPACITY (INCLUDING
BAGGAGE AND/OR PASSENGER) NOT TO
EXCEED 370 POUNDS

SEE WEIGHT AND BALANCE SECTION OF FLIGHT
MANUAL FOR LOADING INSTRUCTIONS

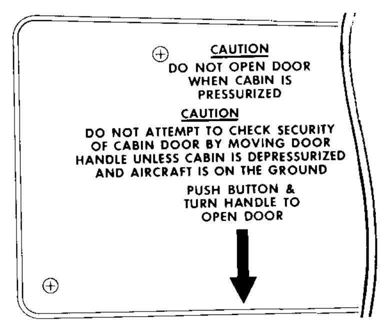
Inside Airstair Door Behind Handle: (200)



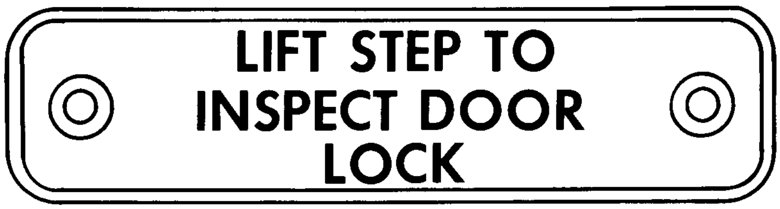
Inside Airstair Door Between Folding Steps: (200)



or

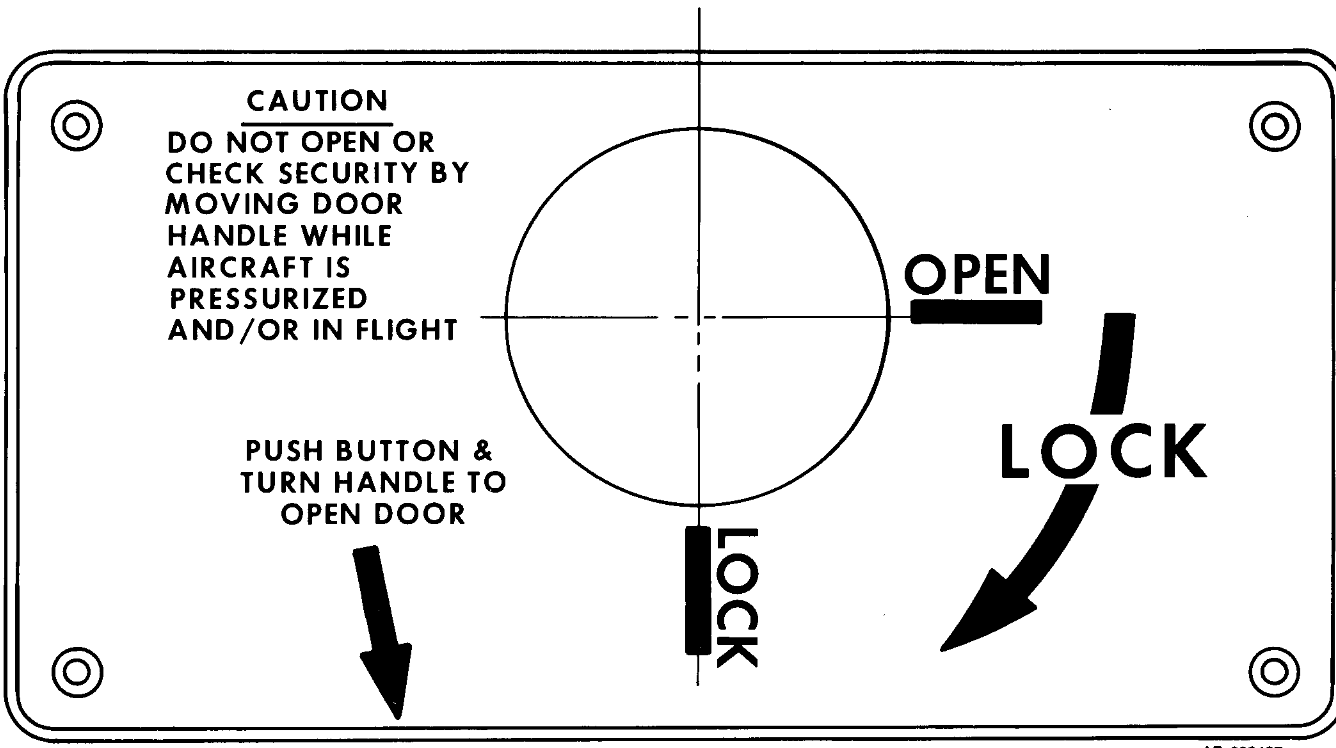


Inside Airstair Door On Folding Step (200C)



AP 003486

Inside Airstair Door Behind Handle (200C)

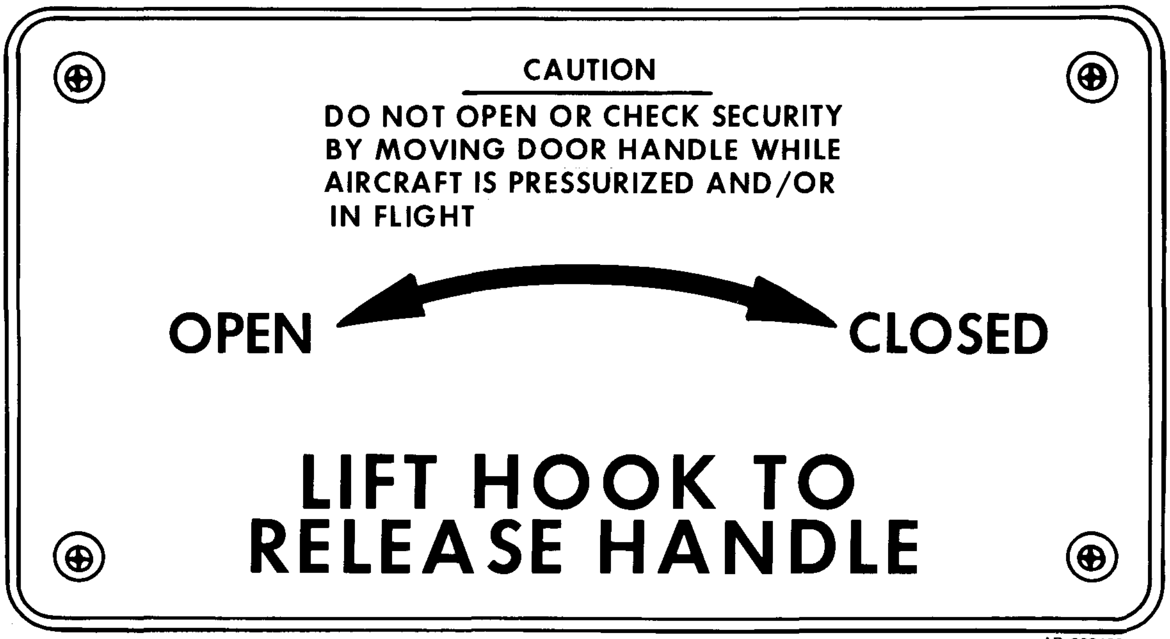


AP 003487

On Lower Access Cover of Cargo Door (200C)

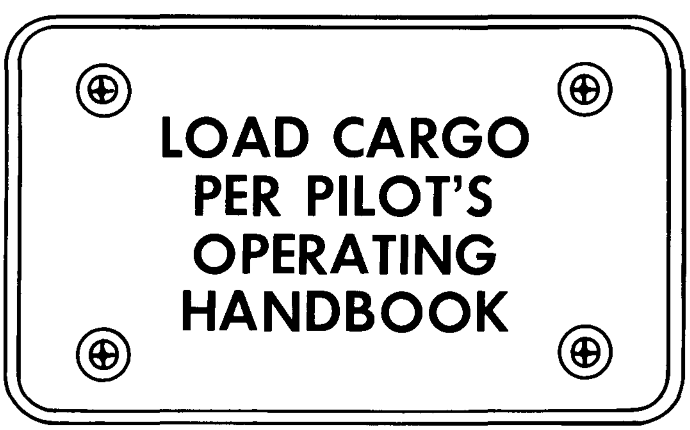
AP 003492

Inside Lower Access Cover of Cargo Door (200C)



AP 003493

On Upper Access Cover of Cargo Door (200C)

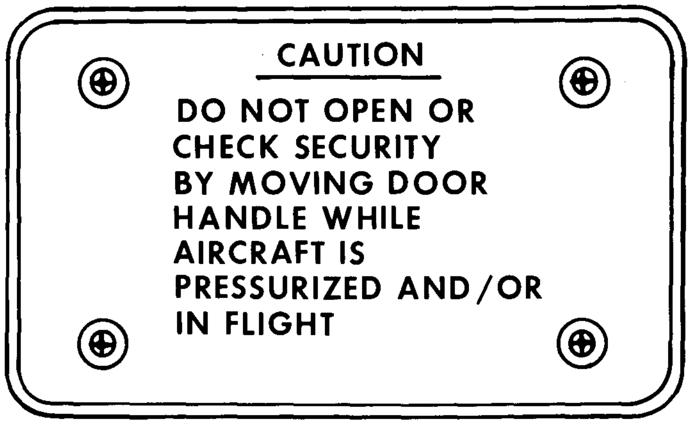


AP 003491

On Cargo Door Upper Latch Handle (200C)

AP 003490

On Upper Access Cover of Cargo Door (200C)



On Upper Access Cover of Cargo Door (200C)

SECTION III

EMERGENCY PROCEDURES

TABLE OF CONTENTS

SUBJECT *PAGE*

SUBJECT *PAGE*

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

EMERGENCY AIRSPEEDS

Air Minimum Control Speed (V_{MCA}) .... 86 knots

Intentional One-Engine-Inoperative Speed (V_{SSE}) .... 104 knots

One-Engine-Inoperative Best Rate-of-Climb Speed (V_Y) .... 121 knots

One-Engine-Inoperative Best Angle-of-Climb Speed (V_X) .... 115 knots

Maximum-Glide-Range Speed .... 140 knots

ENGINE FAILURE

EMERGENCY ENGINE SHUTDOWN

-ENGINE TORQUE INCREASE - UNSCHEDULED (Ground or Flight)
(Not Responsive to Power Lever Movement)
-ENGINE FIRE IN FLIGHT
-ENGINE FAILURE IN FLIGHT
-ILLUMINATION OF MAGNETIC CHIP DETECTOR ANNUNCIATOR

Affected Engine:

1. Condition Lever - CUT-OFF
2. Propeller Lever - FEATHER
3. Fuel Firewall Valve - CLOSED
4. Fire Extinguisher - ACTUATE (if required)
5. Engine Auto Ignition - OFF
6. Generator - OFF
7. Propeller Synchrophaser - OFF
8. Electrical Load - MONITOR

ENGINE FIRE ON GROUND

Affected Engine:

1. Condition Lever - CUT-OFF
2. Fuel Firewall Valve - CLOSED
3. Starter Switch - STARTER ONLY
4. Fire Extinguisher - ACTUATE (as required)

ENGINE FAILURE DURING GROUND ROLL

1. Power Levers - IDLE
2. Brakes - AS REQUIRED
3. Operative Engine - MAXIMUM REVERSE

WARNING

Extreme care must be exercised when using single-engine reversing on surfaces with reduced traction.

If Insufficient Runway Remains for Stopping:

4. Condition Levers - CUT-OFF
5. Fuel Firewall Valves - CLOSED
6. Master Switch - OFF (Gang bar down)

ENGINE FAILURE AFTER LIFT-OFF (If conditions preclude an immediate landing)

1. Power - MAXIMUM ALLOWABLE
2. Airspeed - MAINTAIN (take-off speed or above)
3. Landing Gear - UP

NOTE

If the autofeather system is being used, do not retard the failed engine power lever until the autofeather system has completely stopped propeller rotation. To do so will deactivate the autofeather circuit and prevent automatic feathering.

4. Propeller (inoperative engine) - FEATHER
5. Airspeed - BEST RATE-OF-CLIMB SPEED (after obstacle clearance altitude is reached)
6. Flaps - UP
7. Clean-up (inoperative engine):
   a. Condition Lever - CUT-OFF
   b. Fuel Firewall Valve - CLOSED
   c. Engine Auto Ignition - OFF
   d. Autofeather Switch - OFF
   e. Generator - OFF
8. Electrical Load - MONITOR

ENGINE FAILURE IN FLIGHT BELOW MINIMUM ONE-ENGINE-INOPERATIVE CONTROL SPEED

1. Reduce power on operative engine as required to maintain control.
2. Lower nose to accelerate above minimum control speed.
3. Adjust power as required.
4. Secure affected engine as in EMERGENCY ENGINE SHUTDOWN.

ENGINE FLAMEOUT (2nd Engine)

1. Power Lever - IDLE
2. Propeller - DO NOT FEATHER
3. Condition Lever - CUT-OFF
4. Conduct Air Start Procedures

NOTE

The propeller will not unfeather without engine operating.

AIR START

STARTER ASSIST

CAUTION

The pilot should determine the reason for engine failure before attempting an air start.

Above 20,000 feet, starts tend to be hotter. During engine acceleration to idle speed, it may become necessary to move the condition lever periodically into CUT-OFF in order to avoid over-temp.

1. Cabin Temp Mode - OFF; Blower - AUTO; Aft Blower - OFF
2. Radiant Heat - OFF
3. Radar - STANDBY or OFF
4. Windshield Heat - OFF
5. Power Lever - IDLE
6. Condition Lever - CUT-OFF
7. Fuel Firewall Valve - OPEN

NOTE

If conditions permit, retard operative engine ITT to 700°C or less to reduce the possibility of exceeding ITT limit. Reduce electrical load to minimum consistent with flight conditions.

8. Ignition and Start Switch - ON (up). Check IGNITION Light - ON
9. Condition Lever - LOW IDLE
10. Ignition and Start Switch - OFF (N_1 above 50%)
11. Propeller Lever - AS REQUIRED
12. Power Lever - AS REQUIRED
13. Generator - ON
14. Engine Auto Ignition - ARM
15. Electrical Equipment - AS REQUIRED

WINDMILLING ENGINE AND PROPELLER (No Starter Assist)

1. Cabin Temp Mode - OFF; Blower - AUTO; Aft Blower - OFF
2. Radiant Heat - OFF
3. Radar - STANDBY or OFF
4. Windshield Heat - OFF
5. Power Lever - IDLE
6. Propeller Lever - FULL FORWARD
7. Condition Lever - CUT-OFF
8. Fuel Firewall Valve - OPEN
9. Generator (inoperative engine) - OFF
10. Airspeed - 140 KNOTS MINIMUM
11. Altitude - BELOW 20,000 FEET
12. Engine Auto Ignition - ARM
13. Condition Lever - LOW IDLE
14. Power - AS REQUIRED (after ITT has peaked)
15. Generator - ON
16. Electrical Equipment - AS REQUIRED

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 to the nose and eyes.

ELECTRICAL SMOKE OR FIRE

1. Oxygen -

   Manual Plug-in System:
   a. Oxygen Control Handle - PULL ON
   b. Masks - PLUG IN, DON MASKS

   Auto-deployment System:
   a. Crew (Diluter Demand Masks) - DON MASKS (100% position)
   b. Microphone Selector Switch - OXYGEN MASK
   c. PASSENGER MANUAL O'RIDE - PULL ON
   d. Passengers - PULL LANYARD PIN, DON MASK

2. Cabin Temp Mode - OFF
3. Vent Blower - AUTO
4. Aft Blower - OFF
5. Radiant Heat - OFF
6. Avionics Master - OFF
7. Nonessential Electrical Equipment - OFF

   If Fire or Smoke Ceases:
   a. Individually restore avionics and equipment previously turned off.
   b. Isolate defective equipment.

   If Fire or Smoke Persists:
   a. Initiate emergency descent to 31,000 feet or below.
   b. Cabin Pressure Switch - DUMP
   c. Land as soon as practical.

NOTE

Opening a storm window (after depressurizing) will facilitate smoke and fume removal.

ENVIRONMENTAL SYSTEM SMOKE OR FUMES

1. Oxygen -

   Manual Plug-in System:
   a. Oxygen Control Handle - PULL ON
   b. Masks - PLUG IN, DON MASKS

   Auto-deployment System:
   a. Crew (Diluter Demand Masks) - DON MASK (100% position)
   b. Microphone Selector Switch - OXYGEN MASK
   c. PASSENGER MANUAL O'RIDE - PULL ON
   d. Passengers - PULL LANYARD PIN, DON MASK

2. Cabin Temp Mode - OFF
3. Vent Blower - HI
4. Left Bleed Air Valve - ENVIR OFF

   If Smoke Decreases:
   - Continue operation with left bleed air off.

   If Smoke Does Not Decrease:
   a. Left Bleed Air Valve - OPEN
   b. Right Bleed Air Valve - ENVIR OFF
   c. If smoke decreases, continue operation with right bleed air off.

NOTE

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

EMERGENCY DESCENT

1. Power Levers - IDLE
2. Propeller Controls - FULL FORWARD
3. Flaps - APPROACH
4. Landing Gear - EXTEND
5. Airspeed - 182 KNOTS MAXIMUM

GLIDE

1. Landing Gear - UP
2. Wing Flaps - UP (0%)

WARNING

Determine that procedures for re-starting first and second failed engines are ineffective before feathering second engine propeller.

3. Propellers - FEATHERED
4. Airspeed - 140 KNOTS

LANDING EMERGENCIES

ONE-ENGINE-INOPERATIVE LANDING

When it is certain that the field can be reached:

1. Flaps - APPROACH
2. Landing Gear - DOWN
3. Propeller Control - FULL FORWARD
4. Airspeed - 10 KNOTS ABOVE NORMAL LANDING APPROACH SPEED

When it is certain there is no possibility of go-around:

5. Flaps - DOWN
6. Airspeed - NORMAL LANDING APPROACH SPEED
7. Execute Normal Landing

NOTE

Single-engine reverse thrust may be used with caution after touchdown on smooth, dry, paved surfaces.

ONE-ENGINE-INOPERATIVE GO-AROUND

1. Power - MAXIMUM ALLOWABLE
2. Landing Gear - UP
3. Flaps - UP
4. Airspeed - ONE-ENGINE-INOPERATIVE BEST RATE-OF-CLIMB SPEED

SYSTEMS EMERGENCIES

ENGINE OIL SYSTEM

LOW OIL PRESSURE

Oil pressure values between 60 and 85 psi are undesirable; they should be tolerated only for the completion of the flight, and then only at a reduced power setting not exceeding 1100 foot-pounds torque. Oil pressure values below 60 psi are unsafe; they require either that the engine be shut down, or that a landing be made as soon as possible, using the minimum power required to sustain flight.

FUEL SYSTEM

CROSSFEED (ONE-ENGINE-INOPERATIVE OPERATION)

1. Standby Boost Pumps - OFF
2. Crossfeed Flow Switch - LEFT or RIGHT (as required); Check FUEL CROSSFEED Light - ON; Both FUEL PRESS Lights - OUT

CAUTION

Aux Transfer switch must be in AUTO position on side being crossfed. If the firewall valve is closed, the auxiliary fuel supply will not be available (usable), and the fuel pressure light will remain illuminated on the side supplying fuel.

TO DISCONTINUE CROSSFEED:

- Crossfeed Flow Switch - OFF (Centered)

ENGINE DRIVEN BOOST PUMP FAILURE

- Standby Boost Pump (Failed Side) - ON; Check FUEL PRESS Light - OFF

ELECTRICAL SYSTEM FAILURE

GENERATOR INOPERATIVE (DC GEN annunciator light on)

1. Generator Switch:
   Prior to BB-88: OFF then ON
   BB-88 and After: OFF, then to RESET for a minimum of 1 second, then release to ON

If generator will not reset:

2. Generator Switch - OFF
3. Operating Generator - DO NOT EXCEED 1.0 LOAD

EXCESSIVE LOADMETER INDICATION (over 1.0)

1. Battery Switch - OFF (Monitor Loadmeter)

If loadmeter still indicates above 1.0:

2. Nonessential Electrical Equipment - OFF

If loadmeter indicates 1.0 or below:

3. Battery Switch - ON

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

BUS FEEDER CIRCUIT BREAKER TRIPPED (fuel panel bus feeders and right circuit breaker panel bus feeders)

- A short is indicated, do not reset in flight.

NOTE

The items that may be inoperative can be determined from the power distribution schematic.

INVERTER INOPERATIVE

- Select the other inverter

FLIGHT CONTROLS

UNSCHEDULED ELECTRIC ELEVATOR TRIM

1. Airplane Attitude - MAINTAIN (using elevator control)
2. Control Wheel Disconnect Switch - DEPRESS FULLY (2nd level)
3. Manually Retrim Airplane
4. ELEV TAB Control Switch (Pedestal) - OFF

CAUTION

DO NOT reactivate electric trim system until cause of malfunction has been determined.

UNSCHEDULED RUDDER BOOST ACTIVATION

Rudder boost operation without a large variation of power between the engines indicates a failure of the system.

1. Rudder Boost Switch - OFF

If condition persists:

2. Rudder Trim - ADJUST
3. Bleed Air Valves (2) - INSTR & ENVIR OFF (during approach, landing assured)
4. Conduct normal landing

LANDING GEAR MANUAL EXTENSION

1. Airspeed - ESTABLISH 130 KNOTS.
2. Landing Gear Relay Circuit Breaker (pilot's subpanel) - PULL
3. Landing Gear Switch Handle - DOWN
4. Emergency Engage Handle - LIFT AND TURN CLOCKWISE TO THE STOP TO ENGAGE.
5. Extension Lever - PUMP up and down until the 3 green GEAR DOWN lights are illuminated.

CAUTION

Stop pumping when the 3 green GEAR DOWN lights illuminate. Further movement of the handle could damage the drive mechanism and prevent subsequent electrical gear retraction.

WARNING

If for any reason the green GEAR DOWN lights do not illuminate (e.g., in case of an electrical system failure), continue pumping until sufficient resistance is felt to ensure that the gear is down and locked, even though this procedure may damage the drive mechanism.

WARNING

After an emergency landing gear extension has been made, do not stow pump handle, move any landing gear controls, or reset any switches or circuit breakers until the airplane is on jacks, since the failure may have been in the gear-up circuit and the gear might retract on the ground. The landing gear cannot be retracted manually.

ENVIRONMENTAL SYSTEMS

PRESSURIZATION SYSTEM

Anytime the differential pressure goes into the Red Arc:

1. Cabin Altitude Controller - SELECT HIGHER SETTING

If condition persists:

2. Bleed Air Valves - ENVIR OFF position
3. Cabin Pressure Switch - DUMP (after cabin is depressurized)
4. Bleed Air Valves - OPEN

LOSS OF PRESSURIZATION

In the event that passenger oxygen is required, don oxygen masks and immediately descend to a pressure altitude of 31,000 feet or below.

NOTE

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

35,000 feet	1/2 to 1 minute
30,000 feet	1 to 2 minutes
28,000 feet	2-1/2 to 3 minutes
25,000 feet	3 to 5 minutes
22,000 feet	5 to 10 minutes
12-18,000 feet	30 minutes or more

AUTO-DEPLOYMENT OXYGEN SYSTEM

1. In the event the PASS OXY ON light does not illuminate following illumination of the ALT WARN annunciator, pull PASSENGER MANUAL O'RIDE valve to deploy passenger masks. First aid mask can only be deployed manually.
2. If oxygen quantity is insufficient to sustain both passengers and crew, the supply can be isolated to the crew and First Aid outlets by pulling the OXYGEN CONTROL circuit breaker located in the environmental section of the circuit breaker panel. PASSENGER MANUAL O'RIDE must be in the off position.

ILLUMINATION OF "DUCT OVERTEMP" ANNUNCIATOR (IF INSTALLED)

1. Cabin Temp Knob - SELECT LOWER TEMPERATURE
2. Vent Blower - HI position
3. Cabin Air Knob - PUSH TO INCREASE

If condition persists:

4. Cabin Temp Mode Selector - MAN HEAT position
5. Manual Temp Switch - DECR (down) position

BLEED AIR LINE FAILURE WARNING SYSTEM

Warning lights should be monitored during engine start procedure. Either engine will extinguish both lights upon starting.

Illumination of a warning light in flight indicates a possible rupture of bleed air line aft of the engine firewall.

1. Bleed Air Valve (affected engine) - INSTR & ENVIR OFF position
2. Engine Instruments - MONITOR

NOTE

The bleed air warning light will not extinguish after closing the Bleed Air Valve.

ICE PROTECTION SYSTEM

ELECTROTHERMAL PROPELLER DEICE (AUTO SYSTEM)

Abnormal Readings on Deice Ammeter: (Normal operation: 14 to 18 amps)

1. Zero Amps:

   a. Propeller Deice Switch (AUTO) - CHECK, ON
   b. If OFF, reposition to ON after 30 seconds.
   c. If ON with zero amps reading, system is inoperative: position the switch to OFF.
   d. Use manual backup system. (No deice ammeter indication - monitor loadmeter.)

2. Zero to 14 amps:

   a. Continue operation.
   b. If propeller imbalance occurs, increase rpm briefly to aid in ice removal.

3. Over 18 amps:

   a. If circuit breaker does nof trip, continue operation.
   b. If propeller imbalance occurs, increase rpm briefly to aid in ice removal.
   c. If circuit breaker trips, use manual system; monitor loadmeter for excessive current drain.
   d. If manual mode circuit breaker trips, avoid icing conditions.

ELECTROTHERMAL PROPELLER DEICE (MANUAL SYSTEM)

1. To use manual system, hold switch in outer position for approximately 30 seconds, then in inner position for approximately 30 seconds.
2. Monitor manual system current requirement using the airplane's loadmeters when the switch is in the outer or inner position. A small needle deflection (approximately 5%) indicates the system is functioning.

EMERGENCY EXIT

– Release Handle - PULL (This is a plug-type door and opens into the cabin.)

CAUTION

The outside handle may be locked from the inside with a key. The inside handle will unlatch the door, regardless of the position of the key lock, by overriding the locking mechanism. Before flight, make certain the door is unlocked.

STATIC AIR SYSTEM

PILOT'S ALTERNATE STATIC AIR SOURCE

THE PILOT'S ALTERNATE STATIC AIR SOURCE SHOULD BE USED FOR CONDITIONS WHERE THE NORMAL STATIC SOURCE HAS BEEN OBSTRUCTED. When the airplane has been exposed to moisture and/or icing conditions (especially on the ground), 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 alternate system and noting a sudden sustained change in rate of climb. This may be accompanied by abnormal indicated airspeed and altitude changes beyond normal calibration differences.

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

1. Pilot's Static Air Source (right side panel) - ALTERNATE
2. For Airspeed Calibration and Altimeter Correction, refer to the PERFORMANCE Section.

NOTE

Be certain the static air valve is in the NORMAL position when the alternate system is not needed.

SPINS

If a spin is entered inadvertently:

Immediately move the control column full forward, apply full rudder opposite to the direction of the spin, and reduce power on both engines to idle. These three actions should be done as nearly simultaneously as possible; then continue to hold this control position until rotation stops and then neutralize all controls and execute a smooth pullout. Ailerons should be neutral during recovery.

NOTE

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

ILLUMINATION OF CABIN DOOR WARNING LIGHT (200)

WARNING

The cabin-door locking mechanism must be in the over-centered position (indicated by positioning of safety arm around the diaphragm plunger) in order to provide complete positive locking of the cabln door.

If cabin is pressurized and door is not completely locked, any movement of the door handle toward the unlocked position may cause rapid, complete unlocking and opening of the door.

1. If cabin door warning light on annunciator panel indicates that cabin door may not be secure, depressurize cabin (consider altitude first) by activating cabin pressurization dump switch on pedestal.
2. Do not attempt to check cabin door for security until cabin is depressurized and the airplane is on the ground.
3. Check security of cabin door (on the ground) by lifting cabin door step and checking position of arm and plunger. If unlocked position of arm is indicated, turn door handle toward locked position until arm and plunger are in position.

ILLUMINATION OF CABIN/CARGO DOOR WARNING LIGHT (200C)

WARNING

If the cabin is pressurized and door is not completely locked, any movement of the door handle toward the unlocked position may cause rapid, complete unlocking and opening of the door.

1. If cabin/cargo door warning light on annunciator panel indicates that cabin/cargo door may not be secure, depressurize cabin (consider altitude before depressurizing cabin) by activating cabin pressurization dump switch on pedestal.
2. Do not attempt to check doors for security until cabin is depressurized and the airplane is on the ground.
3. Check security of the cabin door by turning the handle toward the open position. If the handle will turn in this direction, turn it back to the closed position and ensure that it locks in place. Check security of the cargo door by opening the handle access covers and checking that the handles are locked in the closed position.

CRACKED WINDSHIELD

1. If it is positively determined that the crack is on the outer panel, no action is required.

CAUTION

Windshield wipers may be damaged if used on cracked outer panel. Heating elements may be inoperative in area of crack.

2. If it is determined that the crack is on the inner panel, descend or reset the pressurization controller to achieve 4 psi or less differential pressure within ten minutes. Visibility through the windshield may be significantly impaired.

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.

1. Propeller - 1600 RPM
2. Power Lever - SET 120 ft-lbs torque

NOTE

This setting will approximate Zero Thrust at low altitudes using recommended One-Engine-Inoperative Climb speeds.

LANDING GEAR RETRACTION AFTER PRACTICE MANUAL EXTENSION

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

1. Emergency Engage Handle - ROTATE COUNTERCLOCKWISE AND PUSH DOWN
2. Extension Lever - STOW.
3. Landing Gear Control Circuit Breaker (pilot's subpanel) - PUSH IN
4. Landing Gear Switch Handle - UP

SECTION IV

NORMAL PROCEDURES

TABLE OF CONTENTS

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

AIRSPEEDS FOR SAFE OPERATION

Air Minimum Control Speed (V_{MCA}) .... 86 knots

Intentional One-Engine-Inoperative Speed (V_{SSE}) .... 104 knots

Two-engine Best Angle-of-Climb (V_X) .... 100 knots

Two-engine Best Rate-of-Climb (V_Y) .... 126 knots

Turbulent Air Penetration .... 170 knots

Balked Landing .... 100 knots

Maximum Demonstrated Crosswind Component .... 25 knots

Cruise Climb:
- Sea Level to 10,000 feet .... 160 knots
- 10,000 to 20,000 feet .... 140 knots
- 20,000 to 25,000 feet .... 130 knots
- 25,000 to 35,000 feet .... 120 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. Turn off autopilot altitude hold. 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.

PROCEDURES BY FLIGHT PHASE

PREFLIGHT INSPECTION

LEFT WING

1. Flaps - CHECK

2. Fuel Sump (aft of wheel well) - DRAIN
3. Aileron and Tab - CHECK
4. Flush Outboard Wing Fuel Sump - DRAIN
5. Lights - CHECK
6. Main Fuel Tank - CHECK; Cap - SECURE
7. Stall Warning - CHECK
8. Tie-down and Chocks - REMOVE
9. Outboard Deice Boot - CHECK
10. Ram Scoop Fuel Vent - CLEAR
11. Heated Fuel Vent - CLEAR
12. Wing Fuel Sump - DRAIN
13. Fire Extinguisher Pressure - CHECK
14. Landing Gear and Doors - CHECK
15. Fuel Sump (fwd of wheel well) - DRAIN
16. Engine Oil - CHECK QUANTITY; Cap - SECURE
17. Propeller - CHECK
18. Engine Air Intake - CLEAR; Ice Vane and Bypass Door - RETRACTED
19. Firewall Fuel Filter - DRAIN
20. Cowling, Doors and Panels - CHECK
21. Auxiliary Fuel Tank - CHECK; Cap - SECURE
22. Inboard Deice Boot - CHECK
23. Heat Exchanger Inlet - CLEAR
24. Inboard Fuel Tank Sump - DRAIN
25. Lower Antennas and Beacon - CHECK

NOSE SECTION

1. Access Panels - SECURE
2. Air Conditioner Ducts - CLEAR
3. Nose Gear and Doors - CHECK
4. Landing and Taxi Lights - CHECK
5. Pitot Covers - REMOVE
6. Windshield Wipers - CHECK

RIGHT WING

1. Inboard Fuel Tank Sump - DRAIN
2. Inboard Deice Boot - CHECK
3. Heat Exchanger Inlet - CLEAR
4. Battery Air Inlet - CLEAR
5. Auxiliary Fuel Tank - CHECK; Cap - SECURE
6. Engine Oil - CHECK QUANTITY; Cap - SECURE
7. Propeller - CHECK
8. Engine Air Intake - CLEAR; Ice Vane and Bypass Door - RETRACTED
9. Firewall Fuel Filter - DRAIN
10. Cowling, Doors and Panels - CHECK
11. Fuel Sump (fwd of wheel well) - DRAIN
12. Fire Extinguisher Pressure - CHECK
13. Landing Gear and Doors - CHECK
14. Heated Fuel Vent - CLEAR
15. Ram Scoop Fuel Vent - CLEAR
16. Wing Fuel Sump - DRAIN
17. Outboard Deice Boot - CHECK
18. Tie-down and Chocks - REMOVE
19. Main Fuel Tank - CHECK; Cap - SECURE

20. Lights - CHECK
21. Aileron - CHECK
22. Flush Outboard Wing Tank Sump - DRAIN
23. Flaps - CHECK
24. Fuel Sump (aft of wheel well) - DRAIN

TAIL SECTION

1. Oxygen Door - SECURE
2. Emergency Locator Transmitter - ARM
3. Static Ports - CLEAR
4. Tie-down - REMOVE
5. Access Panels - SECURE
6. Deice Boots - CHECK
7. Control Surfaces and Rudder Tab - CHECK
8. Lights - CHECK
9. Top Antennas - CHECK
10. Static Ports - CLEAR

BEFORE ENGINE STARTING

1. Cabin Door/Cargo Door - LOCKED. (Check cabin door security by attempting to turn handle toward unlocked position without depressing release button. Handle should not move. Check cargo door security by opening handle access panels and attempting to open cargo door latches without releasing safety locks. Handles should not move.)

NOTE: Prior to the first flight of the day, cabin door/cargo door annunciator circuitry shall be checked in accordance with CABIN/CARGO DOOR ANNUNCIATOR CHECK at the end of this section.

WARNING

Only a crew member should close and lock the door.

2. Load and Baggage - SECURE
3. Weight and CG - CHECKED
*4. Emergency Exit - SECURE AND UNLOCKED
5. Control Locks - REMOVED
6. Seats - POSITIONED; Seatbacks - UPRIGHT; Lateral-tracking Seats - OUTBOARD POSITION
7. Seat Belts and Shoulder Harnesses - FASTENED
8. Brakes - SET
9. Switches - OFF
10. Landing Gear Switch Handle - DOWN
11. Power Levers - IDLE
12. Propeller Controls - FULL FORWARD
13. Condition Levers - CUT-OFF
14. Cabin Sign - BOTH
15. Cabin Temp Mode - OFF
16. Vent Blower - AUTO
17. Aft Blower - OFF
18. Radiant Heat - OFF
*19. Microphone Switches - NORMAL
*20. Oxygen Supply Pressure - CHECK
*21. Oxygen Supply Control Handle -
Auto-deployment System: PULL ON SYStem READY
Manual Plug-in System: PUSH OFF
*22. Quick-donning Crew Oxygen Masks - CHECK; Selector Lever - 100% POSITION
*23. Circuit Breakers - IN

*24. Pilot's Static Air Source - NORMAL
*25. Fuel Firewall Valves - CLOSED
*26. Circuit Breakers - IN
*27. Standby Pumps - ON (Listen for operation.)
28. Battery Switch - ON (FUEL PRESSure Lights - ON)
*29. Fuel Firewall Valves - OPEN (FUEL PRESSure Lights - OFF)
*30. Standby Pumps - OFF (FUEL PRESSure Lights - ON)
*31. Crossfeed - ALTERNATELY LEFT AND RIGHT (FUEL CROSSFEED Light - ON; FUEL PRESSure Lights - OFF)
*32. Crossfeed - OFF
*33. Auxiliary Transfer Switches - AUTO
*34. NO TRANSFER Lights - PRESS TO TEST
35. Fuel Quantity - CHECK (Main and Auxiliary)
36. DC Volt/Loadmeters - PRESS TO CHECK VOLTAGE (No voltage indicates Current Limiter out.)
37. Stall Warning - TEST
38. Fire Detectors and Fire Extinguishers - TEST
39. Annunciator Lights - TEST
*40. Landing Gear Handle Lights Test Switch - PRESS TO TEST LIGHTS
41. Rotating Beacons Switch - ON

**May be omitted for quick turn-around at pilot's discretion*

USE OF EXTERNAL POWER

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 recharged, or replaced with a battery indicating at least 20 volts, before connecting external power.

When an auxiliary power source is used, ascertain that the polarity of the APU is the same as that of the airplane. If polarity of the APU is unknown, use a voltmeter to assure correct polarity before connecting it to the airplane.

The battery switch must be ON when starting engines with auxiliary power and the generators should be OFF until the auxiliary power has been disconnected.

After the second engine has been started, disconnect the auxiliary power source and secure the access door.

1. AVIONICS MASTER PWR Switch (pilot's left subpanel) - OFF
2. GENerator 1 and GENerator 2 Switches - OFF
3. BATtery Switch - ON (The battery will tend to absorb transients that are present in some auxiliary power units.)
4. Volt/Loadmeter (overhead panel) - DEPRESS SWITCH on face of either meter, and read battery voltage.
5. Auxiliary Power Unit Output Voltage - SET AT 28.25 $\pm$ .25 VOLTS
6. Auxiliary Power Unit - TURN OFF before connecting to airplane

CAUTION

Only use an external power source fitted with an AN-type plug. If uncertain of the polarity, check it with a voltmeter to ensure that it is a negative-ground plug. Connect the positive lead to the larger center post of the receptacle, and connect the negative-ground lead to the remaining large post. The small post is the polarizing pin; it must have a positive voltage applied to it in order for the external power relay to close.

ENGINE STARTING

NOTE

On serials BB-2 through BB-36 (except those serials modified per Service Instructions No. 0701-356), the BATTERY CHG annunciator will illuminate 4 to 6 seconds after Right Ignition and Engine Start switch is on. Annunciator will extinguish after engine start. If the BATTERY CHG annunciator illuminates after the second engine has been started, make a battery condition check using the NICKEL-CADMIUM BATTERY CONDITION CHECK procedure, this section.

On serials BB-37 and after, BL-1 and after (and any earlier serials modified per Service Instructions No. 0701-356), the BATTERY CHG annunciator will illuminate approximately 6 seconds after generator is on the line. If the annunciator does not extinguish within 5 minutes, refer to NICKEL-CADMIUM BATTERY CONDITION CHECK procedure, this section.

1. Right Ignition and Engine Start Switch - ON (R FUEL PRESS Light - OFF)
2. Right Condition Lever - LOW IDLE (after N_1 rpm stabilizes; 12% minimum)
3. ITT and N_1 - MONITOR (1000°C maximum)
4. Right Oil Pressure - CHECK
5. Right Condition Lever - HIGH IDLE
6. Right Ignition and Engine Start Switch - OFF (at 50% N_1 or above)
7. Right Generator - ON. CHARGE BATTERY until loadmeter reads approximately .50, then OFF.

NOTE

On Serials BB-88 and after and BL-1 and after: In order to turn the generator ON, the generator control switch must first be held upward in the spring-loaded RESET position for a minimum of one second, then released to the ON position.

8. Left Ignition and Engine Start Switch - ON (Note L FUEL PRESS Light - OFF)
9. As Left N_1 rpm accelerates thru 12%:
   a. Left Condition Lever - LOW IDLE
   b. Right Generator - ON
10. ITT and N_1 - MONITOR (1000°C maximum)
11. Left Oil Pressure - CHECK
12. Left Ignition and Engine Start Switch - OFF (at 50% N_1 or above)
13. Left Generator - ON
14. Right N_1 - REDUCE TO LOW IDLE

NOTE

To avoid excessive ITT, adjust the condition levers to a higher N_1 speed (approximately 60% N_1) during ground operation in high ambient temperatures, at high elevations, and during periods of high generator load. Even higher N_1 speeds may be necessary on the right engine if the air conditioner compressor is operating.

If an abnormally high ITT is encountered, particularly if accompanied by an N_1 decrease, the associated generator (and air conditioner compressor, on the right engine) should be turned off before attempting to accelerate the engine.

CAUTION

If no ITT rise is observed within 10 seconds after moving the Condition Lever to LOW IDLE, move the Condition Lever to CUT-OFF. Allow 60 seconds for fuel to drain and starter to cool, then follow ENGINE CLEARING procedures.

ENGINE CLEARING

1. Condition Lever - CUT-OFF
2. Ignition and Start Switch - STARTER ONLY (for a minimum of 15 seconds)

CAUTION

Do not exceed the starter time limits; see LIMITATIONS Section.

3. Ignition and Start Switch - OFF

AFTER STARTING, AND TAXIING

1. Inverter - ON
2. DC Voltage and Loadmeters - CHECK
3. AC Voltage and Frequency - CHECK
4. Avionics Master - ON
5. Lights - AS REQUIRED
6. Cabin Temperature and Mode - AS REQUIRED
7. Instruments - CHECK
8. Brakes - CHECK

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 engine check-out on a hard surface free of sand and gravel, to preclude pitting of propeller blades and airplane surfaces.

BEFORE TAKEOFF (RUNUP)

1. Avionics and Radar - CHECK
2. Pressurization - SET

   a. Cabin Altitude Selector Knob - ADJUST SO THAT INNER SCALE (ACFT ALT) INDICATES PLANNED CRUISE ALTITUDE PLUS 1000 FEET. (If this setting does not result in an outer scale (CABIN ALT) indication of at least 500 feet above take-off field pressure altitude, adjust as required.)
   b. Rate Control Selector Knob - SET INDEX BETWEEN 9- AND 12-O'CLOCK POSITIONS.

*3. Autopilot - CHECK

*4. Electric Elevator Trim Control - CHECK

   a. Tab Control Switch - ON
   b. Pilot's and Copilot's Switches - CHECK OPERATION
   c. Trim Disconnect - DEACTIVATION OF SYSTEM
   d. Tab Control Switch - OFF, then ON

WARNING

Operation of the electric trim system should occur only by movement of pairs of switches. Any movement of the elevator trim wheel while depressing only one switch denotes a system malfunction. The elevator tab control switch must then be turned OFF and flight conducted only by manual operation of the trim wheel.

5. Trim Tabs - SET
6. Flaps - CHECK AND SET
7. Flight Controls - FREE

*8. Overspeed Governors and Rudder Boost - TEST

   a. Rudder Boost Control Switch - ON
   b. Propeller Controls - FULL FORWARD (Balance of test is performed on individual engines.)
   c. Prop Test Switch - HOLD TO PROP GOV TEST
   d. Power Lever - INCREASE UNTIL PROP IS STABILIZED AT 1830 TO 1910 RPM. CONTINUE TO INCREASE UNTIL RUDDER MOVEMENT IS NOTED. (Observe ITT and Torque Limits.)
   e. Power Lever - IDLE
   f. Prop Test Switch - RELEASE. Repeat steps c, d, e, and f on the opposite engine.

*9. Primary Governors - EXERCISE AT 1800 RPM.

*10. Instrument Vacuum/Deice Pressure System - CHECK (at 1800 rpm):

   a. Both Bleed Air Valves - INSTR & ENVIR OFF

      (1) Pneumatic Pressure Gage - SHOULD INDICATE ZERO PRESSURE
      (2) Both BL AIR FAIL Annunciators - SHOULD ILLUMINATE

   b. Both Bleed Air Valves - ENVIR OFF or OPEN as desired

      (1) Pneumatic Pressure Gage - SHOULD INDICATE IN GREEN ARC
      (2) Gyro Suction Gage - SHOULD INDICATE IN WIDE GREEN ARC
      (3) Both BL AIR FAIL Annunciators - EXTINGUISHED

*11. Engine Ice Vanes - CHECK (at 1800 rpm): EXTEND (Check torque drop): RETRACT (Retain original torque): MONITOR Ice Vane annunciators during check.

*12. Autofeather - CHECK

   a. Power Levers - APPROXIMATELY 500 FT-LBS TORQUE
   b. Autofeather Switch - HOLD TO TEST (both autofeather annunciators illuminated)
   c. Power Levers - RETARD INDIVIDUALLY:

      (1) At Approximately 400 ft-lbs - OPPOSITE LIGHT OUT
      (2) At Approximately 220 ft-lbs - BOTH LIGHTS OUT (propeller starts to feather)

   d. Power Levers - BOTH RETARDED (both lights out, neither propeller feathers)

**May be omitted for quick turn-around at pilot's discretion.*

13. Autofeather Switch - ARM
14. Propeller Feathering (manual) - CHECK
15. Fuel Quantity, Flight and Engine Instruments - CHECK (See LIMITATIONS Section for Minimum Oil Temperature Required For Flight.)

BEFORE TAKEOFF (FINAL ITEMS)

1. Bleed Air Valves - OPEN
2. Annunciator Lights - EXTINGUISHED or considered
3. Transponder - ON
4. Ice Protection - AS REQUIRED
5. Engine Auto-ignition - ARM

ON TAKE-OFF ROLL

1. AUTOFEATHER Annunciators - ILLUMINATED
2. IGNITION ON Annunciators - EXTINGUISHED

TAKEOFF

- Refer to PERFORMANCE Section for minimum take-off power, take-off speed, distance and climb data.
- Monitor ITT and engine torque. Increasing airspeed will cause torque and ITT to increase.
- Rotating beacons, strobe lights, and tail flood lights should be turned off, at the pilot's discretion, when encountering haze, fog, or clouds.

CLIMB

1. Landing Gear - UP
2. Flaps - UP
3. Yaw Damp - ON
4. Climb Power - SET (Observe maximum ITT, torque, and N_1 rpm limits.)
5. Propeller - 1900 RPM
6. Propeller Synchrophaser - ON
7. Autofeather - OFF
8. Engine Instruments - MONITOR
9. Cabin Sign - AS REQUIRED
10. Cabin Pressurization - CHECK
11. Aft Blower - OFF

CRUISE

WARNING

Do not lift Power Levers in flight.

1. Cruise Power - SET per CRUISE POWER TABLES OR GRAPHS
2. Engine Instruments - MONITOR
3. Auxiliary Fuel Gage - MONITOR (to ensure fuel is being transferred from auxiliary tanks)

CABIN PRESSURIZATION FOR CRUISE

If revised flight plan calls for an altitude increase of 1000 feet or more, select the new cruise altitude plus 1000 feet on the ACFT ALT dial of the cabin pressurization controller.

DESCENT

1. Cabin Pressurization Controller - SET
   a. Cabin Altitude Selector Knob - SET per PRESSURIZATION CONTROLLER SETTING FOR LANDING graph, or so that "CABIN ALT" DIAL INDICATES LANDING FIELD PRESSURE ALTITUDE PLUS 500 FEET.
   b. Rate Control Selector Knob - SET INDEX AT 12-O'CLOCK POSITION.
2. Altimeter - SET
3. Cabin Sign - AS REQUIRED
4. Windshield Anti-Ice - AS REQUIRED (NORMAL or HI well before descent into warm, moist air, to aid in defogging)
5. Power - AS REQUIRED to give desired rate of descent.

NOTE

Approximately 75% N_1 is required to maintain the pressurization schedule during descent.

NORMAL APPROACH

CAUTION

Propeller operation in the range of 1750-1850 rpm should be avoided as it may cause ILS glide slope interference.

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

NOTE

Under low visibility conditions, landing and taxi lights should be left off due to light reflections. If crosswind landing is anticipated, determine Crosswind Component from FAA-PERFORMANCE Section. Immediately prior to touchdown, lower up-wind wing and align the fuselage with the runway. During rollout, hold aileron control into the wind and maintain directional control with rudder and brakes. Use propeller reverse as desired.

1. Pressurization - CHECK
2. Cabin Sign - ON
3. Autofeather Switch - ARM
4. Flaps - APPROACH
5. Landing Gear - DOWN
6. Landing and Taxi Lights - AS REQUIRED
7. Propeller Synchrophaser - OFF
8. Radar - STANDBY

WHEN LANDING ASSURED

1. Flaps - DOWN (100%)
2. Yaw Damp - OFF
3. Propeller Levers - FULL FORWARD AFTER TOUCHDOWN
4. Power Levers - BETA RANGE OR REVERSE (AS REQUIRED)

MAXIMUM REVERSE THRUST LANDING

1. Condition Levers - HIGH IDLE
2. Propeller Levers - FULL FORWARD
3. Power Levers - LIFT AND REVERSE AFTER TOUCHDOWN
4. Condition Levers - LOW IDLE

CAUTION

If possible, propellers should be moved out of reverse at approximately 40 knots, to minimize propeller blade erosion. Care must be exercised when reversing on runways with loose sand or dust on the surface. Flying gravel will damage propeller blades, and dust may impair the pilot's forward field of vision at low airplane speeds.

BALKED LANDING

1. Power - MAXIMUM ALLOWABLE
2. Airspeed - ESTABLISH 100 KNOTS (When clear of obstacles, establish normal climb.)
3. Flaps - UP
4. Landing Gear - UP

AFTER LANDING

1. Landing and Taxi Lights - AS REQUIRED
2. Ice Protection - OFF
3. Engine Auto-ignition - OFF
4. Electrical Load - OBSERVE LIMITS
5. Trim - SET
6. Flaps - UP

SHUTDOWN AND SECURING

1. Parking Brake - SET
2. Inverter - OFF
3. Avionics Master - OFF

4. Autofeather Switch - OFF
5. Light Switches - OFF
6. Cabin Temp Mode - OFF
7. Vent Blower - AUTO
8. Aft Blower - OFF
9. Radiant Heat - OFF
10. Battery - CHARGED (if BATTERY CHG annunciator is illuminated, refer to NICKEL-CADMIUM BATTERY CONDITION CHECK procedure below.)
11. ITT - STABILIZED AT MINIMUM TEMPERATURE FOR ONE MINUTE
12. Condition Levers - CUT-OFF
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 fuel firewall shutoff valves for normal engine shutdown.

14. DC Volt/Loadmeters - CHECK VOLTAGE (No voltage indicates current limiter out.)
15. Overhead Panel Switches - OFF
16. Battery and Generator Switches - OFF
17. Oxygen Supply Control Handle - PUSH OFF
18. Control Locks - INSTALL
19. Tie-downs and Chocks - AS REQUIRED
20. External Covers - INSTALL

CAUTION

The standby boost pumps and crossfeed are connected to the battery bus. Failure to turn these switches OFF will discharge the battery.

ENVIRONMENTAL SYSTEMS

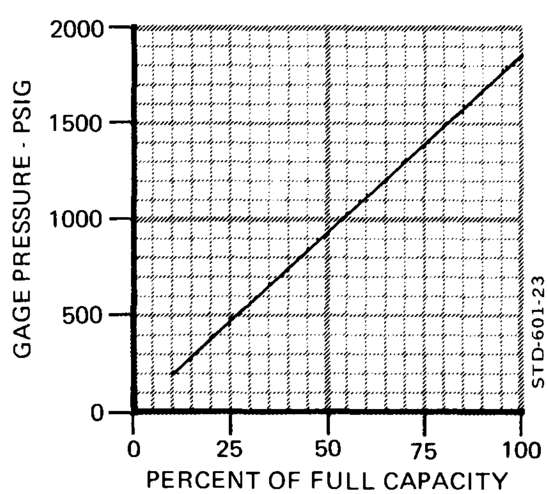
OXYGEN SYSTEM

PREFLIGHT

1. Oxygen Pressure Gage - CHECK TO ENSURE SUFFICIENT PRESSURE, AND NOTE READING.
2. Percent of Full Bottle - DETERMINE FROM "OXYGEN AVAILABLE WITH PARTIALLY FULL BOTTLE" GRAPH AT RIGHT.
3. Oxygen Duration in Minutes - COMPUTE

   a. Duration with Full Bottle - OBTAIN FROM "OXYGEN DURATION" TABLE BELOW.
   b. Current Oxygen Duration Available - MULTIPLY FULL-BOTTLE DURATION BY PERCENT OF FULL BOTTLE to obtain answer in minutes.

4. Oxygen System Control (Auto-deployment) - "PULL ON SYS READY" POSITION
5. Diluter Demand System - CHECK OPERATION, SET MASKS AT 100% POSITION.



NOTE

For duration time with crew using diluter demand quick-donning oxygen masks with selector on 100%, increase computation of "NUMBER OF PEOPLE USING" by two persons (e.g., with four passengers and a crew of two, enter the table at eight).

OXYGEN DURATION

Oxygen duration is computed for a Puritan-Zep oxygen system which utilizes either the red color coded plug-in type mask or the auto-deployed type mask, both rated at 3.7 Standard Liters Per Minute (SLPM) flow and are approved for altitudes up to 31,000 feet. This table is also used for the quick-donning diluter demand crew oxygen masks. When selected to the 100% mode, the number of crew masks in use should be doubled for computation.

Cylinder Volume Cu Ft	NUMBER OF PEOPLE USING														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	DURATION IN MINUTES														
22	150	72	48	36	30	24	21	18	16	15	13	12	11	10	*
49	336	168	108	84	66	54	48	42	37	33	30	27	25	24	22
64	438	216	144	108	84	72	60	54	48	43	39	36	33	31	28
76	552	261	173	130	104	87	74	66	57	52	47	43	40	37	34
115	792	396	264	198	158	132	113	99	88	79	72	66	60	56	52

**Will not meet oxygen requirements*

INFLIGHT

MANUAL PLUG-IN SYSTEM (At Cabin Altitude of 12,500 feet or above)

1. Oxygen Control - PULL ON
2. Mask - INSERT FITTING AND DON MASK

NOTE

Pilot and copilot masks are under their seats; passenger masks are in seat pockets, except with couch installation, where they will be located under the seats of the couch.

3. Oxygen Flow Indicator - CHECK (that the red plunger lifts from its seat when the hose is inserted into the oxygen coupling)

AUTO-DEPLOYMENT SYSTEM

1. Passengers
   - Lanyard Pin - PULL AND DON MASK

NOTE

If system is desired for use, mask can be manually deployed by pulling PASSENGER MANUAL O'RIDE control on pilot's overhead display.

2. Crew

   a. Constant Flow System - INSERT FITTING AND DON MASK
   b. Diluter Demand System - DON QUICK-DONNING MASK (When used at a cabin altitude of 20,000 feet or lower, the selector lever is usually moved to "NORMAL" to conserve oxygen.)

3. First Aid Oxygen

   a. Oxygen System Control - CHECK SYS READY ON
   b. Oxygen Compartment - PULL COVER OPEN
   c. ON/OFF Valve - ON position
   d. DON MASK

AFTER USING OXYGEN

MANUAL PLUG-IN SYSTEM

1. Mask - DISCONNECT by pulling fitting from coupling.
2. Oxygen Control - AS REQUIRED

AUTO-DEPLOYMENT SYSTEM

1. Passengers

   a. Lanyard Pin - INSERT
   b. Masks - RETURN TO OVERHEAD CONTAINER AND SECURE DOOR

NOTE

To close overhead doors, the following conditions must be met: Cabin altitude must be below the range requiring oxygen, and the PASSENGER MANUAL O'RIDE must be in the OFF position.

2. Crew (With Diluter Demand Quick-donning Mask)
   - Mask - RETURN TO MOUNT (Lever at 100% position).
3. First Aid Oxygen

   a. ON/OFF Valve - OFF position
   b. Mask - RETURN TO COMPARTMENT AND CLOSE COVER

PRESSURIZATION SYSTEM

FUNCTIONAL CHECK DURING RUNUP

1. Bleed Air Valves - OPEN
2. Cabin Pressure Controller - SET

   a. Cabin Altitude Selector Knob - ADJUST SO THAT "CABIN ALT" DIAL INDICATES AN ALTITUDE 500 FEET BELOW FIELD PRESSURE ALTITUDE.
   b. Rate Control Selector Knob - SET INDEX BETWEEN 9- AND 12-O'CLOCK POSITIONS.

3. Pressurization Switch - HOLD AT THE "TEST" POSITION.
4. Cabin Altitude Indicator Dial - CHECK FOR DESCENT INDICATION.
5. Pressurization Switch - RELEASE TO THE "PRESS" POSITION when pressurizing is confirmed.
6. Pressurization - SET (See BEFORE TAKEOFF procedure.)

HEATING/COOLING SYSTEM

1. Bleed Air Valves - OPEN (CLOSED for more efficient cooling on the ground.)
2. Cabin Temperature Mode - AUTO
3. Vent Blower - AUTO
4. Radiant Heat or Aft Blower - AS REQUIRED (The radiant heat system should be used in conjunction with manual temp control mode only.)
5. Temperature Control - AS REQUIRED
6. Cabin Air Control - AS REQUIRED (to divert cabin air flow to the cockpit)

NOTE

During operation in AUTO, MANUAL HEAT or MANUAL COOL, the ventilation blower operates in the low position. For increased air circulation, turn the Blower Switch to HIGH. For maximum cooling, the ventilation blower should be in the HIGH mode and the aft blower should be selected ON. With air conditioner on, maintain at least 60% N_1 speed on the right engine. If below N_1 minimum speed, an advisory light on the caution/advisory panel, AIR CND N_1 LOW, will illuminate and the air conditioner compressor clutch will disengage.

Overhead radiant heat, operated by a switch in the environmental group, can be used in conjunction with an auxiliary power unit to warm the cabin prior to engine starting, and may be used for supplemental heat in flight, if required.

DEFROSTER AIR

1. Windshield Defroster Air Control (right side of pilot's control column) - ON (pull)
2. Pilot, Copilot, and Cabin Air Controls - OFF (if increased defroster air flow is required)

OTHER NORMAL PROCEDURES

BLENDING ANTI-ICING ADDITIVE TO FUEL

The following procedure is to be used when blending anti-icing additive (which must conform to specification MIL-L-27686) with the fuel as the airplane is being refueled:

1. Using "HI-FLO PRIST" blender (Model PHF-204), remove cap containing the tube and clip assembly.
2. Attach pistol grip on collar.
3. Press tube into button.
4. Clip tube end to fuel nozzle.
5. Pull trigger firmly to ensure full flow, then lock in place.
6. Start flow of additive when refueling begins. (Refueling should be at a rate of 30 to 60 gallons per minute. A rate of less than 30 gallons per minute may be used when topping off tanks.)

CAUTION

Ensure that the additive is directed into the flowing fuel stream; start additive flow after fuel flow starts, and stop before fuel flow stops. Do not allow concentrated additive to contact coated interior of fuel cells or airplane painted surfaces. Use not less than 20 fl oz of additive per 260 gallons of fuel or more than 20 fl oz of additive per 104 gallons of fuel.

NICKEL-CADMIUM BATTERY CONDITION CHECK

DURING ENGINE START (BB-2 through BB-36, except those serials modified per Service Instructions No. 0701-356)

1. Right Ignition and Engine Start Switch - ON (BATTERY CHG annunciator - ON after 4 to 6 seconds)
2. BATTERY CHG Annunciator Light - OFF after engine starts

NOTE

If annunciator does not extinguish, it indicates a charge current above normal. Use procedure outlined and check battery condition.

DURING ENGINE START (BB-37 and after, BL-1 and after, and any earlier serials modified per Service Instructions No. 0701-356) (Using BATTERY CHG Annunciator)

BATTERY CHG Annunciator - ON (approximately 6 seconds after generator is on the line)

NOTE

Light indicates a charge current above normal. The light should extinguish within 5 minutes following a normal engine start. Failure to do so indicates a partially discharged battery. Continue to charge the battery. Make a check every 90 seconds, using the DURING ENGINE SHUTDOWN procedure outlined below, until the charge current fails to decrease and the light extinguishes.

DURING ENGINE START (Using Loadmeter)

1. Start one engine with the battery.
2. Generator - ON (RESET, then ON, if equipped with 3-position switch)
3. Voltmeter - INDICATING 28 VOLTS
4. After the loadmeter stabilizes, momentarily turn the Battery Switch OFF, noting the change in meter indication.

NOTE

*Failure to obtain a change value of below .025 within 5 minutes indicates a partially discharged battery. Continue to charge the battery, repeating the above check every 90 seconds until the charge current decreases below a value of .025. No decrease of charging current between checks indicates an unsatisfactory condition. The battery should be removed and checked by a qualified nickel-cadmium battery shop.

IN FLIGHT

In-flight illumination of the BATTERY CHG annunciator light indicates a possible battery malfunction. The battery condition can be checked using the following procedure:

1. Battery Switch - OFF (momentarily)
2. Loadmeter - NOTE CHANGE

NOTE

*If the change value exceeds .025, turn the battery switch OFF and proceed to destination. In order to avoid electrical transients caused by power fluctuations, the battery switch should be ON for landing. If the DURING ENGINE SHUTDOWN battery check is unsatisfactory, the battery should be removed and checked by a qualified nickel-cadmium battery shop.

3. BATTERY CHG Light - EXTINGUISHED

NOTE

If the BATTERY CHG light does not extinguish when the battery control switch is placed in the OFF position, land as soon as practicable.

DURING ENGINE SHUTDOWN

1. One Generator - OFF
2. Voltmeter - INDICATING 28 VOLTS
3. Momentarily turn the Battery Switch OFF, noting the change in loadmeter indication.

NOTE

*If the change value exceeds .025, allow the battery to charge, repeating the check every 90 seconds. If the change value is not less than .025 within 3 minutes, the battery should be removed and checked by a qualified nickel-cadmium battery shop.

FOOTNOTE:

**The change in loadmeter indication (i.e., the amount of needle deflection) is directly proportional to the battery charging current. A change value of .025 is indicated by very little needle movement, since full-scale deflection represents a relative load value of 1.0.*

ICING FLIGHT

CAUTION

Due to distortion of the wing airfoil, stalling airspeeds should be expected to increase as ice accumulates on the airplane. For the same reason, stall warning devices are not accurate and should not be relied upon. Maintain a comfortable margin of airspeed above the normal stall airspeed when ice is on the airplane. In order to prevent ice accumulation on unprotected surfaces of the wing, maintain a minimum of 140 knots during operations in sustained icing conditions. In the event of windshield icing, reduce airspeed to 226 knots or below.

1. Surface Deice System

   a. Preflight: Check boots for damage and cleanliness

b. Before takeoff: Deice Switch - CHECK BOTH POSITIONS (SINGLE - Up, MANUAL - Down)

(1) Check deice pressure gage
(2) Check boots visually for inflation and hold down. (Inflation is 6 seconds for wings, then 4 seconds for horizontal stabilizer.)

c. In flight: (When ice accumulates 1/2 to 1 inch) - Deice Switch - SINGLE (repeat as required)

NOTE

Either engine will supply sufficient air pressure for deice operation. In the event of failure of SINGLE cycle, use MANUAL cycle.

2. Engine Anti-Ice

a. Before takeoff: 1800 RPM

(1) Engine Ice Vane Controls

(a) Extend - Check for torque drop, indicating vane extension. Monitor ice vane annunciators.
(b) Retract - Check for torque increase to previous reading, indicating vane retraction.

(2) Power - REDUCE TO IDLE

b. In Flight:

(1) Before visible moisture is encountered at +5°C and below or;
(2) At night when freedom from visible moisture is not assured at +5°C and below.

(a) Engine Ice Vanes - EXTEND (Monitor Ice Vane annunciators.)

NOTE

If yellow ICE VANE annunciators illuminate after 15 seconds, ice vanes have not extended to proper position. Use manual control to retract or extend.

(b) Check proper operation by noting torque drop.

c. Regain torque be increasing power levers if desired (observe ITT limits).

CAUTION

If in doubt, extend the vanes. Engine icing can occur even though no surface icing is present. If freedom from visible moisture can not 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. Ice vanes should be retracted at +15°C and above to assure adequate engine oil cooling. Operation of strobe lights will sometimes show ice crystals not normally visible.

3. Electrothermal Propeller Deice

CAUTION

Do not operate propeller deice when the propellers are static.

a. Before Takeoff:

(1) Automatic Propeller Deice Switch - AUTO
(2) Deice Ammeter - 14 to 18 AMPERES
(3) To check the automatic timer, watch the deice ammeter closely for at least two minutes. A small momentary needle deflection approximately every 30 seconds shows that the timer is switching properly and indicates normal system operation.
(4) Manual Propeller Deice Switch - MOMENTARILY HOLD IN INNER POSITION, THEN OUTER (Small deflection in airplane's loadmeters with switch in each position indicates the manual system is operating.)

NOTE

Use of current for the manual (backup) system is not registered on the propeller deice ammeter, however, it will be indicated as part of the airplane's load on the loadmeter (small needle deflection) when the system is switched on.

(5) Automatic Propeller Deice Switch - OFF

b. In Flight:

(1) Automatic Propeller Deice Switch - AUTO. The system may be operated continuously in flight, and will function automatically until the switch is turned off.
(2) Relieve propeller imbalance due to ice by increasing rpm briefly and returning to the desired setting. Repeat as necessary.

CAUTION

If the deice ammeter does not indicate 14 to 18 amperes, or the automatic timer fails to switch, refer to the EMERGENCY PROCEDURES Section.

4. Fuel Vent Heat - ON
5. Pitot Heat - ON
6. Stall Warning Heat - ON

CAUTION

Prolonged use of pitot and stall warning heat on the ground will damage the heating elements.

7. Windshield Anti-Ice - AS REQUIRED (before ice forms)
8. Wing Ice Lights - AS REQUIRED
9. Alternate Static Air Source - REFER to EMERGENCY PROCEDURES Section.

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 104 KNOTS ARE PROHIBITED.

1. Landing Gear - UP
2. Flaps - UP
3. Airspeed - ABOVE 104 KNOTS (V_{SSE})
4. Propeller Levers - HIGH RPM
5. Power Lever (Simulated inoperative engine) - IDLE
6. Power Lever (Other engine) - MAXIMUM ALLOWABLE
7. Airspeed - Reduce approximately 1 knot per second until either V_{MCA} or stall warning is obtained.

CAUTION

Use rudder to maintain directional control (heading) and ailerons 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 horn sound) immediately initiate recovery: reduce power to idle on the operative engine and immediately lower the nose to regain V_{SSE}.

NOISE CHARACTERISTICS

No special noise reduction procedures are required to comply with FAR 36.1501. Corrected flyover noise levels were measured as follows: SPL 78.7 dB(A).

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

CABIN/CARGO DOOR ANNUNCIATOR CIRCUITRY CHECK (200C)

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

1. Ensure that the cargo door is closed and latched.
2. Ensure that the battery switch is OFF.
3. Check that, with the cabin door closed but not latched, the CABIN DOOR annunciator light illuminates.
4. Open the cabin door and check that the CABIN DOOR annunciator light extinguishes.
5. Turn the battery switch ON and check that the CABIN DOOR annunciator light illuminates.
6. Close and latch the cabin door. Check that the CABIN DOOR annunciator light extinguishes.

NOTE

The above listed procedures check both the cargo door and cabin door annunciator circuitry.

SECTION V

PERFORMANCE

TABLE OF CONTENTS

ITEM	PAGE

INTRODUCTION TO PERFORMANCE AND FLIGHT PLANNING

The graphs and tables in this Section present performance information for takeoff, climb, landing, and flight planning at various parameters of weight, power, altitude, and temperature. All FAA-approved performance information is included within this Section. Examples have been presented on all performance graphs.

The following example presents calculations for flight time, block speed, and fuel required for a proposed flight from Denver to Reno using the conditions listed below:

CONDITIONS

At Denver:

Outside Air Temperature .... 28°C (82°F)
Field Elevation .... 5330 feet
Altimeter Setting .... 29.82 in. Hg
Wind .... 330° at 10 knots
Runway 35 Length .... 11,500 feet

Route of Trip:
DEN - J56 - SLC - J154 - BAM - J32 - RNO

Cruise Altitude:
26,000 feet

Weather Conditions at Cruise Altitude:
IFR

ROUTE SEGMENT	MAGNETIC HEADING	DISTANCE NM	WIND AT FL 260 DIR/KNOTS	OAT AT FL 260 °C	OAT AT **16,000 FT °C	ALTIMETER SETTING IN. HG
DEN - EKR	263°	*155	350°/40	−10	−6	29.82
EKR - SLC	270°	192	350°/40	−10	−6	29.82
SLC - BVL	249°	81	340°/35	−20	0	29.75
BVL - BAM	250°	145	340°/35	−20	0	29.75
BAM - RNO	227°	***145	290°/45	−20	−4	29.60

*Includes climb to Denver VORTAC
**MEA on *Enroute Low Altitude Chart L-8*
***Includes Distance from RNO VORTAC to Reno International

REFERENCE: *Enroute High Altitude Chart H-1* and *Standard Instrument Departures for Western United States.*

At Reno:
Outside Air Temperature .... 32°C (90°F)
Field Elevation .... 4411 feet
Altimeter Setting .... 29.60 in. Hg
Wind .... 270° at 5 knots
Runway 25L Length .... 6105 feet

To determine the pressure altitude at origin and destination airports, add 1000 feet to field elevation for each 1.00 in. Hg that the reported altimeter setting value is below 29.92 in. Hg, and subtract 1000 feet for each 1.00 in. Hg above 29.92 in. Hg. First, find the difference between 29.92 in. Hg and the reported altimeter setting. Then multiply the answer by 1000 to find the difference in feet between field elevation and pressure altitude.

Pressure Altitude at DEN:

29.92 in. Hg − 29.82 in. Hg = 0.10
0.10 X 1000 feet = 100 feet
The pressure altitude at DEN is 100 feet above field elevation.
Pressure Altitude at DEN = 5330 + 100 = 5430 feet.

Pressure Altitude at RNO:

29.92 in. Hg − 29.60 in. Hg = 0.32
0.32 X 1000 feet = 320 feet
The pressure altitude at RNO is 320 feet above field elevation.
Pressure Altitude at RNO = 4411 + 320 = 4731 feet.

PERFORMANCE EXAMPLE

TAKE-OFF WEIGHT

A summary of graphs provided in this handbook to restrict take-off weight is presented below:

1. MAXIMUM TAKE-OFF WEIGHT PERMITTED BY ENROUTE CLIMB REQUIREMENT (No Restriction)
2. TAKE-OFF WEIGHT TO ACHIEVE POSITIVE ONE-ENGINE-INOPERATIVE CLIMB AT LIFT-OFF (separate graphs for Flaps 0% and Flaps 40%) (Optional)
3. MAXIMUM ENROUTE WEIGHT (FAR 135 OPERATIONS) (Required for FAR Part 135 Operations)
4. TAKE-OFF WEIGHT TO MEET FAR 25 TAKE-OFF CLIMB REQUIREMENTS (separate graphs for Flaps 0% and Flaps 40%) (Optional)

Take-off weight must not exceed 12,500 pounds.

ENROUTE CLIMB REQUIREMENT

There is no weight restriction to meet enroute climb requirement.

Maximum allowable take-off weight = 12,500 pounds.

TAKE-OFF WEIGHT TO ACHIEVE POSITIVE ONE-ENGINE-INOPERATIVE CLIMB AT LIFT-OFF

12,500 pounds @ Flaps 0%
12,450 pounds @ Flaps 40%

MAXIMUM ENROUTE WEIGHT (FAR 135 OPERATIONS)

To determine the maximum take-off weight, the weight of the fuel used to reach the MEA is added to the maximum enroute weight.

From the TIME, FUEL, AND DISTANCE TO CLIMB Graph, the time, fuel, and distance required to climb from 5430 feet (28°C) to 16,000 feet (−6°C) are:

Time .... 6 minutes
Fuel .... 85 pounds
Distance .... 19 nautical miles

Enter the MAXIMUM ENROUTE WEIGHT (FAR 135 OPERATIONS) Graph at -6°C, 16,000 feet altitude, and 29.82 in. Hg altimeter setting:

Maximum Enroute Weight = 12,500 pounds

Take-off Weight must not exceed 12,500 pounds

TAKE-OFF WEIGHT TO MEET FAR 25 TAKE-OFF AND CLIMB CRITERIA

The following information has been presented to provide the option of limiting weight to obtain the performance specifications of FAR 25 during the critical take-off and initial climb flight segments. Their use is not mandatory and full compliance with other regulations applicable to FAR 25 is not implied.

The criteria for limiting weight involves the selection from the Take-off Weight graphs of the most adverse conditions of:

1. One-engine-inoperative climb
2. Field length to accelerate-stop
3. Field length to accelerate-go
4. The take-off flight path required to clear known obstacles beyond the runway.

The performance graphs associated with the above conditions are:

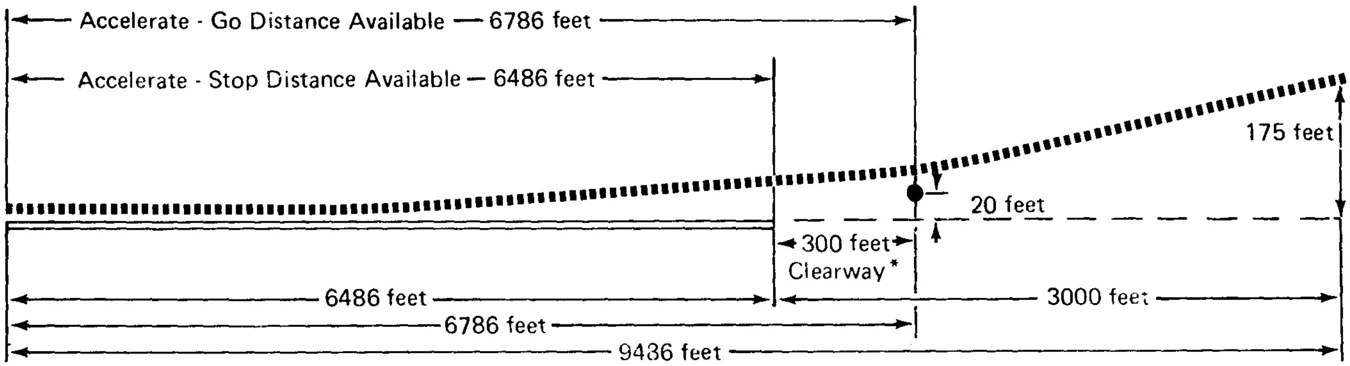
TAKE-OFF WEIGHT - TO MEET FAR 25 TAKE-OFF CLIMB REQUIREMENTS Graphs
ACCELERATE-STOP Graphs
ACCELERATE-GO Graphs
NET GRADIENT OF CLIMB Graphs
TAKE-OFF FLIGHT PATH Graph
(Reference FAR 25.109, 25.111, 25.115, and 25.121)

The performance presented using this criteria is predicated on the autofeather system being armed and operable. The Ground Minimum Control Speed (V_{MCG}) has been determined to be 84 knots. At this speed, control within 25 feet of the runway center line is possible.

The following example illustrates the procedures required to obtain a take-off weight value using the CONDITIONS outlined below, and illustrated by the TAKE-OFF FLIGHT PATH Diagram.

CONDITIONS (These conditions do not pertain to any particular airport location.):

Outside Air Temperature .... 28°C
Field Elevation .... 5330 feet
Altimeter Setting .... 29.82 in. Hg
Surface Wind .... 140° at 11 knots
Runway 17 Length .... 6486 feet
Pressure Altitude (29.92 − 29.82 = 0.10 in. Hg) 5330 + 100 .... 5430 feet
Headwind Component (From WIND COMPONENTS Graph) .... 9.5 knots
Obstacles (Height above runway):
.... 20-foot-high wires 300 feet beyond end of runway
.... 175-foot-high ridge 3000 feet beyond end of runway



**The maximum allowable clearway for this runway is 1621 feet (25% of 6486 feet).*

TAKE-OFF FLIGHT PATH

1. From the TAKE-OFF WEIGHT - TO MEET FAR 25 TAKE-OFF CLIMB REQUIREMENTS Graphs, determine that the maximum take-off weights to meet FAR 25 climb requirements are 12,500 pounds with flaps at 0%, and 12,300 pounds with flaps at 40%.
2. From the ACCELERATE-STOP Graphs, using 12,500 pounds with flaps at 0%, and 12,300 pounds with flaps at 40%, determine that the resulting distances are less than the runway length. Therefore, accelerate-stop is not a limiting factor.
3. From the ACCELERATE-GO Graphs, using 12,500 pounds with flaps at 0%, and 12,300 pounds with flaps at 40%, determine that the resulting distances are greater than the available accelerate-go distance of 6786 feet. (Refer to the TAKE-OFF FLIGHT PATH Diagram.)
4. Using the ACCELERATE-GO Graphs, enter in reverse using the 6786 feet value and determine the weight for which this accelerate-go distance is possible.

   a. Take-off weight of 10,650 pounds with flaps at 0%
   b. Take-off weight of 11,700 pounds with flaps at 40%

5. Enter the TAKE-OFF FLIGHT PATH Graph to determine the minimum gradient of climb which will result in a flight path clear of the 175-foot-high ridge 3000 feet beyond the end of the runway. (Refer to the TAKE-OFF FLIGHT PATH Diagram above.)

   a. Ridge = 175 feet AGL
   b. From Reference Zero (9486 − 6786) = 2700 feet
   c. Minimum Gradient of Climb = 5.2%

6. Enter the NET GRADIENT OF CLIMB - FLAPS 0% Graph at 10,650 pounds, and the NET GRADIENT OF CLIMB - FLAPS 40% Graph at 11,700 pounds.

   - Both resulting gradients are less than 5.2%.

7. Enter in reverse the NET GRADIENT OF CLIMB Graphs using the 5.2% net gradient of climb value to determine the weights for which a climb at this value is possible.

   a. Flaps 0% = 9900 pounds
   b. Flaps 40% = 9250 pounds

8. Using the weight of 9900 pounds with the flaps at 0%, and 9250 pounds with the flaps at 40%, the accelerate-go distance will be shortened. This in turn will decrease the minimum gradient of climb value required to clear the ridge. The allowable take-off weights to meet these requirements are between 10,650 pounds and 9900 pounds with the flaps at 0%, or between 11,700 pounds and 9250 pounds with the flaps at 40%. Exact weight can be determined by an iterative process of assuming new weight halfway between these weights and using the procedures outlined in Steps 3, 5, 6, 7, and 8. Determine new weights for first iteration as follows:

a. Flaps 0%:
10,650 − 9900 = 750 ÷ 2 = 375 + 9900 = 10,275 pounds
b. Flaps 40%:
11,700 − 9250 = 2450 ÷ 2 = 1225 + 9250 = 10,475 pounds

9. (Step 3 procedures): From the ACCELERATE-GO Graphs, using 10,275 pounds for flaps at 0%, and 10,475 pounds for flaps at 40%, the resulting distances are within the available accelerate-go distance of 6786 feet.

   a. 6100 feet with flaps at 0%
   b. 5050 feet with flaps at 40%

10. (Step 5 procedure): Enter the TAKE-OFF FLIGHT PATH Graph and adjust the horizontal distance from Reference Zero and determine minimum gradient of climb.

   a. Flaps 0% - From Reference Zero (9486 − 6100) = 3386 feet
      Minimum Gradient of Climb = 4.1%
   b. Flaps 40% - From Reference Zero (9486 − 5050) = 4436 feet
      Minimum Gradient of Climb = 3.2%

11. (Step 6 procedures): Enter the NET GRADIENT OF CLIMB - FLAPS 0% Graph at 10,275 pounds for a 4.7% net gradient of climb. Enter the NET GRADIENT OF CLIMB - FLAPS 40% Graph at 10,475 pounds for a 3.5% net gradient of climb.

   a. Since these results are greater than the minimum value, the take-off weights of 10,275 pounds with flaps at 0% or 10,475 pounds with flaps at 40% may be used.
   b. If an exact value is required, complete the next step and repeat Steps 3, 5, 6, 7, and 8.

12. (Step 7 procedures): Enter in reverse the NET GRADIENT OF CLIMB - FLAPS 0% Graph using minimum gradient of climb of 4.1% for a take-off weight of 10,825 pounds, and the NET GRADIENT OF CLIMB - FLAPS 40% Graph using minimum gradient of climb of 3.2% for a take-off weight of 10,550 pounds.
13. (Step 8 procedures): Use the weights of Step 8 and Step 12 to obtain a new assumed weight.

   a. Flaps 0%:
      10,825 − 10,275 = 550 ÷ 2 = 275 + 10,275 = 10,550 pounds
   b. Flaps 40%:
      10,725 − 10,475 = 250 ÷ 2 = 125 + 10,475 = 10,600 pounds

Use these assumed weights for second iteration.

14. After several additional iterations, the exact weights which will satisfy all the given conditions are:

   a. Flaps 0% = 10,470 pounds with a 4.5% Net Gradient of Climb.
   b. Flaps 40% = 10,625 pounds with a 3.3% Net Gradient of Climb

The fuel quantity required for start and taxi can be added to these weights.

TAKE-OFF DISTANCE

Enter the TAKE-OFF DISTANCE Graphs at 28°C, 5430 feet pressure altitude, 12,500 pounds, and 9.5 knots headwind component and obtain the following results:

	FLAPS 0%	FLAPS 40%
Ground Roll	2870 feet	2700 feet
Total Distance Over 50-foot Obstacle	4900 feet	3750 feet
Take-off Speed:		
At Rotation	95 knots	94 knots
At 50 Feet	121 knots	106 knots

FLIGHT PLANNING

The following calculations provide information for flight planning at various parameters of weight, power, altitude, and temperature. Graphs and tables are included for: TIME, FUEL, AND DISTANCE TO CLIMB; TIME, FUEL, AND DISTANCE TO DESCEND; RECOMMENDED CRUISE POWER AT 1700 RPM; RECOMMENDED CRUISE POWER AT 1800 RPM; MAXIMUM CRUISE POWER AT 1900 RPM; MAXIMUM RANGE POWER AT 1700 RPM; and HOLDING TIME.

Calculations for flight time, block speed, and fuel requirements for a proposed flight are detailed below.

Enter the ISA CONVERSION Graph at the conditions indicated:

DEN
Pressure Altitude .... 5430 feet
OAT .... 28°C
ISA Condition .... ISA + 23°C

DEN - SLC
Pressure Altitude .... 26,000 feet
OAT .... −10°C
ISA Condition .... ISA + 27°C

SLC - RNO
Pressure Altitude .... 26,000 feet
OAT .... −20°C
ISA Condition .... ISA + 17°C

RNO
Pressure Altitude .... 4730 feet
OAT .... 32°C
ISA Condition .... ISA + 27°C

Enter the TIME, FUEL, AND DISTANCE TO CLIMB Graph at 28°C, to 5430 feet, and to 12,500 pounds and enter at -10°C, to 26,000 feet and to 12,500 pounds, and read:

Time to Climb .... 25 − 3 = 22 minutes

Fuel Used to Climb .... 275 − 45 = 230 pounds

Distance Traveled .... 80 − 11 = 69 nautical miles

Enter the TIME, FUEL, AND DISTANCE TO DESCEND Graph at 26,000 feet, and enter again at 4730 feet and read:

Time to Descend .... 17 − 3 = 14 minutes

Fuel Used to Descend .... 168 − 36 = 132 pounds

Descent Distance .... 81 − 14 = 67 nautical miles

The estimated average cruise weight is approximately 11,600 pounds.

Enter the tables for RECOMMENDED CRUISE POWER @ 1800 RPM for ISA + 10°C, ISA + 20°C, and ISA + 30°C, and read the cruise speeds for 26,000 feet at 12,000 pounds and 11,000 pounds.

CRUISE TRUE AIRSPEEDS AT FL 260

12,000 POUNDS			11,000 POUNDS		
ISA + 10°C	ISA + 20°C	ISA + 30°C	ISA + 10°C	ISA + 20°C	ISA + 30°C
264	261	253	268	266	260

Interpolate between these speeds for ISA + 27°C and ISA + 17°C at 11,600 pounds.

Cruise True Airspeed (ISA + 27°C) .... 258 knots

Cruise True Airspeed (ISA + 17°C) .... 264 knots

Enter the *RECOMMENDED CRUISE POWER @ 1800 RPM Graph at 26,000 feet, and read the recommended torque settings for ISA + 27°C (−3°C OAT) and ISA + 17°C (−13°C OAT):

ISA + 27°C (−3°C OAT) .... 1269 ft-lbs torque per engine

ISA + 17°C (−13°C OAT) .... 1350 ft-lbs torque per engine

Enter the *FUEL FLOW AT RECOMMENDED CRUISE POWER @ 1800 RPM Graph at 26,000 feet, and read the fuel flow for ISA + 27°C (−3°C OAT) and ISA + 17°C (−13°C OAT):

ISA + 27°C (−3°C OAT) Fuel Flow Per Engine .... 247 lbs/hr
Total Fuel Flow .... 494 lbs/hr

ISA + 17°C (−13°C OAT) Fuel Flow Per Engine .... 260 lbs/hr
Total Fuel Flow .... 520 lbs/hr

*NOTE: For flight planning, enter these graphs at the forcasted ISA condition; for enroute power settings and fuel flow, enter the graphs at the actual OAT.

Time and Fuel Used were calculated at Recommended Cruise Power @ 1800 RPM as follows:

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

$$\text{Fuel Used} = (\text{Time})\ (\text{Total Fuel Flow})$$

Results are as follows:

ROUTE	DISTANCE	ESTIMATED GROUND SPEED	TIME AT CRUISE ALTITUDE	FUEL USED FOR CRUISE
	NM	KNOTS	HRS : MIN	LBS
DEN - EKR	*86	243	0:21	173
EKR - SLC	192	239	0:48	395
SLC - BVL	81	252	0:19	165
BVL - BAM	145	251	0:34	295
BAM - RNO	*78	230	0:20	173

*Distance required to climb or descend has been subtracted from segment distance

TIME - FUEL - DISTANCE

ITEM	TIME HRS : MINS	FUEL POUNDS	DISTANCE NM
Start, Runup, Taxi, and Take-off acceleration	00 : 00	90	0
Climb	00 : 22	230	69
Cruise	2 : 22	1201	582
Descent	00 : 14	132	67
Total	2 : 58	1653	718

Total Flight Time: 2 hours, 58 minutes

Block Speed: 718 NM ÷ 2 hours, 58 minutes = 242 knots

Reserve Fuel (45 minutes at Maximum Range Power): Assume weight at end of cruise to be 11,000 pounds. Enter the tables for MAXIMUM RANGE POWER @ 1700 RPM for ISA + 20°C, and read the fuel flow for 26,000 feet at 11,000 pounds:

ISA + 10°C .... 408 lbs/hr Total Fuel Flow

ISA + 20°C .... 418 lbs/hr Total Fuel Flow

Interpolate to find fuel flow at ISA + 17°C:

Total fuel flow for reserve = 408 + 7 = 415 lbs/hr

Reserve Fuel = 45 minutes X 415 lbs/hr = 311 lbs

Total Fuel: 1653 + 311 = 1964 pounds (293 gallons Aviation Kerosene)

Check for Zero Fuel Weight Requirement:

NOTE: Zero Fuel Weight cannot exceed 10,400 pounds.

Ramp Weight – Total Fuel Weight = 12,590 – 1964 = 10,624 pounds (Zero Fuel Weight)

The requirement is not satisfied. Two options exist:

1. Add 226 pounds additional fuel (the difference between 10,626 pounds and 10,400 pounds); or
2. Load to a Ramp Weight of 12,364 pounds (10,400 pounds plus 1972 pounds).

LANDING INFORMATION

The estimated Landing Weight is determined by subtracting the fuel required for the trip from the Ramp Weight.

Ramp Weight .... 12,590 pounds

Fuel Required for Total Trip .... 1,653 pounds

Landing Weight (12,590 – 1653) .... 10,937 pounds

Enter the LANDING DISTANCE WITHOUT PROPELLER REVERSING - FLAPS 100% Graph at 32°C, 4731 feet, 10,937 pounds, and 4.7 knots headwind component:

Ground Roll .... 1850 feet

Total Over 50-foot Obstacle .... 3000 feet

Approach Speed .... 99 knots

Enter the CLIMB - BALKED LANDING Graph at 32°C, 4731 feet, 10,937 pounds, and 4.7 knots headwind component:

Rate of Climb .... 1450 feet per minute

Climb Gradient 12.8%

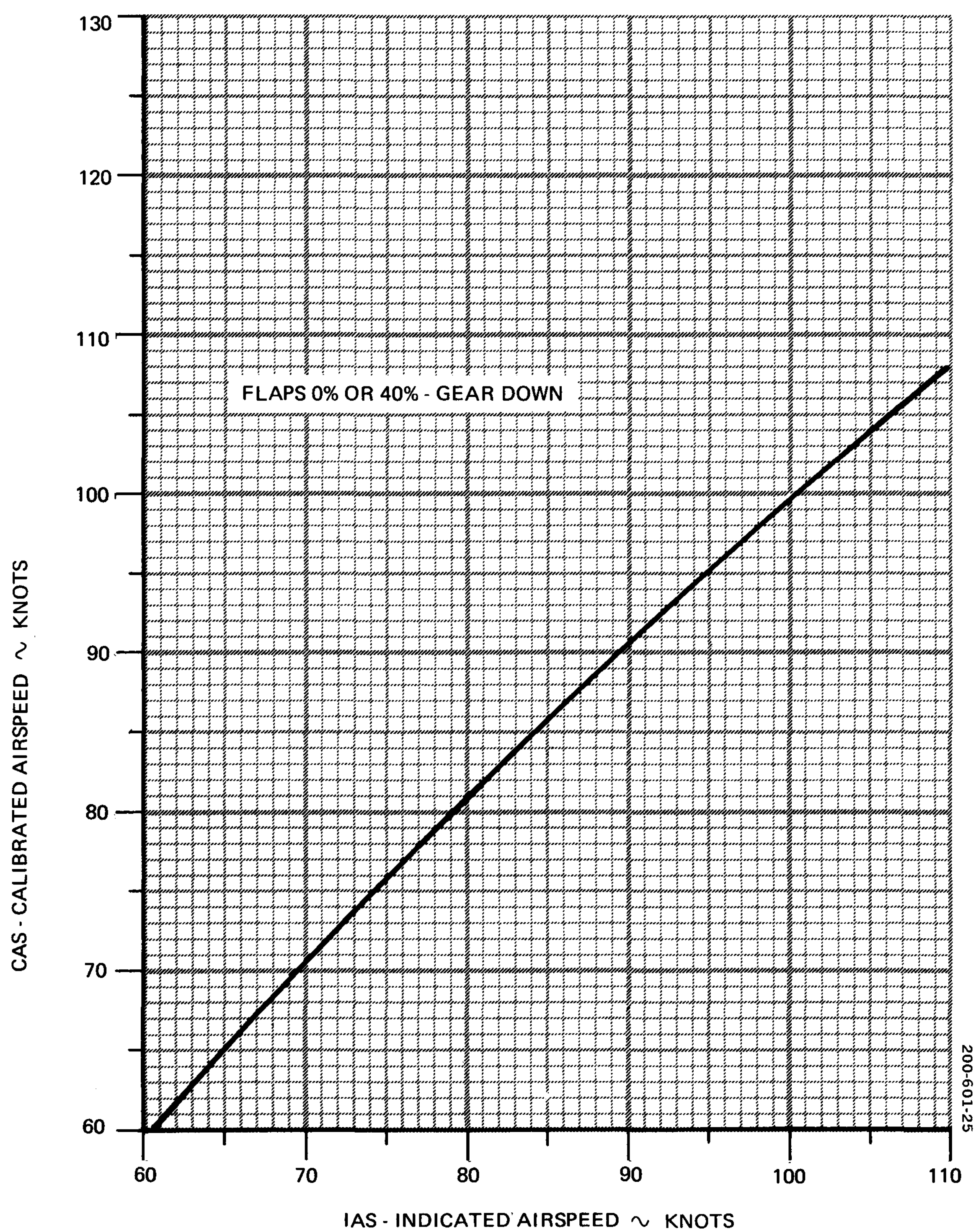
COMMENTS PERTINENT TO THE USE OF PERFORMANCE GRAPHS

1. In addition to presenting the answer for a particular set of conditions, the example on the graph also presents the order in which the various scales on the graph should be used. For instance, if the first item in the example is OAT, then enter the graph at the known OAT.
2. The reference lines indicate where to begin following guide lines. Always project to the reference line first, then follow the guide lines to the next known item.
3. The associated conditions define the specific conditions from which performance parameters have been determined. They are not intended to be used as instructions; however, performance values determined from charts can only be achieved if the specified conditions exist.
4. The full amount of usable fuel is available for all approved flight conditions.
5. Notes have been provided on various graphs and tables to approximate performance with ice vanes extended. The effect is estimated by either entering the graph at a temperature higher than the actual temperature, or adjusting the final results obtained from the graph by a fixed percentage. The effect is approximate and will vary, depending upon airspeed, temperature, altitude, and ambient conditions. At lower altitudes, where operation on the torque limit is possible, the effect of ice vane extension will be less, depending upon how much power can be recovered after the ice vanes have been extended.

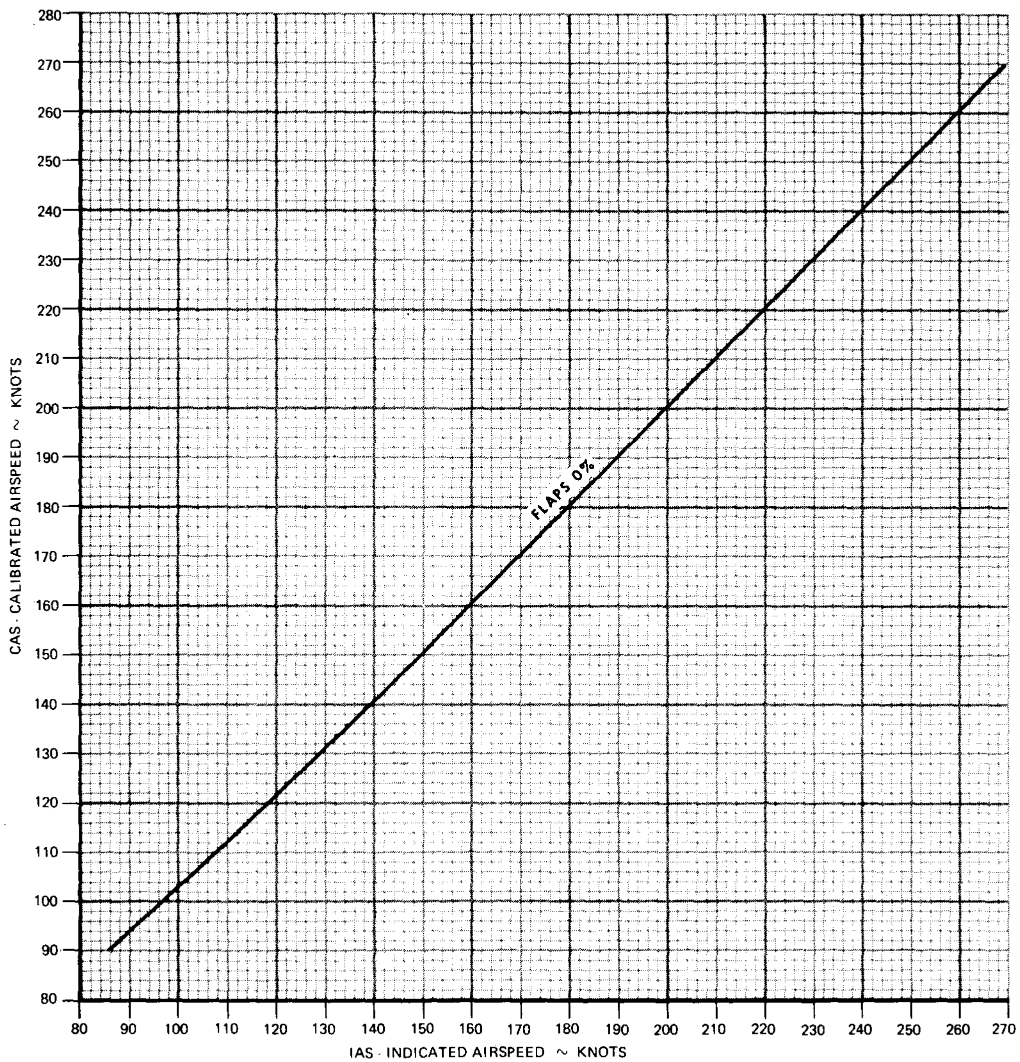
INTENTIONALLY LEFT BLANK

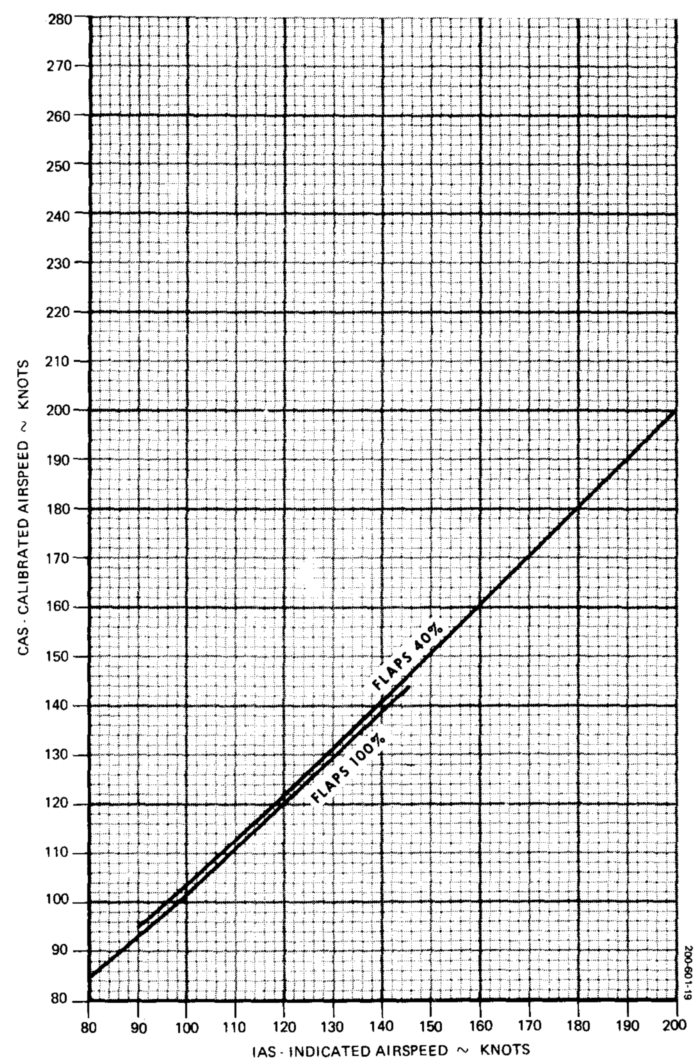
AIRSPEED CALIBRATION — NORMAL SYSTEM

TAKE-OFF GROUND ROLL

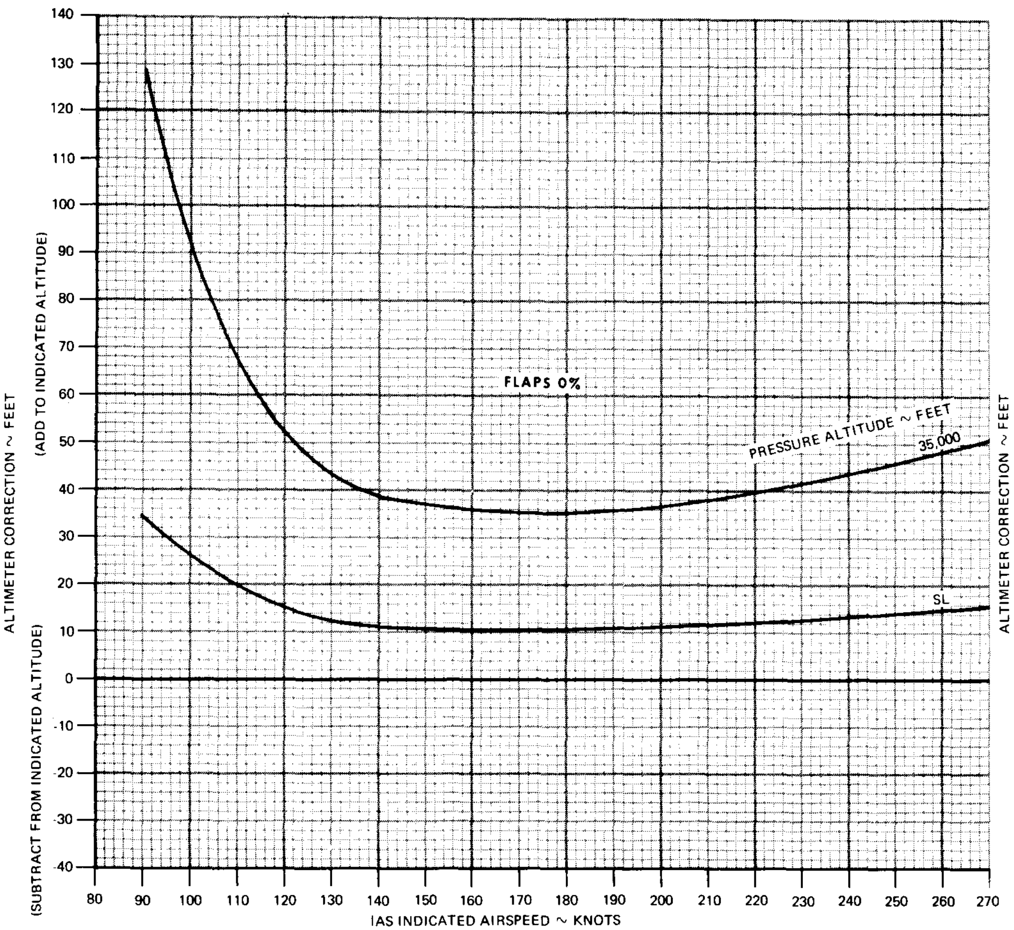


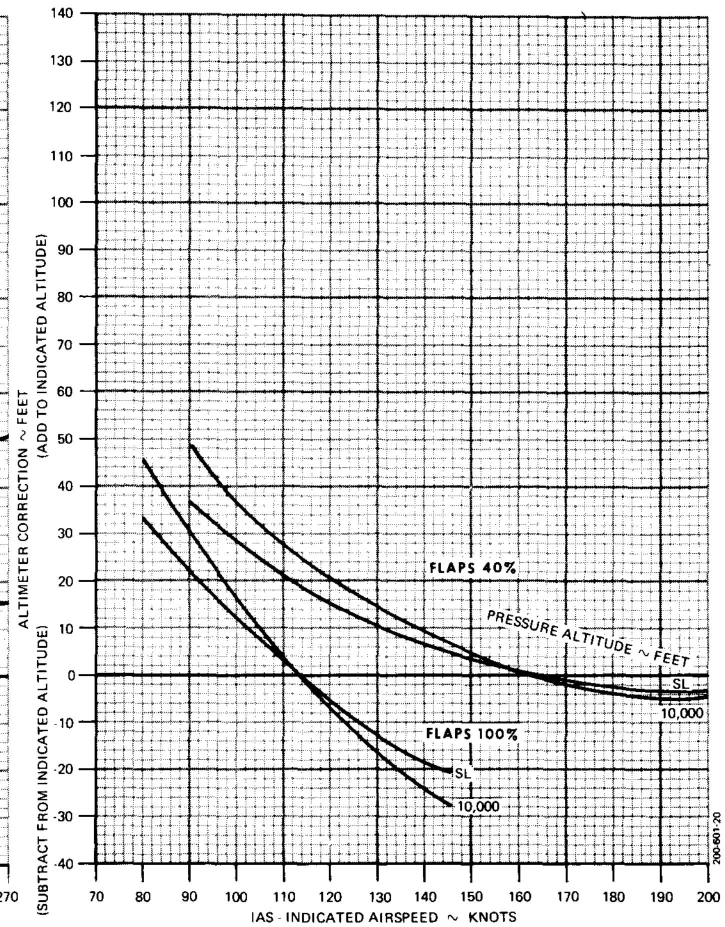
AIRSPEED CALIBRATION — NORMAL SYSTEM





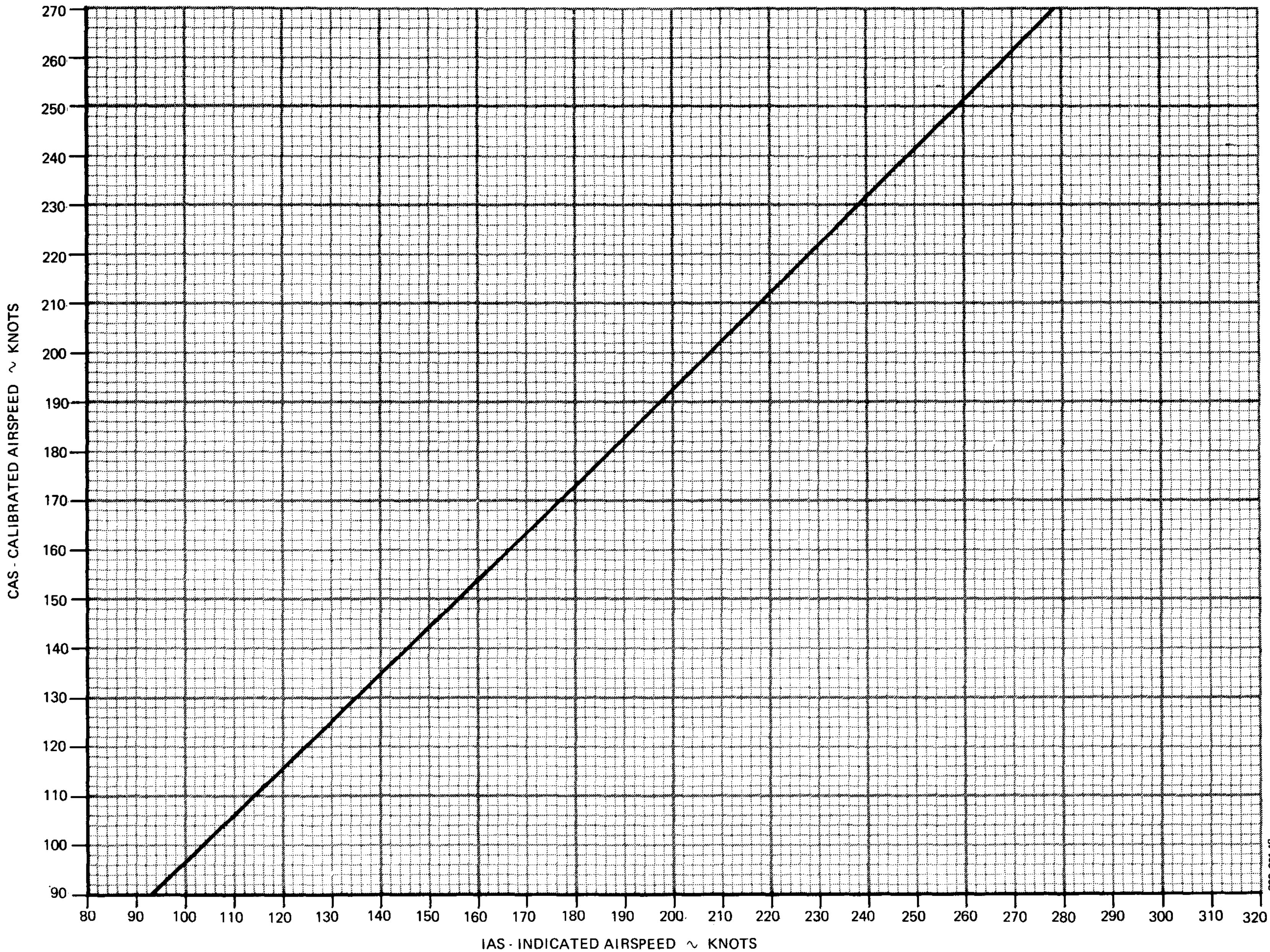
ALTIMETER CORRECTION — NORMAL SYSTEM





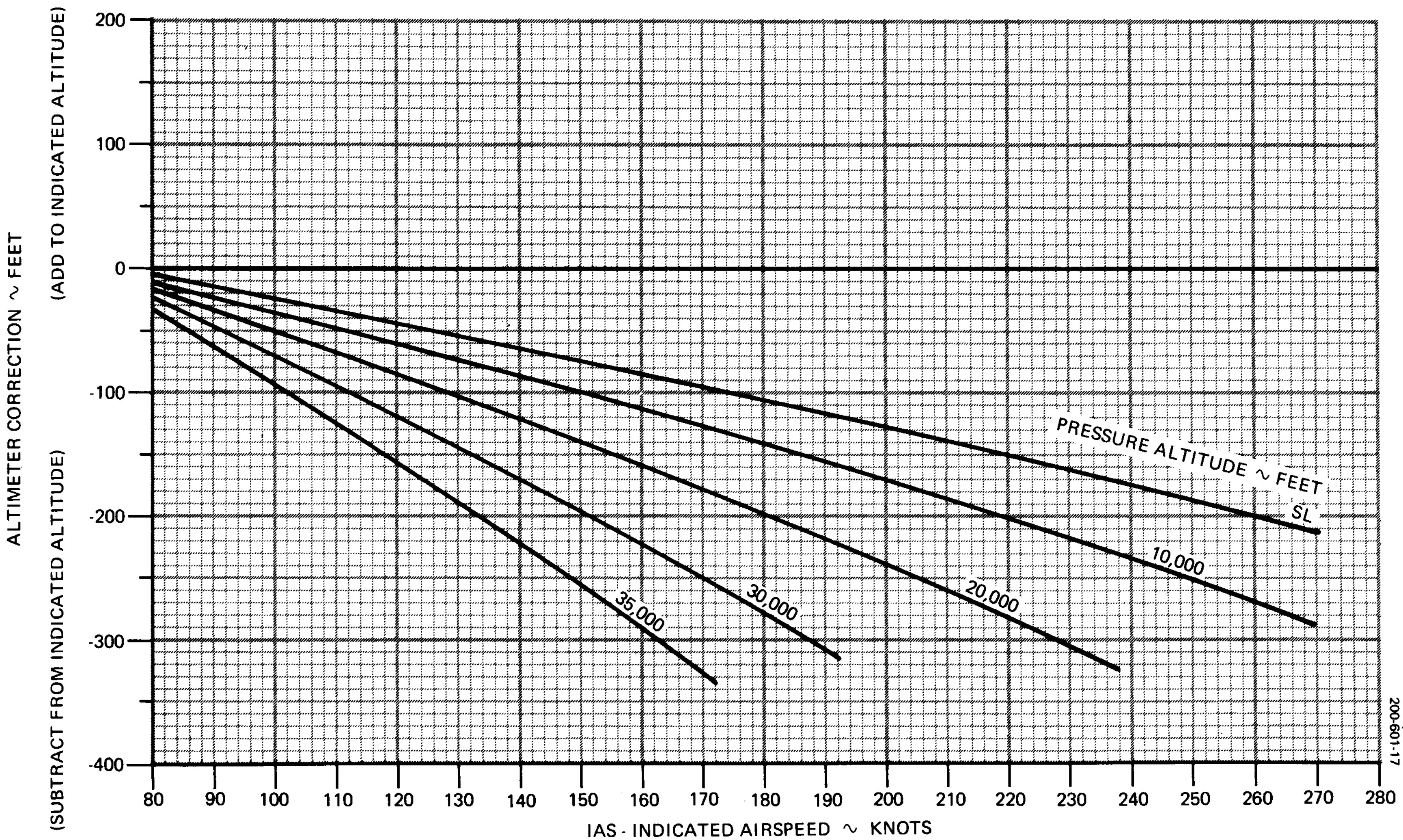
AIRSPEED CALIBRATION — ALTERNATE SYSTEM

APPLICABLE FOR ALL FLAP POSITIONS



ALTIMETER CORRECTION — ALTERNATE SYSTEM

APPLICABLE FOR ALL FLAP POSITIONS

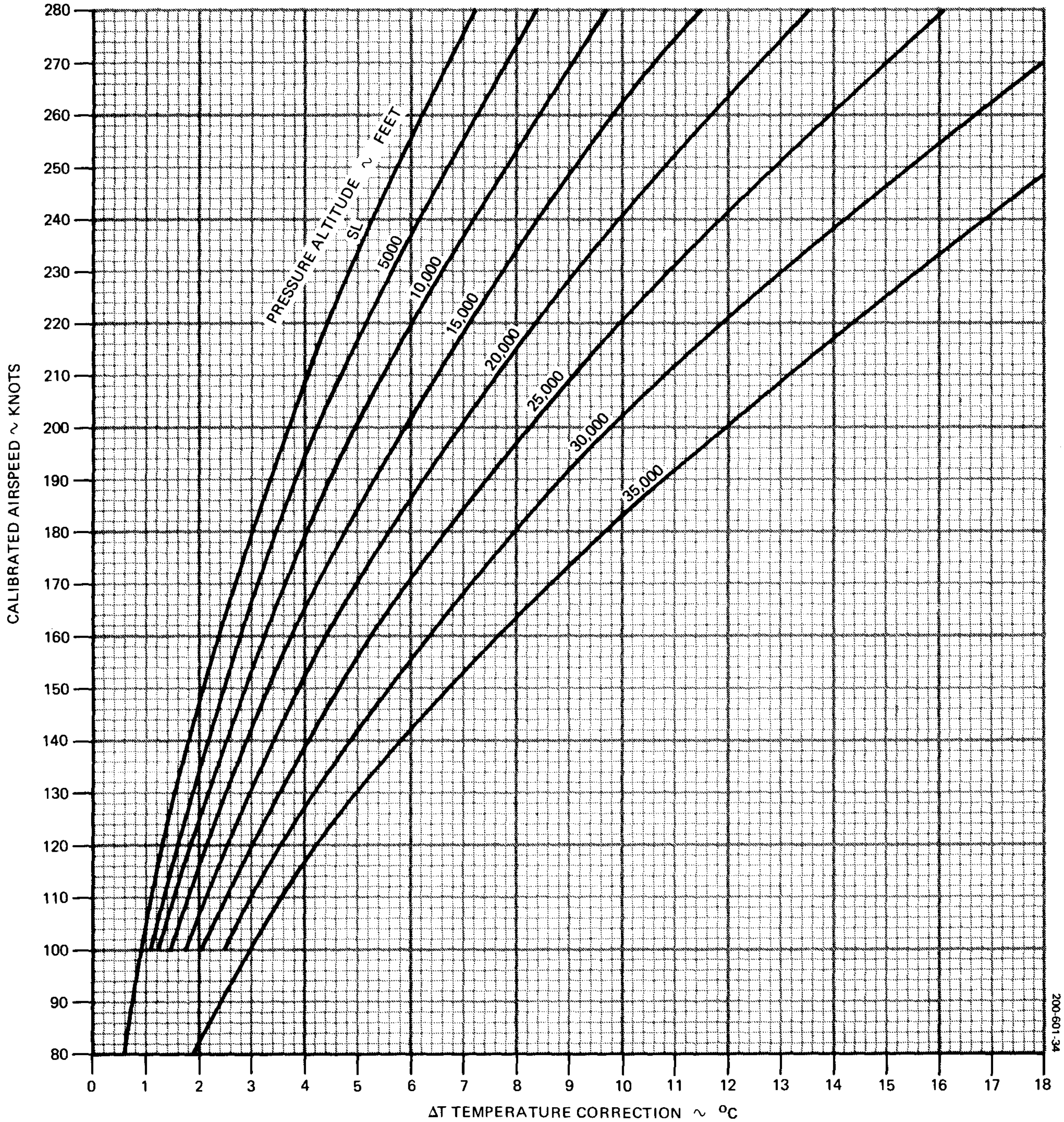


TransNorthern Aviation

INDICATED OUTSIDE AIR TEMPERATURE CORRECTION

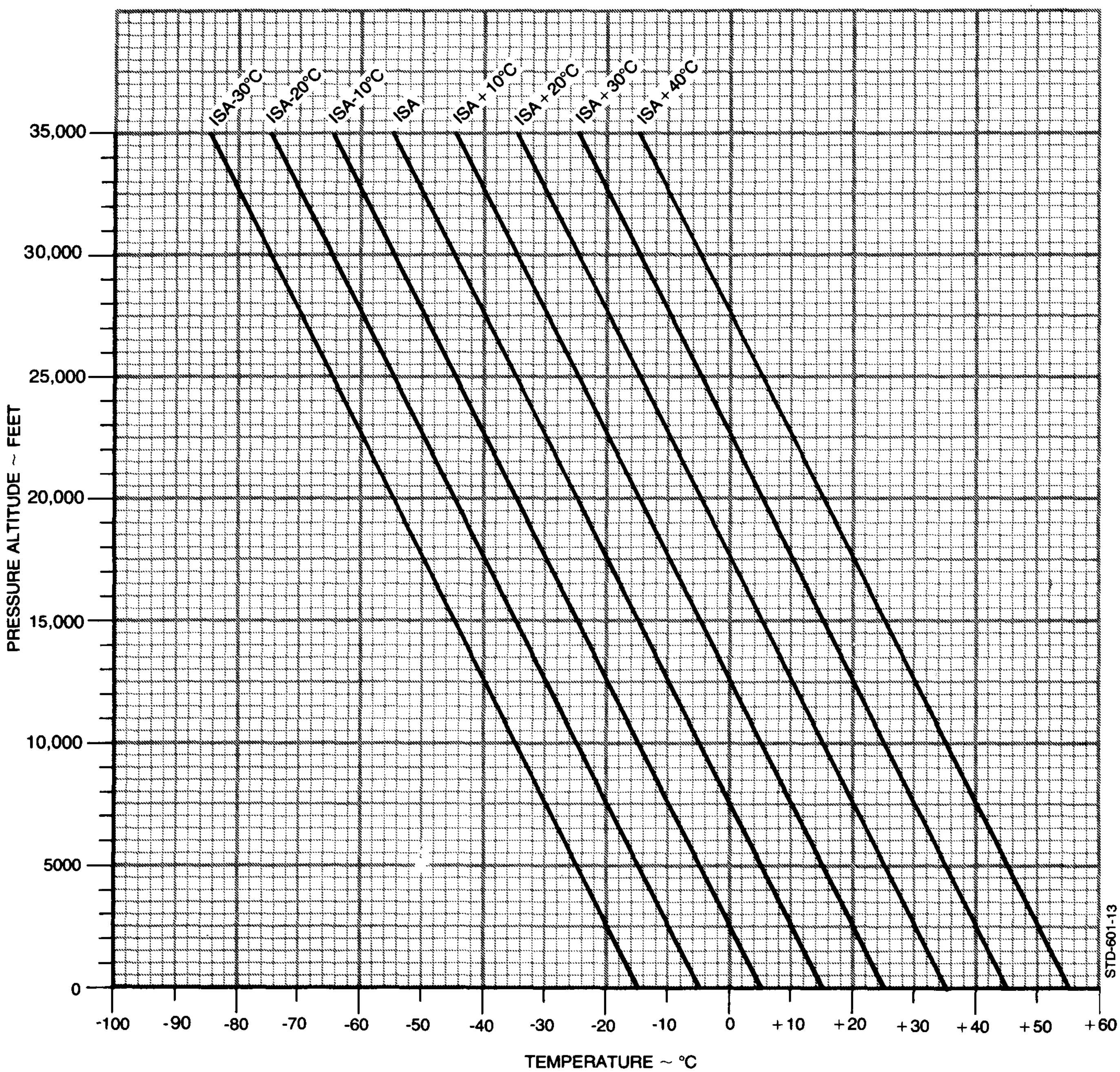
STANDARD DAY (ISA)

NOTE: SUBTRACT ΔT FROM INDICATED (GAGE) OAT TO OBTAIN TRUE OAT. (ΔT ASSUMES A RECOVERY FACTOR OF 0.7)

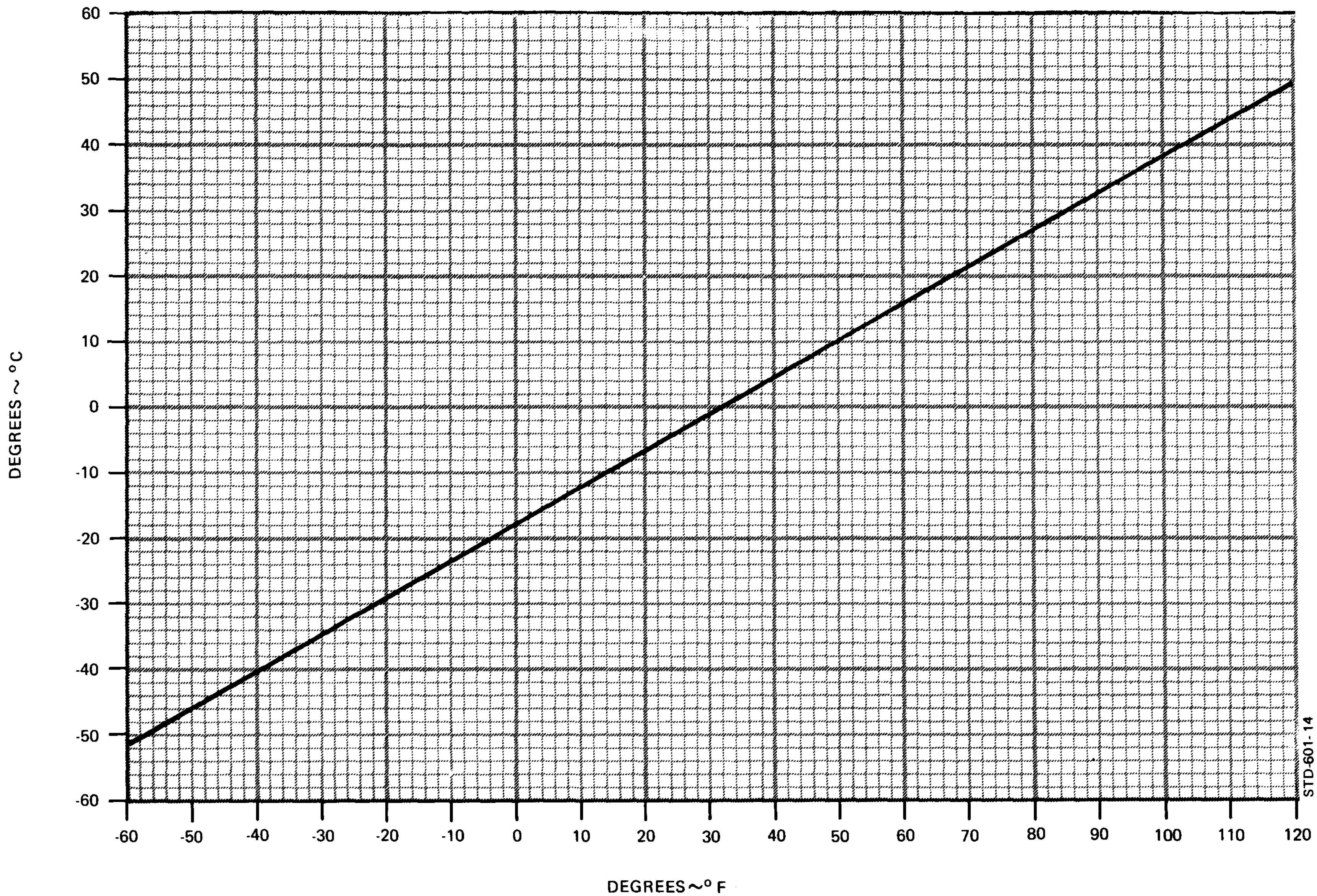


ISA CONVERSION

PRESSURE ALTITUDE vs OUTSIDE AIR TEMPERATURE



FAHRENHEIT TO CELSIUS TEMPERATURE CONVERSION

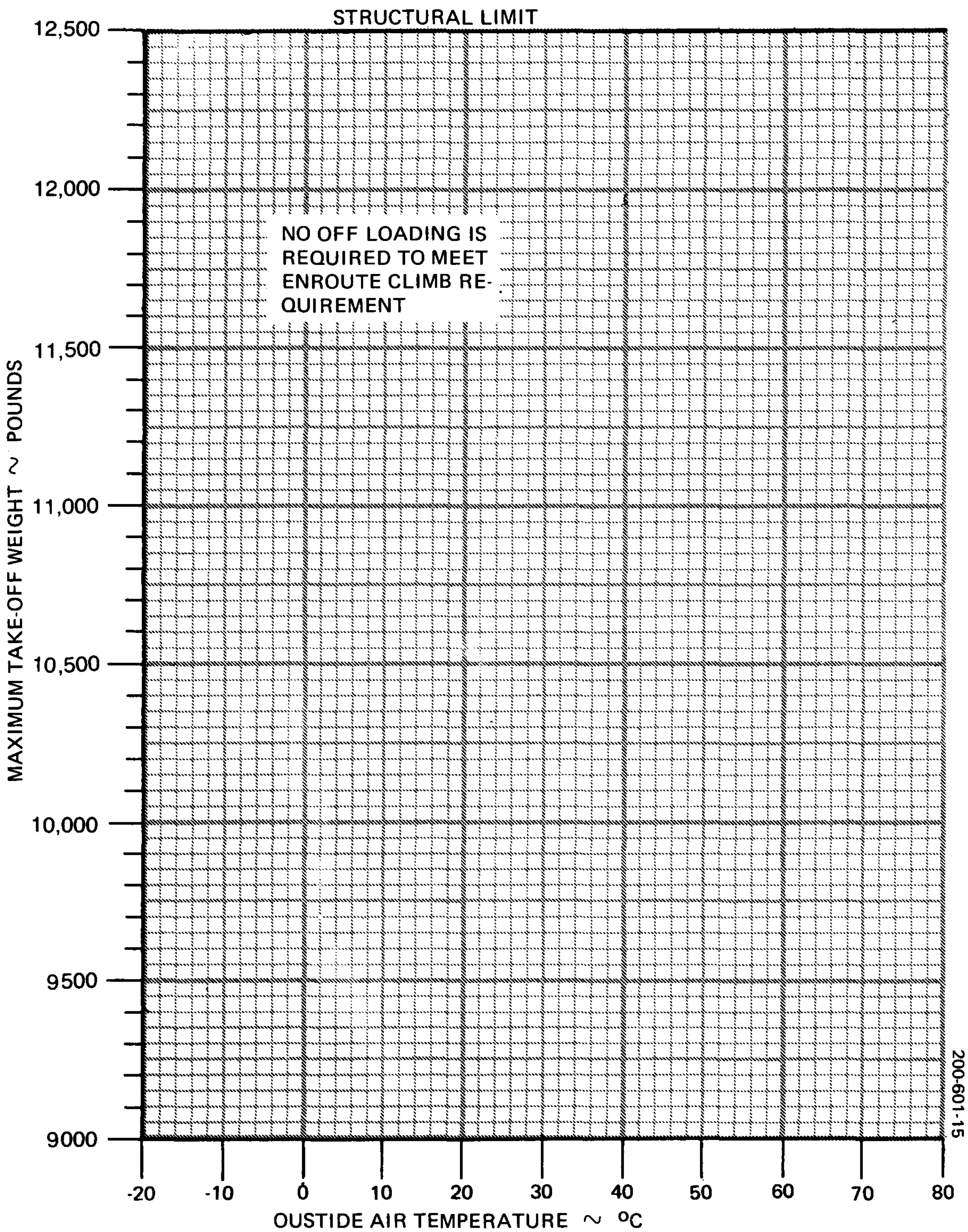


TransNorthern Aviation

MAXIMUM TAKE-OFF WEIGHT

PERMITTED BY ENROUTE CLIMB REQUIREMENT

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, NO OFF LOADING IS REQUIRED.



TAKE-OFF WEIGHT—FLAPS 0%

TO ACHIEVE POSITIVE ONE-ENGINE-INOPERATIVE RATE-OF-CLIMB AT LIFT-OFF

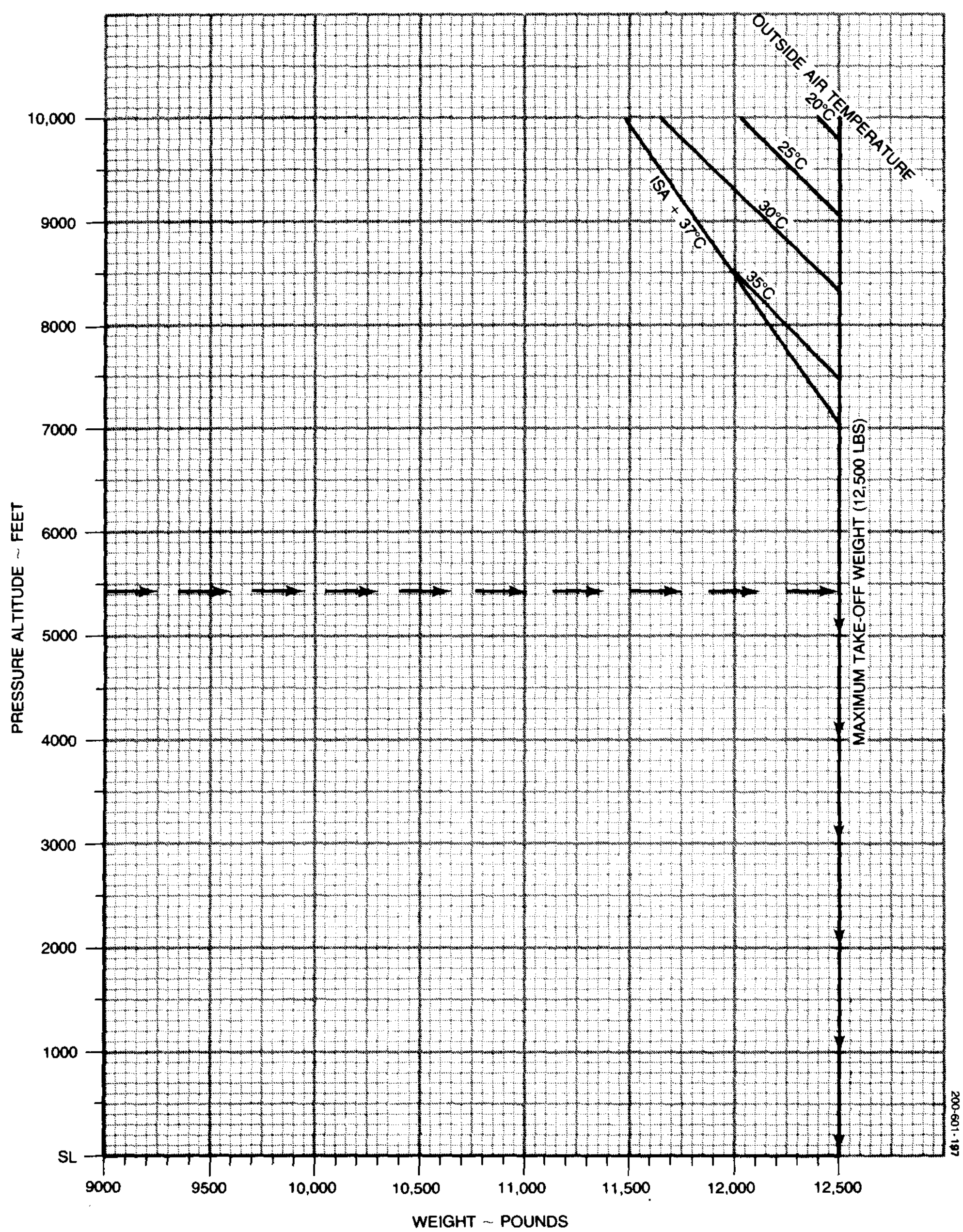
ASSOCIATED CONDITIONS:

POWER .... TAKE-OFF
FLAPS .... UP (0%)
LANDING GEAR .... DOWN

EXAMPLE:

PRESSURE ALTITUDE ...... 5430 FT
OAT .... 28°C
TAKE-OFF WEIGHT .... 12,500 LBS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, NO OFF-LOADING IS REQUIRED.



TAKE-OFF WEIGHT — FLAPS 40%

TO ACHIEVE POSITIVE ONE-ENGINE INOPERATIVE RATE OF CLIMB AT LIFT-OFF

ASSOCIATED CONDITIONS:

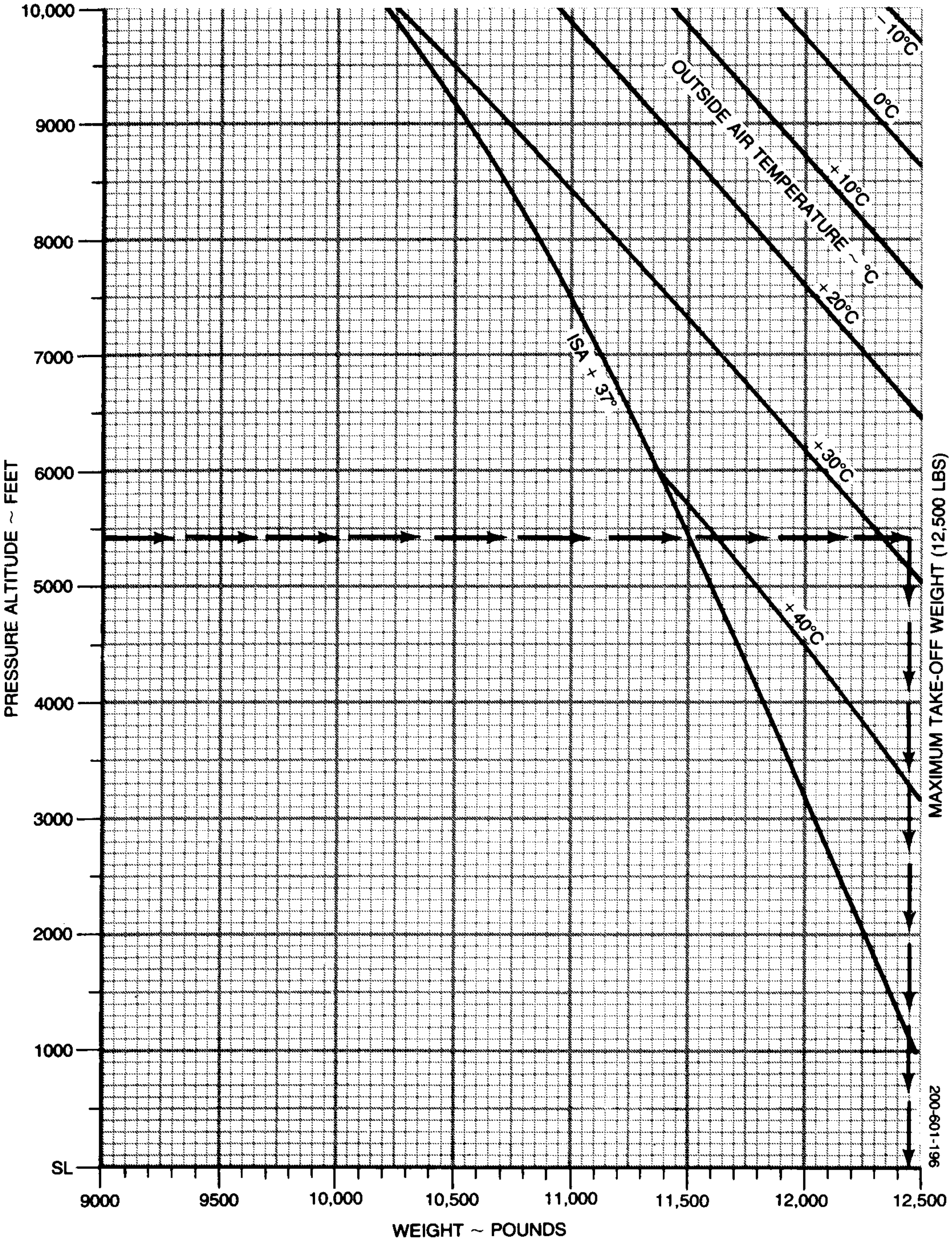
POWER . . . . TAKE-OFF
FLAPS 40%
LANDING GEAR . . . . DOWN

EXAMPLE:

PRESSURE ALTITUDE . . . . 5430 FT
OAT . . . . 28°C

TAKE-OFF WEIGHT . . . . 12,450 LBS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10°C TO THE ACTUAL OAT BEFORE ENTERING THE GRAPH.



MAXIMUM ENROUTE WEIGHT

(FAR PART 135 OPERATIONS)

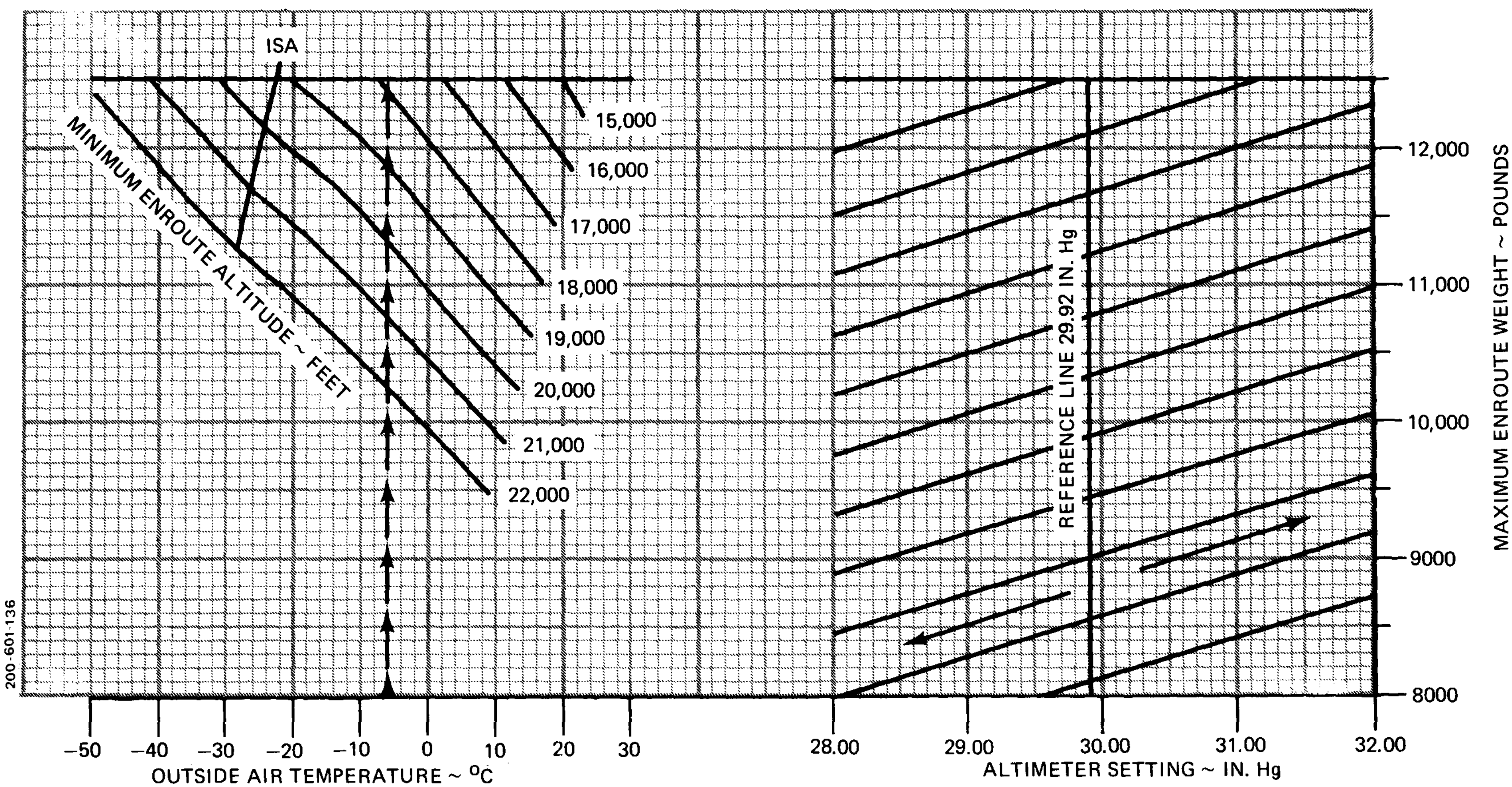
ASSOCIATED CONDITIONS:

POWER	MAXIMUM CONTINUOUS
FLAPS	0%
LANDING GEAR	UP
INOPERATIVE PROPELLER .	FEATHERED

EXAMPLE:

OAT	$-6^{\circ}C$
MINIMUM ENROUTE ALTITUDE . . .	16,000 FEET
ALTIMETER SETTING	29.82 IN. Hg
MAXIMUM ALLOWABLE WEIGHT	12,500 LBS

NOTE: PER FAR 135.145, OPERATIONS OVER THE TOP OR IN IFR CONDITIONS REQUIRE THAT THE AIRPLANE BE CAPABLE OF CLIMBING 50 FT/MIN AT THE MEAs OF THE PROPOSED ROUTE OR 5000 FEET MSL, WHICHEVER IS HIGHER.



INTENTIONALLY LEFT BLANK

TAKE-OFF WEIGHT — FLAPS 0%

TO MEET FAR 25 TAKE-OFF CLIMB REQUIREMENTS

ASSOCIATED CONDITIONS:

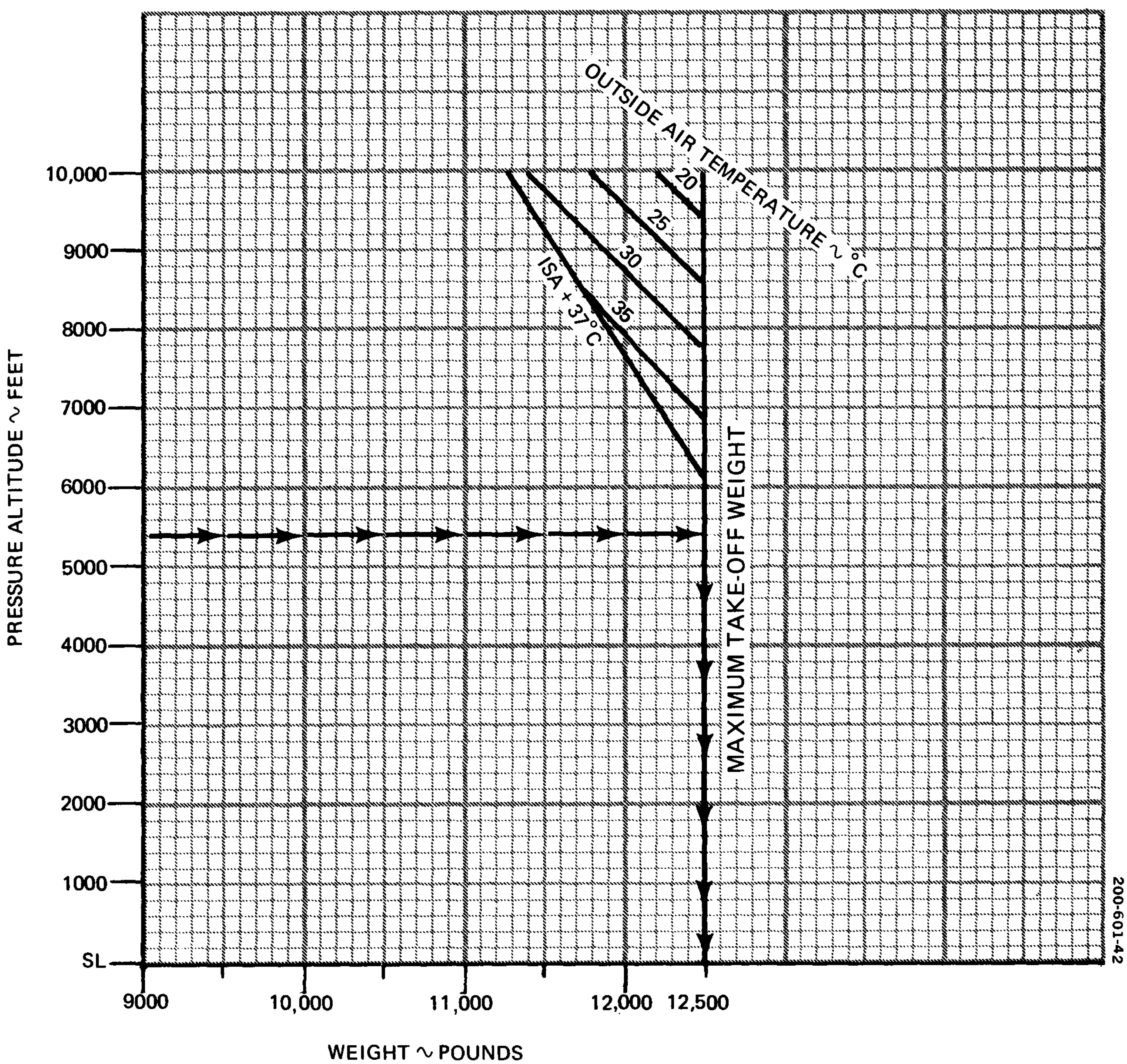
AIRPLANE . . . . . . AIRBORNE
POWER. . . . . TAKE-OFF
FLAPS. . . . . UP
INOPERATIVE
PROPELLER. . . FEATHERED

EXAMPLE:

PRESSURE ALTITUDE. . . . . . 5430 FT
OAT. 28°C

TAKE-OFF WEIGHT. . . . . 12,500 LBS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, NO OFF LOADING IS REQUIRED.



TAKE-OFF WEIGHT — FLAPS 40%

TO MEET FAR 25 TAKE-OFF CLIMB REQUIREMENTS

ASSOCIATED CONDITIONS:

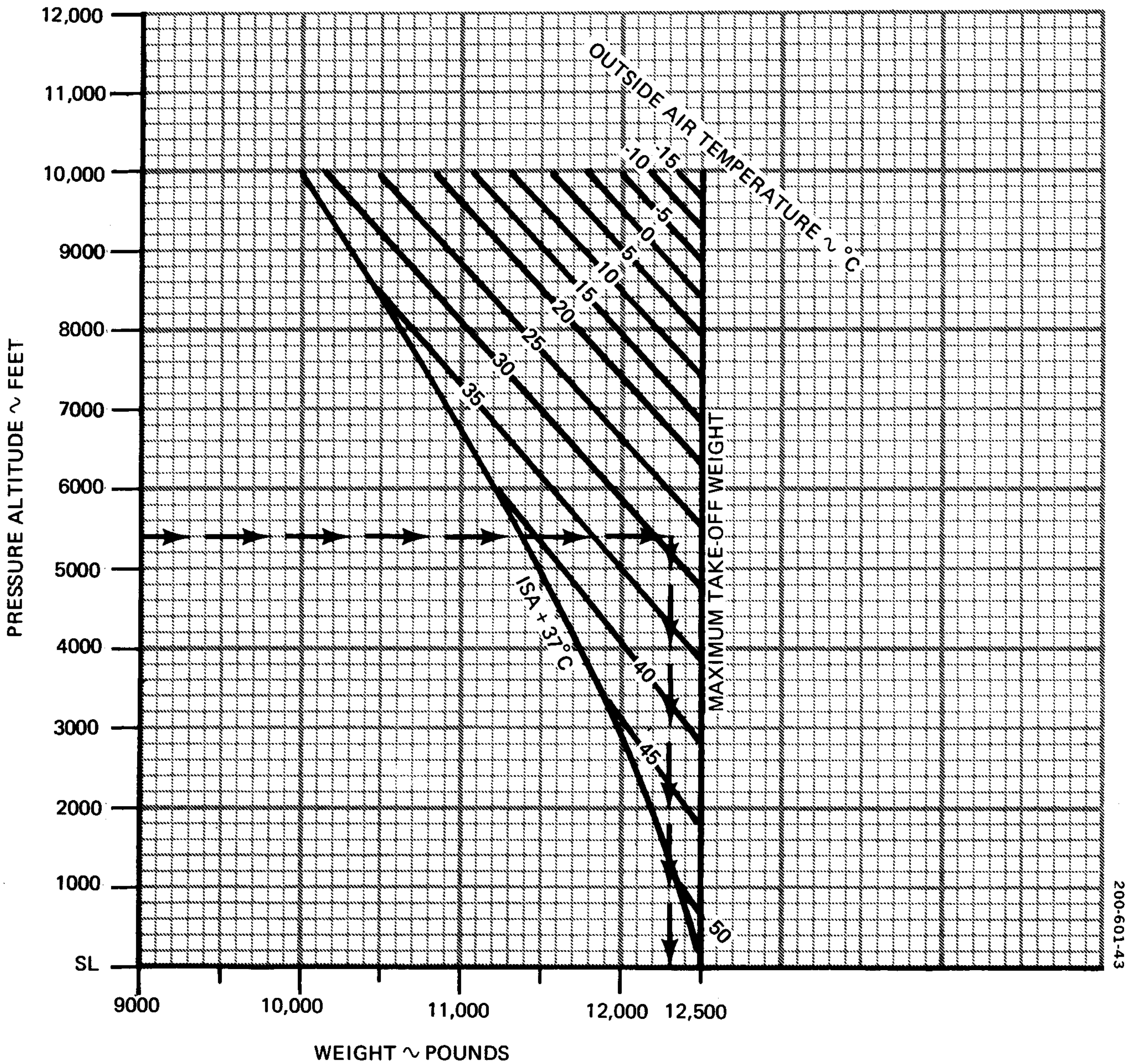
AIRPLANE...... AIRBORNE
POWER.......... TAKE-OFF
FLAPS...........40%
INOPERATIVE
PROPELLER... FEATHERED

EXAMPLE:

PRESSURE ALTITUDE..... 5430 FT
OAT....................28°C

TAKE-OFF WEIGHT........12,300 LBS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10° C TO ACTUAL OAT BEFORE ENTERING ON GRAPH.



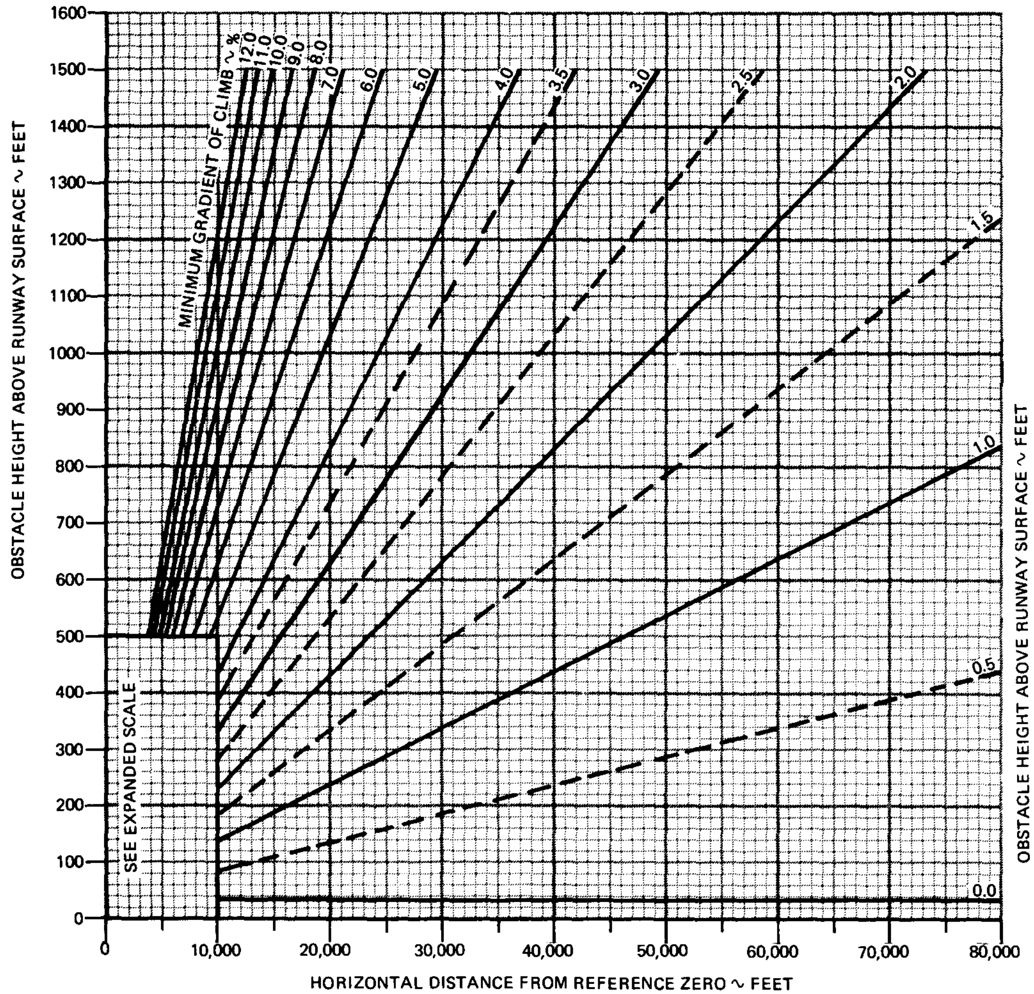
TAKE – OFF FLIGHT PATH

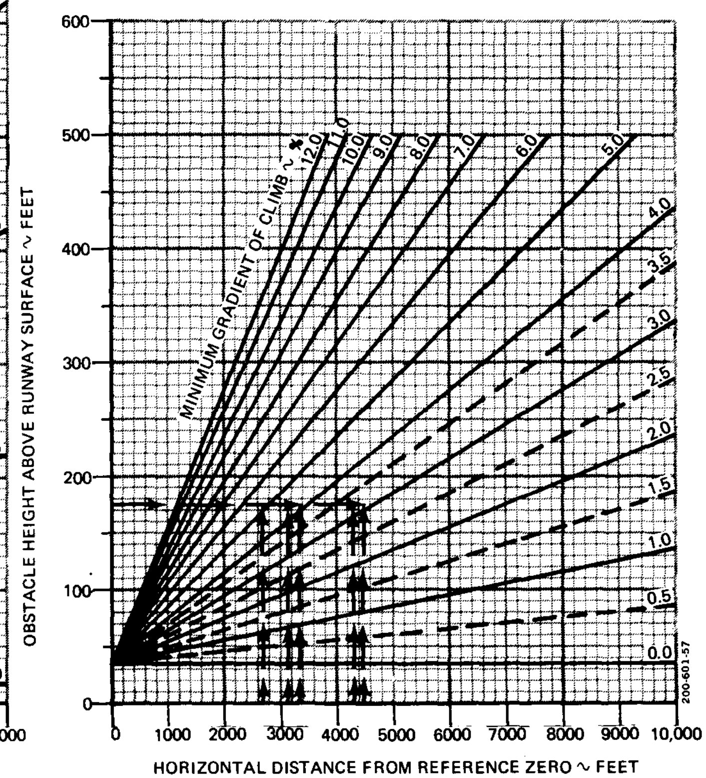
REFERENCE ZERO: THE POINT AT THE END OF THE TAKE-OFF RUN AT WHICH THE AIRPLANE IS 35 FEET ABOVE THE RUNWAY SURFACE.

EXAMPLE:

OBSTACLE HEIGHT . . . . . 175 FEET

HORIZONTAL DISTANCE FROM REFERENCE ZERO ~ FEET	MINIMUM GRADIENT OF CLIMB ~ %
2700	5.2
3386	4.1
4436	3.2
3116	4.5
4336	3.3





STALL SPEEDS — POWER IDLE

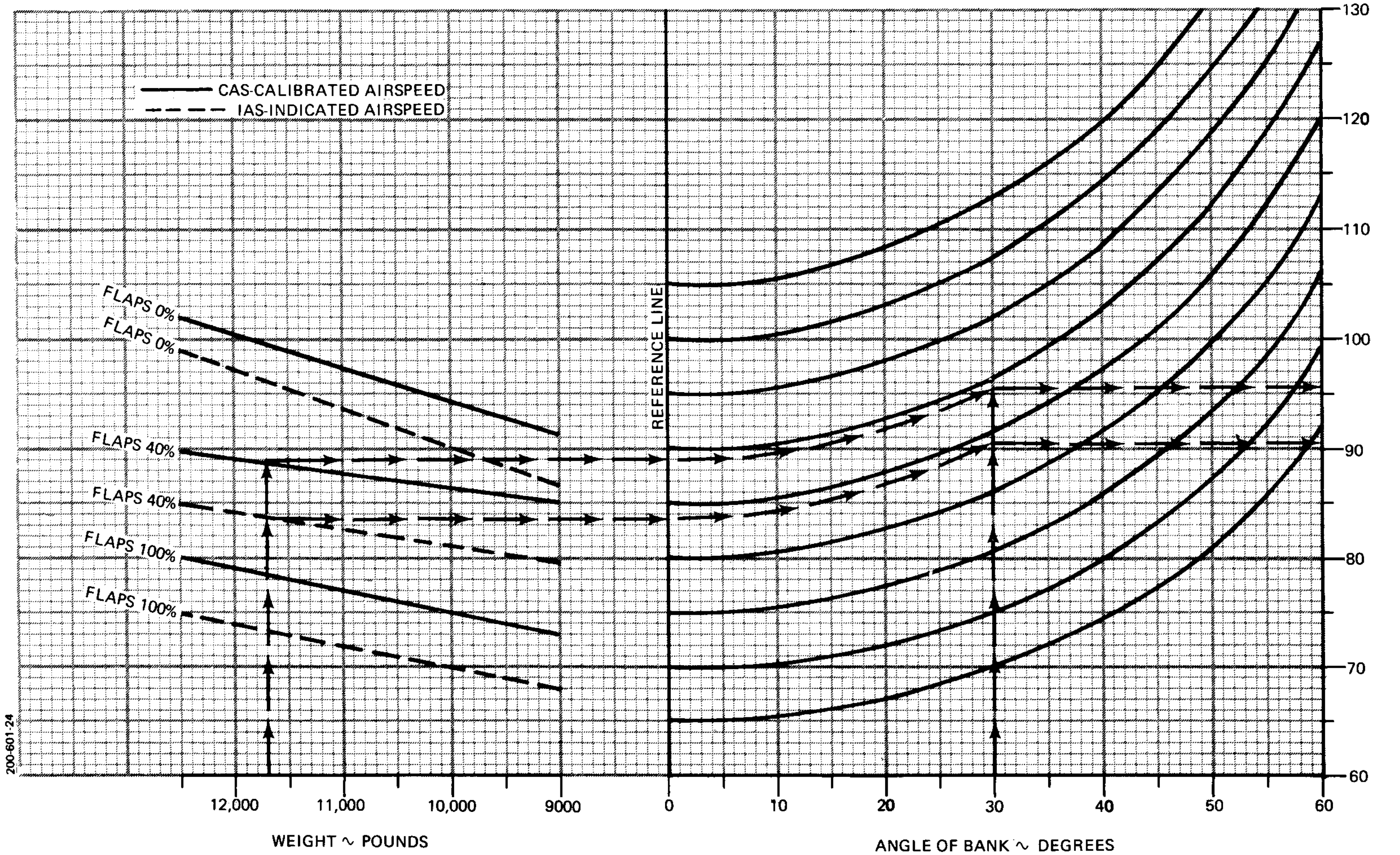
NOTES:

1. ALTITUDE LOSS EXPERIENCED WHILE CONDUCTING STALLS IN ACCORDANCE WITH FAR 23.201 WAS 800 FEET.
2. MAXIMUM NOSE DOWN PITCH ATTITUDE AND ALTITUDE LOSS DURING RECOVERY FROM ONE-ENGINE-INOPERATIVE STALLS PER FAR 23.205 ARE APPROXIMATELY 8° AND 300 FEET RESPECTIVELY.
3. A NORMAL STALL RECOVERY TECHNIQUE MAY BE USED. THE BEST PROCEDURE IS A BRISK FORWARD WHEEL MOVEMENT TO A NOSE DOWN ATTITUDE. LEVEL THE AIRPLANE AFTER AIRSPEED HAS INCREASED APPROXIMATELY 25 KNOTS ABOVE STALL.
4. LANDING GEAR POSITION HAS NO EFFECT ON STALL SPEED.

EXAMPLE:

WEIGHT . . . . 11,700 LBS
FLAPS 40%
ANGLE OF BANK . . . . . 30 DEG.

STALL SPEED . . . . 96 KTS CAS
90 KTS IAS

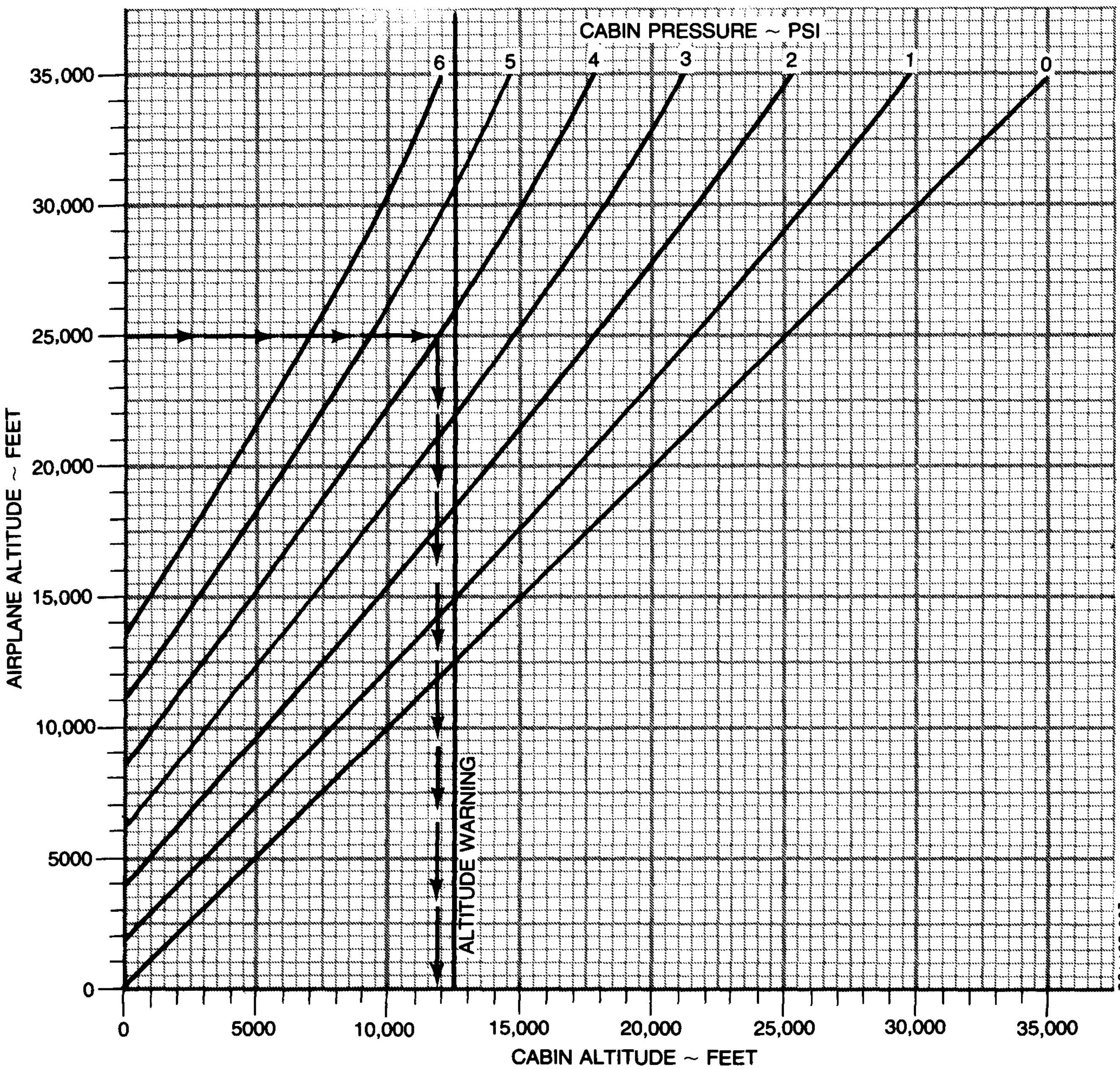


CABIN ALTITUDE FOR VARIOUS AIRPLANE ALTITUDES

EXAMPLE :

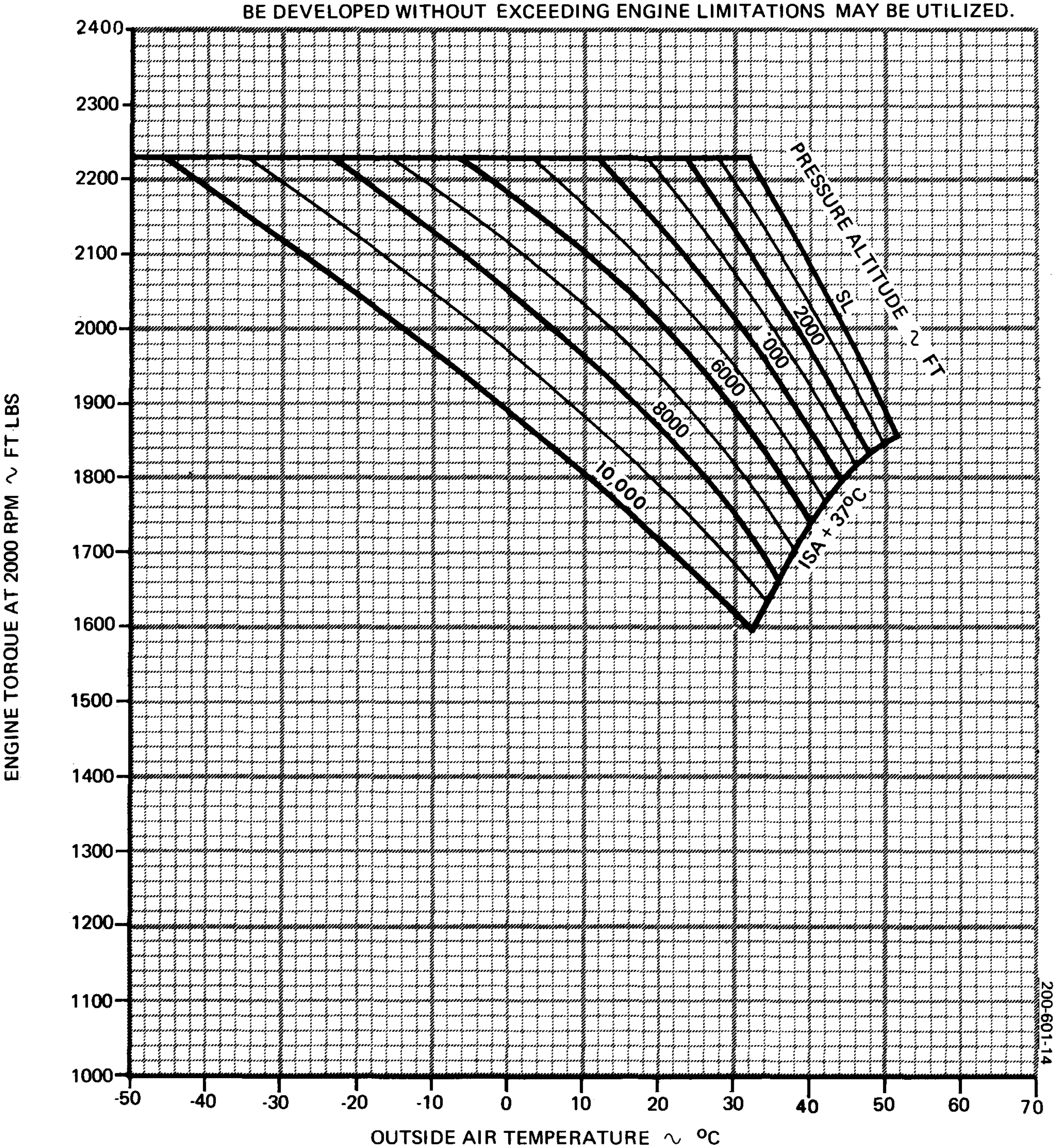
AIRPLANE ALTITUDE . . . . . 25,000 FT
CABIN PRESSURE . . . . 4.0 PSI

CABIN ALTITUDE . . . . 11,800 FT



MINIMUM TAKE-OFF POWER AT 2000 RPM
WITH ICE VANES RETRACTED
(65 KNOTS)

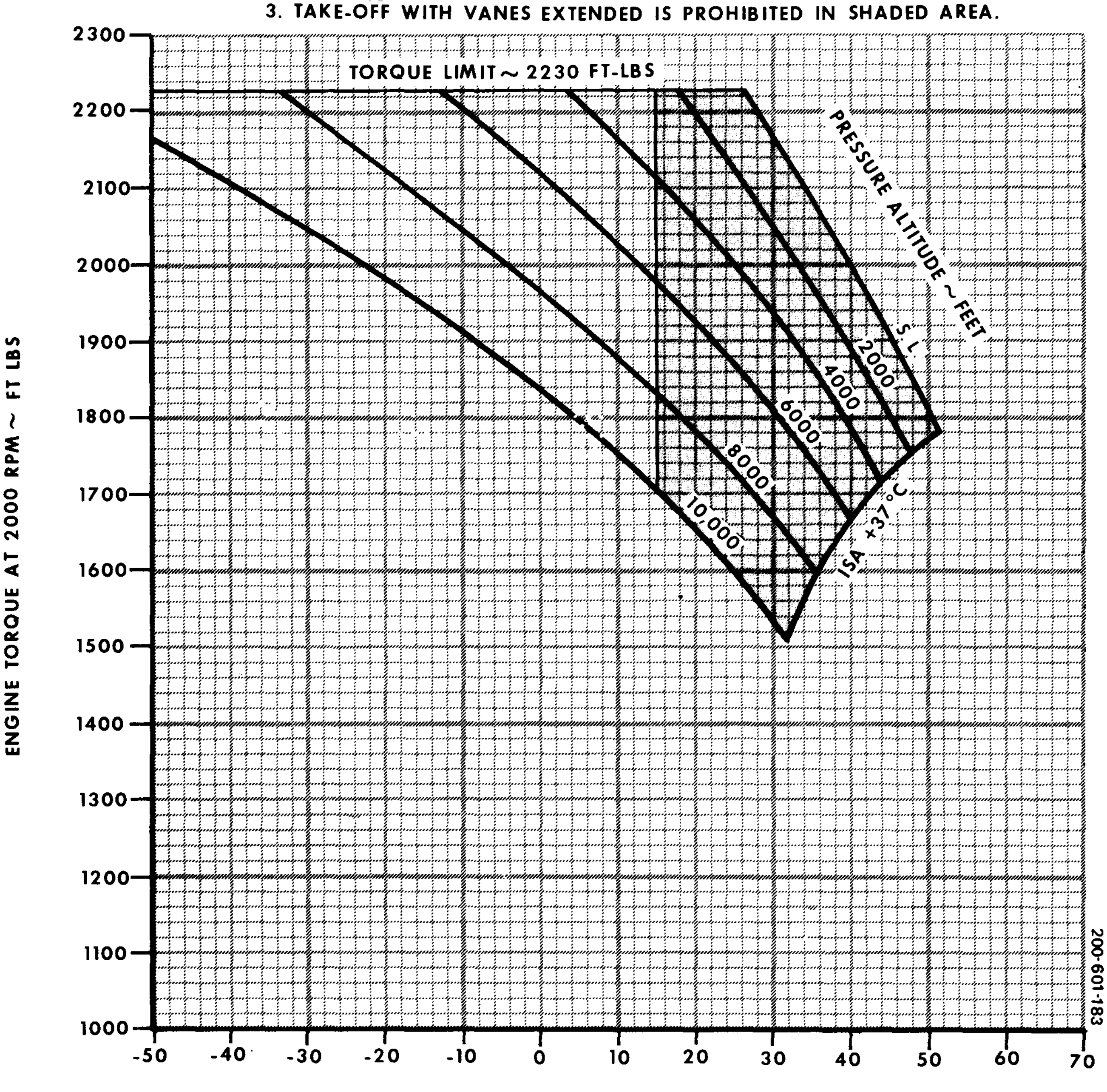
NOTES: 1. TORQUE INCREASES APPROXIMATELY 20 FT-LBS FROM ZERO TO 65 KNOTS.
2. THE POWER (TORQUE) INDICATED IS THE MINIMUM VALUE FOR WHICH TAKE-OFF PERFORMANCE IN THIS SECTION CAN BE OBTAINED. EXCESS POWER WHICH CAN BE DEVELOPED WITHOUT EXCEEDING ENGINE LIMITATIONS MAY BE UTILIZED.



MINIMUM TAKE-OFF POWER
WITH ICE VANES EXTENDED
(65 KNOTS)

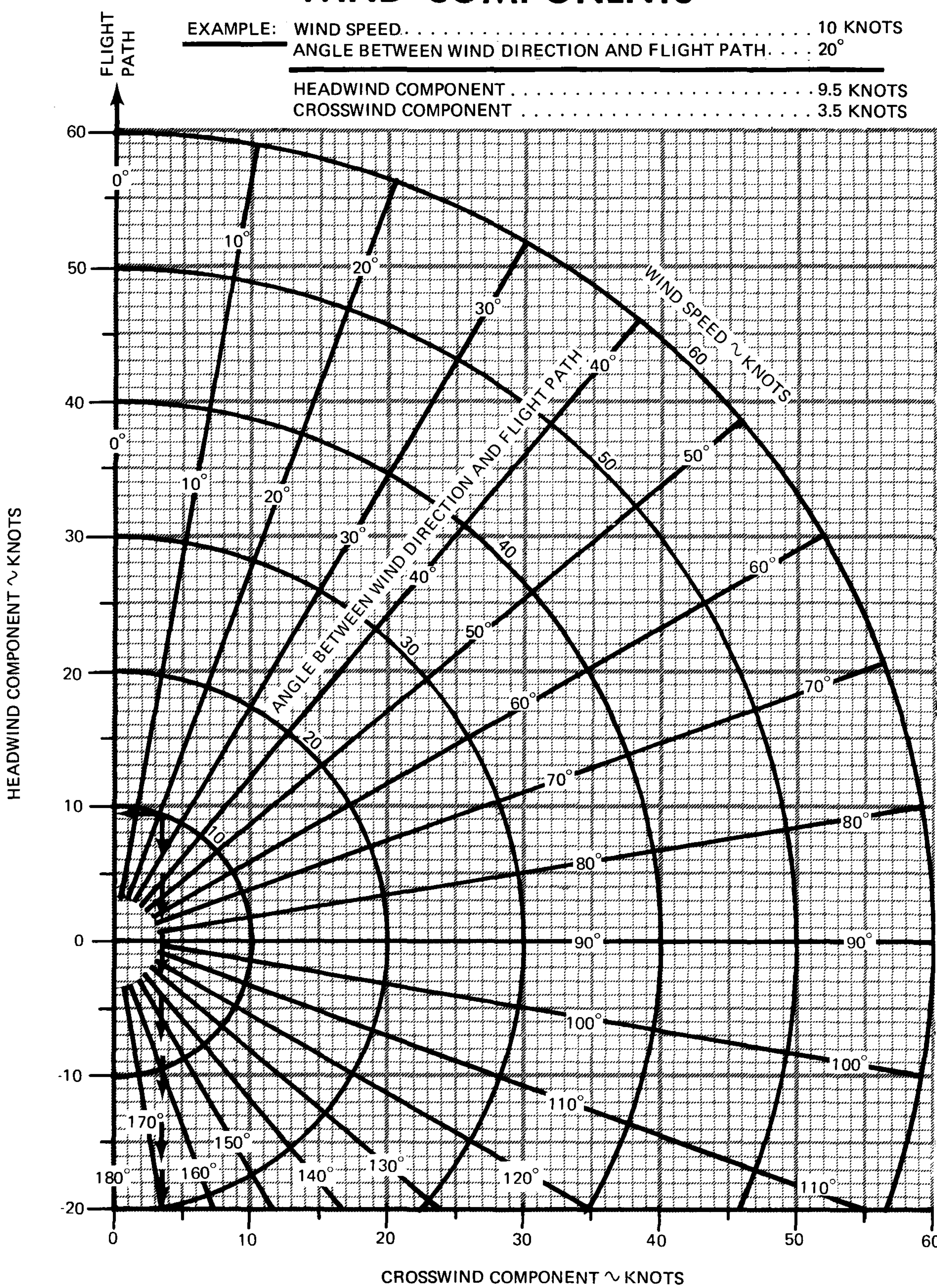
NOTES:

1. TORQUE INCREASES APPROXIMATELY 20 FT-LBS FROM ZERO TO 65 KNOTS.
2. THE POWER (TORQUE) INDICATED IS THE MINIMUM VALUE FOR WHICH TAKE-OFF PERFORMANCE WITH EXTENDED ICE VANES CAN BE OBTAINED. EXCESS POWER WHICH CAN BE DEVELOPED WITHOUT EXCEEDING ENGINE LIMITATIONS MAY BE UTILIZED.
3. TAKE-OFF WITH VANES EXTENDED IS PROHIBITED IN SHADED AREA.



