

Raytheon Aircraft Company

Beechcraft

Super King Air® A200CT

**FAA Approved Airplane Flight Manual
for
BP-1, BP-22, and BP-24 through BP-63**

Airplane Serial Number: _____

Airplane Registration Number: _____

FAA Approved by:



David Bernstorf
Raytheon Aircraft Company
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Raytheon Aircraft Company

LOG OF REVISIONS

FAA Approved Airplane Flight Manual

for

Super King Air® Model A200CT
(BP-1, BP-22, and BP-24 through BP-63)

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SECTION I

LIMITATIONS

All airspeeds quoted in this section are calibrated airspeeds (CAS)

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

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

RESTRICTED CATEGORY OPERATION

The A200CT is eligible for certification in Restricted Category at 14,000 lb. maximum weight and other limitations specified by the applicable Airplane Flight Manual (AFM) or Pilot's Operating Handbook (POH) for any special purpose that is specified by an FAA Approved Supplement to the applicable AFM or POH.

Limitations in this section which apply to Restricted Category operation only are indicated by the use of shading.

ENGINE LIMITS

The following limitations are to be observed in the operation of this airplane equipped with two Pratt and Whitney of Canada, Ltd. PT6A-41 engines. Each column is a separate limitation. The limits presented do not necessarily occur simultaneously. Whenever operating limits are exceeded, the pilots should record the value and duration of the condition encountered in the airplane log.

OPERATING LIMITS

OPERATING CONDITION	SHP	TORQUE PERCENT (1)	MAXIMUM OBSERVED TGT °C	GAS GENERATOR		PROP RPM N ₂	OIL PRESS PSI (2)	OIL TEMP °C
				RPM N ₁ (10)	%			
TAKE-OFF (3)	850	100%	750	38,100	101.5	2000	105 to 135	10 to 99
MAX CONT AND MAX CRUISE	850	100% (4)	750	38,100	101.5	2000	105 to 135	10 to 99
CRUISE CLIMB AND REC CRUISE	850	100% (4)	725	38,100	101.5	2000	105 to 135	0 to 99
HIGH IDLE	---	---	---	---	(5)	---	---	-40 to 99
LOW IDLE	---	---	660 (6)	19,500	52(min)	---	60(min)	-40 to 99
STARTING	---	---	1000 (7)	---	---	---	---	-40(min)
TRANSIENT	---	123% (7)	850	38,500(9)	102.6(8)	2200(7)	---	0 to 104(3)
MAX REVERSE (9)	---	---	750	---	88	1900	105 to 135	0 to 99

(1) Torque limit applies within range of 1600-2000 propeller (N₂). Below 1600 rpm, torque is limited to 50%.

(2) Normal take-off and maximum continuous operation oil pressure at gas generator speeds above 72% with oil temperature between 60 and 71°C is 105 to 135 psig up to 21,000 feet.

Above 21,000 feet, the minimum oil pressure is 85 psig. Plus or minus 10 psig fluctuations are acceptable. Oil pressure between 60 and 85 psig should be tolerated only for the completion of the flight at power setting not to exceed 49% torque. Oil pressures below 60 psig are unsafe and require that either the engine be shut down or a landing be made as soon as possible, using the minimum power required to sustain flight. During extremely cold starts, oil pressure may reach 200 psi.

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

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

(5) At approximately 70% N₁.

(6) High TGT at ground idle may be corrected by reducing accessory load and/or increasing N₁ rpm.

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

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

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

(10) For every 5°C below -48°C ambient temperature, reduce maximum allowable N₁ by 1.6%.

GENERATOR LIMITS

Maximum generator load is limited to 100% for flight and 85% during ground operations. Observe the following limits during ground operation.

GENERATOR LOAD	MINIMUM GAS GENERATOR RPM N ₁	
	WITHOUT AIR CONDITIONING	*WITH AIR CONDITIONING
0% to 70%	52%	61%
70% to 75%	55%	61%
75% to 80%	60%	61%
80% to 85%	65%	65%

*Right engine only, after stabilized.

TEMPERATURE LIMITS

Airplane shall not be operated when ambient temperatures are:

WARMER THAN SL to 25,000 feet ISA + 37°C
 Above 25,000 feet ISA + 31°C
 COLDER THAN All Altitudes -53.9°C

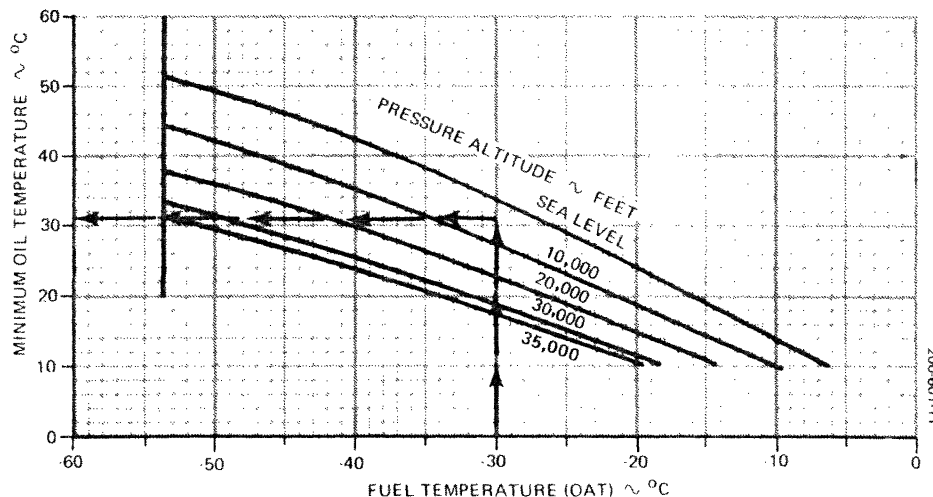
Engine ice vanes shall be retracted at + 15°C and above.

MINIMUM OIL TEMPERATURE REQUIRED FOR FLIGHT

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 temperatures versus OAT are such that ice formation could occur during take-off 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 cell. The additive concentration by volume shall be a minimum of .060% and a maximum of .15%.



CAUTION

JP4 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 if fuel has been blended. To assure proper concentration by volume of fuel on board, blend only enough additive for the unblended fuel.

FUEL

Jet A, Jet A1, Jet B, JP-4, JP-5, JP-8 fuels and grades 80/87 through 115/145 commercial aviation fuels, which conform to PWA Specifications No. 522 and later revisions.

Operation with the fuel pressure light on is limited to 10 hours between replacement or overhaul of the engine-driven fuel pump. Log fuel pressure light on time.

One standby boost pump may be inoperative for takeoff. (Crossfeed of fuel will not be available from the side of the inoperative standby boost pump.)

Operation on aviation gasoline:

1. Operation is limited to 150 hours between engine overhaul.
2. Operation is limited to 20,000 feet altitude with one standby boost pump inoperative.

USABLE FUEL

The fuel system has a total of 544 gallons of usable fuel.

FUEL MANAGEMENT

1. Auxiliary tanks are not to be filled unless the main tanks are full.
2. Maximum fuel imbalance between fuel systems is 1000 lbs.
3. Do not take off if fuel quantity gages indicate in yellow arc or less than 265 lbs of fuel in each main tank.
4. Crossfeed only during single-engine operation.

OIL

Synthetic type conforming to the current CPW 202 and PWA 521 Type II.

STARTERS

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

PROPELLERS

Two Hartzell full-feathering, constant speed, reversing, three-bladed propellers are equipped with T10178B-3R blades and HC-B3TN-3G hubs. Blade angles are measured at the 30 inch station: Feathered 90°, Reverse -9°, set flight idle stop to obtain $36 \pm 3\%$ ft-lbs torque at 1800 rpm (prop) at Sea Level, Standard Day conditions.

PROPELLER OVERSPEED LIMIT

The maximum propeller overspeed limit is 2200 rpm. Propeller speeds above 2000 rpm indicate failure of the primary governor. Propeller speeds above 2080 rpm indicate failure of both primary and secondary governors. Torque is limited to 81% for sustained operation above 2080 rpm.

INSTRUMENT MARKINGS

Turbine Gas Temperature: Green Arc 400°C to 750°C, Red Radial 750°C, Dashed Red Radial 1000°C

Torque Meter: Green Arc 20% to 100%, Red Radial 100%

Propeller Tachometer, N₂: Green Arc 1600 rpm to 2000 rpm, Red Radial 2000 rpm

Gas Generator (Turbine) Tachometer, N₁: Red Radial 101.5% rpm

Oil Pressure: Red Radial 60 psi, Green/Yellow Arc 85 psi to 105 psi, Green Arc 105 psi to 135 psi, Red Radial 200 psi

Oil Temperature: Green Arc 10°C to 99°C, Red Radial 99°C

Propeller Deice Ammeter: Green Arc 14 to 18 amperes

Pneumatic Gage: Green Arc 12 psi to 20 psi, Red Radial 20 psi

Cabin Altimeter and Differential Pressure: Green Arc 0 psi to 6.1 psi, Red Arc 6.1 psi to 6.4 psi (end of scale)

Fuel Quantity Indicators: Yellow Arc - 0 lbs to 265 lbs, No Take-off

AIRSPEED INDICATOR MARKINGS**

MARKING (Knots)	CAS VALUE OR RANGE	IAS VALUE OR RANGE	SIGNIFICANCE
Red Line	91	86	Air Minimum Single-Engine Control Speed (V _{mca})
White Arc	80-155	75-154	Full Flap Operating Range
White Triangle	200	200	Maximum Flaps-to/at-Approach Speed
Blue Line	122	121	One-Engine Inoperative Best-Rate-of-Climb Speed
Red Striped Needle	245	245	Maximum Operating Limit Speed

**The Airspeed Indicator is marked in CAS values.

AIRSPEED LIMITS

Maximum Operating Speed V_{mo} 245 knots

Maximum Operating Mach Number M_{mo}472 mach

NOTE

V_{mo}/M_{mo} may not be deliberately exceeded in any regime of flight (climb, cruise or descent).

Maximum Flap Extension Speed	
Approach Position - 40%	200 knots
Full Down Position - 100%.....	155 knots
Maximum Gear Extended Speed	182 knots
Maximum Gear Operating Speed	
Extension	182 knots
Retraction.....	164 knots
Maximum Design Maneuvering Speed	170 knots

ALTITUDE LIMITATIONS31,000 feet

- 1. Operation with aviation gasoline
 - a. Both standby boost pumps operative31,000 feet
 - b. Either standby boost pump inoperative20,000 feet
- 2. Operation with inoperative Yaw Damp17,000 feet

AUTOPILOT LIMITATIONS

- 1. During autopilot operations, pilot must be seated at the controls with seat belt fastened.
- 2. Maximum speed for autopilot operation is 245 knots/.472 Mach (V_{mo}/M_{mo}).
- 3. Do not use autopilot under 200 feet above terrain.
- 4. Autopilot and yaw damper must not be used during take-off 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.

MANEUVERS

This is a normal category airplane. Acrobatic maneuvers, including spins, are prohibited.

FLIGHT LOAD FACTORS

At the designed gross weight of:

	<u>12,500 Pounds</u>	<u>14,000 Pounds</u>
Flaps Up	3.17 G - Positive	2.5 G - Positive
Flaps Down	2.0 G - Positive	2.0 G - Positive

CAUTION

Do not use controls abruptly above 170 knots.

For turbulent air penetration, use an airspeed of 151 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.

MAXIMUM WEIGHTS

Maximum Take-off Weight	12,500 pounds /	14,000 pounds
Maximum Landing Weight	12,500 pounds /	13,500 pounds
Maximum Ramp Weight	12,590 pounds /	14,090 pounds
Maximum Zero Fuel Weight	10,400 pounds /	10,400 pounds

CENTER OF GRAVITY LIMITS (LANDING GEAR EXTENDED)

Aft Limit (Normal Category): 196.4 inches aft of datum at all weights.

Aft Limit (Restricted Category): 196.4 inches aft of datum at all weights.

Forward Limits (Normal Category): 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 or less.

Forward Limits (Restricted Category): 188.3 inches aft of datum at 13,500 pounds to 14,000 pounds, with straight line variation from 13,500 pounds to 181.0 inches aft of datum at 11,279 pounds or less.

STRUCTURAL LIMITATIONS

Maximum Cabin Pressure Differential	6.1 psi
Cargo Door Cam-Lock Actuator Cable Safelife	9,000 hours
Wing and Associated Structure Fatigue Safelife	20,000 hours
Horizontal and Vertical Stabilizers	45,000 hours
Windshield Frame Screws	10,000 cycles
All Wing Attach Bolts, Nuts, and Barrel Nut Assemblies:	
Steel Components	Replace every 6 calendar years of installed bolt and nut time
Inconel Components	Replace every 15 calendar years of installed bolt and nut time
Cabin Windows Safelife	5,000 hours

Refer to the *Raytheon Aircraft Structural Inspection and Repair Manual* and the *Beech Super King Air 200 Series Maintenance Manual* for inspection and replacement procedures.

Refer to the *Raytheon Aircraft 200 and 200C Pilot's Operating Handbook* and *FAA Approved Airplane Flight Manual* for limitations on cracked or shattered windshield or side windows (pilot's compartment or cabin).

The above lives are based on airplane utilization, operation and maintenance in the category of service for which the airplane was originally designed: specifically 95% or more times accumulated from pressurized executive or corporate transportation wherein the majority of cruise is above 10,000 ft altitude (AGL) and flight duration is more than one hour. Should the airplane be used for missions other than that intended by design, notify the Customer Support Department of Raytheon Aircraft Company for a more appropriate life.

MINIMUM CREW

One Pilot.

MAXIMUM OCCUPANCY

Restricted Category Operations Occupancy is limited to crew members only.

PASSENGER SEATS

The cabin passenger seats may be used in the aft facing position provided the occupant does not exceed the placarded weight limitation of 170 pounds. The headrest and seat back, when the seat is occupied, must be in the fully upright position for takeoff and landing.

CARGO LIMITATIONS

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

BRAKE DEICE

1. The brake deice system is not to be operated at ambient temperatures above 15 C.
2. The brake deice system is not to be operated longer than 10 minutes (one timer cycle) with the landing gear retracted. If operation does not automatically terminate approximately 10 minutes after gear retraction, turn the brake deice switch OFF.
3. Maintain 85% N1 or higher during simultaneous operation of the brake deice and surface deice systems. If adequate pneumatic pressure cannot be provided for simultaneous operation of the brake deice and surface deice systems, turn off the brake deice system.
4. In order to maintain an adequate supply of systems pneumatic bleed air, the brake deice system must be turned off during single engine operation.

PLACARDS

On Overhead Control Panel 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

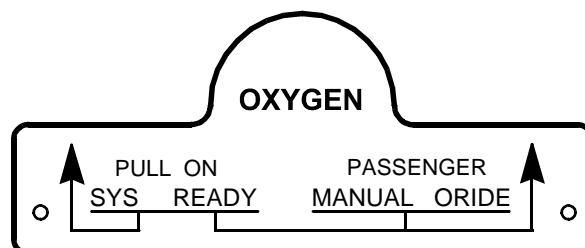
CAUTION

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	155 KNOTS
MAX GEAR EXTENDED	182 KNOTS	MAX MANEUVERING	170 KNOTS

BD02C
062139AA.AI

On Overhead Oxygen Control Panel:



BD02C
062140AA.AI

On Forward Partition Door:

**KICK HERE
FOR EMERGENCY EVACUATION**

AP 003480

On Main Instrument Panel:


**PROP SYN
ON +
OFF
FOR T. O. & LDG**

On Floor Adjacent to Pilot's Seat:

**LANDING
GEAR
ALTERNATE
EXTENSION**

**1. LIFT AND TURN
HANDLE TO
ENGAGE.**

**2. PUMP HANDLE
UP AND DOWN
UNTIL THREE
GREEN GEAR
LIGHTS ILLUM.**



On Pilot's Subpanel:

**SEE MANUAL PERFORMANCE
SECTION FOR INST CAL ERROR**

On Curved Pedestal Adjacent to Power Levers:

**CAUTION
REVERSE
ONLY WITH
ENGINES
RUNNING**

On Fuel Management Panel:

**SEE FLT MANUAL
FOR CAPACITY**

On Copilot's Main Instrument Panel:

**WARNING
DE-PRESSURIZE CABIN
BEFORE LANDING**

AP 003482

On Pilot's Window Frame:

**TURN OFF STROBE LIGHTS WHEN TAXIING
IN VICINITY OF OTHER AIRCRAFT OR
DURING FLIGHT THROUGH FOG OR CLOUDS
STD POSITION LIGHTS TO BE TURNED ON
FOR ALL NIGHT OPERATIONS**

AP 003483

PLACARDS (Continued)

On Pilot's and Copilot's Window Frame:

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

On Emergency Exit Handle:

EXIT-PULL

On Inside of Passenger Oxygen Access Door:

WARNING - DO NOT
SMOKE WHILE
OXYGEN IS IN USE

TO USE
- PULL LANYARD PIN
- DON MASK

On First Aid Oxygen Access Door:

FIRST AID OXYGEN — PULL

AP 003484

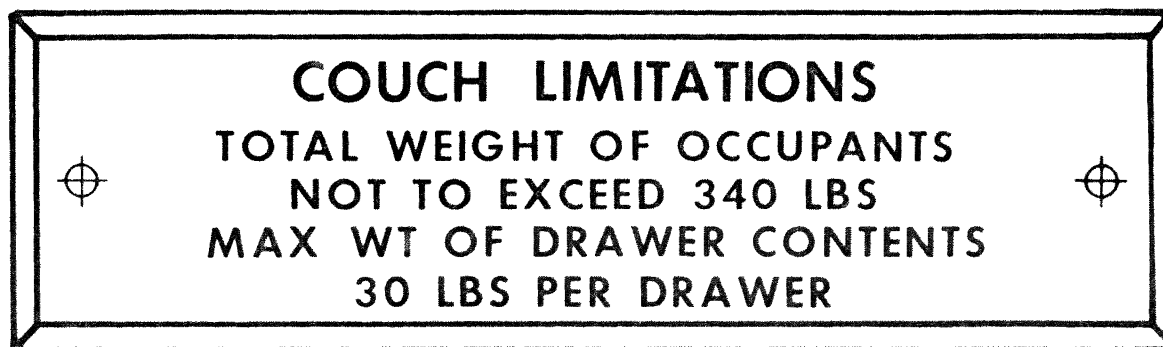
In Cabin Headliner:



On Each Chair Horizontal Cross Brace:



Inside Aft Drawer of 2 Place Couch:



In Lavatory:



AP 003485

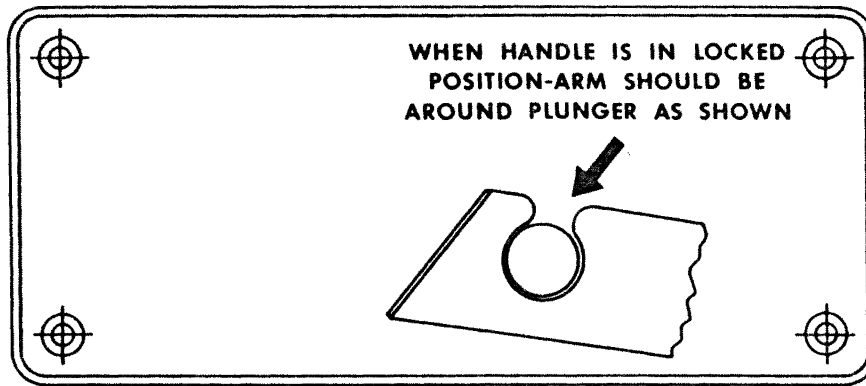
PLACARDS (Continued)

On Folding Step of Airstair Door:

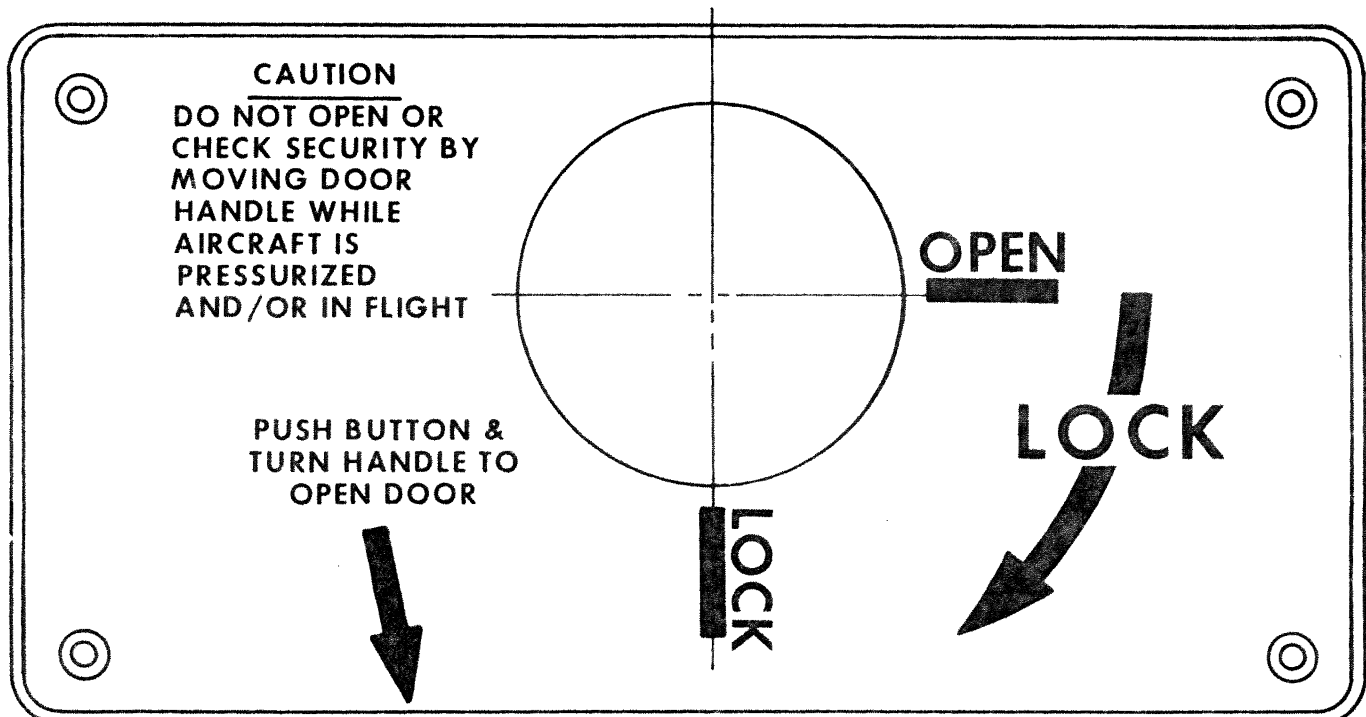


AP 003486

On Airstair Door Between Folding Steps:



