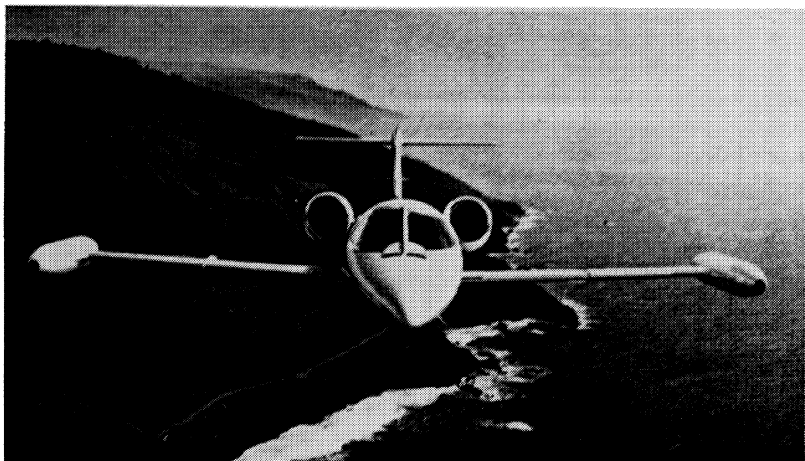


Gates Learjet 35A/36A with FC-200 Autopilot

FAA APPROVED AIRPLANE FLIGHT MANUAL



THIS AIRPLANE MUST BE OPERATED IN COMPLIANCE WITH THE
PRESCRIBED LIMITATIONS IN SECTION 1 OF THIS MANUAL

NOTICE

This AFM is a revised issue of the original AFM dated 4-30-76. This reissue replaces all of the information in the original issue through Change 13.

SERIAL NO. _____

N _____

REISSUE
APPROVED

Robert A. Hambrick

DATE *2/25/81*

for CHIEF, AIRCRAFT CERTIFICATION PROGRAM
FAA CENTRAL REGION
WICHITA, KANSAS

FM-102

Copyright © 1983
GATES LEARJET CORPORATION
All rights reserved

TECHNICAL PUBLICATIONS USER COMMENT SHEET

BOMBARDIER

The Bombardier-Learjet Technical Publications Team is continually striving to make our publications more usable to those in the field. We welcome your comments, criticism, and suggestions concerning any Bombardier-Learjet publication. The action taken, as the result of your comments, will be noted below and a copy returned to you. This electronic form may be returned in any of the following formats:

- E-mailed to learjet.squawk@aero.bombardier.com (preferred)
- Mailed to Bombardier-Learjet Technical Publications using business reply mail (see reverse)
- Faxed to (316) 946-2002
- A User Comment can also be created via <http://www.cic.bombardier.com>
Click on User Comments.

Today's Date _____

Publication Information

Title _____
Rev/Chg No. _____ Issue/Rev Date _____
Chap/Sec/Sub _____
Page No. _____
Page Date _____

Aircraft Information

Model _____
Serial No. _____

Customer Information

Your Name _____
Dept/Title _____
Mailing Address _____

E-mail _____
Telephone _____
Fax No. _____

Comment/Suggestion:

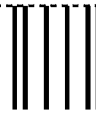
THIS SPACE RESERVED FOR LEARJET USE ONLY

Date Received	Assign To	Action Taken:
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

_____ Answered By _____ Date _____

▼ FOLD HERE FIRST ▼

BOMBARDIER



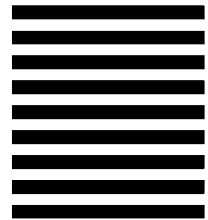
NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 2928

WICHITA, KS

POSTAGE WILL BE PAID BY ADDRESSEE



ATTN: TECHNICAL PUBLICATIONS (MS #53)
LEARJET INC
PO BOX 7707
WICHITA, KS 67277-9801



▲ FOLD HERE LAST. SEAL WITH TAPE. DO NOT STAPLE ▲

IMPORTANT TO THE OWNER OF THIS AIRPLANE

To ensure that you receive all applicable changes to this manual, please fill in the blanks below and mail to the address at the bottom of the page.

There is no charge for the one Flight Manual assigned to the aircraft and you will receive all changes to the assigned manual at no charge. There is, however, a yearly subscription charge for all Flight Manuals not assigned to the aircraft.

AIRCRAFT SERIAL NUMBER _____

MAILING ADDRESS FOR CHANGES:

MAIL THIS SHEET TO:

Gates Learjet Corporation
P.O. Box 7707
Wichita, Kansas 67277

Attn: Technical Data Control Center

LOG OF TEMPORARY FLIGHT MANUAL CHANGES

This list is intended to assist the flight crew in determining the applicable AFM temporary flight manual changes for Model 35A/36A aircraft equipped with FC-200 autopilot. It is the responsibility of the aircraft owner and operator to maintain their basic AFM with the temporary changes applicable to their aircraft. Insert this list before page A.

TFM # Dated	Section or Page	Description	Status
3-31-81	2-19	Revised autopilot pitch monitor check.	Removed by Chg 1.
7-8-81	2-2	Assure pitot-static drain valves close after draining.	Removed by Chg 1.
7-8-81	1-13	Minimum fuel requirement for takeoff and intentional go around.	Removed by Chg 1.
7-8-81	2-29	Warning pertaining to fuel starvation with nose-up attitude and low fuel. (After Take-off checklist)	Removed by Chg 1.
7-8-81	2-35	Warning pertaining to fuel starvation with nose-up attitude and low fuel. Go Around checklist)	Removed by Chg 1.
8-18-81	2-70	Note pertaining to the MSTR WARN light.	Removed by Chg 1.
8-28-81	1-26	Revised stabilizer trim indicator markings.	Removed by Chg 1.
2-5-82	4-1	Revised turbulent air penetration procedure.	Removed by Chg 2.
2-5-82	3-17	Adds recovery from inadvertent overspeed procedure to emergency section.	Removed by Chg 2.
2-5-82	4-2	Deletes recovery from inadvertent overspeed procedure from abnormal section.	Removed by Chg 2.
83-01 3-16-83	1-14	Seat belts and shoulder harnesses required for takeoff and landing.	Removed by Chg 5.
83-02 3-18-83	3-17A	Disengage autopilot during recovery from inadvertent overspeed.	Removed by Chg 5.
83-06 9-23-83	2-7	Select 100% OXY during before starting engines checks.	Removed by Chg 5.
83-09 9-23-83	2-45	Revised operation of diluter-demand crew oxygen masks.	Removed by Chg 5.
83-15 9-23-83	2-47	Revised oxygen duration table for ZMR 100 series crew masks.	Removed by Chg 5.
83-17 9-23-83	3-22	Select 100% OXY during emergency descent procedure.	Removed by Chg 5.

Continued

TFM # Dated	Section or Page	Description	Status
84-02 3-15-84	1-3	Maximum zero wing and tip fuel weight replaces maximum wing bending weight.	Removed by Chg 5.
85-02 3-8-85	IV	Revised FUEL CMPTR light procedure.	Removed by Chg 6.
85-10 1-3-86	2-2	Engine oil and hydraulic accumulator pre-flight checks.	Removed by Chg 6.
85-16 11-8-85	3-5	Current limiter failure procedure associated with AMK 85-1.	Removed by Chg 8.
87-05 3-2-87	4-17	Clarify operation of emergency gear extension valve.	Removed by Chg 7.
87-06 3-2-87	4-19	Clarify operation of emergency gear extension valve.	Removed by Chg 7.
87-15 7-16-87	II	Bleed hydraulic pressure to zero before setting battery switches off.	Superseded by TFM 88-17.
88-07 2-13-89	4-29	Pitot-static system malfunction procedure.	Removed by Chg 7.
88-17 1-17-89	II	Bleed hydraulic pressure to zero before setting battery switches off.	Removed by Chg 9.
89-17 11-16-89	4-16	Fuel imbalance during fuel transfer procedure.	Removed by Chg 9.
92-02 9-10-92	2-16	Clarify the oil pressure annunciator.	Removed by Chg 10.
93-15 12-3-93	2-35	Cold weather operations.	Removed by Chg 10.
94-15 1-9-95	1-14	Maximum operating altitude — 41,000 FT. (When cabin outflow or safety valve has been replaced between 1-1-89 and 1-9-95)	Active, until SB 35/36-21-19 is accomplished.
94-23 3-6-95	5-8	Revised noise level compliance statement.	Removed by Chg 10.
96-08 5-30-96	2-49	Standby fuel pump annunciators.	Removed by Chg 10.
96-09 5-30-96	4-17	Procedure for standby fuel pump failing to shut off.	Removed by Chg 10.
96-10 7-12-96	1-14	Adds paved runway restriction to limitations section.	Removed by Chg 10.
99-02 7-16-99	1-18B	Revises the list of approved oils.	Superseded by TFM 99-24.
99-03 4-16-99	1-20	Revises fuel anti-icing additive limitations.	Removed by Chg 12.
99-24 11-30-99	1-18B	Revises the list of approved oils.	Superseded by TFM 99-26.
99-26 12-21-99	1-18B	Revises the list of approved oils.	Removed by Chg 12.

Continued

TFM # Dated	Section or Page	Description	Status
2001-15 4-13-01	4-44	Revises Single Engine Landing procedure.	Removed by Chg 13.
2007-02 6-14-07	3-46	Revises Stall Warning Activates procedure.	Removed by Chg 14.
2007-04 6-14-07	4-27	Revises AUG AIL Light Illuminated procedure.	Removed by Chg 14.
2007-13 1-14-08	4-9	Revises Single Generator Failure procedure.	Removed by Chg 14.
2007-14 1-14-08	3-8	Revises Dual Generator Failure procedure.	Removed by Chg 14.

— LIST OF EFFECTIVE PAGES —

Use this List of Effective Pages to determine the current status of the Airplane Flight Manual. Pages affected by the current change are indicated by an asterisk (*) immediately preceding the page number.

Learjet 35A/36A with FC-200 Autopilot AFM

Dates of issue for Original and Changed pages are:

Original..... O	4-30-1976	Change..... 7	6-20-1989
Reissue	2-25-1981	Change..... 8	1-12-1990
Change..... 1	9-10-1981	Change..... 9	2-20-1992
Change..... 2	6-24-1982	Change..... 10	3-14-1997
Change..... 3	1-26-1983	Change..... 11	11-18-1998
Change..... 4	8-6-1984	Change..... 12	12-1-2000
Change..... 5	11-7-1984	Change..... 13	9-5-2006
Change..... 6	6-27-1986	Change..... 14	6-23-2008

NOTE

This change supersedes and incorporates TFM 2007-02, TFM 2007-04, TFM 2007-13, and TFM 2007-14. Remove superseded temporary changes from AFM.

Page	Change	Page	Change
Title.....	5	1-10	6
*A thru C.....	14	1-11 thru 1-14	10
i	10	1-15	6
ii.....	Reissued	1-16	10
iii thru v	10	1-17	9
Limitations		1-18	10
I-1	10	1-18A	10
I-2	13	1-18B and 1-18C	13
I-312		1-19	13
1-1	13	1-20 thru 1-24	12
1-2 thru 1-4	6	1-25	Reissued
1-5	10	1-26	5
1-6 thru 1-8	Reissued	1-27	13
1-9	13	1-28	5
		1-29 and 1-30	8

FAA

Approved

DM Baker

Date

6/27/08

for MARGARET KLINE, MANAGER
AIRCRAFT CERTIFICATION OFFICE
FEDERAL AVIATION ADMINISTRATION
WICHITA, KANSAS

LIST OF EFFECTIVE PAGES (Cont)

Learjet 35A/36A with FC-200 Autopilot AFM

Page	Change	Page	Change
Normal Procedures			
II-1 and II-2	12	3-31 and 3-32	13
II-3	10	3-33 thru 3-36	10
*II-4	14	3-37	12
2-1 thru 2-7	10	3-38	10
2-8 and 2-9	11	3-39	13
2-10 thru 2-16	13	3-40 thru 3-44	10
2-17	10	3-45	11
2-18	13	*3-46 and 3-47	14
2-19 thru 2-23	10	*3-48 (Added)	14
2-24	12	Abnormal Procedures	
2-25	10	IV-1	13
2-26 thru 2-28	12	IV-2	12
2-29 and 2-30	10	IV-3	13
2-31 and 2-32	11	IV-4	10
2-33	10	4-1 thru 4-8	10
2-34	11	*4-9	14
2-35 thru 2-37	10	4-10	10
2-38 and 2-39	12	4-11 and 4-12	13
2-40 thru 2-51	10	4-13	12
2-52 and 2-53	12	4-14 and 4-15	10
2-54 and 2-55	10	4-16 thru 4-21	12
2-56	13	4-22 thru 4-26	10
2-57	10	*4-27	14
2-58 thru 2-63	12	4-28 thru 4-34	10
2-64 and 2-65	10	4-35	12
2-66 and 2-67	12	*4-36	14
2-68 thru 2-85	10	4-37 and 4-38	10
Emergency Procedures		4-39	11
III-1	12	4-40 and 4-41	10
*III-2	14	4-42	13
III-3	10	4-43	10
3-1 thru 3-7	10	*4-44	14
*3-8	14	4-45 thru 4-48	11
3-9 and 3-10	10	4-49 and 4-50	13
3-11 thru 3-13	12		
3-14 and 3-15	11		
3-16 thru 3-20	10		
3-21	12		
3-22 thru 3-26	10		
3-27 thru 3-30	12		

—LIST OF EFFECTIVE PAGES (Cont)—

Learjet 35A/36A with FC-200 Autopilot AFM

Page	Change	Page	Change
Performance Data			
V-1	10	5-37	9
V-2	12	5-37A	9
V-3	13	5-37B and 5-37C	12
5-1	9	5-38 and 5-39	Reissued
5-2	Reissued	5-40	3
5-2A	13	5-41	Reissued
5-3 thru 5-5	13	5-42 and 5-43	12
5-6 thru 5-8	10	5-44	3
5-9	Reissued	5-45 thru 5-47	Reissued
5-10	6	5-48 and 5-49	6
5-11	8	5-50 thru 5-53	Reissued
5-12 thru 5-23	Reissued	5-54	3
5-24 thru 5-27	5	5-55 thru 5-57	Reissued
5-28	Reissued	5-58 and 5-59	6
5-29	10	5-60 thru 5-64	Reissued
5-29A thru 5-29C	10	5-65	10
5-30 thru 5-32	Reissued	5-66	13
5-33 and 5-34	5	5-66A	12
5-35 and 5-36	11	5-67 thru 5-72	Reissued
		5-73 and 5-74	10

INTRODUCTION

THIS AIRPLANE FLIGHT MANUAL MUST BE CARRIED IN THE AIRCRAFT AT ALL TIMES.

THE MANUAL

This manual is divided into seven basic sections as follows:

Section I — **LIMITATIONS** containing FAA approved operating limitations which must be observed, except where a deviation is specifically authorized, during operation of the aircraft.

Section II — **NORMAL PROCEDURES** containing FAA approved operation procedures for the aircraft and its systems which may be considered routine in day-to-day operations.

Section III — **EMERGENCY PROCEDURES** containing FAA approved operating procedures requiring the use of special system and/or regular systems in order to protect the occupants and the aircraft from harm during a critical condition requiring immediate response. Steps of procedures enclosed in a box such as this  should be accomplished without the aid of the checklist.

Section IV — **ABNORMAL PROCEDURES** containing FAA approved operating procedures requiring the use of special systems and/or alternate use of regular systems which, if followed, will maintain an acceptable level of airworthiness or reduce operational risk resulting from a failure condition.

Section V — **PERFORMANCE** containing FAA approved data defining the aircraft performance under standard performance conditions. Refer to **RETENTION OF FLIGHT MANUAL PERFORMANCE DATA** in this Introduction.

Section VI — **SUPPLEMENTS** containing FAA Approved Airplane Flight Manual Supplements. These supplements contain operating limitations, procedures, and performance data and other necessary data for aircraft conducting special operations and/or equipped with specific equipment requiring the supplement.

Section VII — **WEIGHT AND BALANCE DATA** contains data intended to assist the operator in ensuring that the aircraft is properly loaded.

INTRODUCTION (CONT)

Section I through Section V is composed of material approved by the Federal Aviation Administration and together with the FAA Approved Airplane Flight Manual Supplements in Section VI constitute the FAA Approved Airplane Flight Manual. Section VII (Weight and Balance Data) is not FAA approved material but is included in this manual for the operator's convenience.



Section VII (Weight and Balance Data) is complete within itself and includes a List of Effective Pages. Therefore, Section VII may be revised in the same manner in which the FAA Approved Airplane Flight Manual portion is revised.

REVISING THE MANUAL

The data presented in this manual is the result of extensive flight tests and has been approved by the Federal Aviation Administration. However, development does not stop with the issuance of this manual and as new procedures are developed they will be forwarded to the holder of this manual. Revised material will be in the form of Temporary Flight Manual Changes or Numbered Changes. It is the responsibility of the operator to ensure that the Flight Manual is current at all times. Therefore, it is very important that changes (temporary or numbered) be incorporated in the manual as soon as they are received.

TEMPORARY FLIGHT MANUAL CHANGES

Temporary Flight Manual Changes may be issued against the Flight Manual when required. These changes generally contain material that is not so extensive as to require a Numbered Change and allow Learjet to transmit revised data to the operator faster than with the Numbered Change system. Temporary Flight Manual Changes are printed on yellow paper and include all necessary information (Publication Affected, Description of Change, and Filing Instructions) on the change itself. Temporary Flight Manual Changes are to be retained in the Flight Manual until removed by some other authority — usually a superseding Temporary Change or a Numbered Change.

INTRODUCTION (CONT)**NUMBERED CHANGES**

Numbered Changes issued against the Flight Manual differ from Temporary Flight Manual Changes in that the pages contained in the Numbered Change supersede like pages in the Flight Manual. Each page in a Numbered Change has a "Change" number located at the lower corner of the page immediately below the FAA APPROVED date. Portions of the text affected by the change are indicated by a vertical bar at the outer margin of the page. The vertical bars may not appear on pages that contain changes to graphs or tables. Additionally, when a "changed" page is the result of a rearrangement of material due to a change on a previous page no vertical bar will appear.

The List of Effective Pages provides the user with a guide to establish the current effective date of each page in the Flight Manual and an instruction sheet for incorporating the latest Numbered Change into the Flight Manual. Information included in the List of Effective Pages states the current Change Number for each page, the dates of Original issue and Numbered Changes, and the Temporary Flight Manual Changes the current Numbered Change supersedes. An asterisk (*) next to a page number indicates pages changed, added, or deleted by the current change.



Numbered Changes do not automatically supersede all outstanding Temporary Flight Manual Changes. Follow instructions given in "Note" on List of Effective Pages to determine which Temporary Flight Manual Changes to remove when incorporating a Numbered Change.

RETENTION OF FLIGHT MANUAL PERFORMANCE DATA

The performance data in Section V of this manual provides performance data for all aircraft with the same model designation rather than performance data for a specific serial number aircraft. Therefore, due to serial number changes or the incorporation of Airplane Modification Kits (AMK's), Airplane Accessory Kits (AAK's) or Service Bulletins, performance charts may be issued against this Flight Manual which are not applicable to the specific aircraft assigned to the Flight Manual. It is permissible to relocate performance data not applicable to your specific aircraft to the rear of the manual.



Retention of relocated performance data is required as all pages listed on the List of Effective Pages constitute a complete FAA Approved Airplane Flight Manual. Additionally, even though some data may be relocated, all changes must be incorporated and the manual kept current.

INTRODUCTION (CONT)**NOTES, CAUTIONS, AND WARNINGS**

Notes, Cautions, and Warnings are used throughout this manual to focus attention on special conditions or procedures as follows:



Notes are used to highlight specific operating conditions or steps of a procedure.



Cautions are used to call attention to operating procedures which, if not strictly observed, may result in damage to equipment.



Warnings are used to call attention to operating procedures which, if not strictly adhered to, may result in personal injury or loss of life.

OTHER PUBLICATIONS

The following is a list of Learjet publications referenced in this Airplane Flight Manual. Such references in this manual are made by number and do not contain any revision indication. However, such references are to be understood as "the latest revision".