WIND COMPONENTS

EXAMPLE:	
WIND SPEED	10 KNOTS
ANGLE BETWEEN WIND DIRECTION AND FLIGHT PATH	20°
HEADWIND COMPONENT	9.5 KNOTS
CROSSWIND COMPONENT	3.5 KNOTS



TAKE-OFF DISTANCE — FLAPS 0%

ASSOCIATED CONDITIONS:

POWER............TAKE-OFF POWER SET BEFORE BRAKE RELEASE
FLAPS............0%
LANDING GEAR....RETRACT AFTER LIFT-OFF
RUNWAY..........PAVED, LEVEL, DRY SURFACE

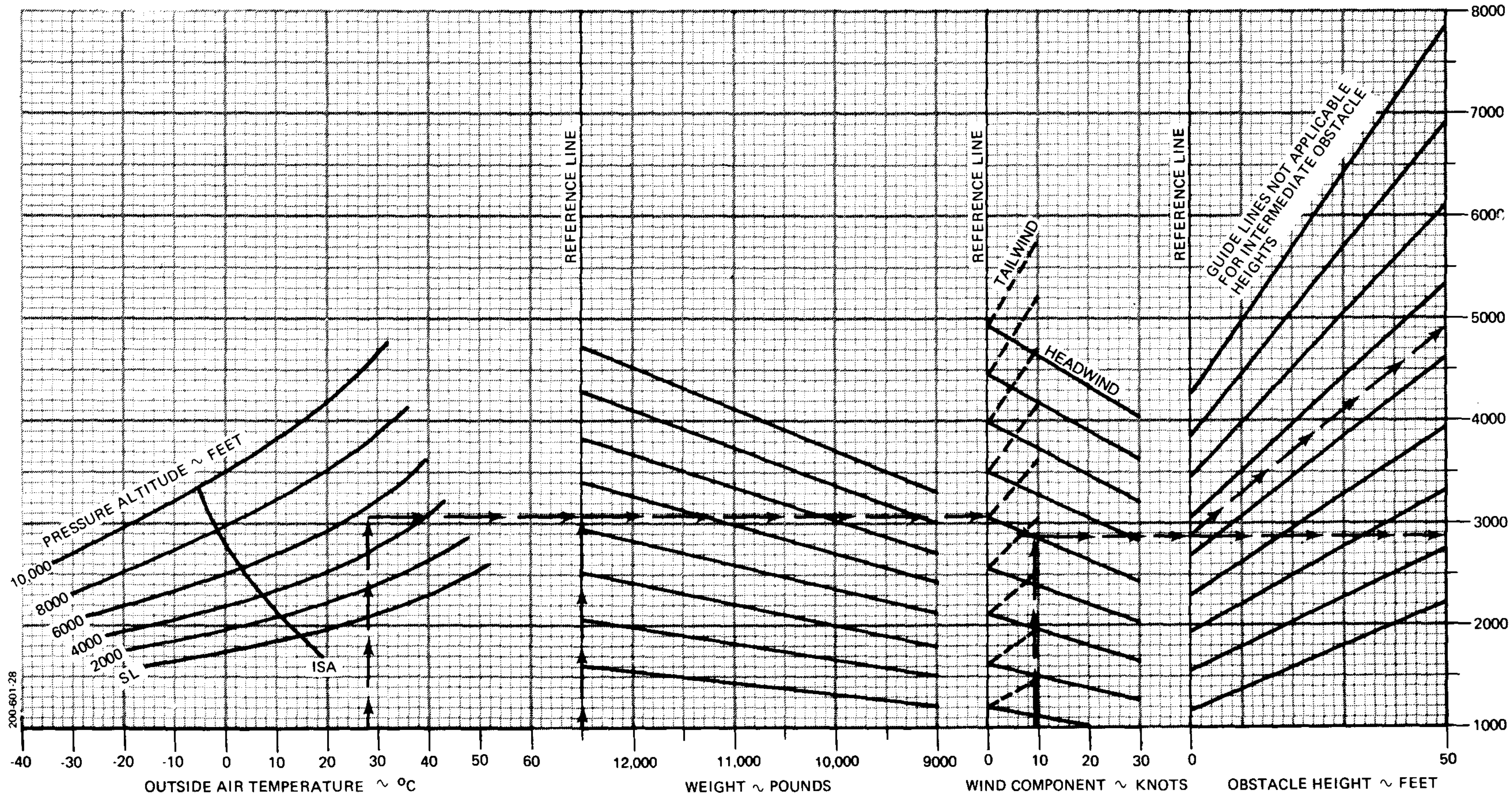
WEIGHT ~ POUNDS	TAKE-OFF SPEED ~ KNOTS	
	ROTATION	50 FT
12,500	95	121
12,000	95	119
11,000	95	115
10,000	95	111
9000	95	108

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10° C TO THE ACTUAL OAT BEFORE EXTERING GRAPH.

EXAMPLE:

OAT...............................28°C
PRESSURE ALTITUDE..............5430 FT
TAKE-OFF WEIGHT .... 12,500 LBS
HEADWIND COMPONENT .... 9.5 KTS

GROUND ROLL....................2870 FT
TOTAL DISTANCE OVER 50 FT OBSTACLE...........4900 FT
TAKE-OFF SPEED AT ROTATION....95 KTS
AT 50 FT ....121 KTS



ACCELERATE – STOP – FLAPS 0%

ASSOCIATED CONDITIONS:

POWER . . . . . 1. TAKE–OFF POWER SET BEFORE BRAKE RELEASE
2. BOTH ENGINES IDLE AT V_1 SPEED AND REVERSE OPERATING ENGINE
FLAPS 0%
AUTOFEATHER . ARMED
BRAKING . . . .MAXIMUM
RUNWAY . . . . PAVED, LEVEL, DRY SURFACE

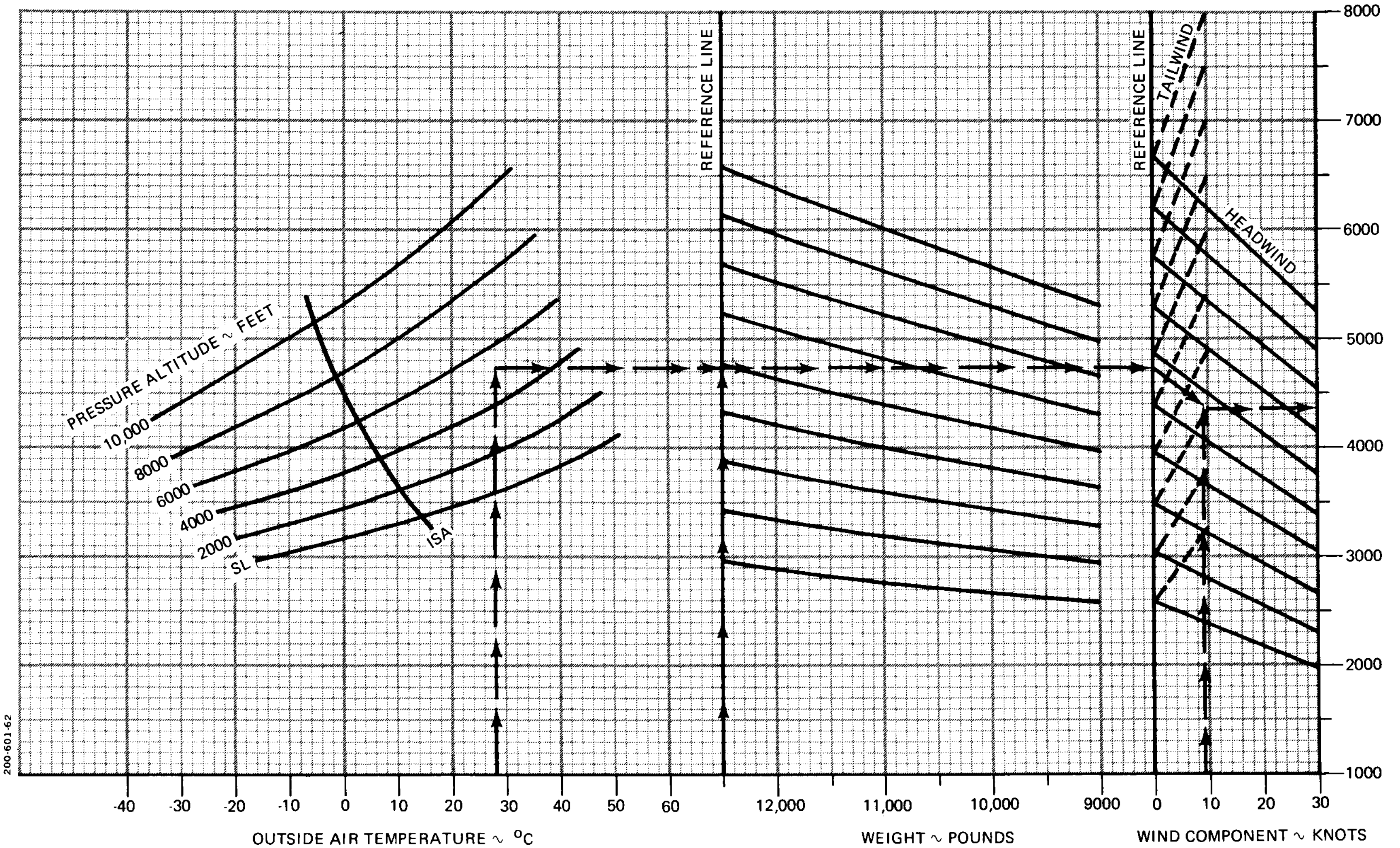
WEIGHT ~ POUNDS	V_1 ~ KNOTS
12,500	95
12,000	95
11,000	95
10,000	95
9000	95

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, PERFORMANCE IS NOT AFFECTED.

EXAMPLE:

OAT . . . . 28°C
PRESSURE ALTITUDE . . . . . . 5430 FT
WEIGHT . . . . 12,500 LBS
HEADWIND COMPONENT. . . . . 9.5 KTS

FIELD LENGTH . . . . 4375 FT
V_1 . . . . 95 KTS



ACCELERATE – GO – FLAPS 0%

ASSOCIATED CONDITION:

POWER	TAKE-OFF POWER SET BEFORE BRAKE RELEASE
FLAPS	0%
AUTOFEATHER	ARMED
LANDING GEAR	RETRACT AFTER LIFT-OFF
RUNWAY	PAVED, LEVEL, DRY SURFACE

WEIGHT ∿ POUNDS	SPEED ∿ KNOTS V_R	V_2
12,500	95	121
12,000	95	119
11,000	95	115
10,000	95	111
9000	95	108

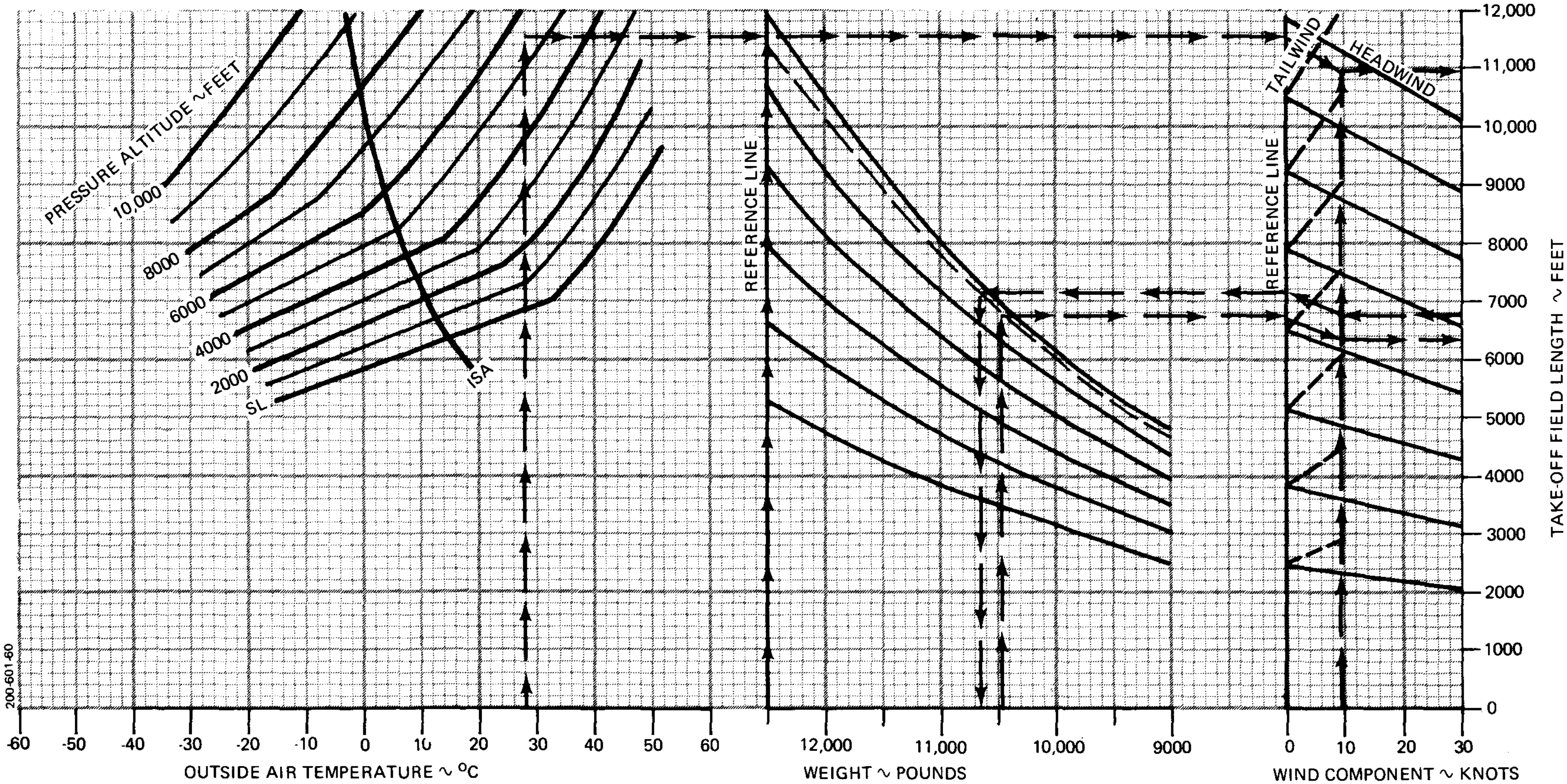
EXAMPLE:

OAT	28°C
PRESSURE ALTITUDE	5430 FT
HEADWIND COMPONENT	9.5 KTS

TAKE-OFF WEIGHT ∿ POUNDS	TAKE-OFF FIELD LENGTH ∿ FEET
12,500	10,950
10,650	6786
10,470	6370

SPEEDS (10,470 POUNDS) V_R . . . 95 KTS
V_2 . . . . 113 KTS

NOTE:
1. AIR DISTANCE IS 50% OF TAKE-OFF FIELD LENGTH
2. V_1 (ENGINE FAILURE SPEED) EQUALS V_R (ROTATION SPEED).
3. USABLE CLEAR WAY CANNOT EXCEED 25% OF THE RUNWAY LENGTH.
4. FOR OPERATION WITH ICE VANES EXTENDED, ADD 6°C TO THE ACTUAL OAT BEFORE ENTERING THE GRAPH.



NET GRADIENT OF CLIMB — FLAPS 0%

ASSOCIATED CONDITIONS:

POWER . . . . TAKE-OFF
FLAPS 0%
LANDING GEAR . . UP
INOPERATIVE
PROPELLER . . . FEATHERED

WEIGHT ~POUNDS	CLIMB SPEED ~ KNOTS
12,500	121
12,000	119
11,000	115
10,000	111
9000	108

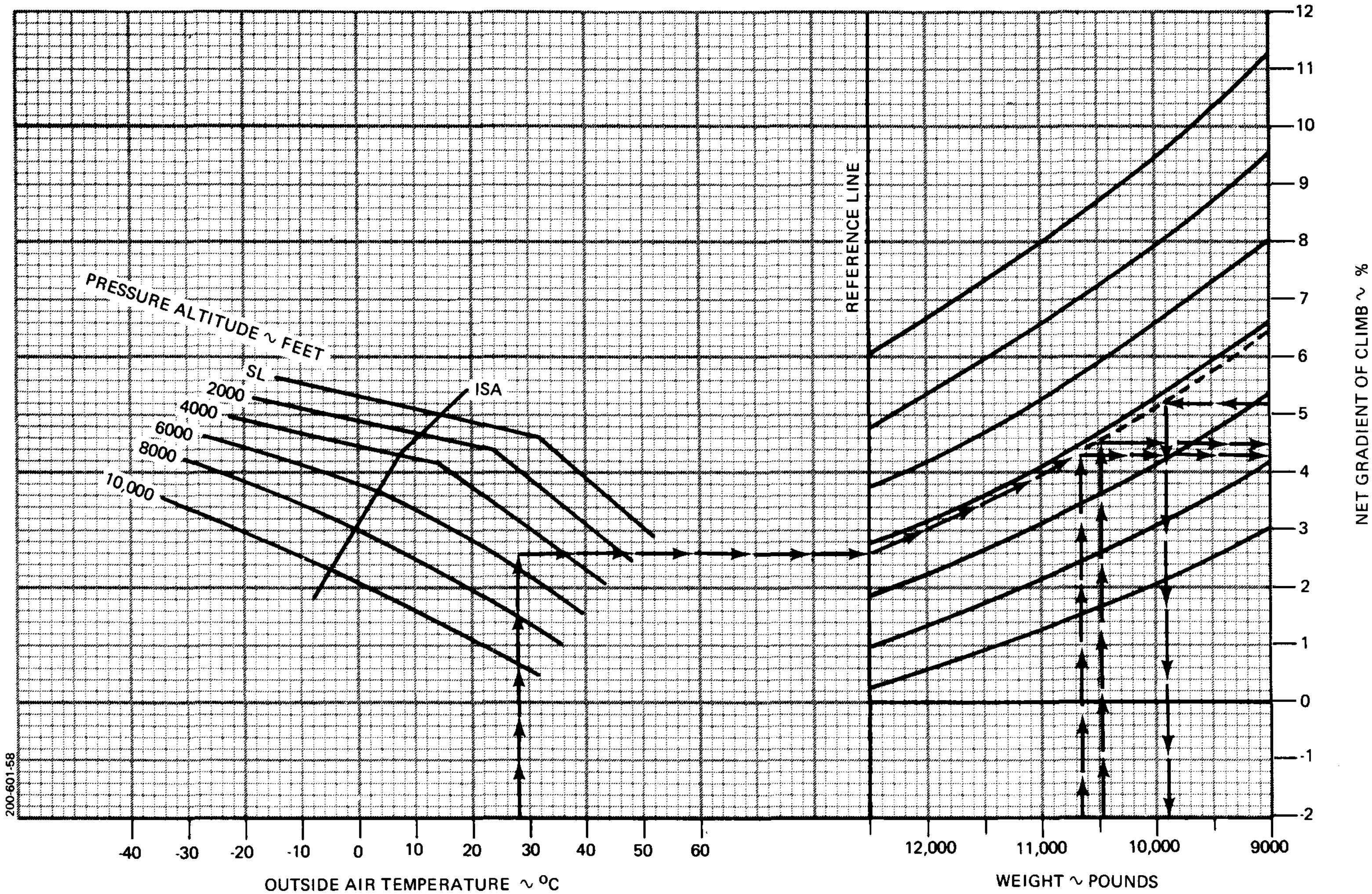
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10° C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.

EXAMPLE:

OAT . . . . 28°C
PRESSURE ALTITUDE . . . . 5430 FT

WEIGHT ~POUNDS	NET GRADIENT OF CLIMB ~ %
10,650	4.3
9900	5.2
10,470	4.5

CLIMB SPEED
@ 10,470 LBS . . . . 113 KTS



TAKE-OFF DISTANCE — FLAPS 40%

ASSOCIATED CONDITIONS:

POWER...........TAKE-OFF POWER SET BEFORE BRAKE RELEASE
FLAPS........... 40%
LANDING GEAR. . RETRACT AFTER LIFT-OFF
RUNWAY.........PAVED, LEVEL, DRY SURFACE

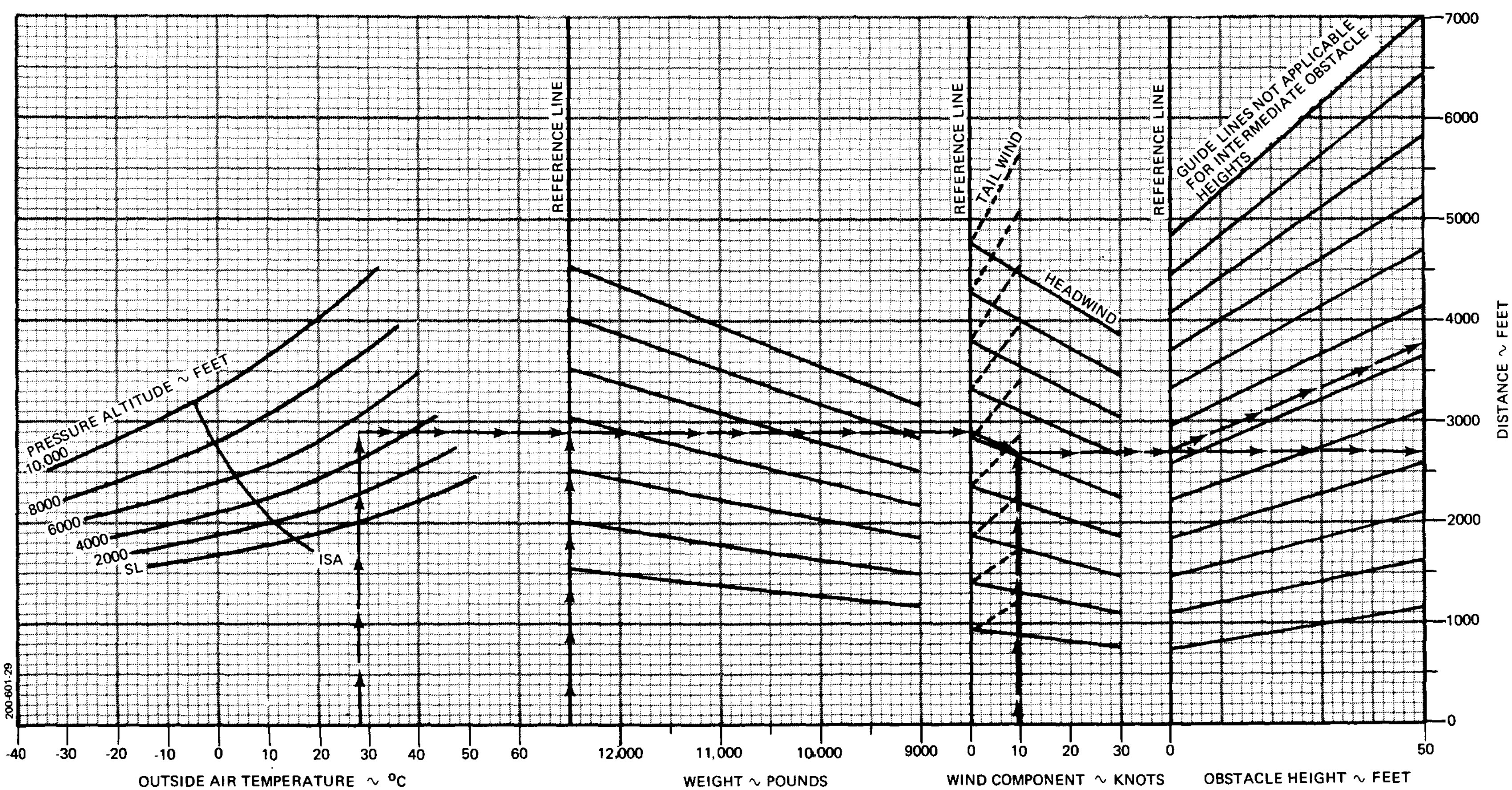
WEIGHT ∿ POUNDS	TAKE-OFF SPEED ∿ KNOTS	
	ROTATION	50 FT
12,500	94	106
12,000	94	105
11,000	94	103
10,000	94	101
9000	94	99

EXAMPLE:

OAT...............................28°C
PRESSURE ALTITUDE..............5430 FT
TAKE-OFF WEIGHT..................12,500 LBS
HEADWIND COMPONENT...........9.5 KTS

GROUND ROLL......................2700 FT
TOTAL DISTANCE OVER 50 FT OBSTACLE............3750 FT
TAKE-OFF SPEED AT ROTATION....94 KTS
AT 50 FT.........106 KTS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10° C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



ACCELERATE – STOP – FLAPS 40%

ASSOCIATED CONDITIONS:

POWER . . . . . 1. TAKE-OFF POWER SET BEFORE BRAKE RELEASE
2. BOTH ENGINES IDLE AT V_1 SPEED AND REVERSE OPERATING ENGINE

FLAPS 40%

AUTOFEATHER . ARMED

BRAKING . . . . MAXIMUM

RUNWAY . . . . PAVED, LEVEL, DRY SURFACE

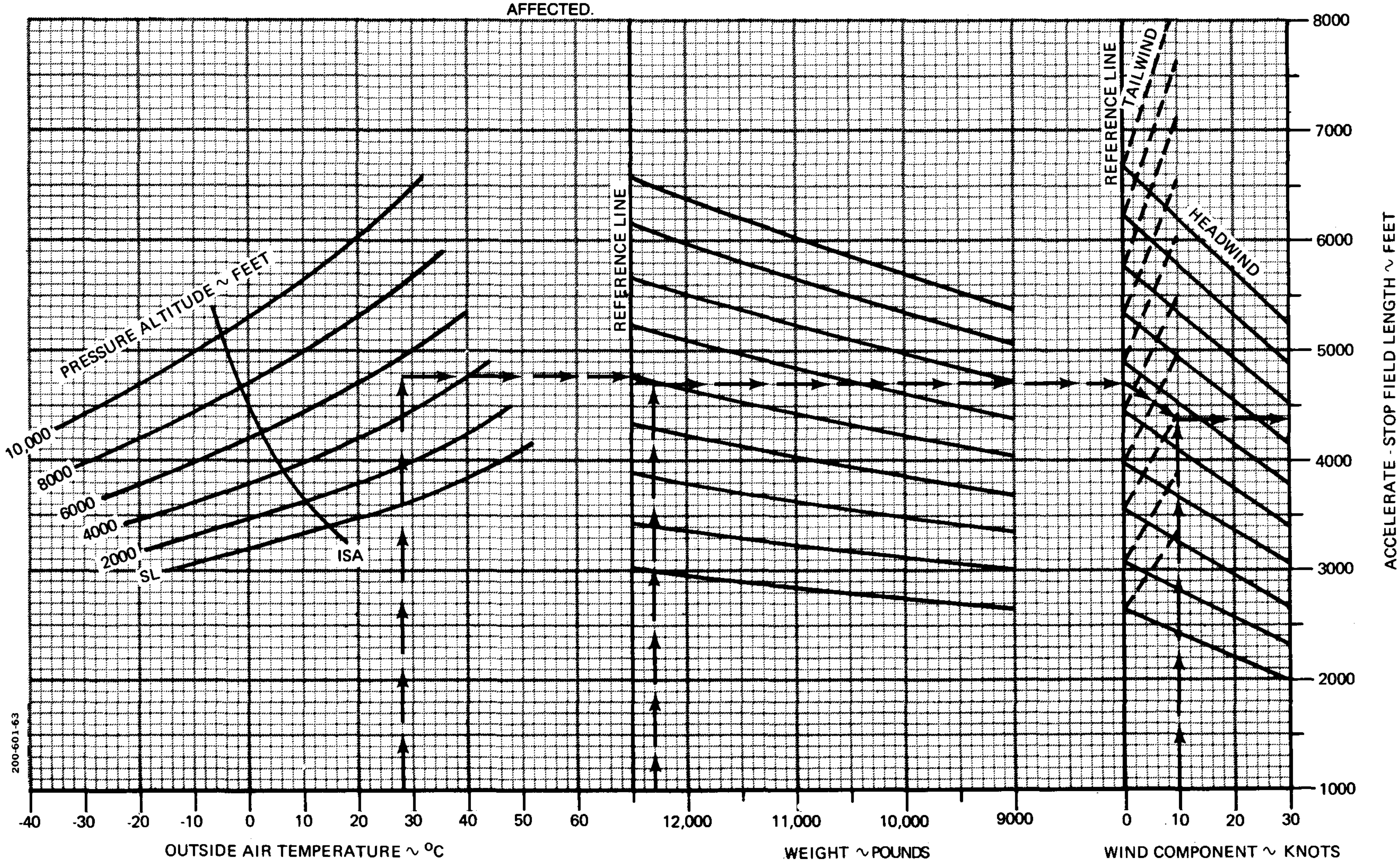
WEIGHT ~ POUNDS	V_1 ~ KNOTS
12,500	94
12,000	94
11,000	94
10,000	94
9000	94

EXAMPLE:

OAT. . . . . 28°C
PRESSURE ALTITUDE. . . . 5430 FT
WEIGHT. . . . . 12,300 LBS
HEADWIND COMPONENT . . . 9.5 KTS

FIELD LENGTH . . . . 4370 FT
V_1 . . . . 94 KTS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, PERFORMANCE IS NOT AFFECTED.



ACCELERATE – GO – FLAPS 40%

ASSOCIATED CONDITIONS:

POWER . . . . . TAKE-OFF POWER SET BEFORE BRAKE RELEASE
FLAPS 40%

AUTOFEATHER . ARMED
LANDING GEAR . RETRACT AFTER LIFT-OFF
RUNWAY . . . . PAVED, LEVEL, DRY SURFACE

WEIGHT ~ POUNDS	SPEED ~ KNOTS V_R	V_2
12,500	94	106
12,000	94	105
11,000	94	103
10,000	94	101
9000	94	99

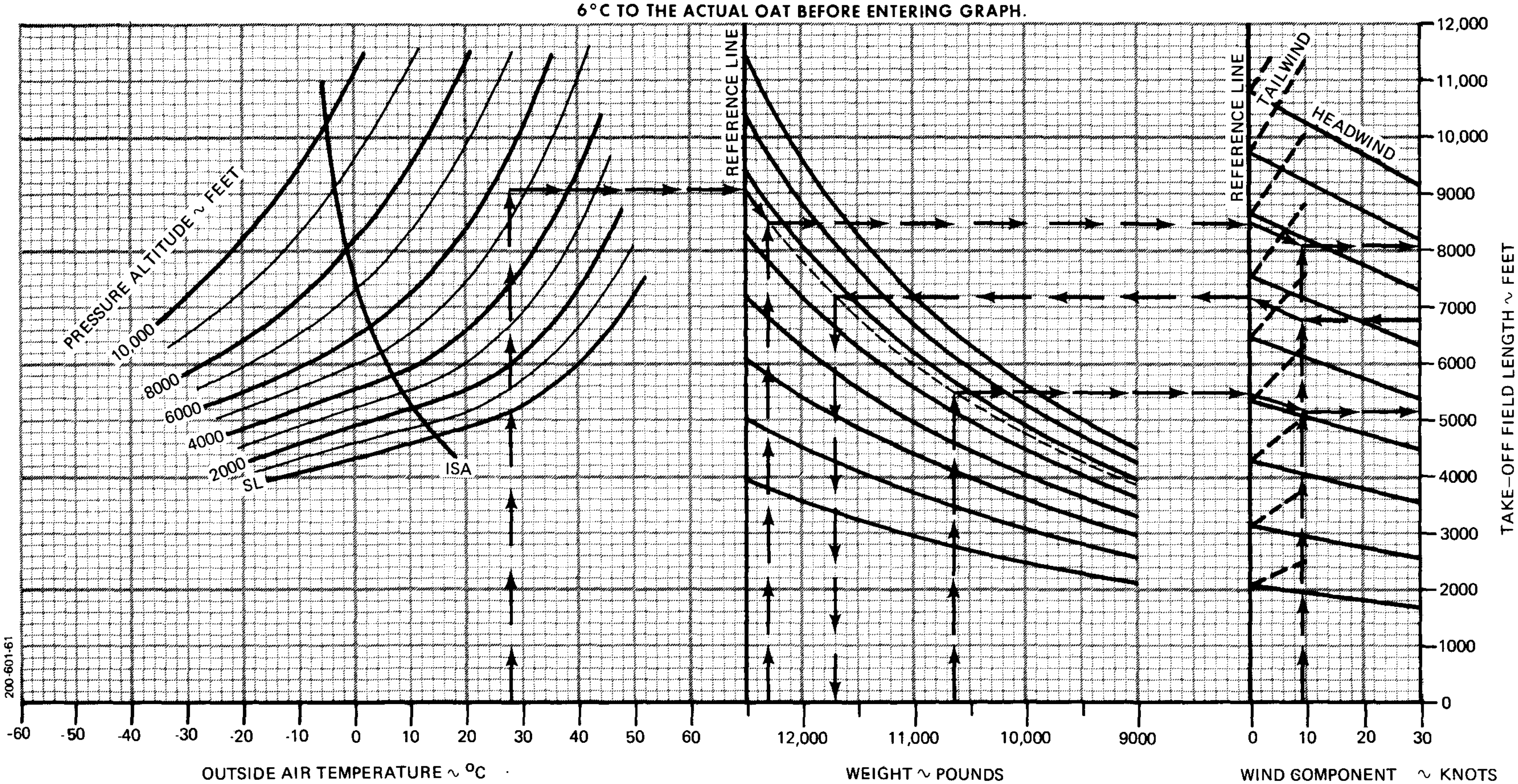
NOTE:
1. **AIR DISTANCE IS 50% OF TAKE-OFF FIELD LENGTH.**
2. **V_1 (ENGINE FAILURE SPEED) EQUALS V_R (ROTATION SPEED).**
3. **USABLE CLEARWAY CANNOT EXCEED 25% OF THE RUNWAY LENGTH.**
4. **FOR OPERATION WITH ICE VANES EXTENDED, ADD 6°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.**

EXAMPLE:

OAT . . . . 28°C
PRESSURE ALTITUDE . . . . 5430 FT
HEADWIND COMPONENT . . . . 9.5 KTS

TAKE-OFF WEIGHT ~ POUNDS	TAKE-OFF FIELD LENGTH ~ FEET
12,300	8080
11,700	6786
10,625	5150

SPEEDS (10,625 POUNDS) V_R . . . . 94 KTS
V_2 . . . . . 102 KTS



NET GRADIENT OF CLIMB – FLAPS 40%

ASSOCIATED CONDITIONS:

POWER . . . . TAKE–OFF
FLAPS 40%
LANDING GEAR . UP
INOPERATIVE
PROPELLER . . FEATHERED

WEIGHT ~ POUNDS	CLIMB SPEED ~ KNOTS
12,500	106
12,000	105
11,000	103
10,000	101
9000	99

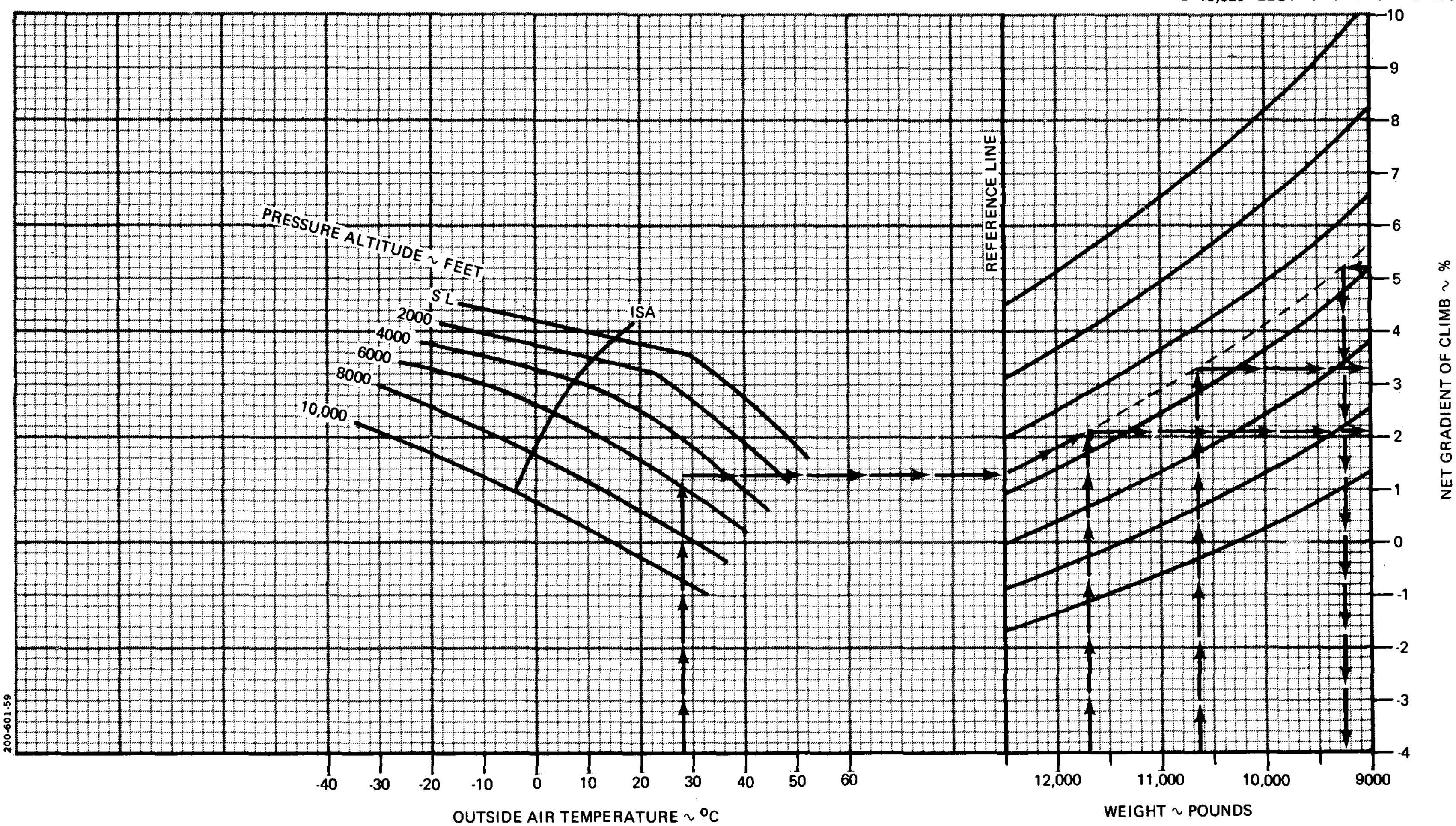
NOTE: FOR OPERATION WITH ICE VANES EXTENTED, ADD 10°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.

EXAMPLE:

OAT . . . . 28°C
PRESSURE ALTITUDE . . . 5430 FT

WEIGHT ~POUNDS	NET GRADIENT OF CLIMB ~ %
11,700	2.1
9250	5.2
10,625	3.3

CLIMB SPEED
@ 10,625 LBS . . . . . 102 KTS



CLIMB — TWO ENGINES — FLAPS 0%

WEIGHT ~ POUNDS	CLIMB SPEED ~ KNOTS
12,500	125
12,000	124
11,000	121
10,000	118
9000	115

ASSOCIATED CONDITIONS:

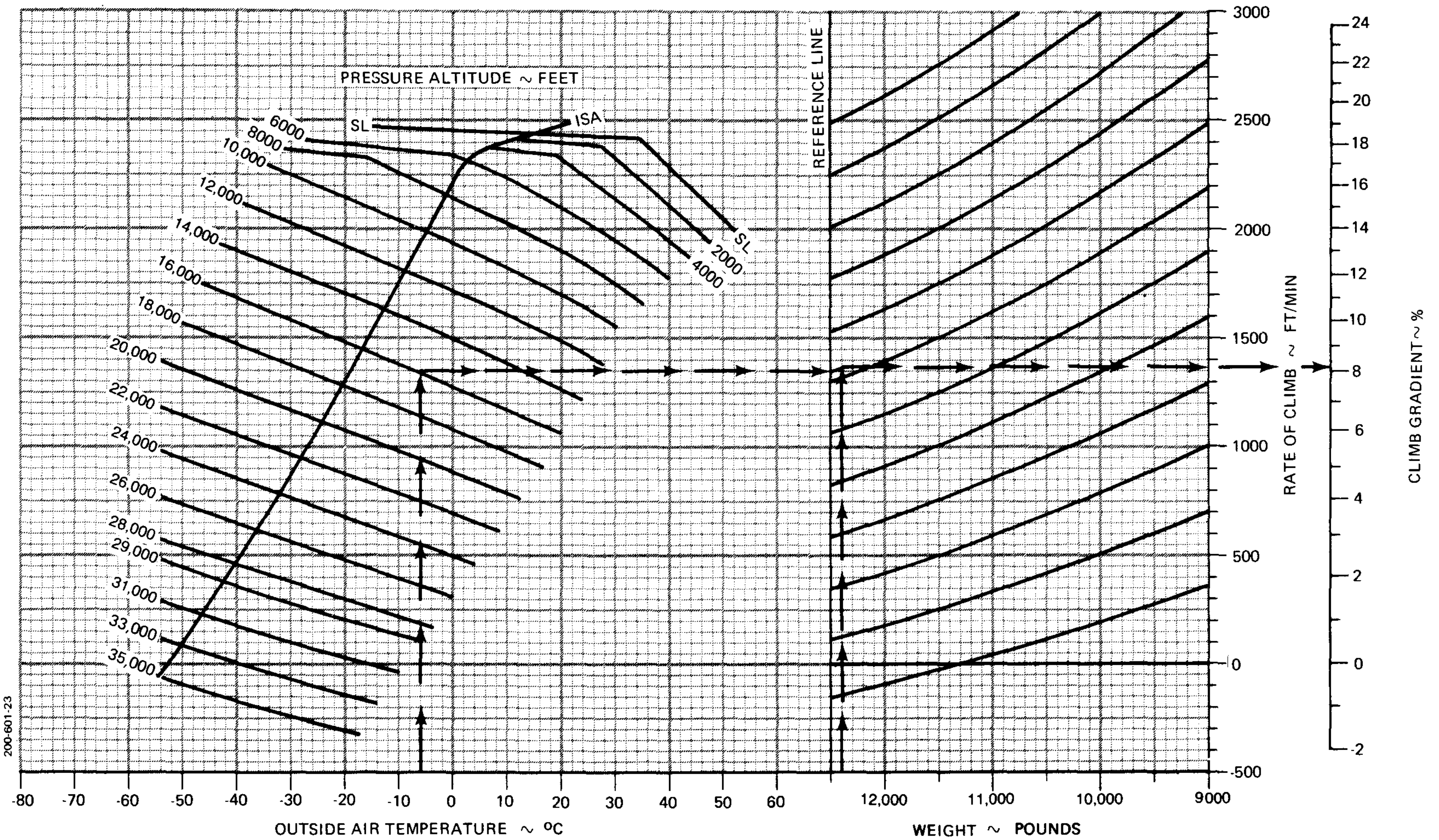
POWER .... MAXIMUM CONTINUOUS
FLAPS 0%
LANDING GEAR .... UP

EXAMPLE:

OAT .... -6°C
PRESSURE ALTITUDE ... 16,000FT
WEIGHT 12,405LBS

RATE OF CLIMB .... 1370 FT/MIN
CLIMB GRADIENT ...... 8.2 %
CLIMB SPEED .... 125 KTS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 15° C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



CLIMB — TWO ENGINES — FLAPS 40%

ASSOCIATED CONDITIONS:

POWER............MAXIMUM CONTINUOUS
FLAPS............40%
LANDING GEAR....UP

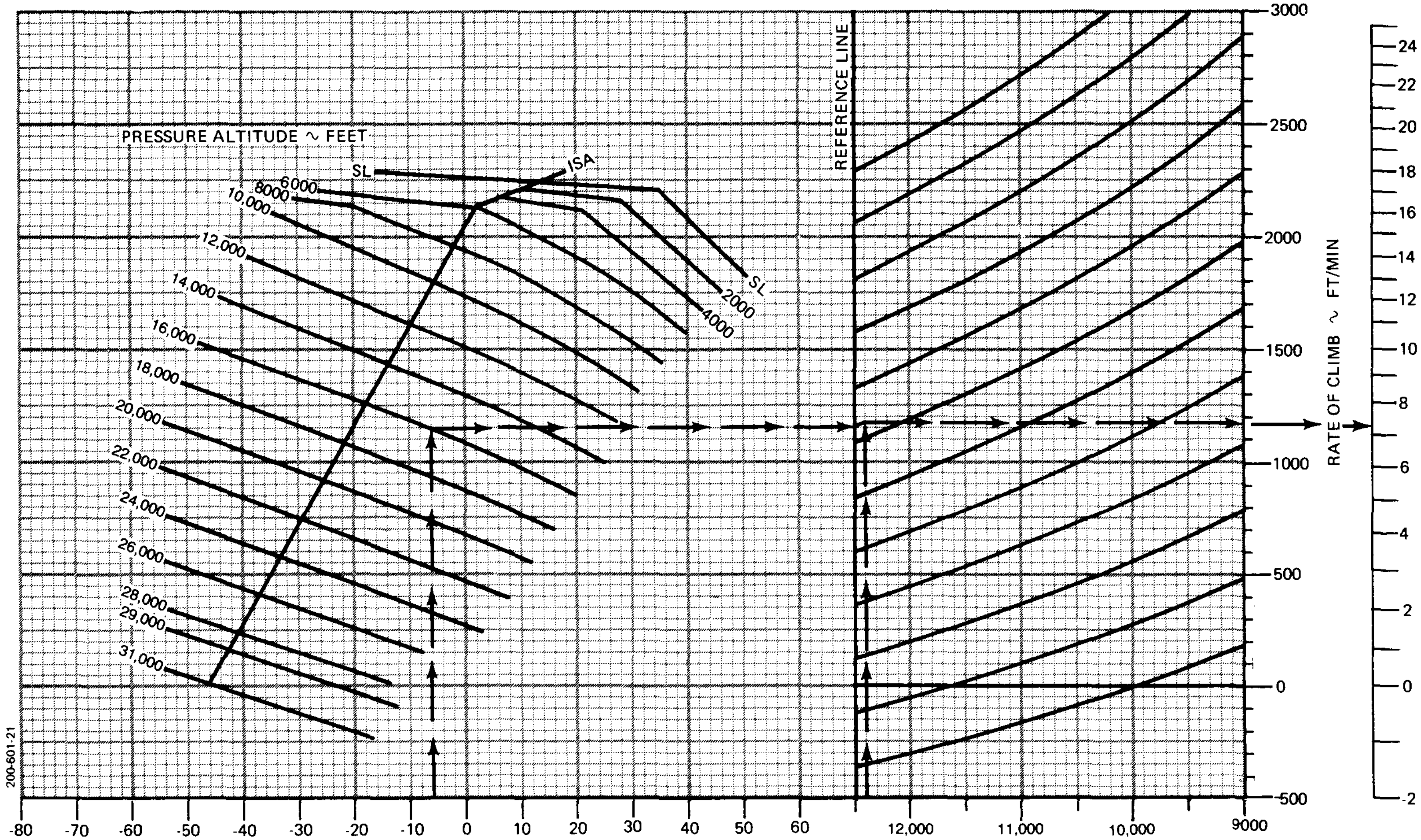
WEIGHT ~ POUNDS	CLIMB SPEED ~ KNOTS
12,500	125
12,000	124
11,000	121
10,000	118
9000	115

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 15°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.

EXAMPLE:

OAT.................. -6°C
PRESSURE ALTITUDE...16,000 FT
WEIGHT...............12,405 LBS

RATE-OF-CLIMB.........1170 FT/MIN
CLIMB GRADIENT.......7.3 %
CLIMB SPEED...........125 KTS



TransNorthern Aviation

INTENTIONALLY LEFT BLANK

TIME, FUEL, AND DISTANCE TO CLIMB

ASSOCIATED CONDITIONS:

PROPELLER SPEED . . . . . 1900 RPM
ITT, OR . . . . 725°C
TORQUE . . . . 2230 FT-LBS

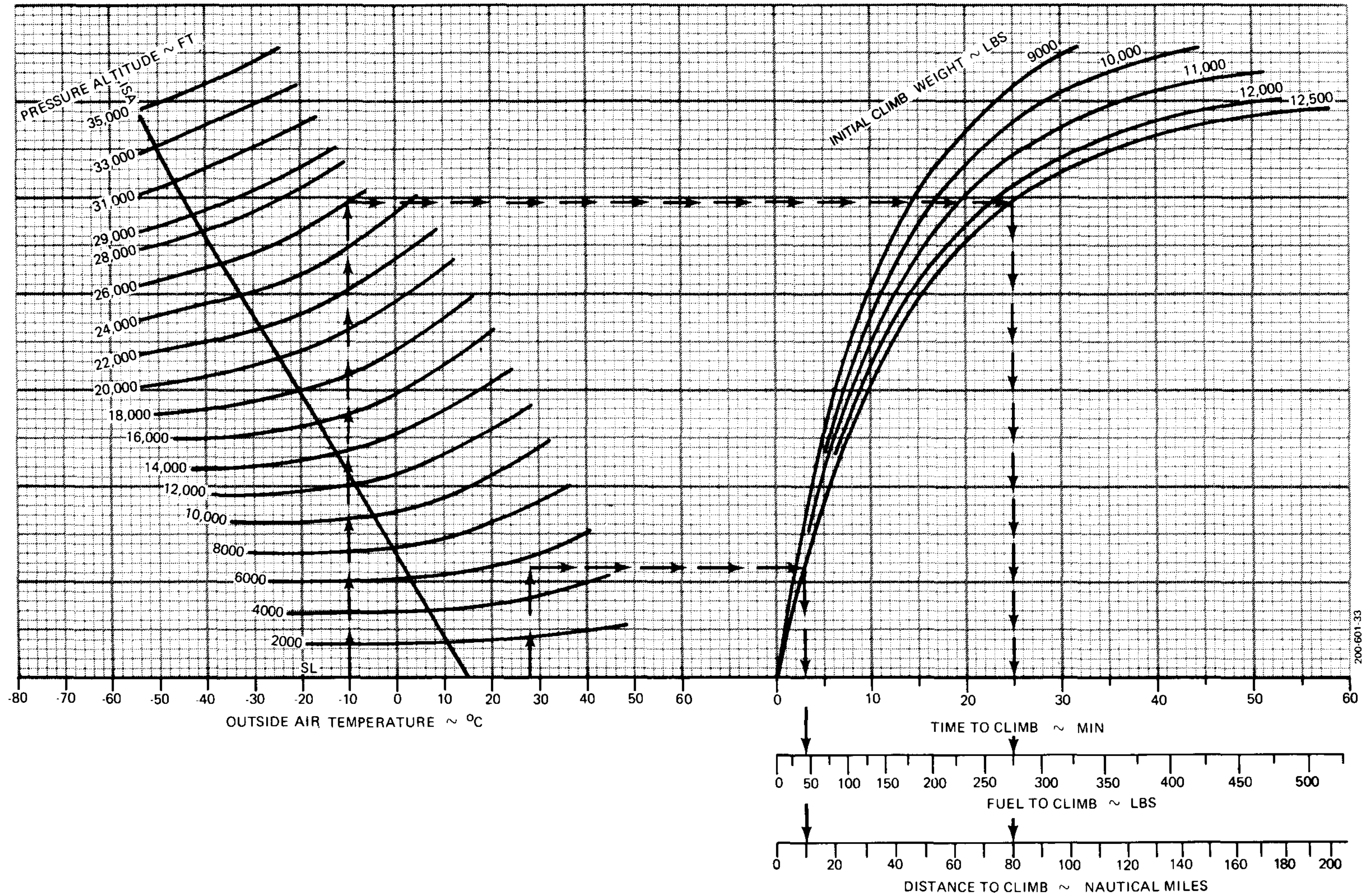
ALTITUDE ~ FEET	CLIMB SPEED ~ KNOTS
S L TO 10,000	160
10,000 TO 20,000	140
20,000 TO 25,000	130
25,000 TO 35,000	120

EXAMPLE:

OAT AT TAKE-OFF . . . . 28°C
OAT AT CRUISE . . . . -10°C
AIRPORT PRESSURE ALTITUDE 5430 FT
CRUISE ALTITUDE . . . . 26,000 FT
INITIAL CLIMB WEIGHT . . . . . 12,500 LBS

TIME TO CLIMB (25-3) . . . . . 22 MIN
FUEL TO CLIMB (275-45) . . . . 230 LBS
DISTANCE TO CLIMB (80-11) . . 69 NM

NOTE: 1. ADD 90 LBS FUEL FOR START, TAXI AND TAKE-OFF.
2. FOR OPERATION WITH ICE VANES EXTENDED, ADD 20°C TO THE ACTUAL OAT BEFORE ENTERING THE GRAPH.



CLIMB – ONE ENGINE INOPERATIVE

ASSOCIATED CONDITIONS:

POWER.......................MAXIMUM CONTINUOUS
FLAPS.......................0%
LANDING GEAR.............UP
INOPERATIVE PROPELLER .. FEATHERED

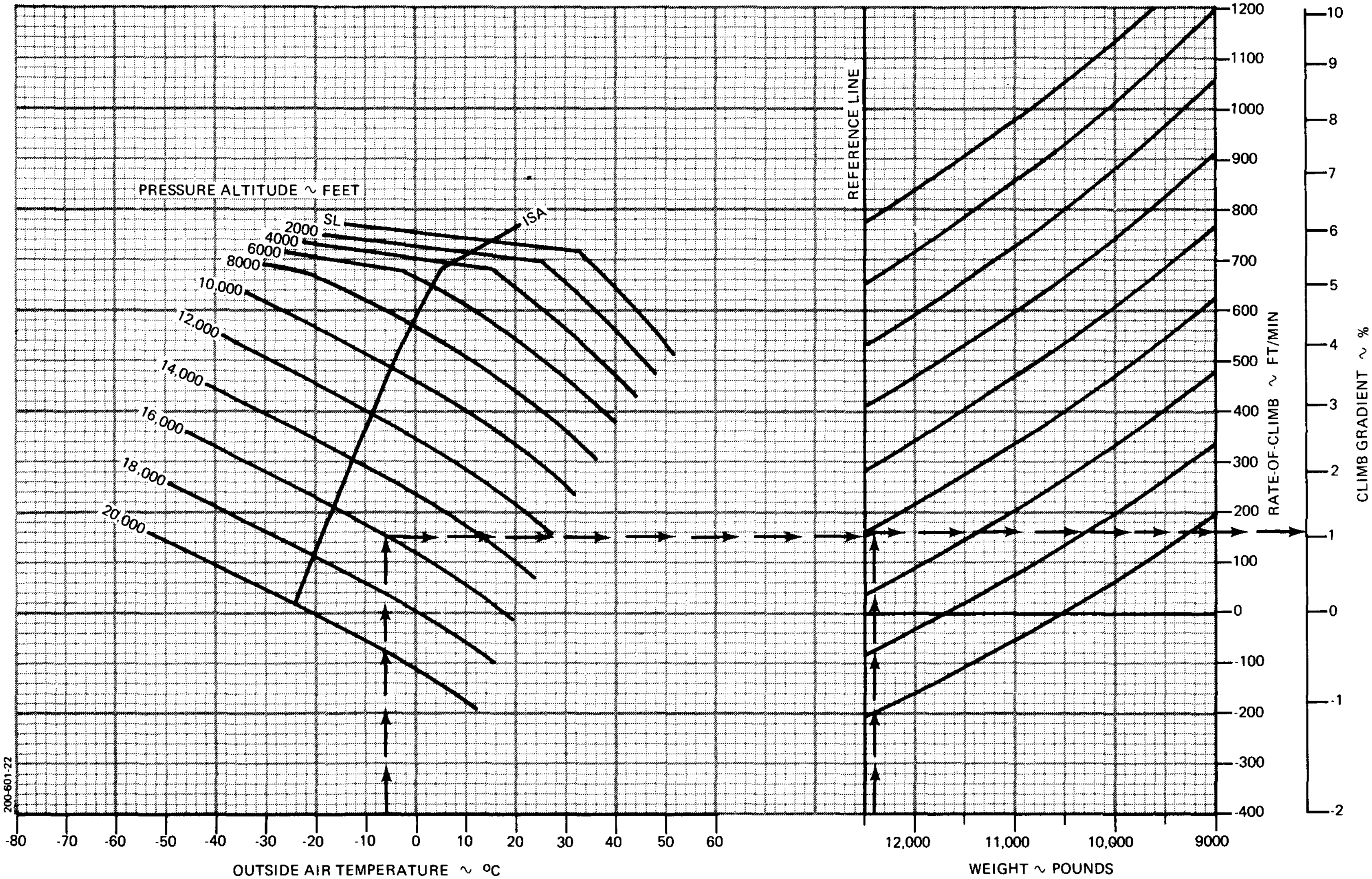
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10° C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.

WEIGHT ~ POUNDS	CLIMB SPEED ~ KNOTS
12,500	121
12,000	119
11,000	117
10,000	114
9000	111

EXAMPLE:

OAT.......................-6°C
PRESSURE ALTITUDE....16,000 FT
WEIGHT...................12,405 LBS

RATE-OF-CLIMB.........158 FT/MIN
CLIMB GRADIENT........1.1 %
CLIMB SPEED............121 KTS



SERVICE CEILING - ONE-ENGINE-INOPERATIVE

ASSOCIATED CONDITIONS:

POWER	MAXIMUM CONTINUOUS
LANDING GEAR	UP
INOPERATIVE PROPELLER	FEATHERED
FLAPS	0%

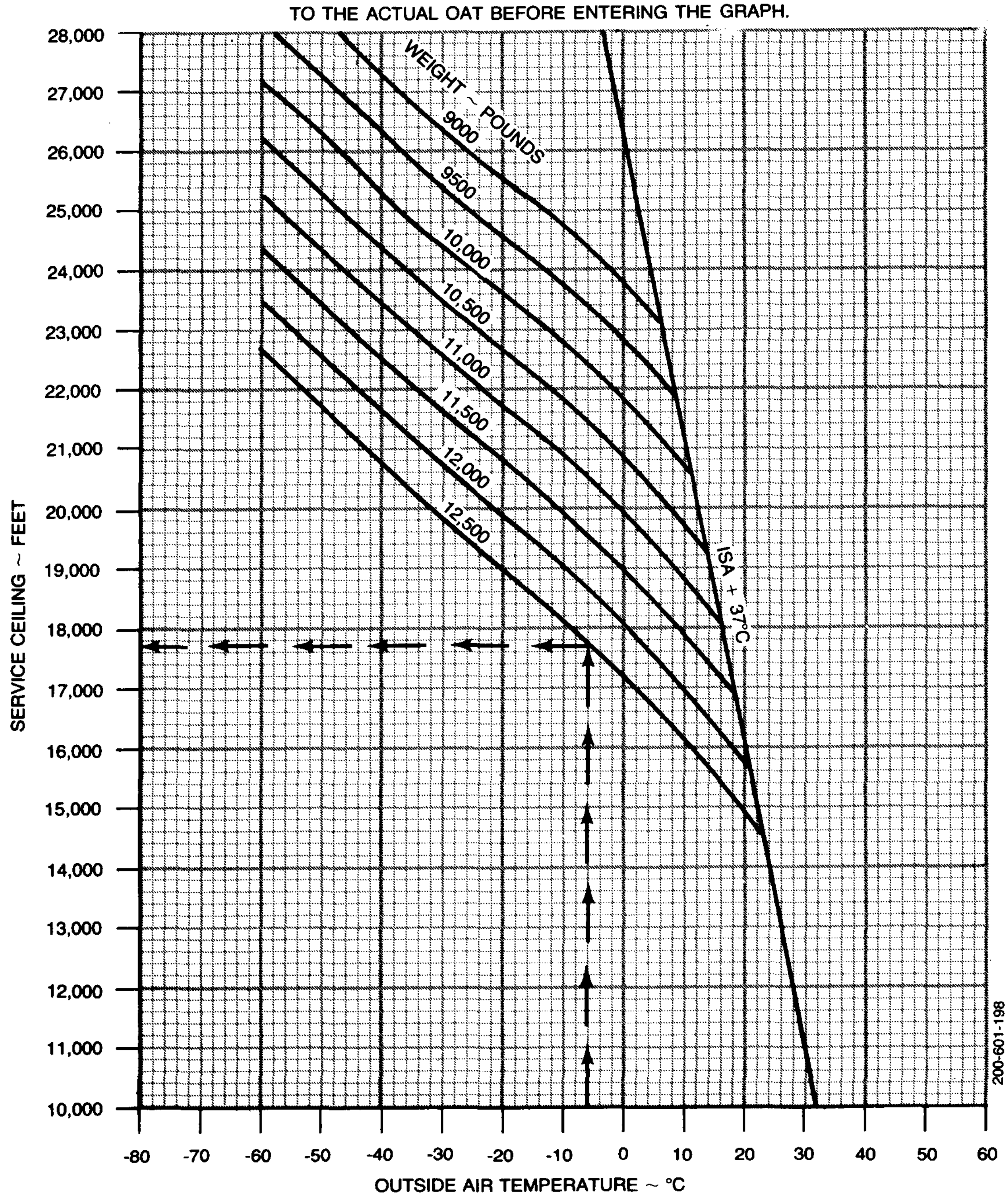
NOTE: SERVICE CEILING IS THE PRESSURE ALTITUDE WHERE THE AIRPLANE HAS CAPABILITY OF CLIMBING 50 FT MINUTE WITH ONE PROPELLER FEATHERED.

EXAMPLE:

OAT AT MEA	-6°C
WEIGHT	12,500 LBS
ROUTE SEGMENT MEA	16,000 FT
SERVICE CEILING	17,700 FT

NOTE: SERVICE CEILING IS ABOVE ENROUTE MEA

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10°C TO THE ACTUAL OAT BEFORE ENTERING THE GRAPH.



CLIMB — BALKED LANDING

CLIMB SPEED 100 KNOTS (ALL WEIGHTS)

ASSOCIATED CONDITIONS:

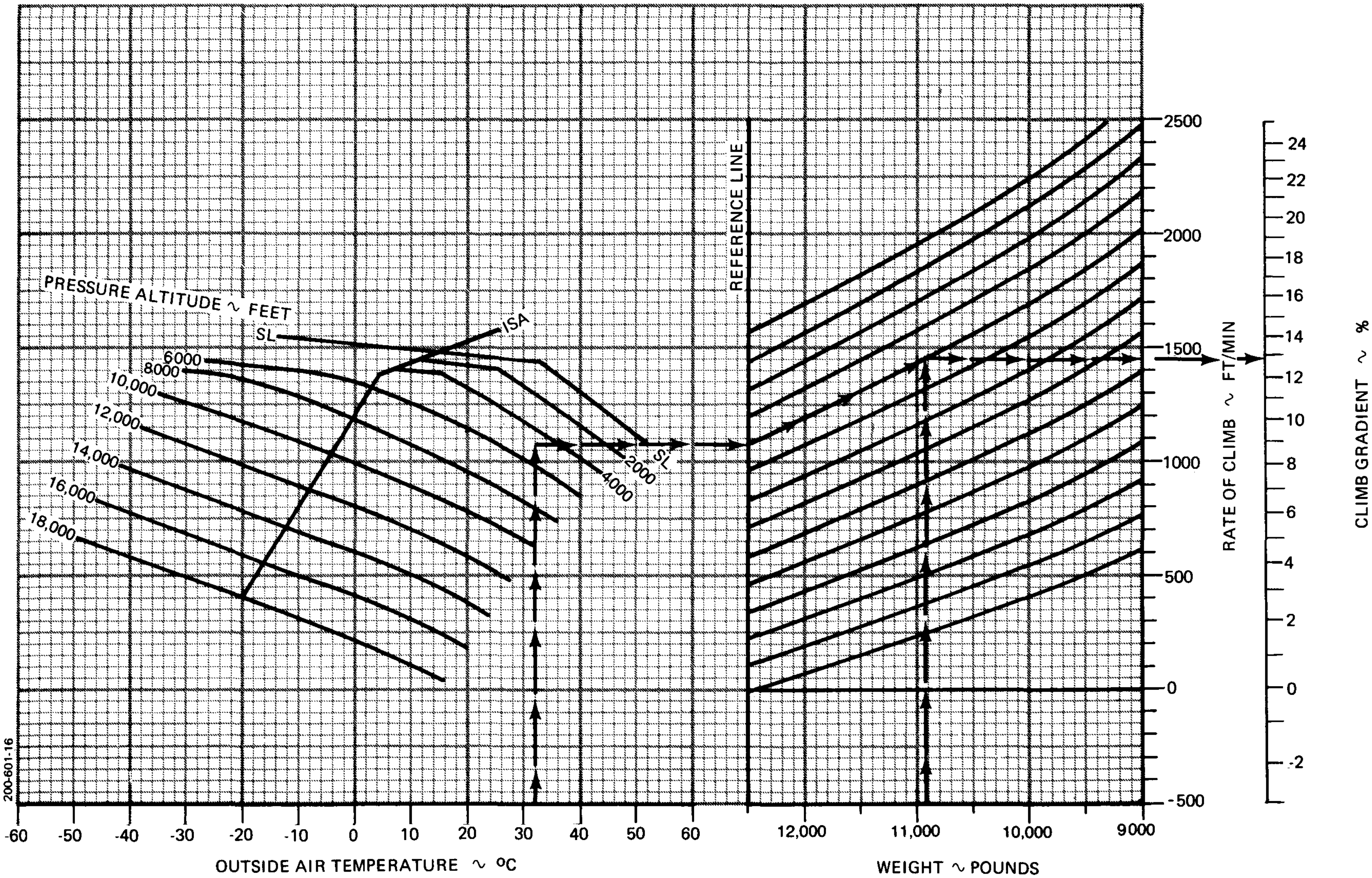
POWER . . . . . . TAKE-OFF
FLAPS 100%
LANDING GEAR . . DOWN

NOTE: FOR OPERATION WITH ICE VANES EXTENTED, ADD 10° C TO ACTUAL OAT BEFORE ENTERING GRAPH.

EXAMPLE:

OAT . . . . 32°C
PRESSURE ALTITUDE . 4730 FT
WEIGHT . . . . 10,937 LBS

RATE-OF-CLIMB . . . . 1450 FT/MIN
CLIMB GRADIENT . . . 12.8 %



INTENTIONALLY LEFT BLANK

RECOMMENDED CRUISE POWER

1700 RPM

ISA −30°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	−10	−15	2230	464	928	243	231	244	232	245	233
2000	−14	−19	2230	452	904	241	236	242	236	243	237
4000	−18	−23	2230	440	880	239	240	240	241	241	242
6000	−21	−27	2230	429	858	237	244	238	245	238	246
8000	−25	−31	2230	419	838	234	249	235	250	236	251
10,000	−29	−35	2230	410	820	232	254	233	255	234	256
12,000	−33	−39	2230	402	804	230	259	231	260	232	261
14,000	−36	−43	2230	397	794	227	264	229	265	229	266
16,000	−40	−47	2230	393	786	225	269	226	270	227	272
18,000	−44	−51	2230	389	778	223	274	224	276	225	277
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1700 RPM

ISA −20°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	0	−5	2230	466	932	242	234	242	235	242	236
2000	−4	−9	2230	453	906	239	238	240	239	241	240
4000	−7	−13	2230	440	880	237	243	238	244	239	245
6000	−11	−17	2230	429	858	235	248	236	249	237	249
8000	−15	−21	2230	420	840	233	252	235	253	234	254
10,000	−19	−25	2230	412	824	230	257	231	258	232	259
12,000	−22	−29	2230	404	808	228	262	229	263	230	264
14,000	−26	−33	2230	398	796	226	267	227	269	228	270
16,000	−30	−37	2230	394	788	223	273	224	274	225	275
18,000	−33	−41	2230	391	782	220	278	222	279	223	281
20,000	−37	−45	2124	371	742	214	278	215	280	217	281
22,000	−41	−48	1981	347	694	205	276	207	278	209	280
24,000	−46	−52	1835	322	644	197	273	199	276	201	278
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1700 RPM

ISA −10°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	10	5	2230	469	938	240	237	241	238	242	238
2000	6	1	2230	456	912	238	241	239	242	239	243
4000	3	− 3	2230	443	886	236	246	236	247	237	248
6000	− 1	− 7	2230	431	862	233	251	234	252	235	252
8000	− 5	−11	2230	421	842	231	255	232	256	233	257
10,000	− 9	−15	2230	412	824	228	260	229	261	230	262
12,000	−12	−19	2230	406	812	226	265	227	267	228	268
14,000	−16	−23	2230	400	800	224	271	225	272	226	273
16,000	−20	−27	2230	396	792	221	276	222	277	223	279
18,000	−23	−31	2184	386	772	216	279	218	280	219	282
20,000	−27	−35	2028	358	716	208	276	209	278	211	280
22,000	−32	−38	1889	334	668	200	274	201	277	203	279
24,000	−36	−42	1750	310	620	191	271	193	274	195	277
26,000	−40	−46	1615	288	576	182	268	184	271	187	274
28,000	−44	−50	1491	267	534	173	263	176	268	178	272
29,000	−46	−54	1430	257	514	168	261	171	266	174	270
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1700 RPM

ISA

PRESSURE ALTITUDE FEET	IOAT °C	OAT °C	TORQUE PER ENGINE FT-LBS	FUEL FLOW PER ENGINE LBS/HR	TOTAL FUEL FLOW LBS/HR	AIRSPEED ~ KNOTS @ 12,000 LBS IAS	@ 12,000 LBS TAS	@ 11,000 LBS IAS	@ 11,000 LBS TAS	@ 10,000 LBS IAS	@ 10,000 LBS TAS
SL	20	15	2230	473	946	238	239	239	240	240	241
2000	17	11	2230	459	918	236	244	237	245	238	246
4000	13	7	2230	446	892	234	249	235	250	236	251
6000	9	3	2230	433	866	232	253	232	254	233	255
8000	5	−1	2230	423	846	229	258	230	259	231	260
10,000	2	−5	2230	414	828	227	263	228	264	229	266
12,000	−2	−9	2230	406	812	224	269	225	270	226	271
14,000	−6	−13	2230	400	800	222	274	223	275	224	277
16,000	−10	−17	2230	396	792	219	279	220	280	221	282
18,000	−13	−21	2098	373	746	211	278	213	280	214	281
20,000	−18	−25	1937	345	690	202	275	204	277	206	279
22,000	−22	−28	1803	322	644	194	272	196	275	198	278
24,000	−26	−32	1668	299	598	185	269	188	273	190	275
26,000	−30	−36	1537	277	554	176	265	179	269	181	273
28,000	−34	−40	1418	257	514	167	260	170	265	173	270
29,000	−36	−42	1360	247	494	162	257	166	263	169	268
31,000	−40	−46	1248	229	458	151	250	156	257	160	263
33,000	−42	−50	1140	211	422	138	236	146	250	151	258
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1700 RPM

ISA +10°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	30	25	2230	475	950	237	242	238	243	239	244
2000	27	21	2230	462	924	235	247	236	248	236	248
4000	23	17	2230	449	898	232	251	233	252	234	253
6000	19	13	2230	437	874	230	256	231	257	232	258
8000	16	9	2230	426	852	228	261	229	262	229	263
10,000	12	5	2230	416	832	225	266	226	267	227	269
12,000	8	1	2230	408	816	223	272	224	273	225	274
14,000	4	−3	2230	402	804	220	277	221	278	222	279
16,000	0	−7	2126	381	762	213	277	215	279	216	280
18,000	−4	−11	1999	358	716	206	276	207	278	209	280
20,000	−8	−15	1871	334	668	198	274	200	277	201	279
22,000	−12	−18	1733	311	622	189	271	191	274	193	277
24,000	−16	−22	1594	288	576	180	267	182	271	185	274
26,000	−20	−26	1464	267	534	170	262	173	267	176	271
28,000	−24	−30	1349	247	494	161	257	165	262	168	267
29,000	−26	−32	1292	238	476	156	253	160	260	163	265
31,000	−30	−36	1183	220	440	144	242	150	253	155	260
33,000	−35	−40	1076	202	404	123	217	138	243	145	254
35,000	−40	−44	955	183	366	—	—	137	218	137	244

RECOMMENDED CRUISE POWER

1700 RPM

ISA +20°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	41	35	2230	478	956	236	245	236	245	237	246
2000	37	31	2230	465	930	233	249	234	250	235	251
4000	33	27	2230	452	904	231	254	232	255	233	256
6000	29	23	2230	439	878	228	259	229	260	230	261
8000	26	19	2230	429	858	226	264	227	265	228	266
10,000	22	15	2230	419	838	224	269	225	271	226	272
12,000	18	11	2202	406	812	220	273	221	275	222	276
14,000	14	7	2088	383	766	213	273	214	275	216	276
16,000	10	3	1973	360	720	206	272	207	274	209	276
18,000	6	− 1	1857	338	676	198	271	200	274	202	276
20,000	2	− 5	1739	315	630	190	269	193	272	194	275
22,000	− 2	− 8	1626	296	592	182	267	185	271	187	274
24,000	− 6	−12	1513	276	552	174	264	177	268	179	271
26,000	−10	−16	1401	256	512	165	259	168	265	171	269
28,000	−15	−20	1289	238	476	155	253	159	260	163	265
29,000	−16	−22	1230	229	458	149	247	154	256	158	262
31,000	−21	−26	1120	211	422	134	232	144	248	149	257
33,000	−25	−30	1011	193	386	—	—	130	232	139	249
35,000	−29	−34	928	179	358	—	—	—	—	126	234

RECOMMENDED CRUISE POWER

1700 RPM

ISA +30°C

PRESSURE ALTITUDE FEET	IOAT °C	OAT °C	TORQUE PER ENGINE FT-LBS	FUEL FLOW PER ENGINE LBS/HR	TOTAL FUEL FLOW LBS/HR	AIRSPEED ~ KNOTS @ 12,000 LBS IAS	@ 12,000 LBS TAS	@ 11,000 LBS IAS	@ 11,000 LBS TAS	@ 10,000 LBS IAS	@ 10,000 LBS TAS
SL	51	45	2230	481	962	234	247	235	248	236	249
2000	47	41	2230	468	936	232	252	233	253	234	254
4000	43	37	2230	454	908	229	257	230	258	231	259
6000	40	33	2230	441	882	227	262	228	263	229	264
8000	36	29	2225	429	858	224	266	225	268	226	269
10,000	32	25	2131	406	812	218	267	219	269	221	270
12,000	28	21	2029	383	766	212	267	213	269	214	271
14,000	24	17	1917	360	720	205	267	206	269	208	271
16,000	20	13	1811	338	676	197	266	199	269	201	271
18,000	16	9	1709	318	636	190	265	192	268	194	271
20,000	12	5	1607	297	594	183	264	185	267	187	270
22,000	8	2	1506	279	558	175	261	178	265	180	269
24,000	4	−2	1403	260	520	167	258	170	263	173	267
26,000	0	−6	1304	242	484	158	253	162	259	165	264
28,000	−4	−10	1211	226	452	148	246	153	255	157	261
29,000	−7	−12	1163	218	436	141	240	148	251	153	259
31,000	−9	−16	1058	201	402	—	—	136	240	143	252
33,000	−15	−20	968	186	372	—	—	—	—	131	240
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1700 RPM

ISA +37°C

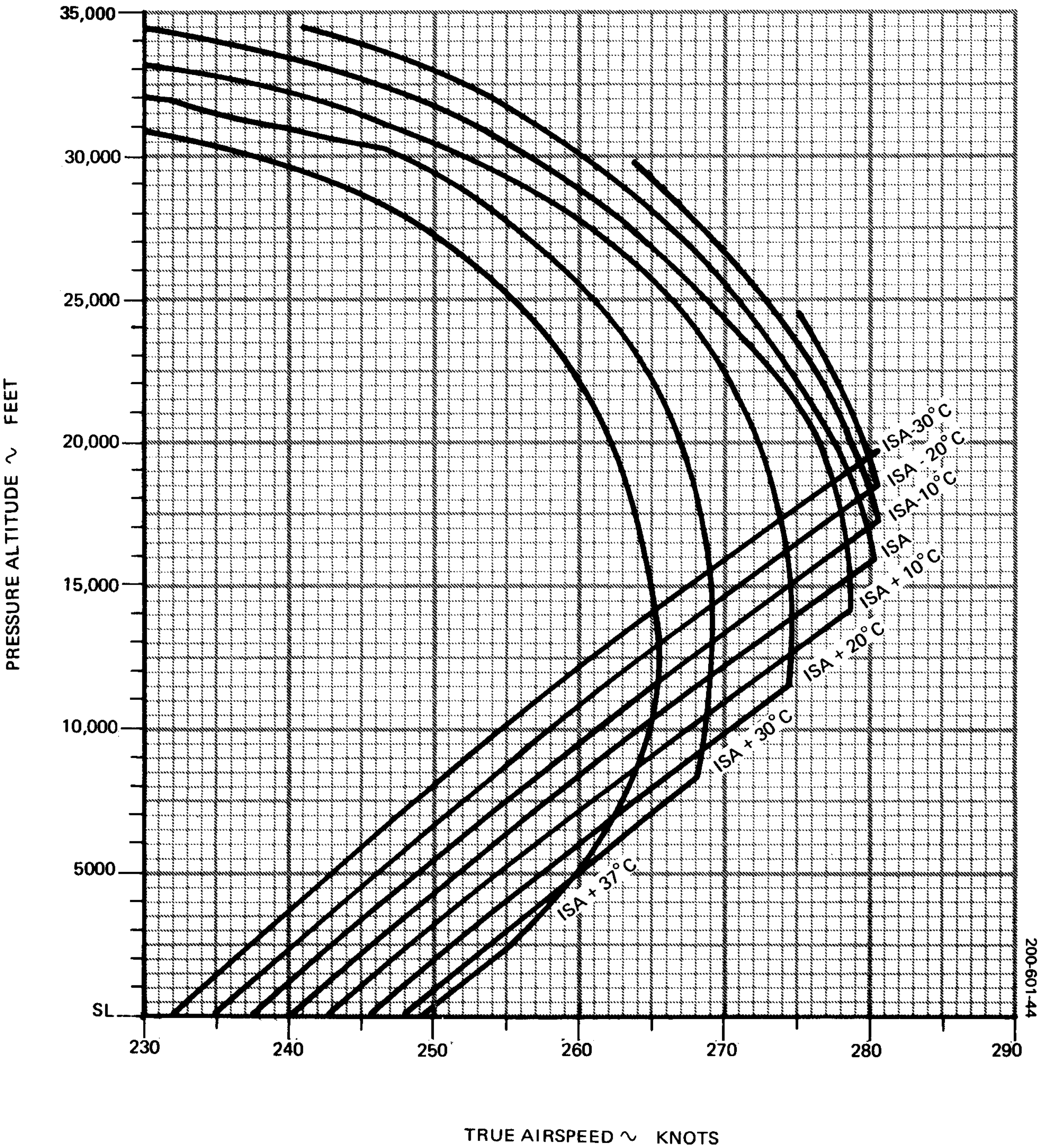
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	58	52	2230	483	966	233	249	234	250	235	251
2000	54	48	2230	470	940	231	253	232	254	233	255
4000	50	44	2198	452	904	227	257	228	258	229	259
6000	46	40	2159	433	866	223	260	224	261	225	263
8000	43	36	2096	413	826	218	262	219	264	221	265
10,000	39	32	2013	391	782	212	263	214	265	215	267
12,000	35	28	1915	368	736	206	263	207	265	209	267
14,000	31	24	1809	346	692	199	263	201	265	202	267
16,000	27	20	1706	325	650	192	262	194	264	195	267
18,000	23	16	1607	305	610	184	260	187	263	189	266
20,000	19	12	1506	284	568	177	258	179	262	182	265
22,000	15	9	1414	267	534	169	255	172	260	175	264
24,000	11	5	1320	249	498	160	252	164	257	167	262
26,000	6	1	1227	232	464	151	246	156	253	160	259
28,000	2	−3	1137	216	432	139	236	147	248	152	255
29,000	0	−5	1090	208	416	131	226	141	243	147	253
31,000	−3	−9	994	192	384	—	—	128	229	138	245
33,000	−8	−13	922	179	358	—	—	—	—	125	232
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE SPEEDS

1700 RPM

WEIGHT 11,000 LBS

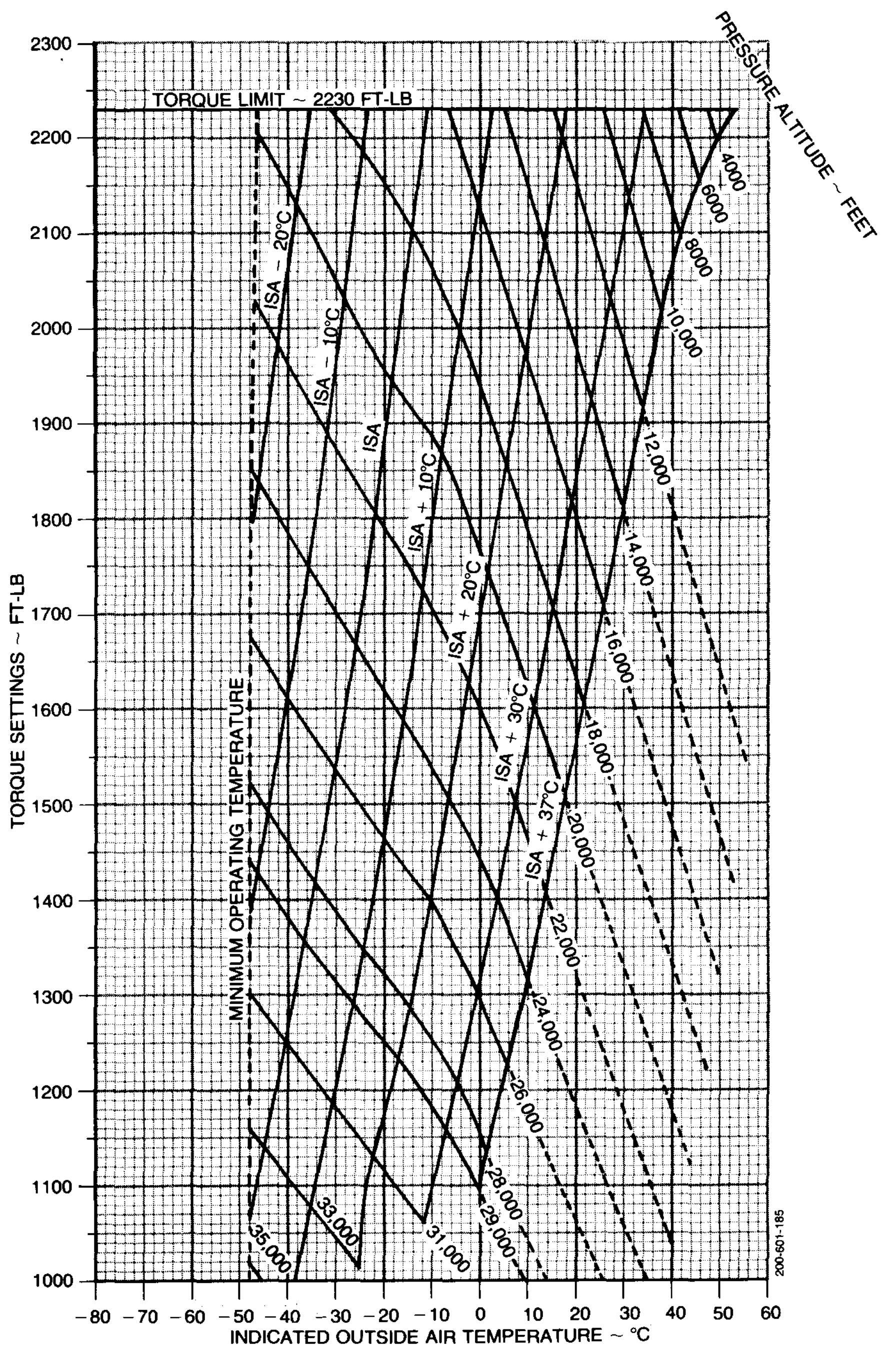
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, TAS WILL BE REDUCED BY APPROXIMATELY 25 KNOTS.



RECOMMENDED CRUISE POWER

1700 RPM

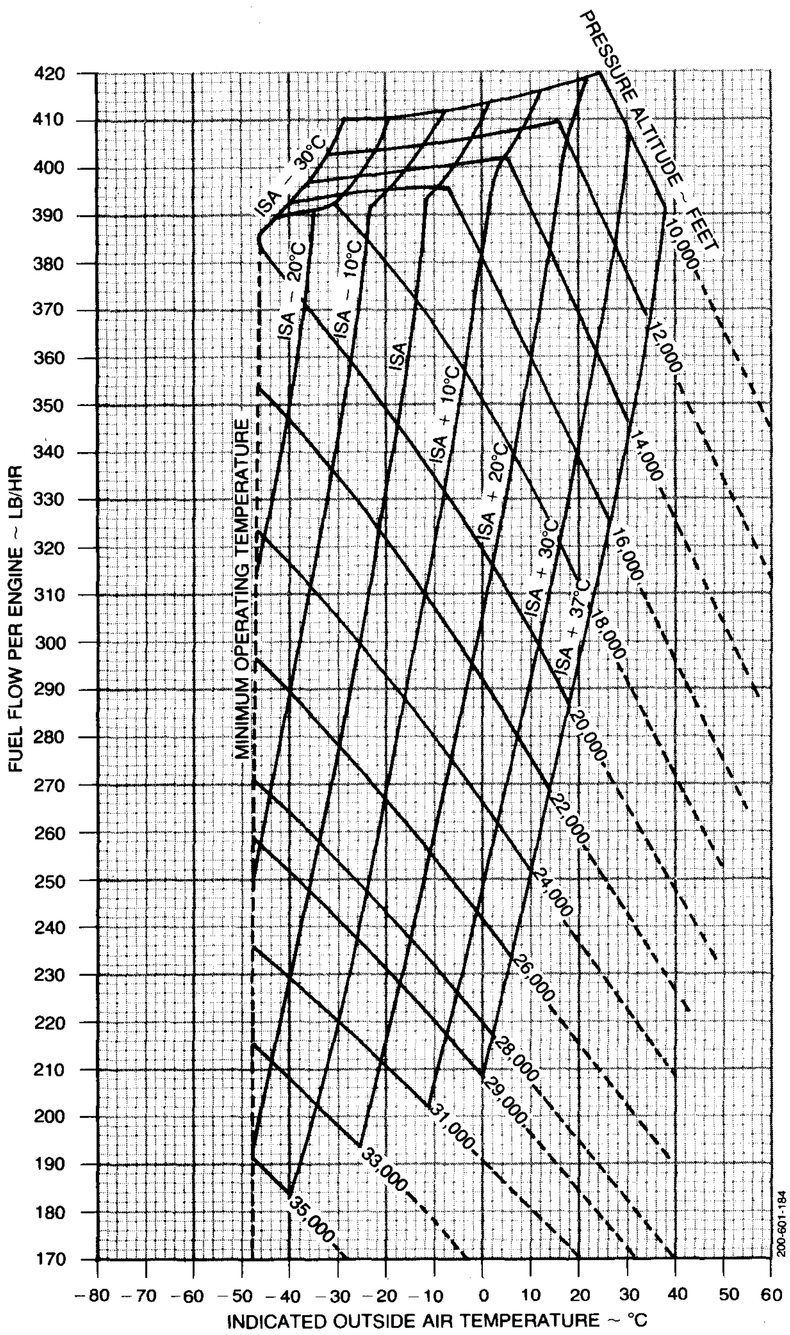
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 35°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



FUEL FLOW AT RECOMMENDED CRUISE POWER

1700 RPM

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 30°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



INTENTIONALLY LEFT BLANK

RECOMMENDED CRUISE POWER

1800 RPM

ISA −30°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	−10	−15	2230	484	968	249	236	249	237	250	238
2000	−14	−19	2230	472	944	246	241	247	241	248	242
4000	−17	−23	2230	460	920	244	245	245	246	246	247
6000	−21	−27	2230	448	896	242	250	243	251	243	251
8000	−25	−31	2230	438	876	240	255	240	255	241	256
10,000	−29	−35	2230	429	858	237	260	238	261	239	261
12,000	−32	−39	2230	422	844	235	265	236	266	237	267
14,000	−36	−43	2230	417	834	233	270	234	271	235	272
16,000	−40	−47	2230	413	826	230	275	231	276	232	277
18,000	−43	−51	2230	409	818	228	281	229	282	230	283
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1800 RPM

ISA −20°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS					
						@ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	0	−5	2230	486	972	247	239	248	240	248	241
2000	−3	−9	2230	473	946	245	244	245	244	246	245
4000	−7	−13	2230	460	920	242	248	243	249	244	250
6000	−11	−17	2230	449	898	240	253	241	254	242	255
8000	−15	−21	2230	440	880	238	258	239	259	239	260
10,000	−18	−25	2230	431	862	236	263	236	264	237	265
12,000	−22	−29	2230	423	846	233	268	234	269	235	270
14,000	−26	−33	2230	418	836	231	273	232	274	233	276
16,000	−29	−37	2230	414	828	228	279	229	280	230	281
18,000	−33	−41	2170	400	800	223	281	225	283	226	284
20,000	−37	−45	2017	372	744	215	279	216	281	218	283
22,000	−41	−48	1881	347	694	207	277	208	280	210	282
24,000	−45	−52	1743	323	646	198	275	200	277	202	280
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1800 RPM

ISA −10°C

PRESSURE ALTITUDE FEET	IOAT °C	OAT °C	TORQUE PER ENGINE FT-LBS	FUEL FLOW PER ENGINE LBS/HR	TOTAL FUEL FLOW LBS/HR	AIRSPEED ~ KNOTS @ 12,000 LBS IAS	TAS	@ 11,000 LBS IAS	TAS	@ 10,000 LBS IAS	TAS
SL	10	5	2230	488	976	245	242	246	243	247	243
2000	7	1	2230	475	950	243	246	244	247	244	248
4000	3	−3	2230	462	924	241	251	241	252	242	253
6000	−1	−7	2230	450	900	238	256	239	257	240	258
8000	−5	−11	2230	440	880	236	261	237	262	238	263
10,000	−8	−15	2230	431	862	234	266	235	267	235	268
12,000	−12	−19	2230	425	850	231	271	232	272	233	274
14,000	−16	−23	2230	420	840	229	277	230	278	231	279
16,000	−19	−27	2224	414	828	226	282	227	283	228	285
18,000	−23	−31	2076	386	772	218	280	219	282	220	284
20,000	−27	−35	1926	358	716	209	278	211	280	212	282
22,000	−31	−38	1795	335	670	201	276	203	278	204	281
24,000	−36	−42	1661	311	622	192	273	194	276	196	278
26,000	−40	−46	1534	288	576	183	269	186	273	188	276
28,000	−44	−50	1415	267	534	174	265	177	269	179	273
29,000	−46	−52	1357	257	514	169	262	172	267	175	271
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1800 RPM

ISA

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	21	15	2230	491	982	244	245	244	245	245	246
2000	17	11	2230	477	954	241	249	242	250	243	251
4000	13	7	2230	463	926	239	254	240	255	241	256
6000	9	3	2230	451	902	237	259	238	260	238	261
8000	6	−1	2230	441	882	234	264	235	265	236	266
10,000	2	−5	2230	433	866	232	269	233	270	234	271
12,000	−2	−9	2230	425	850	230	275	231	276	231	277
14,000	−5	−13	2230	419	838	227	280	228	281	229	283
16,000	−9	−17	2147	401	802	221	282	223	283	224	285
18,000	−13	−21	1995	373	746	213	279	214	281	215	283
20,000	−17	−25	1842	346	692	203	276	205	279	207	281
22,000	−21	−28	1714	323	646	195	274	197	277	199	279
24,000	−26	−32	1584	299	598	186	271	189	274	191	277
26,000	−30	−36	1460	277	554	177	267	180	271	182	274
28,000	−34	−40	1346	257	514	168	262	171	267	174	271
29,000	−36	−42	1291	247	494	162	258	167	264	170	269
31,000	−40	−46	1184	229	458	151	249	157	258	161	265
33,000	−45	−50	1080	211	422	138	236	146	250	151	259
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1800 RPM

ISA +10°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS					
						@ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	31	25	2230	494	988	242	247	243	248	244	249
2000	27	21	2230	481	962	240	252	241	253	241	254
4000	23	17	2230	467	934	237	257	238	258	239	259
6000	20	13	2230	455	910	235	262	236	263	237	264
8000	16	9	2230	444	888	233	267	234	268	235	269
10,000	12	5	2230	434	868	230	272	231	273	232	274
12,000	8	1	2230	426	852	228	278	229	279	230	280
14,000	5	−3	2141	406	812	222	279	223	280	224	282
16,000	1	−7	2020	381	762	214	278	216	280	217	282
18,000	−3	−11	1900	358	716	207	277	208	280	210	281
20,000	−7	−15	1779	334	668	199	276	201	278	203	281
22,000	−12	−18	1648	312	624	190	273	192	276	194	279
24,000	−16	−22	1515	289	578	181	269	183	272	186	276
26,000	−20	−26	1391	267	534	171	264	174	268	177	272
28,000	−24	−30	1281	248	496	161	257	166	264	169	269
29,000	−26	−32	1227	238	476	156	253	161	261	164	266
31,000	−30	−36	1121	220	440	144	242	150	253	155	261
33,000	−35	−50	1019	202	404	127	223	139	243	145	254
35,000	−40	−54	911	184	368	—	—	122	224	134	244

RECOMMENDED CRUISE POWER

1800 RPM

ISA +20°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	41	35	2230	497	994	241	250	241	251	242	251
2000	37	31	2230	483	966	238	255	239	256	240	256
4000	33	27	2230	470	940	236	260	237	261	238	262
6000	30	23	2230	457	914	234	265	234	266	235	267
8000	26	19	2230	446	892	231	270	232	271	233	272
10,000	22	15	2192	431	862	227	273	228	275	229	276
12,000	18	11	2087	407	814	220	274	222	275	223	277
14,000	14	7	1980	383	766	214	274	215	276	216	277
16,000	10	3	1872	360	720	206	273	208	275	210	277
18,000	6	−1	1762	338	676	199	272	201	275	203	277
20,000	2	−5	1651	316	632	191	271	193	274	195	276
22,000	−2	−8	1545	296	592	183	269	186	272	188	275
24,000	−6	−12	1437	276	552	175	265	178	269	180	273
26,000	−10	−16	1331	257	514	166	261	169	266	172	270
28,000	−14	−20	1224	238	476	155	253	160	261	164	267
29,000	−16	−22	1168	229	458	149	248	155	257	159	264
31,000	−21	−26	1062	211	422	135	233	144	247	149	257
33,000	−25	−30	960	193	386	—	—	130	234	139	249
35,000	−29	−34	881	179	358	—	—	—	—	126	235

RECOMMENDED CRUISE POWER

1800 RPM

ISA +30°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	51	45	2230	499	998	239	252	240	253	241	254
2000	47	41	2230	485	970	237	257	238	258	239	259
4000	43	37	2218	470	940	234	262	235	263	236	264
6000	40	33	2173	450	900	230	265	231	266	232	267
8000	36	29	2104	429	858	225	267	226	268	227	269
10,000	32	25	2017	406	812	219	268	220	269	221	271
12,000	28	21	1921	383	766	212	268	214	270	215	271
14,000	24	17	1816	360	720	205	268	207	270	208	272
16,000	20	13	1716	339	678	198	267	200	270	201	272
18,000	16	9	1620	318	636	191	266	193	269	195	271
20,000	12	5	1524	297	594	183	265	186	268	188	271
22,000	8	2	1428	279	558	176	262	178	266	181	269
24,000	4	−2	1331	260	520	167	258	171	264	173	268
26,000	0	−6	1237	243	486	158	253	162	260	166	265
28,000	−4	−10	1147	226	452	148	246	153	255	158	262
29,000	−7	−12	1102	218	436	141	240	148	251	153	259
31,000	−9	−16	1004	201	402	124	219	137	240	143	252
33,000	−16	−20	893	183	366	—	—	119	218	132	241
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1800 RPM

ISA +37°C

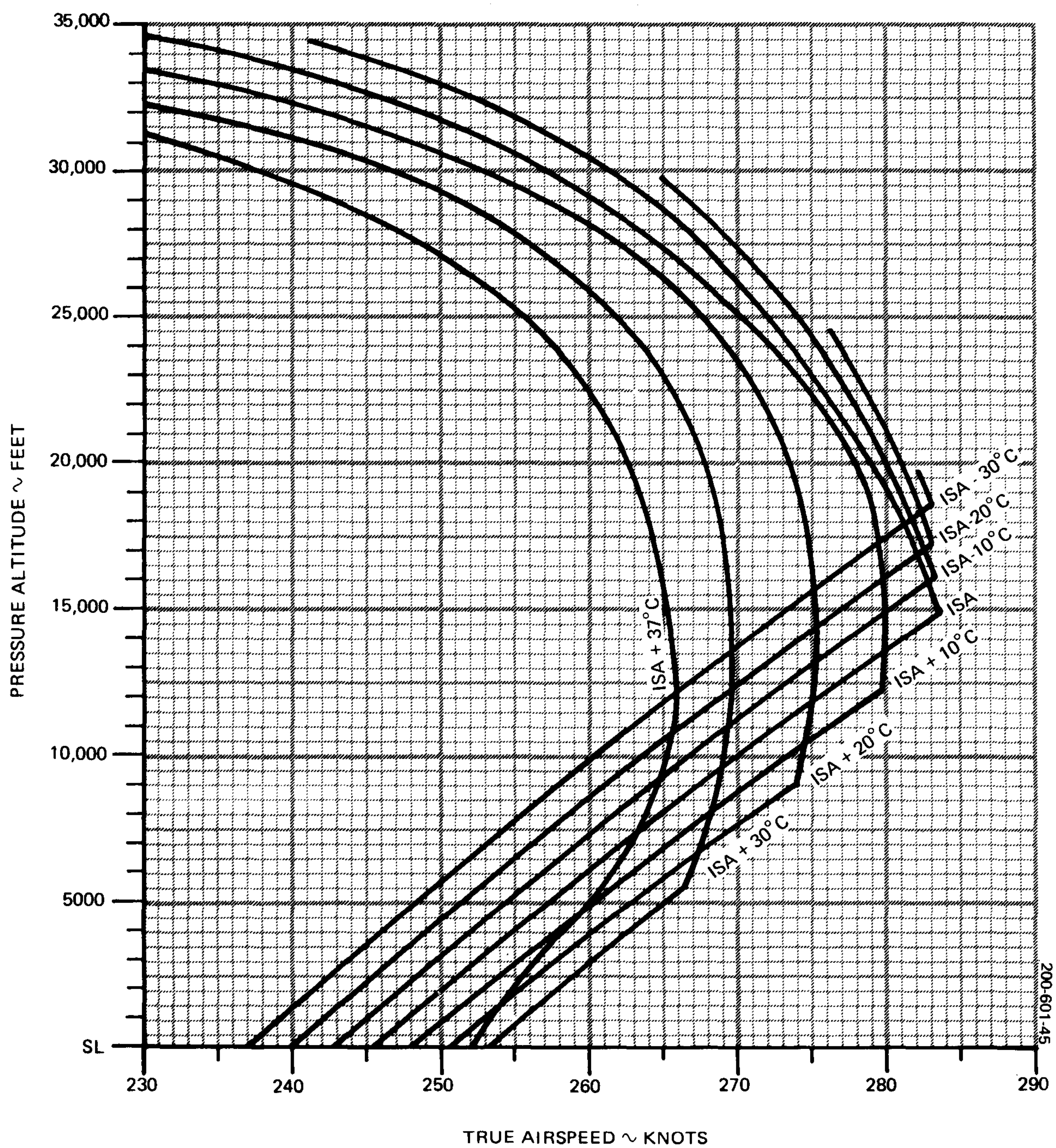
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS					
						@ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	58	52	2164	491	982	235	251	236	252	237	253
2000	54	48	2117	471	942	231	254	232	255	233	256
4000	50	44	2077	452	904	227	257	228	258	229	259
6000	46	40	2040	433	866	223	260	225	262	226	263
8000	43	36	1981	413	826	219	263	220	264	221	265
10,000	39	32	1903	391	782	213	264	214	265	215	267
12,000	35	28	1812	368	736	206	264	208	266	209	268
14,000	31	24	1712	346	692	199	263	201	266	203	268
16,000	27	20	1615	325	650	192	262	194	265	196	267
18,000	23	16	1522	305	610	185	261	187	264	189	267
20,000	19	12	1427	285	570	177	259	180	263	182	266
22,000	15	9	1340	267	534	169	256	172	261	175	265
24,000	11	5	1251	249	498	160	251	164	258	168	263
26,000	6	1	1162	232	464	151	245	156	253	160	260
28,000	2	−3	1076	216	432	140	236	147	247	152	256
29,000	0	−5	1033	208	416	133	228	141	243	147	253
31,000	−2	−9	943	192	384	—	—	129	231	138	245
33,000	−8	−13	874	179	358	—	—	—	—	126	234
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE SPEEDS

1800 RPM

WEIGHT 11,000 LBS

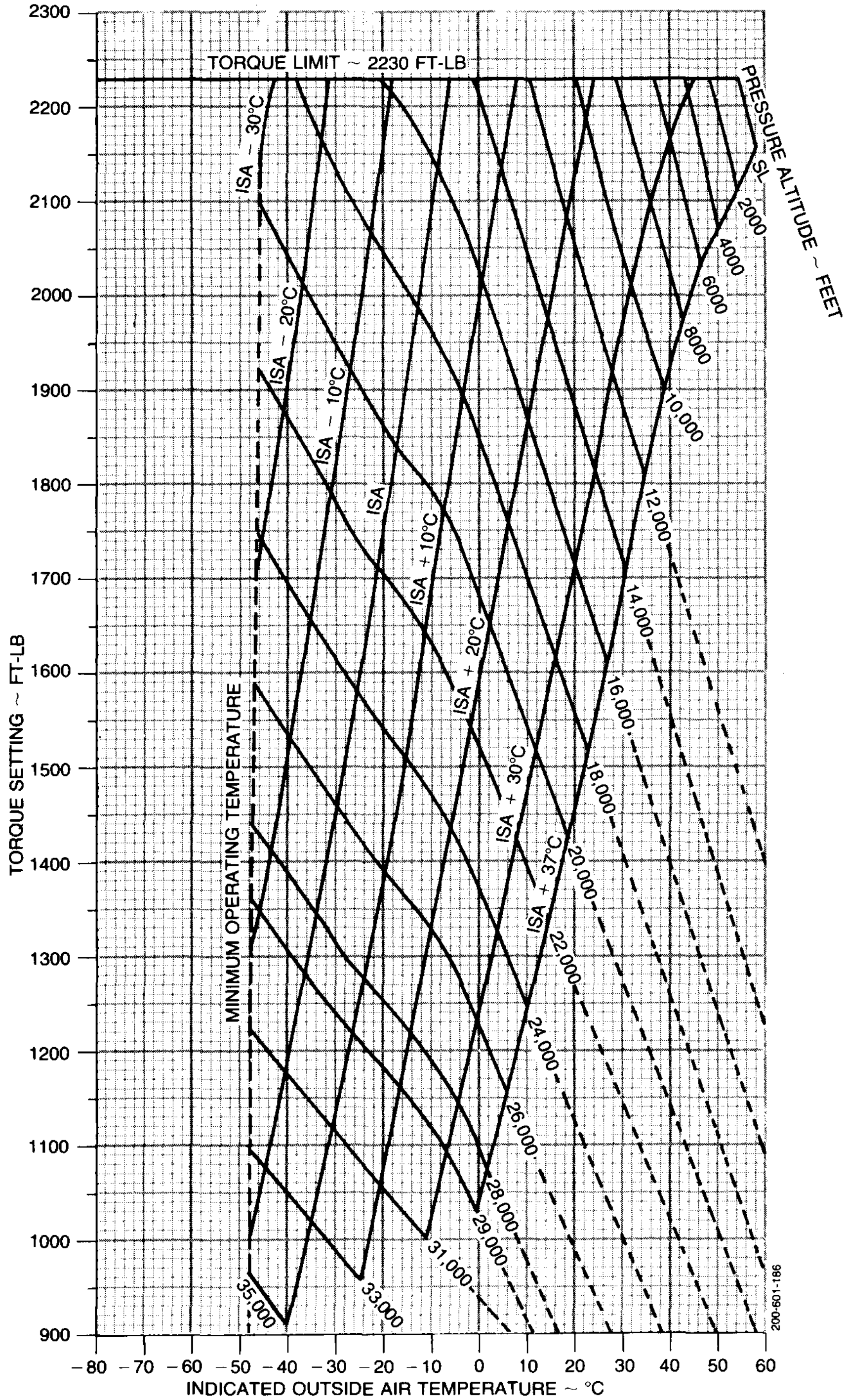
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, TAS WILL BE REDUCED BY APPROXIMATELY 25 KNOTS.



RECOMMENDED CRUISE POWER

1800 RPM

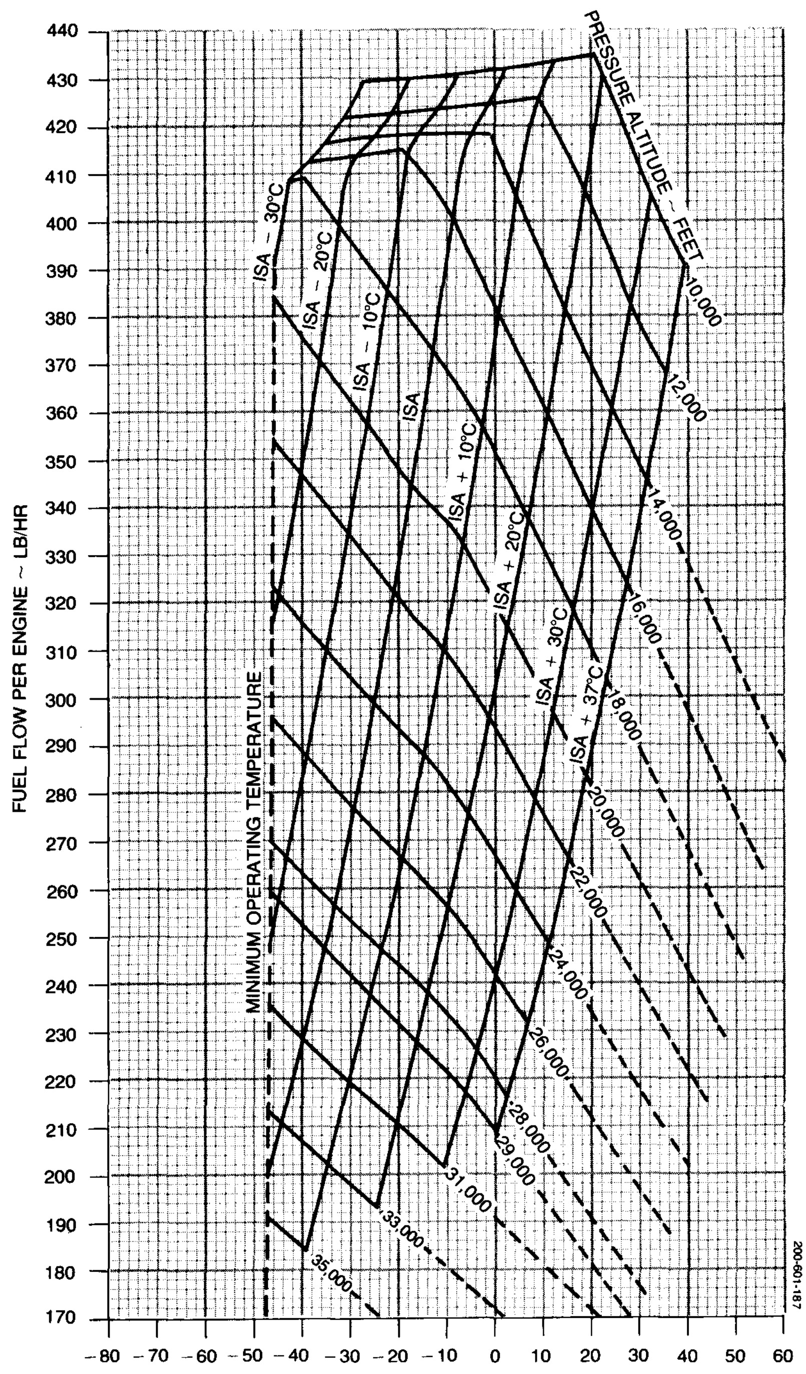
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 40°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



FUEL FLOW AT RECOMMENDED CRUISE POWER

1800 RPM

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 30°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



INTENTIONALLY LEFT BLANK

MAXIMUM CRUISE POWER

1900 RPM

ISA −30°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	−10	−15	2230	500	1000	253	241	254	241	255	242
2000	−13	−19	2230	488	976	251	245	252	246	253	247
4000	−17	−23	2230	477	954	249	250	250	251	251	252
6000	−21	−27	2230	466	932	247	255	248	256	248	257
8000	−25	−31	2230	457	914	245	260	245	261	246	261
10,000	−28	−35	2230	449	898	242	265	243	266	244	263
12,000	−32	−39	2230	442	884	240	270	241	271	242	272
14,000	−36	−43	2230	437	874	238	275	239	277	240	278
16,000	−39	−47	2230	433	866	235	281	236	282	237	283
18,000	−43	−51	2226	429	858	233	286	234	288	235	289
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM CRUISE POWER

1900 RPM

ISA −20°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS					
						@ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	1	−5	2230	503	1006	252	244	252	244	253	245
2000	3	−9	2230	490	980	250	249	250	249	251	250
4000	−7	−13	2230	478	956	247	253	248	254	249	255
6000	−11	−17	2230	467	934	245	258	246	259	246	260
8000	−14	−21	2230	459	918	243	263	244	264	244	265
10,000	−18	−25	2230	450	900	240	268	241	269	242	270
12,000	−22	−29	2230	443	886	238	274	239	275	240	276
14,000	−25	−33	2230	438	876	236	279	237	280	238	281
16,000	−29	−37	2230	435	870	233	285	234	286	235	287
18,000	−33	−41	2132	414	828	227	285	228	287	229	288
20,000	−37	−45	1982	385	770	218	284	220	285	221	287
22,000	−41	−48	1846	359	718	210	282	211	284	213	286
24,000	−45	−52	1709	334	668	201	279	203	281	205	284
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM CRUISE POWER

1900 RPM

ISA −10°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	11	5	2230	505	1010	250	247	251	247	252	248
2000	7	1	2230	492	984	248	251	249	252	249	253
4000	3	−3	2230	480	960	246	256	246	257	247	258
6000	−1	−7	2230	468	936	243	261	244	262	245	263
8000	−4	−11	2230	458	916	241	266	242	267	243	268
10,000	−8	−15	2230	450	900	239	272	240	273	240	274
12,000	−12	−19	2230	445	890	236	277	237	278	238	280
14,000	−16	−23	2230	440	880	234	283	235	284	236	285
16,000	−19	−27	2190	429	858	230	286	231	288	232	289
18,000	−23	−31	2042	400	800	221	285	223	286	224	288
20,000	−27	−35	1894	371	742	212	282	214	284	215	286
22,000	−31	−38	1765	346	692	204	280	206	283	207	285
24,000	−35	−42	1635	322	644	195	278	197	280	199	283
26,000	−39	−46	1510	298	596	186	274	189	277	191	280
28,000	−44	−50	1391	277	554	177	269	180	274	183	278
29,000	−46	−52	1333	266	532	172	266	175	271	178	276
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM CRUISE POWER

1900 RPM

ISA

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	21	15	2230	508	1016	249	250	249	250	250	251
2000	17	11	2230	494	988	246	254	247	255	248	256
4000	13	7	2230	481	962	244	259	245	260	245	261
6000	10	3	2230	470	940	241	264	242	265	243	266
8000	6	−1	2230	460	920	239	269	240	270	241	271
10,000	2	−5	2230	452	904	237	275	238	276	239	277
12,000	−1	−9	2230	445	890	234	280	235	281	236	283
14,000	−5	−13	2226	438	876	232	286	233	287	234	288
16,000	−9	−17	2088	411	822	224	285	225	286	226	288
18,000	−13	−21	1952	385	770	216	283	217	285	218	287
20,000	−17	−25	1814	358	716	207	281	209	283	210	285
22,000	−21	−28	1688	334	668	199	279	201	281	202	284
24,000	−25	−32	1561	310	620	190	276	192	279	194	281
26,000	−29	−36	1440	287	574	180	271	183	275	186	279
28,000	−34	−40	1328	266	532	171	266	174	271	177	276
29,000	−36	−42	1273	256	512	166	263	170	269	173	274
31,000	−40	−46	1167	237	474	155	256	160	263	164	269
33,000	−44	−50	1065	218	436	143	245	149	256	154	263
35,000	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM CRUISE POWER

1900 RPM

ISA +10°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	31	25	2230	511	1022	247	252	248	253	248	254
2000	27	21	2230	499	998	245	257	245	258	246	259
4000	23	17	2230	486	972	242	262	243	263	244	264
6000	20	13	2230	474	948	240	267	241	268	242	269
8000	16	9	2230	463	926	238	273	238	273	239	275
10,000	12	5	2230	454	908	236	278	236	279	237	280
12,000	9	1	2205	442	884	232	282	233	283	234	285
14,000	5	−3	2085	415	830	224	282	226	284	227	285
16,000	1	−7	1965	390	780	217	281	218	283	220	285
18,000	−3	−11	1844	366	732	209	280	211	282	212	284
20,000	−7	−15	1723	341	682	201	279	203	281	204	283
22,000	−11	−18	1603	319	638	193	276	195	279	197	282
24,000	−15	−22	1482	297	594	184	272	186	276	188	279
26,000	−20	−26	1369	276	552	174	268	177	273	180	277
28,000	−24	−30	1264	257	514	165	263	169	269	172	273
29,000	−26	−32	1211	247	494	160	259	164	266	167	271
31,000	−30	−36	1109	228	456	148	250	154	259	158	266
33,000	−35	−40	1011	210	420	135	236	143	251	149	260
35,000	−39	−44	911	192	384	—	—	130	236	138	251

MAXIMUM CRUISE POWER

1900 RPM

ISA +20°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	41	35	2230	515	1030	246	255	246	256	247	256
2000	37	31	2230	501	1002	243	260	244	261	245	261
4000	34	27	2230	488	976	241	265	242	266	242	267
6000	30	23	2230	476	952	238	270	239	271	240	272
8000	26	19	2230	465	930	236	275	237	277	238	278
10,000	22	15	2145	442	884	230	277	231	278	232	279
12,000	18	11	2042	417	834	223	277	225	279	226	280
14,000	14	7	1935	393	786	216	277	218	279	219	281
16,000	11	3	1827	369	738	209	277	211	279	212	281
18,000	7	−1	1719	346	692	202	276	204	278	205	280
20,000	2	−5	1610	323	646	194	274	196	277	198	279
22,000	−2	−8	1505	303	606	186	272	188	275	190	278
24,000	−6	−12	1399	283	566	177	268	180	273	183	276
26,000	−10	−16	1295	263	526	168	264	172	269	174	273
28,000	−14	−20	1192	244	488	158	257	162	264	166	270
29,000	−16	−22	1138	235	470	152	252	157	260	161	267
31,000	−20	−26	1039	217	434	140	241	147	253	152	261
33,000	−25	−30	946	200	400	121	218	135	242	142	254
35,000	−30	−34	843	181	362	—	—	117	218	131	243

MAXIMUM CRUISE POWER

1900 RPM

ISA +30°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	51	45	2230	518	1036	244	258	245	258	246	259
2000	47	41	2230	504	1008	241	262	242	263	243	264
4000	44	37	2182	483	966	237	265	238	266	239	267
6000	40	33	2136	462	924	233	268	234	270	235	271
8000	36	29	2065	440	880	228	270	229	272	230	273
10,000	32	25	1979	417	834	222	271	223	273	224	274
12,000	28	21	1883	394	788	215	272	216	274	218	275
14,000	24	17	1781	370	740	208	271	210	273	211	275
16,000	20	13	1681	348	696	201	271	203	273	204	275
18,000	16	9	1586	326	652	194	270	196	273	197	275
20,000	12	5	1489	305	610	186	268	188	271	190	274
22,000	8	2	1395	286	572	178	266	181	270	183	273
24,000	4	−2	1301	267	534	170	262	173	267	176	271
26,000	0	−6	1209	249	498	161	257	164	263	168	269
28,000	−4	−10	1119	232	464	151	251	156	259	160	265
29,000	−6	−12	1074	223	446	145	246	155	262	155	262
31,000	−11	−16	978	206	412	131	230	146	256	146	256
33,000	−15	−20	877	188	376	—	—	125	229	134	246
35,000	−19	−24	804	174	348	—	—	—	—	121	231

MAXIMUM CRUISE POWER

1900 RPM

ISA +37°C

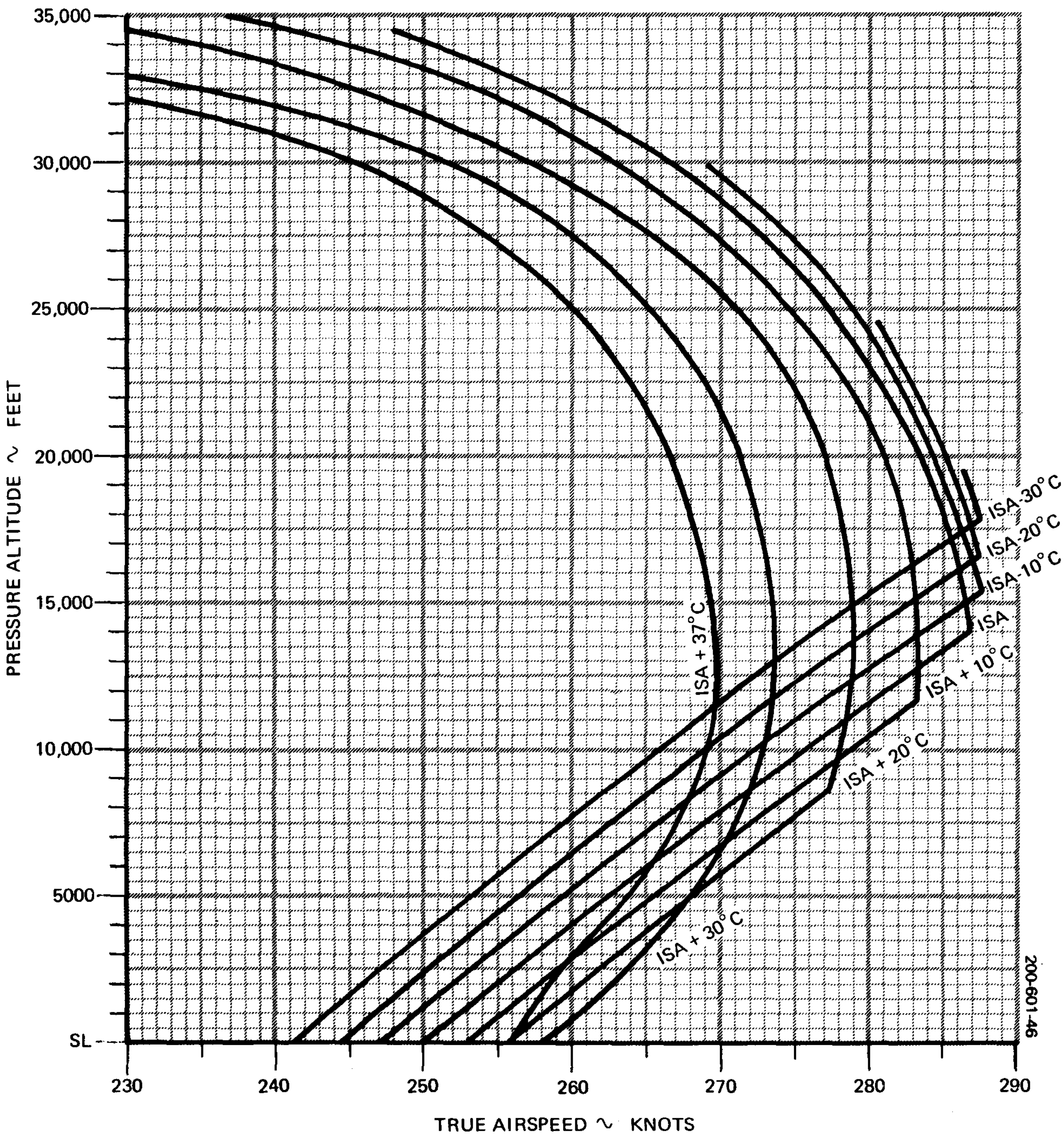
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	58	52	2134	506	1012	239	255	240	256	241	257
2000	54	48	2085	485	970	235	258	236	259	237	260
4000	50	44	2044	465	930	231	261	232	262	233	263
6000	47	40	2009	445	890	227	264	228	265	229	267
8000	43	36	1949	424	848	222	266	223	268	224	269
10,000	39	32	1870	401	802	216	268	217	269	218	271
12,000	35	28	1779	378	756	209	268	211	270	212	271
14,000	31	24	1681	355	710	202	267	204	269	205	271
16,000	27	20	1586	334	668	195	266	197	269	199	271
18,000	23	16	1493	313	626	188	265	190	268	192	271
20,000	19	12	1399	292	584	180	263	182	266	185	270
22,000	15	10	1313	274	548	172	260	175	265	178	268
24,000	11	6	1225	256	512	163	256	167	262	170	266
26,000	7	2	1139	238	476	154	251	159	258	162	264
28,000	2	−2	1055	222	444	144	243	150	253	154	260
29,000	2	−4	1013	214	428	138	237	149	249	150	257
31,000	−2	−8	927	198	396	119	213	134	238	142	251
33,000	−9	−12	833	181	362	—	—	117	217	130	241
35,000	−14	−16	742	165	330	—	—	—	—	114	221

MAXIMUM CRUISE SPEEDS

1900 RPM

WEIGHT 11,000 LBS

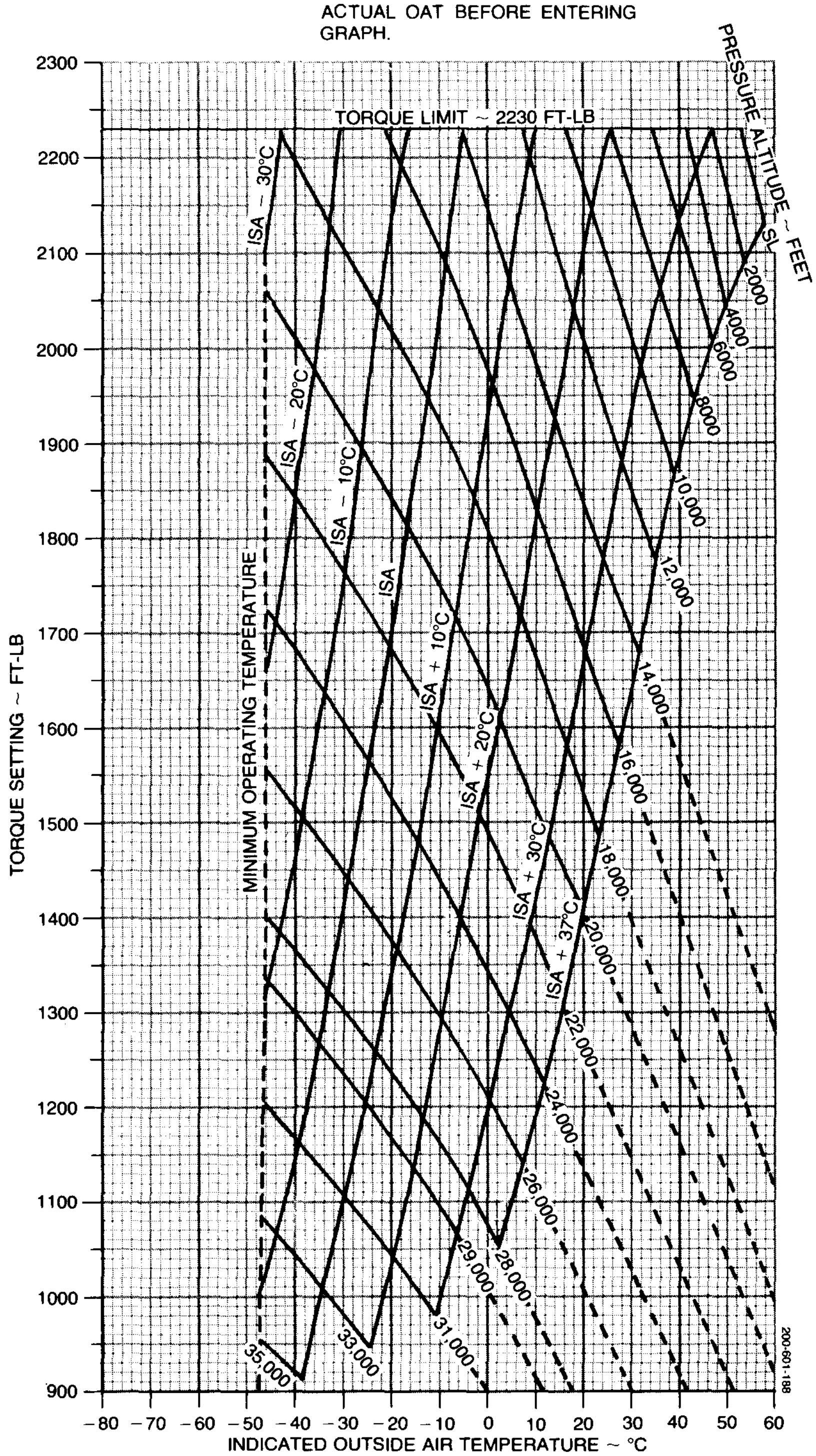
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, TAS WILL BE REDUCED BY APPROXIMATELY 25 KNOTS.



MAXIMUM CRUISE POWER

1900 RPM

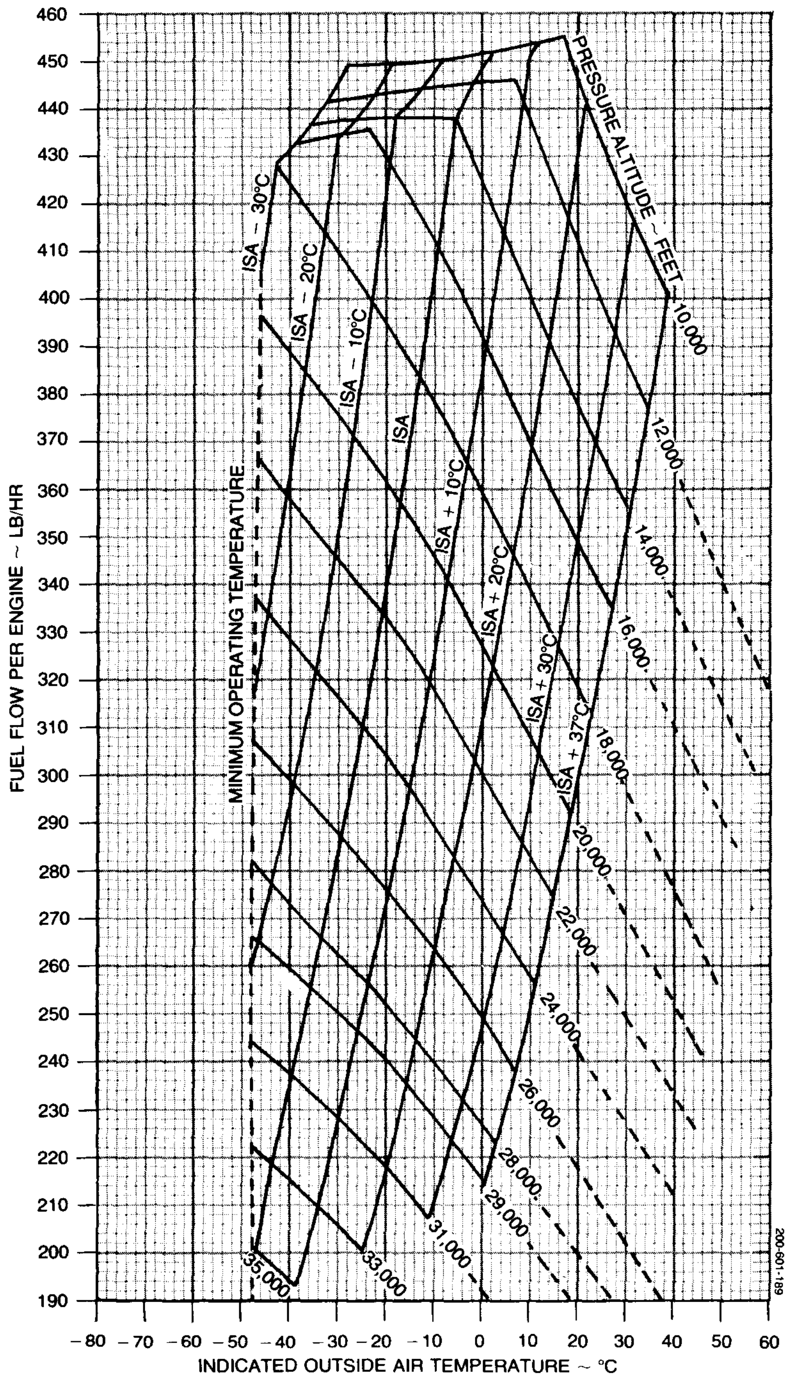
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 40°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



FUEL FLOW AT MAXIMUM CRUISE POWER

1900 RPM

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 30°C TO THE ACTUAL OAT BEFORE ENTERING THE GRAPH.



INTENTIONALLY LEFT BLANK

MAXIMUM RANGE POWER

1700 RPM

ISA −30°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	−11	−15	1556	387	774	211	1517	376	752	210	1465	366	732	208
2000	−15	−19	1476	362	724	212	1423	352	704	211	1360	342	684	209
4000	−20	−23	1407	339	678	213	1343	328	656	212	1276	321	642	210
6000	−23	−27	1345	317	634	215	1275	307	614	214	1205	300	600	212
8000	−27	−31	1294	297	594	216	1219	288	576	216	1145	281	562	213
10,000	−31	−35	1248	280	560	219	1170	271	542	218	1095	264	528	215
12,000	−35	−39	1210	265	530	221	1130	256	512	220	1053	249	498	216
14,000	−39	−43	1175	252	504	223	1095	244	488	221	1015	235	470	218
16,000	−43	−47	1150	240	480	226	1070	233	466	222	985	224	448	219
18,000	−47	−51	1130	231	462	230	1050	224	448	226	965	214	428	221
20,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA −20°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	−1	−5	1485	383	766	193	1368	376	752	185	1282	362	724	177
2000	−6	−9	1420	359	718	198	1311	351	702	191	1225	340	680	183
4000	−9	−13	1362	336	672	200	1257	330	660	194	1174	317	634	188
6000	−13	−17	1315	316	632	202	1210	308	616	197	1128	297	594	190
8000	−17	−21	1267	297	594	203	1170	288	576	198	1086	278	556	193
10,000	−21	−25	1228	281	562	203	1133	272	544	199	1050	262	524	195
12,000	−25	−29	1195	267	534	204	1100	257	514	200	1019	247	494	197
14,000	−29	−33	1165	254	508	206	1074	244	488	202	992	234	468	198
16,000	−33	−37	1140	244	488	208	1051	233	466	204	970	223	446	199
18,000	−37	−41	1122	235	470	211	1033	224	448	206	952	213	426	201
20,000	−41	−45	1108	227	454	215	1020	216	432	209	940	206	412	204
22,000	−44	−48	1100	221	442	219	1012	209	418	214	930	199	398	210
24,000	−48	−52	1095	216	432	221	1010	203	406	219	929	193	386	214
26,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA −10°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	8	5	1409	367	734	196	1335	358	716	183	1228	346	692	175
2000	4	1	1366	349	698	198	1292	335	670	191	1187	323	646	184
4000	1	−3	1327	332	664	201	1249	316	632	195	1150	304	608	189
6000	−3	−7	1290	314	628	203	1209	299	598	198	1115	286	572	193
8000	−7	−11	1255	297	594	204	1173	283	566	200	1083	271	542	196
10,000	−11	−15	1223	282	564	205	1140	269	538	201	1051	258	516	197
12,000	−15	−19	1195	269	538	207	1110	256	512	203	1025	246	492	198
14,000	−19	−23	1172	256	512	209	1085	244	488	205	1000	235	470	200
16,000	−23	−27	1150	246	492	212	1062	234	468	207	980	225	450	202
18,000	−27	−31	1133	237	474	215	1044	225	450	209	962	215	430	205
20,000	−30	−35	1119	228	456	217	1027	216	432	213	947	207	414	209
22,000	−34	−38	1113	222	444	219	1015	209	418	216	935	199	398	212
24,000	−38	−42	1101	215	430	220	1006	203	406	218	928	192	384	215
26,000	−42	−46	1099	210	420	221	1004	198	396	219	925	186	372	218
28,000	−46	−50	1100	207	414	224	1005	194	388	221	925	181	362	220
29,000	−48	−54	1103	206	412	227	1006	192	384	222	927	178	356	220
31,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	19	15	1417	374	748	201	1308	360	720	197	1204	347	694	192
2000	15	11	1304	344	688	198	1226	334	668	195	1157	326	652	193
4000	11	7	1252	323	646	199	1183	314	628	196	1120	306	612	194
6000	7	3	1223	306	612	200	1153	297	594	198	1088	289	578	196
8000	3	−1	1202	291	582	203	1125	282	564	200	1054	273	546	197
10,000	−1	−5	1178	276	552	204	1092	266	532	201	1015	256	512	198
12,000	−5	−9	1165	264	528	207	1068	252	504	202	984	242	484	199
14,000	−9	−13	1152	253	506	209	1050	241	482	204	959	229	458	200
16,000	−13	−17	1153	246	492	213	1060	234	468	209	959	221	442	203
18,000	−16	−21	1146	238	476	216	1071	228	456	213	978	216	432	208
20,000	−20	−25	1123	228	456	217	1059	220	440	216	986	210	420	213
22,000	−24	−28	1114	222	444	220	1026	210	420	216	980	203	406	216
24,000	−28	−32	1114	217	434	223	1005	202	404	217	949	194	388	216
26,000	−32	−36	1117	214	428	226	999	197	394	219	911	184	368	216
28,000	−36	−40	1121	212	424	230	1018	196	392	225	899	179	358	217
29,000	−38	−42	1140	214	428	234	1019	195	390	227	905	179	358	220
31,000	−41	−46	—	—	—	—	1033	195	390	232	918	178	356	225
33,000	−46	−50	—	—	—	—	—	—	—	—	926	177	354	229
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA +10°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	29	25	1583	395	790	213	1510	386	772	210	1431	377	754	207
2000	25	21	1486	369	738	211	1398	358	716	208	1252	341	682	200
4000	21	17	1388	342	684	209	1228	323	646	201	1116	309	618	195
6000	17	13	1264	313	626	205	1148	299	598	199	1066	288	576	196
8000	13	9	1213	295	590	205	1107	281	562	200	1030	271	542	197
10,000	9	5	1185	279	558	206	1076	265	530	201	999	256	512	198
12,000	5	1	1172	267	534	209	1059	253	506	203	972	242	484	199
14,000	1	−3	1165	257	514	212	1044	241	482	205	949	229	458	201
16,000	−3	−7	1171	249	498	216	1049	234	468	209	947	221	442	204
18,000	−6	−11	1177	242	484	221	1062	227	454	214	967	215	430	209
20,000	−10	−15	1172	234	468	224	1055	219	438	217	972	208	416	213
22,000	−14	−18	1159	228	456	226	1063	215	430	222	956	201	402	215
24,000	−18	−22	1122	219	438	226	1055	210	420	224	944	195	390	218
26,000	−22	−26	1131	217	434	230	1033	203	406	225	949	191	382	222
28,000	−26	−30	1175	221	442	239	1029	199	398	228	940	186	372	224
29,000	−27	−34	1180	221	442	241	1047	200	400	232	934	184	368	225
31,000	−31	−38	—	—	—	—	1069	202	404	239	939	182	364	229
33,000	−35	−42	—	—	—	—	—	—	—	—	959	183	366	236
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA +20°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED.
FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	39	35	1550	391	782	212	1473	383	766	209	1400	375	750	206
2000	35	31	1480	367	734	211	1395	358	716	208	1310	350	700	206
4000	31	27	1416	346	692	211	1327	334	668	208	1235	324	648	206
6000	27	23	1365	326	652	211	1270	312	624	208	1171	302	604	206
8000	23	19	1295	309	618	212	1220	293	586	209	1116	282	564	205
10,000	19	15	1275	292	584	214	1176	276	552	210	1070	265	530	205
12,000	15	11	1240	279	558	218	1142	262	524	212	1030	250	500	205
14,000	11	7	1211	267	534	222	1111	250	500	215	996	238	476	207
16,000	8	3	1189	257	514	224	1090	240	480	218	970	207	414	209
18,000	4	−1	1170	248	496	225	1072	231	462	221	950	218	436	214
20,000	0	−5	1159	241	482	226	1060	223	446	223	935	211	422	218
22,000	−4	−8	1151	235	470	227	1055	217	434	225	927	204	408	221
24,000	−8	−12	1152	230	460	230	1057	212	424	227	926	199	398	223
26,000	−12	−16	1159	226	452	237	1066	209	418	231	933	195	390	224
28,000	−15	−20	1175	223	446	242	1085	206	412	237	948	193	386	226
29,000	−17	−22	1185	222	444	244	1100	205	410	240	960	192	384	228
31,000	−21	−26	1215	222	444	245	1130	205	410	243	987	192	384	237
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA +30°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	49	45	1520	392	744	211	1420	377	754	207	1353	369	738	205
2000	45	41	1468	370	740	214	1373	358	716	210	1307	350	700	208
4000	41	37	1420	350	700	216	1327	339	678	212	1264	330	660	210
6000	37	33	1375	330	660	218	1285	322	644	214	1221	313	626	212
8000	34	29	1335	312	624	219	1245	304	608	216	1156	295	590	213
10,000	30	25	1299	296	592	220	1210	288	576	217	1145	279	558	214
12,000	26	21	1267	282	564	221	1180	273	546	218	1111	263	526	215
14,000	22	17	1240	269	538	222	1150	260	520	219	1081	249	498	216
16,000	18	13	1215	258	516	223	1127	247	494	220	1055	236	472	217
18,000	14	9	1195	249	498	225	1109	237	474	221	1033	225	450	218
20,000	10	5	1180	241	482	229	1091	228	456	224	1014	216	432	219
22,000	6	2	1170	234	468	233	1078	220	440	228	997	207	414	222
24,000	2	−2	1165	228	456	236	1069	214	428	232	985	201	402	227
26,000	−1	−6	1165	223	446	239	1064	209	418	235	977	206	412	231
28,000	−5	−10	1170	220	440	241	1065	206	412	238	973	192	384	235
29,000	−7	−12	1175	219	438	241	1065	205	410	239	972	190	380	237
31,000	−11	−16	1190	217	434	241	1077	205	410	240	975	189	378	239
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA +37°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG PER ENG	FUEL FLOW TOTAL	FUEL FLOW	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	56	52	1470	397	794	211	1400	380	760	210	1344	370	740	208
2000	52	48	1430	374	748	212	1355	360	720	211	1300	350	700	209
4000	48	44	1390	352	704	213	1315	340	680	212	1258	331	662	210
6000	44	40	1355	332	664	215	1279	321	642	214	1219	313	626	212
8000	40	36	1323	313	626	217	1244	304	608	216	1180	295	590	213
10,000	37	32	1295	297	594	218	1212	287	574	218	1145	279	558	215
12,000	33	28	1269	284	568	221	1185	273	546	219	1115	264	528	216
14,000	29	24	1245	271	542	224	1160	260	520	221	1087	250	500	218
16,000	25	20	1227	261	522	227	1139	249	498	222	1063	238	476	219
18,000	21	16	1212	252	504	230	1120	239	478	224	1041	227	454	221
20,000	17	12	1200	245	490	233	1107	231	462	227	1025	219	438	222
22,000	13	9	1192	238	476	236	1097	224	448	231	1010	211	422	225
24,000	10	5	1189	233	466	240	1090	218	436	235	1000	205	410	227
26,000	6	1	1190	209	418	245	1092	213	426	238	993	200	400	232
28,000	2	− 3	1195	226	452	250	1090	210	420	241	991	197	394	235
29,000	− 2	− 5	1200	225	450	253	1095	208	416	242	993	196	392	236
31,000	− 4	− 9	1216	224	448	260	1104	206	412	243	998	196	392	239
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

RANGE PROFILE — FULL MAIN AND AUX TANKS

STANDARD DAY

ASSOCIATED CONDITIONS:

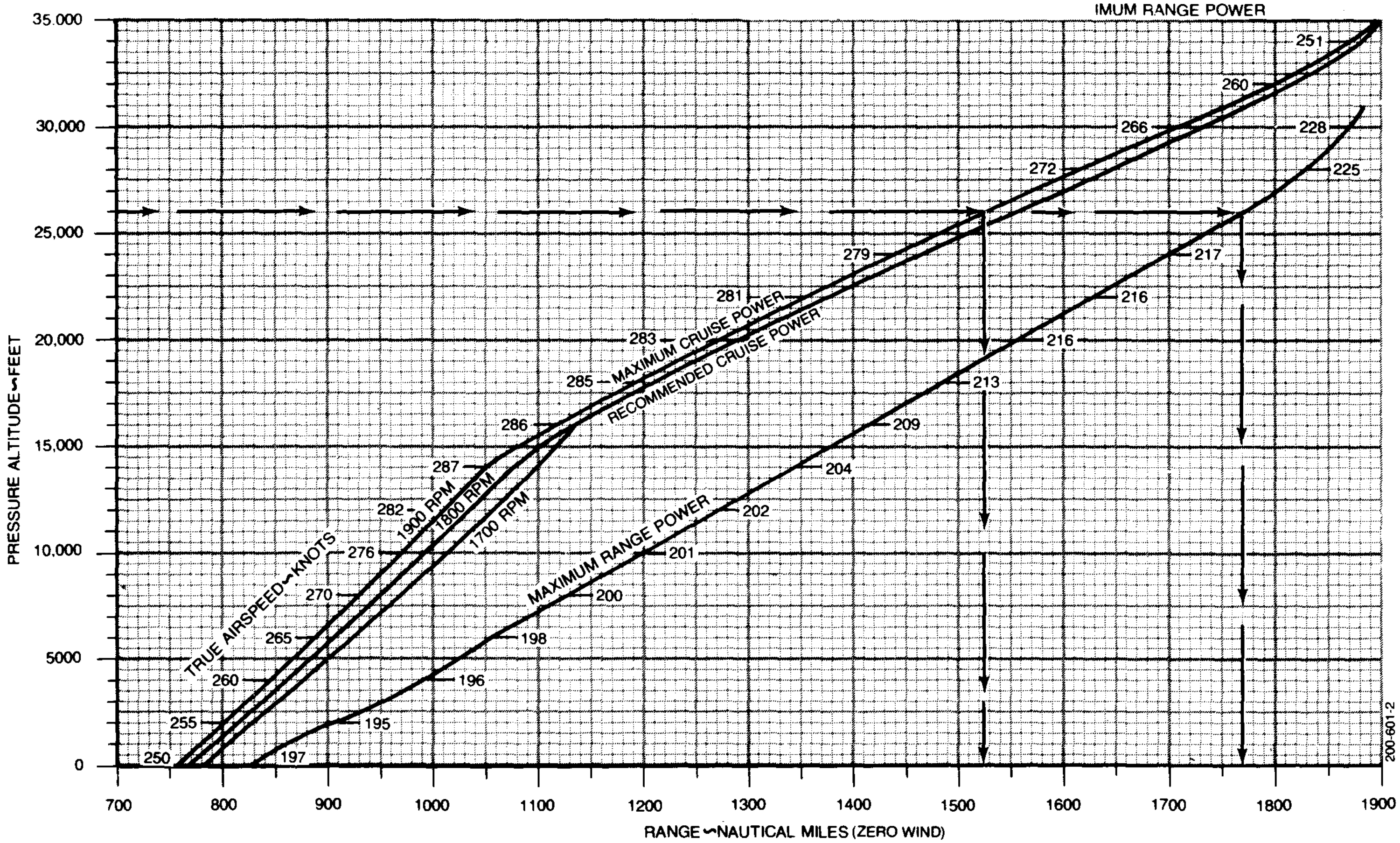
WEIGHT .... 12,590 LBS BEFORE ENGINE START
FUEL.................... AVIATION KEROSENE
FUEL DENSITY .... 6.7 LBS/GAL
ICE VANES.............. RETRACTED

EXAMPLE:

PRESSURE ALTITUDE .... 26,000 FT

RANGE @ MAX CRUISE POWER .... 1525 N.M.
RANGE @ MAX RANGE POWER................ 1770 N.M.

NOTE RANGE INCLUDES START, TAXI, CLIMB AND DESCENT WITH 45 MINUTES RESERVE FUEL AT MAXIMUM RANGE POWER



ENDURANCE PROFILE — FULL MAIN AND AUX TANKS

STANDARD DAY

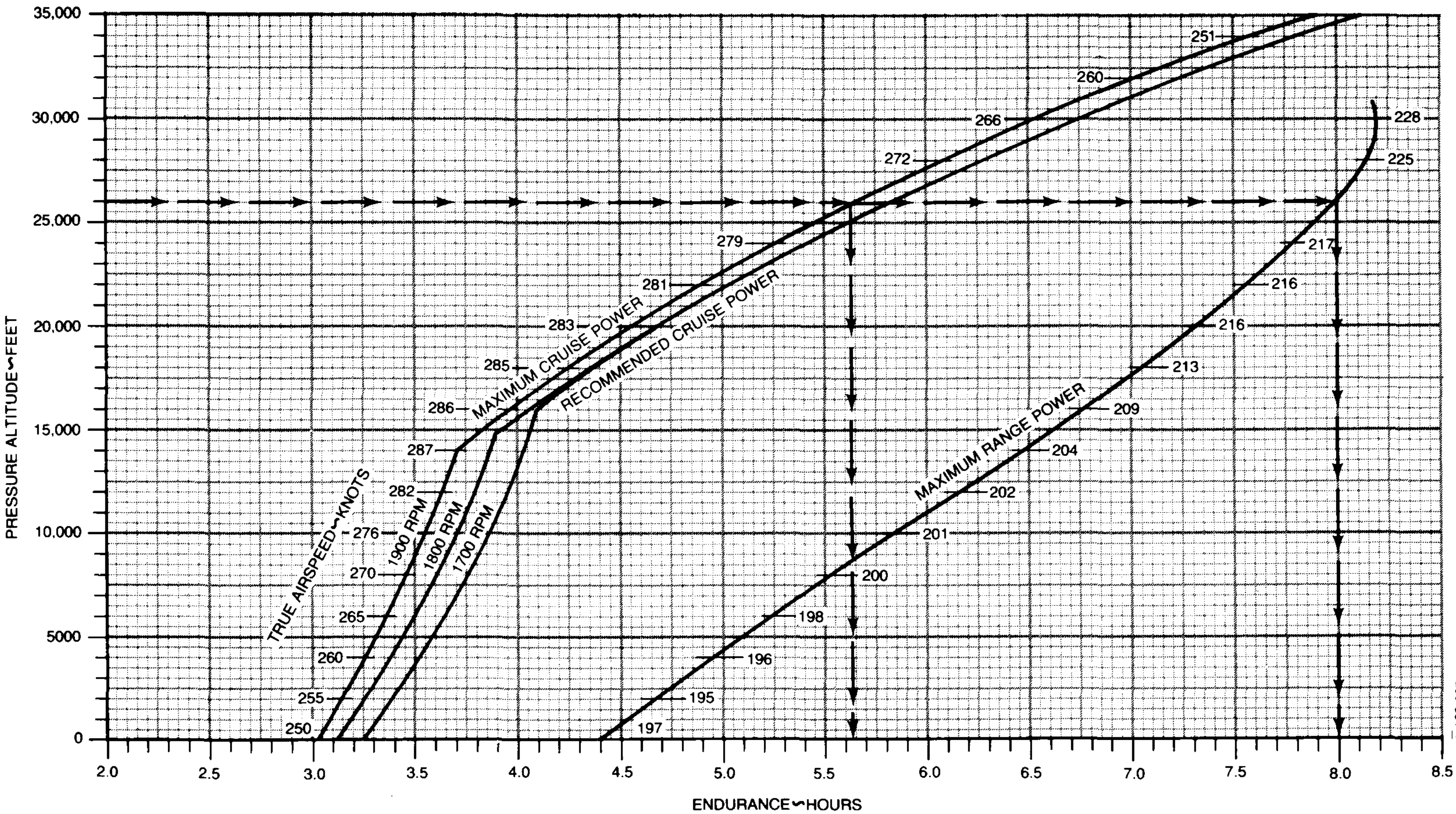
ASSOCIATED CONDITIONS:

WEIGHT	12,590 LBS BEFORE ENGINE START
FUEL	AVIATION KEROSENE
FUEL DENSITY	6.7 LBS/GAL
ICE VANES	RETRACTED

EXAMPLE:

PRESSURE ALTITUDE	26,000 FT
ENDURANCE @ MAX CRUISE POWER	5.63 HRS
ENDURANCE @ MAX RANGE POWER	8.0 HRS

NOTE: ENDURANCE INCLUDES START, TAXI, CLIMB AND DESCENT WITH 45 MINUTES RESERVE FUEL AT MAXIMUM RANGE POWER.



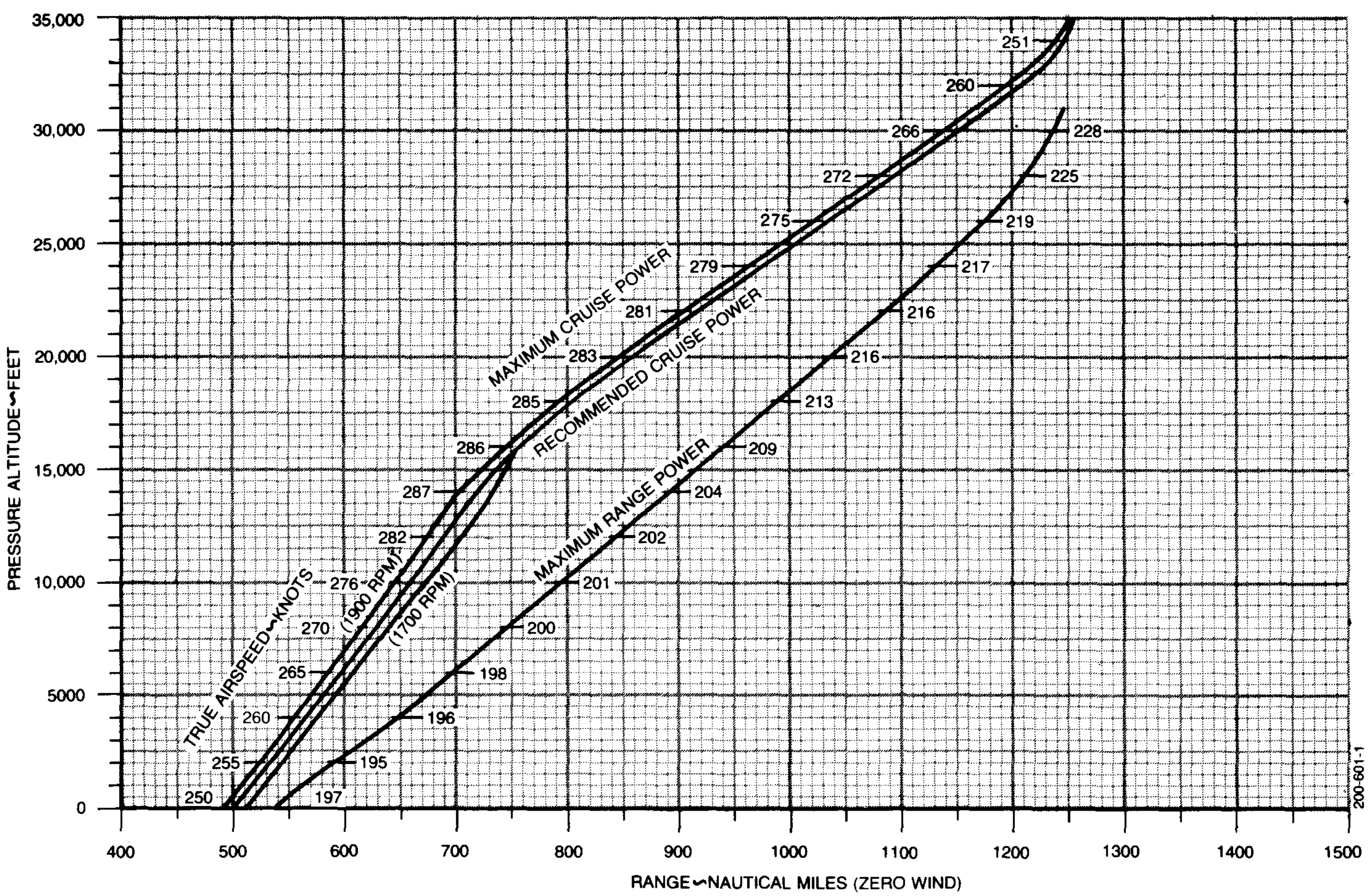
RANGE PROFILE — FULL MAIN TANKS

STANDARD DAY

ASSOCIATED CONDITIONS:

WEIGHT .... 12,590 LBS. BEFORE ENGINE START
FUEL.................... AVIATION KEROSENE
FUEL DENSITY .... 6.7 LB/GAL
ICE VANES.............. RETRACTED

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



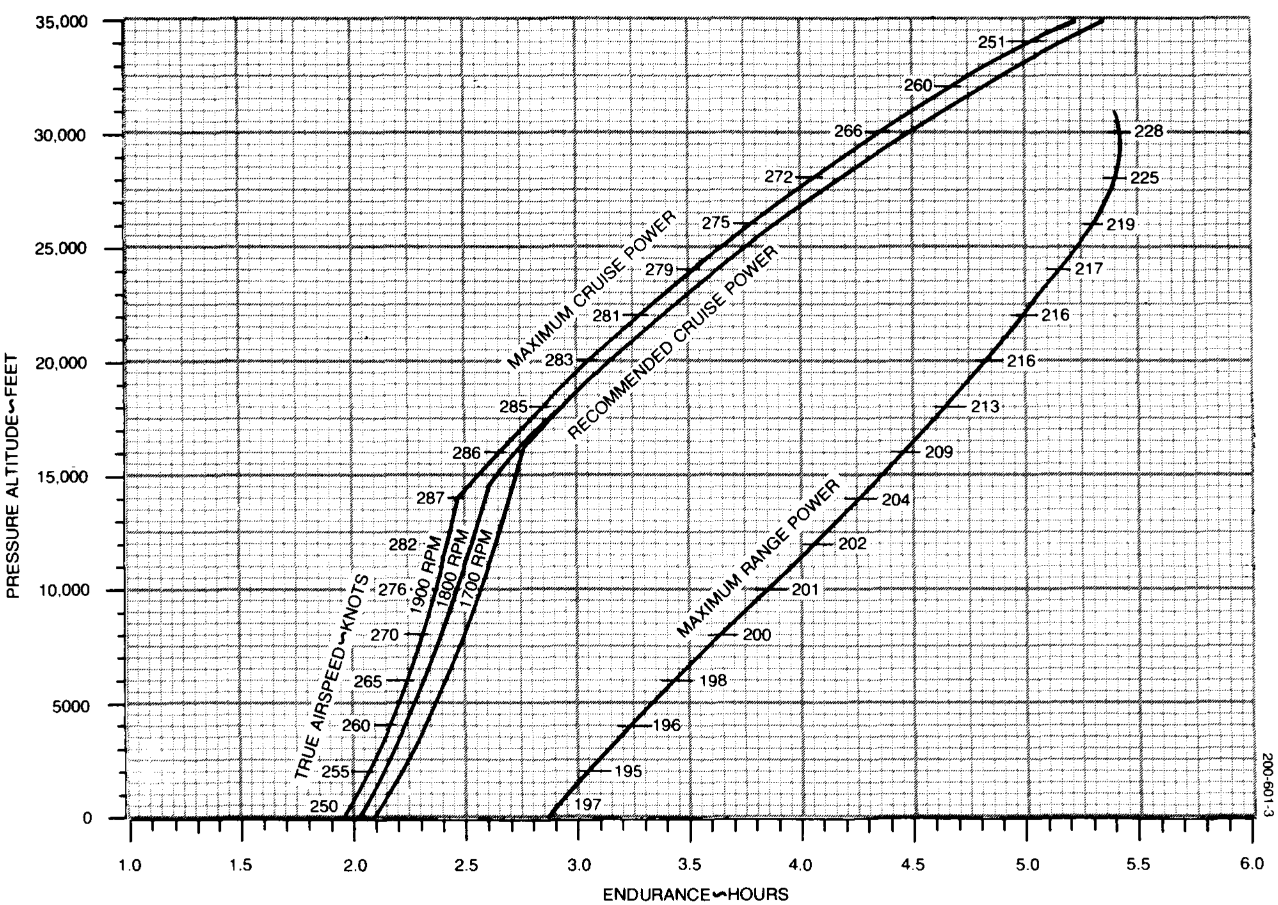
ENDURANCE PROFILE — FULL MAIN TANKS

STANDARD DAY

ASSOCIATED CONDITIONS:

WEIGHT .... 12,590 LBS BEFORE ENGINE START
FUEL.................... AVIATION KEROSENE
FUEL DENSITY .... 6.7 LBS/GAL
ICE VANES.............. RETRACTED

NOTE: ENDURANCE INCLUDES START, TAXI, CLIMB AND DESCENT WITH 45 MINUTES RESERVE FUEL AT MAXIMUM RANGE POWER



TransNorthern Aviation

ONE ENGINE INOPERATIVE
MAXIMUM CRUISE POWER
1900 RPM
ISA −30°C

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	−12	−15	2230	512	512	191	182	193	183	194	185
2000	−16	−19	2230	500	500	189	185	191	187	192	188
4000	−20	−23	2230	488	488	186	188	188	190	190	191
6000	−23	−27	2230	477	477	184	191	186	193	188	195
8000	−27	−31	2230	467	467	182	194	184	196	186	198
10,000	−31	−35	2230	458	458	179	197	182	199	184	202
12,000	−35	−39	2230	452	452	177	200	179	203	181	205
14,000	−39	−43	2230	448	448	174	203	177	206	179	209
16,000	−43	−47	2151	431	431	168	202	171	206	174	209
18,000	−47	−51	2001	401	401	159	198	163	203	167	207
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA −20°C

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	−2	−5	2230	515	515	189	184	191	185	193	187
2000	−6	−9	2230	501	501	187	187	189	189	191	190
4000	−10	−13	2230	489	489	185	190	187	192	189	194
6000	−13	−17	2230	478	478	182	193	184	195	186	197
8000	−17	−21	2230	467	467	180	196	182	198	184	200
10,000	−21	−25	2230	460	460	177	199	180	202	182	204
12,000	−25	−29	2230	454	454	175	202	177	205	180	207
14,000	−29	−33	2209	445	445	171	203	174	207	177	210
16,000	−33	−37	2060	416	416	162	199	166	204	169	208
18,000	−37	−41	1917	387	387	153	195	158	201	162	205
20,000	−41	−45	1777	360	360	143	188	149	196	154	202
22,000	−45	−48	1648	335	335	130	177	139	189	145	197
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA −10°C

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	8	5	2230	517	517	188	185	190	187	192	189
2000	4	1	2230	503	503	185	188	188	191	189	192
4000	1	−3	2230	490	490	183	191	185	194	187	196
6000	−3	−7	2230	479	479	181	195	183	197	185	199
8000	−7	−11	2230	469	469	178	198	181	200	183	203
10,000	−11	−15	2230	461	461	175	201	178	204	180	206
12,000	−15	−19	2230	455	455	173	204	175	207	178	209
14,000	−19	−23	2118	430	430	165	201	169	205	172	209
16,000	−23	−27	1971	401	401	157	197	161	202	164	206
18,000	−27	−31	1834	374	374	147	191	153	198	157	203
20,000	−31	−35	1698	347	347	135	182	143	192	148	199
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	18	15	2230	522	522	186	187	188	189	190	191
2000	14	11	2230	508	508	184	190	186	192	188	194
4000	11	7	2230	494	494	181	193	184	196	186	198
6000	7	3	2230	482	482	179	196	181	199	184	201
8000	3	−1	2230	472	472	176	200	179	202	181	205
10,000	−1	−5	2230	462	462	174	202	176	205	179	208
12,000	−5	−9	2173	445	445	168	203	172	206	174	210
14,000	−9	−13	2036	416	416	160	199	164	204	167	208
16,000	−13	−17	1897	388	388	151	194	156	200	160	205
18,000	−17	−21	1761	361	361	141	187	147	195	152	201
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA +10°C

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	28	25	2230	525	525	185	189	187	191	189	193
2000	25	21	2230	511	511	182	192	185	194	187	196
4000	21	17	2230	497	497	180	195	182	198	184	200
6000	17	13	2230	485	485	177	198	180	201	182	203
8000	13	9	2230	474	474	175	201	177	204	180	207
10,000	9	5	2135	449	449	168	200	172	204	174	207
12,000	5	1	2019	422	422	161	197	165	202	168	206
14,000	1	−3	1902	396	396	153	194	158	199	161	204
16,000	−3	−7	1787	371	371	144	188	150	196	154	201
18,000	−7	−11	1673	347	347	133	179	141	191	147	198
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA +20°C

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE FEET	IOAT °C	OAT °C	TORQUE PER ENGINE FT-LBS	FUEL FLOW PER ENGINE LBS/HR	TOTAL FUEL FLOW LBS/HR	AIRSPEED ~ KNOTS @ 12,000 LBS IAS	@ 12,000 LBS TAS	@ 11,000 LBS IAS	@ 11,000 LBS TAS	@ 10,000 LBS IAS	@ 10,000 LBS TAS
SL	33	35	2230	529	529	183	191	186	193	187	195
2000	35	31	2230	514	514	181	194	183	196	185	198
4000	31	27	2226	499	499	178	196	181	199	183	202
6000	27	23	2161	476	476	173	197	176	200	179	203
8000	23	19	2074	451	451	167	196	171	200	173	203
10,000	19	15	1973	425	425	160	194	164	199	167	202
12,000	15	11	1867	400	400	153	191	157	196	161	201
14,000	11	7	1764	375	375	144	186	150	193	154	199
16,000	7	3	1661	352	352	134	179	142	189	147	196
18,000	2	−1	1556	329	329	—	—	132	183	139	192
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA +30°C

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS					
						@ 12,000 LBS		@ 11,000 LBS		@ 10000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	48	45	2129	517	517	178	188	181	191	183	193
2000	44	41	2087	496	496	174	190	177	193	179	195
4000	41	37	2047	475	475	170	191	173	194	176	197
6000	37	33	1995	453	453	165	191	169	195	171	198
8000	33	29	1918	429	429	159	190	163	195	166	198
10,000	29	25	1825	404	404	152	187	157	193	160	197
12,000	25	21	1726	379	379	144	183	150	190	154	196
14,000	20	17	1625	355	355	134	176	142	186	147	193
16,000	16	13	1528	333	333	—	—	133	180	140	189
18,000	—	—	—	—	—	—	—	—	—	—	—
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA +37°C

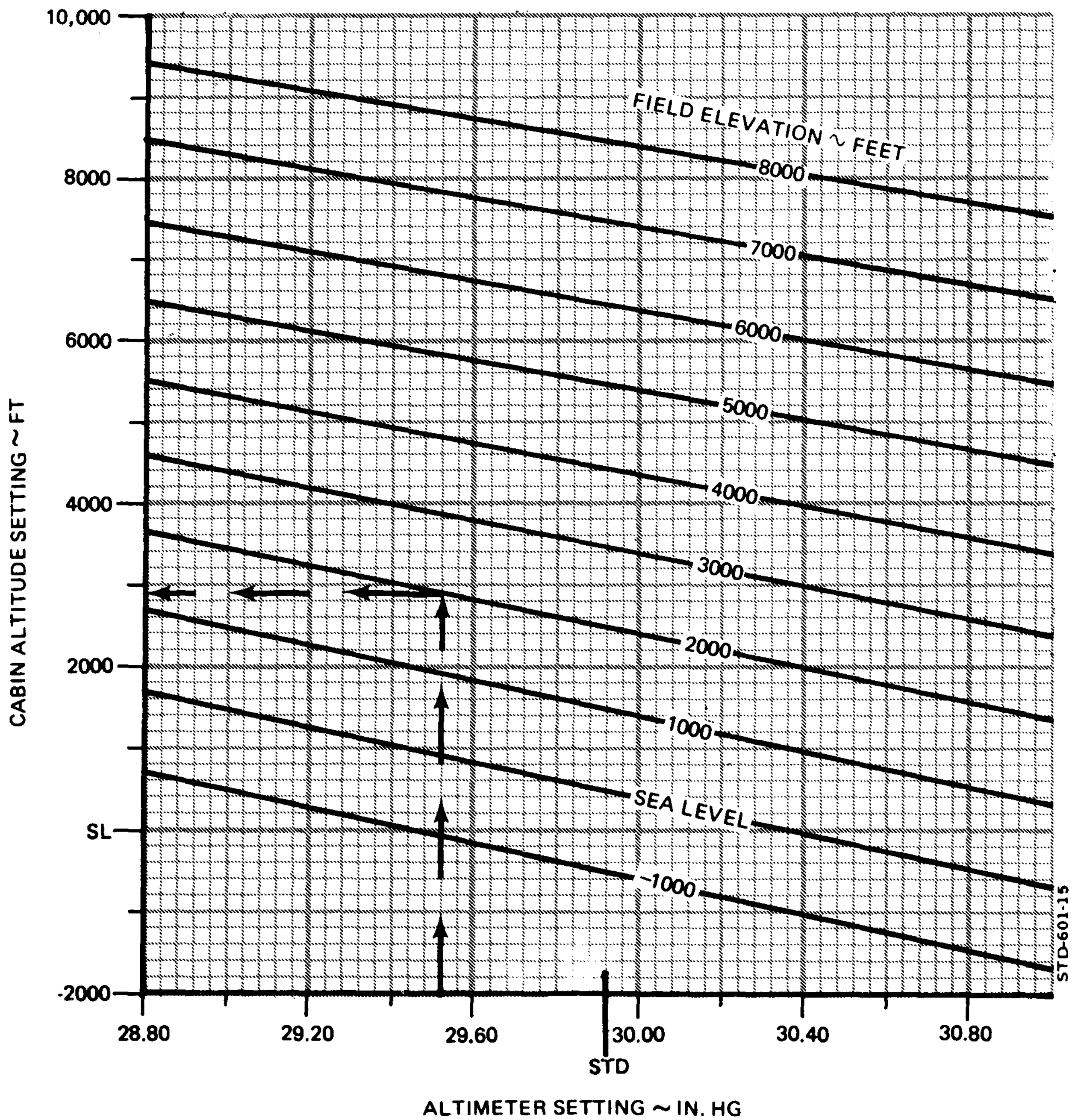
NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	55	52	1985	497	497	172	184	175	187	177	189
2000	51	48	1951	477	477	168	185	171	188	174	191
4000	47	44	1917	457	457	164	186	167	190	170	193
6000	43	40	1876	437	437	159	186	163	191	166	194
8000	40	36	1808	414	414	153	185	158	190	161	194
10,000	35	32	1724	390	390	146	182	151	188	155	193
12,000	31	28	1630	366	366	137	176	144	185	149	191
14,000	27	24	1534	342	342	124	165	135	180	142	188
16,000	23	20	1439	320	320	—	—	125	171	134	184
18,000	—	—	—	—	—	—	—	—	—	—	—
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

PRESSURIZATION CONTROLLER SETTING FOR LANDING

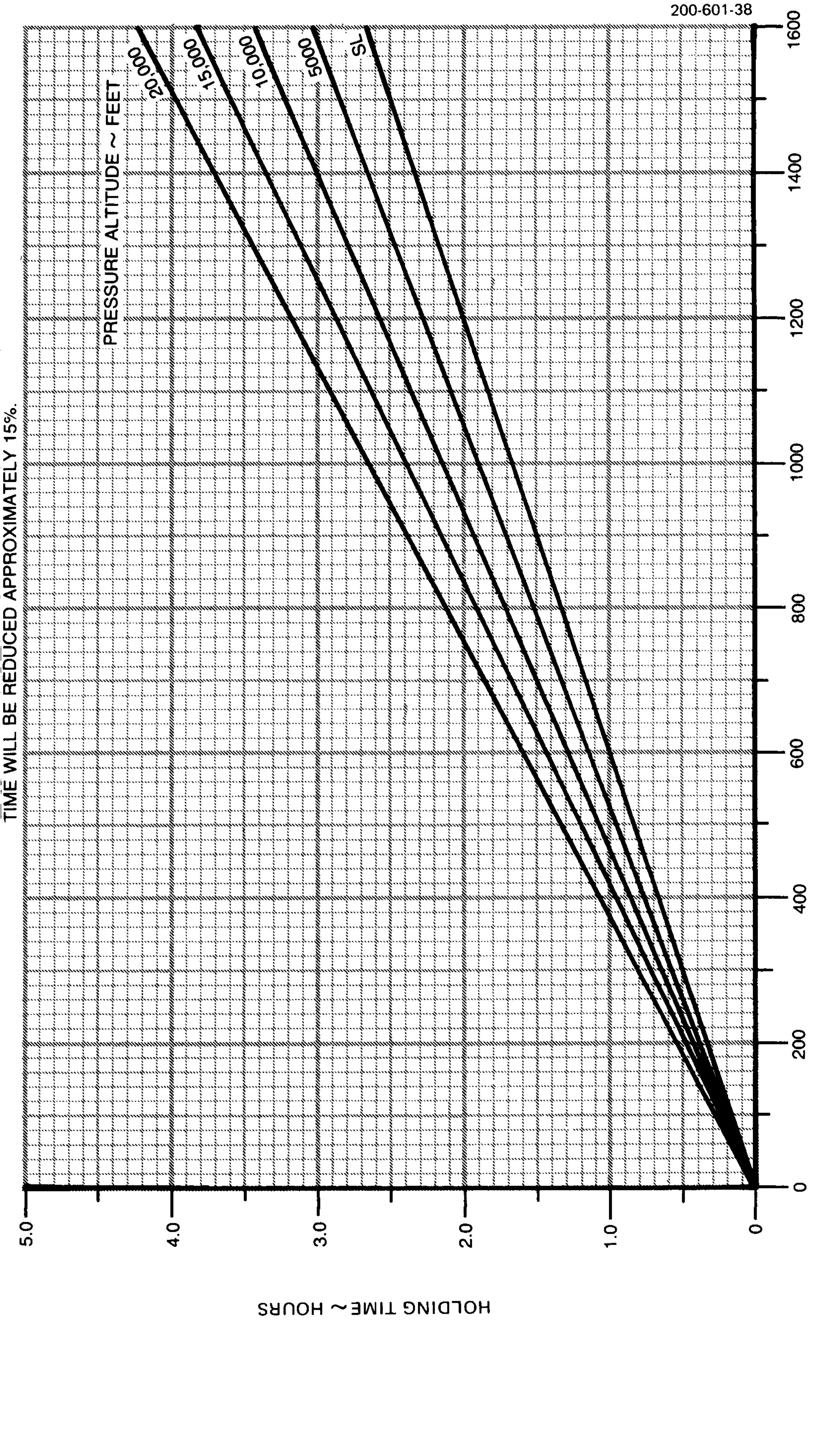
<u>EXAMPLE:</u>

ALTIMETER SETTING . . . . 29.52 In.Hg
LANDING FIELD ELEVATION. . 2000 FEET
CABIN ALTITUDE SETTING . . . 2885 FEET



HOLDING TIME

POWER SETTING
800 FT-LBS AT 1700 RPM
APPLICABLE FOR ALL TEMPERATURES
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, HOLDING TIME WILL BE REDUCED APPROXIMATELY 15%.