Inside Airstair Door Behind Handle:



AP 003487

On Upper Latch Access Cover of Cargo Door:

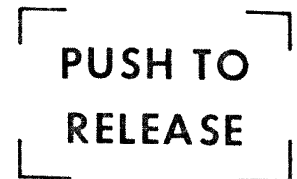


On Upper Latch Access Cover of Cargo Door:

On Cargo Door Upper Latch Handle:

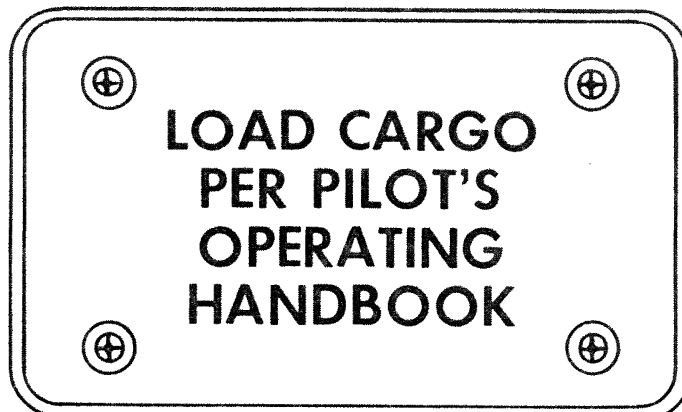


AP 003489



AP 003490

On Upper Access Cover of Cargo Door:



AP 003491

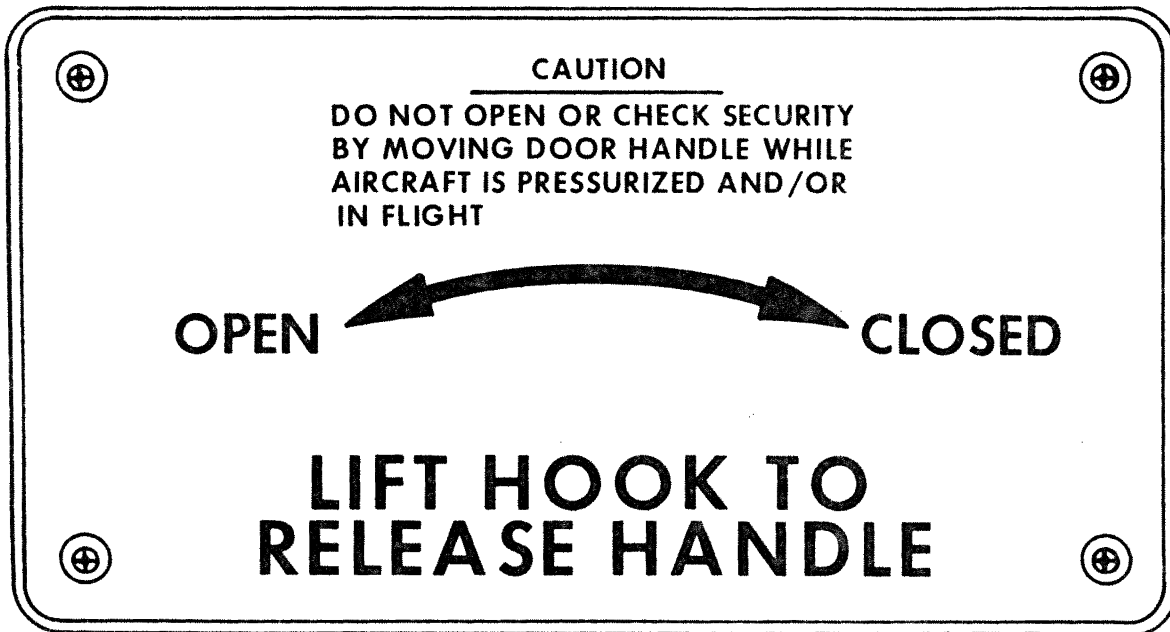
PLACARDS (Continued)

On Lower Access Cover of Cargo Door:



AP 003492

Inside Lower Access Cover of Cargo Door:



AP 003493

On Center of Aft Bulkhead:



On Aft Compartment Headliner:



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.

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 conditions.

- (-) 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						REMARKS and/or EXCEPTIONS
	VFR Day						
	VFR Night						
	IFR Day						
	IFR Night						
Icing Conditions							
COMMUNICATIONS							
Interphone System	1	-	-	-	-	-	-
Static Discharge Wicks	15	-	-	6*	6*	6*	- *Minimum required - one wick at the outboard end of each control surface plus top of vertical stabilizer.
Survival Radios	2	-	-	-	-	-	-
VHF Communications System	2	*	*	*	*	*	- *Per FAR 91.33
UHF Communications System	1	-	-	-	-	-	-
HF/SSB/AM Communications Sys	1	-	-	-	-	-	-
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	- May be inoperative provided both inverters are operative.
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	-
TGT 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	-	-	-	-	-	} May be inoperative provided airplane remains unpressurized.
Outflow Valve	1	1	1	1	1	1	
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						REMARKS and/or EXCEPTIONS
	VFR Day						
	VFR Night						
	IFR Day						
	IFR Night						
	Known Icing Conditions						
EQUIPMENT/FURNISHINGS							
Emergency Locator Transmitter	1	*	*	*	*	*	— *Per FAR 91.52
Seat Belts	*	*	*	*	*	*	— *Per FAR 91.33
Shoulder Harness, Pilot & Co-Pilot	2	*	*	*	*	*	— *Required for pilot and copilot.
FIRE PROTECTION							
Engine Fire Extinguisher	2	-	-	-	-	-	—
Fire Detector System	2	2	2	2	2	2	—
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	—
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.

SYSTEM and/or COMPONENT	Number of items installed						REMARKS and/or EXCEPTIONS
	VFR Day						
	VFR Night						
	IFR Day						
	IFR Night						
	Known Icing Conditions						
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	-
Brake Deice System	1	-	-	-	-	-	-
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	-
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	-
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/Cargo Door Caution Annunciator	1	1	1	1	1	1	- May be inoperative provided visual indicators are checked prior to each takeoff.
Master Caution Lights	2	-	-	-	-	-	-
Cockpit and Instrument Lights	*	-	*	-	*	-	- *Lights must illuminate all instruments and controls.

SYSTEM and/or COMPONENT	Number of items installed						REMARKS and/or EXCEPTIONS
	VFR Day						
	VFR Night						
	IFR Day						
	IFR Night						
Known Icing Conditions							
Landing Light	2	-	*	-	*	-	*One required for night flight if operated for hire.
Passenger Notice System (Fasten Seat Belt and No Smoking)	2	*	*	*	*	*	May be inoperative provided adequate passenger briefing has been accomplished.
Position Lights	3	-	3	-	3	-	
Strobe Beacons	2	-	2	-	2	-	
Strobe Lights	3	-	-	-	-	-	
Taxi Light	1	-	-	-	-	-	
Master Warning Lights	2	-	-	-	-	-	
Wing Ice Lights	2	-	-	-	-	*	*One required for night icing flight.
Recognition Lights	2	-	-	-	-	-	
Emergency Lights	5	-	-	-	-	-	
NAVIGATION INSTRUMENTS							
Airspeed Indicator	2	L	L	L	L	L	
Clock	2	-	-	1	1	1	
Course Indicator	2	-	-	L	L	L	
Distance Measuring Equipment	1	*	*	*	*	*	*Per FAR 91.33
Gyro Horizon Indicator	1	-	-	L*	L	L	
Flight Director Indicator	2	L	L	2*	2*	2*	*Right side may be inoperative if second crew member is not required.
Standby Magnetic Compass	1	1	1	1	1	1	
Navigation Equipment	*	-	-	*	*	*	*Per FAR 91.33
Outside Air Temperature	1	1	1	1	1	1	
Encoding Altimeter	2	L	L	L	L	L	
Pneumatic Altimeter	2	L	L	2*	2*	2*	*Right side may be inoperative if second crew member is not required.
Radio Altimeter	1	-	-	-	-	-	
Transponders	2	*	*	*	*	*	*Per FAR 91.24, 91.90, 91.97
Turn and Bank Indicators	2	-	-	L	L	L	
Instantaneous Vertical Speed Indicators	2	-	-	-	-	-	
Radio Magnetic Indicator	2	-	-	-	-	-	
OXYGEN							
Oxygen System	1	*	*	*	*	*	*Per FAR 91.32, 23.1447(b)
PROPELLERS							
Autofeathering Armed Annunciators	2	-	-	-	-	-	
Autofeathering System	1	*	*	*	*	*	*Autofeathering system must be installed and operational for take-off weights above 12,500 pounds (Restricted Category)
Propeller Governor Test Switch	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.

SYSTEM and/or COMPONENT	Number of items installed							REMARKS and/or EXCEPTIONS
	VFR Day							
	VFR Night							
	IFR Day							
	IFR Night							
Known Icing Conditions								
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.

SECTION II

NORMAL PROCEDURES

This section contains the operators' checklist to be accomplished during normal operation. The pilot is responsible for the initiation and accomplishment of all checklists in the same sequence they are presented in this section. A copilot may read the checklist and perform such duties as indicated. Upon completion of each checklist, a copilot may advise the pilot that the checklist called for has been completed.

* -Indicates performance of step is mandatory for all "Thru Flights", i.e., those stops where no maintenance is performed and no changes are made in crew composition.

PREFLIGHT

BEFORE EXTERIOR CHECK

- * 1. Publications - Check
- * 2. Gear Handle - Down
- 3. Oxygen System - Check and set
- * 4. Key Lock Switch - ON
- * 5. Flight Controls - Unlock/check free and correct response
- * 6. Parking Brake - Set
- 7. Manual Trim - Set zero
- 8. Transponder - OFF
- 9. Emergency Lights - Check

The emergency lights override switch should be placed in the TEST position and the emergency lights (5) checked for illumination and intensity. A dim light indicates a weak battery pack. At the completion of the check the switch must then be cycled from the TEST position to the OFF-RESET position and then placed in AUTO.

- 10. Battery Switch - ON
- 11. Beacons - ON, check - OFF
- 12. Lighting Systems - As required
- 13. Fuel Gage - Check
- 14. Battery - OFF
- 15. Overhead Floodlight - OFF
- 16. Emergency Equipment - Check

EXTERIOR CHECK

Fuel Sample - Check collective fuel sample.

NOTE

While making the exterior inspection, check all surfaces for general condition; check for fuel, oil, and hydraulic leaks; all covers and ground maintenance locks removed; struts for proper extension, gear doors, tire condition, and airplane chocked, as required.

CAUTION

Avoid contact with high temperature brake deicer system lines and distributor manifold if system has recently been operating.

LEFT WING

1. Flaps - Check
2. Fire Extinguisher Pressure - Check
3. Gear and Well - Check

Check for signs of leaks, damage, and wear of the tires, brake assembly and deicer plumbing, safety switch, torque knee, doors and strut. Strut extension of 5.50 inches minimum.

- * 4. Chocks - As required
- 5. Aileron and Trim Tab - Check
- 6. Navigation and Recognition Light - Check
- * 7. Main Fuel Cap - Check secure
- 8. Outboard De-ice Boot - Check
- 9. Stall Warning - Check
- * 10. Tiedown - Released
- 11. Fuel Vents - Check
- * 12. Engine Oil - Check and cap secure
- 13. Outboard Cowls and Exhaust - Check
- 14. Propeller - Check
- 15. Air Inlet and Ice Vane - Check clear and retracted
- 16. Inboard Cowls and Exhaust - Check
- 17. Heat Exchanger Inlet - Check
- 18. Inboard De-ice Boot - Check
- * 19. Auxiliary Fuel Cap - Check secure

NOSE SECTION

1. Lower Antennas and Beacon - Check
2. Outside Air Temperature Probe - Check
3. Avionics Door, Left Side - Secure
4. Air Conditioner Exhaust - Check
5. Gear and Well - Check

Check for signs of leaks, damage, and wear of tires, gear doors, gear actuator chain, torque knee, shimmy damper, turn stops, headset jack, and strut. Strut extension of 3.00 inches minimum.

- 6. Landing and Taxi Light - Check
- * 7. Chocks - As required
- 8. Pitot - Check
- 9. Windshield and Wipers - Check
- 10. Air Conditioner Inlet - Check
- 11. Avionics Door, Right Side - Secure

RIGHT WING

- * 1. Auxiliary Fuel Cap - Check secure
- 2. Battery Air Inlet - Clear
- 3. Inboard De-ice Boot - Check
- 4. Heat Exchanger Inlet - Check
- * 5. Engine Oil - Check and cap secure
- 6. Inboard Cowls and Exhaust - Check
- 7. Propeller - Check
- 8. Air Inlet and Ice Vane - Check clear and retracted
- 9. Outboard Cowls and Exhaust - Check
- 10. Gear and Well - Check

Check for signs of leaks, damage, and wear of the tires, brake assembly and deicer plumbing, safety switch, torque knee, doors and strut. Strut extension of 5.50 inches minimum.

11. Fire Extinguisher Pressure - Check
12. Fuel Vents - Check
- *13. Tiedown - Released
14. Outboard De-ice Boot - Check
- *15. Main Fuel Cap - Check secure
16. Navigation and Recognition Light - Check
17. Aileron and Tab - Check
18. Flaps - Check
- *19. Chocks - As required

EMPENNAGE SECTION

1. Lower Antennas - Check
2. Oxygen Door - Secure
3. Static Ports, Right Side - Clear
4. Emergency Locator Transmitter - Check ARMED
- * 5. Tiedown - Release
6. Access Panels - Secure
7. De-ice Boot, Right Side - Check
8. Control Surfaces and Trim Tabs - Check
9. NAV Lights - Check
10. De-ice Boot, Left Side - Check
11. Static Ports, Left Side - Clear
12. Top Antennas - Check

**INTERIOR CHECK*

1. Cargo/Loose Equipment - Secure

The airplane commander will insure that the airplane is loaded within prescribed limits.

2. Cabin/Cargo Doors - 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 crew members should close and lock doors.

3. Emergency Exit - Secure and unlocked

BEFORE STARTING ENGINES

- * 1. Seats, Pedals, Belts, Harnesses - Adjusted
2. Circuit Breakers - In
3. Light Dimming Controls - As required
- * 4. Cabin Temp Mode - OFF
5. Ice and Rain Switches - OFF and RETRACT
6. Exterior and Interior Lights - As required
7. Master Panel Lights - As required
8. Inverters - OFF
9. Avionics Master - OFF
10. Environmental Switches - As required
11. Oxygen Supply Pressure - Check
12. Oxygen Supply Control Handle - PULL ON SYS READY
13. # 1 Auto Ign and Eng Start Switches - OFF
14. Generator Switches - OFF
15. # 2 Eng Start and Auto Ign Switches - OFF
16. Clock and Map Lights - As required
- * 17. Power Levers - IDLE
- * 18. Propeller Levers - Full forward
- * 19. Condition Levers - FUEL CUTOFF
20. Flap Lever - UP
21. Audio Controls - As required
22. Rudder Boost - ON
23. Radios - As required
24. Gear Alternate Engage Handle - Disengage
25. Gear Ratchet Handle - Stowed
26. Outside Air Temperature - Check
27. VOR and Compass Switches - Set
28. Compass Gyros - SLAVE
29. Flight Instruments - Check
30. DME and Radar - As required

CAUTION

Do not operate radar in congested areas.

31. Engine Instruments - Check
32. Ice Vane Handles - In
33. Pilot's Static Air Source - NORMAL
- * 34. Gear Handle - DOWN and latched
35. Landing and Taxi Lights - OFF
36. Fire Pull Handles - PULL

The PUSH TO EXTINGUISH light will illuminate. Listen for operation of the fuel shutoff valve.

CAUTION

When the PUSH TO EXTINGUISH light is illuminated, the fire extinguisher system is armed. Pressing the extinguisher button will discharge the system.

37. Standby Pumps - ON

Listen for operation of the pumps.

- * 38. Battery - ON (Fuel pressure lights on)
39. Fire Pull Handles - IN (Fuel pressure lights off)
40. Standby Pumps - OFF (Fuel pressure lights on)

41. Crossfeed Check and OFF

Activate the crossfeed switch in each direction, noting that the FUEL CROSSFEED light on the annunciator illuminates. Both fuel pressure lights will extinguish.

42. Aux Transfer Over Ride Switches - AUTO

43. Current Limiters - Check

Individually turn each inverter ON and check for AC power, then turn the inverter OFF. Limits are 104-124 volts and 394-406 Hz.

44. Gear Handle Light - TEST

45. Annunciator - TEST

46. Stall and Gear Warning - TEST

Landing gear handle "Red" warning light will illuminate.

47. Fire Protection - Test

- a. Fire detectors: Activate the switch to check that the FIRE PULL handle lights and the Master Warning Lights illuminate in all three positions. If the Master Warning is cancelled between selections it will not reilluminate.
- b. Fire extinguishers: Check for illumination of the SQUIB OK light and the proper EXTNGH DISC caution light.

***ENGINE START**

BATTERY START

1. Beacon ON, Navigation Lights - As required
2. Propeller - Clear
3. # 2 Ignition and Engine Start Switch - ON

Note # 2 FUEL PRESS and # 2 NO FUEL XFR lights - OFF - within 30 to 50 seconds.

CAUTION

If no TGT rise is observed within 10 seconds after moving the Condition Lever to LOW IDLE, move the Condition Lever to CUT-OFF and the Ignition and Engine Start Switch - OFF. Allow 30 seconds for fuel to drain, then follow ENGINE CLEARING procedures.

4. # 2 Condition Lever - LOW IDLE (after N_1 rpm stabilizes; 12% minimum)
5. TGT and N_1 - Monitor (1000°C maximum)
6. # 2 Oil Pressure - Check
7. # 2 Condition Lever - HIGH IDLE

NOTE

Any time the condition lever is moved, the pilot should monitor TGT.

8. # 2 Ignition and Engine Start Switch - OFF (N_1 , 50% minimum)
9. # 2 Generator - RESET, then ON
10. Charge battery until loadmeter reads 50% or less, then - OFF.
11. Propeller - Clear
12. # 1 Ignition and Engine Start Switch - ON

Note # 1 FUEL PRESS and # 1 NO FUEL XFR lights - OFF - within 30 to 50 seconds.

13. As # 1 N_1 rpm accelerates thru 12%:

- a. # 1 Condition Lever - LOW IDLE
- b. # 2 Generator - RESET, then ON

14. TGT and N_1 - Monitor (1000°C maximum)

15. # 1 Oil Pressure - Check

16. # 1 Condition Lever - HIGH IDLE

17. # 1 Ignition and Engine Start Switch - OFF (N_1 , 50% minimum)

18. # 1 Generator - RESET, then ON

19. # 1 and # 2 Inverters - ON

20. # 1 and # 2 Condition levers - As required

ENGINE CLEARING

1. Condition Lever - FUEL CUTOFF
2. Ignition and Engine Start Switch - OFF (1 min)

CAUTION

Starter time limits are: 40 seconds ON, 60 seconds OFF, 40 seconds ON, 60 seconds OFF, 40 seconds ON, then 30 minutes OFF.

3. Ignition and Engine Start Switch - STARTER ONLY (min 15 Sec., Max 40 Sec.)
4. Ignition and Engine Start Switch - OFF

BEFORE TAXI

1. Brake Deice - As required, see Icing Flight, this section
2. DC Voltage and Loadmeter - Check
3. AC Voltage and Frequency - Check
- * 4. Avionics Master - ON
- * 5. Cabin Temperature and Mode - Set
- * 6. Engine Instruments - Check

WARNING

The radar must be in OFF, STANDBY, or TEST in congested areas.

- * 7. Radios, DME, Radar, and Transponder - As required

Interphone and COMM/NAV Radios should be set as desired. Radar and Transponder should be set to STANDBY if they are to be used for flight.

WARNING

Operation of the electric elevator trim system is controlled by the use of two PITCH - TRIM rocker switches on either control wheel. Any movement of the elevator trim wheel while operating one of the rocker switches on a single control wheel denotes a system malfunction that requires the electric trim system be turned OFF and manual operation only of the elevator trim.

8. Electric Elevator Trim - Check/ON

- a. Elevator Trim Switch - PUSH ON
- b. Pilot's and Copilot's PITCH - TRIM Rocker Switches - Check operation.
- c. A/P Trim Disconnect Switch - Depress (Electric trim system disconnects)
- d. Elevator Trim Switch - PUSH ON

9. Autopilot - Check/disengaged

The preflight check assures the pilot that the safety and failure warning features of the system are operating properly.

- a. Turn on airplane power, an inverter and the avionics master switch. Check that the vertical gyro has erected and that the gyro-stabilized magnetic compass is in the SLAVE mode (all compass 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 of the autopilot. It is possible to get a hardover control surface deflection if an autopilot pitch or roll command is allowed to remain active for any appreciable time. If it is desired to check the operation of the pitch/turn control, move each control only as far as required to check control surface deflection and direction, then return it to the center (detent) position.