AIRPLANE ACCESSORY KITS (AAK)

AAK 77-8	Increase Takeoff Gross Weight to 18,000 Pounds
AAK 79-4	Installation of Conical Fan Spinner for TFE 731 Engines
AAK 79-10	Installation of Wing Fences, Stall Strips and Boundary Layer Energizers (Softflite) (Superseded by AMK 83-5)
AAK 80-2	Increase Takeoff Gross Weight to 18,300 Pounds
AAK 80-3	Increase Landing Gross Weight to 15,300 Pounds
AAK 81-1	Installation of Starter Electrical Contactors
AAK 83-8	Installation of Components to Allow Variable Pitch Trim Settings at Takeoff
AAK 86-1	Installation of Windshield Defog Improvement

INTRODUCTION (CONT)**AIRPLANE MODIFICATION KITS (AMK)**

- AMK 76-3 Installation of Anti-Skid and Nose Steering Interface Electrical Box
- AMK 76-7 Relocation of Cabin Air Distribution Flow Control Valve
- AMK 78-13 Installation of Split Essential Bus Electrical System
- AMK 80-17 Installation of Current Limiter Warning and Starter Indicator Lights
- AMK 83-5 Installation of Wing Fences, Stall Strips and Boundary Layer Energizers (Softflite) (Supersedes AAK 79-10)
- AMK 85-1 Electrical Power Distribution Improvement
- AMK 90-3 Installation of Emergency Pressure Control Circuit Breaker
- AMK 91-2 Replacement of Windshield Anti-ice Thermostats

ENGINEERING CHANGE RECORDS (ECR)

- ECR 1495 18,000 Pounds T.O.G.W.
- ECR 2234 Takeoff Gross Weight Increase

FIELD CHANGE NOTICES (FCN)

- FCN 89-1 Increase Altitude Limitation for Operation of Freon Air Conditioning System

SERVICE BULLETINS (SB)

- SB 35/36-21-17 Installation of Windshield Defog Improvement
- SB 35/36-22-4 Modification of Mach Trim Computer
- SB 35/36-27-7 Modification of Spoileron Computer Assembly
- SB 35/36-28-11 Installation of Standby Fuel Pump Annunciators
- SB 35/36-32-4 Replacement of Landing Gear Hydraulic Selector Valve

SECTION I — LIMITATIONS

TABLE OF CONTENTS

General

Certification Status	1-1
Type of Operation	1-1
Performance Configuration	1-1
Minimum Flight Crew	1-1
Maneuvers	1-1

Weight and C.G. Limits

Maximum Ramp Weight	1-2
Maximum Certified Takeoff Weight	1-3
Maximum Zero Wing and Tip Fuel Weight	1-3
Maximum Allowable Takeoff Weight	1-4
Maximum Certified Landing Weight	1-4
Maximum Allowable Landing Weight	1-5
Center-of-Gravity Envelope	1-5
<i>Aircraft Certified for 17,000 Pounds Takeoff Weight</i>	1-6
(Figure 1-1)	1-6
<i>Aircraft Certified for 18,000 Pounds Takeoff Weight</i>	1-7
(Figure 1-2)	1-7
<i>Aircraft Certified for 18,300 Pounds Takeoff Weight</i>	1-8
(Figure 1-3)	1-8

Airspeed/Mach Limits

Maximum Operating Speed VMO/MMO	1-9
Maneuvering Speed VA	1-9
Maximum Landing Gear Operating Speed VLO	1-9
Airspeed/Mach Limits (Figure 1-4)	1-10
Maximum Landing Gear Extended Speed VLE	1-11
Maximum Flap Extended Speed VFE	1-11
Minimum Control Speed Air VMCA	1-11
Minimum Control Speed Ground VMCG	1-11
Critical Engine Failure Speed V1	1-11
Rotation Speed VR	1-12
Takeoff Safety Speed V2	1-12

Ambient Temperature Limits (Figure 1-4A)..... 1-12

TABLE OF CONTENTS (Cont)

Takeoff and Landing Operational Limits

Temperature Limits.....	1-13
Maximum Altitude	1-13
Wind Components.....	1-13
Runway Conditions.....	1-13
Maximum Nose Wheel Steering Speed	1-13
Tire Limiting Speed	1-13
Tip Tank Fuel.....	1-13
Minimum Fuel	1-13
Pressurization.....	1-14
Seat Belts	1-14

Enroute Operational Limits

Temperature Limits.....	1-14
Maximum Operating Altitude.....	1-14
Flight Load Acceleration Limits.....	1-14

System Limits

Stall Warning System.....	1-15
Trim Systems	1-15
Yaw Damper	1-16
Spoiler.....	1-16
Hydraulic System.....	1-16
Generator Limits	1-16
Electrical System	1-17
Engine Synchronizer	1-17
External Power.....	1-17
Freon Cooling System.....	1-17
Oxygen System	1-18
Pressurization Limit	1-18A
Windshield and Radome Anti-Ice Fluid.....	1-18A
Thrust Reversers (if installed).....	1-18A

Powerplant Limits

Engine Speed Limits	1-18B
Engine Operating Temperatures.....	1-18B
Turbine Temperature Limits (ITT)	
Starting (Figure 1-5).....	1-18C
Except Starting (Figure 1-6)	1-19

Oil Limits

Oil Temperature	1-18B
Approved Oils.....	1-18B

TABLE OF CONTENTS (Cont)

Fuel Limits

Fuel Temperature	1-20
Unusable Fuel	1-20
Fuel Additives.....	1-20
Anti-Icing Additive	1-20
Biocide Additive	1-20
Electronic Fuel Computer Specific Gravity	1-21
Approved Fuels	1-22

Emergency Fuel

Aviation Gasoline	1-23
-------------------------	------

Instrument Markings

Airspeed/Machmeter	1-25
Trim	1-26
Cabin Altimeter/Differential Pressure	1-26
Turbine Speed (N2)	1-27
Turbine Temperature (ITT).....	1-27
Fan Speed (N1).....	1-28
Oil Pressure	1-28
Oil Temperature	1-29
Ammeter	1-29
DC Voltmeter.....	1-29
AC Voltmeter.....	1-29
Hydraulic Pressure	1-30
Emergency Air	1-30
Oxygen Pressure	1-30

GENERAL

CERTIFICATION STATUS

This airplane is certified in accordance with FAR 25.

TYPE OF OPERATION

This aircraft is approved for VFR, IFR, day, night, and icing conditions.

When icing or frost conditions exist, this airplane must be inspected and operated in accordance with the Cold Weather Operation procedures of Section II. These procedures include the requirement to assure that all critical surfaces of the airplane (wing, vertical and horizontal stabilizers, flight control surfaces, spoilers and flaps) are free of frost, ice and snow for takeoff. Conducting only a visual inspection may not detect very small levels of contamination; therefore, a tactile (hand on surface) check of the wing leading edge and adjacent wing upper surface is required when the ambient temperature is less than 10° C (50° F).

PERFORMANCE CONFIGURATION

The airplane configuration must be as presented under Standard Performance Conditions in Section V.

MINIMUM FLIGHT CREW

The minimum flight crew shall consist of pilot and copilot.

MANEUVERS

No aerobatic maneuvers, including spins, are approved.

Intentional stalls (pusher actuations) are prohibited above 18,000 feet with flaps and/or landing gear extended.

WEIGHT AND C.G. LIMITS

MAXIMUM RAMP WEIGHT



Ramp Weight shall not exceed Maximum Allowable Takeoff Weight by more than 250 lbs (113 kg).

MODEL 35A:

- *Serials 35-067 and subsequent not incorporating ECR 1495, ECR 2234, AAK 77-8, or AAK 80-2* 17,250 Pounds
7,825 kg
- *Serials 35-067 thru 35-344 when incorporating ECR 1495 or AAK 77-8* 18,250 Pounds
8,278 kg
- *Serials 35-067 thru 35-344 when incorporating AAK 80-2.....* 18,500 Pounds
8,392 kg
- *Serials 35-345 and subsequent when incorporating ECR 2234* 18,500 Pounds
8,392 kg

MODEL 36A:

- *Serials 36-018 thru 36-045 not incorporating AAK 80-2* 18,250 Pounds
8,278 kg
- *Serials 36-018 thru 36-045 when incorporating AAK 80-2.....* 18,500 Pounds
8,392 kg
- *Serials 36-046 and subsequent* 18,500 Pounds
8,392 kg

WEIGHT AND C.G. LIMITS (CONT)

MAXIMUM CERTIFIED TAKEOFF WEIGHT

MODEL 35A:

- *Serials 35-067 and subsequent not incorporating ECR 1495, ECR 2234, AAK 77-8, or AAK 80-2* 17,000 Pounds
7,711 kg
- *Serials 35-067 thru 35-344 when incorporating ECR 1495 or AAK 77-8* 18,000 Pounds
8,165 kg
- *Serials 35-067 thru 35-344 when incorporating AAK 80-2* 18,300 Pounds
8,301 kg
- *Serials 35-345 and subsequent when incorporating ECR 2234* 18,300 Pounds
8,301 kg

MODEL 36A:

- *Serials 36-018 thru 36-045 not incorporating AAK 80-2* 18,000 Pounds
8,165 kg
- *Serials 36-018 thru 36-045 when incorporating AAK 80-2* 18,300 Pounds
8,301 kg
- *Serials 36-046 and subsequent* 18,300 Pounds
8,301 kg

MAXIMUM ZERO WING AND TIP FUEL WEIGHT. 13,500 Pounds
6,124 kg



All weights in excess of 13,500 pounds must consist of wing and tip tank fuel, except as follows:

1. The Maximum Zero Wing and Tip Fuel Weight may be increased to 14,000 pounds by adding up to 500 pounds of additional fuselage fuel. The additional fuselage fuel must be transferred prior to reaching a total wing fuel quantity of 2250 pounds.
2. In the event the additional fuselage fuel cannot be transferred, V_{MO} must be reduced to 325 KIAS.

WEIGHT AND C.G. LIMITS (CONT)

MAXIMUM ALLOWABLE TAKEOFF WEIGHT

The takeoff weight is limited by the most restrictive of the following requirements:

- Maximum Certified Takeoff Weight.
- Maximum Takeoff Weight (Climb or Brake Energy Limited) for altitude and temperature as determined from the applicable figure entitled TAKEOFF WEIGHT LIMITS in Section V.
- Maximum Takeoff Weight for the runway and ambient conditions as determined from the applicable figure entitled TAKEOFF DISTANCE in Section V.
- Maximum Takeoff Weight for obstacle clearance as determined from the applicable TAKEOFF FLIGHT PATH and CLIMB GRADIENT figures in Section V. (FAR 121 and 135 as applicable to U.S. registered aircraft.)

MAXIMUM CERTIFIED LANDING WEIGHT

MODEL 35A:

- *Serials 35-067 thru 35-344 not incorporating AAK 80-3* 14,300 Pounds
6,486 kg
- *Serials 35-067 thru 35-344 when incorporating AAK 80-3* 15,300 Pounds
6,940 kg
- *Serials 35-345 and subsequent* 15,300 Pounds
6,940 kg

MODEL 36A:

- *Serials 36-018 thru 36-045 not incorporating AAK 80-3* 14,300 Pounds
6,486 kg
- *Serials 36-018 thru 36-045 when incorporating AAK 80-3* 15,300 Pounds
6,940 kg
- *Serials 36-046 and subsequent* 15,300 Pounds
6,940 kg

WEIGHT AND C.G. LIMITS (CONT)**MAXIMUM ALLOWABLE LANDING WEIGHT**

The landing weight is limited by the most restrictive of the following requirements:

- Maximum Certified Landing Weight.



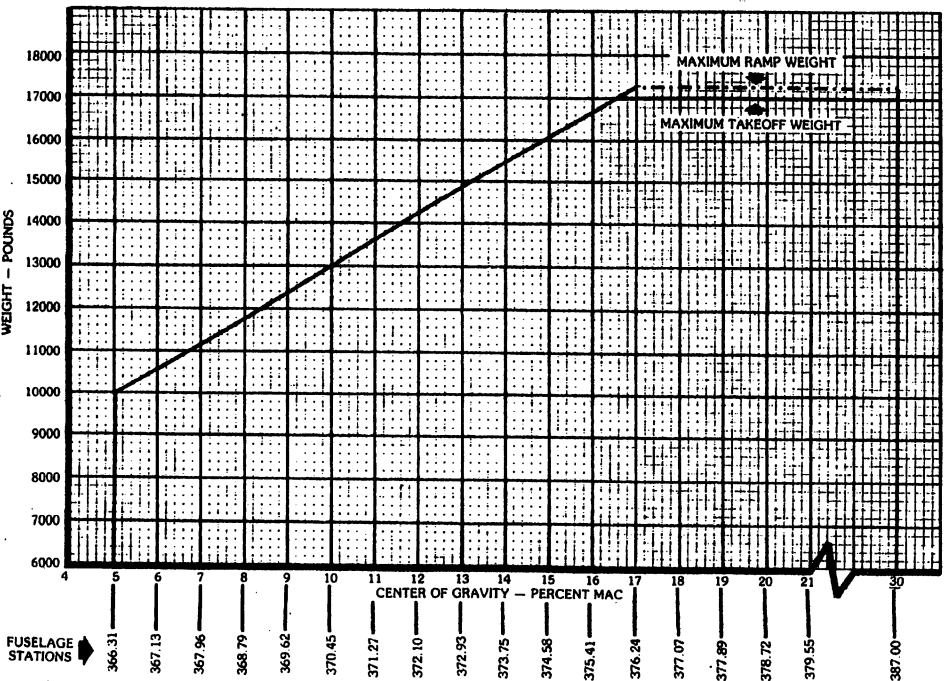
Perform Hard or Overweight Landing Inspection (Chapter 5, 35/36/35A/36A Maintenance Manual) if Maximum Certified Landing Weight is exceeded.

- Maximum Landing Weight for the runway and ambient conditions as determined from the applicable LANDING DISTANCE chart in Section V.
- Maximum Landing Weight (Approach Climb or Brake Energy Limited) for altitude and temperature as determined from the applicable figure entitled LANDING WEIGHT LIMITS in Section V.

CENTER-OF-GRAVITY ENVELOPE

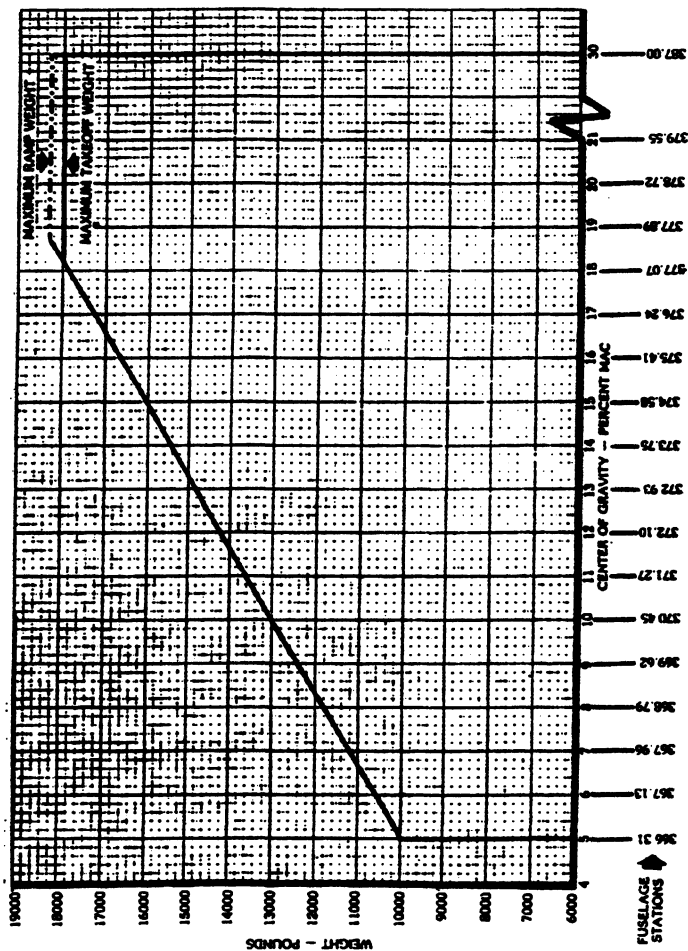
- *Aircraft Certified for 17,000 Pounds Takeoff Weight.* The forward C.G. limit is Fuselage Station (F.S.) 366.31 (5% MAC) for all weights up to and including 10,000 pounds and tapers through F.S. 375.96 (16.66% MAC) at 17,000 pounds to F.S. 376.31 (17.09% MAC) at 17,250 pounds. The aft C.G. limit is F.S. 387.00 (30% MAC) for all weights. Refer to Figure 1-1.
- *Aircraft Certified for 18,000 Pounds Takeoff Weight.* The forward C.G. limit is Fuselage Station (F.S.) 366.31 (5% MAC) for all weights up to and including 10,000 pounds and tapers through F.S. 377.34 (18.33% MAC) at 18,000 pounds to F.S. 377.69 (18.76% MAC) at 18,250 pounds. The aft C.G. limit is F.S. 387.00 (30% MAC) at all weights. Refer to Figure 1-2.
- *Aircraft Certified for 18,300 Pounds Takeoff Weight.* The forward C.G. limit is Fuselage Station (F.S.) 366.31 (5% MAC) for all weights up to and including 10,000 pounds and tapers through F.S. 377.75 (18.83% MAC) at 18,300 pounds to F.S. 378.03 (19.17% MAC) at 18,500 pounds. The aft C.G. limit is F.S. 387.00 (30% MAC) at all weights. Refer to Figure 1-3.

AIRCRAFT CERTIFIED FOR 17,000 POUNDS TAKEOFF WEIGHT



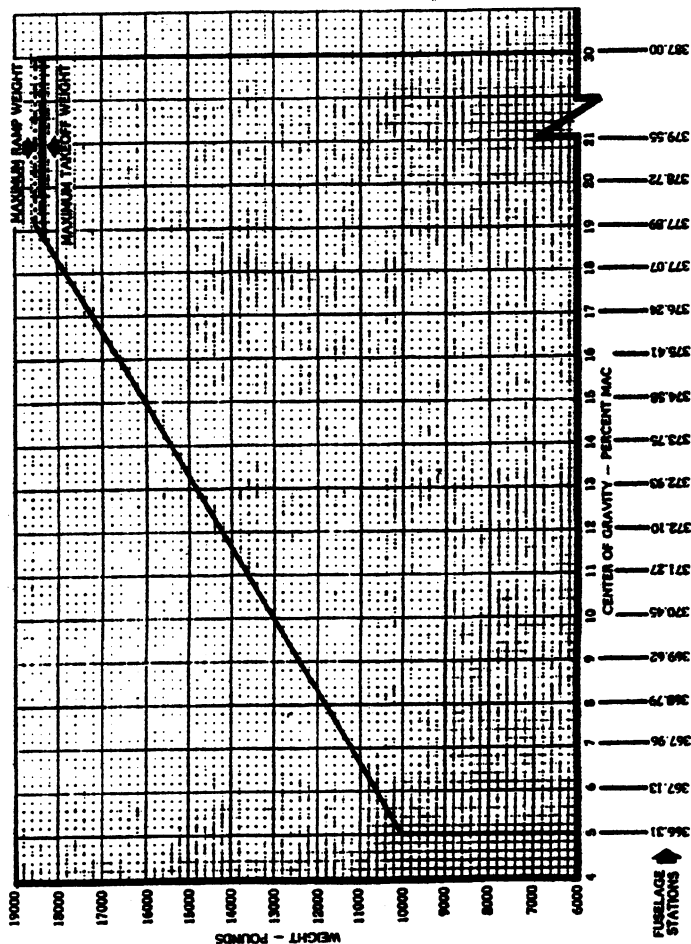
Center of Gravity Envelope
Figure 1-1

AIRCRAFT CERTIFIED FOR 18,000 POUNDS TAKEOFF WEIGHT



Center of Gravity Envelope
Figure 1-2

AIRCRAFT CERTIFIED FOR 18,300 POUNDS TAKEOFF WEIGHT



Center of Gravity Envelope
Figure 1-3

AIRSPEED/MACH LIMITS



All Airspeed/Mach Limits are expressed in terms of indicated values unless otherwise stated. Instrument error is assumed to be zero.

MAXIMUM OPERATING SPEED V_{MO}/M_{MO}



Do not extend spoilers, or operate with spoilers deployed, at speeds above V_{MO}/M_{MO} due to significant nose-down pitching moment associated with spoiler deployment.

V_{MO}/M_{MO} shall not be deliberately exceeded in any regime of flight (climb, cruise or descent) unless a higher speed is authorized for flight test.

V_{MO} Sea Level to 14,000 feet 307 KIAS

V_{MO} above 14,000 feet 359 KIAS

M_{MO} 0.83 M_I

M_{MO} with any missing Boundary Layer Energizers (*Aircraft 35-279 and subsequent, 36-045 and subsequent and prior aircraft incorporating AAK 79-10 or AMK 83-5*) 0.78 M_I

M_{MO} Mach Trim and Autopilot disengaged or inoperative 0.74 M_I

M_{MO} Stick Puller inoperative 0.74 M_I

Refer to figure 1-4, entitled AIRSPEED/MACH LIMITS.

MANEUVERING SPEED V_A



Avoid rapid and large alternating control inputs, especially in combinations with large changes in pitch, roll or yaw, as they may cause structural failure at any speed, including below V_A .

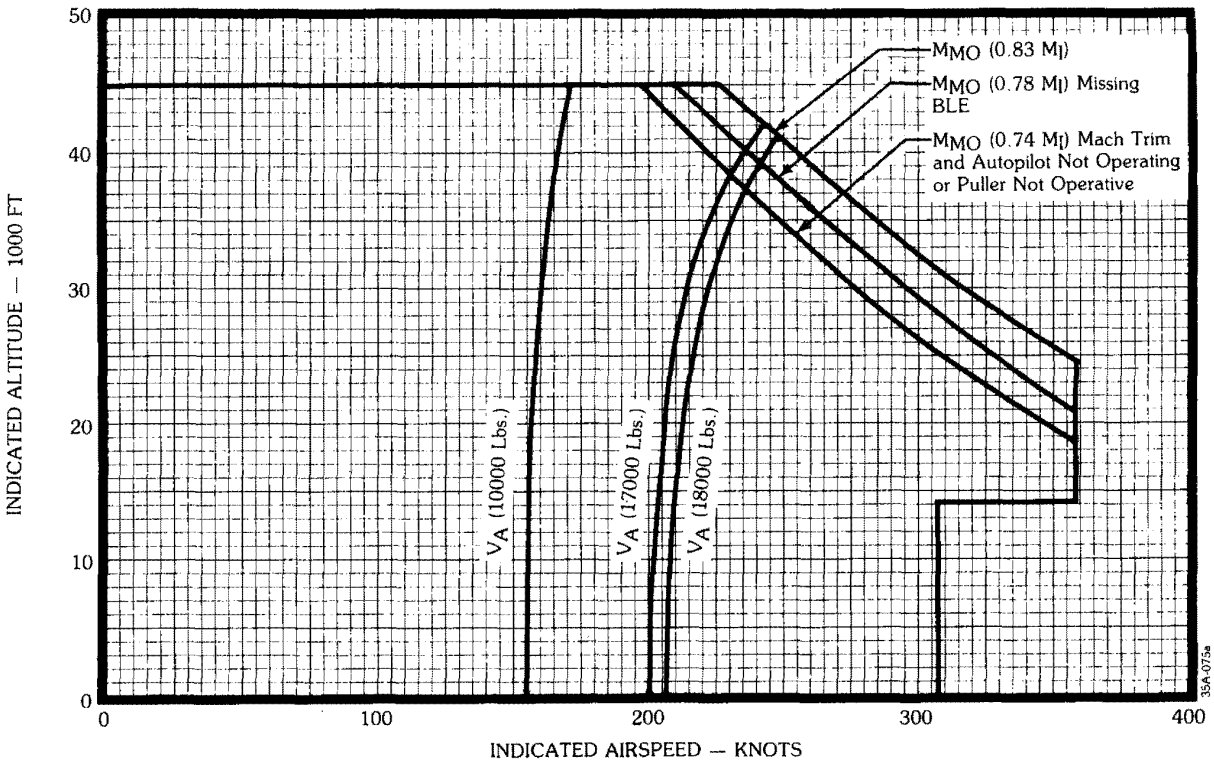
Refer to figure 1-4 entitled AIRSPEED/MACH LIMITS, this section for V_A . Maneuvers involving full application of rudder and aileron controls, as well as maneuvers that involve pusher angles of attack should be confined to speeds below V_A .