INTENTIONALLY LEFT BLANK

TIME, FUEL, AND DISTANCE TO DESCEND

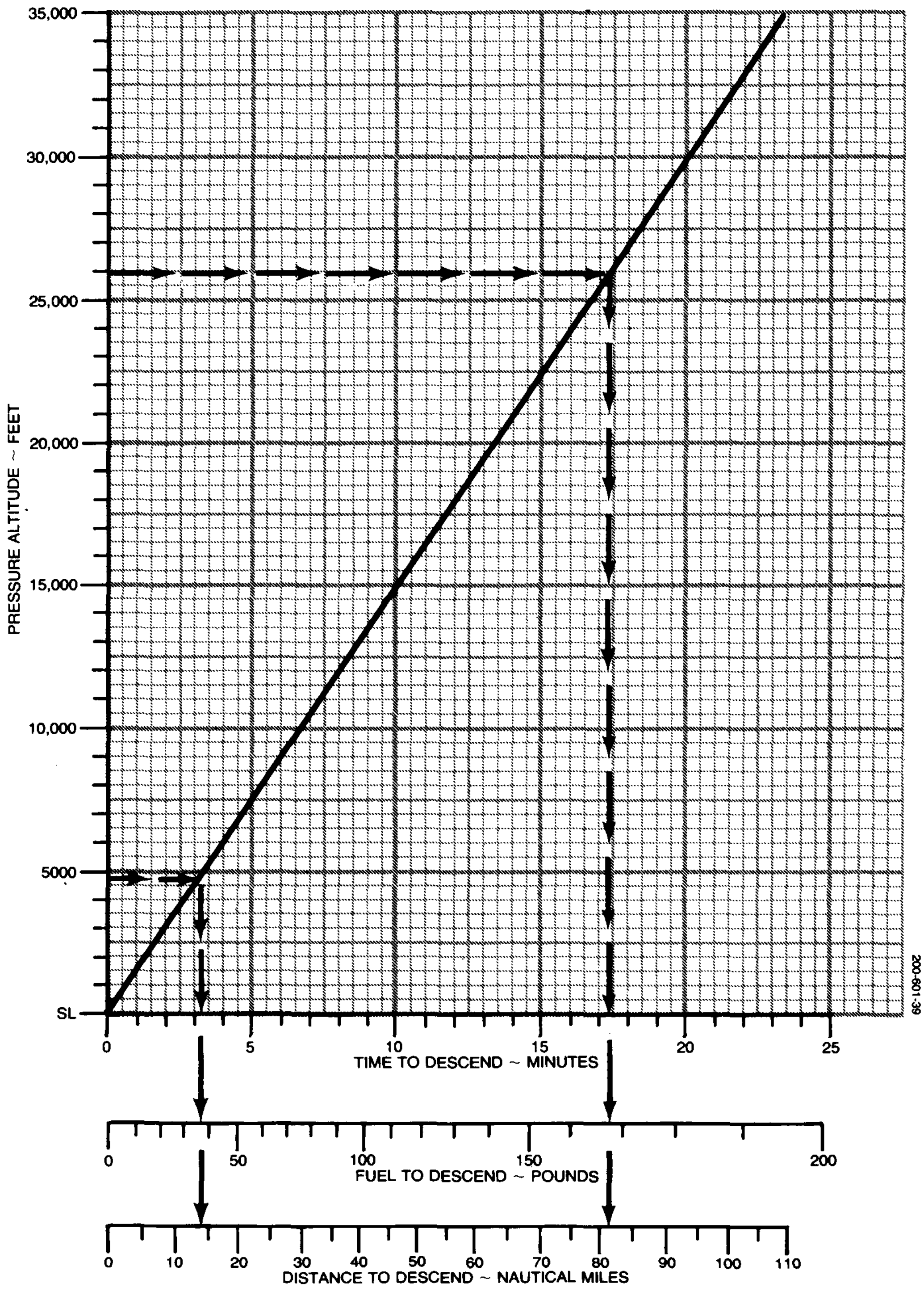
ASSOCIATED CONDITIONS:

POWER .... AS REQUIRED TO DESCEND AT 1500 FT/MIN
GEAR............ UP
FLAPS........... 0%

EXAMPLE:

INITIAL ALTITUDE .... 26,000 FEET
FINAL ALTITUDE .... 4730 FEET

TIME TO DESCEND (17-3) .... 14 MINUTES
FUEL TO DESCEND (168-36)............... 132 POUNDS
DISTANCE TO DESCEND (81-14)........ 67 NM



LANDING DISTANCE WITHOUT PROPELLER REVERSING — FLAPS 100%

ASSOCIATED CONDITIONS:

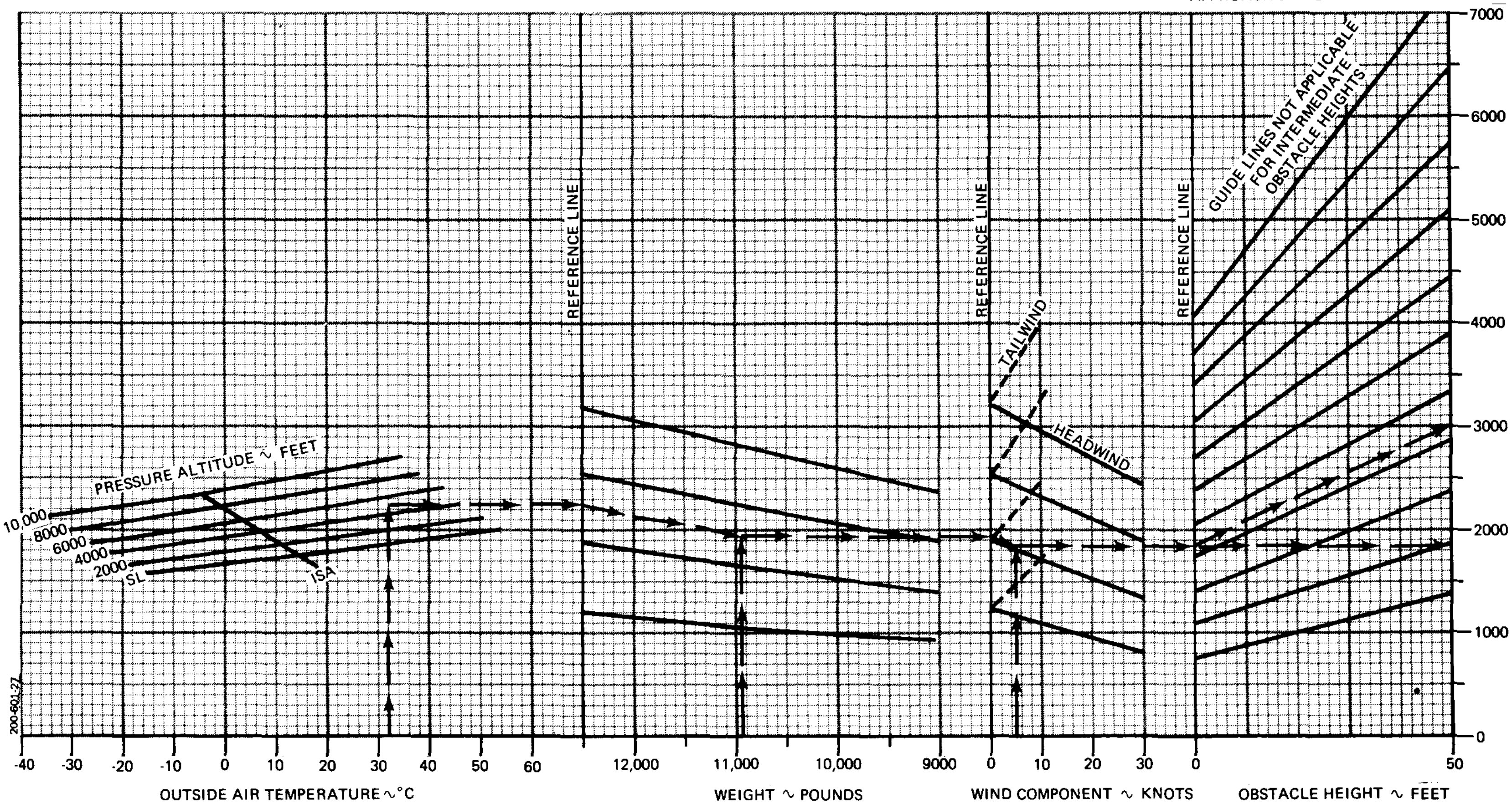
POWER . . . . RETARDED TO MAINTAIN 800 FT/MIN ON FINAL APPROACH
FLAPS 100%
RUNWAY . . . . PAVED, LEVEL, DRY SURFACE
APPROACH SPEED . . IAS AS TABULATED
BRAKING . . . . MAXIMUM

WEIGHT ~ POUNDS	APPROACH SPEED ~ KNOTS
12,500	103
12,000	102
11,000	99
10,000	96
9000	93

EXAMPLE:

OAT . . . . 32°C
PRESSURE ALTITUDE . . . . 4730 FT
LANDING WEIGHT . . . . 10,937 LBS
HEADWIND COMPONENT . . . . 4.7 KTS

GROUND ROLL . . . . 1850 FT
TOTAL OVER 50 FT OBSTACLE . . . 3000 FT
APPROACH SPEED . . . . 99 KNOTS



LANDING DISTANCE WITHOUT PROPELLER REVERSING

FLAPS 0%

ASSOCIATED CONDITIONS

POWER . . . . RETARDED TO MAINTAIN 900 FT/MIN ON FINAL APPROACH
PROPELLER CONTROLS . . . FULL FORWARD
FLAPS . . . . UP
RUNWAY. . . . . PAVED, LEVEL, DRY SURFACE
APPROACH SPEED . . . . . IAS AS TABULATED
BRAKING . . . . MAXIMUM

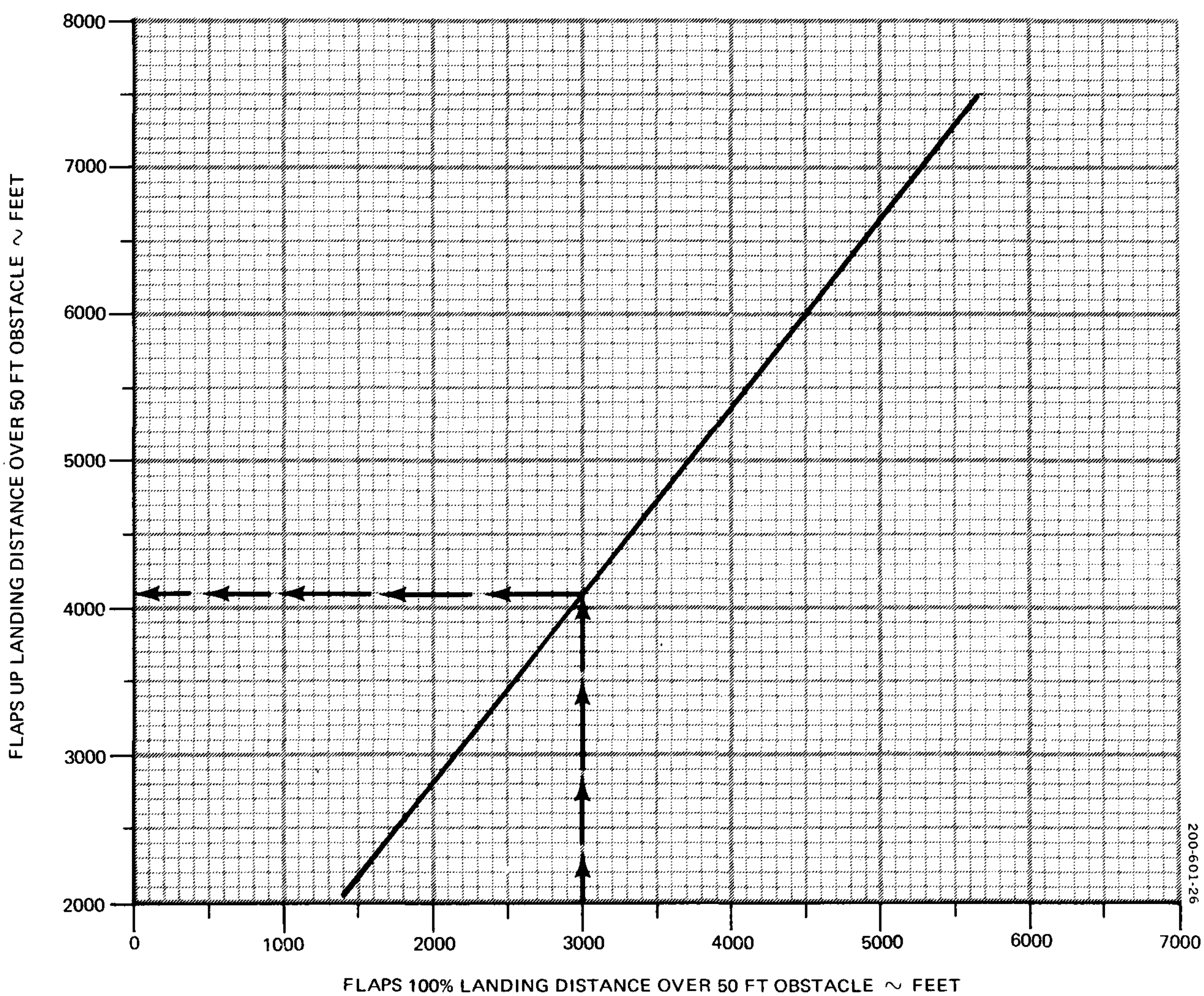
WEIGHT POUNDS	APPROACH SPEED ~ KNOTS
12,500	132
12,000	130
11,000	126
10,000	122
9000	117

EXAMPLE:

FLAPS 100 % LANDING DISTANCE OVER 50 FT OBSTACLE . . . . 3000 FT
LANDING WEIGHT 10,937LBS

FLAPS UP LANDING DISTANCE OVER 50 FT OBSTACLE . . . . 4100 FT
APPROACH SPEED . . . . . 126 KNOTS

NOTES:
1. LANDING WITH FLAPS FULL DOWN (100%) IS NORMAL PROCEDURE. USE THIS GRAPH WHEN IT IS NECESSARY TO LAND WITH FLAPS UP (0%).
2. TO DETERMINE FLAPS-UP LANDING DISTANCE, READ FROM THE **LANDING DISTANCE WITHOUT PROPELLER REVERSING – FLAPS 100%** GRAPH THE LANDING DISTANCE APPROPRIATE TO OAT, ALTITUDE, WEIGHT, WIND, AND 50-FT OBSTACLE. THEN ENTER THIS GRAPH WITH THE DERIVED VALUE AND READ THE FLAPS-UP LANDING DISTANCE.



LANDING DISTANCE WITH PROPELLER REVERSING — FLAPS 100%

ASSOCIATED CONDITIONS:

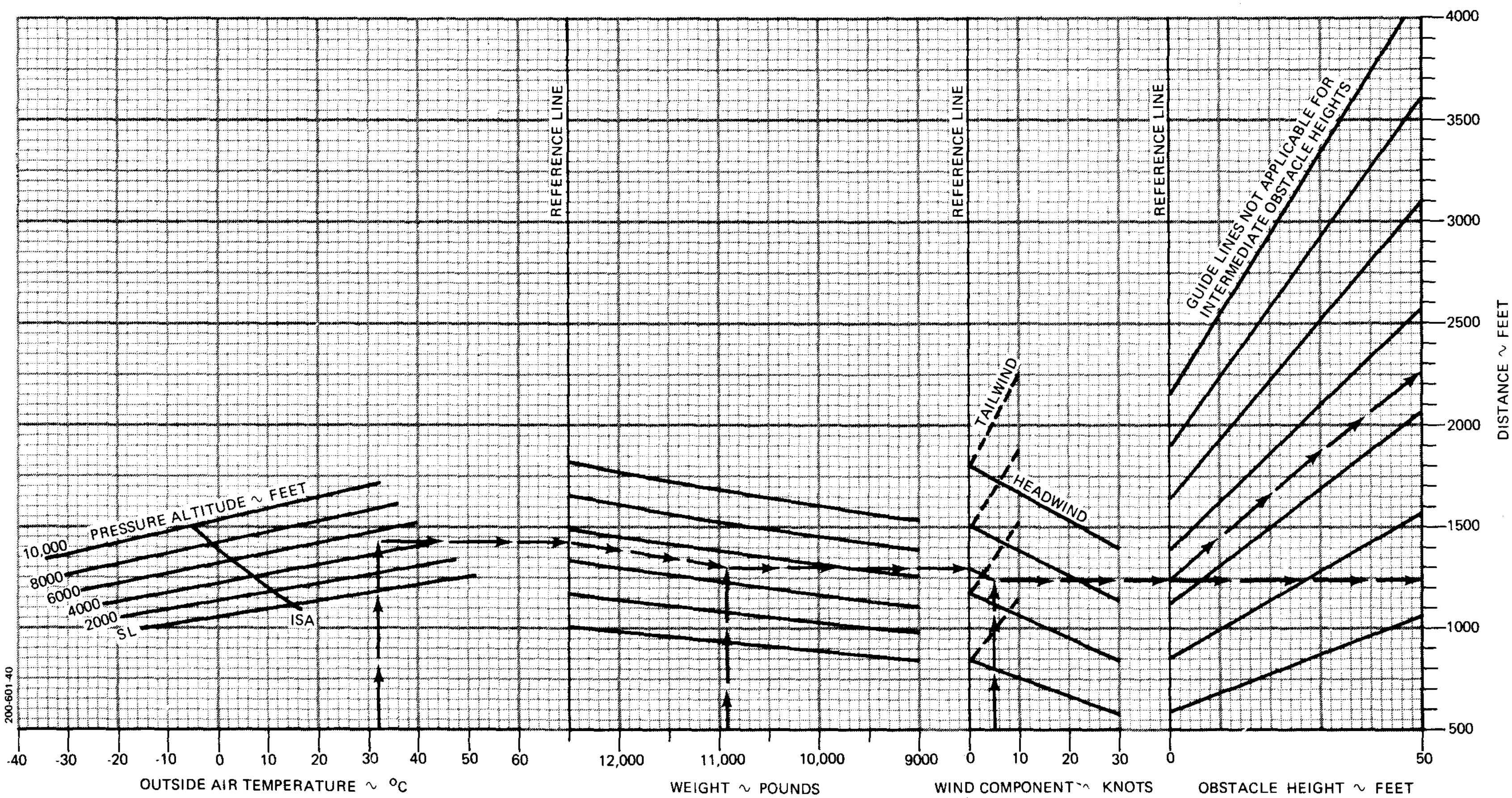
POWER . . . . RETARD TO MAINTAIN 1000 FT/MIN ON FINAL APPROACH
FLAPS 100%
RUNWAY . . . . PAVED, LEVEL, DRY SURFACE
APPROACH SPEED . . . . IAS AS TABULATED
BRAKING . . . . MAXIMUM
CONDITION LEVERS . . . . . . HIGH IDLE
PROPELLER CONTROLS . . . FULL FORWARD
POWER LEVERS . . . . MAXIMUM REVERSE AFTER TOUCHDOWN UNTIL FULLY STOPPED

WEIGHT ~ POUNDS	APPROACH SPEED ~ KNOTS
12,500	103
12,000	102
11,000	99
10,000	96
9000	93

EXAMPLE:

OAT . . . . 32°C
PRESSURE ALTITUDE . . . . 4730 FEET
LANDING WEIGHT . . . . . . 10,937 POUNDS
HEADWIND COMPONENT . . 4.7 KNOTS

GROUND ROLL . . . . 1240 FEET
TOTAL OVER 50 FOOT OBSTACLE . . . . . . 2260 FEET
APPROACH SPEED . . . . 99 KNOTS



LANDING DISTANCE WITH PROPELLER REVERSING

FLAPS 0%

ASSOCIATED CONDITIONS:

POWER . . . . RETARD TO MAINTAIN 1000 FT/MIN ON FINAL APPROACH
FLAPS . . . . UP
RUNWAY . . . . PAVED, LEVEL, DRY SURFACE
APPROACH SPEED . . . . . IAS AS TABULATED
BRAKING . . . . MAXIMUM
CONDITION LEVERS . . . HIGH IDLE
PROPELLER CONTROLS . FULL FORWARD
POWER LEVERS . . . . . . MAXIMUM REVERSE AFTER TOUCHDOWN

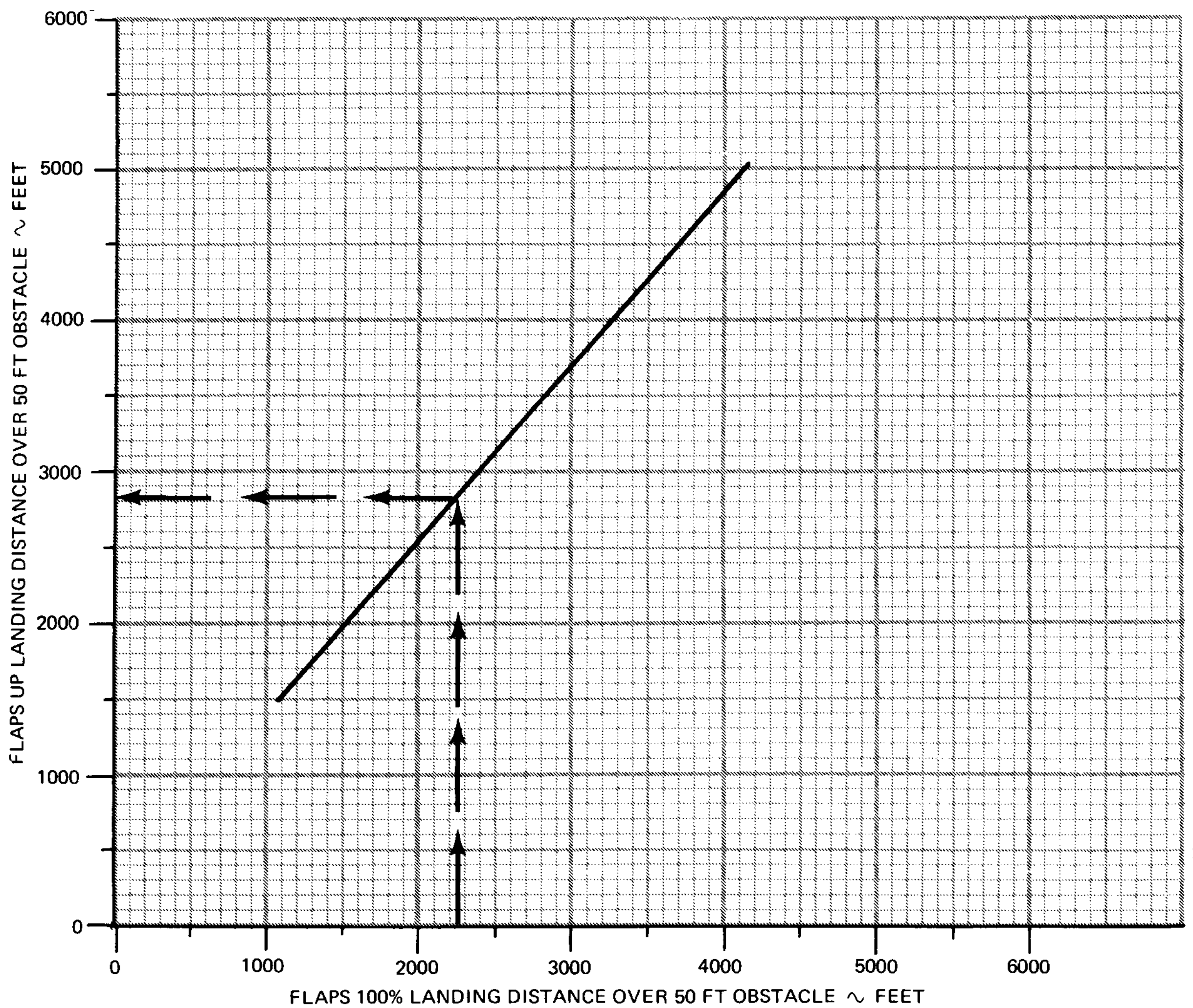
WEIGHT ∿ POUNDS	APPROACH SPEED ∿ KNOTS
12,500	132
12,000	130
11,000	126
10,000	122
9000	117

EXAMPLE:

FLAPS 100% LANDING DISTANCE OVER 50 FOOT OBSTACLE . . . . . 2260 FEET
LANDING WEIGHT . . . . . . 10,937 POUNDS

FLAPS UP LANDING DISTANCE OVER 50 FOOT OBSTACLE . . . . . 2820 FEET
APPROACH SPEED . . . . . . 126 KNOTS

NOTES:
1. LANDING WITH FLAPS FULL DOWN (100%) IS NORMAL PROCEDURE. USE THIS GRAPH WHEN IT IS NECESSARY TO LAND WITH FLAPS UP (0%).
2. TO DETERMINE FLAPS-UP LANDING DISTANCE, READ FROM THE **LANDING DISTANCE WITH PROPELLER REVERSING – FLAPS 100%** GRAPH THE LANDING DISTANCE APPROPRIATE TO OAT, ALTITUDE, WEIGHT, WIND, AND 50-FT OBSTACLE. THEN ENTER THIS GRAPH WITH THE DERIVED VALUE AND READ THE FLAPS-UP LANDING DISTANCE.



SECTION VI

WEIGHT AND BALANCE / EQUIPMENT LIST

DATE ____________________

SERIAL ____________________

REGISTRATION NO. ____________

TABLE OF CONTENTS

NOTE

The 1979 Model Year began with airplane serials BB-310, BB-343, BB-383, BB-415, BB-416, BB-418 thru BB-448, BB-450 and after.

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 jack points. Three jack points are provided: one on the nose section of the fuselage at station 83.5, and one on each wing center section rear spar at station 225.5. 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 unusable fuel remains in the airplane at an arm of 188.0 inches. The remainder of the unusable fuel to be added to a drained system is 33.5 pounds at station 164.0. If the airplane is weighed with full fuel the fuel specific weight (pounds/-gallon) should be determined by using a hydrometer. Compute total fuel weight and moment using fuel tables.

3. Engine oil must be at the full level in each tank. Total engine oil aboard when both tanks are full is 62 pounds at an arm of 131.0 inches.

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 in level attitude. Leveling screws are located on the fuselage entrance door frame. Leveling is accomplished with a plumb bob. 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 amounts of air in the shocks and tires.

6. Measurement of the reaction arms for a wheel weighing is made using the nose jacking point for a reference. Using a steel measuring tape, measurements are taken with the airplane level on the scales from the reference (a plumb bob hung from the center of the nose jacking point) to the axle center line of the nose gear and then from the nose gear axle center line to the main wheel 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 hangar floor and parallel to the fuselage center line. The locations of the wheel reactions will be approximately at an arm of 209 inches for main wheels and 30 inches 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, i.e., usable fuel. Unusable fuel and engine oil are added if not already in the airplane.

8. Weighing should always be made in an enclosed area which is free from air currents. The scales used should be properly calibrated and certified in accordance with the Bureau of Standards.

BASIC EMPTY WEIGHT AND BALANCE

DATE: ____________

SERIAL NO: ____________

REGISTRATION NO: ____________

PREPARED BY:

STRUT POSITION -	NOSE	MAIN
EXTENDED	29.4	208.5
COMPRESSED	30.8	210.5

JACK POINT LOCATION	
FORWARD	83.5
AFT	225.5

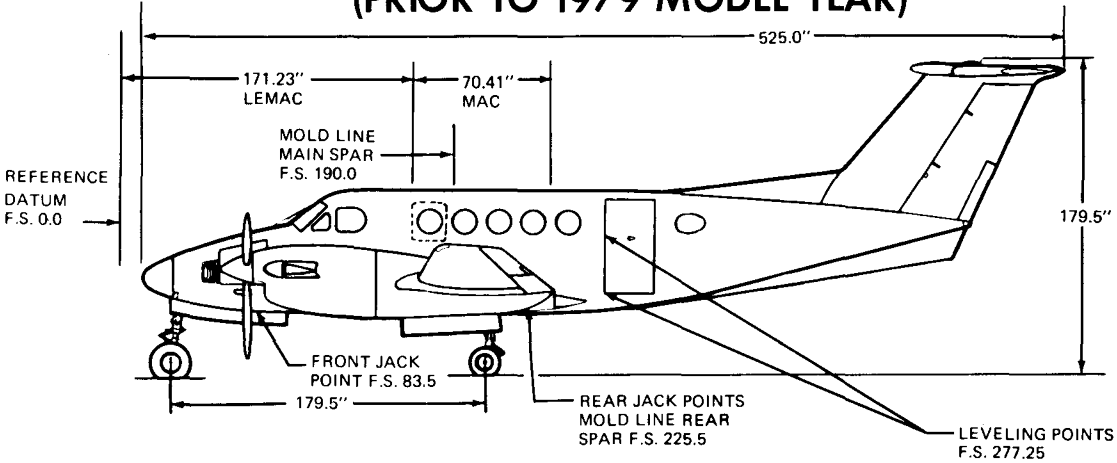
REACTION WHEEL - JACK POINTS	SCALE READING	TARE	NET WEIGHT	STATION OR ARM	MOMENT
LEFT MAIN					
RIGHT MAIN					
SUB TOTAL					
NOSE					
TOTAL (AS WEIGHED)					

SPACE BELOW PROVIDED FOR ADDITIONS AND SUBTRACTIONS TO AS WEIGHED CONDITION

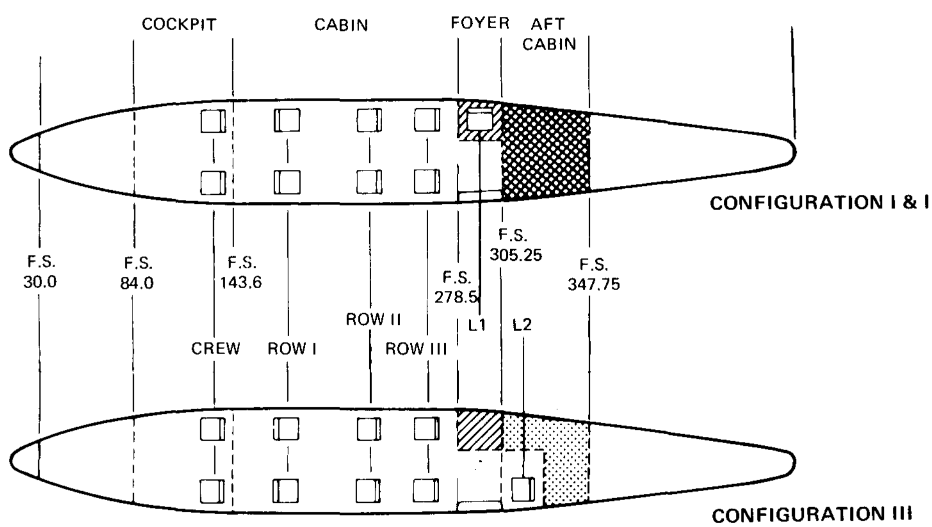
EMPTY WEIGHT			
ENGINE OIL	62	131	8122
UNUSABLE FUEL	44	170	7480
BASIC EMPTY WEIGHT			

200-601-7

DIMENSIONAL AND LOADING DATA
(PRIOR TO 1979 MODEL YEAR)



STANDARD SEATING



OCCUPANT	CENTROID
CREW	F.S. 129.0
ROW I	F.S. 174.0
ROW II	F.S. 220.0
ROW III	F.S. 254.0
L1	F.S. 292.0
L2	F.S. 314.0

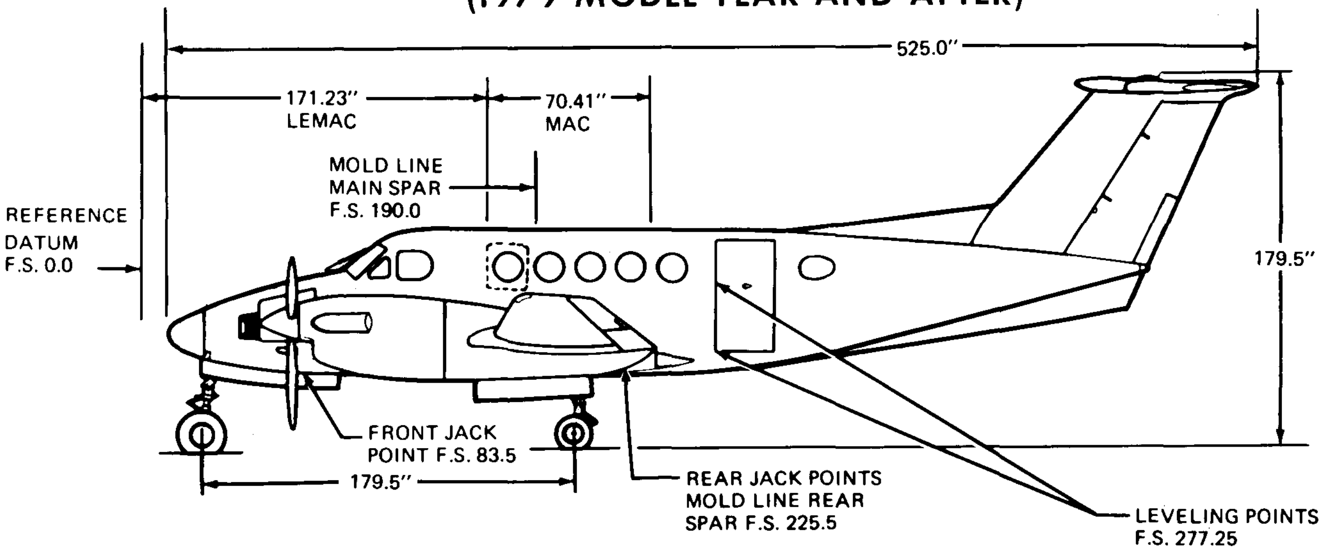
CONFIGURATION	BAGGAGE COMPARTMENT	BAGGAGE CAPACITY	CENTROID
I - SIDE PASSENGER SEAT AND TOILET	FOYER	150	F.S. 292.0
	AFT CABIN	410	F.S. 325.0
II - SIDE TOILET	FOYER	150	F.S. 292.0
	AFT CABIN	410	F.S. 325.0
III - AFT PASSENGER SEAT AND TOILET	FOYER	150	F.S. 292.0
	AFT CABIN	200 & 370 *	F.S. 332.0 & 325.0

NOTE: Loading data for standard configurations only.
** Increase aft baggage to 370 pounds when compartment is not occupied by a passenger. Foyer is not equipped for loose baggage; clothing on hangers may be hung from the rod provided.*

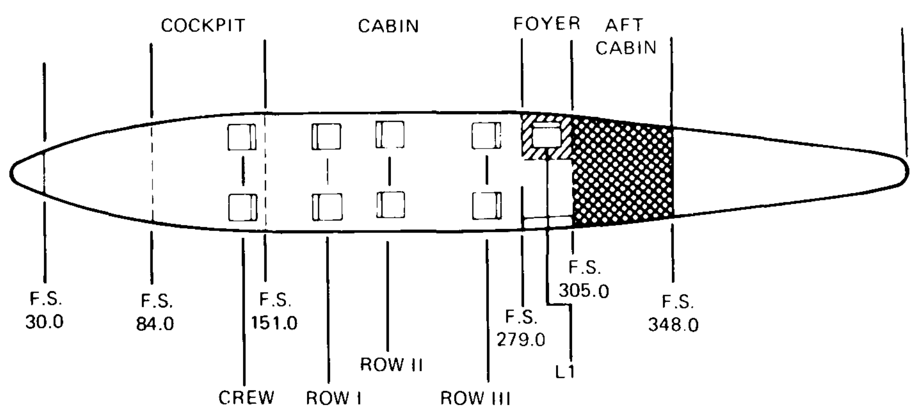
200-603-8

DIMENSIONAL AND LOADING DATA

(1979 MODEL YEAR AND AFTER)



STANDARD SEATING



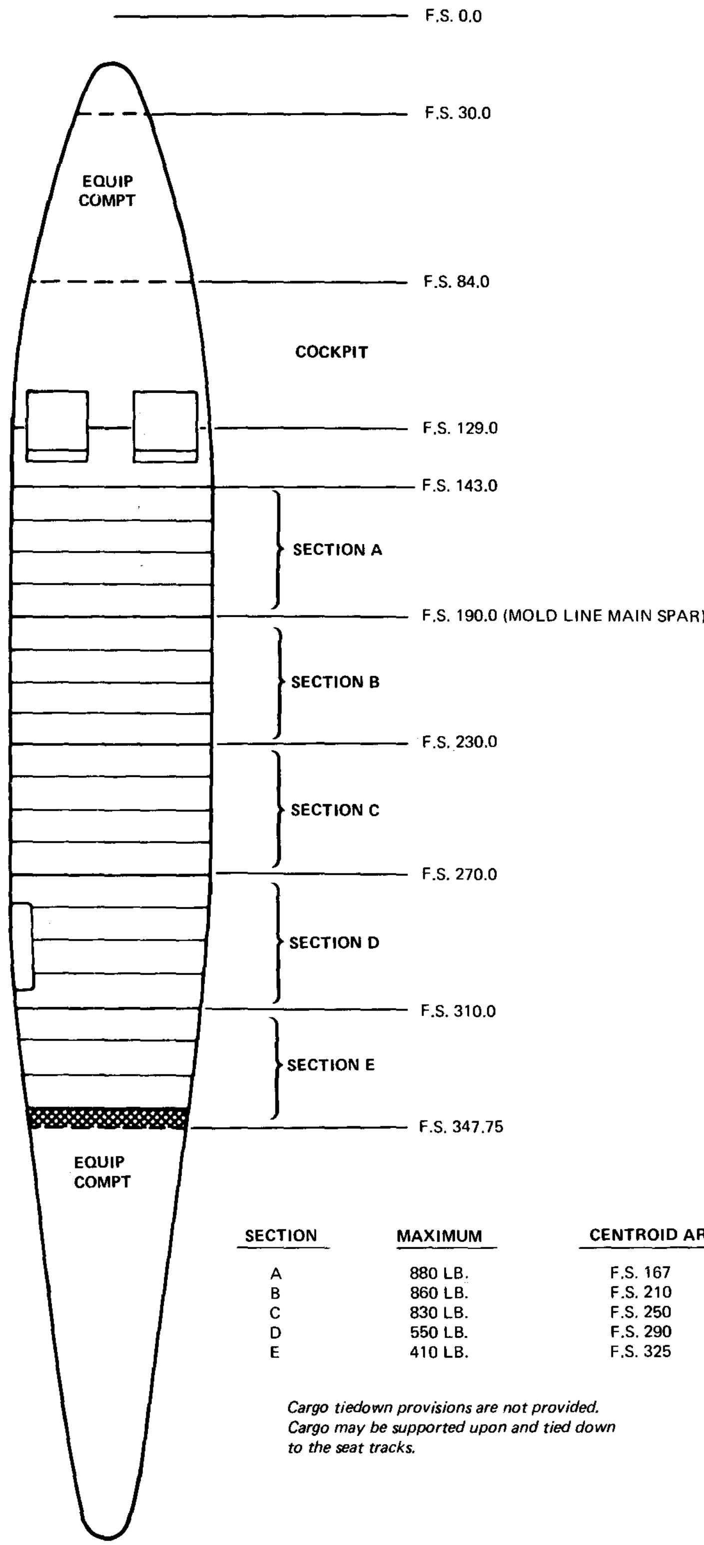
OCCUPANT	CENTROID
CREW	F.S. 129.0
ROW I	F.S. 176 0
ROW II	F.S. 215.0
ROW III	F.S. 259.0
L1	F.S. 292.0

CONFIGURATION	BAGGAGE COMPARTMENT	BAGGAGE CAPACITY	CENTROID
SIDE PASSENGER SEAT AND TOILET	*FOYER —	150	F.S. 292.0
	AFT CABIN —	410	F.S. 325.0

*NOTE:*Loading data for standard configurations only.*
Foyer is not equipped for loose baggage; clothing on hangers may be hung from the rod provided.

200-603-28

LOADING DATA
CARGO CONFIGURATION

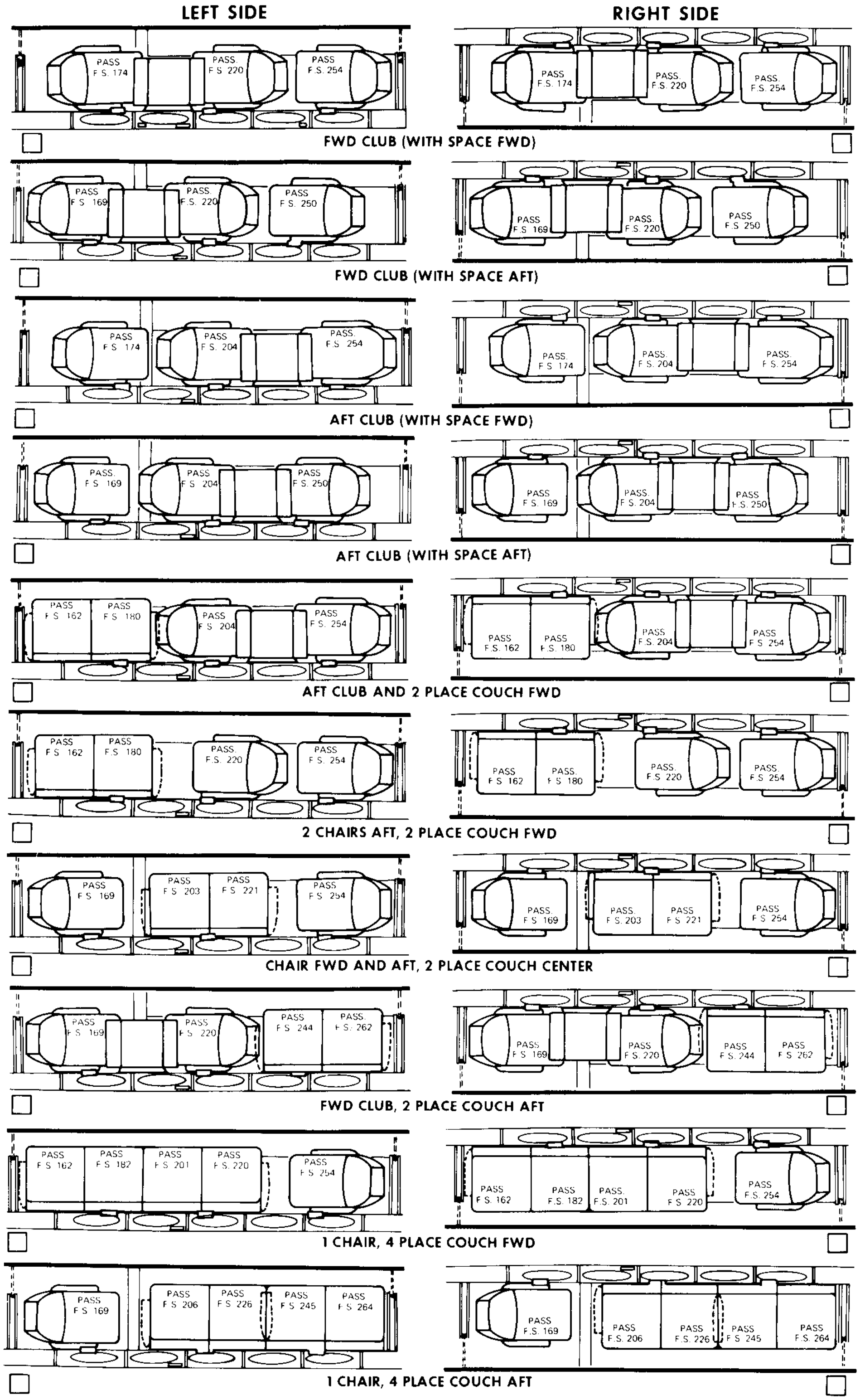


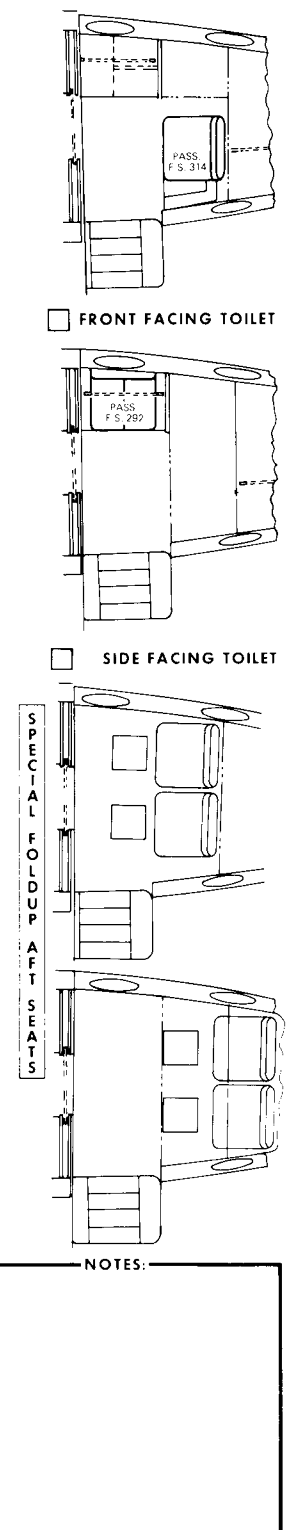
SECTION	MAXIMUM	CENTROID ARM
A	880 LB.	F.S. 167
B	860 LB.	F.S. 210
C	830 LB.	F.S. 250
D	550 LB.	F.S. 290
E	410 LB.	F.S. 325

Cargo tiedown provisions are not provided. Cargo may be supported upon and tied down to the seat tracks.

200-603-7

CABIN ARRANGEMENT DIAGRAM
(PRIOR TO 1979 MODEL YEAR)



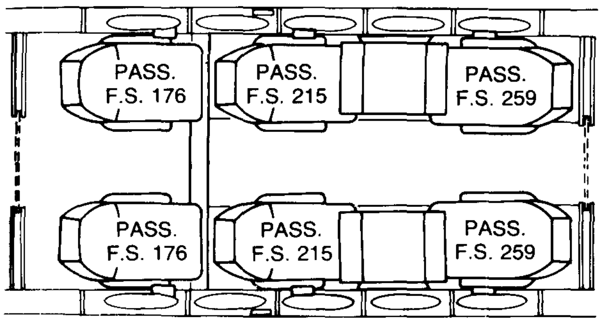


NOTES:

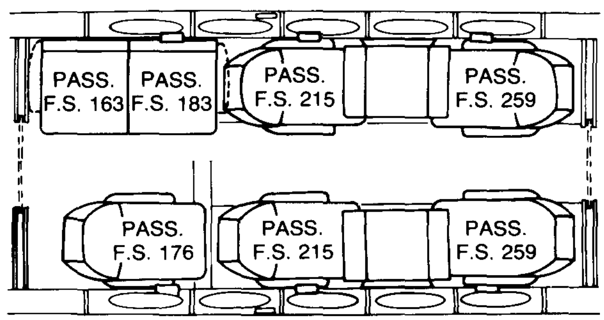
200-605-7

The cabin seating may be arranged in different combinations. The diagrams marked ☒ above represent the seating arrangement established for this airplane prior to delivery. The passenger locations shown on the designated diagram are averages. Additional data for modified arrangements are noted. No diagrams are included for Hi-density versions.

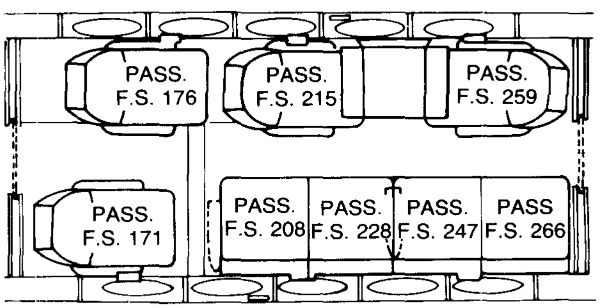
CABIN ARRANGEMENT DIAGRAM (1979 MODEL YEAR AND AFTER)



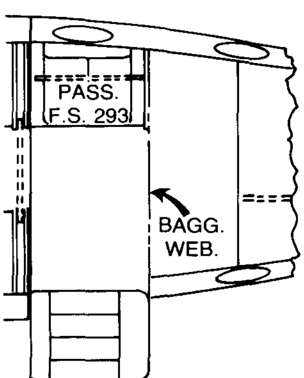
☐



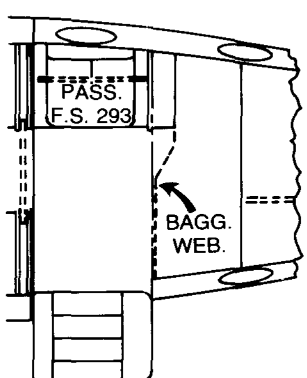
☐



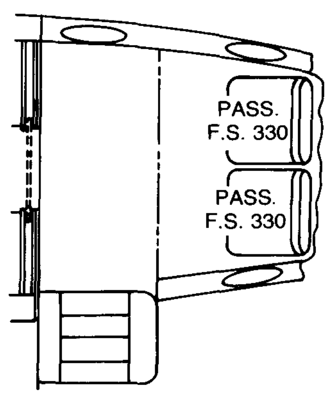
☐



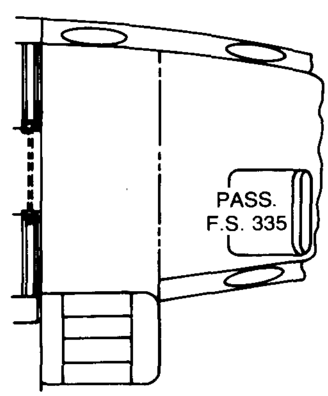
☐ SIDE FACING TOILET



☐ SIDE FACING TOILET WITH VANITY



☐ AFT FOLD UP SEATS



☐ FRONT FACING TOILET

NOTES:

The cabin seating may be arranged in different combinations. The diagrams marked ☒ above represent the seating arrangement established for this airplane prior to delivery. The passenger locations shown on the designated diagram are averages. Additional data for modified arrangements are noted. No diagrams are included for Hi-density versions.

200-603-29

USEFUL LOAD WEIGHTS AND MOMENTS

OCCUPANTS

USE COLUMNS MARKED X →	CREW	CHAIR POSITIONS					
	F.S. 129	F.S. 169	F.S. 174	F.S. 204	F.S. 220	F.S. 250	F.S. 254
WEIGHT	MOMENT/100						
80	103	135	139	163	176	200	203
90	116	152	157	184	198	225	229
100	129	169	174	204	220	250	254
110	142	186	191	224	242	275	279
120	155	203	209	245	264	300	305
130	168	220	226	265	286	325	330
140	181	237	244	286	308	350	356
150	194	254	261	306	330	375	381
160	206	270	278	326	352	400	406
170	219	287	296	347	374	425	432
180	232	304	313	367	396	450	457
190	245	321	331	388	418	475	483
200	258	338	348	408	440	500	508
210	271	355	365	428	462	525	533
220	284	372	383	449	484	550	559
230	297	389	400	469	506	575	584
240	310	406	418	490	528	600	610

OCCUPANTS

USE COLUMNS MARKED X →	AFT FOLD UP SEATS		LAVATORY SEAT		
	F.S. 316	F.S. 330	F.S. 292	F.S. 314	F.S. 335
WEIGHT	MOMENT/100				
80	253	264	234	251	268
90	284	297	263	283	302
100	316	330	292	314	335
110	348	363	321	345	369
120	379	396	350	377	402
130	411	429	380	408	436
140	442	462	409	440	469
150	474	495	438	471	503
160	506	528	467	502	536
170	537	561	496	534	570
180	569	594	526	565	603
190	600	627	555	597	637
200	632	660	584	628	670
210	664	693	613	659	704
220	695	726	642	691	737
230	727	759	672	722	771
240	758	792	701	754	804

USEFUL LOAD WEIGHTS AND MOMENTS

OCCUPANTS

USE COLUMNS MARKED X ➡	FOUR PLACE COUCH							
	FORWARD POSITION				AFT POSITION			
	F.S. 162	F.S. 182	F.S. 201	F.S. 220	F.S. 206	F.S. 226	F.S. 245	F.S. 264
WEIGHT	MOMENT/100							
80	130	146	161	176	165	181	196	211
90	146	164	181	198	185	203	221	238
100	162	182	201	220	206	226	245	264
110	178	200	221	242	227	249	270	290
120	194	218	241	264	247	271	294	317
130	211	237	261	286	268	294	319	343
140	227	255	281	308	288	316	343	370
150	243	273	302	330	309	339	368	396
160	259	291	322	352	330	362	392	422
170	275	309	342	374	350	384	417	449
180	292	328	362	396	371	407	441	475
190	308	346	382	418	391	429	466	502
200	324	364	402	440	412	452	490	528
210	340	382	422	462	433	475	515	554
220	356	400	442	484	453	497	539	581
230	373	419	462	506	474	520	564	607
240	389	437	482	528	494	542	588	634

OCCUPANTS

USE COLUMNS MARKED X ➡	TWO PLACE COUCH					
	FORWARD		CENTER		AFT	
	F.S. 162	F.S. 180	F.S. 203	F.S. 221	F.S. 244	F.S. 262
WEIGHT	MOMENT/100					
80	130	144	162	177	195	210
90	146	162	183	199	220	236
100	162	180	203	221	244	262
110	178	198	223	243	268	288
120	194	216	244	265	293	314
130	211	234	264	287	317	341
140	227	252	284	309	342	367
150	243	270	305	332	366	393
160	259	288	325	354	390	419
170	275	306	345	376	415	445
180	292	324	365	398	439	472
190	308	342	386	420	464	498
200	324	360	406	442	488	524
210	340	378	426	464	512	550
220	356	396	447	486	537	576
230	373	414	467	508	561	603
240	389	432	487	530	586	629

USEFUL LOAD WEIGHTS AND MOMENTS

OCCUPANTS

USE COLUMNS MARKED X ♦	CREW	CHAIR POSITIONS				LAVATORY SEAT	
	F.S. 129	F.S. 171	F.S. 176	F.S. 215	F.S. 259	F.S. 293	F.S. 335
WEIGHT	MOMENT/100						
80	103	137	141	172	207	234	268
90	116	154	158	194	233	264	302
100	129	171	176	215	259	293	335
110	142	188	194	237	285	322	369
120	155	205	211	258	311	352	402
130	168	222	229	280	337	381	436
140	181	239	246	301	363	410	469
150	194	257	264	323	389	440	503
160	206	274	282	344	414	469	536
170	219	291	299	366	440	498	570
180	232	308	317	387	466	527	603
190	245	325	334	409	492	557	637
200	258	342	352	430	518	586	670
210	271	359	370	452	544	615	704
220	284	376	387	473	570	645	737
230	297	393	405	495	596	674	771
240	310	410	422	516	622	703	804

OCCUPANTS

USE COLUMNS MARKED X ♦	TWO PLACE COUCH FORWARD POSITION		FOUR PLACE COUCH AFT POSITION				AFT FOLD UP SEATS
	F.S. 163	F.S. 183	F.S. 208	F.S. 228	F.S. 247	F.S. 266	F.S. 330
WEIGHT	MOMENT/100						
80	130	146	166	182	198	213	264
90	147	165	187	205	222	239	297
100	163	183	208	228	247	266	350
110	179	201	229	251	272	293	363
120	196	220	250	274	296	319	396
130	212	238	270	296	321	346	429
140	228	256	291	319	346	372	462
150	245	275	312	342	371	399	495
160	261	293	333	365	395	426	528
170	277	311	354	388	420	452	561
180	293	329	374	410	445	479	574
190	310	348	395	433	469	505	627
200	326	366	416	456	494	532	660
210	342	384	437	479	519	559	693
220	359	403	458	502	543	585	726
230	375	421	478	524	568	612	759
240	391	439	499	547	593	638	792
250	408	458	520	570	618	665	825

USEFUL LOAD WEIGHTS AND MOMENTS

BAGGAGE

WEIGHT	(Clothing on Hangers) FOYER F.S. 292	AFT CABIN F.S. 325 CONFIGURATIONS I & II *	AFT CABIN F.S. 332 CONFIGURATION III *
	MOMENT/100		
10	29	33	33
20	58	65	66
30	88	98	100
40	117	130	133
50	146	163	166
60	175	195	199
70	204	228	232
80	234	260	266
90	263	293	299
100	292	325	332
200		650	664
300		975	
370		1203	
400		1300	
410		1333	

* SEE CABIN ARRANGEMENT DIAGRAM

CABINET CONTENTS

WEIGHT	CHART CASES F.S. 145	FORWARD CABINET F.S. 155	AFT CABINET F.S. 270	FOYER CABINET F.S. 284	COUCH DRAWERS F.S. 171	COUCH DRAWERS F.S. 212	COUCH DRAWERS F.S. 253
	MOMENT/100						
10	14	16	27	28	17	21	25
20	29	31	54	57	34	42	51
30	44	47	81	85	51	64	76
40	58	62	108	114			
50	72	78	135	142			
60		93	162	170			
70		109	189	199			
80		124	216	227			
90		140	243	256			
100		155	270	284			

NOTE: Weight and Moment/100 of Cabinet Contents must be included in all loading computations.

USEFUL LOAD WEIGHTS AND MOMENTS

CARGO COMPARTMENT*

WEIGHT	A *F.S. 143-190*	B *F.S. 190-230*	C *F.S. 230-270*	D *F.S. 270-310*	E *F.S. 310-348*
	CENTROID				
	F.S. 167	*F.S. 210*	*F.S. 250*	*F.S. 290*	*F.S. 325*
	MOMENT/100				
10	17	21	25	29	33
20	33	42	50	58	65
30	50	63	75	87	98
40	67	84	100	116	130
50	84	105	125	145	163
60	100	126	150	174	195
70	117	147	175	203	228
80	134	168	200	232	260
90	150	189	225	261	293
100	167	210	250	290	325
200	334	420	500	580	650
300	501	630	750	870	975
400	668	840	1000	1160	1300
410	685	861	1025	1189	1333
500	835	1050	1250	1450	
550	919	1155	1375	1595	
600	1002	1260	1500		
700	1169	1470	1750		
800	1336	1680	2000		
830	1386	1743	2075		
860	1436	1806			
880	1470				

NOTE: All cargo must be supported by the seat tracks in a uniform distribution and tied down to the tracks by an FAA approved method.

*Refer to LOADING DATA CARGO CONFIGURATION,

CABINET CONTENTS

USE COLUMNS MARKED X ➧	CHART CASES	FORWARD CABINET	MIDDLE CABINET	AFT CABINET	COUCH DRAWERS		
	F.S. 148	F.S. 158	F.S. 196	F.S. 272	F.S. 173		
WEIGHT	MOMENT/100						
10	15	16	20	27	17		
20	30	32	39	54	35		
30	44	47	59	82	52		
40	59	63	78	109			
50	74	79					
60		95					
70		111					
80		126					
90		142					
100		158					

NOTE: Weight and Moment/100 of Cabinet Contents must be included in all loading computations.

USEFUL LOAD WEIGHTS AND MOMENTS

USABLE FUEL

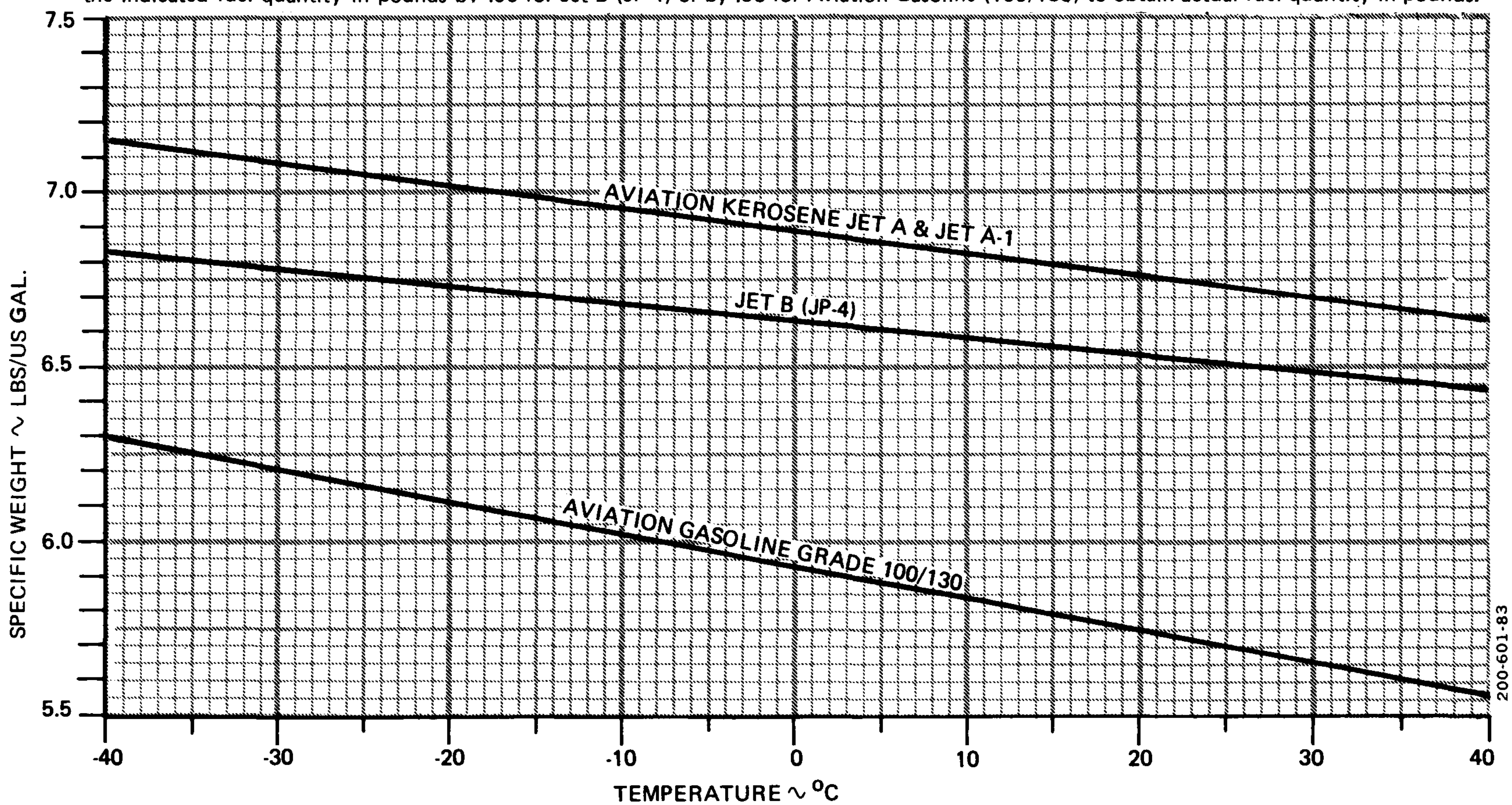
GALLONS	6.4 LB/GAL WEIGHT	6.4 LB/GAL MOMENT/100	6.5 LB/GAL WEIGHT	6.5 LB/GAL MOMENT/100	6.6 LB/GAL WEIGHT	6.6 LB/GAL MOMENT/100	6.7 LB/GAL WEIGHT	6.7 LB/GAL MOMENT/100
10	64	99	65	100	66	102	67	103
20	128	197	130	200	132	203	134	206
30	192	305	195	310	198	314	201	319
40	256	423	260	430	264	436	268	443
50	320	542	325	550	330	559	335	567
60	384	662	390	672	396	683	402	693
70	448	782	455	794	462	807	469	819
80	512	904	520	918	528	932	536	946
90	576	1023	585	1039	594	1055	603	1071
100	640	1142	650	1160	660	1178	670	1196
110	704	1260	715	1280	726	1300	737	1319
120	768	1379	780	1400	792	1422	804	1443
130	832	1496	845	1519	858	1543	871	1566
140	896	1615	910	1640	924	1665	938	1690
150	960	1734	975	1761	990	1788	1005	1815
160	1024	1852	1040	1881	1056	1910	1072	1939
170	1088	1971	1105	2002	1122	2033	1139	2064
180	1152	2090	1170	2122	1188	2155	1206	2188
190	1216	2209	1235	2244	1254	2279	1273	2313
200	1280	2328	1300	2365	1320	2401	1340	2437
210	1344	2447	1365	2486	1386	2524	1407	2562
220	1408	2567	1430	2607	1452	2647	1474	2687
230	1472	2686	1495	2728	1518	2770	1541	2812
240	1536	2806	1560	2850	1584	2894	1608	2938
250	1600	2926	1625	2971	1650	3017	1675	3063
260	1664	3045	1690	3093	1716	3140	1742	3188
270	1728	3164	1755	3213	1782	3263	1809	3312
280	1792	3283	1820	3334	1848	3386	1876	3437
290	1856	3402	1885	3455	1914	3508	1943	3562
300	1920	3521	1950	3576	1980	3631	2010	3686
310	1984	3641	2015	3698	2046	3754	2077	3811
320	2048	3760	2080	3819	2112	3878	2144	3936
330	2112	3880	2145	3940	2178	4001	2211	4062
340	2176	3999	2210	4062	2244	4124	2278	4187
350	2240	4119	2275	4184	2310	4248	2345	4312
360	2304	4244	2340	4310	2376	4377	2412	4443
370	2368	4365	2405	4434	2442	4502	2479	4570
380	2432	4489	2470	4560	2508	4630	2546	4700
386	2470	4562	2509	4634	2548	4706	2586	4776
400	2560	4741	2600	4815	2640	4889	2680	4963
410	2624	4869	2665	4945	2706	5021	2747	5097
420	2688	4997	2730	5075	2772	5153	2814	5231
430	2752	5126	2795	5206	2838	5286	2881	5366
440	2816	5255	2860	5337	2904	5419	2948	5501
450	2880	5386	2925	5470	2970	5554	3015	5638
460	2944	5514	2990	5600	3036	5686	3082	5773
470	3008	5645	3055	5733	3102	5821	3149	5909
480	3072	5775	3120	5866	3168	5956	3216	6046
490	3136	5907	3185	5999	3234	6091	3283	6184
500	3200	6040	3250	6134	3300	6229	3350	6323
510	3264	6172	3315	6269	3366	6365	3417	6462
520	3328	6307	3380	6405	3432	6504	3484	6602
530	3392	6441	3445	6542	3498	6643	3551	6743
540	3456	6573	3510	6676	3564	6779	3618	6881
544	3482	6626	3536	6729	3590	6832	3645	6936

DENSITY VARIATION OF AVIATION FUEL

BASED ON AVERAGE SPECIFIC GRAVITY

FUEL	AVERAGE SPECIFIC GRAVITY AT 15°C (59°F)
AVIATION KEROSENE JET A AND JET A1	.812
JET B (JP-4)	.785
AV GAS GRADE 100/130	.703

NOTE: The Fuel Quantity Indicator is calibrated for correct indication when using Aviation Kerosene Jet A and Jet A1. When using other fuels, multiply the indicated fuel quantity in pounds bv .99 for Jet B (JP-4) or by .98 for Aviation Gasoline (100/130) to obtain actual fuel quantity in pounds.



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 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 form. Useful load items which may be loaded into the airplane are shown on the Useful Load Weight and Moment tables. The minimum and maximum moments approved by the FAA are shown on the Moment Limits vs Weight graph or table. These moments correspond to the forward and aft center of gravity flight limits (landing gear down) for a particular weight. 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 10,400 pounds. All weight in excess of this limitation must be fuel. The auxiliary tanks may be used only when the main tanks are completely filled. The total take-off weight must not exceed the maximum allowable take-off weight and the total moment must be within the minimum and maximum moments shown on the Moment Limits Vs. Weight table or graph.

4. Using the page titled Useful Load Weights and Moments - Usable Fuel, determine the weight and corresponding moment of fuel to be used by subtracting the amount on board on landing from the amount on board at takeoff.

5. For landing configuration weight and balance, subtract the weight and moment of fuel to be used from the take-off weight and moment. 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. Loadings may be made on the Weight and Balance Loading Form.

Beechcraft SUPER KING AIR 200

WEIGHT AND BALANCE LOADING FORM

SERIAL NO:	REGISTRATION NO:	DATE:

PAYLOAD COMPUTATIONS		
ITEM PASSENGERS OR CARGO NO. LOCATION (ROW, F.S.,ETC)	WEIGHT	MOM/100
BAGGAGE		
CABINET CONTENTS		
TOTAL PAYLOAD		

REF	ITEM	WEIGHT	MOM/100
1.	BASIC EMPTY COND.		
2.	PILOT		
3.	PILOT'S BAGGAGE		
4.	EXTRA EQUIPMENT		
5.	TOTAL PAYLOAD		
6.	**SUB TOTAL** ZERO FUEL COND. DO NOT EXCEED 10,400 LBS		
7.	FUEL LOADING		
8.	**SUB TOTAL** RAMP CONDITION		
9.	*LESS FUEL FOR START, TAXI, AND TAKE OFF		
10.	**SUB TOTAL** TAKE OFF CONDITION		
11.	LESS FUEL TO DESTINATION		
12.	**LANDING CONDITION**		

*Fuel for start, taxi and take-off is normally 90 lbs at an average moment/100 of 177.

Beechcraft SUPER KING AIR 200

WEIGHT AND BALANCE LOADING FORM

SERIAL NO:	REGISTRATION NO:	DATE:

PAYLOAD COMPUTATIONS		
ITEM PASSENGERS OR CARGO NO. LOCATION (ROW, F.S.,ETC)	WEIGHT	MOM/100
BAGGAGE		
CABINET CONTENTS		
TOTAL PAYLOAD		

REF	ITEM	WEIGHT	MOM/100
1.	BASIC EMPTY COND.		
2.	PILOT		
3.	PILOT'S BAGGAGE		
4.	EXTRA EQUIPMENT		
5.	TOTAL PAYLOAD		
6.	**SUB TOTAL** ZERO FUEL COND. DO NOT EXCEED 10,400 LBS		
7.	FUEL LOADING		
8.	**SUB TOTAL** RAMP CONDITION		
9.	*LESS FUEL FOR START, TAXI, AND TAKE OFF		
10.	**SUB TOTAL** TAKE OFF CONDITION		
11.	LESS FUEL TO DESTINATION		
12.	**LANDING CONDITION**		

*Fuel for start, taxi and take-off is normally 90 lbs at an average moment/100 of 177.

Beechcraft SUPER KING AIR 200

WEIGHT AND BALANCE LOADING FORM

SERIAL NO:	REGISTRATION NO:	DATE:

PAYLOAD COMPUTATIONS

ITEM PASSENGERS OR CARGO NO. LOCATION (ROW, F.S.,ETC)	WEIGHT	MOM/100
BAGGAGE		
CABINET CONTENTS		
TOTAL PAYLOAD		

REF	ITEM	WEIGHT	MOM/100
1.	BASIC EMPTY COND.		
2.	PILOT		
3.	PILOT'S BAGGAGE		
4.	EXTRA EQUIPMENT		
5.	TOTAL PAYLOAD		
6.	**SUB TOTAL** ZERO FUEL COND. DO NOT EXCEED 10,400 LBS		
7.	FUEL LOADING		
8.	**SUB TOTAL** RAMP CONDITION		
9.	*LESS FUEL FOR START, TAXI, AND TAKE OFF		
10.	**SUB TOTAL** TAKE OFF CONDITION		
11.	LESS FUEL TO DESTINATION		
12.	**LANDING CONDITION**		

*Fuel for start, taxi and take-off is normally 90 lbs at an average moment/100 of 177.

Beechcraft SUPER KING AIR 200

WEIGHT AND BALANCE LOADING FORM

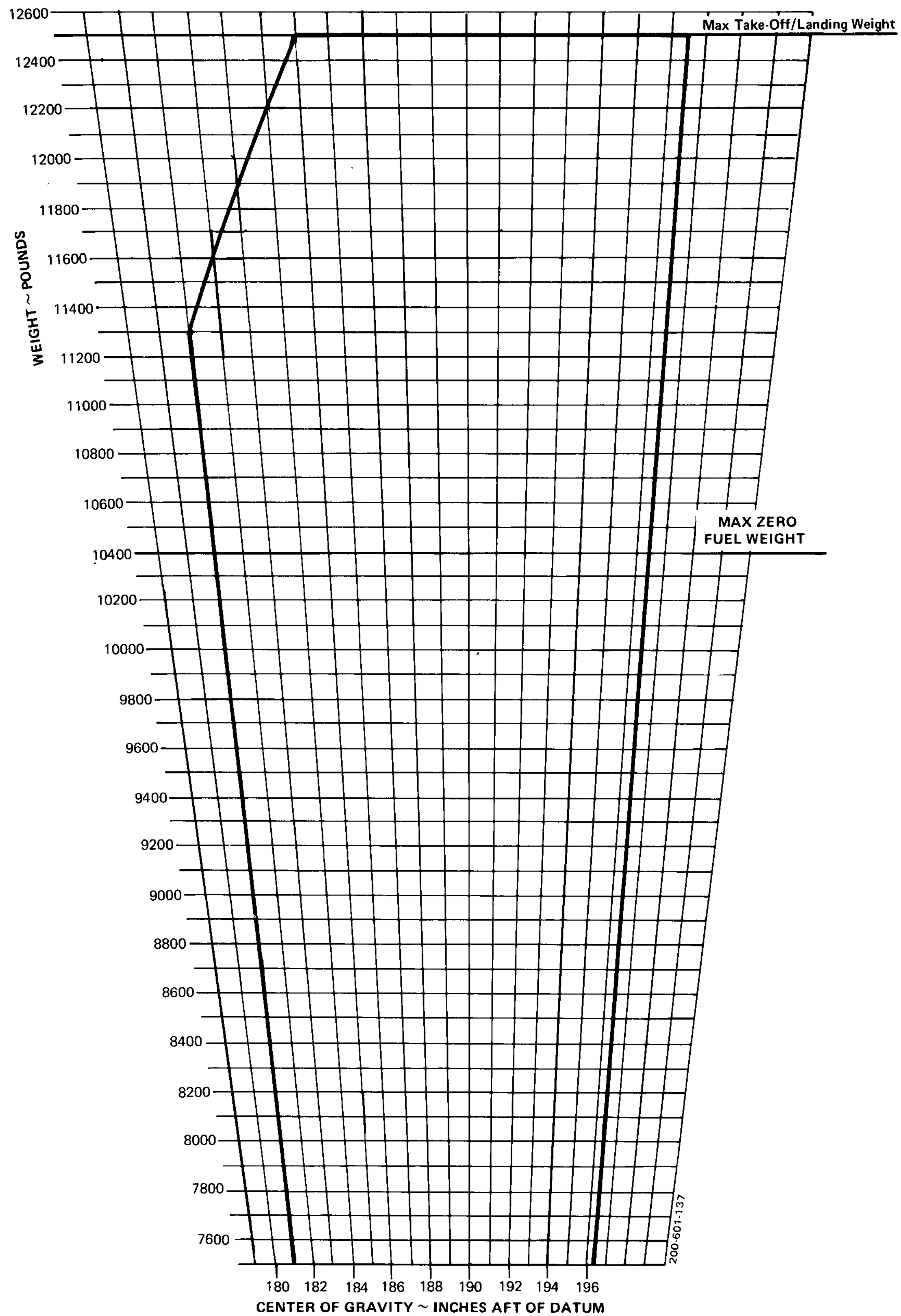
SERIAL NO:	REGISTRATION NO:	DATE:

PAYLOAD COMPUTATIONS		
ITEM PASSENGERS OR CARGO	WEIGHT	MOM/100
NO. LOCATION (ROW, F.S.,ETC)		
BAGGAGE		
CABINET CONTENTS		
TOTAL PAYLOAD		

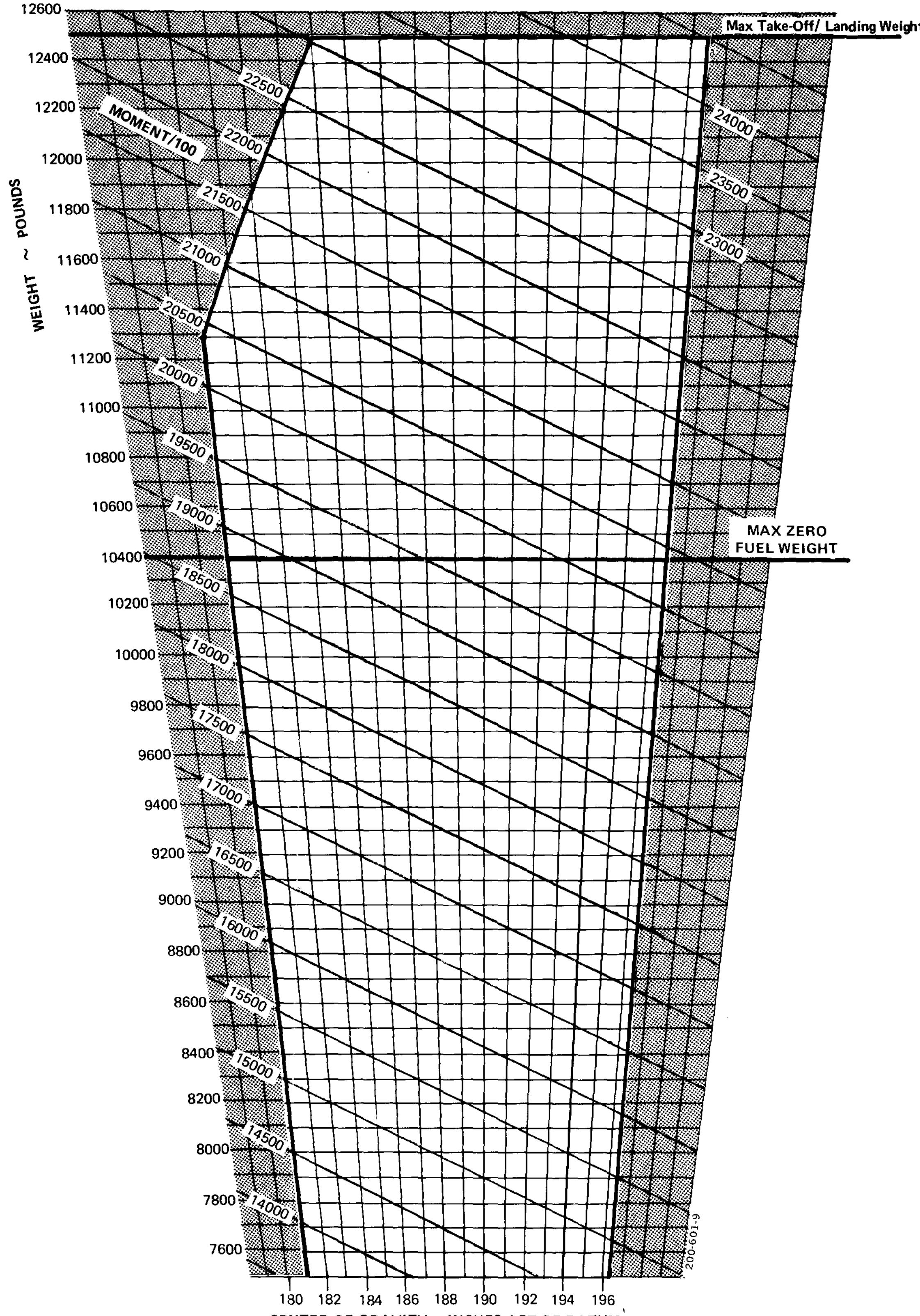
REF	ITEM	WEIGHT	MOM/100
1.	BASIC EMPTY COND.		
2.	PILOT		
3.	PILOT'S BAGGAGE		
4.	EXTRA EQUIPMENT		
5.	TOTAL PAYLOAD		
6.	**SUB TOTAL** **ZERO FUEL COND. DO NOT EXCEED 10,400 LBS**		
7.	FUEL LOADING		
8.	**SUB TOTAL** **RAMP CONDITION**		
9.	*LESS FUEL FOR START, TAXI, AND TAKE OFF		
10.	**SUB TOTAL** **TAKE OFF CONDITION**		
11.	LESS FUEL TO DESTINATION		
12.	**LANDING CONDITION**		

*Fuel for start, taxi and take-off is normally 90 lbs at an average moment/100 of 177.

WEIGHT AND BALANCE DIAGRAM



MOMENT LIMITS vs WEIGHT



MOMENT LIMITS VS. WEIGHT

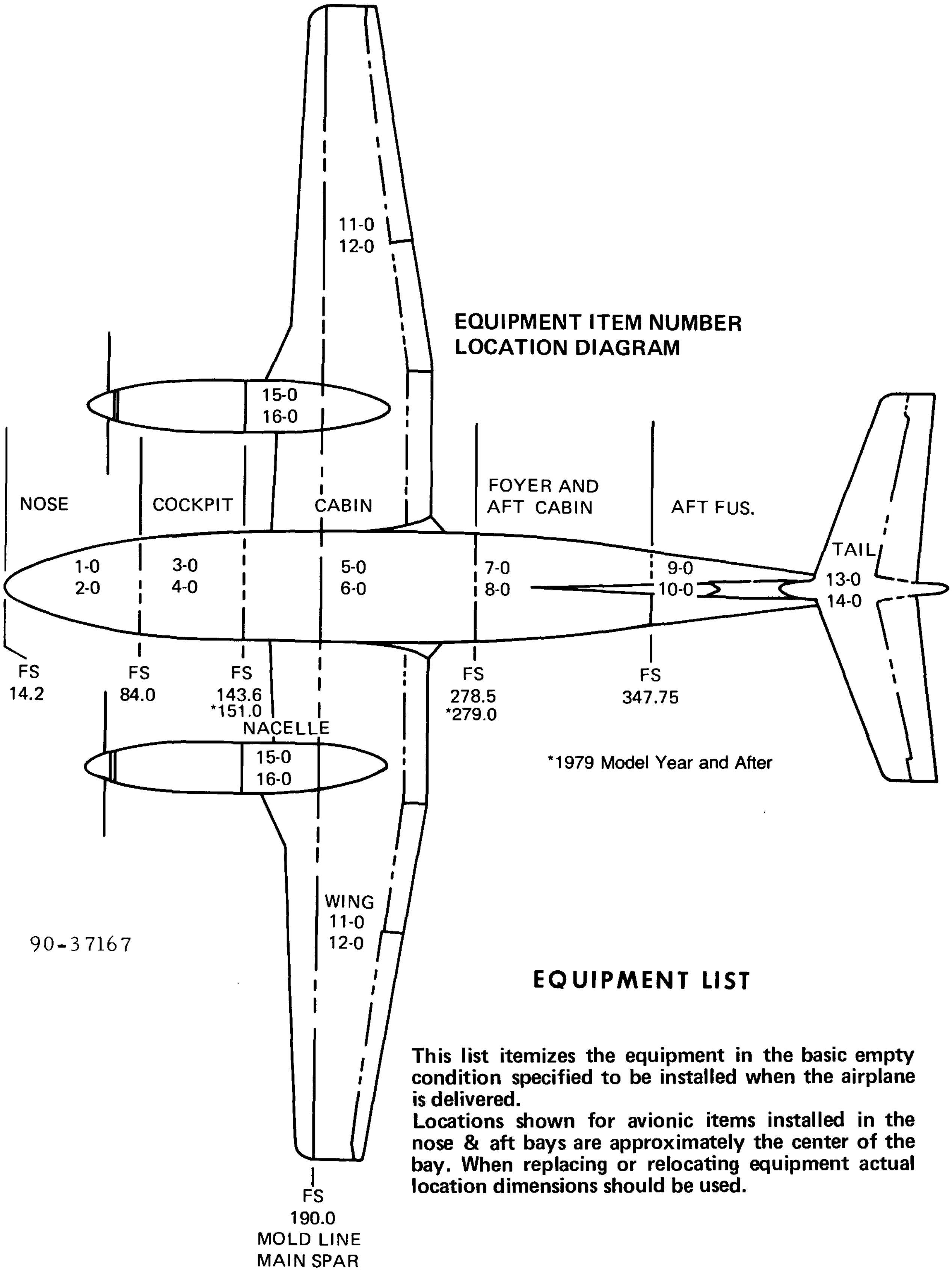
WEIGHT	MINIMUM MOMENT/100	MAXIMUM MOMENT/100
7200	13032	14141
7250	13122	14239
7300	13213	14337
7350	13304	14435
7400	13394	14534
7450	13484	14632
7500	13575	14730
7550	13666	14828
7600	13756	14926
7650	13846	15025
7700	13937	15123
7750	14028	15221
7800	14118	15319
7850	14208	15417
7900	14299	15516
7950	14390	15614
8000	14480	15712
8050	14570	15810
8100	14661	15908
8150	14752	16007
8200	14842	16105
8250	14932	16203
8300	15023	16301
8350	15114	16399
8400	15204	16498
8450	15294	16596
8500	15385	16694
8550	15476	16792
8600	15566	16890
8650	15656	16989
8700	15747	17087
8750	15838	17185
8800	15928	17283
8850	16018	17381
8900	16109	17480
8950	16200	17578
9000	16290	17676
9050	16380	17774
9100	16471	17872
9150	16562	17971
9200	16652	18069
9250	16742	18167
9300	16833	18265
9350	16924	18363
9400	17014	18462
9450	17104	18560
9500	17195	18658
9550	17286	18756
9600	17376	18854
9650	17466	18953
9700	17557	19051
9750	17648	19149
9800	17738	19247
9850	17828	19345

	WEIGHT	MINIMUM MOMENT/100	MAXIMUM MOMENT/100
	9900	17919	19444
	9950	18010	19542
	10000	18100	19640
	10050	18190	19738
	10100	18281	19836
	10150	18372	19935
	10200	18462	20033
	10250	18552	20131
	10300	18643	20229
	10350	18734	20327
MAX ZERO FUEL WEIGHT	10400	18824	20426
	10450	18914	20524
	10500	19005	20622
	10550	19096	20720
	10600	19186	20818
	10650	19276	20917
	10700	19367	21015
	10750	19458	21113
	10800	19548	21211
	10850	19638	21309
	10900	19729	21408
	10950	19820	21506
	11000	19910	21604
	11050	20000	21702
	11100	20091	21800
	11150	20182	21899
	11200	20272	21997
	11250	20362	22095
	11300	20461	22193
	11350	20570	22291
	11400	20679	22390
	11450	20789	22488
	11500	20898	22586
	11550	21008	22684
	11600	21118	22782
	11650	21228	22881
	11700	21338	22979
	11750	21449	23077
	11800	21559	23175
	11850	21670	23273
	11900	21781	23372
	11950	21892	23470
	12000	22003	23568
	12050	22115	23666
	12100	22226	23764
	12150	22338	23863
	12200	22450	23961
	12250	22562	24059
	12300	22674	24157
	12350	22787	24255
	12400	22899	24354
	12450	23012	24452
	12500	23125	24550

CENTER OF GRAVITY LIMITS (LANDING GEAR DOWN)

WEIGHT CONDITION	FORWARD CG LIMIT	AFT CG LIMIT
12,500 LBS (MAX. TAKE-OFF OR LANDING)	185.0	196.4
11,279 LBS OR LESS	181.0	196.4

EQUIPMENT ITEM NUMBER LOCATION DIAGRAM



*1979 Model Year and After

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 & aft bays are approximately the center of the bay. When replacing or relocating equipment actual location dimensions should be used.

INTENTIONALLY LEFT BLANK

INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS (200C)

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 jack points. Three jack points are provided: one on the nose section of the fuselage at station 83.5, and one on each wing center section rear spar at station 225.5. 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 unusable fuel remains in the airplane at an arm of 188.0 inches. The remainder of the unusable fuel to be added to a drained system is 33.5 pounds at station 164.0. If the airplane is weighed with full fuel the fuel specific weight (pounds/gallon) should be determined by using a hydrometer. Compute total fuel weight and moment using fuel tables.

3. Engine oil must be at the full level in each tank. Total engine oil aboard when both tanks are full is 62 pounds at an arm of 131.0 inches.

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 in level attitude. Leveling screws are located on the fuselage entrance door frame. Leveling is accomplished with a plumb bob. 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 amounts of air in the shocks and tires.

6. Measurement of the reaction arms for a wheel weighing is made using the nose jacking point for a reference. Using a steel measuring tape, measurements are taken with the airplane level on the scales from the reference (a plumb bob hung from the center of the nose jacking point) to the axle center line of the nose gear and then from the nose gear axle center line to the main wheel 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 hangar floor and parallel to the fuselage center line. The locations of the wheel reactions will be approximately at an arm of 209 inches for main wheels and 30 inches 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, i.e., usable fuel. Unusable fuel and engine oil are added if not already in the airplane.

8. Weighing should always be made in an enclosed area which is free from air currents. The scales used should be properly calibrated and certified in accordance with the Bureau of Standards.

BASIC EMPTY WEIGHT AND BALANCE

DATE: ______________

SERIAL NO: ______________

REGISTRATION NO: ______________

PREPARED BY:

STRUT POSITION -	NOSE	MAIN
EXTENDED	29.4	208.5
COMPRESSED	30.8	210.5

JACK POINT LOCATION	
FORWARD	83.5
AFT	225.5

REACTION WHEEL - JACK POINTS	SCALE READING	TARE	NET WEIGHT	STATION OR ARM	MOMENT
LEFT MAIN					
RIGHT MAIN					
SUB TOTAL					
NOSE					
TOTAL (AS WEIGHED)					

SPACE BELOW PROVIDED FOR ADDITIONS AND SUBTRACTIONS TO AS WEIGHED CONDITION

EMPTY WEIGHT			
ENGINE OIL	62	131	8122
UNUSABLE FUEL	44	170	7480
BASIC EMPTY WEIGHT			

200-601-7

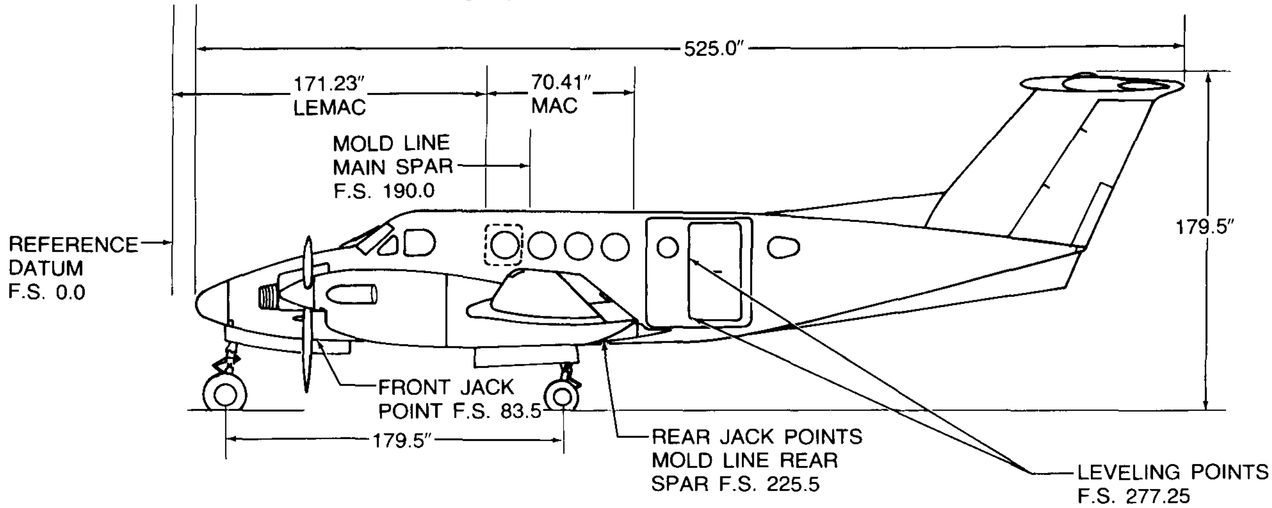
Change from Pass. to Cargo Config.

Date Ser. No. Reg. No

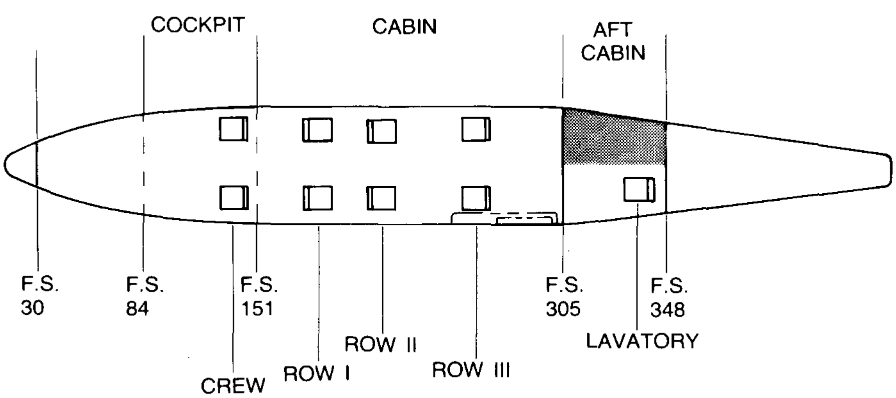
Item	Weight	Arm	Moment
Basic Empty Wt - Pass Config. (Pg 3)			
Basic Empty Wt - Cargo Config.			

Basic Empty Wt - Pass Config.			
Basic Empty Wt - Cargo Config.			

DIMENSIONAL AND LOADING DATA



STANDARD SEATING



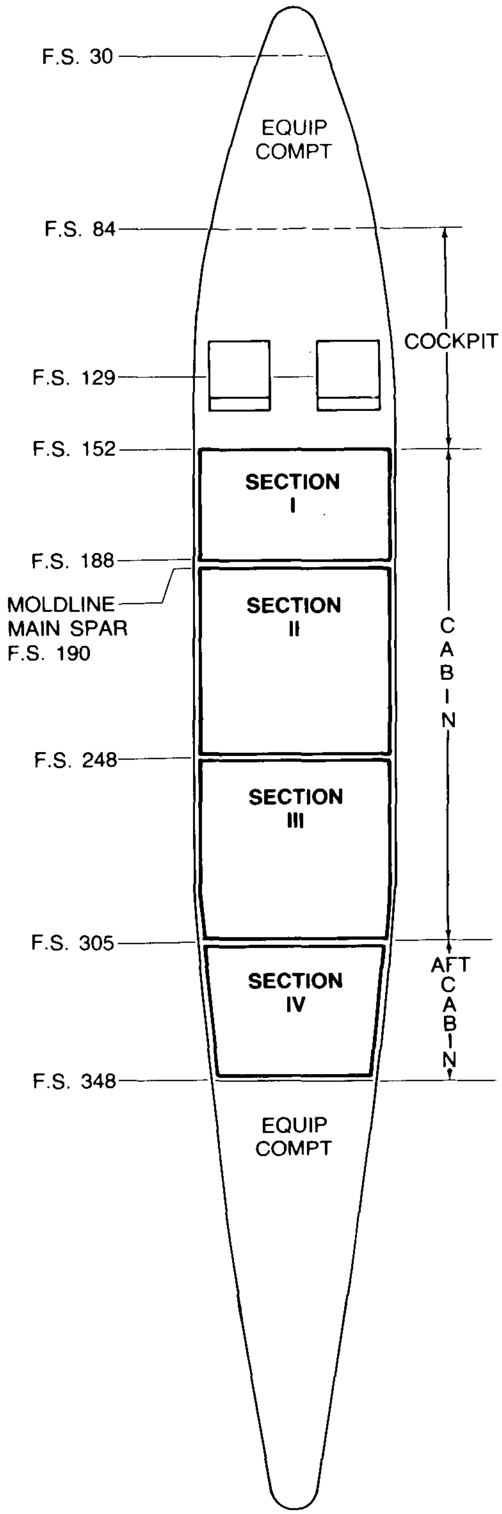
OCCUPANT	CENTROID
CREW	F.S. 129
ROW I	F.S. 171
ROW II	F.S. 206
ROW III	F.S. 251
LAV. PASS.	F.S. 335

CONFIGURATION	BAGGAGE COMPARTMENT	BAGGAGE CAPACITY	CENTROID
AFT PASSENGER SEAT AND TOILET	AFT CABIN – ▒	*410	F.S. 325.0

NOTE * Maximum Structural Capacity of Aft Cabin is 410 lbs. Baggage Capacity is amount remaining after subtracting weight of the toilet and/or other equipment installed (See Equipment list) and lavatory passenger when carried.

200-603-33

LOADING DATA
CARGO CONFIGURATION



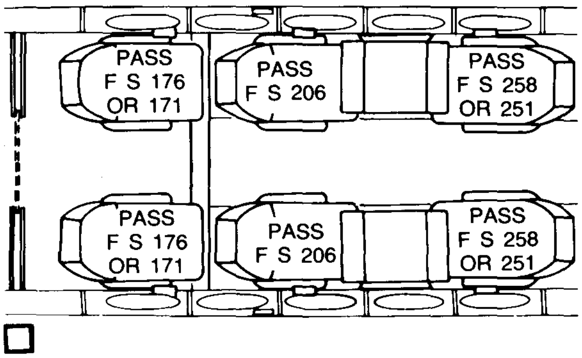
SECTION	MAXIMUM STRUCTURAL CAPACITY	CENTROID ARM
I	770 LBS	F.S. 170
II	1290 LBS	F.S. 218
III	940 LBS	F.S. 276
IV	410 LBS	F.S. 325

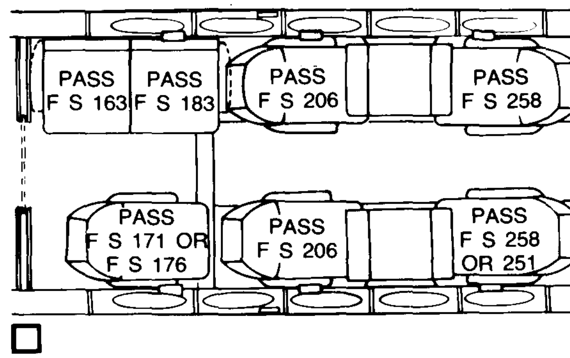
NOTES:

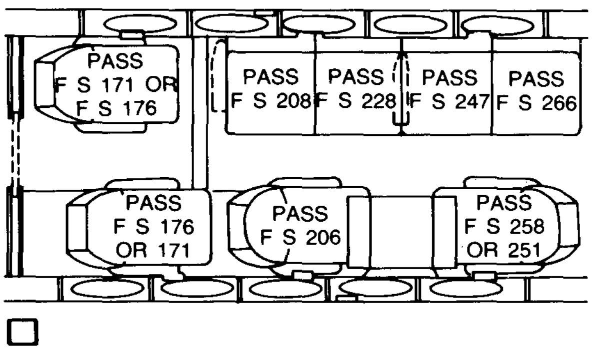
1. All cargo in Sections I, II & III must be supported on and secured to the seat tracks by an FAA approved system.
2. Concentrated cargo loads in Sections I, II & III must not exceed 200 lbs. per square foot & must be supported on the seat rails.
3. Cargo in Section IV is to be secured by Beech furnished baggage net, webbing, or straps.
4. Footman loops in Section IV are to be used to secure cargo/baggage in that area only.
5. Concentrated floor loadings of cargo or baggage in Section IV must not exceed 100 lbs. per square foot.
6. Any exceptions to the above procedures will require approval by a local FAA office.

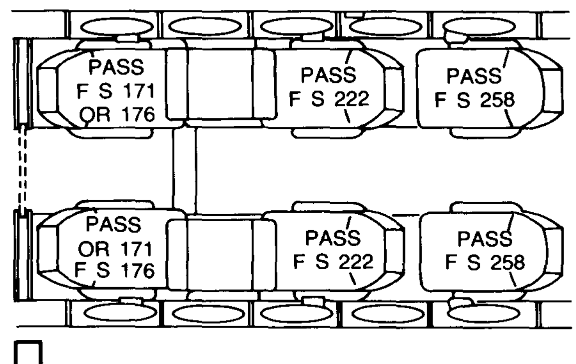
200-603-32

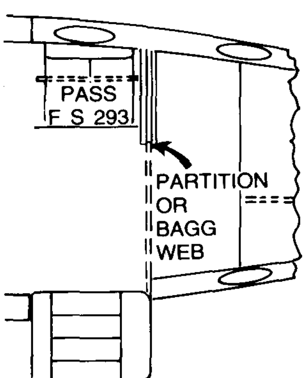
CABIN ARRANGEMENT DIAGRAM



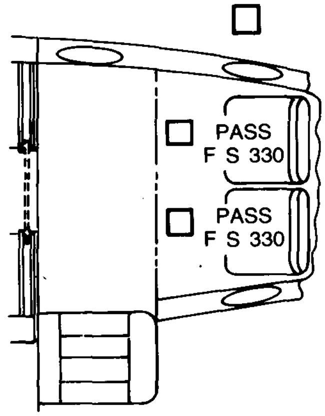




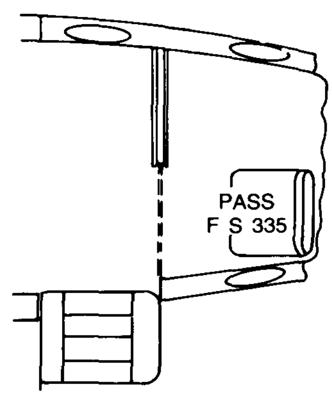




SIDE FACING TOILET



AFT FOLD UP SEATS



FRONT FACING TOILET

NOTES:

The cabin seating may be arranged in different combinations. The diagrams marked ☒ above represent the seating arrangement established for this airplane prior to delivery. The passenger locations shown on the designated diagram are averages. Additional data for modified arrangements is noted. No diagrams are included for Hi-density versions.

200-603-29

USE COLUMNS MARKED X ♦	CREW	CHAIR POSITIONS						LAVATORY
	F.S. 129	F.S. 171	F.S. 176	F.S. 206	F.S. 222	F.S. 251	F.S. 258	F.S. 335
WEIGHT	MOMENT/100							
80	103	137	141	165	178	201	206	268
90	116	154	158	185	200	226	232	302
100	129	171	176	206	222	251	258	335
110	142	188	194	227	244	276	284	369
120	155	205	211	247	266	301	310	402
130	168	222	229	268	289	326	335	436
140	181	239	246	288	311	351	361	469
150	194	257	264	309	333	377	387	503
160	206	274	282	330	355	402	413	536
170	219	291	299	350	377	427	439	570
180	232	308	317	371	400	452	464	603
190	245	325	334	391	422	477	490	637
200	258	342	352	412	444	502	516	670
210	271	359	370	433	466	527	542	704
220	284	376	387	453	488	552	568	737
230	297	393	405	474	511	577	593	771
240	310	410	422	494	533	602	619	804

OCCUPANTS

USE COLUMNS MARKED X ♦	TWO PLACE COUCH FORWARD POSITION		FOUR PLACE COUCH AFT POSITION				AFT FOLD UP SEATS
	F.S. 163	F.S. 183	F.S. 208	F.S. 228	F.S. 247	F.S. 266	F.S. 330
WEIGHT	MOMENT/100						
80	130	146	166	182	198	213	264
90	147	165	187	205	222	239	297
100	163	183	208	228	247	266	350
110	179	201	229	251	272	293	363
120	196	220	250	274	296	319	396
130	212	238	270	296	321	346	429
140	228	256	291	319	346	372	462
150	245	275	312	342	371	399	495
160	261	293	333	365	395	426	528
170	277	311	354	388	420	452	561
180	293	329	374	410	445	479	574
190	310	348	395	433	469	505	627
200	326	366	416	456	494	532	660
210	342	384	437	479	519	559	693
220	359	403	458	502	543	585	726
230	375	421	478	524	568	612	759
240	391	439	499	547	593	638	792
250	408	458	520	570	618	665	825

USEFUL LOAD WEIGHTS AND MOMENTS

BAGGAGE

WEIGHT	AFT CABIN F.S. 325
	MOMENT/100
10	33
20	65
30	98
40	130
50	163
60	195
70	228
80	260
90	293
100	325
200	650
300	975
400	1300
500	1625
550	1788

CABINET CONTENTS

USE COLUMNS MARKED	CHART CASES F.S. 148	FORWARD CABINET F.S. 158	MIDDLE CABINET F.S. 196	AFT CABINET F.S. 272	COUCH DRAWERS F.S. 173
X ➧					
WEIGHT	MOMENT/100				
10	15	16	20	27	17
20	30	32	39	54	35
30	44	47	59	82	52
40	59	63	78	109	
50	74	79			
60		95			
70		111			
80		126			
90		142			
100		158			

Weight and Moment/100 of Cabinet Contents must be included in all loading computations.

USEFUL LOAD WEIGHTS AND MOMENTS

CARGO COMPARTMENT

	CABIN			AFT CABIN
	Section I F.S. 152-188	*Section II F.S. 188-248*	*Section III F.S. 248-305*	*Section IV F.S. 305-348*
	CENTROID			
	F.S 170	*F.S. 218*	*F.S. 276*	*F.S. 325*
WEIGHT	**MOMENT/100**			
10	17	22	28	33
20	34	44	55	65
30	51	65	83	98
40	68	87	110	130
50	85	109	138	163
60	102	131	166	195
70	119	153	193	228
80	136	174	221	260
90	153	196	248	293
100	170	218	276	325
200	340	436	552	650
300	510	654	828	975
400	680	872	1104	1300
410	697	894	1132	1332
500	850	1090	1380	
550	935	1199	1518	
600	1020	1308	1656	
700	1190	1526	1932	
770	1309	1679	2125	
800		1744	2208	
900		1962	2484	
940		2049	2594	
1000		2180		
1100		2398		
1200		2616		
1290		2812		

NOTE: All cargo in Sections I, II & III must be supported by the seat tracks in a uniform distribution and tied down to the tracks by an FAA approved method.

USEFUL LOAD WEIGHTS AND MOMENTS

USABLE FUEL

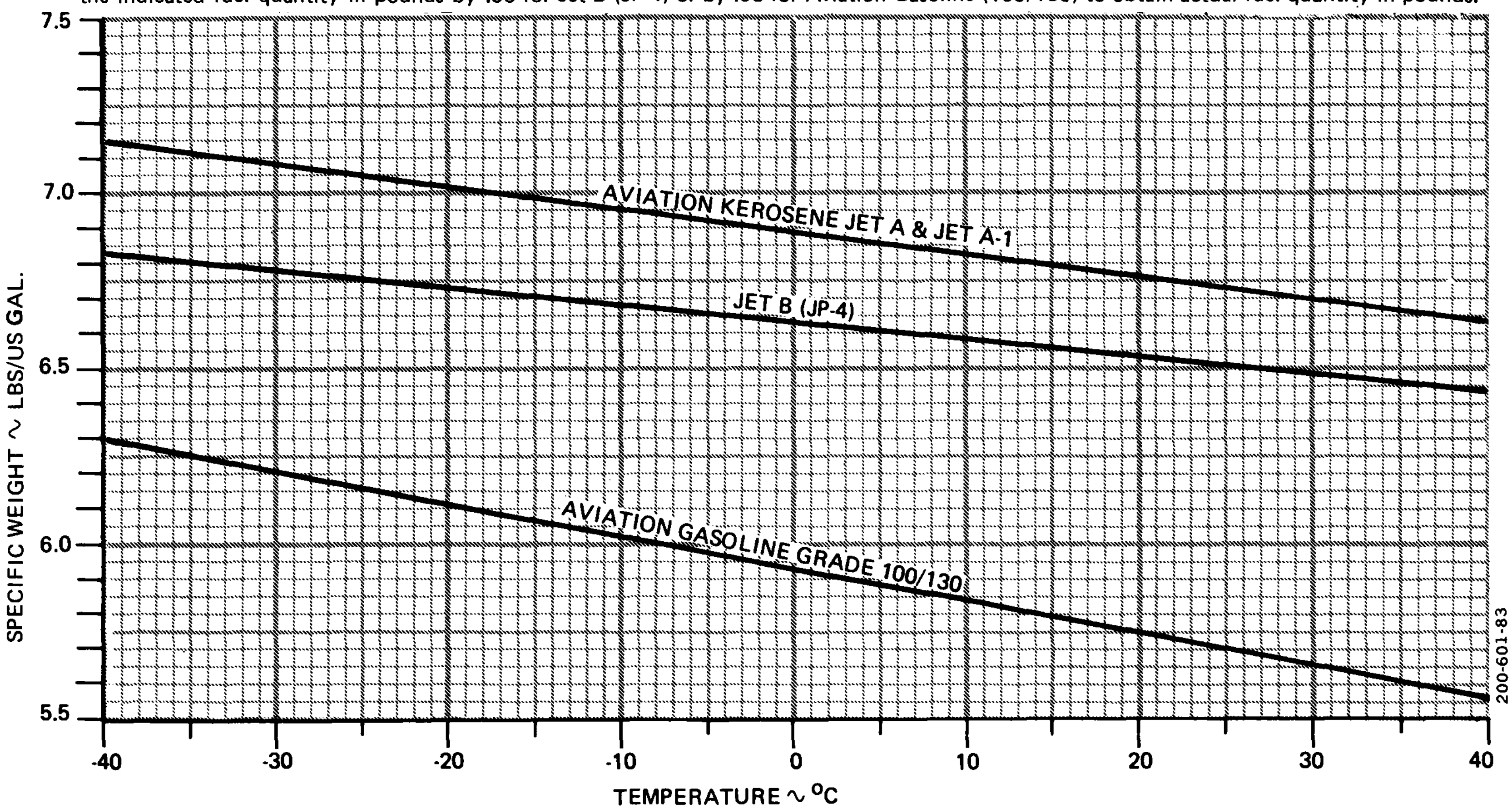
GALLONS	6.4 LB/GAL WEIGHT	6.4 LB/GAL MOMENT/100	6.5 LB/GAL WEIGHT	6.5 LB/GAL MOMENT/100	6.6 LB/GAL WEIGHT	6.6 LB/GAL MOMENT/100	6.7 LB/GAL WEIGHT	6.7 LB/GAL MOMENT/100
10	64	99	65	100	66	102	67	103
20	128	197	130	200	132	203	134	206
30	192	305	195	310	198	314	201	319
40	256	423	260	430	264	436	268	443
50	320	542	325	550	330	559	335	567
60	384	662	390	672	396	683	402	693
70	448	782	455	794	462	807	469	819
80	512	904	520	918	528	932	536	946
90	576	1023	585	1039	594	1055	603	1071
100	640	1142	650	1160	660	1178	670	1196
110	704	1260	715	1280	726	1300	737	1319
120	768	1379	780	1400	792	1422	804	1443
130	832	1496	845	1519	858	1543	871	1566
140	896	1615	910	1640	924	1665	938	1690
150	960	1734	975	1761	990	1788	1005	1815
160	1024	1852	1040	1881	1056	1910	1072	1939
170	1088	1971	1105	2002	1122	2033	1139	2064
180	1152	2090	1170	2122	1188	2155	1206	2188
190	1216	2209	1235	2244	1254	2279	1273	2313
200	1280	2328	1300	2365	1320	2401	1340	2437
210	1344	2447	1365	2486	1386	2524	1407	2562
220	1408	2567	1430	2607	1452	2647	1474	2687
230	1472	2686	1495	2728	1518	2770	1541	2812
240	1536	2806	1560	2850	1584	2894	1608	2938
250	1600	2926	1625	2971	1650	3017	1675	3063
260	1664	3045	1690	3093	1716	3140	1742	3188
270	1728	3164	1755	3213	1782	3263	1809	3312
280	1792	3283	1820	3334	1848	3386	1876	3437
290	1856	3402	1885	3455	1914	3508	1943	3562
300	1920	3521	1950	3576	1980	3631	2010	3686
310	1984	3641	2015	3698	2046	3754	2077	3811
320	2048	3760	2080	3819	2112	3878	2144	3936
330	2112	3880	2145	3940	2178	4001	2211	4062
340	2176	3999	2210	4062	2244	4124	2278	4187
350	2240	4119	2275	4184	2310	4248	2345	4312
360	2304	4244	2340	4310	2376	4377	2412	4443
370	2368	4365	2405	4434	2442	4502	2479	4570
380	2432	4489	2470	4560	2508	4630	2546	4700
386	2470	4562	2509	4634	2548	4706	2586	4776
400	2560	4741	2600	4815	2640	4889	2680	4963
410	2624	4869	2665	4945	2706	5021	2747	5097
420	2688	4997	2730	5075	2772	5153	2814	5231
430	2752	5126	2795	5206	2838	5286	2881	5366
440	2816	5255	2860	5337	2904	5419	2948	5501
450	2880	5386	2925	5470	2970	5554	3015	5638
460	2944	5514	2990	5600	3036	5686	3082	5773
470	3008	5645	3055	5733	3102	5821	3149	5909
480	3072	5775	3120	5866	3168	5956	3216	6046
490	3136	5907	3185	5999	3234	6091	3283	6184
500	3200	6040	3250	6134	3300	6229	3350	6323
510	3264	6172	3315	6269	3366	6365	3417	6462
520	3328	6307	3380	6405	3432	6504	3484	6602
530	3392	6441	3445	6542	3498	6643	3551	6743
540	3456	6573	3510	6676	3564	6779	3618	6881
544	3482	6626	3536	6729	3590	6832	3645	6936

DENSITY VARIATION OF AVIATION FUEL

BASED ON AVERAGE SPECIFIC GRAVITY

FUEL	AVERAGE SPECIFIC GRAVITY AT 15°C (59°F)
AVIATION KEROSENE JET A AND JET A1	.812
JET B (JP-4)	.785
AV GAS GRADE 100/130	.703

NOTE: The Fuel Quantity Indicator is calibrated for correct indication when using Aviation Kerosene Jet A and Jet A1. When using other fuels, multiply the indicated fuel quantity in pounds by .99 for Jet B (JP-4) or by .98 for Aviation Gasoline (100/130) to obtain actual fuel quantity in pounds.



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 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 form. Useful load items which may be loaded into the airplane are shown on the Useful Load Weight and Moment tables. The minimum and maximum moments approved by the FAA are shown on the Moment Limits vs Weight graph or table. These moments correspond to the forward and after center of gravity flight limits (landing gear down) for a particular weight. All moments are divided by 100 to simplify computations.

CARGO LOADING

The method of loading cargo, its placement in the airplane and the method of restraint should each be determined before starting the actual loading.

For loads that are evenly distributed in a given section the useful Load Table under the heading of Cargo Compartment should be used. For any load that cannot be located at the centroid of a section or that extends over more than one section, it will be necessary to determine its own CG and its location in the airplane. Determine the CG arm (Fuselage Station) by measuring in inches, from a known location in the cabin to the CG of the load. Determine the "moment" for the load by multiplying the weight by the CG arm (Fuselage Station). This resultant should be divided by 100 to be compatible with other loading data.

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 or are determined in the manner shown in CARGO LOADING.

3. Total the weight column and moment column. The total weight without usable fuel must not exceed the Maximum Zero Fuel Weight limitation of 10,400 pounds. All weight in excess of this limitation must be fuel. The auxiliary tanks may be used only when the main tanks are completely filled. The total take-off weight must not exceed the maximum allowable take-off weight and the total moment must be within the minimum and maximum moments shown on the Moment Limits Vs Weight table or graph.

4. Using the page titled Useful Load Weights and Moments - Usable Fuel, determine the weight and corresponding moment of fuel to be used by subtracting the amount on board on landing from the amount on board at takeoff.

5. For landing configuration weight and balance, subtract the weight and moment of fuel to be used from the take-off weight and moment. 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 item reduced.If the quantity or location of load items is changed the calculations must be revised and the moments rechecked.

6. Loadings may be made on the Weight and Balance Loading Form.

Beechcraft SUPER KING AIR 200

WEIGHT AND BALANCE LOADING FORM

SERIAL NO:	REGISTRATION NO:	DATE:

PAYLOAD COMPUTATIONS		
ITEM PASSENGERS OR CARGO NO. LOCATION (ROW, F.S.,ETC)	WEIGHT	MOM/100
BAGGAGE		
CABINET CONTENTS		
TOTAL PAYLOAD		

REF	ITEM	WEIGHT	MOM/100
1.	BASIC EMPTY COND.		
2.	PILOT		
3.	PILOT'S BAGGAGE		
4.	EXTRA EQUIPMENT		
5.	TOTAL PAYLOAD		
6.	**SUB TOTAL ZERO FUEL COND. DO NOT EXCEED 10,400 LBS**		
7.	FUEL LOADING		
8.	**SUB TOTAL RAMP CONDITION**		
9.	*LESS FUEL FOR START, TAXI, AND TAKE OFF		
10.	**SUB TOTAL TAKE OFF CONDITION**		
11.	LESS FUEL TO DESTINATION		
12.	**LANDING CONDITION**		

*Fuel for start, taxi and take-off is normally 90 lbs at an average moment/100 of 177.

Beechcraft SUPER KING AIR 200

WEIGHT AND BALANCE LOADING FORM

SERIAL NO: REGISTRATION NO: DATE:

PAYLOAD COMPUTATIONS		
ITEM PASSENGERS OR CARGO NO. LOCATION (ROW, F.S.,ETC)	WEIGHT	MOM/100
BAGGAGE		
CABINET CONTENTS		
TOTAL PAYLOAD		

REF	ITEM	WEIGHT	MOM/100
1.	BASIC EMPTY COND.		
2.	PILOT		
3.	PILOT'S BAGGAGE		
4.	EXTRA EQUIPMENT		
5.	TOTAL PAYLOAD		
6.	**SUB TOTAL ZERO FUEL COND. DO NOT EXCEED 10,400 LBS**		
7.	FUEL LOADING		
8.	**SUB TOTAL RAMP CONDITION**		
9.	*LESS FUEL FOR START, TAXI, AND TAKE OFF		
10.	**SUB TOTAL TAKE OFF CONDITION**		
11.	LESS FUEL TO DESTINATION		
12.	**LANDING CONDITION**		

*Fuel for start, taxi and take-off is normally 90 lbs at an average moment/100 of 177.

Beechcraft SUPER KING AIR 200

WEIGHT AND BALANCE LOADING FORM

SERIAL NO:	REGISTRATION NO:	DATE:

PAYLOAD COMPUTATIONS		
ITEM PASSENGERS OR CARGO NO. LOCATION (ROW, F.S.,ETC)	WEIGHT	MOM/100
BAGGAGE		
CABINET CONTENTS		
TOTAL PAYLOAD		

REF	ITEM	WEIGHT	MOM/100
1.	BASIC EMPTY COND.		
2.	PILOT		
3.	PILOT'S BAGGAGE		
4.	EXTRA EQUIPMENT		
5.	TOTAL PAYLOAD		
6.	**SUB TOTAL** **ZERO FUEL COND. DO NOT EXCEED 10,400 LBS**		
7.	FUEL LOADING		
8.	**SUB TOTAL** **RAMP CONDITION**		
9.	*LESS FUEL FOR START, TAXI, AND TAKE OFF		
10.	**SUB TOTAL** **TAKE OFF CONDITION**		
11.	LESS FUEL TO DESTINATION		
12.	**LANDING CONDITION**		

*Fuel for start, taxi and take-off is normally 90 lbs at an average moment/100 of 177.

Beechcraft SUPER KING AIR 200

WEIGHT AND BALANCE LOADING FORM

SERIAL NO:	REGISTRATION NO:	DATE:

PAYLOAD COMPUTATIONS		
ITEM PASSENGERS OR CARGO NO. LOCATION (ROW, F.S.,ETC)	WEIGHT	MOM/100
BAGGAGE		
CABINET CONTENTS		
TOTAL PAYLOAD		

REF	ITEM	WEIGHT	MOM/100
1.	BASIC EMPTY COND.		
2.	PILOT		
3.	PILOT'S BAGGAGE		
4.	EXTRA EQUIPMENT		
5.	TOTAL PAYLOAD		
6.	**SUB TOTAL** **ZERO FUEL COND. DO NOT EXCEED 10,400 LBS**		
7.	FUEL LOADING		
8.	**SUB TOTAL** **RAMP CONDITION**		
9.	*LESS FUEL FOR START, TAXI, AND TAKE OFF		
10.	**SUB TOTAL** **TAKE OFF CONDITION**		
11.	LESS FUEL TO DESTINATION		
12.	**LANDING CONDITION**		

*Fuel for start, taxi and take-off is normally 90 lbs at an average moment/100 of 177.

Beechcraft SUPER KING AIR 200

WEIGHT AND BALANCE LOADING FORM

SERIAL NO:	REGISTRATION NO:	DATE:

PAYLOAD COMPUTATIONS		
ITEM PASSENGERS OR CARGO NO. LOCATION (ROW, F.S.,ETC)	WEIGHT	MOM/100
BAGGAGE		
CABINET CONTENTS		
TOTAL PAYLOAD		

REF	ITEM	WEIGHT	MOM/100
1.	BASIC EMPTY COND.		
2.	PILOT		
3.	PILOT'S BAGGAGE		
4.	EXTRA EQUIPMENT		
5.	TOTAL PAYLOAD		
6.	**SUB TOTAL** **ZERO FUEL COND. DO NOT EXCEED 10,400 LBS**		
7.	FUEL LOADING		
8.	**SUB TOTAL** **RAMP CONDITION**		
9.	*LESS FUEL FOR START, TAXI, AND TAKE OFF		
10.	**SUB TOTAL** **TAKE OFF CONDITION**		
11.	LESS FUEL TO DESTINATION		
12.	**LANDING CONDITION**		

*Fuel for start, taxi and take-off is normally 90 lbs at an average moment/100 of 177.

Beechcraft SUPER KING AIR 200

WEIGHT AND BALANCE LOADING FORM

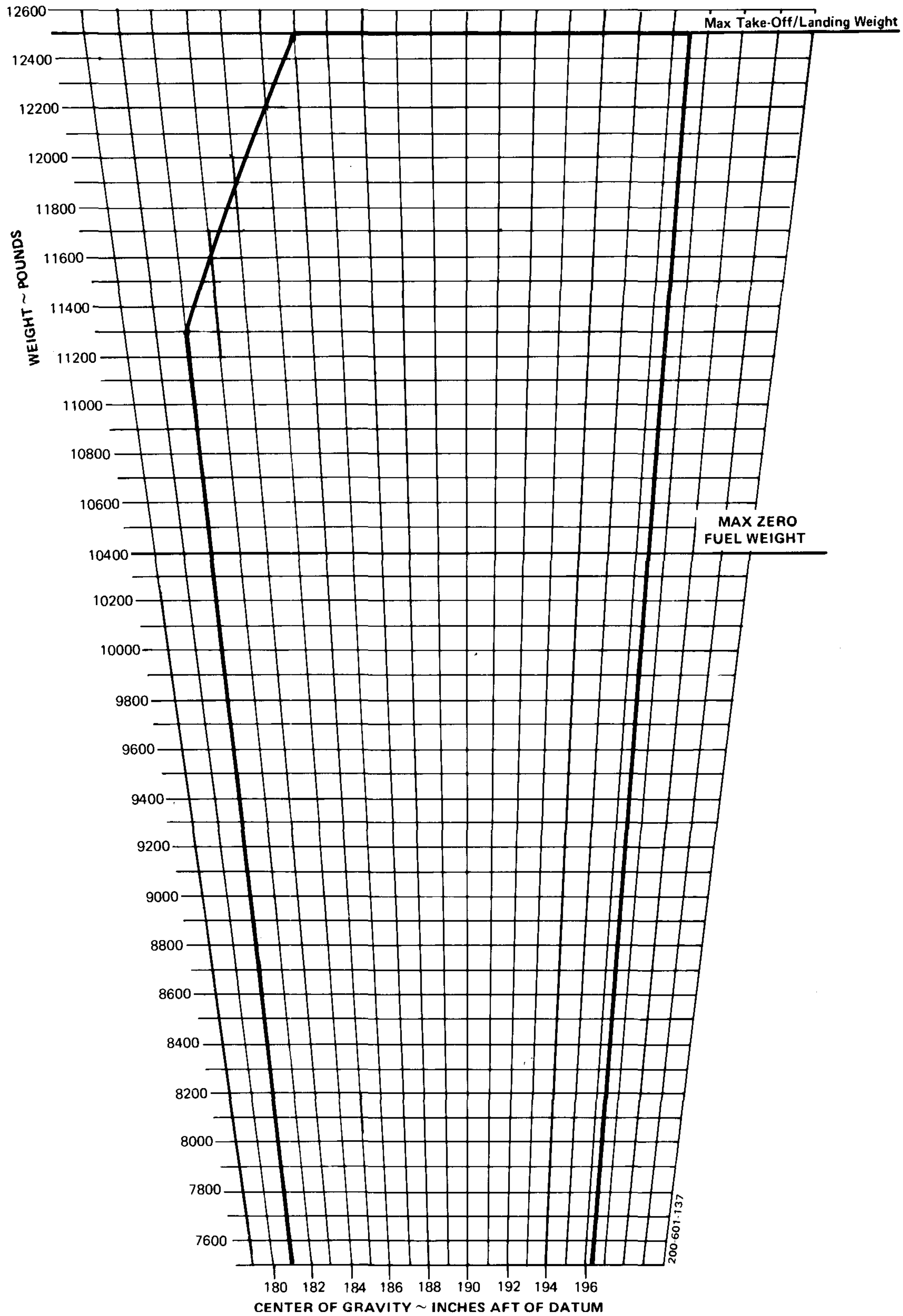
SERIAL NO:	REGISTRATION NO:	DATE:

PAYLOAD COMPUTATIONS		
ITEM PASSENGERS OR CARGO NO. LOCATION (ROW, F.S.,ETC)	WEIGHT	MOM/100
BAGGAGE		
CABINET CONTENTS		
TOTAL PAYLOAD		

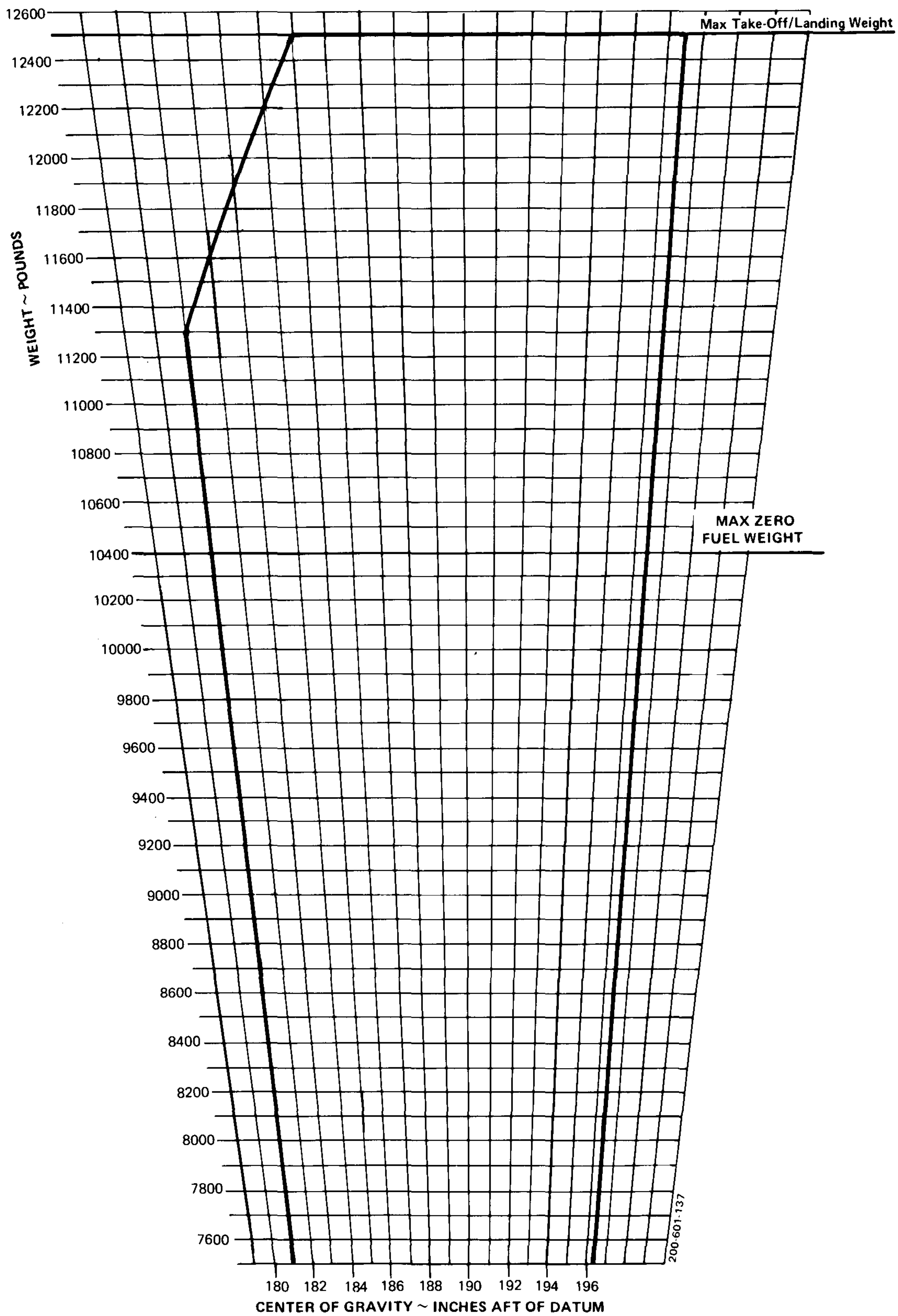
REF	ITEM	WEIGHT	MOM/100
1.	BASIC EMPTY COND.		
2.	PILOT		
3.	PILOT'S BAGGAGE		
4.	EXTRA EQUIPMENT		
5.	TOTAL PAYLOAD		
6.	**SUB TOTAL** **ZERO FUEL COND. DO NOT EXCEED 10,400 LBS**		
7.	FUEL LOADING		
8.	**SUB TOTAL** **RAMP CONDITION**		
9.	*LESS FUEL FOR START, TAXI, AND TAKE OFF		
10.	**SUB TOTAL** **TAKE OFF CONDITION**		
11.	LESS FUEL TO DESTINATION		
12.	**LANDING CONDITION**		

*Fuel for start, taxi and take-off is normally 90 lbs at an average moment/100 of 177.

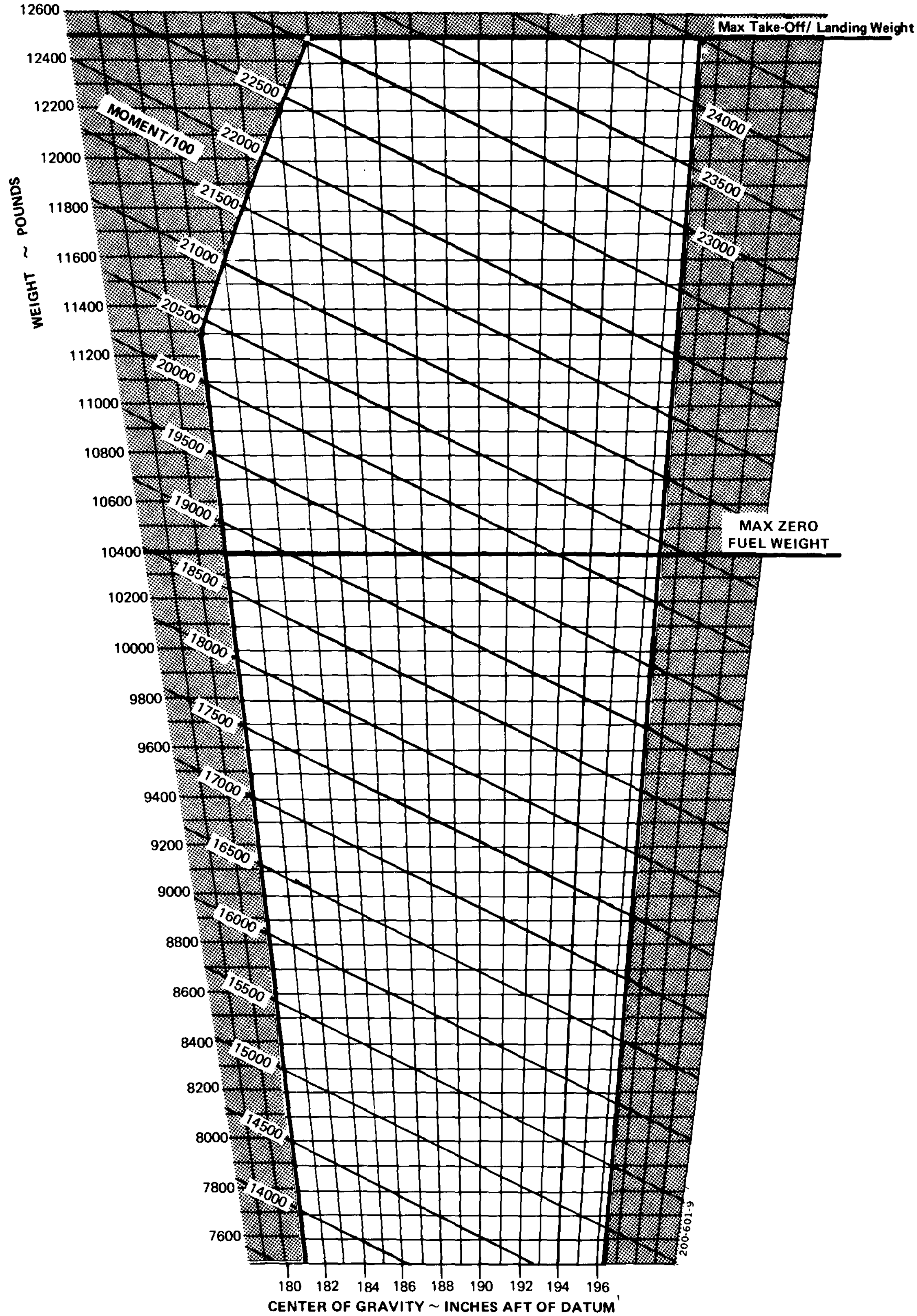
WEIGHT AND BALANCE DIAGRAM



WEIGHT AND BALANCE DIAGRAM



MOMENT LIMITS vs WEIGHT

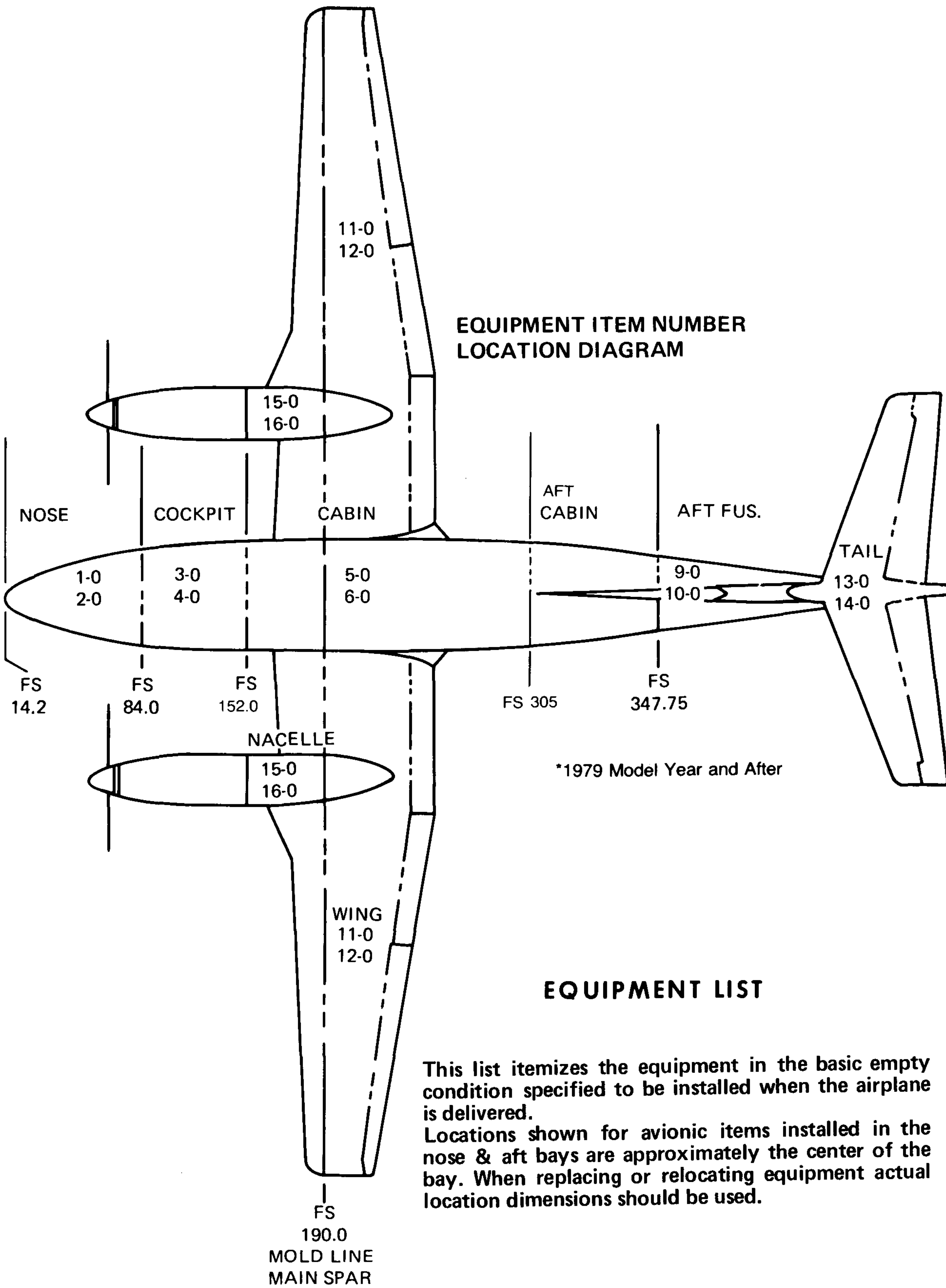


MOMENT LIMITS VS. WEIGHT

WEIGHT	MINIMUM MOMENT/100	MAXIMUM MOMENT/100		WEIGHT	MINIMUM MOMENT/100	MAXIMUM MOMENT/100
7200	13032	14141		9900	17919	19444
7250	13122	14239		9950	18010	19542
7300	13213	14337		10000	18100	19640
7350	13304	14435		10050	18190	19738
7400	13394	14534		10100	18281	19836
7450	13484	14632		10150	18372	19935
7500	13575	14730		10200	18462	20033
7550	13666	14828		10250	18552	20131
7600	13756	14926		10300	18643	20229
7650	13846	15025		10350	18734	20327
7700	13937	15123	MAX ZERO FUEL WEIGHT	10400	18824	20426
7750	14028	15221		10450	18914	20524
7800	14118	15319		10500	19005	20622
7850	14208	15417		10550	19096	20720
7900	14299	15516		10600	19186	20818
7950	14390	15614		10650	19276	20917
8000	14480	15712		10700	19367	21015
8050	14570	15810		10750	19458	21113
8100	14661	15908		10800	19548	21211
8150	14752	16007		10850	19638	21309
8200	14842	16105		10900	19729	21408
8250	14932	16203		10950	19820	21506
8300	15023	16301		11000	19910	21604
8350	15114	16399		11050	20000	21702
8400	15204	16498		11100	20091	21800
8450	15294	16596		11150	20182	21899
8500	15385	16694		11200	20272	21997
8550	15476	16792		11250	20362	22095
8600	15566	16890		11300	20461	22193
8650	15656	16989		11350	20570	22291
8700	15747	17087		11400	20679	22390
8750	15838	17185		11450	20789	22488
8800	15928	17283		11500	20898	22586
8850	16018	17381		11550	21008	22684
8900	16109	17480		11600	21118	22782
8950	16200	17578		11650	21228	22881
9000	16290	17676		11700	21338	22979
9050	16380	17774		11750	21449	23077
9100	16471	17872		11800	21559	23175
9150	16562	17971		11850	21670	23273
9200	16652	18069		11900	21781	23372
9250	16742	18167		11950	21892	23470
9300	16833	18265		12000	22003	23568
9350	16924	18363		12050	22115	23666
9400	17014	18462		12100	22226	23764
9450	17104	18560		12150	22338	23863
9500	17195	18658		12200	22450	23961
9550	17286	18756		12250	22562	24059
9600	17376	18854		12300	22674	24157
9650	17466	18953		12350	22787	24255
9700	17557	19051		12400	22899	24354
9750	17648	19149		12450	23012	24452
9800	17738	19247		12500	23125	24550
9850	17828	19345				

CENTER OF GRAVITY LIMITS (LANDING GEAR DOWN)

WEIGHT CONDITION	FORWARD CG LIMIT	AFT CG LIMIT
12,500 LBS (MAX. TAKE-OFF OR LANDING)	185.0	196.4
11,279 LBS OR LESS	181.0	196.4



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 & aft bays are approximately the center of the bay. When replacing or relocating equipment actual location dimensions should be used.

SECTION VII

SYSTEMS DESCRIPTIONS

TABLE OF CONTENTS

SUBJECT *PAGE*

SUBJECT *PAGE*

SUBJECT *PAGE*

INTENTIONALLY LEFT BLANK

AIRFRAME

STRUCTURE

The Beechcraft Super King Air 200 is an all-metal, low-wing monoplane. It utilizes fully cantilevered wings, and a T-tail empennage.

SEATING ARRANGEMENTS

The pilot and copilot seats are mounted in a separate forward compartment. Various configurations of passenger chairs and two- or four-place couch installations may be installed on the continuous tracks mounted on the cabin floor. One or two fold-up seats may be installed in the aft cabin area. The toilet is also equipped for use as a seat. Seating for up to 15 persons, including crew, is available. For additional information, refer to the "Cabin Arrangement Diagram" in Section VI, WEIGHT AND BALANCE/EQUIPMENT LIST.

FLIGHT CONTROLS

CONTROL SURFACES

The airplane is equipped with conventional ailerons and rudder. It utilizes a T-tail horizontal stabilizer and elevator, mounted at the extreme top of the vertical stabilizer.

OPERATING MECHANISMS

The airplane is equipped with conventional dual controls for the pilot and copilot. The ailerons and elevators are operated by conventional control wheels interconnected by a T-bar. The rudder pedals are interconnected by linkage below the floor. These systems are connected to the control surfaces through push-rod and cable-and-bellcrank systems. Rudder, elevator, and aileron trim are adjustable with controls mounted on the center pedestal. A position indicator for each of the trim tabs is integrated with its respective control.

MANUAL ELEVATOR TRIM

Manual control of the elevator trim is accomplished with a handwheel located on the left side of the pedestal. It is a conventional trim wheel which is rolled forward for nose-down trim, and aft for nose-up trim.

ELECTRIC ELEVATOR TRIM

The electric elevator-trim system, if installed, is controlled by an ELEV TAB CONTROL - ON - OFF switch located on the pedestal, a dual-element thumb switch on each control wheel, a trim-disconnect switch on each control wheel, and a PITCH TRIM circuit breaker in the FLIGHT group on the right side panel. The ELEV TAB CONTROL switch must be ON for the system to operate. Both elements of either dual-element thumb switch must be simultaneously moved forward to achieve nose-down trim, aft for nose-up trim; when released, they return to the center (off) position. Any activation of the trim system by the copilot's thumb switch can be overridden by the pilot's thumb switch. A before take-off check of both dual-element thumb switches should be made by moving each of the four switch elements individually. No one switch element should activate the system; moving the two switch elements on either the pilot's or the copilot's control wheel in opposite directions should not activate the system – only the simultaneous movement of a pair of switch elements in the same direction should activate the electric elevator-trim system.

A bi-level, push-button, momentary-on, trim-disconnect switch is located inboard of the dual-element thumb switch on the outboard grip of each control wheel. The electric elevator-trim system can be disconnected by depressing either of these switches. If an autopilot is installed, depressing either trim-disconnect switch to the first of the two levels disconnects the autopilot and the yaw damp system; depressing the switch to the second level disconnects the autopilot, the yaw damp system, and the electric elevator-trim system. If an autopilot is not installed, depressing the switch to the first level does not do anything, since the yaw damp system is controlled by a separate YAW DAMP switch on the pedestal; depressing the switch to the second level disconnects the electric elevator-trim system. A green annunciator on the caution/advisory annunciator panel, placarded ELEC TRIM OFF, alerts the pilot whenever the system has been disabled with a trim-disconnect switch and the ELEV TAB CONTROL switch is ON. The system can be reset by cycling the ELEV TAB CONTROL switch on the pedestal from ON to OFF, then to ON again. The manual-trim control wheel can be used to change the trim anytime, whether or not the electric-trim system is in the operative mode.

RUDDER BOOST

A rudder boost system is provided to aid the pilot in maintaining directional control in the event of an engine failure or a large variation of power between the engines. Incorporated into the rudder cable system are two pneumatic rudder-boosting servos that actuate the cables to provide rudder pressure to help compensate for asymmetrical thrust.

During operation, a differential pressure valve accepts bleed air pressure from each engine. When the pressure varies between the bleed air systems, the shuttle in the differential pressure valve moves toward the low pressure side. As the pressure difference reaches a preset tolerance, a switch on the low pressure side closes, activating the rudder boost system. This system is designed only to help compensate for asymmetrical thrust. Appropriate trimming is to be accomplished by the pilot. Moving either or both of the bleed air valve switches on the copilot's subpanel to the INSTR & ENVIR OFF position will disengage the rudder boost system.

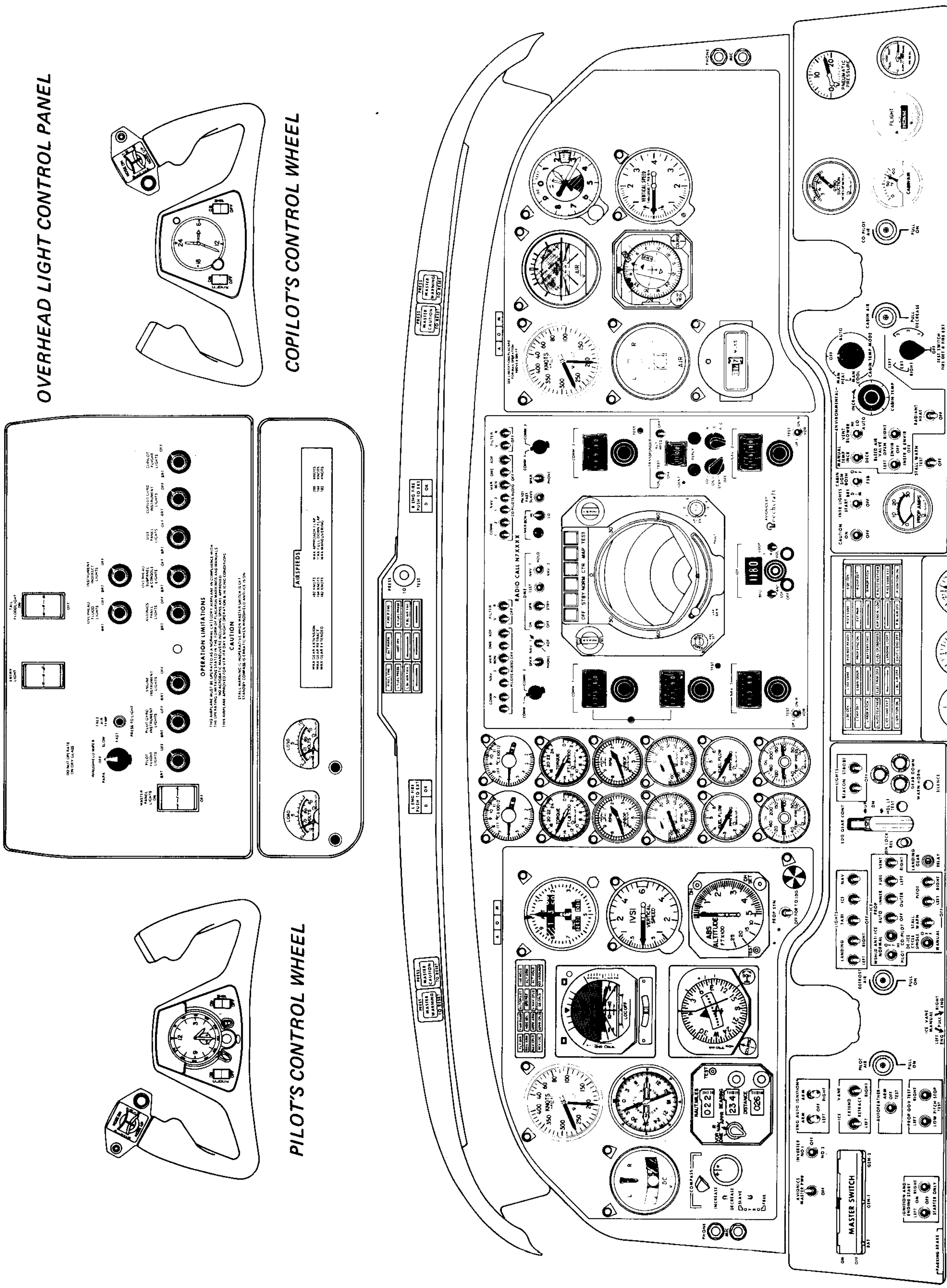
The system is controlled by a toggle switch, placarded RUDDER BOOST - ON - OFF, located on the pedestal below the rudder trim wheel. The switch is to be turned ON before flight. A preflight check of the system can be performed during the run-up by retarding the power on one engine to idle and advancing power on the opposite engine until the power difference between the engines is great enough to close the switch that activates the rudder boost system. Movement of the appropriate rudder pedal (left engine idling, right rudder pedal moves forward) will be noted when the switch closes, indicating the system is functioning properly for low engine power on that side. Repeat the check with opposite power settings to check for movement of the opposite rudder pedal.

INSTRUMENT PANEL

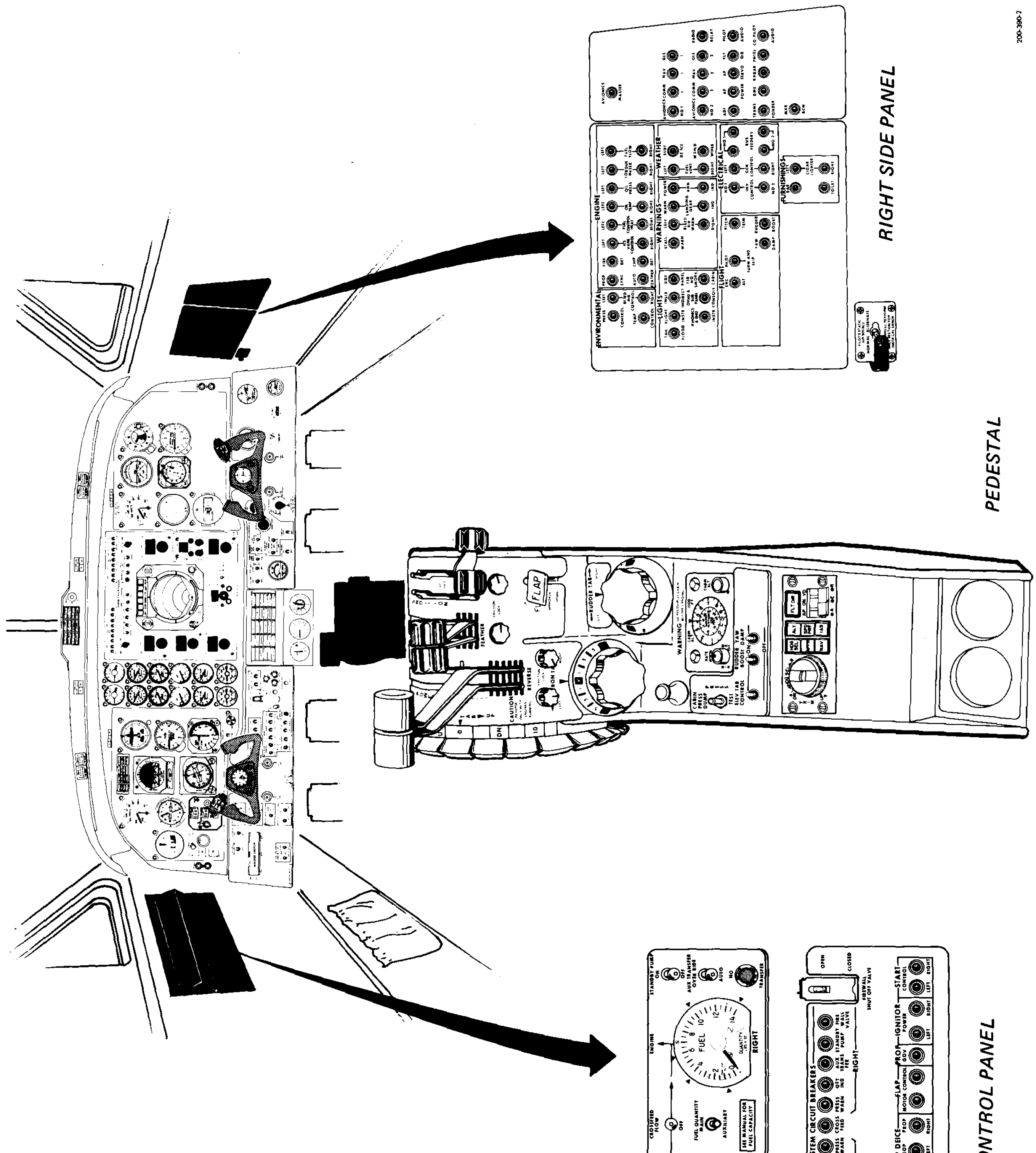
The floating instrument panel design allows the flight instruments to be arranged in a group directly in front of the pilot and the copilot. Complete pilot and copilot flight instrumentation is installed, including dual navigation systems, two course indicators, dual gyro horizons, and dual turn and slip indicators.

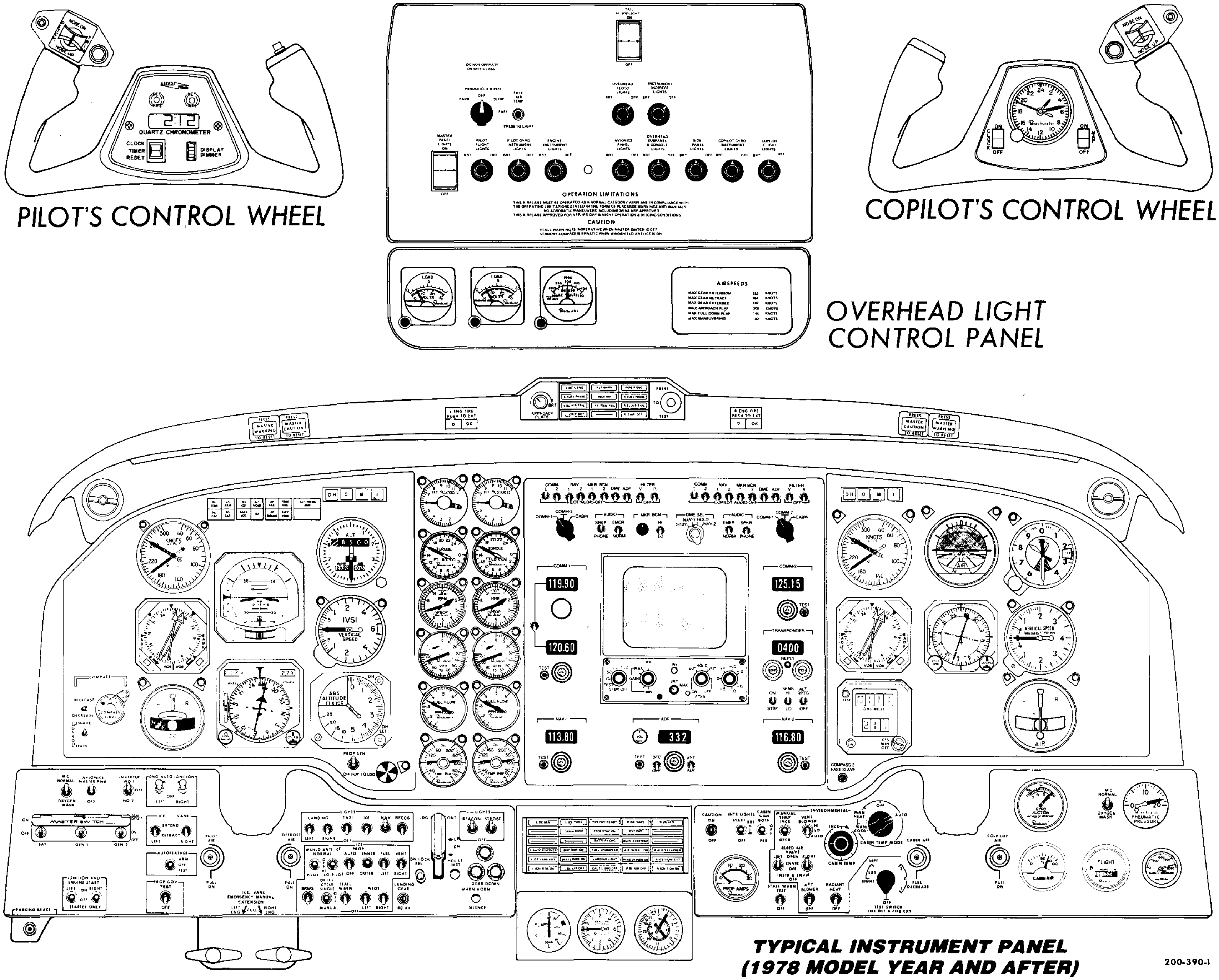
The operation and use of the instruments, lights, switches, and controls located on the instrument panel is explained under the systems descriptions relating to the subject items.

INTENTIONALLY LEFT BLANK



TYPICAL INSTRUMENT PANEL (PRIOR TO 1978 MODEL YEAR)


200-390-2
RIGHT SIDE PANEL
PEDESTAL
FUEL CONTROL PANEL

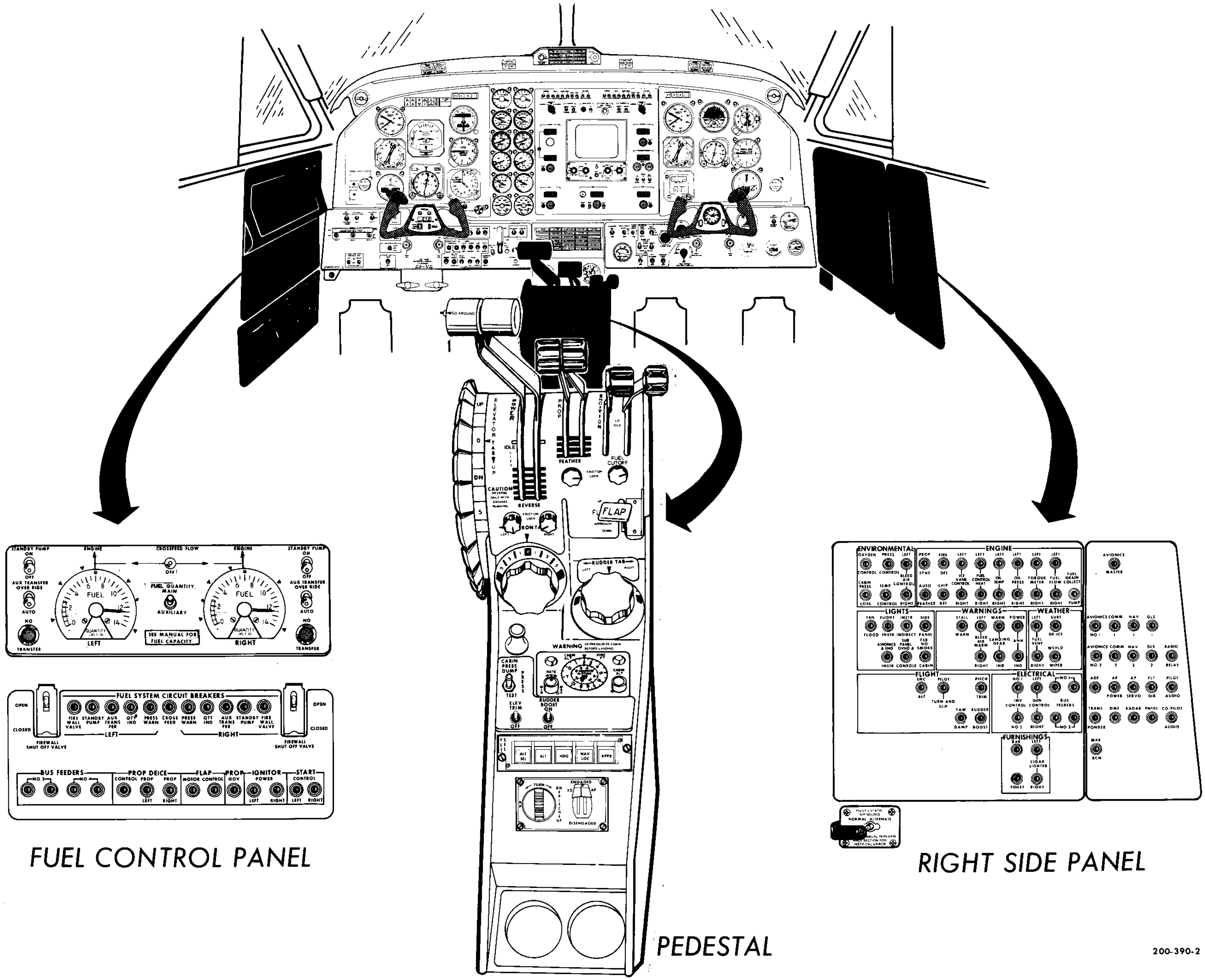


PILOT'S CONTROL WHEEL

COPILOT'S CONTROL WHEEL

OVERHEAD LIGHT CONTROL PANEL

TYPICAL INSTRUMENT PANEL (1978 MODEL YEAR AND AFTER)


FUEL CONTROL PANEL
PEDESTAL
RIGHT SIDE PANEL
200-390-2

INTENTIONALLY LEFT BLANK

ANNUNCIATOR SYSTEM

The annunciator system consists of a warning annunciator panel (with red readout) centrally located in the glareshield, and a caution/advisory annunciator panel (caution - yellow, advisory - green) located on the center subpanel. Adjacent to the warning annunciator panel on the glareshield is a press-to-test switch to test the lights, and pilot's and copilot's red warning and yellow caution flashers.

Individual function lights are of the word readout type. In the event of a fault, a signal is generated and applied to the respective channel in the appropriate annunciator panel. If the fault requires the immediate attention of the pilot, the fault warning lights on the glareshield will flash. The flashing fault warning light may be extinguished by pressing the face of the light to reset the circuit. The illuminated fault indication on the warning annunciator panel will remain on if the fault is not, or cannot be, corrected. If an additional fault occurs, the appropriate light on the annunciator panel will illuminate and the warning flashing light will again illuminate.

Whenever a fault occurs that requires the pilot's attention but does not require immediate reaction, flashing caution lights in the glareshield will illuminate for the caution annunciator system. A caution fault light will also illuminate on the caution/advisory annunciator panel on the center subpanel. The flashing caution lights can be extinguished by pressing the face of the light. The caution/advisory light can be extinguished at the operator's convenience by moving the CAUTION switch, which is a spring loaded toggle switch located in the copilot's subpanel, momentarily to the OFF position. When this is done, a CAUT LGND OFF light will illuminate on the caution/advisory panel as a reminder that an annunciator caution exists. Any time it is desired, the existing caution which has been extinguished by the pilot with the CAUTION switch, can be illuminated again by moving the CAUTION switch momentarily to the ON position. Any new fault, which will illuminate its appropriate annunciator light, will also illuminate the annunciator light which had been previously extinguished by the CAUTION switch.

The caution/advisory annunciator panel also contains the advisory annunciator system. There is no flashing light associated with the advisory functions. Advisory lights are to indicate a functional situation.

The annunciator system features both a "bright" and a "dim" mode of illumination intensity. The "dim" mode will be selected automatically whenever all the following conditions are met: a generator is on the line; the OVERHEAD FLOOD LIGHTS are OFF; the PILOT FLIGHT LIGHTS are ON; and the ambient light level in the cockpit (as sensed by a photo-electric cell) is below a preset value. Unless all these conditions are met, the "bright" mode will be selected automatically. The MASTER WARNING flasher does not have a "dim" mode.

ANNUNCIATOR PANELS

NOMENCLATURE	COLOR	CAUSE FOR ILLUMINATION
	WARNING ANNUNCIATOR	
FIRE L ENG	*Red*	*Fire in left engine compartment*
ALT WARN	*Red*	*Cabin altitude exceeds 12,500 feet*
FIRE R ENG	*Red*	*Fire in right engine compartment*
L FUEL PRESS	*Red*	*Fuel pressure failure on left side*
INST INV	*Red*	*The inverter selected is inoperative*
R FUEL PRESS	*Red*	*Fuel pressure failure on right side*
L BL AIR FAIL	*Red*	*Melted or failed plastic left bleed air failure warning line*
R BL AIR FAIL	*Red*	*Melted or failed plastic right bleed air failure warning line*
L CHIP DETECT	*Red*	*Contamination in left engine oil is detected*
R CHIP DETECT	*Red*	*Contamination in right engine oil is detected*
	CAUTION/ADVISORY ANNUNCIATOR	
L DC GEN	*Yellow*	*Left generator off the line*
L ICE VANE	*Yellow*	*Left ice vane malfunction. Ice vane has not attained proper position.*
RVS NOT READY	*Yellow*	*Propeller levers are not in the high rpm, low pitch position with landing gear extended*
R ICE VANE	*Yellow*	*Right ice vane malfunction. Ice vane has not attained proper position.*
R DC GEN	*Yellow*	*Right generator off the line*
CABIN DOOR	*Yellow*	*Cabin/cargo door open or not secure*
PROP SYNC ON	*Yellow*	*Synchrophaser turned on with landing gear extended*
EXT PWR	*Yellow*	*External power connector is plugged in*
BATTERY CHG	*Yellow*	*Excessive charge rate on battery*
DUCT OVERTEMP	*Yellow*	*Duct air too hot*

L AUTOFEATHER	*Green*	*Autofeather armed with power levers advanced above 90% N_1*
ELEC TRIM OFF	*Green*	*Electric trim de-energized by a trim disconnect switch on the control wheel with the system power switch on the pedestal turned on.*
FUEL CROSSFEED	*Green*	*Crossfeed valve is open*
AIR COND N_1 LOW	*Green*	*Right engine rpm too low for air conditioning load*
R AUTOFEATHER	*Green*	*Autofeather armed with power levers advanced above 90% N_1*
L ICE VANE EXT	*Green*	*Ice vane extended*
BRAKE DEICE ON	*Green*	*Brake deice system in operation*
LANDING LIGHT	*Green*	*Landing lights on with landing gear up*
PASS OXYGEN ON	*Green*	*Passenger oxygen system charged*
R ICE VANE EXT	*Green*	*Ice vane extended*
L IGNITION ON	*Green*	*Left starter/ignition switch is in the engine/ignition mode or left auto ignition system is armed and left engine torque is below 400 ft lbs*
L BL AIR OFF	*Green*	*Left environmental bleed air valve closed*
CAUT LGND OFF	*Green*	*Caution annunciator is turned off*
R BL AIR OFF	*Green*	*Right environmental bleed air valve is closed*
R IGNITION ON	*Green*	*Right starter/ignition switch is in the engine/ignition mode or right auto ignition system is armed and right engine torque is below 400 ft lbs*

INTENTIONALLY LEFT BLANK

GROUND CONTROL

Direct linkage from the rudder pedals allows for nose wheel steering. When the rudder control is augmented by a main wheel brake, the nose wheel deflection can be considerably increased.

The minimum wing-tip turning radius, using partial braking action and differential engine power, is 39 feet 10 inches.

FLAPS

Two flaps are installed on each wing. Power is delivered from an electric motor to a gearbox mounted on the forward side of the rear spar. The gearbox drives four flexible driveshafts which are connected to jackscrews, one of which operates each flap. The motor incorporates a dynamic braking system, through the use of two sets of motor windings. This feature helps prevent overtravel of the flaps. A safety mechanism is provided to disconnect power to the electric flap motor in the event of a malfunction which would cause any flap to be three to six degrees out of phase with the other flaps.

The flaps are operated by a sliding switch handle on the pedestal just below the condition levers. Flap travel, from 0% (full up) to 100% (full down) is registered on an electric indicator on top of the pedestal. A side detent provides for quick selection of the APPROACH position (40% flaps). From the UP position to the APPROACH position, the flaps cannot be stopped in an intermediate position. Between APPROACH and DOWN, the flaps can be stopped anywhere by moving the handle to the DOWN position until the flaps reach the desired position, then moving the flap-switch handle back to APPROACH. The flaps can be raised to any position between DOWN and APPROACH by raising the handle to UP until the desired setting is reached, then returning the handle to APPROACH. Selecting the APPROACH position will stop flap travel anytime the flaps are deflected more than 40%.

The flap-motor power circuit is protected by a 20-ampere flap-motor circuit breaker placarded FLAP MOTOR, located on the left circuit breaker panel below the fuel control panel. A 5-ampere circuit breaker for the control circuit (placarded FLAP CONTROL) is also located on this panel.

Lowering the flaps will produce these results:

Attitude – Nose Up
Airspeed – Reduced
Stall Speed – Lowered
Trim – Nose-Down Adjustment Required
to Maintain Attitude

LANDING GEAR

A 28-volt split-field motor, located on the forward side of the center-section main spar, extends and retracts the landing gear. The landing gear motor is controlled by the switch placarded LDG GEAR CONT - UP - DN on the pilot's right subpanel. The switch handle must be pulled out of a detent before it can be moved from either the UP or the DN position. The motor incorporates a dynamic braking system, through the use of two motor windings, which helps prevent overtravel of the gear.

Torque shafts drive the main gear actuators, and duplex chains drive the nose gear actuator. A spring-loaded friction-type overload clutch incorporated into the gearbox prevents damage to the structure and to the torque shafts in the event of mechanical malfunction. An overload protection circuit, located on the landing gear panel forward of the main spar under the center floorboard, protects the system from electrical overload.

The Beech air-oil type shock struts are filled with compressed air and hydraulic fluid. Spring-loaded linkage from the rudder pedals permits nose wheel steering. When the rudder control is augmented by a main wheel brake, the nose wheel deflection can be considerably increased. As the nose wheel retracts after lift-off, it is automatically centered and the steering linkage becomes inoperative.

A safety switch on the right main gear torque knee opens the control circuit when the strut is compressed. The safety switch also actuates a solenoid-operated down-lock hook on the landing gear control switch located on the pilot's right subpanel. This mechanism prevents the landing gear handle from being raised when the airplane is on the ground. The hook automatically unlocks when the airplane leaves the ground and can be manually overridden by pressing down on the red down-lock release button just left of the landing gear control switch handle, in the event of a malfunction of the down-lock solenoid. The landing gear control switch handle should never be moved out of the DN detent while the airplane is on the ground; if it is, the landing gear warning horn will sound intermittently and the red gear-in-transit lights in the landing gear control switch handle will illuminate (provided the MASTER SWITCH is ON), warning the pilot to return the handle to the DN position.

Visual indication of landing gear position is provided by individual green GEAR DOWN indicator lights arranged in a triangle on the pilot's right subpanel. Two red, parallel-wired indicator lights located in the control handle illuminate to show that the gear is in transit or not locked. They also illuminate when the landing gear warning horn is actuated.

LANDING GEAR WARNING SYSTEM

The landing gear warning system is provided to warn the pilot that the landing gear is not down and locked during specific flight regimes. Various warning modes result, depending upon the position of the flaps.

SERIALS PRIOR TO BB-324

With the FLAPS UP and either or both power levers retarded below a certain power level, the warning horn will sound intermittently and the landing gear switch handle lights will illuminate. The horn can be silenced by pressing the WARNing HORN SILENCE button adjacent to the landing gear switch handle; the lights in the landing gear switch handle cannot be cancelled. The landing gear warning system will be rearmed if the power lever(s) are advanced sufficiently.

With the FLAPS in APPROACH position and either or both power levers retarded below a certain power level, the warning horn and landing gear switch handle lights will be activated and neither can be cancelled.

With the FLAPS BEYOND APPROACH position, the horn and landing gear switch handle lights will be activated regardless of the power settings, and neither can be cancelled.

SERIALS BB-324 THRU BB-452

With the FLAPS UP and either or both power levers retarded below a certain power level, the landing gear switch handle lights will illuminate; and if the airspeed is below 140 knots, the warning horn will sound intermittently. The horn can be silenced by pressing the WARNing HORN SILENCE button adjacent to the landing gear switch handle; the lights in the landing gear switch handle cannot be cancelled. The landing gear warning system will be rearmed if the power lever(s) are advanced sufficiently.

With the FLAPS in APPROACH or BEYOND APPROACH position, the landing gear switch handle lights will illuminate; and if the airspeed is below 140 knots, the warning horn will sound intermittently. Neither the horn nor the lights can be cancelled.

SERIALS BB-453 AND AFTER, BL-1 AND AFTER

With the FLAPS in UP or APPROACH position and either or both power levers retarded below a certain power level, the warning horn will sound intermittently and the landing gear switch handle lights will illuminate. The horn can be silenced by pressing the WARNing HORN SILENCE button adjacent to the landing gear switch handle; the lights in the landing gear switch handle cannot be cancelled. The landing gear warning system will be rearmed if the power lever(s) are advanced sufficiently.

With the FLAPS BEYOND APPROACH position, the warning horn and landing gear switch handle lights will be activated regardless of the power settings, and neither can be cancelled.

MANUAL LANDING GEAR EXTENSION

Manual landing gear extension is provided through a separate, manually powered, chain-drive system. Pull the LANDING GEAR RELAY circuit breaker (on the pilot's right subpanel) and make certain that the landing gear switch handle is in the down position before manually extending the gear. Pulling up on the emergency engage handle (located on the floor) and turning it clockwise will lock it in that position. When the emergency engage handle is pulled up, the motor is electrically disconnected from the system, and the emergency drive system is locked to the gear box and motor. When the emergency drive is locked in, the chain is driven by a continuous-action ratchet, which is activated by pumping the ratchet handle adjacent to the emergency engage handle.

CAUTION

Do not continue pumping the ratchet handle after the GEAR DOWN lights illuminate. Excessive pumping may damage the gear drive mechanism and bind the clutch so that the handle will not release it.

WARNING

After an emergency landing gear extension has been made, do not stow pump handle or move any landing gear controls or reset any switches or circuit breakers until the airplane is on jacks. These precautions are necessary because the failure may have been in the gear-up circuit, in which case the gear might retract on the ground. The gear can not be retracted manually.

After a practice manual extension, the landing gear may be retracted electrically. Rotate the emergency engage handle counterclockwise and push it down. Stow the extension lever, push in the landing gear relay circuit breaker on the pilot's subpanel, and retract the gear in the normal manner with the landing gear switch handle.

BRAKE SYSTEM

The dual hydraulic brakes are operated by depressing the toe portion of either the pilot's or copilot's rudder pedals. Shuttle valves permit braking by either pilot or copilot.

Dual parking-brake valves are installed adjacent to the rudder pedals between the master cylinders of the pilot's rudder pedals and the wheel brakes. A control for the valves, placarded PARKING BRAKE, is located below the pilot's left subpanel. After the pilot's brake pedals have been depressed to build up pressure in the brake lines, both valves can be closed simultaneously by pulling out the parking brake handle. This retains the pressure in the brake lines. The parking brake is released by depressing the pedals briefly to equalize the pressure on both sides of the valve, then pushing in the parking brake handle to open the valve.

TIRES

The airplane is normally equipped with dual 18x5.5, 8-ply-rated, tubeless, rim-inflation tires on each main gear. For increased service life, 10-ply-rated tires of the same size may be installed.

Optionally, the airplane may be equipped with dual 22x6.75-10, 8-ply-rated, tubeless tires on each main gear. These tires provide higher flotation, and permit operation at approximately 2/3 the inflation pressure required for the standard 18x5.5 tires.

The nose gear is equipped with a single 22x6.75-10, 8-ply-rated, tubeless tire.

NOTE

> *Prior to serial BB-165,* airplanes equipped with 18x5.5 main-gear tires were delivered with a 6.50x10, 6-ply-rated, tubeless tire installed on the nose gear. These earlier nose-gear tires may be replaced with 22x6.75-10, 8-ply-rated tires, if desired.

BAGGAGE COMPARTMENT

The entire aft-cabin area, which is aft of the foyer, may be utilized as a baggage compartment. A nylon web is provided for the restraining of loose items.

CAUTION

> Baggage and other objects should be secured by webs, in order to prevent shifting in turbulent air.

Items stowed in the aft-cabin area are easily accessible in flight. The aft-cabin area can be closed off from the foyer by pulling the optional baggage compartment curtain across the opening and securing it with the snap fasteners provided. Alternately, a latching compartment door may be installed. The door is unlatched by rotating the latch handle clockwise, and latched by rotating the handle counterclockwise.

SEATS, SEATBELTS, AND SHOULDER HARNESSES

SEATS

COCKPIT

The pilot and copilot seats are adjustable fore and aft, as well as vertically. When the release lever under the front inboard corner of the seat is lifted, the seat can be moved forward or aft as required. When the release lever under the front outboard corner of the seat is lifted and no weight is on the seat, the seat will rise in half-inch increments to its highest position. When weight is on the seat and the lever is lifted, the seat will slowly move downward in half-inch increments until the lever is released, or until the seat reaches its lowest point of vertical travel. The armrests pivot at the aft end and can be raised to facilitate entry to and egress from the seats.

CABIN

Various configurations of passenger chairs and 2- or 4-place couches may be installed on the continuous tracks which are mounted on the cabin floor. All passenger chairs are placarded either FRONT FACING ONLY or FRONT OR AFT FACING on the horizontal leg cross brace. Only chairs placarded FRONT OR AFT FACING may be installed facing aft. All aft-facing chairs (and all forward-facing chairs that are equipped with shoulder harnesses) are equipped with adjustable headrests.

WARNING

> Before takeoff and landing, the headrest should be adjusted as required to provide support for the head and neck when the passenger leans against the seatback.

Some passenger chairs can be moved fore and aft, to suit legroom requirements of different passengers, by lifting a horizontal release lever that extends laterally under the front of adjustable seats. ("Front" is the direction opposite the seatback, regardless of whether the chair faces fore or aft.)

The seatbacks can be adjusted to any angle from fully upright to fully reclining, by depressing the release lever located on the side of the seat at the front inboard corner. When the lever is depressed and the passenger leans against the seatback, the seatback will slowly recline until the lever is released, or until the fully reclining position is attained. When no weight is placed against the seatback and the lever is depressed, the seatback will rise until the lever is released, or until the fully upright position is reached. The seatbacks of all occupied seats must be upright for takeoff and landing.

The passenger-chair seatback can also be folded flat over the seat cushion, after releasing the lock lever located on the side of the seat at the back inboard corner.

The optional lateral-tracking passenger chairs incorporate a flat, rectangular release lever underneath the front inboard corner of the seats. When this lever is lifted, the chairs can be adjusted fore and aft, as well as laterally. The seatback adjustments are the same as those on the standard passenger chairs. When occupied, these seats must be in the outboard position (i.e., against the cabin wall) for takeoff and landing.

Inboard armrests on passenger chairs - and both armrests on couches and lateral-tracking chairs - can be folded flush with the top of the seat cushions to facilitate entry to and egress from the seat. The armrests can be lowered by lifting the flat, rectangular release plate located under the front end of the armrest, then moving the armrest toward the front of the seat and downward. The armrest can be raised by pulling the armrest upward and toward the seatback until it locks into place.

The couches are not adjustable.

FOYER

Hinged seat-cushion halves mounted on top of the toilet form an extra passenger seat when the toilet is not in use.