- b. Position the control wheel at mid-travel and engage the autopilot. Check that the control wheel resists movement in the fore, aft, left and right directions. Position the heading marker 10 degrees left, then 10 degrees right of the lubber line. Observe that the flight director commands a bank towards the new heading and that the control wheel responds in the proper direction.
- c. Push the AP/YD button to the first detent on the control wheel. Observe that the autopilot disengages and that the flight controls operate freely.
- d. Position the control wheel at mid-travel and engage the autopilot. Select HDG mode. Command 5 degrees nose-up with the autopilot pitch control. The trim wheel should move in the nose-up direction after a few seconds and the TRIM UP annunciator on the mode selector should flash. Command nose-down by moving the control wheel pitch - trim rocker switches to the NOSE DN position. The autopilot should immediately disengage and the AP TRIM FAIL light on the warning annunciator panel and the master fault warning light on the glareshield should illuminate.

NOTE

The AP TRIM FAIL annunciator will extinguish by depressing the TRIM DISC switch (second detent) on either control wheel and the master fault warning light is reset by depressing its face.

- e. Push ON and illuminate the electric elevator trim switch located on the extended pedestal.
- f. Position the control wheel at mid-travel and engage the autopilot. Select HDG mode. Command 5 degrees nose-down with the autopilot pitch control. The trim wheel should move in the nose-down direction after a few seconds and the TRIM DN annunciator on the mode selector should flash. Command nose-up by moving the control wheel pitch-trim rocker switches to the NOSE UP position. The autopilot should immediately disengage and the AP TRIM FAIL light on the warning annunciator panel and the master fault warning light on the glareshield should illuminate.
- g. Push ON and illuminate the electric elevator trim switch located on the extended pedestal.
- h. Position the control wheel at mid-travel and engage the autopilot. Lift the autopilot trim test switch over its detent and hold in the forward position while exerting a constant and overriding forward pressure on the control wheel. The autopilot should disengage after approximately 5 seconds and the AP TRIM FAIL light on the warning annunciator panel and the master fault warning light on the

- glareshield should illuminate.
- i. Push ON and illuminate the electric elevator trim switch located on the extended pedestal.
 - j. Repeat step h while exerting a constant and overriding aft force on the control wheel.
 - k. Push ON and illuminate the electric elevator trim switch located on the extended pedestal.
 - l. Select HDG mode and position heading marker 20 degrees left or right of the lubber line. Observe that the flight director commands a bank in the proper direction. Engage the autopilot and immediately (before the control wheel deflects to a hardover position) press the go-around button located on the left power lever. Observe that the GA annunciator illuminates, the autopilot disengages, and the flight director commands a wings level, 7 degree nose-up attitude.

NOTE

The go-around mode will automatically be terminated by engaging the autopilot or selecting any lateral mode.

10. Radios - Check

Check for proper operation of all required radios.

- *11. Taxi Clearance - Check
- *12. Clocks and Altimeters - Set
- *13. Taxi Lights - As required
- *14. Chocks - Check removed
- *15. Brakes - Released

*TAXI

1. Brakes - Check
2. Flight Instruments - Check

Check for all proper movement.

ENGINE RUN-UP

1. Nose Wheel - Centered
- * 2. Brakes - Set
3. Overspeed Governors and Rudder Boost - Check
 - a. Rudder Boost - ON
 - b. Propeller Levers - Full forward
 - c. Condition Levers - LO IDLE
 - d. # 1 Prop Test Switch - Hold in PROP GOV TEST
 - e. # 1 Power Lever - Increase until propeller is stabilized at 1830 to 1910 RPM (this checks overspeed governor) then continue to increase power until rudder movement is noted (observe TGT and torque limits)
 - f. # 1 Power Lever - IDLE
 - g. # 1 Prop Test Switch - Released
 - h. # 2 Prop Test Switch - Hold in PROP GOV TEST
 - i. # 2 Power Lever - Increase until propeller is stabilized at 1830 to 1910 RPM (this checks overspeed governor) then continue to increase power until rudder movement is noted. (Observe TGT and torque limits)
 - j. # 2 Power Lever - IDLE
 - k. # 2 Prop Test Switch - Released
 - l. Condition Lever - As required

4. Primary Governors - Check

Check by setting power levers at 1800 RPM with the propeller levers full forward.

- a. Propeller Levers - Full forward
- b. Power 1800 RPM - Set
- c. Propeller Levers - To detent
- d. Check RPM - 1600 - 1620
- e. Propeller Levers - Full forward

5. Ice Vanes - Check

At 1800 RPM extend ice vanes electrically and check for torque drop. RETRACT the vanes and check for return to original torque. Monitor for ICE VANE EXT lights illumination during check.

6. Condition Levers - As required

7. Autofeather - Check

- a. Power Levers - Approximately 22% torque
- b. Autofeather Switch - Hold to TEST (observe both autofeather annunciators illuminated)
- c. Power Levers - Retard individually:

- (1) at 16 - 21% torque - opposite light out
- (2) at 9 - 14% torque - both lights out (propeller starts to feather)

- d. Power Levers - Both retarded (both lights out, neither propeller feathers)

8. Autofeather Switch - ARM

9. Propeller Feathering (manual) - Check

10. Anti-icing and De-icing Systems - Check

11. Flaps - Check

***BEFORE TAKEOFF**

1. Flaps - Set
2. Trim - Set
3. Bleed Air Valves - OPEN

NOTE

Under hot and humid conditions (i.e. max air conditioning required) bleed air should be left closed (ENVIRO OFF) until airborne and sufficient altitude is gained.

4. Pressurization - Check and 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.

5. Annunciator Panels - Check clear

6. Communications and Navigation Radio - Set

7. Yaw damp - OFF

8. Flight instruments - Set

9. Engine instruments - Check

10. Fuel panel - Check for proper switch position and fuel quantity

11. Propeller Levers - Full forward
12. Friction locks - Set
13. Flight Controls - Check
14. Engine Auto Ignition - ARM

1 and # 2 IGN ON lights should be illuminated below approximately 20% torque.

*LINEUP

NOTE

Strobe beacons should be turned off at the pilot's discretion when encountering conditions of haze, fog, or clouds.

1. Ice Protection - As required
2. Transponder - As required
3. GYRO heading - Check

TAKEOFF

Handbook's Takeoff Performance is achieved by setting brakes, stabilizing takeoff power, then releasing brakes. Monitor TGT and engine torque. Increasing airspeed will cause torque and TGT to increase. Ensure that AUTO FEATHER armed lights are illuminated while applying power.

Takeoff roll may begin at idle engine power or the brakes may be held while the power levers are advanced to takeoff power. As the takeoff roll progresses, the pilot should initiate directional control using rudder. Plan the takeoff according to the following variables affecting takeoff technique: Field elevation, gross weight, wind, outside air temperature, type of runway, and height and distance of the nearest obstacles. Rotation and lift off speeds can be determined in specific performance graphs which include these variable conditions.

NOTE

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

AFTER TAKEOFF

WARNING

Pilots should avoid adjusting avionics controls located on the aft portion of the extended pedestal while the airplane is in a turn to preclude inducing spatial disorientation (vertigo).

1. Gear - UP
2. Landing/Taxi Lights - OFF
3. Flaps - UP
4. Yaw Damp - ON
5. Climb Power - Set

Observe maximum TGT, Torque, and N_1 RPM limits.

6. Propeller Synchrophaser - ON

7. Autofeather - OFF
8. Engine Instruments - Check
9. Cabin Pressurization - Monitor
10. Wings, Nacelles - Check, for fuel/oil leaks
11. Cabin Signs - As required

CRUISE

WARNING

Do not lift power levers in flight.

1. Power - Set
2. Ice Protection - As required
3. Engine Instruments - Check
4. Cabin Signs - As required
5. Auxiliary Fuel Gage - Monitor

Ensure fuel is being transferred from auxiliary tanks.

CABIN PRESSURIZATION FOR CRUISE

If flight calls for an altitude increase of 1000 feet or more, set ACFT ALT dial to cruise altitude plus 1000 feet.

AUTOPILOT OPERATIONS

The autopilot/flight director commands are selected by the autopilot mode selector located on the extended pedestal. Selection is accomplished by pressing the face of the appropriate push - on/push - off switch. 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. If a vertical mode is not selected, the pitch hold mode is automatically operational.

Selection of a mode causes the legend of that pushbutton switch to illuminate. The self-test switch on the lower right of the autopilot control panel acts as a lamp test when depressed. For operation at night, overall illumination of the autopilot mode selector and switches is adjusted by the 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 lenses and illuminate when the respective conditions are indicated. Dimming of the annunciator panel lights is provided by a rheostat adjacent to the panel placarded DIM - BRT.

ENGAGING AUTOPILOT

1. Place the engage-disengage switch on the autopilot mode selector in 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 autopilot mode selector. The legend of the selected mode button will illuminate, and the autopilot annunciator lights on the instrument panel will light, 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 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 turn control is returned to its detent, the autopilot will maintain that 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) causes the selected lateral modes to release.

CONTROL WHEEL SYNCHRONIZATION

The PITCH SYNC & CWS button on the control wheels 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.

The ALT or IAS mode will immediately disengage (if selected) when the PITCH SYNC & CWS button is depressed.

When the autopilot is coupled to the HDG, NAV, APPR or B/C modes, releasing the PITCH SYNC & CWS button will cause the autopilot to couple to the previously selected mode.

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 place engage-disengage switch 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 autopilot mode selector. The system is then armed to capture the beam as indicated by the NAV ARM annunciator light on the instrument panel. At the point of capture the NAV 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 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 a VORTAC is being used. A LIN DEV light on the autopilot annunciator will illuminate to indicate operation. 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. Linear deviation measures the airplane's displacement in nautical miles from the selected course rather than degrees of displacement associated with normal VOR navigation. Linear deviation permits flying parallel to any selected course by maintaining the appropriate needle deflection on the HSI.

When the LIN DEV light is on, the flight director system is obtaining distance data from the DME and bearing from the VOR-1 receiver. Note: Linear Deviation operates only when DME is on Nav-1 Rec and is displayed on Pilot's Indicator ONLY. 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 the 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 VOR-1 position.

AUTOMATIC APPROACH - FRONT COURSE

NOTE

The localizer and glideslope are captured automatically on an 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 autopilot mode selector. Any vertical mode may be used.
2. Press the APPR button on the autopilot mode selector. The NAV 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 NAV 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. 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 degrees 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.

4. 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.
4. Select B/C on the control unit. The NAV ARM and BACK LOC annunciator lights 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. If a minimum altitude is attained before visual contact is achieved, the ALT mode may be used to hold altitude until time to a missed approach has elapsed.
7. 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 are biased out of view when all lateral modes are cleared.
2. When the autopilot engage-disengage switch 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 autopilot mode selector.
3. To synchronize the vertical command to airplane attitude while in flight director function, depress the PITCH SYNC & CWS button on the control wheel.

4. Altitude hold information is displayed on the command bars in flight director function by pushing the ALT button on the autopilot mode selector.
5. To maintain a desired indicated airspeed, press the IAS button on the autopilot mode selector.
6. Anytime the autopilot is ON, test functions for NAV and MARKER BEACONS are locked out.
7. When the HF radio set is keyed with the autopilot in use there may be a momentary pulse in the control wheel.

DESCENT

NOTE

Approximately 75% N_1 (85% N_1 with one engine inoperative) is required to maintain the pressurization schedule during descent.

1. Seat Belts, Shoulder Harness - Fastened
2. Cabin Pressurization - 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
3. Altimeters - Set
4. Ice Protection - As required

Set windshield heat in NORMAL or HI well before descent into warm moist air to aid in defogging.

5. Cabin Signs - As required

BEFORE LANDING

CAUTION

Propeller Operation in the range of 1750 - 1850 rpm should be avoided as it may cause ILS glideslope interference.

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

The airplane has demonstrated landings on hard, smooth surfaces and dry sod runways. Hard braking, i.e. skidding tires while operating on other than smooth surfaces, can result in damage to the landing gear. Therefore, when landing on these surfaces, the pilot should use discretionary propeller reverse and minimum wheel braking necessary to stop the airplane on the available runway.

NOTE

Under low visibility conditions, landing, taxi and recognition 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 directed.

1. Cabin Signs - BOTH

NOTE

All reclining seats must be in the upright position during landing.

2. Propeller Synchrophaser - OFF
3. Autofeather Switch - ARM
4. Flaps - APPROACH
5. Gear - DOWN
6. Landing/Taxi Lights - As required
7. Brake Deice - As required, see Icing Flight, this section

LANDING

CAUTION

If possible, propellers should be moved out of reverse above 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 visibility at low airplane speeds.

1. Yaw Damp - OFF
2. Flaps - As required
3. Gear - Rechecked DOWN
4. Propeller Controls - Full forward

If maximum reverse thrust landing is made, the condition levers should be in HIGH IDLE.

GO-AROUND (BALKED LANDING)

1. Power - Maximum allowable
2. Airspeed - Establish 100 KIAS minimum

After achieving positive rate of climb

3. Flaps - UP
4. Gear - UP
5. Landing/Taxi Lights - OFF

AFTER LANDING

1. Landing/Taxi Lights - As required
2. Auto Ignition - OFF
3. Ice Protection - OFF
4. Bleed Valves - As required
5. Flaps - UP (after clear of the active or stopped)
6. Transponder - As required

If mission dictates discharging passenger or cargo with one engine running, leave transponder in STANDBY.

7. Weather Radar - OFF

ENGINE SHUTDOWN

1. Nose Wheel - Center
2. Parking Brake - Set
3. Landing/Taxi Lights - OFF
4. Cabin Temp Mode - OFF
5. Autofeather Switch - OFF
6. Vent and Aft Blowers - AUTO
7. Avionics Master - OFF
8. Inverters - OFF
9. Battery Condition - Check

If BATTERY CHG. light is illuminated, refer to NICKEL - CADMIUM BATTERY CONDITION CHECK.

10. Radios and DME - OFF
11. Transponder - OFF
12. TGT - Stabilized one minute
13. Propellers - FEATHER

CAUTION

Monitor TGT 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. Condition Levers - FUEL CUTOFF
15. Nav Lights and Beacons - OFF
16. Master Panel Light Switch - OFF
17. Battery and Generators - OFF
18. Key Lock Switch - Remove
19. Oxygen System - OFF

BEFORE LEAVING AIRPLANE

1. Wheels - Chock

CAUTION

Avoid contact with high temperature brake deicer system lines and distributor manifold if system has recently been operating.

2. Parking Brake - As required
3. Flight Controls - Lock
4. Standby Pumps - OFF
5. Windows - Closed and latched
6. Emergency Exit - Lock
7. Overhead Floodlights - OFF
8. Airplane Forms - Complete
9. Aft Cabin Light - OFF

CAUTION

The standby boost pumps, overhead flood lights and cabin lights are connected to the battery bus. Failure to turn these switches OFF will discharge the battery.

10. Door Light - OFF
11. Airplane - Secure

Check for pitot covers, propeller restraints, inlet covers, and tiedowns installed as necessary. Check cabin/cargo door(s) locked as required.

NICKEL-CADMIUM BATTERY CONDITION CHECK

DURING ENGINE START

1. BATTERY CHARGE Annunciator - ON (approximately 6 seconds after generator is on the line)

NOTE

The yellow BATTERY CHARGE light will illuminate after each battery engine start. The light will normally extinguish within two to five minutes, indicating that the battery is approaching full charge. Prolonged battery operation of radios and lights will reduce the battery state of charge, thereby increasing the time interval the battery charge light remains illuminated.

If the BATTERY CHARGE light does not extinguish within five minutes, conduct the following battery condition check each 90 seconds:

2. Loadmeter - Check

After the loadmeter stabilizes, momentarily turn off the Battery Switch and note charge current on loadmeter.

NOTE

A continued decrease in charge current for two consecutive 90 second loadmeter checks indicates a satisfactory battery charging condition. The battery condition is unsatisfactory if the BATTERY CHARGE light remains illuminated and the charge current fails to decrease between checks.

IN FLIGHT

1. BATTERY CHARGE Annunciator - ON

NOTE

Other than possible illumination for short intervals after landing gear and/or flap operation, the illumination of the charge light during normal steady-state cruise indicates conditions exist which may cause a battery thermal runaway. Conduct a battery condition check as described in DURING ENGINE START.

2. Loadmeter - Check

NOTE

If the loadmeter check does not show a decreasing charge current and the light remains illuminated; turn the Battery Switch OFF and use the battery only for gear and flap extension and approach to landing.

DURING ENGINE SHUTDOWN

1. BATTERY CHARGE Annunciator - ON
2. Loadmeter - Check

NOTE

Conduct a battery condition check as described in DURING ENGINE START. If the battery is unsatisfactory, it should be removed and checked by a qualified nickel-cadmium battery shop.

ICING FLIGHT

CAUTION

Stalling airspeeds should be expected to increase when ice has accumulated on the airplane causing distortion of the wing airfoil. For the same reason, stall warning devices are not accurate and should not be relied upon. Keep a comfortable margin of airspeed above the normal stall airspeed with ice on the airplane. Maintain a minimum of 140 knots during sustained icing conditions to prevent ice accumulation on unprotected surfaces of the wing. In the event of windshield icing, reduce airspeed to 226 knots or below.

1. Surface De-ice System
 - a. Preflight: Check boots for damage and cleanliness
 - b. Before take-off: De-ice switch - Check both positions (SINGLE CYCLE AUTO, DEICE MANUAL)
 - (1) Check pneumatic 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) - De-ice switch - SINGLE CYCLE AUTO (repeat as required)

NOTE

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

2. Engine Anti-Ice System
 - a. Before take-off: 1800 RPM
 - (1) # 1 and # 2 Ice Vane Controls
 - (a) Extend - Check for torque drop, indicating vane extension. Check VANE EXT lights

illuminated.

(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 IOAT and below, or,
- (2) At night when freedom from visible moisture is not assured at + 5° C IOAT and below.

(a) # 1 and # 2 Ice Vanes - EXTEND (Check # 1 and # 2 VANE EXT lights illuminated)

NOTE

If yellow VANE FAIL light(s) illuminate after 15 seconds, ice vane(s) have not extended to proper position. Use manual control to extend.

- (b) Check proper operation by noting torque drop
- (c) Regain torque by increasing power levers if desired (observe TGT limits)

CAUTION

If in doubt, extend 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 IOAT and above to assure adequate engine oil cooling. Operation of strobe beacons will sometimes show ice crystals not normally visible.

3. Electrothermal Propeller De-ice System

CAUTION

Do not operate propeller de-ice when the propellers are static.

a. Before Take-off:

- (1) Propeller De-ice Switch - AUTO
- (2) De-ice Ammeter - 14 to 18 AMPERES
- (3) To check the automatic timer, watch the de-ice 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 De-ice 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 de-ice 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) Propeller De-ice Switch - OFF

b. In Flight:

- (1) Propeller De-ice 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 ice ammeter does not indicate 14 to 18 amperes, or the automatic timer fails to switch, refer to the Emergency Procedures section.

4. Left and Right Fuel Vent Heat - ON
5. Left and Right Pitot Heat - ON
6. Stall Warn 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
10. Brake Deice System

a. Before Taxi:

- (1) Bleed Air Valves - OPEN
- (2) Brake Deice Switch - ON (check annunciator illuminated)
- (3) Condition Levers - HIGH IDLE

NOTE

Once brakes have been deiced, the condition levers may be returned to LOW IDLE.

b. After Takeoff:

- (1) Monitor BRAKE DEICE annunciator for automatic termination of operation (approximately ten minutes after liftoff) and turn the brake deice switch OFF.
- (2) If brake deice operation does not automatically cease operation, the system must be turned off manually with the brake deice switch.

c. Before Landing:

NOTE

If the automatic timer has terminated brake deicer operation after the last landing gear retraction, the landing gear must be extended before the timer can be reset and the brake deice system can again be activated. Brake icing should be considered when encountering moisture during ground operations or inflight icing conditions.

- (1) Brake Deice Switch - ON (check annunciator illuminated)

ENVIRONMENTAL CONTROLS

PRESSURIZATION SYSTEM

After engine start, the pressurization system may be checked for operation in the following manner:

1. Place the bleed air valves in the OPEN position.
2. Set the cabin pressure controller for an altitude of 500 feet below field pressure altitude.
3. Move the pressurization switch to the TEST position. (This will bypass the landing gear safety switch and the cabin will begin to pressurize.)
4. Check the cabin rate-of-climb for pressurizing and, when confirmed, release the pressurization switch.

To set the pressurization before take-off:

1. Check environmental control settings (heat or cool, manual or automatic, as desired)
2. Open the bleed air valves.
3. Check to see that the pressurization switch is in the PRESS position.
4. Select the cabin altitude desired for cruise.
5. After take-off, adjust the rate controller.

HEATING OR COOLING

1. Bleed Air Valves - OPEN (ENVIRO OFF for more efficient cooling on the ground.)
2. Cabin Temperature Mode - AUTO
3. Vent and Aft Vent Blower - AUTO
4. Temperature Control - As required
5. 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. With air conditioner on, maintain at least 65% N_1 speed on the right engine. If below N_1 minimum speed, an advisory light on the caution/advisory panel, AIR COND N_1 LOW, will illuminate and the air conditioner compressor clutch will disengage.