MAXIMUM LANDING GEAR OPERATING SPEED V_{LO}

V_{LO} is the maximum speed at which the landing gear can be safely extended or retracted.

V_{LO} 202 KIAS

AIRSPEED/MACH LIMITS



33A-075a

Figure 1-4

AIRSPEED/MACH LIMITS (CONT)**MAXIMUM LANDING GEAR EXTENDED SPEED VLE**

VLE is the maximum speed at which the aircraft can be safely flown with the landing gear extended.

VLE265 KIAS

MAXIMUM FLAP EXTENDED SPEED VFE

VFE is the maximum speed permissible with the wing flaps in a prescribed extended position.

VFE — Flaps 1° to 8° 198 KIAS

VFE — Flaps 9° to 20° 183 KIAS

VFE — Flaps 21° to 40° 153 KIAS

MINIMUM CONTROL SPEED AIR VMCA

VMCA is the minimum flight speed at which the airplane is controllable with 5° bank when one engine suddenly becomes inoperative and the remaining engine is operating at takeoff thrust.

VMCA is a function of altitude and temperature. The speed shown is a maximum, which occurs at Sea Level, -18°C (0°F). Section V Performance Charts account for the appropriate values.

VMCA -18°C (0°F) at Sea Level112 KIAS

MINIMUM CONTROL SPEED GROUND VMCG

VMCG is the minimum speed on the ground at which control can be maintained, using aerodynamic controls alone, when one engine suddenly becomes inoperative and the remaining engine is operating at takeoff thrust.

VMCG is a function of altitude and temperature. The speed shown is a maximum, which occurs at Sea Level, -18°C (0°F). Section V Performance Charts account for the appropriate values.

VMCG -18°C (0°F) at Sea Level103 KIAS

CRITICAL ENGINE FAILURE SPEED V1

Refer to applicable figure entitled CRITICAL ENGINE FAILURE SPEED V1 in Section V.

AIRSPEED/MACH LIMITS (CONT)

ROTATION SPEED VR

Refer to applicable figure entitled ROTATION SPEED VR in Section V.

TAKEOFF SAFETY SPEED V2

Refer to applicable figure entitled TAKEOFF SAFETY SPEED V2 in Section V.

AMBIENT TEMPERATURE LIMITS

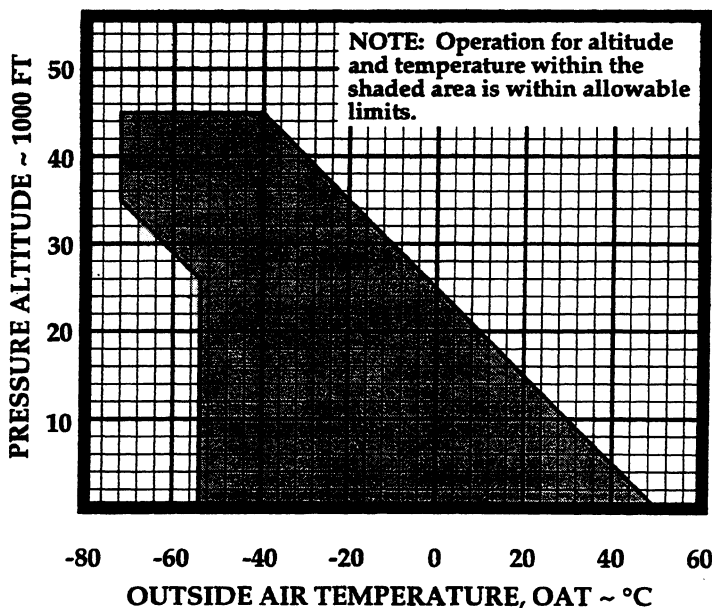


Figure 1-4A

TAKEOFF AND LANDING OPERATIONAL LIMITS

TEMPERATURE LIMITS

Refer to AMBIENT TEMPERATURE LIMITS, Figure 1-4A.



Refer to FUEL TEMPERATURE LIMITS, this section.

MAXIMUM ALTITUDE

Pressure Altitude..... 10,000 Feet

WIND COMPONENTS

MAXIMUM TAILWIND COMPONENT 10 Knots

DEMONSTRATED CROSSWIND COMPONENT

Refer to METEOROLOGICAL DEFINITIONS in Section V — PERFORMANCE.

RUNWAY CONDITIONS

Takeoff and landing is limited to paved runways.

Do not operate if water and/or slush accumulation on the runway exceeds 3/4 inch (19 mm).

MAXIMUM NOSE WHEEL STEERING SPEED

Maximum 45 KNOTS GROUND SPEED

With any two of the following
three Anti-Skid System lights
illuminated: Two inboard and right
outboard 10 KNOTS GROUND SPEED

TIRE LIMITING SPEED

Main Tires 182 KNOTS GROUND SPEED

TIP TANK FUEL

Maximum tip tank fuel for landing is 925 pounds (420 kg) each tip tank.

MINIMUM FUEL

Fuel Load — Minimum 600 pounds (272 kg) in each wing required for take-off and intentional go-around.

TAKEOFF AND LANDING OPERATIONAL LIMITS (CONT)

PRESSURIZATION

Do not takeoff or land with the cabin pressurized. Adhere to PRESSURIZATION SYSTEM OPERATION, Section II.

SEAT BELTS

Seat belts and shoulder harnesses must be worn during takeoff and landing.

ENROUTE OPERATIONAL LIMITS

TEMPERATURE LIMITS

Refer to AMBIENT TEMPERATURE LIMITS, Figure 1-4A.

MAXIMUM OPERATING ALTITUDE

The maximum operating altitude is 45,000 feet. This is the highest altitude for which acceptable flight characteristics and systems operation have been demonstrated.

FLIGHT LOAD ACCELERATION LIMITS

Flaps Up	+3.0 g to -1.0 g
Flaps Down	+2.0 g to 0.0 g



These acceleration values limit the bank angle in a level coordinated turn to 70° (flaps up) and 60° (flaps down). In addition, pullups and pushovers must be limited to these values.

TEMPORARY FLIGHT MANUAL CHANGE

Publication Affected: The following Learjet AFM's are affected:

- | | | |
|-------------------|--------------------------|----------------------|
| 1. 24D (FM-009) | 6. 28/29 (FM-100) | 11. 35A/36A (FM-102) |
| 2. 24E (FM-011) | 7. 31 (FM-112) | 12. 35A/36A (FM-108) |
| 3. 24F (FM012) | 8. 31 Singapore (FM-122) | 13. 55 (FM103) |
| 4. 25B/C (FM-016) | 9. 31A (FM-121) | 14. 55B (FM-110) |
| 5. 25D/F (FM-018) | 10. 35/36 (FM-019) | 15. 55C (FM-114) |

Aircraft Affected: The following aircraft serials are affected:

- | | |
|--------------------------------|-------------------------|
| 1. 24-218, 24-230 thru 24-357* | 7. 35-002 thru 35-645* |
| 2. 25-061, 25-067 thru 25-373* | 8. 35-646 thru 35-676 |
| 3. 28-001 thru 28-005* | 9. 36-002 thru 36-058* |
| 4. 29-001 thru 29-004* | 10. 36-059 thru 36-063 |
| 5. 31-002 thru 31-006* | 11. 55-003 thru 55-136* |
| 6. 31-007 thru 31-087 | 12. 55-137 thru 55-147 |

* When cabin outflow valve or safety valve has been replaced after January 1, 1989.

Description of Change: Revises Maximum Operating Altitude to 41000 Ft.

Filing Instructions: Insert this Temporary Change in the appropriate AFM as indicated below and retain until full compliance with SB24/25-21-4, or SB28/29-21-8, or SB31-21-6, or SB35/36-21-19, or SB55-21-10 (as applicable).

AFM	Insert Adjacent to Page	AFM	Insert Adjacent to Page
1. 24D	1-4	9. 31A	1-10
2. 24E	1-3A	10. 35/36	1-18
3. 24F	1-4	11. 35A/36A (FC-200)	1-14
4. 25B/C	1-4	12. 35A/36A (FC-530)	1-12
5. 25D/F	1-12	13. 55	1-10
6. 28/29	1-11	14. 55B	1-9
7. 31	1-10	15. 55C	1-10
8. 31 Singapore	1-9		

Add the following text to the affected AFM's:

Maximum operating altitude is limited to 41000 Ft. All references to altitudes above 41000 Ft. should be disregarded.

FAA

APPROVED



DATE

1/9/95

**for EVERETT W. PITTMAN, MANAGER
AIRCRAFT CERTIFICATION OFFICE
FEDERAL AVIATION ADMINISTRATION
WICHITA, KANSAS**

SYSTEM LIMITS

STALL WARNING SYSTEM

Both stall warning systems must be on and operating and remain on throughout flight. The systems may be turned off per EMERGENCY and ABNORMAL PROCEDURES in Section III and Section IV of this manual and for stall warning system maintenance per the Maintenance Manual procedures.



Warning lights for both stall warning systems are inoperative when the generator and battery switches are OFF.

To assure proper stall warning system operation, the BEFORE STARTING ENGINES and AFTER TAKEOFF stall warning system operation and comparison checks must be accomplished in accordance with Section II of this manual.

TRIM SYSTEMS

Pitch trim runaway training that actually involves running the trim in flight to simulate malfunctions is prohibited.

To assure proper trim systems operation, the BEFORE STARTING ENGINES trim systems checks must be successfully completed before each flight.



Failure to conduct a complete pitch trim preflight check prior to **each** flight increases the probability of an undetected system failure. An additional single failure in the trim system could result in a trim runaway. In certain critical flight conditions, an unrestricted runaway could result in high speeds, severe buffet, wing roll off, loads in excess of structural limit, and extremely high forces necessary for recovery.

SYSTEM LIMITS (CONT)

YAW DAMPER

To ensure proper yaw damper operation, the BEFORE STARTING ENGINES yaw damper operational check in Section II of this manual must be successfully completed before each flight.

One yaw damper must be ON and operative for all flight conditions except takeoff, landing touchdown, and for trimming rudder. For a normal landing, the following procedures shall apply:

1. The airplane shall be configured for landing at least 500 feet AGL.
2. The yaw damper shall be disengaged during the landing flare.

CAUTION

If landings are attempted in turbulent air conditions with the yaw damper OFF, the airplane may exhibit undesirable lateral-directional (Dutch-Roll) characteristics. These characteristics are improved as the wing/tip fuel is consumed. The pilot shall observe the NOTE relative to turbulence contained in the APPROACH procedure (Section II) and increase airspeed as required.

NOTE

Yaw damper should be turned off while using rudder trim. Reengage yaw damper after trim is established.

SPOILER

Do not extend spoilers with flaps extended while airborne.

Do not extend spoilers, or operate with spoilers deployed, at speeds above VMO/MMO.

HYDRAULIC SYSTEM

Do not exceed auxiliary hydraulic pump duty cycle of 3 minutes ON, then 20 minutes OFF.

Only hydraulic fluid conforming to MIL-H-5606 is approved.

GENERATOR LIMITS

Generator output is limited as follows:

- 320 amps maximum for ground operations.
- 400 amps maximum for flight operations.

SYSTEM LIMITS (CONT)

ELECTRICAL SYSTEM (*Aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047 not incorporating AMK 80-17 or AAK 81-1*)

The battery charging bus current limiter and starter disengagement checks, as outlined in STARTING ENGINES, TAXI, STARTER ASSIST AIRSTARTS, and QUICK TURN-AROUND procedures in Sections II and III of this manual, must be accomplished whenever an engine start using a starter has been performed. These checks require that both engines be operating to perform the check.

ENGINE SYNCHRONIZER

Engine sync must be OFF for takeoff, landing, and single-engine operation.

EXTERNAL POWER

The maximum amperage from an external power source is limited to 1100 amps.

FREON COOLING SYSTEM

- *On aircraft not incorporating FCN 89-1, the freon cooling system must be off above FL180.*
- *On aircraft incorporating FCN 89-1, the freon cooling system must be off above FL350.*

SYSTEM LIMITS (CONT)

OXYGEN SYSTEM

The following aircraft certification requirements are in addition to the requirements of applicable operating rules. The most restrictive requirement (certification or operating) must be observed.

On aircraft with Scott ATO crew masks, hats and "ear-muff" type headsets must be removed prior to donning crew oxygen masks.



Headsets, eyeglasses, or hats worn by crew members may interfere with quick-donning capabilities.

Crew and passenger oxygen masks are not approved for use above 40,000 feet **cabin** altitude.



- Passenger masks are intended for use during an emergency descent to an altitude not requiring supplemental oxygen.
- Passenger masks will not provide sufficient oxygen for prolonged operation above 34,000 feet cabin altitude. Prolonged operation above 25,000 feet cabin altitude with passengers on board is not recommended.

Aircraft 35-067 thru 35-112 except 35-107 and aircraft 36-018 thru 36-031.

Above Flight Level 250 —

- *Aircraft with ZMR 100 Series Crew Masks* — One crew member must wear oxygen mask around his neck.
- *Aircraft with 6600214 Series Crew Masks* — Crew masks must be in the quick-donning position which allows donning within 5 seconds.

Above Flight Level 410 — Pilot, copilot and passengers must wear oxygen masks.

Aircraft 35-107, 35-113 and subsequent and aircraft 36-032 and subsequent.

Above Flight Level 250 — Crew masks must be in the quick-donning position which allows donning within 5 seconds.

SYSTEM LIMITS (CONT)

PRESSURIZATION LIMIT

Maximum Differential Pressure..... 10.0 PSI

WINDSHIELD AND RADOME ANTI-ICE FLUID

Methyl Alcohol (Methanol) per Federal Specification O-M-232, Grade A, is required.

THRUST REVERSERS (IF INSTALLED)

When thrust reversers are installed, refer to the applicable Thrust Reverser Supplement for limitations, normal procedures, emergency procedures, abnormal procedures, and performance data.

POWERPLANT LIMITS

ENGINE SPEED LIMITS

CONDITION	LIMIT
OVERSPEED ❶	105% N1 or N2
TRANSIENT ❷ 5 SECONDS 1 MINUTE	103-105% N1 or N2 100-103% N1 or N2
TAKEOFF ❸	Refer to TAKEOFF POWER SETTING charts in Section V.
MAXIMUM CONTINUOUS ❹	Refer to MAXIMUM CONTINUOUS THRUST tables in Section V.

- ❶ If overspeed limit is exceeded, contact nearest Honeywell Field Service Propulsion Engine Representative prior to engine removal for overspeed inspection.
- ❷ If limit is exceeded, reduce thrust to within limits and make necessary fuel control adjustment prior to next flight.
- ❸ Thrust settings above performance chart values may exceed engine rated thrust.

ENGINE OPERATING TEMPERATURES

Refer to Figure 1-5 and Figure 1-6, TURBINE TEMPERATURE LIMITS.

OIL LIMITS

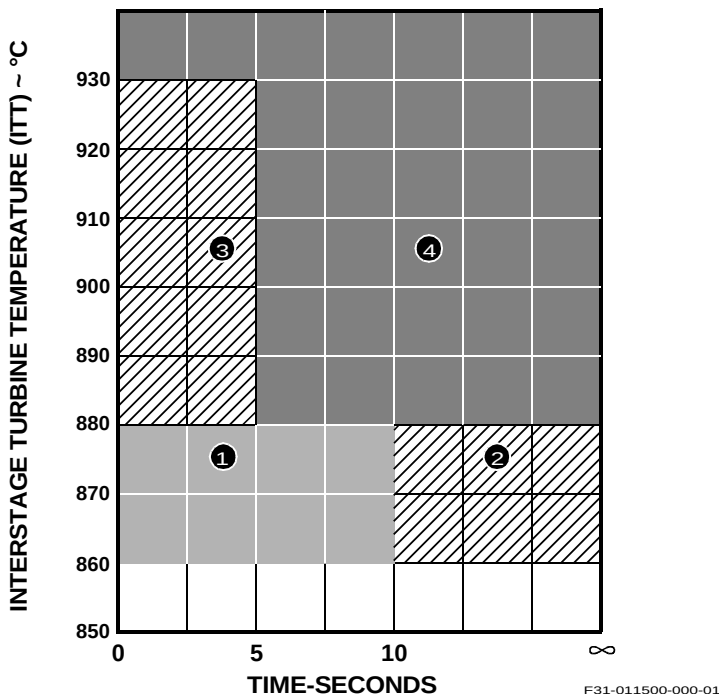
OIL TEMPERATURE

Maximum Oil Temperature 140°C

APPROVED OILS

Oils conforming to Garrett specification EMS 53110, Type II are approved. Refer to Addendum — ENGINE OIL SERVICING for a listing of approved oils.

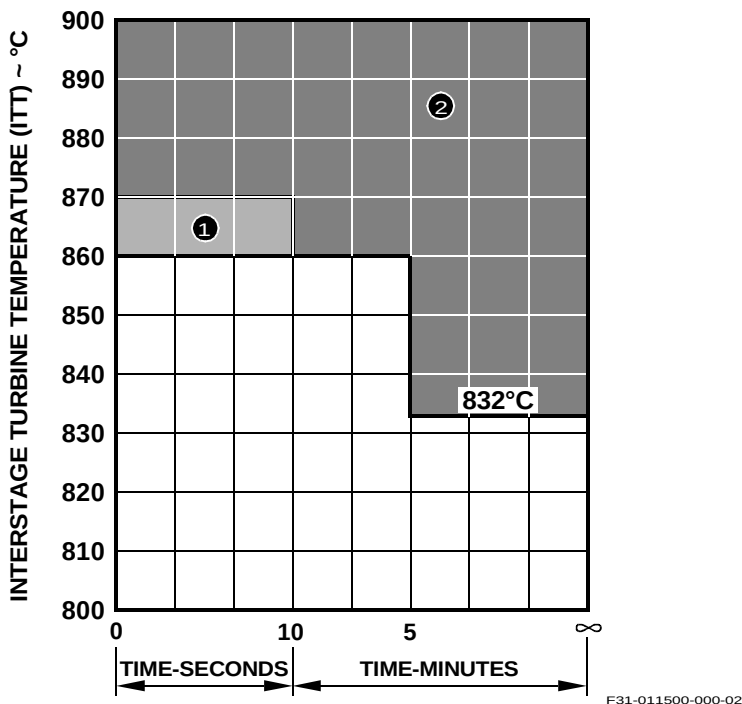
TURBINE TEMPERATURE LIMITS (ITT) STARTING



- ❶ Abort start. Record maximum ITT and time in excess of 860°C in engine log book. Determine cause and correct prior to next start.
- ❷ Abort start. Record maximum ITT and time in excess of 860°C in engine log book. Refer to *Honeywell Engine Light Maintenance Manual* for static takeoff power check.
- ❸ Abort start. Record maximum ITT and time in excess of 880°C in engine log book. Refer to *Honeywell Engine Light Maintenance Manual* for static takeoff power check.
- ❹ Abort start. Record maximum ITT temperature and time in excess of 880°C in engine log book. Refer to *Honeywell Engine Light Maintenance Manual* for hot section inspection before further engine operation.

Figure 1-5

TURBINE TEMPERATURE LIMITS (ITT) EXCEPT STARTING



- ❶ Takeoff Transient Limit. Reduce thrust setting to within limits and make electronic computer N1 adjustment before next flight. Record maximum ITT and time in excess of limit in engine log book. Observe takeoff ITT limit.
- ❷ Record maximum ITT and time in excess of limit in engine log book. Refer to *Honeywell Engine Light Maintenance Manual* for hot section inspection.



Maximum continuous limit is 832°C. For greatest engine life it is recommended that, under normal conditions, engine thrust be reduced to an ITT of 795°C or less after 30 minutes of maximum continuous operation.

Figure 1-6

FUEL LIMITS

FUEL TEMPERATURE

Do not take off with fuels other than JP-4 or equivalent at fuel temperatures below -29°C (-20°F).

Do not take off with fuel temperature lower than -54°C (-65°F).

UNUSABLE FUEL

The fuel remaining in the fuel tanks when the fuel quantity indicator reads zero is not usable in flight.

FUEL ADDITIVES

ANTI-ICING ADDITIVE

Fuel anti-icing additive meeting the requirements of MIL-I-27686 or MIL-I-85470 is required. Any approved or emergency fuels not containing the required anti-icing additive must have it blended during refueling. The additive concentration, by volume, shall be as follows:

Additive Type	Concentration by Volume	
	Minimum	Maximum
MIL-I-27686	0.06%	0.15%
MIL-I-85470	0.10%	0.15%

NOTE

Anti-icing additive conforming to MIL-I-85470 does not inhibit microbial growth. For microbial protection, it is recommended that fuel containing either an approved biocide additive or an anti-icing additive conforming to MIL-I-27686 be used at least once a week for aircraft in regular use and whenever a fueled aircraft will be out of service for a week or more.

Refer to Addendum — FUEL SERVICING for additional information and the proper anti-icing additive blending procedure.

CAUTION

Lack of anti-icing additive may cause fuel filter icing and subsequent engine flameout.

BIOCIDE ADDITIVE

BIOBOR JF is approved for use as a biocide additive when premixed in the fuel supply facility. Concentration is not to exceed 270 ppm. Refer to Addendum — FUEL SERVICING for additional information.

FUEL LIMITS (CONT)**ELECTRONIC FUEL COMPUTER SPECIFIC GRAVITY****WARNING**

Engine surge may occur if the recommended specific gravity adjustment is not adhered to for the type of fuel being used. If surge is encountered, refer to the Engine Maintenance Manual.