AFT-CABIN AREA

One or two optional folding seats may be installed in the aft-cabin area. They are mounted on the cabin sidewall and swing inboard when unfolded. A latch mechanism on the leg locks the seats in place when they are unfolded. When this seating is not needed, the seat(s) may be folded against the cabin sidewall and held in place with retaining straps.

SEATBELTS

Every seat in the airplane is equipped with a seatbelt. The seatbelt can be lengthened by turning the male half of the buckle at a right angle to the belt, then pulling the male half in the direction away from the anchored end of the belt. The buckle is locked by sliding the male half into the female half of the buckle. The belt is then tightened by pulling the short end of the belt through the male half of the buckle until a snug fit is obtained. The buckle is released by lifting the large, hinged release lever on the female buckle half and pulling the male half of the buckle free. All occupants must wear seat belts during takeoff and landing.

SHOULDER HARNESSES

COCKPIT

The shoulder harness installations for the pilot and copilot seats consist of two straps each. Each strap is routed from the lower aft area of the seat, up the seatback, and through a retaining loop on top of the seatback. One strap is worn over each shoulder. Each strap terminates in a slotted bayonet-blade fastener which is aligned with one edge of the strap. When the two bayonet blades are placed together, the shoulder harness straps can be secured by sliding the male half of the seatbelt buckle through the bayonet slots and into the female half of the seatbelt buckle.

The shoulder harness straps proceed from inertia reels built into the crew chairs. Spring loading at the inertia reels keeps the shoulder harnesses snug, but allows the pilot and copilot all the freedom of movemenet normally required in flight. However, the inertia reels incorporate a locking device that will secure the harness straps in the event of sudden forward movement.

CABIN

The shoulder harness on passenger chairs consists of a single strap. It is routed through the top of the seatback and terminates in a triangular metal fastener. The strap is worn diagonally. It runs from the outboard shoulder to the inboard hip area, where it is secured by hooking the metal fastener around the securing stud on the male half of the seatbelt buckle.

The shoulder harness strap proceeds from an inertia reel built into the passenger chair. Spring loading at the inertia reel keeps the shoulder harness strap snug, but allows considerable freedom of movement. However, the inertia reel incorporates a locking device that will secure the harness strap in the event of sudden forward movement. If the seat is equipped with a shoulder harness, it must be worn during takeoff and landing.

WARNING

Ensure that the seatback is in the fully upright position and that the headrest is properly adjusted whenever the shoulder harness is used.

AFT-CABIN AREA

The shoulder harness for aft-cabin-area fold-up chairs is of a double-strap configuration. The middle portion of the strap is secured by a metal slip ring which is anchored to the aft pressure bulkhead. The two ends (which actually function as two separate straps) extend downward toward the seatbelt-buckle area. One end of the shoulder harness strap terminates in a slotted bayonet-blade fastener. The other end is attached to the upper edge of the shoulder harness adjuster. A short adjusting strap, which is also equipped with a slotted bayonet-blade fastener, extends upward from the area of the seatbelt buckle and slides through the lower portion of the shoulder harness adjuster. A small, flexible adjusting tab is also attached to the lower edge of the adjuster.

One end of the shoulder harness strap is worn over each shoulder. When the two bayonet blades are placed together, the shoulder harness straps can be secured by sliding the male half of the seatbelt buckle through the bayonet slots and into the female half of the seatbelt buckle. The shoulder harness strap can be lengthened by grasping the tab on the adjuster and pulling upward. The strap can be tightened by grasping the loose end of the adjusting strap and pulling it through the adjuster until the shoulder harness is snug.

DOORS, WINDOWS, AND EXITS

AIRSTAIR ENTRANCE DOOR (200)

The cabin door is hinged at the bottom. It swings out and down when opened. A stairway built onto the inboard side of the door facilitates entry to and egress from the airplane. Two of the stairsteps automatically fold flat against the door when the door is closed. A hydraulic damper ensures that the door will swing down slowly when it opens. While the door is open, it is supported by a plastic-encased cable, which also serves as a handrail. Additionally, this cable is utilized when closing the door from inside the airplane. The door closes against an inflatable rubber seal which is installed around the opening in the door frame. When weight is off the landing gear, engine bleed air supplies pressure to inflate the door seal, which provides a positive pressure-vessel seal around the door. The outside door handle can be locked with a key, for security of the airplane on the ground.

CAUTION

Only one person at a time should be on the door stairway.

The door locking mechanism is operated by rotating either the outside or the inside door handle, both of which move simultaneously. Two latch bolts at each side of the door, and two latch hooks at the top of the door, lock into the door frame to secure the airstair door.

Whether unlocking the door from the outside or the inside, the release button adjacent to the door handle must be held depressed before the handle can be rotated (counterclockwise from inside the airplane, clockwise from outside) to unlock the door. Consequently, unlocking the door is a two-hand operation requiring deliberate action. The release button acts as a safety device to help prevent accidental opening of the door. As an additional safety measure, a differential-pressure-sensitive diaphragm is incorporated into the release-button mechanism. The outboard side of the diaphragm is open to ambient air pressure, the inboard side to cabin air pressure. As the cabin-to-ambient air pressure differential increases, it becomes increasingly difficult to depress the release button, because the diaphragm moves inboard when either the outside or inside release button is depressed. Never attempt to unlock or even check the security of the door in flight. If the CABIN DOOR caution annunciator illuminates in flight, or if the pilot has any reason whatever to suspect that the door may not be securely locked, the cabin should be depressurized (after first considering altitude), and all occupants instructed to remain seated with their seatbelts fastened. After the airplane has made a full-stop landing and the cabin has been depressurized, a crew member should check the security of the cabin door.

To close the door from outside the airplane, lift up the free end of the airstair door and push it up against the door frame as far as possible. Then grasp the handle with one hand and rotate it clockwise as far as it will go. The door will then move into the closed position. Then rotate the handle counterclockwise as far as it will go. The release button should pop out, and the handle should be pointing aft. Check the security of the door by attempting to rotate the handle clockwise without depressing the release button; the handle should not move.

To close the door from inside the airplane, grasp the handrail cable and pull the airstair door up against the door frame. Then grasp the handle with one hand and rotate it counterclockwise as far as it will go, continuing to pull inward on the door. The door will then move into the closed position. Then turn the handle clockwise as far as it will go. The release button should pop out, and the handle should be pointing down. Check the security of the door by attempting to rotate the handle counterclockwise without depressing the release button; the handle should not move. Next, lift the folded stairstep that is just below the door handle. A placard adjacent to the round observation window advises the observer that the safety lock arm should be in position around the diaphragm shaft (plunger) when the handle is in the locked position. The placard also presents a diagram showing how the arm and shaft should be positioned. A red push-button switch near the window turns on a lamp inside the door, which illuminates the area observable through the window. If the arm is properly positioned around the shaft, proceed to check the indication in each of the visual inspection ports, one of which is located near each corner of the door. The green stripe painted on the latch bolt should be aligned with the black pointer in the visual inspection port. If any condition specified in this door-locking procedure is not met, do not take off.

AIRSTAIR ENTRANCE DOOR (200C)

A swing-down door, hinged at the bottom, provides a convenient stairway for entry and exit. Two of the four steps are movable and automatically fold flat against the door in the closed position. A self-storing platform automatically folds down over the door sill when the door opens to provide a stepping platform for door seal protection. A plastic encased cable provides support for the door in the open position, a handhold for passengers, and a means of closing the door from inside the airplane. A rubber seal around the door positively seals the pressure vessel while the airplane is in flight. A hydraulic dampener permits the door to lower gradually during opening.

The door locking mechanism is operated by either of the two vertically staggered handles, one inside and the other outside the door. The inside and outside handles are mechanically interconnected. When either handle is rotated per placard instructions, three rotating-cam-type latches on either side of the door capture posts mounted on the cargo door side of the opening. When in the closed position the airstair door becomes an integral part of the cargo door.

A button adjacent to the door handle, whether inside or outside the cabin, must be depressed before the handle can be rotated to open the door. When the airplane cabin is pressurized, cabin internal pressure inflates a bellows behind the button to prevent accidental opening of the door.

An annunciator light in the cockpit illuminates if the door is not closed and all latches fully locked. The handle and latches can all be visually checked for security. For security of the airplane on the ground, the door can be locked with a key.

CARGO DOOR (200C)

A swing-up door, hinged at the top, provides cabin access for loading large or bulky items. After initial opening force is applied, gas springs will open the cargo door automatically. The door is counterbalanced and will remain in the open position. The support rod is used to hold the door in the open position and to pulthe door down into the closed position. Once closed, the gas springs apply a closing force to assist in latching the door. A rubber seal around the door seals the pressure vessel while the airplane is in flight.

The door locking mechanism is operated by two handles, one in the bottom forward portion of the door and the other in the upper aft portion of the door. When the upper aft handle is operated per placard instructions, two rotating-cam-type latches on the forward side of the door and two on the aft side rotate, capturing posts mounted on the fuselage side of the door opening. The bottom handle, when operated per placard instructions, actuates four pin-lug latches across the bottom of the door.

A button on the upper aft handle must be pressed before the handle can be operated to open or latch the door. A latching lever on the bottom handle must be lifted to release the handle before the lower latches can be opened. These act as additional aids in preventing accidental opening of the door.

The cabin and cargo doors are equipped with dual sensing circuits to provide the aircrew remote indication of cabin door/cargo door security. An annunciator light in the cockpit illuminates if the cabin door or cargo door is open and the battery switch is turned ON. If the battery switch is turned OFF the annunciator will illuminate only if the cabin door is closed but not securely latched. These circuits shall be checked prior to the first flight of each day.

EMERGENCY EXIT

The emergency exit door, placarded EXIT-PULL, is located on the right side of the fuselage at the forward end of the passenger compartment. From the inside, the door is released with a pull-down handle. From the outside, the door is released with a flush-mounted, pull-out handle. The non-hinged, plug-type door removes completely from the frame into the cabin when the latches are released. The door can be locked with a key from the inside, to prevent opening from the outside. The inside handle will unlatch the door, whether or not it is locked, by overriding the locking mechanism. The key lock should be unlocked prior to flight, to allow removal of the door from the outside in the event of an emergency. The keyhole is in the horizontal position when the door is locked. The key cannot be removed in this position.

A wiper-type disconnect for the air duct that supplies air to the eyeball outlet in the emergency exit door is located on the upper-aft edge of the door. As the door is removed, the duct is disconnected, since it is an integral part of the door.

Located on the lower-forward edge of the door is an electrical disconnect for the wiring that goes to the reading light and the fluorescent light in the emergency exit door. It will unplug as the door is being removed. Upon reinstalling the door, the electrical disconnect should be reconnected before moving the door into the closed position.

INTERIOR DOORS

Sliding doors are provided between the cockpit and cabin, and between the cabin and foyer. These doors provide privacy, and prevent the spilling of light from one compartment into another. The doors are closed by sliding the two partition-type door panels to the center of the aisle, where they are held together by a magnetic strip in the edge of each door.

CABIN WINDOWS

Each cabin window pane, which is composed of a sheet of polyvinyl butyral (PVB) laminated between two sheets of clear acrylic plastic, is stressed to withstand the cabin-to-ambient air pressure differential. It is then sealed into a window opening in the fuselage, and forms an integral part of the pressure vessel.

POLARIZED TYPE

Two dust panes are mounted inboard of the cabin window pane in each window frame. Each of these dust panes is composed of a film of polarizing material laminated between two sheets of acrylic plastic. The inboard dust pane rotates freely in the window frame and has a protruding thumb knob near the edge. Rotating the pane through an arc of 90° permits complete light regulation as desired. Rotation changes the relative alignment between the polarizing films, thus providing any degree of light transmission from full intensity to almost none.

WARNING

Do not look directly at the sun, even through polarized windows, because eye damage could result.

CAUTION

When the airplane is to be parked in areas exposed to intensive sunlight, the polarized windows should be rotated to the clear position to prevent deterioration of the polarized material. Sufficient ultraviolet protection is provided to prevent fading of the upholstery.

SHADE TYPE

A dust pane, which is a single sheet of tinted acrylic plastic, is mounted inboard of the cabin window pane in each window frame. An adjustable window shade is provided to control the amount of light admitted. The shade is adjusted by squeezing the two latch handles located on the lower center of the shade, and then positioning the shade as desired. Detents in the shade tracks provide positive latching action at various positions.

CONTROL LOCKS

The control locks consist of a U-shaped clamp and two pins, all connected by a chain. The pins lock the primary flight controls; the U-shaped clamp fits around the engine control levers, serving to warn the pilot not to start the engines with the control locks installed. It is important that all the locks be installed and removed together, to preclude the possibility of attempting to taxi or fly the airplane with the engine control levers released, but with the pins still installed in the flight controls.

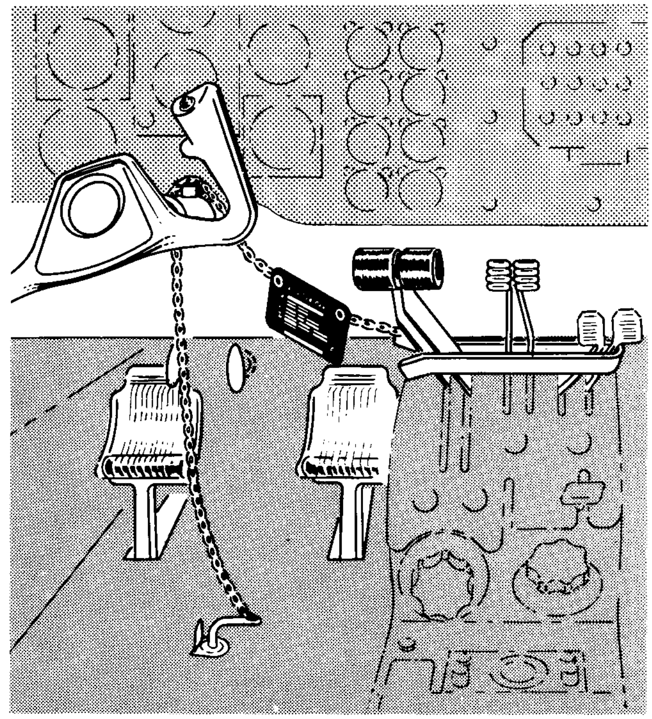
Install the control locks in the following sequence:

1. Position the U-clamp around the engine control levers.
2. Move the control column as necessary to align the holes, then insert the small pin.

NOTE

On serials BB-82 and after, BL-1 and after, the holes are aligned when the control wheel is full forward and rotated approximately 15° to the left.

On serials prior to BB-82, the holes are aligned when the control wheel is full forward and level.



200-150-1

3. Insert the L-shaped pin through the hole provided in the floor aft of the rudder pedals. The rudder pedals must be centered to align the hole in the rudder bellcrank with the hole in the floor. The pin is then inserted until the flange is resting against the floor. This will prevent any rudder movement.

WARNING

Before starting engines, remove the locks, reversing the above procedure.

CAUTION

Remove the control locks before towing the airplane. If towed with a tug while the rudder lock is installed, serious damage to the steering linkage can result.

INTENTIONALLY LEFT BLANK

ENGINES

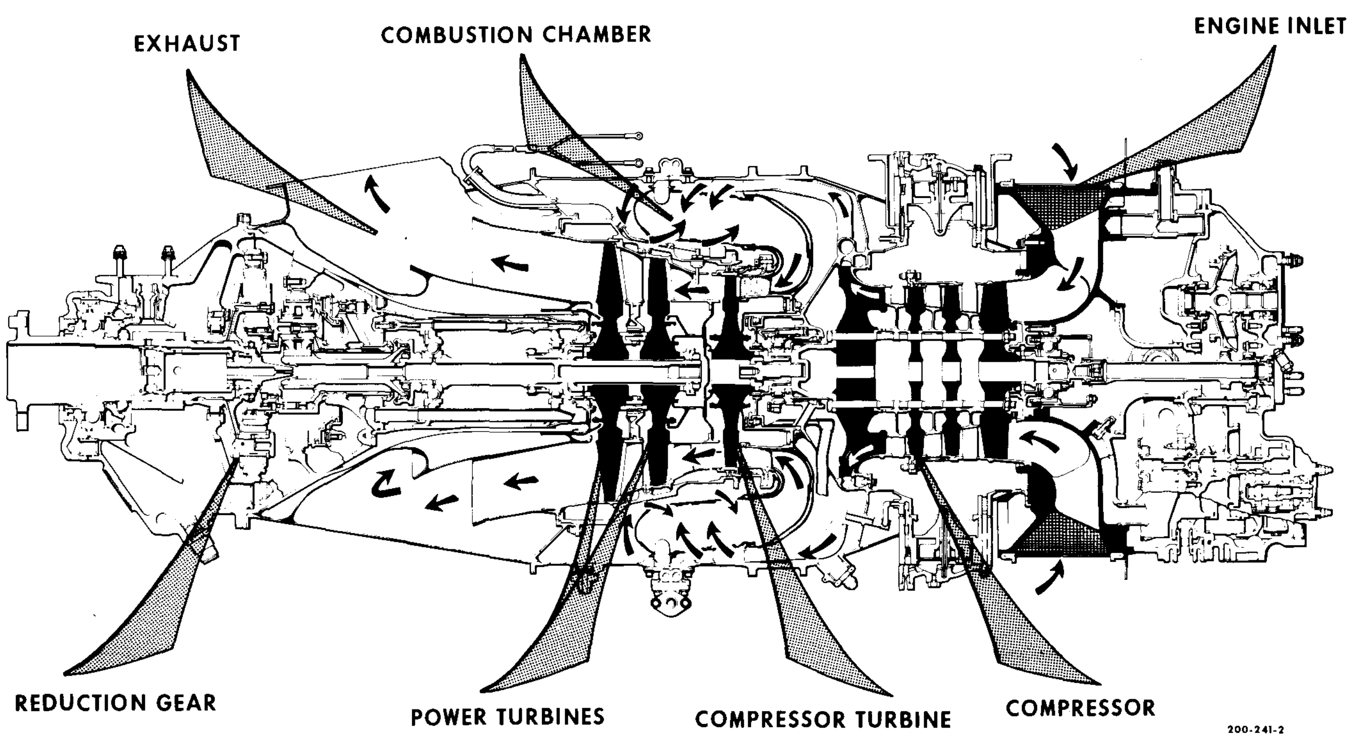
The Beechcraft Super King Air 200 is powered by two Pratt & Whitney Aircraft of Canada Ltd. PT6A-41 turbopropeller engines, each rated at 850 SHP. Each engine has a three-stage axial-flow, single-stage centrifugal-flow compressor, which is driven by a single-stage reaction turbine. The power turbine - a two-stage reaction turbine counter - rotating with the compressor turbine - drives the output shaft. Both the compressor turbine and the power turbine are located in the approximate center of the engine, with their shafts extending in opposite directions. Being a reverse flow engine, the ram air supply enters the lower portion of the nacelle and is drawn in through the aft protective screens. The air is then routed into the compressor. After it is compressed, it is forced into the annular combustion chamber, and mixed with fuel that is sprayed in through 14 nozzles mounted around the gas generator case. A capacitance discharge ignition unit and two spark igniter plugs are used to start combustion. After combustion, the exhaust passes through the compressor turbine and two stages of power turbine and is routed through two exhaust ports near the front of the engine. A pneumatic fuel control system schedules fuel flow to maintain the power set by the gas generator power lever. Propeller speed within the governing range remains constant at any selected propeller control lever position through the action of a propeller governor, except in the beta range where the maximum propeller speed is controlled by the pneumatic section of the propeller governor.

The accessory drive at the aft end of the engine provides power to drive the fuel pumps, fuel control, the oil pumps, the refrigerant compressor (right engine), the starter/generator, and the tachometer transmitter. At this point, the speed of the drive (N_1) is the true speed of the compressor side of the engine, 37,500 rpm (which corresponds to 100% N_1). Maximum continuous speed of the engine is 38,100 rpm, which equals 101.5% N_1, with a transient overspeed of 38,500 rpm, which equals 102.6% N_1.

The reduction gearbox forward of the power turbine provides gearing for the propeller and drives the propeller tachometer transmitter, the propeller overspeed governor, and the propeller governor. Prior to gear reduction, the turbine speed on the power side of the engine is 30,000 rpm at 2000 propeller rpm.

Propeller torque value is measured by a hydro-mechanical device located inside the first stage reduction gear housing to provide an accurate indication of engine power output. The mechanism consists of a torquemeter cylinder, a piston, valve plunger and spring. Rotation of the first stage ring gear in the reduction gearbox is resisted by the helical splines which impart an axial movement to the ring gear and therefore to the torquemeter piston. A torquemeter valve regulates the input of engine oil into the torque cylinder to stabilize the piston position. The pressure created in the torque cylinder is plumbed to the torquemeter transmitter to give a relative reading of torque.

Deceleration on the ground is achieved by bringing the propeller blades through the Beta range into a reversing pitch by utilizing the pitch change mechanism. The power levers must be retarded below the IDLE position by raising them



ENGINE CUTAWAY

over a detent. Reversing power is available in direct proportion to the retarding of the levers in the reversing range.

PROPULSION SYSTEM CONTROLS

The propulsion system is operated by three sets of controls; the power levers, propeller levers, and condition levers. The power levers serve to control engine power. The condition levers control the flow of fuel at the fuel control outlet and select fuel cut off, low idle and high idle functions. The propeller levers are operated conventionally and control the constant speed propellers through the primary governor.

POWER LEVERS

The power levers provide control of engine power from idle through take-off power by operation of the gas generator (N_1) governor in the fuel control unit. Increasing N_1 rpm results in increased engine power.

PROPELLER LEVERS

Each propeller lever operates a speeder spring inside the primary governor to reposition the pilot valve, which results in an increase or decrease of propeller rpm. For propeller feathering, each propeller lever manually lifts the pilot valve to a position which causes complete dumping of high pressure oil. Detents at the rear of lever travel prevent inadvertent movement into the feathering range. Operating range is 1600 to 2000 rpm.

CONDITION LEVERS

The condition levers have three positions; FUEL CUT-OFF, LOW IDLE and HIGH IDLE. Each lever controls the idle cut off function of the fuel control unit and limits idle speed at 52% N_1 for low idle, and 70% N_1 for high idle.

PROPELLER REVERSING

When the power levers are lifted over the IDLE detent, they control engine power through the Beta and reverse ranges.

CAUTION

> Propeller reversing on unimproved surfaces should be accomplished carefully to prevent propeller erosion from reversed airflow and, in dusty conditions, to prevent obscuring the operator's vision.

Condition levers, when set at HIGH IDLE, keep the engines operating at 70% N_1 high idle speed for maximum reversing performance.

CAUTION

> Power levers should not be moved into the reversing position when the engines are not running because the reversing system will be damaged.

FRICTION LOCKS

Four friction locks are located on the power quadrant of the pedestal. When they are rotated counterclockwise, the propulsion system control levers can be moved freely. As the friction locks are rotated clockwise, the control levers progressively become more resistant to movement, so that they will not creep out of position.

ENGINE INSTRUMENTATION

Engine instruments, located on the left of the center portion of the instrument panel, are grouped according to their function. At the top, the ITT (Interstage Turbine Temperature) indicators and torquemeters are used to set take-off power. Climb and cruise power are established with the torquemeters and propeller tachometers while observing ITT limits. Gas generator (N_1) operation is monitored by the gas generator tachometers. The lower grouping consists of the fuel flow indicators and the oil pressure temperature indicators.

The ITT indicator gives an instantaneous reading of engine gas temperature between the compressor turbine and the power turbines.

The torquemeters give an indication in foot-pounds of the torque being applied to the propeller.

The propeller tachometer is read directly in revolutions per minute. The N_1 or gas generator tachometer is read in percent of rpm, based on a figure of 37,500 rpm at 100%. Maximum continuous gas generator speed is limited to 38,100 rpm or 101.5% N_1.

Proper observation and interpretation of these instruments provide an indication of engine performance and condition.

A propeller synchroscope, located to the left of the oil pressure/temperature indicators, operates to give an indication of synchronization of the propellers. If the right propeller is operating at a higher rpm than the left, the face of the synchroscope, a black and white cross pattern, spins in a clockwise rotation. Left, or counterclockwise, rotation indicates a higher rpm of the left propeller. This instrument aids the pilot in obtaining complete synchronization of propellers.

PROPELLER SYNCHROPHASER

The propeller synchrophaser automatically matches the rpm of the right propeller (slave propeller) to that of the left propeller (master propeller) and maintains the blades of one propeller at a predetermined relative position with the blades of the other propeller. To prevent the right propeller from losing excessive rpm if the left propeller is feathered while the synchrophaser is on, the synchrophaser has a limited range of authority from the manual governor setting. Normal governor operation is unchanged but the synchrophaser will continuously monitor propeller rpm and reset the governor as required. A magnetic pickup mounted in each propeller overspeed governor and adjacent to each propeller deice brush block transmits electric pulses to a transistorized control box installed forward of the pedestal.

The control box converts any pulse rate differences into correction commands, which are transmitted to a stepping type actuator motor mounted on the right engine cowl forward support ring. The motor then trims the right propeller governor through a flexible shaft and trimmer assembly to exactly match the left propeller. The trimmer, installed between the governor control arm and the control cable, screws in or out to adjust the governor while leaving the control lever setting constant. A toggle switch installed adjacent to the synchroscope turns the system on. With the switch off, the actuator automatically runs to the center of its range of travel before stopping to assure normal function when used again. To operate the system, synchronize the propeller in the normal manner and turn the synchrophaser on. The system is designed for in-flight operations and is placarded to be off for take-off and landing. Therefore, with the system on and the landing gear extended, the caution flashers and a yellow light on the caution/advisory annunciator panel, PROP SYNC ON, will illuminate.

The right propeller rpm and phase will automatically be adjusted to correspond to the left. To change rpm, adjust both propeller controls at the same time. This will keep the right governor setting within the limiting range of the left propeller. If the synchrophaser is on but is unable to adjust to the right propeller to match the left, the actuator has reached the end of its travel. To re-center, turn the switch off, synchronize the propellers manually, and turn the switch back on.

ENGINE LUBRICATION SYSTEM

Engine oil, contained in an integral tank between the engine air intake and the accessory case, cools as well as lubricates the engine. An oil radiator located inside the lower nacelle, keeps the engine oil temperature within the operating limits. A thermal element is used to regulate a bypass door which controls the volume of cooling air through the radiator. Engine oil also operates the propeller pitch change mechanism and the engine torquemeter system.

The lubrication system capacity per engine is 3.5 U.S. gallons. The oil tank capacity is 2.3 gallons with 5 quarts measured on the dipstick for adding purposes. Recommended oils and oil changing procedures are listed in the SERVICING section.

MAGNETIC CHIP DETECTOR

A magnetic chip detector is installed in the bottom of each engine nose gearbox. This detector will activate a red light on the annunciator panel, L CHIP DETECT or R CHIP DETECT, to alert the pilot of oil contamination indicating possible or pending engine failure.

STARTING AND IGNITION SYSTEM

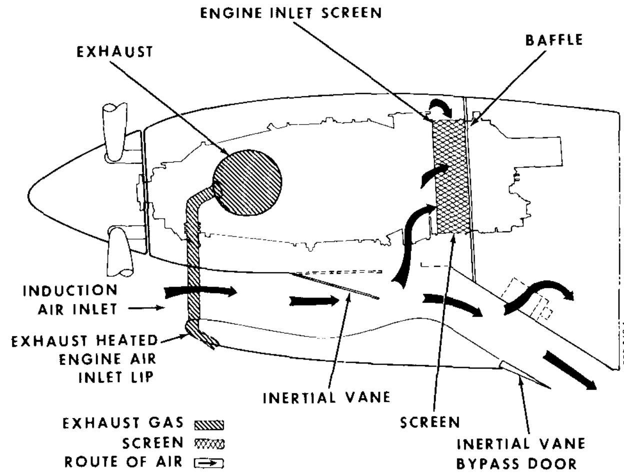
Each engine is started by a three-position switch located on the left subpanel placarded, IGNITION AND ENGINE START - ON - OFF - STARTER ONLY. Each switch may be moved downward to the STARTER ONLY position to motor the engine for the purpose of clearing it of fuel without the ignition circuit on. The switch is spring loaded and will return to the center position when released. Moving the switch upward to the ON position activates both the starter and ignition, and the appropriate IGNITION ON light on the annunciator panel will illuminate. When engine speed has accelerated through 50% N_1 or above on starting, the starter drive action is stopped by placing the switch in the center OFF position.

AUTO IGNITION

The auto ignition system provides automatic ignition to prevent engine loss due to combustion failure. This system is provided to ensure ignition during takeoff, landing, turbulence, and penetration of icing or precipitation conditions. Arming the system prior to takeoff and turning the system off after landing is required to assure the system being armed in the required conditions. To arm the system, move the required ENG AUTO IGNITION switches, located on the pilot's subpanel, from OFF to ARM. If for any reason the engine torque falls below 400 foot-pounds, the igniter will automatically energize and the IGNITION ON light on the caution/advisory annunciator panel will illuminate. For extended ground operation, the system should be turned off to prolong the life of the igniter units.

INDUCTION AIR SYSTEM

The PT6A-41 is a reverse-airflow engine. The compressor wheels draw ambient air into the engine through the induction air inlet at the lower front of the engine nacelle. As airspeed increases, ram air pressure rises, compressing the air inside the induction air duct. The air then flows into an annular inlet-air chamber located at the aft end of the engine compartment. It then passes through a protective screen and into the primary compressor impeller, where it is further compressed. Then the air is forced through a stator ring and successively through the second and third axial-flow compressor stages. It is finally compressed in the centrifugal-flow compressor stage, then discharged into the turbine plenum assembly. Air from the plenum enters the annular combustion chamber through a series of holes in the aft end of the combustion chamber, and mixes with fuel that is sprayed into the combustion chamber through 14 nozzles mounted around the gas generator case. The air-fuel mixture burns inside the combustion chamber, then the hot gases expand forward out of the chamber and pass through the compressor turbine stage, both stages of the power turbine, and out to the atmosphere through two exhaust ports located at the side of each nacelle, near the front.



ENGINE ICE PROTECTION

ICE PROTECTION

ENGINE AIR INLET

Engine exhaust heat is utilized for heating the engine air inlet lips. Hot exhaust is picked up by a scoop inside each engine exhaust stack and plumbed downward to connect into each end of the inlet lip. Exhaust flows through the inside of the lip downward to the bottom where it is plumbed out through the bottom of the nacelle. No shut-off or temperature indicator is necessary for this system.

ICE VANES (INERTIAL SEPARATOR SYSTEM)

An inertial separation system is built into each engine air inlet to prevent moisture particles from entering the engine inlet plenum under icing conditions. A movable vane and a by-pass door are lowered into the airstream when operating in visible moisture at +5°C or colder, by energizing electrical actuators with the switches, placarded ICE VANE - EXTEND - RETRACT, located in the lower left subpanel. The vane deflects the ram airstream slightly downward to introduce a sudden turn in the airstream to the engine, causing the moisture particles to continue on undeflected, because of their greater momentum, and to be discharged overboard.

While in the icing flight mode, the extended position of the vane and by-pass door is indicated by green annunciator lights, L ICE VANE EXT and R ICE VANE EXT.

In the non-ice-protection mode, the vane and by-pass door are retracted out of the airstream by placing the ice vane switches in the RETRACT position. The green annunciator lights will extinguish. Retraction should be accomplished at +15°C and above to assure adequate oil cooling. The vanes should be either extended or retracted; there are no intermediate positions.

If for any reason the vane does not attain the selected position within 15 seconds, a yellow L ICE VANE or R ICE VANE light illuminates on the caution/advisory panel. In this event, a mechanical backup system is provided, and is actuated by pulling the T-handles just below the pilot's subpanel placarded ICE VANE MANUAL - PULL - LEFT ENG - RIGHT ENG. Decrease airspeed to 160 knots or less to reduce forces for manual extension. Normal airspeed may then be resumed.

CAUTION

> Once the manual override system has been engaged (i.e., anytime the manual ice vane T-handle has been pulled out), do not attempt to retract or extend the ice vanes electrically, even if the T-handle has been pushed back in, until the override linkage in the engine compartment has been properly reset on the ground. (See the maintenance manual for resetting procedure.)

When the vane is successfully positioned with the manual system, the yellow annunciator lights will extinguish. The vane may also be retracted with the manual system. During manual system use, the electric motor switch position must match the manual handle position for a correct annunciator readout.

FUEL CONTROL

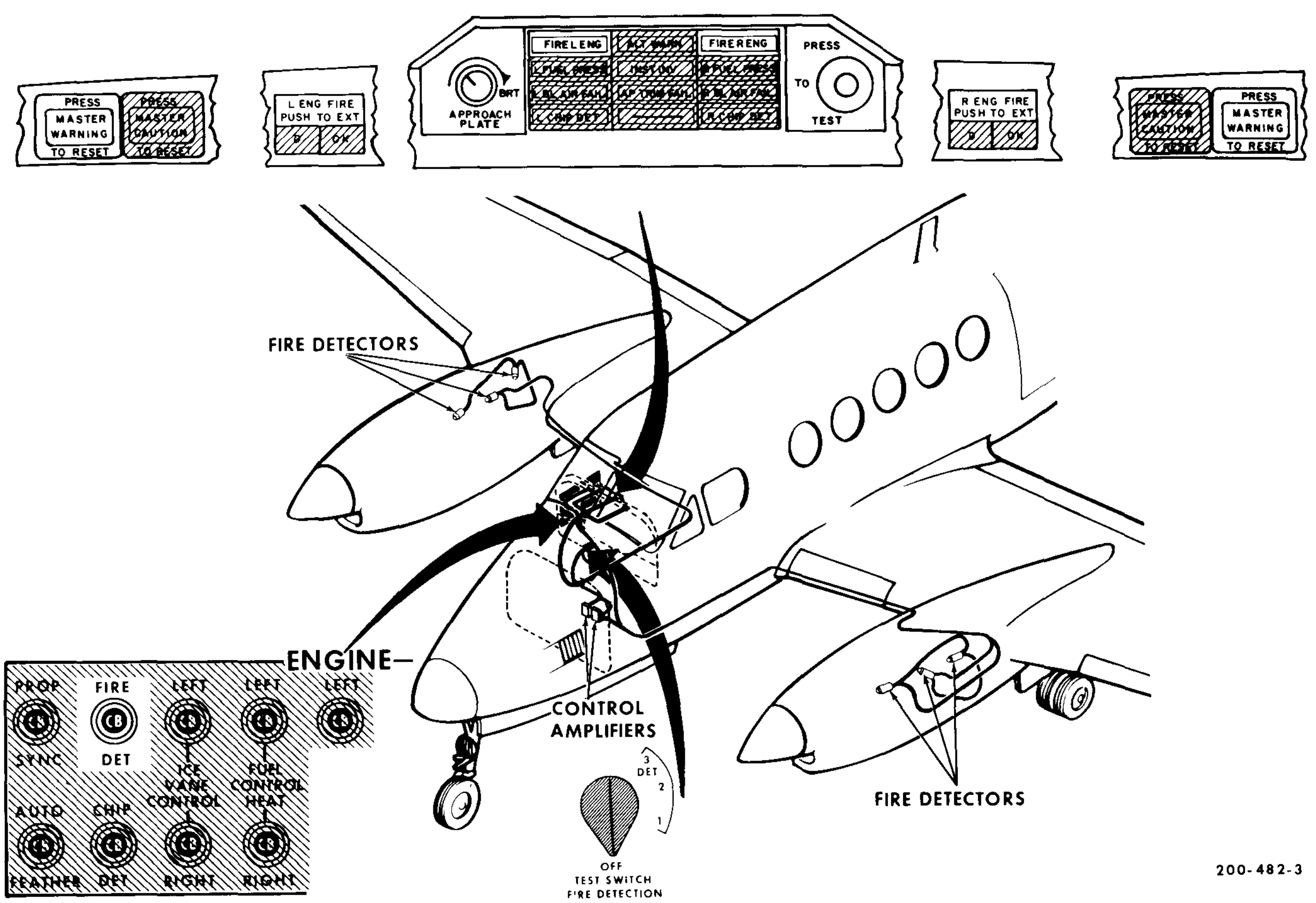
The basic engine fuel system consists of an engine driven fuel pump, a fuel control unit, a fuel manifold dump valve, a dual fuel manifold and fourteen fuel nozzles. The automatic fuel drain valves are provided to clear residual fuel after engine shutdown. The engine fuel control unit works with a temperature compensating unit to supply information for the engine fuel control system. This fuel control unit is a hydromechanical computing and metering device which determines the proper fuel schedule for the engine to provide the power required, as established by the position of the power levers. This is accomplished by controlling the speed of the compressor turbine. The temperature compensator alters the acceleration fuel schedule of the fuel control unit to compensate for variations in compressor inlet air temperature. Engine characteristics vary with changes in inlet temperature and the acceleration fuel schedule must in turn be altered to prevent compressor stall and/or excessive turbine temperature.

FIRE DETECTION SYSTEM

The fire detection system is designed to provide immediate warning in the event of fire in either engine compartment. The system consists of the following: three photoconductive cells for each engine; a control amplifier for each engine; two red warning lights on the warning annunciator panel, one placarded FIRE L ENG, the other FIRE R ENG; a test switch on the copilot's left subpanel; and a circuit breaker placarded FIRE DET on the right side panel. The six photoconductive-cell flame detectors are sensitive to infrared radiation. They are positioned in each engine compartment so as to receive both direct and reflected rays, thus monitoring the entire compartment with only three photocells. Heat level and rate of heat rise are not factors in the sensing method.

Conductivity through the photocell varies in direct proportion to the intensity of the infrared radiation striking the cell. As conductivity increases, the amount of current from the electrical system flowing through the flame detector increases proportionally. To prevent stray light rays from signaling a false alarm, a relay in the control amplifier closes only when the signal strength reaches a preset alarm level. When the relay closes, the appropriate left or right warning annunciators illuminate. When the fire has been extinguished, the cell output voltage drops below the alarm level and the relay in the control amplifier opens. No manual resetting is required to reactivate the fire detection system.

The test switch on the copilot's left subpanel, placarded TEST SWITCH - FIRE DET & FIRE EXT, has six positions: OFF - RIGHT EXT - LEFT EXT - 3 - 2 - 1. (If the optional engine-fire-extinguisher system is not installed, the RIGHT



FIRE DETECTION SYSTEM SCHEMATIC

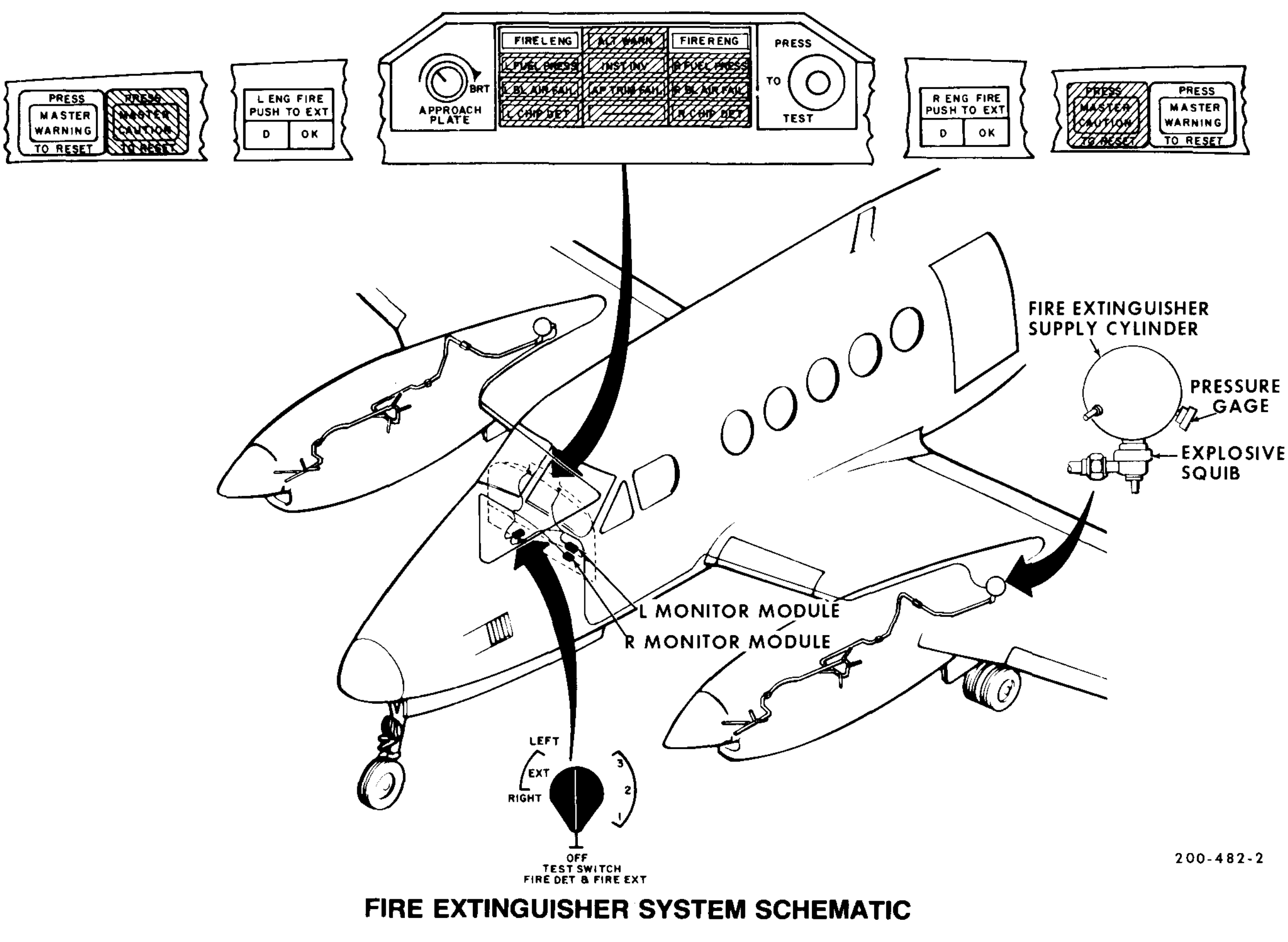
EXT and LEFT EXT positions on the left side of the test switch will not be installed.) The three test positions for the fire detector system are located on the right side of the switch (3 - 2 - 1). When the switch is rotated from OFF (down) to any one of these three positions, the output voltage of a corresponding flame detector in each engine compartment is increased to a level sufficient to signal the amplifier that a fire is present. The following should illuminate: the red pilot and copilot MASTER WARNING flashers; and, if the optional engine-fire-extinguisher system is installed, the red lenses placarded L ENG FIRE - PUSH TO EXT and R ENG FIRE - PUSH TO EXT on the fire-extinguisher activation switches. The system may be tested anytime, either on the ground or in flight. The TEST SWITCH should be placed in all three positions, in order to verify that the circuitry for all six fire detectors is functional. Illumination failure of all the fire detection system annunciators when the TEST SWITCH is in any one of the three flame-detector-test positions indicates a malfunction in one or both of the two detector circuits (one in each engine) being tested by that particular position of the TEST SWITCH.

FIRE EXTINGUISHER SYSTEM

The optional engine-fire-extinguisher system incorporates a pyrotechnic cartridge inside the nacelle of each engine. When the activation valve is opened, the pressurized extinguishing agent is discharged through a plumbing network which terminates in strategically located spray nozzles.

The fire extinguisher control switches used to activate the system are located on the glareshield at each end of the warning annunciator panel. Their power is derived from the hot battery bus. Each push-to-actuate switch incorporates three indicator lenses. The red lens, placarded L (or) R ENG FIRE - PUSH TO EXT, warns of the presence of fire in the engine. The amber lens, placarded D, indicates that the system has been discharged and the supply cylinder is empty. The green lens, placarded OK, is provided only for the test function. To discharge the cartridge, raise the safety-wired clear plastic cover and press the face of the lens. This is a one-shot system and will be completely expended upon activation. The amber D light will illuminate and remain illuminated, regardless of battery switch position, until the pyrotechnic cartridge has been replaced.

The fire-extinguisher-system test functions incorporated in the TEST SWITCH - FIRE DET & FIRE EXT test the circuitry of the fire extinguisher pyrotechnic cartridges. During preflight, the pilot should rotate the TEST SWITCH to each of the two positions (RIGHT EXT and LEFT EXT) and verify the illumination of the amber D light and the green OK light on



FIRE EXTINGUISHER SYSTEM SCHEMATIC

each fire-extinguisher-activation switch on the glareshield.

A gage, calibrated in psi, is provided on each supply cylinder for determining the level of charge. The gages should be checked during preflight.

PROPELLER SYSTEM

DESCRIPTION

Each engine is equipped with a conventional three-blade, full-feathering, constant-speed, counter-weighted, reversing, variable-pitch propeller mounted on the output shaft of the reduction gearbox. The propeller pitch and speed are controlled by engine oil pressure, through single-action, engine-driven propeller governors. Centrifugal counterweights, assisted by a feathering spring, move the blades toward the low rpm (high pitch) position and into the feathered position. Governor boosted engine oil pressure moves the propeller to the high rpm (low pitch) hydraulic stop and reverse position. The propellers have no low rpm (high pitch) stops; this allows the blades to feather after engine shutdown.

Propeller tie-down boots are provided for use on the moored airplane to prevent windmilling at zero oil pressure.

PRIMARY LOW PITCH STOP

Low pitch propeller position is determined by the primary low pitch stop which is a mechanically actuated, hydraulic stop. Beta and reverse blade angles are controlled by the power levers in the Beta and reverse range.

PROPELLER GOVERNORS

Two governors, a constant speed governor, and an overspeed governor, control the propeller rpm. The constant speed governor, mounted on top of the gear reduction housing, controls the propeller through its entire range. The propeller control lever operates the propeller by means of this governor. If the constant speed governor should malfunction and request more than 2000 rpm, the overspeed governor cuts in at 2080 rpm and dumps oil from the propeller to keep the rpm from exceeding approximately 2080 rpm. A solenoid, actuated by the PROP GOV TEST & LOW PITCH STOP TEST switch located on the pilot's subpanel, is provided for resetting the overspeed governor to approximately 1830 to 1910 rpm for test purposes.

If the propeller sticks or moves too slowly during a transient condition causing the propeller governor to act too slowly to prevent an overspeed condition, the power turbine governor, contained within the constant speed governor housing, acts as a fuel topping governor. When the propeller reaches 2120 rpm, the fuel topping governor limits the fuel flow to the gas generator, reducing N_1 rpm, which in turn prevents the propeller rpm from exceeding approximately 2200 rpm. During operation in the reverse range, the fuel topping governor is reset to approximately 95% propeller rpm before the propeller reaches a negative pitch angle. This ensures that the engine power is limited to maintain a propeller rpm somewhat less than that of the constant speed governor setting. The constant speed governor therefore will always sense an underspeed condition and direct oil pressure to the propeller servo piston to permit propeller operation in Beta and reverse ranges.

AUTOFEATHER SYSTEM

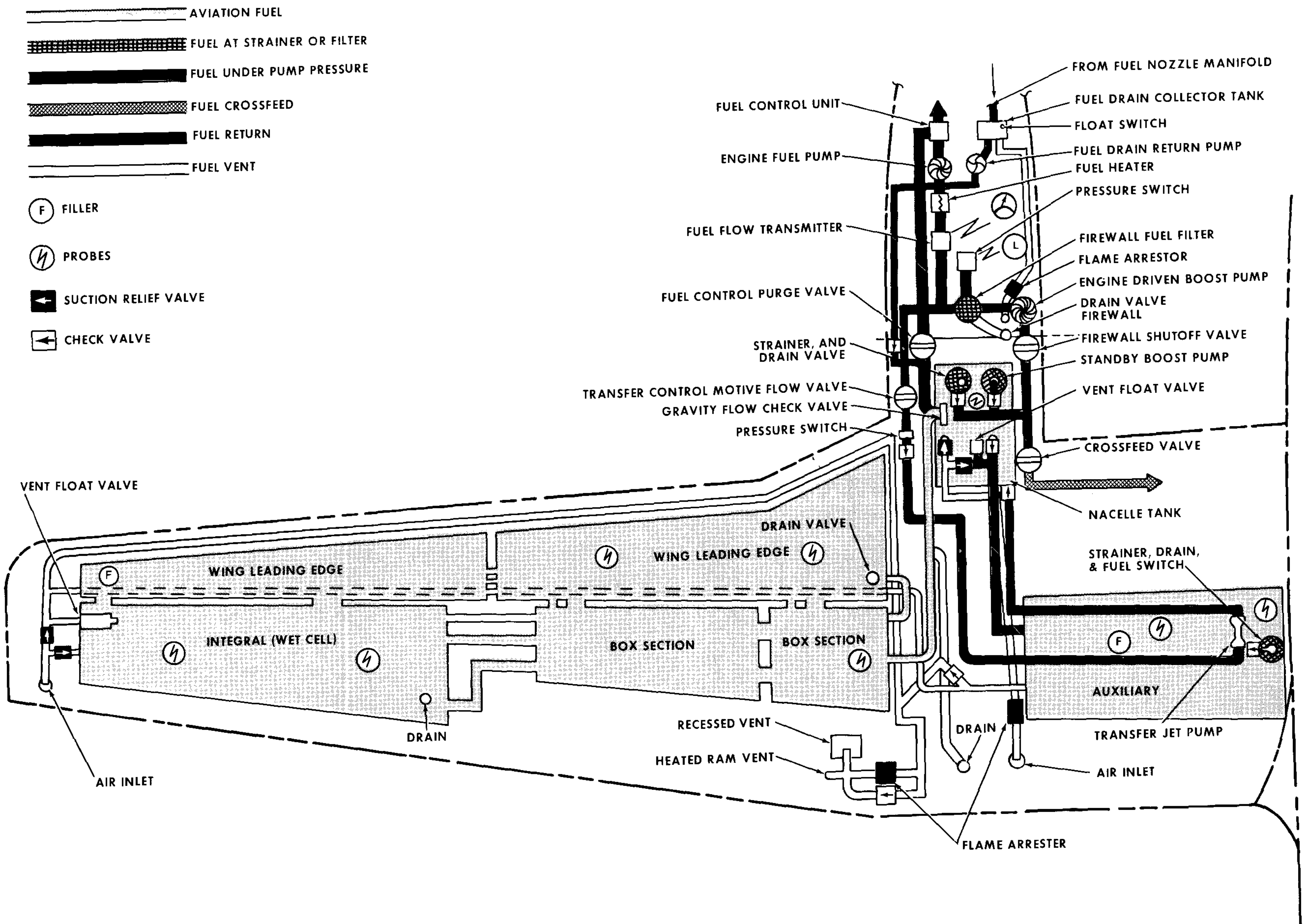
The automatic feathering system provides a means of immediately dumping oil from the propeller servo to enable the feathering spring and counterweights to start the feathering action of the blades in the event of an engine failure. Although the system is armed by a switch on the subpanel, placarded AUTOFEATHER - ARM - OFF - TEST, the completion of the arming phase occurs when both power levers are advanced above 90% N_1 at which time both the right and left indicator lights on the caution/advisory annunciator panel indicate a fully armed system. The annunciator panel lights are green, placarded L AUTOFEATHER and R AUTOFEATHER. The system will remain inoperative as long as either power lever is retarded below 90% N_1 position. The system is designed for use only during take-off and landing and should be turned off when establishing cruise climb. During take-off or landing, if torquemeter oil pressure on either engine drops below a prescribed setting, the oil is dumped from the servo, the feathering spring starts the blades toward feather, and the autofeather system of the other engine is disarmed. Disarming of the autofeather portion of the operative engine is further indicated when the annunciator indicator light for that engine extinguishes.

FUEL SYSTEM

The fuel system consists of two separate systems connected by a valve-controlled crossfeed line. The separate fuel system for each engine is further divided into a main and auxiliary fuel system. The main system consists of a nacelle tank, two wing leading edge tanks, two box section bladder tanks, and an integral (wet cell) tank, all interconnected to flow into the nacelle tank by gravity. This system of tanks is filled from the filler located near the wing tip.

The auxiliary fuel system consists of a center section tank with its own filler opening, and an automatic fuel transfer system to transfer the fuel into the main fuel system.

When the auxiliary tanks are filled, they will be used first. During transfer of auxiliary fuel, which is automatically



FUEL SYSTEM SCHEMATIC

controlled, the nacelle tanks are maintained full. A swing check valve in the gravity feed line from the outboard wing prevents reverse fuel flow. Upon exhaustion of the auxiliary fuel, normal gravity transfer of the main wing fuel into the nacelle tanks will begin.

An anti-siphon valve is installed at each filler port which prevents loss of fuel or collapse of a fuel cell bladder in the event of improper securing or loss of the filler cap.

The two systems are vented through a recessed ram vent coupled to a protruding heated ram vent on the underside of the wing adjacent to the nacelle. One vent is recessed to prevent icing and the protruding vent is added as a backup and is heated to prevent icing.

All fuel is filtered with a firewall-mounted 20 micron filter. These filters incorporate an internal bypass which opens to permit uninterrupted fuel supply to the engine in the event of filter icing or blockage. In addition, a screen strainer is located at each tank outlet before the fuel reaches the boost and transfer pumps. The main engine driven fuel pump has an integral strainer to protect the pump.

A fuel drain collector system is provided in the aft compartment of each engine. The system allows the fuel that is left in the fuel nozzle manifolds at engine shutdown to gravity drain into a collector tank, and eventually be returned to the nacelle tank.

FUEL PUMPS

The engine driven fuel pump (high pressure) is mounted on the accessory case in conjunction with the fuel control unit. Failure of this pump results in an immediate flameout. The primary boost pump (low pressure) is also engine driven and is mounted on a drive pad on the aft accessory section of the engine. This pump operates when the gas generator (N_1) is turning and provides sufficient fuel for start, take-off, all flight conditions except operation with hot aviation gasoline above 20,000 feet altitude, and operation with crossfeed.

An electrically driven standby boost pump (low pressure) located in the bottom of each nacelle tank performs three functions; it is a backup pump for use in the event of a primary fuel boost pump failure, it is for use with hot aviation gasoline above 20,000 feet, and it is used during crossfeed operations. In the event of an inoperative standby pump, crossfeed can only be accomplished from the side of the operative pump.

Electrical power to operate the standby boost pumps is controlled by lever lock toggle switches, placarded STANDBY PUMP - ON - OFF, located on the fuel control panel and is supplied power from two independent sources. One source of power for either the right or the left standby pump is provided through the number 3 or number 4 feeder buses and is protected by a 10-ampere circuit breaker located on the fuel control panel. This power is only available when the master switch is turned on. Another source of power comes directly from the battery through the hot battery bus and is protected by dual 5-ampere fuses located in the right wing center section. The fuse panel may be serviced through an access door on the bottom side of the wing outboard of the battery. This power source makes power available for the pumps at all times, regardless of the battery master switch position. These circuits are protected by diodes to prevent the failure of one circuit from disabling the other circuit. During shutdown, make certain both standby pump switches are off to prevent battery discharge.

In the event of a primary boost pump failure, the respective red FUEL PRESS light in the annunciator panel will illuminate. This light illuminates when pressure decreases below 9 to 11 psi. The light will be extinguished by switching on the standby fuel pump on that side, thus increasing pressure above 9 to 11 psi.

CAUTION

Engine operation with the fuel pressure light on is limited to 10 hours between overhaul, or replacement, of the engine driven fuel pump.

When using aviation gasoline, during climbs above 20,000 feet, the first indication of insufficient fuel pressure will be an intermittent flicker of the FUEL PRESS lights. A wide fluctuation of the fuel flow indicator may also be noted. These conditions can be eliminated by turning on a standby pump.

AUXILIARY FUEL TRANSFER SYSTEM

The auxiliary tank fuel transfer system automatically transfers the fuel from the auxiliary tank to the nacelle tank without pilot action. Motive flow to a jet pump mounted in the auxiliary tank sump is obtained from the engine fuel plumbing system downstream from the engine driven boost pump and routed through the transfer control motive flow valve. The motive flow valve is energized to the open position by the control system to transfer auxiliary fuel to the nacelle tank to be consumed by the engine during the initial portion of the flight. When an engine is started, pressure at the engine driven boost pump closes a pressure switch which, after a 30 to 50 second time delay to avoid depletion of fuel pressure during starting, energizes the motive flow valve. When the auxiliary fuel is depleted, a low level float switch de-energizes the motive flow valve after a 30 to 60 second time delay provided to prevent cycling of the motive flow valve due to sloshing fuel.

In the event of a failure of the motive flow valve or the associated control circuitry, the loss of motive flow pressure when there is still fuel remaining in the auxiliary fuel tank is sensed by a pressure switch and float switch, respectively, which illuminates a light placarded NO TRANSFER on the fuel control panel. During engine start, the pilot should note that the NO TRANSFER lights extinguish 30 to 50 seconds after engine start. A manual override is incorporated as a backup for the automatic transfer system. This is initiated by placing the AUX TRANSFER switch, located in the fuel control panel to the OVERRIDE position.

USE OF AVIATION GASOLINE

If you find you must top off the fuel tanks with aviation gasoline as an alternate fuel, you will need to determine how many hours the airplane is operated on gasoline. Since the gasoline is being mixed with the regular fuel, it is expedient to record the number of gallons of gasoline taken aboard. A good rule to follow for determining the number of hours of operation on aviation gasoline is:

> Each engine will consume approximately 50 gallons of fuel per hour. Divide the number of gallons of gasoline pumped into each side by 50 to get the number of hours of operation on gasoline. Example: If 150 gallons of gasoline are pumped into one side, divide by 50 and the total is 3 hours. This means that the engine should have 3 hours charged against it toward the maximum of 150 hours between-overhaul limit. Maintain a record of hours charged against each engine.

CROSSFEED

During emergency single engine operation, it may become necessary to supply fuel to the operative engine from the fuel system on the opposite side. The simplified crossfeed system is placarded for fuel selection with a diagram on the upper fuel control panel. Place the standby pump switches in the OFF position when crossfeeding. A lever lock switch, placarded CROSSFEED FLOW, is moved from the center OFF position to the left or to the right, depending on direction of fuel flow. This opens the crossfeed valve, energizing the standby pump on the side from which crossfeed is desired, and de-energizes the motive flow valve in the fuel system on the side being fed. When the crossfeed mode is energized, a green FUEL CROSSFEED light on the caution/advisory panel will illuminate.

FIREWALL SHUTOFF

The system incorporates two firewall shutoff valves controlled by two switches, one on each side of the fuel system circuit breaker panel, located on the fuel control panel. These switches, respectively LEFT and RIGHT, are placarded FUEL FIREWALL SHUTOFF VALVE - OPEN - CLOSED. A red guard over each switch is an aid in preventing inadvertant operation. Like the boost pumps, the firewall shutoff valves receive electrical power from the main buses and also from the hot battery bus which is connected directly to the battery.

FUEL ROUTING IN ENGINE COMPARTMENT

Just forward of the firewall shutoff valve is the primary boost pump. From the primary boost pump, the fuel is routed to the main fuel filter, the fuel flow indicator transmitter, through a fuel heater that utilizes heat from the engine oil to warm the fuel, through the engine driven fuel pump, then to the fuel control unit. From there it is directed through the dual fuel manifold to the fuel outlet nozzles and into the annular combustion chamber. Fuel is also taken from just downstream of the main fuel filter to supply the jet transfer pump motive flow.

FUEL DRAINS

During each preflight, the fuel sumps on the tanks, pumps and filters should be bled to check for fuel contamination. There are five sump drains and one filter drain in each wing. They are located as follows:

DRAINS	LOCATION
Leading edge tank	Outboard of nacelle underside of wing
Integral tank	Underside of wing forward of aileron
Firewall fuel filter	Underside of cowling forward of firewall
Sump strainer	Bottom center of nacelle forward of wheel well
Gravity feed line	Aft of wheel well
Auxiliary tank	At wing root just forward of the flap

FUEL DRAIN COLLECTOR SYSTEM

After engine shutdown, a small amount of fuel present in the fuel nozzle manifolds drains into a small collector tank. The tank is mounted to one of the lower fire shields in the aft engine compartment. An electric float switch senses the tank fuel level and activates an electric pump which then transfers the fuel back to the nacelle tank. When the collector tank is emptied, the float switch turns off the pump. The entire operation is automatic and requires no input or additional duties from the crew.

FUEL GAGING SYSTEM

Fuel quantity in either the main or auxiliary fuel system is monitored by a capacitance fuel gaging system. Quantity is read directly in pounds. A maximum 3% error may be encountered in the system. However, the system is compensated for density changes due to temperature excursions. A graph is provided in the CRUISE CONTROL section to allow more accurate readings for all the approved jet fuels and for aviation gasoline. A selector switch on the fuel control panel, placarded FUEL QUANTITY - MAIN - AUXILIARY, allows monitoring of the main or auxiliary system fuel. There are two gages, one for each side.

ELECTRICAL SYSTEM

The airplane electrical system is a 28-VDC (nominal) system with the negative lead of each power source grounded to the main airplane structure. DC electrical power is provided by one 34-ampere-hour, air-cooled, 20-cell, nickel-cadmium battery, and two 250-ampere starter/generators connected in parallel. The system is capable of supplying power to all subsystems that are necessary for normal operation of the airplane. A hot battery bus is provided for emergency operation of certain essential equipment and the cabin entry threshold light circuit. Power to the main bus from the battery is routed through the battery relay which is controlled by a switch placarded BATT - ON - OFF, located on the left subpanel. Power to the bus system from the generators is routed through reverse-current-protection circuitry. Reverse current protection prevents the generators from absorbing power from the bus when the generator voltage is less than the bus voltage. The generators are controlled by switches, placarded GEN 1 and GEN 2, located on the left subpanel.

NOTE

On Serials BB-88 and After, BL-1 and After: In order to turn the generator ON, the generator control switch must first be held upward in the spring-loaded RESET position for a minimum of one second, then released to the ON position.

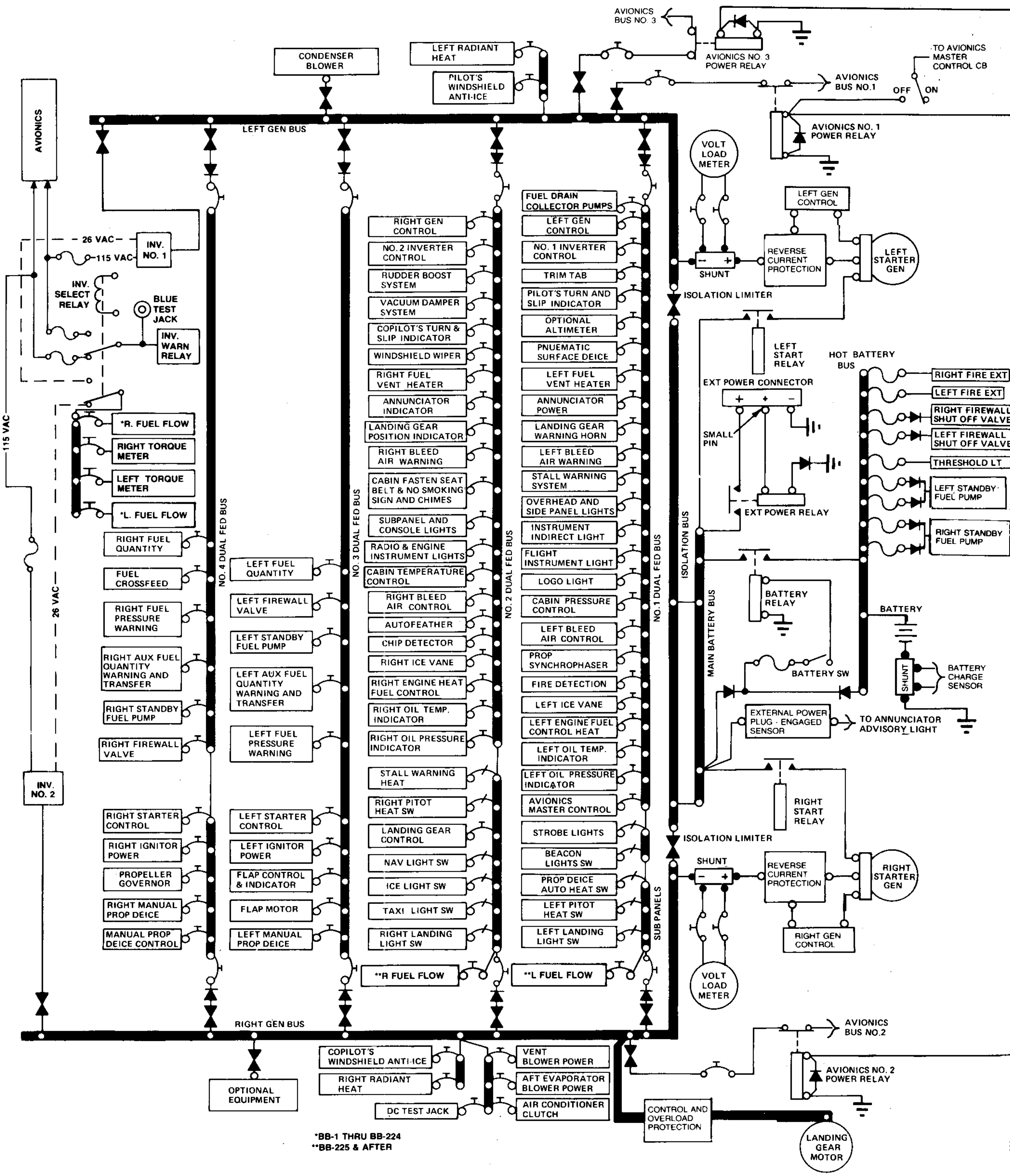
Starter power to each individual starter/generator is provided from the main bus through a starter relay. The start cycle is controlled by a three-position switch for each engine, placarded IGNITION AND ENGINE START, on the left subpanel. The starter/generator drives the compressor section of the engine through the accessory gearing. The starter/generator initially draws approximately 1100 amperes, then drops rapidly to about 300 amperes as the engine reaches 20% of the gas generator speed.

Power is supplied from three sources: the battery, the right generator, and the left generator. The generator busses are interconnected by two 325-ampere current limiters. The entire bus system operates as a single bus, with power being supplied by the battery and both generators. There are four dual-fed sub-busses. Each sub-bus is supplied power from either generator main bus through a 60-amp limiter, a 70-amp diode, and a 50-amp circuit breaker. All electrical loads are divided among these busses except as noted on the accompanying Power Distribution Schematic. The equipment on the busses is arranged so that all items with duplicate functions (such as right and left landing lights) are connected to different busses. Among the loads on the generator busses are the number 1 and number 2 inverters. Through relay circuitry, the INVERTER selector switch activates the selected inverter, which provides 400-hertz, 115-volt, alternating current to the avionics equipment, and 400-hertz, 26 VAC to the torquemeters (and 26 VAC to the fuel flow indicators on serials prior to BB-225). The volt/frequency meter indicates the voltage and frequency of the alternating current being supplied to the avionics equipment.

The generators are controlled by individual voltage regulators which allow a constant voltage to be presented to the busses during variations in engine speed and electrical load requirements. The generators are manually connected to the voltage regulating circuits by means of control switches located on the pilot's left subpanel. The voltage regulating circuit will automatically disable or enable a generator's capabilities on the bus. The load on each generator is indicated by the respective left and right volt/loadmeter located in the overhead panel.

Overheating of the nickel-cadmium battery will cause the battery charge current to increase. Therefore, a yellow BATTERY CHG caution annunciator light is provided in the caution/advisory annunciator panel to alert the pilot of the possibility of battery overheating. Airplane serials BB-2 thru BB-36 (except those serials modified per Service Instructions No. 0701-356) are equipped with a Battery Charge Current Sensor, which will cause illumination of the yellow BATTERY CHG annunciator whenever an *increase* in the battery charging current occurs. This module is self-testing in that the BATTERY CHG annunciator will illuminate during an engine start, but will extinguish after a few seconds. However, the yellow MASTER CAUTION flasher will continue to flash until it is reset by being depressed, just as is the case when any other caution annunciator has illuminated.

Airplane serials BB-37 and after and BL-1 and after (and all earlier serials modified per Service Instructions No. 0701-356) are equipped with a Battery Charge Current Detector, which will cause illumination of the yellow BATTERY CHG annunciator whenever the battery charge current is above normal. Thus the BATTERY CHG annunciator may occasionally illuminate for short intervals when heavy loads switch off. Following a battery-powered engine start, the battery recharge current is very high and causes illumination of the BATTERY CHG annunciator, thus providing an automatic self-test of the detector and the battery. As the battery approaches a full charge and the charge current decreases to a satisfactory level, the annunciator will extinguish. This will normally occur within a few minutes after an engine start, but may require a longer time, if the battery has a low state of charge, low charge voltage per cell (20-cell battery), or low battery temperature. This system is designed for continuous monitoring of the battery condition.



POWER DISTRIBUTION SCHEMATIC

With either system, illumination of the BATTERY CHG annunciator in flight cautions the pilot that conditions may exist that may eventually damage the battery. The operator should check the battery charge current with the loadmeter. This is accomplished by turning off one generator and noting the load on the remaining generator. Turn off the battery and note the loadmeter change. If the change is greater than .025, the battery should be left off the bus and should be inspected after landing. If the annunciator remains on after the battery switch is moved to the OFF position, a malfunction is indicated in either the battery system or charge current detector, in which case the airplane should be landed as soon as practicable. The battery switch should be turned ON for landing in order to avoid electrical transients caused by power fluctuations.

EXTERNAL POWER

For ground operation, an external power socket, located under the right wing outboard of the nacelle, is provided for connecting an auxiliary power unit. A relay in the external power circuit will close only if the external source polarity is correct. The Battery Master Switch should be ON before applying external power, in order to absorb voltage transients when operating avionics equipment and during engine starts. Otherwise, the transients might damage the many solid state components in the airplane. (On serials BB-364 and after and BL-1 and after, the Battery Master Switch *must* be on before the external power relay will close and allow external power to enter the airplane electrical system.)

For starting, an external power source capable of supplying up to 1000 amperes (400 amperes maximum continuous) should be used. A caution light on the caution/advisory annunciator panel, EXT PWR, is provided to alert the operator when an external DC power plug is connected to the airplane.

LIGHTING SYSTEMS

COCKPIT

An overhead light control panel, easily accessible to both pilot and copilot, incorporates a functional arrangement of all lighting systems in the cockpit. Each light group has its own rheostat switch placarded BRT - OFF. The MASTER PANEL LIGHTS switch controls the overhead light control panel lights, fuel control panel lights, engine instrument lights, radio panel lights, subpanel and console lights, pilot and copilot instrument lights, and gyro instrument lights. The instrument indirect lights in the glareshield and overhead map lights are individually controlled by separate rheostat switches. The push-button FREE AIR TEMP switch in the overhead light control panel turns on and off the light in the outside air temperature gage, located in the ceiling near the oxygen control.

CABIN

A three-position switch on the copilot's subpanel, placarded INTR LIGHTS - START BRT - DIM - OFF, controls the fluorescent cabin lights. The switch to the right of the interior light switch activates the cabin NO SMOKING/FASTEN SEAT BELT signs and accompanying chimes. This three-position switch is placarded CABIN SIGN - BOTH - OFF - FSB.

The two baggage-area lights are controlled by a two-position switch just inside the airstair door aft of the door frame.

A threshold light is located forward of the airstair door at floor level, and an aisle light is located at floor level aft of the spar cover. A switch adjacent to the threshold light turns both these lights on and off. This switch also turns the exterior entry light on and off if a separate switch for the entry light is not installed adjacent to the threshold light switch. When the airstair door is closed, all the lights controlled by the threshold light switch will extinguish.

When the master switch is on, the individual reading lights along the top of the cabin may be turned on or off by the passengers with a push-button switch adjacent to each light.

EXTERIOR

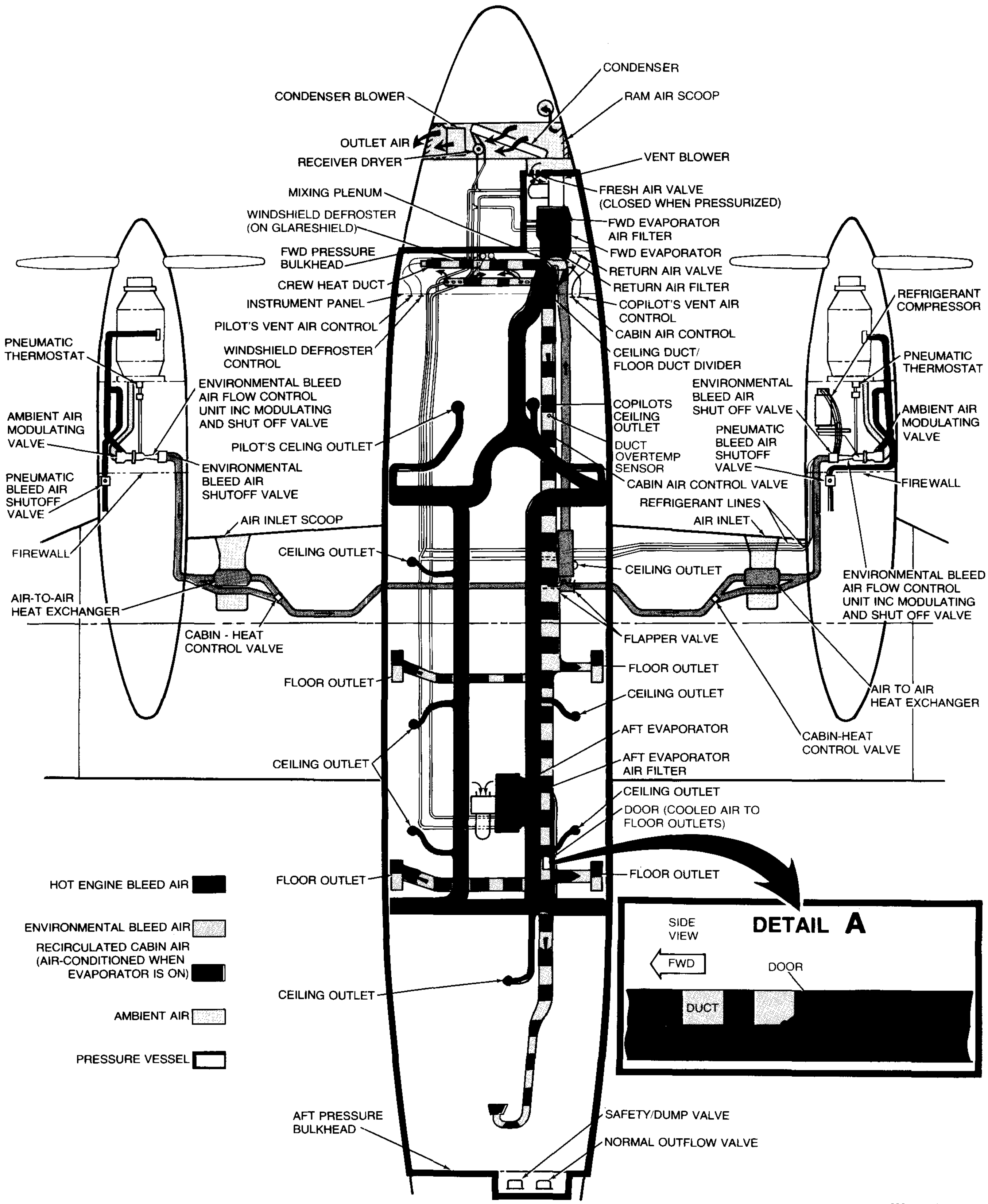
Switches for the landing lights, taxi lights, wing ice lights, navigation lights, recognition lights, rotating beacons, and wing-tip and tail strobe lights are located on the pilot's subpanel. They are appropriately placarded as to their function.

Tail floodlights, if installed, are incorporated into the horizontal stabilizers and are designed to illuminate both sides of the vertical stabilizer. A switch for these lights, placarded TAIL FLOODLIGHT, is located on the overhead light control panel.

A flush-mounted floodlight forward of the flaps in the bottom of the left wing may be installed. This entry light provides illumination of the area around the airstair door, to provide passenger convenience at night. On earlier airplane serials, there are two switches for this light: one just inside the door on the forward door frame, and one on the pilot's overhead light control panel, placarded ENTRY LIGHT. On later serials, there are no separate switches for this light; it is controlled by the threshold light switch just inside the door on the forward door frame, and will extinguish automatically whenever the cabin door is closed.

ENVIRONMENTAL SYSTEM

The environmental system consists of the bleed air pressurization, heating and cooling systems, and their associated controls.



ENVIRONMENTAL SYSTEM SCHEMATIC

PRESSURIZATION SYSTEM

The pressurization system is designed to provide a normal working pressure differential of 6.0±.1 psi, which will provide cabin pressure altitudes of approximately: 3900 feet at an airplane altitude of 20,000 feet; 9900 feet at 31,000 feet; and 11,700 feet at 35,000 feet.

Bleed air from the compressor section of each engine is utilized to pressurize the pressure vessel. A flow control unit in the nacelle of each engine controls the pressure of the bleed air and mixes ambient air with it, in order to provide an air mixture suitable for the pressurization function. The mixture flows to the environmental bleed air shutoff valve, which is controlled by a switch placarded BLEED AIR VALVE - LEFT (or) RIGHT - OPEN - ENVIR OFF - INSTR & ENVIR OFF in the ENVIRONMENTAL controls group on the copilot's subpanel. When this switch is in either the ENVIR(onmental air) OFF or the INSTR(ument air) & ENVIR(onmental air) OFF position, the valve is closed. When it is in the OPEN position, the air mixture flows through the valve and to the air-to-air heat exchanger. Depending upon the position of the bypass valves, a greater or lesser volume of the air mixture will be routed through or around the heat exchanger. The temperature of the air flowing through the heat exchanger is lowered as heat is transferred to cooling fins, which are in turn cooled by ram airflow through the fins of the heat exchanger. The air leaving both (left and right) bypass valves, is then ducted into a single muffler, located under the right floorboard forward of the main spar, which helps ensure quiet operation of the environmental bleed air system. The air mixture is then ducted from the muffler into the mixing plenum, located under the copilot's floorboard.

A partition divides the mixing plenum into two sections. One section supplies the floor-outlet duct, and the other supplies the ceiling-outlet duct. Both sections receive recirculated cabin air from the forward vent blower. This air passes through the forward evaporator, so it will be cooled if the air conditioner is operating. Even in the event that the forward vent blower becomes inoperative, some air will still be circulated, due to a special nozzle in the discharge side of the mixing plenum.

The environmental bleed air duct is routed into the floor-duct section of the mixing plenum, then curves back to discharge the environmental bleed air toward the aft end of the floor-duct section of the mixing plenum. Forward of the discharge end of the environmental bleed air duct, warm air is tapped off and ducted up through the top of the mixing plenum and into the crew heat duct, which also receives recirculated cabin air from the mixing plenum. A valve on the forward side of the crew heat duct allows air to be tapped off for delivery to the windshield defroster when the DEFROST AIR knob on the pilot's left subpanel is pulled out.

The air from the environmental bleed air duct is mixed with recirculated cabin air (which may or may not be air conditioned) in the mixing plenum, then routed into the floor-outlet duct. This pressurized air is then introduced into the cabin through the floor registers. Finally, the air flows out of the pressure vessel through the outflow valve, located on the aft pressure bulkhead. A silencer on the outflow and safety/dump valves ensures quiet operation.

The mixture from both flow control units is delivered to the pressure vessel at a rate which can vary from about 8 to 16 pounds per minute, depending upon ambient temperature and pressure altitude. Pressure within the cabin and the rate of cabin-pressure changes are regulated by pneumatic modulation of the outflow valve, which controls the rate at which air can escape from the pressure vessel.

A vacuum-operated safety valve is mounted adjacent to the outflow valve on the aft pressure bulkhead. It is designed to serve three functions: to provide pressure relief in the event of malfunction of the normal outflow valve; to allow depressurization of the pressure vessel whenever the cabin pressure switch is moved into the DUMP position; and to keep the pressure vessel unpressurized while the airplane is on the ground with the left landing-gear safety switch compressed. A negative-pressure relief function is also incorporated into both the outflow and the safety valves. This prevents outside atmospheric pressure's exceeding cabin pressure by more than 0.1 psi during rapid descents, even if bleed air inflow ceases.

When the BLEED AIR VALVE switches on the copilot's subpanel are OPEN (up), the air mixture from the flow control units enters the pressure vessel. While the airplane is on the ground, a left-landing-gear-safety-switch-actuated solenoid valve in each flow control unit keeps the ambient-air intake port closed, allowing only bleed air to be delivered into the pressure vessel. At lift-off, the safety valve closes and the ambient air shutoff solenoid valve in the left flow control unit opens; approximately 6 seconds later, the solenoid in the right flow control unit opens. Consequently, by increasing the volume of airflow into the pressure vessel in stages, excessive pressure bumps during takeoff are avoided.

An adjustable cabin pressurization controller is mounted in the pedestal. It commands modulation of the outflow valve. A dual-scale indicator dial is mounted in the center of the pressurization controller. The outer scale (CABIN ALT) indicates the cabin pressure altitude which the pressurization controller is set to maintain. The inner scale (ACFT ALT) indicates the maximum ambient pressure altitude at which the airplane can fly without causing the cabin pressure altitude to climb above the value selected on the outer scale (CABIN ALT) of the dial. The indicated value on each scale is read opposite the index mark at the forward (top) position of the dial. Both scales rotate together when the cabin altitude selector knob, placarded CABIN ALT is turned. The maximum cabin pressure altitude is selected by turning the cabin altitude selector knob until the desired setting on the CABIN ALT dial is aligned with the index mark. The maximum cabin altitude selected may be anywhere from −1000 to +10,000 feet MSL. The rate control selector knob is placarded RATE - MIN - MAX. The rate at which the cabin pressure altitude changes from the current value to the selected value is controlled by rotating the rate control selector knob. The rate of change selected may be from approximately 200 to approximately 2000 feet per minute.

The actual cabin pressure altitude is continuously indicated by the cabin altimeter, which is mounted in the right side of the panel that is located between the caution/advisory annunciator panel and the pedestal. Immediately to the left of the cabin altimeter is the cabin vertical speed (CABIN CLIMB) indicator, which continuously indicates the rate at which the cabin pressure altitude is changing.

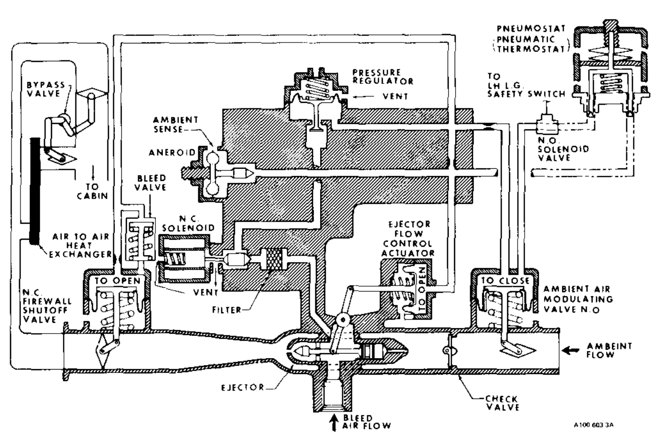
The cabin pressure switch, located to the left of the pressurization controller on the pedestal, is placarded CABIN PRESS - DUMP - PRESS - TEST. When this switch is in the DUMP (forward) position, the safety valve is held open, so that the cabin will depressurize and/or remain unpressurized. When it is in the PRESS (center) position, the safety valve is normally closed in flight, and the outflow valve is controlled by the pressurization controller, so that the cabin will pressurize. When the switch is held in the spring-loaded TEST (aft) position, the safety valve is held closed, bypassing the landing-gear safety switch, to facilitate testing of the pressurization system on the ground.

Prior to takeoff, the cabin altitude selector knob should be adjusted so that the ACFT ALT scale on the indicator dial indicates an altitude approximately 1000 feet above the planned cruise pressure altitude, and the CABIN ALT scale indicates an altitude at least 500 feet above the take-off field pressure altitude. The rate control selector knob should be adjusted as desired; setting the index mark between the 9- and 12-o'clock positions will provide the most comfortable cabin rate of climb. The cabin pressure switch should be checked, to ensure that it is in the PRESS position. As the airplane climbs, the cabin pressure altitude climbs at the selected rate of change until the cabin reaches the selected pressure altitude. The system then maintains cabin pressure altitude at the selected value. If the airplane climbs to an altitude higher than the value indexed on the ACFT ALT scale of the dial on the face of the controller, the cabin-to-ambient pressure differential will reach the pressure relief setting of the outflow valve and safety valve. Either or both valves will then override the cabin pressurization controller in order to limit the cabin-to-ambient pressure differential to 6.0 ± .1 psi. If the pressure altitude should reach a value of 12,500 feet, a pressure-sensing switch mounted on the forward pressure bulkhead will close. This causes the ALT WARN annunciator light to illuminate, warning the pilot of operation requiring the use of oxygen. If the auto-deployment oxygen system is installed, a pressure-sensing switch mounted on the cabin sidewall forward of the emergency exit also closes, signaling the passenger oxygen masks to drop out. During cruise operation, if the flight plan calls for an altitude change of 1000 feet or more, reselect the new altitude plus 1000 feet on the CABIN ALT dial.

During descent and in preparation for landing, the cabin altitude selector should be set to indicate a cabin altitude of approximately 500 feet above the landing field pressure altitude, and the rate control selector should be adjusted as required to provide a comfortable cabin-altitude rate of descent. The airplane rate of descent should be controlled so that the airplane altitude does not catch up with the cabin pressure altitude until the cabin pressure altitude reaches the selected value and stabilizes. Then, as the airplane descends to and reaches the cabin pressure altitude, the negative-pressure relief function modulates the outflow and safety valve poppets toward the fully open position, thereby equalizing the pressure inside and outside the pressure vessel. As the airplane continues to descend below the pre-selected cabin pressure altitude, the cabin will be unpressurized and will follow the airplane rate of descent to touchdown.

FLOW CONTROL UNIT

Each flow control unit consists of an ejector and an integral bleed air modulating valve, firewall shutoff valve, ambient air modulating valve, and a check valve that prevents the bleed air from escaping through the ambient air intake. The flow of bleed air through the flow control unit is controlled as a function of atmospheric pressure and temperature. Ambient air flow is controlled as a function of temperature only. When the BLEED AIR VALVE switches on the copilot's subpanel are OPEN, an electric solenoid valve on each flow control unit opens to allow the bleed air into the unit. As the bleed air enters the flow control unit, it passes through a filter before going to the reference pressure regulator. The regulator will reduce the pressure to a constant value (18 to 20 psi). This reference pressure is then directed to the various components within the flow control unit that regulate the output to the cabin. One reference pressure line is routed to the firewall shutoff valve located downstream of the ejector. An orifice is placed in the line immediately before the shutoff valve to provide a controlled opening rate. At the same time, the reference pressure is directed to the ambient air modulating valve located upstream of the ejector. A pneumatic thermostat with a variable orifice is connected to



BLEED AIR FLOW CONTROL UNIT

the modulating valve. The pneumatic thermostat is located on the lower aft side of the fireseal forward of the firewall. The bimetalic sensing discs of the thermostat are inserted into the cowling intake. These discs sense ambient temperature and regulate the size of the thermostat orificies. Warm air will open the orifice; cold air will restrict it until, at −30°F, the orifice will completely close. When the variable orifice is closed, the pressure buildup will cause the modulating valve to close off the ambient air source. An electric solenoid valve located in the line to the pneumatic thermostat is wired to the left landing gear safety switch. When the airplane is on the ground, the solenoid valve is closed, thereby directing the pressure to the modulating valve, causing it to shut off the ambient air source. The exclusion of ambient air allows faster cabin warmup during cold weather operation. An electric circuit containing a time-delay relay is wired to the above-mentioned solenoid valves to allow the left valve to operate approximately 6 seconds before the right valve. This precludes the simultaneous opening of the shutoff valves, which would result in a sudden pressure surge into the cabin. A check valve, located downstream from the modulating valve, prevents the loss of bleed air through the ambient air intake. At the same time the above operations have been taking place in the control unit, reference pressure is directed to the ejector flow control actuator. This actuator is connected to another variable orifice of the pneumatic thermostat and a variable orifice controlled by an isobaric aneroid. The thermostat orifice is restricted by decreasing ambient temperature, and the isobaric aneroid orifice is restricted by decreasing ambient pressure. The restriction of either orifice will cause a pressure buildup on the ejector flow control actuator, permitting more bleed air to enter the ejector.

UNPRESSURIZED VENTILATION

Fresh-air ventilation is provided by two sources. One source, which is available during both the pressurized and the unpressurized mode, is the bleed air heating system. This air mixes with recirculated cabin air and enters the cabin through the floor registers. The volume of air from the floor registers is regulated by moving a sliding handle at the side of each inboard-facing register.

The second source of fresh air, which is available during the unpressurized mode only, is ambient air obtained (through a check valve) from the condenser section in the nose of the airplane. During pressurized operation, cabin pressure forces the check valve closed. During the unpressurized mode, a spring holds the check valve open, so that the forward blower can draw this air into the cabin. The ambient air then mixes with recirculated cabin air, goes through the forward blower, through the forward evaporator (if it is operating, the air will be cooled), into the mixing plenum, into both the ceiling-outlet and the floor-outlet duct, and into the cabin through all the ceiling and floor outlets. Air ducted to each individual ceiling eyeball outlet can be directionally controlled by moving the eyeball in the socket. Volume is regulated by twisting the outlet to open or close the damper.

HEATING

When air is compressed, its temperature is increased. Therefore, the bleed air extracted from the compressor section of each engine for pressurization purposes is hot. This heat is utilized to warm the cabin.

When the left landing gear safety switch is in the on-the-ground position, the ambient air valve in each flow control unit is closed. Consequently, only bleed air is delivered to the environmental bleed air duct when the airplane is on the ground. In flight, the ambient air valve is open, and ambient air is mixed with the engine bleed air in the flow control unit. This environmental bleed air mixture is then routed into the cabin.

If the environmental bleed air mixture is too warm for cabin comfort, the bypass valve routes some or all of it through the air-to-air heat exchanger, located in the wing center section. The position of the damper in the cabin-heat control valve is determined by positioning of the controls in the ENVIRONMENTAL group on the copilot's subpanel. An air intake on the leading edge of the inboard wing brings ram air into the heat exchanger to cool the bleed air. After leaving the heat exchanger, the ram air is ducted overboard through louvers on the underside of the wing.

After the bleed air passes through or around the air-to-air heat exchanger, it is ducted to the mixing plenum. Some of this environmental bleed air is tapped off and delivered to the pilot/copilot heat duct, which is located below the instrument panel. An outlet at each end of this duct is provided to deliver warm air to the pilot and copilot. A mechanically controlled damper in each outlet permits the volume of airflow to be regulated. The pilot's damper is controlled by the PILOT AIR knob, located on the pilot's subpanel just below and outboard of the control column. The copilot's damper is controlled by the CO-PILOT AIR knob, located on the copilot's subpanel just below and outboard of the control column. The DEFROST AIR control knob is located on the pilot's subpanel just below and inboard of the control column. This knob controls a valve at the forward side of the pilot/copilot heat duct which admits air to two ducts that deliver the warm air to the defroster, located just below the windshields in the top of the glareshield.

The remainder of the air in the environmental bleed air duct is discharged into the floor-outlet-duct section of the mixing plenum and mixed with recirculated cabin air. This air mixture is then ducted aft through the floor-outlet duct. If the air temperature inside this duct becomes excessive, a sensor inside the duct causes the yellow DUCT OVERTEMP caution annunciator to illuminate. Refer to the ILLUMINATION OF "DUCT OVERTEMP" ANNUNCIATOR procedure in the EMERGENCY PROCEDURES Section of this manual for corrective action.

After passing the temperature sensor, the air passes through the cabin air control valve. This valve is controlled by the CABIN AIR control knob on the copilot's subpanel, just below and inboard of the control column. When this knob is pulled out to the stop, only a minimum amount of warm air will be permitted to pass through the valve, thereby increasing the amount of warm air available to the pilot and copilot heat outlets, and to the defroster. When this knob is pushed fully in, the valve is open and the air in the duct will be directed to the floor-outlet registers in the cabin.

RADIANT HEATING

A supplemental electric radiant heating system is available for cabin comfort. It is turned on and off by a switch in the ENVIRONMENTAL group on the copilot's subpanel placarded RADIANT HEAT. This system can be used in conjunction with an auxiliary power unit for warming the cabin prior to starting the engines, and it can be used as supplemental heat in flight. However, it should be used in conjunction with the manual temp control mode only.

AIR CONDITIONING SYSTEM

Cabin air conditioning is provided by a refrigerant-gas-vapor-cycle refrigeration system consisting of: a belt-driven, engine-mounted compressor, installed on the right-engine accessory pad; refrigerant plumbing; and N_1 speed switch; high- and low-pressure-protection switches: a condenser coil; a condenser blower; an evaporator; a receiver-dryer; an expansion valve; and a bypass valve. The plumbing from the compressor is routed through the right-wing inboard leading edge to the fuselage. It is then routed forward to the condenser coil, receiver-dryer, expansion valve, bypass valve, and evaporator, which are all located in the nose of the airplane.

The high- and low-pressure-limit switches and the N_1 engine speed switch are provided to prevent compressor operation outside of established limitation parameters. The N_1 speed switch will prevent the flow of electric current to the compressor clutch when the engine speed is below 60% N_1. When the N_1 speed switch is open and there is a demand for air conditioning, the green AIR CND N_1 LOW advisory annunciator will illuminate. If either the high- or low-compressor-pressure limit is exceeded, the corresponding high- or low-pressure switch, located in the right wing center section leading edge, will cause blowing of the 7.5-ampere compressor-pressure-limit fuse which is inline between the power source and the electrically activated compressor clutch. The resulting interruption of the power will cause the compressor clutch to disengage. The fuse is accessible through an access door on the underside of the right wing, just outboard of the battery. The system should be thoroughly checked before replacing a blown fuse. The compressor-clutch circuit breaker is located in the DC power distribution panel inside the lower forward equipment bay.

The forward evaporator utilizes a solenoid-operated hot-gas-bypass valve to prevent icing. A 33° F thermal switch on the forward evaporator controls the valve solenoid.

The forward vent blower blows recirculated cabin air (plus outside ambient air if the cabin is unpressurized) through the forward evaporator, into the mixing plenum, and into both the floor-outlet and ceiling-outlet ducts. If the cooling mode is operating, refrigerant will be circulating through the evaporator and the air leaving it will be cool. All the air entering the ceiling-outlet duct will be cool. This air is discharged through "eyeball" outlet nozzles in the cockpit and cabin. Each nozzle is movable, so that the airstream can be directed as desired. When the nozzle is twisted, a damper opens or closes to regulate airflow volume.

Cool air will enter the floor-outlet duct, but in order to provide cabin pressurization, warm environmental bleed air will also enter the floor-outlet duct anytime either BLEED AIR valve is OPEN. Therefore, pressurized air discharged from the floor registers will always be warmer than that discharged at the ceiling outlets, no matter what temperature mode is in use. A lever on each floor-outlet register (except the forward-facing register in the baggage compartment) can be moved vertically to regulate the airflow volume.

A vane-axial blower in the nose section draws ambient air through the condenser when the cooling mode is operating. On serials BB-345 and after (and any earlier serials that have complied with Beechcraft Service Instructions No. 0968 by installation of Kit Number 101-5035-1 S or 101-5035-3 S), this blower shuts off when the airplane is airborne. The current limiter for the blower is located in the DC power distribution panel in the lower forward equipment bay.

The receiver-drier and sight gage are located high in the condenser compartment. They can be viewed by removing the upper-compartment access panel, located on top of the nose section just left of the centerline.

An optional aft evaporator and blower may be installed in the fuselage center aisle equipment bay behind the rear spar. Refrigerant will flow through the aft evaporator anytime it flows through the forward evaporator. However, it will provide additional cooling only when the aft blower is operating, recirculating cabin air through the aft evaporator and delivering it to the aft floor and ceiling outlets. See the BLOWER CONTROL description for details concerning operation of the aft blower.

ENVIRONMENTAL CONTROLS

The ENVIRONMENTAL control section on the copilot's subpanel provides for automatic or manual control of the system. This section contains all the major controls of the environmental function: bleed air valve switches; a forward vent blower control switch; an aft evaporator on/off switch; a manual temperature switch for control of the cabin-temperature control valves in the air-to-air heat exchangers;

the modulating valve. The pneumatic thermostat is located on the lower aft side of the fireseal forward of the firewall. The bimetalic sensing discs of the thermostat are inserted into the cowling intake. These discs sense ambient temperature and regulate the size of the thermostat orificies. Warm air will open the orifice; cold air will restrict it until, at −30°F, the orifice will completely close. When the variable orifice is closed, the pressure buildup will cause the modulating valve to close off the ambient air source. An electric solenoid valve located in the line to the pneumatic thermostat is wired to the left landing gear safety switch. When the airplane is on the ground, the solenoid valve is closed, thereby directing the pressure to the modulating valve, causing it to shut off the ambient air source. The exclusion of ambient air allows faster cabin warmup during cold weather operation. An electric circuit containing a time-delay relay is wired to the above-mentioned solenoid valves to allow the left valve to operate approximately 6 seconds before the right valve. This precludes the simultaneous opening of the shutoff valves, which would result in a sudden pressure surge into the cabin. A check valve, located downstream from the modulating valve, prevents the loss of bleed air through the ambient air intake. At the same time the above operations have been taking place in the control unit, reference pressure is directed to the ejector flow control actuator. This actuator is connected to another variable orifice of the pneumatic thermostat and a variable orifice controlled by an isobaric aneroid. The thermostat orifice is restricted by decreasing ambient temperature, and the isobaric aneroid orifice is restricted by decreasing ambient pressure. The restriction of either orifice will cause a pressure buildup on the ejector flow control actuator, permitting more bleed air to enter the ejector.

UNPRESSURIZED VENTILATION

Fresh-air ventilation is provided by two sources. One source, which is available during both the pressurized and the unpressurized mode, is the bleed air heating system. This air mixes with recirculated cabin air and enters the cabin through the floor registers. The volume of air from the floor registers is regulated by moving a sliding handle at the side of each inboard-facing register.

The second source of fresh air, which is available during the unpressurized mode only, is ambient air obtained (through a check valve) from the condenser section in the nose of the airplane. During pressurized operation, cabin pressure forces the check valve closed. During the unpressurized mode, a spring holds the check valve open, so that the forward blower can draw this air into the cabin. The ambient air then mixes with recirculated cabin air, goes through the forward blower, through the forward evaporator (if it is operating, the air will be cooled), into the mixing plenum, into both the ceiling-outlet and the floor-outlet duct, and into the cabin through all the ceiling and floor outlets. Air ducted to each individual ceiling eyeball outlet can be directionally controlled by moving the eyeball in the socket. Volume is regulated by twisting the outlet to open or close the damper.

HEATING

When air is compressed, its temperature is increased. Therefore, the bleed air extracted from the compressor section of each engine for pressurization purposes is hot. This heat is utilized to warm the cabin.

When the left landing gear safety switch is in the on-the-ground position, the ambient air valve in each flow control unit is closed. Consequently, only bleed air is delivered to the environmental bleed air duct when the airplane is on the ground. In flight, the ambient air valve is open, and ambient air is mixed with the engine bleed air in the flow control unit. This environmental bleed air mixture is then routed into the cabin.

If the environmental bleed air mixture is too warm for cabin comfort, the bypass valve routes some or all of it through the air-to-air heat exchanger, located in the wing center section. The position of the damper in the cabin-heat control valve is determined by positioning of the controls in the ENVIRONMENTAL group on the copilot's subpanel. An air intake on the leading edge of the inboard wing brings ram air into the heat exchanger to cool the bleed air. After leaving the heat exchanger, the ram air is ducted overboard through louvers on the underside of the wing.

After the bleed air passes through or around the air-to-air heat exchanger, it is ducted to the mixing plenum. Some of this environmental bleed air is tapped off and delivered to the pilot/copilot heat duct, which is located below the instrument panel. An outlet at each end of this duct is provided to deliver warm air to the pilot and copilot. A mechanically controlled damper in each outlet permits the volume of airflow to be regulated. The pilot's damper is controlled by the PILOT AIR knob, located on the pilot's subpanel just below and outboard of the control column. The copilot's damper is controlled by the CO-PILOT AIR knob, located on the copilot's subpanel just below and outboard of the control column. The DEFROST AIR control knob is located on the pilot's subpanel just below and inboard of the control column. This knob controls a valve at the forward side of the pilot/copilot heat duct which admits air to two ducts that deliver the warm air to the defroster, located just below the windshields in the top of the glareshield.

The remainder of the air in the environmental bleed air duct is discharged into the floor-outlet-duct section of the mixing plenum and mixed with recirculated cabin air. This air mixture is then ducted aft through the floor-outlet duct. If the air temperature inside this duct becomes excessive, a sensor inside the duct causes the yellow DUCT OVERTEMP caution annunciator to illuminate. Refer to the ILLUMINATION OF "DUCT OVERTEMP" ANNUNCIATOR procedure in the EMERGENCY PROCEDURES Section of this manual for corrective action.

After passing the temperature sensor, the air passes through the cabin air control valve. This valve is controlled by the CABIN AIR control knob on the copilot's subpanel, just below and inboard of the control column. When this knob is pulled out to the stop, only a minimum amount of warm air will be permitted to pass through the valve, thereby increasing the amount of warm air available to the pilot and copilot heat outlets, and to the defroster. When this knob is pushed fully in, the valve is open and the air in the duct will be directed to the floor-outlet registers in the cabin.

RADIANT HEATING

A supplemental electric radiant heating system is available for cabin comfort. It is turned on and off by a switch in the ENVIRONMENTAL group on the copilot's subpanel placarded RADIANT HEAT. This system can be used in conjunction with an auxiliary power unit for warming the cabin prior to starting the engines, and it can be used as supplemental heat in flight. However, it should be used in conjunction with the manual temp control mode only.

A radiant heater element, installed in the cargo door, is controlled by the Cabin Temperature Mode switch and operates in all heating modes. This unit provides supplemental heat to the cabin for additional passenger comfort.

AIR CONDITIONING SYSTEM

Cabin air conditioning is provided by a refrigerant-gas-vapor-cycle refrigeration system consisting of: a belt-driven, engine-mounted compressor, installed on the right-engine accessory pad; refrigerant plumbing; and N_1 speed switch; high- and low-pressure-protection switches; a condenser coil; a condenser blower; an evaporator; a receiver-dryer; an expansion valve; and a bypass valve. The plumbing from the compressor is routed through the right-wing inboard leading edge to the fuselage. It is then routed forward to the condenser coil, receiver-dryer, expansion valve, bypass valve, and evaporator, which are all located in the nose of the airplane.

The high- and low-pressure-limit switches and the N_1 engine speed switch are provided to prevent compressor operation outside of established limitation parameters. The N_1 speed switch will prevent the flow of electric current to the compressor clutch when the engine speed is below 60% N_1. When the N_1 speed switch is open and there is a demand for air conditioning, the green AIR CND N_1 LOW advisory annunciator will illuminate. If either the high- or low-compressor-pressure limit is exceeded, the corresponding high- or low-pressure switch, located in the right wing center section leading edge, will cause blowing of the 7.5-ampere compressor-pressure-limit fuse which is inline between the power source and the electrically activated compressor clutch. The resulting interruption of the power will cause the compressor clutch to disengage. The fuse is accessible through an access door on the underside of the right wing, just outboard of the battery. The system should be thoroughly checked before replacing a blown fuse. The compressor-clutch circuit breaker is located in the DC power distribution panel inside the lower forward equipment bay.

The forward evaporator utilizes a solenoid-operated hot-gas-bypass valve to prevent icing. A 33° F thermal switch on the forward evaporator controls the valve solenoid.

The forward vent blower blows recirculated cabin air (plus outside ambient air if the cabin is unpressurized) through the forward evaporator, into the mixing plenum, and into both the floor-outlet and ceiling-outlet ducts. If the cooling mode is operating, refrigerant will be circulating through the evaporator and the air leaving it will be cool. All the air entering the ceiling-outlet duct will be cool. This air is discharged through "eyeball" outlet nozzles in the cockpit and cabin. Each nozzle is movable, so that the airstream can be directed as desired. When the nozzle is twisted, a damper opens or closes to regulate airflow volume.

Cool air will enter the floor-outlet duct, but in order to provide cabin pressurization, warm environmental bleed air will also enter the floor-outlet duct anytime either BLEED AIR valve is OPEN. Therefore, pressurized air discharged from the floor registers will always be warmer than that discharged at the ceiling outlets, no matter what temperature mode is in use. A lever on each floor-outlet register (except the forward-facing register in the baggage compartment) can be moved vertically to regulate the airflow volume.

A vane-axial blower in the hose section draws ambient air through the condenser when the cooling mode is operating. On serials BB-345 and after and BL-1 and after (and any earlier serials that have complied with Beechcraft Service Instructions No. 0968 by installation of Kit Number 101-5035-1 S or 101-5035-3 S) this blower shuts off when the airplane is airborne. The current limiter for the blower is located in the DC power distribution panel in the lower forward equipment bay.

The receiver-drier and sight gage are located high in the condenser compartment. They can be viewed by removing the upper-compartment access panel, located on top of the nose section just left of the centerline.

An optional aft evaporator and blower may be installed in the fuselage center aisle equipment bay behind the rear spar. Refrigerant will flow through the aft evaporator anytime it flows through the forward evaporator. However, it will provide additional cooling only when the aft blower is operating, recirculating cabin air through the aft evaporator and delivering it to the aft floor and ceiling outlets. See the BLOWER CONTROL description for details concerning operation of the aft blower.

ENVIRONMENTAL CONTROLS

The ENVIRONMENTAL control section on the copilot's subpanel provides for automatic or manual control of the system. This section contains all the major controls of the environmental function: bleed air valve switches; a forward vent blower control switch; an aft evaporator on/off switch; a manual temperature switch for control of the cabin-temperature control valves in the air-to-air heat exchangers;

a cabin-temperature-level control; and the cabin temp mode selector switch, for selecting automatic heating or cooling, manual heating or cooling, or off. Four additional manual controls on the main instrument subpanels may be utilized for partial regulation of cockpit comfort when the cockpit partition door is closed and the cabin comfort level is satisfactory. They are: pilot's air, defroster air, cabin air, and copilot's air control knobs. The fully out position of all these controls will provide the maximum heating to the cockpit, and the fully in position will provide minimum heating to the cockpit.

For warm flights, such as short, low-altitude flights in summer, all the cabin floor registers and ceiling outlets should be fully open for maximum cooling. For cold flights, such as high-altitude flights, night flights, and flights in cold weather, the ceiling outlets should all be closed and the floor outlets fully open for maximum heating in the cabin.

If the cabin temperature is comfortable but the cockpit temperature is not, the following procedures are suggested:

HEATING MODE

If the cockpit is too cold:

1. PILOT AIR, CO-PILOT AIR, and DEFROST AIR Knobs - PULLED FULLY OUT, or as required.
2. CABIN AIR Knob - PULLED OUT IN SMALL INCREMENTS (Allow 3 to 5 minutes after each adjustment for system to stabilize.)

If the cockpit is too hot:

1. PILOT AIR, CO-PILOT AIR, DEFROST AIR, and CABIN AIR Knobs - PUSHED FULLY IN, or as required.

COOLING MODE

If the cockpit is too cold:

1. PILOT AIR, CO-PILOT AIR, and DEFROST AIR Knobs - PUSHED FULLY IN, or as required.
2. Cockpit Overhead Eyeball Outlets - CLOSED, or as required.

If the cockpit is too hot:

1. PILOT AIR and CO-PILOT AIR Knobs - PULLED FULLY OUT, or as required.
2. CABIN AIR Knob - PUSHED IN IN SMALL INCREMENTS (Allow 3 to 5 minutes after each adjustment for system to stabilize.)

NOTE

If the CABIN AIR knob is fully in before obtaining satisfactory cockpit temperature, it may be necessary to place the aft vent blower switch in the ON position, so that cabin air will recirculate through the aft evaporator to provide additional cooling.

AUTOMATIC MODE CONTROL

When the CABIN TEMP MODE selector switch on the copilot's subpanel is in the AUTO position, the heating and air conditioning systems operate automatically. The systems are connected to a control box by means of a balanced bridge circuit. When the temperature in the cabin has reached the selected setting, the automatic temperature control modulates the bypass valves to allow heated air to bypass the air-to-air heat exchangers in the wing center sections. The warm bleed air is mixed with recirculated cabin air (which may or may not be air-conditioned) in the forward mixing plenum.

When the automatic control drives the environmental system from a heating mode to a cooling mode, the cabin-heat control valves close. When the left valve reaches the fully closed position, the refrigeration system will begin cooling, provided the right engine speed is above 60% N_1. When the bypass valve is opened to approximately the 30° position, the refrigeration system will turn off.

The CABIN TEMP - INCR control provides regulation of the temperature level in the automatic mode. A temperature-sensing unit in the cabin, in conjunction with the control setting, initiates a heat or cool command to the temperature controller, requesting the desired pressure-vessel environment. A duct anticipator temperature probe (duct stat) allows the system to anticipate changes in temperature of inlet air, thereby providing more even temperature control.

MANUAL MODE CONTROL

When the CABIN TEMP MODE selector is in the MAN HEAT or MAN COOL position, regulation of the cabin temperature is accomplished manually by momentarily holding the MANUAL TEMP switch to either the INCR or DECR position as desired. When released, this switch will return to the center (no change) position. Moving this switch to the INCR or DECR position results in modulation of the cabin-heat control valves in the bleed air lines. Allow approximately 30 seconds per valve (1 minute total time) for the valves to move to the fully open or fully closed position. Only one valve at a time moves. Movement of these valves varies the amount of bleed air routed through the air-to-air heat exchanger. Consequently, the temperature of the incoming bleed air will vary. This bleed air mixes with recirculated cabin air (which will be air-conditioned if the refrigeration system is operating) in the mixing plenum, and is then ducted to the floor registers. As a result, the cabin temperature will vary according to the position of the cabin-heat control valves, whether or not the air conditioner is operating.

When the CABIN TEMP MODE selector is in the MAN COOL position, the air conditioner system will operate, provided the speed of the right engine is above 60% N_1.

NOTE

On serials BB-345 and after and BL-1 and after (and any earlier serials that have complied with Beechcraft *Service Instructions 0968 by installation of Kit Number 101-5035-1 S or 101-5035-3 S),* the air conditioner compressor will not operate unless the cabin-heat control valves are closed. To ensure that the valves are closed, hold the MANUAL TEMPerature switch in the DECRease position for one minute.

BLEED AIR CONTROL

Bleed air entering the cabin is controlled by the switches placarded BLEED AIR VALVE - OPEN - ENVIR OFF - INSTR & ENVIR OFF. When the switch is in the OPEN position, the environmental flow control unit and the pneumatic instrument air valve are open. When the switch is in the ENVIR OFF position, the environmental flow control unit is closed and the pneumatic instrument air valve is open; in the INSTR & ENVIR OFF position, both are closed. For maximum cooling on the ground, turn the bleed air valve switches to the ENVIR OFF position.

VENT BLOWER CONTROL

The forward vent blower is controlled by a switch in the ENVIRONMENTAL group placarded VENT BLOWER - HI - LO - AUTO. When this switch is in the AUTO position, the forward vent blower will operate at low speed if the CABIN TEMP MODE selector switch is in any position other than OFF (i.e., MANual COOL, MANual HEAT, or AUTOmatic).

When the VENT BLOWER switch is in the AUTO position and the CABIN TEMP MODE selector switch is in the OFF position, the blower will not operate. Anytime the VENT BLOWER switch is in the LO position, the forward vent blower will operate at low speed, even if the CABIN TEMP MODE selector switch is OFF. Anytime the VENT BLOWER switch is in the HI position, the forward vent blower will operate at high speed, regardless of the position of the CABIN TEMP MODE selector switch (i.e., MAN COOL, MAN HEAT, OFF, or AUTO).

If the optional aft evaporator unit is installed in the air conditioning system, an aft blower is also installed under the floor.

The aft blower draws in cabin air, blows it across the aft evaporator, and to the aft floor and ceiling outlets. This blower operates at high speed only. It is turned on and off by the AFT BLOWER switch in the ENVIRONMENTAL group on the pilot's subpanel, and is independent of any other control.

The aft blower is intended for use only when maximum cabin cooling (air conditioning) is desired. If the blower should be turned on during a heating mode of operation, the door between the aft-blower duct and the warm-air (floor-outlet) duct will open. This will stop the flow of heated air to the aft floor registers, and deliver recirculated cabin air (which is not cooled, since refrigerant is not flowing through the aft evaporator) to the aft floor registers and ceiling outlets.

NOTE

On serials prior to BB-39, some airplanes were delivered with a two-speed aft blower which did not have a separate AFT BLOWER switch, but was controlled by the forward VENT BLOWER switch and a special temperature sensor. In such an installation, operation of the aft blower is entirely automatic and cannot be controlled by the pilot.

Both blower circuit breakers are located in the DC power distribution panel in the lower forward equipment bay.

OXYGEN SYSTEM

The Super King Air 200 has several oxygen systems available and may utilize a combination of the systems. These systems are based on an adequate flow for an altitude of 31,000 feet. The masks and Oxygen Duration Chart (NORMAL PROCEDURES Section) are based on 3.7 SLPM (Standard Liters Per Minute). The only exception is the diluter-demand crew mask when used in the 100% mode. For oxygen duration computation, each diluter-demand mask being used in the 100% mode is counted as two masks at 3.7 SLPM.

MANUAL PLUG-IN SYSTEM

The manual plug-in system is of the constant-flow type. Each mask plug is equipped with its own regulating orifice. The pilot and copilot oxygen masks are kept under the crew seats. Oxygen outlets are located on the forward cockpit sidewalls. Passenger masks are kept in seatback pockets except in the couch installation, in which case they are stored under the couch. The cabin outlets are located on the cabin headliner at the top center and at both the forward and aft ends of the cabin. When not in use, the cabin outlets are protected by access doors. All masks are easily plugged in by pushing the orifice in firmly and turning clockwise approximately one-quarter turn. Unplugging is easily accomplished by reversing the motion.

AUTO-DEPLOYMENT SYSTEM

A push/pull handle (PULL ON - SYStem READY) located aft of the overhead light control panel is used in conjunction with the automatically deployed passenger oxygen system. This handle operates a cable which opens and closes the shut-off valve located at the oxygen supply bottle in the aft, unpressurized area of the fuselage. When this handle is pushed in, no oxygen supply is available anywhere in the airplane. It should be pulled out prior to engine starting, to ensure that oxygen will be immediately available anytime it is needed. When this handle is pulled out, the primary oxygen supply line is charged with oxygen, provided the oxygen supply bottle is not empty. The primary oxygen supply line delivers oxygen to the two crew oxygen outlets in the cockpit, to the first aid oxygen outlet in the toilet area, and to the passenger oxygen system shut-off valve.

When the auto-deployment passenger oxygen system is installed, the crew is normally provided with diluter-demand, quick-donning oxygen masks. These masks hang on the aft cockpit partition behind and outboard of the pilot and copilot seats. They are held in the armed position by spring-tension clips, and can be donned immediately with one hand. The diluter-demand crew masks deliver oxygen to the user only upon inhalation. Consequently, there is no loss of oxygen when the masks are plugged in and the PULL ON - SYStem READY handle is pulled out, even though oxygen is immediately available upon demand.

A small lever on each diluter-demand oxygen mask permits the selection of two modes of operation: NORMAL and 100%. In the NORMAL position, air from the cockpit is mixed with the oxygen supplied through the mask. This reduces the rate of depletion of the oxygen supply, and it is more comfortable to use than 100% aviator's breathing oxygen. However, in the event of smoke or fumes in the cockpit, the 100% position should be used to prevent the breathing of contaminated air. For this reason, the selector levers should be left in the 100% position when the masks are not in use.

Anytime the primary oxygen supply line is charged, oxygen can be obtained from the first aid oxygen mask, located in the toilet area, by manually opening the overhead access door (placarded FIRST AID OXYGEN - PULL) and opening the on/off valve inside the box. A placard (NOTE: CREW SYStem MUST BE ON) reminds the user that the PULL ON - SYStem READY handle in the cockpit must be pulled out before oxygen will flow from the first aid oxygen mask.

The auto-deployment passenger oxygen system is of the constant-flow type. Anytime the cabin pressure altitude exceeds approximately 12,500 feet, a barometric-pressure switch automatically energizes a solenoid which opens the passenger oxygen system shut-off valve. The pilot can open the valve manually anytime by pulling out the PASSENGER MANUAL OverRIDE handle, located aft of the overhead light control panel. Once the passenger oxygen system shut-off valve has been opened (either automatically or manually), oxygen will flow into the passenger oxygen supply line, if the primary oxygen system line has been charged (i.e., if the oxygen supply bottle contains oxygen and the PULL ON - SYStem READY handle in the cockpit is pulled out). When oxygen flows into the passenger oxygen system supply line, a pressure-sensitive switch in the line closes a circuit to illuminate the green PASS OXYGEN ON annunciator on the cautionary/advisory annunciator panel. On serials beginning with the 1979 model year, this switch will also cause the cabin lights to illuminate in the full bright mode, regardless of the position of the interior lights switch (INTR LIGHTS) on the copilot's left subpanel.

The pressure of the oxygen in the passenger oxygen system supply line then automatically extends a plunger against each of the passenger oxygen mask dispenser doors, forcing the doors open. The oxygen masks then drop down about 9 inches below the dispensers. The lanyard valve pin at the top of the oxygen mask hose must be pulled out in order for oxygen to flow from the mask. The pin is connected to the oxygen mask via a flexible cord; when the oxygen mask is pulled down for use, the cord pulls the pin out of the lanyard valve. The lanyard valve pin must be manually reinserted into the valve in order to stop the flow of oxygen when the mask is no longer needed. The passenger oxygen can be shut off and the remaining oxygen isolated to the crew and first aid outlets by pulling the OXYGEN CONTROL circuit breaker in the ENVIRONMENTAL group on the right side panel, provided the PASSENGER MANUAL O'RIDE handle is pushed in to the off position.

PITOT AND STATIC SYSTEM

The pitot and static system provides a source of impact air and static air for operation of the flight instruments. A heated pitot mast is located on each side of the lower portion of the nose. Tubing from the left pitot mast is connected to the pilot's airspeed indicator, and tubing from the right pitot mast is connected to the copilot's airspeed indicator.

The normal static system provides two separate sources of static air – one for the pilot's flight instruments, and one for the copilot's. Each of the normal static air lines opens to the atmosphere through two static air ports – one on each side of the aft fuselage.

An alternate static air line is also provided for the pilot's flight instruments. In the event of a failure of the pilot's normal static air source (e.g., if ice accumulations should obstruct the static air ports), the alternate source should be selected by lifting the spring-clip retainer off the PILOT'S STATIC AIR SOURCE valve handle, located on the right side panel, and moving the handle aft to the ALTERNATE position. This will connect the alternate static air line to the pilot's flight instruments. The alternate line obtains static air just aft of the rear pressure bulkhead, from inside the unpressurized area of the fuselage.

WARNING

The pilot's airspeed and altimeter indications change when the alternate static air source is in use. Refer to the Airspeed Calibration - Alternate System, and the Altimeter Correction - Alternate System graph in the PERFORMANCE Section for operation when the alternate static air source is in use.

When the alternate static air source is not needed, ensure that the PILOT'S STATIC AIR SOURCE valve handle is held in the forward (NORMAL) position by the spring-clip retainer.

Three petcocks are provided to facilitate draining moisture from the static air lines. They are located behind the STATIC AIR LINE DRAIN access cover below the circuit breakers on the right side panel. The drain valves should be opened to release any trapped moisture at each 100-hour inspection, and after exposure to visible moisture on the ground. They must be closed after draining.

ENGINE BLEED AIR PNEUMATIC SYSTEM

High-pressure bleed air from each engine compressor, routed through the firewall shutoff valves and regulated at 18 psi, supplies pressure for the surface deice system and vacuum source. Vacuum for the flight instruments is derived from a bleed air ejector. One engine can supply sufficient bleed air for all these systems.

During single-engine operation, a check valve in the bleed air line from each engine prevents flow back through the line on the side of the inoperative engine. A suction gage calibrated in inches of mercury, located on the copilot's subpanel, indicates instrument vacuum. To the right of the suction gage is a pneumatic pressure gage, calibrated in pounds per square inch, which indicates air pressure available to the deice distributor valve.

BLEED AIR WARNING SYSTEM

The bleed air lines from the engines to the cabin are shielded with insulation to protect other components from heat. Heat is also dissipated in the air-to-air heat exchanger in the center wing section. The bleed air lines are accompanied in close proximity by plastic tubing from the engines to the cabin. One end of the tubing is plugged off; the other end is connected to a bleed air source in the cabin, to supply the line with pressure. Excessive heat on the plastic tubing caused by a ruptured bleed air line will cause the tubing to fail. Upon release of pressure in the tubing, a normally open switch in the line, located under the copilot's floor in the fuselage, will close, causing a circuit to be completed to the respective BL AIR FAIL light in the warning annunciator panel. When the indication of bleed air line failure becomes evident, the bleed air for that side should be turned off by placing the respective lever-lock BLEED AIR VALVE switch on the copilot's subpanel in the INSTR & ENVIR - OFF position.

AUTOMATIC DEVICES IN THE CONTROL SYSTEM

YAW DAMP

A yaw damp system is provided to aid the pilot in maintaining directional control, and to increase ride comfort. The system may be used at any altitude, and is required for flight above 17,000 feet. It should be deactivated for takeoff and landing.

If the airplane is equipped with an autopilot, the yaw damp system will be a part of the autopilot. Operating instructions for this system will be contained in the appropriate Airplane Flight Manual Supplement.

If an autopilot is not installed in the airplane, yaw damping is provided by an independent yaw damp system. The components include a yaw sensor, amplifier, and control valve. Regulated air pressure from the control valve is directed to the same pneumatic servos used for the rudder boost system. The system (on airplanes without autopilots) is controlled by a YAW DAMP switch adjacent to the RUDDER BOOST switch on the pedestal. In the event the YAW DAMP switch is inadvertently left ON during takeoff or landing, the circuit for the yaw damping system will be interrupted by the left landing gear safety switch while the airplane is on the ground, rendering it inoperative.

STALL WARNING SYSTEM

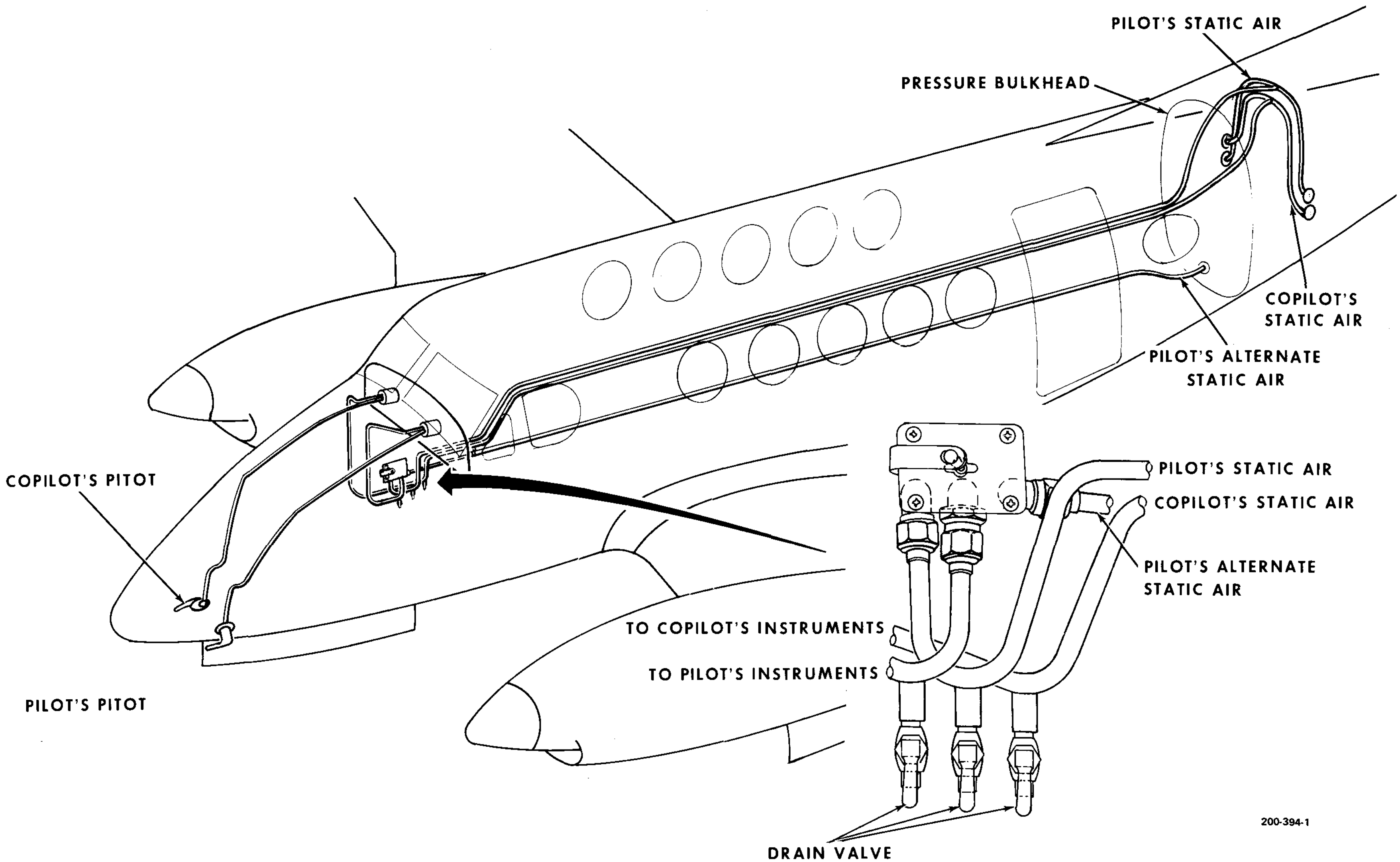
The stall warning system consists of a transducer, a lift computer, a warning horn, and a test switch. Angle of attack is sensed by aerodynamic pressure on the lift transducer vane located on the left wing leading edge. When a stall is imminent, the output of the transducer activates a stall warning horn.

The system has preflight test capability through the use of a switch placarded STALL WARN - TEST - OFF on the right subpanel. Holding this switch in the TEST position actuates the warning horn.

ICE PROTECTION SYSTEMS

WINDSHIELD HEAT

Two levels of heat are provided. When the switches are in the NORMAL (up) position, heat is supplied to the major portion of the windshields. When they are in the HI (down) position, a higher level of heat is supplied to a smaller area of the windshields. Each switch must be lifted over a detent before it can be moved into the HI position. This lever-lock feature prevents inadvertent selection of the HI position when



PITOT AND STATIC SYSTEM

moving the switches from NORM to the OFF (center) position.

Controllers with temperature-sensing units provide for proper heat at the windshield surfaces. Five-ampere circuit breakers, located on a panel on the forward pressure bulkhead, protect the control circuits. The power circuit of each system is protected by a 40-ampere circuit breaker (50-ampere on BB-35 and after and BL-1 and after, and on earlier serials modified per Service Instructions No. 0712-365) located in the power distribution panel under the floor forward of the main spar.

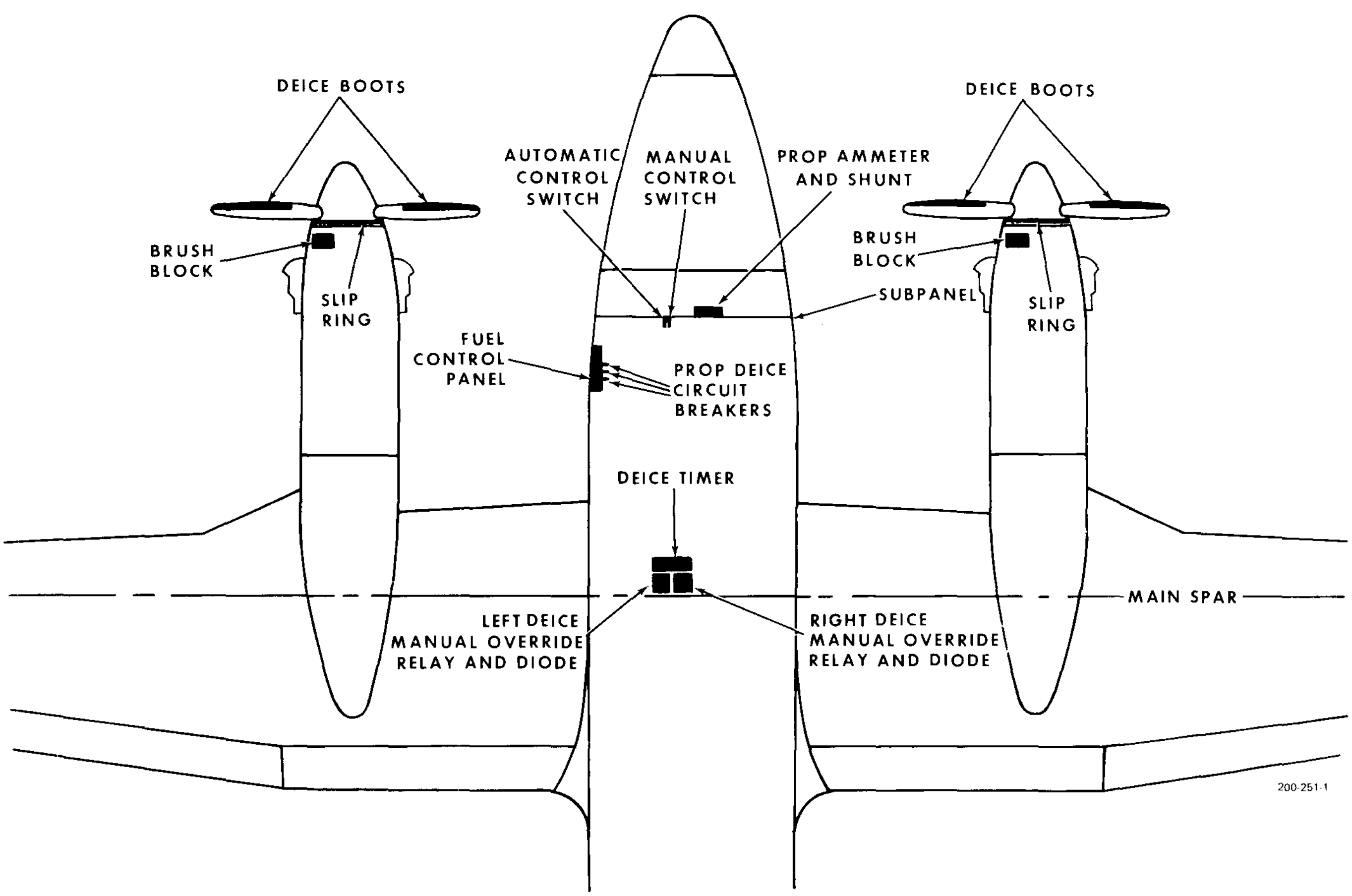
NOTE

Erratic operation of the magnetic compass may occur while windshield heat is being used.

PROPELLER ELECTRIC DEICE SYSTEM

The propeller electric deice system includes: an electrically heated boot with two elements (inner and outer) for each propeller blade, brush assemblies, slip rings, an ammeter, a timer for automatic operation, and a circuit for manual control for backup.

A 20-ampere circuit breaker switch on the pilot's subpanel, placarded PROP - AUTO - OFF, is provided to activate the automatic system. A deice ammeter on the right subpanel registers the amount of current (14 to 18 amperes) passing through the system being used. During AUTO operation, power to the timer will be cut off if the current rises above the circuit breaker switch rating. Current flows from the timer to the brush assembly and then to the slip rings installed on the spinner backing plate. The slip rings carry the current to the deice boots on the propeller blades. Heat from the boots reduces the grip of the ice, which is then thrown off by centrifugal force aided by the air blast over the propeller surfaces. Power to the two heating elements on each blade, the inner and outer element, is cycled by the timer in the following sequence: right propeller outer elements, right propeller inner elements, left propeller outer elements, and left propeller inner elements. Loss of one heating element circuit on one side does not mean that the entire system must be turned off.



PROPELLER ELECTRIC DEICE SYSTEM SCHEMATIC

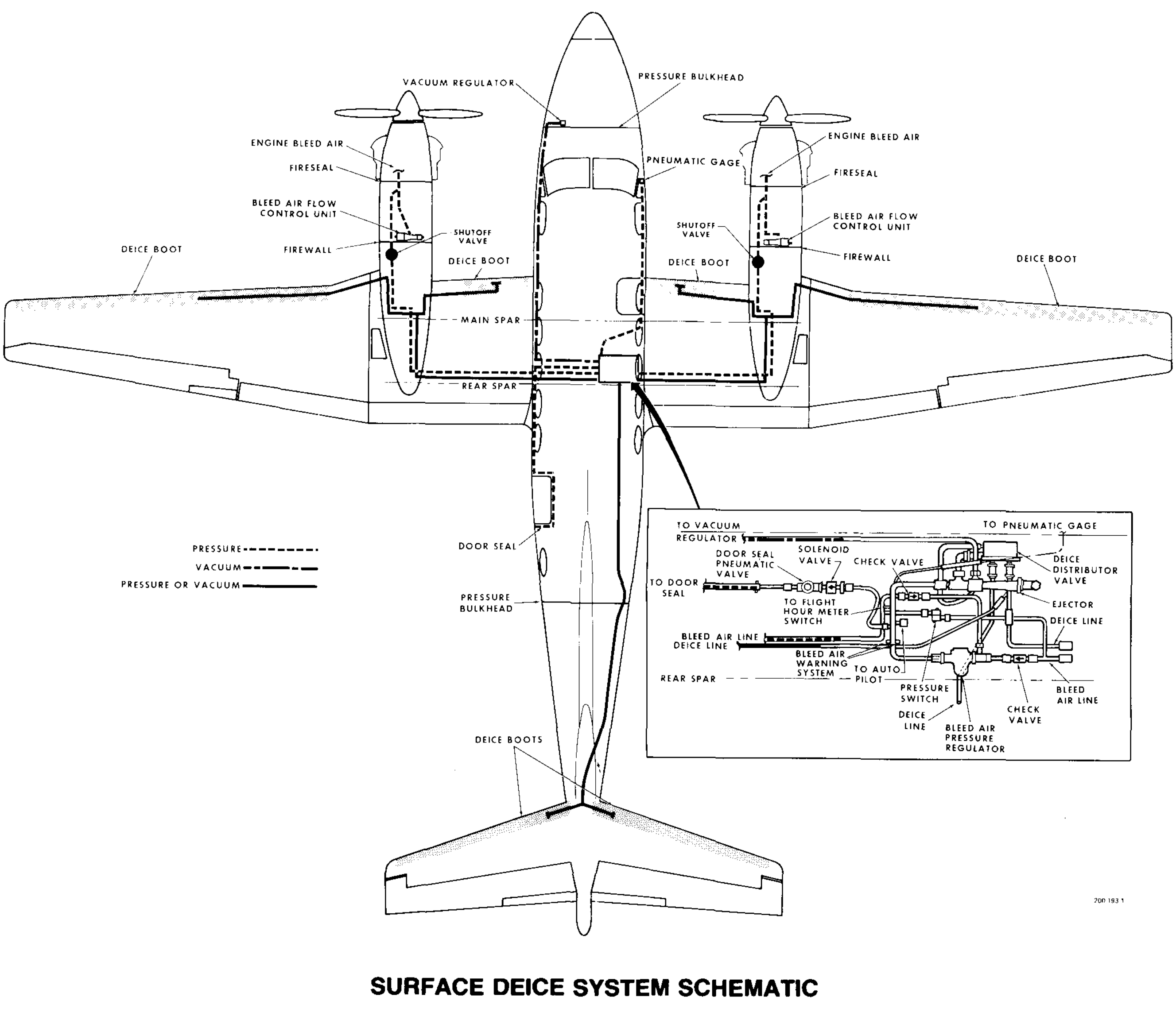
Proper operation can be checked by noting the correct level of current usage on the ammeter. An intermittent flicker of the needle approximately every 30 seconds indicates switching to the next group of heating elements by the timer.

The manual prop deice system is provided as a backup to the automatic system. A control switch located on the left subpanel, placarded PROP - INNER - OUTER, controls the manual override relays. When the switch is in the OUTER position, the automatic timer is overriden and power is supplied to the outer heating elements of both propellers simultaneously. The switch is of the momentary type and must be held in position until the ice has been dislodged from the propeller surface. After deicing with the outer elements, the switch is to be held in the INNER position to perform the same function for the inner elements of both propellers. The loadmeters will indicate approximately a .05 increase of load per meter when manual prop deice is operating. The prop deice ammeter will not indicate any load in the manual mode of operation.

SURFACE DEICE SYSTEM

The surface deice system removes ice accumulations from the leading edges of the wings and horizontal stabilizers. Ice removal is accomplished by alternately inflating and deflating the deice boots. Pressure-regulated bleed air from the engines supplies pressure to inflate the boots. A venturi ejector, operated by bleed air, creates vacuum to deflate the boots and hold them down while not in use. To assure operation of the system in the event of failure of one engine, a check valve is incorporated in the bleed air line from each engine to prevent loss of pressure through the compressor of the inoperative engine. Inflation and deflation phases are controlled by a distributor valve.

A three-position switch on the pilot's subpanel, placarded DEICE CYCLE - SINGLE - OFF - MANUAL, controls the deicing operation. The switch is spring-loaded to return to the OFF position from SINGLE or MANUAL. When the SINGLE position is selected, the distributor valve opens to inflate the



SURFACE DEICE SYSTEM SCHEMATIC

wing boots. After an inflation period of approximately 6 seconds, an electronic timer switches the distributor to deflate the wing boots, and a 4-second inflation begins in the horizontal stabilizer boots. When these boots have inflated and deflated, the cycle is complete.

When the switch is held in the MANUAL position, all the boots will inflate simultaneously and remain inflated until the switch is released. The switch will return to the OFF position when released. After the cycle, the boots will remain in the vacuum hold down condition until again actuated by the switch.

For most effective deicing operation, allow at least 1/2 inch of ice to form before attempting ice removal. Very thin ice may crack and cling to the boots instead of shedding. Subsequent cyclings of the boots will then have a tendency to build up a shell of ice outside the contour of the leading edge, thus making ice removal efforts ineffective.

PITOT MAST

Heating elements are installed in the pitot masts located on the nose. Each heating element is controlled by an individual circuit breaker switch placarded PITOT - LEFT - RIGHT, located on the pilot's subpanel. It is not advisable to operate the pitot heat system on the ground except for testing or for short intervals of time to remove ice or snow from the mast.

STALL WARNING VANE

The lift transducer is equipped with anti-icing capability on both the mounting plate and the vane. The heat is controlled by a switch located on the pilot's subpanel placarded STALL WARN. The level of heat is minimal for ground operation, but is automatically increased for flight operation through the left landing gear safety switch.

WARNING

The heating elements protect the lift transducer vane and face plate from ice. However, a build-up of ice on the wing may change or disrupt the airflow and prevent the system from accurately indicating an imminent stall. Remember that the stall speed increases whenever ice accumulates on any airplane.

FUEL

An oil-to-fuel heat exchanger, located on the engine accessory case, operates continuously and automatically to heat the fuel sufficiently to prevent ice from collecting in the fuel control unit.

Each pneumatic fuel control line is protected against ice by an electrically heated jacket. Power is supplied to each fuel control air line jacket heater by two switches actuated by moving the condition levers in the pedestal out of the fuel cutoff range. Fuel control heat is automatically turned on for all flight operations.

COMFORT FEATURES

TOILET

The toilet is installed in the foyer and faces the airstair door. The foyer can be closed off from the cabin by sliding the two partition-type door panels to the center of the fuselage, where they are held closed by magnetic strips. The toilet may be either the chemical type or the electrically flushing type. In either case, the two hinged lid half-sections must be raised to gain access to the toilet. A toilet tissue dispenser is contained in a slide-out compartment on the forward side of the toilet cabinet.

CAUTION

If a Monogram electrically flushing toilet is installed, the sliding knife valve should be open at all times, except when actually servicing the unit. The cabinet below the toilet must be opened in order to gain access to the knife valve actuator handle.

RELIEF TUBES

A relief tube is contained in a special tilt-out compartment at the aft side of the toilet cabinet. A relief tube may also be installed in the cockpit, and stowed under the pilot or copilot chair. The hose on the cockpit relief tube is of sufficient length to permit use by both pilot and copilot.

A valve lever is located on the side of the relief tube horn. This valve lever must be depressed at all times while the relief tube is in use. Each tube drains into the atmosphere through its own special drain port, which protrudes from the bottom of the fuselage. Each drain port is designed to atomize the discharge and keep it away from the skin of the airplane.

NOTE

The relief tubes are designed for use during flight only.

CABIN FEATURES

FIRE EXTINGUISHERS

An optional portable fire extinguisher may be installed on the floor on the left side of the airplane forward of the airstair entrance door, just aft of the rearmost seat. Another one may also be installed underneath the copilot's seat.

WINDSHIELD WIPERS

The dual windshield wiper installation consists of a motor, arm assemblies, drive shafts, and converters, all located forward of the instrument panel. The system includes a control switch, located in the upper left corner of the overhead panel. The system circuit breaker is located in the right subpanel. Windshield wipers may be operated for both flight and ground operations. Do not use them on dry glass. The control knob, placarded PARK-OFF-SLOW-FAST, controls the wipers. They have two speeds, one for light and one for heavy precipitation. After the control is turned to PARK to bring the wipers to their most inboard position, spring-loading returns the control to the OFF position.

CARGO RESTRAINT (200C)

Beech Aircraft Corporation offers an FAA approved cargo restraint system as Kit No. 101-5040. Any other restraint system used in this airplane must be approved by the FAA. Such approval is the sole responsibility of the owner/operator of the airplane.

SECTION VIII

HANDLING, SERVICING AND MAINTENANCE

TABLE OF CONTENTS

SUBJECT *PAGE*

INTENTIONALLY LEFT BLANK

INTRODUCTION TO SERVICING

The purpose of this section is to outline to the Owner and Operator the requirements for maintaining the Super King Air 200 in a condition equal to that of its original manufacture. This information sets the time intervals at which the airplane should be taken to a Beechcraft Aviation Center for periodic servicing or preventive maintenance.

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

All limits, procedures, safety practices, time limits, servicing and maintenance requirements contained in this handbook are considered mandatory.

Authorized Beechcraft Aviation Centers will have recommended modification, service, and operating procedures issued by both FAA and Beech Aircraft Corporation, designed to get maximum utility and safety from the airplane.

If a question arises concerning the care of the Super King Air 200, it is important that the airplane serial number be included in any correspondence. The serial number appears on the Manufacturer's Identification Plaque, located on the aft frame of the airstair door opening.

WARNING

The Beechcraft Super King Air 200 is a pressurized airplane. Drilling, modification, or any type of work which creates a break in the pressure vessel is considered the responsibility of the owner or facility performing the work. Obtaining approval of the work is, therefore, their responsibility.

PUBLICATIONS

The following publications for the Super King Air 200 are available through authorized Beechcraft Aviation Centers:

1. Pilot's Operating Handbook and FAA Approved Airplane Flight Manual
2. Pilot's Check List
3. Maintenance Manual
4. Component Maintenance Manual
5. Beechcraft Manufactured Components Maintenance Manual
6. Wiring Diagram Manual
7. Parts Catalog
8. Service Instructions
9. Continuous Inspection Procedures Manual
10. 100-Hour Inspection Guide
11. Intermediate 100-Hour Inspection Guide (Short Form)

NOTE

Neither Service Publications, Reissues, nor Revisions are automatically provided to the holder of this handbook. For information on how to obtain "Revision Service" applicable to this handbook, consult a Beechcraft Aero or Aviation Center, or refer to the latest revision of Beechcraft Service Instructions No. 0250-010.

AIRPLANE INSPECTION PERIODS

1. FAA-required Annual Inspection
2. Beechcraft *100-hour Inspection Guide*
3. Beechcraft *Continuous Inspection Procedures Manual*
4. Beechcraft *Maintenance Manual*
5. Servicing Schedule (later in this Section)
6. Check the wing attach bolts for proper torque at the first 100-hour inspection, and at the first 100-hour inspection after each reinstallation of the bolts.

NOTE

The FAA may require other inspections by issuance of Airworthiness Directives applicable to the airplane, engines, propellers, and components. It is the responsibility of the owner/operator to ensure that all applicable Airworthiness Directives are complied with, and when repetitive inspections are required, to prevent inadvertent noncompliance with subsequent inspection requirements. It is also the responsibility of the owner/operator to ensure that all FAA-required inspections and most Beech-recommended inspections are accomplished by properly certificated mechanics at properly certificated agencies (both meeting FAR 91 and FAR 43 requirements). Consult an authorized Beechcraft Aviation Center for assistance in determining and complying with these requirements.

SPECIAL CONDITIONS CAUTIONARY NOTICE

Airplanes operated for Air Taxi or other than normal operation and airplanes operated in humid tropics or cold and damp climates, etc., may need more frequent inspections for wear, corrosion and/or lack of lubrication. In these areas periodic inspections should be performed until the operator can set his own inspection periods based on experience. The required periods do not constitute a guarantee that the item will reach the period without malfunction, as the aforementioned factors cannot be controlled by the manufacturer.

PREVENTATIVE MAINTENANCE THAT MAY BE ACCOMPLISHED BY A CERTIFICATED PILOT

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

   To ensure that proper procedures are followed, obtain a Beechcraft Maintenance Manual prior to performing preventative maintenance.

2. All other maintenance must be performed by properly certificated personnel. Contact a Beechcraft Aviation Center for further information.

NOTE

Pilots operating airplanes of other than U. S. registry should refer to the regulations of the country of registry for information on preventative maintenance that may be performed by a pilot.

ALTERATIONS OR REPAIRS TO AIRPLANE

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

NOTE

Alterations or repairs to the airplane must be accomplished by properly licensed personnel.

GROUND HANDLING

TOWING

The tow bar connects to the upper torque knee fitting of the nose strut. The airplane is steered with the tow bar when moving the airplane by hand, or it can be connected to a tug to tow the airplane. Although the tug will control the steering of the airplane, someone should be positioned in the pilot's seat to operate the brakes in case of an emergency.

CAUTION

Always ensure that the control locks are removed before towing the airplane. Serious damage to the steering linkage can result if the airplane is towed with tug while the control locks are installed.

The nose gear strut has turn limit warning marks to warn the tug driver when turning limits of the gear will be exceeded. Damage will occur to the nose gear and linkage if the turn limit is exceeded. The maximum nose wheel turn angle is 48° left and right. When ground handling the airplane, do not use the propellers or control surfaces as hand holds to push or move the airplane.

PARKING

The parking brake may be set by pulling out the parking brake control, located on the extreme left side, below the pilot's subpanel, and depressing the toe portion of the pilot's rudder pedals. The parking control closes dual valves in the brake lines that trap the pressure applied to the brakes and keep it from returning through the master cylinders. To release the parking brake, depress the pilot's brake pedals to equalize the pressure on both sides of the parking brake valves and push the parking brake control fully in.

NOTE

Avoid setting the parking brake when the brakes are hot from severe usage, or when moisture conditions and freezing temperatures could form ice locks.

TIE-DOWN

Three mooring eyes are provided: one underneath each wing, and one in the ventral fin. To moor the airplane, chock the wheels fore and aft, install the control locks, and tie the airplane down at all three points. If extreme weather is anticipated, it is advisable to nose the airplane into the wind before tying it down. Install engine inlet and exhaust covers, propeller tie-down boots and pitot mast covers when mooring the airplane.

JACKING AND LEVELING

The Super King Air 200 is provided with three jacking points to raise the airplane for servicing. The forward point is on the left side of the wheel well opening near the aft end of the nose wheel doors. The main gear points are on the rear spar just inboard of the nacelle fairing. All three points are easily identified by the placarding JACK PAD adjacent to the jack points. The areas around the jack pads are unobstructed to facilitate the use of jacks. All adapters extend 0.7 inch or more below the structure surface.

Leveling screws are located on the fuselage entrance door frame. Leveling is accomplished with a plumb bob. Jack pad leveling may require the nose-gear shock strut to be secured in the static position to prevent its extension. Wheel weighings can be leveled by varying the amounts of air in the shocks and tires.

PROLONGED OUT-OF-SERVICE CARE

Refer to Beechcraft *Super King Air 200 Maintenance Manual.*

ENGINE CARE IN SALTY ENVIRONMENTS

When the airplane is operated in a salty atmosphere (such as near the sea) or off airstrips treated with salt:

1. Wash engine exterior as soon as possible with clean water.
2. Start engine and run at ground idle for a minimum of 10 minutes to remove moisture and salt residue.
3. Spray rust preventive material on fuel control assembly, controls linkage assembly, and any exposed metal parts.
4. Inspect the entire gearcase for corrosion and spray with rust preventive material at one-week intervals. Pay particular attention to the areas around studs and inserts.

SERVICING

EXTERNAL POWER

The airplane is equipped with an external power receptacle, located just outboard of the right engine in the lower side of the wing center section. The receptacle will accept a standard AN-type plug. The airplane electrical system is automatically protected from reverse polarity (i.e., positive ground) by a diode network. A yellow EXT PWR caution light on the caution/advisory annunciator panel will illuminate when the external power plug is engaged.

External power can be used to operate all the airplane electrical equipment (this includes avionics checkouts) during ground operations without the engines running, and it can be used to start the engines. The external power circuit is capable of accepting 400 amperes continuously, and it can withstand current surges up to 1100 amperes for short durations (up to 100 milliseconds), which may occur during engine starting.

The following precautions must be observed when using an external power source:

a. AVIONICS MASTER PWR Switch (pilot's left subpanel) - OFF

b. GENerator 1 and GENerator 2 Switches - OFF

c. BATTery Switch - ON

d. Volt/Loadmeter (overhead panel) - DEPRESS SWITCH on face of either meter, and read battery voltage.

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 recharged, or replaced with a battery indicating at least 20 volts, before connecting external power.

e. Auxiliary Power Unit Output Voltage - SET AT 28.25 ± .25 VOLTS

f. Auxiliary Power Unit - TURN OFF before connecting to airplane

CAUTION

Only use an external power source fitted with an AN-type plug. If uncertain of the polarity, check it with a volt meter to ensure that it is a negative-ground plug. Connect the positive lead to the larger center post of the receptacle, and connect the negative-ground lead to the remaining large post. The small post is the polarizing pin; it must have a positive voltage applied to it in order for the external power relay to close.

g. External Power Source Plug - PLUG INTO AIRPLANE RECEPTACLE

h. Auxiliary Power Unit - TURN ON

i. Volt/Loadmeter (overhead panel) - DEPRESS SWITCH on face of either meter, and read voltage. (If external power is properly connected, the value will be greater than it was when reading battery voltage only.)

BATTERY

Servicing the 24-volt, 20-cell, air-cooled, nickel-cadmium battery is normally limited to checking the electrolyte level, cleaning the battery box and associated components, and equalizing the cells. For detailed servicing of the battery, refer to the *Super King Air 200 Maintenance Manual.*

CAUTION

The electrolyte in the nickel-cadmium battery is an alkali solution. Use equipment reserved for nickel-cadmium batteries only. Even minute traces of acid can damage a nickel-cadmium battery.

Add only distilled water when liquid level is low. The battery electrolyte level is related to the amount of electrical charge stored in the battery. When the charge is low, the electrolyte will appear to be low, therefore the distilled water should only be added when the battery is fully charged.

BATTERY OVERHEAT FACTORS

Battery overheating can be caused or accelerated by the following factors:

a. Frequent engine starts and excessive engine cranking.

b. Airplane generator bus voltage too high.

c. Improper charging.

d. Unnecessary use of the airplane battery to run auxiliary equipment such as lights, avionics equipment, ventilation system, etc., during ground operations.

e. Loose cell-to-cell connectors (links).

f. Ground operations using power units with voltage settings higher than the recommended airplane bus voltage, or power units with poor regulation.

MAINTENANCE PRACTICES TO PREVENT BATTERY OVERHEATING

a. Service the battery at the interval recommended in the maintenance manual; however, more frequent servicing may be necessary, depending upon the type of operation to which the airplane is subjected.

b. The voltage regulators should be checked periodically for proper calibration, thereby reducing the possibility of overcharging and concurrent rise in battery temperature.

c. Keep battery loads to a minimum during extended ground operation.

d. Reduce the probability of localized heating of the cells by checking torque values of the cell-to-cell connectors.

e. Keep battery clean.

f. When charging the battery with an auxiliary power unit, observe the following:

1. Provide adequate ventilation for the battery compartment.
2. The auxiliary power unit voltages should not exceed the specified airplane voltage. Make certain the unit is well regulated and that its ammeters are accurate.
3. Open the battery cavity during charging, to allow visual monitoring and increased ventilation.

TIRES

The Super King Air 200 is equipped with dual tires on the main gear, and a single tire on the nose gear. The standard configuration features 18x5.5, 8-ply-rated (or optionally, 10-ply-rated) tubeless tires on the main gear, and a 22x6.75-10, 8-ply-rated tubeless tire on the nose gear. On serials prior to BB-165, a 6.50x10, 6-ply-rated tubeless tire was delivered on the nose gear.

Airplanes equipped with the optional high flotation landing gear are equipped with 22x6.75-10, 8-ply-rated tubeless tires on the main gear and on the nose gear.

CAUTION

Tires that have picked up a film of fuel, hydraulic fluid, or oil should be washed down as soon as possible, in order to prevent deterioration of the rubber.

Maintaining proper tire inflation pressures will help prolong tire service life. Check tires frequently to maintain pressures within recommended limits, and maintain equal pressures on both tires of each dual-wheel installation. Proper inflation pressures will help avoid damage from landing shocks, contact with sharp stones and ruts, and will minimize tread wear. When inflating the tires, inspect them for cuts, cracks, breaks, and tread wear. Rim-inflated tubeless tires with small "weep-hole" leaks may be repaired by injecting 2 ounces of approved tire sealant through the valve stem with the tire deflated to 35 psi or less.

NOTE

This procedure is recommended only for those airplanes equipped with rim-inflated tubeless tires. The leak rate of tires to be sealed by this method should not exceed 5% over a 24-hour period.

Inflate the standard main wheel tires (18x5.5) to 96 ± 2 psi. Inflate the optional high flotation main wheel tires (22x6.75-10) to 62 ± 2 psi. Both the standard and high flotation configuration nose wheel tires should be inflated to between 55 and 60 psi.

NOTE

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

SHOCK STRUTS

Servicing the shock struts is normally part of each 100-hour inspection procedure. If it becomes necessary to service the shock struts due to the leakage of either the hydraulic oil or the air, the following procedure should be followed:

NOSE GEAR STRUT

a. Release all of the air from the strut by depressing the core of the air valve on top of the strut.

b. Remove the air valve and wipe clean. With the strut fully compressed, the end of the filler neck on the air valve should touch the oil. If the oil is below this level, add approved hydraulic fluid. Reinstall and safety the air valve.

c. With the airplane empty except for full fuel and oil, inflate the nose gear until the inner cylinder is extended 3 to 3½ inches.

MAIN GEAR STRUT

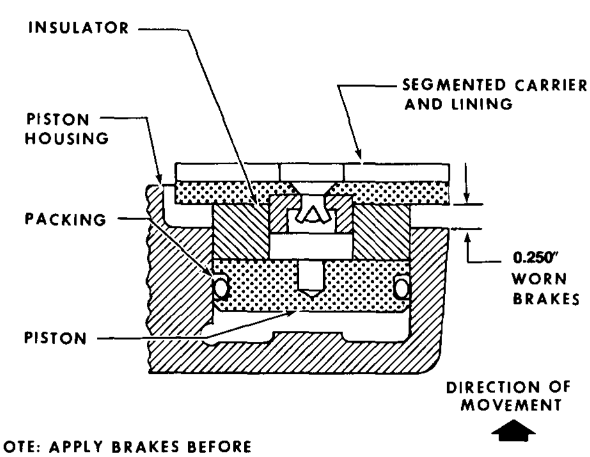
a. Release all of the air from the strut through the air valve, and remove the core from the valve.

b. Fully compress the strut and attach a small hose over the air valve and immerse the other end of the hose in hydraulic fluid. Slowly extending the strut will create a partial vacuum, thereby drawing the oil into the cylinder. Cycling the strut slightly as it is extended will expel any trapped air. Slowly return the strut to the fully compressed position; this will force the excess oil back into the container, and the strut will be properly filled with oil.

c. With the airplane empty except for full fuel and oil, inflate the strut until the inner cylinder is extended 4¼ to 4½ inches. If the optional high flotation gear is installed, inflate the strut until the inner cylinder is extended 4½ to 4¾ inches.

BRAKE SYSTEM

Brake servicing is limited to maintaining adequate fluid in the reservoir mounted on the bulkhead in the upper left corner of the nose avionics compartment. A dipstick is provided as part of the reservoir lid to measure the fluid level. When the fluid is low, add sufficient quantity of approved hydraulic fluid to raise the level to the full mark on the dipstick.



BRAKE WEAR TOLERANCE

Each wheel cylinder is provided with a means of conveniently checking brake wear. The distance between the piston housing and the lining carrier will increase with lining wear. When the distance exceeds 0.250 inch (as indicated by the accompanying illustration) the brakes should be replaced. This check should be accomplished with brake pressure applied. For more detail on servicing of the wheels and brakes, refer to the Beechcraft *Super King Air 200 Maintenance Manual.*

OIL SYSTEM

Servicing the engine oil system primarily involves maintaining the engine oil at the proper level, inspecting and cleaning or replacing the filter element, and changing the oil at the proper intervals. The interval for changing the oil is dependent upon airplane utilization. For typical utilization (50 hours per month or less), change the oil each 400 hours or 9 months, whichever occurs first. For high utilization (more than 50 hours per month), change the oil each 1200 hours or 9 months, whichever occurs first.

CAUTION

Do not mix different brands of oil when adding oil between oil changes. Different brands or types of oil may be incompatible because of the difference in their chemical structures.

The oil tank is provided with an oil filler neck and quantity dipstick cap which protrude through the accessory gearcase at the eleven-o'clock position. The dipstick is marked in U. S. quarts and indicates the last five quarts required to bring the system up full. Access to the dipstick cap is gained through an access door on the aft engine cowl. Service the oil system with oil as specified in Consumable Materials. Do not mix different oil brands together. Total oil tank capacity is 2.3 U. S. gallons. When a dry engine is first serviced, it will require approximately 5 quarts in addition to tank capacity to fill the lines and cooler, giving a total system capacity of 14 quarts. The engine will trap approximately 1.5 quarts which cannot be drained; therefore, when performing an oil change, refill the system with 12 quarts and add additional oil based on the dipstick reading. While the airplane is standing idle, engine oil could possibly seep into the scavenge pump reservoir, causing a low dipstick reading. Anytime an engine has been shut down for 12 hours or more, or if the oil has just been changed, run the engine for at least two minutes before checking the oil level.

NOTE

The dipstick indicates one quart below full when the oil level is normal. Overfilling may cause a discharge of oil through the breather until a satisfactory level is reached.

CAUTION

Spilled oil should be removed immediately to prevent possible tire contamination or damage.

CHANGING THE ENGINE OIL

CAUTION

When changing to a different brand of oil, completely drain the airplane oil system as indicated in the procedure below. Remove the oil filter and immerse it in the brand of oil to be used. Reinstall the oil filter and drain plugs. Fill the system to the proper level, and ground run the engines for 20 minutes to thoroughly circulate the new brand of oil throughout the system. Completely drain the airplane oil system and again remove the oil filter and immerse it in the new brand of oil. Refill the airplane oil system as indicated below. This will prevent chemical interaction between it and the new brand.

1. Remove the forward and lower aft cowlings to gain access to the engine and oil cooler drains.

2. Remove the oil tank drain dust cap at the aft left side of the upper forward cowling.

NOTE

On BB-98 and after, BL-1 and after, and earlier airplanes reworked per Service Instructions No. 0748-257, the drain line from the oil tank was rerouted to the aft left side of the upper forward cowling to facilitate draining the engine oil tank. A shutoff valve was installed in the line adjacent to the drain cap. On these airplanes, remove the drain cap and install the oil drain tube in the end of the line from which the drain cap was removed. Then unsafety and open the shutoff valve to drain the engine oil tank.

3. Remove the drain plug at the 6-o'clock position on the rear face of the accessory gearbox housing.

4. Remove the drain plug on the oil cooler inlet elbow.

5. Remove the oil filter element as described in OIL FILTER SERVICING.

6. Remove the chip detector at the 6-o'clock position on the reduction gearbox front case.

7. Remove the drain plug from the oil-to-fuel heater.

8. With all the drain plugs removed, motor the engine over with the starter only (no ignition) to permit the scavenge pumps to clear the engine.

CAUTION

Limit motoring to the time required to accomplish the above because of the limited lubrication available to the engine during this operation. To prevent damage to the fuel control unit, leave the condition lever in IDLE CUT-OFF while motoring the engine.

9. Install the oil filter element as described in OIL FILTER SERVICING.

10. Use a jumper wire to complete the circuit across the chip detector contacts, then check the warning annunciator panel to ensure that the CHIP DETECT light illuminates.

11. Install new preformed packings on the drain plugs and the chip detector.

12. Reinstall the chip detector on the reduction gearbox front case. Torque to 45-55 inch-pounds and lockwire. Finger tighten the cannon plug on the chip detector.

13. Reinstall the drain plug on the rear face of the accessory gearbox housing. Torque to 215-240 inch-pounds and lockwire.

14. Reinstall the drain plug on the oil cooler inlet elbow and lockwire.

15. Reinstall and safety the drain plug in the oil-to-fuel heater.

CAUTION

Damage to the threads will result if the fuel heater drain plugs are tightened to a torque exceeding 15 to 20 inch-pound Apply MIL-P-17232, Type A, Class 2, anti-seize compound to the drain prior to reinstallation.

16. Remove the oil drain tube from the end of the drain line to the engine oil tank and reinstall the dust cap and safetywire the shutoff valve in the closed position.

17. Fill the engine with the correct amount and type of oil as specified in CONSUMABLE MATERIALS.

18. Motor the engine over, with the starter only, long enough to get an oil pressure reading.

CAUTION

Observe the starter operating limits of 40 seconds ON, 60 seconds OFF, 40 seconds ON, 60 seconds OFF, 40 seconds ON, then 30 minutes OFF.

19. Check the engine for oil leaks and refill the engine to the proper oil level.

20. Reinstall the forward and lower aft cowlings and secure the access doors.

21. Ground run engines for 20 minutes if changing brands of oil, or long enough to distribute the new oil.

OIL FILTER SERVICING

CLEANABLE OIL FILTER (Engine serials prior to PC-E80041, except those complying with Pratt & Whitney Service Bulletin 3018)

The engine oil filter is located under the square cover plate at the three-o'clock position of the compressor inlet case and just behind the aft fire seal. The filter may be cleaned as follows:

1. Remove the four self-locking nuts and plain washers securing the filter cover to the compressor inlet case. Remove the cover and withdraw the element from the filter housing.

2. Agitate the element for five minutes in clean, unused solvent.

3. Dry the element with clean, filtered air, or allow to stand until dry.

4. Visually inspect and repeat the cleaning process if required. The filter should be inspected at 100-hour intervals. Inspect the filter element with a magnifying glass. If more than 5% of the visible passages are blocked, the element must be cleaned and inspected at an approved overhaul facility. If dents or broken wires are found in the filter element screen, the filter element must be replaced. Each time the filter is removed for cleaning or inspection, the O-ring seal inside the perforated flange must be replaced.

HIGH-CAPACITY OIL FILTER, P/N 3024084 (Engine serials PC-E80041 and after, and any earlier serials complying with Pratt & Whitney Service Bulletin 3018)

The engine oil filter is located under the square cover plate at the three-o'clock position of the compressor inlet case and just behind the aft fire seal. The filter element should be replaced after 1000 hours of use and inspected for cleanliness and condition at 100-hour intervals.

CAUTION

This filter element is not cleanable and must be replaced if it has been subjected to ultrasonic cleaning, or heavy contamination from the engine oil system.

Light contaminants collected on the external protective screen may be removed by hand flushing the element with Varsol. The filter element may be removed, inspected, and replaced as follows:

1. Remove the four self-locking nuts and plain washers securing the filter cover to the compressor inlet case.

2. Remove the cover and withdraw the element from the filter housing.

3. Visually inspect the filter element with a magnifying glass. The element must be replaced if dents or broken wires are found in the filter element screen or if more than 5% of the visible passages are blocked.

4. Insert the filter element (perforated, flanged end first) into the filter housing.

5. Coat a new O-ring seal with engine oil and install the seal and cover on the compressor inlet case.

6. Secure the filter cover with four plain washers and self-locking nuts. Torque the nuts between 20 and 30 inch-pounds above the torque necessary to turn the nuts before seating.

FUEL SYSTEM

FUEL HANDLING PRACTICES

All hydrocarbon fuels contain some dissolved, suspended water. The quantity of water contained in the fuel depends on temperature and the type of fuel. Kerosene, with its higher aromatic content, tends to absorb and suspend more water than aviation gasoline. Along with the water, it will suspend rust, lint, and other foreign materials longer. Given sufficient time, these suspended contaminants will settle to the bottom of the tank. However, the settling time for kerosene is five times that of aviation gasoline. Due to this fact, jet fuels require good fuel handling practices to assure that the Beechcraft Super King Air 200 is serviced with clean fuel. If recommended ground procedures are carefully followed, solid contaminants will settle and free water can be reduced to 30 parts per million (PPM), a value that is currently accepted by the major airlines. Since most suspended matter can be removed from the fuel by sufficient settling time and proper filtration, it is not a major problem. Dissolved water has been found to be the major fuel contamination problem. Its effects are multiplied in airplanes operating primarily in humid regions and warm climates.

Dissolved water cannot be filtered from the fuel with micronic type filters, but can be released by lowering the fuel temperature, such as will occur in flight. For example, a kerosene fuel may contain 65 ppm (8 ounces per 1000 gallons) of dissolved water at 80°F. When the fuel temperature is lowered to 15°F, only about 25 ppm will remain in solution. The difference of 40 ppm will have been released as supercooled water droplets which need only a piece of solid contaminant or an impact shock to convert them to ice crystals. Tests indicate that these water droplets will not settle since the specific gravity of ice is approximately equal to that of kerosene. The 40 ppm of suspended water seems like a very small quantity, but when added to suspended water in the fuel at the time of delivery, is sufficient to ice a filter. While the critical fuel temperature range is from 0° to −20°F, which produces severe system icing, water droplets can freeze at any temperature below 32°F.

Water in jet fuel also creates an environment favorable to the growth of microbiological sludge in the settlement areas of the fuel cells. This sludge, plus other contaminants in the fuel, can cause corrosion of metal parts in the fuel system as well as clogging of the fuel filters.

Since fuel temperature and settling time affect total water content and foreign matter suspension, contamination can be minimized by keeping equipment clean. Use adequate filtration equipment and careful water drainage procedures, store the fuel in the coolest areas possible, and allow adequate settling time. Underground storage is recommended for fuels. Filtering the fuel each time it is transferred will minimize the quantity of suspended contaminants carried by the fuel.

The primary means of contamination control by the owner/operator is careful handling. This applies not only to fuel supply, but to keeping the airplane system clean. The following is a list of steps that may be taken to prevent and recognize contamination problems.

1. Know your supplier. It is impractical to assume that fuel free from contaminants will always be available, but it is feasible to exercise precaution and be watchful for signs of fuel contamination.

2. Assure, as much as possible, that the fuel obtained has been properly stored, filtered as it is pumped to the truck, and filtered again as it is pumped from the truck to the airplane.

3. Perform filter inspections to determine if sludge is present.

4. Periodically flush the fuel tanks and systems. The frequency of flushing should be determined by the climate and the presence of sludge.

5. Use only clean fuel servicing equipment.

6. After refueling, allow a three hour settle period,

whenever possible, then drain a small amount of fuel from each drain.

CAUTION

Fuel spills on tires have a deteriorating effect and the tires should be cleaned promptly.

FILLING THE TANKS

When filling the airplane fuel tanks, always observe the following:

1. Make sure the airplane is statically grounded to the servicing unit and that the airplane and servicing unit are both grounded to ground.

2. The main filler cap is located on top of the outboard wing section, and the auxiliary filler cap is located on top of the center wing section. Do not rest fuel nozzle in tank filler neck, because this may damage the filler neck.

WARNING

Do not fill auxiliary tanks unless main tanks are full.

3. Allow a three-hour settle period whenever possible, then drain a small amount of fuel into a container from each drain point. Check fuel at each drain point for contamination.

FUEL GRADES AND TYPES

A FUEL BRAND AND TYPE DESIGNATION chart is included later in this Section. It gives the fuel refiner's brand names for the designations established by the American Petroleum Institute (API) and the American Society for Testing and Materials (ASTM). The brand names are listed for ready reference and are not specified by Beech Aircraft Corporation as the only acceptable products. Any product conforming to the recommended specifications may be used.

Aviation Kerosene Grades Jet A, Jet A-1, Jet B, JP-4, and JP-5 may be mixed in any ratio. Aviation Gasoline Grades 80 (80/87), 100LL, 100 (100/130), and 115/145 are emergency fuels and may be mixed with the recommended fuels in any ratio; however, use of the lowest octane rating available is recommended. Operation on Aviation Gasoline shall be limited to 150 hours per engine during each time-between-overhaul (TBO) period. Refer to LIMITATIONS Section for additional limitations on the use of Aviation Gasoline.

NOTE

Make certain the fuel cells do not dry out and crack. At a later servicing, the cracks would allow fuel to diffuse through the walls of the fuel cell. If any fuel cell is to remain empty for an extended interval, ensure that it last contained jet fuel; if it last contained aviation gasoline, coat it with oil.

DRAINING THE MAIN FUEL SYSTEM

BB-85 AND AFTER, BL-1 AND AFTER (And Any Earlier Serials Complying With Beech Service Instructions Number 0725-295)

A rapid defueling adapter is installed in the nacelle tank sump strainer. A valve in the adapter opens as a standard AN-type fuel connector is screwed into the adapter. This facilitates rapid, complete draining of the main fuel system.

SERIALS PRIOR TO BB-85 (Except Those Serials Complying With Beech Service Instructions Number 0725-295)

To drain the main fuel system only, when the standby fuel pump is operative, the fuel line to the engine fuel heater inlet should be disconnected and a drain hose connected to the line to allow pumping of the fuel into a fuel truck or a suitable container. If the reason for draining the fuel is for the purpose of replacing an inoperative standby fuel pump, an external pump connected to the drain line can be used or the drain plug in the nacelle tank sump strainer can be removed to gravity feed the fuel into a suitable container.

DRAINING THE AUXILIARY FUEL SYSTEM

The auxiliary fuel system can be drained by either transferring it to the main system with the transfer system, or by draining it into a container by removing the drain plug located in the bottom of the auxiliary tank sump strainer.

The auxiliary tank need not be drained to replace the standby fuel pump.

CLEANING FUEL FILTERS

Clean the firewall filters every 100 hours as follows:

1. Open the access door on the aft lower cowling to gain access to the firewall filter.

2. Remove the drain tube from the firewall filter.

3. Cut the lockwire securing the filter housing retaining nut and remove the nut.

4. Remove the filter housing from the filter body by inserting a No. 10 (32 UNF-3B) screw in the filter removal hole in the cover assembly.

5. Remove the preformed packings.

6. Inspect the filter pack for foreign material and microbiological sludge.

7. Plug the open ends of the center tube and wash the unit in solvent.

8. Remove the plugs and reinstall the assembled filter and cover in the pump housing and torque the attaching bolts to 40 to 60 inch-pounds. Safety the cover bolts with lockwire.

9. Reattach the drain tube to the firewall filter.

10. Open the valve in the transfer line.

CHANGING THE FUEL PUMP FILTER

The fuel pump filter is housed in the engine driven pump located on the right side of the engine accessory case.

At intervals of 100 operating hours, clean the fuel pump filter as follows:

1. Remove the lockwire and the four retaining screws in the cover of the filter.

2. Use a CPWA 30443 puller to remove the filter assembly from the fuel pump housing.

3. Disassemble the filter by removing the long bolt in the center of the filter.

4. Clean the filter element by sloshing it in solvent, and blowing it with compressed air regulated to 15 psi. Check the filter for broken screen, loose brazing or corrosion. Replace the filter element if any of these conditions exist.

5. Reassemble the clean or new filter element on the cover plate with the spring, washer, and teflon packing ring and torque the long bolt 25 to 30 inch-pounds.

6. Install a new packing and O-ring on the cover flange and install the filter assembly into the pump body. Install the four retaining screws, torque them to 40 to 46 inch-pounds, and lockwire them.

INSTRUMENT VACUUM AIR

Vacuum for the flight instruments is obtained by operating an ejector with bleed air from the engines. During operation, the ejector draws air in through the instrument filter and the gyros. If the gyros are not using the total vacuum pressure created by the ejector, a vacuum relief regulator handles the remainder.

The instrument filter, located at the top of the avionics compartment, is of prime importance and should be replaced every 500 hours, or more often if conditions warrant (smokey, dusty conditions).

The vacuum relief regulator valve, located on the forward pressure bulkhead in the bottom of the avionics compartment, is protected by a foam sponge type filter which should be cleaned in solvent at least every 100 hours. If vacuum pressure rises above a normal reading, clean the filter and recheck vacuum pressure before attempting to adjust the valve.

SERVICING THE OXYGEN SYSTEM

OXYGEN COMPONENTS

Oxygen for unpressurized, high-altitude flight is supplied by a cylinder located in the compartment immediately aft of the aft pressure bulkhead. A 22-, 49-, 64-, 76-, or 115-cubic-foot cylinder may be installed. The oxygen system is serviced by a filler valve accessible by removing an access plate on the right side of the aft fuselage. The system has two pressure gages, one located on the right subpanel in the crew compartment for in-flight use, and one adjacent to the filler valve for checking system pressure during filling. A shutoff valve and regulator, located on the cylinder, controls the flow of oxygen to the crew and passenger outlets. The shutoff valve is actuated by a push-pull type control located aft of the overhead light control panel in the cockpit. The regulator is a constant-flow type which supplies low pressure oxygen through system plumbing to the outlets.