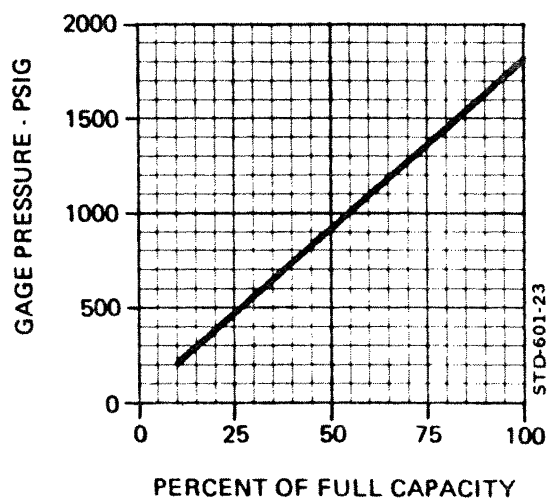
DEFROSTER AIR

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)

OXYGEN SYSTEM

PREFLIGHT

1. Note pressure on oxygen pressure gage
2. Determine percent of full capacity on graph
3. Multiply oxygen duration in minutes by percent of full capacity
4. Oxygen System Control - PULL ON SYS READY
5. Diluter Demand Masks - Check operation, set masks at 100% position, plugged in and hung on sidewall



NOTE

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

OXYGEN DURATION

Oxygen duration is computed at a rate of 3.7 Standard Liters Per Minute (SLPM) flow and is approved for altitudes up to 30,000 feet. This table is also used for the diluter demand crew oxygen masks. When selected to the 100% mode, the number of crew masks in use should be doubled for computation.

NUMBER OF PEOPLE USING

Cylinder Volume Cu Ft	1	2	3	4	5	6	7	8	9	10	11	12
DURATION IN MINUTES												
49	336	168	108	84	66	54	48	42	37	33	30	27

USING OXYGEN

1. *Passengers* - Lanyard Pin - PULL PIN and DON MASK

NOTE

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

2. *Crew* - Diluter Demand System - Don Mask (When used at a cabin alt. of 20,000 ft. 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

1. *Passengers*
 - a. Insert Lanyard Pin
 - b. Return Masks 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 ORIDE must be in the OFF position.

2. *Crew* - Return Mask to Mount (Lever at 100% position)
3. *First Aid Oxygen*
 - a. ON/OFF Valve - OFF position
 - b. Return Mask to Compartment and Close Cover

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.

Flyover noise level established in compliance with FAR 36 is:

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.

CARGO DOOR

TO OPEN THE CARGO DOOR

The cargo door latching mechanism can only be operated from inside the airplane.

CAUTION

Ensure that the airstair door is closed and locked. Operating the cargo door while the airstair door is open may damage the door hinges and adjacent structure.

1. Unfasten and open the handle access door at the lower forward corner of the cargo door. Lift hook and move the handle to the OPEN position.
2. Unfasten and open the handle access door at the upper aft corner of the cargo door. Depress the button and lift the handle to the OPEN position. This handle will latch into place.
3. Attach one end of the door stabilizer assembly (door support rod) to the cargo door ball stud on the forward side of the door. (Ensure the detent pin is installed.)
4. Push out on the airstair door sill step, and allow the cargo door to swing open. (The gas springs will automatically open the cargo door.)

CAUTION

Avoid side loading of the gas springs to prevent damage to the mechanism.

5. Attach the free end of the support rod to the ball stud on the forward fuselage door frame.

TO CLOSE THE CARGO DOOR

1. Detach the door support rod from the fuselage door frame ball stud.
2. Firmly grasp the free end of the door support rod while exerting a downward force to overcome the pressure of the gas spring assemblies. Remove the support rod from the door as the gas spring assemblies pass the overcenter position. (The internal pressure of the gas springs is reversed forcing the door to the closed position.)
3. Using the finger hold cavity in the fixed airstair door step, pull the cargo door closed to permit the latching mechanism to engage.
4. Depress the button in the center of the handle at the upper aft corner of the cargo door and pull the handle down until the handle latches into position. Pull aft on the handle to assure that it is locked in place. Close and fasten the access door.
5. Move the handle at the bottom forward corner of the door to the full forward (CLOSED) position. Ensure that the safety hook locks the handle in position by pulling aft on the handle. Close and fasten the access door.
6. Move the handle at the bottom forward corner of the door to the full forward (CLOSED) position. Ensure that the safety hook locks the handle in position by pulling aft on the handle. Close and fasten the access door.

CABIN/CARGO DOOR ANNUNCIATOR CIRCUITRY CHECK

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 III

EMERGENCY PROCEDURES

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

INTRODUCTION

This section is divided into five separate groups: GROUND, TAKEOFF, INFLIGHT, LANDING AND MISCELLANEOUS EMERGENCIES.

The procedures contained in this section are considered the best for coping with the various emergencies that may be encountered during operation of this airplane. Only single failures are normally considered; however, each failure presents a different problem. A pilot with a thorough knowledge of these procedures will be better able to cope with the problems encountered. Even though the procedures are considered the best possible, sound judgement must be exercised.

EMERGENCY AIRSPEED

Air Minimum Control Speed (VMCA)	86 kts
Best-Angle-of-Climb Speed – One Engine Inoperative (VxSE)	115 kts
Best-Rate-of-Climb Speed – One Engine Inoperative (VySE)	121 kts
Maximum Glide - Range Speed	140 kts

GROUND

ENGINE/NACELLE FIRE ON THE GROUND

1. Fire Pull Handle (affected engine) - PULL
2. Fire Extinguisher - Actuate as required
3. Master Switch - OFF
4. Propeller Levers - FEATHER
5. Condition Levers - FUEL CUTOFF

IF FIRE CONTINUES:

6. Personnel - Evacuate airplane

TAKEOFF

ENGINE FAILURE DURING GROUND ROLL

ABORT

1. Power Levers - IDLE, reverse as required

WARNING

If at anytime engine torque does not respond to power lever control (overtorque), shutdown affected engine by placing the engine condition lever in FUEL CUTOFF. NOTE: This warning applies to all ground/flight conditions.

CAUTION

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

2. Braking - As required

IF INSUFFICIENT RUNWAY REMAINS FOR STOPPING:

3. Condition Levers - FUEL CUTOFF
4. Fire Pull Handles - PULL
5. Master Switch - OFF

INFLIGHT

ENGINE

ENGINE FAILURE IMMEDIATELY AFTER LIFTOFF

WARNING

If unable to sustain flight, reduce power as necessary to maintain directional control and touchdown in a wings level attitude.

NOTE

If conditions permit, make an immediate landing. For continued flight, maintain 3° to 5° bank and half ball width towards the operating engine.

1. Power - Maximum allowable
2. Airspeed - Maintain (takeoff speed or above)
3. Gear - UP

CAUTION

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. Inoperative Engine - Identify
5. Propeller (inoperative engine) - FEATHER
6. Airspeed - Single Engine Best Rate of Climb Speed (After obstacle clearance altitude is reached)
7. Flaps - UP
8. Engine Clean Up - Perform

ENGINE SHUTDOWN IN FLIGHT (AFFECTED ENGINE)

Used for engine failure, fire, or illumination of chip detector light.

1. Power Lever - IDLE
2. Propeller - FEATHER
3. Fire Pull Handle - PULL
4. Fire Extinguisher - Actuate as required
5. Engine Clean-Up - Perform

ENGINE CLEAN UP (AFFECTED ENGINE)

1. Condition Lever - FUEL CUTOFF
2. Power - As required
Check single engine performance
3. Engine Auto Ignition - Off
4. Autofeather Switch - OFF
5. Generator - OFF
6. Propeller Synchrophaser - OFF
7. Electrical Load - Monitor
8. Fuel - Monitor

ENGINE FLAMEOUT (2ND ENGINE)

1. Power Lever - IDLE
2. Propeller - Do not feather
3. Condition Lever - FUEL CUTOFF
4. Conduct air start procedures

NOTE

The propeller will not unfeather without engine operating.

The best glide speed for both engines inoperative is 140 knots indicated airspeed. Glide distance will be approximately 2 nautical miles per 1,000 feet of altitude.

LOW OIL PRESSURE

Oil pressure between 60 and 85 psi is undesirable and should be tolerated only for the completion of the flight at reduced power (not over 56% torque). Oil pressure below 60 psi is unsafe and require that either the engine be shutdown or a landing be made as soon as practical using the minimum power required to sustain flight.

ENGINE FAILURE IN FLIGHT BELOW MINIMUM SINGLE ENGINE CONTROL SPEED

If an engine should fail below the minimum single engine control speed, immediately reduce power on operating engine as required to maintain control. Lower the nose to accelerate above the minimum control speed. Add engine power as required. Secure the affected engine as in ENGINE CLEAN UP.

SMOKE ENTERING CABIN

1. Crew Oxygen - 100% and ON (PASSENGER MANUAL ORIDE - PULL ON, Passenger Masks - ON)
Descend as required
2. Cabin Pressure Switch - DUMP (if required)
3. Bleed Air Valve Switches - ENVIRO OFF
4. Engine Oil Pressure - Monitor

Observe engine oil pressure gage for fluctuations or drop, and engine cowlings for visible signs of external oil leaks. If either is observed, malfunctioning engine should be secured as speed and altitude permit.

5. Electrical System - Monitor

Smoke could be from an electrical source if no oil leaks are indicated. If smoke is from an electrical source, follow ELECTRICAL FIRE procedures.

6. Bleed Air Valve Switch (NORMALLY OPERATING ENGINE) - OPEN

If it is determined that an engine is the source of smoke entering the cabin, the normally operating engine bleed air can be turned back on and pressurization resumed.

7. Land as soon as practical

AIRSTART (INOPERATIVE ENGINE)

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 FUEL CUTOFF in order to avoid over-temp.

NOTE

If propeller is not windmilling, an airstart without starter assist is not likely to be accomplished. Unassisted airstarts are not to be practiced.

1. Cabin Temp Mode - OFF
2. Vent and Aft Blower - AUTO
3. Wx Radar - STBY or OFF
4. Generator - OFF
5. Electrical Load - Reduce to minimum
Windshield anti-ice is the highest electrical load
6. Power Lever - IDLE
7. Condition Lever - FUEL CUTOFF
8. Fire Pull Handle - In

IF STARTER ASSIST AVAILABLE, PROCEED TO STEP 13; IF STARTER ASSIST IS NOT AVAILABLE, PROCEED TO STEP 9

9. Airspeed - 140 KIAS Minimum
10. Altitude - Below 20,000 feet
11. Auto Ignition - Arm

12. Propeller Lever - Full forward

PROCEED TO STEP 15

13. Operative Engine TGT - Reduce (700° or less)

NOTE

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

14. Ignition and Start Switch - ON
15. Condition Lever - LOW IDLE
Monitor TGT and N₁
16. Oil Pressure - Check
17. Ignition and Start Switch - OFF (N₁ above 50%)
18. Engine Clean up - Perform (if airstart unsuccessful)
19. Propeller Lever - As required
20. Power Lever - As required
21. Generator - RESET and ON
22. Auto Ignition - ARM
23. Electrical Equipment - As required

PROPELLER

PROPELLER OVERSPEED (AFFECTED ENGINE)

If propeller is not controllable, accomplish engine shutdown procedures. The maximum propeller overspeed limit is 2200 rpm. Propeller speeds above 2000 rpm indicate failure of the primary governor. Propeller speeds above 2080 rpm indicate failure of both primary and secondary governors. Torque is limited to 91% for sustained operation above 2000 rpm.

FUSELAGE FIRE/SMOKE AND FUME ELIMINATION

CAUTION

All odors not identifiable by the flight crew shall be considered toxic. Immediately go on 100% oxygen. Properly ventilate the airplane and land as soon as practical. Do not take off when unidentified odors are detected.

1. Crew Oxygen - 100% and ON (PASSENGER MANUAL ORIDE - PULL ON, Passenger Masks - On)
2. Vent Blower - AUTO, Aft Blower - OFF
3. Cabin Temp Mode - OFF
4. Fire - Fight as required

WARNING

The extinguisher agent (Bromochlorodifluoromethane) in the fire extinguisher can produce toxic effects if inhaled.

5. Bleed Air Valves - ENVIRO OFF (if required)

6. Cabin Pressure Switch - DUMP (if required)

CAUTION

Placing both Bleed Air Valve switches in the ENVIRO OFF position will result in a loss of cabin pressurization.

7. If fire persists - Land immediately, evacuate airplane

ELECTRICAL FIRE

1. Crew Oxygen - 100% and ON (PASSENGER MANUAL ORIDE - PULL ON, Passenger Masks - On)
2. Master Switch - OFF (visual conditions only)
3. All Nonessential Electrical Equipment - Off
4. All Circuit Breakers - Check for indication of defective circuit

IF FIRE PERSISTS:

5. All Electrical Switches - Off (as necessary to isolate source of fire)
6. Land as soon as possible

IF FIRE IS ISOLATED:

CAUTION

As each electrical switch is returned to ON, check for evidence of fire.

7. Battery - ON
8. Generators - RESET and ON (individually)
9. Essential Electrical Equipment - On (individually until fire source is isolated)

FUEL

CROSSFEED FOR ONE ENGINE OPERATIVE

1. Standby Boost Pumps - OFF
2. Crossfeed Switch - As required
3. Crossfeed Fuel Light - Illuminated
4. Fuel Pressure Lights - Out

NOTE

With the Fire Pull Handle pulled, the FUEL PRESS light will remain illuminated on the side supplying fuel.

CAUTION

The Aux Transfer switch must be in the AUTO position on the side receiving fuel. With the FIRE PULL HANDLE pulled, the fuel in the auxiliary tank for that side will not be available (usable) for crossfeed.

5. Fuel Load - Monitor

ENGINE DRIVEN BOOST PUMP FAILURE (AFFECTED ENGINE)

1. Standby Boost Pump - ON
2. Fuel Pressure Lights - Out
(If light remains on, record unboosted operating time)

ELECTRICAL

GENERATOR INOPERATIVE (DC GEN ANNUNCIATOR LIGHT ON)

1. Generator Switch - OFF, RESET, then ON

IF GENERATOR WILL NOT RESET:

2. Generator Switch - OFF
3. Operating Generator - Do not exceed 100% load

EXCESSIVE LOADMETER INDICATION (OVER 100%)

1. Battery Switch - OFF (monitor loadmeter)

IF LOADMETER STILL INDICATES ABOVE 100%:

2. Non-Essential Electrical Equipment - Off

IF LOADMETER INDICATES 100% OR BELOW:

3. Battery Switch - ON

INVERTER FAILURE (INVERTER FAIL LIGHT ON)

1. Inverter Switch - OFF

CIRCUIT BREAKER TRIPPED

If the circuit breaker is for a non-essential unit on circuit, do not reset in flight. If the circuit breaker is for an essential circuit, the circuit breaker may be reset once.

If a bus feeder circuit breaker (on the overhead circuit breaker panel) trips, a short is indicated, do not reset in flight. Items which may be inoperative can be determined from the power distribution schematic.

BATTERY CHARGE ANNUNCIATOR LIGHT ILLUMINATED

1. Battery - OFF
2. Loadmeter - Note change (2.5% maximum)

IF BATTERY CONDITION GOOD:

3. Battery - ON

IF BATTERY CONDITION UNSATISFACTORY:

4. Battery - ON, (only during landing gear and flap extension.)

AFTER EXTENSION:

5. Battery - OFF

ELECTRIC ELEVATOR TRIM FAILURE

1. Electric Trim - Disconnect

Use both the control wheel disconnect switch and the electric trim switch.

2. Manual Trim - As required

CAUTION

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

AUTOPILOT EMERGENCY PROCEDURES

THE AUTOPILOT CAN BE DISENGAGED BY ANY OF THE FOLLOWING METHODS:

- Press the AP/YD disconnect switch on the pilot's or copilot's control wheel.
- Move the engage lever to the DIS position.
- Engage the go-around mode (yaw damper will remain ON).
- Pull the flight director/autopilot circuit breaker out (OFF).
- Turn OFF the airplane master switch.
- Turn OFF the avionics master switch.

THE FOLLOWING CONDITIONS WILL CAUSE THE AUTOPILOT TO DISENGAGE AUTOMATICALLY:

- Any interruption or failure of power.
- Vertical gyro failure indication.
- Flight control system power or circuit failure.
- Autopilot trim failure.

IN THE EVENT OF AN ENGINE FAILURE:

Disengage the autopilot, retrim the airplane, and re-engage the autopilot. Maintain 120 knots 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.

ELECTROTHERMAL PROPELLER DE-ICE SYSTEM

Normal readings on the de-ice ammeter will be 14 to 18 amps. If there is no indication on the ammeter, proceed as follows: Determine the propeller de-ice switch is on and the anti-ice circuit breaker is in. If the system will still not operate or circuit breaker will not reset, turn the propeller de-ice switch off and use manual backup system.

NOTE

When using the manual backup system, no electrical load will be indicated on the de-ice ammeter; monitor the loadmeter for approximately 5% needle deflection, indicating the system is functioning.

If de-ice ammeter readings are below or above the normal operating range, continue operation if circuit breaker does not trip. If propeller imbalance occurs, increase rpm briefly to aid in ice removal. If circuit breaker trips, use the manual backup system. If the manual mode circuit breaker trips, avoid icing conditions.

To use the manual system, hold the switch in the OUTER position, then in the INNER position, alternating each 30 seconds.

PNEUMATIC/ENVIRONMENTAL

RUDDER BOOST FAILURE

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

1. Rudder Boost - OFF

WARNING

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.

IF CONDITION PERSISTS:

2. Rudder Trim - Adjust
3. Bleed Air Valves - PNEU and ENVIRO OFF (during approach and landing)

EXCESSIVE DIFFERENTIAL PRESSURE

1. Cabin Altitude Controller - Select higher setting

IF CONDITION PERSISTS:

2. Bleed Valves - ENVIRO-OFF (left first)

Activation of one switch may control the pressurization.

3. Cabin Pressure Switch - DUMP (after cabin is depressurized)
4. Bleed Air Valves - OPEN (if cabin heating is required)

LOSS OF PRESSURIZATION

1. Crew Oxygen - As required
2. Descent - As required
3. Cabin Oxygen - PULL ON
4. Passenger Oxygen Masks - As required

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 AUTO CONTROL circuit breaker located in the environmental section of the circuit breaker panel. PASSENGER MANUAL O'RIDE must be in the off position.

BLEED AIR FAILURE

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 ruptured bleed air line aft of the engine firewall.

TGT and torque readings will return to original indications when leak is stopped.

1. Bleed Air Valve (affected engine) - PNEU & ENVIRO - OFF position
2. Brake Deice System Switch - OFF
3. Engine Instruments - Monitor

NOTE

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

NOTE

BLEED AIR FAIL lights may momentarily illuminate during simultaneous surface deice and brake deice operation at low N_1 speeds. If lights immediately extinguish, they may be disregarded.

DUCT OVERTEMPERATURE LIGHT (ILLUMINATED IN FLIGHT)

NOTE

Allow approximately 30 seconds after each adjustment for the system temperature to stabilize. The overtemp condition is considered correct at any point during the procedure that the light extinguishes.

1. Determine Cabin Air Control is pushed fully in
2. Cabin Temp Mode Selector - AUTO, rotate Cabin Temp knob in decrease direction
3. Place Vent Blower Switch in HI
4. Cabin Temp Mode Selector - MAN COOL, hold MANUAL TEMP switch in the DECREASE position
5. Place either Bleed Air Valve Switch to ENVIRO OFF position. If light does not extinguish within 30 seconds, return switch to OPEN position

CAUTION

Placing both Bleed Air Valve switches in the ENVIRO OFF position will result in a loss of cabin pressurization.

6. Place the other Bleed Air Valve Switch in the ENVIRO OFF position. If the overtemp light has not extinguished within 30 seconds, the warning system has malfunctioned; return switch to OPEN position

LANDING

EMERGENCY DESCENT

1. Power - IDLE
2. Props - Full forward
3. Flaps - APPROACH
4. Gear - DOWN
5. Airspeed - 181 KIAS maximum

Window defogging may be required.

LANDING GEAR UNSAFE INDICATION

1. Circuit Breakers - Check

The Landing Gear Relay and Landing Gear Indicator circuit breakers on overhead panel must be in.

2. Gear lights - Check
3. Gear Handle - Cycle
4. Manual Gear Extension - Perform (if required)

NOTE

If gear continues to indicate unsafe, attempt to verify position by tower fly by or other means.

LANDING GEAR MANUAL EXTENSION

1. Airspeed - Establish 130 knots
2. Landing Gear Relay Circuit Breaker (FLIGHT section of overhead circuit breaker panel) - Pull
3. Landing Gear Switch - DOWN
4. Alternate Engage Handle - LIFT and TURN clockwise to the stop (to engage)
5. Extension Lever - Pump (up and down until 3 green GEAR DOWN lights are illuminated)

CAUTION

Do not continue pumping after receiving three green lights (gear down indication). Further movement of the handle could damage the drive mechanism and prevent subsequent electrical gear retraction. The landing gear cannot be retracted manually.

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 cause of the malfunction has been corrected as failure may be in the gear up circuit and the gear might retract on the ground.

GEAR UP LANDING

WARNING

If one main gear cannot be fully extended, retract all the other gear if possible and make a belly landing.

1. Personnel Emergency Briefing - Complete
2. Loose Equipment - Stowed
3. Bleed Air Valves - ENVIRO OFF
4. Cabin Pressure Switch - DUMP (after cabin is depressurized)
5. Emergency Exit - Remove and stow
6. Seat Belts and Harnesses - Secured (personnel checked)
7. Gear Alternate Engage Handle - Turn counterclockwise to disengage and stow
8. Extension Lever - Disengage and stow
9. Gear Handle - UP
10. Gear Relay Circuit Breaker - In
11. Non-Essential Electrical Equipment - Off
12. Landing Checks - Complete
13. Flaps - DOWN

WARNING

Fly a normal approach to touchdown. Avoid touching down in a nose high attitude.

14. Power - As required
15. Airspeed - As recommended for weight

WHEN RUNWAY IS ASSURED:

16. Power Levers - IDLE (runway assured)
17. Fire Pull Handles - PULL
18. Master Switch - OFF

LANDING WITH AN UNSAFE LANDING GEAR

WARNING

If the nose gear cannot be extended, landing will be accomplished with main gear down.