CAUTION

A decrease in the specific gravity setting, on the fuel computer, without a change in fuel specific gravity, results in higher turbine temperatures in start, acceleration and deceleration.

The engine electronic fuel computer must be adjusted to the recommended specific gravity setting in the Engine Log Book for the type of fuel being used. If no entry is made in the Engine Log Book, the following settings must be observed:

- Jet A, Jet A-1, JP-5 and JP-8..... Position 5
- Jet B and JP-4 Position 6
- 50% or more Aviation Gasoline Position 7

NOTE

Fuel adjustment knob may be rotated one "click" either direction from the recommended fuel adjustment of positions 5, 6 and 7 to compensate for individual engine characteristics or installation effects.

Refer to Addendum — FUEL SERVICING for adjustment procedures.

NOTE

Due to fuel computer accessibility, fuel computer specific gravity adjustment is not considered a normal pilot function.

FUEL LIMITS (CONT)**APPROVED FUELS**

The mixing of fuel types is allowed.

Special precautions to preclude electrostatic discharge must be taken when switch fueling. Refer to Addendum — FUEL SERVICING.

Jet A, Jet A-1, Jet B, JP-4, JP-5 and JP-8 fuels conforming to Garrett Turbine Engine Company Specifications EMS 53111, EMS 53112, EMS 53113 and EMS 53116 are approved. Refer to Addendum — FUEL SERVICING for a listing of approved fuels.

EMERGENCY FUEL

AVIATION GASOLINE



When using any aviation gasoline in the fuel mixture, operation is limited as follows:

1. **Do not** take off with fuel temperature lower than -54°C (-65°F).
2. Restrict airplane flights to below 15,000 feet.
3. Both JET PUMPS and both STANDBY PUMPS Switches **must** be ON and the pumps must be operating.

Aviation gasoline (MIL-D-5572D, Grades 80/87, 100/130 and 115/145) may be used as an emergency fuel and mixed, in any proportion, with various approved jet fuels.

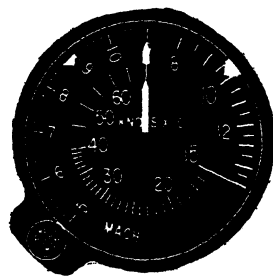
Aviation gasoline may **not** be used in excess of 500 gallons (1892.5 liters) per 100 hours of operation per engine.

INTENTIONALLY LEFT BLANK

INSTRUMENT MARKINGS

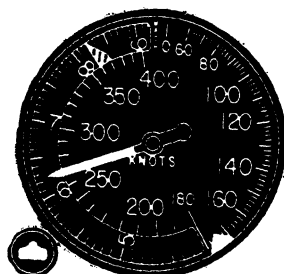
AIRSPEED/MACHMETER

Red Line	307 KIAS
Red Line	359 KIAS
Red Line	.83 M _I



OR

Red Line	307 KIAS
Red Line	359 KIAS
Red Line	.83 M _I



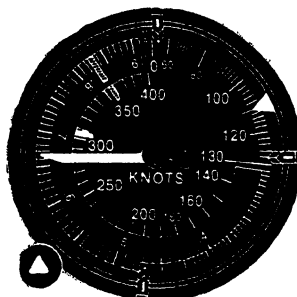
OR

Red Line	307 KIAS
Barber Pole pick-up at	359 KIAS
	and .83 M _I



OR

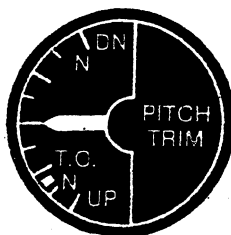
Red Line	307 KIAS
Barber Pole pick-up at	359 KIAS
	and .83 M _I



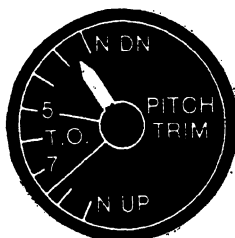
INSTRUMENT MARKINGS (CONT)

TRIM

*Aircraft 35-067 thru 35-145 and 36-018
thru 36-035 not incorporating AAK 83-8*



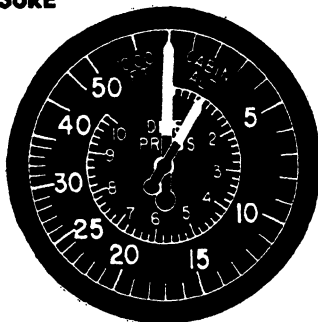
Aircraft 35-146 and Subsequent and 36-036 and Subsequent and prior aircraft incorporating AAK 83-8



CABIN ALTIMETER/DIFFERENTIAL PRESSURE

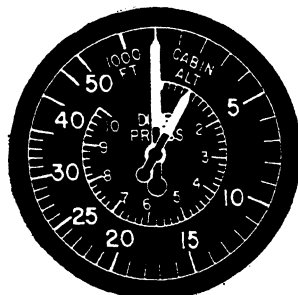
*Aircraft 35-067 thru 35-112 except 35-107
and 36-018 thru 36-031*

Green Arc..... 0-8.9 PSI
Yellow Arc 8.9-9.2 PSI
Red Arc 9.2-10.0 PSI



*Aircraft 35-107, 35-113 and Subsequent
and 36-032 and Subsequent*

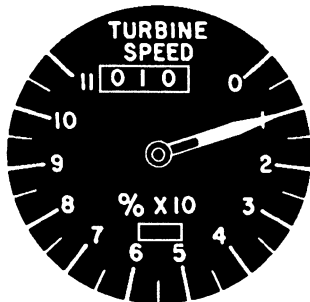
Green Arc..... 0-9.4 PSI
Yellow Arc 9.4-9.7 PSI
Red Arc 9.7-10.0 PSI



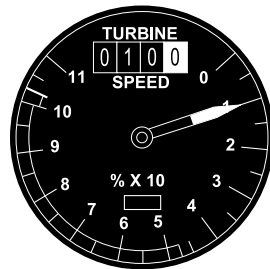
INSTRUMENT MARKINGS (CONT)

TURBINE SPEED (N2)

Green Arc 48%-100%
 Yellow Arc ... 100%-103% (One minute limit)
 Red Line 103%

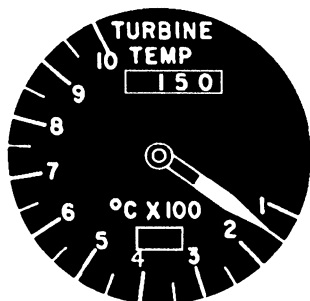


OR

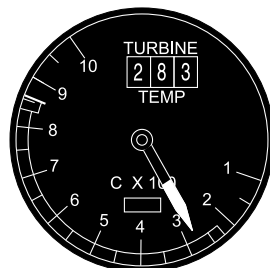


TURBINE TEMPERATURE (ITT)

Green Arc 230°C-832°C
 Yellow Arc 832°C-860°C
 Red Line 860°C
 (Refer to Figure 1-5 and Figure 1-6)



OR



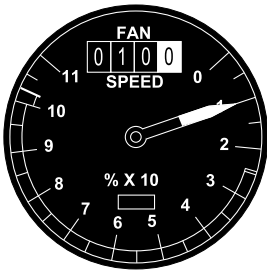
INSTRUMENT MARKINGS (CONT)

FAN SPEED (N1)

Green Arc 24%-100%
Yellow Arc.... 100%-103% (One minute limit)
Red Line 103%



OR

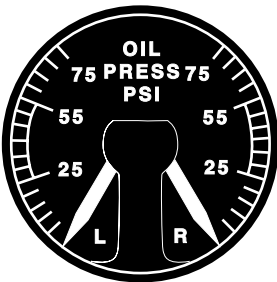


OIL PRESSURE

Red Line (Min.) 25 PSI
Yellow Arc..... 25-38 PSI
Green Arc 38-46 PSI
Yellow Arc..... 46-55 PSI
Red Line (Max.) 55 PSI



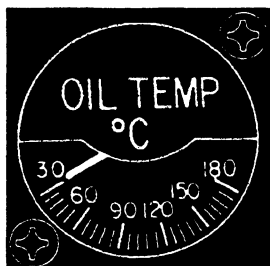
OR



INSTRUMENT MARKINGS (CONT)

OIL TEMPERATURE

Green Arc..... 30°C-127°C
Yellow Arc..... 127°C-140°C
Red Line..... 140°C

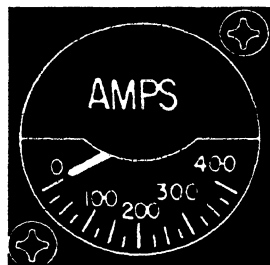


AMMETER

Yellow Arc..... 320-400 AMPS
Red Line..... 400 AMPS

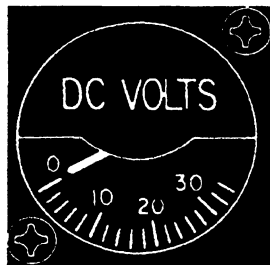


Do not exceed 320 amps during ground operation.



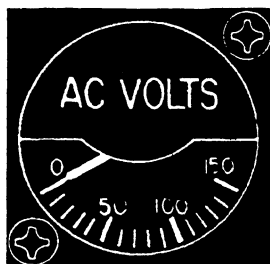
DC VOLTMETER

Red Line..... 32 VOLTS



AC VOLTMETER

Green Arc..... 110-130 VOLTS



INSTRUMENT MARKINGS (CONT)

HYDRAULIC PRESSURE

Yellow Arc 0-500 PSI
Green Arc 1250-1500 PSI
Red Line 1750 PSI



EMERGENCY AIR

Green Arc 1800-3000 PSI
Red Line 3000 PSI



If air bottle is serviced near low end of green arc, pressure may drop during flight if system cools; satisfactory gear extension and braking can still be expected.



OR

Yellow Arc 0-1800 PSI
Green Arc 1800-3000 PSI
Red Line 3000 PSI



If air bottle is serviced near high end of yellow arc (slightly above 1800 psi), pressure may drop during flight if system cools; satisfactory gear extension and braking can still be expected.

OXYGEN PRESSURE

Green Arc 1550-1850 PSI
Yellow Arc 0-300 PSI
Red Line 2000 PSI



SECTION II — NORMAL PROCEDURES

TABLE OF CONTENTS

Exterior Preflight.....	2-1
Walk-Around Inspection (Figure 2-1).....	2-1
Power Off Checks.....	2-2
Power On Checks.....	2-7
Cabin Preflight.....	2-7
Before Starting Engines.....	2-8
Takeoff Trim • CG Function (Figure 2-2).....	2-17
Starting Engines.....	2-18
Before Taxi.....	2-23
Taxi and Before Takeoff.....	2-25
Runway Lineup.....	2-28
Takeoff.....	2-28
After Takeoff.....	2-29
Climb.....	2-31
Cruise.....	2-31
Descent.....	2-32
Approach.....	2-33
Before Landing.....	2-34
Go Around.....	2-35
Landing.....	2-35
After Landing/Clearing Runway.....	2-36
Shutdown.....	2-37
Quick Turnaround.....	2-38
Cold Weather Operation.....	2-40
Preflight Preparation.....	2-40
Preflight Inspection.....	2-40
Engine Start.....	2-41
Taxiing.....	2-42
Takeoff.....	2-42
After Takeoff.....	2-43
Before Landing.....	2-43
Landing.....	2-43
After Clearing Runway.....	2-43
Shutdown and Postflight.....	2-44
Pressurization System Operation.....	2-45
Manual Mode Operation.....	2-45
Landing at Field Elevation above 8500 Feet (Aircraft with Emergency Pressurization Override Switches).....	2-46
Takeoff at Field Elevation above 8500 Feet (Aircraft with Emergency Pressurization Override Switches).....	2-46

TABLE OF CONTENTS (Cont)

Cabin Temperature Control	2-47
Bleed Air Heating and Cooling	2-47
Additional Cooling or to Decrease Cabin Humidity	2-48
Additional Heating (<i>If Auxiliary Heater Is Installed</i>)	2-49
Additional Air Circulation	2-50
Aileron Augmentation	2-51
Oxygen System	2-52
Oxygen Duration	2-52
Passenger Oxygen	2-52
Crew Oxygen	2-53
Brake Systems	2-55
Normal Braking	2-55
Emergency Braking	2-56
Landing Gear Warning System	2-56
Fuel Management	2-57
Normal Fuselage Fuel Transfer	
Model 35A without FUS VALVE Switch	2-59
Model 35A with FUS VALVE Switch and Model 36A	2-59
Auxiliary Fuselage Fuel Transfer (<i>Aircraft with</i> <i>FUS VALVE Switch</i>)	2-61
Fuel Crossflow (<i>Wing-to-Wing Fuel Transfer</i>)	2-62
Refueling	2-63
Ice Detection	2-64
Anti-Ice Systems	2-66
Exterior Windshield Defog, Anti-Ice, and Rain Removal	2-68
Interior Windshield and Passenger Window Defog	2-72
Radome Anti-Ice	2-73
Wing and Horizontal Stabilizer Anti-Ice	2-73
Nacelle Heat	2-74
Pitot Heat	2-75
Static Port Heat	2-75
Audio Control System Panel	2-76
Switch Function	2-76
Audio Control Panel (<i>Figure 2-4</i>)	2-78
Flight Operation	2-81

TABLE OF CONTENTS (Cont)

Emergency Lighting System (*If Installed*)
 Aircraft 35-067 thru 35-415 and
 Aircraft 36-018 thru 36-0472-82
 Aircraft 35-416 & Subsequent and
 Aircraft 36-048 & Subsequent2-83
Annunciator Panel2-84
Engine Synchronizer2-85

INTRODUCTION TO NORMAL PROCEDURES

The procedures in this section of the manual have been developed by Learjet Inc. for certification of this aircraft. This section contains those procedures which may be considered routine in day-to-day operations. The presentation includes, but is not limited to, detailed checklist procedures by flight phase. These normal procedures are provided as guidance and should not be construed as prohibiting the operator from developing equivalent normal procedures in accordance with the applicable operating rules.

THROUGH-FLIGHT PROCEDURES (BOTH ENGINES SHUT DOWN)

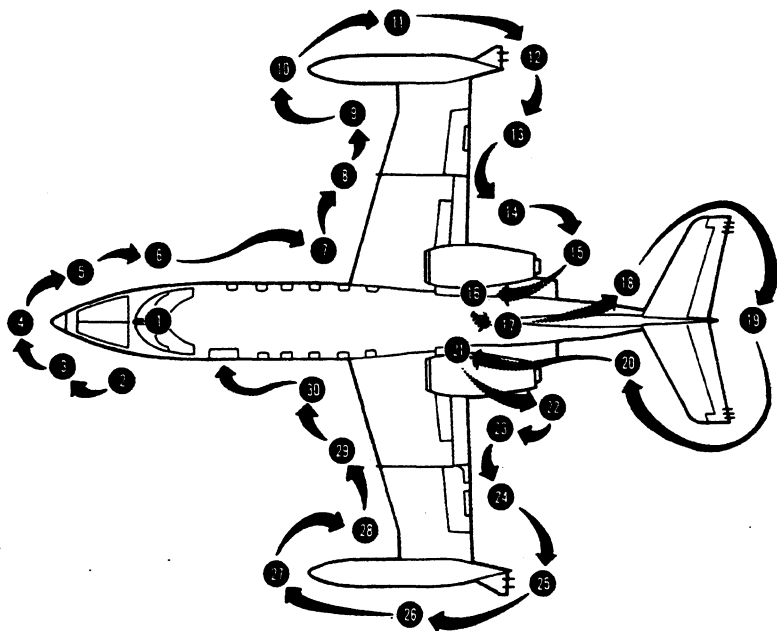
Normal preflight procedures (all checklist line items) must be accomplished prior to takeoff at the original departure point of a flight. At each intermediate stop of flight where both engines are shutdown, the Through-Flight Checklist may be used for preflight provided certain criteria are met during a stop. In the following section, procedures marked with this symbol (◆) denote Through-Flight Checklist items. When permitted, accomplishment of all Through-Flight Checklist items fulfills a minimum preflight requirement.

The Through-Flight Checklist may be used following an intermediate stop with both engines shutdown provided the following criteria have been satisfied during that stop:

- There has been no change in flight crew personnel.
- No maintenance has been performed on the aircraft. Routine line servicing is not considered maintenance.
- No more than three (3) hours have elapsed between engine shutdown and engine start.
- Extreme weather conditions (heavy precipitation, ice, snow, extreme cold, etc.) have not occurred which would change the preflight status of the aircraft.

For intermediate stops with one or no engine shut down, completion of the QUICK TURNAROUND procedure in this section provides the minimum preflight requirements.

EXTERIOR PREFLIGHT



Walk-Around Inspection
Figure 2-1

EXTERIOR PREFLIGHT (CONT)

POWER OFF CHECKS

- ◆ During exterior inspection, check all vents clear, access doors for security, and all aircraft surfaces for condition.

- 1 ◆ a. Controls Lock — Remove and stow.
- 2 a. Pilot's Windshield Alcohol Discharge Outlets and Pilot's Defog Outlet — Clear of obstructions.
- 3 ◆ a. Left Pitot Head — Cover removed, clear of obstructions.
 ◆ b. Left Stall Warning Vane — Freedom of movement, leave in down position.
 ◆ c. Left Static Ports (2) and Shoulder Static Port (1) — Clear of obstructions.
 d. Left Pitot-Static (2) and Shoulder Static (1) Drain Valves — Drain. Required only if moisture in the pitot-static system is known or suspected.



If pitot-static drain valves are opened, ensure that valve stem returns to the closed position.

- e. Nose Gear and Wheel Well — Hydraulic leakage and condition.
- ◆ f. Nose Wheel and Tire — Condition and nose gear uplock forward.



Chine on nose tire must be a minimum of 3/4 inch (19 mm) from ground to operate safely with an accumulation of 3/4 inch (19 mm) water on runway surface.

- 4 a. Radome Alcohol Discharge Port — Clear of obstructions.
 b. Radome and Radome Erosion Shoe — Condition.
- 5 a. Oxygen Bottle Supply Valve (if applicable) — Open (On).
 ◆ b. Right Pitot Head — Cover removed, clear of obstructions.
 ◆ c. Total Temperature Probe (if installed) — Clear of obstructions.
 ◆ d. Right Stall Warning Vane — Freedom of movement, leave in down position.
 ◆ e. Right Static Ports (2) and Shoulder Static Port (1) — Clear of obstructions.
 ◆ f. Pressurization Static Port — Clear of obstructions.

EXTERIOR PREFLIGHT (CONT)

- g. Right Pitot-Static Drain Valves (2) — Drain. Required only if moisture in the pitot-static system is known or suspected.

NOTE

If pitot-static drain valves are opened, ensure that valve stem returns to the closed position.

- h. Oxygen Discharge Disc (if applicable) — Condition.

6

- a. Copilot's Windshield Defog Outlet — Clear of obstructions.
b. Wing Inspection Light and Lens (if installed) — Condition.
c. Lower Fuselage Antennas, Rotating Beacon Light and Lens — Condition.

7

- a. Emergency Exit — Secure.
b. Upper Fuselage Antennas, Rotating Beacon Light and Lens (on vertical fin) — Condition.

- ◆ c. Right Engine Inlet and Fan — Clear of obstructions and condition.

WARNING

- If fan is windmilling, stop by pressing on fan spinner. Do not attempt to stop windmilling by grabbing blades.

- The wing, flight control surfaces, and engine inlet must be free of frost, snow, and ice.

- d. Fuel Crossover, Left Wing Sump, Left Engine Fuel, Right Wing Sump, and Right Engine Fuel Drain Valves — Drain.
e. Right Main Gear and Wheel Well — Hydraulic/fuel leakage and condition:
f. Right Main Gear Landing Light — Condition.
◆ g. Right Main Gear Wheels, Brakes and Tires — Condition.

8

- a. *Aircraft 35-279 and subsequent, 36-045 and subsequent and prior aircraft incorporating AAK 79-10 or AMK 83-5, Stall Strip (wing leading edge) and Stall Fence* — Condition.
b. Right Wing Access Panels (underside of wing) — Check for fuel leakage.
c. Right Fuel Vent (underside of wing) — Plug removed, clear of obstructions.

9

- a. • *Aircraft 35-279 and subsequent, 36-045 and subsequent and prior aircraft incorporating AAK 79-10 or AMK 83-5, Boundary Layer Energizers* — Condition.
• *Other aircraft, Vortex Generators* — Condition.
b. Right Wing Heat Scupper (underside of wing forward) — Clear of obstructions.

EXTERIOR PREFLIGHT (CONT)

- 10 a. Right Tip Tank — Condition.
- b. Right Tip Tank Recognition Light and Lens — Condition.
- 11 a. Right Tip Tank Sump Drain Valve — Drain.
- ◆ b. Right Tip Tank Fuel Cap — Condition and secure.
- c. Right Tip Tank Navigation Light, Strobe Light and Lens — Condition.
- 12 a. Right Tip Tank Fin and Static Discharge Wicks (2) — Condition.
- b. Right Tip Tank Fuel Jettison Tube — Clear of obstructions.
- 13 a. Scupper (underside of right wing aft) — Clear of obstructions, no fuel leakage.
- b. Right Aileron — Check free motion, balance tab linkage and brush seal condition.
- 14 a. Right Spoiler and Flap — Condition.
- b. Right Engine Oil — Open access. Check oil level (normal) and oil tank filler cap for security. Secure access.

NOTE

If preflight oil level checks low, start and run engine until stabilized at idle. Shut down engine and recheck oil level. If there is no oil level indication, add enough oil to obtain an indication before starting engine to recheck oil level.