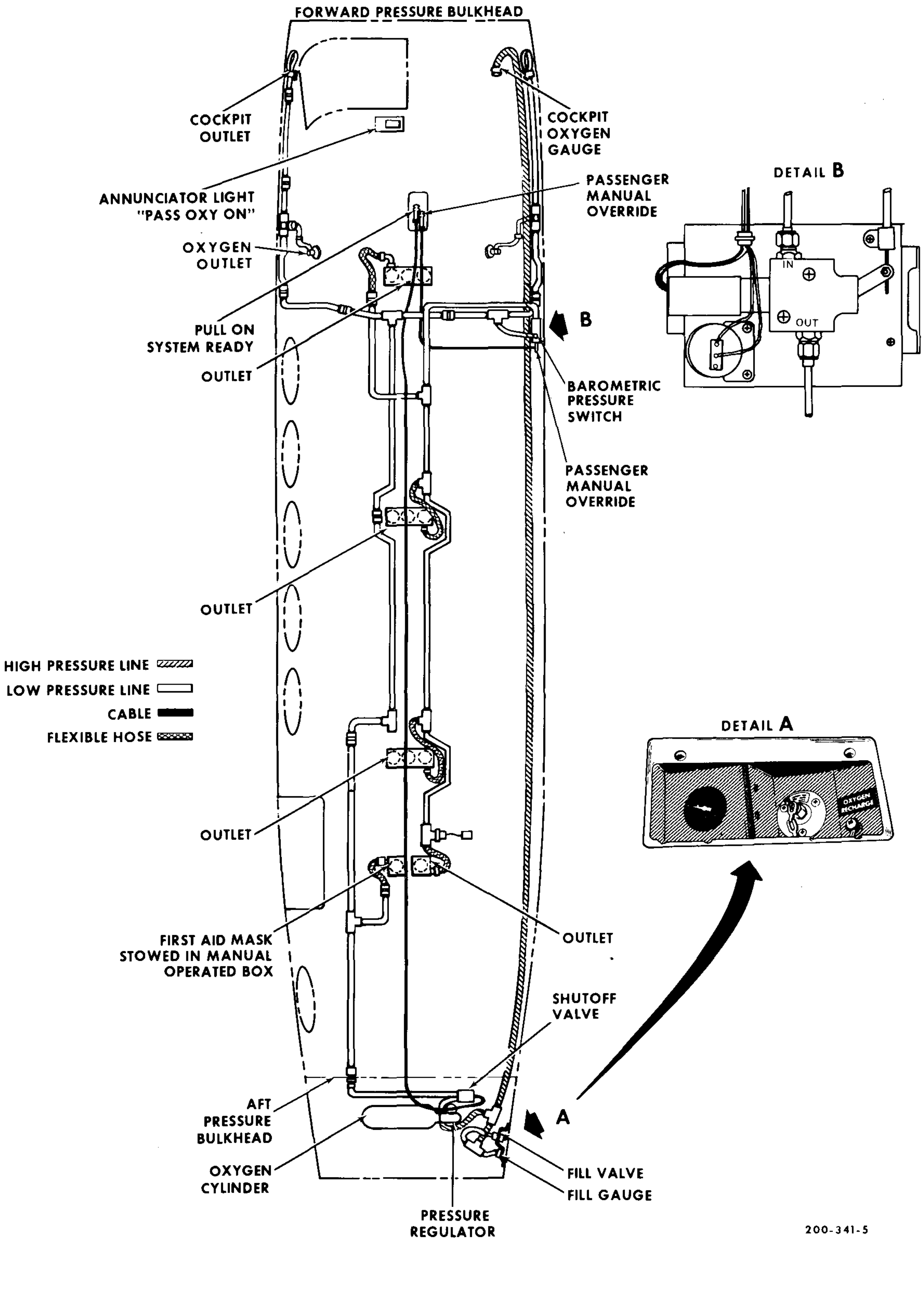
OXYGEN SYSTEM PURGING

Offensive odors may be removed from the oxygen system by purging. The system should also be purged anytime system pressure drops below 50 psi, or a line in the system is opened. Purging is accomplished simply by connecting a recharging cart into the system and permitting oxygen to flow through the lines and outlets until any offensive odors have been carried away. The following precautions should be observed when purging or servicing the oxygen system:

1. Avoid any operation that could create sparks. Keep all burning cigarettes or fire away from the vicinity of the airplane when the outlets are in use.

2. Inspect the filler connection for cleanliness before attaching it to the filler valve.

3. Make sure that your hands, tools, and clothing are clean, particularly of grease or oil stains, for these contaminants are extremely dangerous in the vicinity of oxygen.



OXYGEN SYSTEM SERVICING
(Auto-deployment System Shown)

4. As a further precaution against fire, open and close all oxygen valves slowly during filling.

FILLING THE OXYGEN SYSTEM

When filling the oxygen system, only use Aviator's Breathing Oxygen, MIL-O-27210.

WARNING

DO NOT USE MEDICAL OXYGEN. It contains moisture which can cause the oxygen valve to freeze.

Fill the oxygen system slowly by adjusting the recharging rate with the pressure regulating valve on the servicing cart, because the oxygen, under high pressure, will cause excessive heating of the filler valve. Fill the cylinder (22-cubic-foot cylinder installation) to a pressure of 1800 ± 50 psi at a temperature of 70°F. This pressure may be increased an additional 3.5 psi for each degree of increase in temperature; similarly, for each degree of drop in temperature, reduce the pressure for the cylinder by 3.5 psi. The oxygen system, after filling, will need to cool and stabilize for a short period before an accurate reading on the gage can be obtained. The 49-, 64-, 76-, or 115-cubic-foot cylinders may be charged to a pressure of 1850 ± 50 psi at a temperature of 70°F. When the system is properly charged, disconnect the filler hose from the filler valve and replace the protective cap on the filler valve.

OXYGEN CYLINDER RETESTING

Oxygen cylinders used in the airplane are of two types. Light weight cylinders, stamped "3HT" on the plate on the side, must be hydrostatically tested every three years and the test date stamped on the cylinder. This bottle has a service life of 4,380 pressurizations or 24 years, whichever occurs first, and then must be discarded. Regular weight cylinders, stamped "3A", or "3AA", must be hydrostatically tested every five years and stamped with the retest date. Service life on these cylinders is not limited.

AIR CONDITIONER

If an extended period of time occurs during which the air conditioning system is not operated, moisture may condense and settle in the system low spots, resulting in corrosion of the refrigerant lines. Also, the system seals may dry out, shrink, and crack, due to the lack of lubrication. In order to protect the integrity of the system, the air conditioner should be operated at least 10 minutes every month.

CAUTION

Do not attempt to operate the air conditioner when the ambient temperature is below 10°C (50°F). If for several weeks it is impossible to obtain an ambient temperature of at least 10°C (50°F), the recommended monthly interval for operating the air conditioner may be extended somewhat.

For air conditioner system servicing information, refer to the Maintenance Manual.

WARNING

Refrigerant and oil are under pressure within the refrigeration system. Injury to personnel or damage to the system could occur if the maintenance is not performed properly. The refrigerant system should be serviced only by qualified air conditioner technicians.

CABIN AIR FILTERS

A flexible, fiberglass-type air filter covers the coils of both the forward and the aft air-conditioner evaporators. On later serials, a foam-rubber type recirculated-air filter is also installed over the return-air valve, at floor level forward of the copilot's rudder pedals. All these filters should be inspected each 100 hours of operation, and replaced whenever dirty.

FORWARD EVAPORATOR FILTER REPLACEMENT

1. Remove the access door in the nose-wheel-well keel under the refrigerant plumbing.

2. Pull the filter down and out of the retaining springs on the evaporator coil.

3. Fold the new filter to insert it through the access doors. The filter must be carefully inserted between the coil assembly and the refrigerant plumbing under the retaining springs.

4. Replace the access doors.

AFT EVAPORATOR FILTER REPLACEMENT

1. Remove the carpet and floor panel behind the rear spar, and remove the cover of the evaporator plenum.

2. Remove the old filter from behind the retaining springs on the evaporator coil.

3. Insert the new filter between the retaining springs and

the evaporator coil.

4. Replace the plenum cover, floor panel, and carpet.

RETURN AIR FILTER REPLACEMENT (Later Serials Only)

1. Reach forward of the copilot's rudder pedals to the pressure bulkhead at floor level.

2. Pull out the two (left and right) flexible filters.

3. Insert one new filter into the left half of the channel on top of the filter support grill, and one into the right half.

4. Tamp the filters into place by hand and smooth them out.

MISCELLANEOUS MAINTENANCE

CLEANING

AIRCRAFT FINISH

Urethane paint is used on the Super King Air 200 because it is impervious to synthetic oil and most solvents, and has excellent abrasion resistance. This paint finish gives a very lustrous sparkle. The airplane may be washed with mild soap and water. Mild solvent may be used sparingly to remove accumulations of oil, grease, and runway tar.

CAUTION

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

In hot weather, oxidation will occur faster than in cold weather, so it is recommended that a good grade of nonabrasive wax or polish be used to aid in preserving the finish. Hangaring the airplane while not in use is good insurance against deterioration from sun and weather.

WINDOWS AND WINDSHIELDS

The windshield and plastic windows should be kept clean and waxed. To prevent scratches, wash the windows carefully with plenty of mild soap and water, using the palm of the hand to dislodge dirt and mud. Flood the surface with clean water to rinse away dirt and soap. After rinsing, dry the windows with a clean, moist chamois. Rubbing the surface of the plastic with a dry cloth should be avoided, as it builds up an electrostatic charge on the surface, which attracts dust particles.

NOTE

The windshield vendor has approved the use of Windex Glass Cleaner, Permatex Plastic Cleaner, and Whiz Aircraft Windshield Cleaner for cleaning the windshield. However, the use of soap and water is still the preferred method of cleaning the windshields, and is the only approved method of cleaning the cabin windows.

If oil or grease is present on the surface of the plastic, remove it with a cloth moistened with kerosene, then wash the surface with soap and water. Never use gasoline, benzine, alcohol, acetone, carbon tetrachloride, fire-extinguisher or anti-ice fluid, lacquer thinner, or glass cleaner. These materials will soften the plastic and may cause it to craze.

After thoroughly cleaning, wax the surface with a good grade of commercial wax that does not have an acrylic base. The wax will fill in minor scratches and help prevent further scratching. Apply a thin, even coat of wax and bring it to a high polish by rubbing lightly with a clean, dry, soft, flannel cloth. Do not use a power buffer; the heat generated by the buffing pad may soften the plastic.

POLARIZED CABIN WINDOWS

The polarized cabin windows consist of two plastic window panes installed with the polarized surfaces facing each other in a sealed assembly. To clean the interior exposed surface of the window requires only careful application of the practices for cleaning plastic windows. If it should become necessary to clean the inner surface of the sealed assembly and the inside of the pressure glass, the sealed assembly may be removed by removing the escutcheon, four screws, and the sealed assembly. Clean the interior windows and reinstall the sealed assembly and escutcheon.

SURFACE DEICE BOOT CLEANING

The deice boots are made of soft, flexible stock, which may be damaged if gasoline hoses are dragged over the surface of the boots or if ladders and platforms are rested against them. Keep deice boots free of oil, fuel, paint remover, solvents, and other injurious substances. Deice boots should be cleaned regularly with a mild soap and water solution not to exceed 180°F.

INTERIOR CARE

To remove dust and loose dirt from the upholstery, headliner, and carpet, clean the interior regularly with a vacuum cleaner.

Blot up any spilled liquid promptly with cleansing tissue or rags. Do not pat the spot. Press the blotting material firmly and hold it for several seconds. Continue blotting until no more liquid is taken up. Scrape off sticky materials with a dull knife, then spot clean the area.

Oily spots may be cleaned with household spot removers, used sparingly. Before using any solvent, read the instructions on the container and test it on an obscure place on the fabric to be cleaned. Never saturate the fabric with a volatile solvent; it may damage the padding and backing materials.

Soiled upholstery and carpet may be cleaned with foam-type detergent, used according to the manufacturer's instructions. To minimize wetting the fabric, keep the foam as dry as possible and remove it with a vacuum cleaner.

The plastic trim, instrument panel, and control knobs need only be wiped with a damp cloth. Oil and grease on the control wheel and control knobs can be removed with a cloth moistened with kerosene. Volatile solvents, such as those mentioned in the article on care of plastic windows, should never be used, since they soften and craze the plastic.

ICE VANES (INERTIAL SEPARATOR SYSTEM)

RESETTING OVERRIDE ASSEMBLY FOR NORMAL OPERATION

Once the manual extension handle has been pulled out, do not use the electric actuator system on the affected side again until the override is disengaged as follows:

a. Open the forward cowling.

b. Push up on the latch where it protrudes into the slot in the override assembly until the clevis bolt on the end of the manual override arm is free to travel forward in the slot.

c. If necessary, center the clevis bolt on the end of the actuator arm in the semicircular slot in the override assembly. This will align the clevis bolt with the pin in the override assembly. When in this position, the actuator arm clevis engages the cam slot and is properly locked in place for the extent of travel required to operate the inertial vane.

CAUTION

Failure to properly position the end of the actuator arm in the semicircular slot of the override assembly will prevent full travel of the actuator and could result in damage to the electrical actuator.

CARE AND HANDLING IN COLD WEATHER

PREFLIGHT INSPECTION

Check the brakes and tire to ground contact for freeze lock-up. Anti-ice solutions may be used on the brakes or tires if freeze-up occurs. No 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 preflight exterior inspection, special attention should be given all vents, openings, control surfaces, hinge points, and wing, tail and fuselage surfaces for accumulation of ice or snow. Removal of these accumulations is necessary prior to takeoff. The wing contour may be sufficiently altered by the ice and snow that its lift qualities are seriously impaired.

Inspect the propeller blades and hubs for ice or 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 the 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 into reverse range to flush any congealed oil through the oil system.

TAXIING

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

TAKEOFF AND FLIGHT

Allow additional take-off distance when snow or slush is on the runway. If flight conditions permit, leave the landing gear extended (without braking the wheels) for a short time after takeoff under these conditions. This permits both centrifugal force and the relative wind to help remove most of the moisture, snow, or slush. Extra cycling of the landing gear retraction system shortly after takeoff could help dislodge any moisture on moving parts of the retraction system. If the optional brake deice system is installed, turn it ON for taxiing, takeoff, and landing in slush, snow, or freezing rain.

If encountering any visible moisture during takeoff, the intertial separator ice vanes should be extended to preclude the possibility of ice going into the engine air inlet.

LANDING

Braking and steering is less effective under slick runway conditions. 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.

Applying reverse thrust to the propellers can effectively reduce stopping distances on slick runways. Reversing the thrust may cause snow or moisture to be thrown forward, temporarily reducing the pilot's visibility.

FUEL BRANDS AND TYPE DESIGNATIONS

PRODUCT NAME	DESIGNATION
AMERICAN OIL COMPANY	
American Jet Fuel Type A	Jet A
American Jet Fuel Type A-1	Jet A-1
ATLANTIC REFINING COMPANY	
Arcojet-A	Jet A
Arcojet-A-1	Jet A-1
Arcojet-B	Jet B
BP TRADING COMPANY	
BP A.T.K.	Jet A-1
BP A.T.G.	Jet B
CALIFORNIA TEXAS COMPANY	
Caltex Jet A-1	Jet A-1
Caltex Jet B	Jet B
CITIES SERVICE COMPANY	
Turbine Type A	Jet A
CONTINENTAL OIL COMPANY	
Conoco Jet-40	Jet A
Conoco Jet-50	Jet A
Conoco Jet-60	Jet A-1
Conoco JP-4	Jet B
GULF OIL COMPANY	
Gulf Jet A	Jet A
Gulf Jet A-1	Jet A-1
Gulf Jet B	Jet B
EXXON OIL COMPANY	
Exxon Turbo Fuel A	Jet A
Exxon Turbo Fuel 1-A	Jet A-1
Exxon Turbo Fuel 4	Jet B
MOBIL OIL COMPANY	
Mobil Jet A	Jet A
Mobil Jet A-1	Jet A-1
Mobil Jet B	Jet B
PHILLIPS PETROLEUM COMPANY	
Philjet A-50	Jet A
Philjet JP-4	Jet B
PURE OIL COMPANY	
Purejet Turbine Fuel Type A	Jet A
Purejet Turbine Fuel Type A-1	Jet A-1

PRODUCT NAME	DESIGNATION
RICHFIELD PETROLEUM COMPANY	
Richfield Turbine Fuel A	Jet A
Richfield Turbine Fuel A-1	Jet A-1
SHELL OIL COMPANY	
Aeroshell Turbine Fuel 640	Jet A
Aeroshell Turbine Fuel 650	Jet A-1
Aeroshell Turbine Fuel JP-4	Jet B
SINCLAIR OIL COMPANY	
Sinclair Superjet Fuel	Jet A
Sinclair Superjet Fuel	Jet A-1
STANDARD OIL OF CALIFORNIA	
Chevron TF-1	Jet A-1
Chevron JP-4	Jet B
STANDARD OIL OF KENTUCKY	
Standard JF A	Jet A
Standard JF A-1	Jet A-1
Standard JF B	Jet B
STANDARD OIL OF OHIO	
Jet A Kerosene	Jet A
Jet A-1 Kerosene	Jet A-1
TEXACO	
Texaco Avjet K-40	Jet A
Texaco Avjet K-58	Jet A-1
Texaco Avjet JP-4	Jet B
UNION OIL COMPANY	
76 Turbine Fuel	Jet A-1
Union JP-4	Jet B

NOTE

Jet A - Aviation Kerosene type fuel with -40°F (-40°C) Freeze Point.

Jet A-1 - Aviation Kerosene type fuel with -58°F (-50°C) Freeze Point.

Jet B - Aviation wide-cut gasoline type fuel similar to MIL-T-5624 grade JP-4, but may have a Freeze Point of -60°F (-51°C) instead of -76°F (-60°C) Freeze Point of JP-4.

LAMP REPLACEMENT GUIDE

ITEM	*NUMBER*

EXTERIOR

Entry Light (Under Left Wing)	4174
Ice Light	A7079B-24
Landing Lights	4596
Rotating Beacons	A7079B-24
Strobe Lights	Refer to Parts Catalog and Maintenance Manual
Tail Floodlight	DS0079-BJ
Tail Navigation Light	1683
Taxi Light	4587
Wing Navigation Light	A7512-24
Wing-tip Recognition Light	(GE) 1982 or (GTE) DN25-3

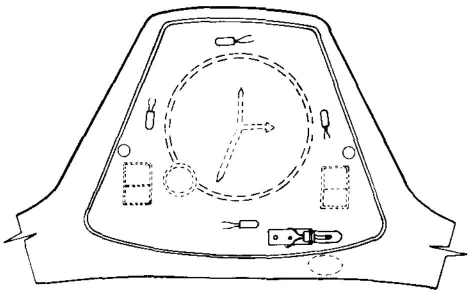
PASSENGER COMPARTMENT

Aft Dome/Baggage Compartment Light	303
Spar Cover Light	1495
Cabin Door Lock Light	1864
Cabin Sign Light	
Earlier Serials (4 Lamps)	313
Intermediate Serials (16 Lamps)	6838
Later Serials (9 Lamps)	D158-100-4
Cabin Table Light	1309
Fluorescent Light Tube	5108WW
Reading Light	303
Step Light	1864
Threshold Light	4587

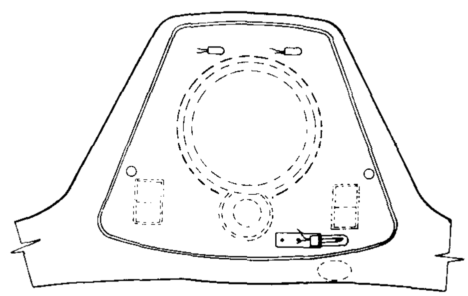
FLIGHT COMPARTMENT

All Edgelighted Placards	D158-100-5
Fuel Quantity Indicator Light	267
Instrument Indirect Lights (Under Glareshield)	1864
Map Light (Control Wheel)	1495
Overhead Floodlight	303
Lights for all other Instruments, Indicators, Annunciators, and Switches	327

CONTROL WHEEL LIGHTS



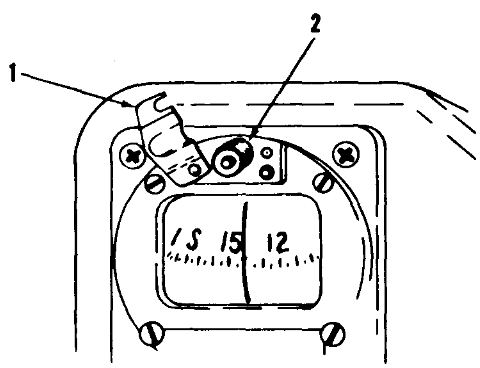
PILOT



COPILOT

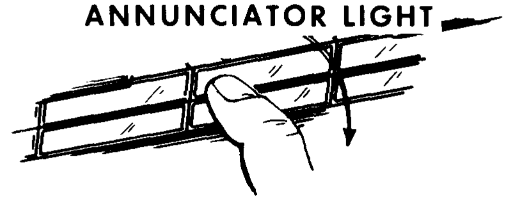
1. Remove two screws in center piece
2. Remove map light from interior
3. Unsolder wheat light, and resolder replacement.

COMPASS LIGHT

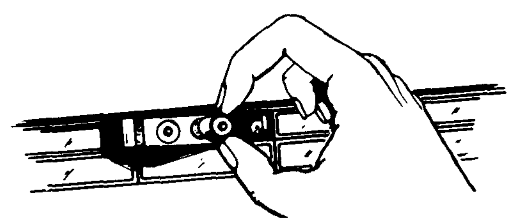


1. Swing shield (1) up
2. Remove lamp (2)

ANNUNCIATOR LIGHT

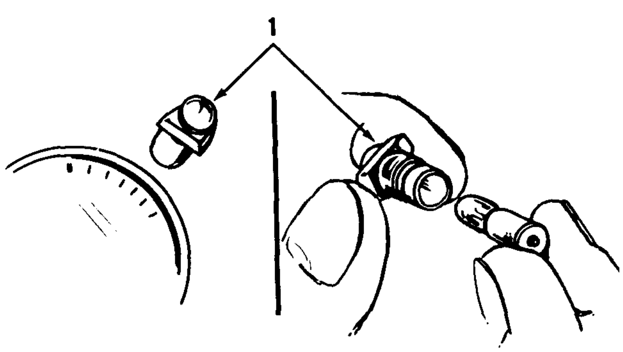


1. Depress left side of indicator panel to rotate in direction shown



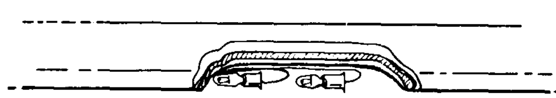
2. Pull bulb from rear of indicator panel

INSTRUMENT LIGHTS



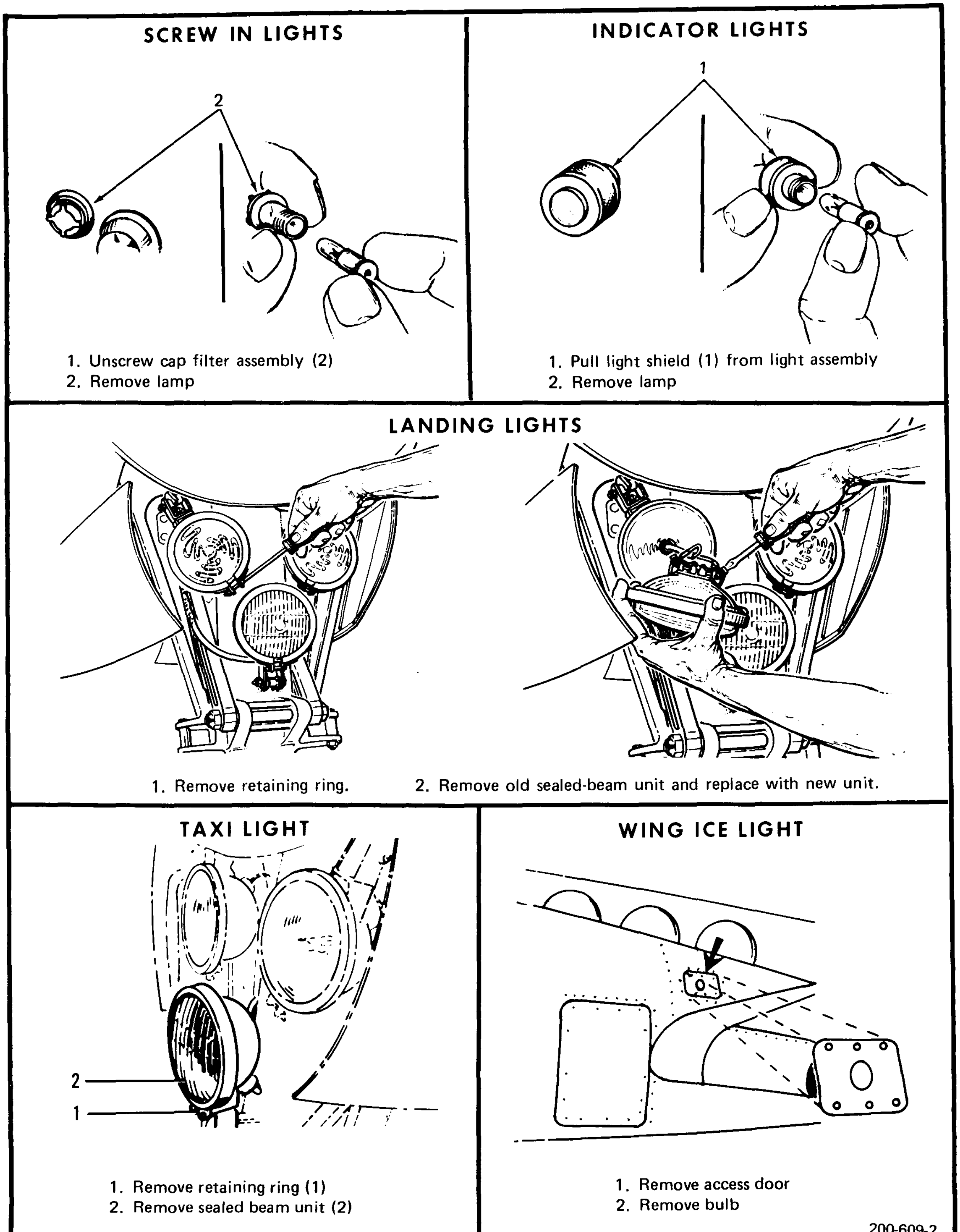
1. Pull light shield (1) from light assembly
2. Remove lamp

INDIRECT INSTRUMENT (GLARESHIELD) LIGHTS

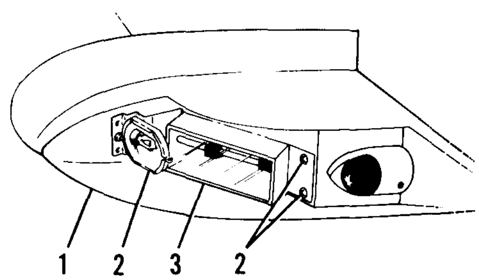


1. Locate faulty bulb under glareshield
2. Remove bulb by turning counter-clockwise

200-609-3

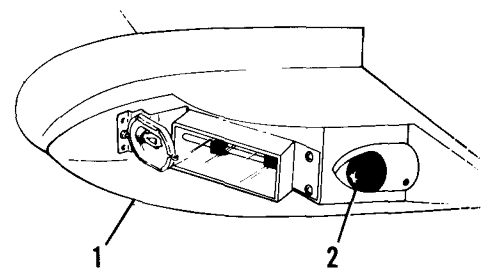

SCREW IN LIGHTS
2
1. Unscrew cap filter assembly (2)
2. Remove lamp
INDICATOR LIGHTS
1
1. Pull light shield (1) from light assembly
2. Remove lamp
LANDING LIGHTS
1. Remove retaining ring.
2. Remove old sealed-beam unit and replace with new unit.
TAXI LIGHT
2
1
1. Remove retaining ring (1)
2. Remove sealed beam unit (2)
WING ICE LIGHT
1. Remove access door
2. Remove bulb
200-609-2

WING STROBE LIGHT



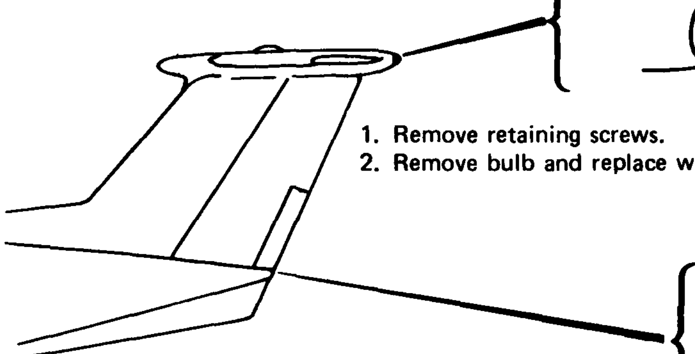
1. Remove transparent shield.
2. Remove four retaining screws and lift out strobe light assembly.
3. Unplug light assembly and replace with new light assembly.

WING NAVIGATION LIGHT



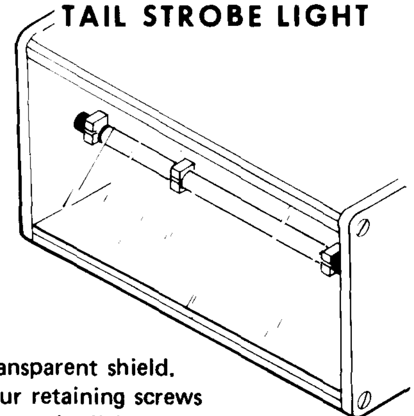
1. Remove transparent cover (1) and shield (2).
2. Remove bulb.

TAIL NAVIGATION LIGHT



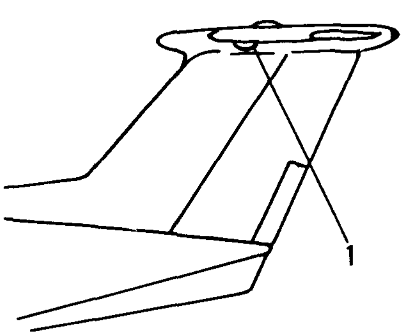
1. Remove retaining screws.
2. Remove bulb and replace with new bulb.

TAIL STROBE LIGHT



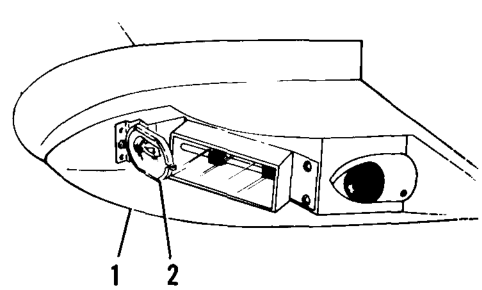
1. Remove transparent shield.
2. Remove four retaining screws and lift out strobe light assembly.
3. Unplug light assembly and replace with new light assembly.

EMPENNAGE FLOOD LIGHT



1. Remove retaining screws.
2. Remove bulb and replace with new bulb.

RECOGNITION LIGHT



1. Remove transparent cover (1).
2. Remove two retaining screws and pull reflector assembly (2) off.
3. Press bulb into socket, turn counterclockwise, and remove.

200-609-4A

CONSUMABLE MATERIALS

Vendors listed as meeting Federal and Military Specifications are provided as reference only and are not specifically recommended by Beech Aircraft Corporation. Any product conforming to the specification may be used, except in the case of engine oils; only the engine oil brand names listed are approved for use.

Addresses of vendors are listed in alphabetical order at the end of the consumable materials listing. In cases such that one vendor has different addresses for various products, the product(s) will also be listed with the address.

MATERIAL	*SPECIFICATION*	*BRAND*	*VENDOR*
RECOMMENDED ENGINE FUEL	Commercial Grades: Jet A, Jet A-1, Jet B Military Grades: JP-4, JP-5	See FUEL BRANDS AND TYPE DESIGNATIONS Table earlier in this Section.	
EMERGENCY ENGINE FUEL	Aviation Gasoline Grades: 80 (80/87) (Red) 100LL (Blue)* 100 (100/130) (Green) 115/145 (Purple)	NOTE: Always select the available fuel having the lowest octane number. Use of Aviation Gasoline is limited to 150 hours per engine between engine overhauls. See LIMITATIONS Section for additional limitations on the use of Aviation Gasoline.	
	*In some foreign countries, Grade 100LL (Blue) is colored Green and is designated "100L".		
ENGINE OIL	Pratt & Whitney Specification PWA 521 Type II (5 Centistokes) Oil	Aero Shell Turbine Oil 500	Shell Oil Company
		BP Enerjet 51	BP (North America) Ltd.
		Caltex RPM Jet Engine Oil 5	California Texas Oil Corp.
		Castrol 205 (See Note 1)	Castrol Oil Inc.
		Chevron Jet Engine Oil 5	Chevron International Oil Co., Inc.
		Esso Turbo Oil 2380* (See Note 2)	Exxon International Co., or Imperial Oil Limited
		Exxon Turbo Oil 2380* (See Note 2)	Exxon Company, U.S.A.
		Mobil Jet Oil II*	Mobil Oil Corp.
		Monsanto Skylube 450	Monsanto Co., Inc.
		Stauffer Jet II (See Note 1)	Stauffer Chemical Co.
		Texaco Starjet 5	Texaco Inc.

CAUTION: Do not mix oils of different brands, nor oils of different types produced by the same manufacturer, except as noted below.

NOTE 1: Castrol 205 and Stauffer Jet II are identical and may be intermixed. Different brand names are used for reasons of market segmentations.

NOTE 2: "Esso" and "Exxon" are interchangeable trade names dependent solely on marketing region. These brands are identical and may be intermixed.

CONSUMABLE MATERIALS (Cont'd)

MATERIAL	SPECIFICATION	PRODUCT	VENDOR
Lubricating Grease, High Temperature, Aircraft	MIL-G-3545	Aeroshell Grease 5	Shell Oil Co.
		Beacon 265	Imperial Oil Enterprises
		BP Aero Grease 35	BP Trading Limited
		Castrolease AHT	Castrol Oils, Inc.
		Royco 45A-1	Royal Lubricants Co.
		22440	International Lubricants Co.
Lubricating Grease, General Purpose, Wide Temperature Range	MIL-G-81322	Aeroshell Grease 22	Shell Oil Company
		Mobilgrease 28*	Mobil Oil Corporation
		Royco 22S	Royal Lubricants Co.
Grease	MIL-G-10924	Cato Code 5210	Cato Oil and Grease Co. Inc.
		Code 5542-C	Southwest Grease and Oil Company, Inc.
		Shell A and A Grease	Shell Oil Co.
		Sunoco C-352-EP	Sun Oil Company
Lubricating Grease, Molybdenum Disulfide	MIL-G-21164	Aeroshell Grease 17	Shell Oil Company
		Castrolease MSA (C)	Castrol Oil, Inc.
		Chevron Aviation Grease 44	Standard Oil of California
		Royco 64C	Royal Lubricants Co.
		TG-8173	Texaco Inc.
Lubricating Grease		Molykote 505 Paste	Dow Corning
Molybdenum Disulfide	MIL-M-7866	Braycote 610	Bray Oil Co.
		Molykote Z	Haskel Engineering and Supply Co.
		Mokykote Z	Wilco Co.
		Moly-Paul No. 4	Paul Products, Ltd.
Lubricant	MIL-L-8937		Electrofilm Inc.
			Alpha-Molykote Corp.
Lubricating Oil, Heavy Duty	MIL-! -2104	PED 3342 (Grade 10)	Standard Oil of California
		Phillips 66 HDS Motor Oil (Grade 10)	Phillips Petroleum Co.
		Super Lonet (Grade 10)	Sinclair Refining Company

CONSUMABLE MATERIALS (Cont'd)

MATERIAL	SPECIFICATION	PRODUCT	VENDOR
Lubricating Oil, General Purpose, Low Temperature	MIL-L-7870	Caltex Low Temp Oil	Caltex Oil Products Co.
		Sinclair Aircraft Orbitlube	Sinclair Refining Co.
		1692 Low Temp Oil	Texaco , Inc.
Lubricating Oil, Gear, Sub Zero	MIL-L-10324 (Replaces MIL-O-6086 Grade M)	Ace-Lube K-24	Ace-Lube Oil Company
		Gear Lubricant SZ 9285	American Oil Company
		ILCO Lubricant Gear Universal Sub Zero	International Lubricants Corporation
		RP 95-X*	Mobil Oil Corporation
Lubricating Oil Special Preservative	VV-L-800	Brayco 300	Bray Oil Co.
		Nox Rust 518, (Code R-62-203-1)	Daubert Chemical Co.
		Royco 308	Royal Lubricants Co.
Lubricating Oil		Aeroshell No. 12	Shell Oil Co.
Marvel Mystery Oil			Marvel Oil Company, Inc.
Lubricating Grease		Lubriplate No. 130A	Fiske Bros. Refining Co.
Lubricating Grease Aircraft and Instrument, Gear and Actuator Screw	MIL-G-23827	Aeroshell Grease 7	Shell Oil Co.
		BP Aero Grease 31B	BP Trading Limited
		Castrolease A1	Castrol Oils Inc.
		Royco 27A	Royal Lubricants Co.
		Supermil Grease No. A72832	Amoco Oil Company
Lubricant, Powdered Graphite	SS-659		Superior Graphite Co.
Chain Lubricant		Petrochem Chain Life	Ashland Chemical Co.
Metal Protector		LPS No. 3	LPS Research Laboratories or, William F. Hurst Company
Hydraulic Fluid (Brakes and Shock Struts)	MIL-H-5606	Aeroshell Fluid 4	Shell Oil Co.
		PED 3337	Standard Oil of California
		3126 Hydraulic Oil	Exxon Company USA
	MIL-H-83282		Bray Oil Company

CONSUMABLE MATERIALS (Cont'd)

MATERIAL	SPECIFICATION	PRODUCT	VENDOR
Solvent	PD680	Stoddard Solvent	
Solvent		Varsol*	Exxon Company, USA
Oil (Air Conditioner)		Frigidaire Refrigerant Oil (Viscosity 525)	Frigidaire Division of General Motors Corp.
Air Conditioning Refrigerant (Charging)	Dichlorodifluoromethane	Freon 12	DuPont Inc., Freon Products Division
		Genetron 12	Allied Chemicals, Speciality Chemicals Division
		Racon 12	Racon Inc.
Leak Detector, Oxygen System Leak Testing	MIL-L-25567		
Aviator's Breathing Oxygen	MIL-O-27210		
Door-Ease			American Grease Stick Co.
Anti-Ice Additive	MIL-I-27686		
Toilet (Flush Type) Cleaner		Monogram Solution DG-19	Monogram Solution Division
Tire Sealant		Consult a Beechcraft Aviation Center for approved product.	

VENDOR ADDRESSES

Ace-Lube Oil Co.
3983 Pacific Blvd.
San Mateo, California
94403

Allied Chemicals,
Speciality Chemicals Div.
Columbia Road & Park Ave.
Morristown, New Jersey
07960

Alpha-Molykote Corp.
65 Harvard Ave.
Stamford, Connecticut
06902

American Grease Stick Co.
2651 Hoyt
Muskegon, Michigan
49443

American Oil Co.
910 South Michigan Ave.
Chicago, Illinois
60680

Amoco Oil Co.
200 E. Randolf
Chicago, Illinois
60606

Ashland Chemical Co.
P. O. Box 2260
Santa Fe Springs, Calif.
90607

BP (North America) Ltd.
620 Fifth Avenue
New York, New York
10020

BP Trading Ltd.
Britannic House, Moore Lane
London E.C.2, England

Bray Oil Co.
1925 No. Marianna Ave.
Los Angeles, California
90063

California Texas Oil Corp.
380 Madison Ave.
New York, New York
10017

Caltex Oil Products Co.
380 Madison Ave
New York, New York
10017

Castrol Oils Inc.
254-266 Doremus Ave.
Newark, New Jersey
07105

Cato Oil & Grease Co., Inc.
P. O. Box 26868
Oklahoma City, Oklahoma
73126

Chevron International Oil Corp.
555 Market Street
San Francisco, California
94120

Daubert Chemical Co.
1200 Jorie
Oak Brook, Illinois
60521

Dow Corning
So. Saginaw Road
Midland, Michigan
48640

DuPont Inc.
Freon Products Div.
1007 Market Street
Wilmington, Delaware
19898

Electrofilm Inc.
P. O. Box 106
7116 Laurel Canyon Blvd.
No. Hollywood, California
91605

*(Turbo Oil 2380 or 3126 Hydraulic Oil)
Exxon Company, USA
P. O. Box 2180
Houston, Texas
77001

*(Varsol)
Exxon Company, USA
1251 Ave. of Americas
New York, New York
10020

Exxon International Co.
1257 Ave. of Americas
New York, New York
10020

Fiske Brothers Refining Co.
129 Lockwood
Newark, New Jersey
07105

Frigidaire Division
General Motors Corp.
300 Taylor
Dayton, Ohio
45401

Fuller Brothers, Inc.
5620 Southwest Kelley Ave.
Portland, Oregon
97201

Haskel Engineering & Supply Co.
100 E. Graham Place
Burbank, California
91502

Imperial Oil Enterprises
P. O. Box 3022
Sarnia, Ontario

Imperial Oil Ltd.
111 St. Clair Ave. W.
Toronto, Ontario
M5W 1K3

LPS Research Laboratories
2050 Cotner Ave. W.
Los Angeles, California
90025

Marvel Oil Co., Inc.
331-337 N. Main Street
Port Chester, New York
10573

*(Mobil Jet Oil II)
Mobil Oil Corp.
150 E. 42nd St.
New York, New York
10017

*(RP 95-X)
Mobil Oil Corp.
Paulsboro, New Jersey
08066

*(Mobilgrease 28)
Mobil Oil Corp.
Shoreham Bldg.
806 15th NW
Washington, D. C.
20005

Monogram Solutions Div.
Monogram Industries Inc.
3226 Thatcher Ave.
Venice, California
90291

Monsanto Co., Inc.
800 N. Lindbergh Blvd.
St. Louis, Missouri
63166

Paul Products Ltd.
London, England

Phillips Petroleum Co.
Phillips Bldg.
Bartlesville, Oklahoma
74003

Racon Inc.
6040 S. Ridge Road
Wichita, Kansas
67215

Royal Lubricants Co.
River Road
Hanover, New Jersey
07936

Shell Oil Co.
50 W. 50th St.
New York, New York
10020

Sinclair Refining Co.
500 Fifth Ave.
New York, New York
10036

Southwest Grease & Oil Co. Inc.
220 W. Waterman
Wichita, Kansas
67202

Standard Oil of California
225 Bush St.
San Francisco, California
94120

Stauffer Chemical Co.
299 Park Ave.
New York, New York
10017

Sun Oil Co.
P. O. Box 426
Marcus Hook, Pennsylvania
19061

Superior Graphite Co.
20 N. Wacker Dr.
Chicago, Illinois
60606

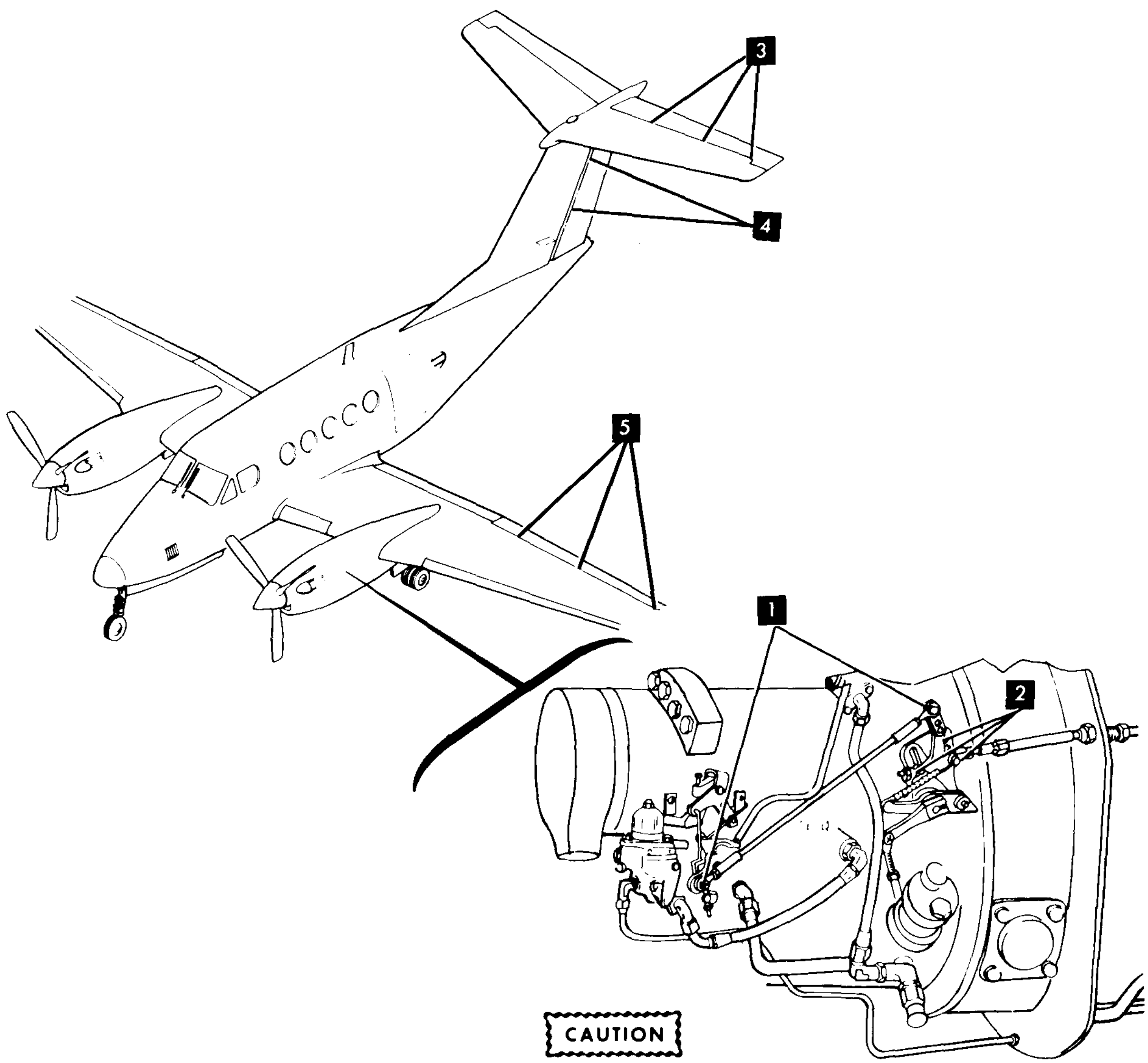
Texaco Inc.
135 E. 42nd St.
New York, New York
10017

Wilco Company
4425 Bandini Blvd.
Los Angeles, California
90023

William F. Hurst Co.
P. O. Box 13130
Wichita, Kansas
67217

LUBRICATION POINTS

INDEX NUMBER	LOCATION	LUBRICANT	INTERVAL IN HOURS
1	Control Rod Ends	MIL-G-23827	100
2	Cam Plates and Pins	Lubriplate No. 130A	100

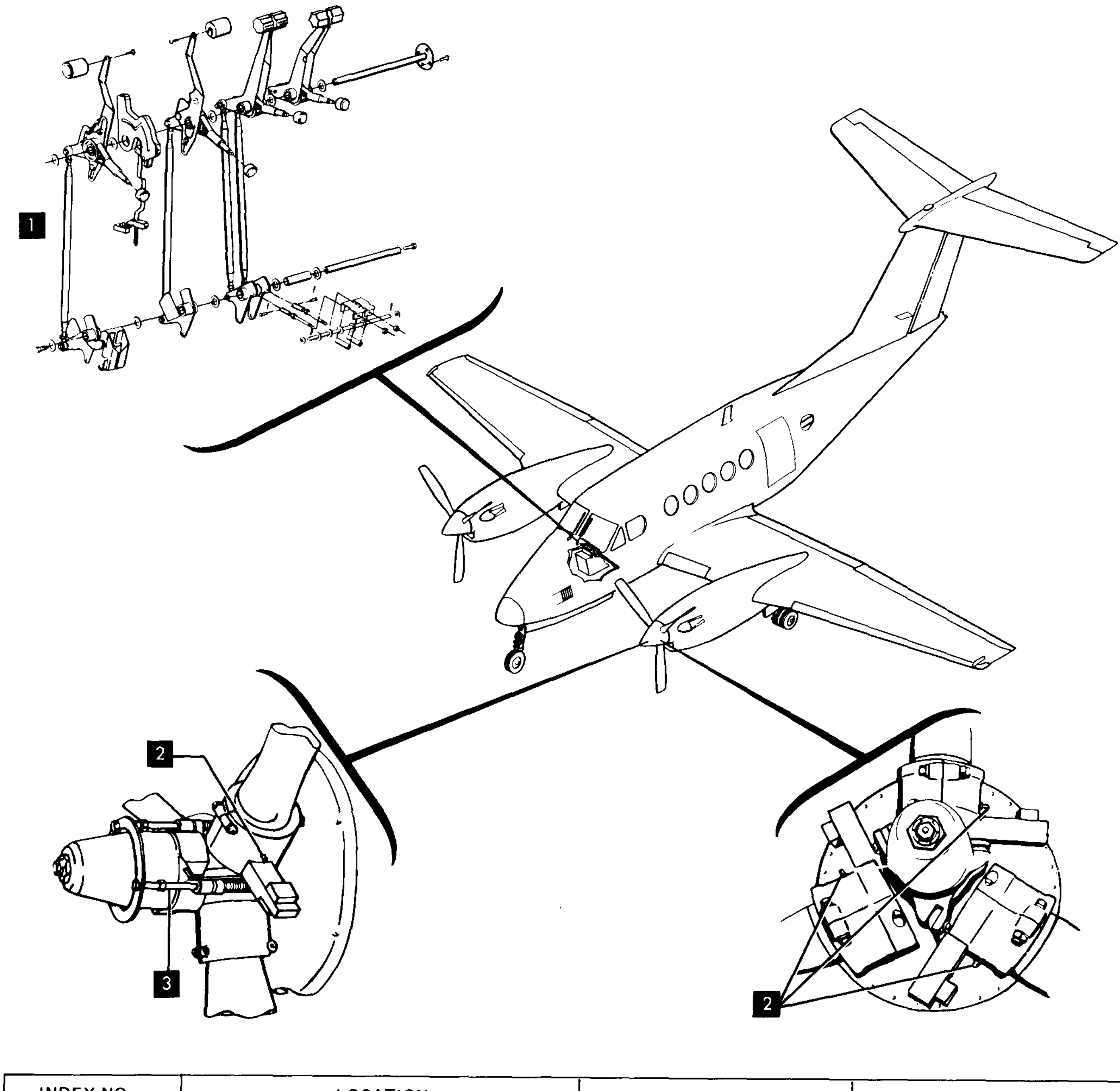


Check to ascertain that the rod ends rotate freely.

INDEX NO.	LOCATION	LUBRICANT	INTERAVAL IN HRS.
3	Elevator Hinge Bearings	MIL-G-23827 Grease	500
4	Rudder Hinge Bearings	MIL-G-23827 Grease	500
5	Aileron Hinge Bearings	MIL-G-23827 Grease	500

LUBRICATION POINTS

INDEX NO.	LOCATION	LUBRICANT	INTERVAL IN HRS.
1	ENGINE CONTROLS Linkage (All moving parts)	MIL-G-21164 Grease	As required for proper operation

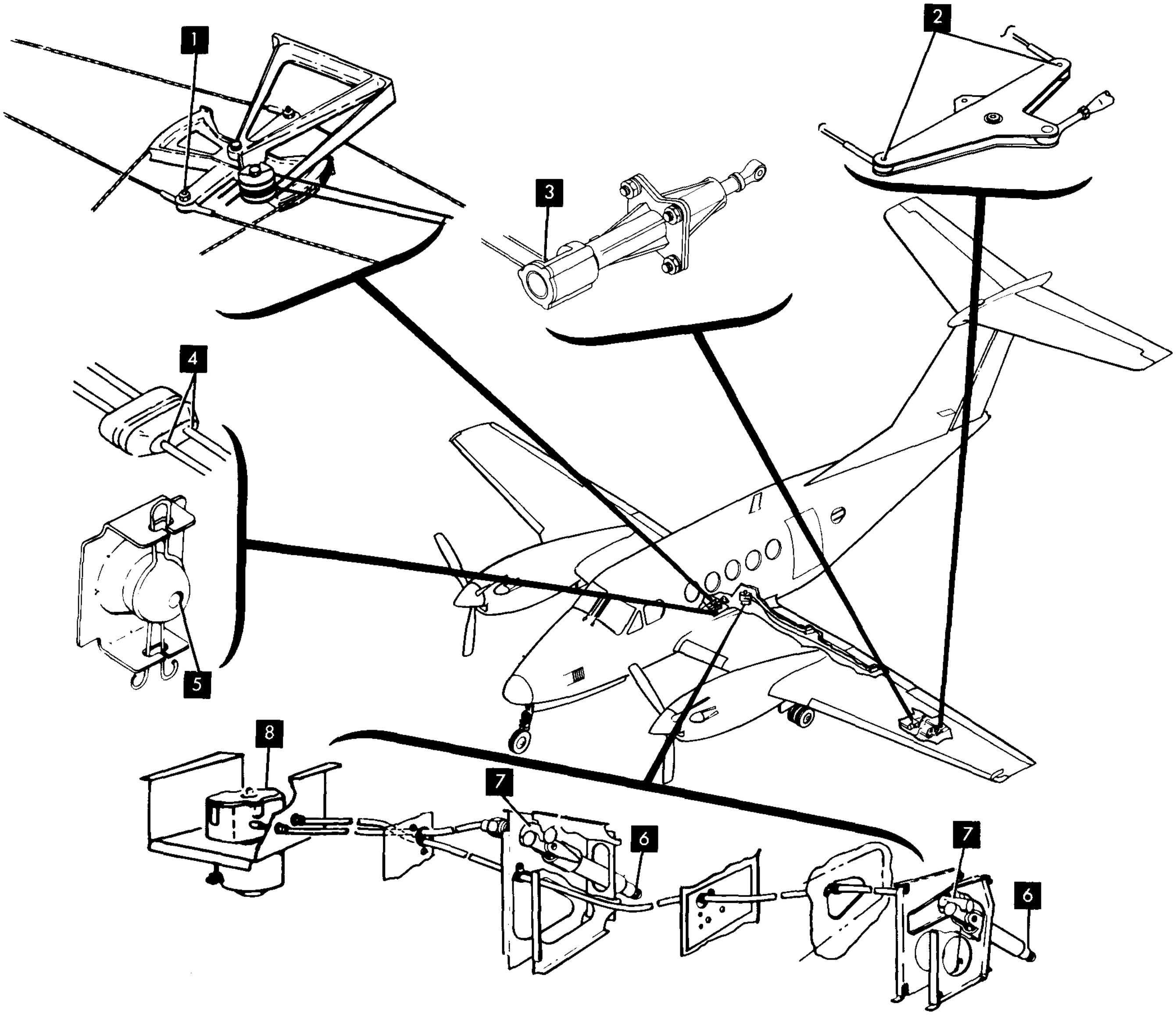


INDEX NO.	LOCATION	LUBRICANT	INTERVAL IN HRS.
	PROPELLER		
2	Propeller Blade Bearings (2 zerks per blade)	MIL-G-23827	100
3	Low Pitch Stop Rods (3 per propeller)	Marvel Mystery Oil	100

200-604-1.4

LUBRICATION POINTS

INDEX NO.	LOCATION	LUBRICANT	INTERVAL IN HRS.
	AILERON CONTROL SYSTEM		
1	Aileron Quadrant	MIL-L-7870 Oil	200
2	Aileron Bell Cranks	MIL-L-7870 OIl	200
3	Trim Tab Actuator	MIL-G-23827 Grease	200
4	Aileron Tab Cable Seals	MIL-G-23827 Grease	1000
5	Aileron Cable Seals	MIL-G-23287 Grease	1000

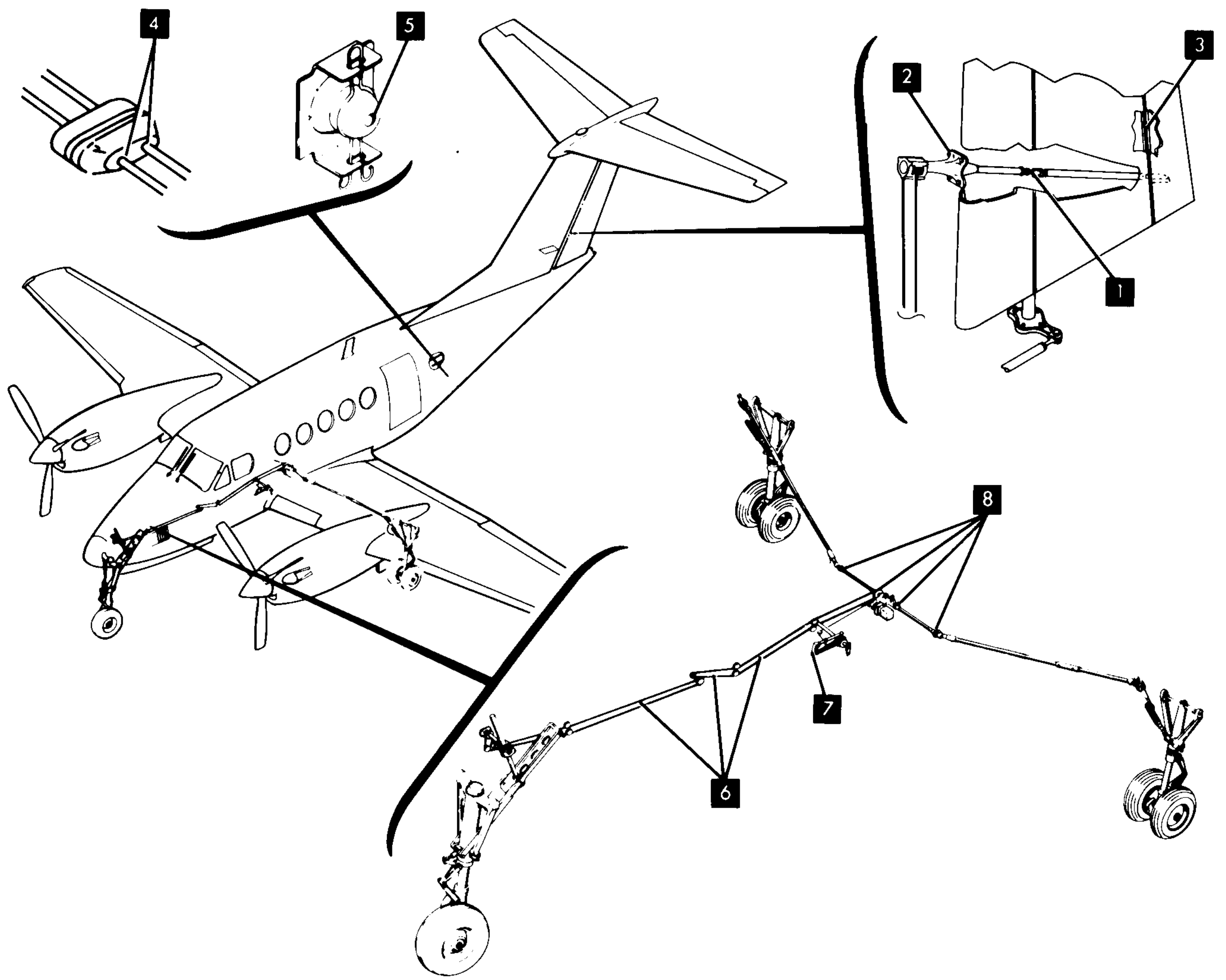


INDEX NO.	LOCATION	LUBRICANT	INTERVAL IN HRS.
	FLAP CONTROL SYSTEM		
6	Flap Actuator Pistons	MIL-L-10324A Oil	As required
7	Flap Actuator 90° Drives	MIL-G-21164 Grease	1000
8	Flap Motor Gearbox	MIL-G-10924 Grease	1000

200-604-1.7

LUBRICATION POINTS

INDEX NO.	LOCATION	LUBRICANT	INTERVAL IN HRS.
1	Rudder Trim Tab Tube	MIL-L-7870 Oil	100
2	Rudder Trim Tab Actuator	MIL-G-23827 Grease	200
3	Rudder Trim Hinge	MIX MIL-M-7866 Molybdenum Disulfide with naphtha into a paste and apply with a brush.	100
4	Rudder Trim Tab Cable Seal	MIL-G-23827 Grease	1000
5	Rudder Cable Seals	MIL-G-23827 Grease	1000

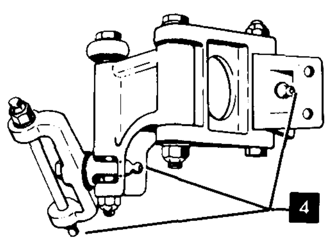


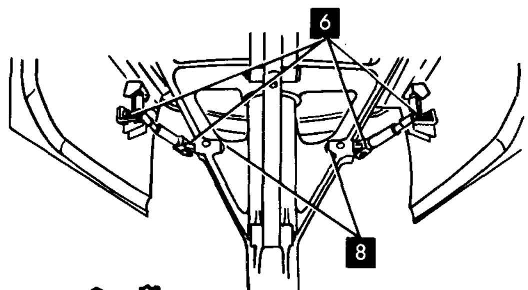
INDEX NO.	LOCATION	LUBRICANT	INTERVAL IN HRS.
6	LANDING GEAR RETRACT SYSTEM Retract Chains	Lubricate sparingly with Petrochem Chain Life, taking care to avoid overspray on adjacent rubber parts.	500
7	Emergency Extension Mechanism	MIL-L-7870 oil	100
8	Torque Tube Splines	MIL-G-23827 Grease	1000

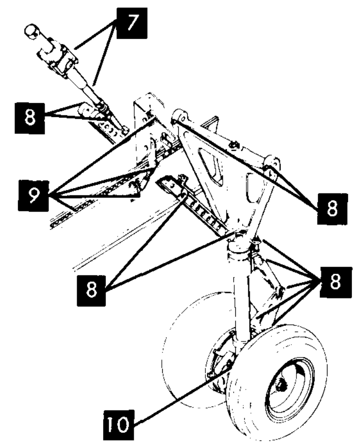
200-604-1.6

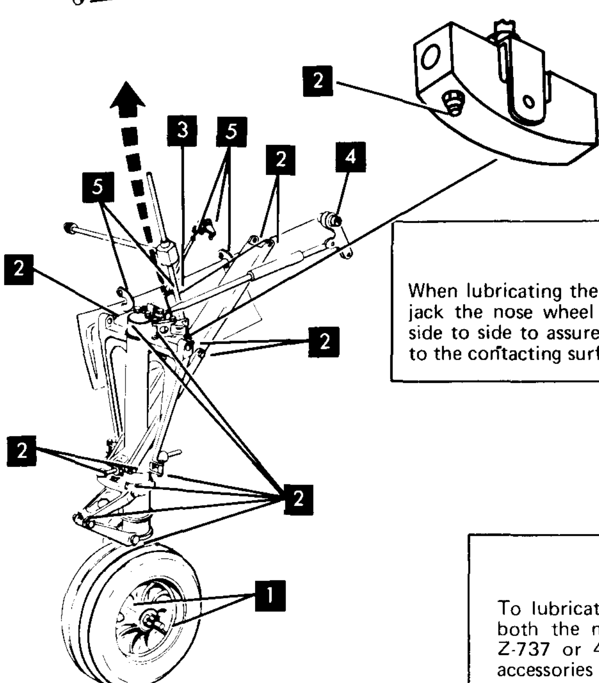
LUBRICATION POINTS

INDEX NO.	LOCATION	LUBRICANT	INTERVAL IN HRS.
	NOSE LANDING GEAR		
1	Wheel Bearings	MIL-G-3545 (Aeroshell Grease 5 Preferred)	100
2	Grease Fittings	MIL-G-81322 Grease	100
3	Retract Actuator Jackscrew	MIL-G-21164 Grease	1000
4	Nose Wheel Steering Mechanism	MIL-G-81322 Grease	50
5	Door Hinges and Retract Linkage	MIL-L-7870 Oil	100









NOTE

When lubricating the lower or upper strut bushing, jack the nose wheel up and turn the wheel from side to side to assure that the lubricant penetrates to the contacting surfaces of the bushing

NOTE

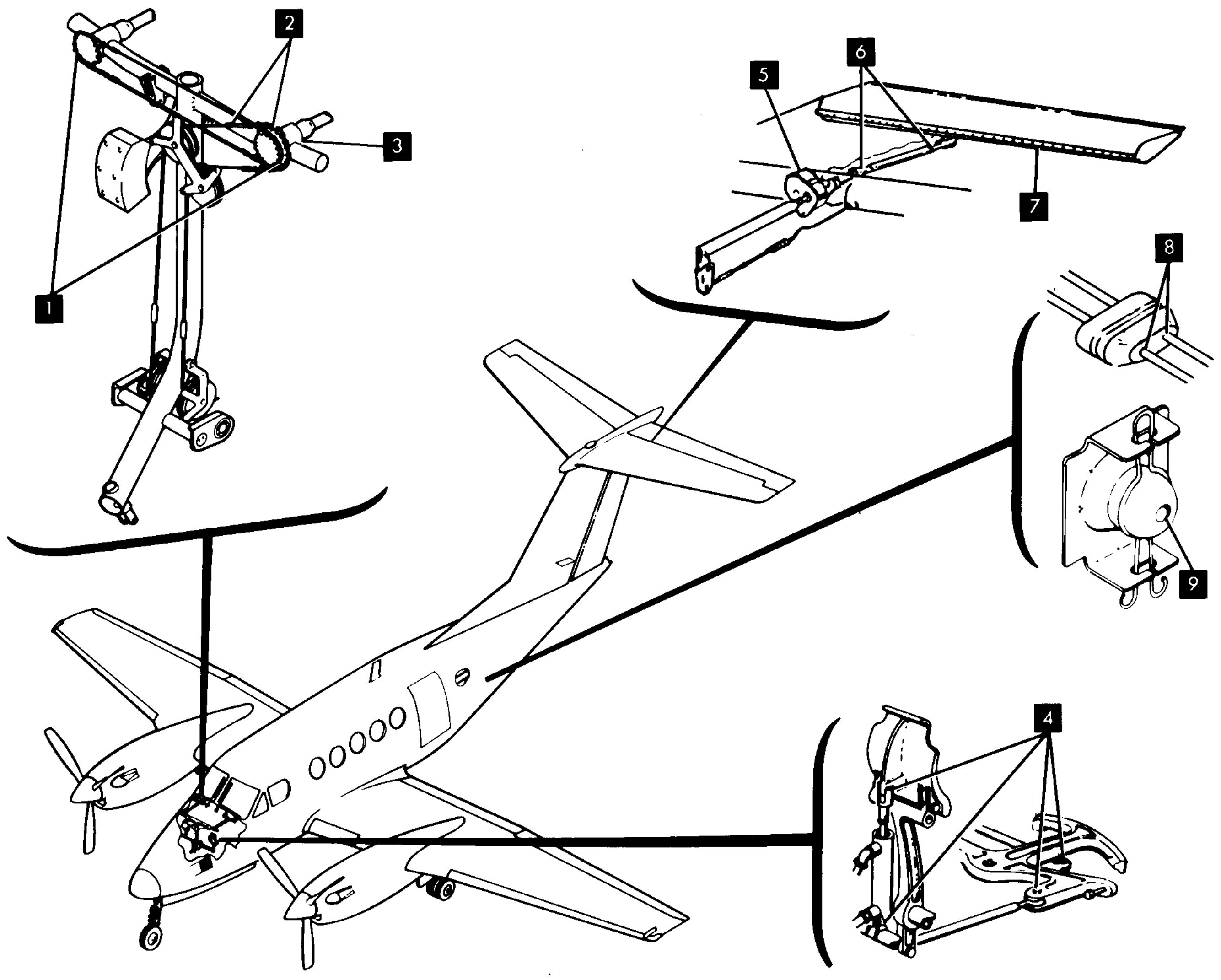
To lubricate the center attachment bolts and bushings of both the main and nose gear drag leg, use the Alemite Z-737 or 41613 nozzle included in the loose tools and accessories of the airplane on the flush type fitting.

INDEX NO.	LOCATION	LUBRICANT	INTERVAL IN HRS.
	MAIN LANDING GEAR		
6	High Flotation Gear Door Linkage	LPS #3 Metal Protector	Every 6 Months
7	Retract Actuator Jackscrew	MIL-G-21164 Grease	1000
8	Grease Fittings	MIL-G-81322 Grease	100
9	Door Hinges and Retract Linkage	MIL-L-7870 Oil	100
10	Wheel Bearings	MIL-G-3545 (Aeroshell Grease 5 Preferred)	100

200-604-1.1

LUBRICATION POINTS

INDEX NO.	LOCATION	LUBRICATION	INTERVAL IN HRS.
	CONTROL COLUMN		
1	Linkage	MIL-G-23827 Grease	200
2	Chain	Lubricate sparingly with Petrochem Chain Life, taking care to avoid overspray on adjacent rubber parts.	500
3	Bearing	MIL-G-23827 Grease	As Required

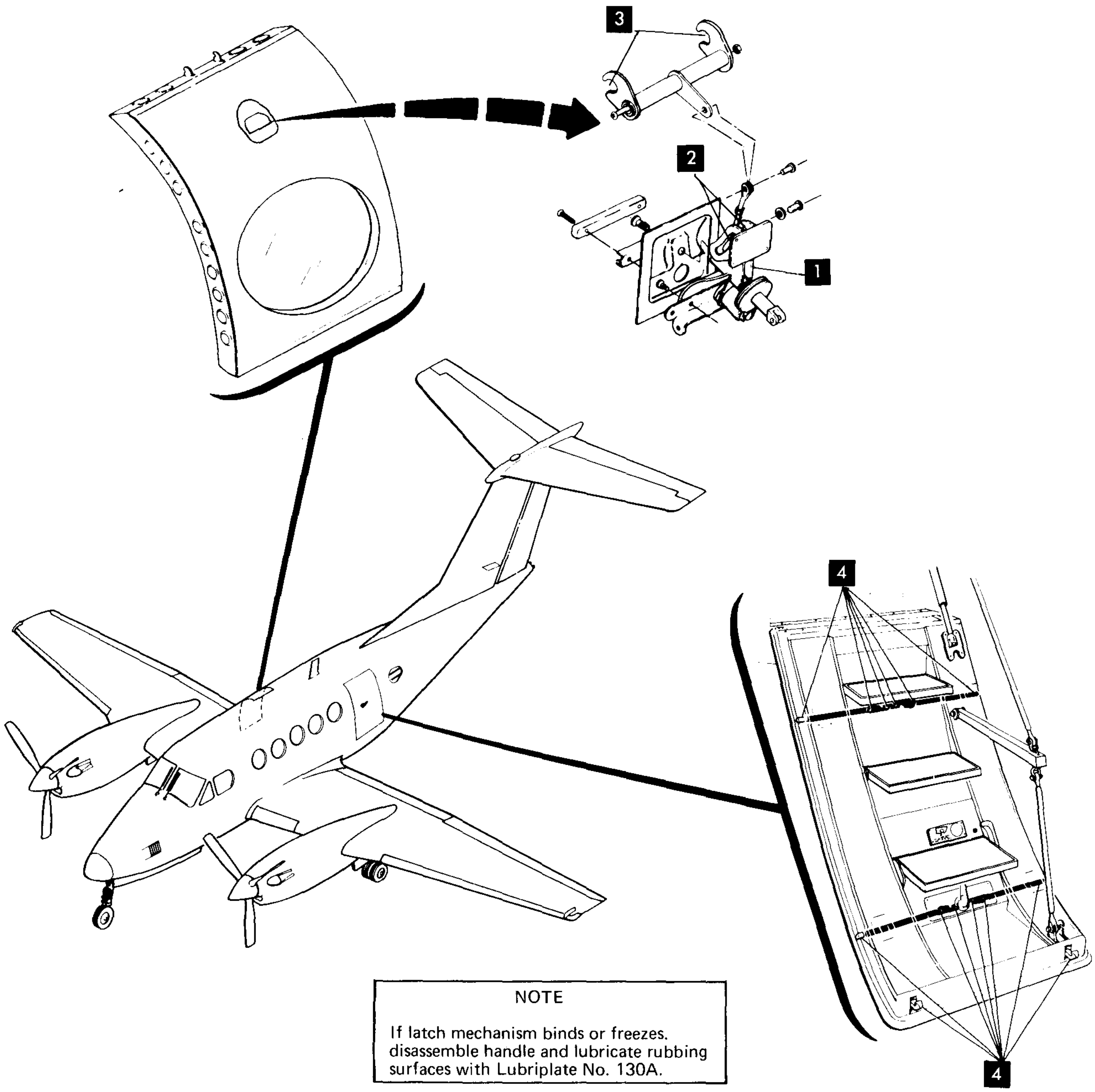


INDEX NO.	LOCATION	LUBRICATION	INTERVAL IN HRS.
	RUDDER PEDALS AND BELLCRANKS		
4	Pedal and Bellcrank Linkage	MIL-L-7870 Oil	200
	ELEVATOR CONTROL SYSTEM		
5	Elevator Trim Tab Actuator	MIL-G-23827 Grease	200
6	Elevator Trim Tab Tube	MIL-L-7870 Oil	100
7	Elevator Trim Hinges	MIX MIL-M-7866 Lubricant with naphtha into a paste and apply with a brush.	100
8	Elevator Trim Tab Cable Seal	MIL-G-23827	1000
9	Elevator Cable Seal	MIL-G-23827	1000

200-604-1.5

LUBRICATION POINTS

INDEX NO.	LOCATION	LUBRICANT	INTERVAL IN HRS.
	EMERGENCY EXIT DOOR		
1	Track	Molykote 505 Paste Product	500
2	Guide	MIL-L-8937 Form A	500
3	Latch	MIL-L-8937 Form A	500



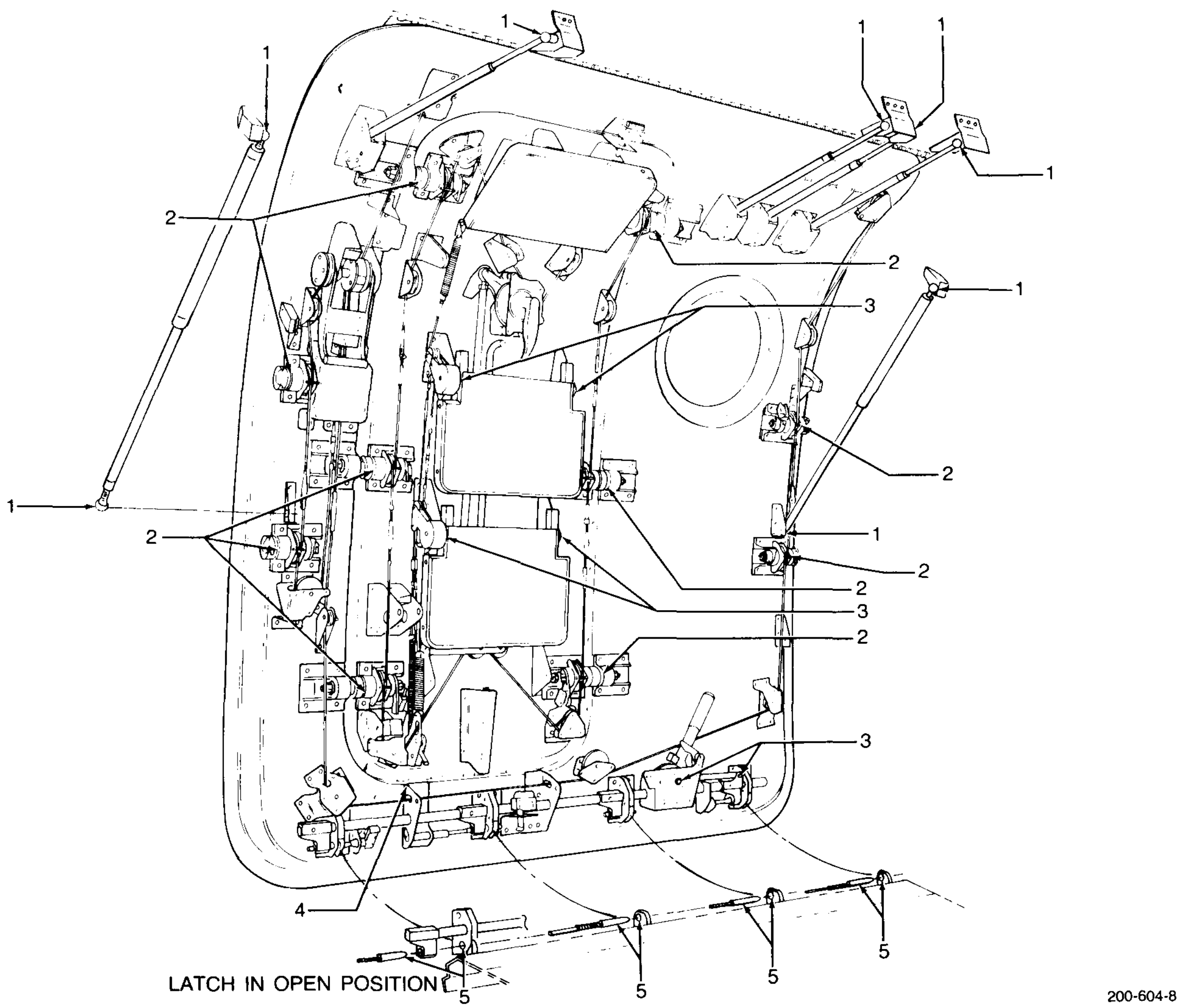
NOTE

If latch mechanism binds or freezes. disassemble handle and lubricate rubbing surfaces with Lubriplate No. 130A.

INDEX NO.	LOCATION	LUBRICANT	INTERVAL IN HRS.
	CABIN DOOR		
4	Latching Mechanism	MIL-L-7870 Oil	100

200-604-1.3

LUBRICATION POINTS



INDEX NO.	LOCATION	LUBRICANT	INTERVAL IN HRS.
1	GAS SPRING END FITTINGS	DISASSEMBLE JOINT AND LUBRICATE SPARINGLY WITH MIL-G-23827 GREASE.	100
2	DOOR CAMLOCKS	WIPE CLEAN AND LUBRICATE LIP OF CAMLOCK WITH DOOR-EASE. DO NOT APPLY TO FACE OF CAMLOCK.	100
3	STEP HINGE BUSHINGS	LUBRICATE SPARINGLY WITH MIL-L-7870 OIL.	100
4	ENTRANCE DOOR HINGE	LUBRICATE SPARINGLY WITH MIL-L-7870 OIL.	100
5	LATCH PIN AND LATCH PLATE	WIPE CLEAN AND LUBRICATE PIN AND HOLE IN LATCH PLATE WITH DOOR-EASE.	100

INTENTIONALLY LEFT BLANK

SERVICING SCHEDULE

INTERVAL	ITEM	LOCATION	MATERIAL
Preflight	Engine Oil Level (Check)	11-o'clock position of accessory gear case	See Engine Oil in Consumable Materials
	Firewall Fuel Filter Drain	Open and close drain valve on lower forward side of firewall	
	Sump Strainer Drain	Drain cock on underside of nacelle just forward of the main wheel well	
	Gravity Feed Line Drain	Drain valve in the manifold located aft of the main wheel well	
	Leading Edge Tank	Drain valve on underside of outboard wing just forward of the main spar	
	Auxiliary Tank Drain	Drain cock on underside of wing center section adjacent to the fuselage	
	Integral Tank Flush Drain	Underside of wing forward of aileron	
100 Hrs	Engine Oil Filter (Check)	3-o'clock position of compressor inlet case	Inspect for foreign material and condition
	Refrigerant Level (Check)	Sight gage window, in upper fuselage nose under cover plate	See Refrigerant in Consumable Materials
	Static Line Outflow Control Line Drain	Access panel in upholstery at right lower aft corner of cabin	
	Engine Driven Fuel Pump Screen (Clean)	Right side of engine accessory section	Dry compressed air

INTERVAL	ITEM	LOCATION	MATERIAL
100 Hrs (Continued)	Firewall Fuel Filter (Clean)	Lower forward side of firewall	Clean with solvent and blow dry with compressed air
	Suction Relief Valve Filter (Clean)	Mounted in nose compartment on left side of pressure bulkhead	Clean with solvent and blow dry with compressed air
	P_3 Air Filter (Check)	RH lower aft side of engine just aft of rear fireseal mount ring	Check for cleanliness and replace on condition
	Cabin Air Filters (Check)	FORWARD EVAPORATOR: Access panel in right side of nose wheel-well. AFT EVAPORATOR: Under floor aft of rear spar. RETURN AIR: At floor level forward of copilot's rudder pedals.	Check for cleanliness and replace on condition
	Magnetic Drain Plug (Check)	6-o'clock position on front case of reduction gearbox	Check for metal particles
Each 100 Hrs or 30 days, whichever occurs first	Battery Charge Sensor (Check)	Electronic module box in fuselage	
	Battery, Air Cooled (Service)	Right wing center section, forward of main spar	See Aircraft Battery Care Manual
	Battery Air Valve Control (Service)	Right wing center section, forward of main spar	See Maintenance Manual
100 Hrs and after exposure to visible moisture on the ground	Static Line Drains	Access panel in upholstery under the circuit breaker panel	

INTERVAL	ITEM	LOCATION	MATERIAL
Each 100 Hrs or as required	Main Landing Gear Struts (Service)	Filler plug at the top of each strut of main landing gear	See Hydraulic Fluid in Consumable Materials
	Nose Landing Gear Strut (Service)	Filler plug at top of nose gear strut	See Hydraulic Fluid in Consumable Materials
	Shimmy Damper (Service)	Mounted at upper knee of nose landing gear	See Hydraulic Fluid in Consumable Materials
300 Hrs or more often if conditions warrant, i.e., operation in heavy smoke or dust	Instrument Air Filters (Replace)	Instrument filter mounted on upper corner of pressure bulkhead in nose compartment	
400 Hrs or 9 months, whichever occurs first (if operating 50 hrs per month or less). 1200 Hrs or 9 months, whichever occurs first (if operating over 50 hrs per month).	Engine Oil (Change)	Remove cowlings to gain access to nose case drain and oil cooler drain. Refill at 11-o'clock position on the accessory gear case.	See Engine Oil in Consumable Materials
500 Hrs or On Condition	Filter (Replace)	On back of pressurization controller	

INTERVAL	ITEM	LOCATION	MATERIAL
1000 Hrs or On Condition	High Capacity Oil Filter (Replace)	3-o'clock position on compressor inlet case	
	P_3 Air Filter (Replace)	RH lower aft side of engine just aft of rear fireseal mount ring	
As required	Brake Fluid Reservoir (Service)	Upper left corner of pressure bulkhead nose compartment	See Hydraulic Fluid in Consumable Materials
	Cabin Door Damper (Service)	Mounted on aft side of cabin door	See Hydraulic Fluid in Consumable Materials
	Oxygen Supply Cylinder (Service)	Access panel on right side of aft fuselage	MIL-O-27210 Oxygen
Whenever system is recharged with refrigerant	Air Conditioner Compressor (Service)	Left side of right engine	Frigidaire 525 Viscosity Refrigerant oil (See Maintenance Manual)
Whenever fuel system requires draining	Fuel System Drain	MAIN: Plug type drain located in nacelle tank sump strainer. AUXILIARY: Plug type drain located in auxiliary tank sump strainer.	
††	Emergency Locator Transmitter (ELT) Battery	Aft of pressure bulkhead, right side	

†† Rechargeable Batteries: Recharge after one cumulative hour of use or after 50% of the useful charge life.
Non-Rechargeable Batteries: Replace after one cumulative hour or after 50% of the useful life.

SECTION IX

SUPPLEMENTS

NOTE

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

INTENTIONALLY LEFT BLANK

BEECHCRAFT SUPER KING AIR 200
PILOT'S OPERATING HANDBOOK
and
FAA APPROVED AIRPLANE FLIGHT MANUAL
P/N 101-590010-127

LOG OF SUPPLEMENTS

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

Part Number	Subject	Revision Number	Date
101-590010-23	Woodward Electronic Propeller Synchrophaser	1	December 15, 1976
101-590010-29	Collins AP-105/FD-108Y/Z or AP-105/FD-109Y/Z Automatic Flight Control System	4	June 17, 1977
101-590010-35	King KFC 300 Automatic Flight Control System	1	June 17, 1977
101-590010-55	King KNC-610 Area Navigation System	3	January, 1979
101-590010-57	Sperry SPZ-200/STARS IV C or SPZ-200/SPI-77 C Automatic Flight Control System	1	June 17, 1977
101-590010-59	High Flotation Landing Gear	1	October, 1978
101-590010-63	Dual Camera Well Installation		June 14, 1974
101-590010-69	King KNR-665 Area Navigation System	1	June 17, 1977
101-590010-71	Collins ANS-31/31A Area Navigation System or Collins NCS-31/31A Navigation Control System	4	October, 1978
101-590010-73	Canadian Marconi CMA-720 Area Navigation System		March 7, 1975
101-590010-83	Collins AP-106 Automatic Flight Control System	2	June 17, 1977
101-590010-85	Gull Fuel Measuering System (Pounds of Fuel Consumed)	1	June 17, 1977
101-590010-91	Communications Components Corporation ONTRAC II VLF 1000-3 Navigation System		January 9, 1976
101-590010-93	Sperry SPZ-200A/STARS IV D or SPZ-200A/SPI-80/81 Automatic Flight Control System	3	June 17, 1977
101-590010-95	Communications Components Corporation ONTRACT II VLF 1000-2 Navigation System		January 16, 1976
101-590010-97	Bendix RNS 3500 Area Navigation System	2	June 17, 1977
101-590010-103	Global GNS-500A VLF/OMEGA Navigation System	1	February, 1979
101-590010-105	AirData AD611/D Area Navigation/Vertical Navigation System	3	January 29, 1979
101-590010-107	Brake Deice System	2	January 27, 1978
101-590010-109	Communications Components Corporation ONTRAC III VLF/OMEGA Navigation System	3	September 8, 1978
101-590010-119	King KFC 300 Automatic Flight Control System for BB-298, BB-299, BB-329, and BB-330 Only		September 23, 1977
101-590010-121	Secondary Low Pitch Stop System (BB-2, and BB-6 thru BB-83 Only)		October 14, 1977
101-590010-123	JET DAC-2000 Area Navigation System		January 12, 1978
101-590010-125	Flight With Cabin Entrance Door Removed		March, 1978
101-590037-23	Decca Doppler 72 Navigation System (TANS Computer, Type 9447C)		January 28, 1977

98-37800A

BEECHCRAFT SUPER KING AIR 200 AND 200T LANDPLANES

AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

WOODWARD ELECTRONIC PROPELLER SYNCHROPHASER

The information in this document is FAA Approved material which, together with the basic Airplane Flight Manual is applicable and must be attached to the basic manual when the airplane is modified by the installation of the Woodward Electronic Propeller Synchrophaser in accordance with STC SA250CE.

The information in this document supersedes the basic manual only where covered in the items contained herein. For Limitations, Procedures, and Performance not contained in the supplement, consult the basic Airplane Flight Manual.

LIMITATIONS

The following placard must be mounted on or near the synchrophaser control switch:

PROP SYN

+

OFF FOR T.O. LDG

NORMAL PROCEDURES

1. Synchronize the engines manually.
2. Position control switch to ON position.
3. If a change in rpm setting is desired, move both master (left) and slave propeller governor control levers together.
4. If synchronization is not maintained with the switch ON, indicating the actuator has reached the end of its travel, turn switch OFF and repeat procedures above. With the switch in the OFF position, the actuator is returned to the center of its travel.

PERFORMANCE

No change in the airplane performance results from the installation of the synchrophaser.

FUNCTIONAL TEST

The rpm range of the synchrophaser may be checked in cruise by slowly moving only the master propeller control toward both high and low rpm until propellers are no longer synchronized.

Note the range of rpm over which the slave engine remains synchronized with the master engine. This is the limited range provided for safety and is the maximum speed adjustment range beyond which the slave engine cannot be adjusted by the synchrophaser.

Approved: [signature]

for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200 AND 200T LANDPLANES

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

COLLINS AP-105/FD-108Y/Z AUTOMATIC FLIGHT CONTROL SYSTEM

or the

COLLINS AP-105/FD-109Y/Z AUTOMATIC FLIGHT CONTROL SYSTEM

Category I

GENERAL

The information in this supplement is FAA-approved material and must be attached to the *FAA Approved Airplane Flight Manual* when the airplane has been modified by installation of the Collins AP-105/FD-108Y/Z or AP-105/FD-109Y/Z Automatic Flight Control System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic *FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

LIMITATIONS

1. Maximum speed limit for autopilot operation is unchanged from the airplane maximum airspeed limit (V_{MO}/M_{MO}).
2. Do not use autopilot under 200 feet above terrain.
3. Do not use autopilot or yaw damper during takeoff or landing.
4. Pilot must be seated at the controls with the seat belt fastened during autopilot operations.
5. Do not use propeller in the range of 1750-1850 rpm during coupled ILS approaches.
6. Do not extend landing gear above 15,000 feet with autopilot engaged.

EMERGENCY PROCEDURES

The autopilot can be disengaged by any of the following methods:

1. Press the AP/YD disconnect switch on the pilot's or copilot's control wheel.

2. Move the engage lever to the DISENGAGE position.

3. Engage the go-around mode (Yaw damper will remain on).

4. Pull out (off) the AP power circuit breaker.

5. Turn off the airplane master switch.

6. Turn off the avionics master switch.

The following conditions will cause the autopilot to disengage automatically:

1. Any interruption or failure of power.

2. Vertical gyro failure indication.

3. Flight control system power or circuit failure.

In the event of an engine failure:

1. Disengage the autopilot, retrim the airplane, and re-engage the autopilot. Maintain 120 KIAS for single engine approach speed until landing is assured.

Maximum altitude losses during malfunction tests were:

OPERATION CONFIGURATION	ALTITUDE LOSS
Climb	200 feet
Cruise	400 feet
Maneuvering	120 feet
Descent	430 feet
Approach/ILS Coupled	80 feet
Single Engine Approach/ILS Coupled	90 feet

NORMAL PROCEDURES

NOTE

The switches on the mode selector are the push-on, push-off type that activate solenoid held switches. When engaged, a green bar appears at the edge of the button. For operation at night the switches are illuminated by the OVERHEAD SUBPANEL AND CONSOLE light control. When the switch is on, the green bar will illuminate with an ON placarding visible.

The autopilot incorporates its own annunciator panel located just above the flight director display on the instrument panel. The modes and indications given on the annunciator panel are placarded on the face of the plastic lenses and illuminate when the respective conditions are indicated. Depending upon the type of flight director installation, dimming of the annunciator panel is provided for by a switch located adjacent to the annunciator panel; or by the airplane's navigation lights switch.

PREFLIGHT CHECK

The preflight check assures the pilot that the safety and failure warning features of the system are operating properly.

1. Turn on airplane power, an inverter and the avionics master switch. Check that the vertical gyro has erected (GYRO flag out of view), and that the gyrostabilized magnetic compass is slaved. Tune the navigation receiver to a local VOR frequency. Set the heading marker under the lubber line, and select HDG mode.

NOTE

The pressure of air flow that normally opposes movement of control surfaces is absent during any preflight check. It is possible to get a hardover control surface deflection if an autopilot command is allowed to remain active for any appreciable time. If it is desired to check operation of the TURN or PITCH controls, move them only as required to check control operation, and then return them to the center position.

2. Engage the autopilot. Check that the controls resist movement. Move the heading marker to either side of the lubber line. Observe that the command bars indicate a bank toward the new heading and the control wheel responds in the appropriate direction.

3. Press the VG FAST ERECT button. Observe that the GYRO and COMPUTER flags appear and the autopilot disengages. Release VG FAST ERECT button.

   FD-109Y/Z Only

   Press the TEST button on the flight director indicator. Observe that the GYRO and CMPTR flags appear and the attitude display indicates 20 degrees right bank and 10 degrees pitch up. Release the TEST button.

4. Pull the control wheel aft to mid-travel and engage the autopilot. Push forward on the control wheel and hold. The trim wheel should move in the nose-up direction, and after a few seconds, the ELEV TRIM annunciator should illuminate. Continue to hold the control wheel and press the control wheel trim switches to the NOSE DN position. Observe that the TRIM FAIL annunciator illuminates. Pull the control wheel aft and hold. The trim wheel should move to the nose-down direction, and again the ELEV TRIM annunciator should illuminate. Press the control wheel trim switches to the NOSE UP position and observe the TRIM FAIL annunciator illuminates.

5. Press the AP/YD disconnect button on the control wheel. Observe that the engage levers move to the DISENGAGE position and that the flight controls operate freely.

6. Set the course arrow to a VOR radial approximately 15 degrees either side of the course from the airplane position to the VOR station. Select NAV/LOC mode. Observe that the N/L ARM annunicator illuminates and the command bars still follow the heading marker for bank commands.

7. Move the course arrow to center the course deviation bar. Observe that the course arrow indicates the proper radial to the VOR station and that the to-from arrow points to the head of the course arrow.

8. Move the heading marker so that the command bars indicate a bank, select any lateral mode (HDG, NAV/LOC, APPR) on the mode selector and engage the autopilot. Press the GA button on the left power lever and observe the GA annunciator illuminates, the autopilot disengages and the command bars move to indicate a wings-level, pitch-up attitude.

ENGAGING AUTOPILOT

1. Place the ENGAGE-DISENGAGE switch lever on the autopilot controller in the ENGAGE position.

NOTE

The autopilot and flight director are coupled when both units are engaged. If the optional AP CPLD pushbutton switch is installed, then the autopilot is either coupled or uncoupled from the flight director. When coupled, the autopilot accepts guidance commands from the flight director. When uncoupled, the autopilot accepts pitch and roll commands from the vertical command and turn controls as selected by the pilot. The autopilot may be uncoupled by depressing the AP CPLD push button on the mode selector to the OFF position.

2. The autopilot may be engaged in any reasonable attitude and in either the coupled or uncoupled mode. The autopilot will smoothly acquire the command attitude. When uncoupled, the autopilot will maintain the bank (heading, if bank is less than 2 degrees) and pitch attitude at the time of engagement.

MANEUVERING

1. To change flight functions, press the desired mode button on the mode selector. The green bar will appear at the edge of the button and the autopilot annunciator lights on the instrument panel will illuminate, indicating the respective modes in operation.

2. With the AP CPLD mode switch off, use the TURN knob for turns.

3. In any function except "after glideslope capture", use the autopilot pitch control for climbing and descending. Movement of the pitch control determines a pitch rate that is proportional to knob displacement.

4. With the optional altitude preselect feature, the flight director gives commands to climb/descend to and level off at the altitude selected on the altitude alerter. A rate of climb/descent toward the selected altitude must be established manually or with the autopilot. Movement of the altitude alerter selector knob during the level-off maneuver results in desengagement of the mode. If a new altitude is selected while tracking a previously selected altitude, a command at a rate of approximately 700 FPM toward the newly selected altitude is given. If a different rate is desired, the altitude preselect mode must be disengaged, the desired rate established, and the mode reengaged.

5. If any vertical mode button (except altitude preselect before the selected altitude is captured) has been selected, it will automatically release when the AP pitch control is rotated.

6. When the HDG mode is selected, the autopilot will command the airplane to turn and maintain the heading set on the heading marker.

YAW DAMPER OPERATION

1. The rudder channel of the autopilot may be selected separately for yaw damping by moving the YD lever on the autopilot controller to the ENGAGE position.

2. To disengage the yaw damper, press the disconnect button on the pilot's or copilot's control wheel to the first detent or manually place the YD lever to the DISENGAGE position.

3. Refer to EMERGENCY PROCEDURES for other means of disconnecting the yaw damper.

DISCONNECTING AUTOPILOT

1. Press the release button on the outboard horn of either control wheel to the first detent or manually place the AP lever to the disengage position to disengage the autopilot for transition to manual control.

NOTE

After assuming manual control, fly the airplane using the same Course Indicator and Approach Horizon used to monitor autopilot operation prior to assuming manual control.

VOR FLYING

1. Tune NAV receiver to the appropriate frequency.

2. Set the desired course to or from the station on the pilot's Course Indicator by turning the course knob.

3. Set the desired beam intercept heading with the HDG knob. The intercept angle with respect to the radio beam may be any angle of 90 degrees or less. Depress the HDG button on the mode selector and establish the intercept heading.

4. Depress the NAV/LOC button on the mode selector. The system is then armed to capture the beam as indicated by the N/L ARM annunciator light on the instrument panel. At the point of capture the N/L CAP annunciator light will illuminate, indicating that the system has captured the selected course. Correction for proper tracking of the radial is automatically provided.

NOTE

Except as described below, do not select a different VOR frequency or course once a course and intercept have been programmed or capture achieved. To select a different course or VOR frequency, return the HDG mode, select the course and/or frequency and then return to the NAV/LOC mode.

5. Radio course may be changed over a VOR station when operating in NAV/LOC mode as long as the course change is not more than 10 degrees. If the course change is more than 10 degrees, HDG mode should be selected to establish a new intercept and then NAV/LOC mode reselected to set up a new capture.

6. When crossing a VOR station in the NAV/LOC mode, the flight director automatically switches to a dead reckoning (DR) mode until the airplane is positioned to receive reliable VOR signals. While in the DR mode, the flight director maintains the heading required to track over the station. On airplanes S/N BB-88, BB-202, BB-204 and after and BT-3 and after this mode is annunciated by flashing of the N/L CAP light.

7. The APPR mode should be used in lieu of the NAV/LOC mode for flying a VOR approach.

AUTOMATIC APPROACH - FRONT COURSE

NOTE

The localizer and glideslope are captured automatically and independently of each other on an ILS front course approach. Either one may capture before the other. The localizer is always captured from a selected heading, but the glideslope may be captured from any of the vertical modes and from above or below the glideslope.

1. To intercept the localizer beam, turn the NAV receiver to the correct ILS frequency. Set the course selector to the inbound runway heading and set the heading marker to the desired intercept angle. Program DH if radio altimeter is installed.

2. Press the APPR button on the mode selector. The N/L ARM and GS ARM annunciator lights will illuminate indicating the system is armed for localizer and glideslope capture. As the airplane approaches the localizer beam, the N/L CAP annunciator light will illuminate, indicating the system has captured the localizer course. At the point of glideslope intercept, the G/S CAP annunciator light will illuminate and all vertical modes preselected will be cleared, indicating the system is in glideslope operation.

3. The DH lights on the pilot's and copilot's instrument panels will illuminate when the airplane reaches the decision height previously selected on the radio altimeter, if installed.

4. FD-109Y/Z Only
At approximately 200 feet above the ground, and if a radio altimeter has been installed and is operating, the runway symbol on the flight director will begin to rise toward the airplane symbol, while continuing to show localizer deviation.

5. Go-around mode may be activated by pressing the GA button on the left power lever, and may be actuated from any lateral mode (HDG, NAV/LOC, APPR) with the following results:

   a. Illuminates the GA light on the autopilot annunciator panel.

   b. Disengages the autopilot.

   c. Gives command presentation for wing level 7° nose up climb attitude.

NOTE

The heading marker may be preset to the go-around heading after the localizer is captured. After go-around airspeed and power settings are established, the autopilot may be engaged in the HDG mode. Select PITCH SYNC or any desired vertical mode (except ALT SEL) to clear the go-around mode, If PITCH SYNC is selected before HDG, command bars go out of view. To track outbound on the ILS course, use the NAV/LOC mode to prevent false glide-slope capture.

6. To assume manual control of the airplane for landing, press the disengage button on the control wheel.

BACK COURSE APPROACH

As in a front course approach, the localizer is captured automatically. The airplane should be maneuvered into the approach area by setting the heading marker and functioning in the HDG mode.

1. Tune the NAV receiver to localizer frequency.

2. Set course selector to front course inbound localizer bearing.

3. Set heading marker for desired intercept heading. (Intercept angle must be within 75° of the back course inbound localizer bearing).

4. Select APPR on the mode selector. When the airplane heading is within 75° of the back course inbound localizer bearing, the system will automatcally switch to back course operation and the BACK LOC annunciator light will illuminate.

5. Use the PITCH control on the autopilot controller to establish and maintain the desired rate of descent.

NOTE

The HDG mode should be used if intercept is within one mile of the runway due to the large radio deviations encountered when flying over the localizer transmitter.

6. The DH lights on the pilot's and copilot's instrument panels will illuminate when the airplane reaches the decision height previously selected on the radio altimeter, if installed.

7. If minimum altitude is attained before visual contact is achieved, arrest the rate of descent using the pitch control. The ALT HOLD mode may then be used to hold altitude until time to a missed approach has elapsed.

8. FD-109Y/Z Only
   The rising runway symbol on the flight director indicator operates as in Front Course Approach.

9. Go-around mode may be activated by pressing the GA button on the left power lever, with the results as specified in the AUTOMATIC APPROACH-FRONT COURSE PROCEDURE.

SPECIAL NOTES

1. The V bars on the flight director indicator will disappear to the top of the instrument when the optional AP CPLD button on the autopilot controller is pressed to the off position and all lateral modes are cleared.

2. When the autopilot engage lever is in the DISENGAGED position, the system may be used as a manual flight director system by selecting the desired mode of operation on the mode selector.

3. To synchronize the vertical command to airplane attitude, depress the PITCH SYNC button on the pilot's control wheel. When the autopilot is engaged, the vertical command remains synchronized after the first actuation of the PITCH SYNC switch.

4. Altitude hold information is displayed on the V-bars in flight director function by pushing the ALT button on the mode selector.

5. After selection of APPR mode, test functions for Nav, Marker Beacons and Radio Altimeter are disarmed to prevent operation.

6. The APPR mode should be used for flying all approaches (Front Course, Back Course, VOR and RNAV). Fly all approaches at 120 kts with 40% flap.

7. The autopilot may disengage during manual extension of the landing gear. Reengage if required after gear extension.

8. FD-108Z/FD-109Z Only
   To maintain a desired indicated airspeed, press the IAS button on the mode selector. To maintain a desired climb or descent, press the VS button on the mode selector.

PERFORMANCE - No Change.

Approved: H. A. Schultz
for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200 AND 200T LANDPLANES

AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

KING KFC 300 AUTOMATIC FLIGHT CONTROL SYSTEM (RNAV AND VNAV OPTIONAL) CATEGORY I

The information in this supplement is FAA-approved material and must be attached to the *FAA Approved Airplane Flight Manual* when the airplane has been modified by installation of the King KFC 300 Automatic Flight Control System in accordance with Beechcraft Drawing 101-500002.

The information in this supplement supersedes or adds to the basic *FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

LIMITATIONS

1. Do not use autopilot on the **Super King Air 200T** when the optional wing-tip fuel tanks are installed.
2. During autopilot operations, pilot must be seated at the controls with seat belt fastened.
3. Maximum speed limit for autopilot operation is unchanged from the airplane maximum airspeed limit (V_{MO}/M_{MO}).
4. Do not use autopilot under 200 feet above terrain.
5. Do not use autopilot or yaw damper during takeoff or landing.
6. Do not use propeller in the range of 1750-1850 rpm during coupled ILS approach.
7. The Vertical Navigation (VNAV) function does not adversely affect any airplane system. Flight operations must not be predicated on its use as the primary source of vertical guidance.
8. Reengagement of autopilot following use of the control-wheel-steering switch (placarded PITCH SYNC & CWS) shall be made at a rate of climb or descent not to exceed 500 feet per minute, if altitude hold is engaged.

NORMAL PROCEDURES

NOTE

The autopilot incorporates its own annunciator panel located just above the flight director display on the instrument panel. The modes and indications given on the annunciator panel are placarded on the face of the plastic lenses and illuminate when the respective conditions are indicated. Located on the left side of the autopilot annunciator panel is a light sensitive dimmer switch to control light intensity for night operation. The switches on the mode selector are push-on, push-off type. When engaged, the corresponding flight director annunciator light illuminates. For operation at night, the OVERHEAD SUBPANEL AND CONSOLE light control for the backlighting of the switches is located on the overhead console.

PREFLIGHT

Neither the autopilot nor the flight director may be turned on if the attitude flag is visible on the flight command indicator or if the gyros are not up to operating speed.

1. Check that all circuit breakers for the autopilot are in.

2. Turn the battery, inverter, and avionics switches on and engage the flight director to bring the command bars into view.

3. Engage the autopilot and yaw damper. (The autopilot will not engage when the flight director is inoperative.) Check that the system can be overpowered in all three axes.

4. Press and hold the preflight test button located on the lower left corner of the flight command indicator. This will activate a self test cycle provided to preflight the autopilot and flight director system. Note the following sequence for the test cycle:

   a. All autopilot and flight director warning and mode lights should illuminate and remain lighted until the test has been completed.

   b. A simulated climbing right turn of 10° pitch up and 10° right roll will appear on the attitude display.

   c. The command bars will remain centered with the airplane reference symbol until the flight director, autopilot computer, and servos check valid.

   d. All three servo actuator monitors will trip.

   e. The autopilot and yaw damper will disengage to demonstrate proper computer monitor operation.

   f. The command bars will come into exact alignment with the original horizon display after the flight director computer, autopilot computer, and servos check valid.

5. Release the preflight test button and check to see that warning and mode lights extinguish. A warning light illuminated after the test button is released indicates malfunction for that mode.

6. Check for proper trim action as follows:

   a. Position the command bars approximately 5° above the airplane reference symbol with the vertical trim switch (on mode controller).

   b. Engage the autopilot and yaw damper. Trim should run in nose up direction 3 to 4 seconds after autopilot engagement.

   c. Depress and hold the TRIM TEST switch (on pedestal). The trim should cease operation and the A/P TRIM FAIL light should illuminate in 15 to 20 seconds.

   d. Release and depress the TRIM TEST switch. Actuate the control wheel trim switches to the nose down direction. The trim should run in the nose down direction and the A/P TRIM FAIL light should illuminate immediately.

   e. Repeat the procedures with the command bars positioned approximately 5° below the aircraft symbol. Trim operation should be reversed from the previous as specified.

7. Disengage the autopilot by depressing the AP/YD DISC switch on the pilot's control wheel.

INFLIGHT

ENGAGING THE AUTOPILOT

1. Engage the flight director by depressing the FLT DIR switch on the mode controller or by depressing the PITCH SYNC & CWS switch on the pilot's control wheel. The existing pitch attitude and heading information will be retained on the flight command indicator command bars as they are brought into view.

2. Engage the autopilot. The autopilot action is always in response to, and consistent with, flight director commands. When engaged by the solenoid-held toggle switch on the mode controller, the autopilot will respond to any operating mode through a fader circuit, which allows engagement into an unsatisfied flight director command without an abrupt control transient.

3. Depressing the control wheel steering (PITCH SYNC & CWS) button located on the horn of the pilot's control wheel, allows the pilot to momentarily revert to manual control in pitch and roll (yaw damper stays engaged), while retaining his previous mode program, and conveniently resuming that profile upon disengagement.

4. The autopilot, together with the yaw damper, provides three-axis rate stabilization, automatic turn coordination, and automatic elevator trim as well as automatic response to all flight director modes.

HEADING CONTROL OPERATION

The flight control system is electrically connected to the directional gyro for heading hold information whenever the system is in basic flight director mode. Heading hold is automatically disengaged when an incompatible lateral mode is engaged or when the control wheel PITCH SYNC & CWS switch is depressed and held.

Pressing the HDG SEL mode button automatically causes the airplane to execute a pre-selected heading change as set on the pictorial navigation indicator with either the HDG control knob on the indicator or the HDG SEL spring loaded knob on the mode controller. Heading changes using HDG SEL mode will bank the airplane two degrees for every degree of heading change selected up to a maximum bank angle of 25 degrees.

VERTICAL CONTROL OPERATION

1. Vertical Trim:

   Operation of the vertical trim switch (on mode controller), provides a convenient means of adjusting the reference parameter of all the vertical modes except glideslope and vertical navigation. This permits the pilot to change his vertical reference without disengaging and re-engaging modes.

2. Altitude Hold:

   The altitude hold mode may be engaged by pressing the ALT mode switch on the mode controller. The airplane will maintain the pressure altitude existing at the time the switch is depressed. Altitude hold may be engaged at any rate-of-climb or descent. For best performance, engagement should be made after establishing stabilized operation in any other vertical mode. Altitude hold is automatically disengaged when any other vertical mode is selected. The vertical trim switch may be used to trim the referenced altitude up or down at approximately 500 fpm.

3. Altitude Select:

   This mode allows the pilot to select, arm, and upon approaching the pre-set altitude, obtain an automatic visual pitch command to capture and hold the preselected altitude. Prior to selecting the function, the pilot must set the desired altitude (by means of rotary control knobs) into the selected altitude readout of the vertical navigation computer. The ALT ARM button on the vertical navigation computer may be depressed any time during climb or descent, to arm the altitude capture circuitry and the ALT ARM annunciator will illuminate. As the airplane approaches the selected altitude, the ALT ARM annunciator will extinguish, and as the airplane passes through the selected altitude, the altitude hold will automatically engage and the ALT HOLD annunciator light will illuminate.

4. Indicated Airspeed Hold:

   Engaging the indicated airspeed hold mode will introduce a computed, visually-displayed pitch command to maintain the reference airspeed. The mode is utilized by maneuvering the airplane, and setting engine power, to attain the desired speed in climb, descent, or level flight and then depressing the IAS button. The reference airspeed may be adjusted at a rate of approximately one knot per second by operation of the vertical trim switch on the mode controller.

5. Speed Profile:

   Engaging the speed profile mode will introduce a visually displayed pitch command on the flight command indicator which varies the indicated climb or descent speed as a function of altitude. During climb, airspeed is decreased at the rate of 1.75 knots per 1000 feet. The proper initial airspeed must be set up by the pilot and correct power settings maintained before depressing the SPD PRF button. After engagement, airspeed reference may be trimmed using the vertical trim switch.

6. Vertical Navigation:

   The vertical navigation computer provides a computed pitch command, which is displayed on the flight command indicator, to capture and maintain a vertical track angle in ascent or descent to a selected waypoint or VORTAC facility.

7. Altitude Alerting:

   Two altitude alert lights, one on the vertical navigation computer and one on the servoed altimeter, provide altitude alerting with the vertical navigation computer. When the airplane climbs, or descends, to within 1000 feet of the selected altitude, the alert lights illuminate and remain illuminated through a 500 foot altitude warning band. At 500 feet from the selected altitude, the lights extinguish. When the airplane reaches the selected altitude, a two-second aural tone indicates the desired flight altitude has been achieved. The two-second tone is also heard when the lights first illuminate upon penetration of a warning band.

   An MDA toggle switch on the vertical navigation computer allows the pilot to activate the MDA annunciator and warning horn for warning when the minumum descent altitude is reached.

8. Go-around:

   Engagement of the go-around mode using the go-around button on the left power lever will introduce a wings level 7°, nose-up display on the flight command indicator command bars. Operation of go-around cancels all other vertical modes and also disengages the autopilot, if the autopilot has been engaged. The autopilot may be re-engaged in the go-around mode. The go-around mode may be used as a take-off pitch reference, if desired, by engaging go-around mode on the runway. Momentary operation of the trim switch disengages the go-around mode.

FLYING RADIO FACILITIES

VOR PROCEDURES

1. Tune the NAV receiver to the appropriate frequency. (RNAV mode selector in VOR-DME.)

2. Set the desired course to or from the station on the pilot's course indicator.

3. Set the desired intercept heading. (Heading hold or HDG SEL may be used)

   NOTE

   The intercept angle with respect to the VOR radial selected may be any angle up to 90°.

4. Arm the navigation mode by depressing the NAV switch on the mode controller. The NAV ARM light on the flight director annunciator panel illuminates indicating that the system is armed to capture the selected radial. At the point of capture, the NAV ARM light on the annunciator extinguishes and the NAV CPLD annunciator light illuminates, indicating the system has captured the selected course.

5. The selected track may be changed while in the tracking mode, by setting a new course using the

COURSE knob on the pictorial navigation indicator. Course changes made at less than 4^{o} per second with the COURSE knob are acquired without leaving the tracking mode, however if the COURSE knob is moved at a rate exceeding 4° per second, a pre-programmed intercept angle of 45° is automatically engaged without having to return to the heading mode. When over the navigational facility, the course selection should be made at the change from "to" to "from", for best results.

AREA NAVIGATION ENROUTE

1. Tune the NAV and DME receivers supplying information to the area navigation computer to the radio facility (VORTAC) being used. The signal must be valid.
2. Set the area navigation bearing and distance to establish the desired waypoint.
3. Set the area navigation mode switch to RNAV position.
4. Set the desired course using the COURSE knob on the pilot's pictorial navigation indicator.
5. Set the desired intercept heading (heading hold or HDG SEL may be used).

NOTE

The intercept angle, relative to the RNAV radial, may be any angle of 90° or less.

6. Arm the navigation mode by depressing the NAV switch on the mode controller. The NAV ARM light on the flight director annunciator panel illuminates indicating that the system is armed to capture the selected radial. At the point of capture, the NAV ARM light on the annunciator will extinguish and the NAV CPLD annunciator light illuminates, indicating the system has captured the selected course.

VERTICAL NAVIGATION (VNAV)

Vertical navigation provides a computed pitch command, displayed on the flight command indicator, to capture and maintain a vertical track angle in ascent or descent to an RNAV waypoint or VORTAC facility. The following prerequisites must be fulfilled prior to flight director/autopilot coupling to the vertical navigation system:

1. Tune the NAV and DME receivers supplying information to the RNAV or VNAV computer to the radio facility (VORTAC) being used. The signal must be valid.
2. The desired course to the selected waypoint or VORTAC facility, must be set on the pictorial navigation indicator.
3. The RNAV computer mode switch must be placed in the RNAV or APPR position. If no RNAV system is installed, the VNAV switch must be placed in the ON position. The APPR selector switch and APPR CPLD annunciator are inoperative with VNAV only.
4. Arm the NAV mode by depressing the NAV button.
5. The selected course must then be captured.

Programming the vertical navigation computer:

1. Preset the desired altitude in the selected altitude window.
2. Set the altitude of the VORTAC facility being used, using the VTAC ALT - 1000 FT tab.
3. If altitude acquisition is desired prior to reaching the selected waypoint or VORTAC facility, program the mileage offset (0 to 30 miles) using the DIST BIAS MILES knob. (Bias is the distance short of the selected waypoint.)

If the NAV receiver, RNAV computer (if installed), servo altimeter and DME are valid, the vertical track angle will be indicated on the right display scale of the flight command indicator in degrees of angle, to a maximum of ± 5°. As the airplane flys toward the waypoint or VORTAC facility at a constant altitude, the displayed vertical track angle will slowly increase. When the vertical track angle has reached a value desired by the pilot, the pilot must manually couple VNAV by depressing the VNAV CPLD button on the VNAV computer. The vertical track angle displayed upon engagement becomes the reference flight path angle and the display pointer then becomes a deviation display above or below the selected flight path. The maximum scale deflection in the VNAV coupled mode is ± 250 feet. Selection of the VNAV CPLD mode automatically activates ALT ARM to capture the selected altitude.

APPROACH

1. VOR

VOR approaches may be made by coupling VOR in the approach mode. This gives proper responses for a close in non-precision approach.

2. ILS FRONT COURSE

a. Tune the NAV receiver to the correct ILS frequency, set the course selector to the inbound runway heading, set the heading bug to the desired intercept angle, and set the decision height on the radio altimeter.

NOTE

With both NAV receivers tuned to the same ILS facility, if the number 2 NAV receiver deviates more than 35 millivolts from the number 1 NAV receiver on either localizer or glideslope, the appropriate APPR CPLD or GS CPLD annunciator will flash indicating monitor limits have been exceeded.

Localizer and glideslope are captured automatically on front course. The localizer must be captured before glideslope capture is possible.

If the airplane heading is within 90° of the back course heading, the REV LOC annunciator will illuminate.

b. Engage HDG mode and arm the APPR mode. The APPR ARM annunciator will illuminate, indicating the system is armed to capture the localizer beam. As the airplane nears the beam, the APPR CPLD annunciator will illuminate and the system will intercept the localizer. At the point of glide path intercept, the GS CPLD annunciator will illuminate and all vertical modes will be disengaged, indicating the system is locked on to the glide slope.

c. The decision height light on the flight command indicator will illuminate when the aircraft reaches the decision height previously selected by the pilot on the radio altimeter.

d. To assume manual control of the airplane for landing, depress the autopilot disengage switch on the pilot's control wheel.

e. Disengage the autopilot at no less than 200 feet above the ground prior to manually landing the aircraft.

f. Go-around mode may be selected by pressing the go-around button on the left power lever any time the pilot needs to execute a missed approach. The autopilot will be disengaged and the flight command indicator will command a 7° nose-up wings level attitude.

3. ILS BACK COURSE

a. Tune the NAV receiver to the correct ILS frequency, set the course selector to the inbound front course runway heading, set the heading indicator to establish the desired intercept angle and set decision height on the radio altimeter.

NOTE

With both NAV receivers tuned to the same ILS facility, if the number 2 NAV receiver deviates more than 35 millivolts from the number 1 NAV receiver on localizer, the appropriate APPR CPLD annunciator will flash indicating monitor limits have been exceeded.

b. Engage HDG mode and arm the APPR mode. The APPR ARM annunciator will illuminate, indicating the system is armed to capture the localizer beam. As the aircraft nears the beam, the APPR CPLD annunciator will illuminate and the system will intercept the localizer. If the airplane heading is within 90° of the back course heading, the REV LOC annunciator will light.

c. Indicated airspeed hold or pitch attitude hold may be used to establish a descent while on reverse localizer.

d. Disengage the autopilot at no less than 200 feet above the ground prior to manually landing the aircraft.

e. Go around operation is the same as for front course operation.

I. RNAV APPROACH

a. Tune the NAV receiver and DME to the appropriate VORTAC frequency.

b. Set RNAV bearing and distance as given on the navigation charts for RNAV approaches. Set RNAV to APPR mode when within ten miles of the selected waypoint.

c. Set vertical navigation to give minimum descent altitude and bias as desired. Set the MDA switch to the MDA WARN position.

d. Set the required course on the pictorial navigation indicator and establish an intercept angle to the inbound radial. Arm the approach mode.

e. After RNAV approach is coupled, observe the vertical navigation deviation on the flight command indicator and depress the VNAV CPLD button when desired descent angle is displayed.

f. When the MDA annunciator on the flight director indicator illuminates, a go-around should be executed unless the pilot has the field in sight.

DISENGAGING THE AUTOPILOT

1. Monitor the controls prior to disengagement. Under normal operating conditions the automatic pitch trim will have the aircraft properly trimmed in the pitch axis at the pitch attitude existing when the system is disengaged.
2. Disengage the system by pressing the pilot's or copilot quick disconnect switch, pilot/copilot trim switches, or returning the autopilot engage switch to OFF. The flight director may be turned off, then on, which will also disengage the autopilot.

SPECIAL NOTES

1. The V-bars on the flight director indicator will disappear to the top of the instrument when no flight director modes are engaged.

2. The V-bars must be in view before the autopilot can be engaged.

3. When the autopilot is not engaged, the system may be used as a manual flight director system.

EMERGENCY PROCEDURES

The autopilot can be disengaged by any of the following methods:

1. Press the A/P disconnect switch on the pilot's or copilot's control wheel.

2. Move the on-off switch to the off position.

3. Engage the go-around mode. (Yaw damper will remain engaged.)

4. Pull the flight director/autopilot circuit breaker out (off).

5. Turn off the aircraft master switch.

6. Turn off the avionics master switch.

7. Any interruption or failure of power.

8. Operate main trim switches UP or DN. (Yaw damper will remain engaged.)

The following conditions will cause the autopilot to disengage automatically:

1. Vertical gyro failure indication.

2. Flight control system power or circuit failure.

The following will cause a servo to disengage:

1. Rapidly overpowering any servo will cause disengagement of only that servo through operation of the servo monitor. The servo may be re-engaged by turning off the autopilot and waiting for the monitor light to extinguish before re-engaging the autopilot.

2. A hardover failure in any of the primary servos will result in only that servo being automatically disengaged.

In the event of an engine failure:

1. Disengage the autopilot, retrim the aircraft, and re-engage the autopilot. Maintain at least 120 knots for single-engine approach.

Maximum altitude losses during malfunction tests were:

CONFIGURATION	ALTITUDE LOSS
Climb	Negative loss (40 ft gain)
Cruise	170 ft
Maneuvering	50 ft
Descent	420 ft
Approach/ILS Coupled	50 ft
Single Engine Approach/ILS Coupled	80 ft

Approved: V. H. Schultz

for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

P/N 101-590010-55
BEECHCRAFT SUPER KING AIR 200
AND 200T LANDPLANES

PILOT'S OPERATING HANDBOOK AND FAA APPROVED FLIGHT MANUAL SUPPLEMENT for the KING KNC-610 AREA NAVIGATION SYSTEM

GENERAL

The information in this supplement is FAA-Approved material and must be attached to the FAA-Approved Airplane Flight Manual when the airplane has been modified by installation of the King KNC-610 Area Navigation System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic FAA-Approved Airplane Flight Manual only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

LIMITATIONS

1. This system may not be used as a primary system under IFR conditions except on approved approach procedures, approved area navigation airways, and random area navigation routes when approved by Air Traffic Control.
2. This system can only be used with co-located facilities. (VOR and DME signals originate from the same geographical location).
3. An area navigation installation located on the right instrument panel may be used for primary navigation only if a qualified pilot occupies the right seat.

EMERGENCY PROCEDURES

CAUTION

DME may unlock due to loss of signal with certain combinations of distance from station, altitude, and angle of bank.

1. VOR or Distance flag appears while in RNAV mode:
   a. Selected Frequency - CHECK FOR CORRECT FREQUENCY
   b. VOR or Distance flag intermittent or lost - UTILIZE OTHER NAV EQUIPMENT AS REQUIRED.
2. VOR or Distance flag appears while in APPR mode:
   a. If flag appears while on an approach, execute published missed approach and utilize other approved facility.

NORMAL PROCEDURES

1. VHF NAV - ON
2. DME - ON
3. Mode Selector - SELECT VOR/DME, RNAV, or APPR (whichever is appropriate).

NOTE

Assure Mode Selector switch is in VOR/DME position for best Flight Director performance in an ILS approach mode.

4. NAV Frequency - SET
5. DME Frequency - SET
6. Waypoint Bearing - SET WAYPOINT RADIAL FROM VORTAC
7. Waypoint Distance - SET WAYPOINT DISTANCE FROM VORTAC
8. OBS Control - DESIRED MAGNETIC COURSE
9. Self-Test - PRESS BUTTON (must have VOR reception)

PERFORMANCE - No change

WEIGHT AND BALANCE - No change

SYSTEMS DESCRIPTION

The RNAV function of the King KNC-610 system performs a vector computation that results in a visual display of the magnetic bearing and distance to or from a selected waypoint. The computer, in effect, moves the selected reference facility (VORTAC or colocated VOR/DME facility) to a different location called a waypoint. The waypoint, which is expressed in terms of nautical miles along a selected radial from the VORTAC, is programmed into the system by the pilot.

Steering guidance is presented as a left/right display on the Horizontal Situation Indicator (HSI). The display format differs from the conventional VOR course deviation of ± 10 degrees called "angular course deviation". Rather, course deviation is presented in nautical miles from the course centerline. This feature, referred to as "linear course deviation", provides for a constant course width irrespective of the distance to the waypoint. Two levels of sensitivity are available for area navigation. The enroute sensitivity, available when the Mode Selector switch is positioned to RNAV, provides a constant course width of ± 5 nautical miles. Approach sensitivity, available when the Mode Selector switch is positioned to APPR, provides a constant course width of ± 1.25 nautical miles. Approach sensitivity should be used when within ten nautical miles of the terminal waypoint.

The Range Monitor feature (optional) provides for the separation of the RNAV computed range to a waypoint from the steering guidance of the pilot's Horizontal Situation Indicator. Selecting the Range Monitor switch to the RANGE MONITOR position will connect the RNAV computer to the NAV 2 receiver. The pilot's Horizontal Situation Indicator will be retained on the NAV 1 receiver.

On an ILS approach, for example, it is desirable to know distance to the outer marker and then to the runway threshold. By selecting RANGE MONITOR and setting the appropriate NAV 2 frequency and waypoint parameters into the system, the distance to the desired fix will be continuously displayed while ILS steering guidance on the Horizontal Situation Indicator will be conventional. The result is the ability to fly a localizer or full ILS steering situation while retaining RNAV computed distance to a selected fix.

CAUTION

It is imperative the Range Monitor switch be placed in the NORMAL position during RNAV operation. If left in the RANGE MONITOR position, the range display will be based on the NAV 2 frequency and waypoint parameters, and the pilot's Horizontal Situation Indicator will display conventional VOR steering based on the selected NAV 1 frequency.

HANDLING, SERVICING AND MAINTENANCE - No change

Approved:

for Donald H. Peter

W. H. Schultz
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200 LANDPLANE

AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

SPERRY SPZ-200/STARS IV C AUTOMATIC FLIGHT CONTROL SYSTEM

or

SPERRY SPZ-200/SPI-77C AUTOMATIC FLIGHT CONTROL SYSTEM

CATEGORY I

The information in this supplement is FAA-approved material and must be attached to the *Super King Air 200 FAA Approved Airplane Flight Manual* when the airplane has been modified by installation of the Sperry SPZ-200/STARS IV C or SPI-77C Automatic Flight Control System in accordance with Beechcraft Drawing 101-500003.

The information in this supplement supersedes or adds to the basic *FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

LIMITATIONS

1. During autopilot operations, pilot must be seated at the controls with seat belt fastened.
2. Maximum speed limit for autopilot operation is unchanged from the airplane maximum airspeed limit (V_{MO}/M_{MO}).
3. Do not use autopilot under 200 feet above terrain.
4. Do not use autopilot or yaw damper during takeoff or landing.
5. Do not use propeller in the range of 1750-1850 rpm during coupled ILS approach.
6. Autopilot preflight check must be conducted and found satisfactory prior to each flight on which the autopilot is to be used.

NORMAL PROCEDURES

FLIGHT DIRECTOR OPERATION

The pilot can select any of the following flight modes using the mode selector pushbuttons on the Flight Director Computer Controller which combines the flight director and autopilot mode control and annunciation.

1. Standby (SBY): In this mode the flight director is ready for operation of the other modes. The command bars on the Attitude Display Indicator are retracted from view.
2. Heading Select (HDG): This mode provides lateral commands on the Attitude Display Indicator vertical command bar to acquire and maintain the heading displayed on the heading cursor on the Horizontal Situation Indicator. The desired heading is selected by turning the heading select knob.
3. VOR/Localizer (V/L): In this mode VOR or localizer operation is selected as the radio is tuned to a VOR or LOC frequency. The desired radial or inbound course is selected on the Horizontal Situation Indicator cursor by turning the course knob. When V/L mode is selected with the airplane outside the edge of the

beam, the HDG mode is automatically selected. The heading select cursor can be used to set the intercept angle to the beam. When the capture point is reached, the HDG mode drops out and the vertical flight director bar commands the proper airplane responses to track the VOR radial or Localizer beam. Crosswind washout is automatiaclly provided for VOR or Localizer operation.

4. Reverse (REV): This mode provides lateral commands on the vertical flight director bar to fly back course approaches or outbound on the front course. The inbound front course should be selected on the Horizontal Situation Indicator using the course knob. Lateral beam sensor operation is as described in the V/L mode.

5. Altitude Hold (ALT): This mode provides pitch commands on the horizontal pointer to maintain the engaged altitude. To provide protection for the altitude controller, the ALT mode will disengage if the airplane deviates more than 500 feet from the engaged altitude.

6. Indicated Airspeed Hold (IAS): The IAS mode is used to maintain a constant indicated airspeed by controlling pitch attitude. The pilot selects the IAS mode when the airplane is at the desired airspeed. The vertical flight director bar commands attitude changes to maintain this selected airspeed.

7. Approach Arm (APP ARM): This mode is the same as the V/L mode except that the glideslope function is also armed. If the airplane is inside the lateral beam, selecting the APP ARM mode engages the V/L mode. If the airplane is outside the edge of the lateral beam, selecting the APP ARM mode engages the HDG mode and arms the V/L mode. The glideslope cannot be captured until after the lateral beam is captured. If the ALT or IAS modes were selected prior to selecting APP ARM, these modes are retained until glideslope capture.

8. Glideslope (GS): This mode, besides annunciating automatic glideslope capture, provides manual capture of the localizer and glideslope. This mode is normally used when intercepting the glideslope from above the beam.

9. Glideslope Extend (GS EXT): This is not a mode selector but only an annunciator which is illuminated by the radio altitude or middle marker. This provides reduced gains for flight smoothness when approaching the glideslope transmitter.

10. GO-AROUND: This mode provides commands to the flight director bars when an approach is to be terminated. The horizontal bar provides fixed pitch-up attitude command; the vertical bar provides commands for roll to wings level. The GO-AROUND mode cancels all other modes and is selected by depressing the go-around switch on the left power lever which illuminates the GO-AROUND annunciator on the Flight Director Computer Controller. After the GO-AROUND mode is selected, the fixed pitch command may be retained and either HDG, REV, or V/L roll mode commands selected by pushing the desired roll mode annunciator while the GO-AROUND annunciator is illuminated. The GO-AROUND mode may be cancelled by selecting ALT, IAS, or SBY.

AUTOPILOT

The autopilot engage controller provides a convenient means of engaging the autopilot and yaw damper as well as coupling the autopilot to the pitch and roll flight director modes. The optional manual controller contains a pitch wheel and turn knob for manual control of the autopilot.

AUTOPILOT ENGAGE

When the A/P ENGAGE button is depressed with the Flight Director Computer Controller in SBY, pitch attitude is held and roll attitude is brought to zero. The yaw damper is automatically engaged with autopilot engagement.

With the optional turn knob in detent, roll less than 6 degrees, and the roll axis not coupled, the airplane heading is maintained.

YAW DAMPER ENGAGE

The yaw damper is engaged by depressing the Y/D ENGAGE button on the autopilot controller. The yaw damper provides yaw stabilization through rudder control.

ELEV TRIM INDICATOR

The elevator trim indicator deflects when a sustained signal is being applied to the elevator servo, whether it's engaged or not. Indicator should be close to center before autopilot is engaged.

TEST BUTTON

The TEST button provides a test for the torque limit monitors. After engaging the autopilot, pressing the TEST button will disengage the autopilot by simulating a failure in the torque limit monitors. This test should be performed prior to each flight.

SOFT RIDE MODE

Selection of the SOFT RIDE mode on the autopilot engage controller reduces autopilot response in both roll and pitch axes, making the system more of a damper. This mode should be used for turbulence penetration or any other time that a softer response is desired.

TURN KNOB (OPTIONAL WITH AUTOPILOT MANUAL CONTROLLER)

Rotation of the turn knob out of detent results in a roll command. The roll angle is proportional to and in the direction of the turn knob rotation. If HDG, V/L, or REV is on the Flight Director Computer Controller, rotation of the turn knob resets to SBY. The HDG, V/L, or REV mode cannot be selected until the turn knob is in detent.

PITCH WHEEL (OPTIONAL WITH AUTOPILOT MANUAL CONTROLLER)

Rotation of the pitch wheel results in a change of pitch attitude proportional to the rotation of the wheel and in the direction of wheel movement. If IAS or GS is on the Flight Director Computer Controller, rotation of the pitch wheel resets to SBY. If ALT is on the Flight Director Computer Controller, rotation of the pitch wheel disengages ALT.

TOUCH CONTROL STEERING

When the Touch Control Steering switch on the control wheel is depressed with the Flight Director Computor Controller in SBY mode, the AP ENGAGE annunciator is extinguished, and the pitch and roll attitude of the airplane can be changed by pilot inputs through the control wheel. When the switch is released, the autopilot re-engages, illuminating the AP ENGAGE annunciator. Pitch attitude is held, and if the roll attitude is less than 6 degrees, heading is held. If the roll attitude is more than 6 degrees, the roll attitude is maintained. Touch Control Steering may only be used with the optional turn knob in the detent.

The Touch Control Steering feature further allows the pilot to modify the commanded flight path from the Flight Director Computer Controller. When coupled to ALT, IAS, or GS modes, Touch Control Steering can be selected and the altitude, airspeed, or position on glideslope manually changed through pitch attitude or power change. Upon release of the switch, the new altitude or airspeed is held or the autopilot recouples to the Glide slope. If the autopilot is coupled to a Flight Director Computer Controller roll mode, Touch Control Steering allows maneuvering in roll while the button is depressed. Upon release, the autopilot will couple to the previously selected roll mode.

AUTOPILOT COUPLING AND FLIGHT DIRECTOR MODES

The autopilot uses the Flight Director Computer Controller as a common computer for both the flight director and autopilot. When the autopilot is engaged and a command is displayed on the flight director, the autopilot is coupled to the Flight Director Computer Controller and the ROLL COUPLE and/or PITCH COUPLE annunciators on the autopilot controller will be illuminated.

The following modes from the Flight Director Computer Controller may be coupled to the autopilot:

HDG - Heading Select
V/L - VOR and LOC Beam Tracking
REV - LOC Reverse Course
GS - Glidepath Control

ALT - Altitude Hold
IAS - Airspeed Hold

Autopilot operation in these modes is the same as described for flight director operation. When SBY mode is selected, the autopilot will not couple to the Flight Director Computer Controller. When GO-AROUND mode is selected, the autopilot disconnects. Re-engagement of the autopilot when the Flight Director Computer Controller is in GO-AROUND mode, results in a pitch attitude hold command for the autopilot. When the autopilot is engaged and a coupled mode has previously been selected, the autopilot automatically couples to the mode selected. If the autopilot is engaged when the Flight Director Computer Controller is in SBY, subsequent selection of a mode couples the autopilot to the mode selected.

If only a lateral mode is selected, the Flight Director Computer Controller automatically commands a vertical mode of pitch attitude hold for the autopilot and flight director.

If only a vertical mode is selected, the Flight Director Computer Controller automatically commands a lateral mode of heading hold for the autopilot.

When the autopilot is engaged and coupled to the Flight Director Computer Controller, the autopilot may be de-coupled by:

1. Rotating the turn knob out of detent if HDG, V/L, or REV is selected. This action resets the Flight Director Computer Controller to SBY.

2. Rotating the pitch wheel if IAS or GS is selected. This action resets the Flight Director Computer Controller to SBY.

3. Selecting SBY on the Flight Director Computer Controller.

4. Selecting GO-AROUND mode. This action disengages the autopilot. The autopilot may be re-engaged but will not couple to the go-around command.

AUTOPILOT OPERATION

PREFLIGHT

1. Elevator Trim Indicator - CHECK (Observe that autopilot trim indicator on autopilot controller shows an average signal of zero with only short period deviations from zero. A steady full scale deflection on the elevator trim indicator denotes automatic synchronization is not functioning and the autopilot should not be engaged.)

2. Turn Knob (optional with Autopilot Manual Controller) - IN CENTER DETENT POSITION.

3. Autopilot - TEST

   a. Control Wheel to Mid-travel - DEPRESS AP ENGAGE ANNUNCIATOR SWITCH

   b. Control Movement - CHECK (that the system can be overpowered by slowly moving controls through all three axes).

CAUTION

If autopilot disengages, do not use.

   c. Elevator Trim Followup - CHECK (Hold control wheel forward of mid-travel. Trim wheel will run nose-up after 3 to 5 seconds. Hold control wheel aft of mid-travel. Trim wheel will run nose-down after 3 to 5 seconds.)

   d. AP/YD TRIM DISC Button - DEPRESS THROUGH SECOND LEVEL (autopilot will disengage and ELEC TRIM OFF annunciator will illuminate.)

e. Autopilot - RE-ENGAGE WITH CONTROL WHEEL AT MID-TRAVEL (Hold control wheel forward of mid-travel. Trim wheel will not operate and AP TRIM FAIL annunciator will illuminate after 3 to 5 seconds. Hold control wheel aft of mid-travel. Trim wheel will not operate and AP TRIM FAIL annunciator will re-illuminate after 3 to 5 seconds.)

f. Autopilot TEST Button - DEPRESS (Autopilot will disengage and AP DISC and MASTER WARNING annunciators will illuminate).

g. Annunciators - CLEAR (AP/YD DISC annunciator will extinguish by depressing the control wheel AP/YD DISC button and the MASTER WARNING annunciator by depressing its face.)

CAUTION

If autopilot does not disengage when the test button is depressed, it indicates autopilot torque monitors are not functioning properly. DO NOT USE AUTOPILOT IN FLIGHT UNTIL CORRECTIVE ACTION HAS BEEN TAKEN.

h. ELEV TAB CONTROL Switch - OFF, then ON (resets electric trim and ELECT TRIM OFF annunciator will extinguish).

IN FLIGHT ENGAGING AUTOPILOT

1. All Autopilot and Flight Director Circuit Breakers - IN.
2. Elevator Trim Indicator - CHECK (Observe that autopilot trim indicator on autopilot controller shows an average signal of zero with only short period deviations from zero).
3. Turn Knob (optional with autopilot manual controller) - IN CENTER DETENT POSITION.
4. Autopilot Controller AP ENGAGE Annunciator Switch - DEPRESS

DISENGAGING THE AUTOPILOT

The autopilot and yaw damper may be disengaged by:

1. Actuation of the AP/YD & TRIM DISC buttons on either control wheel to the first level. (Copilot's button causes MASTER WARNING and AP DISC annunciator to illuminate)

NOTE

The AP/YD & TRIM DISC button is a two level switch. The first level disengages the autopilot while the second level disengages both autopilot and electric trim.

2. Pressing the TEST button on the Autopilot Engage Controller. (MASTER WARNING and AP DISC annunciator will illuminate.)
3. Pressing the go-around mode switch on the left power lever. (AP DISC annunciator will illuminate.)
4. Using the dual element electric trim switches on the control wheel. (MASTER WARNING and AP DISC annunciator will illuminate.)

NOTE

The AP DISC annunciator light is extinguished by depressing the pilot's AP/YD & TRIM DISC button. Depressing the MASTER WARNING annunciator extinguishes this warning light.

EMERGENCY PROCEDURES

IN THE EVENT OF AN AUTOPILOT MALFUNCTION, disengagement can be accomplished by one of the following:

1. Pressing (momentarily) to first level the pilot's or copilot's AP/YD & TRIM DISC button on the control wheel.
2. Pressing (momentarily) the go-around button on the left power lever.
3. Pressing the TEST button on the Autopilot Engage Controller.
4. Opening the autopilot circuit breaker.
5. Operating the dual element electric trim switches on the control wheel
6. If necessary, the autopilot may be overpowered by either pilot.

IN THE EVENT OF AN ENGINE FAILURE:

1. Disengage the autopilot, retrim the airplane and re-engage the autopilot. Maintain at least 120 knots for single-engine approach.

MAXIMUM ALTITUDE LOSSES DURING MALFUNCTION TESTS WERE:

CONFIGURATION	ALTITUDE LOSS
Climb	250 feet
Cruise	410 feet
Maneuvering	100 feet
Descent	500 feet
Approach/ILS Coupled	.80 feet
Single Engine Approach/ILS Coupled	.50 feet

Approved:

for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

FAA Approved
Revised: June 17, 1977
P/N 101-590010-57

BEECHCRAFT SUPER KING AIR 200 LANDPLANE

PILOT'S OPERATING HANDBOOK

AND

FAA APPROVED AIRPLANE FLIGHT MANUAL

SUPPLEMENT

FOR

HIGH FLOTATION LANDING GEAR

GENERAL

The information in this supplement is FAA-approved material and must be attached to the Beechcraft *Super King Air 200 Pilot's Operating Handbook and FAA Approved Airplane Flight Manual* if the airplane is equipped with the Beech-installed high flotation landing gear.

The information in this supplement supersedes or adds to the basic Beechcraft *Super King Air 200 Pilot's Operating Handbook and FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the pilot's operating handbook are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

When the high flotation landing gear (22x6.75-10 tires on 6.50x10 wheels) is installed, the pilot will find the use of the performance data contained in this supplement more convenient and expeditious if the entire contents of the PERFORMANCE Section of the handbook are relocated to the back of the handbook, and the PERFORMANCE portion of this supplement inserted behind the PERFORMANCE divider tab.

LIMITATIONS

No change.

EMERGENCY PROCEDURES

No change.

NORMAL PROCEDURES

No change.

PERFORMANCE

A complete PERFORMANCE Section for the high flotation landing gear is provided at the end of this supplement. The pages are numbered to correspond with the PERFORMANCE Section of the handbook. If the airplane is equipped with the high flotation landing gear, the PERFORMANCE data included in this supplement totally replaces all PERFORMANCE data provided in the PERFORMANCE Section of the basic Beechcraft *Super King Air 200 Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.*

WEIGHT AND BALANCE/EQUIPMENT LIST

No change.

SYSTEMS DESCRIPTIONS

No change.

HANDLING, SERVICING, AND MAINTENANCE

No change.

SAFETY INFORMATION

No change.

Approved:

W. H. Schultz
Beech Aircraft Corporation
DOA CE-2

SECTION V
PERFORMANCE
TABLE OF CONTENTS

ITEM *PAGE*

ITEM *PAGE*

ITEM *PAGE*

INTENTIONALLY LEFT BLANK

INTRODUCTION TO PERFORMANCE AND FLIGHT PLANNING

The graphs and tables in this Section present performance information for takeoff, climb, landing, and flight planning at various parameters of weight, power, altitude, and temperature. All FAA-approved performance information is included within this Section. Examples have been presented on all performance graphs.

The following example presents calculations for flight time, block speed, and fuel required for a proposed flight from Denver to Reno using the conditions listed below:

CONDITIONS

At Denver:

Outside Air Temperature .... 28°C (82°F)
Field Elevation .... 5330 feet
Altimeter Setting .... 29.82 in. Hg
Wind .... 330° at 10 knots
Runway 35 Length .... 11,500 feet

Route of Trip:
DEN - J56 - SLC - J154 - BAM - J32 - RNO

Cruise Altitude:
26,000 feet

Weather Conditions at Cruise Altitude:
IFR

ROUTE SEGMENT	MAGNETIC HEADING	DISTANCE NM	WIND AT FL 260 DIR/KNOTS	OAT AT FL 260 °C	OAT AT **16,000 FT °C	ALTIMETER SETTING IN. HG
DEN - EKR	263°	*155	350°/40	−10	−6	29.82
EKR - SLC	270°	192	350°/40	−10	−6	29.82
SLC - BVL	249°	81	340°/35	−20	0	29.75
BVL - BAM	250°	145	340°/35	−20	0	29.75
BAM - RNO	227°	***145	290°/45	−20	−4	29.60

* Includes climb to Denver VORTAC
** MEA on *Enroute Low Altitude Chart L-8*
*** Includes Distance from RNO VORTAC to Reno International

REFERENCE: *Enroute High Altitude Chart H-1* and *Standard Instrument Departures for Western United States.*

At Reno:

Outside Air Temperature .... 32°C (90°F)
Field Elevation .... 4411 feet
Altimeter Setting .... 29.60 in. Hg
Wind .... 270° at 5 knots
Runway 25L Length .... 6105 feet

To determine the pressure altitude at origin and destination airports, add 1000 feet to field elevation for each 1.00 in. Hg that the reported altimeter setting value is below 29.92 in. Hg, and subtract 1000 feet for each 1.00 in. Hg above 29.92 in. Hg. First, find the difference between 29.92 in. Hg and the reported altimeter setting. Then multiply the answer by 1000 to find the difference in feet between field elevation and pressure altitude.

Pressure Altitude at DEN:

29.92 in. Hg − 29.82 in. Hg = 0.10
0.10 X 1000 feet = 100 feet
The pressure altitude at DEN is 100 feet above field elevation.
Pressure Altitude at DEN = 5330 + 100 = 5430 feet.

Pressure Altitude at RNO:

29.92 in. Hg − 29.60 in. Hg = 0.32
0.32 X 1000 feet = 320 feet
The pressure altitude at RNO is 320 feet above field elevation.
Pressure Altitude at RNO = 4411 + 320 = 4731 feet.

PERFORMANCE EXAMPLE

TAKE-OFF WEIGHT

A summary of graphs provided in this handbook to restrict take-off weight is presented below:

1. MAXIMUM TAKE-OFF WEIGHT PERMITTED BY ENROUTE CLIMB REQUIREMENT (No Restriction)
2. TAKE-OFF WEIGHT TO ACHIEVE POSITIVE ONE-ENGINE-INOPERATIVE CLIMB AT LIFT-OFF (separate graphs for Flaps 0% and Flaps 40%) (Optional)
3. MAXIMUM ENROUTE WEIGHT (FAR 135 OPERATIONS) (Required for FAR Part 135 Operations)
4. TAKE-OFF WEIGHT TO MEET FAR 25 TAKE-OFF CLIMB REQUIREMENTS (separate graphs for Flaps 0% and Flaps 40%) (Optional)

Take-off weight must not exceed 12,500 pounds.

ENROUTE CLIMB REQUIREMENT

There is no weight restriction to meet enroute climb requirement.

Maximum allowable take-off weight = 12,500 pounds.

TAKE-OFF WEIGHT TO ACHIEVE POSITIVE ONE-ENGINE-INOPERATIVE CLIMB AT LIFT-OFF

12,500 pounds @ Flaps 0%
12,450 pounds @ Flaps 40%

MAXIMUM ENROUTE WEIGHT (FAR 135 OPERATIONS)

To determine the maximum take-off weight, the weight of the fuel used to reach the MEA is added to the maximum enroute weight.

From the TIME, FUEL, AND DISTANCE TO CLIMB Graph, the time, fuel, and distance required to climb from 5430 feet (28°C) to 16,000 feet (−6°C) are:

Time .... 6 minutes
Fuel .... 85 pounds
Distance .... 19 nautical miles

Enter the MAXIMUM ENROUTE WEIGHT (FAR 135 OPERATIONS) Graph at −6°C, 16,000 feet altitude, and 29.82 in. Hg altimeter setting:

Maximum Enroute Weight = 12,500 pounds

Take-off Weight must not exceed 12,500 pounds

TAKE-OFF WEIGHT TO MEET FAR 25 TAKE-OFF AND CLIMB CRITERIA

The following information has been presented to provide the option of limiting weight to obtain the performance specifications of FAR 25 during the critical take-off and initial climb flight segments. Their use is not mandatory and full compliance with other regulations applicable to FAR 25 is not implied.

The criteria for limiting weight involves the selection from the Take-off Weight graphs of the most adverse conditions of:

1. One-engine-inoperative climb
2. Field length to accelerate-stop
3. Field length to accelerate-go
4. The take-off flight path required to clear known obstacles beyond the runway.

The performance graphs associated with the above conditions are:

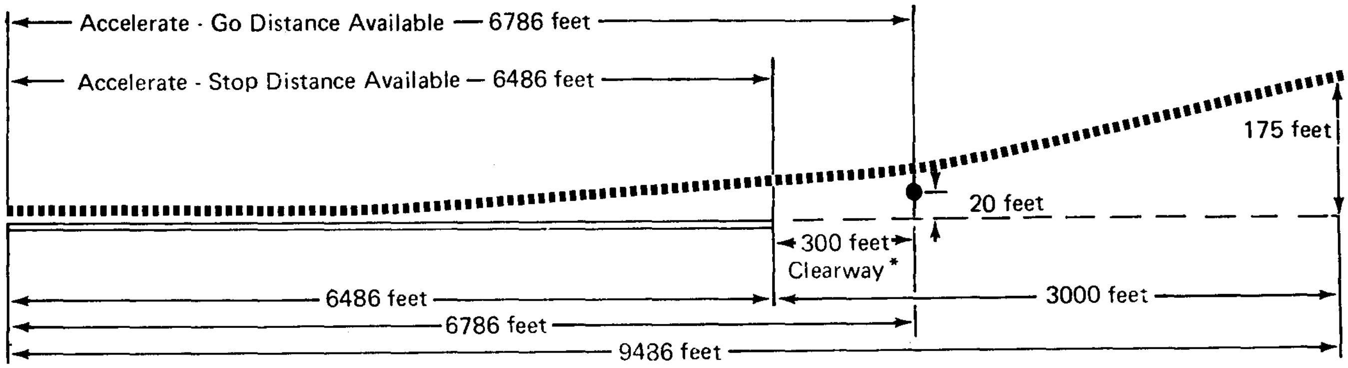
TAKE-OFF WEIGHT - TO MEET FAR 25 TAKE-OFF CLIMB REQUIREMENTS Graphs
ACCELERATE-STOP Graphs
ACCELERATE-GO Graphs
NET GRADIENT OF CLIMB Graphs
TAKE-OFF FLIGHT PATH Graph
(Reference FAR 25.109, 25.111, 25.115, and 25.121)

The performance presented using this criteria is predicated on the autofeather system being armed and operable. The Ground Minimum Control Speed (V_{MCG}) has been determined to be 84 knots. At this speed, control within 25 feet of the runway center line is possible.

The following example illustrates the procedures required to obtain a take-off weight value using the CONDITIONS outlined below, and illustrated by the TAKE-OFF FLIGHT PATH Diagram.

CONDITIONS (These conditions do not pertain to any particular airport location.):

Outside Air Temperature .... 28°C
Field Elevation .... 5330 feet
Altimeter Setting .... 29.82 in. Hg
Surface Wind .... 140° at 11 knots
Runway 17 Length .... 6486 feet
Pressure Altitude (29.92 − 29.82 = 0.10 in. Hg) 5330 + 100 .... 5430 feet
Headwind Component (From WIND COMPONENTS Graph) .... 9.5 knots
Obstacles (Height above runway):
.... 20-foot-high wires 300 feet beyond end of runway
.... 175-foot-high ridge 3000 feet beyond end of runway



The maximum allowable clearway for this runway is 1621 feet (25% of 6486 feet).

TAKE-OFF FLIGHT PATH

1. From the TAKE-OFF WEIGHT - TO MEET FAR 25 TAKE-OFF CLIMB REQUIREMENTS Graphs, determine that the maximum take-off weights to meet FAR 25 climb requirements are 12,500 pounds with flaps at 0%, and 12,000 pounds with flaps at 40%.
2. From the ACCELERATE-STOP Graphs, using 12,500 pounds with flaps at 0%, and 12,000 pounds with flaps at 40%, determine that the resulting distances are less than the runway length. Therefore, accelerate-stop is not a limiting factor.
3. From the ACCELERATE-GO Graphs, using 12,500 pounds with flaps at 0%, and 12,000 pounds with flaps at 40%, determine that the resulting distances are greater than the available accelerate-go distance of 6786 feet. (Refer to the TAKE-OFF FLIGHT PATH Diagram.)
4. Using the ACCELERATE-GO Graphs, enter in reverse using the 6786 feet value and determine the weight for which this accelerate-go distance is possible.

   a. Take-off weight of 10,600 pounds with flaps at 0%
   b. Take-off weight of 11,380 pounds with flaps at 40%

5. Enter the TAKE-OFF FLIGHT PATH Graph to determine the minimum gradient of climb which will result in a flight path clear of the 175-foot-high ridge 3000 feet beyond the end of the runway. (Refer to the TAKE-OFF FLIGHT PATH Diagram above.)

   a. Ridge = 175 feet AGL
   b. From Reference Zero (9486 − 6786) = 2700 feet
   c. Minimum Gradient of Climb = 5.2%

6. Enter the NET GRADIENT OF CLIMB - FLAPS 0% Graph at 10,600 pounds, and the NET GRADIENT OF CLIMB - FLAPS 40% Graph at 11,380 pounds.

   - Both resulting gradients are less than 5.2%.

7. Enter in reverse the NET GRADIENT OF CLIMB Graphs using the 5.2% net gradient of climb value to determine the weights for which a climb at this value is possible.

   a. Flaps 0% = 9700 pounds
   b. Flaps 40% = 9000 pounds

8. Using the weight of 9700 pounds with the flaps at 0%, and 9000 pounds with the flaps at 40%, the accelerate-go distance will be shortened. This in turn will decrease the minimum gradient of climb value required to clear the ridge. The allowable take-off weights to meet these requirements are between 10,600 pounds and 9700 pounds with the flaps at 0%, or between 11,380 pounds and 9000 pounds with the flaps at 40%. Exact weight can be determined by an iterative process of assuming new weight halfway between these weights and using the procedures outlined in Steps 3, 5, 6, 7, and 8. Determine new weights for first iteration as follows:

a. Flaps 0%:

10,600 − 9700 = 900 ÷ 2 = 450 + 9700 = 10,150 pounds

b. Flaps 40%:

11,380 − 9000 = 2380 ÷ 2 = 1190 + 9000 = 10,190 pounds

9. (Step 3 procedures): From the ACCELERATE-GO Graphs, using 10,150 pounds for flaps at 0%, and 10,190 pounds for flaps at 40%, the resulting distances are within the available accelerate-go distance of 6786 feet.

   a. 6050 feet with flaps at 0%
   b. 5000 feet with flaps at 40%

10. (Step 5 procedure): Enter the TAKE-OFF FLIGHT PATH Graph and adjust the horizontal distance from Reference Zero and determine minimum gradient of climb.

    a. Flaps 0% - From Reference Zero (9486 − 6050) = 3436 feet
       Minimum Gradient of Climb = 4.0%
    b. Flaps 40% - From Reference Zero (9486 − 5000) = 4486 feet
       Minimum Gradient of Climb = 3.1%

11. (Step 6 procedures): Enter the NET GRADIENT OF CLIMB - FLAPS 0% Graph at 10,150 pounds for a 4.7% net gradient of climb. Enter the NET GRADIENT OF CLIMB - FLAPS 40% Graph at 10,190 pounds for a 3.5% net gradient of climb.

    a. Since these results are greater than the minimum value, the take-off weights of 10,150 pounds with flaps at 0% or 10,190 pounds with flaps at 40% may be used.
    b. If an exact value is required, complete the next step and repeat Steps 3, 5, 6, 7, and 8.

12. (Step 7 procedures): Enter in reverse the NET GRADIENT OF CLIMB - FLAPS 0% Graph using minimum gradient of climb of 4.0% for a take-off weight of 10,800 pounds, and the NET GRADIENT OF CLIMB - FLAPS 40% Graph using minimum gradient of climb of 3.1% for a take-off weight of 10,500 pounds.
13. (Step 8 procedures): Use the weights of Step 8 and Step 12 to obtain a new assumed weight.

    a. Flaps 0%:
       10,800 − 10,150 = 650 ÷ 2 = 325 + 10,150 = 10,475 pounds

    b. Flaps 40%:
       10,550 − 10,190 = 360 ÷ 2 = 180 + 10,190 = 10,370 pounds

Use these assumed weights for second iteration.

14. After several additional iterations, the exact weights which will satisfy all the given conditions are:

    a. Flaps 0% = 10,310 pounds with a 4.5% Net Gradient of Climb.
    b. Flaps 40% = 10,360 pounds with a 3.3% Net Gradient of Climb

The fuel quantity required for start and taxi can be added to these weights.

TAKE-OFF DISTANCE

Enter the TAKE-OFF DISTANCE Graphs at 28°C, 5430 feet pressure altitude, 12,500 pounds, and 9.5 knots headwind component and obtain the following results:

	FLAPS 0%	FLAPS 40%
Ground Roll	2870 feet	2700 feet
Total Distance Over 50-foot Obstacle	4900 feet	3750 feet
Take-off Speed:		
At Rotation	95 knots	94 knots
At 50 Feet	121 knots	106 knots

FLIGHT PLANNING

The following calculations provide information for flight planning at various parameters of weight, power, altitude, and temperature. Graphs and tables are included for: TIME, FUEL, AND DISTANCE TO CLIMB; TIME, FUEL, AND DISTANCE TO DESCEND; RECOMMENDED CRUISE POWER AT 1700 RPM; RECOMMENDED CRUISE POWER AT 1800 RPM; MAXIMUM CRUISE POWER AT 1900 RPM; MAXIMUM RANGE POWER AT 1700 RPM; and HOLDING TIME.

Calculations for flight time, block speed, and fuel requirements for a proposed flight are detailed below.

Enter the ISA CONVERSION Graph at the conditions indicated:

DEN	Pressure Altitude	5430 feet
	OAT	28°C
	ISA Condition	ISA + 23°C
DEN - SLC	Pressure Altitude	26,000 feet
	OAT	−10°C
	ISA Condition	ISA + 27°C
SLC - RNO	Pressure Altitude	26,000 feet
	OAT	−20°C
	ISA Condition	ISA + 17°C
RNO	Pressure Altitude	4730 feet
	OAT	32°C
	ISA Condition	ISA + 27°C

Enter the TIME, FUEL, AND DISTANCE TO CLIMB Graph at 28°C, to 5430 feet, and to 12,500 pounds and enter at -10°C, to 26,000 feet and to 12,500 pounds, and read:

Time to Climb .... 25 − 3 = 22 minutes

Fuel Used to Climb .... 275 − 45 = 230 pounds

Distance Traveled .... 80 − 11 = 69 nautical miles

Enter the TIME, FUEL, AND DISTANCE TO DESCEND Graph at 26,000 feet, and enter again at 4730 feet to read:

Time to Descend .... 17 − 3 = 14 minutes

Fuel Used to Descend .... 168 − 36 = 132 pounds

Descent Distance .... 81 − 14 = 67 nautical miles

The estimated average cruise weight is approximately 11,600 pounds.

Enter the tables for RECOMMENDED CRUISE POWER @ 1800 RPM for ISA + 10°C, ISA + 20°C, and ISA + 30°C, and read the cruise speeds for 26,000 feet at 12,000 pounds and 11,000 pounds.

CRUISE TRUE AIRSPEEDS AT FL 260

12,000 POUNDS			11,000 POUNDS		
ISA + 10°C	ISA + 20°C	ISA + 30°C	ISA + 10°C	ISA + 20°C	ISA + 30°C
258	254	246	264	261	254

Interpolate between these speeds for ISA + 27°C and ISA + 17°C at 11,600 pounds.

Cruise True Airspeed (ISA + 27°C) .... 253 knots

Cruise True Airspeed (ISA + 17°C) .... 259 knots

Enter the *RECOMMENDED CRUISE POWER @ 1800 RPM Graph at 26,000 feet, and read the recommended torque settings for ISA + 27°C (−3°C OAT) and ISA + 17°C (−13°C OAT):

ISA + 27°C (−3°C OAT) .... 1269 ft-lbs torque per engine

ISA + 17°C (−13°C OAT) .... 1350 ft-lbs torque per engine

Enter the *FUEL FLOW AT RECOMMENDED CRUISE POWER @ 1800 RPM Graph at 26,000 feet, and read the fuel flow for ISA + 27°C (−3°C OAT) and ISA + 17°C (−13°C OAT):

ISA + 27°C (−3°C OAT) Fuel Flow Per Engine .... 247 lbs/hr
Total Fuel Flow .... 494 lbs/hr

ISA + 17°C (−13°C OAT) Fuel Flow Per Engine .... 260 lbs/hr
Total Fuel Flow .... 520 lbs/hr

*NOTE: For flight planning, enter these graphs at the forecasted ISA condition; for enroute power settings and fuel flow, enter the graphs at the actual OAT.

Time and Fuel Used were calculated at Recommended Cruise Power @ 1800 RPM as follows:

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

$$\text{Fuel Used} = (\text{Time})\,(\text{Total Fuel Flow})$$

Results are as follows:

ROUTE	DISTANCE	ESTIMATED GROUND SPEED	TIME AT CRUISE ALTITUDE	FUEL USED FOR CRUISE
	NM	KNOTS	HRS : MIN	LBS
DEN - EKR	*86	238	0:22	181
EKR - SLC	192	234	0:49	403
SLC - BVL	81	247	0:20	173
BVL - BAM	145	246	0:35	303
BAM - RNO	*78	225	0:21	182

*Distance required to climb or descend has been subtracted from segment distance

TIME - FUEL - DISTANCE

ITEM	TIME HRS : MINS	FUEL POUNDS	DISTANCE NM
Start, Runup, Taxi, and Take-off acceleration	00 : 00	90	0
Climb	00 : 22	230	69
Cruise	2 : 27	1242	582
Descent	00 : 14	132	67
Total	3 : 03	1694	718

Total Flight Time: 3 hours, 03 minutes

Block Speed: 718 NM ÷ 3 hours, 03 minutes = 235 knots

Reserve Fuel (45 minutes at Maximum Range Power): Assume weight at end of cruise to be 11,000 pounds. Enter the tables for MAXIMUM RANGE POWER @ 1700 RPM for ISA + 10°C and ISA + 20°C, and read the fuel flow for 26,000 feet at 11,000 pounds:

ISA + 10°C .... 416 lbs/hr Total Fuel Flow

ISA + 20°C .... 426 lbs/hr Total Fuel Flow

Interpolate to find fuel flow at ISA + 17°C:

Total fuel flow for reserve = 416 + 7 = 423 lbs/hr

Reserve Fuel = 45 minutes X 423 lbs/hr = 317 lbs

Total Fuel: 1694 + 317 = 2011 pounds (300 gallons Aviation Kerosene)

Check for Zero Fuel Weight Requirement:

NOTE: Zero Fuel Weight cannot exceed 10,400 pounds.

Ramp Weight − Total Fuel Weight = 12,590 − 2011 = 10,579 pounds (Zero Fuel Weight)

The requirement is not satisfied. Two options exist:

1. Add 179 pounds additional fuel (the difference between 10,579 pounds and 10,400 pounds); or
2. Load to a Ramp Weight of 12,411 pounds (10,400 pounds plus 2011 pounds).

LANDING INFORMATION

The estimated Landing Weight is determined by subtracting the fuel required for the trip from the Ramp Weight.

Ramp Weight .... 12,590 pounds

Fuel Required for Total Trip .... 1694 pounds

Landing Weight (12,590 − 1694) .... 10,896 pounds

Enter the LANDING DISTANCE WITHOUT PROPELLER REVERSING - FLAPS 100% Graph at 32°C, 4731 feet, 10,896 pounds, and 4.7 knots headwind component:

Ground Roll .... 1850 feet

Total Over 50-foot Obstacle .... 3000 feet

Approach Speed .... 99 knots

Note: Example on graph is for 10,937 pounds landing weight.

Enter the CLIMB - BALKED LANDING Graph at 32°C, 4731 feet, 10,896 pounds, and 4.7 knots headwind component:

Rate of Climb .... 1450 feet per minute

Climb Gradient 12.8%

NOTE: Example on graph is for 10,937 pounds weight.

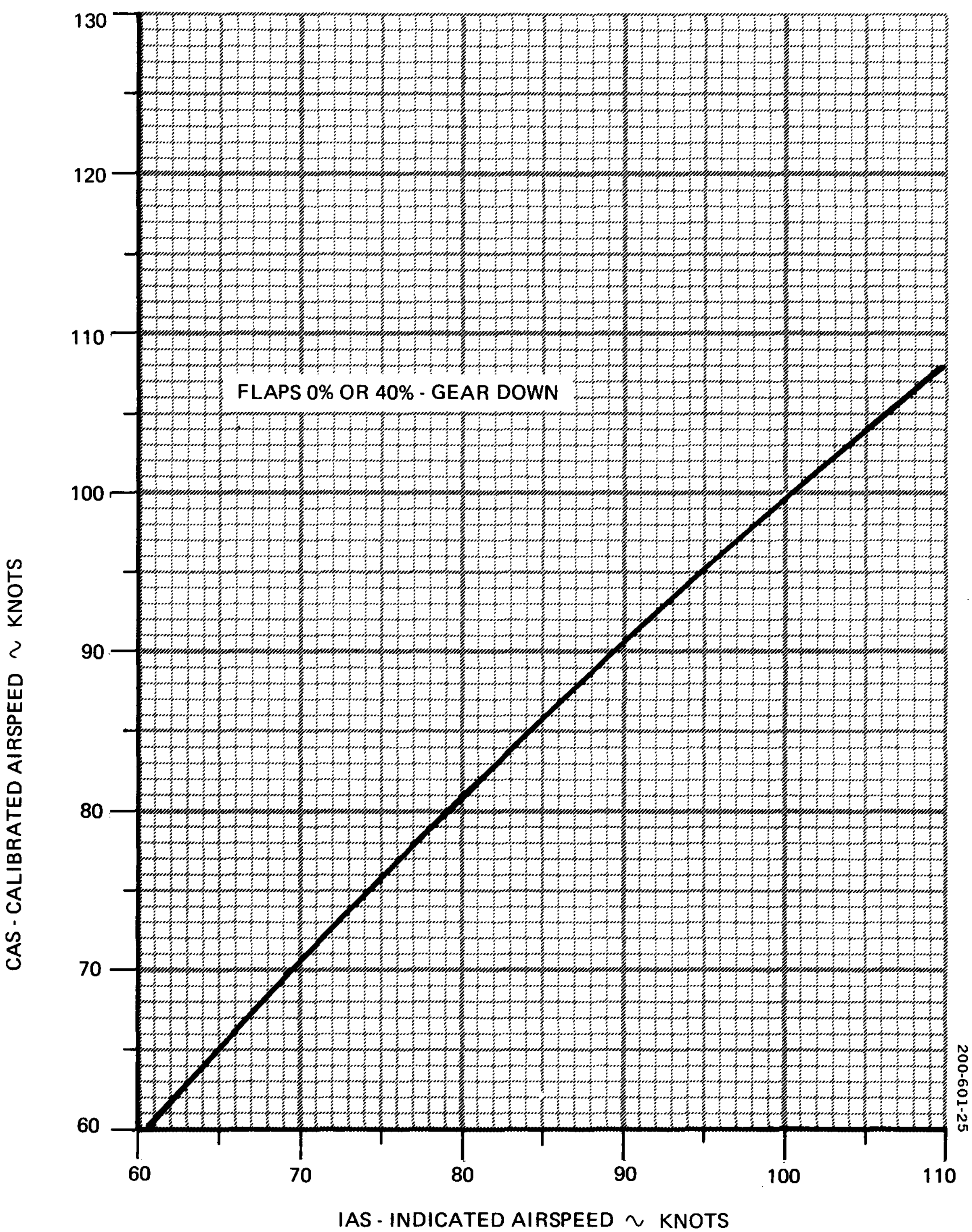
COMMENTS PERTINENT TO THE USE OF PERFORMANCE GRAPHS

1. In addition to presenting the answer for a particular set of conditions, the example on the graph also presents the order in which the various scales on the graph should be used. For instance, if the first item in the example is OAT, then enter the graph at the known OAT.
2. The reference lines indicate where to begin following guide lines. Always project to the reference line first, then follow the guide lines to the next known item.
3. The associated conditions define the specific conditions from which performance parameters have been determined. They are not intended to be used as instructions; however, performance values determined from charts can only be achieved if the specified conditions exist.
4. The full amount of usable fuel is available for all approved flight conditions.
5. Notes have been provided on various graphs and tables to approximate performance with ice vanes extended. The effect is estimated by either entering the graph at a temperature higher than the actual temperature, or adjusting the final results obtained from the graph by a fixed percentage. The effect is approximate and will vary, depending upon airspeed, temperature, altitude, and ambient conditions. At lower altitudes, where operation on the torque limit is possible, the effect of ice vane extension will be less, depending upon how much power can be recovered after the ice vanes have been extended.