1. Personnel Emergency Briefing - Complete
2. Loose Equipment - Stowed
3. Bleed Air Valves - ENVIRO OFF
4. Cabin Pressure Switch - DUMP (after cabin is depressurized)
5. Emergency Exit - Remove and stow
6. Seat Belts and Harnesses - Secured (personnel checked)
7. Non-Essential Electrical Equipment - Off
8. Landing Checks - Complete
9. Flaps - DOWN
10. Power - As required
11. Airspeed - As recommended for weight

WARNING :

Fly a normal approach to touchdown.

IF NOSE GEAR IS UNSAFE (RUNWAY ASSURED):

12. Power Levers - IDLE
13. Fire Pull Handles - PULL
14. Master Switch - OFF

Gently lower nose to the runway prior to loss of elevator control to prevent sudden drop and structural damage. Use rudder and brakes for directional control.

IF ONE MAIN GEAR IS UNSAFE (RUNWAY ASSURED):

12. Touchdown - On safe main gear first

Touchdown close to the edge of the runway opposite the unsafe landing gear and attempt to maintain directional control with rudder and brakes.

13. Power Levers - IDLE
14. Fire Pull Handles - PULL
15. Master Switch - OFF

LANDING WITH FLAT TIRE

If a main gear tire is flat, touchdown on the edge of the runway opposite the flat tire. Use rudder, brakes and propeller reverse to maintain directional control.

If the nose tire is flat, use the minimum wheel braking necessary to stop the airplane on the runway.

LANDING - ONE ENGINE INOPERATIVE

WHEN IT IS CERTAIN THAT THE FIELD CAN BE REACHED:

1. Flaps - APPROACH
2. Landing Gear - DOWN
3. Propeller Control - Full forward
4. Yaw Damp - OFF
5. Airspeed - Maintain 120 KIAS minimum until landing is assured

WHEN IT IS CERTAIN THERE IS NO POSSIBILITY OF A GO-AROUND:

6. Flaps - DOWN
7. Airspeed - Normal landing approach speed
8. Execute normal landing

NOTE

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

GO-AROUND - ONE ENGINE INOPERATIVE

1. Power - Maximum allowable
2. Landing Gear - UP
3. Flaps - UP
4. Airspeed - Single engine best rate of climb speed

WARNING

Do not attempt go-around after flaps are extended beyond APPROACH.

DITCHING

Ditching of the airplane has not been demonstrated, the following procedure is offered as a guide only.

1. Radio Calls - As required
2. Personnel Emergency Briefing - As required
3. Bleed Air Valve - ENVIRO OFF
4. Cabin Pressure Switch - DUMP (after cabin is depressurized)
5. Emergency Exit - Remove and stow
6. Seat Belts and Harnesses - Secured (personnel checked)
7. Gear - UP
8. Flaps - DOWN
9. Non-Essential Electrical Equipment - Off
10. Approach - Normal, power on if possible

MISCELLANEOUS

SIMULATING SINGLE ENGINE ZERO THRUST

When establishing zero thrust operation, use the power setting listed below. By using this power setting to establish zero thrust, the inherent delays of restarting a shutdown engine are avoided, and almost instant power is available to counter any attendant hazard.

1. Propeller - 1600 RPM
2. Power Lever - Set 6% torque

NOTE

This setting will approximate zero thrust at low altitudes using recommended single engine climb speeds.

PRACTICE DEMONSTRATION OF AIR MINIMUM CONTROL SPEED

VMCA demonstration may be required for multi-engine pilot certification. This procedure shall be used at a safe altitude of at least 5000 feet above the ground in clear air only.

Minimize the number of passengers before practicing inflight engine cuts, then make certain the airplane CG is as far forward as practical, and the airplane weight has been reduced, for more responsive maneuvering.

WARNING

Inflight engine cuts below the safe one-engine inoperative speed (VSSE - 104 KIAS) are prohibited.

1. Landing Gear - UP
2. Flaps - UP
3. Airspeed - Above safe one-engine inoperative speed (VSSE)
4. Propeller Levers - Full forward
5. Power Lever (simulated inoperative engine) - IDLE
6. Power Lever (other engine) - Maximum allowable
7. Airspeed - Reduce approximately 1 knot per second until either VMCA 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 VMCA 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 VSSE.

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 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.

NOTE

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

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. Alternate Engage Handle - Rotate counterclockwise and push down
2. Extension Lever - Stow
3. Landing Gear Relay Circuit Breaker (overhead circuit breaker panel) - In
4. Landing Gear Switch - UP

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 substantial 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 (pilot's subpanel) - ALTERNATE
2. For Airspeed Calibration and Altimeter Correction, refer to FAA Performance Section.

CAUTION

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

ILLUMINATION OF CABIN DOOR WARNING LIGHT

The CABIN DOOR annunciator light indicates that the airstair and/or cargo door may not be secure. Ensure all passengers and crew members are seated with seat belts fastened and depressurize cabin. (Consider altitude first.)

WARNING

Do not attempt to check either door for security while cabin is pressurized, and/or in flight. If the cabin is pressurized and the airstair or cargo door is not completely locked, any movement of the door handles may cause rapid and complete unlatching and opening of the door(s).

NOTE

The CABIN DOOR annunciator includes both the cargo and airstair door circuits.

1. Check security of the airstair door (aircraft depressurized and on ground) by lifting door step and checking position of safety arm and diaphragm plunger. If unlocked position of arm is indicated, turn door handle toward locked position until arm is completely around plunger. Visually check that the white index marks on each of the six rotary cam locks align with the notched tab on the adjacent door.

2. Check security of the cargo door (aircraft depressurized and on ground) by observing through the handle access cover windows that the upper and lower latch handles are latched in the CLOSED position. Determine the white index marks on the four rotary cam locks align with the adjacent stripes. Determine the latching pins along the bottom of the cargo door are inserted into the door frame attachment lugs. The untapered shoulder of the latching pins must extend past each attachment lug.

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.

CRACKED WINDSHIELD

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

NOTE

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

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

CRACKED CABIN WINDOW

Cracks appear to start between 2 and 3 inches from edge of glass and proceed in a circumferential direction ending no closer than .5 inch from edge of glass. If it is determined that there is no crack on the inner window panel, the airplane may be operated as follows:

1. Do not exceed a maximum operating altitude of 25,000 feet.
2. Set cabin pressurization controller to achieve a differential pressure not to exceed 4.6 psi.
3. Do not operate the airplane more than 20 hours after the crack occurs.

SECTION IV

FAA PERFORMANCE

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COMMENTS PERTINENT TO THE USE OF PERFORMANCE GRAPHS:

1. The example, in addition to presenting an answer for a particular set of conditions, also presents the order in which the graphs should normally be used, i.e., 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 guidelines. Always project to the reference line first, then follow the guidelines to the next known item.
3. Indicated airspeeds (IAS) were obtained by using the AIRSPEED CALIBRATION-NORMAL SYSTEM. The AIRSPEED CALIBRATION-NORMAL SYSTEM TAKE-OFF GROUND ROLL is used for rotation speeds.
4. The associated conditions define the specific conditions from which performance parameters have been determined. They are not intended to be used as instructions.
5. The full amount of usable fuel is available for all approved flight conditions.
6. Use of the brake deice system during certain ambient conditions may reduce available engine power. Consult the MINIMUM TAKE-OFF POWER chart 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 a TGT rise of approximately 20°C. Observe TGT limitations when setting climb and cruise power.

ENGINE FAILURE PRIOR TO LIFT-OFF

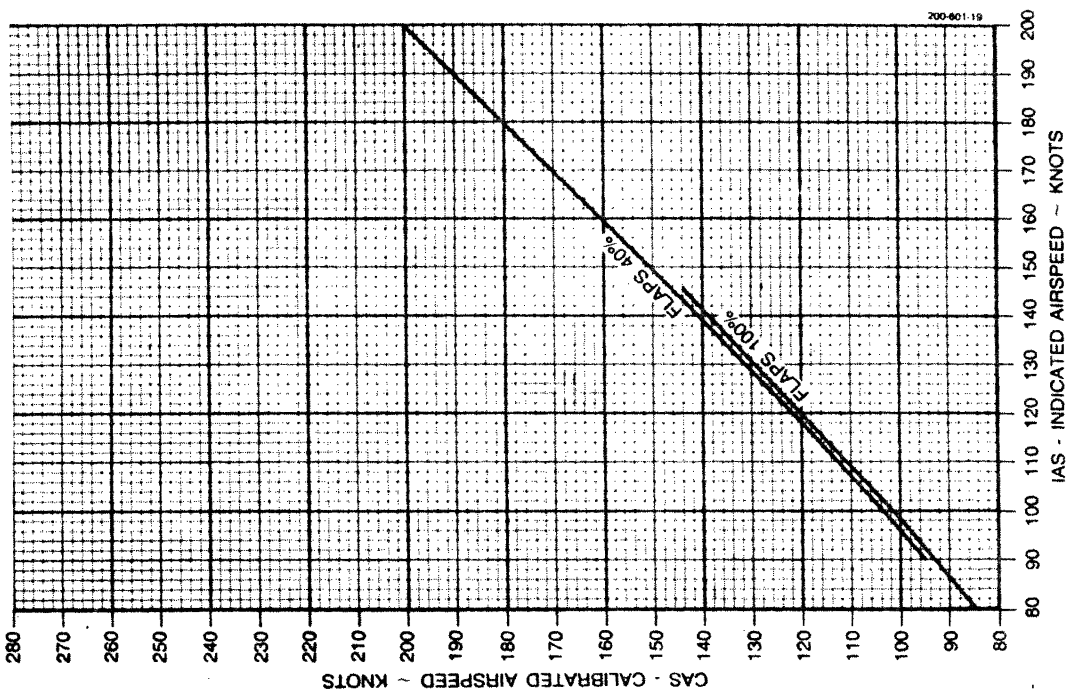
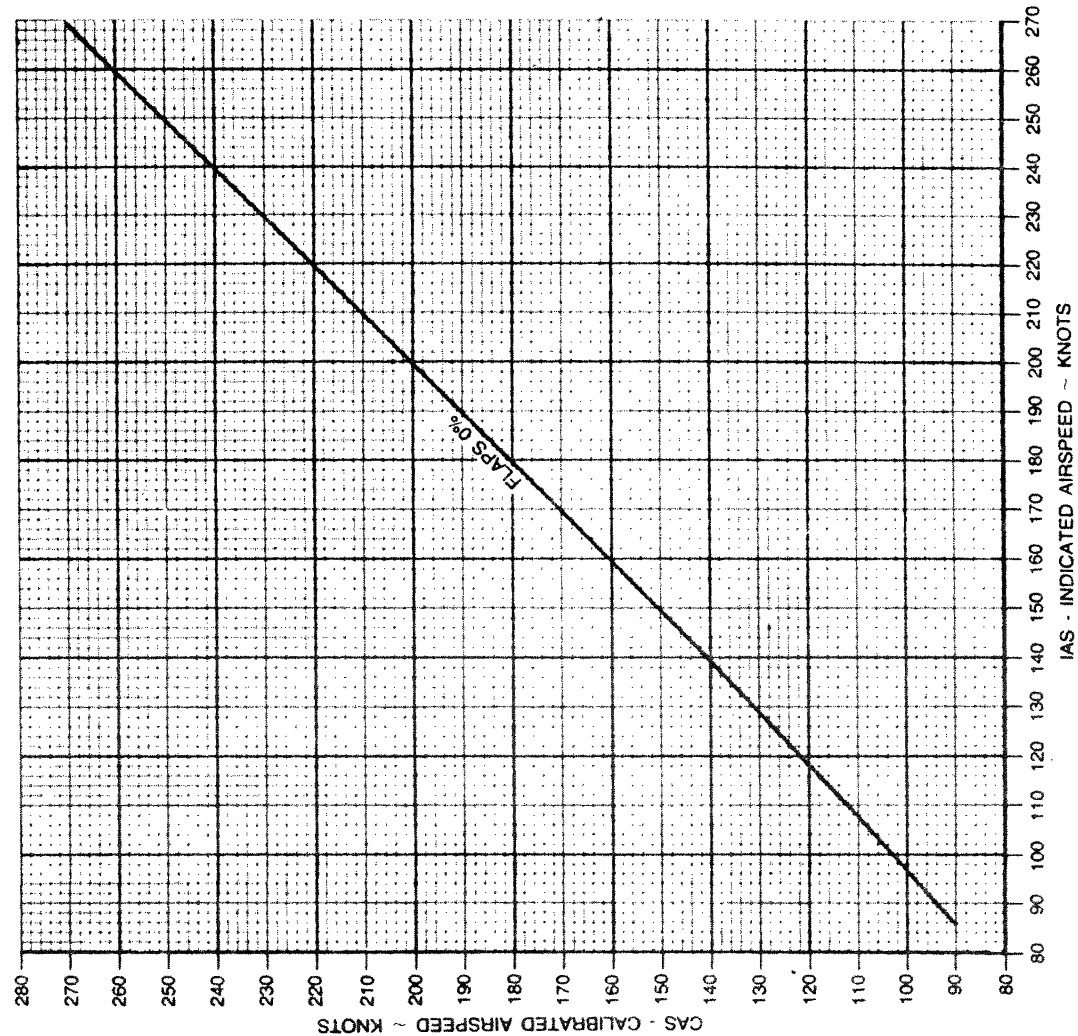
1. If an engine fails prior to lift-off the Abort procedure should be performed. Directional control while identifying and feathering the inoperative engine and distance required to accelerate may not be sufficient to continue take-off.

ENGINE FAILURE AT LIFT-OFF

1. If an engine fails at or immediately after liftoff, climb to 50 feet may be critical. Positive pilot actions will be required to maintain aircraft control and the distance to attain 50 feet will be significant.

One-engine-inoperative climb performance predictions 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.