- c. Right Engine Oil Bypass Valve Indicator — Check, not extended. (If red pin indicator protrudes, investigate.)
- 15 ◆ a. Right Engine Turbine Exhaust Area — Condition, clear of obstructions.
- 16 a. Right Engine Fuel Bypass Valve Indicator — Check, not extended. (If red pin indicator protrudes, investigate.)
- ◆ b. Fuel Vent Drain Valve — Drain completely.
- c. Transfer Line Drain Valve (*Aircraft with FUS VALVE switch*) — Drain.
- d. Fuselage Tank Sump Drain Valve, Left Fuel Filter Drain Valve and Right Fuel Filter Drain Valve — Drain.
- 17 a. Tailcone Access Door — Open.
- b. Tailcone Interior — Check for fluid leaks, security and condition of installed equipment.
- c. Hydraulic Accumulator Pressure — Check, 750 psi minimum.

EXTERIOR PREFLIGHT (CONT)

- d. Drag Chute (if applicable) — Check for proper installation.
- e. Tailcone Access Door — Close and secure.

18

- a. Right Fuel Computer Drain Valve — Drain.
- b. Oxygen Discharge Disc (if applicable) — Condition.
- c. Right VOR/LOC Antenna — Condition.
- d. Right ELT Antenna (if applicable) — Condition.

19

- a. Vertical Stabilizer, Rudder, Horizontal Stabilizer and Elevator — Condition, drain holes clear.

WARNING

The vertical and horizontal stabilizer, and flight control surfaces must be free of frost, snow, and ice.

- b. Static Discharge Wicks (6 on elevators, 1 above nav light and 1 on ventral fin) — Condition.
- c. Vertical Fin Navigation Lights, Strobe Light and Lens — Condition.
- d. VLF H-Field Antenna (if applicable) — Condition.

20

- a. Left VOR/LOC Antenna — Condition.
- b. Left ELT Antenna (if applicable) — Condition.
- c. Left Fuel Computer Drain Valve — Drain.

21

- a. Fire Extinguisher Discs — Condition.
- b. Left Engine Oil Bypass Valve Indicator — Check, not extended. (If red pin indicator protrudes, investigate.)

22

- a. Left Engine Turbine Exhaust Area — Condition, clear of obstructions.

23

- a. Left Engine Fuel Bypass Valve Indicator — Check, not extended. (If red pin indicator protrudes, investigate.)
- b. Left Engine Oil — Open access. Check oil level (normal). Secure access.

NOTE

If preflight oil level checks low, start and run engine until stabilized at idle; then shut down engine and recheck oil level. If there is no oil level indication, add enough oil to obtain an indication before starting engine to recheck oil level.

- c. Left Spoiler and Flap — Condition.

EXTERIOR PREFLIGHT (CONT)

24. a. Left Aileron — Check free motion, balance and trim tabs linkage and brush seal condition.
b. Scupper (underside of left wing aft) — Clear of obstructions, no fuel leak.
25. a. Left Tip Tank Fuel Jettison Tube — Clear of obstructions.
b. Left Tip Tank Fin and Static Discharge Wicks (2) — Condition.
26. a. Left Tip Tank Navigation Light, Strobe Light and Lens — Condition.
♦ b. Left Tip Tank Fuel Cap — Condition and secure.
c. Left Tip Tank Sump Drain Valve — Drain.
27. a. Left Tip Tank Erosion Shoe (or recognition light and lens if installed) — Condition.
b. Left Tip Tank — Condition.
28. a. Left Wing Heat Scupper (underside of wing forward) — Clear of obstructions.
b. • Aircraft 35-279 and subsequent, 36-045 and subsequent and prior aircraft incorporating AAK 79-10 or AMK 83-5, Boundary Layer Energizers — Condition.
• Other aircraft, Vortex Generators — Condition.
29. a. Left Wing Access Panels (underside of wing) — Check for fuel leakage.
b. Left Fuel Vent (Underside of Wing) — Plug removed, clear of obstructions.
c. Aircraft 35-279 and subsequent, 36-045 and subsequent and prior aircraft incorporating AAK 79-10 or AMK 83-5, Stall Strip (wing leading edge) and Stall Fence — Condition.
30. a. Left Main Gear and Wheel Well — Hydraulic/fuel leakage and condition.
b. Left Main Gear Landing Light — Condition.
♦ c. Left Main Gear Wheels, Brakes, and Tires — Condition.
♦ d. Left Engine Inlet and Fan — Clear of obstructions and condition.

WARNING

- If fan is windmilling, stop by pressing on fan spinner. Do not attempt to stop windmilling by grabbing blades.
- The wing, flight control surfaces, and engine inlet must be free of frost, snow, and ice.

EXTERIOR PREFLIGHT (CONT)

POWER ON CHECKS

- 1 LANDING GEAR Switch — DN.
Both BAT Switches — On. Both PITOT HEAT Switches — On.
Fuel Quantities — Check.
- 3 5 Use caution when touching pitot heads, static ports, total temperature probe (if installed), and stall warning vanes to check for heat.
Set PITOT HEAT switches OFF.
- 7 If night flight is anticipated, check exterior lighting. All exterior
11 20 light switches — On. Check proper illumination then all exterior
light switches — Off.
- 24 28
- 1 Both BAT Switches — OFF.

CABIN PREFLIGHT

- ◆ 1. Baggage — Secure.
- 2. Cabin Air Damper Control Knob or Cabin Blower Switch (on blower duct in aft cabin) — As required.



- *On aircraft with cabin air damper control knob, the auxiliary cabin heater will not operate unless damper control knob is in the closed position.*
- *On aircraft with cabin blower switch, when cabin blower switch (on blower duct in aft cabin) is in the OFF position, airflow is diverted above the headliner at all times except during auxiliary heater operation.*

- ◆ 3. Emergency Exit — Aisle clear and handle unobstructed.
- ◆ 4. Brief passengers. Briefing to include seat belt operation, oxygen system operation, life vest location and operation, emergency evacuation, and fire extinguisher location.



- Inform passengers that smoking in the lavatory area when the privacy curtains are closed is prohibited.
- Passengers should be advised not to use portable electronic equipment during takeoff, approach and landing.

BEFORE STARTING ENGINES

- ◆ 1. Controls Lock — Stowed.
- ◆ 2. Safety Belts, Shoulder Harnesses, and Seats — Secure and adjust.



Ensure that seat is adjusted so that full travel can be obtained on all controls.

- ◆ 3. Flight Controls — Check. Full travel on all controls.



Ensure that, during full rudder pedal movement, foot wear does not hinder movement of rudder pedals.

4. Oxygen System:

- a. PASS MASK Valve — AUTO.
- b. PASS OXY Valve — NORM.
- ◆ c. OXYGEN PRESSURE Gage — Check.
- d. Crew Masks:
 - (1) Check oxygen flow available. Select 100% oxygen.
 - (2) On Scott ATO masks, check harness inflation.
- ◆ 5. Circuit Breaker Panels — Breakers depressed.
- 6. LANDING GEAR Switch — DN.
- 7. Emergency Power System Check:
 - *Aircraft with Single Emergency Battery System.*
 - a. EMER BAT Switch — STBY. Check attitude gyro for starting and erection, and amber EMER PWR light illuminated.
 - b. EMER BAT Switch — On. Check attitude gyro operation and amber EMER PWR light illuminated and green gear LOCKED DN lights illuminated.
 - ◆ *For thru flight, EMER BAT Switch — On. Check attitude gyro for starting and erection.*
 - *Aircraft with Dual Emergency Battery System.*
 - a. EMER PWR BAT 1 Switch — STBY. Check attitude gyro for starting and erection.
 - b. EMER PWR BAT 2 Switch — On. Check both amber EMER PWR lights illuminated, and equipment powered by second emergency battery for operation.
 - c. EMER PWR BAT 1 Switch — On. Check attitude gyro for operation, and both amber EMER PWR lights illuminated, and green gear LOCKED DN lights illuminated.
 - ◆ *For thru flight, both EMER PWR Switches — On. Check attitude gyro for starting and erection.*
- ◆ 8. Panel Switches and Avionics — Off or set:
 - a. FUEL CMPTR Switches — ON.
 - b. ANTI-SKID Switch — ON.
 - c. Pilot's Altimeter — NORM.
 - d. ALT INSTR STATIC VALVE — Check CLOSED.
 - e. BLEED AIR Switches — ON.

BEFORE STARTING ENGINES (CONT)

- f. PITCH TRIM Switch — PRI.
- g. JET PUMP Switches — ON.
- h. EMER PRESS Switches (if installed) — NORMAL except for takeoff above 8500 feet pressure altitude.

NOTE

Aircraft with emergency pressurization override switches installed. For takeoff at field elevations above 8500 feet pressure altitude, refer to PRESSURIZATION SYSTEM OPERATION, this section.

9. Battery Check:

NOTE

Setting battery switches On also energizes the windshield ice detect lights. Check Turbine Temperature (ITT), Fan Speed (N1), and Turbine Speed (N2) to ensure red OFF flags are retracted.

- a. BAT 1 Switch — Set to BAT 1. Check for proper voltage. Amber EMER PWR light(s) will go out.
- b. BAT 2 Switch — Set to BAT 2.
- c. BAT 1 Switch — OFF. Check for proper voltage, then BAT 1 Switch set to BAT 1.



For thru flight, both BAT Switches — On.

NOTE

- *On aircraft with Lead-Acid Batteries*, do not attempt a battery start with less than 24 VDC each battery at 70°F (21°C) or below, or less than 25 VDC each battery at 110°F (43°C) or above. Interpolate for temperatures between 70°F (21°C) and 110°F (43°C).
- *On aircraft with Nickel-Cadmium Batteries*, do not attempt a battery start with less than 23 VDC each battery.

◆ 10. GPU (if desired) — Connect.

NOTE

Ensure unit is regulated to 28 VDC and limited to 1100 amps maximum.

11. Inverter System — Check:

- a. PRI INVERTER Switch — PRI. SEC and AUX INVERTER (if installed) Switches — OFF. Check PRI INV light out and AC VOLTS reading is within green arc.
- b. AC BUS Switch — PRI then SEC. Check AC VOLTS reading is within green arc in both positions.
- c. SEC INVERTER Switch — SEC. Check SEC INV light out.
- d. PRI INVERTER Switch — OFF. Check AC VOLTS reading is within green arc.

BEFORE STARTING ENGINES (CONT)

- e. Auxiliary Inverter (if installed) — Check:
 - (1) AUX INVERTER ON-OFF Switch — ON. Check AUX INV light not illuminated.
 - (2) SEC INVERTER Switch — OFF. Check AC VOLTS reading is within green arc.
- ◆ f. PRI, SEC, and AUX INVERTER (if installed) Switches — On.



On aircraft with auxiliary inverter, it is recommended that all three inverters be On during normal operations for maximum inverter life.

- 12. EMER LT Switch (if installed) — TEST; check for illumination, then switch — ARMED.

◆ *For thru flight, EMER LT Switch (if installed) — ARMED.*

- ◆ 13. Systems Pressure Checks:

- a. EMERGENCY AIR Pressure Gage — Check.
- b. HYDRAULIC PRESSURE Gage — Check. If pressure is below 1000 psi, HYD PUMP Switch — On.

- ◆ 14. PARKING BRAKE — Set. PARK BRAKE light (if installed) illuminated.

- 15. EMER BRAKE — Pull the handle out of the recess then return. Do not push the handle downward, as it may introduce emergency brake air into the hydraulic system.

- ◆ 16. HYD PUMP Switch — OFF.

- 17. Warning Light Test Switch (under glareshield) — Depress switch and check annunciator panel lights, MSTR WARN lights, FIRE PULL or ENG FIRE PULL T-Handle warning lights, ARMED lights, ANTI-SKID GEN lights, instrument panel annunciator lights, AIR IGN lights, Starter Engaged lights (if installed), and fuel panel lights illuminate. During daylight, check photoelectric cells by covering both cells and noting that lights dim. Alternately uncover and cover cells to ensure warning lights dim and come on full bright. During darkness, check photoelectric cells by shining flashlight on each cell and noting that lights are full bright. Then note that lights dim when light source is removed.

- 18. Warning System Checks:

- a. Windshield Ice Detect Lights — Check illuminated by placing an object between the lights and windshield, use care to prevent scratching windshield when checking ice detect lights.
- b. Landing Gear Lights — Check; three (3) green. Then TEST-MUTE Switch — TEST. Check horn and three (3) red UNSAFE lights illuminated.

- ◆ c. Fire Detect System — Check:
 - (1) TEST Selector Switch — Rotate to FIRE DET.

BEFORE STARTING ENGINES (CONT)

- (2) TEST Button — Depress. FIRE PULL or ENG FIRE PULL T-Handle shall illuminate and flash. This indicates continuity of the fire detect systems.
- (3) TEST Button — Release.

NOTE

It is recommended that one engine be started after Step c if external power is not being used. Refer to STARTING ENGINES this section.

- d. Cabin Altitude Warning — Check:
 - (1) TEST Selector Switch — Rotate to CABIN ALT, then depress and hold TEST button. Cabin altitude warning horn shall sound.
 - (2) HORN SILENCE Switch — Momentarily engage. Cabin altitude warning shall cease.
 - (3) TEST Button — Release.
- e. Stick Puller/Mach Warning Check:
 - (1) PRI or SEC INVERTER Switch — PRI or SEC.
 - (2) Set Pitch Trim within T.O. segment on PITCH TRIM indicator.
 - (3) L STALL WARNING Switch — On.
 - (4) TEST Selector Switch — Rotate to MACH.
 - (5) Depress and hold TEST button. Control Column shall move aft with approximately 18 pounds force and the aural overspeed warning shall sound.
 - (6) TEST Button — Release.
- f. Mach Trim Check:
 - (1) TEST Selector Switch — Rotate to MACH TRIM.
 - (2) Depress and hold TEST Button. The stabilizer should trim slowly in the nose up direction for 1 to 3 seconds and then stop. The MACH TRIM warning light shall illuminate and the overspeed warning horn shall sound.
 - (3) TEST Button — Release. MACH TRIM warning light shall go out and overspeed warning horn shall cease.
- g. Stall Warning System Check:

NOTE

During heavy wind conditions, it may be necessary to head aircraft into the wind to prevent wind from blowing stall warning vanes up.

- (1) Flaps — UP.
- (2) STALL WARNING Switches — On.
- (3) Rotate TEST Selector Switch to L STALL — Depress and hold TEST button. The pilot's angle-of-attack indicator needle will begin to sweep from the green segment to the red segment.

BEFORE STARTING ENGINES (CONT)

- (a) As the needle passes the green-yellow margin, the shaker will actuate and the L STALL warning light shall flash.
- (b) As the needle advances to the red segment, the pusher will actuate briefly, then stop. L STALL warning light will illuminate steady just prior to or at pusher actuation. After pusher stops, the needle shall sweep back and remain in the yellow or green segment.
- (4) TEST Button — Release.
- (5) Rotate TEST Selector Switch to R STALL. Depress and hold TEST button. The test operation will be identical to Step (3) above except needle will sweep the copilot's angle-of-attack indicator, and the red R STALL warning light will flash.
- (6) TEST Button — Release.



With STALL WARNING switches On, steady illumination of the L or R STALL warning light indicates a malfunction, except during pusher actuation or system test.

- (7) Flaps — DN. Check that both angle-of-attack indicators shift position three times as flaps are lowered to the full travel.
- (8) STALL WARNING Switches — OFF.

◆ 19. Third Attitude Gyro — Uncage.

20. Pressurization and Temperature Controls — Check and set as follows:

a. Pressurization Controls:



- For manual mode pressurization, refer to PRESSURIZATION SYSTEM OPERATION, this section.
- *Aircraft with Emergency Pressurization Override switches installed.* For takeoff at field elevations above 8500 feet pressure altitude, refer to PRESSURIZATION SYSTEM OPERATION, this section.

• *Aircraft 35-067 thru 35-112 except 35-107. Aircraft 36-018 thru 36-031.*

- (1) L and R BLEED AIR Switches — Check, On.
- (2) CABIN AIR Switch — OFF.
- (3) PRESSURIZATION AUTO-MAN Switch — AUTO.
- (4) AIRCRAFT ALT Selector Knob — Rotate to cruise altitude.

BEFORE STARTING ENGINES (CONT)

- (5) Cabin RATE Selector — Position as desired.
- (6) IN NORMAL-OUT DEFOG Knob — Push in.
- *Aircraft 35-107, 35-113 and subsequent and 36-032 and subsequent.*
 - (1) L and R BLEED AIR Switches — Check, On.
 - (2) CAB AIR Switch — OFF.
 - (3) PRESSURIZATION AUTO-MAN Switch — AUTO.
- ◆ (4) CABIN CONTROLLER — Select cruising altitude or desired cabin altitude.
- (5) Cabin RATE Selector — Position as desired.
- b. CABIN CLIMATE CONTROL Switches — As Desired.
- *Aircraft 35-067 thru 35-112 except 35-107. 36-018 thru 36-031.*

Automatic Mode Operation:

- (1) MAN-AUTO-HOT Knob — Rotate out of MAN detent (to AUTO) and set to desired cabin temperature. After take-off, the cabin temperature control system will automatically maintain the cabin at the desired setting.

Manual Mode Operation:

- (1) MAN-AUTO-HOT Knob — Rotate to MAN detent.
- (2) MAN-HOT-COLD Switch — Hold to COLD or HOT until desired setting is reached.
- *Aircraft 35-107, 35-113 and subsequent, and aircraft 36-032 and subsequent.*

Automatic Mode Operation:

- (1) AUTO-MAN Switch — AUTO.
- (2) COLD-HOT Knob — Rotate to desired cabin temperature. After takeoff, the cabin temperature control system will automatically maintain the cabin at the desired setting.

Manual Mode Operation:

- (1) AUTO-MAN Switch — MAN.
- (2) COLD-HOT Knob — Rotate to desired setting.

- ◆ 21. Trim Check:
 - a. PITCH TRIM Selector Switch (pedestal) — SEC.
 - b. NOSE DN-OFF-NOSE UP Switch (pedestal) — Hold to NOSE UP, then NOSE DN. Check for horizontal stabilizer movement in both directions. Stabilizer movement will be at approximately one half the rate of PRI Trim.
 - c. Either Control Wheel Trim Switch — Operate NOSE UP, the NOSE DN. Trim motion shall not occur.
 - d. PITCH TRIM Switch — OFF.

BEFORE STARTING ENGINES (CONT)

- e. Actuate pilot's and copilot's control wheel trim and trim arming switches and pedestal NOSE DN-OFF-NOSE UP switch. Trim motion shall not occur.
- f. PITCH TRIM Switch — $\downarrow$ PRI.
- g. Pedestal NOSE DN-OFF-NOSE UP Switch — Operate NOSE UP, then NOSE DN. Trim motion shall not occur.
- h. Pilot's Control Wheel Trim Switch — Without depressing arming button, move switch to LWD, RWD, NOSE UP and NOSE DN; trim motion shall not occur. Depress arming button; trim motion shall not occur. Then depress arming button and move switch to LWD, RWD, NOSE UP and NOSE DN; trim motion shall occur.
- i. Repeat step h. for copilot's control wheel trim switch.
- j. Trim by positioning copilot's control wheel trim switch, then trim in the opposite direction using the pilot's control wheel trim switch. Pilot's trim shall override copilot's trim. Repeat for each trim position.
- k. Pilot's Control Wheel Trim Switch — $\downarrow$ NOSE UP. Then depress control wheel master switch (MSW); trim motion shall stop while control wheel master switch (MSW) is held. Repeat procedure for NOSE DN condition; trim motion shall stop.
- l. Repeat step k. using copilot's control wheel trim switch and control wheel master switch (MSW).
- m. Yaw Trim Switch — $\downarrow$ Move each half separately to NOSE LEFT and NOSE RIGHT. Trim motion shall not occur.
- n. Yaw Trim Switch — Move both halves simultaneously to each position. Trim motion shall occur.
- o. Trim — Set all axes for takeoff, and check amber T.O. TRIM light not illuminated. *On aircraft 35-146 & subsequent, and aircraft 36-046 & subsequent, and prior aircraft incorporating AAK 83-8, determine Stabilizer Trim Setting by referring to Figure 2-2.*

22. Autopilot Monitor Check:



The following procedure accomplishes the autopilot monitor preflight check. For a complete autopilot operational check, refer to the Flight Manual Supplement for J.E.T. FC-200 Automatic Flight Control System.

- ◆ a. AUTOPILOT Switch — ON. The PWR light on the Autopilot Controller (glareshield) will illuminate.
- b. TEST Button — Depress. All lights on the Autopilot Controller will illuminate.

BEFORE STARTING ENGINES (CONT)

- ◆ c. Attitude Director Indicator (ADI) flags and Horizontal Situation Indicator (HSI) flags — Check that flags have disappeared. This indicates that vertical and directional gyros have been energized long enough to time-out erection cycles (approx. 90 seconds).
- ◆ d. ENG Button — Depress. The ROLL, PITCH and LVL lights will illuminate. The autopilot will oppose movement of the flight controls.
- ◆ e. TEST Button — Depress and hold.
- ◆ f. Control Wheel Trim Switch — Move to LWD without depressing the arming button. ROLL light will extinguish and autopilot disconnect horn will sound within 5 seconds.
- ◆ g. Release TEST switch and trim switch.
- ◆ h. Repeat steps d., e., f., and g. except move control wheel trim switch to the RWD.
- ◆ i. Repeat steps d. and e.
- ◆ j. Control Wheel Trim Switch — Without depressing arming button, move switch to the NOSE DN position while holding moderate pull force on control column. PITCH light will go out and the autopilot disconnect horn will sound within 6 seconds.

NOTE

Normally, roll axis will disengage along with the pitch. If such disengagement does not occur, it may be disregarded since roll axis disengagement is not required.

- k. ENG Button — Depress.
 - l. Control Wheel Master Switch — Depress. Check that autopilot pitch and roll axis disengage.
23. Yaw Dampers — Check as follows:
- ◆ a. Primary Yaw Damper PWR/TEST Button — Depress and hold. PWR/TEST light and PRI ENG light will illuminate. Release PWR/TEST button. PWR/TEST light will remain illuminated and PRI ENG light will go out.
 - ◆ b. Secondary Yaw Damper PWR/TST Button — Depress and hold. PWR/TEST light and SEC ENG light will illuminate. Release PWR/TEST button. PWR/TEST light will remain illuminated and SEC ENG light will go out.
 - c. Yaw Force Indicator — Center by rotating control wheel.
 - d. SEC ENG Button — Depress.
 - e. Depress first one rudder pedal and then the other while holding control wheel centered. It must be possible to depress each rudder pedal against the opposition of the yaw damper system. The Yaw Force Indicator will indicate the direction of input.