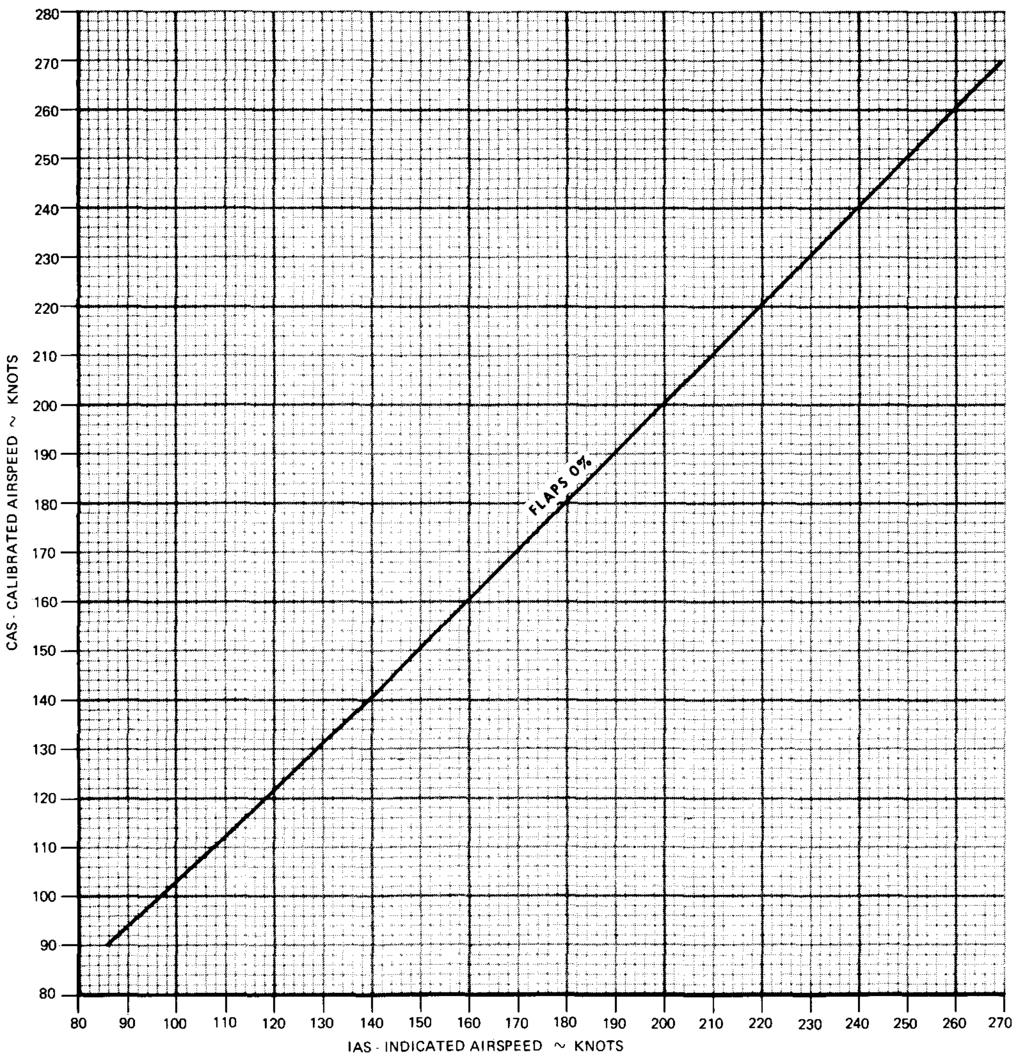
INTENTIONALLY LEFT BLANK

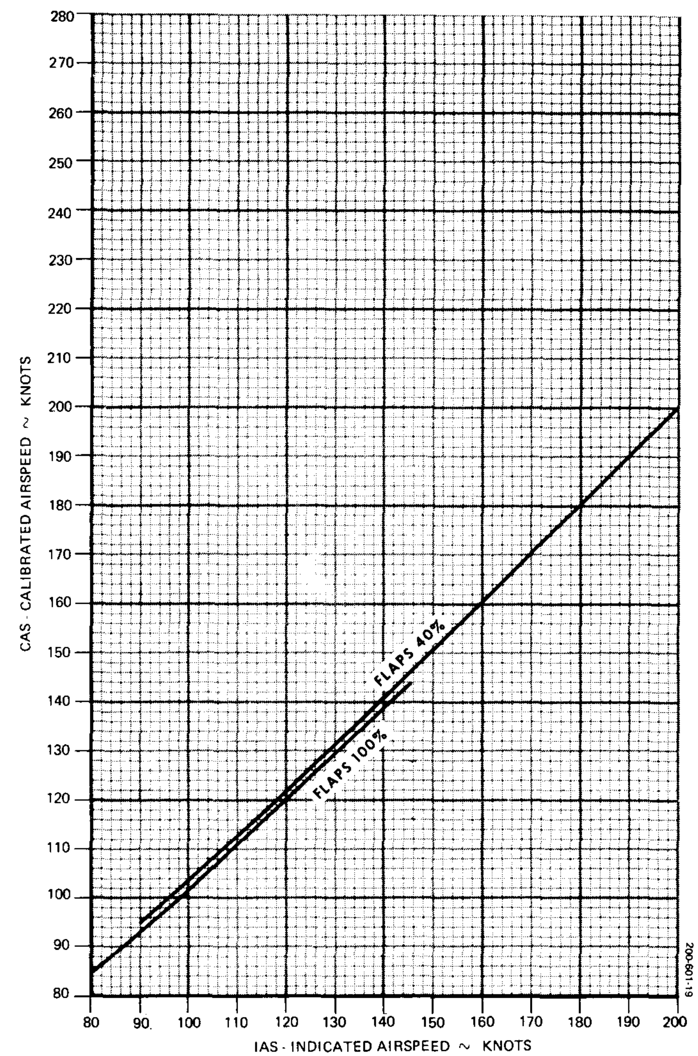
AIRSPEED CALIBRATION — NORMAL SYSTEM

TAKE-OFF GROUND ROLL

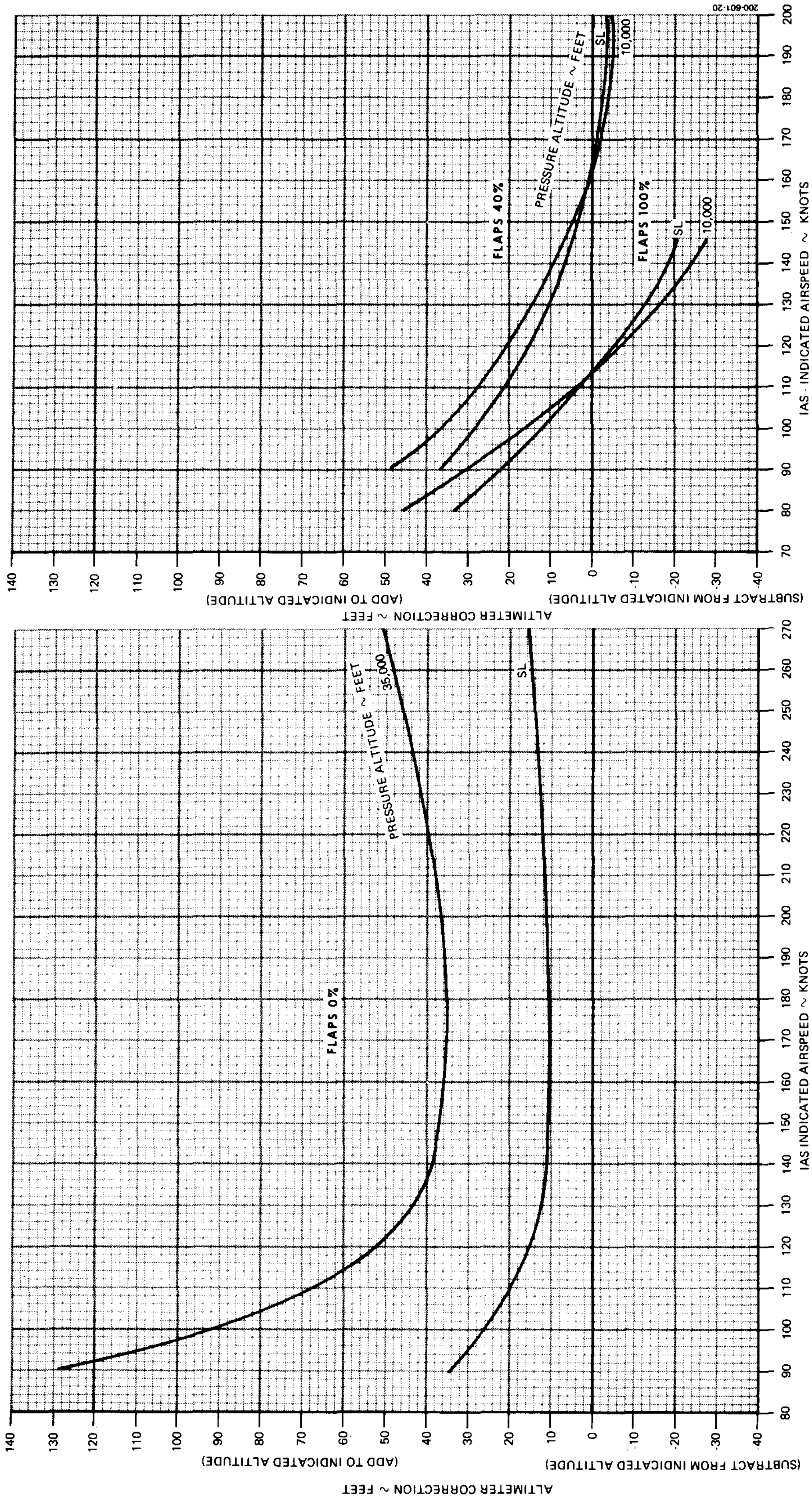


AIRSPEED CALIBRATION — NORMAL SYSTEM



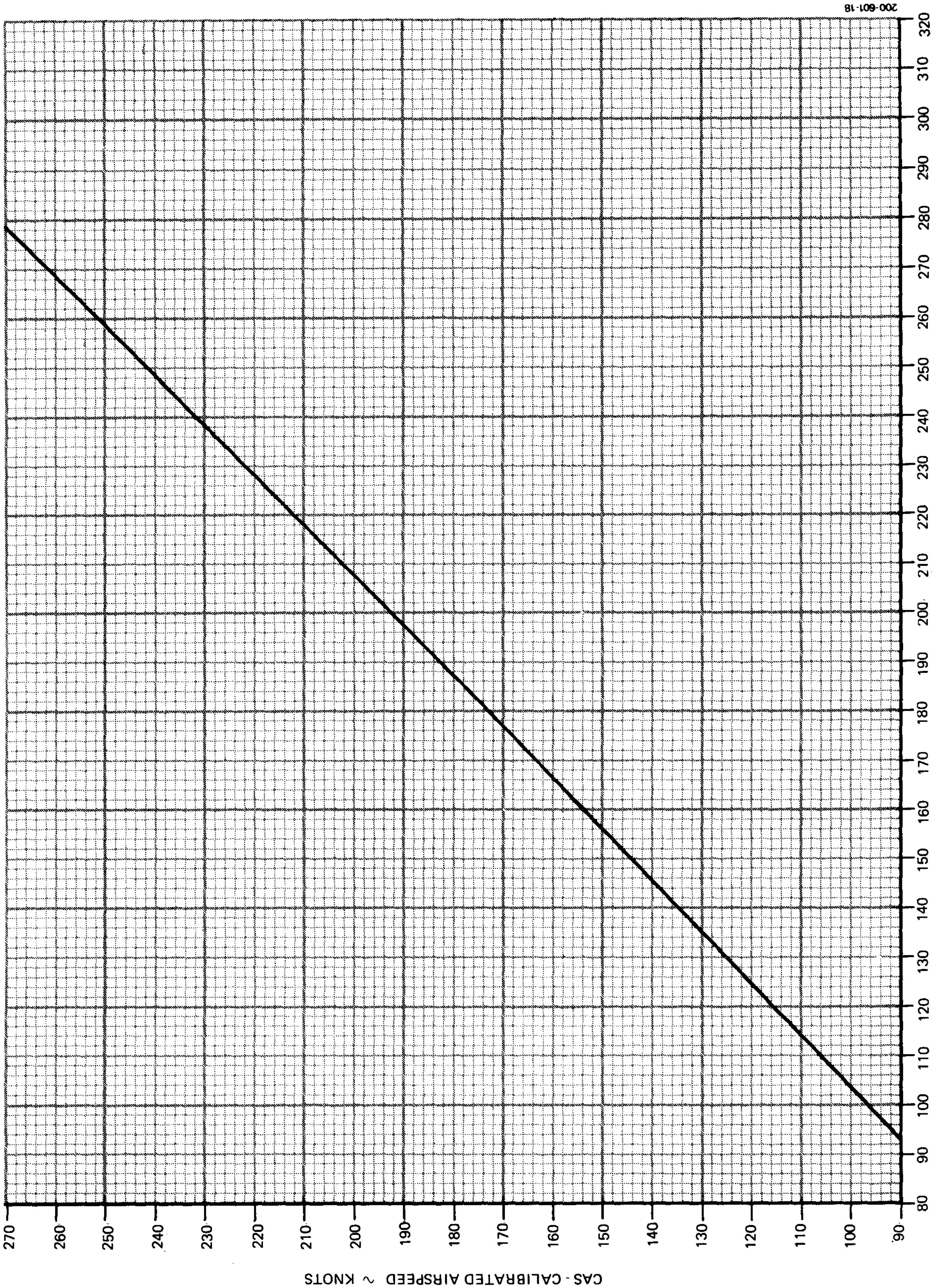


ALTIMETER CORRECTION — NORMAL SYSTEM



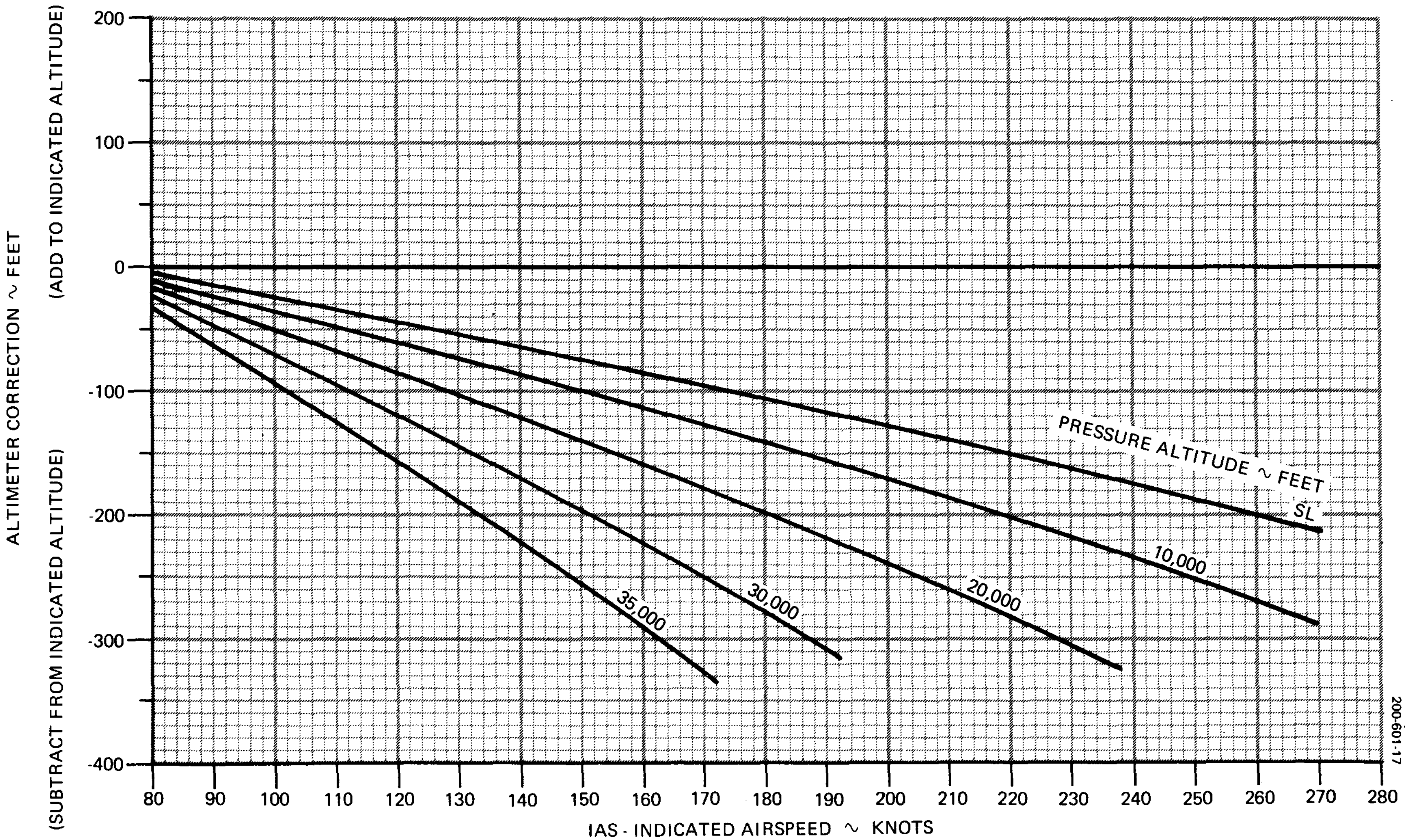
AIRSPEED CALIBRATION — ALTERNATE SYSTEM

APPLICABLE FOR ALL FLAP POSITIONS



ALTIMETER CORRECTION — ALTERNATE SYSTEM

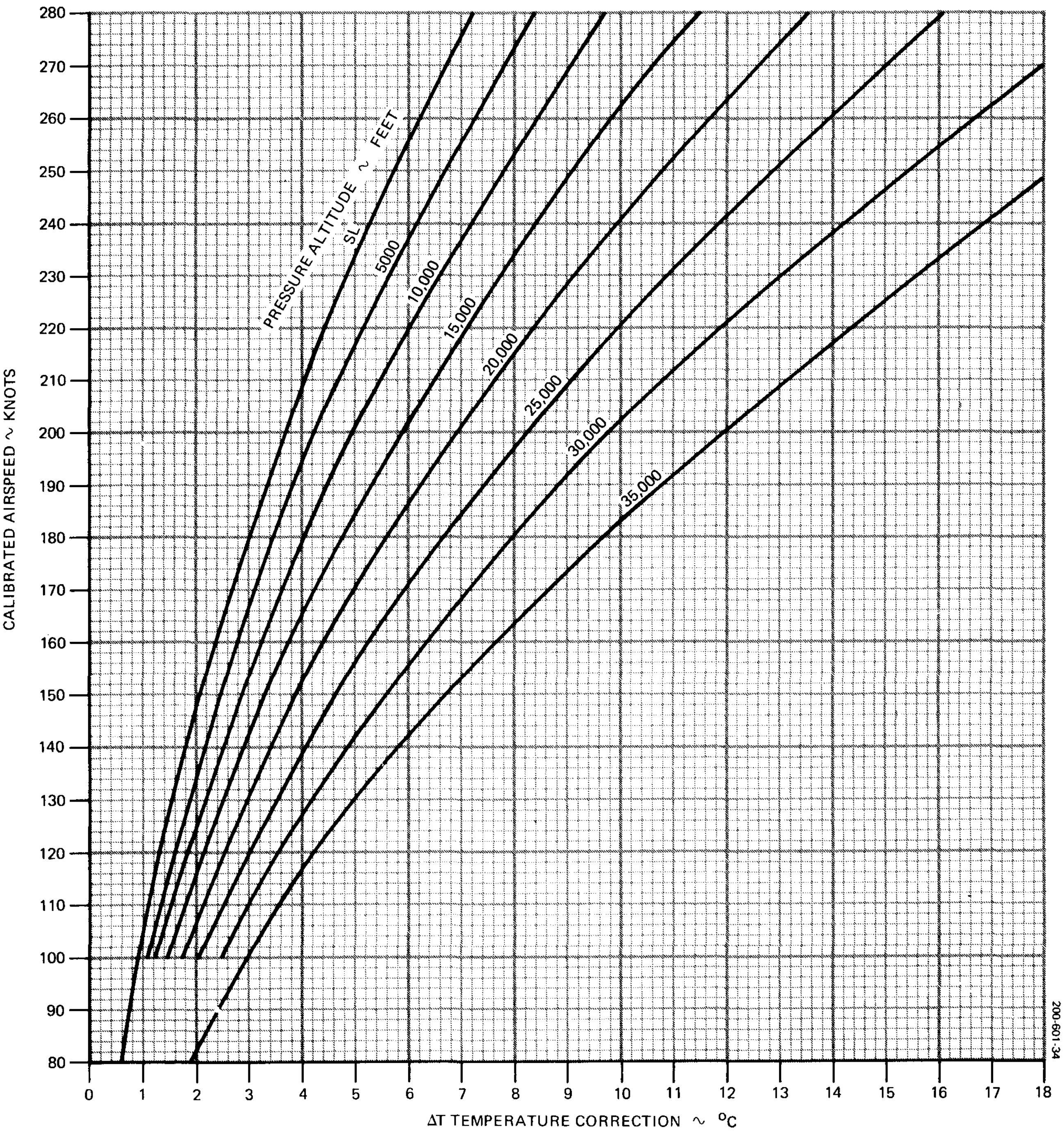
APPLICABLE FOR ALL FLAP POSITIONS



INDICATED OUTSIDE AIR TEMPERATURE CORRECTION

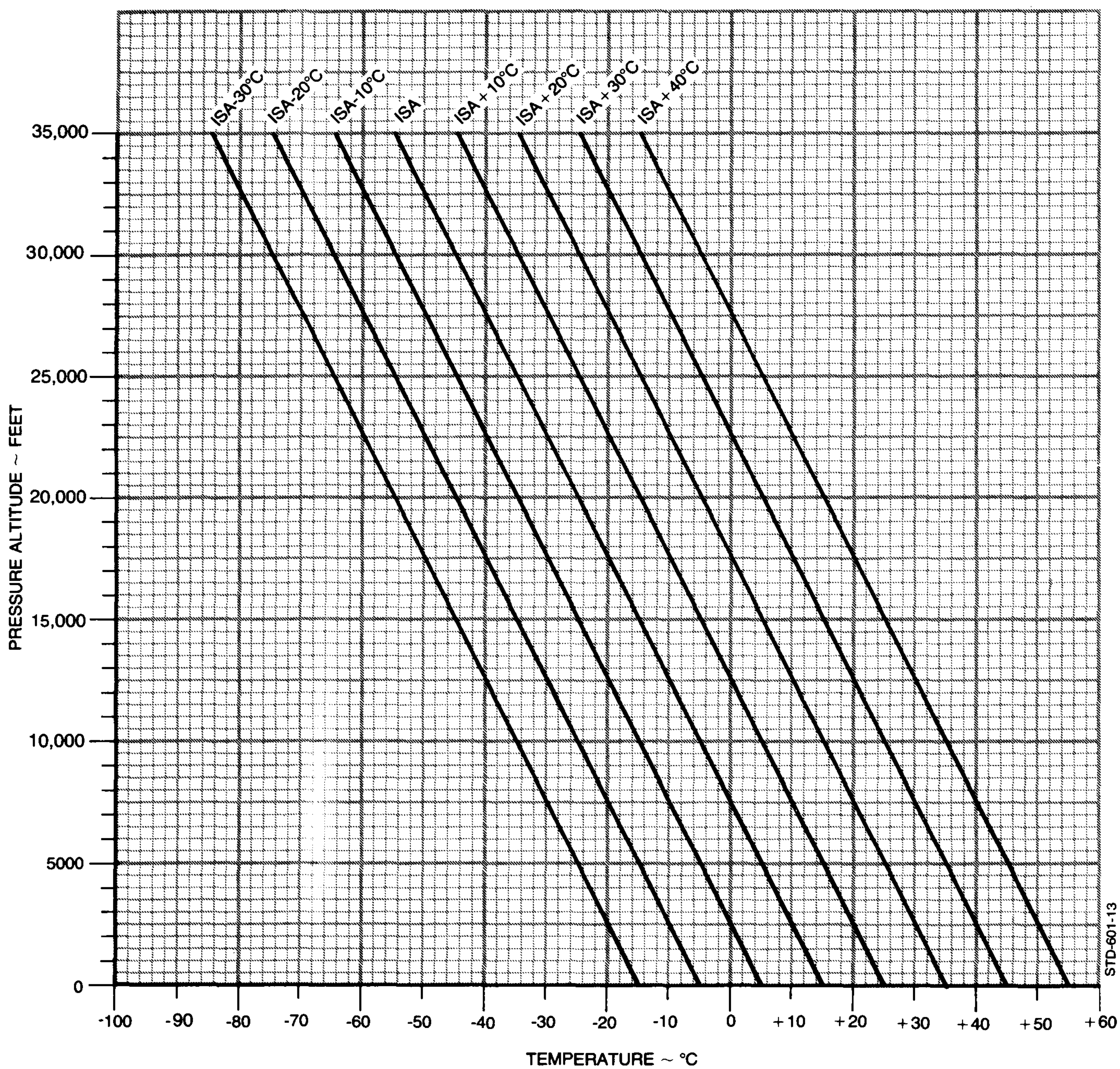
STANDARD DAY (ISA)

NOTE: SUBTRACT ΔT FROM INDICATED (GAGE) OAT TO OBTAIN TRUE OAT. (ΔT ASSUMES A RECOVERY FACTOR OF 0.7)

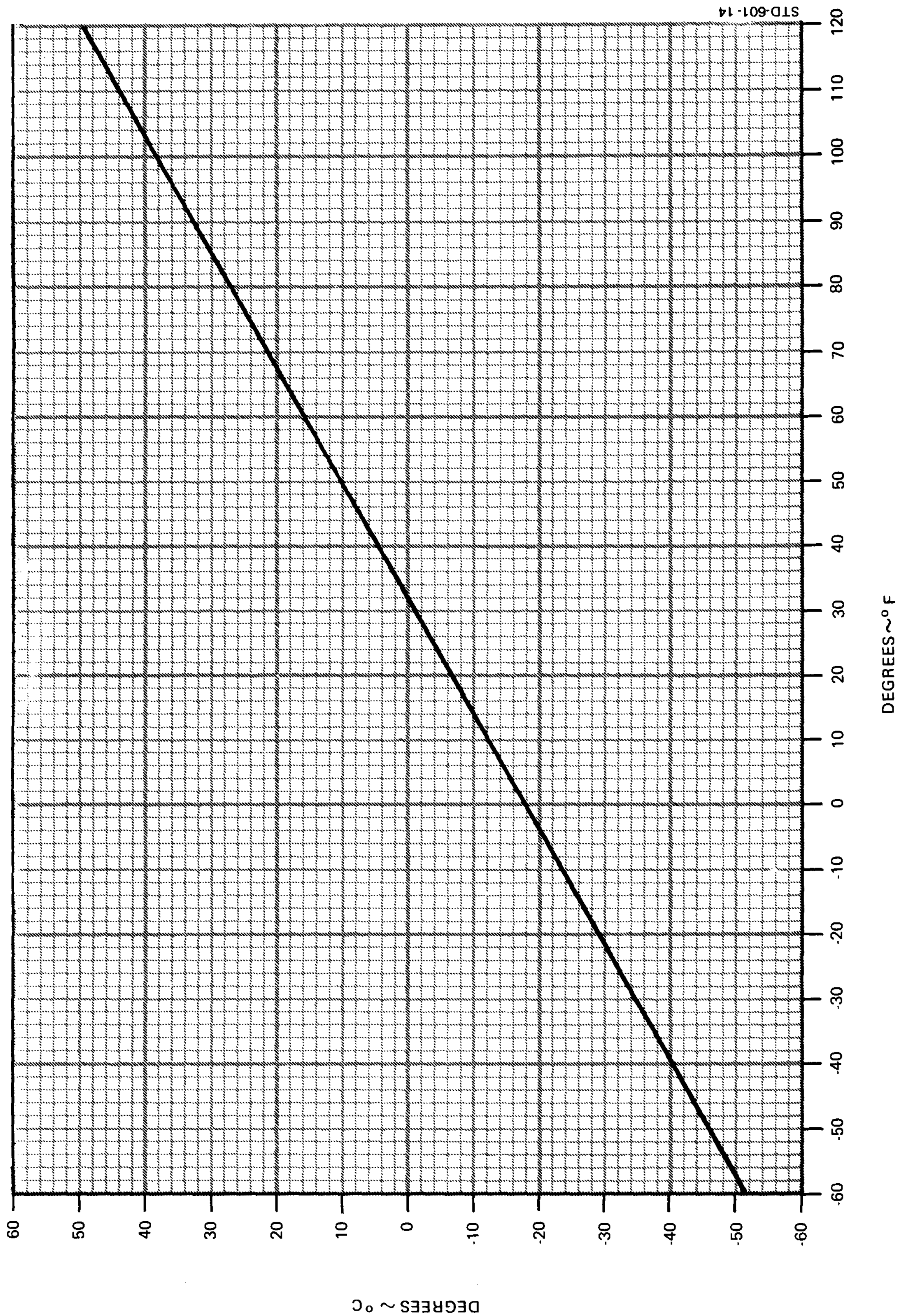


ISA CONVERSION

PRESSURE ALTITUDE vs OUTSIDE AIR TEMPERATURE



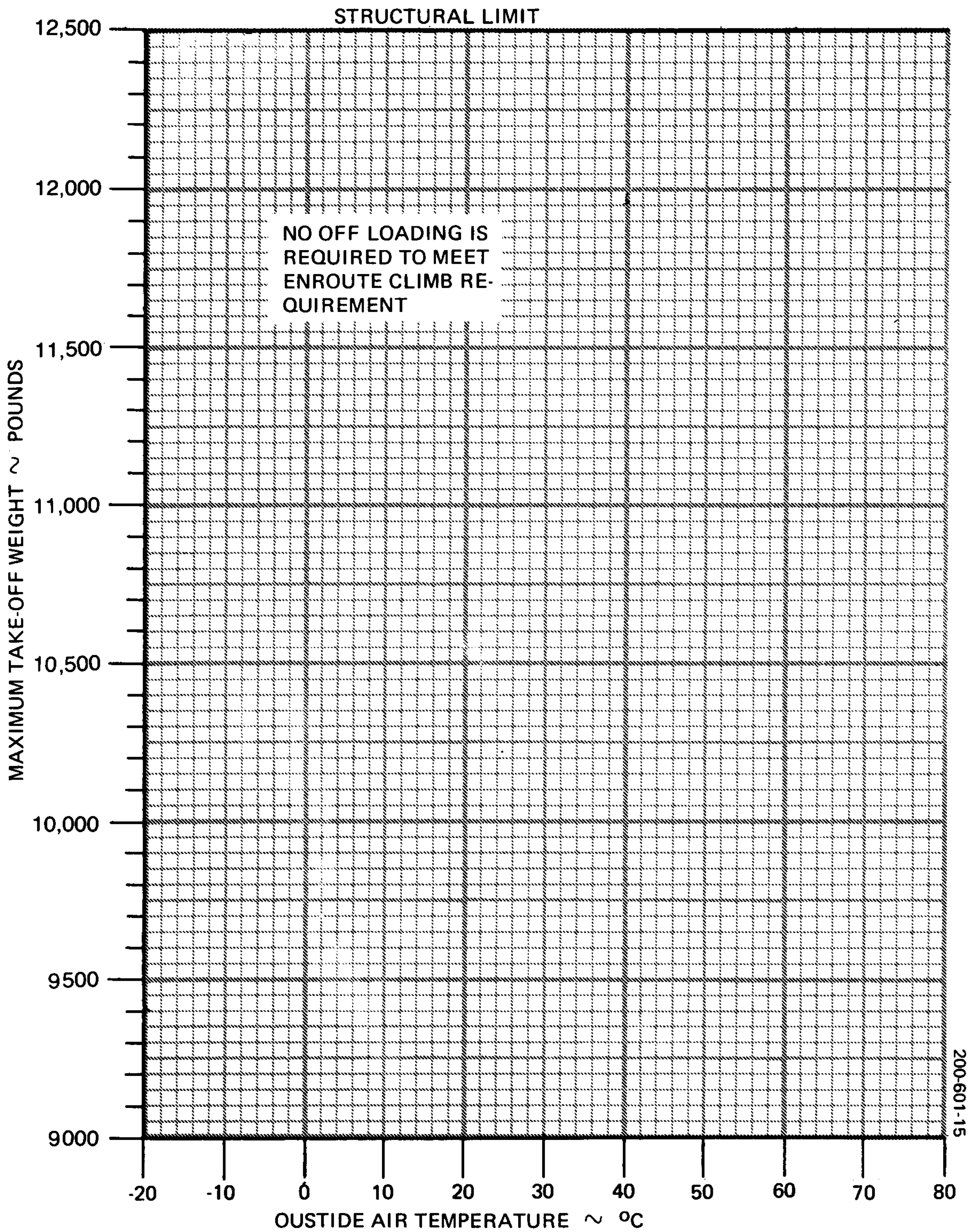
FAHRENHEIT TO CELSIUS TEMPERATURE CONVERSION



MAXIMUM TAKE-OFF WEIGHT

PERMITTED BY ENROUTE CLIMB REQUIREMENT

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, NO OFF LOADING IS REQUIRED.



TAKE-OFF WEIGHT—FLAPS 0%

TO ACHIEVE POSITIVE ONE-ENGINE-INOPERATIVE RATE-OF-CLIMB AT LIFT-OFF

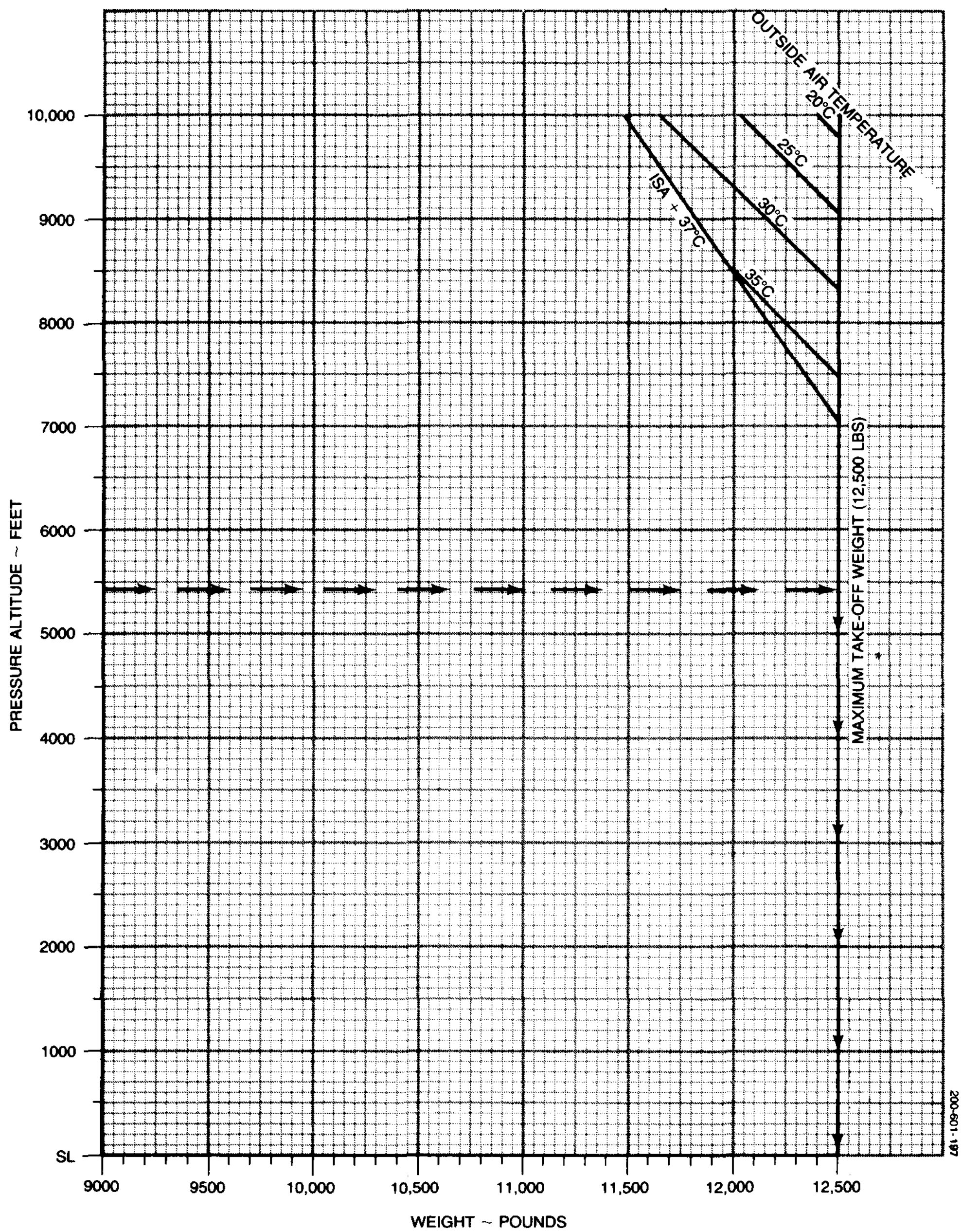
ASSOCIATED CONDITIONS:

POWER	TAKE-OFF
FLAPS	UP (0%)
LANDING GEAR	DOWN

EXAMPLE:

PRESSURE ALTITUDE	5430 FT
OAT	28°C
TAKE-OFF WEIGHT	12,500 LBS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, NO OFF-LOADING IS REQUIRED.



TAKE-OFF WEIGHT — FLAPS 40%

TO ACHIEVE POSITIVE ONE-ENGINE INOPERATIVE RATE OF CLIMB AT LIFT-OFF

ASSOCIATED CONDITIONS:

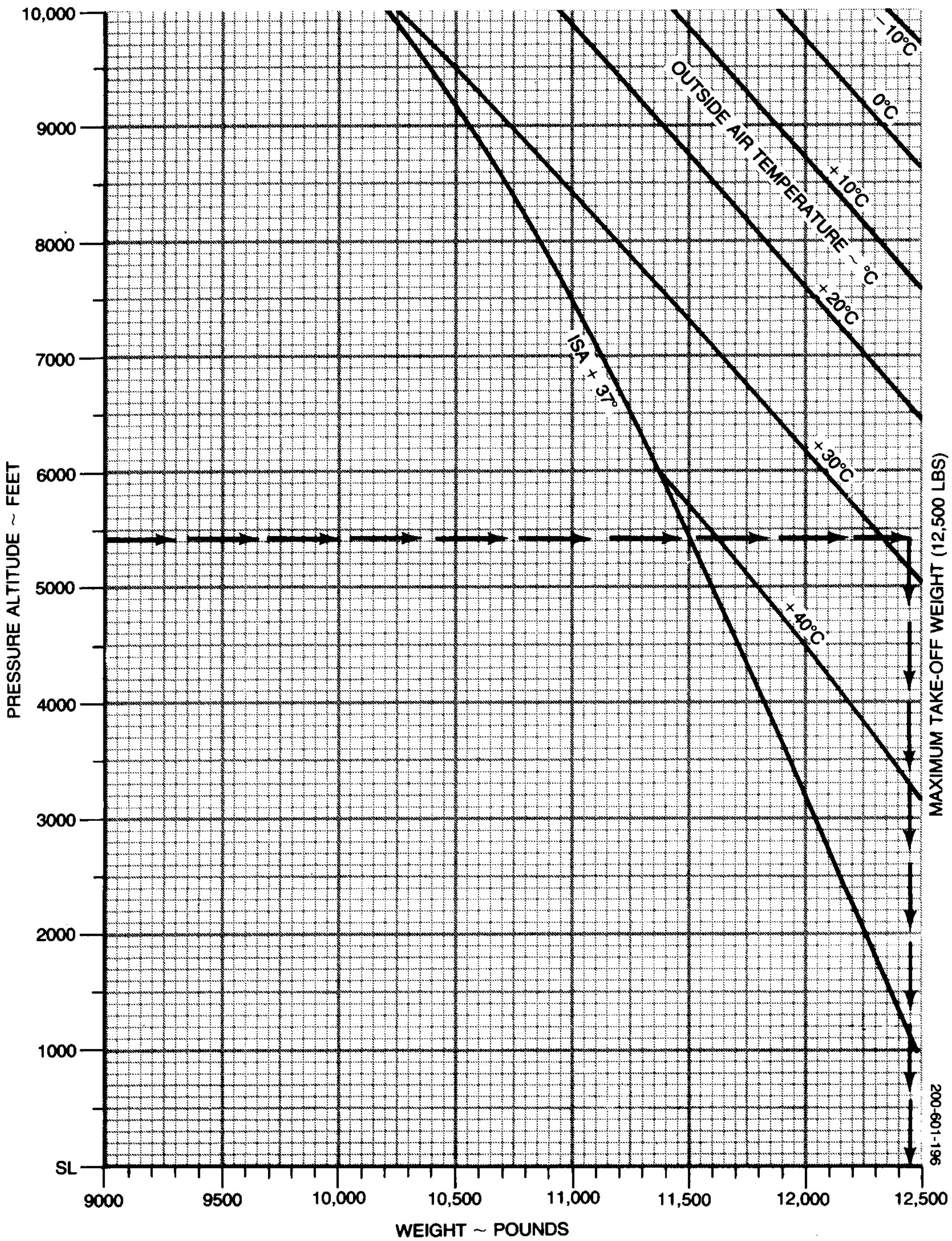
POWER .... TAKE-OFF
FLAPS 40%
LANDING GEAR .... DOWN

EXAMPLE:

PRESSURE ALTITUDE .... 5430 FT
OAT .... 28°C

TAKE-OFF WEIGHT .... 12,450 LBS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10°C TO THE ACTUAL OAT BEFORE ENTERING THE GRAPH.



MAXIMUM ENROUTE WEIGHT

(FAR PART 135 OPERATIONS)

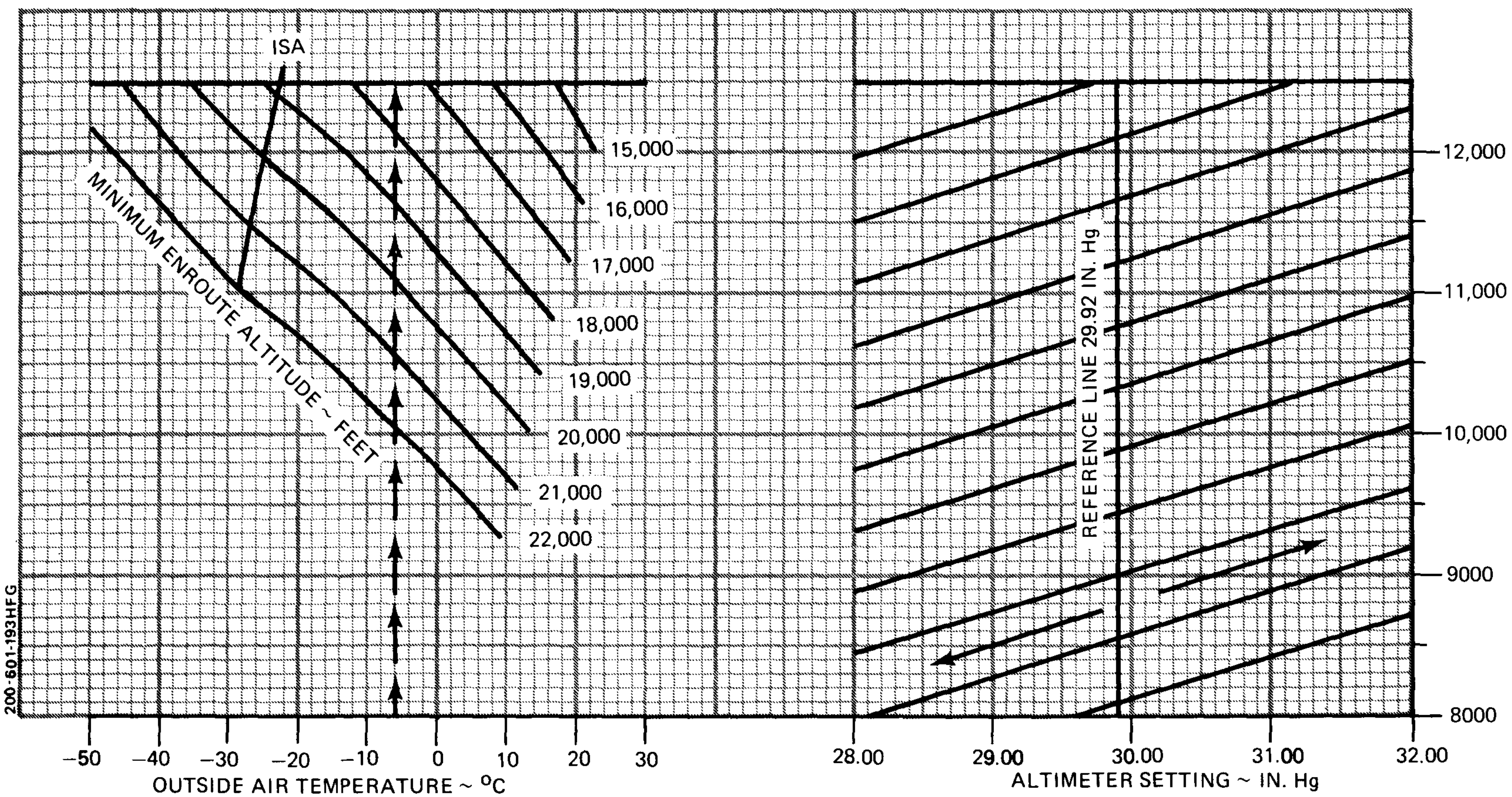
ASSOCIATED CONDITIONS:

POWER	MAXIMUM CONTINUOUS
FLAPS	0%
LANDING GEAR	UP
INOPERATIVE PROPELLER	FEATHERED

EXAMPLE:

OAT	$-6^{o}C$
MINIMUM ENROUTE ALTITUDE	16,000 FEET
ALTIMETER SETTING	29.82 IN. Hg
MAXIMUM ALLOWABLE WEIGHT	12,500 LBS

NOTE: PER FAR 135.145, OPERATIONS OVER THE TOP OR IN IFR CONDITIONS REQUIRE THAT THE AIRPLANE BE CAPABLE OF CLIMBING 50 FT/MIN AT THE MEAs OF THE PROPOSED ROUTE OR 5000 FEET MSL, WHICHEVER IS HIGHER.



INTENTIONALLY LEFT BLANK

TAKE-OFF WEIGHT – FLAPS 0%
TO MEET FAR 25 TAKE-OFF CLIMB REQUIREMENTS

ASSOCIATED CONDITIONS:

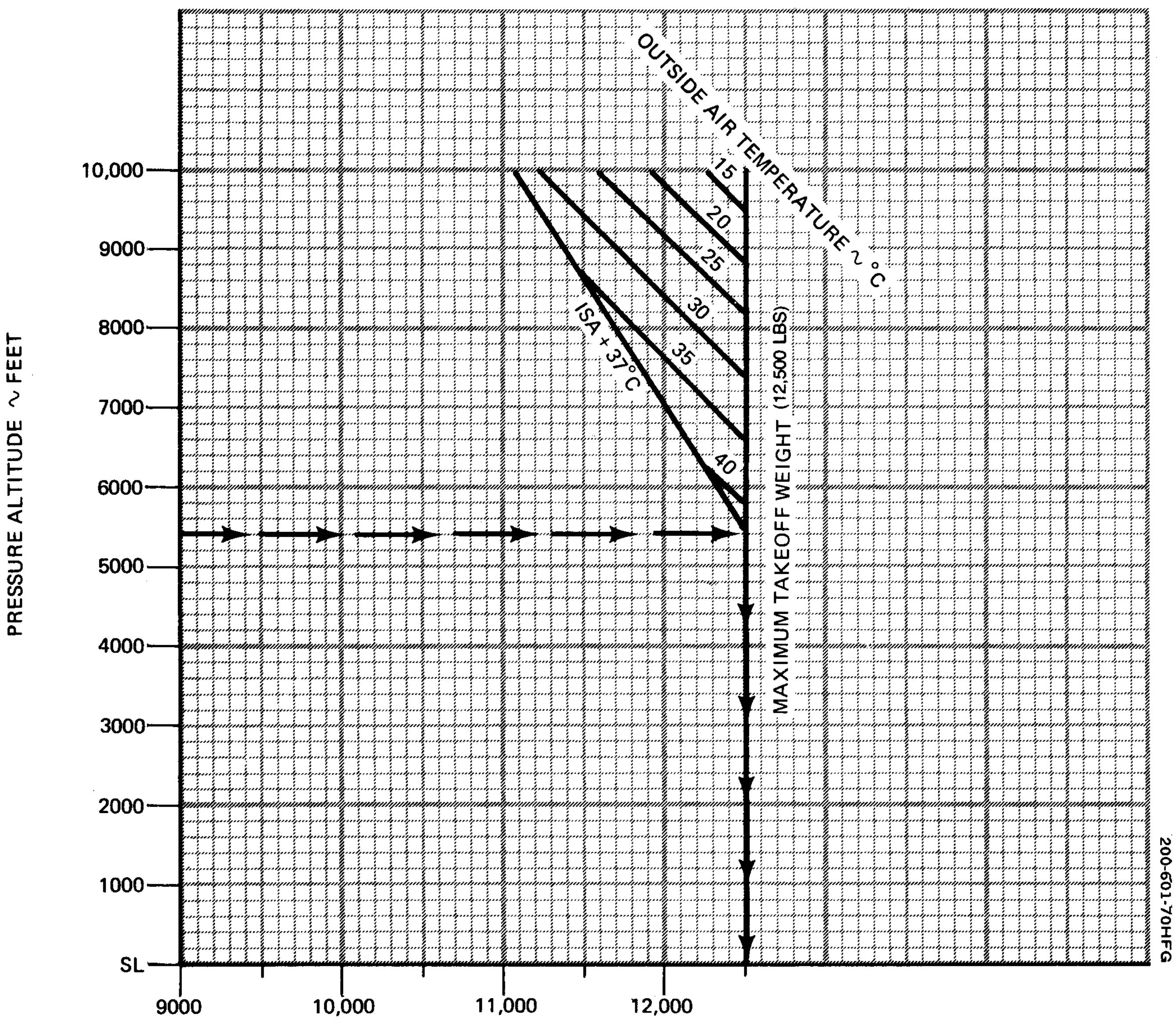
AIRPLANE . . . . . . AIRBORNE
POWER . . . . TAKE-OFF
FLAPS . . . . UP
INOPERATIVE
PROPELLER . . . FEATHERED

EXAMPLE:

PRESSURE ALTITUDE. .5430 FEET
OAT. . . . . 28°C

TAKE-OFF WEIGHT. . . .12,500 LBS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, NO OFF LOADING IS REQUIRED.



TAKE-OFF WEIGHT — FLAPS 40%

TO MEET FAR 25 TAKE-OFF CLIMB REQUIREMENTS

ASSOCIATED CONDITIONS:

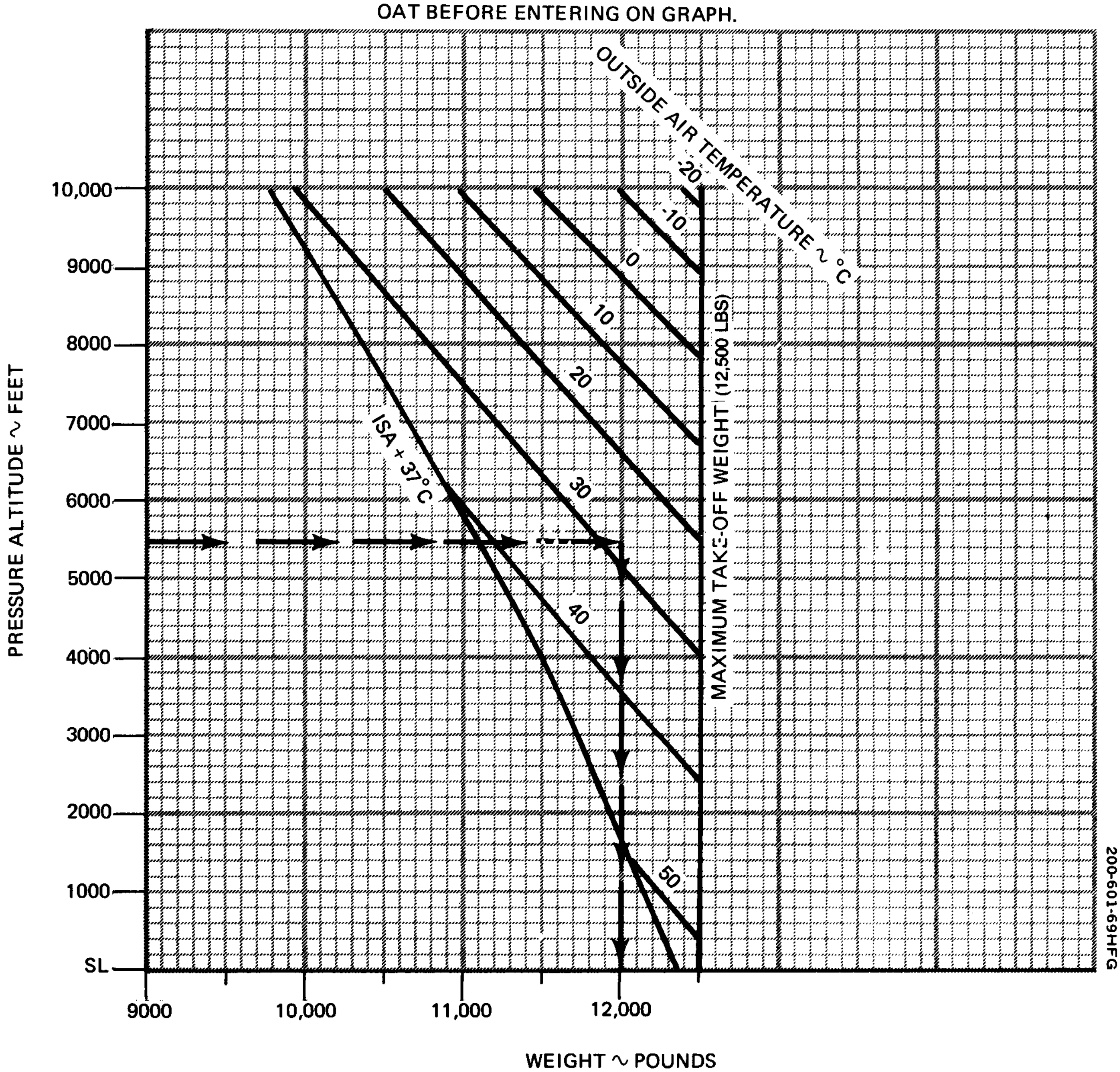
AIRPLANE . . . . . . AIRBORNE
POWER . . . . TAKE-OFF
FLAPS 40%
INOPERATIVE
PROPELLER . . . FEATHERED

EXAMPLE:

PRESSURE ALTITUDE . . 5430 FEET
OAT . . . . 28°C

TAKE-OFF WEIGHT . . . 12,000 LBS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10°C TO ACTUAL OAT BEFORE ENTERING ON GRAPH.



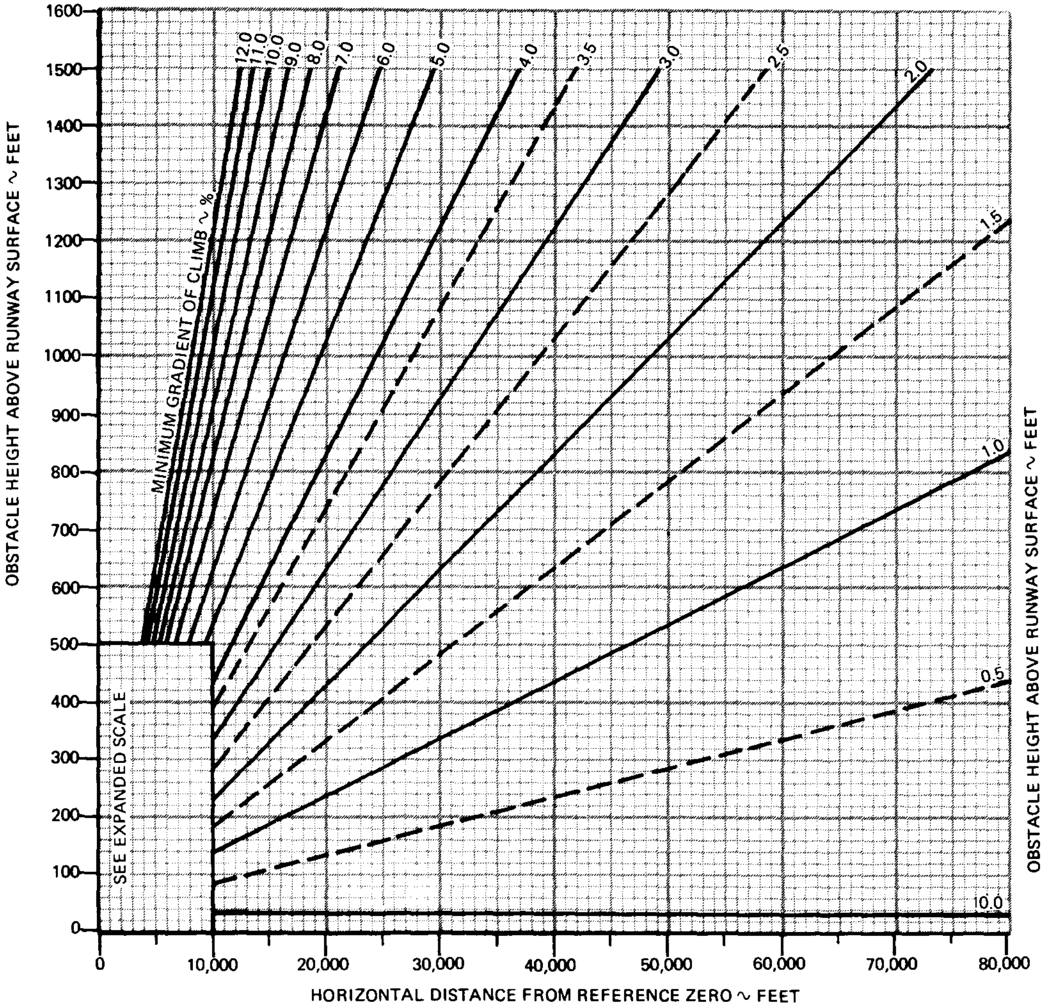
TAKE - OFF FLIGHT PATH

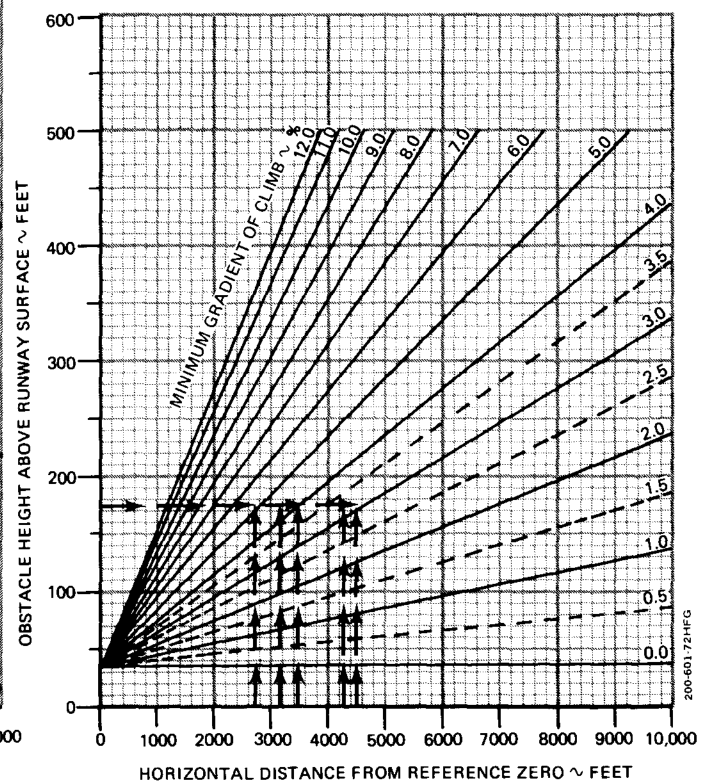
REFERENCE ZERO: THE POINT AT THE END OF THE TAKE-OFF RUN AT WHICH THE AIRPLANE IS 35 FEET ABOVE THE RUNWAY SURFACE.

EXAMPLE:

OBSTACLE HEIGHT . . . . . 175 FEET

HORIZONTAL DISTANCE FROM REFERENCE ZERO ~ FEET	MINIMUM GRADIENT OF CLIMB ~ %
2700	5.2
3436	4.0
4486	3.1
3186	4.5
4236	3.3





STALL SPEEDS – POWER IDLE

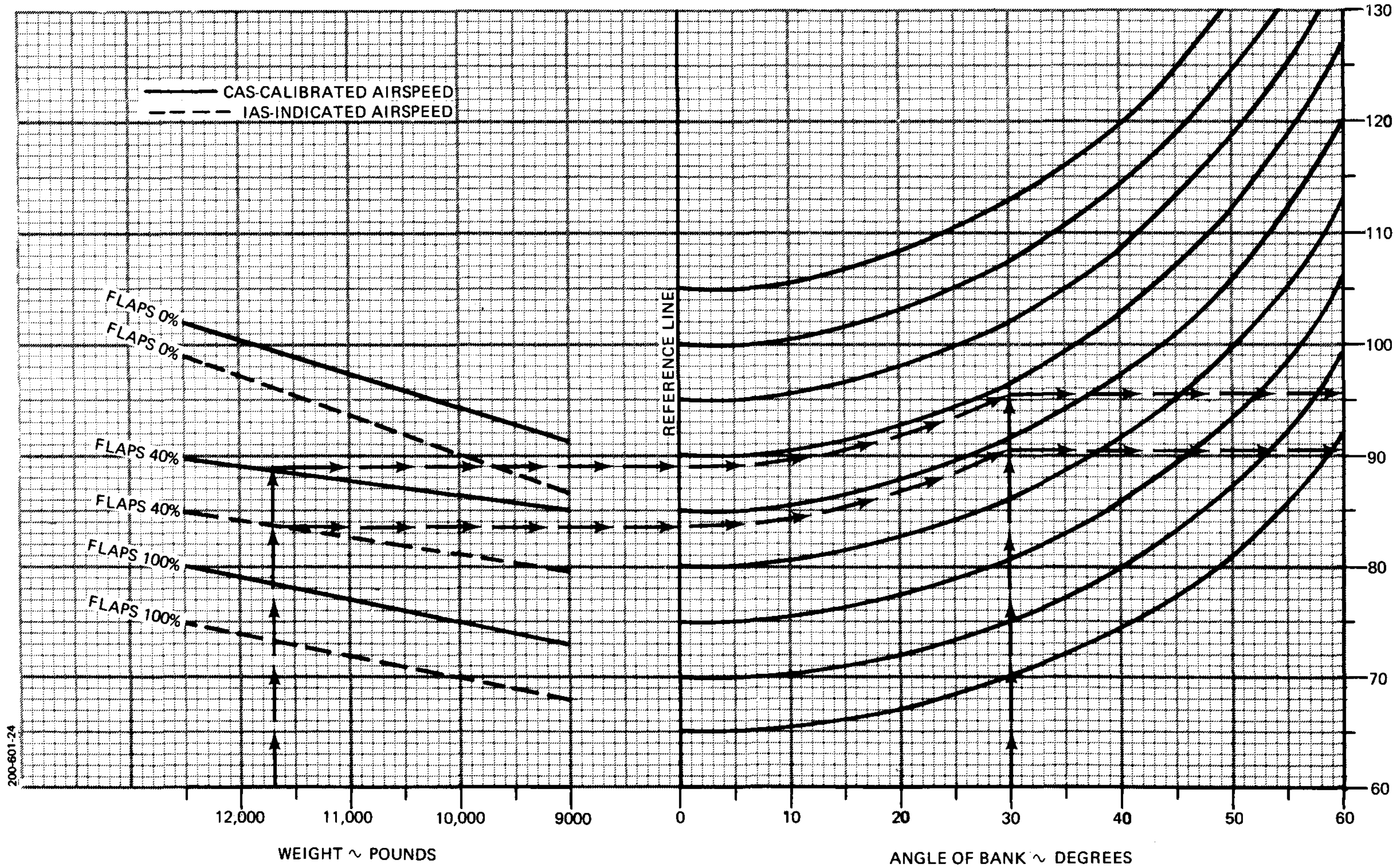
NOTES:

1. ALTITUDE LOSS EXPERIENCED WHILE CONDUCTING STALLS IN ACCORDANCE WITH FAR 23.201 WAS 800 FEET.
2. MAXIMUM NOSE DOWN PITCH ATTITUDE AND ALTITUDE LOSS DURING RECOVERY FROM ONE-ENGINE-INOPERATIVE STALLS PER FAR 23.205 ARE APPROXIMATELY 8° AND 300 FEET RESPECTIVELY.
3. A NORMAL STALL RECOVERY TECHNIQUE MAY BE USED. THE BEST PROCEDURE IS A BRISK FORWARD WHEEL MOVEMENT TO A NOSE DOWN ATTITUDE. LEVEL THE AIRPLANE AFTER AIRSPEED HAS INCREASED APPROXIMATELY 25 KNOTS ABOVE STALL.
4. LANDING GEAR POSITION HAS NO EFFECT ON STALL SPEED.

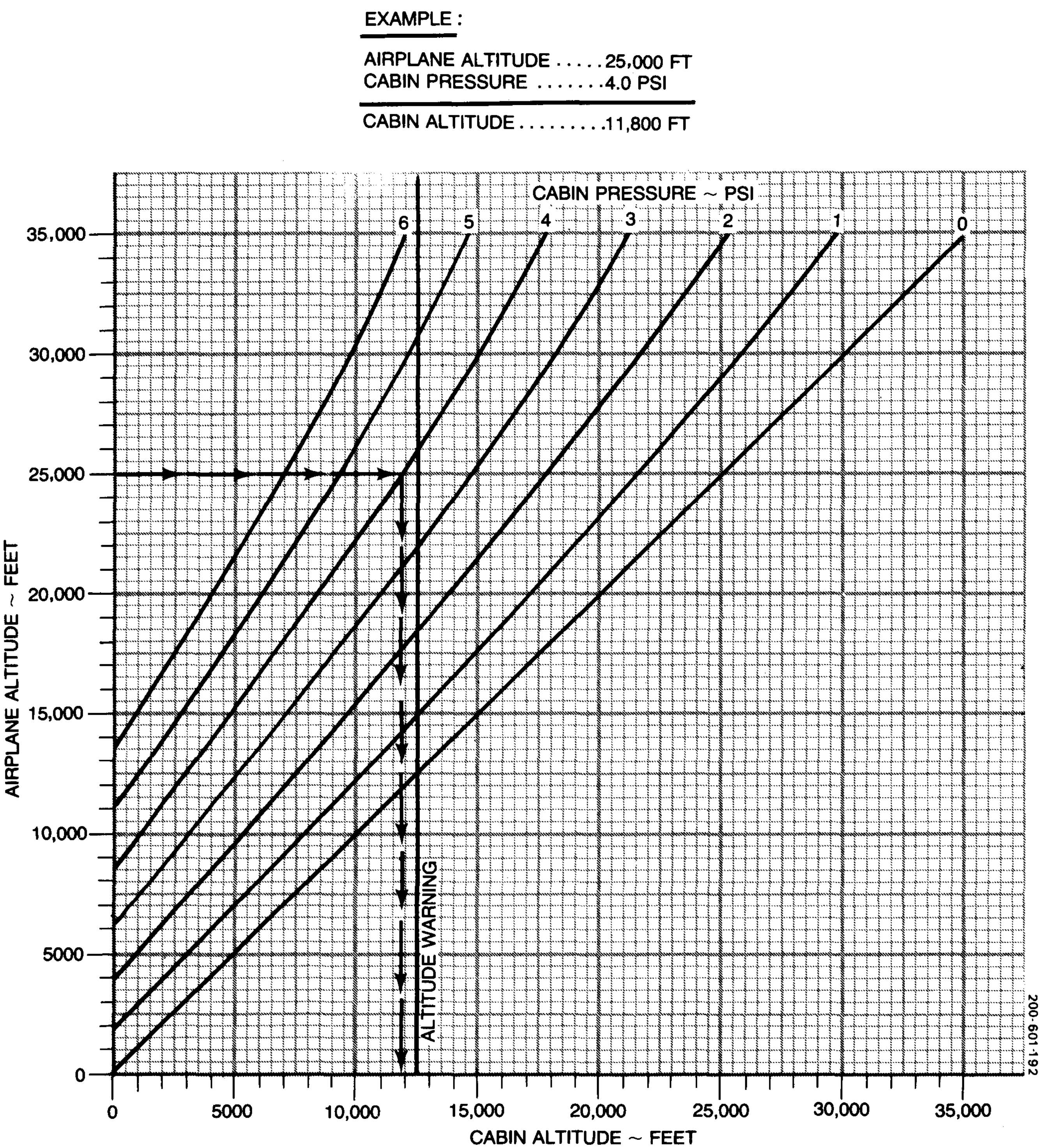
EXAMPLE:

WEIGHT . . . . 11,700 LBS
FLAPS 40%
ANGLE OF BANK . . . . . 30 DEG.

STALL SPEED . . . . 96 KTS CAS
90 KTS IAS

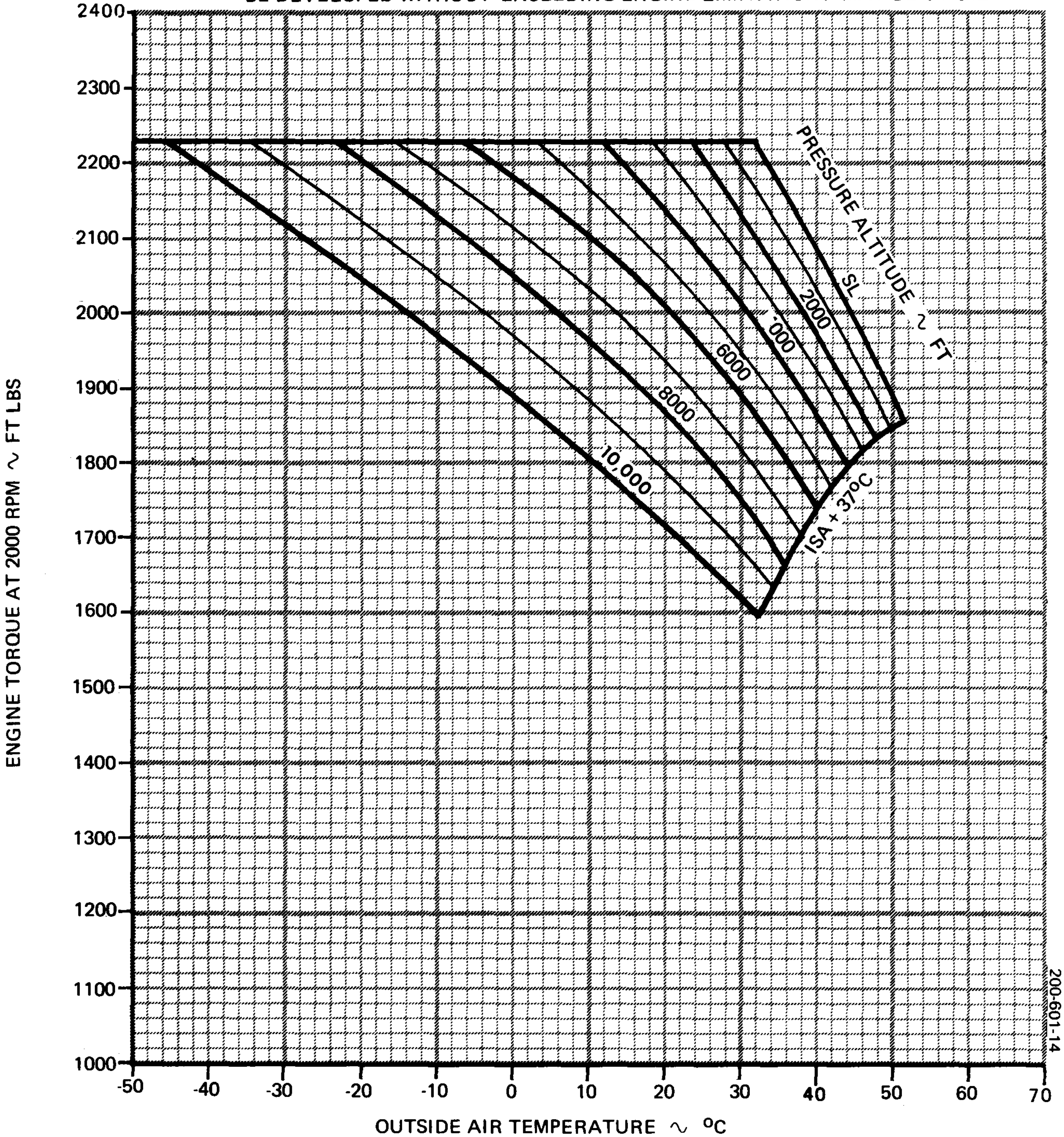


CABIN ALTITUDE FOR VARIOUS AIRPLANE ALTITUDES



MINIMUM TAKE-OFF POWER AT 2000 RPM
WITH ICE VANES RETRACTED
(65 KNOTS)

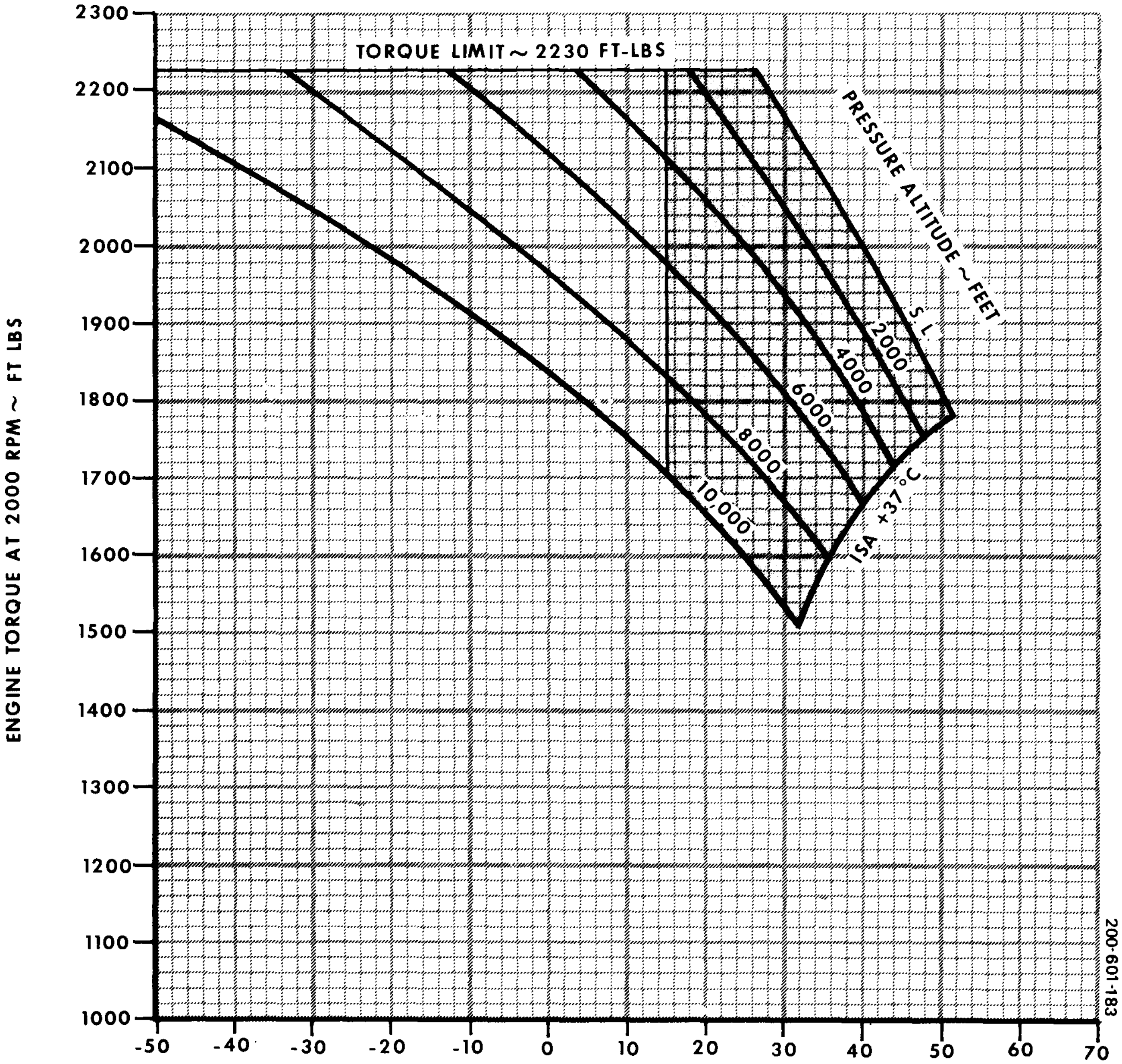
NOTES: 1. TORQUE INCREASES APPROXIMATELY 20 FT-LBS FROM ZERO TO 65 KNOTS.
2. THE POWER (TORQUE) INDICATED IS THE MINIMUM VALUE FOR WHICH TAKE-OFF PERFORMANCE IN THIS SECTION CAN BE OBTAINED. EXCESS POWER WHICH CAN BE DEVELOPED WITHOUT EXCEEDING ENGINE LIMITATIONS MAY BE UTILIZED.



MINIMUM TAKE-OFF POWER
WITH ICE VANES EXTENDED
(65 KNOTS)

NOTES:

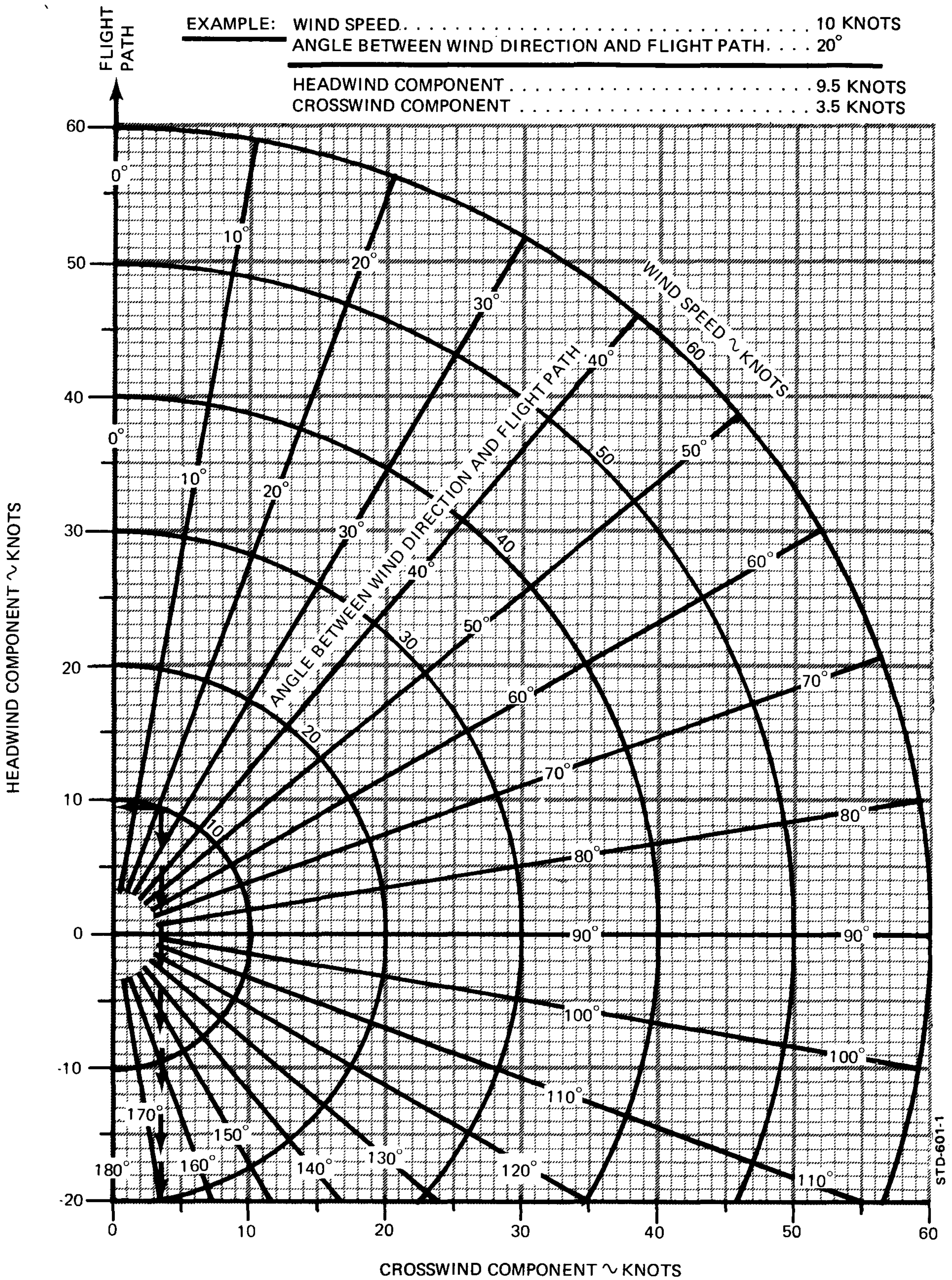
1. TORQUE INCREASES APPROXIMATELY 20 FT-LBS FROM ZERO TO 65 KNOTS.
2. THE POWER (TORQUE) INDICATED IS THE MINIMUM VALUE FOR WHICH TAKE-OFF PERFORMANCE WITH EXTENDED ICE VANES CAN BE OBTAINED. EXCESS POWER WHICH CAN BE DEVELOPED WITHOUT EXCEEDING ENGINE LIMITATIONS MAY BE UTILIZED.
3. TAKE-OFF WITH VANES EXTENDED IS PROHIBITED IN SHADED AREA.



WIND COMPONENTS

EXAMPLE:

WIND SPEED	10 KNOTS
ANGLE BETWEEN WIND DIRECTION AND FLIGHT PATH	20°
HEADWIND COMPONENT	9.5 KNOTS
CROSSWIND COMPONENT	3.5 KNOTS



TAKE-OFF DISTANCE — FLAPS 0%

ASSOCIATED CONDITIONS:

POWER............TAKE-OFF POWER SET BEFORE BRAKE RELEASE
FLAPS............0%
LANDING GEAR....RETRACT AFTER LIFT-OFF
RUNWAY...........PAVED, LEVEL, DRY SURFACE

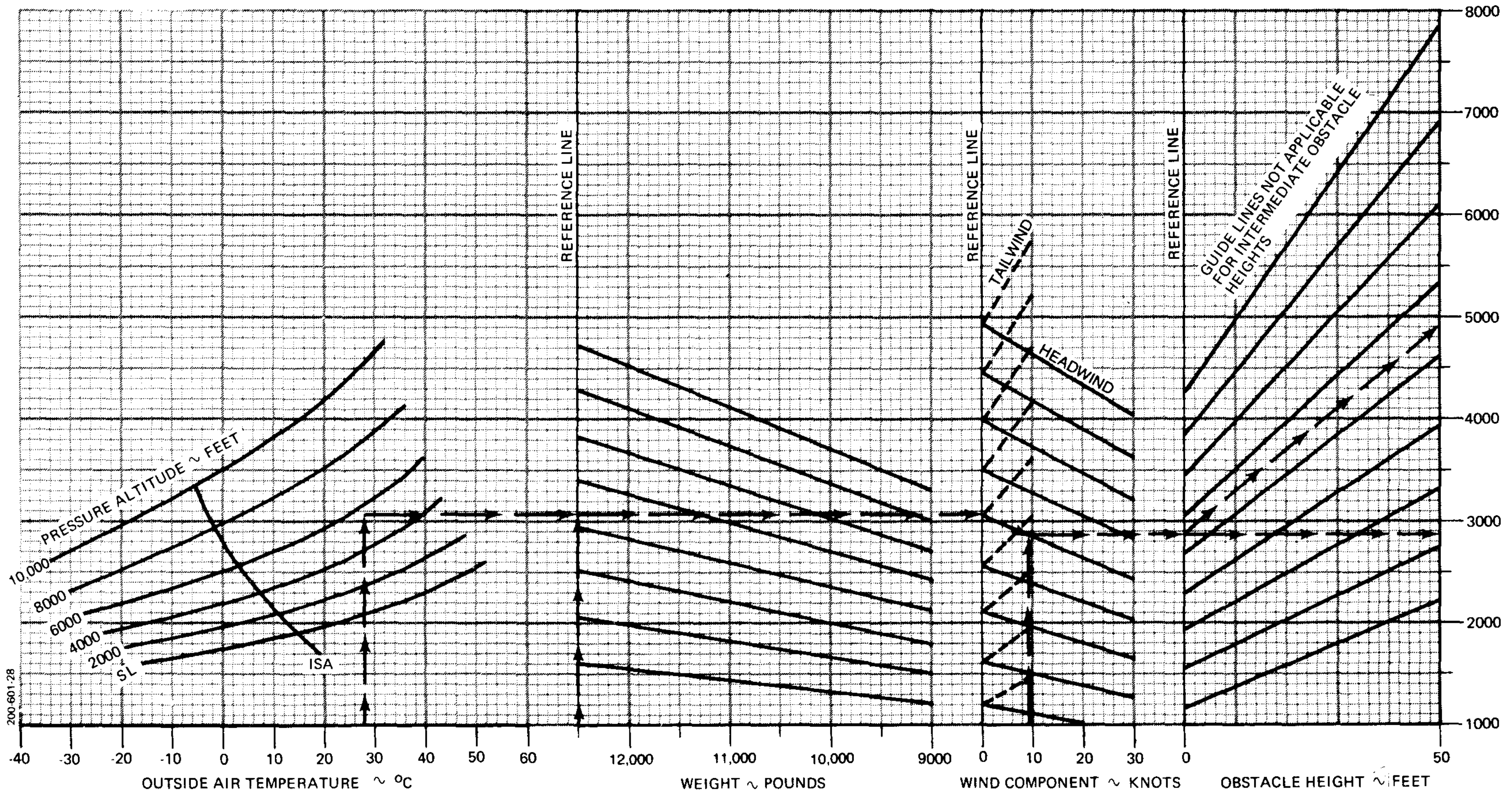
WEIGHT ~ POUNDS	TAKE-OFF SPEED ~ KNOTS	
	ROTATION	50 FT
12,500	95	121
12,000	95	119
11,000	95	115
10,000	95	111
9000	95	108

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10° C TO THE ACTUAL OAT BEFORE EXTERING GRAPH.

EXAMPLE:

OAT.......................................28°C
PRESSURE ALTITUDE..............5430 FT
TAKE-OFF WEIGHT .... 12,500 LBS
HEADWIND COMPONENT .... 9.5 KTS

GROUND ROLL.......................2870 FT
TOTAL DISTANCE OVER 50 FT OBSTACLE............4900 FT
TAKE-OFF SPEED AT ROTATION....95 KTS
AT 50 FT.........121 KTS



High Flotation Gear

FAA Approved
Revised: October, 1978
P/N 101-590010-59

BEECHCRAFT
Super King Air 200

ACCELERATE – STOP – FLAPS 0%

ASSOCIATED CONDITIONS:

POWER . . . . . 1. TAKE–OFF POWER SET BEFORE BRAKE RELEASE
2. BOTH ENGINES IDLE AT V_1 SPEED AND REVERSE OPERATING ENGINE
FLAPS 0%
AUTOFEATHER . ARMED
BRAKING . . . . MAXIMUM
RUNWAY . . . . PAVED, LEVEL, DRY SURFACE

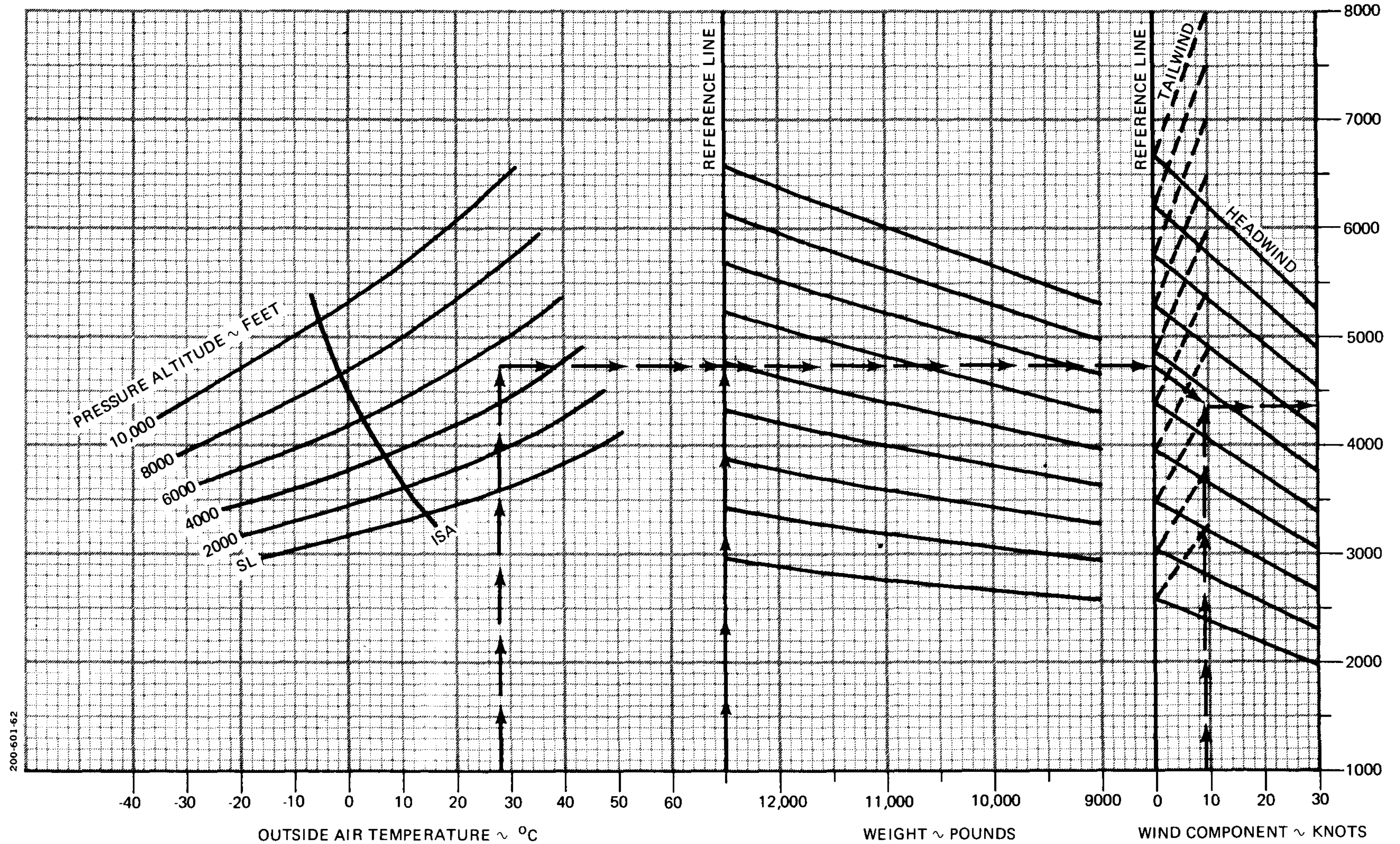
WEIGHT ~ POUNDS	V_1 ~ KNOTS
12,500	95
12,000	95
11,000	95
10,000	95
9000	95

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, PERFORMANCE IS NOT AFFECTED.

EXAMPLE:

OAT . . . . 28°C
PRESSURE ALTITUDE . . . . . . 5430 FT
WEIGHT . . . . 12,500 LBS
HEADWIND COMPONENT . . . . . 9.5 KTS

FIELD LENGTH . . . . 4375 FT
V_1 . . . . 95 KTS



ACCELERATE-GO — FLAPS 0%

ASSOCIATED CONDITIONS:

POWER . . . . TAKE-OFF POWER SET BEFORE BRAKE RELEASE
FLAPS 0%
AUTOFEATHER . . ARMED
LANDING GEAR . . RETRACT AFTER LIFT-OFF
RUNWAY . . . . PAVED, LEVEL, DRY SURFACE

NOTE:
1. AIR DISTANCE IS 50% OF TAKE-OFF FIELD LENGTH
2. V_1 (ENGINE FAILURE SPEED) EQUALS V_R (ROTATION SPEED)
3. USABLE CLEARWAY CANNOT EXCEED 25% OF THE RUNWAY LENGTH
4. FOR OPERATION WITH ICE VANES EXTENDED, ADD 6°C TO THE ACTUAL OAT BEFORE ENTERING THE GRAPH.

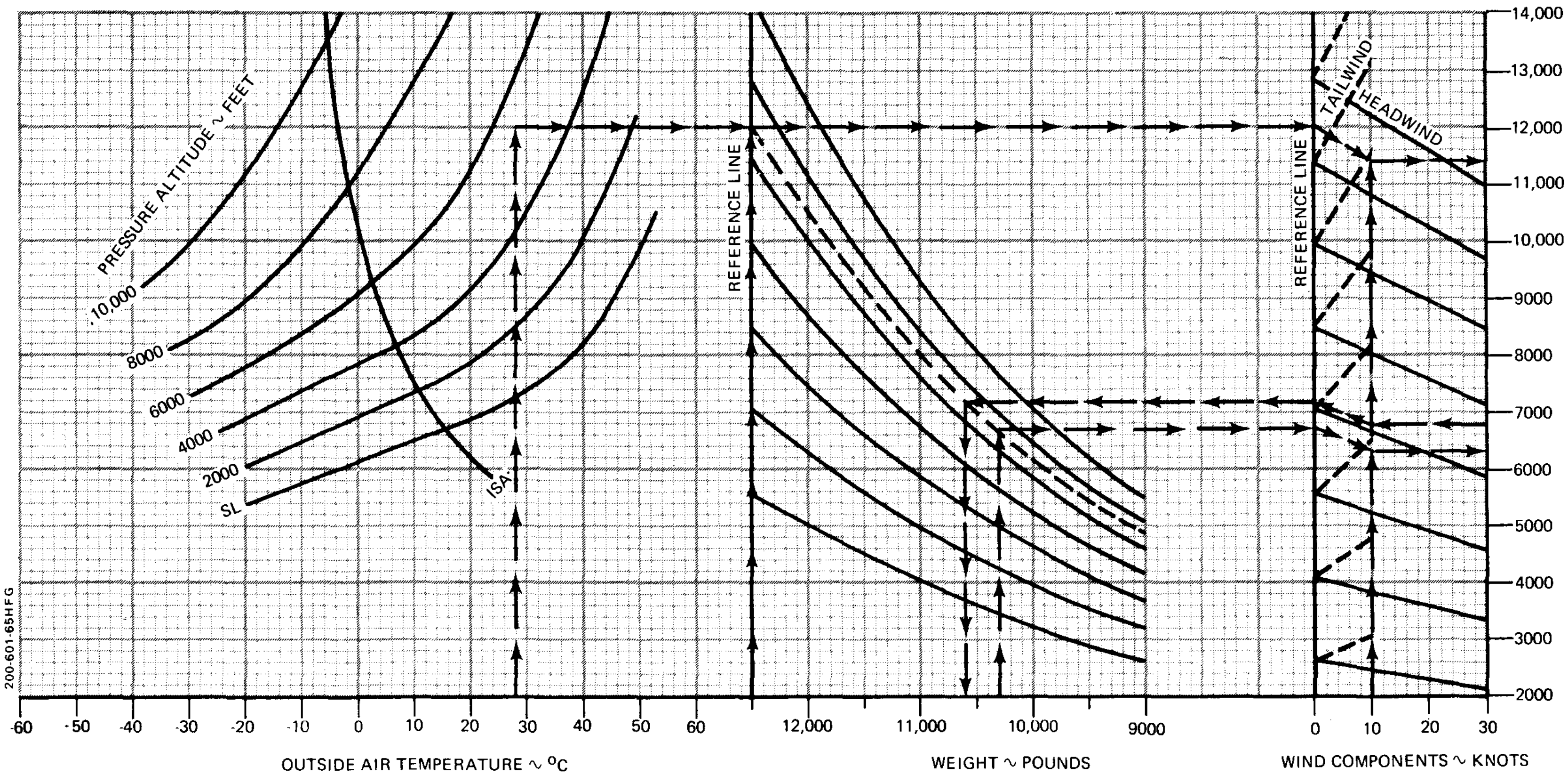
WEIGHT ~ POUNDS	SPEED ~ KNOTS V_R	SPEED ~ KNOTS V_2
12,500	95	121
12,000	95	119
11,000	95	115
10,000	95	111
9000	95	108

EXAMPLE:

OAT . . . . 28°C
PRESSURE ALTITUDE . . . . 5430 FEET
HEADWIND COMPONENT . . 9.5 KNOTS

TAKE-OFF WEIGHT ~ POUNDS	TAKE-OFF FIELD LENGTH ~ FEET
12,500	11,400
10,600	6786
10,314	6300

SPEEDS (10,314 LBS): V_R . . . . . 95 KNOTS
V_2 . . . . . 112 KNOTS



NET GRADIENT OF CLIMB – FLAPS 0%

ASSOCIATED CONDITIONS:

POWER . . . . TAKE-OFF
FLAPS 0%
GEAR . . . . UP
INOPERATIVE
PROPELLER. . . FEATHERED

WEIGHT ~ POUNDS	CLIMB SPEED ~ KNOTS
12,500	121
12,000	119
11,000	115
10,000	111
9000	108

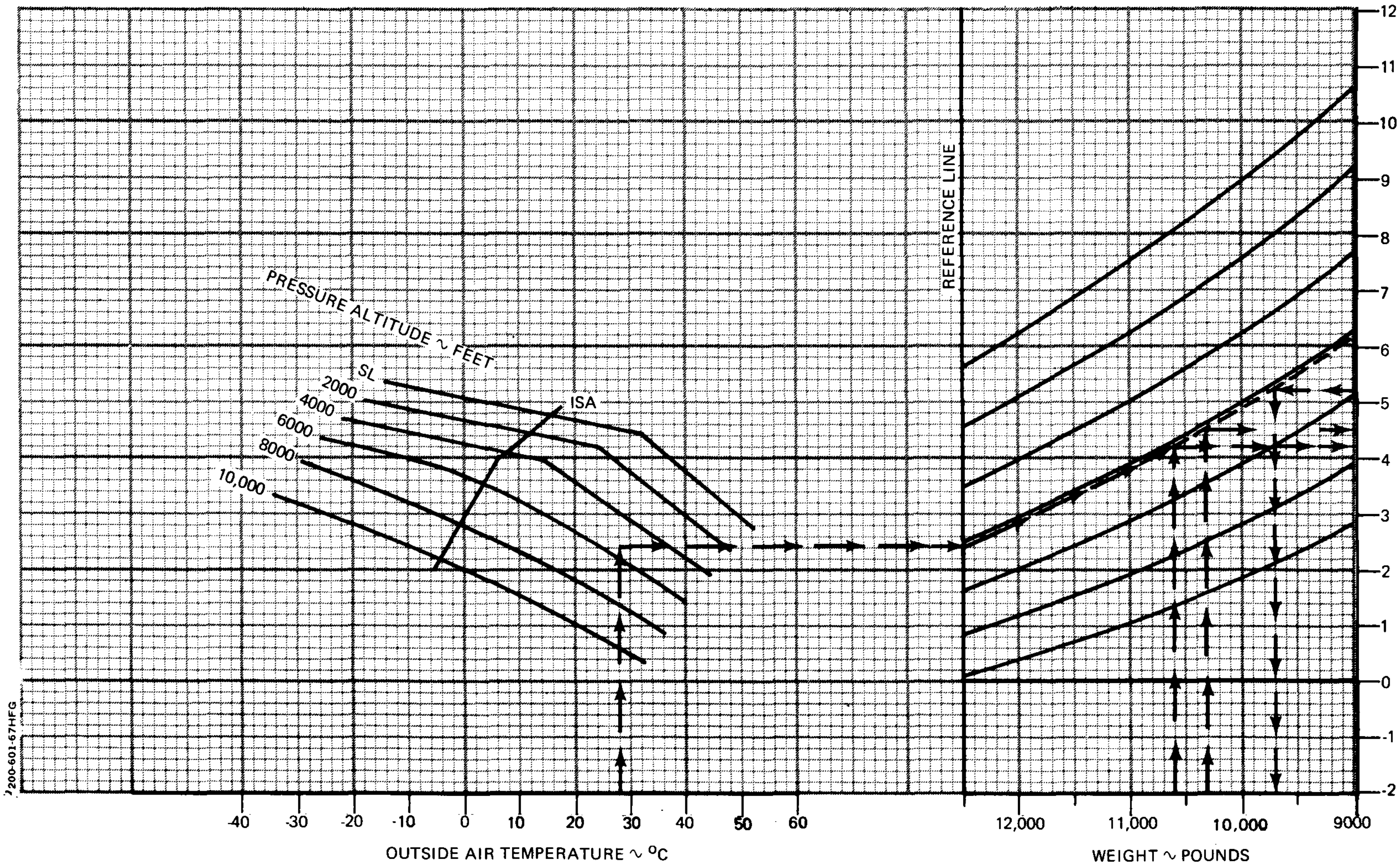
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.

EXAMPLE:

OAT. . . . . 28°C
PRESSURE ALTITUDE. . .5430 FEET

WEIGHT ~ POUNDS	NET GRADIENT OF CLIMB ~ %
10,600	4.2
9700	5.2
10,314	4.5

CLIMB SPEED (10,314 LBS). . . .112 KNOTS



TAKE-OFF DISTANCE — FLAPS 40%

ASSOCIATED CONDITIONS:

POWER...........TAKE-OFF POWER SET
BEFORE BRAKE RELEASE
FLAPS........... 40%
LANDING GEAR..RETRACT AFTER LIFT-OFF
RUNWAY.........PAVED, LEVEL, DRY SURFACE

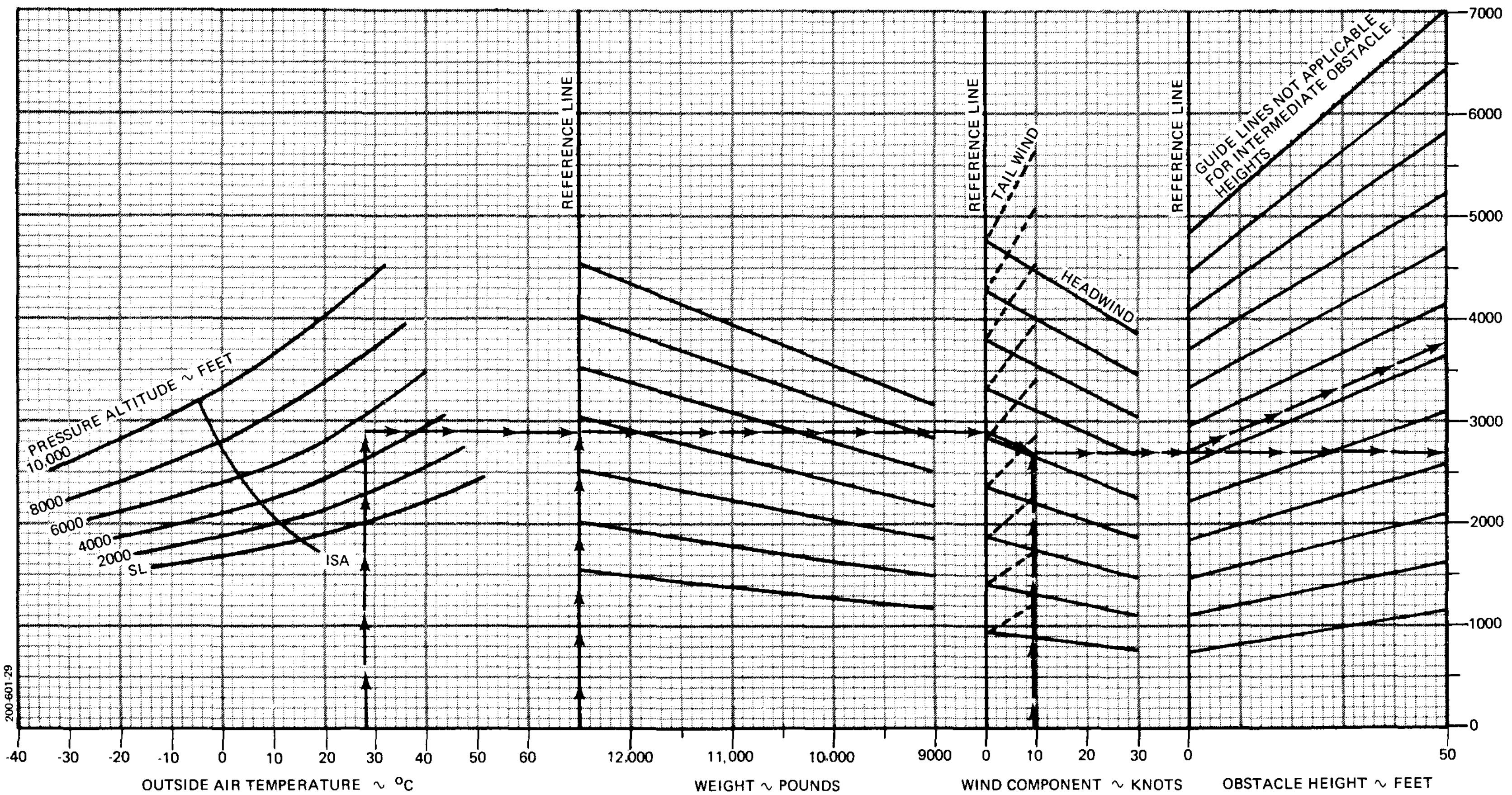
WEIGHT ~ POUNDS	TAKE-OFF SPEED ~ KNOTS	
	ROTATION	50 FT
12,500	94	106
12,000	94	105
11,000	94	103
10,000	94	101
9000	94	99

EXAMPLE:

OAT................................28°C
PRESSURE ALTITUDE..............5430 FT
TAKE-OFF WEIGHT.................12,500 LBS
HEADWIND COMPONENT...........9.5 KTS

GROUND ROLL.....................2700 FT
TOTAL DISTANCE OVER
50 FT OBSTACLE............3750 FT
TAKE-OFF SPEED AT ROTATION....94 KTS
AT 50 FT.........106 KTS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10° C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



ACCELERATE – STOP – FLAPS 40%

ASSOCIATED CONDITIONS:

POWER..........1. TAKE-OFF POWER SET BEFORE BRAKE RELEASE
2. BOTH ENGINES IDLE AT V_1 SPEED AND REVERSE OPERATING ENGINE
FLAPS..........40%
AUTOFEATHER..ARMED
BRAKING.........MAXIMUM
RUNWAY.........PAVED, LEVEL, DRY SURFACE

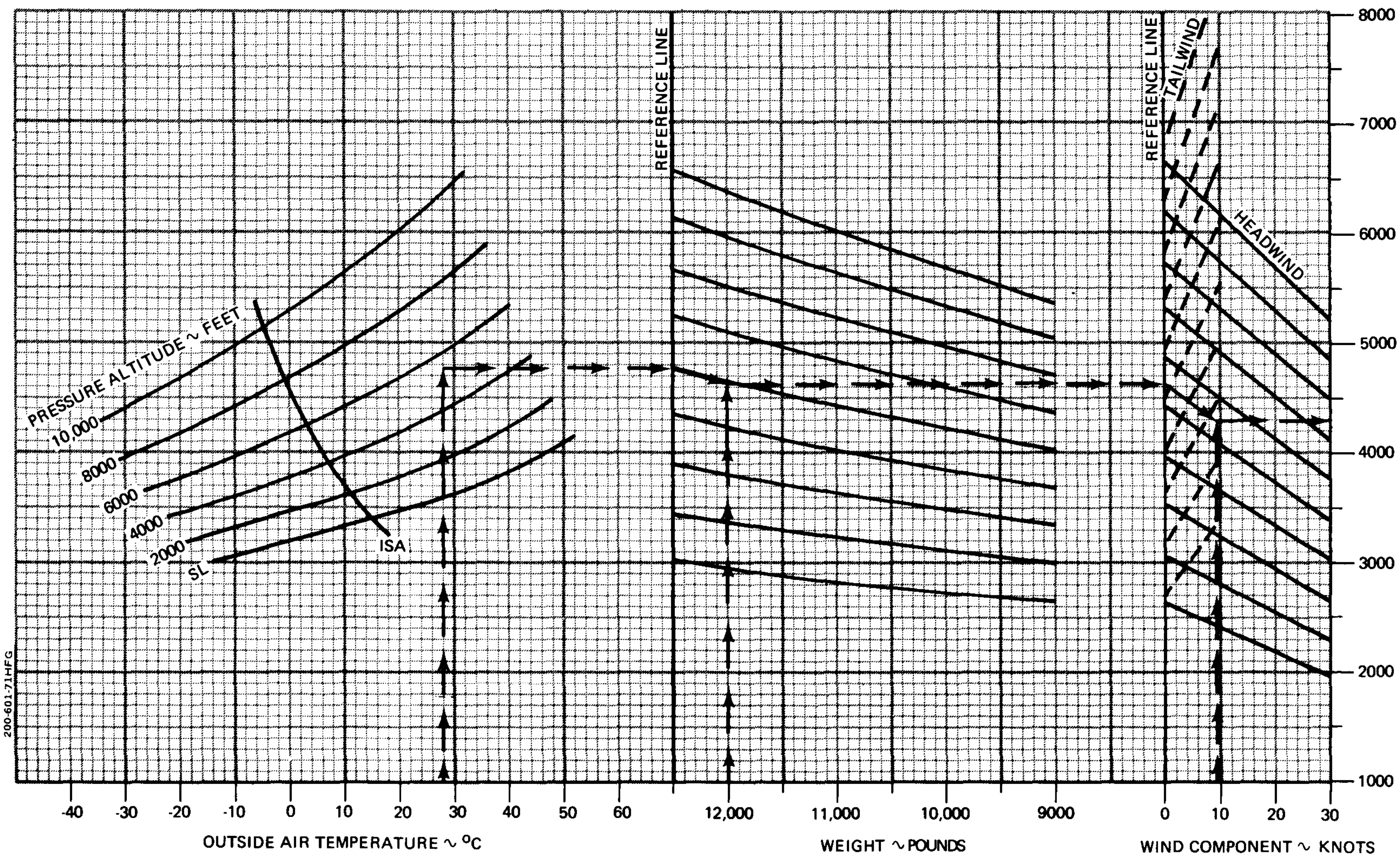
WEIGHT ~ POUNDS	V_1 ~ KNOTS
12,500	94
12,000	94
11,000	94
10,000	94
9000	94

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, PERFORMANCE IS NOT AFFECTED

EXAMPLE:

OAT........................28°C
PRESSURE ALTITUDE.....5430 FEET
WEIGHT....................12,000 LBS
HEADWIND COMPONENT..9.5 KNOTS

FIELD LENGTH.............4290 FEET
V_1..........................94 KNOTS



ACCELERATE-GO — FLAPS 40%

ASSOCIATED CONDITIONS:

POWER............TAKE-OFF POWER SET BEFORE BRAKE RELEASE
FLAPS.............40%
AUTOFEATHER....ARMED
LANDING GEAR ... RETRACT AFTER LIFT-OFF
RUNWAY..........PAVED LEVEL DRY SURFACED

NOTE:
1. AIR DISTANCE IS 50% OF TAKE-OFF FIELD LENGTH
2. V_1 (ENGINE FAILURE SPEED) EQUALS V_R (ROTATION SPEED)
3. USABLE CLEARWAY CANNOT EXCEED 25% OF THE RUNWAY LENGTH
4. FOR OPERATION WITH ICE VANES EXTENDED, ADD 6°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.

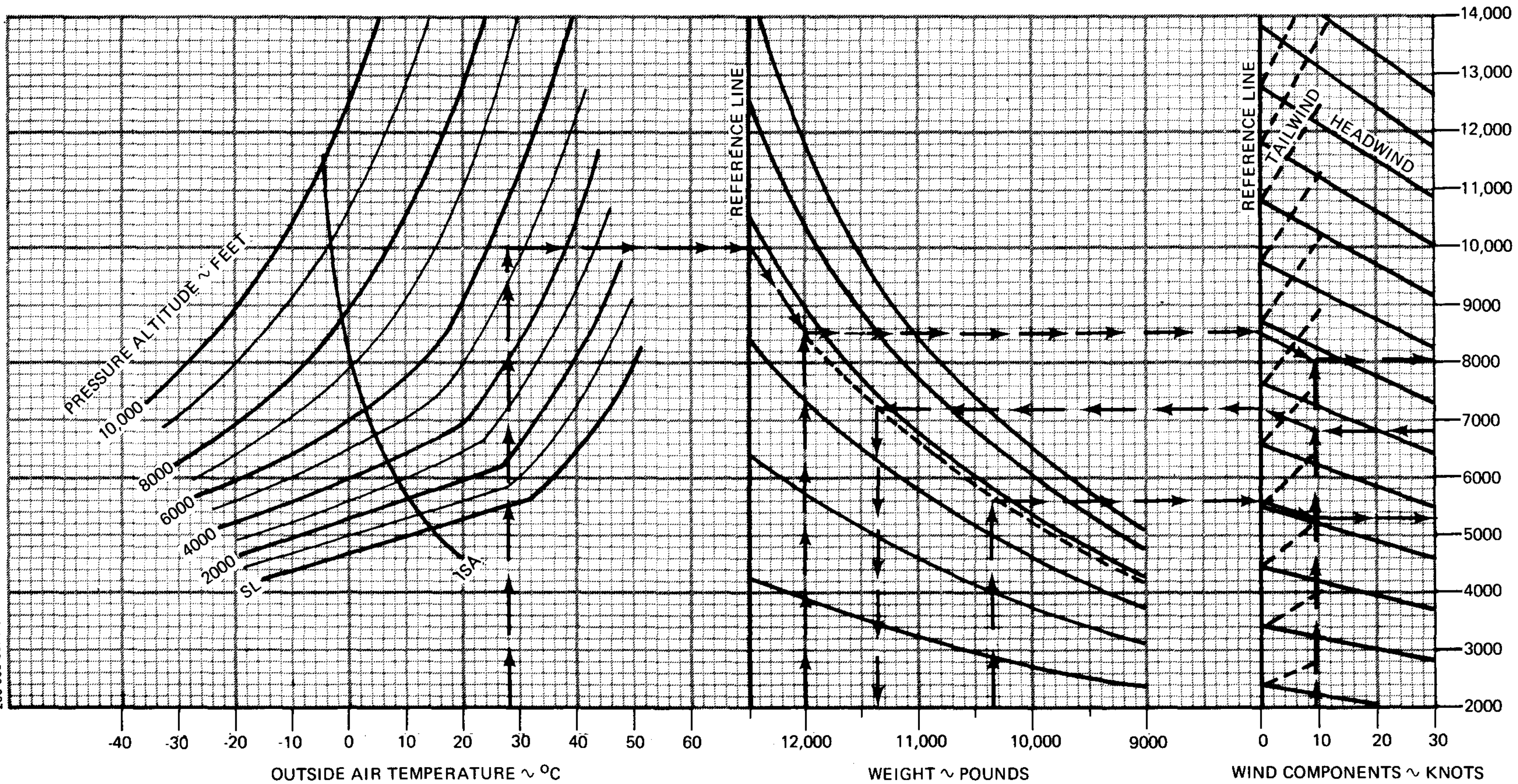
WEIGHT ~ POUNDS	SPEED ~ KNOTS	
	V_R	V_2
12,500	95	106
12,000	94	105
11,000	94	103
10,000	94	101
9000	94	99

EXAMPLE:

OAT......................28°C
PRESSURE ALTITUDE......5430 FEET
HEADWIND COMPONENT...9.5 KNOTS

TAKE-OFF WEIGHT ~ POUNDS	TAKE-OFF FIELD LENGTH ~ FEET
12,000	8020
11,380	6786
10,360	5250

SPEEDS (10,360 LBS): V_R........94 KNOTS
V_2........102 KNOTS



High Flotation Gear

NET GRADIENT OF CLIMB – FLAPS 40%

ASSOCIATED CONDITIONS:

POWER . . . . TAKE-OFF
FLAPS 40%
GEAR . . . . UP
INOPERATIVE
PROPELLER . . . FEATHERED

WEIGHT ∿ POUNDS	CLIMB SPEED ∿ KNOTS
12,500	106
12,000	105
11,000	103
10,000	101
9000	99

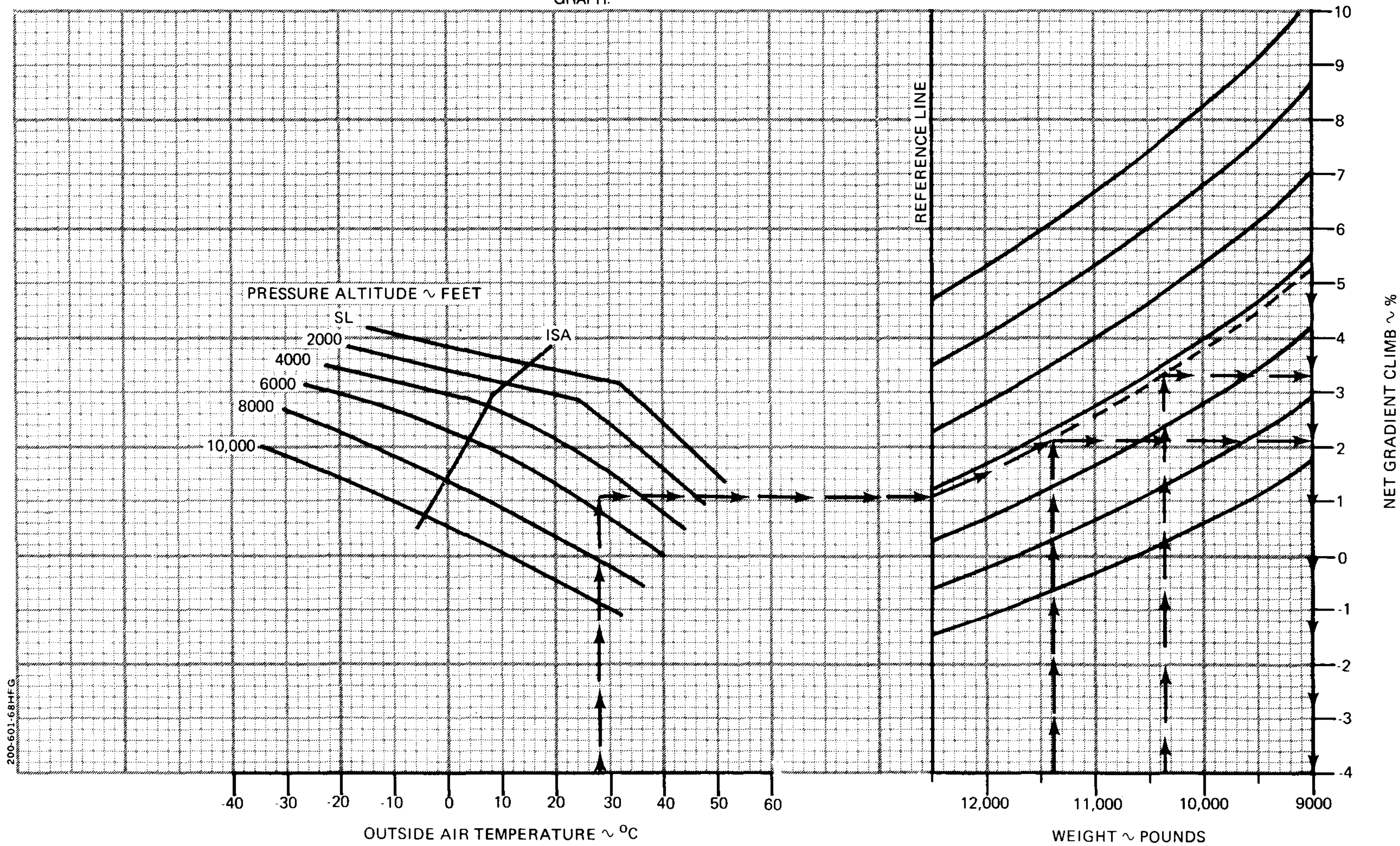
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.

EXAMPLE:

OAT . . . . 28^oC
PRESSURE ALTITUDE . . 5430 FEET

WEIGHT ∿ POUNDS	NET GRADIENT OF CLIMB ∿ %
11,380	2.1
9000	5.2
10,360	3.3

CLIMB SPEED (10,360 LBS) . . . 102 KNOTS



TAKE-OFF DISTANCE — FLAPS 0%
GRASS SURFACE

ASSOCIATED CONDITIONS:

POWER . . . . TAKE-OFF POWER SET BEFORE BRAKE RELEASE
FLAPS. 0%
LANDING GEAR . . . RETRACT AFTER LIFT-OFF
RUNWAY. . . . . SHORT, DRY GRASS WITH FIRM SUBSOIL

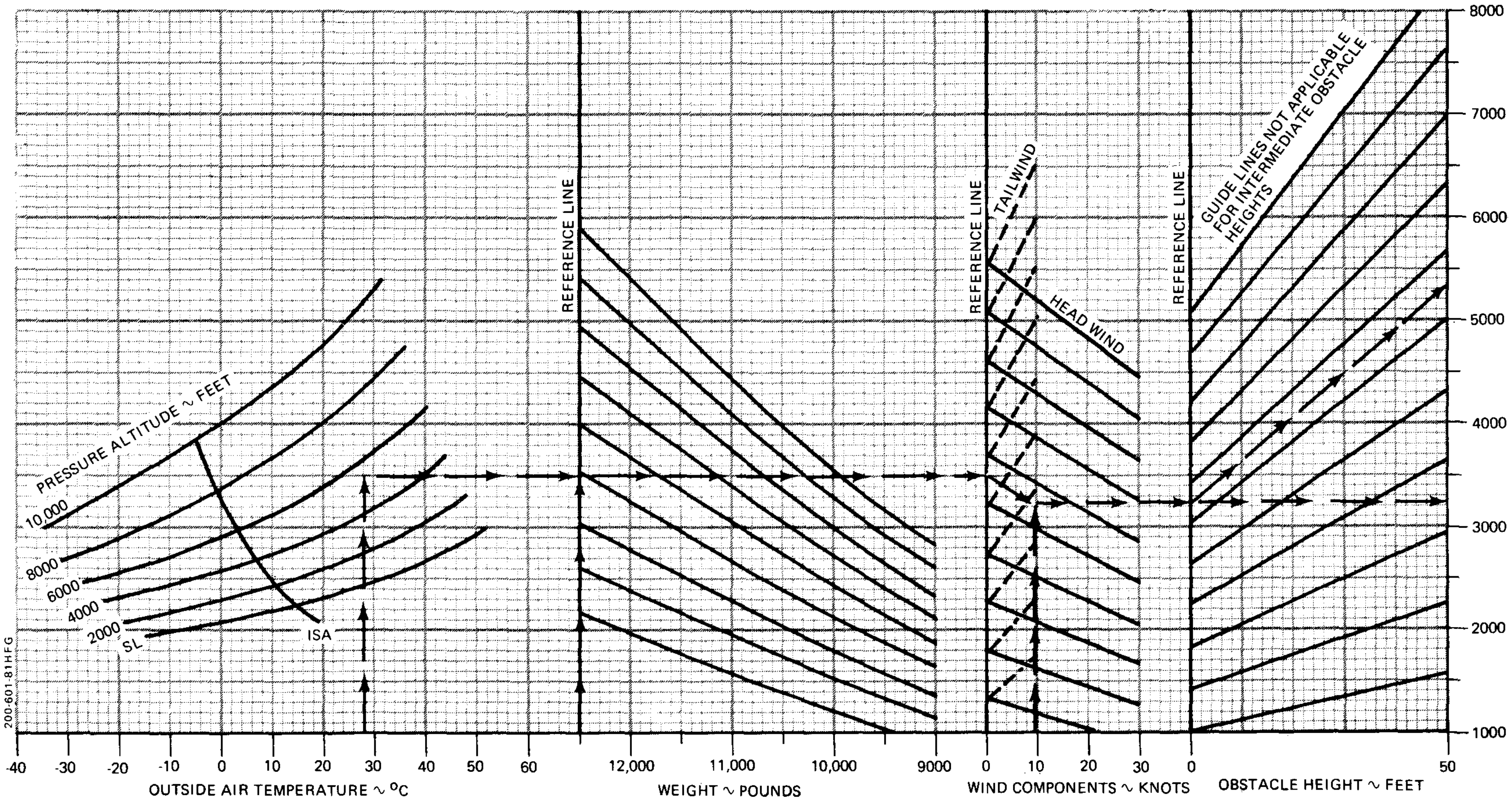
WEIGHT ~ POUNDS	TAKE-OFF SPEED ~ KNOTS	
	ROTATION	50 FT
12,500	95	121
12,000	95	119
11,000	95	115
10,000	95	111
9000	95	108

EXAMPLE:

OAT . . . . 28°C
PRESSURE ALTITUDE . . . . 5430 FEET
TAKE-OFF WEIGHT . . . . 12,500 LBS
HEAD WIND COMPONENT. . . . . 9.5 KNOTS

GROUND ROLL . . . . 3240 FEET
TOTAL DISTANCE OVER
50 FT OBSTACLE . . . . 5310 FEET
TAKE-OFF SPEED AT ROTATION . . . 95 KNOTS
AT 50 FEET. . . . . . 121 KNOTS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10°C TO THE ACTUAL OAT BEFORE ENTERING THE GRAPH.



TAKE-OFF DISTANCE — FLAPS 40%

GRASS SURFACE

ASSOCIATED CONDITION:

POWER............TAKE-OFF POWER SET BEFORE BRAKE RELEASE
FLAPS.............40%
LANDING GEAR....RETRACT AFTER LIFT-OFF
RUNWAY..........SHORT, DRY GRASS WITH FIRM SUBSOIL

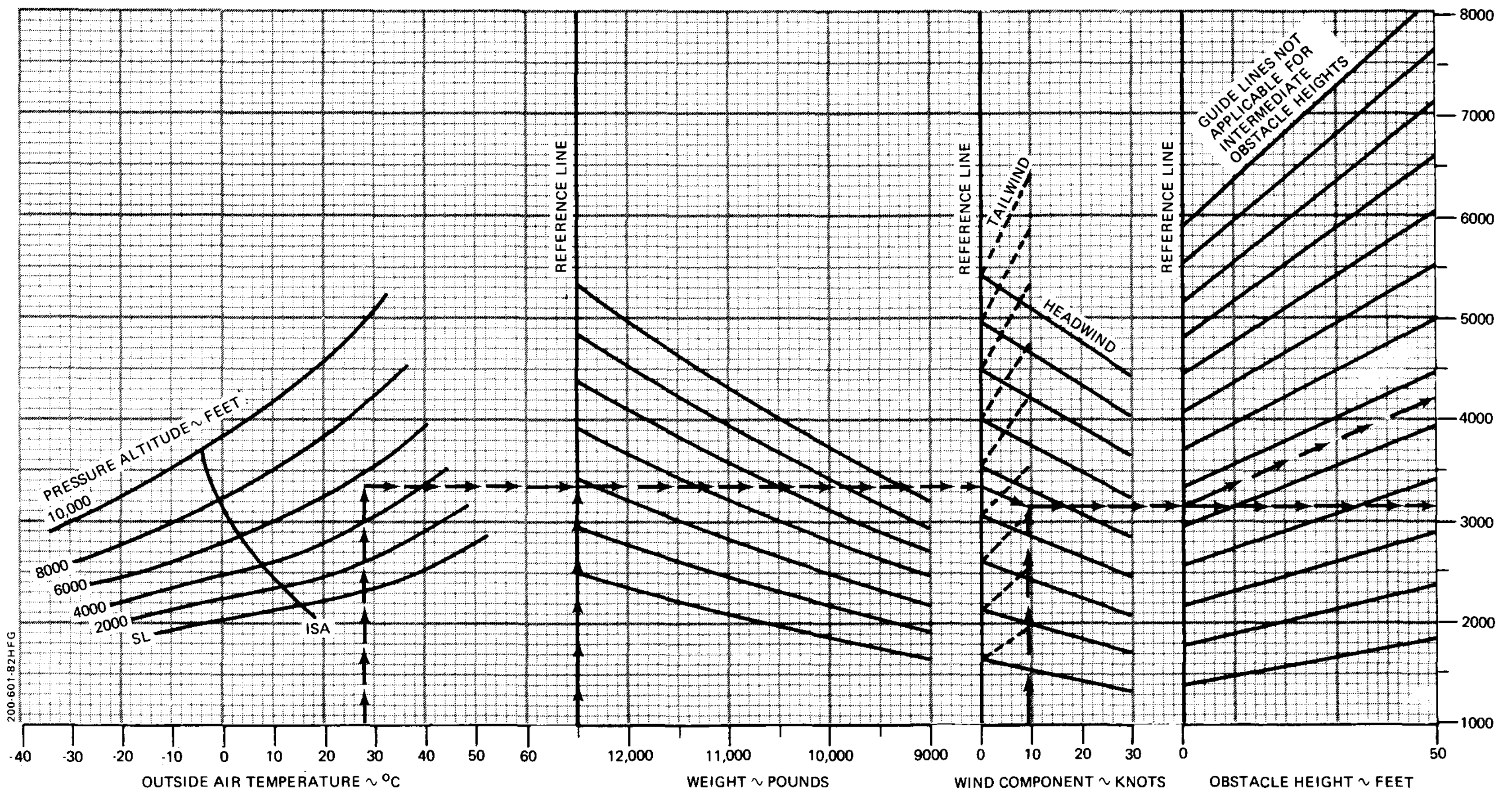
WEIGHT ~ POUNDS	TAKE-OFF SPEED ~ KNOTS	
	ROTATION	50 FT
12,500	94	106
12,000	94	105
11,000	94	103
10,000	94	101
9000	94	99

EXAMPLE:

OAT.............................28°C
PRESSURE ALTITUDE.............5430 FEET
TAKE-OFF WEIGHT.................12,500 LBS
HEAD WIND COMPONENT..........9.5 KNOTS

GROUND ROLL...................3140 FEET
TOTAL DISTANCE OVER 50 FT OBSTACLE...............4200 FEET
TAKE-OFF SPEED AT ROTATION....94 KNOTS
AT 50 FEET.......106 KNOTS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10°C TO THE ACTUAL OAT BEFORE ENTERING THE GRAPH.



CLIMB — TWO ENGINES — FLAPS 0%

ASSOCIATED CONDITIONS:

POWER .... MAXIMUM CONTINUOUS
FLAPS 0%
LANDING GEAR .... UP

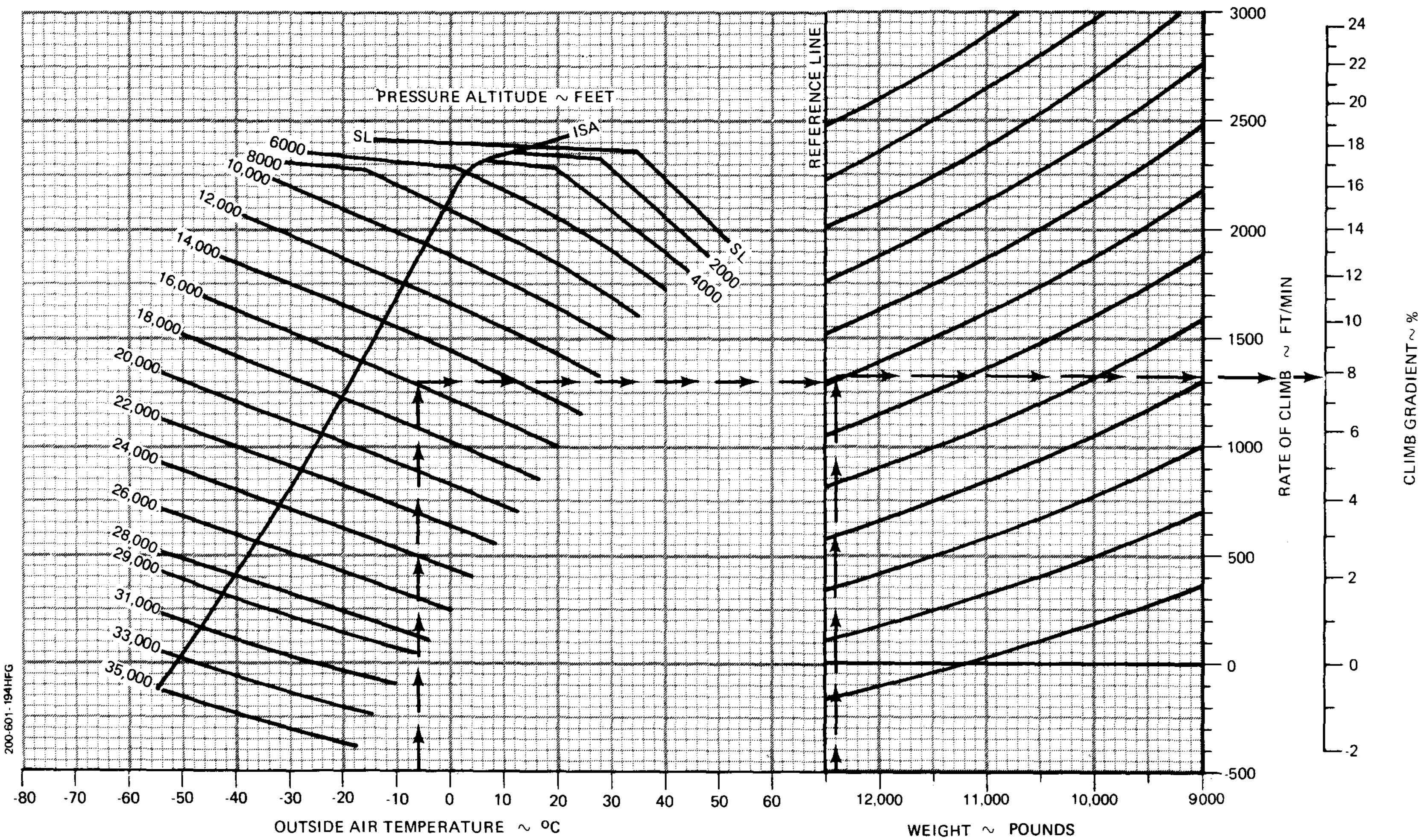
WEIGHT ~ POUNDS	CLIMB SPEED ~ KNOTS
12,500	125
12,000	124
11,000	121
10,000	118
9000	115

EXAMPLE:

OAT .... -6°C
PRESSURE ALTITUDE .... 16,000 FT
WEIGHT .... 12,405 LBS

RATE OF CLIMB .... 1325 FT/MIN
CLIMB GRADIENT 7.8%
CLIMB SPEED .... 125 KTS

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 15° C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



CLIMB – TWO ENGINES – FLAPS 40%

ASSOCIATED CONDITIONS:

POWER............MAXIMUM CONTINUOUS
FLAPS.............40%
LANDING GEAR....UP

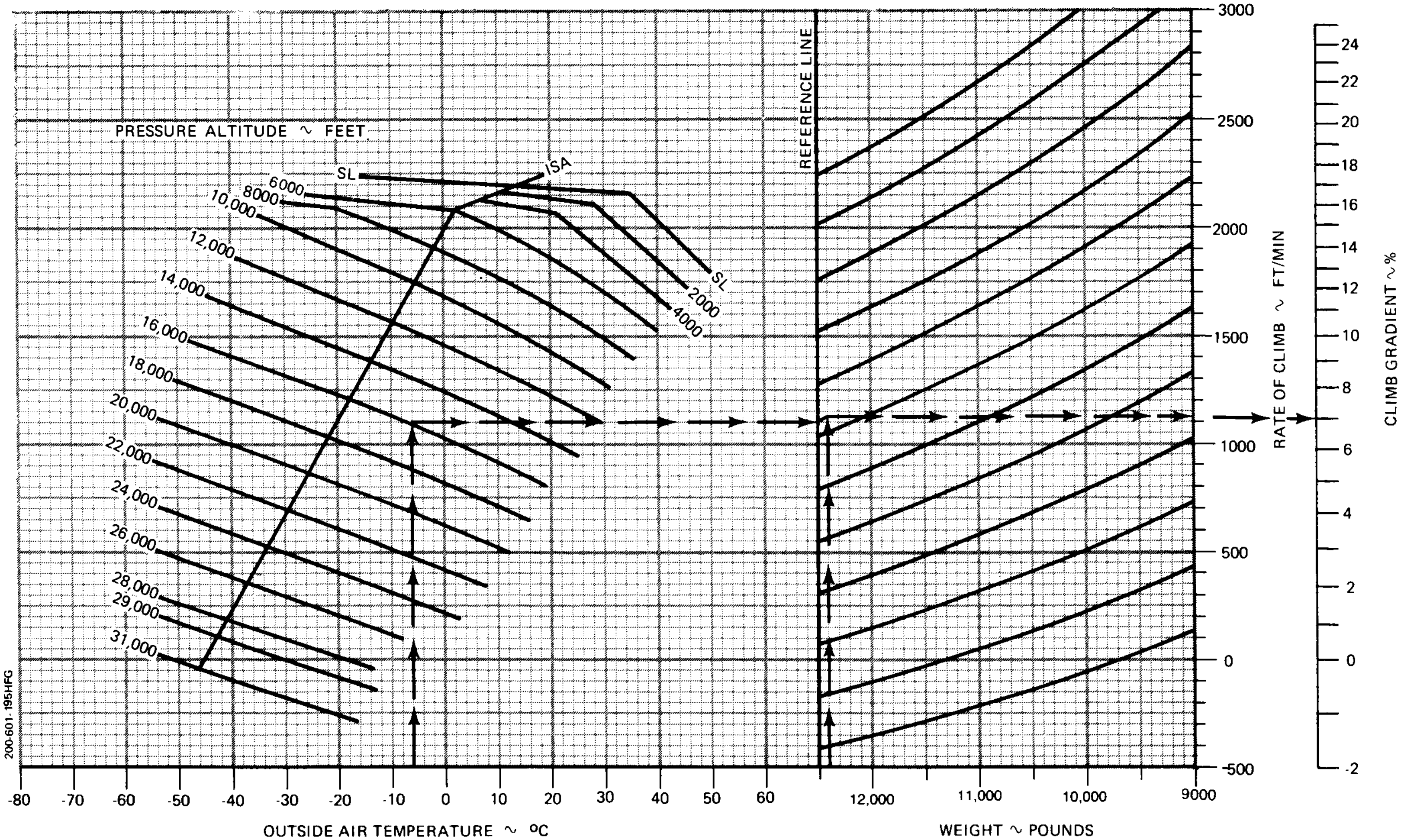
WEIGHT ~ POUNDS	CLIMB SPEED ~ KNOTS
12,500	125
12,000	124
11,000	121
10,000	118
9000	115

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 15°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.

EXAMPLE:

OAT.................. -6°C
PRESSURE ALTITUDE...16,000 FT
WEIGHT................ 12,405 LBS

RATE-OF-CLIMB........1125 FT/MIN
CLIMB GRADIENT.......7.0%
CLIMB SPEED........... 125 KTS



INTENTIONALLY LEFT BLANK

TIME, FUEL, AND DISTANCE TO CLIMB

ASSOCIATED CONDITIONS:

PROPELLER SPEED........... 1900 RPM
ITT, OR........................ 725°C
TORQUE...................... 2230 FT LBS

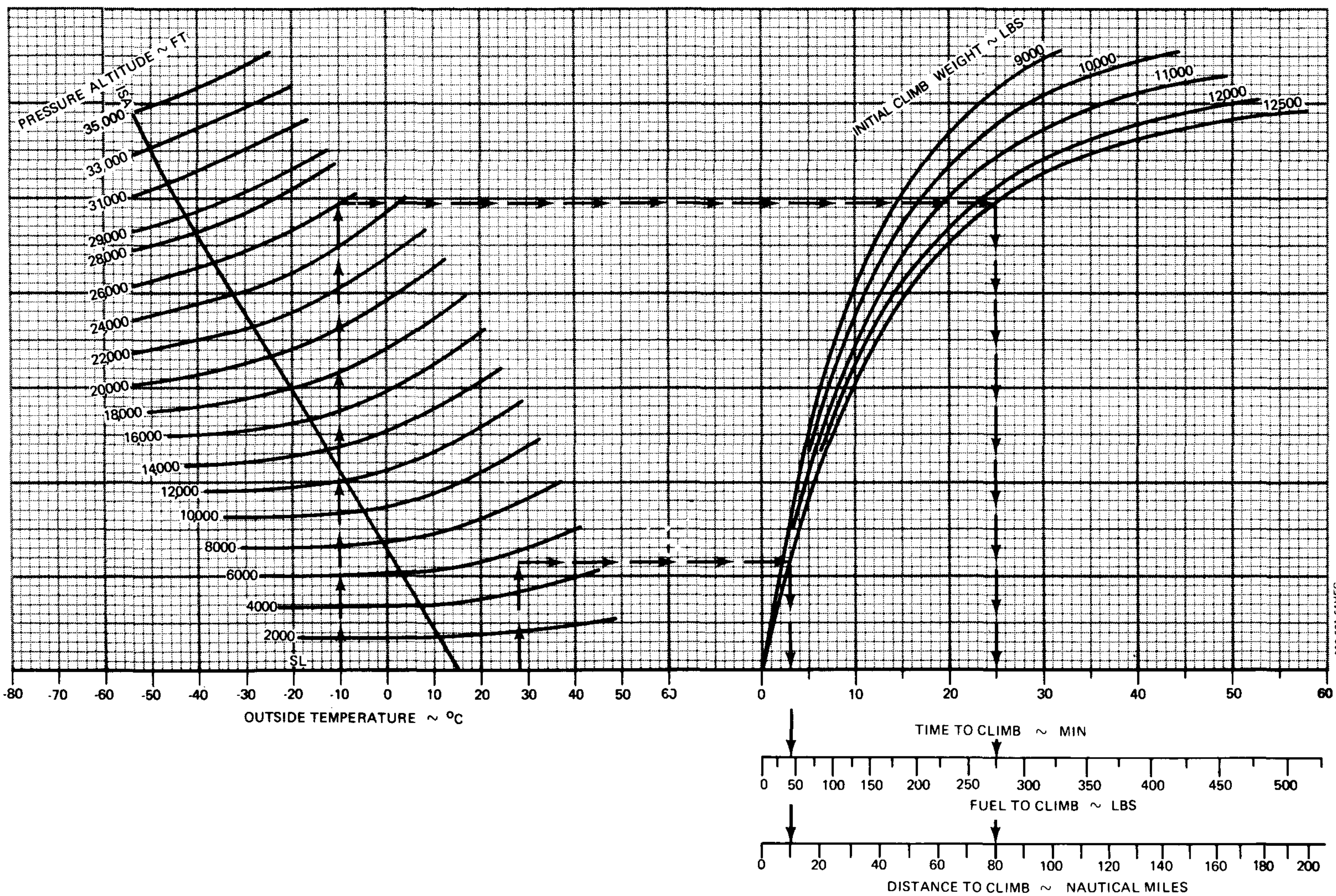
ALTITUDE ~ FEET	CLIMB SPEED ~ KNOTS
S L TO 10,000	155
10,000 TO 20,000	135
20,000 TO 25,000	125
25,000 TO 35,000	115

NOTE: 1. ADD 90 LBS FUEL FOR START, TAXI AND TAKE-OFF.
2. FOR OPERATION WITH ICE VANES EXTENDED, ADD 20°C. TO THE ACTUAL OAT BEFORE ENTERING THE GRAPH.

EXAMPLE:

OAT AT TAKE-OFF................ 28°C
OAT AT CRUISE................... 10°C
AIRPORT PRESSURE ALTITUDE.. 5430 FT
CRUISE ALTITUDE................ 26000 FT
INITIAL CLIMB WEIGHT........... 12500 LBS

TIME TO CLIMB (25-3)............. 22 MIN
FUEL TO CLIMB (275-45).......... 230 LBS
DISTANCE TO CLIMB (80 -11) .... 69 NM



High Flotation Gear

CLIMB — ONE ENGINE INOPERATIVE

ASSOCIATED CONDITIONS:

POWER .... MAXIMUM CONTINUOUS
FLAPS 0%
LANDING GEAR .... UP
INOPERATIVE PROPELLER .. FEATHERED

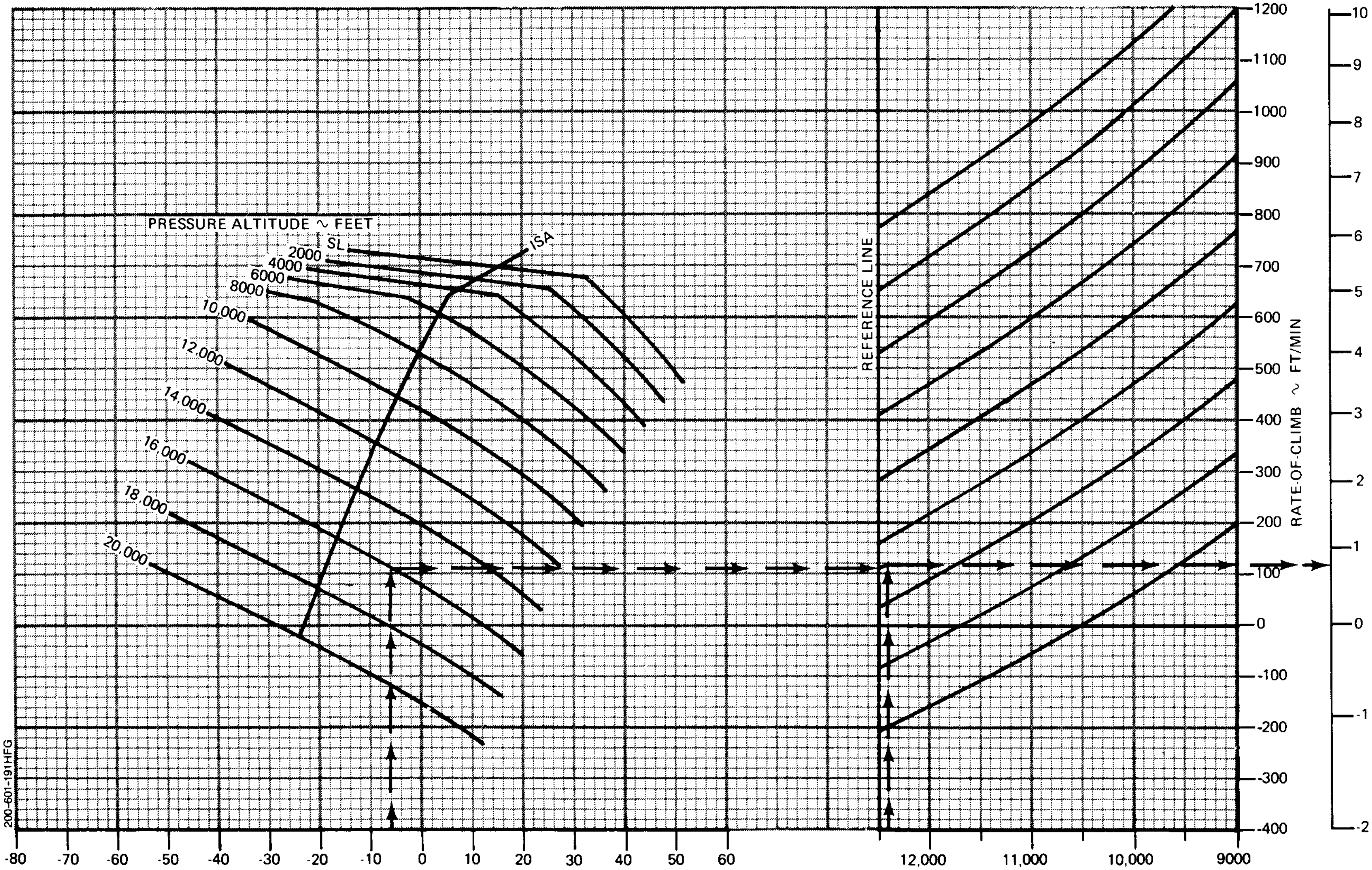
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 10° C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.

WEIGHT ~ POUNDS	CLIMB SPEED ~ KNOTS
12,500	121
12,000	119
11,000	117
10,000	114
9000	111

EXAMPLE:

OAT .... −6°C
PRESSURE ALTITUDE .... 16,000 FT
WEIGHT .... 12,405 LBS

RATE-OF-CLIMB .... 118 FT/MIN
CLIMB GRADIENT 0.8%
CLIMB SPEED .... 121 KTS



SERVICE CEILING - ONE ENGINE INOPERATIVE

ASSOCIATED CONDITIONS:

POWER .... MAXIMUM CONTINUOUS
LANDING GEAR...................... UP
INOPERATIVE PROPELLER .. FEATHERED
FLAPS .... UP (0%)

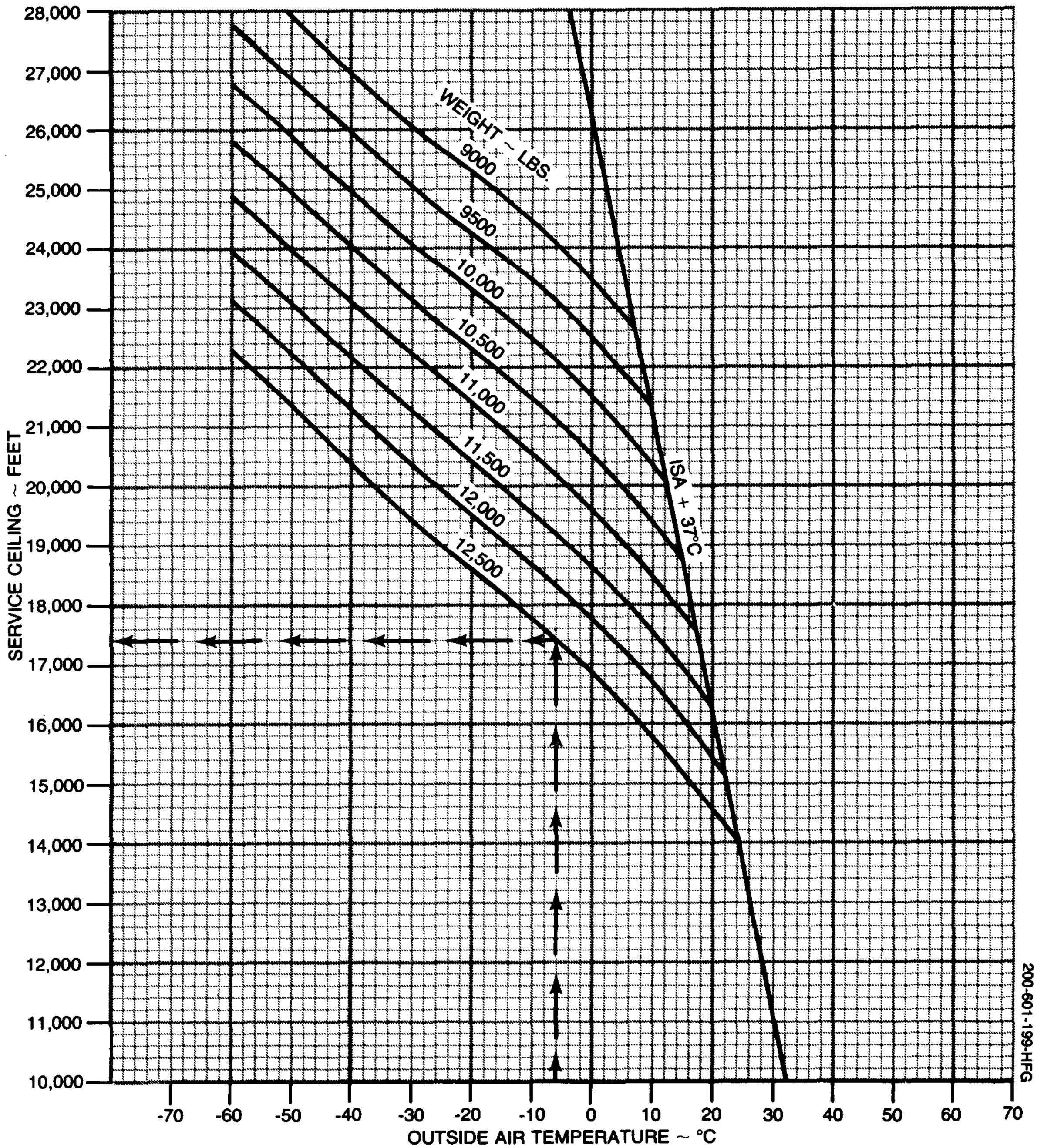
EXAMPLE:

OAT .... −6°C
WEIGHT .... 12,500 LBS
ROUTE SEGMENT MEA......... 16,000 FT

SERVICE CEILING.................. 17,400 FT

NOTE: SERVICE CEILING IS THE PRESSURE ALTITUDE WHERE THE AIRPLANE HAS CAPABILITY OF CLIMBING 50 FT/MINUTE WITH ONE PROPELLER FEATHERED.

NOTE: SERVICE CEILING IS ABOVE ENROUTE MEA.



CLIMB — BALKED LANDING

CLIMB SPEED 100 KNOTS (ALL WEIGHTS)

ASSOCIATED CONDITIONS:

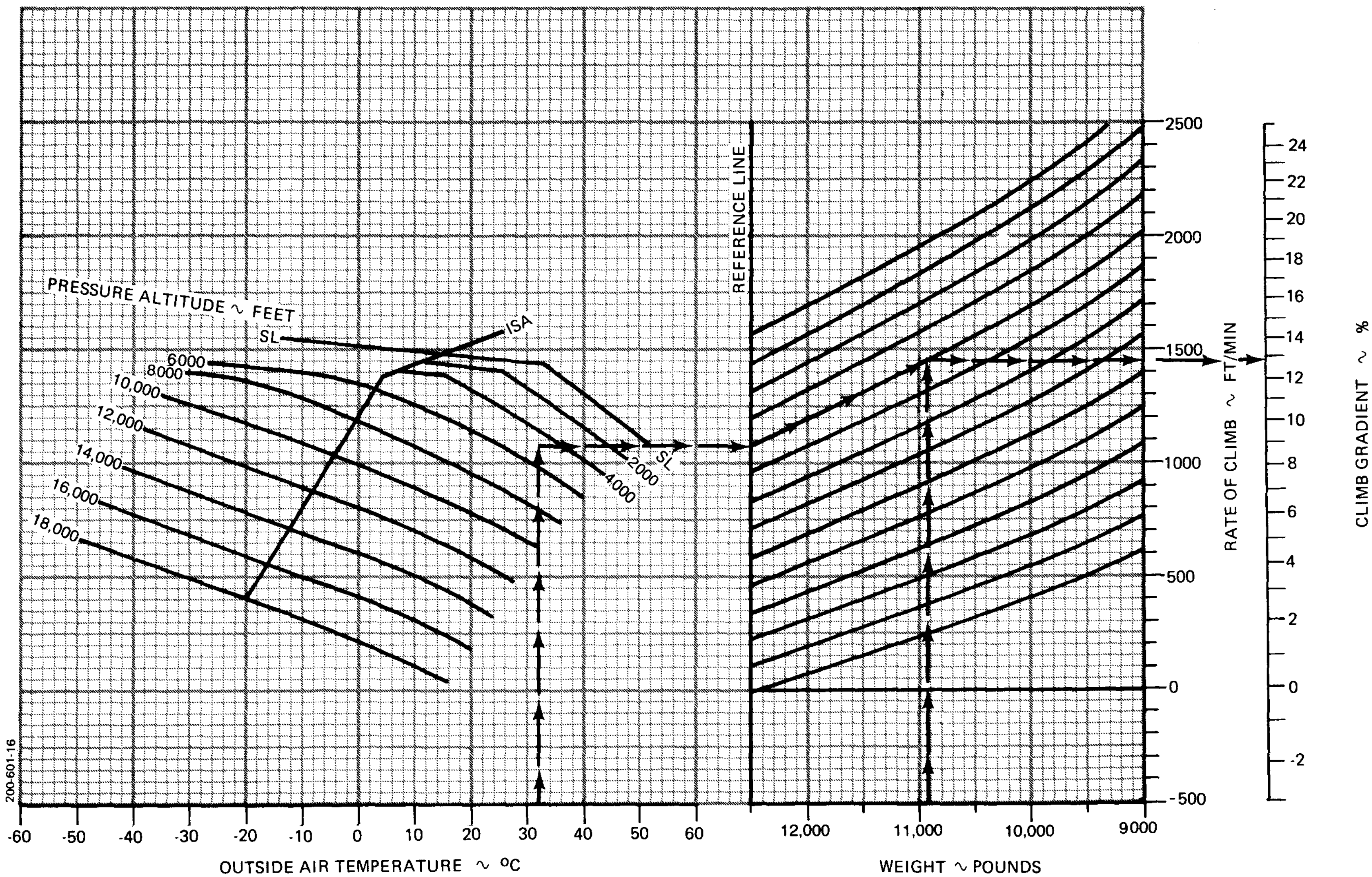
POWER . . . . . . TAKE-OFF
FLAPS 100%
LANDING GEAR . . DOWN

NOTE: FOR OPERATION WITH ICE VANES EXTENTED, ADD 10° C TO ACTUAL OAT BEFORE ENTERING GRAPH.

EXAMPLE:

OAT . . . . 32°C
PRESSURE ALTITUDE . 4730 FT
WEIGHT . . . . 10,937 LBS

RATE-OF-CLIMB . . . . 1450 FT/MIN
CLIMB GRADIENT . . . 12.8 %



High Flotation Gear

INTENTIONALLY LEFT BLANK

RECOMMENDED CRUISE POWER

1700 RPM

ISA −30°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	−10	−15	2230	464	928	241	229	242	230	243	231
2000	−14	−19	2230	452	904	239	233	239	234	240	235
4000	−18	−23	2230	440	880	236	237	237	238	238	239
6000	−21	−27	2230	429	858	234	242	235	243	236	244
8000	−25	−31	2230	419	838	232	246	233	248	234	249
10,000	−29	−35	2230	410	820	230	251	231	252	232	253
12,000	−33	−39	2230	403	806	227	256	228	257	229	258
14,000	−36	−43	2230	397	794	225	261	226	262	227	263
16,000	−40	−47	2230	393	786	223	266	224	268	225	269
18,000	−44	−51	2230	389	778	220	271	221	273	223	274
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1700 RPM

ISA −20°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS					
						@ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	0	−5	2230	467	934	239	232	240	233	241	233
2000	−4	−9	2230	453	906	237	236	238	237	239	238
4000	−8	−13	2230	440	880	235	240	236	241	236	242
6000	−11	−17	2230	429	858	232	245	233	246	234	247
8000	−15	−21	2230	420	840	230	250	231	251	232	252
10,000	−19	−25	2230	412	824	228	254	229	255	230	257
12,000	−23	−29	2230	404	808	225	259	226	261	227	262
14,000	−26	−33	2230	398	796	223	264	224	266	225	267
16,000	−30	−37	2230	394	788	221	270	222	271	223	272
18,000	−34	−41	2230	391	782	218	275	219	276	220	278
20,000	−38	−45	2113	370	740	211	274	212	276	214	278
22,000	−42	−48	1970	346	692	202	272	204	274	206	277
24,000	−46	−50	1824	321	642	194	269	196	272	198	275
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1700 RPM

ISA −10°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	10	5	2230	470	940	237	234	238	235	239	236
2000	6	1	2230	456	912	235	239	236	240	237	240
4000	3	−3	2230	444	888	233	243	234	244	235	245
6000	−1	−7	2230	432	864	231	248	232	249	233	250
8000	−5	−11	2230	421	842	228	253	229	254	230	255
10,000	−9	−15	2230	412	824	226	257	227	259	228	260
12,000	−12	−19	2230	406	812	224	262	225	264	226	265
14,000	−16	−23	2230	400	800	221	268	222	269	223	270
16,000	−20	−27	2230	396	792	219	273	220	274	221	276
18,000	−24	−31	2174	384	768	213	275	215	277	216	279
20,000	−28	−35	2018	357	714	205	272	207	275	208	277
22,000	−32	−38	1879	333	666	196	270	199	273	200	275
24,000	−36	−42	1739	309	618	188	367	190	270	192	273
26,000	−40	−46	1606	287	574	179	263	181	267	184	271
28,000	−44	−50	1482	266	532	169	258	173	263	176	267
29,000	−46	−52	1422	256	512	165	255	169	261	172	265
31,000	−50	−56	1304	237	474	153	247	159	255	162	261
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1700 RPM

ISA

PRESSURE ALTITUDE FEET	IOAT °C	OAT °C	TORQUE PER ENGINE FT-LBS	FUEL FLOW PER ENGINE LBS/HR	TOTAL FUEL FLOW LBS/HR	AIRSPEED ~ KNOTS @ 12,000 LBS IAS	TAS	@ 11,000 LBS IAS	TAS	@ 10,000 LBS IAS	TAS
SL	20	15	2230	473	946	236	237	237	238	238	239
2000	16	11	2230	459	918	234	241	235	242	235	243
4000	13	7	2230	446	892	231	246	232	247	233	248
6000	9	3	2230	434	868	229	251	230	252	231	253
8000	5	−1	2230	423	846	227	255	228	257	229	258
10,000	2	−5	2230	414	818	224	260	225	262	226	263
12,000	−2	−9	2230	406	812	222	265	223	267	234	268
14,000	−6	−13	2230	401	802	219	271	221	272	222	274
16,000	−10	−17	2230	396	792	216	276	218	277	219	279
18,000	−14	−21	2089	372	744	208	274	210	276	211	278
20,000	−18	−25	1928	344	688	199	271	201	273	203	276
22,000	−22	−28	1794	321	642	191	268	193	271	195	274
24,000	−26	−32	1658	298	596	182	265	185	268	187	272
26,000	−30	−36	1529	276	552	173	260	176	265	178	269
28,000	−34	−40	1409	256	512	163	255	167	260	170	265
29,000	−36	−42	1351	246	492	158	251	162	258	166	263
31,000	−41	−46	1239	228	456	147	242	153	252	157	259
33,000	−45	−50	1127	209	418	127	218	141	241	148	252
35,000	−50	−54	1003	190	380	—	—	122	218	136	242

RECOMMENDED CRUISE POWER

1700 RPM

ISA +10°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	30	25	2230	475	950	234	239	235	240	236	241
2000	27	21	2230	462	924	232	244	233	245	234	246
4000	23	17	2230	449	898	230	249	231	250	232	251
6000	19	13	2230	437	874	227	253	228	254	229	256
8000	15	9	2230	426	852	225	258	226	259	227	261
10,000	12	5	2230	416	832	223	263	224	265	225	266
12,000	8	1	2230	409	818	220	269	221	270	222	271
14,000	4	−3	2230	402	804	217	273	219	275	220	276
16,000	1	−7	2117	380	760	210	273	212	275	213	277
18,000	−4	−11	1990	357	714	203	272	205	274	206	276
20,000	−8	−15	1863	333	666	195	270	197	273	199	275
22,000	−12	−18	1725	310	620	186	267	188	270	190	273
24,000	−16	−22	1585	287	574	177	262	179	266	182	270
26,000	−20	−26	1456	266	532	167	257	170	262	173	266
28,000	−24	−30	1340	246	492	157	251	161	257	165	263
29,000	−26	−32	1283	237	474	151	246	157	254	160	261
31,000	−31	−36	1173	219	438	138	232	146	247	151	255
33,000	−36	−40	1059	200	400	—	—	132	231	141	247
35,000	−40	−44	975	185	370	—	—	—	—	128	233

RECOMMENDED CRUISE POWER

1700 RPM

ISA +20°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	40	35	2230	479	958	233	242	234	243	235	244
2000	37	31	2230	465	930	231	246	232	248	233	249
4000	33	27	2230	452	904	228	251	229	252	230	253
6000	29	23	2230	440	880	226	256	227	257	228	258
8000	26	19	2230	429	858	223	261	225	262	226	263
10,000	22	15	2230	419	838	221	266	222	268	223	269
12,000	18	11	2194	406	812	217	270	218	271	220	273
14,000	14	7	2080	382	764	211	269	212	271	213	273
16,000	10	3	1965	359	718	203	269	205	271	206	273
18,000	6	−1	1848	337	674	195	267	197	270	199	272
20,000	2	−5	1731	315	630	187	265	190	268	192	271
22,000	−2	−8	1619	295	590	179	263	182	266	184	270
24,000	−6	−12	1505	275	550	171	259	174	263	177	267
26,000	−10	−16	1393	255	510	161	254	165	260	169	265
28,000	−14	−20	1280	237	474	151	246	156	254	160	260
29,000	−17	−22	1222	228	456	144	240	151	251	155	258
31,000	−21	−26	1108	209	418	126	218	139	239	146	251
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1700 RPM

ISA +30°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		AIRSPEED ~ KNOTS @ 11,000 LBS		AIRSPEED ~ KNOTS @ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	51	45	2230	482	964	231	244	233	245	233	246
2000	47	41	2230	468	936	229	249	230	250	231	251
4000	43	37	2230	454	908	227	254	228	255	229	256
6000	39	33	2230	441	882	224	259	225	260	226	261
8000	36	29	2219	428	856	221	263	223	264	224	266
10,000	32	25	2124	405	810	215	264	217	266	218	267
12,000	28	21	2021	383	766	209	264	210	266	212	268
14,000	24	17	1910	360	720	202	263	203	266	205	268
16,000	20	13	1803	338	676	195	262	197	265	198	267
18,000	16	9	1702	317	634	187	261	190	264	192	267
20,000	12	5	1600	297	594	180	259	182	263	185	266
22,000	8	2	1498	278	556	172	256	175	261	177	265
24,000	4	−2	1395	259	518	163	252	167	258	170	262
26,000	−1	−6	1296	242	484	154	246	158	254	162	260
28,000	−5	−10	1201	225	450	142	236	149	249	154	256
29,000	−7	−12	1153	217	424	135	229	144	244	150	254
31,000	−11	−16	1045	200	400	—	—	131	230	140	246
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1700 RPM

ISA +37°C

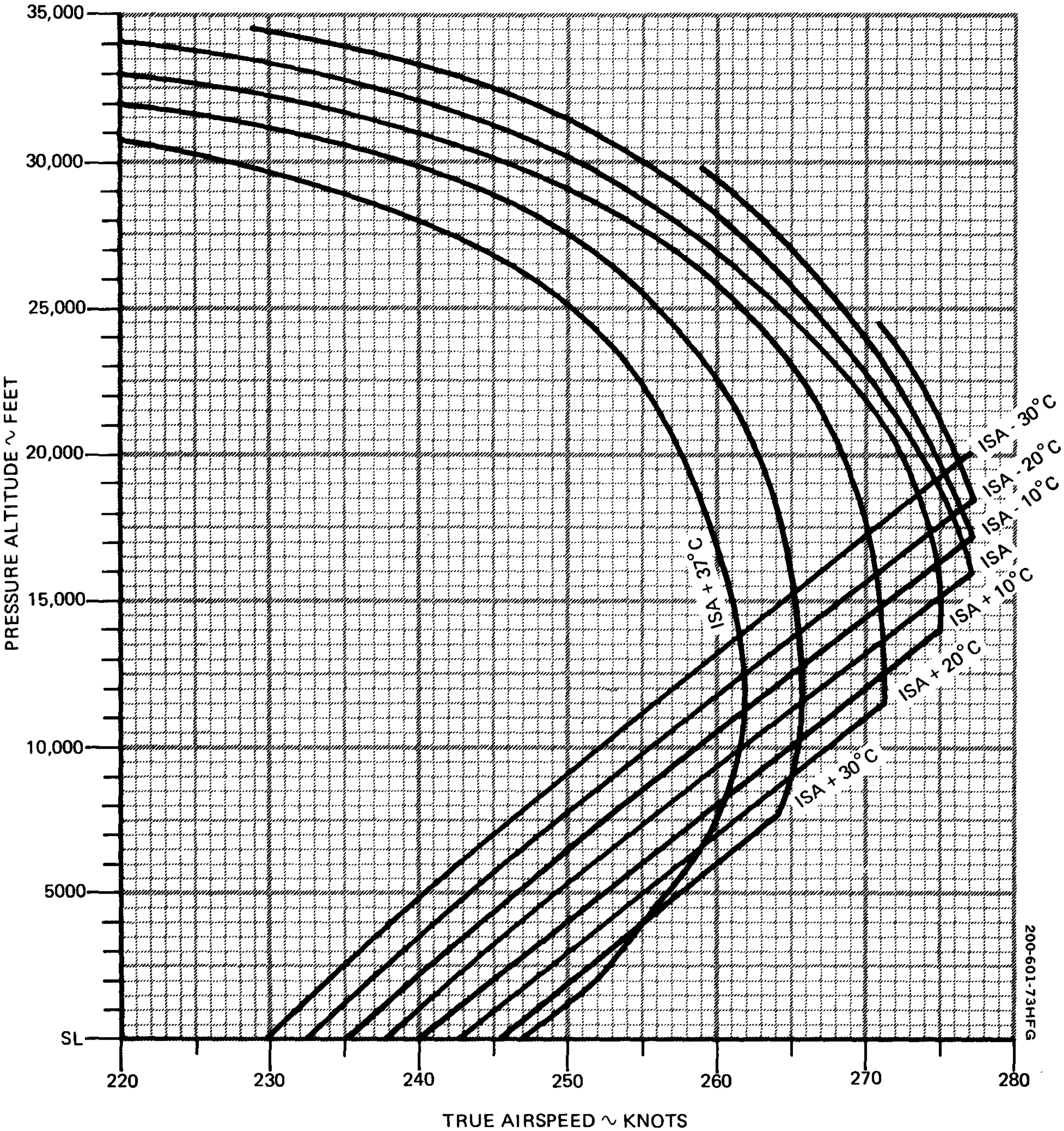
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	58	52	2230	484	968	231	246	232	247	233	248
2000	54	48	2230	470	940	228	251	229	252	230	253
4000	50	44	2192	451	902	224	254	225	255	226	256
6000	46	40	2153	433	866	220	257	222	258	223	260
8000	42	36	2089	412	824	215	259	217	261	218	262
10,000	39	32	2006	390	780	210	260	211	262	212	263
12,000	35	28	1908	368	736	203	260	205	262	206	264
14,000	31	24	1802	345	690	196	259	198	261	200	264
16,000	27	20	1699	324	648	189	258	191	261	193	263
18,000	23	16	1599	304	608	181	256	184	260	186	263
20,000	19	12	1499	284	568	173	253	176	258	179	261
22,000	14	9	1406	266	532	165	250	169	256	172	260
24,000	10	5	1312	248	496	156	245	161	252	164	258
26,000	6	1	1218	231	462	146	237	152	248	157	254
28,000	2	−3	1125	215	430	132	224	142	240	148	250
29,000	0	−5	1078	207	414	123	212	136	234	144	247
31,000	−5	−9	978	191	382	—	—	121	216	133	238
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE SPEEDS

1700 RPM

WEIGHT 11,000 LBS

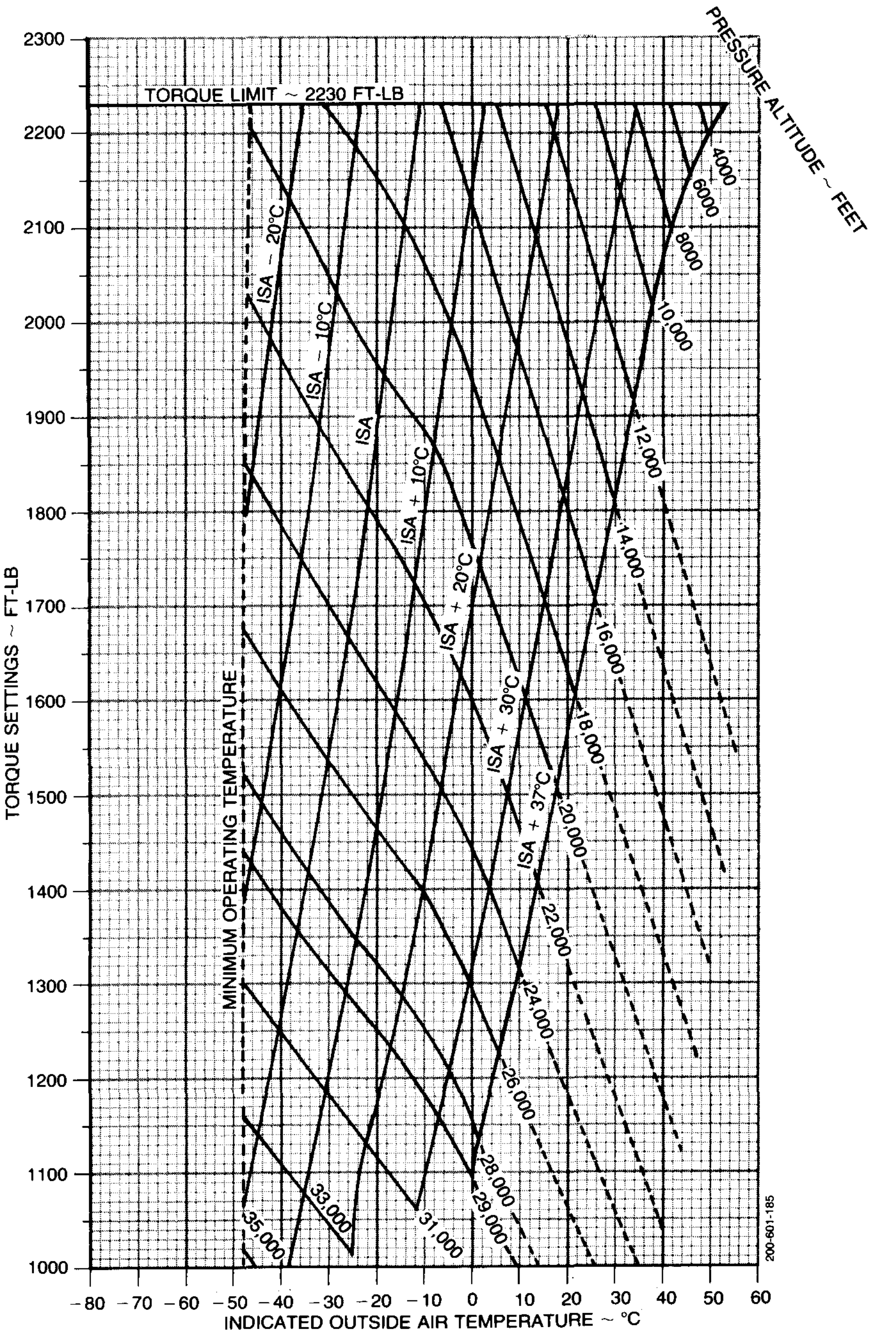
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, TAS WILL BE REDUCED BY APPROXIMATELY 25 KNOTS



RECOMMENDED CRUISE POWER

1700 RPM

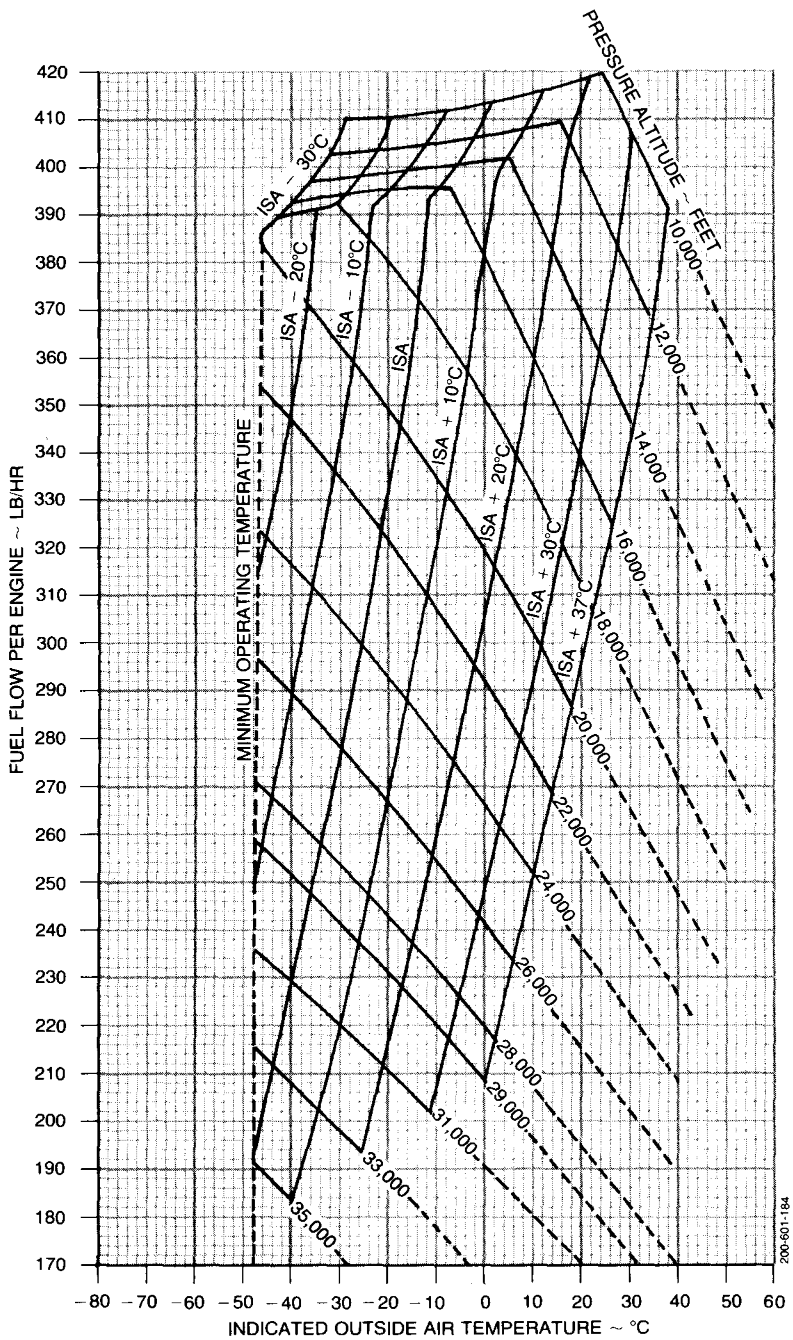
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 35°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



FUEL FLOW AT RECOMMENDED CRUISE POWER

1700 RPM

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 30°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



INTENTIONALLY LEFT BLANK

RECOMMENDED CRUISE POWER

1800 RPM

ISA −30°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	−10	−15	2230	484	968	246	234	247	235	248	235
2000	−14	−19	2230	472	944	244	238	245	239	245	240
4000	−17	−23	2230	460	920	242	243	242	243	243	244
6000	−21	−27	2230	448	896	239	247	240	248	241	249
8000	−25	−31	2230	438	876	237	252	238	253	239	254
10,000	−29	−35	2230	429	858	235	257	236	258	237	259
12,000	−32	−39	2230	422	844	233	262	234	263	234	264
14,000	−36	−43	2230	417	834	230	267	231	268	232	269
16,000	−40	−47	2230	413	826	228	272	229	273	230	275
18,000	−43	−51	2230	409	818	225	278	227	279	228	280
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1800 RPM

ISA −20°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	0	−5	2230	486	972	244	237	245	238	246	238
2000	−4	−9	2230	473	946	242	241	243	242	244	243
4000	−7	−13	2230	460	920	240	246	241	246	241	247
6000	−11	−17	2230	449	898	237	250	238	251	239	252
8000	−15	−21	2230	440	880	235	255	236	256	237	257
10,000	−19	−25	2230	431	862	233	260	234	261	235	262
12,000	−22	−29	2230	423	846	231	265	232	266	233	267
14,000	−26	−33	2230	418	836	228	270	229	272	230	273
16,000	−30	−37	2230	414	828	226	276	227	277	228	278
18,000	−33	−41	2160	399	798	220	278	222	279	223	281
20,000	−38	−45	2006	370	740	212	276	213	278	215	279
22,000	−42	−48	1870	346	692	203	273	205	276	207	278
24,000	−46	−52	1732	321	642	195	270	197	273	199	276
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1800 RPM

ISA −10°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	10	5	2230	489	978	243	239	244	240	244	241
2000	7	1	2230	475	950	240	244	241	245	242	246
4000	3	− 3	2230	463	926	238	248	239	249	240	250
6000	− 1	− 7	2230	451	902	236	253	237	254	238	255
8000	− 5	−11	2230	440	880	233	258	234	259	235	260
10,000	− 8	−15	2230	431	862	231	263	232	264	233	265
12,000	−12	−19	2230	425	850	229	268	230	270	231	271
14,000	−16	−23	2230	420	840	226	274	227	275	228	276
16,000	−19	−27	2213	413	826	223	278	224	280	226	281
18,000	−24	−31	2066	385	770	215	276	216	278	218	280
20,000	−28	−35	1917	357	714	206	274	208	276	209	278
22,000	−32	−38	1785	333	666	198	272	200	275	202	277
24,000	−36	−42	1652	310	620	189	269	191	272	193	275
26,000	−40	−46	1524	287	574	180	265	182	268	185	272
28,000	−44	−50	1407	266	532	170	259	174	265	177	269
29,000	−46	−52	1349	256	512	165	256	169	262	172	267
31,000	−50	−56	1235	237	474	153	247	159	256	163	262
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1800 RPM

ISA

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	20	15	2230	492	984	241	242	242	243	243	244
2000	17	11	2230	478	956	239	247	240	247	240	248
4000	13	7	2230	464	928	236	251	237	252	238	253
6000	9	3	2230	451	902	234	256	235	257	236	258
8000	6	−1	2230	441	882	232	261	233	262	234	263
10,000	2	−5	2230	433	866	229	266	230	268	231	269
12,000	−2	−9	2230	425	850	227	272	228	273	229	274
14,000	−6	−13	2230	419	838	225	277	226	278	227	280
16,000	−9	−17	2137	400	800	218	278	220	280	221	281
18,000	−14	−21	1985	372	744	210	276	211	278	213	280
20,000	−18	−25	1832	345	690	201	272	202	275	204	277
22,000	−22	−28	1704	322	644	192	270	194	273	196	276
24,000	−26	−32	1575	298	596	183	266	186	270	188	273
26,000	−30	−36	1452	276	552	174	262	177	266	180	270
28,000	−34	−40	1338	256	512	164	255	168	262	171	267
29,000	−36	−42	1282	246	492	158	251	163	259	167	265
31,000	−41	−46	1174	228	456	146	242	153	252	158	260
33,000	−45	−50	1068	209	418	130	223	141	241	148	252
35,000	−50	−54	955	190	380	—	—	125	223	136	242

RECOMMENDED CRUISE POWER

1800 RPM

ISA +10°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	31	25	2230	494	988	239	245	240	246	241	246
2000	27	21	2230	481	962	237	249	238	250	239	251
4000	23	17	2230	468	936	235	254	236	255	237	256
6000	19	13	2230	455	910	232	259	234	260	234	261
8000	16	9	2230	444	888	230	264	231	265	232	266
10,000	12	5	2230	434	868	228	269	229	271	230	272
12,000	8	1	2230	427	854	225	275	226	276	227	277
14,000	4	−3	2132	405	810	219	275	220	277	221	278
16,000	0	−7	2011	380	760	212	275	213	277	214	278
18,000	−4	−11	1892	357	714	204	274	206	276	207	278
20,000	−8	−15	1771	334	668	196	272	198	275	200	277
22,000	−12	−18	1640	311	622	187	269	190	272	192	275
24,000	−16	−22	1507	288	576	178	264	181	268	183	272
26,000	−20	−26	1383	266	532	167	258	171	264	174	268
28,000	−24	−30	1272	246	492	157	251	162	258	166	264
29,000	−26	−32	1217	237	472	151	246	157	255	161	262
31,000	−31	−36	1111	218	436	138	233	146	246	152	256
33,000	−36	−40	1005	200	400	—	—	133	233	141	247
35,000	−41	−44	883	181	362	—	—	—	—	128	234

RECOMMENDED CRUISE POWER

1800 RPM

ISA +20°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	41	35	2230	497	994	238	247	239	248	240	249
2000	37	31	2230	483	966	236	252	237	253	237	254
4000	33	27	2230	470	940	233	257	234	258	235	259
6000	30	23	2230	457	914	231	262	232	263	233	264
8000	26	19	2230	446	892	229	267	230	268	231	269
10,000	22	15	2184	430	860	224	270	225	271	227	273
12,000	18	11	2079	406	812	218	270	219	272	220	273
14,000	14	7	1972	382	764	211	270	212	272	214	274
16,000	10	3	1864	359	718	204	270	205	272	207	274
18,000	6	−1	1754	337	674	196	268	198	271	200	273
20,000	2	−5	1644	315	630	188	267	191	270	193	272
22,000	−2	−8	1537	295	590	180	264	183	268	185	271
24,000	−6	−12	1429	275	550	172	260	175	265	178	269
26,000	−10	−16	1323	256	512	162	254	166	261	169	266
28,000	−14	−20	1215	237	474	151	246	156	255	161	262
29,000	−17	−22	1158	228	456	144	240	151	250	156	259
31,000	−21	−26	1050	210	420	128	222	139	240	146	251
33,000	−26	−30	940	191	392	—	—	122	219	134	240
35,000	−30	−34	829	173	356	—	—	—	—	119	222

RECOMMENDED CRUISE POWER

1800 RPM

ISA +30°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	51	45	2230	499	998	237	250	238	251	238	251
2000	47	41	2230	485	970	234	254	235	255	236	256
4000	43	37	2212	469	938	231	258	232	260	233	261
6000	40	33	2167	450	900	227	262	228	263	229	264
8000	36	29	2098	428	856	222	264	223	265	224	266
10,000	32	25	2010	405	810	216	264	217	266	218	268
12,000	28	21	1914	383	766	209	265	211	267	212	268
14,000	24	17	1809	360	720	202	264	204	266	206	268
16,000	20	13	1709	338	676	195	263	197	266	199	268
18,000	16	9	1613	317	634	188	262	190	265	192	268
20,000	12	5	1516	297	594	180	260	183	264	185	267
22,000	8	2	1421	278	556	172	257	175	262	178	266
24,000	4	−2	1323	260	520	163	252	167	258	170	263
26,000	−1	−6	1228	242	484	153	246	158	254	162	260
28,000	−5	−10	1138	225	450	142	237	149	248	154	256
29,000	−7	−12	1092	217	434	136	231	144	244	150	254
31,000	−11	−16	993	200	400	—	—	131	232	141	245
33,000	−16	−20	—	—	—	—	—	—	—	126	231
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE POWER

1800 RPM

ISA +37°C

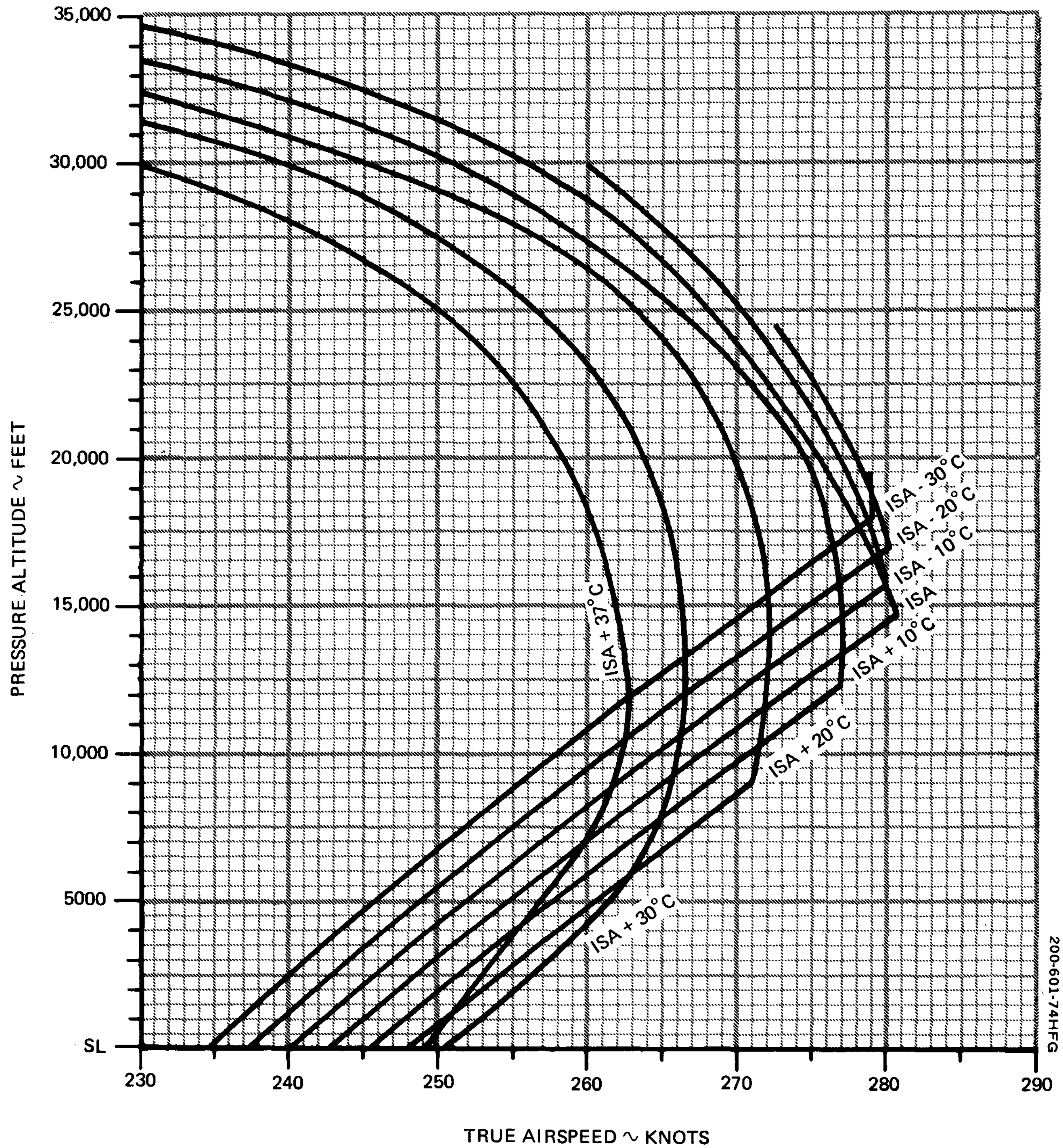
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	58	52	2156	491	982	232	243	234	249	235	250
2000	54	48	2110	471	942	228	251	230	252	231	253
4000	50	44	2071	451	902	224	254	226	255	227	256
6000	46	40	2034	433	866	220	257	222	259	223	260
8000	42	36	1975	413	826	216	259	217	261	218	263
10,000	39	32	1897	390	780	210	260	212	262	213	264
12,000	35	28	1806	368	736	203	260	205	263	207	265
14,000	31	24	1705	345	690	196	259	198	262	200	264
16,000	27	20	1608	324	648	189	258	191	261	193	264
18,000	23	16	1514	304	608	181	256	184	260	182	263
20,000	19	12	1420	284	568	173	254	177	258	179	262
22,000	15	9	1332	266	532	165	250	169	256	172	260
24,000	10	5	1242	248	496	156	245	161	252	165	258
26,000	6	1	1153	231	462	146	237	152	247	157	254
28,000	2	− 3	1066	215	430	134	226	142	240	148	250
29,000	0	− 5	1022	207	414	125	216	137	235	144	247
31,000	− 5	− 9	930	191	382	—	—	123	220	133	238
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

RECOMMENDED CRUISE SPEEDS

1800 RPM

WEIGHT 11,000 LBS

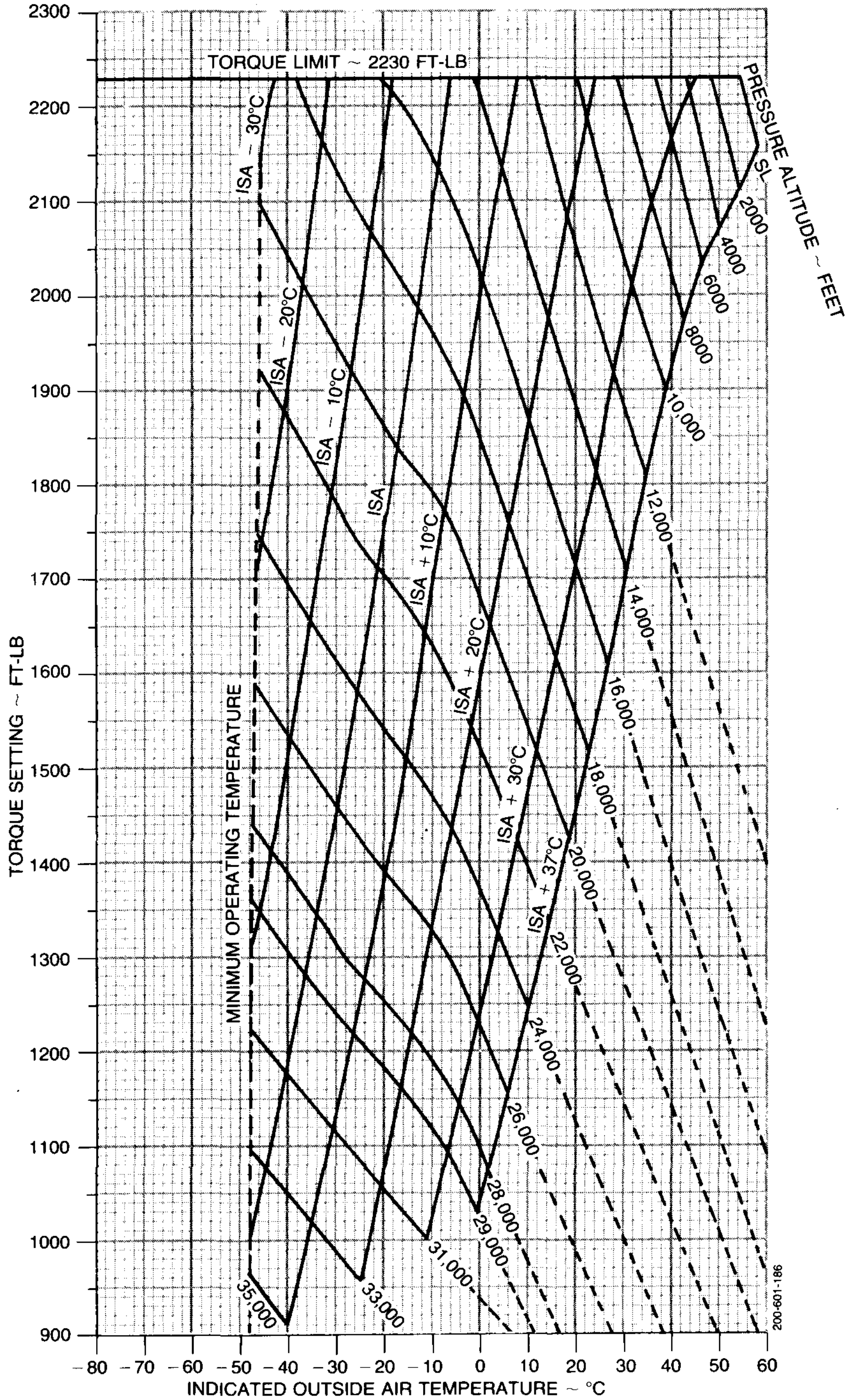
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, TAS WILL BE REDUCED BY APPROXIMATELY 25 KNOTS.