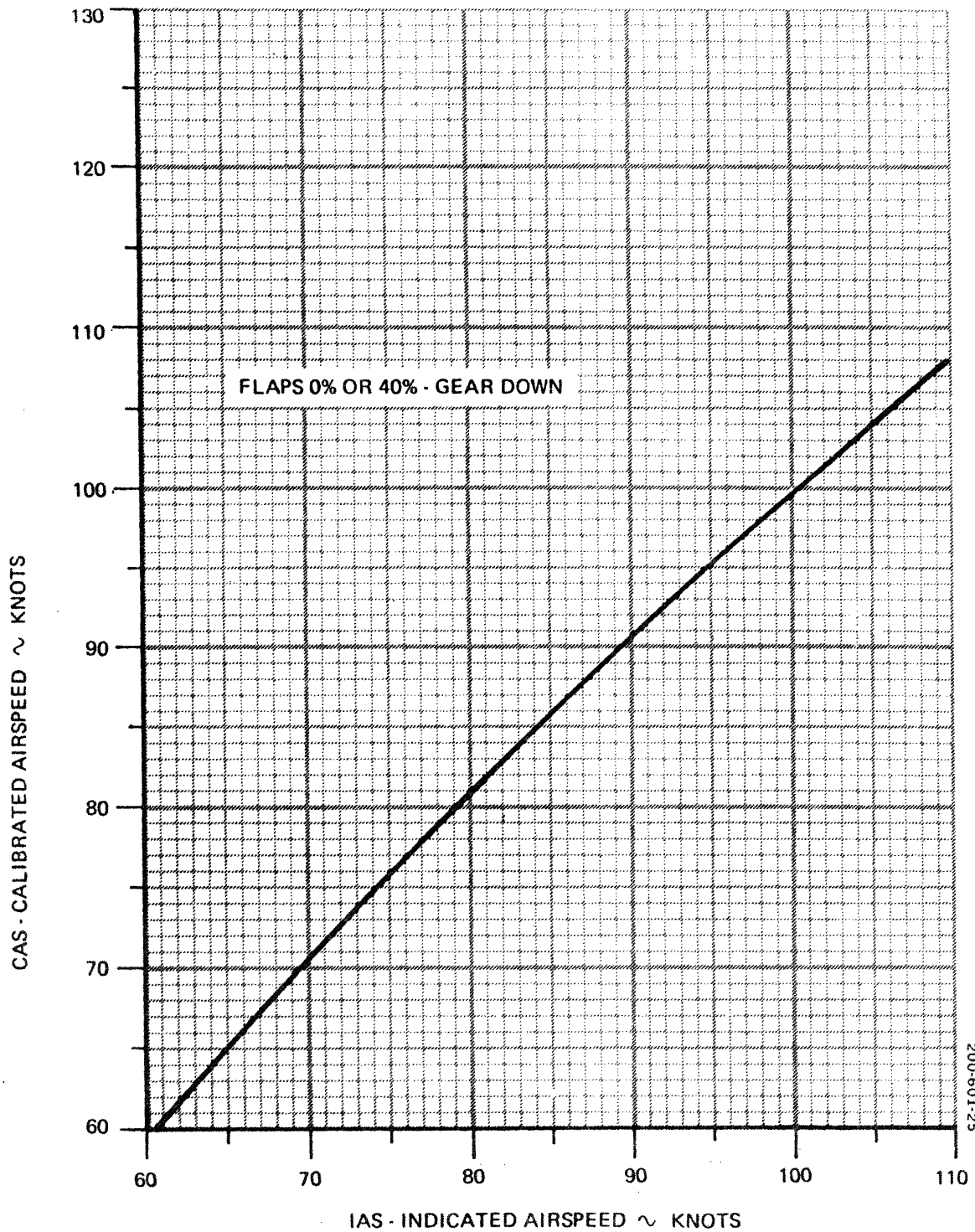
AIRSPEED CALIBRATION - NORMAL SYSTEM



200-601-19

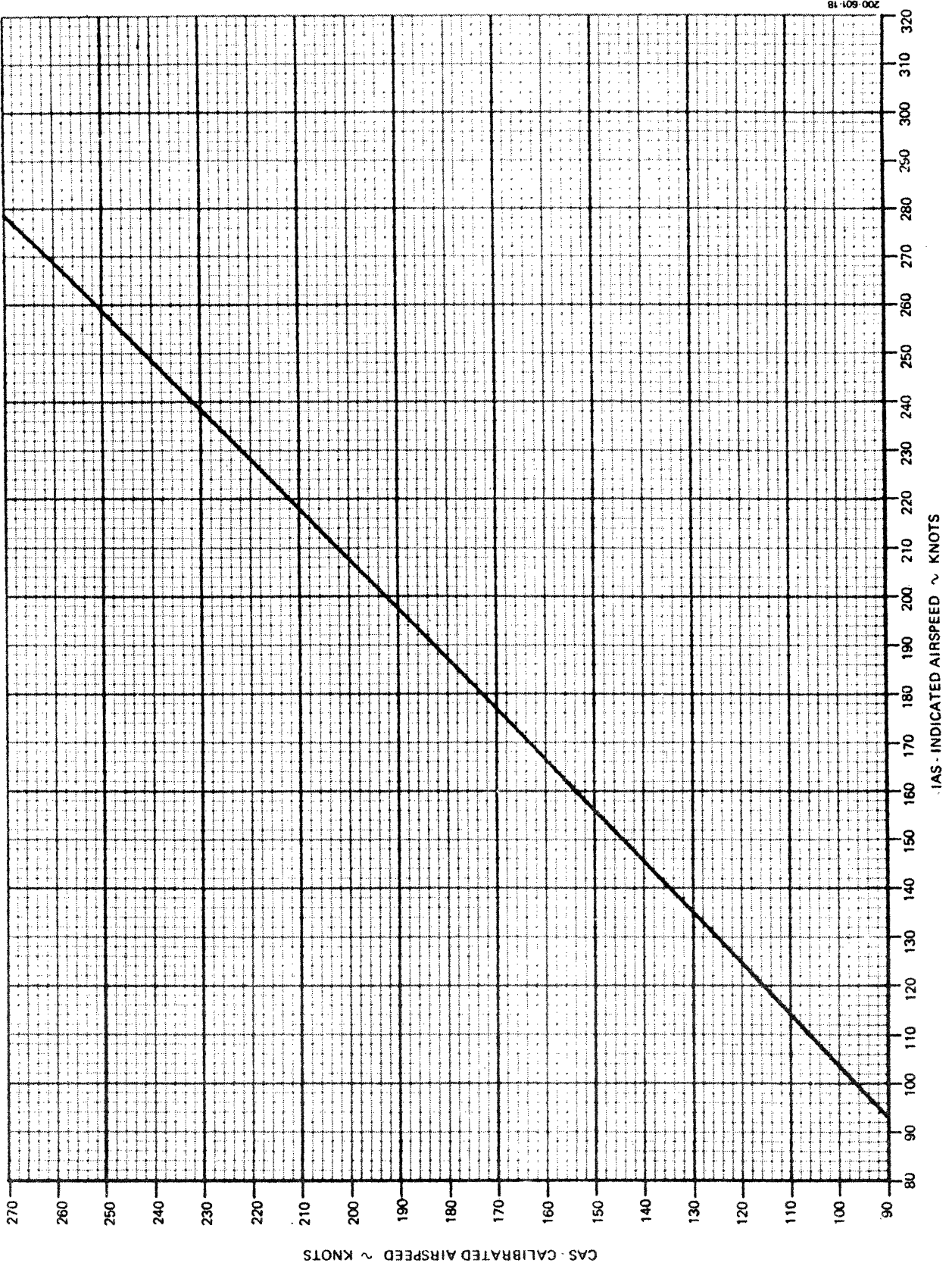
AIRSPEED CALIBRATION – NORMAL SYSTEM

TAKE-OFF GROUND ROLL



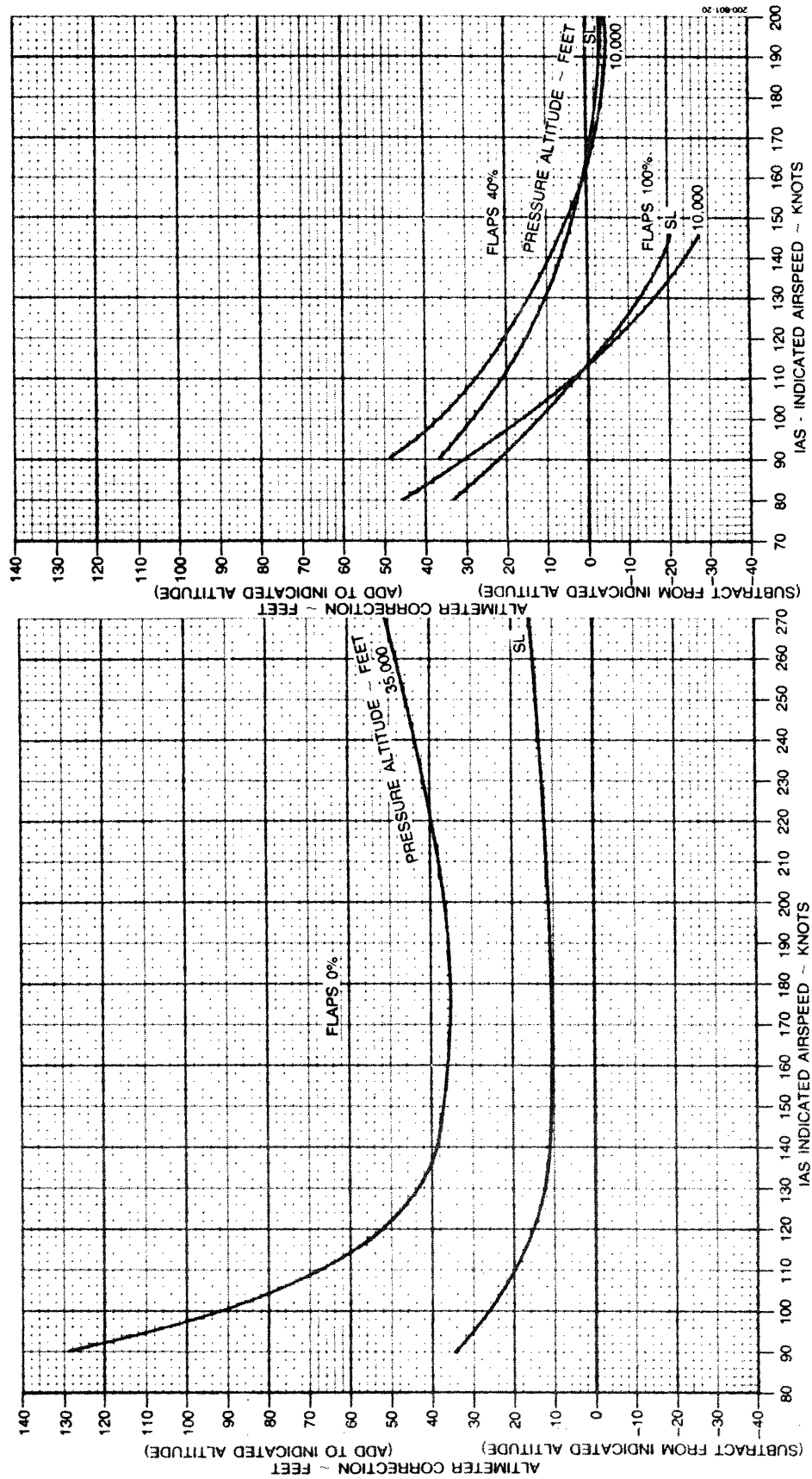
AIRSPEED CALIBRATION - ALTERNATE SYSTEM

APPLICABLE FOR ALL FLAP POSITIONS



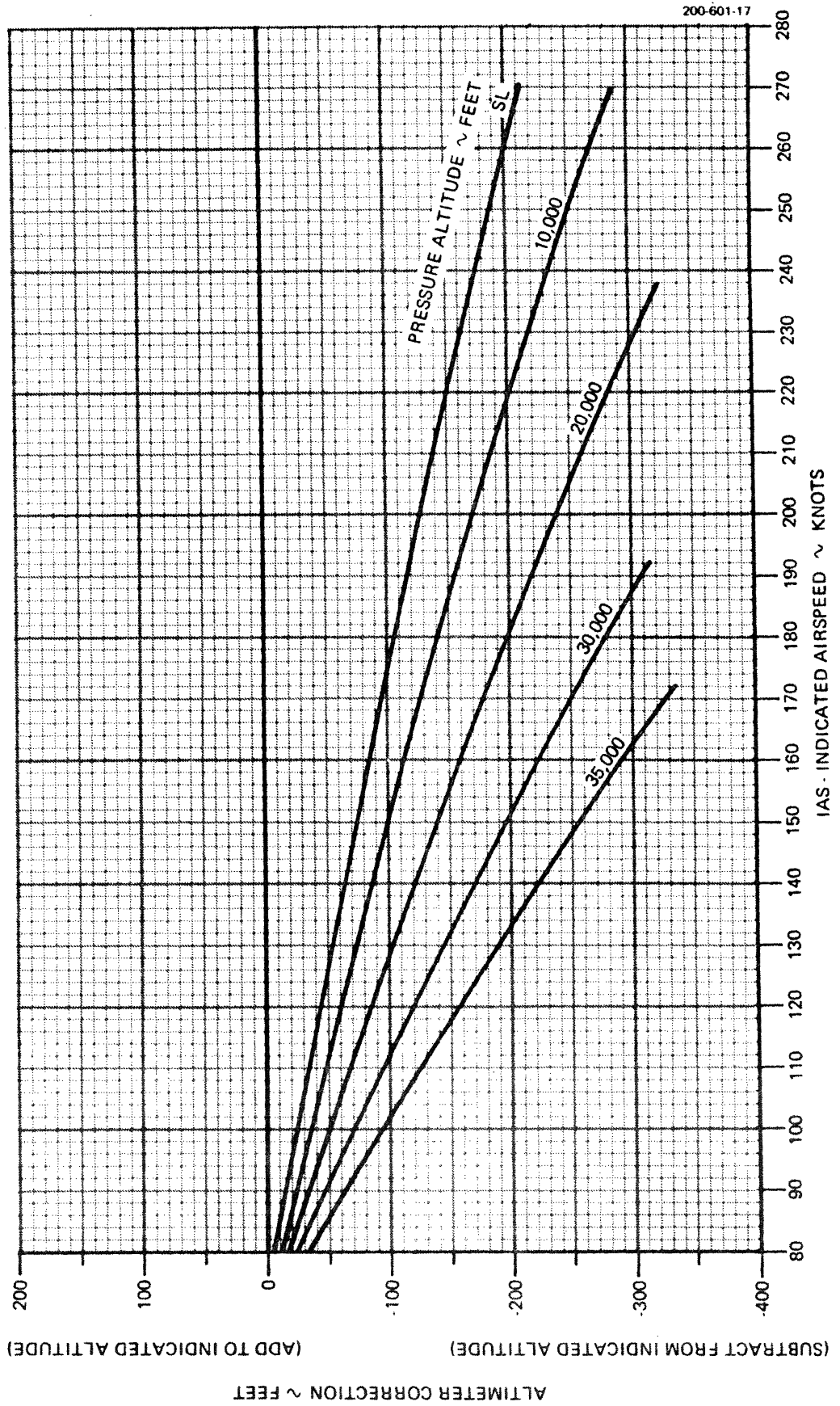
200-601-18

ALTIMETER CORRECTION - NORMAL SYSTEM

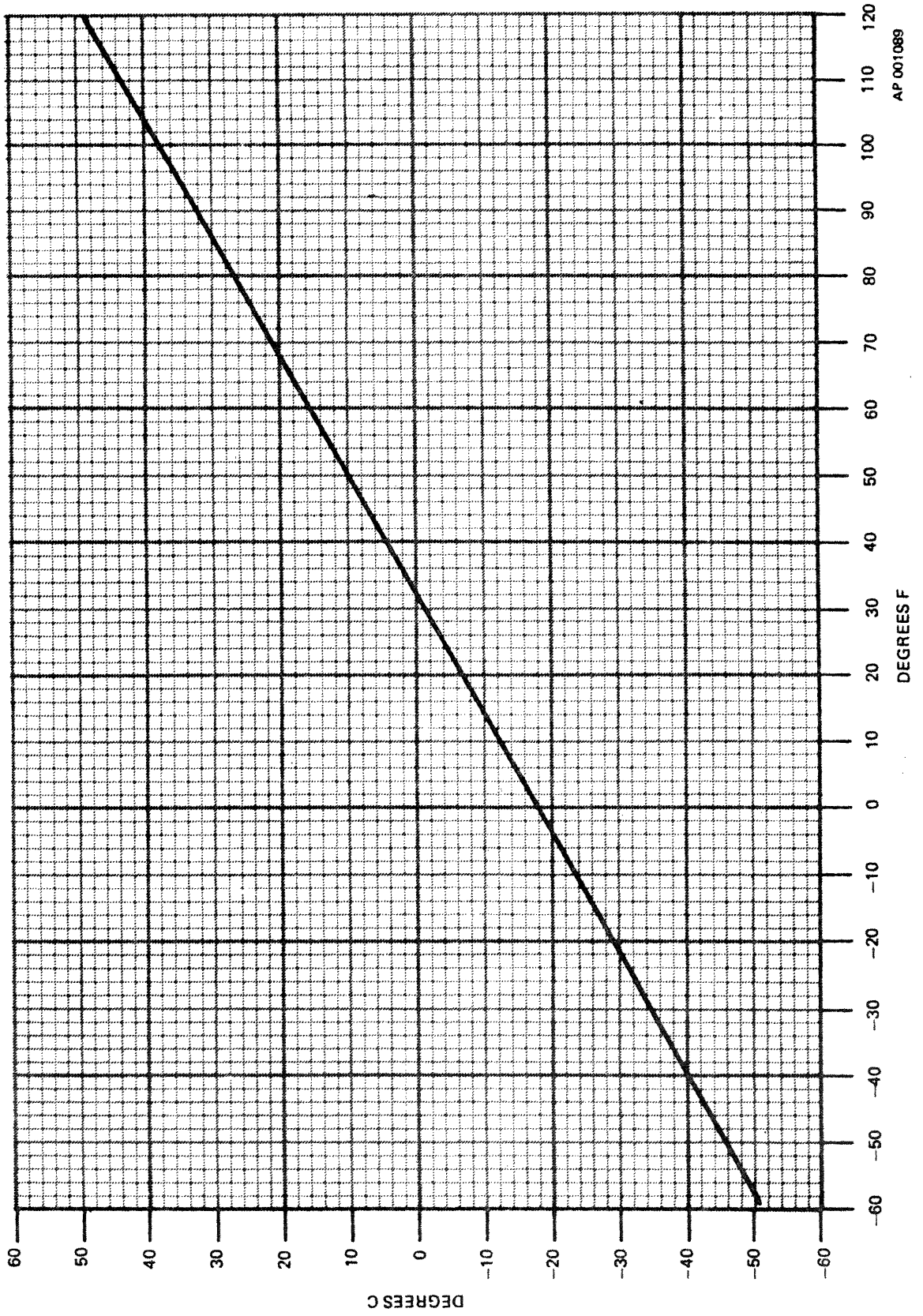


ALTIMETER CORRECTION — ALTERNATE SYSTEM

APPLICABLE FOR ALL FLAP POSITIONS



TEMPERATURE CONVERSION °C vs °F

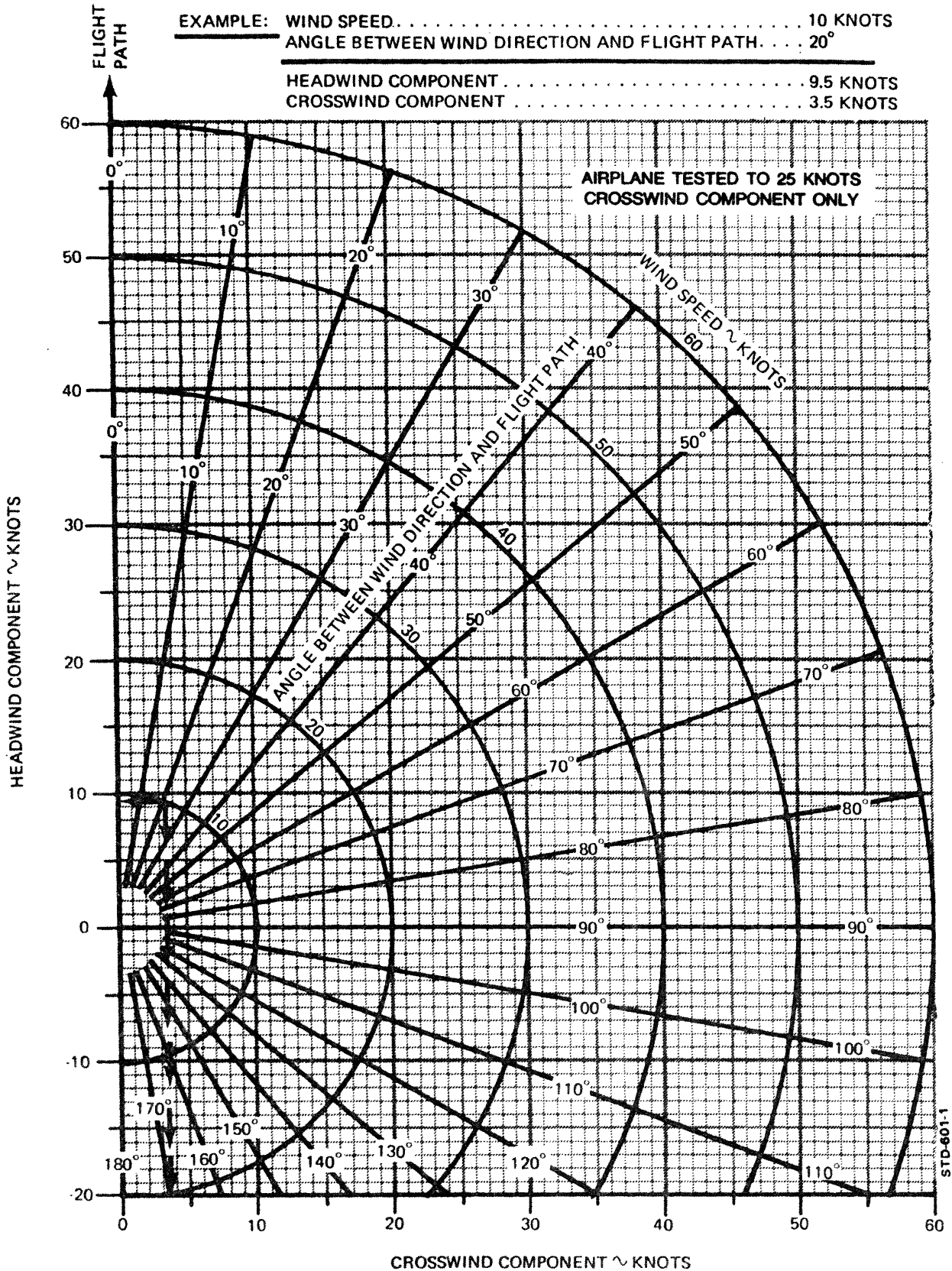


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WIND COMPONENTS

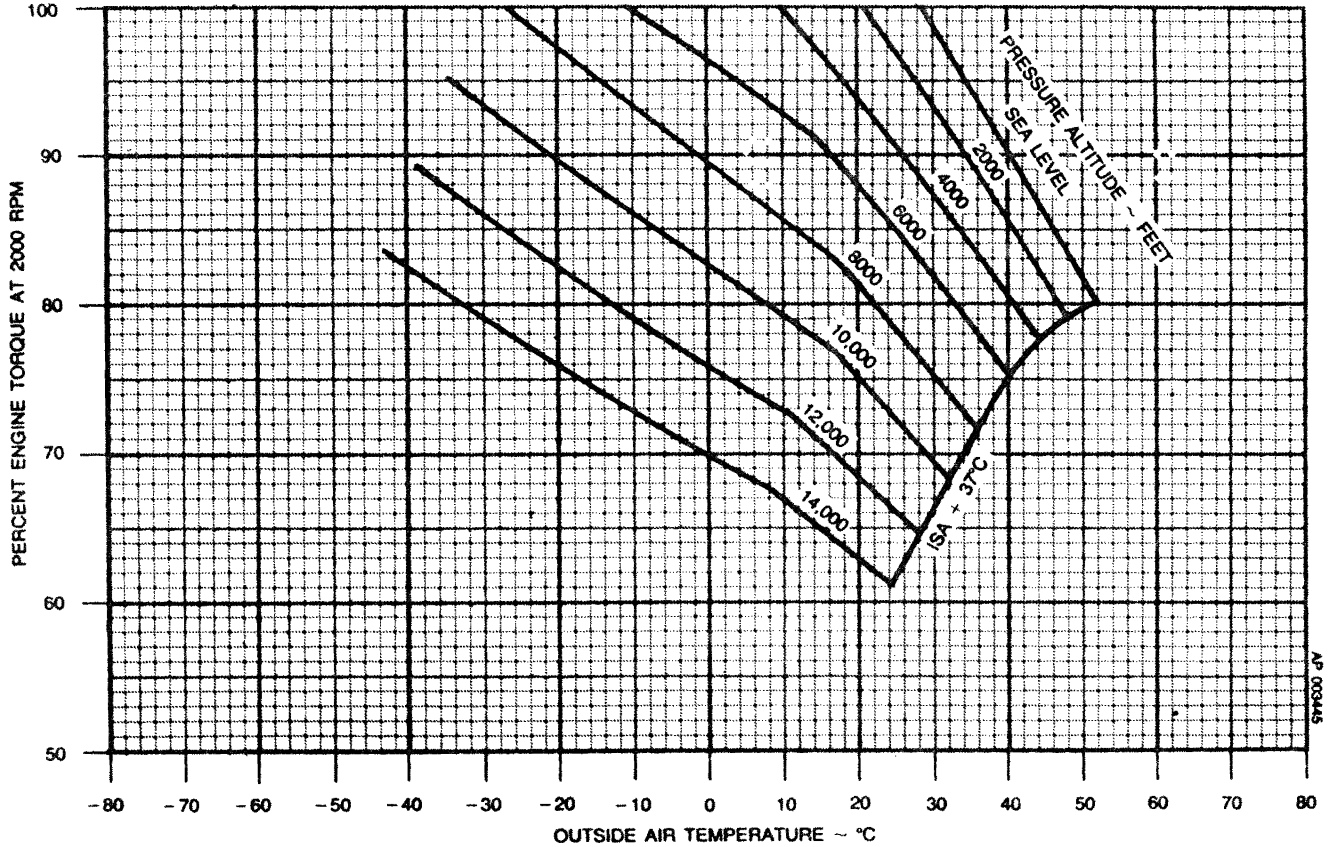
EXAMPLE: WIND SPEED 10 KNOTS
 ANGLE BETWEEN WIND DIRECTION AND FLIGHT PATH 20°

HEADWIND COMPONENT 9.5 KNOTS
 CROSSWIND COMPONENT 3.5 KNOTS



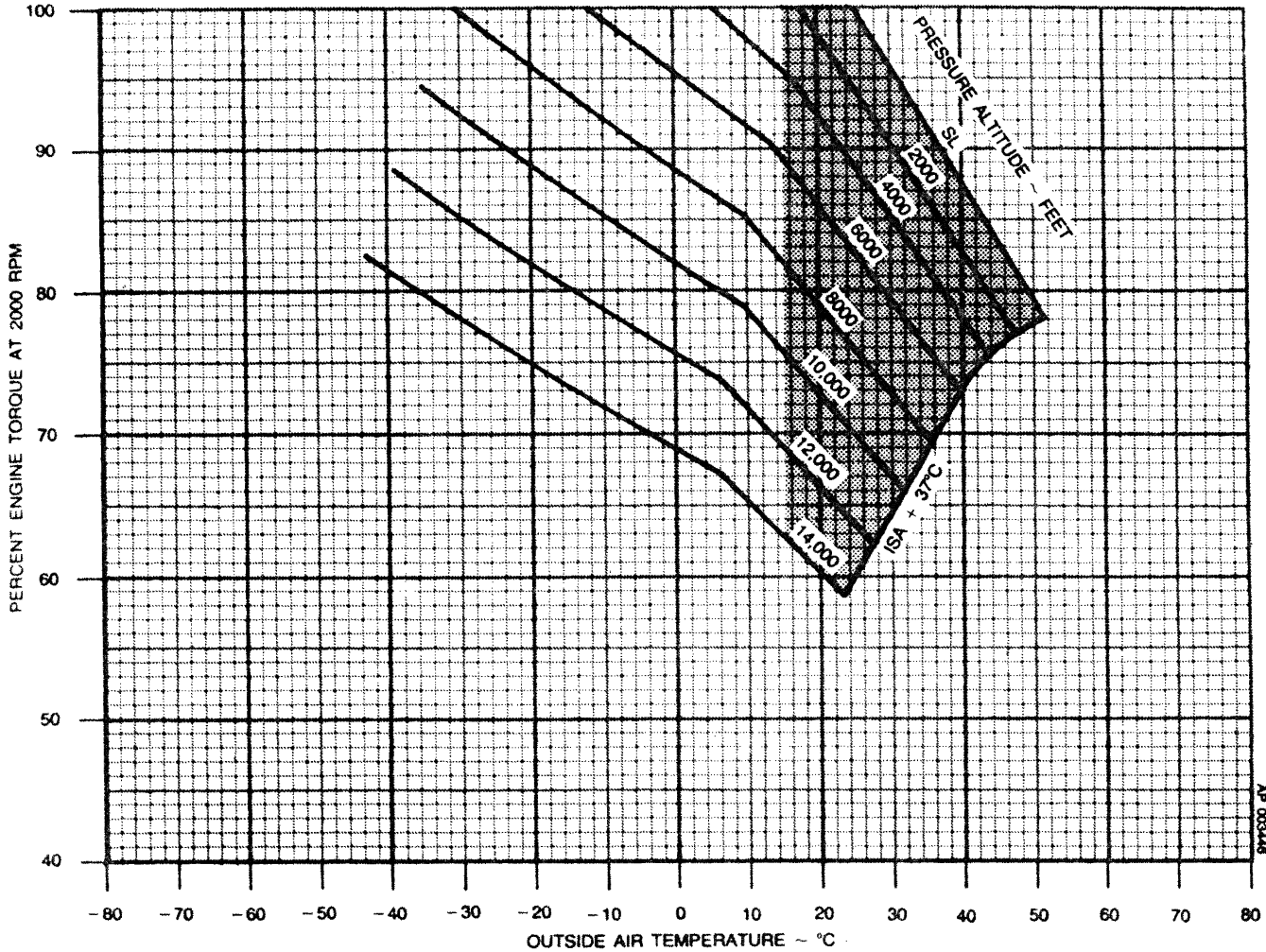
MINIMUM TAKE-OFF POWER AT 2000 RPM (ICE VANES RETRACTED) (65 KNOTS)

- NOTE:
1. TORQUE INCREASES APPROXIMATELY 1% FROM 0 TO 65 KNOTS.
 2. THE PERCENT TORQUE INDICATED IN THIS FIGURE IS THE MINIMUM VALUE AT WHICH TAKE-OFF PERFORMANCE PRESENTED IN THIS SECTION CAN BE REALIZED. ANY EXCESS POWER WHICH MAY BE DEVELOPED WITHOUT EXCEEDING ENGINE LIMITATIONS MAY BE UTILIZED.