BEFORE STARTING ENGINES (CONT)

- f. Control Wheel — Rotate to full left, rudder pedals will deflect to the left. Rotate to full right, rudder pedals will deflect to the right.
- g. SEC ENG OFF Button — Depress. SEC ENG light will extinguish and yaw damper will disengage.
- h. PRI ENG Button — Depress. PRI ENG light will illuminate.
- i. Depress first one rudder pedal and then the other while holding control wheel centered. It must be possible to depress each rudder pedal against the opposition of the yaw damper system. The Yaw Force Indicator will indicate the direction of input
- j. Control Wheel — Rotate to full left, rudder pedals will deflect to the left. Rotate to full right, rudder pedals will deflect to the right.
- k. Control Wheel Master Switch (MSW) — Depress. PRI ENG light will extinguish and yaw damper will disengage.

24. Fuel Panel:

- ◆ a. Fuel Counter — Zero.
- ◆ b. Fuel Quantities — Check.
- ◆ c. CROSSFLOW Switch — CLOSE.
- ◆ d. FUS TANK XFER-FILL Switch — OFF.
- e. L STANDBY PUMP Switch — ON. Check annunciator in switch (if applicable) illuminated and L FUEL PRESS light (red) not illuminated.
- f. L STANDBY PUMP Switch — Off. Check annunciator in switch (if applicable) extinguishes.
- g. R STANDBY PUMP Switch — ON. Check annunciator in switch (if applicable) illuminated and R FUEL PRESS light (red) not illuminated.
- h. R STANDBY PUMP Switch — Off. Check annunciator in switch (if applicable) extinguishes.
- ◆ i. FUS VALVE Switch (if installed) — CLOSE.
- j. FUEL JTSN Switch — Off.

25. CVR — Test.

- ◆ 26. DRAG CHUTE Handle (if installed) — Stowed.
- ◆ 27. Takeoff Data (N1, V1, VR, V2, Takeoff Distance) — Computed and bugs set (Refer to Section V).

TAKEOFF TRIM • CG FUNCTION

Aircraft 35-146 & subsequent, aircraft 36-036 & subsequent, and prior aircraft incorporating AAK 83-8

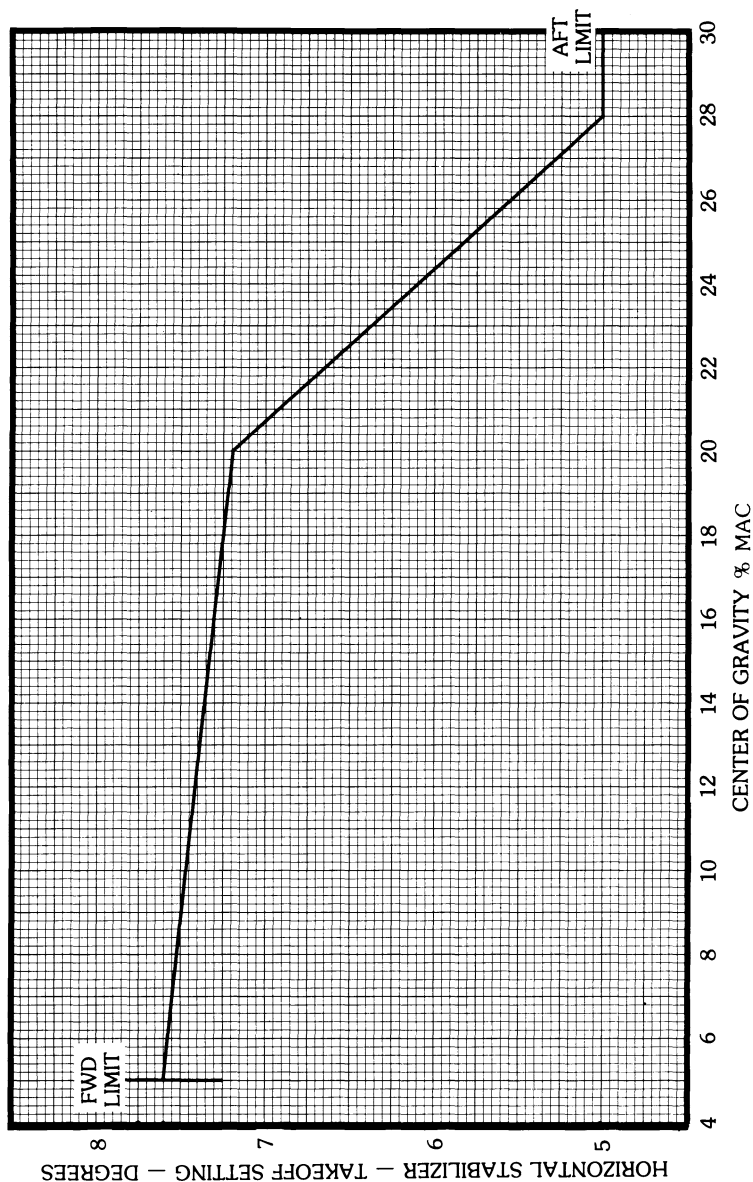


Figure 2-2

STARTING ENGINES

It is recommended that a GPU be used when ambient temperature is 32°F (0°C) or below. Ensure GPU supply is regulated to 28 VDC, has adequate capacity for engine starting and is limited to 1100 amps maximum.

WARNING

Airflow into the TFE 731 engine is sufficient to draw personnel and equipment into the engine inlet. Personnel in proximity of the engine inlet should maintain a safe distance at all times during engine operation.

CAUTION

*On aircraft equipped with Nickel-Cadmium batteries, **do not dispatch** if red BAT 140 or BAT 160 warning light comes on at any time prior to takeoff, including engine start. Check batteries per Learjet Maintenance Manual.*

- ◆ 1. Cabin Door — Closed and locked.
 - a. Both Door Handles — Forward.
 - b. DOOR Light (red) — Not illuminated.
- 2. L and R FUEL CMPTR Switches — On. Check L and R FUEL CMPTR lights — Out.
- ◆ 3. COOL-FAN Switch — OFF or FAN.
- ◆ 4. AUX HT Switch (if installed) — OFF.
- ◆ 5. Batteries — Check for minimum voltage.
- ◆ 6. PRI INVERTER Switch — On.
- ◆ 7. PARKING BRAKE (hydraulic pressure required) — Set.
- ◆ 8. HYD PUMP Switch — OFF.
- ◆ 9. BCN LT Switch — On.
- 10. Thrust Levers — CUTOFF.
- ◆ 11. Engine — Start:
 - a. START-GEN Switch — START. Red starter engaged light (if installed) will illuminate.
 - b. Thrust Lever (at N1 rotation and 10% N2) — IDLE. AIR IGN light will illuminate.
 - c. If temperature is 0°F or below, SPR Switch — L or R depending on engine being started. Release switch at 300°C – 400°C Turbine Temperature (ITT). Use of SPR switch is not required at temperatures above 0°F.

NOTE

Do not energize SPR switch at any time other than engine start.

STARTING ENGINES (CONT)

- d. Monitor the following:
 - (1) Fan Speed (N1) — Increasing as Turbine Speed (N2) increases.
 - (2) Turbine Temperature (ITT) — Max. 860°C.
 - (3) OIL PRESS — Indication within 10 seconds.
 - (4) Fuel Flow.
- e. At approximately 45% or 50% Turbine Speed (N2), the starter will automatically disengage. Check:
 - (1) AIR IGN Light — Out.
 - (2) Starter Engaged Light (if installed) — Extinguished. If starter engaged light remains illuminated, refer to **STARTER ENGAGED LIGHT REMAINS ILLUMINATED AFTER START**, Section IV.



If engine does not start, adhere to the following cooling periods between starting attempts.

After Start Attempt

Wait

1	One Minute
2	One Minute
3	Fifteen Minutes
4	One Minute
5	One Minute
6	One Hour

The above cycle may then be repeated.

◆ 12. START-GEN Switch — GEN at Idle.



On aircraft 35-067 thru 35-147 and 36-018 thru 36-035, set BAT 1 or BAT 2 switch to OFF prior to setting the START-GEN switch to GEN. Prior to starting the second engine or, in the case of single engine taxi, when ammeter reads less than 175 amps — Both battery switches — On.

◆ 13. DC VOLTS and AMPS — Check generator output.

14. Spoileron/Spoiler Check:

- *Aircraft 35-067 thru 35-142 and 36-018 thru 36-035 when not incorporating SB 35/36-27-7:*
 - a. Flaps — Check, DN.
 - b. Control Wheel — Center.
 - c. SPOILERON RESET Switch — Hold On. Rotate control wheel. AUG AIL light will illuminate. Release SPOILERON RESET switch.

STARTING ENGINES (CONT)

- d. Control Wheel — Center.
- e. SPOILERON RESET Switch — Hold On. AUG AIL light will extinguish. Rotate control wheel in the opposite direction. AUG AIL light will illuminate. Release SPOILERON RESET switch.

NOTE

Control wheel movement to cause AUG AIL light to illuminate should be approximately the same in both directions.

- f. Control Wheel — Center.
- g. SPOILERON RESET Switch — On and release. AUG AIL light will extinguish.
- h. Control Wheel — Rotate left then right. Note that spoiler movement coincides with aileron movement and AUG AIL light remains extinguished.
- i. SPOILER Switch — EXT. Check that spoilers extend fully and symmetrically in approximately 1 to 2 seconds. SPOILER light will flash.
- j. SPOILER Circuit Breaker (copilot's essential bus) — Pull. Check that spoilers slam down.

NOTE

Slam down is a quick spoiler retraction (less than one second). It is markedly different from the normal four second spoiler retraction.

- k. SPOILER Circuit Breaker (copilot's essential bus) — Engage. Check that spoilers extend.
- l. SPOILER Switch — RET. Check that spoilers retract fully and symmetrically in approximately 4 seconds and SPOILER light goes out.
- *Aircraft 35-143 and subsequent, 36-036 and subsequent, and prior aircraft incorporating SB 35/36-27-7:*
 - a. Flaps — Check, DN.
 - b. Control Wheel — Center.
 - c. SPOILERON RESET Switch — Hold On. Rotate control wheel. AUG AIL light will illuminate. Release SPOILERON RESET switch.
 - d. Control Wheel — Center.
 - e. SPOILERON RESET Switch — Hold On. AUG AIL light will extinguish. Rotate control wheel in the opposite direction. AUG AIL light will illuminate. Release SPOILERON RESET switch.

NOTE

Control wheel movement to cause AUG AIL light to illuminate should be approximately the same in both directions.

STARTING ENGINES (CONT)

- f. Control Wheel — Center.
- g. SPOILERON RESET Switch — On and release. AUG AIL light will extinguish.
- h. Control Wheel — Rotate left then right. Note that spoiler movement coincides with aileron movement and AUG AIL light remains extinguished.
- i. SPOILER Switch — EXT. Check that spoilers extend fully and symmetrically in approximately 1 to 2 seconds. SPOILER light will flash.
- j. Flaps — UP. SPOILER light will go steady.
- k. SPOILER Switch — RET. Check that spoilers retract fully and symmetrically in approximately 6 seconds and SPOILER light goes out.
- ◆ 15. Flaps — Set 20° or 8°.
- ◆ 16. HYDRAULIC PRESSURE — Check. Check LO HYD light (if installed) not illuminated.
- ◆ 17. Engine Instruments — Check for normal indications.
 - a. At Turbine Speed (N₂) Idle of 55% to 62% — Check Fan Speed (N₁) 26% to 32%.
 - b. OIL PRESS — Check, applicable red L or R LO OIL light extinguished.



- *On aircraft with a single red LO OIL PRESS or OIL PRESS light, the light will remain illuminated until both engines are operating.*
- *On aircraft with red L and R LO OIL lights, the applicable light will extinguish.*

- c. FUEL PRESS Light — Check, not illuminated. This indicates JET PUMPS are operating.



For normal operations, JET PUMP switches should always be in the ON position. However, if for some reason, either or both switches are noted to be Off, reset to ON during steady engine operation at 80%, or above, Fan Speed (N₁).

- ◆ 18. Start other engine (Optional) by repeating step 11.
- ◆ 19. START-GEN Switch — GEN at idle.
- ◆ 20. Engine Instruments — Check for normal indications on both engines.
- ◆ 21. GPU (if applicable) — Disconnect.

STARTING ENGINES (CONT)

- ◆ 22. CUR LIM Light(s) (if installed) — Out.

CAUTION

- If AMK 80-17 or AAK 81-1 is installed on aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047, illumination of the amber L or R CUR LIMITER light indicates that the associated 275-amp current limiter(s) has failed. Replace 275-amp current limiter(s) prior to takeoff.
- On aircraft 35-370, 35-390 & subsequent and aircraft 36-048 & subsequent, illumination of the red CUR LIM light indicates that one or both 275-amp current limiters has failed. Replace 275-amp current limiter(s) prior to takeoff.

- ◆ 23. On aircraft 35-067 thru 35-389 except 35-370; 36-018 thru 36-047, except aircraft incorporating AMK 80-17 or AAK 81-1, Starter Disengagement — After both engines are operating, check as follows:

- a. COOL FAN Switch — OFF.
 - b. AUX HT Switch — OFF.
 - c. Battery Switches — OFF.
 - d. AMPS — Check total current indication of less than 100 amps.
- If total current is greater than 100 amps, shut down engines.

CAUTION

A total ammeter indication greater than 100 amps indicates that a starter has not disengaged and subsequent starter and/or engine damage may occur.

- If total current indication is less than 100 amps, set both battery switches On.

- ◆ 24. DC VOLTS and AMPS — Check generator output.

BEFORE TAXI



After start, **do not** turn on air conditioner or auxiliary heater until one of the following conditions are met.

1. Each ammeter reads below 250 amps with both engines operating.
2. • On aircraft 35-067 thru 35-147 and 36-018 thru 36-035, one ammeter reads below 200 amps with one engine operating.
- On aircraft 35-148 and subsequent and 36-036 and subsequent, one ammeter reads below 150 amps with one engine operating.

- ◆ 1. Avionics — Set as desired.
- ◆ 2. Radar — Standby.
- ◆ 3. Circuit Breakers — Check, in.
- ◆ 4. Coffee/Oven Switches (if installed) — As required.
- 5. Fuel Control Governor Check:
 - a. Left Thrust Lever — IDLE.



If the engine accelerates uncontrolled during the following step, set FUEL CMPTR switch On until engine stabilizes at idle. Shut down engine and determine and correct cause prior to flight.

- b. L FUEL CMPTR Switch — OFF. Note L FUEL CMPTR light illuminated (engine RPM may increase or decrease slightly).



If turbine speed does not respond during the following steps, shut down engine and determine and correct cause prior to flight.

- c. Once RPM stabilizes, gradually advance thrust lever until an increase in Turbine Speed (N₂) is observed.
 - d. Retard thrust lever and note decrease in Turbine Speed (N₂).
 - e. If Turbine Speed responds to thrust lever changes, L FUEL CMPTR switch On and note that L FUEL CMPTR light is out.
 - f. Repeat steps a. thru e. using R FUEL CMPTR switch and right thrust lever.
- ◆ 6. Purge Windshield Heat system of possible moisture accumulation (first flight of day and if exposed to moisture):
 - Aircraft 35-067 thru 35-112 except 35-107, 36-018 thru 36-031:
 - a. IN NORMAL OUT DEFOG Knob — Pull out.
 - b. WSHLD HEAT-MAN-AUTO Switch — AUTO until water has cleared.
 - c. WSHLD OV HT Light — Monitor.

BEFORE TAXI (CONT)

- d. WSHLD HEAT AUTO MAN Switch — MAN.
- e. WSHLD HEAT ON-OFF Switch — OFF until airflow stops.
- f. IN NORMAL OUT DEFOG Knob — Push in.
- Aircraft 35-107, 35-113 and subsequent and 36-032 and subsequent:
 - a. WSHLD HEAT-ON-OFF Switch — ON until water has cleared.
 - b. WSHLD OV HT Light — Monitor.
 - c. WSHLD HEAT-ON-OFF Switch — OFF.

- ◆ 7. Lights — ON, as required.



Do not use strobe lights when taxiing in vicinity of other aircraft. Position lights to be turned on for all night operations.

- ◆ 8. ANTI-SKID Switch — On. Check ANTI-SKID GEN Lights — Out.
- ◆ 9. Cabin Check:
 - a. Passengers — Briefed.
 - b. Swivel Seats — Forward or as placarded. Seat backs in upright and locked position.
 - c. Work Tables and Toilet Door — Check stowed.
 - d. Emergency Exit — Aisle clear and handle unobstructed.
- ◆ 10. NO SMOKING FASTEN SEAT BELT Switch — On.
- ◆ 11. PARKING BRAKE — Release. Check PARK BRAKE light (if installed) Out.

TAXI AND BEFORE TAKEOFF

- ◆ 1. Throughout taxi:
 - a. Nose Wheel Steering — As required.



Nose wheel steering may be locked in by depressing the STEER LOCK switch. The STEER ON light will illuminate. The steer lock may be disengaged at any time by depressing and releasing the pilot's or copilot's control wheel master switch (MSW).

- b. Brakes — Check.



When taxiing through slush or snow, use the brakes to create some friction heat in the brake discs to prevent brakes from freezing.

- ◆ 2. Fuel Balance — Check.
- ◆ 3. Flight Controls — Check.
- ◆ 4. Flight Instruments — Check.
- ◆ 5. Takeoff Data (N1, V1, VR, V2) — Reviewed and Bugs Set.
- ◆ 6. Start Opposite Engine (if applicable) — Refer to STARTING ENGINES, this section.
- ◆ 7. Engine Instruments — Check for normal indication.
- ◆ 8. Starter Disengagement Check (if second engine is started during taxi) — Perform. Refer to STARTING ENGINES, this section.
- ◆ 9. Battery Charging Bus Current Limiter Check (after both engines are started):



Failure to successfully complete the following checks indicates a malfunction. Replace 275-amp current limiter(s) prior to takeoff.

- ◆ *Aircraft 35-067 thru 35-147 and aircraft 36-018 thru 36-035, except aircraft incorporating AMK 80-17 or AAK 81-1:*
 - a. MAIN BUS TIE Circuit Breaker (copilot's main bus) — Pull.
 - b. One START GEN Switch — OFF. Check ammeter reading on opposite generator increases (approximately doubles), then switch back to GEN.
 - c. Opposite START GEN Switch — OFF. Check ammeter reading on opposite generator increases (approximately doubles), then switch back to GEN.
 - d. MAIN BUS TIE Circuit Breaker (copilot's main bus) — Reset.

TAXI AND BEFORE TAKEOFF (CONT)

- Aircraft 35-148 thru 35-389 except 35-370 and aircraft 36-036 thru 36-047, except aircraft incorporating AMK 80-17 or AAK 81-1:
 - a. TEST Selector Switch — Rotate to L CUR LIM.
 - b. TEST Button — Depress. Green current limiter light will illuminate and remain on while button is held. The light indicates continuity through the left current limiter. Also the L GEN light will come on and the right generator voltage may be reduced by approximately 2 VDC.
 - c. TEST Selector Switch — Rotate to R CUR LIM.
 - d. TEST Button — Depress. Green current limiter light will illuminate and remain on while button is held. The light indicates continuity through the right current limiter. Also the R GEN light will come on and the left generator voltage may be reduced by approximately 2 VDC.
- Aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047 incorporating AMK 80-17 or AAK 81-1:
 - a. L CUR LIMITER and R CUR LIMITER Lights — Check extinguished.
- Aircraft 35-370, 35-390 & subsequent and aircraft 36-048 & subsequent:
 - a. CUR LIM Light — Check extinguished.
- 10. Fuel Control Governor Check (if second engine is started during taxi) — Perform. Refer to BEFORE TAXI, this section.
- ◆ 11. Voltmeters and Ammeters — Check.
- ◆ 12. Navigation Equipment — Set for takeoff.
- ◆ 13. Radar — As required.
- ◆ 14. Spoilers — Retracted and SPOILER light out.
- ◆ 15. Flaps — Set 20° or 8°, check indication.
- ◆ 16. Trim — Set for takeoff. Check PITCH TRIM switch in PRI and T.O. TRIM light out.
- ◆ 17. Pressurization System — Set.
- ◆ 18. CABIN AIR or CAB AIR Switch — NORM or ON.
- ◆ 19. CABIN CLIMATE CONTROL Switches — Set.

TAXI AND BEFORE TAKEOFF (CONT)

20. Anti-Ice Systems:

WARNING

The wings, vertical and horizontal stabilizers, flight control surfaces, and engine inlets must be free of frost, snow, and ice.

NOTE

- Anti-ice systems should be turned on prior to flight into visible moisture and Outside Air Temperature of 40°F (4.4°C) or below.
- If anti-ice systems are required during takeoff, they should be turned On prior to setting takeoff power.

- ◆ a. Windshield Heat — As required.

NOTE

Maintain minimum RPM required to keep windshield clear.

- b. NAC HEAT Switches — ON one at a time. Check amber ENG ICE lights extinguish by 60% Fan Speed (N1).
- ◆ c. NAC HEAT Switches — As required.
- d. STAB WING HEAT Switch — On. Check for slight up rate on Cabin Climb Indicator.
- ◆ e. STAB WING HEAT Switch — As required. Monitor WING TEMP and STAB TEMP indicators to prevent overheat condition.
- ◆ 21. Crew Takeoff Briefing — Complete.