RECOMMENDED CRUISE POWER

1800 RPM

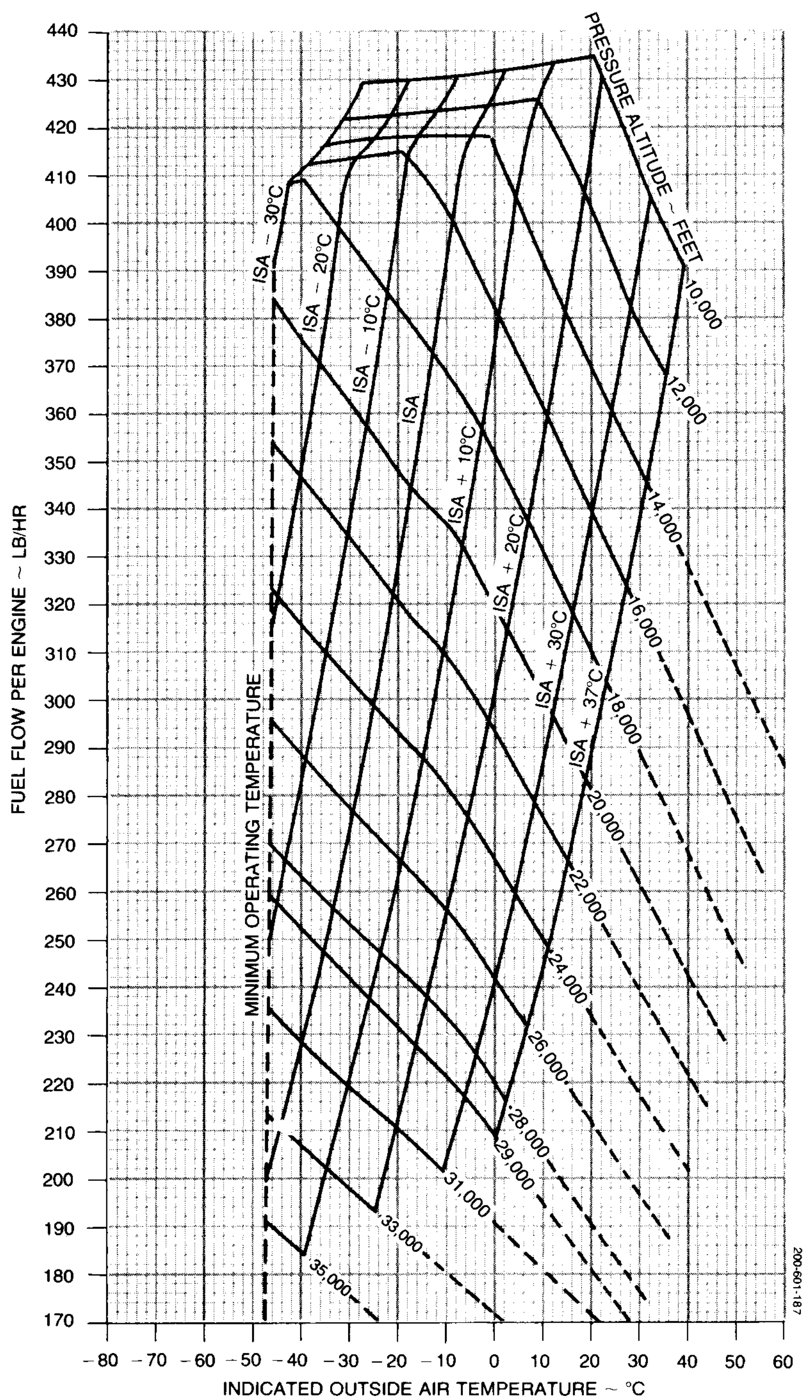
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 40°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



FUEL FLOW AT RECOMMENDED CRUISE POWER

1800 RPM

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 30°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



INTENTIONALLY LEFT BLANK

MAXIMUM CRUISE POWER

1900 RPM

ISA −30°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS					
						@ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	−10	−15	2230	500	1000	251	238	252	239	252	240
2000	−14	−19	2230	488	976	249	243	249	244	250	244
4000	−17	−23	2230	477	954	247	248	247	248	248	249
6000	−21	−27	2230	466	932	244	252	245	253	246	254
8000	−25	−31	2230	457	914	242	257	243	258	244	259
10,000	−28	−35	2230	449	898	240	262	241	263	241	264
12,000	−32	−39	2230	442	884	237	267	238	268	239	269
14,000	−36	−43	2230	437	874	235	272	236	274	237	275
16,000	−40	−47	2230	433	866	233	278	234	279	235	280
18,000	−43	−51	2216	428	856	230	283	231	284	232	286
20,000	−47	−55	2057	397	794	221	281	222	282	224	284
22,000	−51	−58	1917	371	742	212	279	214	281	215	283
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM CRUISE POWER

1900 RPM

ISA −20°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	0	−5	2230	503	1006	249	241	250	242	251	243
2000	−3	−9	2230	490	980	247	246	248	247	249	247
4000	−7	−13	2230	478	956	245	251	246	252	246	252
6000	−11	−17	2230	467	934	242	255	243	256	244	257
8000	−15	−21	2230	459	918	240	260	241	261	242	262
10,000	−18	−25	2230	450	900	238	265	239	266	240	267
12,000	−22	−29	2230	443	886	235	271	236	272	237	273
14,000	−26	−33	2230	439	878	233	276	234	277	235	278
16,000	−29	−37	2230	435	870	231	282	232	283	233	284
18,000	−33	−41	2123	413	826	224	282	225	284	226	285
20,000	−37	−45	1973	383	766	215	280	217	282	218	284
22,000	−41	−48	1837	358	716	207	278	209	280	210	282
24,000	−45	−52	1699	332	664	198	275	200	278	202	280
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM CRUISE POWER

1900 RPM

ISA −10°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	11	5	2230	505	1010	248	244	248	245	249	246
2000	7	1	2230	492	984	245	249	246	250	247	250
4000	3	− 3	2230	480	960	243	254	244	254	245	255
6000	− 1	− 7	2230	468	936	243	258	242	259	242	260
8000	− 4	−11	2230	458	916	238	268	239	264	240	265
10,000	− 8	−15	2230	450	900	236	269	237	270	238	271
12,000	−12	−19	2230	445	890	234	274	235	275	236	276
14,000	−15	−23	2230	440	880	231	280	232	281	233	282
16,000	−19	−27	2181	428	856	227	283	228	284	229	286
18,000	−23	−31	2034	399	798	218	281	220	283	221	284
20,000	−27	−35	1886	370	740	210	279	211	281	213	283
22,000	−31	−38	1757	345	690	201	276	203	279	205	281
24,000	−35	−42	1627	321	642	192	273	195	276	197	279
26,000	−40	−46	1500	297	594	183	269	186	273	188	276
28,000	−44	−50	1382	275	550	173	264	177	269	179	273
29,000	−46	−52	1324	265	530	168	261	172	266	175	271
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM CRUISE POWER

1900 RPM

ISA

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS					
						@ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	21	15	2230	508	1016	246	247	247	248	248	249
2000	17	11	2230	494	988	244	252	245	253	245	253
4000	13	7	2230	481	962	241	256	242	257	243	258
6000	9	3	2230	470	940	239	261	240	262	241	263
8000	6	−1	2230	461	922	237	267	237	268	238	269
10,000	2	−5	2230	452	904	234	272	235	273	236	274
12,000	−2	−9	2230	445	890	232	277	233	279	234	280
14,000	−5	−13	2218	437	874	229	282	230	284	231	285
16,000	−9	−17	2081	410	820	221	281	222	283	223	284
18,000	−13	−21	1944	384	768	213	280	214	282	216	283
20,000	−17	−25	1806	357	714	204	277	206	280	207	282
22,000	−21	−28	1680	333	666	196	275	198	278	200	280
24,000	−26	−32	1553	309	618	186	271	189	275	191	278
26,000	−30	−36	1432	286	572	178	266	180	271	183	275
28,000	−34	−40	1319	266	530	167	261	171	266	174	271
29,000	−36	−42	1265	255	510	162	257	166	264	170	269
31,000	−40	−46	1159	236	472	151	249	156	258	161	264
33,000	−45	−50	1055	217	434	137	235	145	248	151	258
35,000	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM CRUISE POWER

1900 RPM

ISA +10°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	31	25	2230	512	1024	244	250	245	251	246	251
2000	27	21	2230	499	998	242	254	243	255	244	256
4000	23	17	2230	486	972	240	259	241	260	241	261
6000	20	13	2230	474	948	237	264	238	265	239	266
8000	16	9	2230	463	926	235	270	236	271	237	272
10,000	12	5	2230	454	908	233	275	234	276	235	277
12,000	8	1	2197	441	882	229	279	230	280	231	282
14,000	5	−3	2077	415	830	222	279	223	280	224	282
16,000	1	−7	1957	389	778	214	278	216	280	217	281
18,000	−3	−11	1837	365	730	206	277	208	279	209	281
20,000	−8	−15	1715	341	682	198	275	200	277	202	280
22,000	−12	−18	1596	319	638	189	272	192	275	194	278
24,000	−16	−22	1474	296	592	180	268	183	272	186	275
26,000	−20	−26	1360	275	550	171	263	174	268	177	272
28,000	−24	−30	1255	256	512	161	257	165	263	169	269
29,000	−26	−32	1203	246	492	155	253	160	260	164	266
31,000	−30	−36	1101	227	454	144	242	150	253	155	261
33,000	−35	−40	1001	209	418	126	221	138	242	147	254
35,000	−40	−44	894	190	380	—	—	121	222	133	243

MAXIMUM CRUISE POWER

1900 RPM

ISA +20°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	41	35	2230	515	1030	243	252	244	253	245	254
2000	37	31	2230	502	1004	241	257	241	258	242	259
4000	33	27	2230	488	976	238	262	239	263	240	264
6000	30	23	2230	476	952	236	267	237	268	238	269
8000	26	19	2230	465	930	233	272	234	274	235	275
10,000	22	15	2138	441	882	227	274	228	275	230	276
12,000	18	11	2034	417	834	220	274	222	275	223	277
14,000	14	7	1927	392	784	213	274	215	276	216	277
16,000	10	3	1819	368	736	206	273	208	275	210	277
18,000	6	−1	1711	345	690	199	272	201	274	203	277
20,000	2	−5	1602	323	646	191	270	193	273	195	276
22,000	−2	−8	1497	302	604	182	267	185	271	188	274
24,000	−6	−12	1391	282	564	174	263	177	268	180	272
26,000	−10	−16	1288	262	524	164	258	168	264	171	269
28,000	−14	−20	1184	243	486	154	251	159	258	163	265
29,000	−16	−22	1130	234	468	148	246	153	255	158	262
31,000	−21	−26	1030	216	432	134	232	143	246	148	255
33,000	−26	−30	933	198	396	—	—	129	231	138	247
35,000	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM CRUISE POWER

1900 RPM

ISA +30°C

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS					
						@ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	51	45	2230	518	1036	242	255	242	256	243	257
2000	47	41	2224	504	1008	239	259	240	260	241	261
4000	43	37	2176	482	964	234	262	235	263	236	264
6000	40	33	2130	462	924	230	265	231	266	232	268
8000	36	29	2059	440	880	225	267	226	268	227	270
10,000	32	25	1971	417	834	219	268	220	270	221	271
12,000	28	21	1876	393	786	212	268	214	270	215	272
14,000	24	17	1773	369	738	205	267	207	270	208	272
16,000	20	13	1674	347	694	198	367	200	269	201	272
18,000	16	9	1578	326	652	190	265	193	269	195	271
20,000	12	5	1482	304	608	183	263	185	267	188	270
22,000	8	2	1388	285	570	175	261	178	265	180	269
24,000	4	−2	1293	266	532	166	257	170	262	173	267
26,000	0	−6	1201	248	496	156	251	161	258	165	264
28,000	−5	−10	1111	231	462	146	243	152	253	156	260
29,000	−7	−12	1066	222	444	140	237	147	249	152	257
31,000	−11	−16	969	205	410	123	218	135	238	142	250
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM CRUISE POWER

1900 RPM

ISA +37°C

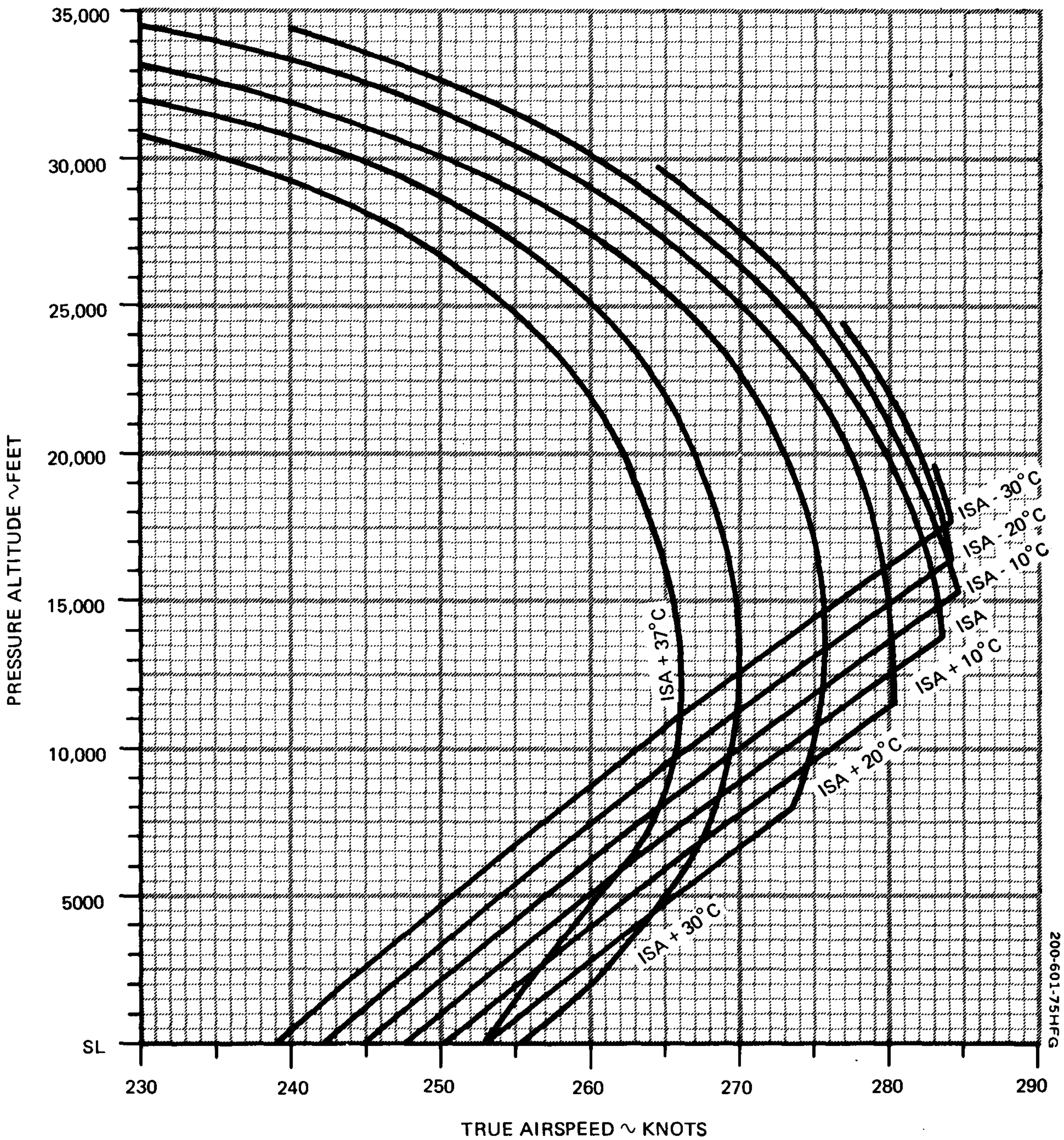
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	58	52	2128	506	1012	236	252	237	253	238	254
2000	54	48	2079	485	970	232	255	233	256	234	257
4000	50	44	2039	464	928	228	258	229	259	230	260
6000	46	40	2003	445	890	224	261	225	262	226	264
8000	43	36	1943	424	848	219	263	220	265	221	266
10,000	39	32	1863	401	802	213	264	214	266	216	268
12,000	35	28	1773	378	756	206	264	208	266	210	268
14,000	31	22	1674	355	710	199	263	201	266	203	268
16,000	27	18	1578	333	666	192	262	194	265	196	268
18,000	23	14	1486	312	624	184	260	187	264	189	267
20,000	19	10	1392	292	584	176	258	179	262	182	266
22,000	15	7	1306	273	546	168	255	172	260	175	264
24,000	11	3	1218	255	510	160	250	164	257	167	262
26,000	6	−1	1131	237	474	150	244	155	252	159	259
28,000	2	−5	1046	221	442	138	234	146	246	151	254
29,000	0	−7	1004	213	426	132	227	141	242	146	252
31,000	−5	−11	917	197	394	—	—	128	229	137	244
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM CRUISE SPEEDS

1900 RPM

WEIGHT 11,000 LBS

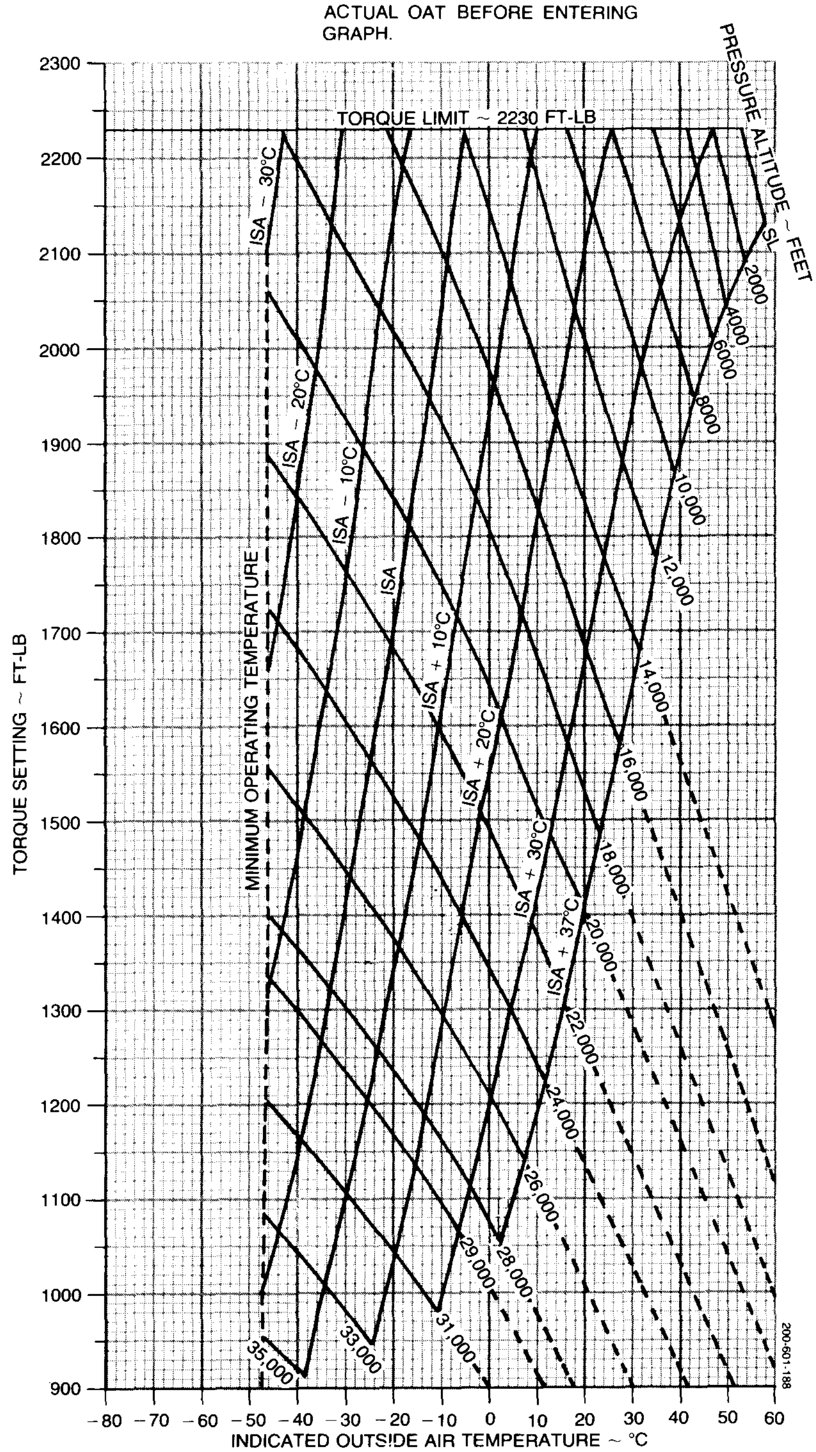
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, TAS WILL BE REDUCED BY APPROXIMATELY 25 KNOTS.



MAXIMUM CRUISE POWER

1900 RPM

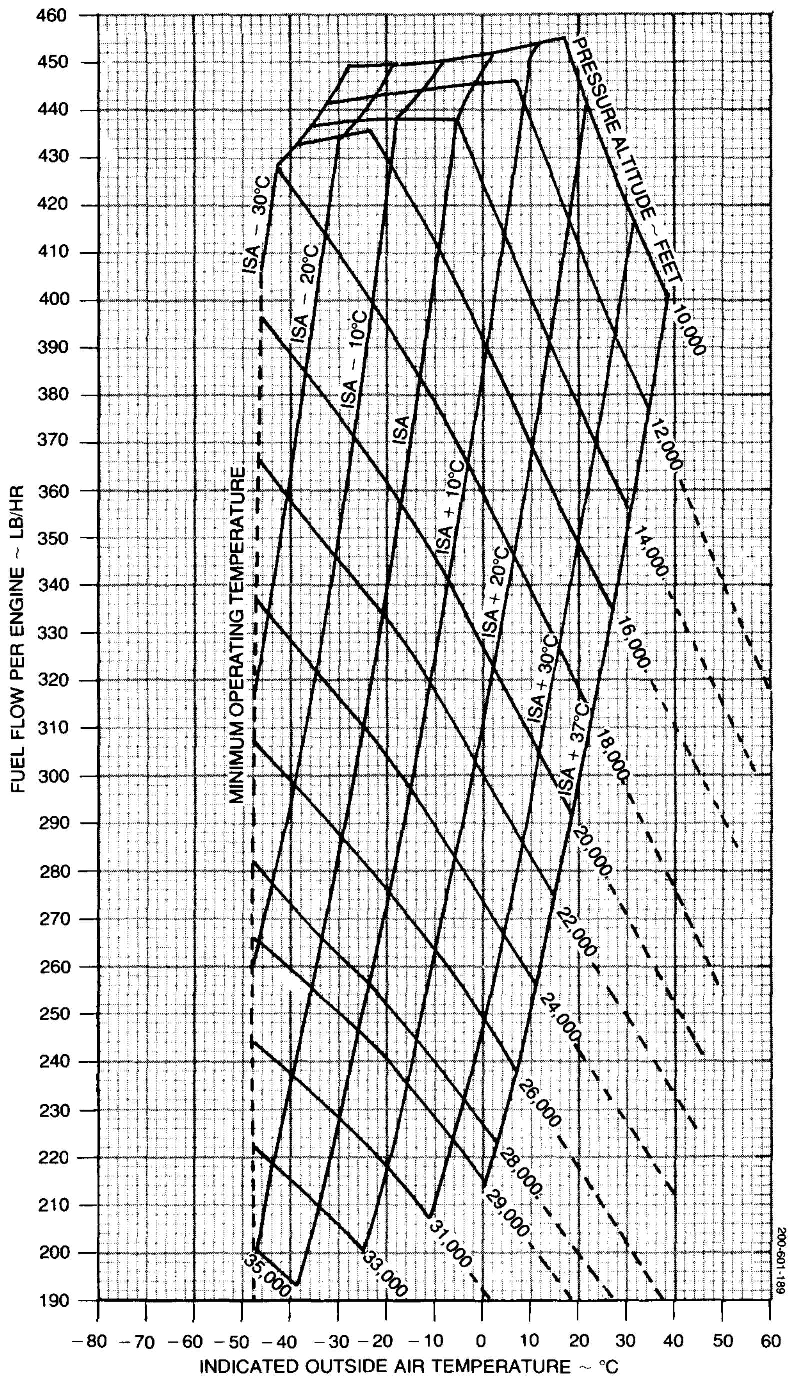
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 40°C TO THE ACTUAL OAT BEFORE ENTERING GRAPH.



FUEL FLOW AT MAXIMUM CRUISE POWER

1900 RPM

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, ADD 30°C TO THE ACTUAL OAT BEFORE ENTERING THE GRAPH.



INTENTIONALLY LEFT BLANK

MAXIMUM RANGE POWER

1700 RPM

ISA −30°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	−12	−15	1467	373	746	196	1380	363	726	193	1273	350	700	189
2000	−16	−19	1417	354	708	197	1328	343	686	194	1247	333	666	190
4000	−19	−23	1378	336	672	198	1297	326	652	195	1212	315	630	191
6000	−23	−27	1349	319	638	199	1276	310	620	196	1196	300	600	193
8000	−27	−31	1317	303	606	200	1241	294	588	197	1163	284	568	194
10,000	−31	−35	1279	287	574	201	1200	277	554	198	1122	268	536	195
12,000	−35	−39	1246	273	546	202	1163	262	524	199	1083	252	504	196
14,000	−39	−43	1214	260	520	204	1127	249	498	200	1043	239	478	197
16,000	−43	−47	1196	250	500	206	1107	239	478	202	1022	228	456	198
18,000	−47	−51	1189	242	484	208	1098	230	460	204	1011	219	438	200
20,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA −20°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	−2	−5	1449	372	744	197	1351	360	720	194	1268	350	700	191
2000	−5	−9	1408	353	706	199	1327	343	686	196	1232	332	664	192
4000	−9	−13	1371	335	670	200	1291	325	650	197	1193	313	626	193
6000	−13	−17	1332	318	636	201	1253	308	616	198	1162	297	594	194
8000	−17	−21	1294	301	602	202	1210	291	582	199	1120	280	560	195
10,000	−21	−25	1265	286	572	203	1179	276	552	200	1090	265	530	196
12,000	−25	−29	1240	273	546	205	1151	262	524	201	1062	251	502	197
14,000	−29	−33	1215	260	520	206	1123	249	498	202	1035	238	476	198
16,000	−33	−37	1200	250	500	209	1107	238	476	204	1019	227	454	200
18,000	−37	−41	1199	243	486	212	1100	230	460	207	1012	219	438	203
20,000	−41	−45	1198	236	472	215	1094	222	444	210	1002	210	420	205
22,000	−44	−48	1188	230	460	220	1105	219	438	215	1003	205	410	209
24,000	−48	−52	1174	224	448	221	1113	215	430	220	1009	201	402	213
26,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA −10°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	8	5	1390	367	734	196	1326	359	718	194	1264	351	702	192
2000	5	1	1345	347	694	197	1279	339	678	195	1215	331	662	193
4000	1	−3	1313	329	658	198	1244	320	640	196	1177	312	624	194
6000	−3	−7	1286	312	624	200	1210	303	606	198	1140	294	588	195
8000	−7	−11	1263	298	596	202	1178	287	574	199	1104	278	556	196
10,000	−11	−15	1240	283	566	204	1148	272	544	200	1068	262	524	197
12,000	−15	−19	1204	269	538	205	1106	257	514	200	1021	246	492	197
14,000	−19	−23	1191	258	516	207	1088	246	492	202	996	234	468	198
16,000	−23	−27	1199	251	502	211	1090	237	474	206	992	225	450	201
18,000	−27	−31	1204	244	488	215	1108	232	464	211	1007	219	438	205
20,000	−30	−35	1180	234	468	216	1114	225	450	215	1016	212	424	210
22,000	−34	−38	1137	224	448	215	1100	218	436	217	1023	208	416	214
24,000	−38	−42	1119	217	434	216	1062	209	418	217	1017	202	404	217
26,000	−42	−46	1139	216	432	221	1032	201	402	216	992	195	390	219
28,000	−46	−50	1160	217	434	227	1020	196	392	218	953	186	372	217
29,000	−48	−52	1163	217	434	229	1037	197	394	221	942	183	366	217
31,000	−52	−56	—	—	—	—	1057	198	396	227	937	180	360	220
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

FAA Approved
Revised: October, 1978
P/N 101-590010-59

MAXIMUM RANGE POWER

1700 RPM

ISA

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	19	15	1482	382	764	202	1360	367	734	197	1253	353	706	193
2000	15	11	1353	351	702	199	1263	339	678	195	1188	330	660	192
4000	11	7	1292	328	656	199	1217	319	638	196	1149	310	620	194
6000	7	3	1263	311	622	200	1187	302	604	198	1118	293	586	195
8000	3	−1	1243	296	592	202	1162	286	572	200	1086	277	554	197
10,000	−1	−5	1220	282	564	204	1131	271	542	201	1048	261	522	197
12,000	−5	−9	1209	270	540	207	1109	258	516	202	1019	246	492	198
14,000	−9	−13	1195	259	518	209	1094	246	492	205	995	234	468	200
16,000	−13	−17	1191	251	502	212	1105	239	478	209	997	226	452	203
18,000	−16	−21	1179	243	486	215	1104	232	464	212	1017	221	442	209
20,000	−20	−25	1167	235	470	217	1084	223	446	214	1019	214	428	213
22,000	−24	−28	1172	230	460	221	1057	214	428	215	1002	207	414	215
24,000	−28	−32	1171	226	452	224	1043	208	416	216	972	197	394	215
26,000	−32	−36	1166	222	444	226	1058	206	412	221	939	189	378	214
28,000	−36	−40	1195	223	446	233	1068	204	408	226	937	185	370	217
29,000	−38	−42	1208	225	450	236	1070	203	406	227	951	185	370	220
31,000	−42	−46	—	—	—	—	1092	205	410	234	965	185	370	225
33,000	−46	−50	—	—	—	—	—	—	—	—	981	186	372	231
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA +10°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	29	25	1600	398	796	211	1532	389	778	209	1449	379	758	206
2000	25	21	1520	373	746	211	1426	362	724	207	1310	348	696	202
4000	21	17	1426	348	696	209	1288	331	662	202	1166	315	630	196
6000	17	13	1322	321	642	206	1195	305	610	200	1102	293	586	196
8000	13	9	1266	301	602	206	1149	287	574	200	1062	275	550	196
10,000	9	5	1238	286	572	207	1119	271	542	201	1033	260	520	198
12,000	5	1	1227	274	548	210	1104	259	518	204	1008	246	492	199
14,000	1	−3	1222	264	528	213	1093	248	496	206	987	234	468	201
16,000	−3	−7	1229	257	514	218	1095	240	480	210	985	226	452	204
18,000	−6	−11	1234	250	500	222	1109	234	468	215	998	220	440	209
20,000	−10	−15	1220	241	482	224	1110	226	452	219	998	212	424	212
22,000	−14	−18	1187	233	466	224	1111	222	444	222	993	206	412	215
24,000	−18	−22	1165	226	452	225	1091	215	430	224	996	202	404	219
26,000	−22	−26	1210	229	458	233	1068	208	416	224	992	197	394	223
28,000	−26	−30	1228	230	460	239	1095	209	418	231	976	192	384	224
29,000	−28	−34	—	—	—	—	1106	210	420	234	974	190	380	225
31,000	−32	−36	—	—	—	—	—	—	—	—	989	190	380	231
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA +20°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	39	35	1536	392	784	210	1478	385	770	208	1426	378	756	207
2000	35	31	1498	373	746	211	1437	365	730	210	1386	358	716	209
4000	31	27	1463	354	708	213	1401	346	692	212	1317	336	672	208
6000	27	23	1440	337	674	216	1344	325	650	212	1237	312	624	207
8000	23	19	1388	318	636	217	1282	305	610	212	1152	289	578	205
10,000	19	15	1338	300	600	217	1224	286	572	211	1086	269	538	203
12,000	15	11	1306	286	572	218	1193	272	544	213	1059	255	510	205
14,000	12	7	1287	274	548	221	1185	261	522	216	1049	244	488	208
16,000	8	3	1254	261	522	222	1171	250	500	219	1048	235	470	212
18,000	4	−1	1222	250	500	222	1157	241	482	221	1048	227	454	216
20,000	0	−5	1197	240	480	224	1128	230	460	222	1042	219	438	219
22,000	−4	−8	1200	235	470	227	1099	221	442	223	1034	212	424	222
24,000	−8	−12	1221	234	468	233	1078	214	428	224	1009	204	408	223
26,000	−12	−16	1233	232	464	238	1103	213	426	230	980	196	392	223
28,000	−15	−20	—	—	—	—	1123	214	428	236	981	193	386	226
29,000	−18	−22	—	—	—	—	—	—	—	—	996	194	388	230
31,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA +30°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	49	45	1593	402	804	215	1491	390	780	211	1410	380	760	208
2000	45	41	1473	372	744	212	1404	364	728	210	1336	355	710	207
4000	41	37	1423	351	702	213	1360	343	686	211	1300	335	670	209
6000	37	33	1398	334	668	215	1336	326	652	213	1276	319	638	212
8000	33	29	1360	317	634	216	1306	310	620	215	1248	303	606	214
10,000	30	25	1322	301	602	218	1269	294	588	217	1201	285	570	215
12,000	26	21	1286	286	572	219	1235	279	558	218	1160	269	538	216
14,000	22	17	1259	273	546	220	1186	263	526	218	1120	254	508	216
16,000	18	13	1250	263	526	223	1154	251	502	219	1090	242	484	218
18,000	14	9	1252	256	512	227	1133	240	480	221	1065	231	462	219
20,000	10	5	1254	249	498	231	1128	232	464	224	1038	220	440	220
22,000	6	2	1239	242	484	233	1132	227	454	228	1014	211	422	222
24,000	2	−2	1234	237	474	236	1131	222	444	232	1007	205	410	224
26,000	−1	−6	—	—	—	—	1124	217	434	234	1016	201	402	229
28,000	−5	−10	—	—	—	—	—	—	—	—	1020	199	398	233
29,000	−7	−12	—	—	—	—	—	—	—	—	1028	198	396	236
31,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAXIMUM RANGE POWER

1700 RPM

ISA +37°C

NOTE: FOR OPERATION WITH ICE VANES EXTENDED, MAINTAIN SAME POWER AS WITH ICE VANES RETRACTED. FUEL FLOW WILL INCREASE APPROXIMATELY 15%.

WEIGHT→			12,000 POUNDS				11,000 POUNDS				10,000 POUNDS			
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS	TORQUE PER ENG	FUEL FLOW PER ENG	FUEL FLOW TOTAL	TAS
FEET	°C	°C	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS	FT-LB	LB/HR	LB/HR	KNOTS
SL	56	52	1618	406	812	218	1502	392	784	213	1402	380	760	209
2000	52	48	1552	383	766	218	1436	369	738	213	1344	357	714	209
4000	48	44	1470	359	718	217	1360	345	690	212	1280	335	670	209
6000	44	40	1394	335	670	216	1311	325	650	213	1243	316	632	211
8000	40	36	1359	318	636	218	1278	308	616	215	1211	299	598	213
10,000	37	32	1338	304	608	220	1243	292	584	216	1177	283	566	214
12,000	33	28	1317	291	582	222	1211	277	554	218	1148	269	538	216
14,000	29	24	1300	279	558	225	1188	265	530	220	1104	254	508	216
16,000	25	20	1287	269	538	228	1176	255	510	222	1074	241	482	218
18,000	21	16	1271	260	520	230	1168	246	492	226	1055	231	462	220
20,000	17	12	1243	249	498	231	1162	238	476	229	1045	222	444	222
22,000	13	10	1241	244	488	234	1147	230	460	231	1046	216	432	226
24,000	9	6	—	—	—	—	1125	222	444	232	1042	210	420	230
26,000	6	2	—	—	—	—	1154	222	444	240	1025	204	408	231
28,000	2	−2	—	—	—	—	—	—	—	—	1028	201	402	236
29,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—	—	—	—

RANGE PROFILE–FULL MAIN AND AUX TANKS

STANDARD DAY

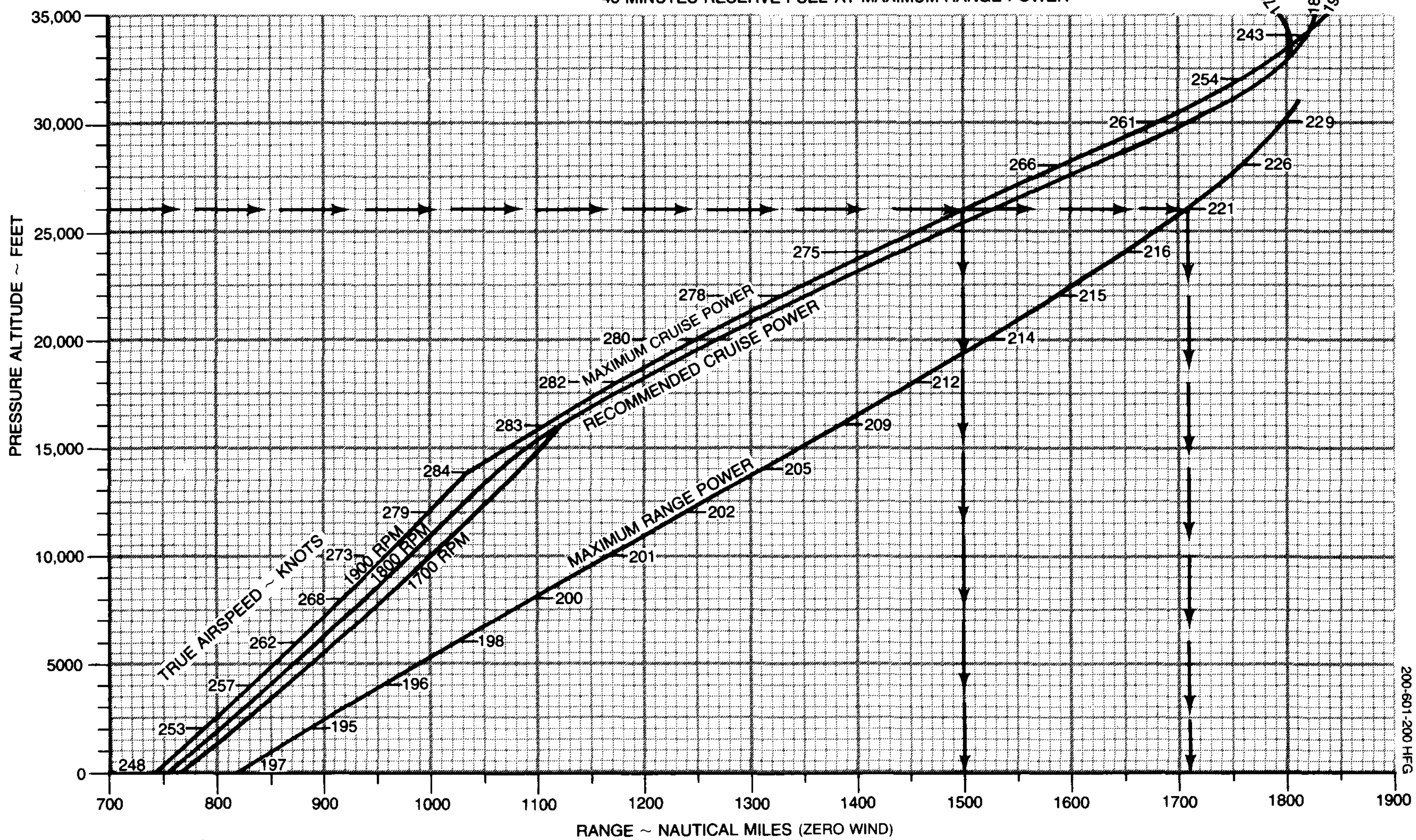
ASSOCIATED CONDITIONS:

WEIGHT	12,590 LBS. BEFORE ENGINE START
FUEL	AVIATION KEROSENE
FUEL DENSITY	6.7 LBS/GAL.
ICE VANES	RETRACTED

EXAMPLE:

PRESSURE ALTITUDE	26,000 FEET
RANGE @ MAX CRUISE POWER	1500 MILES
RANGE @ MAX RANGE POWER	1710 MILES

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



High Flotation Gear

FAA Approved
Revised: October, 1978
P/N 101-590010-59

BEECHCRAFT
Super King Air 200

ENDURANCE PROFILE — FULL MAIN AND AUX TANKS

STANDARD DAY

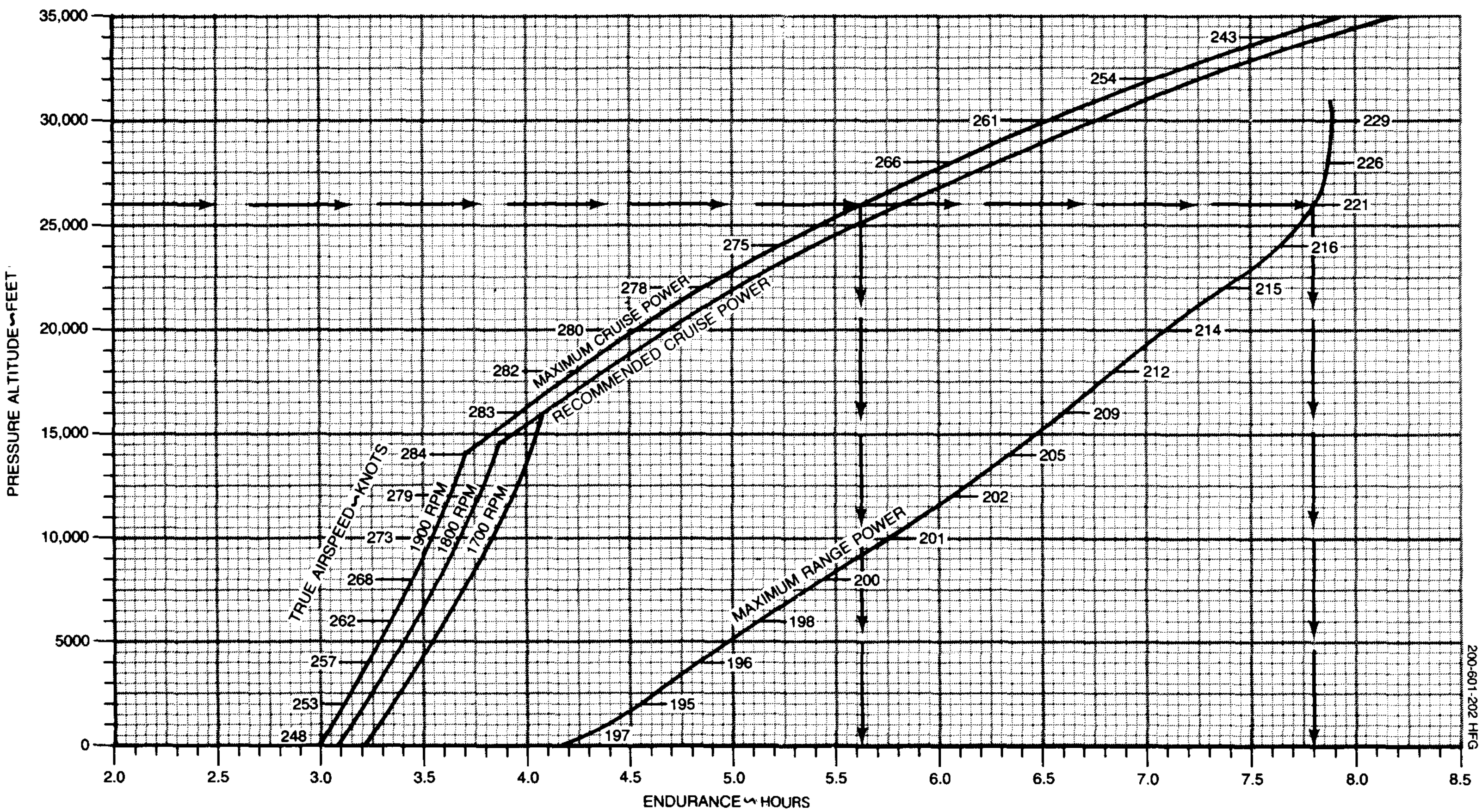
ASSOCIATED CONDITIONS:

WEIGHT	12,590 LBS BEFORE ENGINE START
FUEL	AVIATION KEROSENE
FUEL DENSITY	6.7 LBS/GAL
ICE VANES	RETRACTED

EXAMPLE:

PRESSURE ALTITUDE	26,000 FEET
ENDURANCE @ MAX CRUISE POWER	5.625 HRS
ENDURANCE @ MAX RANGE POWER	7.8 HRS

NOTE: ENDURANCE INCLUDES START, TAXI, CLIMB AND DESCENT WITH 45 MINUTES RESERVE FUEL AT MAXIMUM RANGE POWER.



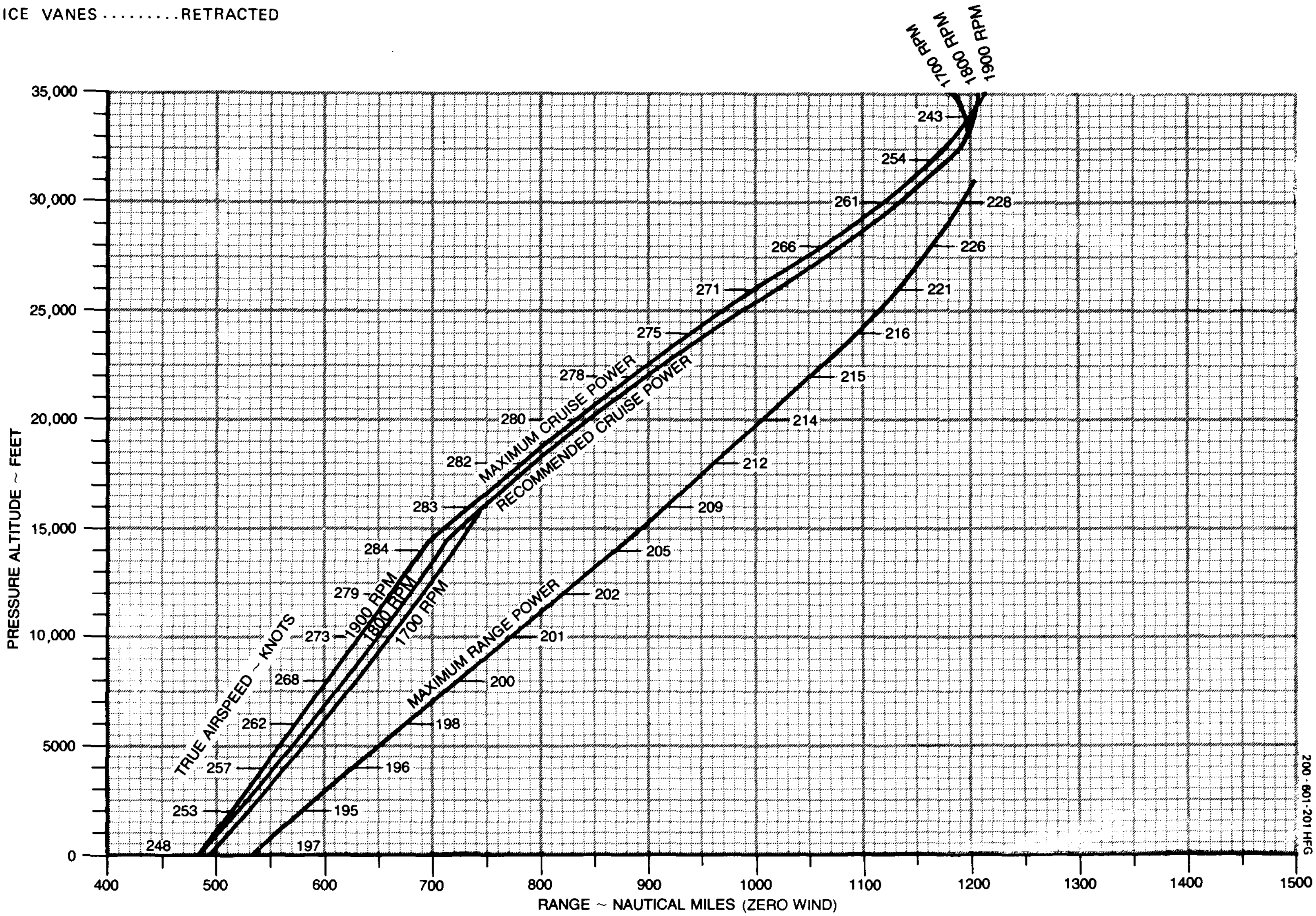
RANGE PROFILE - FULL MAIN TANKS

STANDARD DAY

ASSOCIATED CONDITIONS:

WEIGHT . . . . 12590 LBS. BEFORE ENGINE START
FUEL . . . . AVIATION KEROSENE
FUEL DENSITY . . . . 6.7 LBS/GAL
ICE VANES . . . . RETRACTED

NOTE: RANGE INCLUDES START, TAXI, CLIMB, AND DESCENT WITH 45 MINUTES RESERVE FUEL AT MAXIMUM RANGE POWER.



TransNorthern Aviation

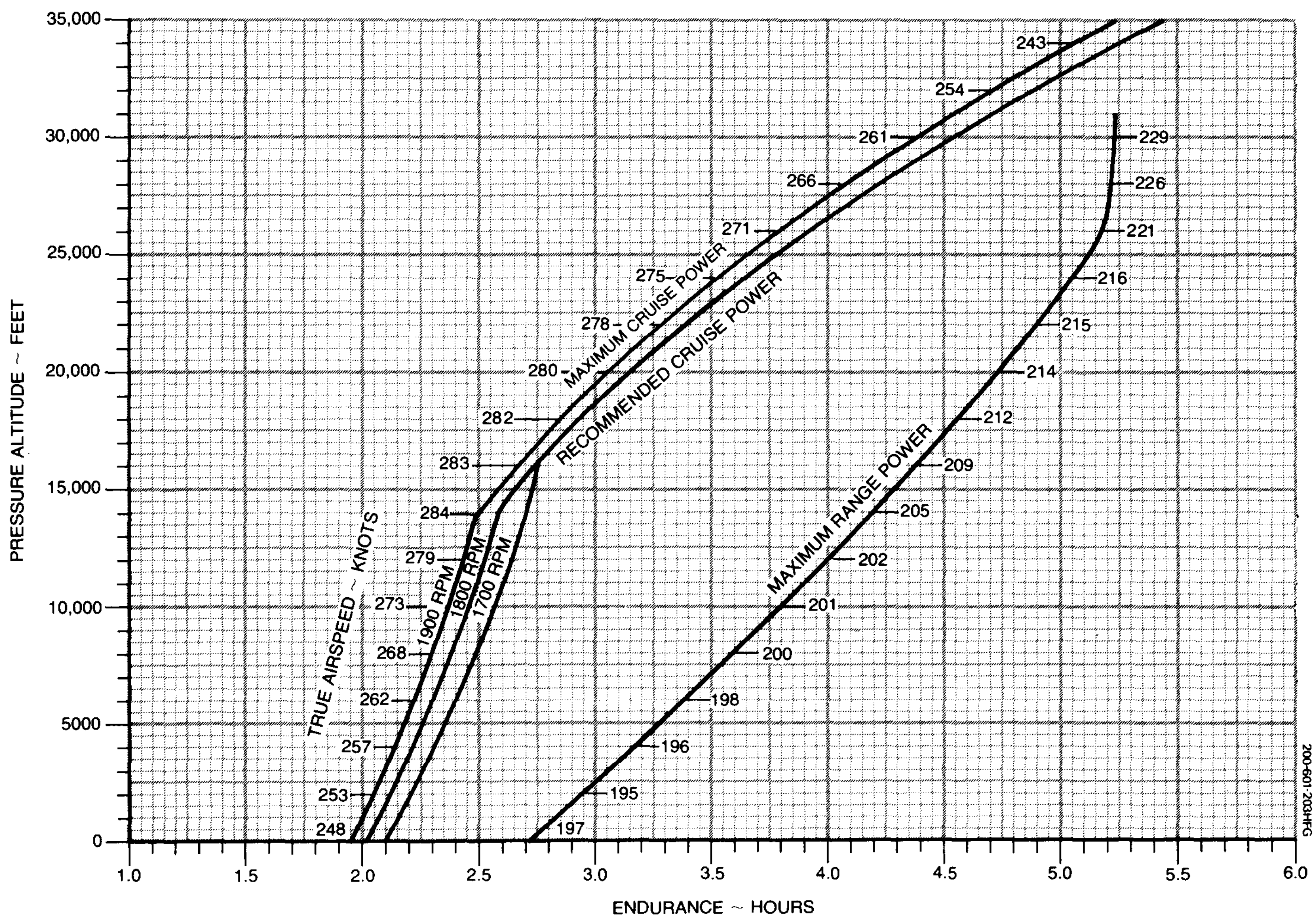
ENDURANCE PROFILE — FULL MAIN TANKS

STANDARD DAY

ASSOCIATED CONDITIONS:

WEIGHT	12,590 LBS BEFORE ENGINE START
FUEL	AVIATION KEROSENE
FUEL DENSITY	6.7 LBS/GAL
ICE VANES	RETRACTED

NOTE: ENDURANCE INCLUDES START, TAXI, CLIMB AND DESCENT WITH 45 MINUTES RESERVE FUEL AT MAXIMUM RANGE POWER



ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA −30°C

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	−12	−15	2230	512	1024	191	182	193	183	194	185
2000	−16	−19	2230	500	1000	189	185	191	187	192	188
4000	−20	−23	2230	488	976	186	188	188	190	190	191
6000	−23	−27	2230	477	954	184	191	186	193	188	195
8000	−27	−31	2230	467	934	182	194	184	196	186	198
10,000	−31	−35	2230	458	916	179	197	182	199	184	202
12,000	−35	−39	2230	452	904	177	200	179	203	181	205
14,000	−39	−43	2230	448	896	174	203	177	206	179	209
16,000	−43	−47	2151	431	862	168	202	171	206	174	209
18,000	−47	−51	2001	401	802	159	198	163	203	167	207
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA −20°C

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	−2	−5	2230	515	1030	189	184	191	185	193	187
2000	−6	−9	2230	501	1002	187	187	189	189	191	190
4000	−10	−13	2230	489	978	185	190	187	192	189	194
6000	−13	−17	2230	478	956	182	193	184	195	186	197
8000	−17	−21	2230	467	938	180	196	182	198	184	200
10,000	−21	−25	2230	460	920	177	199	180	202	182	204
12,000	−25	−29	2230	454	908	175	202	177	205	180	207
14,000	−29	−33	2209	445	890	171	203	174	207	177	210
16,000	−33	−37	2060	416	832	162	199	166	204	169	208
18,000	−37	−41	1917	387	774	153	195	158	201	162	205
20,000	−41	−45	1777	360	720	143	188	149	196	154	202
22,000	−45	−48	1648	335	670	130	177	139	189	145	197
24,000	−50	−52	1517	310	620	—	—	127	179	136	191
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE
MAXIMUM CRUISE POWER

1900 RPM

ISA −10°C

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	8	5	2230	517	1034	188	185	190	187	192	189
2000	4	1	2230	503	1006	185	188	188	191	189	192
4000	1	−3	2230	490	980	183	191	185	194	187	196
6000	−3	−7	2230	479	958	181	195	183	197	185	199
8000	−7	−11	2230	469	938	178	198	181	200	183	203
10,000	−11	−15	2230	461	922	175	201	178	204	180	206
12,000	−15	−19	2230	455	910	173	204	175	207	178	209
14,000	−19	−23	2118	430	860	165	201	169	205	172	209
16,000	−23	−27	1971	401	802	157	197	161	202	164	206
18,000	−27	−31	1834	374	748	147	191	153	198	157	203
20,000	−31	−35	1698	347	694	135	182	143	192	148	199
22,000	−35	−38	1576	323	646	—	—	133	184	140	194
24,000	−40	−42	1445	299	598	—	—	—	—	130	187
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	18	15	2230	522	1044	186	187	188	189	190	191
2000	14	11	2230	508	1016	184	190	186	192	188	194
4000	11	7	2230	494	988	181	193	184	196	186	198
6000	7	3	2230	482	964	179	196	181	199	184	201
8000	3	−1	2230	472	944	176	200	179	202	181	205
10,000	−1	−5	2230	462	924	174	202	176	205	179	208
12,000	−5	−9	2173	445	890	168	203	172	206	174	210
14,000	−9	−13	2036	416	832	160	199	164	204	167	208
16,000	−13	−17	1897	388	776	151	194	156	200	160	205
18,000	−17	−21	1761	361	722	141	187	147	195	152	201
20,000	−21	−25	1623	334	668	126	173	137	188	143	196
22,000	−26	−28	1502	311	622	—	—	125	177	134	190
24,000	−31	−32	1337	283	566	—	—	—	—	123	181
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA +10°C

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS					
						@ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	28	25	2230	525	1050	185	189	187	191	189	193
2000	25	21	2230	511	1022	182	192	185	194	187	196
4000	21	17	2230	497	994	180	195	182	198	184	200
6000	17	13	2230	485	970	177	198	180	201	182	203
8000	13	9	2230	474	948	175	201	177	204	180	207
10,000	9	5	2135	449	898	168	200	172	204	174	207
12,000	5	1	2019	422	844	161	197	165	202	168	206
14,000	1	−3	1902	396	738	153	194	158	199	161	204
16,000	−3	−7	1787	371	742	144	188	150	196	154	201
18,000	−7	−11	1673	347	694	133	179	141	191	147	198
20,000	−12	−15	1557	322	644	—	—	131	183	138	193
22,000	−16	−18	1431	300	600	—	—	—	—	128	186
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA +20°C

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	33	35	2230	529	1058	183	191	186	193	187	195
2000	35	31	2230	514	1028	181	194	183	196	185	198
4000	31	27	2226	499	998	178	196	181	199	183	202
6000	27	23	2161	476	952	173	197	176	200	189	203
8000	23	19	2074	451	902	167	196	171	200	173	203
10,000	19	15	1973	425	850	160	194	164	199	167	202
12,000	15	11	1867	400	800	153	191	157	196	161	201
14,000	11	7	1764	375	750	144	186	150	193	154	199
16,000	7	3	1661	352	704	134	179	142	189	147	196
18,000	2	−1	1556	329	658	—	—	132	183	139	192
20,000	−2	−5	1447	306	612	—	—	119	170	131	186
22,000	−7	−8	1310	283	566	—	—	—	—	120	177
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA +30°C

NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	48	45	2129	517	1034	178	188	181	191	183	193
2000	44	41	2087	496	992	174	190	177	193	179	195
4000	41	37	2047	475	950	170	191	173	194	176	197
6000	37	33	1995	453	906	165	191	169	195	171	198
8000	33	29	1918	429	858	159	190	163	195	166	198
10,000	29	25	1825	404	808	152	187	157	193	160	197
12,000	25	21	1726	379	758	144	183	150	190	154	196
14,000	20	17	1625	355	710	134	176	142	186	147	193
16,000	16	13	1528	333	666	—	—	133	180	141	189
18,000	12	9	1432	311	622	—	—	121	170	131	185
20,000	7	5	1301	287	574	—	—	—	—	121	176
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

ONE ENGINE INOPERATIVE MAXIMUM CRUISE POWER

1900 RPM

ISA +37°C

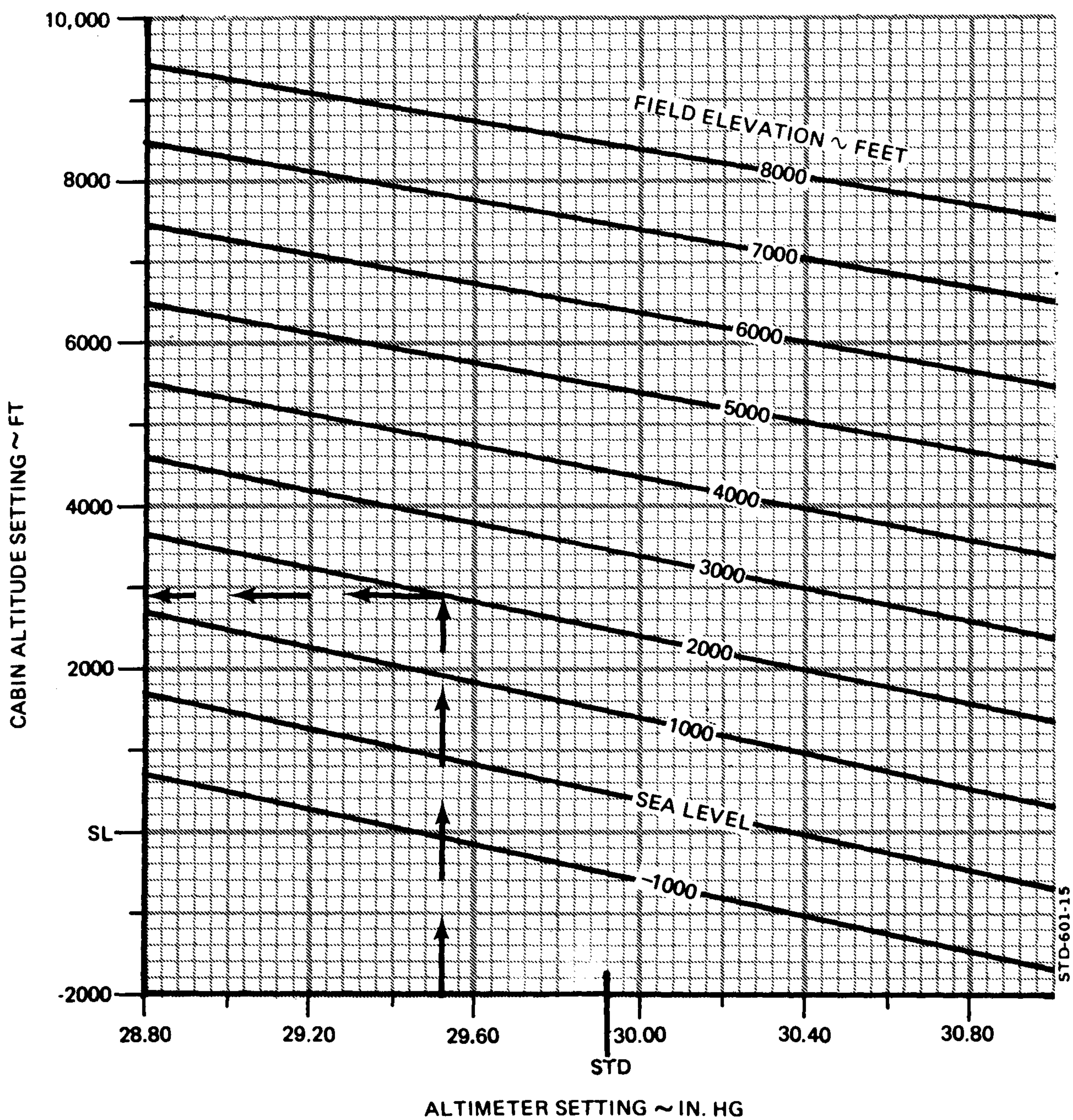
NOTE: FOR OPERATION WITH ICE VANE EXTENDED, DECREASE FUEL FLOW AND TAS BY 7%.

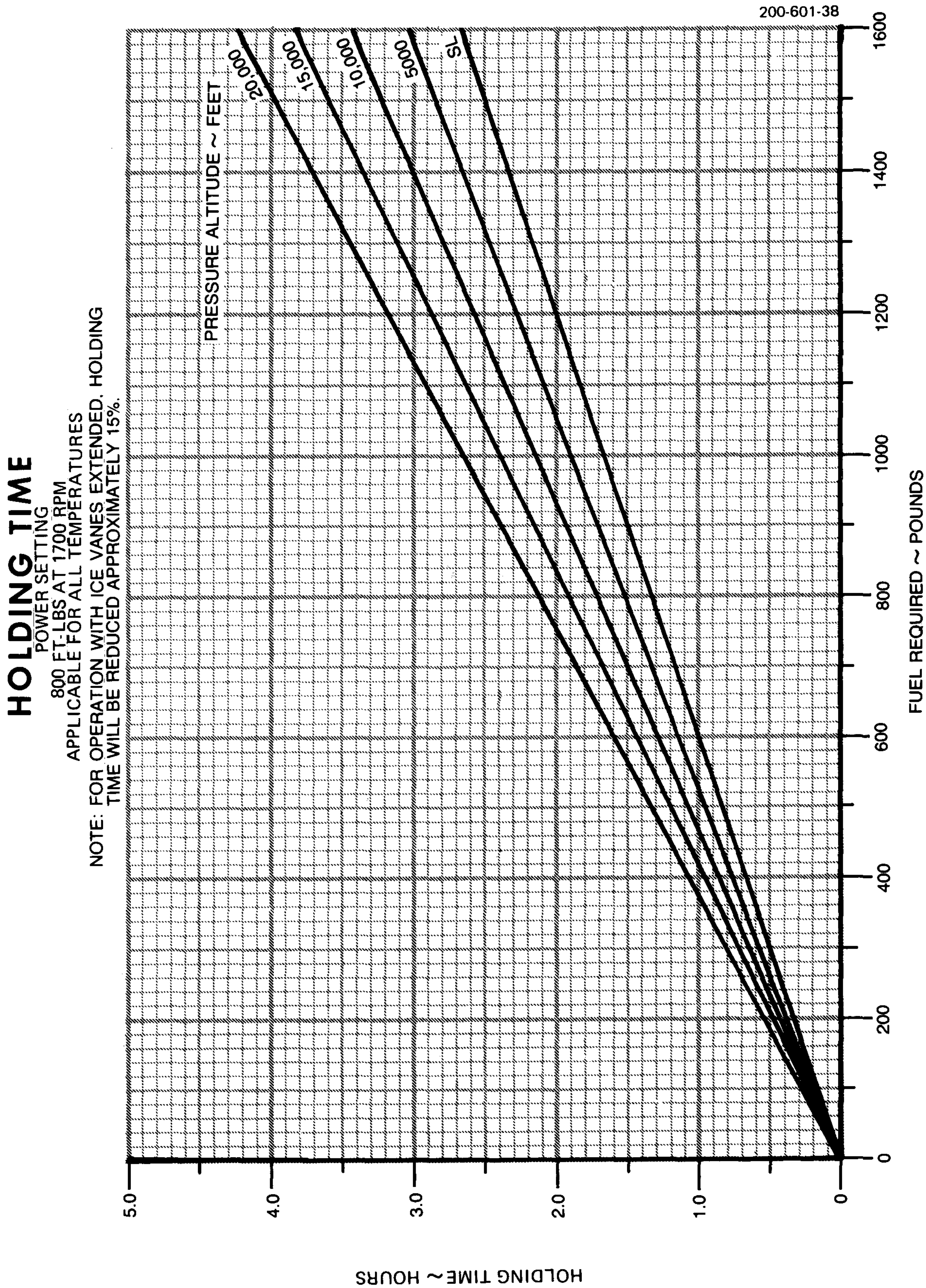
PRESSURE ALTITUDE	IOAT	OAT	TORQUE PER ENGINE	FUEL FLOW PER ENGINE	TOTAL FUEL FLOW	AIRSPEED ~ KNOTS @ 12,000 LBS		@ 11,000 LBS		@ 10,000 LBS	
FEET	°C	°C	FT-LBS	LBS/HR	LBS/HR	IAS	TAS	IAS	TAS	IAS	TAS
SL	55	52	1985	497	994	172	184	175	187	177	189
2000	51	48	1951	477	954	168	185	171	188	174	191
4000	47	44	1917	457	914	164	186	167	190	170	193
6000	43	40	1876	437	874	159	186	163	191	166	194
8000	40	36	1808	414	828	153	185	158	190	161	194
10,000	35	32	1724	390	780	146	182	151	188	155	193
12,000	31	28	1630	366	732	137	176	144	185	149	191
14,000	27	24	1534	342	684	124	165	135	180	142	188
16,000	23	20	1439	320	640	—	—	125	171	134	184
18,000	18	16	1306	295	590	—	—	—	—	124	177
20,000	—	—	—	—	—	—	—	—	—	—	—
22,000	—	—	—	—	—	—	—	—	—	—	—
24,000	—	—	—	—	—	—	—	—	—	—	—
26,000	—	—	—	—	—	—	—	—	—	—	—
28,000	—	—	—	—	—	—	—	—	—	—	—
29,000	—	—	—	—	—	—	—	—	—	—	—
31,000	—	—	—	—	—	—	—	—	—	—	—
33,000	—	—	—	—	—	—	—	—	—	—	—
35,000	—	—	—	—	—	—	—	—	—	—	—

PRESSURIZATION CONTROLLER SETTING FOR LANDING

EXAMPLE:

ALTIMETER SETTING . . . . 29.52 In.Hg
LANDING FIELD ELEVATION. . 2000 FEET
CABIN ALTITUDE SETTING . . . 2885 FEET




200-601-38
HOLDING TIME
POWER SETTING
800 FT-LBS AT 1700 RPM
APPLICABLE FOR ALL TEMPERATURES
NOTE: FOR OPERATION WITH ICE VANES EXTENDED, HOLDING TIME WILL BE REDUCED APPROXIMATELY 15%.
PRESSURE ALTITUDE ~ FEET
20,000
15,000
10,000
5000
SL
FUEL REQUIRED ~ POUNDS
0
200
400
600
800
1000
1200
1400
1600
HOLDING TIME ~ HOURS
0
1.0
2.0
3.0
4.0
5.0

INTENTIONALLY LEFT BLANK

TIME, FUEL, AND DISTANCE TO DESCEND

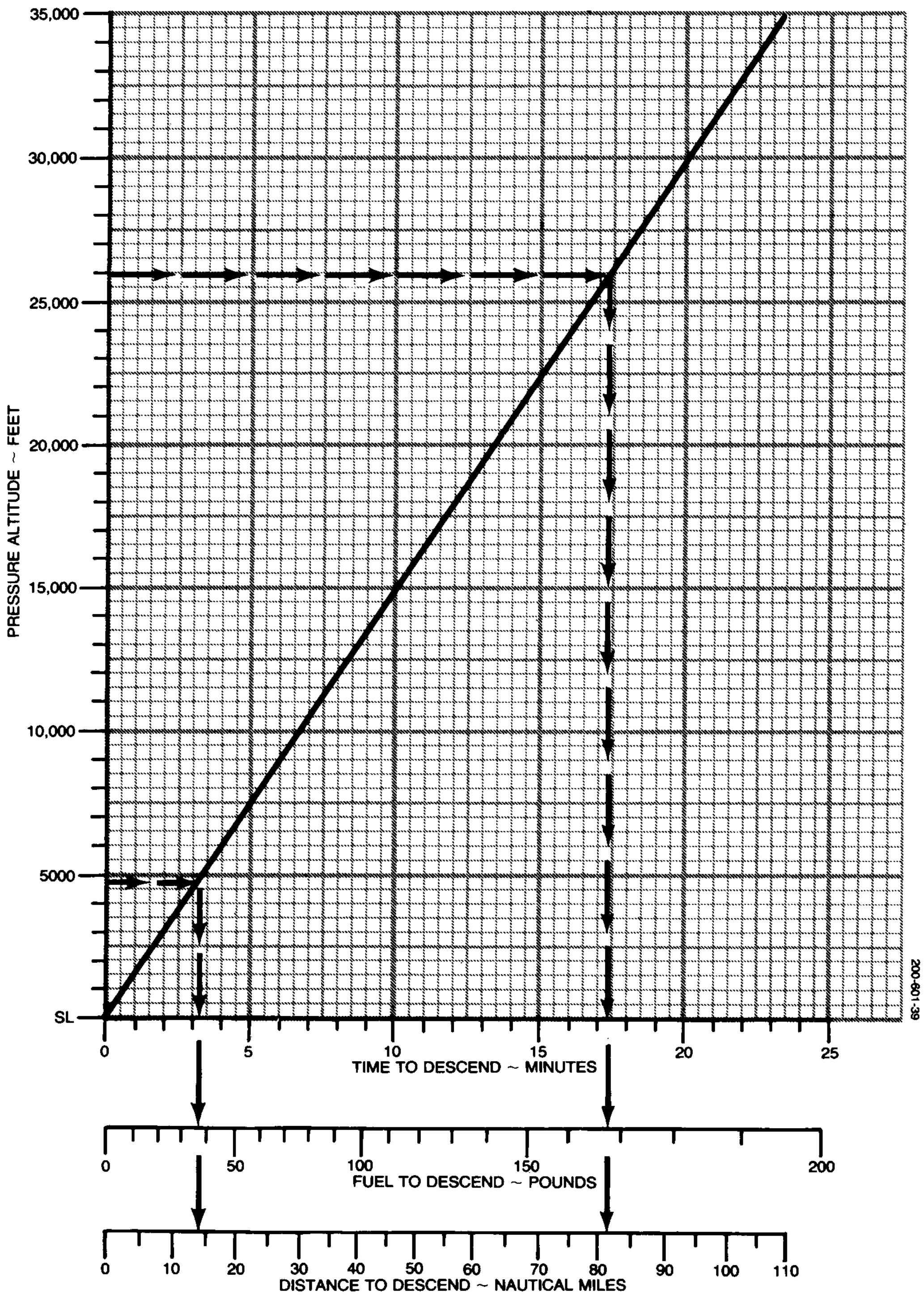
ASSOCIATED CONDITIONS:

POWER .... AS REQUIRED TO DESCEND AT 1500 FT/MIN
GEAR............ UP
FLAPS........... 0%

EXAMPLE:

INITIAL ALTITUDE .... 26,000 FEET
FINAL ALTITUDE .... 4730 FEET

TIME TO DESCEND (17-3) .... 14 MINUTES
FUEL TO DESCEND (168-36)............... 132 POUNDS
DISTANCE TO DESCEND (81-14)........ 67 NM



LANDING DISTANCE WITHOUT PROPELLER REVERSING — FLAPS 100%

ASSOCIATED CONDITIONS:

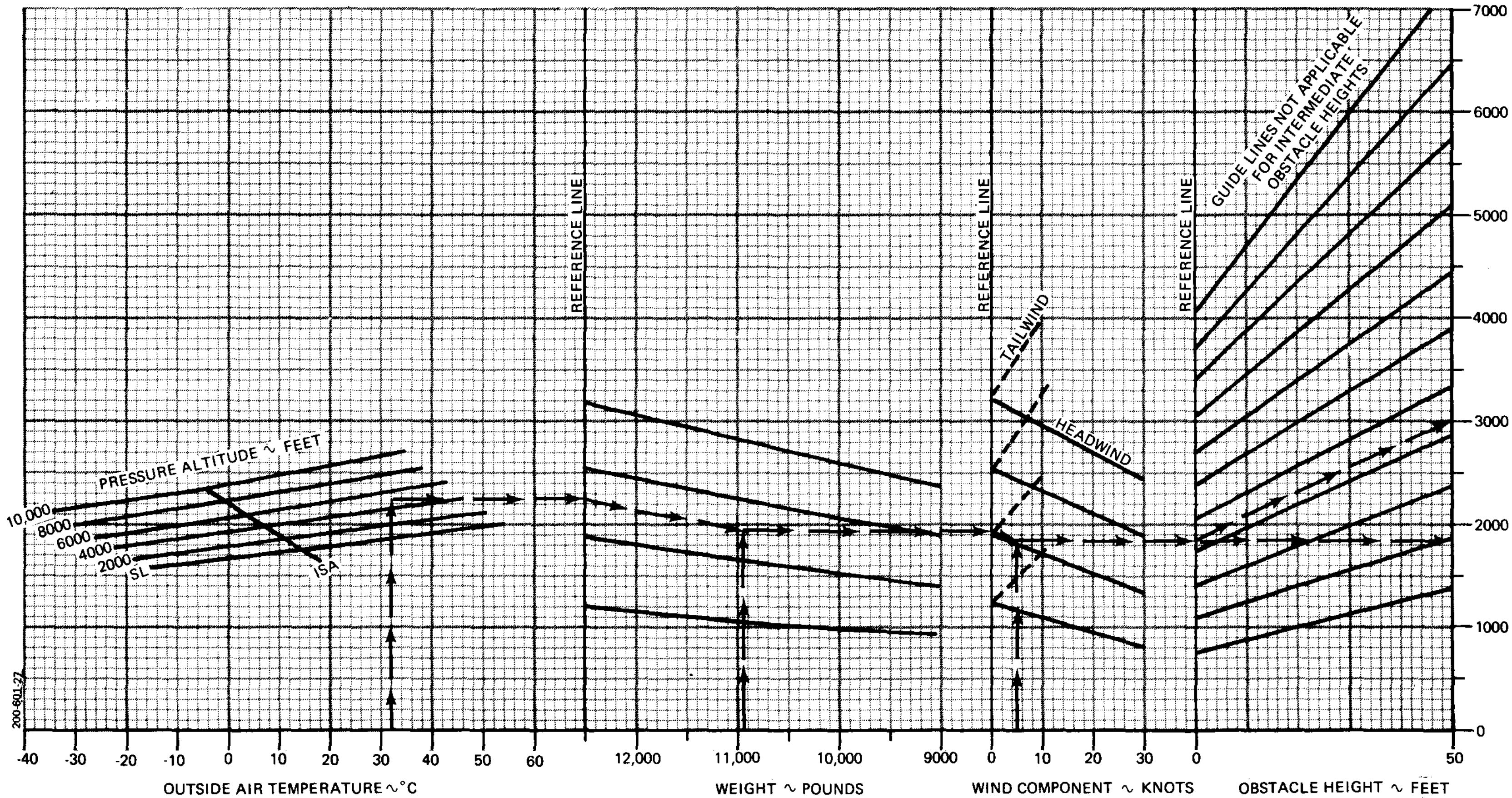
POWER . . . . RETARDED TO MAINTAIN 800 FT/MIN ON FINAL APPROACH
FLAPS 100%
RUNWAY . . . . PAVED, LEVEL, DRY SURFACE
APPROACH SPEED . . IAS AS TABULATED
BRAKING . . . . MAXIMUM

WEIGHT ~ POUNDS	APPROACH SPEED ~ KNOTS
12,500	103
12,000	102
11,000	99
10,000	96
9000	93

EXAMPLE:

OAT . . . . 32°C
PRESSURE ALTITUDE . . . . 4730 FT
LANDING WEIGHT . . . . 10,937 LBS
HEADWIND COMPONENT . . . . 4.7 KTS

GROUND ROLL . . . . 1850 FT
TOTAL OVER 50 FT OBSTACLE . . . 3000 FT
APPROACH SPEED . . . . 99 KNOTS



LANDING DISTANCE WITHOUT PROPELLER REVERSING

FLAPS 0%

ASSOCIATED CONDITIONS

POWER . . . . RETARDED TO MAINTAIN 900 FT/MIN ON FINAL APPROACH
PROPELLER CONTROLS . . . FULL FORWARD
FLAPS . . . . UP
RUNWAY. . . . . PAVED, LEVEL, DRY SURFACE
APPROACH SPEED. . . . . IAS AS TABULATED
BRAKING . . . . MAXIMUM

WEIGHT POUNDS	APPROACH SPEED ~ KNOTS
12,500	132
12,000	130
11,000	126
10,000	122
9000	117

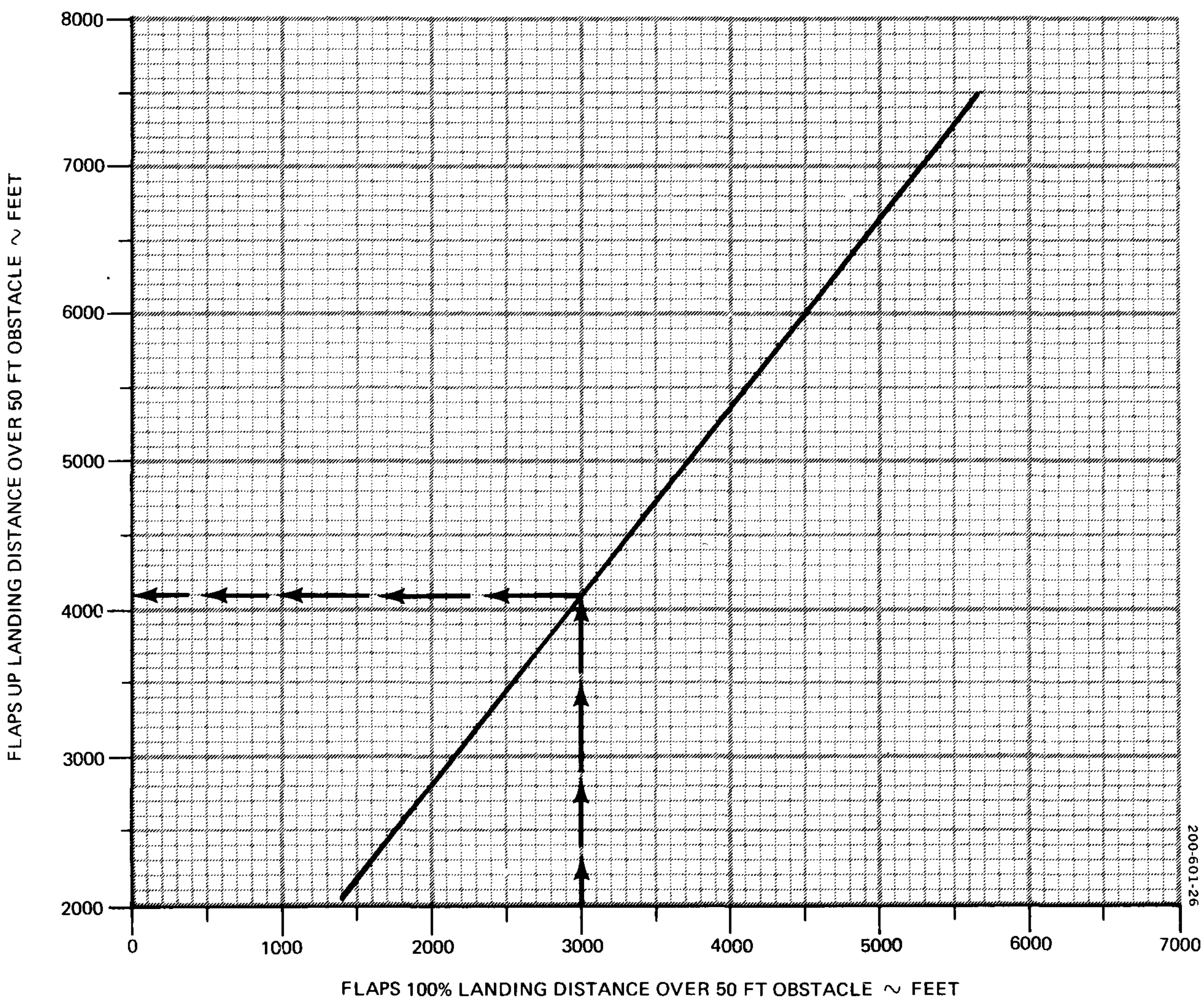
EXAMPLE:

FLAPS 100 % LANDING DISTANCE OVER 50 FT OBSTACLE . . . . 3000 FT
LANDING WEIGHT 10, 937LBS

FLAPS UP LANDING DISTANCE OVER 50 FT OBSTACLE . . . . 4100 FT
APPROACH SPEED . . . . . 126 KNOTS

NOTES: 1. LANDING WITH FLAPS FULL DOWN (100%) IS NORMAL PROCEDURE. USE THIS GRAPH WHEN IT IS NECESSARY TO LAND WITH FLAPS UP (0%).

2. TO DETERMINE FLAPS-UP LANDING DISTANCE, READ FROM THE **LANDING DISTANCE WITHOUT PROPELLER REVERSING – FLAPS 100%** GRAPH THE LANDING DISTANCE APPROPRIATE TO OAT, ALTITUDE, WEIGHT, WIND, AND 50-FT OBSTACLE. THEN ENTER THIS GRAPH WITH THE DERIVED VALUE AND READ THE FLAPS-UP LANDING DISTANCE.



LANDING DISTANCE WITHOUT PROPELLER REVERSING — FLAPS 100%

GRASS SURFACE

ASSOCIATED CONDITIONS:

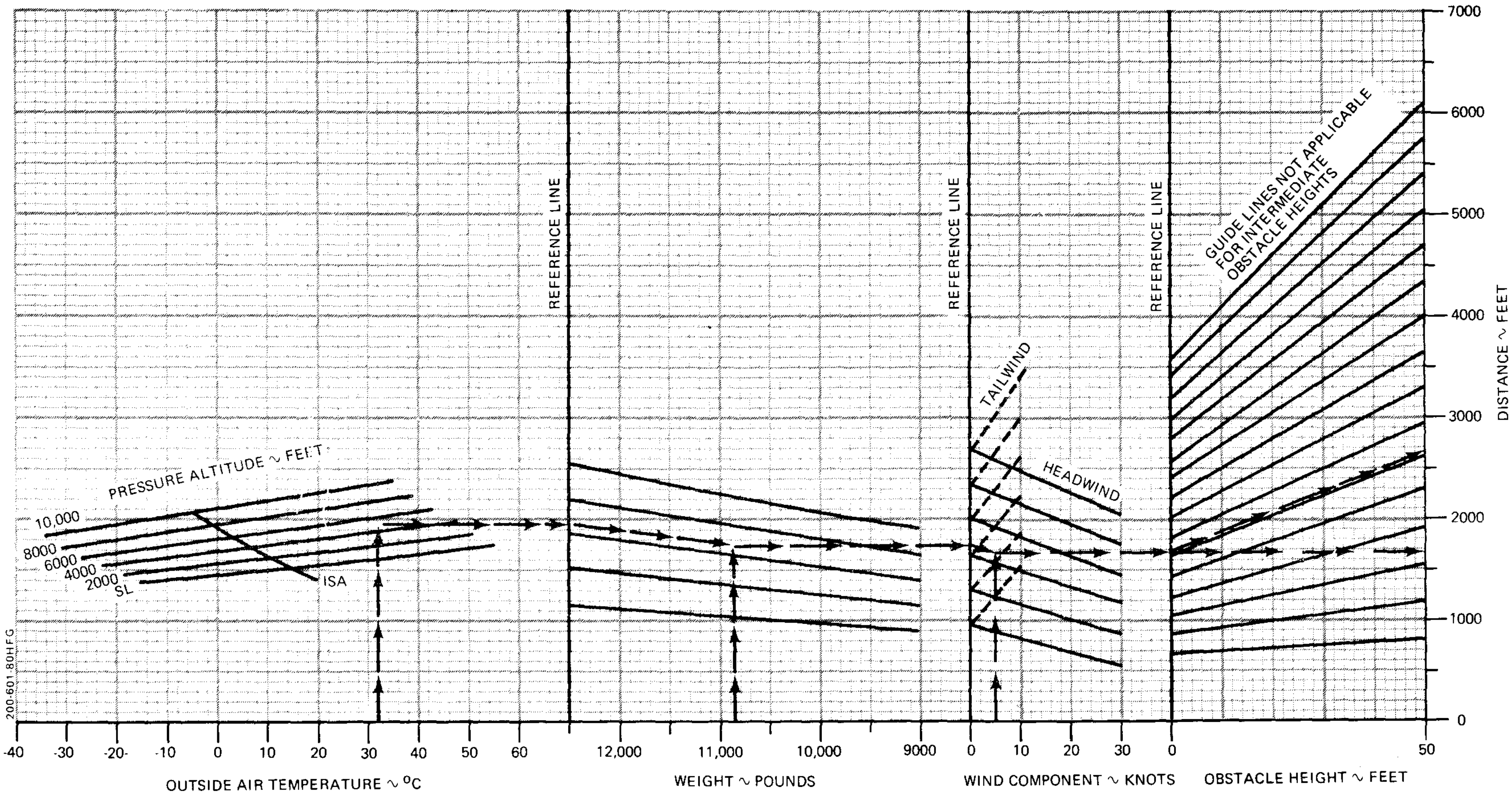
POWER............RETARDED TO MAINTAIN 1000 FT/MIN ON FINAL APPROACH
FLAPS............100%
RUNWAY..........SHORT, DRY GRASS WITH FIRM SUBSOIL
APPROACH SPEED..IAS AS TABULATED
BRAKING..........MAXIMUM

WEIGHT ~ POUNDS	APPROACH SPEED ~ KNOTS
12,500	103
12,000	102
11,000	99
10,000	96
9000	93

EXAMPLE:

OAT..........................32°C
PRESSURE ALTITUDE...........4730 FEET
LANDING WEIGHT..............10,894 LBS
HEAD WIND COMPONENT........4.7 KNOTS

GROUND ROLL.................1670 FEET
TOTAL OVER 50 FT OBSTACLE...2640 FEET
APPROACH SPEED..............98 KNOTS



High Flotation Gear

INTENTIONALLY LEFT BLANK

LANDING DISTANCE WITH PROPELLER REVERSING — FLAPS 100%

ASSOCIATED CONDITIONS:

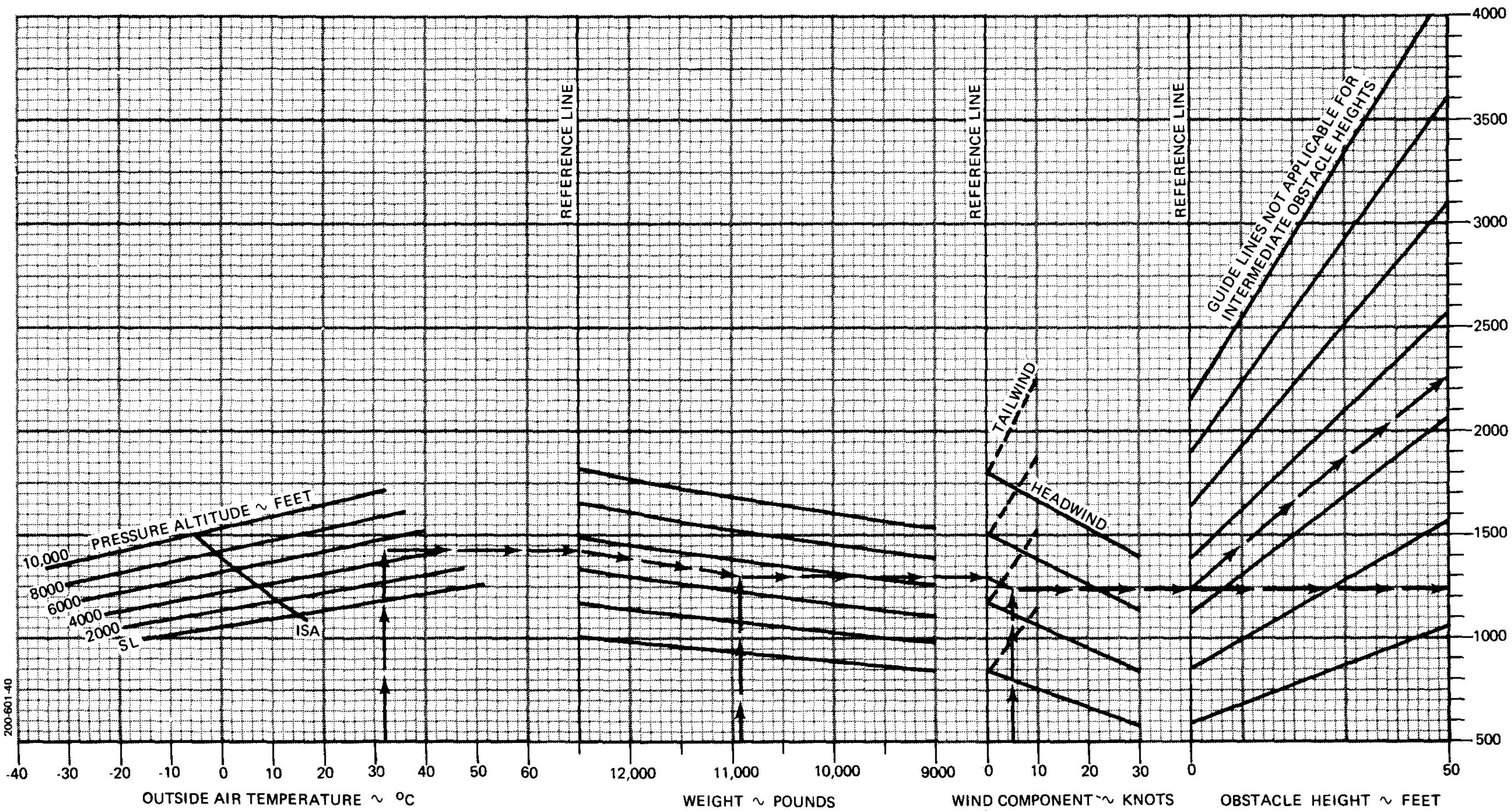
POWER . . . . RETARD TO MAINTAIN 1000 FT/MIN ON FINAL APPROACH
FLAPS. 100%
RUNWAY. . . . . PAVED, LEVEL, DRY SURFACE
APPROACH SPEED. . . . . IAS AS TABULATED
BRAKING. . . . . MAXIMUM
CONDITION LEVERS . . . . . . HIGH IDLE
PROPELLER CONTROLS . . . FULL FORWARD
POWER LEVERS. . . . . MAXIMUM REVERSE AFTER TOUCHDOWN UNTIL FULLY STOPPED

WEIGHT ~ POUNDS	APPROACH SPEED ~ KNOTS
12,500	103
12,000	102
11,000	99
10,000	96
9000	93

EXAMPLE:

OAT . . . . 32°C
PRESSURE ALTITUDE. . . . 4730 FEET
LANDING WEIGHT . . . . . . 10,937 POUNDS
HEADWIND COMPONENT. . 4.7 KNOTS

GROUND ROLL. . . . . 1240 FEET
TOTAL OVER 50 FOOT OBSTACLE . . . . . . 2260 FEET
APPROACH SPEED . . . . 99 KNOTS



LANDING DISTANCE WITH PROPELLER REVERSING

FLAPS 0%

ASSOCIATED CONDITIONS:

POWER . . . . RETARD TO MAINTAIN 1000 FT/MIN ON FINAL APPROACH
FLAPS . . . . UP
RUNWAY . . . . PAVED, LEVEL, DRY SURFACE
APPROACH SPEED . . . . . IAS AS TABULATED
BRAKING . . . . MAXIMUM
CONDITION LEVERS . . . HIGH IDLE
PROPELLER CONTROLS . FULL FORWARD
POWER LEVERS . . . . MAXIMUM REVERSE AFTER TOUCHDOWN

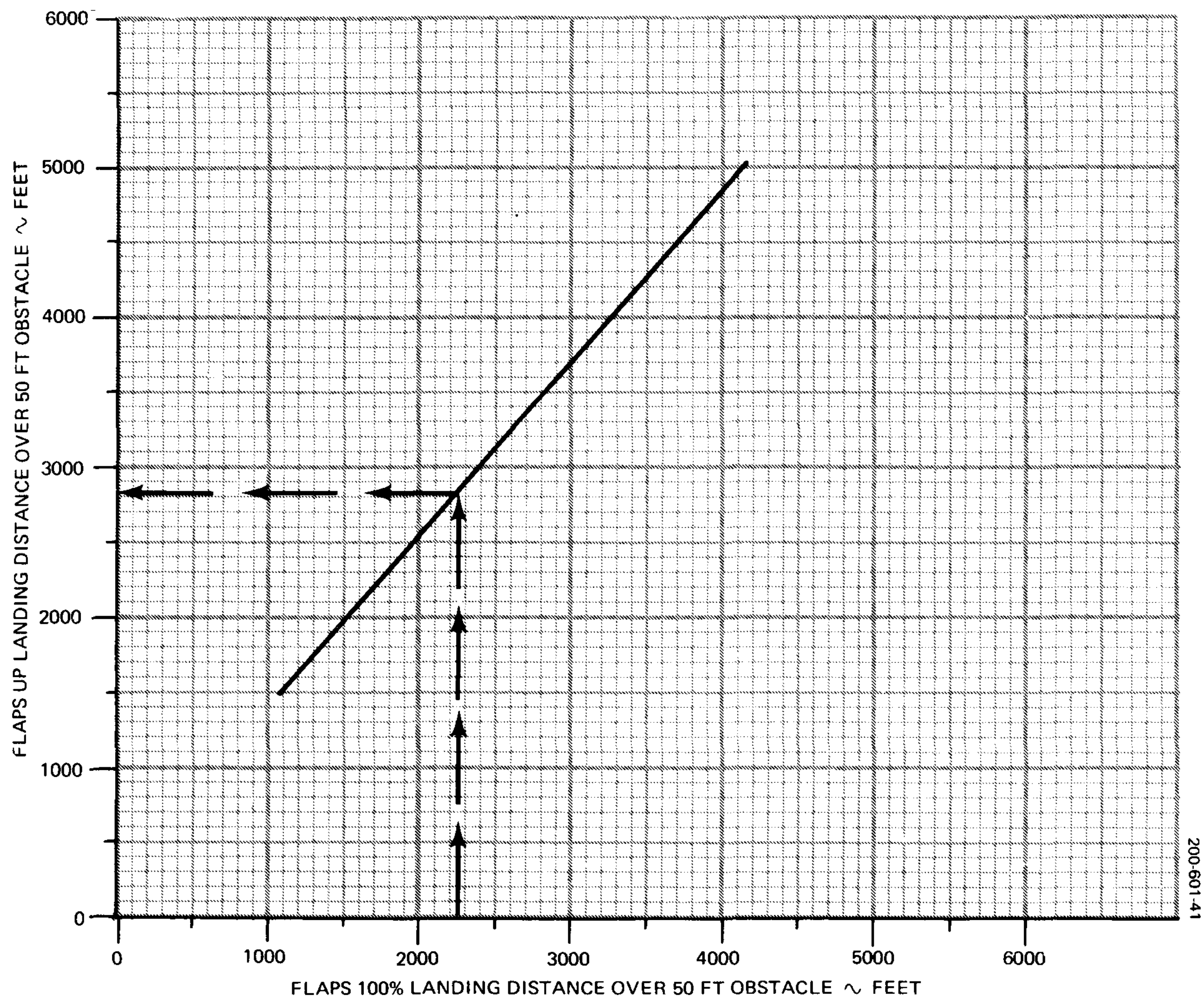
WEIGHT ~ POUNDS	APPROACH SPEED ~ KNOTS
12,500	132
12,000	130
11,000	126
10,000	122
9,000	117

EXAMPLE:

FLAPS 100% LANDING DISTANCE OVER 50 FOOT OBSTACLE . . . . . 2260 FEET
LANDING WEIGHT . . . . . . 10,937 POUNDS

FLAPS UP LANDING DISTANCE OVER 50 FOOT OBSTACLE . . . . . 2820 FEET
APPROACH SPEED . . . . . . 126 KNOTS

NOTES:
1. LANDING WITH FLAPS FULL DOWN (100%) IS NORMAL PROCEDURE. USE THIS GRAPH WHEN IT IS NECESSARY TO LAND WITH FLAPS UP (0%).
2. TO DETERMINE FLAPS-UP LANDING DISTANCE, READ FROM THE **LANDING DISTANCE WITH PROPELLER REVERSING – FLAPS 100%** GRAPH THE LANDING DISTANCE APPROPRIATE TO OAT, ALTITUDE, WEIGHT, WIND, AND 50-FT OBSTACLE. THEN ENTER THIS GRAPH WITH THE DERIVED VALUE AND READ THE FLAPS-UP LANDING DISTANCE.



BEECHCRAFT SUPER KING AIR 200 LANDPLANE

AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

DUAL CAMERA WELL INSTALLATION

The information in this document is FAA Approved material which, together with the appropriate basic Airplane Flight Manual, is applicable and must be carried in the airplane when it has been modified for special photographic purposes in accordance with BEECHCRAFT FAA Approved data.

The external modification from the standard configuration is the addition of a forward 30 inch diameter optical glass camera port, and an aft 26-1/2 inch diameter optical glass camera port. Each port is supplied with a protective covering which should be installed whenever the ports are not required for use. These covers will protect the optical glasses from possible chips or cracks.

LIMITATIONS

STRUCTURAL LIMITATIONS

Fuselage must not be pressurized with chips or cracks in the optical glass of the camera ports.

FAA PERFORMANCE

Take-off, climb, stall, and landing performance is unchanged by this installation.

CRUISE CONTROL

1. Decrease Cruise Speeds by 4%.

2. Decrease Range Values by 4%.

Approved: [signature]

Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200
AND 200T LANDPLANES
AIRPLANE FLIGHT MANUAL SUPPLEMENT
for the
KING KNR-665 AREA NAVIGATION SYSTEM

GENERAL

The information in this supplement is FAA-approved material and must be attached to the *FAA Approved Airplane Flight Manual* when the airplane has been modified by installation of the King KNR-665 Area Navigation System in accordance with Beechcraft Drawing 101-340156.

The information in this supplement supersedes or adds to the basic *FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

LIMITATIONS

1. The Area Navigation Function may not be used as a primary system under IFR conditions except on approved approach procedures, approved area navigation airways, and random area navigation routes when approved by Air Traffic Control.

2. The Area Navigation Function can only be used with co-located facilities. (VOR and DME signals originate from same geographical location.)

NORMAL PROCEDURES

The King KNR-665 Area Navigation System is a push-button tuned, navigational unit with a ten waypoint memory capacity. Included is the capability to select the VOR/DME, localizer and glideslope frequencies, electronically "move" the VOR to a phantom location called a Waypoint, and set the navigational course in the Flight Director.

The KNR-665 functions in three modes. In the VOR mode, the unit operates as a conventional VOR Converter with a course deviation scale factor of ±10 degrees presented on the Pictorial Navigation Indicator. This mode is also utilized for localizer/glideslope approaches with a conventional display. Two Area Navigation modes are available. They are designated ENROUTE and APPR for use in enroute and terminal/approach navigation. For Area Navigation, the course deviation is presented in nautical miles on the Pictorial Navigation Indicator rather than in degrees as with the VOR mode. This is referred to as "constant course width". The ENROUTE mode provides a constant course width of ±5 nautical miles (1 nautical mile per 1 dot deviation). APPR mode has a constant course width of ±1.25 nautical miles (1/4 nautical mile per 1 dot deviation) and should be used when within ten miles of the terminal waypoint.

CONTROL FUNCTIONS

The KNR-665 Area Navigation System is programmed and operated from a panel mounted control unit. Information such as station frequency, course, waypoint radial and waypoint distance is entered into memory from the keyboard on the control unit. During the flight, the desired waypoints are recalled from memory and the modes of operation are selected from the control unit.

1. Mode Switch:
   This three position switch selects conventional VOR/DME operation designated "VOR", enroute Area Navigation designated "ENROUTE", and terminal/approach Area Navigation designated "APPR".

2. 0 thru 9 Keys:
   Each depression of one of these keys enters one digit into the FREQ/KEYBOARD window.

3. FREQ/KEYBOARD Window:

   a. Displays the Waypoint facility frequency when display is constant.

   b. Serves as a "scratch pad" to confirm the input of the keyboard when display is flashing.

4. COURSE Window:

   Displays the selected course in degrees.

5. WPT Radial Window:

   Displays the VOR radial on which the Waypoint is placed.

6. WPT DISTANCE Window:

   Displays the distance along the selected VOR radial on which the Waypoint is placed.

7. Load Keys:

   Load keys are located to the right of the FREQ/KEYBOARD, COURSE, WPT RADIAL and WPT DISTANCE windows. The load keys cause data from the keyboard to be loaded into the respective windows.

8. WPT-CRS-DSPY Window:

   Annunciates the waypoint and course being displayed.

9. WPT-CRS-IN USE Window:

   Annunciates the waypoint and course in use.

10. → Transfer Key:

    Puts the displayed waypoint into use.

11. CRS 1 Key:

    Selects Course 1 (Inbound course).

12. CRS 2 Key:

    Selects Course 2 (Outbound course).

13. AUTO CRS Key:

    Computes and enters the direct course from present position to the facility. VOR (In VOR mode) or waypoint (In ENROUTE or APPR mode).

14. KYBD CLR Key:

    The Keyboard Clear Key clears the "scratch pad" (FREQ/KEYBOARD window when flashing).

15. NAV TEST Key:

    Initiates an automatic, three-part, sequential self-test. Active in ENROUTE mode only.

PREFLIGHT

The preflight check consists of a sequential test of the entire RNAV system, including a test of the computation accuracy of the computer and all displays. The RNAV system will not test with the autopilot engaged or with the navigation receiver tuned to an ILS frequency.

1. Set mode selector switch to ENROUTE.

2. Press and hold NAV TEST key for approximately 15 seconds to initiate three-part self-test.

   Part 1. All lamp segments are illuminated to numeral "8" (except the extreme left digit of FREQ/KEYBOARD window which illuminates to numeral "1").

   Part 2. The airplane is placed over the VOR, the waypoint is located 30.0 miles on the 90.0° radial, the selected course is 30°. The FREQ/KEYBOARD, DSPY, and IN USE windows are extinguished. The Pictorial Navigation Indicator course needle will rotate to 30°.

   Part 3. The course required to fly to the waypoint is computed (90°) and entered into the COURSE window. The Pictorial Navigation Indicator course needle will rotate to 90°.

Failure to satisfy the preflight test requirements indicates an inoperative RNAV computer. Set the mode selector to VOR and use navigational units in conventional VOR/DME operation.

PROGRAMMING

Pertinent information (frequency, course, waypoint radial, waypoint distance, waypoint number) for up to ten waypoints is entered into memory from the panel mounted keyboard unit. Programming the computer may be completed prior to take-off or during the flight. Any combination of navigational facilities (RNAV waypoint, VOR/DME, ILS) may be loaded into the computer; however, it is desirable that each facility be numbered and loaded in the sequence it is to be used.

RNAV WAYPOINTS

1. Select the first waypoint and the inbound course by depressing keyboard number "1" and CRS 1 pushbuttons. These numbers will appear in the top center DSPY window over WPT and CRS.

   NOTE

   If the navigational facility is at or near the departure point and the first route segment is outbound from that facility, depress keyboard number "1" and CRS 2 pushbuttons.

2. Select the VORTAC frequency by depressing the keyboard buttons in the number sequence. A total of five digits must be entered to complete the frequency input (i.e., frequency 113.8 entered as 113.80). The frequency will appear flashing in the FREQ/KEYBOARD window. Upon confirming the proper frequency has been entered on the keyboard, it is stored into memory by depressing the load key adjacent to the FREQ/KEYBOARD window. The flashing presentation will become steady which confirms frequency storage.

3. Select inbound course to the waypoint on the keyboard. The frequency number in the FREQ/KEYBOARD window will be replaced by the flashing course numbers. Confirm accuracy of course numbers and store into memory with the load key adjacent to the COURSE window. The inbound course number in the FREQ/KEYBOARD window will transfer to the COURSE window and the VORTAC frequency will reappear in the FREQ/KEYBOARD window.

4. Select outbound course from the waypoint by depressing CRS 2 pushbutton. The number 2 will appear in the DSPY window over CRS and adjacent to WPT number 1. Select and load the outbound course value using the same procedure as the inbound course.

5. Select the waypoint radial on the keyboard and enter into memory (after checking) by depressing the load key adjacent to the WPT RADIAL window.

6. Select the waypoint distance following the same procedure as with the selection of the waypoint radial. Enter the value into memory by depressing the load key adjacent to the WPT DISTANCE window.

NOTE

WPT RADIAL and WPT DISTANCE are decimal readouts. Program these values to the nearest tenth unit.

7. This completes the programming for the first waypoint and inbound/outbound courses. Follow these procedures for all selected waypoints up to a maximum of ten.

NOTE

If an error is noted while the value in the FREQ/KEYBOARD window is still flashing, depress the KYBD CLR button and select the correct value on the keyboard. This will not affect any information already stored in the memory. If the error is noted after the value has been loaded, select the proper value on the keyboard, confirm its accuracy in the flashing FREQ/KEYBOARD window, and reload the value into the appropriate window.

CONVENTIONAL VOR

The programming technique for conventional navigation directly toward or away from a VOR facility is similar to that for RNAV waypoints. Inputing the waypoint number, course number, frequency and course values into the memory is accomplished in the same manner. Since the station is not to be electronically "moved" to a new location (waypoint), no values are programmed into the WPT RADIAL and WPT DISTANCE windows.

ILS APPROACH (Front Course and Back Course)

Programming an ILS approach is accomplished in the same manner as programming conventional VOR. However, it is essential that only the inbound front course localizer bearing be entered into the COURSE window for both front course and back course approaches. This will assure that the Pictorial Navigation Indicator and autopilot maintain the proper left/right logic.

MISSED APPROACH

If the published missed approach utilizes an RNAV waypoint or VOR facility, it may be entered into memory anytime prior to the approach. It is recommended that WPT "O" (keyboard numeral 0) be reserved for this operation. Any other waypoint storage (1 thru 9) could be used; however, habitual use of WPT "O" eliminates the possibility of error that could be experienced when selecting an intermediate digit during this critical flight phase.

ENROUTE OPERATION

Prior to take-off, select ENROUTE on the mode switch. Flight in this mode is recommended even if navigating directly toward or away from a VORTAC facility. The ENROUTE mode provides the advantages of "constant course width" and smooths the received signals to improve autopilot operation. An exception to this procedure would be caused by the lack of a DME signal co-located with the VOR facility. In this case, the VOR mode would be selected.

1. Place WPT 1/CRS 1 in the DSPY window by depressing keyboard number "1" and CRS 1 pushbuttons. This calls up waypoint 1 information from the memory bank and displays that information in the appropriate windows for checking.

NOTE

At this point, changes to a waypoint parameter may be made by replacing the original numbers with a new entry without affecting the other parameters that are in memory.

2. Depress → (transfer key) to place the displayed information into active use. The waypoint numbers WPT 1/CRS 1 will appear in the IN USE window. This action also automatically tunes the VOR/DME receivers to the appropriate frequencies and causes the course needle on the Pictorial Navigation Indicator to be driven to the displayed course.

3. As the waypoint is approached, recall the outbound course by depressing the CRS 2 pushbutton. This places WPT 1/CRS 2 in the DSPY window. The waypoint information and outbound course are displayed for checking. However, navigation continues on the inbound course. The IN USE window will flash WPT 1/CRS 1 to advise the waypoint and course currently displayed are not in use. Transition to the outbound course is accomplished by depressing the → (transfer key). The displayed waypoint parameters will be placed in use and WPT 1/CRS 2 will appear steady in the IN USE window.

4. Follow these procedures for subsequent waypoints.

AUTOCOURSE OPERATION

The "autocourse" function allows for navigation from the airplane's present location direct to an IN USE waypoint or VORTAC.

1. DIRECT TO WAYPOINT

   Depress AUTO CRS pushbutton. The direct course will be computed and displayed in the COURSE window. The course needle on the Pictorial Navigation Indicator will be driven to the displayed course.

2. DIRECT TO VORTAC

   Select VOR on mode switch. Depress AUTO CRS pushbutton. The direct course will be computed and displayed as above. (To obtain the advantages of "constant course width", load 0 nautical miles into the WPT DISTANCE window and return the mode switch to ENROUTE.)

EMERGENCY PROCEDURES

CAUTION

DME may unlock due to loss of signal with certain combinations of distance from station, altitude, and angle of bank.

1. If NAV flag appears while in the ENROUTE mode, check for correct frequency.

2. If VOR or DME equipment is intermittent or lost, utilize other navigation equipment as required.

3. If NAV flag appears during an approach while in the APPR mode, execute published missed approach and utilize another approved facility.

Approved: N. H. Schultz
for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200, 200T, AND KING AIR C90, E90, A100 AND B100 LANDPLANES

AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

COLLINS ANS-31 OR ANS-31A AREA NAVIGATION SYSTEM OR COLLINS NCS-31 OR NCS-31A NAVIGATION CONTROL SYSTEM

GENERAL

The information in this supplement is FAA-approved material and must be attached to the *FAA Approved Airplane Flight Manual* when the airplane has been modified by installation of the Collins ANS-31 Area Navigation System or the Collins NCS-31 Navigation Control System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic *FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

Except as noted, all references to the ANS-31 or NCS-31 systems also apply respectively to the ANS-31A or NCS-31A systems.

LIMITATIONS

1. The Area Navigation mode may not be used as a primary system under IFR conditions except on approved approach procedures, approved airways, and random area navigation routes when approved by Air Traffic Control.

2. The Area Navigation mode can only be used with colocated facilities. (VOR and DME signals originate from same geographical location.)

EMERGENCY PROCEDURES

CAUTION

DME may unlock due to loss of signal with certain combinations of distance from station, altitude and angle of bank.

1. If NAV flag appears while in the enroute mode, check for correct frequency.

2. If VOR or DME equipment is intermittent or lost, utilize other navigation equipment as required.

3. If NAV flag appears during an approach, execute published missed approach and utilize another approved facility.

NORMAL PROCEDURES

The Collins ANS-31/NCS-31 Systems are push-button operated navigation computers with ten waypoint memory capacities. They contain a numerical keyboard for data entry and digital displays for data readout. Included is the capability to tune the VOR/DME, localizer and glideslope receivers, and electronically "move" the VOR to a phantom location called a waypoint. A waypoint is a convenient navigational position either at or within reception range of a selected VOR/DME station. The position of the waypoint is a function of its bearing and distance from the station.

In addition to the navigation function, the NCS-31 system can provide for the frequency control of two VHF communications radios, two ADF radios, two ATC transponders, and a second VOR and DME radio. Refer to the appropriate Collins manual for specific operating instructions of this feature.

The ANS-31/NCS-31 systems operate in three fundamental modes: VOR, localizer/glideslope, and Area Navigation. In the VOR mode, the units operate as conventional VOR converters with an "angular course deviation" scale factor of ±10 degrees presented on the Horizontal Situation Indicator. The localizer/glideslope mode presents data in a conventional display with an "angular course deviation" scale factor appropriate to the specific approach facility.

For Area Navigation, course deviation is presented in nautical miles on the Horizontal Situation Indicator rather than in degrees as with the VOR mode. This feature, referred to as "linear course deviation", provides for a constant course width irrespective of the distance to the waypoint. Two levels of sensitivity are available in the Area Navigation mode. They are designated ENROUTE and APPROACH for use in enroute and terminal/approach navigation. The ENROUTE sensitivity, available when the flight control system is not in the approach mode, provides a constant course width of ±10 nautical miles. APPROACH sensitivity, available when the flight control system is in the approach mode, provides a constant course width of ±2 nautical miles. APPROACH sensitivity should be used when within ten nautical miles of the terminal waypoint.

DISPLAYS AND CONTROLS

The ANS-31/NCS-31 systems are programmed and operated from a panel mounted control unit. Information such as waypoint number, station frequency, station elevation, waypoint bearing, and waypoint distance are entered into memory from the keyboard on the control unit. During the flight, the desired waypoints are recalled from memory and the modes of operation are selected on the control unit.

1. WPT Window:

   Identifies the waypoint defined by the displayed data. The letter "P" precedes the waypoint number when the displayed waypoint/frequency/code data is inactive/preset. The "P" blinks when the displayed data is on the scratch pad only.

2. FREQ Window:

   Displays the programmed VOR/DME/localizer frequency (108.00 through 117.95).

3. EL 100′ Window:

   a. Displays the programmed VOR/DME station elevation in hundreds of feet.

   b. Displays the VOR-only mode of operation (VOR).

   c. Displays the localizer mode of operation (LOC).

4. BRG Window:

   a. Displays the waypoint bearing from the VOR/DME station (000.0° through 359.9°).

   b. Displays the localizer bearing in the LOC mode (000° through 359°).

   c. Displays the held VOR/DME frequency when DME HOLD is in use.

5. DIST Window:

   a. Displays the waypoint distance from the VOR/DME station (000.0 through 249.9 nautical miles).

   b. Annunciates DME HOLD is in use (dh).

6. TEST Button:

   Momentary push button to initiate ANS-31/NCS-31 self-test.

7. Data Keyboard:

   Ten digital (0 through 9) momentary keys for entry of numerical data.

8. CLR Key:

   Momentary key to clear scratch pad for correction of entry errors or revision of stored data.

9. PRE Key:

   Momentary key to store data displayed on scratch pad into memory.

10. WPT Key:

    Momentary key to display active waypoint data on the scratch pad. When used in conjunction with a digital key, the WPT key recalls the desired waypoint data from memory to the scratch pad.

11. USE Key:

    Momentary key to transfer displayed data on the scratch pad to the navigation computer and the VOR/DME/localizer receivers. Annunciates active data by blanking the display for 1/2 second before displaying active data.

NOTE

NAV/DME TEST and DME HOLD keys are located on the panel mounted control unit (ANS-31) or the mode select unit (NCS-31). The momentary NAV/DME TEST key only serves to initiate the VOR and DME receivers self-test. The particular system under test should be monitored for proper test indications. These tests will not affect the ANS-31/NCS-31 operation provided the key is not depressed for more than 8 seconds in the enroute mode, or more than 1 second in the approach mode. The DME HOLD key is an on-off pushbutton to hold the DME frequency.

A second panel-mounted component, the remote readout unit, displays the active navigation information in use. Distance or time to the waypoint, waypoint number, computed ground speed, waypoint passage alert, and various navigational modes are displayed on this unit.

1. MILES/MIN Window:

   Displays either the distance or time to or from the waypoint as selected by the MILES/MIN toggle switch.

2. WPT Window:

   a. Displays the active waypoint number in use.

   b. Displays the active VOR/DME frequency when DME HOLD is in use.

3. KTS Window:

   a. Displays the computed ground speed.

   b. Annunciates the VOR-only mode of operation is in use (VOR).

c. Annunciates the localizer mode of operation is in use (LOC).

d. Annunciates computer is in dead reckoning mode of operation (d-r).

e. Annunciates DME HOLD is in use (dh).

4. ALERT Light:

   a. Indicates approach of waypoint (steady light).

   b. Indicates crossing the TO/FROM line (flashing light).

   c. Indicates recovery of valid VOR/DME signal after a prolonged loss in the dead reckoning, enroute mode (flashing light).

   d. **(ANS-31A/NCS-31A only):** When depressed, displays bearing to waypoing (RNAV mode) or bearing to station (VOR mode) in place of distance or time to waypoint.

MEMORY FUNCTION

CAUTION

Memory function is intended for a maximum use period of three hours with airplane's main electrical system off. Memory should be turned off if down time is to exceed three hours.

The status of the ANS-31/NCS-31 computer memory is annunciated on the upper scratch pad display of the control unit when avionic power is applied. If the memory has been erased, as would normally be the case when avionic power was last removed, the letters "POC" appear in the WPT and EL 100′ display windows.

Actuation of the remote memory switch prior to removing avionic power will hold the programmed data in the computer memory. Subsequent reapplication of avionic power will confirm the program has been saved by showing the letters "POC" only in the WPT display window. The memory save function permits the computer to be programmed in advance of the flight and held in storage without the airplane's main electrical system activated. A small light adjacent to the memory switch indicates the memory function has been selected.

PREFLIGHT

SELF-TEST

This abbreviated self-test prescribes a procedure to check the ANS-31/NCS-31 prior to flight. Complete self-test procedures for maintenance checks are available in the system maintenance section (523-0765313/523-0765291) of the Collins ANS-31/NCS-31 Navigation Control System Instruction Manual (523-0765309/523-0765286). Abbreviated self-test procedures without fault isolation are available in the Collins ANS-31/NCS-31 Self-Test Guide (523-0765453/523-0765454).

1. Press the TEST button once on the control unit. The figure "8" will appear in all positions of the upper scratch pad.

2. Press the TEST button the second time. The figure "8" will extinguish from all positions and the figure "2" will appear in the WPT display. All other positions will be blank.

3. Press the TEST button the third time.

   a. Press the USE button, the numeral "1" key, and the numeral "8" key. The figure "8" will again appear in all positions of the upper scratch pad.

   b. Press the USE button, the numeral "2" key, and the numeral "8" key. The figure "8" will appear in all positions of the lower scratch pad.

c. Press the USE button, the numeral "3" key, and the numeral "8" key. The figure "8" will appear in all positions (except position 5) of the remote readout unit.

4. Press the CLR key to exit the self-test program.

CAUTION

Engaging the ANS-31/NCS-31 self-test in flight may disrupt navigation calculations.

AREA NAVIGATION FUNCTIONAL TEST

The following procedure applies only to airports equipped with, or in range of, a colocated VOR/DME station.

1. Place the MILES/MIN switch on the remote readout unit in the MILES position.

2. Press WPT key.

3. Press any number key.

4. Enter the local VOR/DME station frequency and elevation.

5. Press USE key.

6. Adjust the course control knob on the Horizontal Situation Indicator to center the deviation bar.

7. The course arrow on the Horizontal Situation Indicator will point to the local station and the remote readout unit will display the distance.

PROGRAMMING

Pertinent information (waypoint number, station frequency, station elevation, waypoint bearing, and waypoint distance) for up to ten waypoints is entered into memory from the control unit. Programming the computer may be completed prior to take-off or during the flight. Any combination of navigational facilities (RNAV waypoint, VOR/DME, ILS) may be loaded into the computer; however, it is desirable that each facility be numbered and loaded in the sequence it is to be used.

RNAV WAYPOINTS

1. Press the WPT key. One of two display conditions will occur on the control unit.

   a. The display will be blank indicating the absence of an active waypoint. This is a normal display when loading the initial waypoint parameters.

   b. Active waypoint data will appear on the display.

2. Select the first waypoint by pressing the keyboard number "1" key.

   a. If the waypoint has not been previously stored in the memory, only the letter "P" and the waypoint number "1" will appear on the display.

   b. If the selected waypoint has been preset, the letter "P", the waypoint number, and the waypoint parameters will appear on the display.

3. Select the VOR/DME frequency by pressing the keyboard number keys in the proper sequence. A total of five digits must be entered to complete the frequency input (i.e., frequency 113.8 entered as 113.80). Prior data is blanked when the first frequency digit is entered. The letter "P" will blink as long as data displayed is on the scratch pad only (not stored in memory.)

Entries beyond the allowable range of navigational frequencies (108.00 through 117.95 MHz in .05 MHz increments) are annunciated immediately by the letters "CLR" appearing on the right edge of the scratch pad. Further entries are inhibited until the CLR key is pressed to erase the false digit.

4. Select the VOR/DME station elevation in hundreds of feet by pressing the keyboard number keys in the appropriate sequence. Two digits must be entered. Use a leading zero for elevations less than 1000 feet.

5. Successively press the keyboard number keys to select the waypoint bearing (radial) and waypoint distance from the station. All four digits must be entered, using leading zeros as required. Bearing and distance entries are not required when the waypoint is colocated with the VOR/DME station site.

   Entries beyond the allowable range of values for bearing (000.0° through 359.9°) and distance (000.0 through 249.9 nautical miles) are annunciated immediately by the letters "CLR" appearing on the right edge of the scratch pad. Further entries are inhibited until the CLR key is pressed to erase the false digit.

NOTE

If an error is noted during the programming, corrections or revisions of data within the allowable range of values can be made by pressing the CLR key. Data is erased by fields (FREQ, EL 100', BRG, and DIST) in the reverse order of entry each time CLR is pressed. Enter the correct data. Values for fields of correct data that were erased must be reentered.

6. Press the PRE key to place the displayed data into memory. This action will cause the display to go blank.

7. This completes the programming for the first waypoint. Follow these procedures for all selected waypoints up to a maximum of ten.

CONVENTIONAL VOR

The programming technique for conventional navigation directly toward or away from a VOR facility without a colocated DME is similar to that for RNAV waypoints. Inputing the waypoint number and frequency into the memory is accomplished in the same manner. Since the station has no DME, it cannot be electronically "moved" to a new location (waypoint). Therefore, no values are programmed in the EL 100', BRG or DIST displays. Only angular deviation on the Horizontal Situation Display is available in this mode.

ILS APPROACH (Front Course and Back Course)

Programming an ILS approach is accomplished in the same manner as programming conventional VOR. The control unit decodes the frequency as it is entered. Upon detecting the frequency is in the ILS range, the letters "LOC" are annunciated immediately in the EL 100' display thereby inhibiting an elevation entry. Although not required for ILS operation, the localizer bearing (000° through 359°) may be programmed into the BRG display for convenient reference. Only angular deviation is provided in the ILS mode.

MISSED APPROACH

If the published missed approach utilizes an RNAV waypoint or VOR facility, it may be entered into memory any time prior to the approach. It is recommended that WPT "O" (keyboard numeral 0) be reserved for this operation. Any other waypoint storage (1 thru 9) could be used; however, habitual use of WPT "O" eliminates the possibility of error that could be experienced when selecting an intermediate digit during this critical flight phase.

INFLIGHT

Preset waypoints may be recalled from memory and put into active use as required.

1. Press the WPT key. If an active waypoint is displayed on the remote readout unit, the waypoint data will appear on the control unit display. Otherwise, the display will be blank.

2. Press the appropriate number key to select the desired waypoint. The preset waypoint data will replace any active waypoint data on the control unit display. The letter "P" is annunciated adjacent to the waypoint number to indicate that this is not the active waypoint. Information displayed on the remote readout unit, Horizontal Situation Indicator, and signals supplied to the flight control system will continue to reference the active waypoint and selected course.

3. Verify that the displayed data is correct.

NOTE

Revisions to the waypoint data can be programmed at this time by entering the new waypoint parameters. Entry of the first frequency digit blanks the remainder of the display.

4. When reference to the next waypoint is desired, press the USE key. The letter "P" is blanked to indicate that this is now the active waypoint. The Horizontal Situation Indicator NAV flag will momentarily come into view, the deviation signals supplied to the course deviation bar and flight control system will be zero, and the remote readout unit will be blanked until the NAV radios complete retuning the new active waypoint.

5. Select the desired course on the Horizontal Situation Indicator course arrow.

NOTE

Any waypoint may be used without being preset (PRE key) by entering the waypoint data in the normal manner and immediately pressing the USE key. The waypoint data will be put into active use and also stored into memory.

RNAV OPERATION

This is the normal mode of operation. If the VOR/DME radios are receiving valid signals from a colocated VOR/DME station, the ANS-31/NCS-31 computer will supply linear deviation information to the Horizontal Situation Indicator. The ENROUTE sensitivity, available when the flight control system is not in the approach mode, provides a constant course width of ±10 nautical miles. APPROACH sensitivity, available when the flight control system is in the approach mode, provides a constant course width of ±2 nautical miles. APPROACH sensitivity should be used when within ten nautical miles of the terminal waypoint.

Distance or time to the waypoint, waypoint number, and computed groundspeed are displayed on the remote readout unit. The ANS-31/NCS-31 computer combines inputs from the encoding altimeter with the VOR/DME station elevation to correct DME slant range error.

NOTE

The RNAV mode of operation requires the programming of station elevation to correct DME slant range error. Operation in this mode is recommended even if navigating directly toward or away from a VOR/DME facility. This provides the advantages of linear deviation and smooths the received signals to improve autopilot operation.

CONVENTIONAL VOR OPERATION

This is the mode of operation when either DME is not available or the DME is not colocated with the desired VOR facility. The VOR mode is annunciated by the letters "VOR" appearing on the control unit display in place of station elevation, and on the remote readout unit in place of ground speed. Raw DME distance will be displayed on the remote readout unit if a valid DME signal is received. However, slant range correction and computed ground speed will not be available. The ANS-31/NCS-31 computer supplies angular deviation information to the Horizontal Situation Indicator.

ILS OPERATION (Front Course and Back Course)

This is the mode of operation when the navigation receiver is tuned to a localizer frequency. The localizer mode is annunciated by the letters "LOC" appearing on the control unit display in place of station elevation, and on the remote readout unit in place of ground speed. Raw DME distance will be displayed on the remote readout unit if a valid DME signal is received. It is essential that only the inbound front course localizer bearing be set on the Horizontal Situation Indicator for both front course and back course approaches. This will assure the Flight Director display and autopilot maintain the proper left/right logic. Only angular deviation information is provided in the ILS mode.

DEAD RECKONING OPERATION

The ANS-31/NCS-31 will automatically enter the dead reckoning mode from either the enroute or approach RNAV mode whenever the VOR or DME signal is lost, or when passing over the VOR/DME station being used for navigation. Navigation calculations will continue using the ground speed and wind values available at the time the dead reckoning mode is entered. Changes in ground speed or wind velocity while in the dead reckoning mode will result in degradation of the accuracy of position estimates.

The loss of the VOR or DME signal for less than 9 seconds in the enroute mode or 1 second in the approach mode will not affect normal operation.

When operating in the enroute mode, loss of signal for more than 9 seconds forces the ANS-31/NCS-31 into dead reckoning. The dead reckoning mode is annunciated by displaying the letters "d-r" in place of ground speed on the remote readout unit. Recovery of the signal after 9 seconds but before 72 seconds returns the ANS-31/NCS-31 to the enroute mode and replaces the letters "d-r" with the normal ground speed display. If an invalid signal condition exceeds 72 seconds, the NAV flag on the Horizontal Situation Indicator will come into view and automatic reentry to the enroute mode will be inhibited.

Signal recovery after the NAV flag has been displayed is indicated by the ALERT light flashing. Normal operation may be regained by pressing the WPT key, the desired waypoint number key, and the USE key.

NOTE

> A flashing ALERT light may also indicate crossing the TO/FROM line. This is verified by a zero distance or time to the waypoint displayed on the remote readout unit. Press the WPT key to extinguish the light.

When operating in the approach mode, loss of signal for more than 1 second forces the ANS-31/NCS-31 into dead reckoning. The letters "d-r" will again appear on the remote readout unit. Loss of signal in excess of 9 seconds causes the NAV flag on the Horizontal Situation Indicator to come into view. Recovery of the signal at any time returns the ANS-31/NCS-31 to the normal approach mode of operation and replaces the letters "d-r" with ground speed.

When operating under conventional VOR (including DME HOLD) conditions, the system will not enter dead reckoning in the event of an invalid signal. However, the NAV flag will be displayed and the annunciation "VOR" on the remote readout unit will be blanked.

WAYPOINT ALERT

Active waypoint approach is annunciated by an illuminated ALERT light on the remote readout unit when within 24 seconds flying time from the waypoint. This feature is available only in the enroute and approach RNAV modes of operation.

Crossing the TO/FROM line is indicated by a flashing ALERT light and reversal of the TO/FROM arrow on the Horizontal Situation Indicator. The ALERT light will automatically extinguish 24 seconds after crossing the TO/FROM line or it may be manually extinguished by pressing the WPT key.

DME HOLD OPERATION

The DME HOLD function inhibits changing the DME receiver frequency. Engaging DME HOLD and then selecting a new waypoint forces the ANS-31/NCS-31 into either a conventional VOR or LOC mode of operation according to the newly selected frequency.

If the waypoint to be selected is a conventional VOR or LOC waypoint, engage the DME HOLD as follows:

1. Press the DME HOLD key.

2. Select the new waypoint data on the scratch pad by pressing the WPT key and the appropriate waypoint number key.

3. Press the USE key once. The upper scratch pad of the control unit will display the letter "P", waypoint number, frequency and the letters "VOR" or "LOC". The lower scratch pad will display the active frequency on which the DME is to be held and the letters "dh" flashing on and off.

4. Verify the displayed data.

5. Press the USE key the second time. The NAV receiver will be tuned to the new waypoint frequency. The DME will remain tuned to the previously active frequency. The held DME frequency and the letters "dh" will be displayed steadily on the lower scratch pad, and also will appear on the remote readout unit in the place of waypoint number and computed ground speed. Raw DME distance to the held DME facility will be displayed on the remote readout unit.

NOTE

Only VOR radials may be flown with angular deviation provided.

Releasing the DME HOLD key will tune the DME receiver to the active NAV frequency. The lower scratch pad on the control unit will be cleared. Raw DME distance (if the signal is valid), waypoint number, and the letters "VOR" or "LOC" will appear on the remote readout unit.

CAUTION

The DME HOLD function should not be used when navigating between RNAV waypoints. These waypoints require valid signals from colocated VOR and DME facilities to establish their geographical positions. If the VOR and DME receivers are not tuned to a colocated facility, the DME HOLD function will cause raw DME distance to the held facility to be displayed on the remote readout unit and angular deviation to the VOR facility on the Horizontal Situation Indicator.

PERFORMANCE - No change

Approved:

for Donald St Peter

Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200 LANDPLANE

AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

CANADIAN MARCONI CMA-720 AREA NAVIGATION SYSTEM

GENERAL

The information in this supplement is FAA Approved material which along with the basic Super King Air 200 FAA Approved Airplane Flight Manual is applicable to the operation of the airplane when modified by the installation of the Canadian Marconi CMA-720 Area Navigation System installed in accordance with Beechcraft Approved Data. The information in this supplement supersedes or adds to that of the basic airplane flight manual. Users of the FAA Approved Airplane Flight Manual are advised to always refer to the supplements for possible superseding information and placarding applicable to the operation of the airplane.

The operation of the Canadian Marconi CMA-720 Area Navigation System is to be accomplished in conformity with the operating instructions included in the Canadian Marconi Company's "Pilot's Guide", Publication No. 720-SF1-202. The Pilot's Guide is available from Beech Aircraft Corporation and must be in the airplane and available to the pilot during all flight operations using the CMA-720 Area Navigation System.

LIMITATIONS

1. This system may not be used as a primary system under IFR conditions except on approved approach procedures, approved airways, and random area navigation routes when approved by Air Traffic Control.

2. This system can only be used with colocated facilities. (VOR and DME signals originate from same geographical location.)

3. The Vertical Navigation (VNAV) does not adversely affect any other airplane system. Pending publication of certification requirements, flight operations must not be predicated on its use as the primary source of vertical guidance.

NORMAL PROCEDURES

Refer to the Canadian Marconi CMA-720 Pilot's Guide, Publication No. 720-SF1-202.

EMERGENCY PROCEDURES

Refer to the Canadian Marconi CMA-720 Pilot's Guide, Publication No. 720-SF1-202.

PERFORMANCE

No change.

Approved:

H.H. Schultz

for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200 LANDPLANE

AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

COLLINS AP-106 AUTOMATIC FLIGHT CONTROL SYSTEM

CATEGORY I

GENERAL

The information in this supplement is FAA-approved material and must be attached to the *Super King Air 200 FAA Approved Airplane Flight Manual* when the airplane has been modified by installation of the Collins AP-106 Automatic Flight Control System in accordance with Beechcraft Drawing 101-500004.

The information in this supplement supersedes or adds to the basic *FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

LIMITATIONS

1. During autopilot operations, pilot must be seated at the controls with seat belt fastened.
2. Maximum speed limit for autopilot operation is unchanged from the airplane maximum airspeed limit (V_{MO}/M_{MO}).
3. Do not use autopilot under 200 feet above terrain.
4. Do not use autopilot or yaw damper during takeoff or landing.
5. Do not use propeller in the range of 1750 - 1850 rpm during coupled ILS approach.
6. Autopilot preflight check must be conducted and found satisfactory prior to each flight on which the autopilot is to be used.

NORMAL PROCEDURES

The autopilot/flight director modes are selected on the system control unit by momentary action, push-on/push-off switches. The lateral modes are HDG, NAV, APPR, and B/C. When not in a lateral mode, the flight director command bars are biased out of view. The vertical modes are ALT, IAS, and pitch. These are all hold modes. The pitch hold mode is automatically operational when none of the vertical modes are selected.

Selection of a mode causes that pushbutton to illuminate along the edges. Switch lighting intensity of the selected mode is adjusted by the dimmer control on the lower right of the system control unit. The dimmer control also acts as a lamp test when turned fully counter clockwise. For operation at night, the switches have an overall illumination as adjusted by the OVERHEAD, SUBPANEL AND CONSOLE light control.

The autopilot incorporates its own annunciator panel located just above the flight director display on the instrument panel. The modes and indications given on the annunciator panel are placarded on the face of the plastic lenses and illuminate when the respective conditions are indicated. Dimming of the annunciators is provided for by a switch located adjacent to the annunciator panel.

PREFLIGHT CHECK

The preflight check assures the pilot that the safety and failure warning features of the system are operating properly.

1. Turn on airplane power, an inverter, and the avionics master switch. Check that the vertical gyro has erected and that the gyrostabilized magnetic compass is slaved (flags out of view). Set the heading marker under the lubber line, and select HDG mode.

NOTE

The pressure of air flow that normally opposes movement of control surfaces is absent during any preflight check. It is possible to get a hardover control surface deflection if an autopilot command is allowed to remain active for any appreciable time. If it is desired to check operation of the pitch/turn control knobs, move them only as required to check control operation, and then return them to the center position.

2. Engage the autopilot. Check that the controls resist movement. Move the heading marker to 10 degrees right, then 10 degrees left of the lubber line. Observe that the flight director commands a bank toward the new heading and the control wheel responds in the appropriate direction.

3. Press the AP/YD disconnect button on the control wheel. Observe that the autopilot disengages and that the flight controls operate freely.

4. Depress the pedestal mounted ELEV TRIM push-switch.

5. Pull the control wheel aft to mid-travel and engage the autopilot. Push forward lightly on the control wheel and hold. The trim wheel should move to the nose-up direction after a few seconds and the TRIM UP annunciator on the control unit should flash. Continue to hold the control wheel and press the control wheel trim switches to the NOSE DN position. The autopilot should immediately disengage and the AP TRIM FAIL and MASTER WARNING annunciators should illuminate.

NOTE

The AP TRIM FAIL annunciator will extinguish by depressing the AP/YD disconnect button on the control wheel and the MASTER WARNING annunciator by depressing its face.

6. Pull the control wheel aft to mid-travel and re-engage the autopilot. Pull further aft and hold. The trim wheel should move to the nose-down direction after a few seconds and the TRIM DN annunciator should flash. Press the control wheel trim switches to the NOSE UP position. The autopilot should again immediately disengage and the AP TRIM FAIL and MASTER WARNING annunciators should illuminate.

7. Pull the control wheel aft to mid-travel and re-engage the autopilot. Depress the pedestal mounted AP TRIM TEST switch. Push forward lightly on the control wheel and hold. The trim wheel should not move. The autopilot should disengage after approximately five seconds and the AP TRIM FAIL and MASTER WARNING annunciators should illuminate.

8. Select any lateral mode (HDG, NAV, APPR, B/C), and move the heading marker so that the flight director commands a bank. Engage the autopilot. Press the go-around button on the left power lever and observe the GA annunciator illuminates, the autopilot disengages, and the flight director commands a wings-level, 7° nose-up attitude.

ENGAGING AUTOPILOT

1. Move the engage-disengage switch lever on the system control unit to the ENG position.

NOTE

The autopilot and flight director are coupled when both units are engaged. When coupled, the autopilot accepts guidance commands from the flight director. When the flight director is not engaged, the autopilot accepts pitch and roll commands from the pitch/turn control knobs as selected by the pilot.

2. The autopilot may be engaged in any reasonable attitude and in either the coupled or uncoupled mode. The autopilot will smoothly acquire the command attitude. When uncoupled, the autopilot will maintain the bank and pitch attitude at the time of engagement.

MANEUVERING

1. To change flight functions, press the desired mode button on the control unit. The selected mode button will illuminate along the edges and the autopilot annunciator lights on the instrument panel will illuminate, indicating the respective modes in operation.

2. In any function except "after glideslope capture", use the autopilot pitch control for climbing and descending. Movement of the pitch control determines a pitch rate that is proportional to knob displacement. If any vertical mode button has been selected, it will automatically release when the AP pitch control knob is rotated.

3. When the HDG mode is selected, the autopilot will command the airplane to turn and maintain the heading set on the heading marker.

4. Use the autopilot turn control to command a roll rate when the autopilot is engaged. At the time the control is returned to detent, the autopilot maintains the bank angle (up to approximately 30 degrees). Rotating the turn control when the autopilot is engaged and a lateral mode is selected (except APPR and GA modes) will cause the selected lateral modes to release.

CONTROL WHEEL SYNCHRONIZATION

The PITCH SYNC & CWS button on the pilot's control wheel can be used instead of the pitch/turn control to establish the airplane in a desired attitude. Depressing the button causes the autopilot servos to disengage from the control surfaces. The pilot manually flies the airplane to the desired attitude. Releasing the PITCH SYNC & CWS button re-engages the servos and the system then will maintain that attitude.

The ALT or IAS mode will immediately disengage (if selected) when the PITCH SYNC & CWS button is depressed. If the autopilot is coupled to the HDG, NAV, or B/C modes, upon release of the PITCH SYNC & CWS button, the autopilot will couple to the previously selected lateral mode.

NOTE

The APPR mode will not disengage when the PITCH SYNC & CWS button is depressed. When the button is released, the airplane will return to the localizer course and glideslope.

YAW DAMPER OPERATION

1. The rudder channel of the autopilot may be selected separately for yaw damping by depressing the YAW DAMP switch on the pedestal. The switch face will illuminate when the yaw damper is engaged.

2. To disengage the yaw damper, press the disconnect button on the pilot's or copilot's control wheel to the first detent or press the YAW DAMP switch on the pedestal.

3. Refer to EMERGENCY PROCEDURES for other means of disconnecting the yaw damper.

DISCONNECTING AUTOPILOT

1. Press the release button on the outboard horn of either control wheel to the first detent or manually move the engage-disengage switch lever to the DIS position to disengage the autopilot for transition to manual control.

NOTE

After assuming manual control, fly the airplane using the same heading, course, and attitude displays used to monitor autopilot operation prior to assuming manual control.

VOR FLYING

1. Tune NAV receiver to the appropriate frequency.

2. Set the desired course to or from the station on the pilot's Course Indicator by turning the course knob.

3. Set the desired beam intercept heading with the HDG knob. The intercept angle with respect to the radio beam may be any angle of 90 degrees or less.

4. Depress the NAV button on the system control unit. The system is then armed to capture the beam as indicated by the N/L ARM annunciator light on the instrument panel. At the point of capture the N/L CAP annunciator light will come on, indicating that the system has captured the selected course. Correction for proper tracking of the radial is automatically provided.

NOTE

Except as described below, do not select a different VOR frequency or course once a course and intercept have been programmed or capture achieved. To select a different course or VOR frequency, return to the HDG mode, select the course or frequency, return to the NAV mode, and reset the desired beam.

5. Radio course may be changed over a VOR station when operating in NAV mode as long as the course change is not more than 30 degrees. If the course change is more than 30 degrees, HDG mode should be selected to establish a new intercept and then NAV mode reselected to set up a new capture.

6. The system features linearized VOR deviation when the airplane is DME equipped and a VORTAC is being used. The lateral deviation bar indicates the distance in nautical miles from the selected radial regardless of how close the airplane is to the ground station.

   For enroute operation in the NAV mode, full scale deflection of the lateral deviation bar equals 10 miles from the selected radial. For VOR approach operation, the APPR mode should be selected. This provides linear deviation with the sensitivity limits of the computer increased so that full scale deflection of the lateral deviation bar equals 1 mile from the selected radial. APPR mode should be selected when within 10 miles of the final approach fix. Capture is the same as in NAV mode.

7. Conventional angular deviation of ±10 degrees will be presented on the lateral deviation bar if a DME signal is not being received or the DME selector is not in the NAV 1 position.

AUTOMATIC APPROACH - FRONT COURSE

NOTE

The localizer and glideslope are captured automatically on the ILS front course approach. The localizer must be captured before glideslope capture can occur. The localizer is always captured from a selected heading, but the glideslope may be captured from any of the vertical modes and from above (not recommended) or below the glideslope.

1. To intercept the localizer beam, turn the NAV receiver to the correct ILS frequency. Set the course selector to the inbound runway heading, set the heading marker to the desired intercept angle, and select HDG on the control unit. Any vertical mode may be used. Program DH if installed.

2. Press the APPR button on the control unit. The N/L ARM annunciator light will appear on the annunciator panel indicating the system is armed for localizer capture. As the airplane approaches the localizer beam, the N/L CAP annunciator light will illuminate, indicating the system has captured the localizer course. When localizer track occurs, the GS ARM annunciator illuminates to verify that the system is armed for glideslope capture. At the point of glideslope intercept, the G/S CAP annunciator light will appear and all vertical modes preselected will be cleared, indicating the system is in glideslope operation.

3. The DH lights on the pilot's and copilot's instrument panels will illuminate when the airplane reaches the decision height previously selected by the pilot on the radio altimeter, if installed.

4. Go-around mode may be activated by pressing the GA button on the left power lever, and may be actuated from any lateral mode (HDG, NAV, APPR, B/C) with the following results:

   a. Illuminates the GA light on the autopilot annunciator panel.

   b. Disengages the autopilot.

   c. Gives command presentation for wing level 7° nose up climb attitude.

NOTE

The heading marker may be preset to the go-around heading after the localizer is captured. After go-around airspeed and power settings are established, select the HDG mode to clear the go-around mode. Pitch attitude will remain at that used for go-around until changed with the PITCH SYNC & CWS button or the selection of a vertical mode.

5. To assume manual control of the airplane for landing, press the disengage button on the control wheel.

BACK COURSE APPROACH

As in a front course approach, the localizer is captured automatically. The airplane should be manuevered into the approach area by setting the heading marker and functioning in the HDG mode.

1. Tune the NAV receiver to localizer frequency.

2. Set course selector to front course inbound localizer bearing.

3. Set heading marker for desired intercept heading. Program DH if installed.

4. Select B/C on the control unit. The N/L ARM and BACK LOC annunciator light will illuminate indicating the system is armed for the back course localizer approach. Capture and tracking is the same as front course.

5. Use the pitch control on the autopilot controller to establish and maintain the desired rate of descent.

NOTE

The HDG mode should be used within one mile of the runway due to the large radio deviations encountered when flying over the localizer transmitter.

6. The DH lights on the pilot's and copilot's instrument panels will illuminate when the airplane reaches the decision height previously selected by the pilot on the radio altimeter, if installed.

7. If minimum altitude is attained before visual contact is achieved, the ALT HOLD mode may be used to hold altitude until time to a missed approach has elapsed.

8. Go-around mode may be activated by pressing the GA button on the left power lever, with the results as specified in the AUTOMATIC APPROACH-FRONT COURSE procedure.

SPECIAL NOTES

1. The command bars on the flight director indicator will be biased out of view when all lateral modes are cleared.
2. When the autopilot engage lever is in the DIS position, the system may be used as a manual flight director system by selecting the desired mode of operation on the control unit.
3. To synchronize the vertical command to airplane attitude while in flight director function, depress the PITCH SYNC & CWS button on the pilot's control wheel.
4. Altitude hold information is displayed on the command bars in flight direction function by pushing the ALT button on the mode selector.
5. To maintain a desired indicated airspeed, press the IAS button on the control unit.
6. After selection of APPR mode, test functions for Nav, Marker Beacons and Radio Altimeter are locked out.

EMERGENCY PROCEDURES

The autopilot can be disengaged by any of the following methods:

1. Press the AP/YD disconnect switch on the pilot's or copilot's control wheel.
2. Move the engage lever to the DIS position.
3. Engage the go-around mode (Yaw damper will remain on).
4. Pull the flight director/autopilot circuit breaker out (off).
5. Turn off the airplane master switch.
6. Turn off the avionics master switch.

The following conditions will cause the autopilot to disengage automatically:

1. Any interruption or failure of power.
2. Vertical gyro failure indication.
3. Flight control system power or circuit failure.
4. Autopilot trim failure.

In the event of an engine failure:

1. Disengage the autopilot, retrim the airplane, and re-engage the autopilot. Maintain 120 KIAS for single engine approach speed until landing is assured.

Maximum altitude losses during malfunction tests were:

CONFIGURATION	ALTITUDE LOSS
Climb	30 ft.
Cruise	350 ft.
Maneuvering	100 ft.
Descent	530 ft.
Approach/ILS Coupled	60 ft.
Single Engine Approach/ILS Coupled	60 ft.

Approved: N. H. Schultz

for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

FAA Approved
Revised: June 17, 1977
P/N 101-590010-83

BEECHCRAFT SUPER KING AIR 200 AND 200T LANDPLANES

AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

GULL FUEL MEASURING SYSTEM (POUNDS OF FUEL CONSUMED)

GENERAL

The information in this supplement is FAA-approved material and must be attached to the *FAA Approved Airplane Flight Manual* when the aiplane has been modified by installation of the Gull Fuel Measuring (Pounds Of Fuel Consumed) System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic *FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

This system is designed to read in pounds of fuel consumed.

LIMITATIONS

System tolerance is ±3% of the total indicated and should be allowed for in flight planning. Example: 3% of full fuel load (mains and auxiliaries) = 109 pounds, which should be subtracted from full fuel load.

EMERGENCY PROCEDURES - No change.

NORMAL PROCEDURES

1. Set indicator to zero prior to starting engines.
2. To determine amount of fuel remaining:
   a. Calculate the fuel on board before takeoff by reading the fuel quantity indicator for both the main and auxiliary fuel system, if utilized, to determine fuel load in pounds.
   b. To ensure adequate margin, increase the consumed reading by 3% due to manufacturing tolerance and readability error.
   c. Subtract the pounds consumed from the initial fuel loading.

PERFORMANCE - No change.

Approved: N. H. Schultz
for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200 LANDPLANE

AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

COMMUNICATIONS COMPONENTS CORPORATION

ONTRAC II VLF 1000 - 3 NAVIGATION SYSTEM

GENERAL

The information in this supplement is FAA Approved material which along with the basic Super King Air 200 FAA Approved Airplane Flight Manual is applicable to the operation of the airplane when modified by the installation of the Communications Components Corporation ONTRAC II VLF 1000-3 Navigation System installed in accordance with Beechcraft Approved Data. The information in this supplement supersedes or adds to that of the basic airplane flight manual. Users of the FAA Approved Airplane Flight Manual are advised to always refer to the supplements for possible superseding information and placarding applicable to the operation of this airplane.

LIMITATIONS

This navigation system does not adversely affect any other airplane system. Pending publication of certification requirements, flight operations must not be predicated on its use as the primary source of navigation.

NORMAL PROCEDURES

The ONTRAC II VLF 1000-3 is a very low frequency (VLF) radio navigation system designed for world-wide area navigation utilizing existing VLF transmitting stations. Aircraft position is determined by the "Rho-Rho" (distance - distance) technique wherein position fixes are automatically made by time referencing radio signals from several VLF stations. Generally, two stations can determine a position on the surface of the earth. From changes in latitude/longitude position, the ONTRAC II derives distance to go, bearing, desired track, cross track error, groundspeed and time to waypoint/destination.

Navigation is computed along a Great Circle flight path to provide the shortest distance between positions. Course deviation is presented in nautical miles on the Horizontal Situation Indicator rather than in degrees as with conventional VOR navigation. This feature provides for a constant course width of approximately ± 7 nautical miles irrespective of the distance to the waypoint.

CONTROLS AND DISPLAYS

The ONTRAC II is programmed and operated from a pedestal mounted control/display unit (CDU). The control section is used to enter data in the computer and select the computed information to be displayed. The display section provides navigational information to the pilot. It also displays the data to be entered into the computer.

1. Data Keyboard:

   Ten momentary keys for entry of data into the computer. Digit keys (0 through 9) enter numerical data. N (north), E (east), S (south), and W (west) keys enter the sign of latitude/longitude information.

2. CLR Key:

   Clears the computer of data in the position the FUNCTION selector is positioned.

3. CAL Key:

   Enables the computer to process the start position of the airplane prior to flight.

4. ON/OFF Switch:

   Applies power to all system components.

5. WAYPOINT Selector:

   Six position switch to select either the start position or one of five waypoint/destination positions:

6. TEST Switch:

   Tests all lights on the display section. All digits display number "8".

7. DIM Switch:

   Adjusts background lighting for display section.

8. FUNCTION Selector:

   Eleven position switch to select mode of operation. When in one of four enroute positions, ENROUTE light will illuminate. When in one of seven enter data positions, ENTER DATA light and keyboard will illuminate.

ENROUTE	ENTER DATA
POS	LON
BRG/DIS	LAT
DTK/XTK	VAR
TIME/GS	RAD
	DME
	GMT
	DATE

9. Numerical Display Registers:

   Left display is a five digit register to indicate latitude, bearing, desired track, and time to selected waypoint. Right display is a six digit register to indicate longitude, distance to selected waypoint, cross track error, ground speed, magnetic variation, DME, GMT, and date.

10. Function Indicators:

   Lamps to indicate S (south) and N (north) for latitude; E (east) and W (west) for longitude and magnetic variation; DTK for desired track; BRG for bearing; TIME for time to waypoint; NM (nautical miles) for distance to waypoint or cross track error; KTS (knots) for ground speed.

11. DR (Dead Reckoning) Light:

   Illuminates when less than two VLF transmitting stations are being received or when only stations of unusable geometry are being received (see Enroute Operation). System will go into dead reckoning mode of operation. Airplane's position will be updated based on last computed ground speed and track.

12. WARN Light:

   Illuminates with a computer or system malfunction. Navigational information should be considered unreliable.

13. BATT Light:

   Illuminates when the system is operating on the emergency battery pack.

14. STD Light:

    Illuminates when the Frequency Standard has stabilized and the computer is ready to navigate.

15. Station Received Indicators:

    Illuminate to indicate those VLF stations which are locked on by the receivers.

16. ENROUTE Light:

    Illuminates when the FUNCTION selector is in one of the four enroute positions.

17. ENTER DATA Light:

    Illuminates when the FUNCTION selector is in one of the seven enter data positions.

18. ALERT Light:

    Illuminates approximately two minutes from selected waypoint/destination.

19. L - R Lights:

    Illuminate in conjunction with the FUNCTION selector XTK (crosstrack) position. Indicate airplane's position left or right of the desired track.

PROGRAMMING

Prior to take-off, the departure point latitude/longitude data is entered into the computer. This is referred to as a START position. In addition, the date and time of day are entered for the computer to compensate for diurnal shift while navigating. Coordinates (latitude/longitude) for up to five way points can be entered while the airplane is on the ground or after take-off.

1. Turn on airplane's avionics master-switch.
2. Set ONTRAC II master switch to ON.
3. Depress TEST switch. Verify all lights on display section are functional.
4. Set WAYPOINT switch to S (start).
5. Set FUNCTION switch to DATE.

NOTE

Verify that six zero's are shown on the right display register. This indicates the computer is ready to accept data. ENTER DATA light should be illuminated.

6. Enter present month (one or two digits) day (two digits) and year (two digits) by depressing the keyboard buttons in the number sequence.

DATA FORMAT: CLR XX.XX.XX i.e., CLR 12-22-75 or 1-01-76.

NOTE

Always press CLR (clear) key before entering data in any position. Leading zeros need not be entered, but all subsequent zeros must be entered.

7. Set FUNCTION switch to GMT. Enter current Greenwich Mean Time (within + 5 minutes).

DATA FORMAT: CLR XX.XX i.e., CLR 22-06.

8. Enter departure position into computer.

NOTE

There are two methods available to enter the departure (start) position into the computer. These are referred to as (1) Standard Entry Method and (2) Offset Entry Method. The Standard Entry Method is used when the departure position (latitude/longitude) is known and may be entered directly into the computer. The Offset Entry Method is used when the departure position is not known, but the latitude/longitude, radial (RAD), distance (DME) and magnetic variation (VAR) of a VORTAC or other known point to which the airplane's position may be referenced is known. The computer will automatically establish the departure position when these parameters are entered.

Standard Entry Method

a. Assure WAYPOINT switch is set to S (start).

b. Set FUNCTION switch to LAT. Enter latitude (5 digits) of departure position. N (north) or S (south) must be entered prior to latitude digits.

DATA FORMAT: CLR - N/S - XX.XX.X i.e., CLR-N-33.40.2

c. Set FUNCTION switch to LON. Enter longitude (6 digits) of departure position. E (east) or W (west) must be entered prior to longitude digits.

DATA FORMAT: CLR - E/W - XXX.XX. i.e., CLR-W-117.48.0

d. Press CAL button to calibrate the system.

NOTE

In S (start) position, LAT or LON, the CAL light will automatically flash. This is a warning not to enter data unless it is intended to calibrate a new start position. After both departure latitude and departure longitude data have been entered, the CAL button must be pressed to enable the computer to accept and process this data as a start position. The light will stop flashing when the CAL button is pressed.

Offset Entry Method

NOTE

At a distance of approximately 60 miles, an error of ± 1° in bearing from the offset position will cause up to one mile error in airplane position. This mode of operation should not be used with an offset distance of more than 150 miles.

a. Assure WAYPOINT switch is set to S (start).

b. Enter latitude and longitude of the VORTAC or other known point in the same manner as the airplane's position was entered with the Standard Entry Method.

c. Press CAL button to calibrate the system.

d. Set FUNCTION switch to RAD (radial). Enter magnetic radial from the known point to the airplane. If 1/10 degree is not known, enter a zero for this digit.

DATA FORMAT: CLR-XXX.X i.e., CLR - 269.0.

e. Set FUNCTION switch to DME.Enter distance from the known point to the airplane. If 1/10 nautical mile is not known, enter a zero for this digit.

DATA FORMAT: CLR-XXX.X i.e., CLR - 113.5

f. Set FUNCTION switch to VAR (variation). Enter magnetic variation of the known point. If 1/10 degree is not known, enter a zero for this digit.

DATA FORMAT: CLR-E/W-XX.X i.e., CLR-W-14.0.

This completes the programming and calibration of the departure position. Coordinates (latitude/longitude) for up to five waypoints can now be entered while the aircraft is on the ground or after take-off. Waypoints may be changed any time during the flight by eliminating one previously entered. If entered waypoint data is incorrect, press CLR button and re-enter. The start position and all waypoints are automatically cleared when the master switch is set to OFF.

9. Set WAYPOINT switch to 1 and FUNCTION switch to LAT. Enter latitude of first waypoint. North or south must be entered prior to latitude digits.

DATA FORMAT: CLR-N/S-XX.XX.X i.e., CLR-N-39.56.0.

10. WAYPOINT switch remains at 1. Set FUNCTION switch to LON. Enter longitude of first waypoint. East or west must be entered prior to longitude digits.

DATA FORMAT: CLR-E/W-XXX.XX.X i.e., CLR-W-86.03.0.

11. Set WAYPOINT switch to 2 through 5. Enter coordinates of additional waypoints as required.

PREFLIGHT

The preflight check is to test the computation accuracy of the computer and to assure its capability for proper operation. This procedure should be completed prior to programming for the intended flight.

Coordinates for a calibrated start position and destination are programmed into the computer along with the current date and Greenwich Mean Time. Upon selecting the BRG/DIS enroute mode, a predetermined bearing and distance should be displayed.

1. Set WAYPOINT switch to S (start).

2. Set FUNCTION switch to DATE. Enter current date.

3. Set FUNCTION switch to GMT. Enter current Greenwich Mean Time.

4. Set FUNCTION switch to LAT. Enter: CLR-N-33.40.2

5. Set FUNCTION switch to LON. Enter: CLR-W-117.48.0.

6. Press CAL button.

7. Set WAYPOINT switch to 1.

8. Set FUNCTION switch to LAT. Enter: CLR-N-44.38.9.

9. Set FUNCTION switch to LON. Enter: CLR-W-67.16.9.

10. Set FUNCTION switch to BRG/DIS. The numerical display registers should indicate a bearing of 058.6 degrees and a distance of 2406.6 nautical miles.

ENROUTE OPERATION

Immediately prior to take-off, set the WAYPOINT switch to the first waypoint and the FUNCTION switch to BRG/DIS. The Great Circle bearing and distance to the first waypoint will be shown on the display section. Set the course indicator on the Horizontal Situation Indicator to agree with the displayed bearing.

NOTE

Do not set the FUNCTION Switch to any enroute position until the green "STD" light and a minimum of two stations are illuminated on the display. Avoid setting an enroute position until just prior to take-off.

Any difference in the airplane's position between the start position and that when an enroute mode is selected will cause start position errors.

Waypoints/destination may be changed at any time during flight by eliminating one previously entered. However, do not leave the system in an enter data mode longer than three minutes during the flight. The computer will not update navigational information in this mode.

In the enroute mode of operation, eight functions of navigational information are available. These eight functions are selected by placing the FUNCTION switch to the appropriate position and reading the display. The ENROUTE light will be illuminated in any of the enroute modes.

POS Function (Latitude/Longitude)

This position displays the current latitude and longitude in degrees, minutes, and tenths of minutes. Airplane position is updated every four seconds and is stable to approximately 2/10 minutes of latitude.

BRG/DIS Function (Bearing/Distance)

The bearing and distance to the waypoint as selected on the WAYPOINT switch will be displayed. Bearing is defined as the Great Circle angle from the airplane's current position to the waypoint as referenced to North (true or magnetic). The N light will be displayed if the bearing is defined to true North (i.e., no variation has been entered). If a magnetic course or route is desired to be flown, the magnetic variation for the area of flight should be entered and periodically updated in the VAR position of the FUNCTION switch. The N light will not be displayed if the bearing is magnetic. Bearing is calculated to 1/10 degree and distance to 1/10 nautical mile. The display is updated every four seconds.

DTK/XTK Function (Desired Track/Cross Track)

The desired track is defined as a Great Circle path from the airplane's position to the selected waypoint. This track is established when the waypoint is selected on the WAYPOINT switch. The DTK function displays to the nearest 1/10 degree the angle of the desired track flight path as referenced to North (true or magnetic). A magnetic desired track will be displayed provided the area magnetic variation has been entered.

Bearing (BRG) and desired track (DTK) will always agree when the airplane is centered on the prescribed Great Circle Course. If a deviation is made from the course, the bearing will update to provide the angle, as referenced to North, from the current position to the selected waypoint. The desired track angle will vary only as required to define the previously established Great Circle course.

NOTE

If it is required to intercept a predetermined track (true or magnetic) to a waypoint, set up an appropriate intercept angle to the desired track. Monitor the displayed bearing in the BRG/DIS function. When the displayed bearing indicates the required track angle, set the WAYPOINT switch to an alternate waypoint for at least five seconds; then switch back to the desired waypoint. The desired track (DTK) will then be altered to agree with the displayed bearing (BRG). Set the Horizontal Situation Indicator course to match the desired track.

Approximately two minutes from the selected waypoint, the ALERT light will flash. The WAYPOINT selector should be set to the next waypoint, the desired track read in the DTK/XTK mode, and the Horizontal Situation Indicator course set to agree.

Crosstrack is defined as the lateral deviation from the desired track. The crosstrack error, displayed to the nearest 1/10 nautical mile, indicates by the L/R lights whether the airplane is to the left or right of the desired track.

TIME/GS Function (Time/Ground speed)

Time to any of the programmed waypoints is available by setting the WAYPOINT switch to the desired waypoint. The computed time is presented in hours, minutes, and tenths of minutes and is updated every 4 seconds.

The GS (ground speed) function is independent of the selected waypoint and indicates the true ground speed in knots. The ground speed display will remain valid even when not tracking to a waypoint. This function is updated every 60 seconds and averaged over the preceding three minute period.

Unusable Station Geometry

If the airplane's position is within 6 degrees of a line between all received stations, the system will go into the DR (dead reckoning) mode. This is because the geometry of the received stations makes for potentially large navigation errors. This condition usually happens in cases of only two station reception, but in very rare situations can happen with three stations. The airplane's position will be updated based on the last computed ground speed and track. When the airplane flys out of the unusable geometry condition, the system will return to normal operation.

GENERAL NOTES

1. Always press CLR key before entering data on the keyboard. This clears any previous entries and sets the computer to receive new data.

2. Always press CAL key after entering the departure position latitude/longitude.

3. An illuminated BATT light indicates the system is operating on the emergency battery pack and not on the primary power source. The system cannot be turned on without primary power first

being applied. The emergency battery pack should not be used for ground check or warm-up.

4. Do not switch to an enroute mode of operation before the green STD light illuminates. Stations cannot be calibrated and the system cannot navigate.

5. The DR light will remain illuminated for up to 35 seconds after switching to an enroute mode for the first time. During this time, the system is calibrating the current stations, but is navigating. Navigation data is displayed after the DR light extinguishes.

6. The FUNCTION switch should not be left in an enter data mode longer than three minutes during navigation. The computer will not update in this mode although the system is navigating.

7. Turning off the system input power will cause the computer to lose all navigational information.

EMERGENCY PROCEDURES

Since flight operations may not be predicated on the use of ONTRAC II as the primary source of navigation, emergency procedures are not applicable. However, an emergency battery pack is provided in the event the primary power source is lost. If the primary power is interrupted, the system will switch to the emergency battery pack until the primary power is restored at which time the system will switch back to primary power. The system cannot be turned on using only the emergency battery. Battery power will only function with loss of primary power. It is important the system power switch be selected off at the conclusion of flight to avoid depleting the emergency battery.

The ONTRAC II can operate from the emergency battery pack for approximately 30 minutes at 70°F. The battery pack will recharge in approximately three hours when the system is on the primary power source.

APPROVED: N. H. Schutt

for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200 LANDPLANE

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

SPERRY SPZ-200A/STARS IV D AUTOMATIC FLIGHT CONTROL SYSTEM or

SPERRY SPZ-200A/SPI-80/81 AUTOMATIC FLIGHT CONTROL SYSTEM

CATEGORY I

GENERAL

The information in this supplement is FAA-approved material and must be attached to the *Super King Air 200 FAA Approved Airplane Flight Manual* when the airplane has been modified by installation of the Sperry SPZ-200A/STARS IV D or SPI-80/81 Automatic Flight Control System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic *FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

LIMITATIONS

1. During autopilot operations, pilot must be seated at the controls with seat belt fastened.
2. Maximum speed limit for autopilot operation is unchanged from the airplane maximum airspeed limit (V_{MO}/M_{MO}).
3. Do not use autopilot under 200 feet above the terrain.
4. Do not use autopilot or yaw damper during takeoff or landing.
5. Do not use propeller in the range of 1750-1850 rpm during coupled ILS approach.
6. Autopilot preflight check must be conducted and found satisfactory prior to each flight on which the autopilot is to be used.
7. The accuracy of the VNAV system has not been shown to meet the requirements of advisory circular 90-45A and is therefore not to be used as the primary source of vertical guidance information.