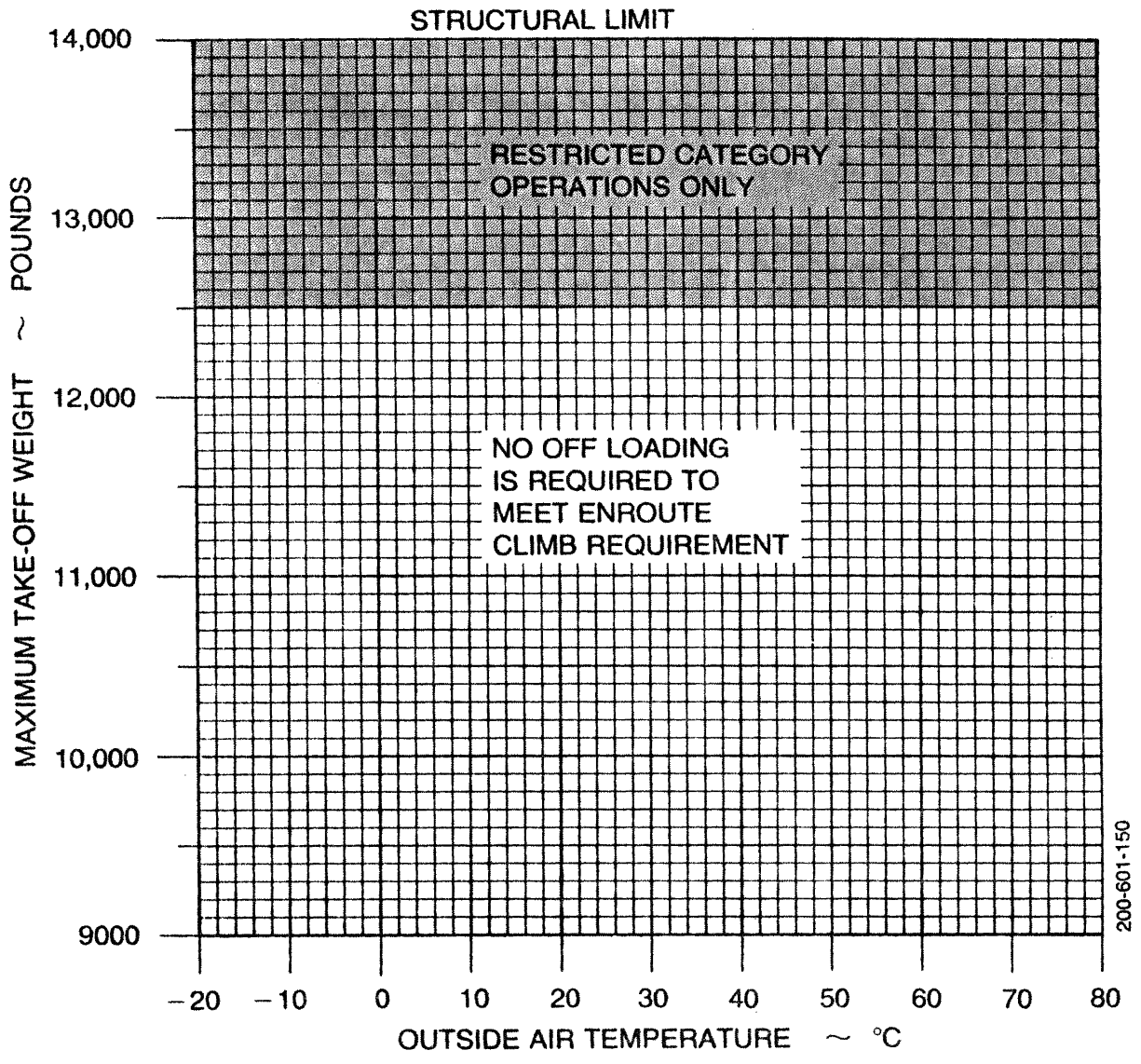


MINIMUM TAKE-OFF POWER AT 2000 RPM (ICE VANES EXTENDED) (65 KNOTS)

- NOTE:
1. TORQUE INCREASES APPROXIMATELY 1% FROM 0 TO 65 KNOTS,
 2. THE PERCENT TORQUE INDICATED IN THIS FIGURE IS THE MINIMUM VALUE AT WHICH TAKE-OFF PERFORMANCE CAN BE REALIZED WITH ICE VANES EXTENDED. ANY EXCESS POWER WHICH MAY BE DEVELOPED WITHOUT EXCEEDING ENGINE LIMITATIONS CAN BE UTILIZED.
 3. DO NOT EXTEND ICE VANES WITHIN SHADED AREA.



MAXIMUM TAKE-OFF WEIGHT PERMITTED BY ENROUTE CLIMB REQUIREMENT



TAKE-OFF DISTANCE-FLAPS 0%

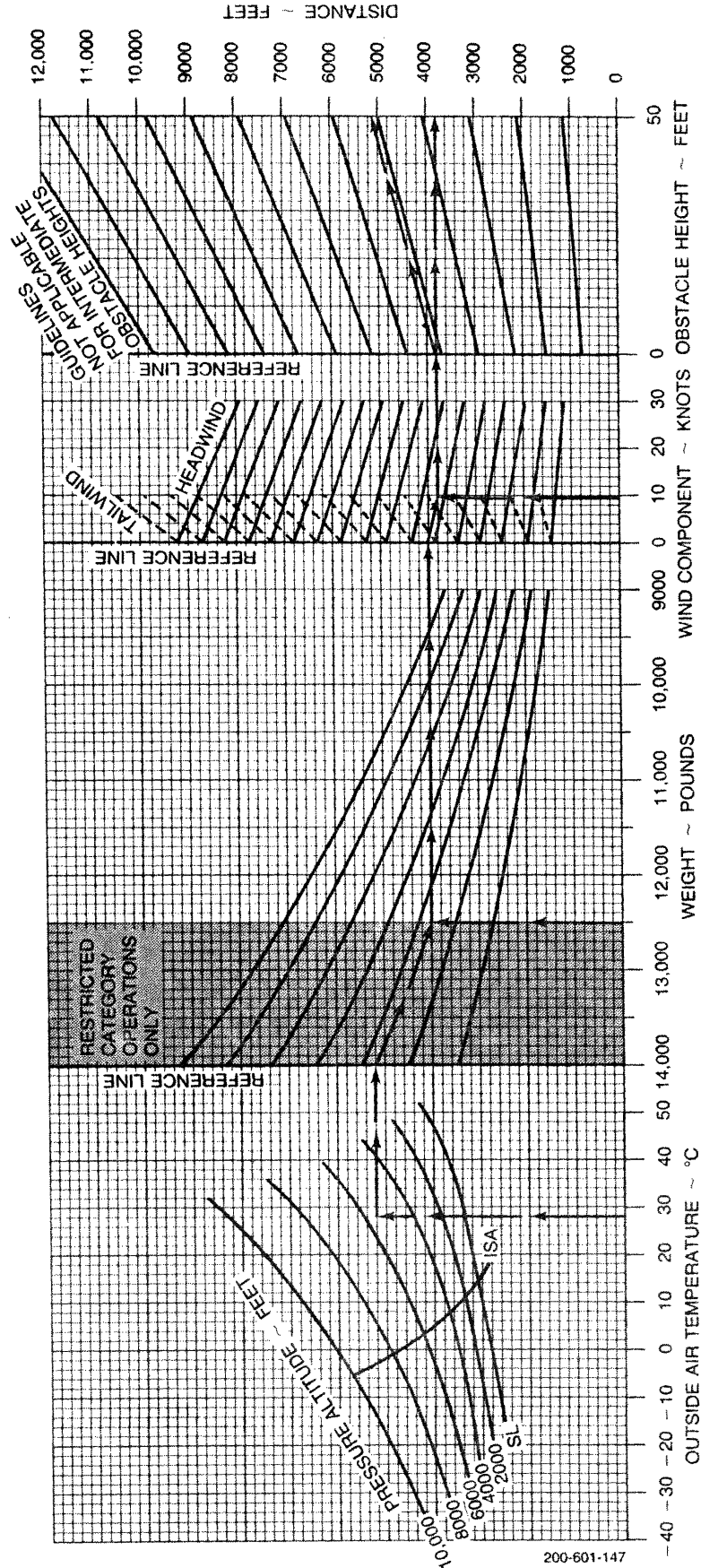
ASSOCIATED CONDITIONS:

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 SPEEDS ~ KNOTS	
	ROTATION	50 FT
14,000	117	125
13,000	113	123
12,500	111	121
12,000	109	120
11,000	105	115
10,000	101	111
9000	98	108

EXAMPLE:

OAT..... 28°C
 PRESSURE ALTITUDE..... 5430 FT
 TAKE-OFF WEIGHT..... 12,500 LBS
 HEADWIND COMPONENT..... 9.5 KTS
 GROUND ROLL..... 3800 FT
 TOTAL DISTANCE OVER 50 FT OBSTACLE..... 5100 FT
 TAKE-OFF SPEED AT ROTATION..... 111 KTS
 AT 50 FT..... 121 KTS



200-601-147

TAKE-OFF DISTANCE-FLAPS 40%

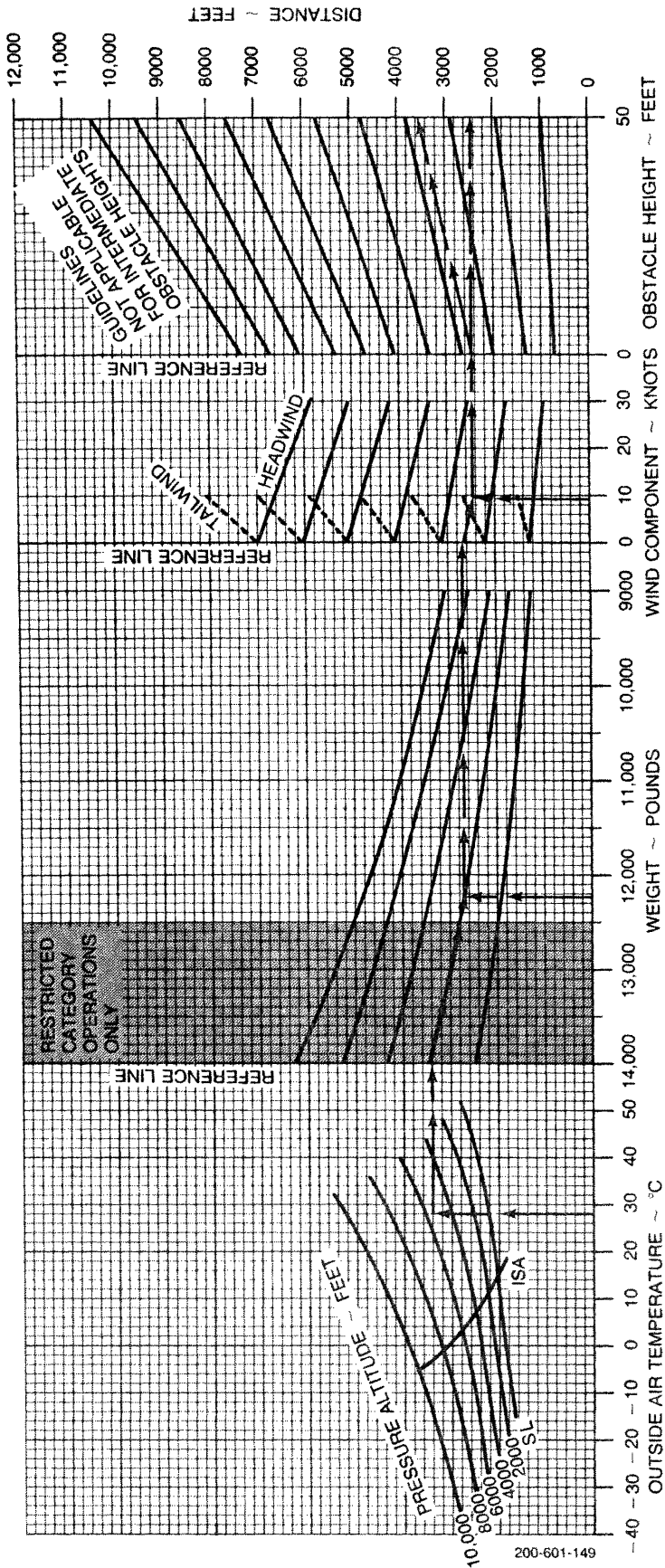
WEIGHT ~ POUNDS	TAKE-OFF SPEED ~ KNOTS	
	ROTATION	50 FT
14,000	93	108
13,000	96	106
12,500	95	105
12,000	96	104
11,000	94	103
10,000	94	101
9000	94	99

ASSOCIATED CONDITIONS:

POWER..... TAKE-OFF POWER SET BEFORE BRAKE RELEASE
 FLAPS..... 40%
 LANDING GEAR..... RETRACT AFTER LIFT-OFF
 RUNWAY..... PAVED, LEVEL, DRY SURFACE

EXAMPLE:

OAT..... 28°C
 PRESSURE ALTITUDE..... 5430 FT
 TAKE-OFF WEIGHT..... 12,220 LBS
 HEADWIND COMPONENT..... 9.5 KTS
 GROUND ROLL..... 2430 FT
 TOTAL DISTANCE OVER 50 FT OBSTACLE..... 3590 FT
 TAKE-OFF SPEED AT ROTATION..... 95 KTS
 AT 50 FT..... 104 KTS



CLIMB-TWO ENGINES-FLAPS 0%

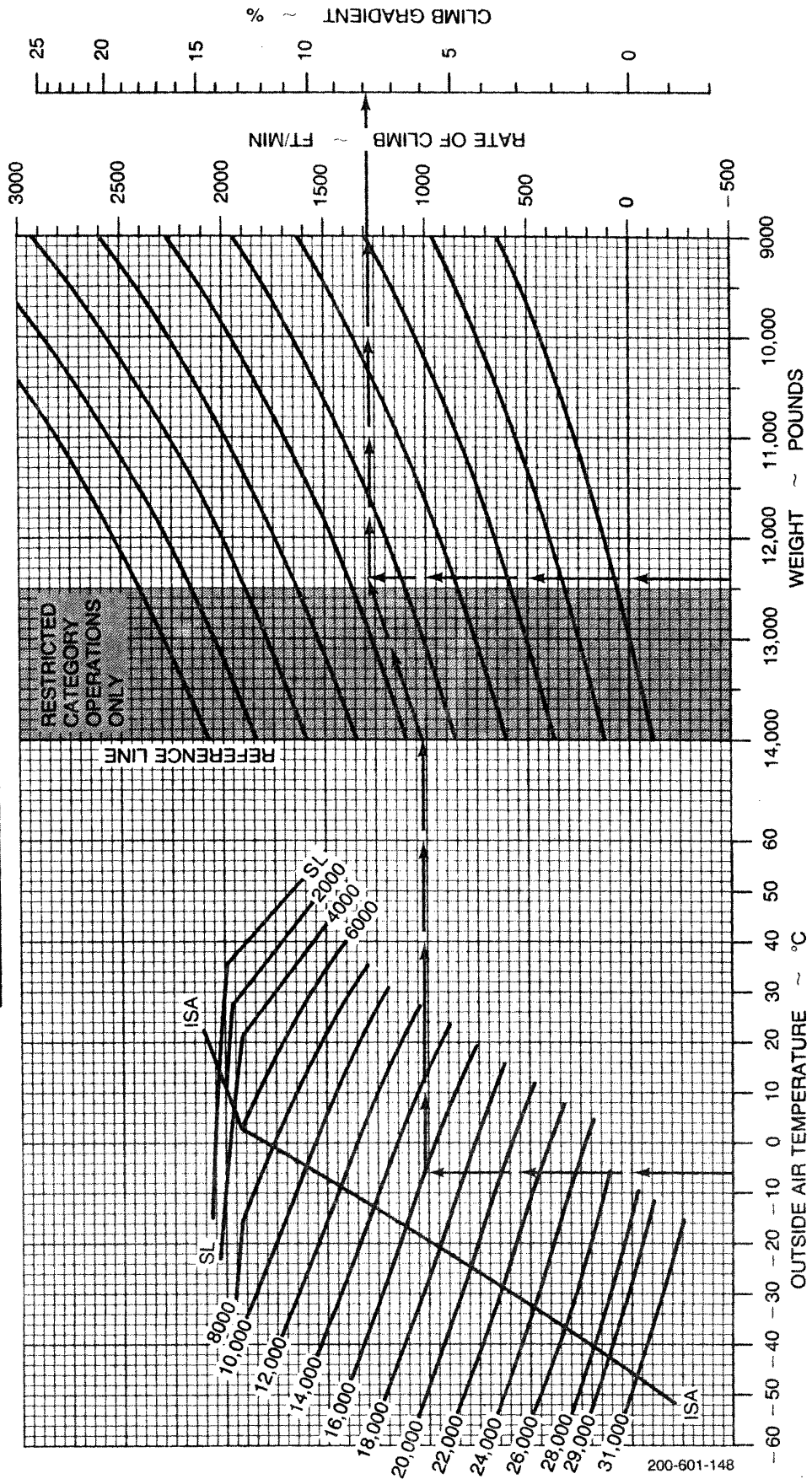
ASSOCIATED CONDITIONS:

POWER TAKEOFF
 FLAPS 0%
 LANDING GEAR..... UP

WEIGHT ~ POUNDS	CLIMB SPEED ~ KNOTS
14,000	129
13,000	126
12,500	125
12,000	123
11,000	121
10,000	118
9000	115

EXAMPLE:

OAT -6°C
 PRESSURE ALTITUDE 16,000 FT
 WEIGHT 12,409 LBS
 RATE OF CLIMB 1290 FT/MIN
 CLIMB GRADIENT 7.8%



200-601-148

CLIMB-TWO ENGINES-FLAPS 40%

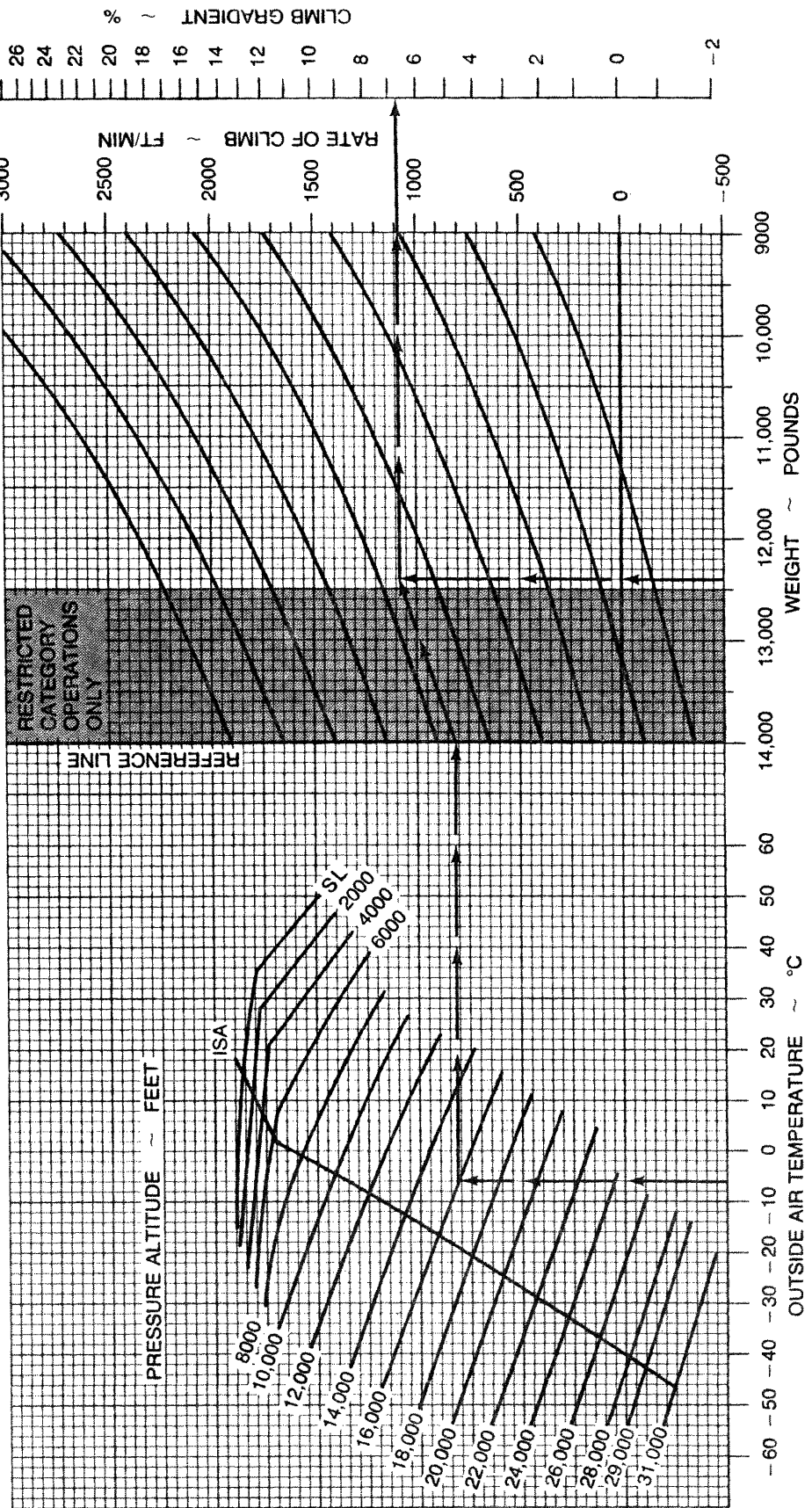
WEIGHT ~ POUNDS	CLIMB SPEED ~ KNOTS
14,000	129
13,000	128
12,500	125
12,000	124
11,000	121
10,000	118
9000	115