RUNWAY LINEUP

- ◆ 1. Parking Brake — Released. Check PARK BRAKE light (if installed) — Out.
- ◆ 2. Transponder — On.
- 3. Pitot Heat — Check PITOT HEAT light(s) (if installed) then On:
 - On aircraft equipped with Single PITOT HEAT light:
 - a. L PITOT HEAT Switch — On. Note that PITOT HEAT light remains illuminated, then L PITOT HEAT Switch — OFF.
 - b. R PITOT HEAT Switch — On. Note that PITOT HEAT light remains illuminated.
 - c. L PITOT HEAT Switch — On. Check PITOT HEAT light goes out.
 - On aircraft equipped with L and R PITOT HEAT lights:
 - a. L PITOT HEAT Switch — On. Note that L PITOT HEAT light goes out.
 - b. R PITOT HEAT Switch — On. Note that R PITOT HEAT light goes out.
- ◆ For thru flight, both PITOT HEAT Switches — On. Check PITOT HEAT light(s) (if installed) out.
- ◆ 4. STROBE LT and RECOG LT Switches — On.



Do not use strobe lights during flight through fog or clouds.

- ◆ 5. LDG LT-TAXI Switches — On as desired.
- ◆ 6. STALL WARNING Switches — On.



In a strong crosswind, it may be necessary to wait until indication of airspeed is achieved before setting STALL WARNING switches On.

- ◆ 7. AIR IGN Switches — On.
- ◆ 8. Annunciator Panel and Warning Lights — Lights not illuminated, except L and R STALL lights, STEER ON light, NAC HEAT light(s) (if installed and NAC HEAT switch(es) On).

TAKEOFF

- ◆ 1. Nose Wheel Steering — As required for heading control. Release at first indication of airspeed.

AFTER TAKEOFF**WARNING**

When the fuel quantity gage indicates 600 pounds or less remaining in either wing tank, prolonged nose up attitude of 10° or more may cause fuel to be trapped in the aft area of the wing tank outboard of the wheel well. Fuel starvation and engine flameout may occur. Reducing pitch attitude and thrust to a minimum required will prevent this situation.

NOTE

- JET PUMP Switches should always be in the ON position. However, at any time during flight, if either or both switches are noted to be in the Off position, reset to ON during steady engine operation at 80% Fan Speed (N₁), or above.
- If taxi and/or takeoff were on ice, snow, or slush, allow the wheels to spin down for approximately one minute prior to gear retraction to throw off as much slush as possible.

1. LANDING GEAR Switch — UP. Landing gear should be fully retracted prior to retracting flaps.
2. Yaw Damper PRI or SEC ENG Button — Depress.
3. Flaps — UP prior to VFE.
4. Anti-Ice Systems — As required.

WARNING

Even small accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can also cause angle-of-attack indicator information to be unreliable.

NOTE

Anti-ice systems should be turned on prior to flight into visible moisture and Ram Air Temperature of 10°C or below.

5. AIR IGN Switches — OFF unless ambient conditions require ignition to remain On.

NOTE

During periods of heavy precipitation, set AIR IGN Switches On to prevent possible engine flameout due to large quantities of water entering the engine.

AFTER TAKEOFF (CONT)

6. Pressurization System:



- For manual mode pressurization, refer to PRESSURIZATION SYSTEM OPERATION, this section.
- *Aircraft with emergency pressurization override switches installed.* For takeoff at field elevations above 8500 feet pressure altitude, refer to PRESSURIZATION SYSTEM OPERATION, this section.

- a. Cabin Altitude and Cabin Climb Indicators — Monitor.
- b. Cabin RATE Selector — As desired.

7. LDG LT-TAXI Switches — OFF.

8. Autopilot APPR Light — OUT.

9. HYDRAULIC PRESSURE — Check, normal.

10. ANGLE-OF-ATTACK Indicators — Cross-check pilot's and copilot's instruments for relative agreement.

CLIMB**10,000 Ft Checks:**

1. NO SMOKING FASTEN SEAT BELT Switch — As required.

18,000 Ft (or Transition Altitude) Checks:

1. Altimeter — Set to 29.92" Hg (1013 mb) at transition altitude.
2. RECOG LT Switch — OFF.
3. COOL-FAN Switch — FAN or OFF at or before FL 180 (if applicable). Refer to FREON COOLING SYSTEM, Section I.
4. Crew Masks — Positioned to quick donning position at or before FL 250. Refer to OXYGEN SYSTEM, Section I. On aircraft with ZMR 100 series diluter-demand crew masks, check 100% OXY selected.
5. EMER PRESS Switches (if installed) — NORMAL.

FL 350 Checks:

1. COOL-FAN Switch — FAN or OFF. Refer to FREON COOLING SYSTEM, Section I.

FL 410 Checks:

Aircraft 35-067 thru 35-112 except 35-107, 36-018 thru 36-031.

1. Crew and Passenger Oxygen Masks — Don above Flight Level 410. Ensure lanyards have been pulled.

CRUISE

Once established at cruise altitude, crew duties consist mainly of monitoring aircraft systems indications and annunciators to ensure proper operation. Monitor pressurization and engine instruments. Monitor fuel distribution and crossflow fuel as required to maintain wings balanced. Use small thrust adjustments as necessary to maintain desired cruise Mach.

DESCENT

1. Windshield Heat — As required.
2. Windshield Aux Defog Heat (if installed) — As required.
3. Pressurization — Set as follows:



- For manual mode pressurization, refer to PRESSURIZATION SYSTEM OPERATION, this section.
- *Aircraft with emergency pressurization override switches installed.* For landing at field elevations above 8500 feet pressure altitude, refer to PRESSURIZATION SYSTEM OPERATION, this section.
- Maintain sufficient RPM, especially at high altitudes, to maintain cabin pressurization.

- a. CABIN ALT Selector Knob — Turn to destination field elevation.
- b. Cabin RATE Selector — Adjust as desired during descent.
4. Anti-ice Systems — As required.



Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can also cause angle-of-attack indicator information to be unreliable.



Anti-ice systems should be turned on prior to flight into visible moisture and Ram Air Temperature of 10°C or below.

FL 180 (or Transition Level) Checks:

1. Barometric Altimeters — Set to field barometric pressure at transition altitude. Cross-check pilot's and copilot's instruments.
2. RECOG LT Switch — ON.
3. Cabin Altitude and Cabin Climb Indicators — Check.
4. NO SMOKING FASTEN SEAT BELT Switch — On.
5. Cabin Check:
 - a. Swivel Seats — Forward or as placarded.
 - b. Work Table and Toilet Doors (if installed) — Check stowed.
 - c. Emergency Exit — Check aisle clear and handle unobstructed.

APPROACH

1. Circuit Breakers — Check in.
2. HYDRAULIC PRESSURE and EMERGENCY AIR Pressure — Check.
3. Landing Approach Speed (VREF), Approach Climb Speed (approximately VREF + 7), and N1 for Go-Around — Computed and bugs set. Refer to Section V.

NOTE

It is recommended that if turbulence is anticipated due to gusty winds, wake turbulence, or wind shear, the approach speed be increased. For gusty wind conditions, an increase in approach speed of one half the gust factor is recommended.

4. Fuel Balance — Check.
5. Avionics:
 - a. Avionics Equipment — Set for approach.
 - b. Radio Altimeter — Set to approach minimums.
 - c. Crew Approach Briefing — Complete.

BEFORE LANDING

1. SPOILER — Check RET.
2. Flaps — As desired (8°/20°).
3. LANDING GEAR Switch — DN at V_{LO} or less. Check for green LOCKED DN indication.



- If taxi and/or takeoff were on ice, snow or slush; ANTI-SKID Switch — OFF, pump brakes 6 to 10 times, then ANTI-SKID Switch — On. Brake application will tend to crack any ice between brake discs and between the discs and wheels.
- The ENG SYNC light will illuminate whenever the nose gear is down and the ENG SYNC switch is in the SYNC position.

4. LDG LT-TAXI Switches — As required.



The left landing light will not illuminate unless the left main gear is down and locked. The right landing light will not illuminate unless the right main gear is down and locked.

5. ANTI-SKID Switch — On. ANTI-SKID GEN Lights — Out.
6. ENG SYNC Switch — OFF.
7. Flaps — DN.
8. HYDRAULIC PRESSURE Gage — Check, normal.
9. AIR IGN Switches — On.
10. Autopilot — Disengage.



Use control wheel trim switch to disengage autopilot. Control wheel master switch (MSW) will also disengage yaw damper.

11. Yaw Damper — Off during landing flare:
 - a. Depressing either control wheel master switch will disengage primary or secondary yaw damper.
 - b. Depressing the PRI or SEC OFF button on the Y/D controller will disengage the PRI or SEC yaw damper.

GO AROUND

 WARNING

When the fuel quantity gage indicates 600 pounds or less remaining in either wing tank, prolonged nose-up attitude of 10° or more may cause fuel to be trapped in the aft area of the wing tank outboard of the wheel well. Fuel starvation and engine flameout may occur.

For go-around conditions with low fuel, on first steady indication by the LOW FUEL warning light, reduce climb attitude and thrust to a minimum required.

1. Autopilot — Disengaged.
2. Thrust Levers — Set to takeoff power or as required.
3. SPOILER Switch — Check RET.
4. Flaps — 20°.
5. LANDING GEAR Switch — UP after positive rate of climb is established.
6. Climb at Approach Climb Speed.
7. When clear of obstacles, accelerate to VREF +30 and retract flaps.

LANDING

1. SPOILER Switch — EXT after touchdown.

 CAUTION

If, upon touchdown, one or more ANTI-SKID GEN lights come on, anti-skid protection for the associated wheel is inoperative and has reverted to manual brake control.

2. Brakes — As required.

 CAUTION

If not already operating, **do not** turn on cooling system during landing with anti-skid system operating. Initial voltage drop may cause false signals in the anti-skid system and dump brake pressure for 2 to 3 seconds.

3. Thrust Reversers or Drag Chute (if installed) — As desired.
4. Nose Wheel Steering — As required below 45 knots.

 NOTE

During moderate to heavy braking action on patchy snow or ice, avoid use of nose wheel steering above 10 knots.

AFTER LANDING/CLEARING RUNWAY

1. STALL WARNING Switches — OFF.
2. AIR IGN Switches — OFF.
3. CABIN AIR or CAB AIR Switch — OFF.
4. Anti-Ice Systems:
 - a. PITOT HEAT Switches — OFF.
 - b. Windshield and Radome Alcohol — OFF.
 - c. Windshield Heat and Windshield Aux Defog Heat (if applicable) — As required.

NOTE Maintain minimum RPM required to keep windshield clear.

- d. NAC HEAT Switches — As required.
 - e. STAB WING HEAT Switch — As required. Monitor WING TEMP and STAB TEMP Indicators to prevent overheat condition.
5. LDG LT-TAXI Lights and RECOG LT — As desired.

NOTE Do not use strobe lights when taxiing in the vicinity of other aircraft. Navigation lights should be on for all night operations.

6. Thrust Lever (on engine started first) — CUTOFF (optional).

NOTE Idle engine for 2 minutes prior to thrust lever cutoff.

7. SPOILER Switch — RET.
8. Flaps — UP.
9. HYDRAULIC PRESSURE Gage — Check.
10. Unnecessary Avionics — OFF.
11. Transponder — Standby or Off.

SHUTDOWN

1. PARKING BRAKE and/or Chocks — Set.
2. Anti-Ice Systems — OFF.
3. EMER LT Switch (if installed) — DISARM.
4. All Switches (including Avionics) — OFF except FUEL CMPTR, ANTI-SKID, BLEED AIR, JET PUMPS, and PITCH TRIM.
5. Third Attitude Gyro — Cage.
6. EMER BAT or EMER PWR Switch(es) — OFF.
7. Coffee and Oven Switches (if installed) — Off.
8. Thrust Lever(s) — CUTOFF.
9. START-GEN Switches — OFF.
10. INVERTER Switches — OFF.
11. Fuel Transfer — OFF.
12. CROSSFLOW Valve — CLOSE.
13. *On aircraft not incorporating SB 35/36-32-4, Hydraulic Pressure — Bleed to zero (0).*



Failure to bleed hydraulic pressure from the system before setting the battery switches OFF could result in nose gear retraction if the landing gear selector valve malfunctions.



If the parking brake is set, use of flaps to bleed hydraulic system pressure will not affect parking brake pressure.

14. BCN LT Switch — OFF.
15. Battery Switches — OFF.
16. Controls Lock — Install.

QUICK TURNAROUND (ONE OR NO ENGINE SHUTDOWN)

1. Cabin Door — Closed and locked. DOOR light out.
2. COOL-FAN Switch — OFF or FAN.
3. AUX HT Switch (if installed) — OFF.
4. Engine — Start (2 running).
5. START GEN Switches — GEN.
6. DC VOLTS and AMPS — Check generator output.
7. If engine has been restarted.
 - On aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047 not incorporating AMK 80-17 or AAK 81-1:
 - a. Starter Disengagement Check — Perform. Refer to START-ING ENGINES, this section.
 - b. Battery Charging Bus Current Limiter Check — Perform. Refer to TAXI AND BEFORE TAKEOFF, this section.
 - On aircraft 35-370, 35-390 and subsequent, aircraft 36-048 and subsequent, and prior aircraft incorporating AMK 80-17 or AAK 81-1:
 - a. Starter Engaged and CUR LIM Light(s) — Out.
8. Circuit Breakers — In.
9. Avionics — As required.
10. Coffee/Oven Switches (if installed) — As required.
11. Anti-ice Systems — As required.

WARNING

The wings, vertical and horizontal stabilizers, flight control surfaces, and engine inlets must be free of frost, snow, and ice.

NOTE

- Anti-ice systems should be turned on prior to flight into visible moisture and Outside Air Temperature of 40°F (4.4°C) or below.
- If anti-ice systems are required during takeoff, they should be turned On prior to setting takeoff power.

12. Cabin Check:
 - a. Passengers — Briefed.
 - b. Swivel Seats — Forward or as placarded. Seat backs in upright and locked position.
 - c. Work Tables and Toilet Door — Check stowed.
 - d. Emergency Exit — Aisle clear and handle unobstructed.
13. NO SMOKING FASTEN SEAT BELT Switch — On.

QUICK TURNAROUND (CONT)

Taxi:

1. Fuel Panel — Check.
2. Takeoff Data (N_1 , V_1 , V_R , V_2 , Takeoff Distance) — Compute; Bugs — Set. Refer to Section V.
3. Nav Equipment — Set.
4. Radar — As required.
5. Flight Controls — Check.
6. Flight Instruments — Check.
7. Spoilers — Retracted and SPOILER light out.
8. Flaps — Set 20° or 8° , check indication.
9. Trim — Set for takeoff. Check PITCH TRIM switch in PRI and T.O. TRIM light out.
10. Pressurization — Select cruising altitude or desired cabin altitude.
11. CABIN AIR or CAB AIR Switch — NORM or ON.
12. Crew Takeoff Briefing — Complete.

Runway Lineup:

1. Parking Brake — Released. Check PARK BRAKE light (if installed) — Out.
2. Transponder — On.
3. Both PITOT HEAT Switches — On. Check PITOT HEAT light(s) (if installed) out.
4. Lights:
 - a. STROBE LT and RECOG LT Switches — On.

NOTE

Do not use strobe lights during flight through fog or clouds.

- b. LDG LT-TAXI Switches — On as desired.
5. STALL WARNING Switches — On.

NOTE

In a strong crosswind, it may be necessary to wait until indication of airspeed is achieved before setting STALL WARNING switches On.

6. AIR IGN Switches — On.
7. Annunciator Panel and Warning Lights — Lights not illuminated, except L and R STALL lights, STEER ON light, NAC HEAT light(s) (if installed and NAC HEAT switch(es) On).

COLD WEATHER OPERATION

Operational problems related to cold weather may occur unless proper pre-flight and inspection procedures are accomplished. Additionally, operational difficulties due to ice, snow, slush or water accumulation may be encountered. The following instructions supplement the normal procedures and, when followed, will help ensure satisfactory operation of the aircraft and its systems in cold climatic conditions.

PREFLIGHT PREPARATION

It is essential to take off with an aerodynamically clean airplane. Low temperatures and precipitation associated with cold weather operation create problems while the airplane is on the ground, in that frost, ice and snow adhere to and accumulate on the surfaces of the airplane. All surfaces of the airplane (wing, vertical and horizontal stabilizers, flight controls, spoilers and flaps) must be free of frost, ice and snow before takeoff. During periods of precipitation, once the airplane has been de-iced, anti-icing is likely to be required to ensure that the airplane remains aerodynamically clean for departure. De-icing/anti-icing must be accomplished at the last possible time prior to takeoff to maximize the time that anti-icing will be able to provide protection (holdover time). Refer to Learjet Addendum — DE-ICING/ANTI-ICING for de-icing/anti-icing procedures.

PREFLIGHT INSPECTION

1. Conduct normal exterior inspection.
2. Check the entire aircraft (including top surface of horizontal stabilizer) for ice, snow and frost. Brush off light snow. Remove all frost, encrusted snow and ice.
3. Remove ice, snow and dirt from landing gear shock struts and wheel wells. Check gear doors, position switches, squat switches, wheels, brakes and tires.
4. Carefully inspect engines for frozen precipitation in fan duct and tailpipe. Under certain climatic conditions, ice can form on the back of fan blades and cause vibration during start.

ENGINE START

Use of a GPU for an engine start is recommended at ambient temperatures of 32°F (0°C) or below. Ensure GPU is regulated to 28 VDC, has adequate capacity (at least 500 amps), and is limited to 1100 amps.

Use of SPR is recommended for engine starts at ambient temperatures of 0°F (-17.8°C) or below. During an engine start using SPR, discontinue SPR at 300-400°C Turbine Temperature (ITT).

NOTE

Use of SPR is not required above 0°F (-17.8°C). Do not energize SPR at any time other than engine start.

If the engines are exposed to extremely cold temperatures (below -40°F [-40°C]) for an extended period, the engines should be preheated prior to attempting a start. For ambient temperatures between -40°F and -65°F (-40°C and -53.9°C), direct warm air flow into each engine for a minimum of 30 minutes prior to engine start.

During engine starts in cold weather, engine acceleration, particularly Fan Speed (N1), is much slower than normal and Turbine Temperature (ITT) has a tendency to increase more rapidly due to the increased spool-up times. Additionally, higher than normal oil pressure can be expected which may exceed the maximum allowable transients.

NOTE

During engine starts in cold conditions:

- If Fan Speed (N1) does not rise with Turbine Speed (N2) or stops during the start attempt, abort start.
- If Turbine Temperature (ITT) is rising rapidly and appears likely to exceed the start limit, abort start.
- Exceeding idle power with oil temperature below 30°C is not recommended. However, if ambient temperature prevents attainment of 30°C, idle power may be exceeded as required to further warm the oil to normal operating limits prior to takeoff.
- If abnormal engine vibration occurs during or after engine start, immediately abort start or shutdown engine and investigate for possible ice formation on back of fan blades.

When the aircraft has been cold soaked at ambient temperatures below -13°F (-25°C), the engines should be operated a minimum of 3 minutes to bring the hydraulic system up to normal operating temperature.

TAXIING

Use normal taxi procedures if the ramp and taxiways are clean and dry. If it is necessary to taxi on ice, snow, slush, or water, taxi at reduced speed and allow greater distance for stopping because of decreased braking efficiency.

If taxi is to be accomplished through slush or snow, use the brakes to create some friction-induced heating of the brake discs to prevent the brakes from freezing.

Use both engines for taxi on slippery surfaces. Directional control may be difficult to maintain during single-engine taxi on a slick surface.

Use anti-ice systems as required.

Insofar as possible, taxi should be accomplished with the flaps up on snow or slush covered surfaces.

Avoid taxiing in the exhaust wake or propeller wash of other aircraft on other than hard packed or dry surfaces.

Thrust reversers (if installed) should be used with extreme caution on slippery surfaces and only when absolutely necessary to maintain directional control.

Do not use thrust reversers (if installed) if taxiways and ramps are covered with slush, ice, standing water or snow except in the interest of safety.

TAKEOFF

If anti-ice systems are required for takeoff, the systems should be energized prior to setting takeoff power. Refer to Section V for aircraft takeoff performance data with anti-ice systems in operation.

Do not take off with runway water or slush accumulation of 3/4 inch (19mm) or more.

Do not take off with frost, snow, or ice on the wings or aircraft control surfaces, including the horizontal stabilizer and elevators. Refer to Learjet Addendum — DE-ICING/ANTI-ICING for de-icing/anti-icing procedures.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can also cause angle-of-attack indicator information to be unreliable.

AFTER TAKEOFF

After takeoff from a snow-covered or slush-covered runway, delay retracting landing gear to allow residual slush to be thrown or blown off.

BEFORE LANDING

If taxi or takeoff was made from a snow-covered or slush-covered field, it is recommended that the following procedure be used to help crack any ice between brake discs and between the brake discs and wheels:

1. After landing gear is extended, set ANTI-SKID switch to OFF.
2. Pump brakes 6 to 10 times. Use moderate to heavy braking pressure.
3. Prior to touchdown, set ANTI-SKID switch to ON and check ANTI-SKID lights are out.

LANDING

Use normal landing procedures if runway is clean and dry. Refer to Section V for landing distance factors to be applied when landing on wet or icy runways.

AFTER CLEARING RUNWAY

During moderate to heavy braking action on patchy snow or ice, avoid use of nose wheel steering above 10 knots.



For taxi after landing on a slush or snow covered field, it is recommended that the flaps not be retracted above 20°. This will protect flaps and wing from damage in the event ice or snow has accumulated on the flaps.

SHUTDOWN AND POSTFLIGHT

When the aircraft must be parked outside in extremely cold or fluctuating freeze/thaw temperatures, perform the following in addition to the normal shutdown and post-flight procedures:

1. Chock main gear wheels before releasing park brake. Do not leave aircraft parked for extended periods in subfreezing weather with parking brake set.
2. Remove ice, snow and dirt from landing gear shock struts and wheel wells. Check gear doors, position switches, squat switches, wheels and tires.
3. Remove ice, snow and dirt from flaps and flap tracks before retracting flaps.
4. If the aircraft is to be parked for an extended period at ambient temperatures of 20°F (-6.7°C) or below, it is recommended that the crew oxygen masks be stowed in a heated room or the cabin should be warmed to at least 20°F (-6.7°C) before use.
5. If the aircraft is to remain in subfreezing temperatures for an extended period, remove water and beverage containers from the aircraft. Remove toilet tank and reservoir fluid from aircraft or add ethylene glycol base anti-freeze containing antifoam agent to the flush fluid.
6. Install aircraft protective covers.
7. If the aircraft will be exposed to extremely cold temperatures for an extended period, it is recommended that the batteries be removed and stored in a warm area if possible.