EMERGENCY PROCEDURES

If the AP TRIM FAIL and MASTER WARNING annunciators illuminate while the autopilot is engaged, immediately disconnect while restraining the control wheel for a possible out of trim force.

IN THE EVENT OF AN AUTOPILOT MALFUNCTION, disengagement can be accomplished by one of the following:

1. Pressing (momentarily) to the first level the pilot's or copilot's AP/YD & TRIM DISC button on the control wheel.
2. Pressing (momentarily) the go-around button on the left power lever.
3. Pressing the TEST button on the Autopilot Engage Controller.

4. Opening the autopilot circuit breaker.

5. If necessary, the autopilot may be overpowered by either pilot.

IN THE EVENT OF AN ENGINE FAILURE:

1. Disengage the autopilot, retrim the airplane and re-engage the autopilot. Maintain at least 120 knots for one-engine-inoperative approach.

MAXIMUM ALTITUDE LOSSES DURING MALFUNCTION TESTS WERE:

CONFIGURATION	**ALTITUDE LOSS**
Climb	250 feet
Cruise	410 feet
Maneuvering	100 feet
Descent	500 feet
Approach/ILS Coupled	80 feet
One-engine-inoperative Approach/ILS Coupled	50 feet

NORMAL PROCEDURES

FLIGHT DIRECTOR OPERATION

The pilot can select any of the following flight modes using the flight director mode selector pushbuttons which provide both the flight director and autopilot mode control and annunciation. All modes on the mode selector have push on - push off capability. When no mode has been selected, the command bars on the Attitude Display Indicator (ADI) are retracted from view.

1. Standby (SBY): In this mode, flight director is ready for operation of the other modes. The command bars on the Attitude Display Indicator are retracted from view. Depressing the SBY pushbutton tests all flight control system annunciators and resets the flight director mode.

2. Heading Select (HDG): This mode provides lateral commands on the Attitude Display Indicator command bar to acquire and maintain the heading displayed on the heading cursor on the Horizontal Situation Indicator. The desired heading is selected by turning the heading select knob.

3. VOR/RNAV/Front Course Localizer (NAV): Selecting NAV with the radio tuned to a VOR or localizer frequency results in the NAV ARM light illuminating. The desired radial or inbound course is set on the Horizontal Situation Indicator course selector by turning the course knob. When NAV is selected with the airplane outside the edge of the beam, the HDG mode is automatically selected. The heading select cursor can be used to set the intercept angle to the beam. When the capture point is reached, the HDG mode drops out, the NAV mode goes from ARM to CAP, and the flight director command bars provide commands to track the VOR radial or localizer beam. Crosswind correction is automatically provided.

4. ILS Approach (APR): Selecting APR with the radio tuned to a localizer frequency will result in both the APR ARM and NAV ARM lights illuminating which indicate glideslope and localizer signals respectively are armed. The inbound course should be set on the Horizontal Situation Indicator course selector. The heading mode will be automatically selected if the airplane is outside the edge of the localizer beam. An appropriate intercept angle should be set with the heading select cursor. When the localizer is captured, the HDG mode drops out and the NAV mode goes from ARM to CAP. The APR mode goes from ARM to CAP upon intercepting the glideslope. Glideslope capture will not occur until after the localizer has been captured. If ALT, VS or IAS modes were selected, they will drop out at glideslope capture.

5. Back Course Localizer (BC): This mode provides lateral commands on the flight director to fly back course approaches or outbound on the front course. The inbound front course should be set on the Horizontal Situation Indicator course selector. Lateral beam sensor operation is as described in the NAV mode.

6. VOR/RNAV Approach (VOR APR): Selecting VOR APR with the radio tuned to a VOR frequency results in the VOR APR ARM and NAV ARM lights illuminating. Course intercept and capture operation is as described in the NAV mode. When the course capture is accomplished, the ARM lights will extinguish and the VOR APR CAP and NAV CAP lights will illuminate. This mode provides optimum gains for the VOR/RNAV approach.

7. Altitude Hold (ALT): This mode provides pitch commands on the flight director to maintain the engaged altitude. If the autopilot is engaged, selection of the ALT mode should be made at vertical speeds less than 2000 feet per minute.

8. Altitude Preselect (ALT SEL): This mode operates in conjunction with the Altitude Alert Controller on which the desired altitude is set. Pressing ALT SEL will illuminate the ARM annunciator indicating the flight director is armed to automatically capture the selected altitude. Pitch hold, IAS or VS modes may be used to fly to the selected altitude. When the difference between the airplane's altitude and the selected altitude is approximately one quarter of the vertical rate, the ARM and any selected vertical mode annunciators will extinguish and the CAP annunciator will illuminate. The flight director will command a programmed flare to the selected altitude. When the altitude is reached, the altitude hold mode automatically engages and the CAP annunciator will extinguish.

9. Vertical Speed (VS): The VS mode maintains the existing vertical speed at the time of selection through pitch commands on the flight director.

10. Airspeed Hold (IAS): The IAS mode is used to maintain a constant indicated airspeed by controlling pitch attitude. The IAS mode is selected when the airplane is at the desired airspeed. The flight director commands pitch attitude changes to maintain the selected airspeed.

11. Go-Around: This mode provides commands to the flight director when an approach is to be terminated. A fixed pitch-up, wings-level command of 7 degrees is presented. The GO-AROUND mode cancels all other modes and is selected by depressing the go-around switch on the left power lever. Selection of the GO-AROUND mode will disengage the autopilot; however, the yaw damper will be retained.

    After GO-AROUND is selected, any roll mode can be selected and will cancel the wings level roll command. The GO-AROUND mode is cancelled by either selecting another pitch mode, selecting TCS or engaging the autopilot.

12. Vertical Navigation (VNAV): This optional mode operates in conjunction with the optional VNAV computer/controller to compute and display pitch commands to capture and maintain a vertical track angle in ascent or descent to a selected waypoint or VORTAC facility.

AUTOPILOT FEATURES

1. Autopilot Controller: The autopilot controller provides the means of engaging the yaw damper and autopilot. The controller also contains a pitch wheel and turn knob for manual control of the autopilot.

2. Yaw Damper Engage: The yaw damper is engaged by depressing the Y/D ENGAGE button on the autopilot controller. The YAW DAMPER may be engaged independently of the autopilot to provide yaw stabilization.

3. Autopilot Engage: When the A/P ENGAGE button is pressed the yaw damper is engaged and, with no modes selected on the Flight Director mode selector, pitch attitude is held, roll attitude is brought to zero, and airplane heading is maintained.

NOTE

To engage the autopilot, the yaw damper must be operable.

4. Elevator Trim Annunciator: The elevator trim light illuminates when a sustained signal is being applied to the elevator servo. IF EITHER THE DN OR UP TRIM ANNUNCIATOR IS ILLUMINATED, THE AUTOPILOT SHOULD NOT BE ENGAGED.

5. Soft Ride Mode: Selection of the SOFT RIDE mode on autopilot controller reduces autopilot response in both roll and pitch axes. This mode should be used for turbulence pentration or any other time that softer response is desired.

6. Turn Knob: Rotation of the turn knob out of its detent results in a roll command proportional to, and in direction of, the turn knob rotation. If HDG, NAV, APR, BC, or VOR APR is on the flight director mode selector, rotation of the turn knob cancels the mode. These modes cannot be reselected and the autopilot cannot be engaged until the turn knob is in its detent.

7. Pitch Wheel: Rotation of the pitch wheel results in a change of pitch attitude proportional to the rotation of the pitch wheel and in the direction of wheel movement. If IAS, ALT, VS, ALT SEL CAP, or VNAV CAP is on the flight director mode selector, rotation of the pitch wheel cancels the mode.

8. Touch Control Steering: When the touch control steering (TCS) switch on the control wheel is depressed, the elevator and aileron axes of the autopilot will disengage, the AP ENGAGE annunciator will extinguish, and the pilot can manually control the airplane. When the TCS switch is released, the autopilot will re-engage and illuminate the AP ENGAGE annunciator. TCS can only be used with the turn knob in the center detent.

   If no mode has been selected on the flight director, the existing pitch attitude will be maintained when the TCS switch is released. If the airplane roll attitude is more than 6 degrees, the roll attitude will be maintained. If the roll attitude is less than 6 degrees, the airplane heading will be maintained.

   The TCS feature also allows the pilot to modify the commanded flight path from the flight director computer. When coupled to ALT, VS, IAS, or APR, touch control steering can be selected and the altitude, vertical speed, airspeed or position on the glideslope can be manually changed through pitch attitude or power changes. Upon release of the TCS switch, the new reference will be held or the autopilot will recouple to APR. If the autopilot is coupled to the roll mode, TCS allows maneuvering in roll while the switch is depressed. Upon release, the autopilot will couple to the previously selected lateral mode.

NOTE

If the ALT hold mode is engaged, vertical speed should be less than 2000 feet per minute prior to release of the TCS switch.

AUTOPILOT COUPLING TO FLIGHT DIRECTOR

The autopilot uses the Flight Director computer for autopilot commands. Whenever autopilot is engaged, it will fly the roll and/or pitch mode selected except for the GO-AROUND mode. When the autopilot is engaged and a roll mode is on the flight director, operation of the turn knob will cancel the selected roll mode. When the autopilot is engaged with a pitch mode on the flight director, operation of the pitch wheel will cancel the selected pitch mode. If a roll mode is selected prior to moving the pitch wheel, the command indicator will synchronize to the existing attitude.

The following modes on the flight director are also autopilot modes:

HDG - Heading Select
NAV - VOR, RNAV or Front Course Localizer Beam Tracking
APR - Front Course ILS Beam Tracking
BC - Back Course Localizer Beam Tracking
VOR APR - VOR or RNAV Approach
ALT - Altitude Hold
ALT SEL - Altitude Preselect
VS - Vertical Speed Hold
IAS - Airspeed Hold
VNAV - Vertical Navigation

If no mode is selected, the autopilot will fly heading hold and pitch hold. When GO-AROUND mode is selected, the autopilot will disengage; however, the yaw damper will remain engaged. Re-engagement of the autopilot when the Flight Director is in the GO-AROUND mode results in a pitch attitude hold command for the autopilot. If a Flight Director mode is previously selected, the autopilot will couple to the selected mode.

AUTOPILOT OPERATION

PREFLIGHT

1. Elevator Trim Annunciator - CHECK (Observe that autopilot trim light on autopilot controller is not indicating UP or DN. A steady UP or DN light denotes automatic synchronization is not functioning and the autopilot should not be engaged.)

2. Turn Knob - IN CENTER DETENT POSITION.

3. Autopilot - TEST

   a. Control Wheel to mid-travel - DEPRESS AP ENGAGE ANNUNCIATOR SWITCH

   b. Control movement - CHECK (that the system can be overpowered by slowly moving the controls of all three axes.)

CAUTION

If autopilot disengages, do not use.

   c. Elevator Trim followup - CHECK

   (1) Hold control wheel forward of mid-travel, trim wheel will run nose up after approximately 2 seconds. Actuate control wheel trim switches to nose down. AP TRIM FAIL and MASTER WARNING annunciators will illuminate.

   (2) Hold control wheel aft of mid-travel. AP TRIM FAIL annunciator will extinguish and trim wheel will run nose down after approximately 2 seconds. Actuate control wheel trim switches to nose up. AP TRIM FAIL and MASTER WARNING annunciators will illuminate.

   d. AP/YD & TRIM DISC Button - DEPRESS THROUGH SECOND LEVEL (Autopilot will disengage and ELEC TRIM OFF annunciator will illuminate.

   e. Re-engage Autopilot.

   f. Autopilot TEST Button - DEPRESS (Autopilot will disengage and AP DISC and MASTER WARNING annunciators will illuminate.)

CAUTION

If autopilot does not disengage when the test button is depressed, it indicates autopilot torque monitors are not functioning properly. DO NOT USE AUTOPILOT IN FLIGHT UNTIL CORRECTIVE ACTION HAS BEEN TAKEN.

   g. Annunciators - CLEAR (AP DISC annunciator will extinguish by depressing the control wheel AP/YD & TRIM DISC button and the MASTER WARNING annunciator will extinguish by depressing its face.)

   h. ELEV TAB CONTROL Switch - OFF, then ON (resets electric trim and ELEC TRIM OFF annunciator will extinguish).

   i. Elevator Trim - RESET AS REQUIRED.

IN-FLIGHT ENGAGEMENT OF AUTOPILOT

1. All autopilot and Flight Director Circuit Breakers - IN
2. Elevator Trim Indicator - CHECK (Observe that autopilot trim annunciators on autopilot controller are not illuminated.)
3. Turn Knob - IN CENTER DETENT POSITION
4. Autopilot Controller AP ENGAGE Annunciator Switch - DEPRESS

DISENGAGING THE AUTOPILOT

The autopilot may be disengaged by:

1. Actuation of the AP/YD & TRIM DISC buttons on either control wheel to the first level. (Copilot's button causes MASTER WARNING and AP DISC annunciators to illuminate.)

NOTE

The AP/YD & TRIM DISC button is a two-level switch. The first level disengages the autopilot while the second level disengages both autopilot and electric trim.

2. Pressing the TEST button on the Autopilot Engage Controller. (MASTER WARNING and AP DISC annunciator will illuminate.)
3. Pressing the go-around mode switch on the left power lever. (AP DISC annunciator will illuminate.)

NOTE

The AP DISC annunciator light is extinguished by depressing the pilot's AP/YD & TRIM DISC button. The MASTER WARNING annunciator is extinguished by depressing its face.

DISENGAGING THE YAW DAMPER

The yaw damper may be disengaged by actuation of the AP/YD & TRIM DISC button on either control wheel to the first level.

PREFLIGHT ALTITUDE ALERTING

The alerting sequence can be verified by the following procedure:

1. Set the altitude on the altitude alert controller for 1500 feet above the altitude on the pilot's altimeter.
2. Using the baro set on the pilot's altimeter, adjust altitude toward the alert controller reading. At 1000 feet from the desired altitude, the alert light on the altimeter will illuminate and the alert tone will sound.
3. Within 250 feet of selected altitude, the alert light will extinguish.
4. Then using the baro set to return to the original altitude, the alert light will illuminate and the tone will sound when the altimeter has deviated over 250 feet from that on the alert controller. At 1000 feet from the selected altitude, the alert light will extinguish.

VERTICAL NAVIGATION OPERATION (optional)

The VNAV computer/controller (VNCC) provides for both altitude alerting and vertical navigation.

Altitude alerting: The desired altitude is selected by placing the VNCC selector switch to ALT and slewing the display to the desired altitude using the SET knob. This altitude can be attained by using either the altitude preselect (ALT SEL) or vertical navigation (VNAV) modes of the flight director.

Vertical Navigation: To utilize the VNAV for capturing and maintaining a vertical track to the selected altitude, the VORTAC station elevation (STA EL), along track offset distance (TO/FR), and vertical angle (VANG) must be set after selecting the desired altitude.

STA EL: Station elevation is set in 100 foot increments by selecting the STA EL position and using the SET knob. When using RNAV in conjunction with VNAV, it is only necessary to clear the dashes from the display by setting any arbitrary STA EL such as zero (000) unless the RNAV system does not correct for slant range error.

TO/FR: The TO and FR settings, respectively represent the distance prior to or beyond a VORTAC or waypoint at which a desired altitude is to be reached. These distances are set in tenths of nautical miles up to a maximum of 35.0 miles using the set knob.

VANG: If ALT and STA EL parameters have been set, selection of the VANG position results in the display of the vertical angle from present position to the selected altitude at the offset distance. The display can also be slewed to a desired vertical angle in tenths of a degree up to a maximum of 6 degrees using the set knob unless the Flight Director VNAV mode has been selected. This display will revert to computed angle if an attempt is made to set an angle less than the computed angle.

After the above values have been set, the Flight Director VNAV mode may be used to either capture the displayed vertical angle or if a desired angle has been set, to arm and capture the desired angle when it is reached. The Flight Director will then display commands to follow the vertical angle so as to level off at the selected altitude at the specified along track offset distance. The VNCC supplies a vertical deviation signal similar to a glideslope signal which is displayed on the course indicator. When the selected altitude is reached, the STA EL, TO/FR, and VANG settings revert to dashes to prevent erroneous VORTAC data from being used on subsequent VNAV uses. Furthermore, should the computed angle reach the preset maximum, the above displays will be cancelled in the same manner. This automatic cancellation will be preceded by flashing of the display for the last degree of computed vertical path angle.

PERFORMANCE - No Change

Approved: N. H. Schultz

for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200 LANDPLANE

AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

COMMUNICATIONS COMPONENTS CORPORATION

ONTRAC II VLF 1000 -2 NAVIGATION SYSTEM

GENERAL

The information in this supplement is FAA Approved material which along with the basic Super King Air 200 FAA Approved Airplane Flight Manual is applicable to the operation of the airplane when modified by the installation of the Communciations Components Corporation ONTRAC II VLF 1000-2 Navigation System installed in accordance with Beechcraft Approved Data. The information in this supplement supersedes or adds to that of the basic airplane flight manual. Users of the FAA Approved Airplane Flight Manual are advised to always refer to the supplements for possible superseding information and placarding applicable to the operation of this airplane.

LIMITATIONS

This navigation system does not adversely affect any other airplane system. Pending publication of certification requirements, flight operations must not be predicated on its use as the primary source of navigation.

NORMAL PROCEDURES

The ONTRAC II VLF 1000-2 is a very low frequency (VLF) radio navigation system designed for world-wide area navigation utilizing existing VLF transmitting stations. Aircraft position is determined by the "Rho-Rho" (distance - distance) technique wherein position fixes are automatically made by time referencing radio signals from several VLF stations. Generally, two stations can determine a position on the surface of the earth. From changes in latitude/longitude position, the ONTRAC II derives distance to go, bearing, desired track, cross track error, groundspeed and time to waypoint/destination.

Navigation is computed along a Great Circle flight path to provide the shortest distance between positions. Course deviation is presented in nautical miles on the Horizontal Situation Indicator and ONTRAC II display unit rather than in degrees as with conventional VOR navigation. This feature provides for a constant course width of approximately ± 7 nautical miles in the ENROUTE mode and ± 1.4 nautical miles in the APPROACH mode irrespective of the distance to the waypoint.

CONTROLS AND DISPLAYS

The ONTRAC II is programmed and operated from a pedestal mounted control unit. The control unit is used to enter data in the computer and select the computed information to be displayed. The panel mounted display unit provides navigational information to the pilot. It also displays the data to be entered into the computer. The station indicator annunciates those stations which are being received, stabilization of the Frequency Standard, and when the system is being powered by the emergency battery pack.

CONTROL UNIT

1. Data Keyboard:

   Momentary keys for entry of data into the computer. Digit keys (0 through 9) enter numerical data. N/E (north or east), S/W (south or west) keys enter the sign of latitude/longitude information.

2. CLR Key:

   Clears the computer of data in the position the FUNCTION selector is positioned.

3. Reset Key:

   Enables the computer to process the start position of the airplane prior to flight. In addition, the switch light will flash, while in the ENROUTE mode, if the computer malfunctions.

4. APCH Key:

   Selects the approach mode of operation.

5. TST (Test) Key:

   Illuminates all digit 8's and left/right steering indicators on the display unit.

6. ON/OFF Switch:

   Applies power to all system components.

7. DIM Switch:

   Adjusts background lighting for the control unit and station indicator.

8. WAYPOINT Selector:

   Six position switch to select either the start position or one of five waypoint/destination positions:

9. FUNCTION Selector:

   Eleven position switch to select mode of operation. When in one of four enroute positions, ENROUTE light will illuminate. When in one of seven enter data positions, ENTER DATA light and keyboard will illuminate.

ENROUTE	ENTER DATA
POS	MAG
BRG/DIS	GMT
DTK/XTK	DATE
TIME/GS	RAD
	DME
	LON
	LAT

DISPLAY UNIT

1. Upper Display Register:

   A five-digit register that indicates latitude, bearing, desired track, or time to selected waypoint.

2. Lower Display Register:

   A six-digit register that indicates longitude, speed, distance to selected waypoint, cross track error, date, GMT, DME and magnetic variation.

3. Left/Right Track Indicator:

   This fifteen-dot indicator gives left/right track information in the Enroute mode of operation. Each dot to the left or right of the large center dot indicates one nautical mile off track in normal mode. In the APCH (Approach) mode of operation, each dot indicates 2/10 of a nautical mile. When the airplane is on course, only the large center dot will be illuminated.

4. DR (Dead Reckoning) Light:

   Illuminates when less than two VLF transmitting stations are being received or when two stations of unusable geometry are being received (see Enroute Operation). The system will then go into the Dead Reckoning mode of operation. In this mode, the system updates the aircraft's position based on the last computed ground speed and track.

5. APCH (Approach) Light:

   Indicates that the approach mode has been selected, increasing the sensitivity of the left/right track indicator by a factor of five.

6. Function Indicators:

   These lamps indicate N (north), S (south), E (east), and W (west) for latitude/longitude, or variation, NM (nautical miles) for distance; KTS (knots) for speed, and TIME (time to waypoint). DTK (desired track) for desired track from airplane to waypoint, BRG (bearing) for actual bearing from airplane to waypoint.

7. DIM:

   Adjusts the background lighting of the Display.

STATION INDICATOR

1. Station Received Indicators:

   Illuminate to indicate those VLF stations which are locked on by the receivers.

2. Battery Light:

   The red E illuminates to indicate the system is operating on the emergency battery pack.

3. Standard Light:

   The green S illuminates to indicate the Frequency Standard has stabilized and is ready to navigate.

PROGRAMMING

Prior to take-off, the departure point latitude/longitude data is entered into the computer. This is referred to as a START position. In addition, the date and time of day are entered for the computer to compensate for diurnal shift while navigating. Coordinates (latitude/longitude) for up to five way points can be entered while the airplane is on the ground or after take-off.

1. Turn on airplane's avionics master-switch.

2. Set ONTRAC II master switch to ON.

3. Depress TEST switch. Verify all lights on numerical displays and left/right steering indicators are functional.

4. Set WAYPOINT switch to S (start).

5. Set FUNCTION switch to LAT.

NOTE

Verify that five zero's are shown on the upper display register. This indicates the computer is at reset. ENTER DATA light should be flashing. This is normal in the ENTER DATA mode of operation.

6. Enter departure position into computer.

NOTE

There are two methods available to enter the departure (start) position into the computer. These are referred to as (1) Standard Entry Method and (2) Offset Entry Method. The Standard Entry Method is used when the departure position (latitude/longitude) is known and may be entered directly into the computer. The Offset Entry Method is used when the departure position is not known, but the latitude/longitude, radial (RAD), distance (DME) and magnetic variation (MAG) of a VORTAC or other known point to which the airplane's position may be referenced is known. The computer will automatically establish the departure position when these parameters are entered.

Always press CLR (clear) key before entering data in any position. Leading zeros need not be entered, but all subsequent zeros must be entered.

STANDARD ENTRY METHOD

a. Assure WAYPOINT switch is set to S (start).

b. Set FUNCTION switch to LAT. Enter latitude (5 digits) of departure position. N (north) or S (south) must be entered prior to latitude digits.

DATA FORMAT: CLR - N/S - XX.XX.X i.e., CLR-N-33.40.2

c. Set FUNCTION switch to LON. Enter longitude (6 digits) of departure position. E (east) or W (west) must be entered prior to longitude digits.

DATA FORMAT: CLR - E/W - XXX.XX. i.e., CLR-W-117.48.0

d. Press RESET button to calibrate the system.

NOTE

In S (start) position, LAT or LON, the RESET light will automatically flash. This is a warning not to enter data unless it is intended to calibrate a new start position. After both departure latitude and departure longitude data have been entered, the RESET button must be pressed to enable the computer to accept and process this data as a start position.

OFFSET ENTRY METHOD

NOTE

At a distance of approximately 60 miles, an error of $\pm 1^\circ$ in bearing from the offset position will cause up to one mile error in airplane position. This mode of operation should not be used with an offset distance of more than 150 miles.

a. Assure WAYPOINT switch is set to S (start).

b. Enter latitude and longitude of the VORTAC or other known point in the same manner as the airplane's position was entered with the Standard Entry Method.

c. Press RESET button to calibrate the system.

d. Set FUNCTION switch to RAD (radial). Enter magnetic radial from the known point to the airplane. If 1/10 degree is not known, enter a zero for this digit.

DATA FORMAT: CLR-XXX.X i.e., CLR - 269.0.

e. Set FUNCTION switch to DME. Enter distance from the known point to the airplane. If 1/10 nautical mile is not known, enter a zero for this digit.

DATA FORMAT: CLR-XXX.X i.e., CLR - 113.5

f. Set FUNCTION switch to MAG (magnetic variation). Enter magnetic variation of the known point. If 1/10 degree is not known, enter a zero for this digit.

DATA FORMAT: CLR-E/W-XX.X i.e., CLR-W-14.0.

7. Set FUNCTION switch to DATE.
   Enter present month (one or two digits) day (two digits) and year (two digits) by depressing the keyboard buttons in the number sequence.

DATA FORMAT: CLR XX.XX.XX i.e., CLR 12-22-75 or 1-01-76.

8. Set FUNCTION switch to GMT. Enter current Greenwich Mean Time (within + 5 minutes).

DATA FORMAT: CLR XX.XX i.e., CLR 22-06.

This completes the programming and calibration of the departure position. Coordinates (latitude/longitude) for up to five waypoints can now be entered while the airplane is on the ground or after take-off. Waypoints may be changed any time during the flight by eliminating one previously entered. If entered waypoint data is incorrect, press CLR button and re-enter. The start position and all waypoints are automatically cleared when the master switch is set to OFF.

9. Set WAYPOINT switch to 1 and FUNCTION switch to LAT. Enter latitude of first waypoint. North or south must be entered prior to latitude digits.

DATA FORMAT: CLR-N/S-XX.XX.X i.e., CLR-N-39.56.0.

10. WAYPOINT switch remains at 1. Set FUNCTION switch to LON. Enter longitude of first waypoint. East or west must be entered prior to longitude digits.

DATA FORMAT: CLR-E/W-XXX.XX.X i.e., CLR-W-86.03.0.

11. Set WAYPOINT switch to 2 through 5. Enter coordinates of additional waypoints as required.

PREFLIGHT

The preflight check is to test the computation accuracy of the computer and to assure its capability for proper operation. This procedure should be completed prior to programming for the intended flight.

Coordinates for a calibrated start position and destination are programmed into the computer along with the current date and Greenwich Mean Time. Upon selecting the BRG/DIS enroute mode, a predetermined bearing and distance should be displayed.

1. Set WAYPOINT switch to S (start).

2. Set FUNCTION switch to LAT. Enter: CLR-N-33.40.2

3. Set FUNCTION switch to LON. Enter: CLR-W-117.48.0.

4. Press RESET button.

5. Set FUNCTION switch to DATE. Enter current date.

6. Set FUNCTION switch to GMT. Enter current Greenwich Mean Time.

7. Set WAYPOINT switch to 1.

8. Set FUNCTION switch to LAT. Enter: CLR-N-44.38.9.

9. Set FUNCTION switch to LON. Enter: CLR-W-67.16.9.

10. Set FUNCTION switch to BRG/DIS. The numerical display registers should indicate a bearing of 058.6 degrees and a distance of 2406.6 nautical miles.

ENROUTE OPERATION

Immediately prior to take-off, set the WAYPOINT switch to the first waypoint and the FUNCTION switch to BRG/DIS. The Great Circle bearing and distance to the first waypoint will be shown on the display unit. Set the course indicator on the Horizontal Situation Indicator to agree with the displayed bearing.

NOTE

Do not set the FUNCTION switch to any enroute position until the green S (standard) light and a minimum of two stations are illuminated on the station indicator. Avoid setting an enroute position until just prior to take-off.

Any difference in the airplane's position between the start position and that when an enroute mode is selected will cause start position errors.

Effective BB-136 and after, the NAV 1 frequency selector must be placed in the VOR range to permit the ONTRAC II to couple to the flight director. Frequency selection in the ILS range will automatically switch the flight director to the ILS mode.

Waypoints/destination may be changed at any time during flight by eliminating one previously entered. However, do not leave the system in an enter data mode longer than three minutes during the flight. The computer will not update navigational information in this mode.

In the enroute mode of operation, eight functions of navigational information are available. These eight functions are selected by placing the FUNCTION switch to the appropriate position and reading the display. The ENROUTE light will flash in any of the enroute modes.

POS Function (Latitude/Longitude)

This position displays the current latitude and longitude in degrees, minutes, and tenths of minutes. Airplane position is updated every four seconds and is stable to approximately 2/10 minutes of latitude.

BRG/DIS Function (Bearing/Distance)

The bearing and distance to the waypoint as selected on the WAYPOINT switch will be displayed. Bearing is defined as the Great Circle angle from the airplane's current position to the waypoint as referenced to North (true or magnetic). If a magnetic course or route is desired to be flown, the magnetic variation for the area of flight should be entered and periodically updated in the MAG position of the FUNCTION switch. Bearing is calculated to 1/10 degree and distance to 1/10 nautical mile. The display is updated every four seconds.

DTK/XTK Function (Desired Track/Cross Track)

The desired track is defined as a Great Circle path from the airplane's position to the selected waypoint. This track is established when the waypoint is selected on the WAYPOINT switch. The DTK function displays to the nearest 1/10 degree the angle of the desired track flight path as referenced to North (true or magnetic). A magnetic desired track will be displayed provided the area magnetic variation has been entered.

Bearing (BRG) and desired track (DTK) will always agree when the airplane is centered on the prescribed Great Circle course. If a deviation is made from the course, the bearing will update to provide the angle, as referenced to North, from the current position to the selected waypoint. The desired track angle will vary only as required to define the previously established Great Circle course.

NOTE

If it is required to intercept a predetermined track (true or magnetic) to a waypoint, set up an appropriate intercept angle to the desired track. Monitor the displayed bearing in the BRG/DIS function. When the displayed bearing indicates the required track angle, set the WAYPOINT switch to an alternate waypoint for at least five seconds; then switch back to the desired waypoint. The desired track (DTK) will then be altered to agree with the displayed bearing (BRG). Set the Horizontal Situation Indicator course to match the desired track.

As each waypoint is reached, the WAYPOINT selector should be set to the next waypoint, the desired track read in the DTK/XTK mode, and the Horizontal Situation Indicator course set to agree.

Crosstrack is defined as the lateral deviation from the desired track. The crosstrack error, displayed to the nearest 1/10 nautical mile, indicates by the left/right lights and Horizontal Situation Indicator whether the airplane is to the left or right of the desired track.

TIME/GS Function (Time/Ground speed)

Time to any of the programmed waypoints is available by setting the WAYPOINT switch to the desired waypoint. The computed time is presented in hours, minutes, and tenths of minutes and is updated every 4 seconds.

The GS (ground speed) function is independent of the selected waypoint and indicates the true ground speed in knots. The ground speed display will remain valid even when not tracking to a waypoint. This function is updated every 60 seconds and averaged over the preceding three minute period.

Unusable Station Geometry

If the airplane's position is within 6 degrees of a line between all received stations, the system will go into the DR (dead reckoning) mode. This is because the geometry of the received stations makes for potentially large navigation errors. This condition usually happens in cases of only two station reception, but in very rare situations can happen with three stations. The airplane's position will be updated based on the last computed ground speed and track. When the airplane flys out of the unusable geometry condition, the system will return to normal operation.

GENERAL NOTES

1. Always press CLR key before entering data on the keyboard. This clears any previous entries and sets the computer to receive new data.

2. Always press RESET key after entering the departure position latitude/longitude.

3. An illuminated red E light on the station indicator indicates the system is operating on the emergency battery pack and not on the primary power source. The system cannot be turned on without primary power first being applied. The emergency battery pack should not be used for ground check or warm-up.

4. Do not switch to an enroute mode of operation before the green S (standard) light illuminates. Stations cannot be calibrated and the system cannot navigate.

5. The DR light will remain illuminated for up to 35 seconds after switching to an enroute mode for the first time. During this time, the system is calibrating the current stations, but is navigating. Navigation data is displayed after the DR light extinguishes.

6. The FUNCTION switch should not be left in an enter data mode longer than three minutes during navigation. The computer will not update in this mode although the system is navigating.

7. Turning off the system input power will cause the computer to lose all navigational information.

EMERGENCY PROCEDURES

Since flight operations may not be predicated on the use of ONTRAC II as the primary source of navigation, emergency procedures are not applicable. However, an emergency battery pack is provided in the event the primary power source is lost. If the primary power is interrupted, the system will switch to the emergency battery pack until the primary power is restored at which time the system will switch back to primary power. The system cannot be turned on using only the emergency battery. Battery power will only function with loss of primary power. It is important the system power switch be selected off at the conclusion of flight to avoid depleting the emergency battery.

The ONTRAC II can operate from the emergency battery pack for approximately 30 minutes at 70°F. The battery pack will recharge in approximately three hours when the system is on the primary power source.

APPROVED: Chester A Rembleske

Chester A Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200, 200T, KING AIR E90, AND C90 (LJ-668 AND AFTER, EXCEPT LJ-670) LANDPLANES

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
for the
BENDIX RNS 3500 AREA NAVIGATION SYSTEM

GENERAL

The information in this supplement is FAA-approved material and must be attached to the *FAA Approved Airplane Manual* when the airplane has been modified by installation of the Bendix RNS 3500 Area Navigation System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic *FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

LIMITATIONS

1. The Area Navigation Function may not be used as a primary system under IFR conditions except on approved approach procedures, approved area navigation airways, and random area navigation routes when approved by Air Traffic Control.

2. The Area Navigation Function can only be used with co-located facilities. (VOR and DME signals originate from the same geographical location.)

3. The Area Navigation installation located on the right instrument panel may be used for primary navigation, only if qualified copilot occupies the right seat.

4. The Bendix RNS 3500 Area Navigation System must have a minimum electrical power supply of 23.0 volts to function properly and to provide accurate information.

5. Waypoints are limited to a maximum distance from the VOR/DME ground station of 199.9 nautical miles.

EMERGENCY PROCEDURES

CAUTION

DME may unlock due to loss of signal with certain combinations of distance from station, altitude and angle of bank.

1. If NAV flag appears while in the enroute mode, check for correct frequency.

2. If VOR or DME equipment is intermittent or lost, utilize other navigation equipment as required.

3. If NAV flag appears during an approach while in the APR mode, execute published missed approach and utilize another approved facility.

NORMAL PROCEDURES

The RNS-3500 Area Navigation System, is an airborne system that provides a capability for navigating and flying an airplane on any desired course within the coverage of co-located VOR/DME (TACAN) ground stations. The RNS-3500 system has been designed to compliment the airplane NAV system.

The RNS-3500 system is a station oriented two-dimensional navigation device whose primary position determining data sources are: (1) barometric encoded altitude, (2) VOR bearing, and (3) DME distance relative to a selected VORTAC or colocated VOR/DME station installed at some specified elevation above mean sea level.

When operated within the service volume of a colocated VOR/DME ground station, this system will provide position information relative to any desired or specified location defined as a waypoint. This way point is sometimes referred to as a phantom station. The position of the way point is arbitrary and is defined in terms of bearing and distance from the reference ground station. Area navigation is accomplished by continuously solving the horizontal navigation triangle. In addition, the RNS-3500 system contains circuitry that corrects for the slant range DME distance to provide the true ground distance to the VOR/DME station.

Correcting the slant range error places the navigation triangle in the horizontal plane which permits the RNS-3500 system to operate at all altitudes and distances within the service volume of any selected VOR/DME (VORTAC) facility.

The position information computed by the RNS-3500 system is presented in terms of bearing and distance to or from the waypoint. This information is provided in terms of deviation from a selected track through the waypoint in the horizontal plane determined by the OBS setting.

Linearized deviation signals are proportional to cross-track error in the horizontal plane at any distance from the waypoint and are developed for display on conventional Horizontal Situation/Course Deviation Indicators and for use by autopilot and flight director systems.

In addition to outputs for flight instruments and flight control systems, the RNS-3500 system provides outputs to drive the Radio Magnetic Indicator (RMI) and external distance inoicators. The system also has the capability of providing for a pilot display of such items as ground speed, time, distance, and bearing, all of which are relative to the waypoint. Remote mode and alert annunciator drive capabilities are additional features of the RNS-3500 system.

CONTROL FUNCTIONS

MODE SWITCH:

Controls the mode of operation (off, VOR/LOC, RNAV, or APR) for the system.

(T) TEST PUSHBUTTON:

Used to initiate a comprehensive system test.

DISPLAY SWITCH:

Controls selection of readout display.

SBY:

The parameters for the standby waypoint are displayed and may be reprogrammed as desired.

ACT:

The parameters for the active waypoint are displayed.

BRG/DST:

Displays bearing and distance to the waypoint if the MODE selector is in the RNAV or APR position. Displays bearing and distance to the VOR/DME (VORTAC) station if the MODE selector is in the VOR/LOC position.

KTS/TME:

Displays ground speed and time relative to the waypoint in the RNAV or APR mode or to the VOR/DME (VORTAC) station in the VOR/LOC mode.

V Pushbutton:

Depressing the V pushbutton reverts RMI and remote distance display readouts to NAV receiver and DME system to provide VOR/DME station orientation without interrupting RNAV guidance to HSI and autopilot.

ADDRESS PUSHBUTTONS:

SBY:

Depressing the standby (SBY) address pushbutton allows the SBY W/P number to be changed from 0 through 31. Use of this pushbutton is required only when displaying SBY W/P parameters and then only if another address pushbutton has been depressed; otherwise, the SBY W/P number is constantly addressed as indicated by the W/P legend being illuminated.

EL:

Depressing the station elevation (EL) address pushbutton when the DISPLAY selector is set to SBY, causes the EL legend to flash indicating that the station elevation of the SBY W/P can be altered.

BRG:

Depressing the bearing (BRG) address pushbutton when the DISPLAY selector is set to SBY, causes the BRG lamp to flash indicating that the bearing of the SBY W/P can be altered.

DST:

Depressing the distance (DST) address pushbutton when the DISPLAY selector is set to SBY, causes the DST lamp to flash indicating that the distance to the SBY W/P can be altered.

NOTE

After SBY, EL, BRG, or DST information has been inserted the associated legend will continue to flash until another address pushbutton is depressed or the position of the DISPLAY selector is changed.

PADDLE SWITCHES:

There are four paddle switches each of which is associated with a specific vertical column of 7-segment indicators. The left most paddle switch controls the left most digit in the EL, BRG, or DST display. The second paddle from the left controls the second column of digits, etc. The up/down action of the switch permits incrementing or decrementing of the digit in the addressed display window. Holding the paddle switch actuated in the up or down position slews the associated digit in an increasing or decreasing count direction.

NUMERIC DISPLAY:

Seven-segment numeric displays that illuminate to indicate W/P number, elevation, bearing, distance, speed, and time data.

SBY W/P:

Two digit display that indicates the standby waypoint number.

ACT W/P:

Two digit display that indicates the active waypoint number.

EL:

Single display that indicates waypoint station elevation to the nearest thousand feet.

BRG:

Three digit display that indicates bearing to waypoint or station.

DST:

Four digit display that indicates distance to waypoint or station.

KTS:

Three digit display that indicates ground speed in nm/hr.

TME:

Four digit display that indicates time to waypoint in minutes and tenths of minutes.

AMBIENT LIGHT SENSOR:

Intensity of all seven-segment numeric displays and logic controlled legends is automatically controlled by an ambient light sensor and its associated circuitry. The legends are W/P, EL, KTS, BRG, TME, and DST.

PANEL LIGHTING:

There are integral panel lamps that provide halo lighting for display address pushbuttons and back lighting for the MODE and DISPLAY controls.

The light intensity for these controls is set by the instrument panel light dimmer control.

PROGRAMMING

Pertinent information (elevation, bearing, distance and waypoint number) for up to thirty two waypoints is entered into memory from the panel mounted unit. Programming the computer may be completed prior to take-off or during flight. The computer memory is non-volatile and program data is not lost with a power loss. Any combination of navigational facilities (RNAV waypoint VOR/DME, ILS) may be loaded into the computer; however, it is desirable that each facility be numered and loaded in the sequence it is used.

Turn the MODE control to VOR/LOC. If the seven-segment numeric displays illuminate, power is being applied to the equipment. If displays are not illuminated, check the circuit breaker and input power.

Check that VOR, DME and barometric altimeter are on and operating. Tune VOR and DME to the same ground station or to the frequency of the portable VOR/DME test sets.

Set MODE to VOR/LOC, RNAV, or APR. Select SBY W/P number for which parameters are to be altered. Set DISPLAY to SBY.

Select values for way point parameters (elevation, bearing, and distance). Depress EL address pushbutton; insert station EL by actuating paddle switch. Depress BRG address pushbutton; insert station BRG by actuating paddle switches. Depress DST address pushbutton; insert station DST actuating paddle switches.

PREFLIGHT OR SYSTEM TEST

This is a comprehensive system test of the RNS-3500 Area Navigation System. It tests associated airplane wiring and interface circuits, including the NAV, DME, ALT, HSI, and optional equipment such as RMI, remote distance display and annunciators.

Place autopilot in heading hold mode.

NOTE

> The RNS-3500 provides a signal which causes some flight control systems to automatically revert to the heading hold mode whenever the test (T) is initiated.

Tune VOR and DME to the same frequency. Display the active W/P data by setting the display control to the active position, to show the parameters to be tested.

Press the test (T) pushbutton and hold for the duration of the test.

Lighting Test (2 seconds)

All displays will be lighted to 8's and all amber panel legends will be dashed (center lamp segment lighted). The HSI nav flag will be displayed, and the remote distance indicator will indicate a flagged condition.

Computed BRG/DST Test

For the remainder of the test (until the pushbutton is released) the active W/P bearing and distance parameters are computed and displayed. The computed values should agree with the active W/P bearing and distance within normal system tolerances. The bearing accuracy should be within ±2° and distance within ±1.5% or ±0.3 NMI. A W/P with a distance of 10 nm or more should be used. Accuracy will be degraded slightly when no nav signal is present. In the RNAV or APR mode the optional remote distance indicator and RMI will repeat the computed bearing and distance. The RMI (optional) will point to the active W/P bearing.

Left-Right, To-From Test

With the test button still depressed, turn the CRS knob to center the L-R needle with a "To" indication. The CRS should point to the active W/P bearing within 2° with a signal, or 10° without a signal. Turn the CRS knob to center the L-R needle with a "From" indication. The CRS should point to the reciprocal of the active W/P bearing within the above tolerances.

CONVENTIONAL VOR OR CO-LOCATION OF WAYPOINTS AND VORTACS

The constant course width feature of RNAV can be used when flying conventional VOR airways. Set the mode control the RNAV and the active bearing and distance parameters to zero. This method will locate the waypoint at the same location as the vortac. Linear needle displacement may be flown. During flight, the direction and true ground distance to the vortac will be continuously displayed on the control display unit. The Left/Right indicator will indicate the distance in nautical miles left or right of the airway.

APPROACH PROCEDURES

Flying the RNS-3500 system for an approach is similar to making a localizer approach. However, the system is using VOR and DME information and the MDA will be higher than when flying a precision approach. Insert the waypoint parameters from the approach chart. These parameters must be taken from an approved RNAV approach procedure. Place the mode selector in the APR mode. Select the inbound heading on the course indicator of the HSI. Activate each successive W/P by depressing the transfer switch as each W/P is passed. Similar to a localizer approach, the left/right needle movement will be more active than enroute because full needle deflection is equal to 1.25 nm when in the APR mode. If landing cannot be initiated upon reaching MDA, follow the missed approach procedure outlined on the approved plate, using additional waypoints as required.

IN–FLIGHT PROCEDURES

Flying the RNS-3500 system enroute corresponds to flying VOR airways, except flying is now to or from waypoints. The waypoint parameters move the VORTAC. Once this is accomplished, the HSI, OBS, remote DME indicator and RMI functions are the same as the pilot has been using for VOR and DME. Insert the waypoint parameters as explained in the programming procedures. Waypoint parameters may be taken from RNAV enroute charts, or plotted and measured on other charts. In either case, it is important to assure that altitude and distance from the VORTAC will result in a Satisfactory NAV/DME signal. Random waypoints may be used only during VFR conditions. Select the proper VORTAC frequency. Place mode selector in RNAV mode. Select desired course to first waypoint on the HSI. Pilot must select the next outbound course at each waypoint and the next inbound course and waypoint at each change-over point. Transfer to next active W/P; select the proper VOR/DME frequency. Select proper course on the HSI for next W/P at the change-over point, and continue to fly the left-right needle on the nav indicator.

PERFORMANCE - No change

Approved: N. H. Schultz

for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200, 200C, 200T, 200CT, AND KING AIR C90 and E90 LANDPLANES PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

GLOBAL GNS-500A VLF/OMEGA NAVIGATION SYSTEM

GENERAL

The information in this supplement is FAA-approved material and must be attached to the FAA Approved Airplane Flight Manual when the airplane has been modified by installation of the Global GNS-500A VLF/OMEGA Navigation System in accordance with Beech-approved data.

The information this supplement supersedes or adds to the basic FAA Approved Airplane Flight Manual only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to the operation of the airplane.

LIMITATIONS

The GNS-500A may be used as an additional means of enroute navigation during VFR/IFR conditions provided the following limitations are observed:

1. Only enroute operations in the conterminous United States and Alaska are approved.
2. The system is not to be used for navigation in terminal areas or during departures from or approaches to airports or into valleys or between peaks in mountainous terrain.
3. Additional equipment which would permit navigation appropriate to the available ground facilities must be installed and operating.
4. VOR and DME equipment must be installed and operating during navigation or published RNAV routes.
5. IFR flight is not approved based on VLF/OMEGA navigation into any area in which such operation could not be approved based on the installed equipment required by paragraph 3. This includes overwater flights beyond the range of approved ground navigation facilities.
6. The VLF/OMEGA position information must be checked for accuracy (reasonableness) against a visual ground fix or other approved navigation equipment under the following conditions:
   a. Prior to compulsory reporting points when not under radar surveillance or control.
   b. At or prior to arrival at each enroute waypoint during operation on a published RNAV route.
   c. Prior to requesting off-airway routing, and at hourly intervals thereafter during operation off of published RNAV routes.
7. The VLF/OMEGA position information should be updated when a cross-check other than on board approved navigation equipment reveals an error greater than 2 nautical miles along track or crosstrack.
8. Navigation shall not be predicated on the use of this system during periods of dead reckoning.
9. Following a period of dead reckoning, the position information must be verified by a visual ground fix or by using other approved navigation equipment.

EMERGENCY PROCEDURES

A display Quality Factor over a value of "100" represents the possible failure of a system component.

1. Revert to the other installed navigation equipment appropriate to the available ground facilities.
2. Refer to the GNS-500A Operator's Manual, Report No. 1023, for failure analysis.

NORMAL PROCEDURES

1. PREDEPARTURE

   A. POWER ON

   1. Mode Selector Switch - M
   2. DIM knob - as required
   3. Depress BACK key to test readouts and CDU annunciators

   B. GMT and DATE ENTRY

   1. Display Selector Switch - GMT/DATE
   2. Key the DATE (day/month/year)
   3. Depress ENTER key once
   4. Key the GMT
   5. Depress ENTER key

   C. DEPARTURE COORDINATES ENTRY

   1. Display Selector Switch - POS
   2. Insert departure point* latitude
   3. Depress ENTER key once
   4. Insert departure point* longitude
   5. Depress ENTER key once
   6. Verify position display accurate
   7. Depress flashing ENTER key
      *(See Runway Lineup, 1. D.)

      a. WAYPOINT ENTRY

NOTE

For Waypoint 1, perform Steps 1, 2, and 6 only.

1. Display Selector Switch - WPT
2. Depress WPT DEF key
3. Insert waypoint latitude
4. Depress ENTER key once
5. Insert waypoint longitude
6. Depress ENTER key
7. Repeat Steps 2 through 6 for remaining waypoints

b. MAGNETIC VARIATION ENTRY

1. Display Selector Switch - BRG/VAR
2. Insert local variation (E or W first)
3. Depress ENTER key

c. INITIAL LEG SELECTION

1. Depress LEG CHG key
2. Depress "1" key
3. Depress desired "TO" waypoint reference number
4. Verify new BRG and DIS reasonable

d. MANUAL TAS ENTRY

1. Display Selector Switch - Q/TAS
2. Key TAS in knots

3. Depress ENTER key

*D. RUNWAY LINEUP *(Departure point)*

1. Verify DR light flashing
2. Display Selector Switch - POS
3. Depress HOLD key
4. Depress ENTER key
5. Verify: VLF light steady - DR light off

2. ENROUTE OPERATIONS

A. MANUAL LEG CHANGE AT WAYPOINT

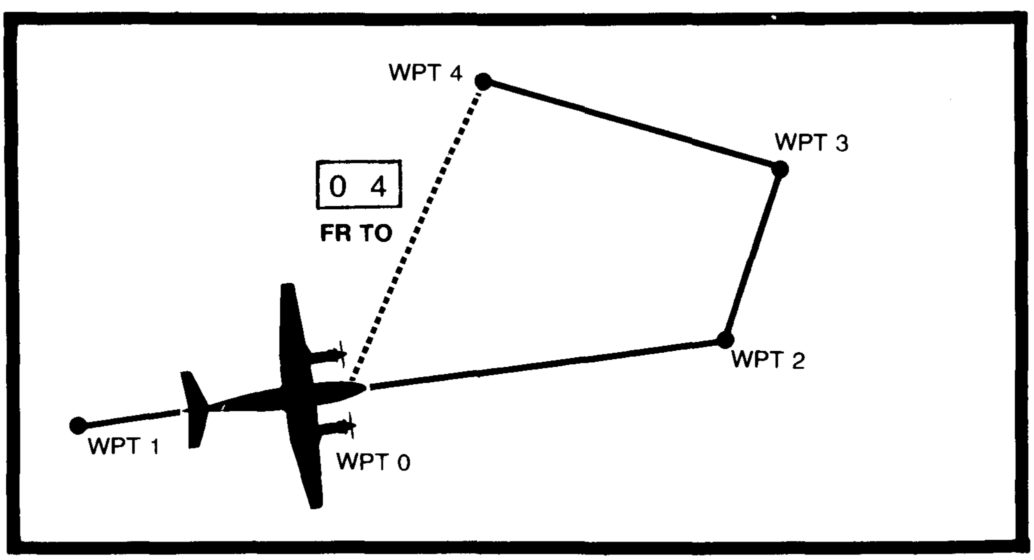
1. Mode Selector Switch - M
2. Depress LEG CHG key
3. Depress leg's defining waypoints
4. Verify new BRG and DIS reasonable

B. AUTOMATIC LEG CHANGE AT WAYPOINT

1. Mode Selector Switch - A
2. Verify proper leg changes
3. Verify new BRG and DIS reasonable

C. PRESENT POSITION DIRECT ANY WAYPOINT

1. Depress LEG CHG key
2. Depress "0" key
3. Depress desired "TO" waypoint reference number
4. Verify new BRG and DIS reasonable



D. WAYPOINT DEFINE/REDEFINE

1. Display Selector Switch - WPT
2. Depress waypoint reference number key
3. Depress WPT DEF key
4. Insert waypoint latitude
5. Depress ENTER key once
6. Insert waypoint longitude
7. Depress ENTER key

E. DEAD RECKONING (TO VLF) (See Limitations, Par. 6)

Whenever the system is operating in the VLF mode and the Quality Factor deteriorates to a value of 8 or greater, the system will automatically revert to the Dead Reckoning (DR) mode.

When the Quality Factor improves to a value of 7 or lower, the system will, after approximately 30 seconds, automatically revert to the VLF mode. The green VLF light will come on steady and the DR light will be flashing to inform the pilot that the system had been operating in the DR mode.

To Turn The Flashing DR Light Off:

1. Display Selector Switch - POS
2. Depress HOLD key
3. Depress ENTER key

F. POSITION (ACCURACY) CHECK AND UPDATE (See Limitations Par. 5 and 7)

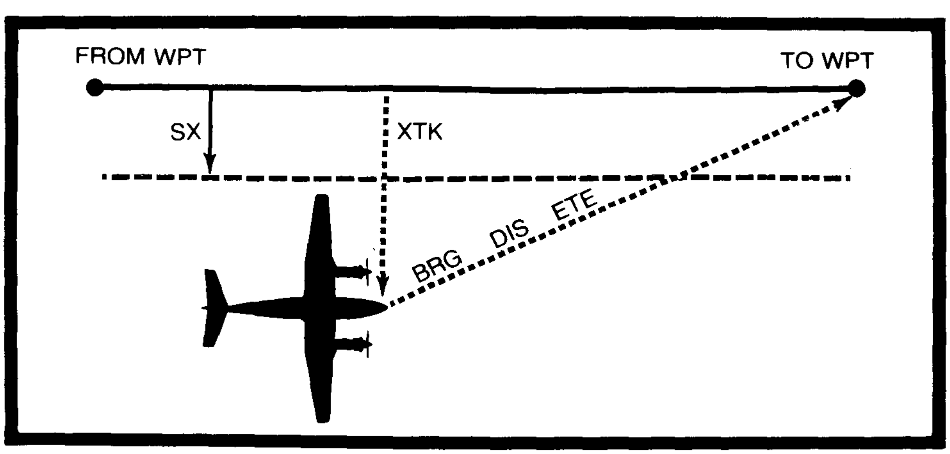
1. Display Selector Switch - POS
2. Depress HOLD key over identifiable point
3. Check POS display against known coordinates
4. Insert known latitude if required
5. Depress ENTER key
6. Insert known longitude if required
7. Depress ENTER key
8. Depress flashing ENTER key

NOTE

To update latitude only: Steps 4, 5, 7, 8
To update longitude only: Steps 6, 7, 5, 8

G. PARALLEL COURSE

1. Display Selector Switch - XTK/SX
2. Depress "R" or "L" key
3. Key offset distance (NM and tenths)
4. Depress ENTER key



H. GNS-500A INITIALIZATION ENROUTE

Ten Minutes (Minimum) Prior to Reaching Known Point:

1. Mode Selector Switch - M
2. DIM knob - as required
3. Enter DATE and GMT
4. Enter coordinates of point
5. Verify DR light flashing

Within 10 NM of Known Point:

6. Display Selector Switch - POS
7. Depress HOLD key
8. Depress ENTER key

Over Known Point:

9. Depress HOLD key

Shortly After Passing the Point:

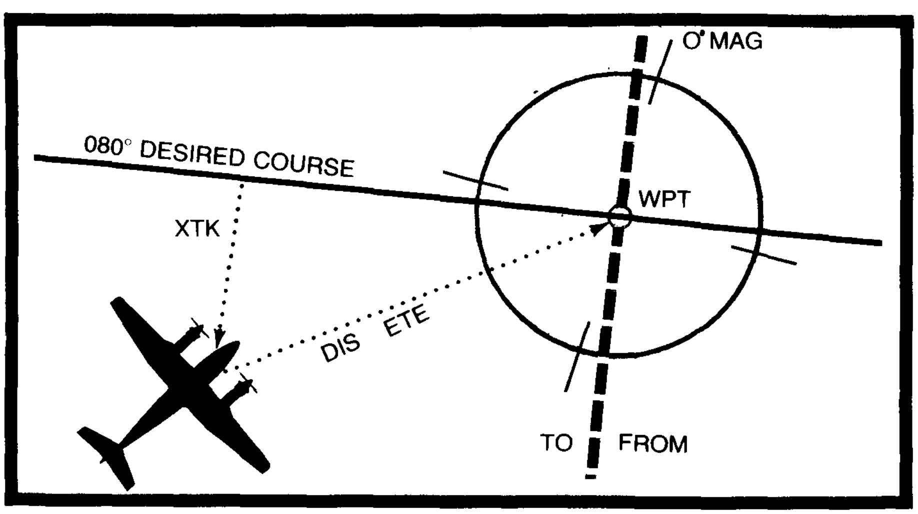
10. Re-insert proper coordinates of the point and ENTER
11. Verify: VLF light steady - DR light off

Enter the Following Information as Required:

- Waypoint coordinates
- Local magnetic variation
- FROM/TO leg selection
- True Airspeed

I. PSEUDO-VORTAC

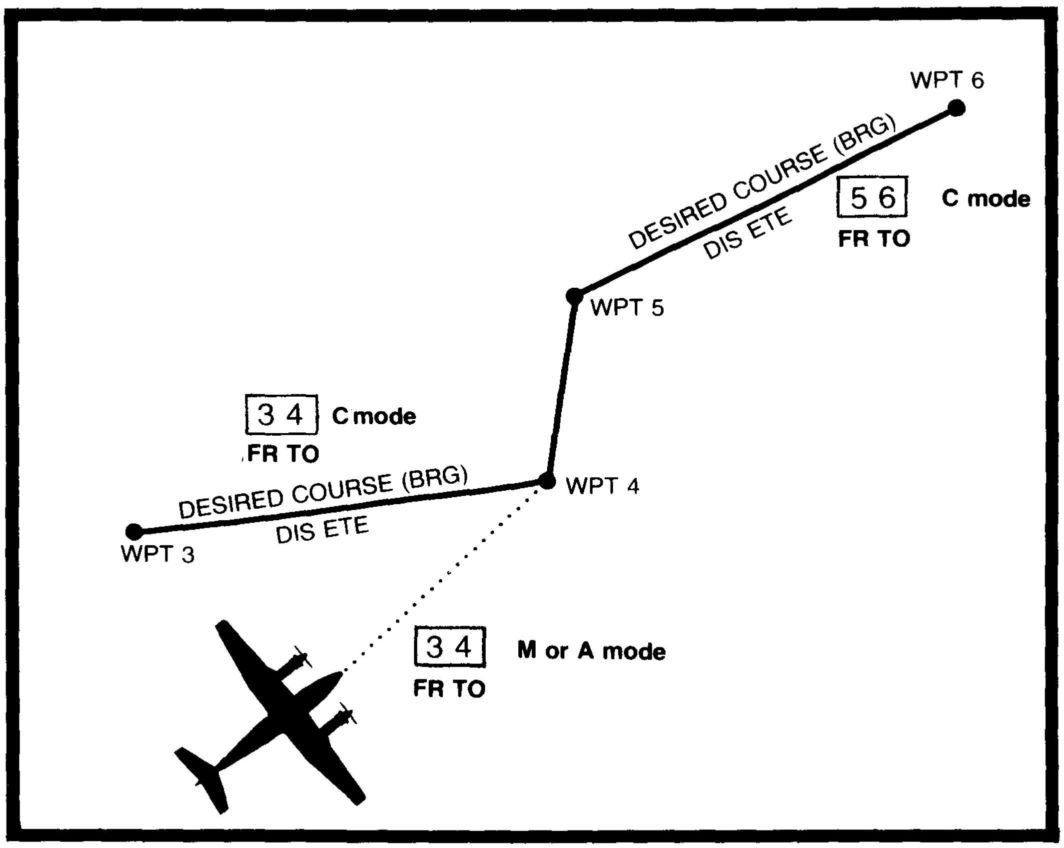
1. Mode Selector Switch - M
2. If necessary, define coordinates of waypoint to be used (use Waypoint Define/Redefine procedure)
3. Depress LEG CHG key
4. Depress waypoint reference number key twice (may use "0" for present position pseudo VORTAC)
5. Display Selector Switch - BRG/VAR
6. Insert magnetic variation and depress ENTER key once
7. Key desired bearing
8. Depress ENTER key



3. COMPUTER ACCESS MODE

A. *FLIGHT PLANNING*

1. Waypoint entries must be made or have been made previously
2. With Mode Selector Switch - M or A enter planned groundspeed (Manual TAS Entry) and magnetic variation for desired leg
3. Mode Selector Switch - C
4. Depress LEG CHG key
5. Key waypoint reference numbers defining desired leg
6. Use Display Selector Switch to select: DIS, ETE, Desired Course (BRG)
7. Repeat Steps 2 through 6 for remaining legs desired
8. Mode Selector Switch - M or A



B. *COMPUTER PROGRAM IDENTIFICATION*

1. Mode Selector Switch - C
2. Display Selector Switch - Q/TAS
3. Key the Code 1777 into the Left Data Display
4. Depress ENTER key
5. The number that appears in the Right Data Display represents the computer version and Comm slot tuning configuration shown:

Computer Program	Right Data Display	Communications Station Slot Number						
		0	1	2	4	5	6	7
X-8	1	G	R		A	W	J	L
	2	G	R		A	W	M	L
	3	G	R		A	M	S	L
	4	G	R		W	J	S	L
X-9	5	G	R	J	A	W	M	S
	6	G	R	J	A	W	M	L
	7	G	R	J	L	W	M	S

C. *STATION USAGE*

This procedure allows the operator to determine which stations are being used for navigation and the order in which they were selected. Up to eight stations may be used simultaneously for navigation, with any additional stations being received held as backups.

1. Mode Selector Switch - C
2. Display Selector Switch - Q/TAS
3. Key the desired entry code into the left data display
4. Depress the ENTER key

The left data display will blank momentarily and when it reappears a number will also appear in the right data display. This number represents a particular station as shown in the table below.

ENTRY CODES		RIGHT DATA DISPLAY	
First station	- 1170	0-	No station
Second station	- 1171	1-A	Annapolis, Maryland
Third station	- 1172	2-G	Rugby, England
Fourth station	- 1173	3-J	Yosami, Japan
Fifth station	- 1174	4-L	Lualualei, Hawaii
Sixth station	- 1175	5-M	Cutler, Maine
Seventh station	- 1176	6-O	Helgeland, Norway
Eighth station	- 1177	7-P	Panama, Canal Zone
		10-S	Australia
		11-R	Anthorne, England
		13-W	Jim Creek, Washington
		30-	Norway Omega
		31-.	Liberia Omega
		32-	Hawaii Omega
		33-	North Dakota Omega
		34-	La Reunion Omega
		35-	Argentina Omega
		36-	Trinidad Omega
		37-	Japan Omega

D. *DETERMINING COMM RECEIVER/SLOT LOCATION CORRELATION*

This procedure provides a means of determining which Comm station the computer has tuned each receiver "slot" to.

1. Mode Selector Switch - C
2. Display Selector Switch - Q/TAS
3. Key the code for the Comm slot desired. The digits keyed will appear in the left data display and the ENTER light will illuminate.

4. Depress the ENTER key

   The left data display will blank momentarily and when it reappears a number will also appear in the right data display. This number represents the Comm station which that particular slot is tuned to as shown in the table below.

ENTRY CODES	RIGHT DATA DISPLAY	
Comm Station tuned in Slot 0-660	0-	No station
Comm Station tuned in Slot 1-661	1-A	Annapolis, Maryland
Comm Station tuned in Slot 2-662	2-G	Rugby, England
Comm Station tuned in Slot 4-664	3-J	Yosami, Japan
Comm Station tuned in Slot 5-665	4-L	Lualualei, Hawaii
Comm Station tuned in Slot 6-666	5-M	Cutler, Maine
Comm Station tuned in Slot 7-667	6-O	Helgeland, Norway
	7-P	Panama, Canal Zone
	10-S	Australia
	11-R	Anthorne, England
	13-W	Jim Creek, Washington

E. *INDIVIDUAL COMMUNICATIONS/OMEGA STATION SIGNAL AMPLITUDE*

This procedure is designed to provide a means of checking the amplitude (or strength) of each station's signal individually.

1. Mode Selector Switch - C
2. Display Selector Switch - Q/TAS
3. Key the code for the Comm slot or OMEGA station desired. The digits keyed will appear in the left data display and the ENTER light will illuminate.
4. Depress the ENTER key

   The left data display will blank momentarily and when it reappears a six-digit number will appear in the right data display.

COMM ENTRY CODES	OMEGA ENTRY CODES	
Station in Slot 0 - 560	Norway	- 570
Station in Slot 1 - 561	Liberia	- 571
Station in Slot 2 - 562	Hawaii	- 572
Station in Slot 4 - 564	North Dakota	- 573
Station in Slot 5 - 565	La Reunion	- 574
Station in Slot 6 - 566	Argentina	- 575
Station in Slot 7 - 567	Trinidad	- 576
	Japan	- 577

LEGEND (Right Data Display)	COMM	OMEGA
Minimum signal for navigational use:	14000	26000
Maximum amplitude:	77777	50000

If no OMEGA stations are received during flight, refer to the *GNS-500A Maintenance Manual, Report No. 1030,* for failure analysis.

4. CDU ANNUNCIATORS

A. *"VLF" (Green)*

1. Steadily illuminated: The "VLF" annunciator light is illuminated steadily whenever the GNS-500A is operating in the navigational mode with sufficient VLF/OMEGA signals to be used for navigation.

2. Flashing: Indicates that the GNS-500A is on and lacking either GMT/DATE or Position inputs.

3. OFF:

   a. If the "VLF" and amber "DR" annunciators are off, the navigation computer has failed.

   b. If the "VLF" annunciator is off while the amber "DR" annunciator is flashing, the system is ready to be placed into the navigational mode (see Paragraph 1. D.).

B. *"DR" (Amber)*

1. Steadily illuminated: The "DR" annunciator light is illuminated steadily whenever the GNS-500A is not operating with sufficient VLF/OMEGA signals to be used for navigation.

NOTE

Operation near a ground power unit may cause electrical interference, preventing station aquisition and causing steady illumination of the DR light. This has no affect on data entry or computer functions.

2. Flashing:

   a. VLF annunciator off: Indicates that the system has sufficient inputs for navigation and is ready to be placed into the "VLF" navigation mode. If the system had not yet been in the VLF mode this indication will continue until the pilot manually selects the VLF mode. (See Runway Lineup, 1.D.) If the system had previously been in the VLF mode, this indication will continue for approximately 30 seconds and then automatically change to that of subparagraph b. below.

   b. VLF annunciator steadily illuminated: (With the DR annunciator flashing) indicates that the system is operating in the VLF mode but had been in the DR mode for a period of time. The Nav Warning Flag will retract when the VLF light comes on steady.

3. OFF:

   a. If the "VLF" and amber "DR" annunciators are off, the navigation computer has failed.

   b. The "DR" annunciator will be off during normal operations in the "VLF" navigational mode.

C. *"ENTER" (White)*

1. Steadily illuminated: The word ENTER will be steadily illuminated whenever the computer expects to receive some new information.

2. Flashing:

   a. The ENTER light will flash if the computer needs to have the information just entered verified by the pilot.

   b. Continued flashing will result whenever totally unreasonable information is being programmed, i.e., latitude over 90° or GMT over 2400.

D. WAYPOINT ALERT

Flashing digits in the FROM/TO display window indicate that the automatic leg change is impending.

5. NAVIGATION DISPLAYS

Once a navigation leg or pseudo-VORTAC mode has been selected, left and right course information will be displayed on the HSI when the flight director switch is selected to the FD VLF position. The NAV 1 frequency selector must be placed in the VOR range. Frequency selection in the ILS range will automatically switch the flight director to the ILS mode. A green FLT DIR VLF light will illuminate on the flight director annunciator panel when VLF information is being supplied to the HSI. Course information is provided for enroute navigation with a constant course width of ±7½ nautical miles irrespective of the distance to the waypoint. The HSI DME readout will display raw DME distance to a tuned VORTAC, not distance to a VLF waypoint.

The GNS-500A drives the normal VOR/LOC warning flag when VLF information is displayed on the HSI. The warning flag will be in view anytime the VLF information is invalid (e.g., invalid leg selection or computer malfunction) or the system goes into the DR mode.

The course deviation indicator (CDI) displacement on the HSI is independent of the course selected (similar to a localizer). Therefore, to get relative bearing as well as displacement information, the current selected leg bearing must be set on the HSI course selector. In the MANUAL or AUTO modes, the BRG displayed on the GNS-500A display unit is alwasy the bearing from the present position to the selected "TO" waypoint. Therefore, the selected leg bearing will be displayed only when the CDI is centered. The bearing of the selected leg will change in flight because the Great Circle route between selected waypoints will be displayed. Therefore, the course selector must be reset periodically to agree with the displayed bearing.

After a selected cross-track (SX) has been entered, the CDI will be centered when the airplane is positioned on the selected parallel leg. A green VLF SX light will illuminate on the flight director annunciator panel to indicate the displayed course guidance is with respect to a pilot-selected offset parallel leg.

6. AUTOPILOT OPERATION

Once the navigation leg or the pseudo-VORTAC mode has been selected and the flight director switch is in the FD VLF position, the autopilot can be coupled to the GNS-500A using the NAV mode.

NOTE

> To obtain reliable autopilot operation, the current selected leg bearing must be set on the HSI course selector.

If a course change of more than 30° is made at a waypoint, the new leg and course must be selected prior to waypoint passage. When operating in the AUTO mode and a course change of more than 30° is anticipated, MANUAL must be selected and the leg and course change made prior to waypoint passage. To obtain improved autopilot performance during large course changes, select the flight director HDG and NAV ARM modes, and establish a heading which will recapture the new course.

PERFORMANCE - No Change.

Approved:

For Donald H. Wite
W. H. Schultz
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200, 200T

KING AIR A100, B100, E90 AND

C90 (LJ-668 AND AFTER, EXCEPT LJ-670) LANDPLANES

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT for the AIRDATA AD611/D AREA NAVIGATION/VERTICAL NAVIGATION SYSTEM

GENERAL

The information in this supplement is FAA-approved material and must be attached to the FAA Approved Airplane Flight Manual when the airplane has been modified by installation of the AirData AD611/D Area Navigation/Vertical Navigation System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic FAA Approved Airplane Flight Manual only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

The RNAV function of the AirData AD611/D system performs a vector computation that results in a visual display of the magnetic bearing and distance to or from a selected waypoint. The computer, in effect, moves the selected reference facility (VORTAC or colocated VOR/DME facility) to a different location called a waypoint. The waypoint, which is expressed in terms of nautical miles along a selected radial from the VORTAC, is programmed into the system on the Manual Waypoint Setter.

Steering guidance is presented as a left/right display on the Horizontal Situation Indicator(HSI). The display format differs from the conventional VOR course deviation of 10 degrees called "angular course deviation". Rather, course deviation is presented in nautical miles from the course centerline. This feature, referred to as "linear course deviation", provides for a constant course width irrespective of the distance to the waypoint. Two levels of sensitivity are available for area navigation. The enroute senstivity, available when the APPR pushbutton on the system's range indicator is not activated, provides a constant course width of 5 nautical miles. Approach sensitivity, available with the APPR pushbutton depressed, provides a constant course width of 1.25 nautical miles. Approach sensitivity should be used when within ten nautical miles of the terminal waypoint.

The Multi-Waypoint Memory System is an option to the basic AD611/D Area Navigation Computer System. This system consists of a Horizontal Display Unit (61HDU) and the Data Entry Unit (61DEU). These units may be used in conjunction with or in lieu of the Manual Waypoint Setter. The Multi-Waypoint System stores RADIAL/DISTANCE and TRACK/FREQUENCY information for up to 10 different waypoints. The memory does not erase when electrical power to the unit is turned off.

The VNAV function of the AirData AD611/D does not depend on interconnection with the encoding altimeter nor does it drive the vertical needle on the HSI. It does not depend on wind or groundspeed, but is based solely on vertical triangulation. Two versions of the VNAV controller are available, the 61CAC and the 541CAC. With the 61CAC installed, the VNAV displays as a set of numbers the MSL altitude the airplane "should be at" for a 3.0 degree (330 feet per nautical mile) approach slope to the runway waypoint. The pilot compares the computed "should be at" altitude with the standard altimeter in the cockpit and manually adjusts the airplane flight path as required. The display takes into account the MSL elevation of the waypoint, which is a value entered by the pilot. There is also provision for entering an MDA value appropriate to the approach conditions. The "count down" of the altitude display ceases at the MDA value and the screen blinks to indicate that further descent must be based on visual observations.

Airplanes equipped with the 541CAC operate the same as those equipped with the 61CAC except that a 1.5° (165 feet per nautical mile) slope is also available. Operation is the same as for the 3° slope except NO MDA FUNCTION IS PROVIDED. A 1.5° descent should NEVER be used to a waypoint placed at a runway elevation.

LIMITATIONS

1. The area navigation system may not be used as a primary system under IFR conditions except on approved approach procedures, approved airways, and random area navigation routes when approved by Air Traffic Control.

2. This system can only be used with colocated facilities. (VOR and DME signals originate from same geographical location.)

3. An area navigation installation located on the right instrument panel may be used for primary navigation only if a qualified pilot occupies the right seat.

4. The vertical navigation system does not adversely affect any other airplane system. The computed vertical slope on those systems with the 61CAC controller is preprogrammed to a single value of 3.0 degrees. Systems with the optional 541CAC controller offer an additional 1.5 degree vertical slope. This mode MUST NOT be used for an approach descent. Pending publication of certification requirements, use of the 3.0 degree computed vertical slope to stabilize the flight path is permitted provided the maximum/minimum altitudes specified in the published procedures are observed.

EMERGENCY PROCEDURES

CAUTION

DME may unlock due to loss of signal with certain combinations of distance from station, altitude and angle of bank.

1. If NAV flag appears while in the enroute mode, check for correct frequency.

2. If VOR or DME equipment is intermittent or lost, utilize other navigation equipment as required.

3. If NAV flag appears during an approach, execute published missed approach and utilize another approved facility.

NORMAL PROCEDURES

The AirData AD611/D system is programmed and operated from a Digital Range/Mode Control unit, one or more Waypoint Setter Units, and a Command Altitude Computer for VNAV display. Frequency selection and course display are provided by the standard navigation controls and HSI.

CONTROLS AND DISPLAYS

DIGITAL RANGE/MODE CONTROL UNIT (RNAV 61 DRM)

1. RNAV ON-OFF Pushswitch:

   Used to activate and deactivate the RNAV system. It is a push on/push off switch that is backlighted whenever it is in the ON state. When selected ON, it connects the RNAV computer to the HSI. When selected OFF, the HSI display presents conventional VOR/LOC information.

2. APPR Pushswitch:

   Used to activate or deactivate the RNAV approach mode of operation. This operation increases the sensitivity of the HSI presentation and is used when approaching a waypoint in an approach to landing. The switch is backlighted whenever it is switched ON.

3. Digital Display:

   Normally indicates the distance to the waypoint in nautical miles from present position. The airplane's standard DME distance indicator will continue to display DME distance to the reference VORTAC.

4. BRG Pushbutton:

   Used to temporarily cause the digital display to indicate the magnetic bearing from the airplane to the selected waypoint. Valid VOR and DME signals must be received for this function.

5. TEST Pushbutton:

   Illuminates the three diagnostic annunciator lights to verify their operation. Temporarily causes the digital display to indicate the waypoint DISTANCE value entered on the active waypoint setter unit. Also, a reference bearing output is sent to the HSI which causes the left/right needle to center when the course selector is set to the RADIAL value entered on the active waypoint setter unit. Depressing both the TEST and BRG buttons simultaneously causes the waypoint RADIAL value entered on the active waypoint setter unit to appear on the digital display.

   These tests require at least 10 nautical miles to be set into the waypoint DISTANCE and reception of a valid VOR signal.

6. Diagnostic Lights:

   Each of the three fault annunciators will flash and the digital display will be blank under the specified conditions.

   DTW: Indicates that "distance to waypoint" computation cannot be made. This can be an excessive distance (over 199.9 N.M. to waypoint), excessive RADIAL setting (over 359.9°) or a computer malfunction.

   VOR: Indicates that computation quality of VOR signal has been lost.

   DME: Indicates a loss of DME signal.

WAYPOINT SETTER UNIT (RNAV 61 WPS)

1. RADIAL Thumbwheels:

   Set to indicate the bearing from the VOR to the waypoint. The DTW diagnostic annunciator will flash if a RADIAL entry exceeds 359.9 degrees or results in a distance-to-waypoint exceeding 199.9 nautical miles.

2. DISTANCE Thumbwheels:

   Set to indicate the distance from the VOR to the waypoint.

3. ACTIVATE Pushbutton:

   Depressing white pushbutton, located above the RADIAL thumbwheels, activates that waypoint setter unit, placing its RADIAL and DISTANCE information into the RNAV computer. In systems containing more than one waypoint setter unit, the number 1 unit is automatically activated when the RNAV ON-OFF switch is selected ON. Any other waypoint setter unit can then be activated by depressing the ACTIVATE pushbutton on the desired waypoint setter unit.

   Depressing the ACTIVATE pushbutton also performs a "fast update" function for the RNAV computer each time it is depressed. Fast update allows current VOR and DME information on airplane position into the computer without averaging out the errors in these signals. Fast update would be used after channeling a new frequency into the NAV equipment, after regaining DME lock-on, or after changing a thumbwheel setting on an active waypoint setter unit.

4. Waypoint Indicator Light:

   Yellow light, located above DISTANCE thumbwheels, illuminates whenever its waypoint setter unit is activated. These lights are numbered when more than one waypoint setter unit is installed.

HORIZONTAL DISPLAY UNIT (61 HDU)

1. RADIAL/DISTANCE Pushswitch:

   Depressing pushswitch causes RADIAL (upper line) and DISTANCE (lower line) information to be displayed from either the active waypoint or from a new waypoint being entered into the MEMORY.

2. TRACK/FREQUENCY Pushswitch:

   Depressing pushswitch causes prestored TRACK and FREQUENCY information for the selected waypoint to be displayed.

DATA ENTRY UNIT (61 DEU)

1. ACTIVE Pushbutton:

   This pushbutton selects the Memory Waypoint System for use when installed in conjunction with a Manual Waypoint Setter (61WPS). The pushbutton also engages the AD611/D computer "Fast Update".

2. MEMORY Pushbutton:

   Pressing pushbutton opens the MEMORY allowing data to be stored in the MEMORY. After data has been entered, pressing the pushbutton again closes the MEMORY and permanently stores the data.

3. Thumbwheel "SCRATCH PAD":

   Set to indicate information to be entered into MEMORY.

4. ENTER Pushbuttons:

   Pushbuttons are pressed after MEMORY is opened to enter "SCRATCH PAD" data into the waypoint MEMORY; Upper pushbuttons enter RADIAL or TRACK information and the lower pushbuttons enter DISTANCE or FREQUENCY information.

5. WAYPOINT Number Window:

   This window displays the number of the waypoint currently selected.

6. WAYPOINT Select Pushbuttons:

   These pushbuttons, located above and below the waypoint number window, are used to change the waypoint number selected to a larger number (upper pushbutton) or a smaller number (lower pushbutton).

COMMAND ALTITUDE COMPUTER (VNAV 61CAC)

1. Digital Display:

   Normally displays COMMAND ALTITUDE (altitude MSL that airplane currently "should be at" in order to achieve a 3.0°/330 feet per nautical mile approach descent angle to the runway waypoint). It also displays values set for waypoint altitude and MDA.

2. ON-STBY Switch:

   Turns the VNAV computer ON. W/P MSL and MDA MSL values may be set in either ON or STBY switch positions.

3. W/P-SET-MDA Switch:

   W/P position enters the value set by the W/P MSL knob into the VNAV computer. MDA position enters the value set by the MDA MSL knob into the VNAV computer. It should be in the SET position for normal VNAV operation.

4. W/P MSL Knob:

   Sets the altitude MSL of the waypoint.

5. MDA MSL:

   Sets the selected minimum decision altitude.

COMMAND ALTITUDE COMPUTER (VNAV 541CAC)

1. Digital Display:

   Normally displays COMMAND ALTITUDE (altitude MSL that airplane currently "should be at" in order to achieve a 3°/330 feet per nautical mile approach descent angle to the runway waypoint or a 1.5°/165 feet per nautical mile cruise descent). It also displays values set for waypoint altitude and, in the 3° descent, MDA.

2. ON Lamp/Pushbutton:

   An illuminated push-on/push-off switch which illuminates when in the ON position. Turns the VNAV computer ON.

3. ALT-SET-MDA Switch:

   ALT position enters the value set by the rotary knob into the computer for desired altitude at the waypoint. MDA position enters the value set by the rotary knob for minimum decision altitude into the computer. It should be in the SET position for normal VNAV operation.

4. 1.5°/3° Lamp/Pushbuttons:

   When pushed these switches select either the 1.5° or 3° descent angle. The appropriate switch illuminates when that descent angle is selected.

5. Rotary Knob:

   Sets the altitude MSL of the waypoint or the minimum decision altitude, depending on the setting of the ALT - SET - MDA Switch.

PREFLIGHT (MANUAL WAYPOINT SELECTOR)

The preflight check is to test the computation accuracy of the computer and to assure the proper operation of the controls and displays. This procedure should be completed prior to programming for the intended flight.

1. Depress RNAV pushswitch to ON.
2. Set RADIAL thumbwheels to 000.0°.
3. Set DISTANCE thumbwheels to 25.0 NM.
4. Set NAV 1 receiver to a VOR or VORTAC within receiving range.
5. Press and hold TEST button. Adjust course control on HSI to produce centered needle with "TO" indication. Check that:

   a. Digital display indicates 25.0 ± 1 NM.

   b. The course setting is 000 ± 2 degrees.

6. Press and hold BRG and TEST buttons. Check that:

   a. Digital display indicates 0 ± 1 degree.

7. Release BRG and TEST buttons.

NOTE

If any of the preflight tests are not within the prescribed tolerances, the RNAV system will not meet the required standards of accuracy. Corrective adjustment or maintenance is required. This procedure does not test the DME.

PREFLIGHT (Multi-Waypoint Memory System)

To preflight check the RNAV system using the Multi-Waypoint Memory System prior to flight, the following procedure should be used.

1. Depress RNAV pushswitch to ON.

2. Press ACTIVE pushbutton on Data Entry Unit (providing unit is used in conjunction with one or more manual waypoint setters).

3. Firmly press MEMORY pushbutton to open MEMORY (Horizontal display unit readout will flash indicating MEMORY is open).

4. Set thumbwheel "SCRATCH PAD" to 000.00.

5. Press upper ENTER button to enter data into MEMORY.

6. Set thumbwheel "SCRATCH PAD" to 25.00.

7. Press lower ENTER pushbutton.

8. Set NAV 1 receiver to VOR or VORTAC within receiving range.

9. Press and hold TEST button. Adjust course control on HSI to produce centered needle with "TO" indication.

   a. Digital display indicates 25.0 ± 1 NM.

   b. Course setting is 000 ± 2 degrees.

10. Press and hold BRG and TEST buttons. Check that digital display indicates 0 ± 1 degree.

11. Release BRG and TEST buttons.

NOTE

If any of the preflight tests are not within the prescribed tolerances, the RNAV system will not meet the required standards of accuracy. Corrective adjustment or maintenance is required. This procedure does not test the DME.

PROGRAMMING

1. RNAV ON-OFF Pushswitch - ON (switch illuminated)

NOTE

The number 1 waypoint setter unit is automatically selected when the RNAV pushswitch is turned ON.

2. Waypoint Definition - Determine in terms of RADIAL and DISTANCE from a specific VORTAC.

NOTE

The maximum allowable RADIAL setting is 359.9 degrees. If a RADIAL of 360.0 degrees is desired, use a value of 000.0 degrees. The maximum allowable DISTANCE setting is 199.9 NM. The maximum allowable range from the airplane to the waypoint is also 199.9 NM. If any of these restrictions are exceeded, select a waypoint that is within these values.

3. Manual Waypoint Setter Units or Multi-Waypoint Memory System.

   a. Manual Waypoint Setters - Set RADIAL and DISTANCE thumbwheels.

   b. Multi-Waypoint Memory System - Enter data.

      1. Press MEMORY pushbutton to "open" MEMORY - Digital display will blink.

      2. Select category of data to be entered - (RADIAL/DISTANCE or TRACK/FREQUENCY) and press appropriate pushswitch.

      3. Select waypoint number.

      4. Set proper data on "SCRATCH PAD" thumbwheels.

      5. Enter data - If RADIAL or TRACK data, press upper ENTER pushbutton; If DISTANCE or FREQUENCY data, press lower ENTER pushbutton.

NOTE

RADIAL/DISTANCE information entered is used by the RNAV to compute course information. TRACK/FREQUENCY information entered is used as a reference only and is provided as a reminder of what information is pertinent to that waypoint. TRACK/FREQUENCY information is not used by the RNAV for computation of any kind.

      6. Check digital display for proper data entry.

      7. Press MEMORY pushbutton to close MEMORY, digital display will stop blinking.

NOTE

The MEMORY does not erase when power to the RNAV unit is turned off.

4. NAV Receivers (VOR and DME) - ON. Frequency set.

5. Digital Display - Check to insure that distance to waypoint value appears.

6. HSI Course Control - SET to desired magnetic course.

ENROUTE

Using the AirData AD611/D system enroute corresponds to flying VOR airways, except navigation is now to or from waypoints. The waypoint parameters (radial and distance) in effect "move" the VORTAC. Once this is accomplished, the horizontal situation indicator and AD611/D digital range indicator will provide guidance to the waypoint similar to conventional VOR/DME navigation. The only notable difference is that the course deviation needle on the HSI will maintain a constant sensitivity of ± 5 nautical miles irrespective of the distance to the waypoint. The range indicator will count down to approximately 0.2 nautical mile when, upon reaching the waypoint, the "TO" flag will change to "FROM".

When the next waypoint is required for navigation, depress the ACTIVATE pushbutton on the next waypoint setter unit in sequence, confirm the proper VORTAC frequency is set, and set the desired magnetic course on the horizontal situation indicator.

The next waypoint is selected on the Multi-Waypoint Memory System by pressing the appropriate waypoint select pushbutton until the desired waypoint number appears in the waypoint number window.

NOTE

> If an ILS frequency is selected on NAV 1 while in an RNAV mode, the NAV flag will appear on the horizontal situation indicator and the VOR diagnostic light will flash. The RNAV must be selected OFF for ILS or conventional VOR operation (except for Approach Range Monitor operation).

Data may be entered into the MEMORY system or data already entered may be reviewed while the system is being used in flight. The MEMORY may be opened at any time to enter or review data. When this happens, the waypoint data currently being used is locked in to the computer; the RNAV continues to use this data for navigation while the MEMORY is open. Data may be entered at this time as previously described. After all desired data changes or reviews have been made, the MEMORY is closed. This causes the data displays to revert back to the currently active waypoint.

APPROACH

Using the AirData AD611/D system for an approach is similar to making a localizer approach. However, the system is using VOR and DME information and the MDA will be higher than when conducting a precision approach. Insert the waypoint parameters from the approach chart into the waypoint setter units. These parameters must be taken from an approved RNAV approach procedure for IFR operations. Activate the approach mode by depressing the APPR pushswitch. This will increase the horizontal situation indicator navigation sensitivity to a ± 1.25 nautical miles course width. For smoother operation, the computed distance to the waypoint should not exceed 30 nautical miles while in the approach mode.

Set the appropriate inbound course to each waypoint in turn and depress the ACTIVATE pushbutton on the appropriate waypoint setter unit to establish the next waypoint. If landing cannot be made upon reaching the MAP, follow the missed approach procedure outlined on the approved plate.

VERTICAL NAVIGATION (VNAV 61CAC)

The digital display screen of the Command Altitude Computer indicates the altitude the airplane "should be at" on a descent profile of 3.0° (330 feet per nautical mile) to the runway waypoint. The screen will count down as the airplane proceeds toward the runway waypoint and will count up as the airplane flies from the runway waypoint. The display will stop counting when the airplane should be at the MDA, at which point the display will flash the MDA value. The maximum altitude of the display is 9900 feet.

1. ON-STBY Switch - STBY.
2. SET Switch - W/P Position.
3. W/P MSL Knob - TURN until altitude MSL of runway waypoint shows in display.
4. SET Switch - MDA Position.

5. MDA MSL Knob - TURN until altitude MSL of MDA shows in display.

6. SET Switch - Center Position.

Immediately prior to reaching descent waypoint:

7. ON-STBY Switch - ON.

8. Command Altitude - READ from digital display.

9. MDA Reached - Display starts flashing and stops decreasing.

CAUTION

It is essential that the runway end waypoint setter unit be activated when the Command Altitude Computer is being used. DO NOT activate the VNAV while navigating to the Final Approach Fix waypoint.

VERTICAL NAVIGATION (VNAV 541CAC)

PROCEDURES FOR 3° DESCENT ANGLE

The digital display screen of the Command Altitude Computer (CAC) indicates the altitude the airplane "should be at" on a descent profile of 3.0° (330 feet per nautical mile) to the runway waypoint. The screen will count down as the airplane proceeds toward the runway waypoint and will count up as the airplane flies from the runway waypoint. The display will stop counting when the airplane should be at the MDA, at which point the display will flash the MDA value. The maximum altitude of the display is 9900 feet.

1. ALT-SET-MDA Switch - ALT Position.

2. Rotary Knob - TURN until altitude MSL of runway waypoint shows in display.

3. ALT-SET-MDA Switch - MDA Position.

4. Rotary Knob - TURN until altitude MSL of MDA shows in display.

5. ALT-SET-MDA Switch - SET Position.

Immediately prior to reaching descent waypoint:

6. ON Button - PRESS.

7. 3° Button - PRESS.

8. Command Altitude - READ from digital display.

9. MDA Reached - Display starts flashing and stops decreasing.

CAUTION

It is essential that the runway end waypoint setter unit be activated when the Command Altitude Computer is being used DO NOT activate the VNAV while navigating to the Final Approach Fix waypoint.

PROCEDURES FOR 1.5° DESCENT ANGLE

The digital display screen of the Command Altitude Computer indicates the altitude the airplane "should be at" on a cruise descent profile of 1.5° (165 feet per nautical mile) to a selected altitude at a waypoint. The screen will count down as the airplane proceeds toward the waypoint. The display screen will commence flashing while counting down when the airplane is within 1000 feet of the set altitude. The 3° lamp also commences flashing at this time to assure the pilot is aware that the 3° slope must be selected to complete an approach.

1. Complete steps 1 thru 4 for 3° slope.
2. ALT-SET-MAD Switch - ALT Position.
3. ON Lamp/Pushbutton - ON.
4. 1.5° Lamp/Pushbutton - PUSH, 3° lamp extinguishes and 1.5° lamp illuminates.

Within 1000 feet of set altitude the CAC display and 3° lamp commence flashing. Countdown of altitude continues.

CAUTION

The 1.5° slope is NOT to be used as an approach descent.

5. 3° Lamp/Pushbutton - PUSH, 3° altitude data presented

or

6. ALT-SET-MDA Switch - SET Position, 3° altitude data presented.

APPROACH RANGE MONITOR

The Approach Range Monitor feature provides for the separation of the RNAV computed range to a waypoint from the steering guidance of the pilot's horizontal situation indicator. Selecting the Approach Range Monitor switch to the RANGE MONITOR position will connect the RNAV computer to the NAV 2 receiver. The pilot's horizontal situation indicator will be retained on the NAV 1 receiver.

On an ILS approach, for example, it is desirable to know distance to the outer marker and then to the runway threshold. By selecting RANGE MONITOR and setting the appropriate NAV 2 frequency and waypoint parameters in the waypoint setter unit, the distance to the desired fix will be continuously displayed while ILS steering guidance on the horizontal situation indicator will be conventional. The result is the ability to fly a localizer or full ILS steering situation while retaining RNAV computed distance to a selected fix.

CAUTION

It is imperative the Approach Range Monitor switch be placed in the NORMAL position during RNAV operations. If left in the RANGE MONITOR position, the range display will be based on the NAV 2 frequency and waypoint setter unit parameters, and the pilots horizontal situation indicator will display conventional VOR steering based on the selected NAV 1 frequency.

PERFORMANCE - No Change

Approved:

for W. H. Schultz
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200
AND 200T LANDPLANES

AIRPLANE FLIGHT MANUAL SUPPLEMENT

for the

BRAKE DEICE SYSTEM

GENERAL

The information in this supplement is FAA-approved material and must be attached to the *FAA Approved Airplane Flight Manual* when the airplane has been modified by installation of a Brake Deice System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic *FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

LIMITATIONS

1. Brake deice system is not to be operated above 15°C ambient temperature.
2. Brake deice system is not to be operated longer than10 minutes (one deice timer cycle) with the landing gear retracted. If operation does not automatically terminate approximately 10 minutes after gear retraction, system must be manually selected off.
3. Maintain 85% N_1 or higher during periods of simultaneous brake deice and wing boot operation. If inadequate pneumatic pressure is developed for proper wing boot inflation, select brake deice system off.
4. Both sources of instrument bleed air must be in operation. Select brake deice system off during single engine operation.

EMERGENCY PROCEDURES

RUDDER BOOST OPERATION

The rudder boost system may not operate when the brake deice system is in use. Consequently, increased rudder-pedal forces should be anticipated in the event of single-engine operation. Availability of the rudder boost system will be restored to normal when the brake deice system is turned off.

ILLUMINATION OF BLEED AIR FAIL ANNUNCIATOR

If either BLEED AIR FAIL light illuminates in flight, shut off the INSTR & ENVIR bleed air valves on the affected engine. Select brake deice system off.

NOTE

BLEED AIR FAIL lights may momentarily illuminate during simultaneous wing boot and brake deice operation at low N_1 speeds. If lights immediately extinguish, they may be disregarded.

NORMAL PROCEDURES

AFTER STARTING

If brakes require deicing:

1. Bleed Air Valves - OPEN
2. Brake Deice - ON (check annunciator illuminated)
3. Condition Levers - HIGH IDLE

NOTE

Once brakes have been deiced, the condition levers may be returned to LOW IDLE.

BEFORE LANDING

If it is possible that brakes may be restricted by ice accumulations from previous ground operation or inflight icing conditions:

1. Brake Deice - ON (check annunciator illuminated)

NOTE

If automatic timer has terminated brake deice operation after last retraction of the landing gear, the landing gear must be extended to obtain further operation of the system.

SYSTEM DESCRIPTION

High temperature engine compressor bleed air is directed onto the brake assemblies by a distributor manifold on each main landing gear. This high pressure air is supplied by the standard bleed air pneumatic system which also provides regulated pressure to the surface deice system and vacuum source. High temperature air from the pneumatic system is routed through a solenoid control valve in each main wheel well, through a flexible hose on the main gear strut, and to the distribution manifold around the brake assembly.

A switch on the pilot's subpanel, placarded BRAKE DEICE, controls the brake deice system. When this switch is activated, both solenoid control valves are opened and an indicator light, BRAKE DEICE ON, on the lower annunciator panel is illuminated to advise the system is in operation.

The brake deice system may be operated as required on a continuous basis with the landing gear extended provided the appropriate LIMITATIONS are observed. To avoid excessive wheel well temperatures with the landing gear retracted, a timer is incorporated to automatically terminate system operation approximately ten minutes after the landing gear is retracted. The system indicator light should be monitored and the control switch selected OFF when the light extinguishes or if brake deice operation has not automatically terminated within approximately ten minutes. The landing gear must be extended before the timer is reset and the system can be activated again.

PERFORMANCE

Use of the brake deice system during certain ambient conditions may reduce available engine power. Consult the MINIMUM TAKE-OFF POWER chart in the FAA Performance Section of the Pilot's Operating Handbook to determine the minimum torque value permitted for take-off. If this value cannot be obtained, without exceeding engine limitations, the brake deice system must be selected off until after the take-off has been completed.

Use of the brake deice system in flight will result in an ITT rise of approximately 20°C. Observe ITT limitations when setting climb and cruise power.

Approved:

Donald St Peter
for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200, 200T, KING AIR B100, E90, AND C90 (LJ-668 AND AFTER, EXCEPT LJ-670) LAND-PLANES

PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT for the COMMUNICATIONS COMPONENTS CORPORATION ONTRAC III VLF/OMEGA NAVIGATION SYSTEM

GENERAL

The information in this supplement is FAA-approved material and must be attached to the *FAA Approved Airplane Flight Manual* when the airplane has been modified by installation of the Communications Components Corporation Ontrac III VLF/OMEGA Navigation System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic *FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

LIMITATIONS

The ONTRAC III may be used as an additional means of navigation during IFR conditions provided the following limitations are observed:

1. Only enroute operations in the 48 contiguous United States, District of Columbia, and Alaska are approved.

2. Additional equipment which would permit navigation appropriate to the available ground facilities must be installed and operating.

3. VOR and DME equipment must be installed and operating during navigation on published RNAV routes.

4. IFR flight is not approved based on VLF/OMEGA navigation into any area in which such operation could not be approved based on the installed equipment required by item 2.

5. The VLF/OMEGA position information must be checked for accuracy (reasonableness) against a visual ground fix or other approved navigation equipment under the following conditions:

   a. Prior to compulsory reporting points when not under radar surveillance or control.

   b. At or prior to arrival at the first enroute waypoint during operation on a published RNAV route.

   c. Prior to requesting OFF-AIRWAY routing, and at hourly intervals thereafter during operation OFF published RNAV routes.

6. Navigation shall not be predicated on the use of this system during periods of dead reckoning.

7. Following a period of dead reckoning, the position information must be verified by a visual ground fix or by utilizing other approved navigation equipment.

EMERGENCY PROCEDURES

An emergency battery pack is provided in the event the primary power source is lost. If the primary power is interrupted, the system will switch to the emergency battery pack unitl the primary power is restored at which time the system will switch back to primary power. The system cannot be turned on using only the emergency battery. Battery power will only function with loss of primary power. It is important the system power switch be selected off at the conclusion of flight to avoid depleting the emergency battery. The ONTRAC III can operate from the emergency battery pack for approximately 30 seconds at 70°F. The battery pack will recharge in approximately ten hours when the system is on the primary power source.

In the event that the WARN light illuminates, or any time the navigational information is questioned based on information from other onboard navigation equipment, the other onboard navigational equipment must be used as the primary source of navigational information.

NORMAL PROCEDURES

The ONTRAC III is a very low frequency (VLF) radio navigation system designed for world-wide area navigation utilizing existing VLF and OMEGA transmitting stations. Aircraft position is determined by automatically making position fixes by time referencing radio signals from several stations. Generally, two stations can determine a position on the surface of the earth. From changes in latitude/longitude position, the ONTRAC III derives distance to go, bearing, desired track, cross track error, ground speed and time to waypoint/destination. With an airplane true airspeed input, the ONTRAC III can compute the current wind direction and speed.

Navigation is computed along a Great Circle flight path to provide the shortest distance between positions. Course deviation is presented in nautical miles on the Pilot's Course Indicator rather than in degrees as with conventional VOR navigation. This feature provides for a constant course width of approximately ± 3 nautical miles regardless of the distance to the waypoint.

CONTROLS AND DISPLAYS

The ONTRAC III is programmed and operated from a pedestal mounted control/display unit (CDU). The control section is used to enter data in to the computer and select the computed information to be displayed. The display section provides navigational information to the pilot. It also displays the data to be entered into the computer.

1. Data Keyboard:
   Ten momentary keys for entry of data into the computer. Digit keys (0 through 9) enter numerical data. N (north), E (east), S (south), W (west) keys enter the sign of latitude/longitude information.

2. CLR Key:
   Clears the computer of data in the position selected by the FUNCTION selector.

3. CAL Key:
   Activates the calibration of the system to a known position.

4. ON/OFF Switch:
   Applies power to all system components.

5. WAYPOINT Selector:
   Ten position switch to select either the start position or one of nine waypoint/destination positions.

6. LAMP TEST Switch:
   Tests all lights on the display section, except BATT. All digits display the number "8."

7. DIM Switch:
   Adjusts background lighting for display section.

8. FUNCTION Selector:
   Twelve position switch to select the desired input or output mode of operation.

9. Numerical Display Registers:
   Left display is a five digit register to indicate latitude, bearing, desired track, wind direction, and time to selected waypoint. Right display is a six digit register to indicate longitude, distance to selected waypoint, cross track error, ground speed, magnetic variation, wind speed, DME, GMT, and date.

10. Function Indicators:
    Lamps to indicate S (south) and N (north) for latitude; E (east) and W (west) for longitude and magnetic variation.

11. DR (Dead Reckoning) Light:
Illuminates when less than two VLF/OMEGA transmitting stations are being received or when only stations of unusable geometry are being received (see Enroute Operation). In the DR mode, the airplane's position is updated based on true airspeed, heading, and last known wind information. DR will remain illuminated until the system is recalibrated or the position is checked.

12. WARN Light:
Illuminates with a computer or system malfunction or improper pilot operation procedure. Navigational information should be considered unreliable.

13. BATT Light:
Illuminates when the system is operating on the emergency battery pack.

14. SY Light:
Illuminates to indicate the received OMEGA stations are being synchronized.

15. STD Light:
Illuminates when the Frequency Standard is stabilizing. The computer is ready to navigate when the STD and SY lights extinguish.

16. Station Received Indicators:
Illuminate to indicate those VLF and OMEGA stations which are being received.

VLF STATIONS	*OMEGA STATIONS*
1. - MAINE	A. - NORWAY
2. - WASHINGTON	B. - LIBERIA
3. - AUSTRALIA	C. - HAWAII
4. - ENGLAND	D. - NORTH DAKOTA
5. - MARYLAND	E. - LA REUNION
6. - TBD	F. - ARGENTINA
7. - JAPAN	G. - TRINIDAD
8. - NORWAY	H. - JAPAN
9. - SPARE	

17. ENROUTE Light:
Illuminates when the system is calibrated and navigating.

18. OFFSET Light:
Illuminates when the selected waypoint is offset by an input of radial and DME distance.

19. ALERT Light:
Illuminates approximately one minute from selected waypoint/destination.

20. L-R Lights:
Illuminate in conjunction with the FUNCTION selector XTK (crosstrack) position. Indicate airplane's position left or right of the desired track.

21. DECIMALS:
Each decimal point illuminates in the proper position appropriate to the data selected by the FUNCTION selector.

22. FD NAV 1/FD VLF Selector:
Lighted push switch which selects and indicates which course information is displayed on the pilot's course indicator (NAV 1 or VLF). NAV 1 information is always displayed when an ILS frequency is selected on NAV 1.

23. VLF MSG Light:
Illuminates to call attention to the CDU for one or more of the following messages: DR, WARN, BATT, or ALERT

PROGRAMMING

Prior to take-off, the departure point latitude/longitude data is entered into the computer. This is referred to as a START position. Although the following procedures specify use of the START (S) position for system calibration, any waypoint position may be used for this purpose, provided that the position used is selected each time the START (S) position appears in the procedures. After calibration is complete, the waypoint position used for calibration may then be used as an additional enroute waypoint. In addition, the date and time of day are entered for the computer to compensate for diurnal shift while navigating. Coordinates (latitude/longitude) for up to nine waypoints (ten if system is calibrated) can be entered while the airplane is on the ground or after take-off.

1. Turn on airplane's avionics master-switch.
2. Set ONTRAC III master switch to ON.
3. Depress TEST switch. Verify all lights on display section are functional.
4. Set WAYPOINT switch to S (start).
5. Set FUNCTION switch to DATE.

NOTE

Verify that six zero's are shown on the right display register. This indicates the computer is ready to accept data. The STD and SY light should be illuminated.

6. Enter present month (one or two digits) day (two digits) and year (two digits) by depressing the keyboard buttons in the number sequence. The date entered must be the current Greenwich Mean Date.

DATA FORMAT: XX.XX.XX i.e., 12-29-75 or 1-01-76

NOTE

Leading zeros need not be entered, but all subsequent zeros must be entered.

7. Set FUNCTION switch to GMT. Enter current Greenwich Mean Time (within +5 minutes).

DATA FORMAT: XX.XX i.e., 22-06 or 02-27

8. Set FUNCTION switch to VAR. Enter existing variation to the nearest 0.1 degree. If variation is not known to a 0.1 degree, enter a zero for this digit.

DATA FORMAT: E/W XX-X i.e., E9.5 or W10.0

NOTE

Magnetic variation need not be entered unless it is desired that the bearing and desired track outputs be referenced to magnetic north. If no variation is entered, bearing and desired track information displayed will be referenced to true north and the N function indicator will illuminate in both functions. Variation *MUST* be entered for accurate WIND calculations.

9. Enter departure position into computer.

   a. Assure WAYPOINT switch is set to S (start).

   b. Set FUNCTION switch to LAT. Enter latitude (5 digits) of departure position, N (north) or S (south) must be entered prior to latitude digits.

DATA FORMAT: N/S-XX.XX.X i.e., N-33.40.2

   c. Set FUNCTION switch to LON. Enter longitude (6 digits) of departure position. E(east) or W(west) must be entered prior to longitude digits.

DATA FORMAT: E/W-XXX.XX i.e., W-117.48.0

10. Calibrate the system to the previously entered present position.

NOTE

Do not attempt to calibrate the system or calculate distances until the STD and SY lights have extinguished. This may require a period of up to 10 minutes in very low start up temperatures. This time may be used to enter desired waypoints.

If the aircraft is located in or near a hangar, or near a noise source where good signals cannot be received, the system cannot synchronize to the OMEGA pattern. In these conditions, the SY light will remain illuminated until adequate signals are received and the system has synchronized.

a. Set the WAYPOINT selector to S (start).

b. Set the FUNCTION selector to POS (CAL key will flash).

c. Press the CAL key ONCE, verify that displayed data agrees with the actual start position (CAL key will continue to flash).

d. Press the CAL key again (it will stop flashing).

e. Note that the ENROUTE light illuminates within approximately 60 seconds, (DR will illuminate if insufficient navigation signals are received).

NOTE

After the ENROUTE light has illuminated, the system is navigating and sensing airplane movement. It is preferable to calibrate the system near the start of the take-off roll to minimize any errors which may be incurred while taxiing long distances while being exposed to extraneous ground interference.

WAYPOINT ENTRIES

Coordinates (latitude/longitude) for up to nine (ten after system calibration) waypoints can be entered while the airplane is on the ground or after take-off. Once entered, waypoints remain in the computer until new waypoints are entered. Waypoints may be changed any time during the flight by eliminating one previously entered. If entered waypoint data is incorrect, press CLR button and re-enter. All navigational information is automatically cleared when the ON/OFF switch is set to OFF. The waypoint data and last known position will be retained.

1. Set WAYPOINT switch to 1 and FUNCTION switch to LAT. Enter latitude of first waypoint. North or south must be entered prior to latitude digits.

DATA FORMAT: N/S-XX.XX.X i.e., N-39.56.0

2. WAYPOINT switch remains at 1. Set FUNCTION switch to LON. Enter longitude of first waypoint. East or west must be entered prior to longitude digits.

DATA FORMAT: E/W-XXX.XX.X i.e. W-86.03.0

3. Set WAYPOINT switch to 2 through 9. Enter coordinates of additional waypoints as required.

If the bearing (RAD) and distance (DME) from a known latitude/longitude waypoint is known, this information can be inserted into the computer to define a new waypoint OFFSET from the latitude/longitude waypoint. This is accomplished as follows:

1. Enter latitude and longitude of reference waypoint as described above.

2. Set FUNCTION selector to DME - enter distance to the offset position to the nearest 0.1 mi.

DATA FORMAT: XXX.X i.e., 30.0

3. Set FUNCTION selector to RAD/VAR

   a. Enter bearing from waypoint (RAD) to the nearest 0.1 degree leading zeros must be entered.

   b. Enter variation (VAR).

DATA FORMAT: XXX.X and E/WXX.X, i.e., 0.94.2 and E9.5

The OFFSET light will illuminate indicating the selected waypoint has been offset by the values of RAD and DME.

PREFLIGHT

The preflight check is to test the computation accuracy of the computer and to assure its capability for proper operation. This procedure should be completed prior to programming for the intended flight.

Coordinates for a calibrated start position and destination are programmed into the computer along with the current date and Greenwich Mean Time. Upon selecting the BRG/DIS enroute mode, a predetermined bearing and distance should be displayed.

1. Set WAYPOINT switch to S (start).
2. Set FUNCTION switch to DATE. Enter current date.
3. Set FUNCTION switch to GMT. Enter current Greenwich Mean Time.
4. Set FUNCTION switch to LAT. Enter: N-33.40.2.
5. Set FUNCTION switch to LON. Enter: W-117.48.0.
6. Calibrate the system (See Step 10 Above - PROGRAMMING).

NOTE

The test waypoint may be entered while waiting for the STD light to extinguish.

7. Set WAYPOINT switch to 1.
8. Set FUNCTION switch to LAT. Enter: N-44.38.9
9. Set FUNCTION switch to LON. Enter: W-67.16.9
10. Set FUNCTION switch to BRG/DIS (after system calibration). The numerical display registers should indicate a bearing of 058.6 degrees and a distance of 2406.6 nautical miles.

ENROUTE OPERATION

The desired waypoint/destination may be selected prior to take-off or when airborne. When the desired waypoint is selected, the computer determines the desired track (DTK), bearing (BRG), and distance (DIS) from the airplane's position when the waypoint is selected. If autopilot tracking is desired, set the displayed value of desired track on the pilot's course indicator and select FD VLF with the selector switch. The computed course information is now displayed on the pilot's Course Indicator. Autopilot tracking is accomplished by selecting the flight director's navigation mode and engaging the autopilot. While enroute, the following functions of navigational information are available. These functions are selected by placing the FUNCTION switch to the appropriate position and reading the display.

POS Function (Latitude/Longitude)

This position displays the current latitude and longitude in degrees, minutes, and tenths of minutes. Airplane position is updated every five seconds and is stable to approximately 2/10 minutes of latitude.

BRG/DIS Function (Bearing/Distance)

The bearing and distance to the waypoint as selected on the WAYPOINT switch will be displayed. Bearing is defined as the Great Circle angle from the airplane's current position to the waypoint as referenced to North (true or magnetic). The N light will be displayed if the bearing is defined to true North (i.e., no variation has been entered). If a magnetic course or route is desired to be flown, the magnetic variation for the area of flight should be entered and periodically updated in the VAR position of the FUNCTION switch. The N light will not be displayed if the bearing is magnetic. Bearing is calculated to 1/10 degree and distance to 1/10 nautical mile. The display is updated every four seconds.

DTK/XTK Function (Desired Track/Cross Track)

The desired track is defined as a Great Circle path from the airplane's position to the selected waypoint. This track is established when the waypoint is selected on the WAYPOINT switch. The DTK function displays to the nearest 1/10 degree the angle of the desired track flight path as referenced to North (true or magnetic). A magnetic desired track will be displayed provided the area magnetic variation has been entered.

Bearing (BRG) and desired track (DTK) will always agree when the airplane is centered on the prescribed Great Circle Course. If a deviation is made from the course, the bearing will update to provide the angle, as referenced to North, from the current position to the selected waypoint. The desired track angle will vary only as required to define the previously established Great Circle course.

NOTE

> If it is desired to approach a waypoint on a predetermined track, this track may be inserted into the computer by (1) selecting DTK/XTK, (2) entering desired track to the nearest 0.1 degree. (If 0.1 degree is not known, enter a zero for this digit). The entered desired track will be referenced to the entered magnetic variation. This track should also be set on the pilot's course indicator.

Approximately one minute from the selected waypoint, the ALERT light will flash. The WAYPOINT selector should be set to the next waypoint, the desired track read in the DTK/XTK mode, and the Horizontal Situation Indicator course set to agree.

Crosstrack is defined as the lateral deviation from the desired track. The crosstrack error is displayed to the nearest 1/10 nautical mile. The L/R lights indicate whether the airplane is to the left or right of the desired track.

TIME/GS Function (Time/Ground speed)

Time to any of the programmed waypoints is available by setting the WAYPOINT switch to the desired waypoint. The computed time is presented in hours, minutes, and tenths of minutes and is updated every 4 seconds and assumes the airplane is on track and headed toward the waypoint.

The GS (ground speed) function is independent of the selected waypoint and indicates the true ground speed in knots. The ground speed display will remain valid even when not tracking to a waypoint. Ground speed is not accurate until navigation has been established for 3 minutes. If TAS and HDG inputs are supplied to the system, ground speed is updated every six seconds; otherwise, ground speed is updated every three to five minutes.

WIND FUNCTION

Wind direction, to the nearest 0.1 degree referenced to true north, is displayed in the left display register and wind speed, in knots, is displayed in the right register. If the computer does not have enough information to calculate the wind, the following flags will appear when the WIND position is selected:

1. The left display register will indicate four zeros if no VAR is entered.

2. The right display register will indicate.

   a. The digit 1 with no TAS input

   b. The digit 2 with no HDG input

   c. The digit 3 with no HDG and no TAS input.

The heading input comes from the pilot's compass system and can not be entered manually. True airspeed must be manually entered, unless the airplane is equipped with an Air Data System with a TAS output. TAS may be manually inserted into the computer by: (1) selecting the WIND position, (2) entering TAS in knots (three digits), and (3) selecting a different function, such as BRG/DIS, for several seconds and then returning to the WIND position. The displayed wind information will not be reliable for approximately 6 minutes after TAS is manually inserted. During this time, TIME and GS are also not reliable.

Unusable Station Geometery

If the airplane's position is such that the geometry of the received stations is not suitable for navigation, the system will go into the DR (dead reckoning) mode. This is because the geometry of the received stations makes for potentially large navigation errors. This condition usually happens in cases of only two station reception, but in very rare situations can happen with three stations. The airplane's position will be updated based on true airspeed, heading, and last known wind information. When the airplane flys out of the unusable geometry condition, the ENROUTE light will again illuminate. However, DR will remain illuminated, and navigation is not approved utilizing the ONTRAC III. To resume normal navigation and extinguish the DR light, the system's position must be recalibrated to a visual ground fix or to other approved navigation equipment.

INFLIGHT CALIBRATION

During flight, accumulated error can be reduced by calibrating over an entered waypoint or an offset waypoint.

1. Set the WAYPOINT selector to the upcoming waypoint or reference waypoint (if offset).

2. If the calibration point is the waypoint (no offset), assure that the DME position reads zero. If offset, enter the DME and RAD/VAR to define the offset.

3. Set the Function Selector to POS.

4. Prior to crossing the calibration point, press the CAL key once, the latitude/longitude of the waypoint will be displayed for verification and the CAL key will flash.

5. Directly at the reference point, press the CAL key a second time. The computer will calibrate on the coordinates of the selected waypoint (or waypoint offset). The enroute light will extinguish for up to 30 seconds during the calibration process and illuminate after calibration.

NOTE

To minimize DME slant range error, all inflight calibrations using a VORTAC as the reference waypoint and VOR/DME equipment to define the offset calibration point should be restricted to a distance greater than twice the airplane altitude and less than 60 NM from the VORTAC.

OMEGA RE-SYNCHRONIZATION PROCEDURE

The ONTRAC III will automatically synchronize to the OMEGA stations with system turn on. Re-synchronization is only to be done if incorrect synchronization is suspected.

Never re-synchronize for normal calibration (up-date) of the system. Once the system has synchronized and has not been switched off, the OMEGA receivers lock to the frequency standard and the system will remain synchronized.

If the system has mis-synchronized, do not attempt to re-synchronize until the amber STD light extinguishes.

1. Set FUNCTION switch to WIND
2. Set WAYPOINT switch to S
3. Press CAL key

NOTE

The SY light will illuminate for approximately two to six minutes during synchronization. The system must be calibrated after manual synchronization.

SYNCHRONIZATION BYPASS

When the ONTRAC III is synchronizing (SY light illuminated), it cannot be used for preflight navigation computations. If OMEGA reception is poor, such as in or near a hangar, the system may stay in the synchronization mode indefinitely. The synchronization bypass procedure permits preflight navigation computations prior to normal synchronization.

BYPASS PROCEDURE

1. Set FUNCTION switch to GMT
2. Enter all 8's on display
3. SY light will extinguish

RESYNCHRONIZATION PROCEDURE

1. Set FUNCTION switch to GMT
2. Press CLR key
3. Set FUNCTION switch to WIND
4. Set WAYPOINT switch to S
5. Press CAL key once.

Or

1. Turn system OFF; then back ON.

CAUTION

Prior to flight operations, the system must be synchronized to the OMEGA format and calibrated. Use of the ONTRAC III as an additional means of navigation is not authorized while using fewer than two OMEGA stations.

GENERAL NOTES

1. An illuminated BATT light indicates the system is operating on the emergency battery pack and not on the primary power source. The system cannot be turned on without primary power first being applied. The emergency battery pack should not be used for ground check or warm-up.

2. To redefine a new desired track from the airplane's present position to the waypoint being used, set the WAYPOINT selector to another waypoint position for at least five seconds, then switch back to the original waypoint.

3. While enroute, the system calibration can be checked utilizing VOR/DME equipment. This can be accomplished by entering, as waypoints, known VORTAC stations (or fixes offset from known VORTAC stations) and comparing the ONTRAC III indications relative to these waypoints against the VOR and DME indications. Any fix whose latitude and longitude are known (visual, VOR, VOR/DME, ADF or combination thereof) may be utilized to check for system calibration by entering its location as a waypoint and comparing the ONTRAC III indications relative to the fix with those of other approved equipment.

Approved:

Donald H Peter

For Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200 LANDPLANE

AIRPLANE FLIGHT MANUAL SUPPLEMENT FOR THE

KING KFC 300 AUTOMATIC FLIGHT CONTROL SYSTEM (RNAV AND VNAV OPTIONAL) CATEGORY I for

BB-298, BB-299, BB-329, and BB-330 ONLY

The information in this supplement is FAA-approved material and must be attached to the *FAA Approved Airplane Flight Manual* when any of the subject airplanes (the Serial Numbers of which are specified in the title of this supplement) is modified by installation of the King KFC 300 Automatic Flight Control System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic *FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

LIMITATIONS

1. During autopilot operations, pilot must be seated at the controls and have seat belt fastened.
2. Maximum speed limit for autopilot operation is unchanged from the airplane maximum airspeed limit (V_{MO}/M_{MO}).
3. Do not use autopilot under 200 feet above terrain.
4. Do not use autopilot or yaw damper during takeoff or landing.
5. Do not use propeller in the range of 1750-1850 rpm during coupled ILS approach.
6. The Vertical Navigation (VNAV) function does not adversely affect any airplane system. Flight operations must not be predicated on its use as the primary source of vertical guidance.
7. Re-engagement of autopilot following use of the control-wheel-steering switch (placarded PITCH SYNC & CWS) shall be made at a rate of climb or descent not to exceed 500 feet per minute, if altitude hold is engaged.

NORMAL PROCEDURES

NOTE

The autopilot incorporates its own annunciator panel, located just above the flight director display on the instrument panel. The various mode and indication readouts presented on this annunciator panel are placarded on the face of plastic lenses which are illuminated when the corresponding conditions occur. A photocell located on the left side of the autopilot annunciator panel controls the illumination intensity of the annunciator lights, in reponse to ambient light levels in the cockpit. The switches on the mode selector, located on the pedestal, are the push-on, push-off type. When any of these switches is engaged, the corresponding autopilot annunciator light illuminates. Illumination of these backlighted switches is controlled by the OVERHEAD SUBPANEL & CONSOLE LIGHTS switch on the overhead light control panel.

PREFLIGHT

Neither the autopilot nor the flight director may be turned on if the attitude flag is visible on the flight command indicator or if the gyros are not up to operating speed.

1. Ensure that all circuit breakers for the autopilot are in.

2. Turn ON the battery, inverter, and avionics switches; engage the flight director; and check to ensure that the command bars come into view.

3. Engage the autopilot and yaw damper. (The autopilot will not engage when the flight director is inoperative.) Verify that the system can be overpowered in all three axes.

4. Press and hold the preflight TEST button, located on the lower left corner of the flight command indicator. This will activate a self-test cycle provided to preflight the autopilot and flight director system. Note the following sequence for the test cycle:

   a. All autopilot and flight director warning and mode lights should illuminate and remain lighted until the test has been completed.

   b. A simulated climbing right turn of 10° pitch-up and 10° right roll will appear on the attitude display.

   c. The command bars will remain centered with the airplane reference symbol until the flight director, autopilot computer, and servos check valid.

   d. All three servo actuator monitors will trip.

   e. The autopilot and yaw damper will disengage to demonstrate proper computer monitor operation.

   f. The command bars will come into exact alignment with the original horizon display after the flight director computer, autopilot computer, and servos check valid.

5. Release the preflight TEST button, and check to see that all warning and mode lights extinguish. A warning light illuminated after the TEST button is released indicates a malfunction for that mode.

6. Check for proper trim action as follows:

   a. Using the vertical trim switch on the mode controller, position the command bars approximately 5° above the airplane reference symbol.

   b. Engage the autopilot and yaw damper. Trim should run in nose-up direction, beginning 3 to 4 seconds after autopilot engagement.

   c. Depress and hold the TRIM TEST switch (on pedestal). The trim should cease operation and the A/P TRIM FAIL light should illuminate in 15 to 20 seconds.

   d. Release and re-depress the TRIM TEST switch. Actuate the control wheel trim switches in the nose-down direction. The trim should run in the nose-down direction, and the A/P TRIM FAIL light should illuminate immediately.

   e. Repeat the above procedures with the command bars positioned approximately 5° below the airplane symbol. Trim operation should be reversed from that previously specified.

7. Disengage the autopilot by depressing the AP/YD DISC switch on the pilot's control wheel.

INFLIGHT

ENGAGING THE AUTOPILOT

1. Engage the flight director by depressing the FLT DIR switch on the mode controller, or by depressing the PITCH SYNC & CWS switch on the pilot's control wheel. The existing pitch attitude and heading information will be retained on the flight command indicator command bars as they are brought into view.

2. Engage the autopilot. The autopilot action is always in response to, and consistent with, flight director commands. When engaged by the solenoid-held toggle switch on the mode controller, the autopilot will respond to any operating mode through a fader circuit, which allows engagement into an unsatisfied flight director command without an abrupt control transient.

3. Depressing the control wheel steering (PITCH SYNC & CWS) button, located on the horn of the pilot's control wheel, allows the pilot to momentarily revert to manual control of pitch and roll (yaw damper stays engaged) while retaining the previous mode program, then conveniently resume that profile upon disengagement.

4. The autopilot, together with the yaw damper, provides three-axis rate stabilization, automatic turn coordination, and automatic elevator trim, as well as automatic response to all flight director modes.

HEADING CONTROL OPERATION

The flight control system is electrically connected to the directional gyro for heading-hold information whenever the system is in basic flight director mode. Heading hold is automatically disengaged when an incompatible lateral mode is engaged, or when the control wheel PITCH SYNC & CWS switch is depressed and held.

Pressing the HDG SEL mode button causes the airplane to automatically execute a preselected heading change, as set on the pictorial navigation indicator with either the HDG control knob on the indicator, or the spring-loaded HDG SEL knob on the mode controller. Heading changes using HDG SEL mode will bank the airplane 2° for every degree of heading change selected, up to a maximum bank angle of 25°.

VERTICAL CONTROL OPERATION

1. Vertical Trim:

   Operation of the vertical trim switch (on mode controller) provides a convenient means of adjusting the reference parameter of all the vertical modes except glideslope and vertical navigation. This permits the pilot to change his vertical reference without disengaging and re-engaging modes.

2. Altitude Hold:

   The altitude-hold mode may be engaged by pressing the ALT mode swtich on the mode controller. The airplane will maintain the pressure altitude existing at the time the switch is depressed. Altitude hold may be engaged at any rate of climb or descent. For best performance, engagement should be made after establishing stabilized operation in any other vertical mode. Altitude hold is automatically disengaged when any other vertical mode is selected. The vertical trim switch may be used to trim the referenced altitude up or down at approximately 500 fpm.

3. Altitude Select:

   This mode allows the pilot to select, arm, and upon approaching the preset altitude, obtain an automatic visual pitch command to capture and hold the preselected altitude. Prior to selecting the function, the pilot must set the desired altitude (by means of rotary control knobs) into the selected altitude readout of the vertical navigation computer. The ALT ARM button on the vertical navigation computer may be depressed any time during climb or descent, to arm the altitude capture circuitry, and the ALT ARM annunciator will illuminate. As the airplane approaches the selected altitude, the ALT ARM annunciator will extinguish; as the airplane passes through the selected altitude, the altitude hold will automatically engage, and the ALT HOLD annunciator light will illuminate.

4. Indicated-Airspeed Hold:

   Engaging the indicated-airspeed hold mode will introduce a computed, visually displayed pitch command to maintain the reference airspeed. The mode is utilized by maneuvering the airplane and setting engine power to attain the desired speed in climb, descent, or level flight, and then depressing the IAS button. The reference airspeed may be adjusted at a rate of approximately one knot per second by operation of the vertical trim switch on the mode controller.

5. Speed Profile:

Engaging the speed profile mode will introduce a visually displayed pitch command on the flight command indicator, which varies the indicated climb or descent speed as a function of altitude. During climb, airspeed is decreased at the rate of 1.75 knots per 1000 feet. The proper initial airspeed must be set up by the pilot, and correct power settings maintained, before depressing the SPD PRF button. After engagement, airspeed reference may be trimmed using the vertical trim switch.

6. Vertical Navigation:

The vertical navigation computer provides a computed pitch command (which is displayed on the flight command indicator) to capture and maintain a vertical track angle in ascent or descent to a selected waypoint or VORTAC facility.

7. Altitude Alerting:

Two altitude alert lights (one on the vertical navigation computer and one on the servoed altimeter) provide altitude alerting with the vertical navigation computer. When the airplane climbs or descends to within 1200 feet of the selected altitude, the alert lights illuminate and remain illuminated through a 900-foot altitude warning band. At 300 feet from the selected altitude, the lights extinguish. When the airplane reaches the selected altitude, a two-second aural tone indicates the desired flight altitude has been achieved. The two-second tone is also heard when the lights first illuminate upon penetration of a warning band.

An MDA toggle switch on the vertical navigation computer allows the pilot to arm the MDA annunciator and warning horn, so that they will be activated when the minimum descent altitude is reached.

8. Go-around:

Engagement of the go-around mode using the go-around button on the left control wheel will introduce a wings-level, 7°-nose-up display on the flight command indicator command bars. Operation of go-around cancels all other vertical modes and also disengages the autopilot, if the autopilot has been engaged. The autopilot may be re-engaged in the go-around mode. The go-around mode may be used as a take-off pitch reference, if desired, by engaging go-around mode on the runway. Momentary operation of the trim switch disengages the go-around mode.

FLYING RADIO FACILITIES

VOR Procedures

1. Tune the NAV receiver to the appropriate frequency. (RNAV mode selector in VOR-DME.)
2. Set the desired course to or from the station on the pilot's course indicator.
3. Set the desired intercept heading. (Heading hold or HDG SEL may be used.)

NOTE

The intercept angle with respect to the VOR radial selected may be any angle up to 90°.

4. Arm the navigation mode by depressing the NAV switch on the mode controller. The NAV ARM light on the flight director annunciator panel illuminates, indicating that the system is armed to capture the selected radial. At the point of capture, the NAV ARM light on the annunciator extinguishes and the NAV CPLD annunciator light illuminates, indicating the system has captured the selected course.
5. The selected track may be changed while in the tracking mode by setting a new course, using the

COURSE knob on the pictorial navigation indicator. Course changes made at less than 4° per second with the COURSE knob are acquired without leaving the tracking mode; however, if the COURSE knob is moved at a rate exceeding 4° per second, a preprogrammed intercept angle of 45° is automatically engaged without having to return to the heading mode. When over the navigational facility, the course selection should be made at the change from "TO" to "FROM", for best results.

Area Navigation Enroute

1. Tune the NAV and DME receivers supplying information to the area navigation computer to the radio facility (VORTAC) being used. The signal must be valid.

2. Set the area navigation bearing and distance, to establish the desired waypoint.

3. Set the area navigation mode switch to RNAV position.

4. Set the desired course, using the COURSE knob on the pilot's pictorial navigation indicator.

5. Set the desired intercept heading (heading hold or HDG SEL may be used).

NOTE

The intercept angle, relative to the RNAV radial, may be any angle of 90° or less.

6. Arm the navigation mode by depressing the NAV switch on the mode controller. The NAV ARM light on the flight director annunciator panel illuminates, indicating that the system is armed to capture the selected radial. At the point of capture, the NAV ARM light on the annunciator will extinguish and the NAV CPLD annunciator light illuminates, indicating the system has captured the selected course.

Vertical Navigation (VNAV)

Vertical navigation provides a computed pitch command, displayed on the flight command indicator, to capture and maintain a vertical track angle in ascent or descent to an RNAV waypoint or VORTAC facility. The following prerequisites must be fulfilled prior to flight director/autopilot coupling to the vertical navigation system:

1. Tune the NAV and DME receivers supplying information to the RNAV or VNAV computer to the radio facility (VORTAC) being used. The signal must be valid.

2. The desired course to the selected waypoint or VORTAC facility must be set on the pictorial navigation indicator.

3. The RNAV computer mode switch must be placed in the RNAV or APPR position. If no RNAV system is installed, the VNAV switch must be placed in the ON position. The APPR selector switch and APPR CPLD annunciator are inoperative with VNAV only.

4. Arm the NAV mode by depressing the NAV button.

5. The selected course must then be captured.

Programming The Vertical Navigation Computer

1. Preset the desired altitude in the SELECTED ALTITUDE window.

2. Set the altitude of the VORTAC facility being used, using the VTAC ALT - 1000 FT tab.

3. If altitude acquisition is desired prior to reaching the selected waypoint or VORTAC facility, program the mileage offset (0 to 30 miles), using the DIST BIAS MILES knob. (Bias is the distance short of the

selected waypoint.)

If the NAV receiver, RNAV computer (if installed), servo altimeter, and DME are valid, the vertical track angle will be indicated in degrees of angle, to a maximum of $\pm$ 5°, on the right display scale of the flight command indicator. As the airplane flies toward the waypoint or VORTAC facility at a constant altitude, the displayed vertical track angle will slowly increase. When the vertical track angle has reached a value desired by the pilot, the pilot must manually couple VNAV by depressing the VNAV CPLD button on the VNAV computer. The vertical track angle displayed upon engagement becomes the reference flight path angle, and the display pointer then becomes a deviation display above or below the selected flight path. The maximum scale deflection in the VNAV coupled mode is $\pm$ 250 feet. Selection of the VNAV CPLD mode automatically activates ALT ARM to capture the selected altitude.

Approach

1. VOR

VOR approaches may be made by coupling VOR in the approach mode. This gives proper responses for a close-in, nonprecision approach.

2. ILS FRONT COURSE

a. Tune the NAV receiver to the correct ILS frequency, set the course selector to the inbound runway heading, set the heading bug to the desired intercept angle, and set the decision height on the radio altimeter.

NOTE

With both NAV receivers tuned to the same ILS facility, if the Number 2 NAV receiver deviates more than 35 millivolts from the Number 1 NAV receiver on either localizer or glideslope, the appropriate APPR CPLD or GS CPLD annunciator will flash, indicating monitor limits have been exceeded.

Localizer and glideslope are captured automatically on front course. The localizer must be captured before glideslope capture is possible.

If the airplane heading is within 90° of the back course heading, the REV LOC annunciator will illuminate.

b. Engage HDG mode and arm the APPR mode. The APPR ARM annunciator will illuminate, indicating the system is armed to capture the localizer beam. As the airplane nears the beam, the APPR CPLD annunciator will illuminate and the system will intercept the localizer. At the point of glide path intercept, the GS CPLD annunciator will illuminate and all vertical modes will be disengaged, indicating the system is locked onto the glideslope.

c. The decision height light on the flight command indicator will illuminate when the airplane reaches the decision height previously set on the radio altimeter by the pilot.

d. To assume manual control of the airplane for landing, depress the autopilot disengage switch on the pilot's control wheel.

e. Disengage the autopilot at no less than 200 feet above the ground, prior to manually landing the airplane.

f. Go-around mode may be selected by pressing the go-around button on the left control wheel anytime the pilot needs to execute a missed approach. The autopilot will be disengaged, and the flight command indicator will command a 7°-nose-up, wings-level attitude.

3. ILS BACK COURSE

   a. Tune the NAV receiver to the correct ILS frequency, set the course selector to the inbound front course runway heading, set the heading indicator to establish the desired intercept angle, and set decision height on the radio altimeter.

NOTE

With both NAV receivers tuned to the same ILS facility, if the Number 2 NAV receiver deviates more than 35 millivolts from the Number 1 NAV receiver on localizer, the appropriate APPR CPLD annunciator will flash, indicating monitor limits have been exceeded.

   b. Engage HDG mode and arm the APPR mode. The APPR ARM annunciator will illuminate, indicating the system is armed to capture the localizer beam. As the airplane nears the beam, the APPR CPLD annunciator will illuminate, and the system will intercept the localizer. If the airplane heading is within 90° of the back course heading, the REV LOC annunciator will illuminate.

   c. Indicated-airspeed hold or pitch-attitude hold may be used to establish a descent while on reverse localizer.

   d. Disengage the autopilot at no less than 200 feet above the ground, prior to manually landing the airplane.

   e. Go-around operation is the same as for front course operation.

4. RNAV APPROACH

   a. Tune the NAV receiver and DME to the appropriate VORTAC frequency.

   b. Set RNAV bearing and distance as given on the navigation charts for RNAV approaches. Set RNAV to APPR mode when within ten miles of the selected waypoint.

   c. Set vertical navigation to give minimum descent altitude and bias as desired. Set the MDA switch to the MDA WARN position.

   d. Set the required course on the pictorial navigation indicator, and establish an intercept angle to the inbound radial. Arm the approach mode.

   e. After RNAV approach is coupled, observe the vertical navigation deviation on the flight command indicator, and depress the VNAV CPLD button when desired descent angle is displayed.

   f. When the MDA annunciator on the flight director indicator illuminates, a go-around should be executed unless the pilot has the field in sight.

DISENGAGING THE AUTOPILOT

1. Monitor the controls prior to disengagement. Under normal operating conditions, the automatic pitch trim will have the airplane properly trimmed in the pitch axis at the pitch attitude existing when the system is disengaged.

2. Disengage the system by pressing the pilot's or copilot's quick-disconnect switch, pilot/copilot trim switches, or returning the autopilot engage switch to OFF. The flight director may be turned off, then on, which will also disengage the autopilot.

SPECIAL NOTES

1. The V-bars on the flight director indicator will disappear to the top of the instrument when no flight director

modes are engaged.

2. The V-bars must be in view before the autopilot can be engaged.

3. When the autopilot is not engaged, the system may be used as a manual flight director system.

EMERGENCY PROCEDURES

THE AUTOPILOT CAN BE DISENGAGED BY ANY OF THE FOLLOWING METHODS:

1. Press the A/P disconnect switch on the pilot's or copilot's control wheel.
2. Move the on-off switch to the off position.
3. Engage the go-around mode. (Yaw damper will remain engaged.)
4. Pull the flight director/autopilot circuit breaker out (off).
5. Turn off the airplane master switch.
6. Turn off the avionics master switch.
7. Any interruption of power.
8. Operate main trim switches UP or DN. (Yaw damper will remain engaged.)

THE FOLLOWING CONDITIONS WILL CAUSE THE AUTOPILOT TO DISENGAGE AUTOMATICALLY:

1. Vertical gyro failure indication.
2. Flight control system power or circuit failure.

THE FOLLOWING WILL CAUSE A SERVO TO DISENGAGE:

1. Rapidly overpowering any servo will cause disengagement of only that servo, through operation of the servo monitor. The servo may be re-engaged by turning off the autopilot and waiting for the monitor light to extinguish, before re-engaging the autopilot.
2. A hardover failure in any of the primary servos will result in only that servo being automatically disengaged.

IN THE EVENT OF ENGINE FAILURE:

Disengage the autopilot, retrim the airplane, and re-engage the autopilot. Maintain at least 120 knots for single-engine approach.

MAXIMUM ALTITUDE LOSSES DURING MALFUNCTION TESTS WERE:

CONFIGURATION	*ALTITUDE LOSS*
Climb	Negative loss (40-ft gain)
Cruise	170 ft
Maneuvering	50 ft
Descent	420 ft
Approach/ILS Coupled	50 ft
Single-Engine Approach/ILS Coupled	80 ft

Approved:

Donald W. Peter
for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200 LANDPLANES
(SERIALS BB-2, AND BB-6 THRU BB-82 ONLY)
FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
for the
SECONDARY LOW PITCH STOP SYSTEM

GENERAL

The information in this supplement is FAA-approved material and must be attached to the *Super King Air 200 FAA Approved Airplane Flight Manual* (serial numbers BB-2, and BB-6 thru BB-82 only) when the airplane has **not** been modified by the installation of Beech Kit No. 101-3026-1 S (Propeller Secondary Low Pitch Stop Removal) in compliance with Beech Service Instruction No. 0808-247.

The information in this supplement supersedes or adds to the basic *Super King Air 200 FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

LIMITATIONS

No change.

EMERGENCY PROCEDURES

No change.

NORMAL PROCEDURES

BEFORE TAKEOFF

Add the following procedure to the BEFORE TAKEOFF checklist.

*Secondary Low Pitch Stops - TEST:
- a. Condition Levers - HIGH IDLE
- b. Power Levers - IDLE (Read Propeller rpm)
- c. Prop Test Swtiches - HOLD (to LOW PITCH STOP TEST)
- d. Power Levers - ALIGN (aft edge with top of beta range marks)
- e. Prop Pitch Lights - CHECK, ON
- f. RPM - CHECK (stabilized at 210 ± 40 above RPM in step "b")
- g. Prop Test Swtiches - RELEASE
- h. RPM - CHECK (must increase above step "f")
- i. Power Levers - IDLE

CAUTION

Do not force the Power Levers into the FULL REVERSE position when the switches are in the LOW PITCH STOP TEST position.

*May be omitted for quick turn-around at pilot's discretion.

PERFORMANCE

No change.

SYSTEMS DESCRIPTIONS

ANNUNCIATOR SYSTEM

CAUTION/ADVISORY ANNUNCIATOR

Add the following.

NOMENCLATURE	COLOR	CAUSE FOR ILLUMINATION
L PROP PITCH	*Yellow*	*Left propeller is beyond the primary low pitch stop*
R PROP PITCH	*Yellow*	*Right propeller is beyond the primary low pitch stop*

Approved:

For Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT SUPER KING AIR 200 AND 200T LANDPLANES

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT for the

J.E.T. DAC-2000 AREA NAVIGATION SYSTEM

GENERAL

The information in this supplement is FAA-approved material and must be attached to the FAA Approved Airplane Flight Manual when the airplane has been modified by installation of the Jet Electronics and Technology, Inc. (J.E.T.) DAC-2000 Area Navigation System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic FAA Approved Airplane Flight Manual only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

Except as specified herein, the operation of this system is to be accomplished in conformity with the procedures set forth in the latest edition of the J.E.T. DAC-2000 Pilot's Guide TP-257. This publication, which may be obtained from Beech Aircraft Corporation, must be available to the pilot during all flight operations which utilize the J.E.T. DAC-2000 Area Navigation System.

LIMITATIONS

1. The area navigation system may not be used as a primary system under IFR conditions except on approved approach procedures, approved airways, and random area navigation routes when approved by Air Traffic Control.

2. This system can only be used with co-located facilities (i.e., both VOR and DME signals originate from the same geographical location).

3. IFR operation is restricted to a distance not to exceed 100 nautical miles radius from high-altitude VORTAC facilities in ascent and descent, and 120 nautical miles in level flight. Operation from low-altitude facilities is limited to 18,000 feet and below, and a distance not to exceed 40 nautical miles.

4. The standard FAR 91.25 VOR accuracy test must be performed, with the exception that the error tolerance on an approved test signal or designated airport checkpoint must not exceed $\pm 3°$. In flight, accuracy must be within $\pm 5°$ over a designated airborne checkpoint.

5. The vertical navigation (VNAV) mode has been shown to meet the accuracy and operational requirements of Advisory Circular 90-45A. Use of this mode for enroute and terminal vertical navigation and for approaches to a published vertical flight path is permitted provided the specified maximum/minimum altitudes are observed.

EMERGENCY PROCEDURES

CAUTION

DME may unlock due to loss of signal with certain combinations of distance from station, altitude, and angle of bank.

1. If NAV flag appears while in the enroute mode, check for correct frequency.
2. If operation of VOR or DME equipment becomes intermittent or ceases, utilize other navigation equipment as required.
3. If NAV flag appears during an approach, execute published missed approach and utilize another approved facility.

NORMAL PROCEDURES

The J.E.T. DAC-2000 Area Navigation System is programmed and operated from a panel– or pedestal-mounted Control/Display unit, and an RNAV Control Annunciator. Refer to the latest edition of the J.E.T. DAC-2000 Pilot's Guide TP-257 for specific operating procedures.

NOTE

Paragraphs in the Pilot's Guide TP-257 referring to NAV 1 and NAV 2 selections are not valid for this installation. NAV 1 and DME are automatically selected when the NAV 1/DME push button on the Control Annunciator is depressed.

RANGE MONITOR

The Range Monitor feature provides for the separation of the RNAV-computed range to a waypoint from the steering guidance of the pilot's horizontal situation indicator. Depressing the RANGE MONITOR push button on the Control Annunciator will connect the RNAV computer to the NAV 2 receiver. The pilot's horizontal situation indicator will be retained on the NAV 1 receiver.

On an ILS approach, for example, it is desirable to know distance to the outer marker and then to the runway threshold. By selecting RANGE MONITOR and setting the appropriate NAV 2 frequency and waypoint parameters on the Control/Display unit, the distance to the desired fix will be continuously displayed, while ILS steering guidance on the horizontal situation indicator will be conventional. The result is the ability to fly a localizer or full ILS steering situation while retaining RNAV-computed distance to a selected fix.

CAUTION

It is imperative that the NAV 1/DME push button be depressed during normal RNAV operations. If left in the RANGE MONITOR mode, the range display will be based on the NAV 2 frequency and Control/Display unit bearing/range parameters, and the pilot's horizontal situation indicator will display conventional VOR steering based on the selected NAV 1 frequency.

SPECIAL OPERATIONAL INFORMATION

1. The RNAV power switch on the avionics panel supplies power to the Control/Display unit for programming. The Control Annunciator RNAV ON push button ties the RNAV to the flight-director/autopilot.

2. When the autopilot is coupled in NAV mode, DME, NAV and RNAV self-tests are disabled.

3. When the RNAV system is selected, the DME "HOLD" function is overridden.

4. The VNAV function cannot be coupled to the flight director or autopilot. A VNAV deviation display is presented on the glideslope pointer of the pilot's horizontal situation indicator and may be utilized through manual inputs to the autopilot or flight controls.

5. When changing altimeter setting at FL 180, VNAV information will be affected slightly as the altimeter is changed.

6. When approaching a waypoint using an RNAV lateral mode coupled to the autopilot or flight director, it is recommended that heading mode be selected until after waypoint passage.

7. Distance to the waypoint is presented on the pilot's horizontal situation indicator during normal RNAV operations. Raw bearing and distance information to the selected VORTAC is shown on the pilot's RMI and DME indicators.

PERFORMANCE

No Change

Approved:

Donald St Peter
for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT KING AIR 65-90, 65-A90, B90, C90, E90, 100, A100, B100, SUPER KING AIR 200 AND 200T LANDPLANES

PILOT'S OPERATING HANDBOOK AND FAA APPROVED FLIGHT MANUAL SUPPLEMENT for FLIGHT WITH CABIN ENTRANCE DOOR REMOVED

GENERAL

The information in this supplement is FAA Approved material and must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the airplane is flown with the cabin entrance door removed.

The information in this supplement supersedes or adds to the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only as set forth below.

Beechcraft kit number 100-4006 specifies required modifications which shall be accomplished prior to flight with the cabin entrance door removed.

LIMITATIONS

1. Pilot must use an approved headset at all times during flight (models 100, A100 and B100 only) Trim-in-motion warning is not audible without headset .
2. Maximum speed 208 knots CAS (205 knots IAS).
3. All occupants, except crew, must be properly equipped with parachutes when conducting operations with the cabin entrance door removed. Crew (pilot and copilot) must be at their stations secured by restraint straps, or equipped with parachutes if away from pilot or copilot seats.
4. Smoking is prohibited.
5. When flown for the purpose of dropping objects or equipment from the doorway, a suitable guard rail or equivalent safety device must be provided.
6. All loose articles must be tied down or stowed.
7. Parachutist's static lines shall be kept free of pilot's controls and control surfaces.
8. All flights with the cabin entrance door removed must be for the purpose of intentional egress of personnel, material or equipment.
9. The following placard must be in view of the pilot:

"FOR FLIGHT WITH CABIN DOOR REMOVED, SEE AIRCRAFT OPERATING LIMITATIONS WITH DOOR REMOVED."

10. Center of gravity limits:
    Aft limit: No change.
    Forward limit: 1.0 inch farther aft, at all weights.

EMERGENCY PROCEDURES - No change.

NORMAL PROCEDURES - No change.

PERFORMANCE

MAXIMUM TAKE-OFF WEIGHT: No change.

TAKE-OFF: No change.

CLIMB:

Models 100, A100, B100, 200 and 200T: Subtract 40 ft/min rate of climb from climb graph (TWO ENGINES and ONE ENGINE INOPERATIVE)

Models 65-90, 65-A90, B90, C90, and E90: No change.

CRUISE

SPEEDS:

Models 100, A100, B100, 200 and 200T: Subtract 8 knots true airspeed from graph values.

Models 65-90, 65-A90, B90, C90 and E90: No change.

LANDING: No change.

WEIGHT AND BALANCE:

Calculate weight and balance loadings as if door were installed.

Approved: Donald H. Peter

for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

FAA Approved
Issued: March, 1978
P/N 101-590010-125

BEECHCRAFT SUPER KING AIR 200 AND 200T LANDPLANES
PILOT'S OPERATING HANDBOOK AND
FAA APPROVED AIRPLANE FLIGHT MANUAL
SUPPLEMENT
for the
DECCA DOPPLER 72 NAVIGATION SYSTEM
(TANS COMPUTER, TYPE 9447C)

GENERAL

The information in this supplement is FAA Approved material which along with the basic Super King Air 200 or Super King Air 200T Pilot's Operating Handbook and FAA Approved Airplane Flight Manual is applicable to the operation of the airplane when modified by the installation of the Decca Doppler 72 Navigation System installed in accordance with BEECHCRAFT FAA Approved data. The information in this supplement supersedes or adds to that of the basic airplane flight manual. Users of this manual are advised always to refer to the supplement for possible superseding information and placarding applicable to the operation of this airplane.

The operation of the Decca Doppler 72 Navigation System is to be accomplished in conformity with the procedures included in the Decca Doppler 70 Series Aircrew Operating Instructions (October 1973 or later issue). This publication is available from the Decca Navigator Company Ltd, Aviation Electronics Division, Decca House, 9 Albert Embankment, London SE 1 7SW, England. The Aircrew Operating Instructions must be in the airplane and available to the pilot during all flight operations using the Decca Doppler 72 Navigation System.

This navigation system does not adversely affect any other airplane system. However, the functional and performance characteristics have not been fully evaluated.

LIMITATIONS

Flight operations must not be predicated on its use as the primary source of navigation.

EMERGENCY PROCEDURES

The Doppler system drives the normal VOR/LOC warning flag when Doppler information is displayed on the horizontal situation indicator (HSI). The warning flag will be in view anytime the Doppler information is invalid (e.g. Doppler failure or computer malfunction).

Refer to the Decca Doppler 70 Series Aircrew Operating Instructions (October 1973 or later issue).

NORMAL PROCEDURES

Refer to the Decca Doppler 70 Series Aircrew Operating Instructions (October 1973 or later issue).

DOPPLER CONTROL

A rotary switch is provided to activate the Doppler system power, conduct the appropriate system tests, and select the Doppler for presentation on the HSI.

1. Test A - Allows manual selection of the "Memory" condition to permit simulated Doppler speeds to be fed into the TANS computer for ground checking purposes.

2. Test B - Provides an artifical spectrum for self-testing the Doppler system.

3. OPR - Activates the Doppler ground speed and drift meter.

4. FD CPLD - Provided the TANS computer is properly programmed, Doppler steering information is presented on the flight director.

NAVIGATION DISPLAYS

The course deviation indicator on the HSI is activated whenever a waypoint number is shown on the TANS display and the Doppler control switch is selected to the FD CPLD position. The NAV 1 frequency selector must be placed in the VOR range. Frequency selection in the ILS range will automatically switch the flight director to the ILS mode. A green FLT DIR DOPPLER light will illuminate on the flight director annunciator panel when Doppler information is being supplied to the HSI.

The heading error indication as shown by the course deviation indicator is appropriate to the waypoint number shown, and will continue to indicate so long as the waypoint number is displayed even though the remainder of the TANS display may be showing present position, wind velocity, etc. The HSI DME readout will display raw DME distance to a tuned VORTAC, not distance to a Doppler waypoint.

The course deviation indicator displacement on the HSI is dependent on the airplane heading relative to the bearing to the waypoint. Therefore, to get relative bearing as well as displacement information, the current selected waypoint bearing as shown in the "Bearing-Distance" mode of the TANS display must be set on the HSI course selector.

AUTOPILOT OPERATION

Once a waypoint has been selected and the Doppler control switch set to the FD CPLD position, the autopilot can be coupled to the Doppler.

1. Set the waypoint bearing on the HSI course selector.

2. Depress the NAV mode on the flight director controller to "arm" the navigation function.

3. Adjust the heading bug to agree with the intercept heading as shown in the "Intercept" mode of the TANS display. Small additional adjustments to the heading bug may be required until the flight director transitions to the "capture" mode.

NOTE

If it is required to intercept a predetermined track to a waypoint, set up an appropriate intercept angle to the desired track. Monitor the displayed bearing in the "Bearing-Distance" mode. When the displayed bearing indicates the desired track angle, proceed as in Steps 1 through 3 above.

PERFORMANCE - No Change

Approved: N. A. Schutz

for Chester A. Remblesske
Beech Aircraft Corporation
DOA CE-2

SECTION X

SAFETY INFORMATION

TABLE OF CONTENTS

SUBJECT *PAGE*

INTRODUCTION

The best of engineering know-how and manufacturing craftsmanship have gone into the design and building of all BEECHCRAFTS. Like any other high performance airplane they operate most efficiently and safely in the hands of a skilled pilot.

We urge you to be thoroughly familiar with the contents of operating manuals, placards, and check list to insure maximum utilization of your airplane. When the airplane was manufactured, it was equipped with some combination of pilot's operating manual, airplane flight manual, owner's manual and placards. If the airplane has changed ownership, some of these may have been misplaced. If any are missing, replacements should be obtained from any BEECHCRAFT Aviation Center as soon as possible.

For your added protection and safety, we have developed this special publication of safety information to refresh owners' and pilots' knowledge of a number of safety subjects. We strongly recommend these subjects be reviewed periodically and kept with the airplane, along with the FAA Approved Airplane Flight Manual, and other documents required for operation of the airplane.

Topics in this publication are mostly excerpts from FAA Documents and other articles pertaining to the subject of safe flying. They are not limited to any particular make or model airplane and do not replace instructions for particular types of airplanes.

BEECHCRAFTS are designed and built to provide you with many years of safe and efficient transportation. By maintaining it properly and flying it prudently, you should realize its full potential.

.... BEECH AIRCRAFT CORPORATION

GENERAL

Flying is one of the safest modes of travel. Remarkable safety records are being established each year. As a pilot you are responsible to yourself, your relatives, to those who travel with you, to other pilots and to ground personnel to fly wisely and safely.

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

DO'S

Be thoroughly familiar with your airplane and be current in it, or get a check ride.

Pre-plan all aspects of your flight - including weather.

Use services available - FSS, Weather Bureau, etc.

Pre-flight your airplane.

Use a check list.

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

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

Be sure articles and baggage are secured.

Check freedom of all controls.

Maintain an appropriate airspeed in takeoff, climb, descent and landing.

Avoid big airplane wake turbulence.

Switch fuel tanks before you have to.

Practice engine out, landing gear extension and other emergency procedures at safe altitudes and preferably with a check pilot.

Keep your airplane in good mechanical condition.

Stay informed and alert, fly in a sensible manner.

DON'TS

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

Don't take off with less than minimum recommended fuel, plus reserves.

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

Don't fly in thunderstorms or severe weather.

Don't fly in possible icing conditions unless airplane is approved and equipped; if you encounter icing conditions that are severe, alter altitude or course to minimize exposure.

Don't fly close to mountainous terrain.

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

Don't fly when physically or mentally under par.

Don't trust to luck.

GENERAL SOURCES OF INFORMATION

There is a wealth of information available to the pilot created for the sole purpose of making your flying easier, faster, and safer. Take advantage of this knowledge and be prepared for an emergency in the remote event that one should occur. You as a pilot also have certain responsibilities under government regulations. These again are designed for your own protection. Compliance is not only beneficial but mandatory.

RULES AND REGULATIONS

Federal Aviation Regulations, Part 91, General Operating and Flight Rules, is a document of law governing operation of aircraft and the owner's and pilot's responsibilities.

This document covers such subjects as:

Responsibilities and authority of the pilot in command
Certificates required
Liquor and drugs
Flight plans
Pre-flight action
Fuel requirements
Flight rules
Maintenance, preventative maintenance, alterations, inspections, and maintenance records

These are only some of the topics covered. It is the owner's and pilot's responsibility to be thoroughly familiar with all items in FAR Part 91 and to follow them.

FEDERAL AVIATION REGULATIONS, PART 39, AIRWORTHINESS DIRECTIVES

This document specifies that no person may operate a product to which an airworthiness directive issued by the FAA applies, except in accordance with the requirements of that airworthiness directive.

AIRMAN INFORMATION, ADVISORIES, AND NOTICES - FAA AIRMAN'S INFORMATION MANUAL

This document contains a wealth of pilot information for nearly all realms of flight, navigation, ground procedures, and medical information. Among the subjects are:

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

We urge all pilots to be thoroughly familiar with and use the information in this manual.

ADVISORY INFORMATION

Airmen can subscribe to services to obtain FAA NOTAMS and Airman Advisories, and these are also available at FAA Flight Service Stations.

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

GENERAL INFORMATION ON SPECIFIC TOPICS

FLIGHT PLANNING

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

All pilots are urged to obtain a complete pre-flight briefing. This would consist of weather; local, enroute and destination, plus alternates, enroute navaid information. Also airport runways active, length of runways, take-off and landing distances for the airplane for conditions expected should be known.

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

The pilot must be completely familiar with the performance of the airplane and performance data in the airplane manuals and placards. The resultant effect of temperature and pressure altitude must be taken into account in determining performance if not accounted for on the charts. Applicable FAA manuals must be aboard the airplane at all times including the weight and balance forms and equipment lists.

The airplane must be loaded so as not to exceed the weight and center of gravity (C.G.) limitations. Also, that at least minimum fuel for takeoff and sufficient fuel for the trip, plus reserves, is on board. Oil in the tank(s) or engine(s) should be checked and filled as required.

INSPECTIONS - MAINTENANCE

In addition to maintenance inspections and pre-flight information required by FAR Part 91, a complete pre-flight inspection is imperative. It is the responsibility of the owner and operator to assure that the airplane is maintained in an airworthy condition and proper maintenance records are kept.

While the following items cannot substitute for the pre-flight specified for each type of airplane, they will serve as reminders of general items that should be checked.

SPECIAL CONDITIONS CAUTIONARY NOTICE

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

NOTE

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

Corrosion, and its effects, must be treated at the earliest possible opportunity. A clean dry surface is virtually immune to corrosion. Make sure that all drain holes remain unobstructed. Protective films and sealants help to keep corrosive agents from contacting metallic surfaces. Corrosion inspections should be made most frequently under high-corrosion-risk operating conditions, such as in areas of exorbitant airborne salt concentrations (e.g., near the sea) and in high-humidity areas (e.g., tropical regions).

WALK AROUND INSPECTIONS

All airplane surfaces free of ice, frost or snow.
Tires and struts properly inflated.
All external locks, covers and tie downs removed.
Fuel sumps drained.
Fuel quantity, adequate for trip, plus reserve, visually checked if possible and access doors secured.
Oil quantity checked and access doors secured.
Check general condition of airplane, engine, propeller, exhaust stacks, etc.
All external doors secured.

COCKPIT CHECKS

Flashlight available.
Required documents on board.
Use the check list.
All control locks removed.
Check freedom of controls.
Cabin and exit doors and windows properly closed and latched.
Seat belts and shoulder harnesses fastened.
Passengers briefed.
Engine and propeller operating satisfactorily.
All engine gages checked for proper readings.
Cowl flaps in proper position.
Fuel selector in proper position.
Fuel quantity checked by gages.
Altimeter setting checked.
Carburetor heat control checked (if equipped).
Ice and rain equipment set as required.

FLIGHT OPERATIONS

GENERAL

The pilot should be thoroughly familiar with all information published by the manufacturer concerning the airplane and is required by FAA to operate in accordance with the FAA Approved Airplane Flight Manual and/or placards installed.

TURBULENT WEATHER

A complete weather briefing prior to beginning a flight is the start of assurance of a safe trip.

Updating of weather information enroute is another assurance. However, the wise pilot also knows weather conditions change quickly at times and treats weather forecasting as professional advice rather than as absolute fact. He obtains all the advice he can, but still stays alert through knowledge of weather changes, observations, and conditions.

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

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

A roll cloud ahead of a squall line or thunderstorm is visible evidence of violent turbulence, however, the absence of a roll cloud should not be interpreted as denoting the lack of turbulence.

FLIGHT IN TURBULENT AIR

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

Federal Aviation Regulations were revised in 1969 to increase the gust velocity used in new airplane design from 30 feet per second to 50 feet per second. Airplanes approved under the new standards have improved structural capability to withstand these turbulent air conditions.

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

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

If turbulence encountered in cruise or descent becomes uncomfortable to the pilot or passengers, the best procedure is to reduce speed to the turbulent air penetration speed, if given, or to the maneuvering speed, which is listed in the Limitations Section of the FAA Approved Airplane Flight Manual, or the Airplane Owner's Manual. This speed gives the best assurance of avoiding excessive stress loads, and at the same time providing margin against inadvertent stalls due to gusts.

Beware of overcontrolling in attempting to correct for changes in altitude; applying control pressure abruptly will build up G-forces rapidly and could cause damaging structural stress loads. You should watch particularly your angle of bank, making turns as wide and shallow as possible, and be equally cautious in applying forward or back pressure to keep the nose level. Maintain straight and level attitude in either up or down drafts. Use trim sparingly to avoid being grossly mistrimmed as the vertical air columns change velocity and direction.

FLIGHT IN ICING CONDITIONS

It is no longer unusual to find complete deicing equipment on a wide range of airplane sizes and types, reflecting the capability of going almost anywhere at almost any time. This capability introduces a concomitant responsibility to the pilot to understand the limitations which may prevent unrestricted use of his airplane. It is important for him to know whether the required equipment is installed and operable and how to operate it effectively.

An airplane which does not have all critical areas protected in a proper manner must not be exposed to icing encounters — the pilot must make an immediate 180 degree turn when icing conditions are encountered. Airplanes which are approved for flight into icing conditions will have the required equipment, which must be operational, identified in the approved manual.

No airplane or combination of deicing and anti-icing equipment can be designed for the worst possible icing encounter — this condition cannot even be defined. As competent pilots know, there appear to be no predictable limits for the severest weather conditions. For essentially the same reasons that airplanes, however designed or equipped for IFR flight, cannot be flown safely into conditions such as severe thunderstorms, tornadoes, hurricanes or other phenomena likely to produce extreme turbulence, airplanes equipped for flight in icing conditions cannot be expected to cope with the worst of such conditions that nature can produce. The prudent pilot must remain alert to the possibility that icing conditions may become so severe that his equipment cannot cope with them. At the first indication that such conditions may have been encountered or may be ahead, he should react by deciding the most expeditious and safe course of action. The decision should be based on weather briefing, recent pilot reports and ATC observations. Alternatives could be course changes, altitude changes and even continuing on the same course.

We recommend the book WEATHER FLYING by Robert N. Buck as an excellent source for the information and knowledge essential to safe all-weather flight. This book includes valuable information for identifying the most favorable altitudes for flight in known icing conditions. It is the inexperienced or uneducated pilot who presses on "regardless", hoping that steadily worsening conditions will improve, only to find himself flying an airplane which has become so loaded with ice that he can no longer maintain altitude. At this point he has lost most if not all of his safety options, including perhaps, a 180 degree turn to retreat along the course already traveled. The responsible and well informed pilot recognizes the limitations of his airplane and its systems and reacts accordingly.

MOUNTAIN FLYING

Pilots flying in mountainous areas should inform themselves of all aspects of mountain flying.

Many good articles have been published and a synopsis of mountain flying operations is included in the FAA Airman's Information Manual Part 1. Thousands of pilots fly safely in mountain areas; however, the important fact is they are informed of safe operating procedures.

Avoid flight at low altitudes over mountainous terrain, particularly near the lee slopes. If the wind velocity near the level of the ridge is in excess of 25 knots and approximately perpendicular to the ridge, mountain wave conditions are likely over and near the lee slopes. If the wind velocity at the level of the ridge exceeds 50 knots, a strong mountain wave is probable with strong up and down drafts and severe or extreme turbulence. The worst turbulence will be encountered in and below the rotor zone which is usually 8 to 10 miles downwind from the ridge. This zone is characterized by the presence of "roll clouds" if sufficient moisture is present; altocumulus standing lenticular clouds are also visible signs that a mountain wave exists, but their presence is likewise dependent on moisture. Mountain wave turbulence can, of course, occur in dry air and the absence of such clouds should not be taken as any assurance that mountain wave turbulence will not be encountered. A mountain wave downdraft may exceed the climb capability of your airplane. Avoid mountain wave downdrafts.

VFR - LOW CEILINGS

If you are not instrument rated, avoid "VFR On Top" and "Special VFR". Being caught above an undercast when an emergency descent is required (or at destination) is an extremely hazardous position for the VFR pilot. Accepting a clearance out of certain airport control zones with no minimum ceiling and one-mile visibility as permitted with "Special VFR" is not a recommended practice for a VFR pilot.

Avoid areas of low ceilings and restricted visibility unless you are instrument proficient and have an instrument equipped airplane. Then proceed with caution and have planned alternates.

VFR AT NIGHT

When flying VFR at night, in addition to the altitude appropriate for the direction of flight, pilots should maintain a safe minimum altitude as dictated by terrain, obstacles such as TV towers, or communities in the area flown. This is especially true in mountainous terrain, where there is usually very little ground reference and absolute minimum clearance is 2,000 feet. Don't depend on your being able to see obstacles in time to miss them. Flight on dark nights over sparcely populated country can be almost the same as IFR and should be avoided by untrained pilots.

VERTIGO - DISORIENTATION

Disorientation can occur in a variety of ways. During flight, inner ear balancing mechanisms are subjected to varied forces not normally experienced on the ground. This combined with loss of outside visual reference can cause vertigo. False interpretations (illusions) result and may confuse the pilot's conception of the attitude and position of his airplane.

Under VFR conditions the visual sense, using the horizon as a reference, can override the illusions. Under low visibility conditions (night, fog, clouds, haze, etc.) the illusions predominate. Only through awareness of these illusions, and proficiency in instrument flight procedures, can an airplane be operated safely in a low visibility environment.

Flying in fog, dense haze or dust, cloud banks, or very low visibility, with strobe lights, and particularly rotating beacons turned on, frequently causes vertigo. They should be turned off in these conditions, particularly at night.

All pilots should check the weather and use good judgment in planning flights. The VFR pilot should use extra caution in avoiding low visibility conditions.

Motion sickness often precedes or accompanies disorientation and may further jeopardize the flight.

FLIGHT OF MULTI-ENGINE AIRPLANES WITH ONE ENGINE INOPERATIVE

The Emergency Procedures Section of Pilot's Operating Handbooks outlines those procedures which are applicable to engine failure during takeoff and in flight. They are a sequence which should be followed in the event of an engine failure and have been tailored, to the extent possible, for each airplane. The successful accomplishment of these procedures depends to a great extent on the piloting techniques and judgment applied during execution. The following will assist in development of these techniques and judgment:

1. Take-off Weight. If engine fails at, or just after liftoff, an immediate landing is advisable regardless of take-off weight. Altitude and temperature are the critical factors that affect an airplane's capability to climb after liftoff. Associated with these factors is a corresponding take-off weight that will assure positive climb in the event of an engine failure. Higher take-off weights will result in a loss of altitude while retracting the landing gear and feathering the propeller. Beechcraft Pilot's Operating Handbooks, when issued, include graphs to determine these weights and it is recommended that they be used in preflight planning to establish a definite plan of action prior to takeoff.

2. Airspeed. Beech Aircraft procedures advise to maintain airspeed at or above the 50 ft. take-off airspeed. If an engine failure occurs during climb after takeoff, positive action is required to accomplish this procedure. To maintain airspeed, the nose must be lowered. If attitude existing prior to failure is maintained, the airplane will progress rapidly toward a stall and/or loss of lateral/directional control. Additionally, airplane performance will not improve by slowing to airspeeds below the 50 ft. take-off airspeed.

3. Airplane Flight Attitude. There may be a tendency to maintain the wings in a level condition and the ball centered on the turn and slip indicator. This is adequate for higher speeds such as cruise with one engine inoperative, however at lower speeds this technique will result in the airplane actually flying in a "side-slip" condition. One-engine-inoperative

climb performance given in the Pilot's Operating Handbooks or manuals can only be realized in a zero side-slip. This is accomplished by maintaining a 3° to 5° bank angle and ½ ball off center towards the operating engine. If engine failure should occur immediately after liftoff, it may be advisable to use bank angles up to 10° while regaining directional control. This action will facilitate landing or climb-out along the runway heading.

STALLS, SPINS, SLOW FLIGHT, AIR MINIMUM CONTROL SPEED (V_{MCA}), AND INTENTIONAL ONE-ENGINE-INOPERATIVE SPEED (V_{SSE}) FOR MULTI-ENGINE AIRPLANES

The stall warning system must be kept operational at all times and must not be deactivated by interruption of circuits, circuit breakers or fuses. Compliance with this requirement is especially important in multi-engine airplanes during engine-out practice or demonstrations because the stall speed is critical in all low speed operations. The proper function of the audible stall warning system is particularly important in the case of airplanes which display a minimum of aerodynamic buffeting prior to stall.

V_{SSE} is the airspeed below which an engine should not be intentionally rendered inoperative for practice purposes. This airspeed was established because of the apparent practice of some pilots, instructors and examiners of intentionally rendering an engine inoperative at a time when the airplane is being operated at a speed close to, or below the power idle stall speed. Unless the pilot takes immediate and proper corrective action under such circumstances, it is possible to enter an inadvertent spin. Beech Aircraft Corporation, with the approval of the FAA, has established a V_{SSE} airspeed for each of its multi-engine airplanes. It is recognized that flight below V_{SSE} with one engine inoperative, or simulated inoperative, may be required for conditions such as practice demonstration of V_{MCA} for multi-engine pilot certification. A procedure for this purpose has also been established for all multi-engine airplanes. This procedure calls for simulating one engine inoperative by reducing the power lever (throttle) on one engine to idle while operating at an airspeed above V_{SSE}. Power on the other engine is set at maximum, then airspeed is reduced approximately one knot per second until either V_{MCA} or stall warning is obtained. During this transition, rudder should be used to maintain directional control and ailerons should be used to maintain a 5° bank toward the operative engine. At the first sign of either V_{MCA} or stall warning (which may be evidenced by inability to maintain longitudinal, lateral or directional control, aerodynamic stall buffet, or stall warning horn sound), recovery must be initiated immediately by reducing power to idle on operative engine and lowering nose to regain V_{SSE}. Resume normal flight. This entire procedure should be used at a safe altitude of at least 5,000 feet above the ground in clear air only.

If this procedure is not followed and the airplane is allowed to become fully stalled while one engine is providing lift-producing thrust, a rapid rolling and yawing motion may develop even against full aileron and rudder, resulting in the airplane becoming inverted during the onset of a spinning motion. Once the airplane is allowed to reach the rapid rolling and yawing condition, the pilot must immediately initiate the generally accepted spin recovery procedure for multi-engine airplanes, which is as follows:

> Immediately move the control column full forward, apply full rudder opposite to the direction of the spin and reduce power on both engines to idle. These three actions should be done as near simultaneously as possible; then continue to hold this control position until rotation stops and then neutralize all controls and execute a smooth pullout. Ailerons should be neutral during recovery. THE LONGER THE PILOT DELAYS BEFORE TAKING PROPER CORRECTIVE ACTION, THE MORE DIFFICULT RECOVERY WILL BECOME.

Always remember that extra alertness and pilot techniques are required for slow flight maneuvers including the practice or demonstration of stalls or V_{MCA}. In addition to the foregoing mandatory procedures, always:

1. Be certain that the center of gravity of the airplane is as far forward as possible. Forward C.G. aids stall recovery, spin avoidance and spin recovery. An aft C.G. can create a tendency for a spin to flatten out, which delays recovery.

2. Whenever a student pilot will be required to practice slow flight or single engine maneuvers, be certain that the qualified instructor pilot has a full set of operable controls in front of him. FAA regulations prohibit flight instruction without full dual controls.

3. Conduct any maneuvers which could possibly result in a spin at altitudes in excess of five thousand (5,000) feet above ground level in clear air only.

4. Remember that an airplane at or near traffic pattern and approach altitudes cannot recover from a spin before impact with the ground. When descending to traffic altitude and during pattern entry and all other flight operations, maintain a speed no lower than V_{SSE}. On final approach maintain at least the airspeed shown in the flight manual. Should a go-around be required, do not apply more power than necessary until the airplane has accelerated to V_{SSE}.

5. Remember that if an airplane flown under instrument conditions is permitted to stall or enter a spin, the pilot, without reference to the horizon, is certain to become disoriented. He may be unable to recognize a stall, spin entry or the spin condition and he may be unable to determine even the direction of the rotation.

DESCENT

In piston-powered airplanes, whether single or twin engines, supercharged or normally aspirated, it is necessary to avoid prolonged descents with low power, as this produces two problems: (1) Excessively cool cylinder head temperatures which cause premature engine wear, and (2) Excessively rich mixtures due to idle enrichment (and altitude) which causes soot and lead deposits on the spark plugs (fouling). The second of these is the more serious consideration; the engine may not respond to the throttle when it is desired to discontinue the descent.

Both problems are amenable to one solution: maintain adequate power to keep cylinder head temperatures in the "green" range during descent, and lean to best power mixture (that is, progressively enrich the mixture from cruise only slightly as altitude decreases). This procedure will lengthen the descent, of course, and requires some advanced planning.

If it is necessary to make a prolonged descent at or near idle, as in practicing forced landings, at least avoid the problem of fouled spark plugs by frequently advancing the throttle until the engine runs smoothly, and maintain an appropriate mixture setting with altitude.

VORTICES-WAKE TURBULENCE

Every airplane generates wakes of turbulence while in flight. Part of this is from the propeller or jet engine and part from the wing tip vortices. The larger and heavier the airplane the more pronounced and turbulent the wakes will be. Wing tip vortices from large heavy airplanes are very severe at close range, degenerating with time, wind and space. These are rolling in nature from each wing tip. In test, vortex velocities of 133 knots have been recorded.

Encountering the rolling effect of wing tip vortices within two minutes or less after passage of large airplanes is the most hazardous to the light airplanes. This roll effect can exceed the maximum counter roll obtainable in an airplane.

The turbulent areas may remain for as long as three minutes or more, depending on wind conditions, and may extend several miles behind the airplane. Plan to fly slightly above or to the side of the other airplanes. Because of the wide variety of conditions that can be encountered, there is no set rule to follow to avoid wake turbulence in all situations. However, the Airman's Information Manual goes into considerable detail for a number of vortex avoidance procedures. Use prudent judgment and allow ample clearance time and space following or crossing the wake of large airplanes and in all takeoff, climb out, approach and landing operations.

TAKEOFF AND LANDING CONDITIONS

When taking off on runways covered with water or freezing slush, the landing gear should remain extended for approximately ten seconds longer than normal, allowing the wheels to spin and dissipate the freezing moisture. The landing gear should then be cycled up, then down, wait approximately five seconds and then retract again.

Caution must be exercised to insure that the entire operation is performed below Maximum Landing Gear Operating Airspeed.

Use caution when landing on runways that are covered by water or slush which cause hydroplaning (aquaplaning), a phenomenon that renders braking and steering ineffective because of the lack of sufficient surface friction. Snow and ice covered runways are also hazardous. The pilot should also be alert to the possibility of the brakes freezing.

Use caution when taking off or landing during gusty wind conditions. Also be aware of the special wind conditions caused by buildings or other obstructions located near the runway in a crosswind pattern.

MEDICAL FACTS FOR PILOTS

GENERAL

Modern industry's record in providing reliable equipment is very good. When the pilot enters the airplane, he becomes an integral part of the man-machine system. He is just as essential to a successful flight as the control surfaces. To ignore the pilot in pre-flight planning would be as senseless as failing to inspect the integrity of the control surfaces or any other vital part of the machine. The pilot himself has the responsibility for determining his reliability prior to entering the airplane for flight.

While piloting an airplane, an individual should be free of conditions which are harmful to alertness, ability to make correct decisions, and rapid reaction time.

FATIGUE

Fatigue generally slows reaction times and causes foolish errors due to inattention. In addition to the most common cause of fatigue, insufficient rest and loss of sleep, the pressures of business, financial worries and family problems, can be important contributing factors. If your fatigue is marked prior to a given flight, don't fly. To prevent fatigue effects during long flights, keep mentally active by making ground checks and radio-navigation position plots.

HYPOXIA

Hypoxia in simple terms is a lack of sufficient oxygen to keep the brain and other body tissues functioning properly. There is wide individual variation in susceptibility to hypoxia. In addition to progressively insufficient oxygen at higher altitudes, anything interfering with the blood's ability to carry oxygen can contribute to hypoxia (anemias, carbon monoxide, and certain drugs). Also, alcohol and various drugs decrease the brain's tolerance to hypoxia.

Your body has no built in alarm system to let you know when you are not getting enough oxygen. It is impossible to predict when or where hypoxia will occur during a given flight, or how it will manifest itself. A major early symptom of hypoxia is an increased sense of well-being (referred to as euphoria). This progresses to slow reactions, impaired thinking ability, unusual fatigue, and dull headache feeling.

The symptoms are slow but progressive, insidious in onset, and are most marked at altitudes starting above ten thousand feet. Night vision, however, can be impaired starting at altitudes lower than 10,000 feet. Heavy smokers may experience early symptoms of hypoxia at altitudes lower than non-smokers. Use oxygen on flights above 10,000 feet and at any time when symptoms appear.

HYPERVENTILATION

Hyperventilation or overbreathing is a disturbance of respiration that may occur in individuals as a result of ery from hypoxia is rapid). If the symptoms persist, discontinue use of oxygen and consciously slow your breathing rate until symptoms clear and then resume normal breathing rate. Normal breathing can be aided by talking aloud.

ALCOHOL

Common sense and scientific evidence dictate that you not fly as a crew member while under the influence of alcohol. Even small amounts of alcohol in the human system can adversely affect judgment and decision making abilities. FAR 91.11 states "(a) No person may act as a crew member - (1) within 8 hours after the consumption of any alcoholic beverage."

Tests indicate that as a general rule, 2 ounces of alcohol at 15,000 feet produce the same adverse effects as 6 ounces at sea level. In other words, the higher you get, "the higher you get".

DRUGS

Self-medication or taking medicine in any form when you are flying can be extremely hazadous. Even simple home or over-the-counter remedies and drugs such as aspirin, antihistamines, cold tablets, cough mixtures, ence the bends at altitudes even under 10,000 feet, where most light planes fly.

ADDITIONAL INFORMATION

In addition to the coverage of subjects in this section, the National Transportation Safety Board and the Federal Aviation Administration periodically issue in greater detail, general aviation pamphlets concerning aviation safety. These can be obtained at FAA Offices, Weather Stations, Flight Service Stations, or Airport Facilities. These are very good sources of information and are highly recommended for study. Some of these are titled:

Airman's Information Manual
12 Golden Rules for Pilots
Weather or Not
Disorientation
Plane Sense
Weather Info Guide for Pilots
Wake Turbulence
Don't Trust to Luck, Trust to Safety
Thunderstorm - TRW
IFR-VFR Either Way Disorientation Can be Fatal