ASSOCIATED CONDITIONS:

POWER MAXIMUM CONTINUOUS
 FLAPS 40%
 LANDING GEAR UP

EXAMPLE:

OAT -6°C
 PRESSURE ALTITUDE 16,000 FT
 WEIGHT 12,408 LBS
 RATE OF CLIMB 1090 FT/MIN
 CLIMB GRADIENT 6.9%
 CLIMB SPEED 125 KTS



200-601-144

CLIMB-ONE ENGINE INOPERATIVE

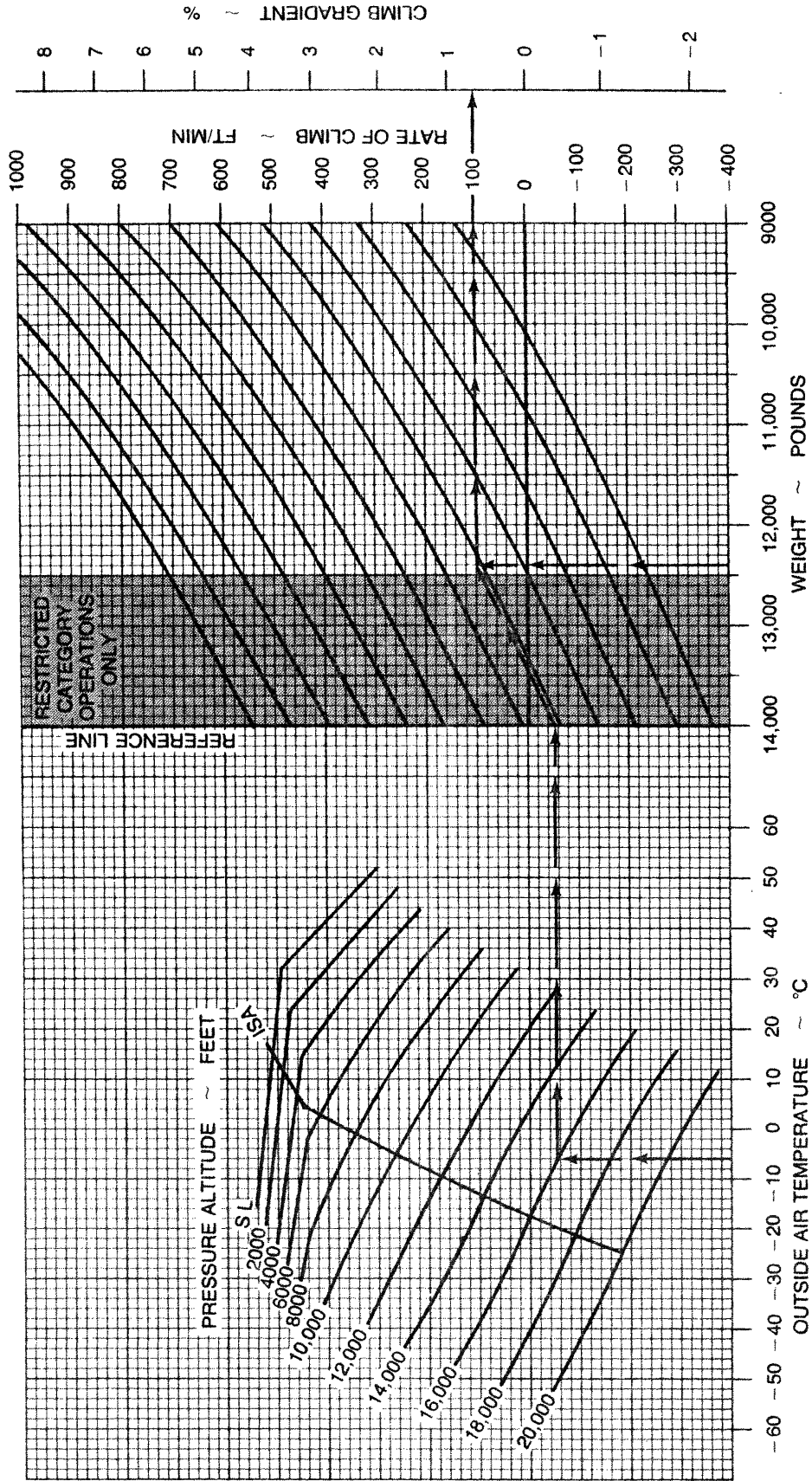
ASSOCIATED CONDITIONS:

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

WEIGHT ~ POUNDS	CLIMB SPEED ~ KNOTS
14,000	124
13,000	122
12,500	121
12,000	119
11,000	117
10,000	114
9000	111

EXAMPLE:

OAT..... -6°C
 PRESSURE ALTITUDE . 16,000 FT
 WEIGHT 12,409 LBS
 RATE OF CLIMB..... 100 FT/MIN
 CLIMB GRADIENT..... 6.8%
 CLIMB SPEED..... 121 KTS



200-601-143

CLIMB-BALKED LANDING

CLIMB SPEED 100 KNOTS (ALL WEIGHTS)

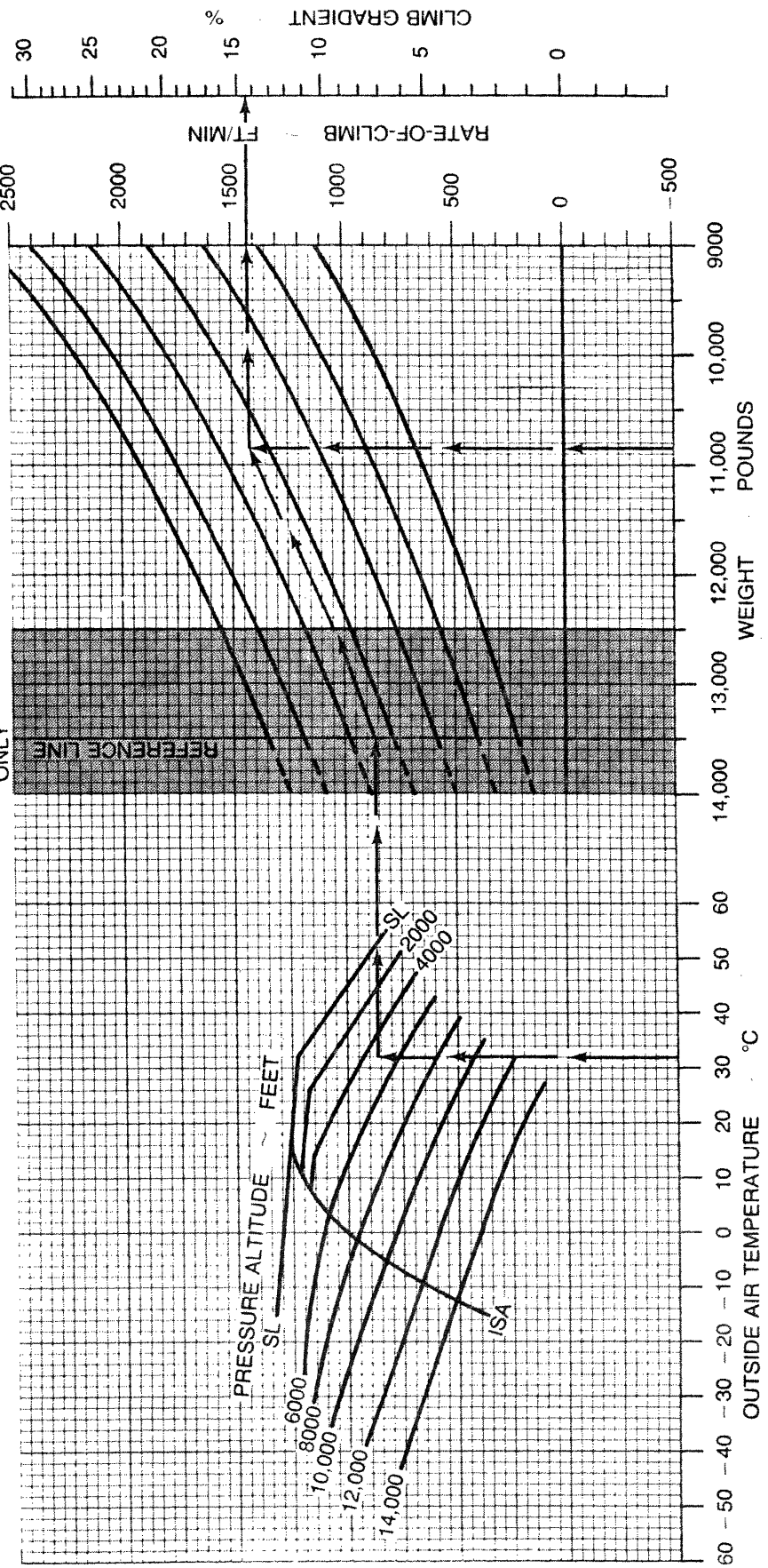
ASSOCIATED CONDITIONS:

POWER TAKE-OFF
 FLAPS 100%
 LANDING GEAR DOWN

EXAMPLE:

OAT 32°C
 PRESSURE ALTITUDE 4730 FT
 WEIGHT 10,854 LBS
 RATE-OF-CLIMB 1420 FT/MIN
 CLIMB GRADIENT 14.4%

RESTRICTED
 CATEGORY
 OPERATIONS
 ONLY



200-601-151

LANDING DISTANCE WITHOUT PROPELLER REVERSING-FLAPS 100%

ASSOCIATED CONDITIONS:

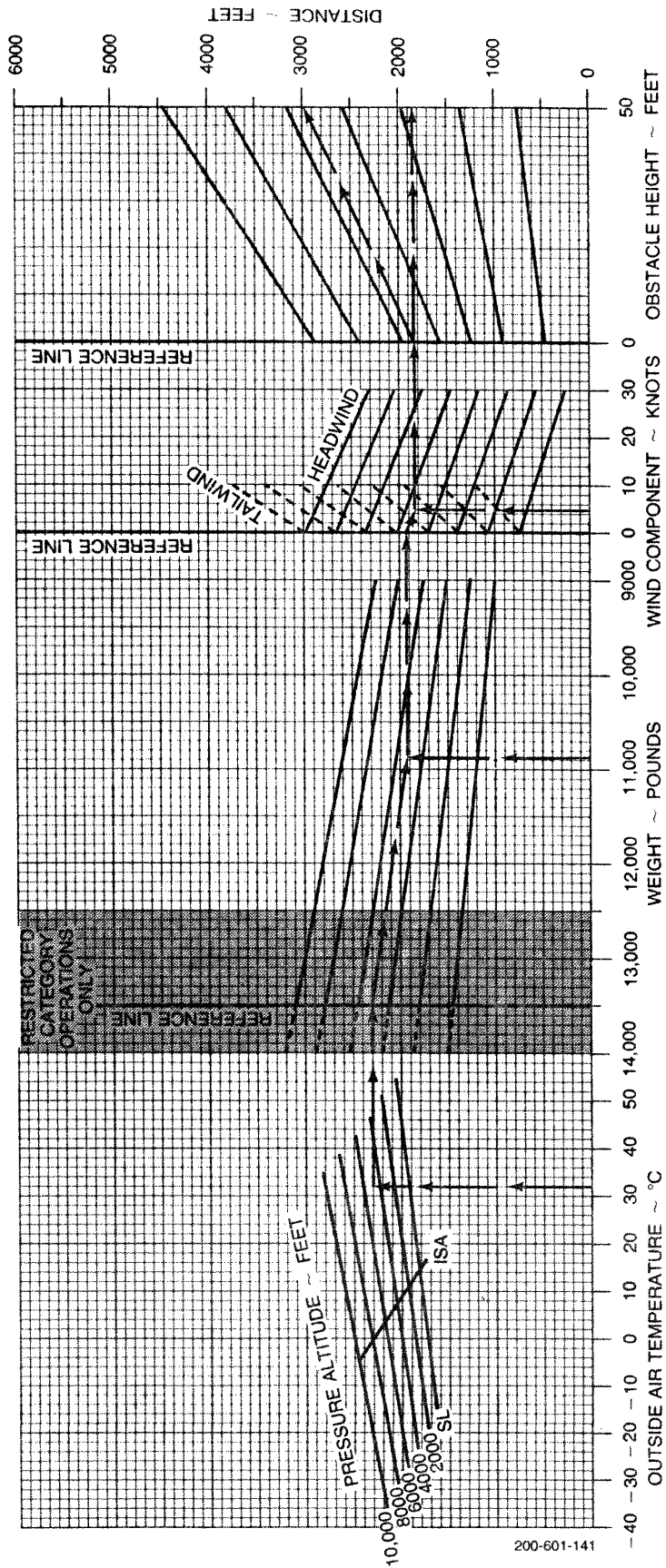
- POWER.....RETARDED TO MAINTAIN 800 FT/MIN ON FINAL APPROACH
- FLAPS.....100%
- RUNWAY.....PAVED LEVEL DRY SURFACE
- APPROACH SPEED IAS AS TABULATED
- BRAKING.....MAXIMUM

WEIGHT ~ POUNDS	APPROACH SPEED ~ KNOTS
14,000	106
13,500	105
13,000	104
12,500	102
12,000	101
11,000	99
10,000	96
9000	94

EXAMPLE:

- OAT.....32°C
- PRESSURE ALTITUDE.....4730 FT
- LANDING WEIGHT.....10,854 LBS
- HEADWIND COMPONENT.....4.7 KTS

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



200-601-141

LANDING DISTANCE WITHOUT PROPELLER REVERSING - FLAPS 0%

ASSOCIATED CONDITIONS:

POWER..... RETARDED TO MAINTAIN
 900 FT/MIN ON FINAL APPROACH
 FLAPS..... UP
 RUNWAY..... PAVED, LEVEL, DRY SURFACE
 APPROACH SPEED..... AS TABULATED
 BRAKING..... MAXIMUM

WEIGHT ~ POUNDS	APPROACH SPEED ~ KNOTS
14,000	137
13,500	135
13,000	133
12,500	131
12,000	129
11,000	125
10,000	121
9,000	117

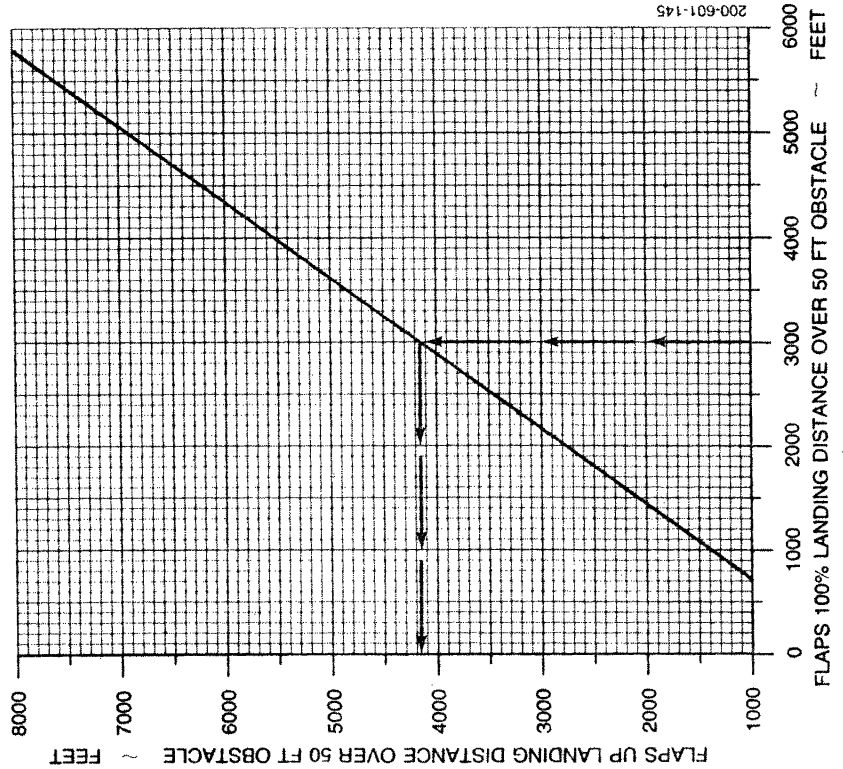
EXAMPLE:

FLAPS 100% LANDING DISTANCE
 OVER 50 FT OBSTACLE..... 3000 FT
 LANDING WEIGHT..... 10,854 LBS

FLAPS UP LANDING DISTANCE
 OVER 50 FT OBSTACLE..... 4150 FT
 APPROACH SPEED..... 124 KTS

NOTE:

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. ENTER THIS GRAPH WITH THE DERIVED VALUES AND READ FLAPS UP LANDING DISTANCE



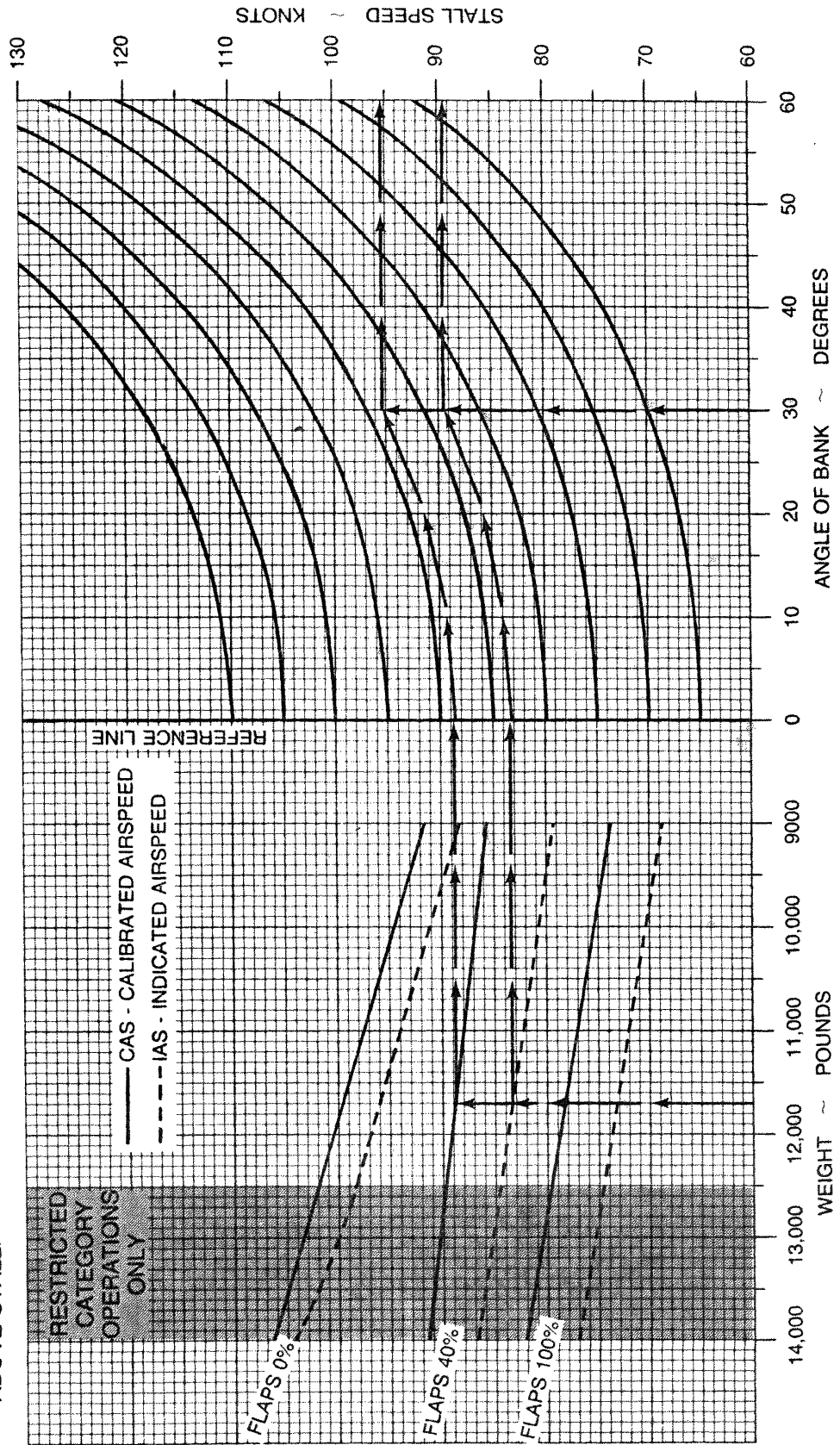
STALL SPEEDS-POWER IDLE

NOTES:

1. MAXIMUM ALTITUDE LOSS DURING A NORMAL STALL RECOVERY IS APPROXIMATELY 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.

EXAMPLE:

WEIGHT	11,700 LBS
FLAPS	40%
ANGLE OF BANK	30°
<hr/>	
STALL SPEED	95 KTS CAS
	90 KTS IAS



200-601-142