PRESSURIZATION SYSTEM OPERATION**NOTE**

For Automatic Mode operation, refer to BEFORE STARTING ENGINES, AFTER TAKEOFF and DESCENT procedures in this section.

MANUAL MODE OPERATION

1. AUTO-MAN Switch — MAN.
2. UP-DN Manual Control (red) — As required to maintain satisfactory pressurization.
3. To return to automatic operation, proceed as follows:
 - Aircraft 35-067 thru 35-112 except 35-107, 36-018 thru 36-031:

NOTE

If cabin altitude should increase to 10,000 (± 500) feet or above, the automatic mode is deactivated until the cabin altitude is decreased to 7500 feet or below.

- a. CABIN ALT Controller — Set at or below 7500 feet.
 - b. RATE Knob — Turn to full INCR.
 - c. UP-DN Manual Control (red) — Control to altitude selected on CABIN ALT Controller.
 - d. CABIN CLIMB Speed Indicator — Stabilize at zero.
 - e. RATE Knob — Reset to nominal position.
 - f. AUTO-MAN Switch — AUTO.
 - g. CABIN ALT Controller — Reset (if required) to appropriate cabin altitude for flight altitude.
- Aircraft 35-107, 35-113 & Subsequent and 36-032 & Subsequent:

NOTE

If cabin altitude should increase to 8750 (± 250) feet or above, the automatic pressurization mode is deactivated and the amber CAB ALT light will illuminate. Automatic mode operation will not be available until the cabin altitude is decreased to extinguish the CAB ALT light.

- a. CABIN CONTROLLER — Set at or below 7200 feet.
- b. UP-DN Manual Control (red) — Control to altitude selected on Cabin Controller.
- c. AUTO-MAN Switch — AUTO.
- d. CABIN CONTROLLER — Reset (if required) to appropriate cabin altitude for flight altitude.

PRESSURIZATION SYSTEM OPERATION (CONT)

LANDING AT FIELD ELEVATION ABOVE 8500 FEET (*Aircraft with Emergency Pressurization Override Switches*)

DESCENT

1. EMER PRESS Switches — OVERRIDE.
2. AUTO-MAN Switch — MAN.
3. UP-DN Manual Control (red) — UP to destination field elevation.



- After landing, leave EMER PRESS switches in OVERRIDE position. If the switches are set to NORMAL above approximately 9500 feet, emergency pressurization will activate. In the event of inadvertent activation of emergency airflow, the system may be reset as follows:
 - a. EMER PRESS Switches — OVERRIDE.
 - b. Both BLEED AIR Switches — OFF then ON.
- Applicable operating rules, pertaining to the use of oxygen at high cabin altitude, must be observed.

TAKEOFF AT FIELD ELEVATION ABOVE 8500 FEET (*Aircraft with Emergency Pressurization Override Switches*)

BEFORE STARTING ENGINES

1. EMER PRESS Switches — OVERRIDE.
2. BLEED AIR Switches — ON.
3. CAB AIR Switch — OFF.
4. AUTO-MAN Switch — MAN.



- Applicable operating rules, pertaining to the use of oxygen at high cabin altitude, must be observed.
- At field elevations above 8750 (± 250) feet, the automatic pressurization mode will be deactivated and the CAB ALT light will be illuminated.

5. CABIN CONTROLLER — Select cruising altitude or desired cabin altitude.

TAXI AND BEFORE TAKEOFF

1. CAB AIR Switch — ON.

AFTER TAKEOFF

1. UP-DN Manual Control (red) — DN to obtain cabin altitude selected on CABIN CONTROLLER.

PRESSURIZATION SYSTEM OPERATION (CONT)

2. AUTO-MAN Switch — AUTO.



The pressurization system cannot be reset to automatic mode until the CAB ALT light is extinguished.

3. EMER PRESS Switches — NORMAL.

CABIN TEMPERATURE CONTROL

Cabin air is provided by cooling engine bleed air in a ram air heat exchanger. Primary heating and cooling is obtained by controlling the amount of warm air that goes through the heat exchanger.

BLEED AIR HEATING AND COOLING

• Aircraft 35-067 thru 35-112 except 35-107, 36-018 thru 36-031:

1. BLEED AIR Switches — On.
2. CABIN AIR Switch — NORM.



Do not select MAX position of CABIN AIR switch while on the ground. **Do not** perform extended engine operation above IDLE with CABIN AIR switch NORM. With the aircraft static there is no ram airflow through the heat exchanger and possible damage to air conditioning components could result. Cabin overheating and damage to cabin components may also occur.

3. MAN-AUTO-HOT Knob — Rotate out of MAN detent to AUTO and turn to desired temperature. In flight, the cabin temperature control system will automatically maintain the cabin at the desired temperature.
 4. If satisfactory cabin temperature is not maintained:
 - a. MAN-AUTO-HOT Knob — Rotate to MAN detent.
 - b. MAN-HOT-COLD Switch — HOT or COLD until desired setting is reached.
- Aircraft 35-107, 35-113 & Subsequent and 36-032 & Subsequent:
 1. BLEED AIR Switches — ON.
 2. CAB AIR Switch — ON.



With the aircraft sitting statically on the ground, **do not** perform extended engine operation above IDLE with CAB AIR switch ON. There is no ram airflow through the heat exchanger and possible damage to air conditioning components may occur.

CABIN TEMPERATURE CONTROL (CONT)

3. AUTO-MAN Switch — AUTO.
4. COLD-HOT Knob — Rotate to desired cabin temperature. In flight the cabin temperature control system will automatically maintain the cabin at the desired temperature.
5. If satisfactory cabin temperature is not maintained:
 - a. AUTO MAN Switch — MAN.
 - b. COLD HOT Knob — Rotate to desired setting.

ADDITIONAL COOLING OR TO DECREASE CABIN HUMIDITY

NOTE

- Power for the cooling system must be supplied by an engine generator or GPU.
 - *On aircraft not incorporating FCN 89-1, do not operate cooling system above FL180.*
 - *On aircraft incorporating FCN 89-1, do not operate cooling system above FL350.*
 - **Do not** turn on cooling system unless:
 - *Aircraft 35-067 thru 35-147 and 36-018 thru 36-035:*
 1. With one engine operating, the ammeter reads below 200 amps.
 2. With both engines operating, each ammeter reads below 250 amps.
 - *Aircraft 35-148 & subsequent and 36-036 & subsequent:*
 1. With one engine operating, the ammeter reads below 150 amps.
 2. With both engines operating, each ammeter reads below 250 amps.
1. COOL-FAN Switch — COOL.
 2. If recirculation only is required, COOL-FAN Switch — FAN. CABIN BLOWER Rheostat (copilot's side panel, if installed) — As Desired.

CABIN TEMPERATURE CONTROL (CONT)

ADDITIONAL HEATING

CABIN (*If Auxiliary Heater Is Installed*)

- Power for the auxiliary heater must be supplied by an engine generator or GPU.
- **Do not** turn on the auxiliary heater unless:
 - Aircraft 35-067 thru 35-147 and 36-018 thru 36-035:
 1. With one engine operating, the ammeter reads below 200 amps.
 2. With both engines operating, each ammeter reads below 250 amps.
 - Aircraft 35-148 & subsequent and 36-036 & subsequent:
 1. With one engine operating, the ammeter reads below 150 amps.
 2. With both engines operating, each ammeter reads below 250 amps.

1. • On aircraft with damper control knob (on blower duct in aft cabin), Damper Control Knob — Rotate to CLOSE. Auxiliary heater will not operate unless knob is in CLOSE position.
- On aircraft with cabin blower switch (on blower duct in aft cabin), Cabin Blower Switch — ON.
2. AUX HT Switch — HI or LO as desired.

COCKPIT (*Aircraft incorporating AAK 86-1 or SB 35/36-21-17*)

1. W/S AUX HEAT DEFOG Switch — CKPT.



To prevent damage to the heater element, cabin air must be On and airflow available before activating the cockpit heater.

CABIN TEMPERATURE CONTROL (CONT)**ADDITIONAL AIR CIRCULATION**

1. For additional cabin air circulation, Cooling System COOL-FAN Switch — FAN. CABIN BLOWER Rheostat (copilot's side panel, if installed) — As desired.
2. For additional cockpit air circulation, Cockpit Air Control — Rotate to desired setting.



If the overhead air outlets are closed, the cockpit blower must be turned off to prevent overheating blower motor.

AILERON AUGMENTATION

Spoilers are used to provide aileron control augmentation in the following airplane configuration:

1. SPOILER Switch — RET.
2. Flaps — Below 25 degrees.

Aileron augmentation will not be energized with flaps retracted above 25 degrees or when SPOILER switch is in the EXT position. Always check that SPOILER switch is in the RET position before actuating the SPOILERON RESET switch.

Normal spoiler operation overrides the aileron augmentation mode of operation and the SPOILER light will be illuminated anytime spoilers are extended 1 degree or more during normal spoiler operation.

With flaps lowered beyond 13° and spoiler extended, the SPOILER light will flash.

If the aileron augmentation system malfunctions, the AUG AIL light comes on and spoilers retract. However, actuating the SPOILERON RESET switch will restore normal operation if the system clears itself.

During Spoileron/Spoiler Check, if AUG AIL light does not come on, possible failures are:

1. Computer monitor failure.
2. Spoileron selector valve failure.

Continued operation with either of these failure modes could result in inadvertent asymmetrical spoiler extension. Malfunction should be corrected before flight.

OXYGEN SYSTEM

WARNING

Smoking is prohibited while oxygen system is in use.

OXYGEN DURATION

The oxygen duration charts in Section IV show oxygen supply duration of a fully charged system as a function of cabin altitude and number of occupants using the system.

- Figure 4-1 is provided for Aircraft with ZMR 100 Series Diluter Demand Crew Masks.
- Figure 4-2 is provided for Aircraft with 6600214 Series Demand Crew Masks.
- Figure 4-3 is provided for Aircraft with Scott ATO Crew Masks.

PASSENGER OXYGEN

WARNING

- Passenger masks are intended for use during an emergency descent to an altitude not requiring supplemental oxygen.
- Passenger masks will not provide sufficient oxygen for prolonged operation above 34,000 feet cabin altitude. Prolonged operation above 25,000 feet cabin altitude with passengers on board is not recommended.

1. With the PASS OXY Valve in the OFF position, no oxygen is supplied to the cabin.
2. With the PASS OXY Valve in the NORM position and the PASS MASK Valve in the AUTO position, the passenger oxygen masks will drop from their storage compartments if the cabin altitude reaches 14,000 (± 750) feet. Whenever the oxygen masks deploy, the upper center panel lights will illuminate to provide maximum visibility for donning masks. The passengers must don the masks and pull the attached lanyards to start the flow of oxygen.

NOTE

If Generator and Battery switches are Off, automatic presentation of masks will not occur. In this event, turn PASS MASK Valve to MAN to deploy masks if passenger oxygen is required.

3. With the PASS OXY Valve in the NORM position and the PASS MASK Valve in the MAN position, the passenger oxygen masks will drop from their storage compartments. The passengers must don the masks and pull the attached lanyards to start the flow of oxygen. This should be used if automatic presentation of the masks does not occur.

Continued

OXYGEN SYSTEM (CONT)

4. Deploy passenger oxygen if pressurization irregularities are encountered above 10,000 feet MSL.



The rebreather bag may not inflate even though oxygen is flowing. This is normal.

CREW OXYGEN

1. If oxygen is required by the crew only, PASS OXY Valve — OFF.
2. When oxygen masks are worn by the crew, OXY-MIC Switch(es) — ON. Communication between crew members can be accomplished by using the INPH function of the audio control panel and increasing the MASTER VOL level.
3. Crew Oxygen Masks:
 - **Operate ZMR 100 series diluter-demand crew masks as follows:**
 - a. With 100% OXY position (control lever down) selected on the mask regulator, the mask will provide 100% oxygen at all cabin altitudes. Maintain the 100% OXY position on undonnied masks to reduce crew member action in the event of pressurization system failure or smoke in the cabin. 100% OXY must be selected for cabin altitudes above 20,000 feet.
 - b. With NORMAL position (control lever up) selected on the mask regulator, the mask will deliver diluted oxygen. When using oxygen at cabin altitudes below 20,000 feet, the NORMAL position should be selected to conserve oxygen and provide greater oxygen duration times.
 - **Operate 6600214 series masks with Robertshaw regulators as follows:**
 - a. With NORMAL selected on the Pressure Regulator Control and “normal” (100% lever locked up) selected on the Diluter Control, the crew mask will deliver automatic oxygen dilution from S.L. to 30,000 feet cabin altitude. Above 30,000 feet cabin altitude, the mask will provide 100% oxygen and maintain a slight positive pressure.
 - b. To obtain 100% oxygen at any time, depress 100% lever.
 - c. For emergency operation, select EMERGENCY on the Pressure Regulator Control and depress 100% lever on the Diluter Control. With the regulator controls in this position, the crew mask will deliver 100% oxygen and maintain a slight positive pressure for respiratory protection from smoke and fumes.

OXYGEN SYSTEM (CONT)

- **Operate 6600214 series crew masks with Puritan-Bennett regulators as follows:**

- With NORM selected on the Pressure Regulator Control, the crew mask will deliver automatic oxygen dilution from S.L. to 33,000 feet cabin altitude and 100% oxygen above 33,000 feet cabin altitude. Automatic positive pressure breathing is provided above 39,000 feet cabin altitude.
- To obtain 100% oxygen at any time, select 100% on the Pressure Regulator Control.
- For emergency operation, select EMER on the Pressure Regulator Control. With the regulator control in this position, the crew mask will deliver 100% oxygen, maintain a slight positive pressure in the mask cup at all times for respiratory protection from smoke or fumes, and automatic positive pressure breathing above 39,000 feet cabin altitude.

- **Operate Scott ATO masks as follows:**

- To check for oxygen availability to the mask while stowed, depress the PRESS TO TEST button/knob on the bottom of mask pressure regulator — oxygen will flow while button is held.
- To don crew oxygen masks:
 - Remove hats and "ear muff" type headsets.

NOTE

Headsets and eyeglasses worn by crew members may interfere with quick-donning capabilities.

- Squeeze and hold the red handles on the mask pressure regulator together to inflate the pneumatic harness for donning.
- Position harness over the head, position mask as desired, then release red handles.
- Ensure that mask is properly sealed. Reposition mask if required.

NOTE

Beards worn by crew members may make proper sealing of the mask more difficult.

- With the 100% lever extended and the PRESS TO TEST button/knob rotated to the  position, the mask will deliver automatic oxygen dilution from S.L. to 30,000 feet cabin altitude, 100% oxygen above 30,000 feet cabin altitude, and automatic pressure breathing above approximately 37,000 feet cabin altitude.

OXYGEN SYSTEM (CONT)

- d. To obtain 100% oxygen at any time, depress 100% lever on mask pressure regulator.
- e. For emergency operation, select EMERGENCY (rotate PRESS TO TEST button/knob to ●). With the mask pressure regulator controls in this position the crew mask will deliver 100% oxygen at all cabin altitudes and maintain a positive pressure in the mask cup at all times for respiratory protection from smoke or fumes.

BRAKE SYSTEMS

The primary brake system utilizes hydraulic system pressure for power boost and incorporates an anti-skid system to prevent tire skid and/or tire blow-out during landing or aborted takeoff. The brakes are operated by depressing the upper portion of the rudder pedals.

NOTE

Large temperature differences between wheels after landing may indicate improper brake operation.

A parking brake is installed. The parking brake is operated by depressing and holding the toe brakes (hydraulic system pressurized) and then pulling the PARKING BRAKE handle to set the brakes. Some aircraft have a PARK BRAKE light installed on the instrument panel which illuminates whenever the PARKING BRAKE handle is not fully in.

An emergency air braking system is installed to provide emergency braking in the event of a hydraulic system failure. Refer to EMERGENCY PROCEDURES (Section III) for emergency braking procedures.

NORMAL BRAKING

Anti-skid On Operation:

1. ANTI-SKID Switch — On. Check ANTI-SKID GEN lights extinguished.
2. Apply brakes as required. Maximum braking pressures can be maintained when anti-skid is operative.

NOTE

The takeoff and landing distances with anti-skid On, presented in Section V of this manual, are based on full anti-skid braking from first brake application to complete stop.

BRAKE SYSTEMS (CONT)

Anti-skid Off Operation:

When anti-skid is inoperative, care must be used during brake application and stopping distances will be increased. Refer to Section IV for operation of the brake system with anti-skid off, and Section V for increased stopping distances.

EMERGENCY BRAKING

In the event of a normal brake system failure, emergency (pneumatic) brakes can be used to stop the airplane. Refer to Section III for operation of the emergency brake system.

LANDING GEAR WARNING SYSTEM

The landing gear warning horn only will sound under the following conditions:

- Landing gear is not extended.
- Flaps are lowered beyond 25°.



When the horn sounds because the flaps are lowered, the horn cannot be silenced by the mute switches.

The landing gear warning horn will sound and the three red UNSAFE lights will illuminate under the following conditions:

- Landing gear is not extended.
- Altitude is below 14,500 feet.
- Either thrust lever is retarded (below 70% N1).



When the horn sounds under these conditions, the horn can be silenced by moving the TEST-MUTE switch, on the LANDING GEAR control panel, to MUTE or depressing the MUTE button in the right thrust lever handle (if installed). The UNSAFE light indication will continue until either the gear is lowered or one of the above conditions is corrected.

FUEL MANAGEMENT

For flight planning, use only TOTAL pound indication on the fuel quantity gage. **Do not** use separate tank indications for this purpose. The fuel quantity indicating system is set to indicate properly in level flight.

The red LOW FUEL warning light on the glareshield annunciator panel will illuminate when the fuel level in either wing tank is approximately 400-500 pounds.

The amber FUEL XFLO light (if installed) on the glareshield annunciator panel will be illuminated whenever the crossflow valve is open. The crossflow valve will be open during wing to wing transfer, wing to fuselage transfer, or fuselage to wing transfer.

Steady illumination of any of the amber fuel system valve lights on the fuel control panel, except fuel jettison valve lights, indicates the corresponding valves are not in the position selected. Momentary illumination while the corresponding valve is in transit after switching modes indicates proper operation.

On aircraft incorporating SB 35/36-28-11, illumination of the annunciator installed in either STANDBY PUMP switch indicates power is applied to the corresponding standby fuel pump (regardless of switch position). It is normal for the annunciators to illuminate during starter-assisted starts, fuselage tank FILL operations and whenever the STANDBY PUMP switch is ON.

The fuel control panel on the pedestal contains all the necessary switches and indicators to fuel the aircraft and maintain proper fuel management.

INTENTIONALLY LEFT BLANK

FUEL MANAGEMENT (CONT)

NORMAL FUSELAGE FUEL TRANSFER (*Model 35A without FUS VALVE Switch*)**CAUTION**

Do not energize fuselage fuel transfer system when wing and tip tanks are full.

1. FUS TANK XFER-FILL Switch — XFER when tip tank fuel quantity indicates 760 pounds or less in each tank. When XFER is selected, the standby pumps will be de-energized, the crossflow valve will open, the fuselage tank valve will open, and the transfer pump will be energized.

NOTE

- If the crossflow valve fails to open, fuselage fuel cannot be transferred forward to the wing tanks using the transfer pump. However, fuselage fuel will gravity flow into the right wing tank until the heads are equal. A right wing heavy condition will occur.
 - Plan fuel requirements to ensure return to takeoff point or alternate if fuselage tank fails to transfer.
2. FUS TANK XFER-FILL Switch — OFF after EMPTY light comes on.

NORMAL FUSELAGE FUEL TRANSFER (*Model 35A with FUS VALVE Switch and Model 36A*)**CAUTION**

Do not energize fuselage fuel transfer system when wing and tip tanks are full.

1. FUS TANK XFER-FILL Switch — XFER when tip tank fuel quantity indicates 760 pounds or less in each tank (*Model 35A*) or zero fuel in each tank (*Model 36A*). When XFER is selected, the standby pumps will be de-energized, the crossflow valve will open, the fuselage tank valve will open, and the transfer pump will be energized.

NOTE

If the crossflow valve fails to open, fuselage fuel cannot be transferred forward to the wing tanks using the transfer pump. However, fuselage fuel will gravity flow into the left wing until the heads are equal. A left wing heavy condition will occur.

2. FUS TANK XFER-FILL Switch — OFF after EMPTY light comes on.

INTENTIONALLY LEFT BLANK

FUEL MANAGEMENT (CONT)

AUXILIARY FUSELAGE FUEL TRANSFER (*Aircraft with FUS VALVE Switch*)

This procedure may be used to minimize transfer pump operation and may be used **only** if Jet Pumps are operating.

1. STANDBY PUMP Switches — Off.



Activation of standby pumps will override gravity transfer and cause the right transfer and crossflow valves to close.

2. FUS VALVE Switch — OPEN when tip tank fuel quantity indicates 760 pounds or less in each tank. When OPEN is selected the right fuselage transfer valve and the crossflow valve will open. Fuel will gravity flow from the fuselage tank until the wing tank heads are equal.



If the crossflow valve fails to open, a right wing heavy condition will occur.

3. FUS VALVE Switch — CLOSE, when wing fuel quantity starts to decrease or prior to approach.



If the right fuselage transfer valve (FUS VALVE) is allowed to remain open when normal transfer is activated, some fuel will recirculate into the fuselage tank through the right transfer line.

4. FUS TANK XFER-FILL Switch — XFER.
5. FUS TANK XFER-FILL Switch — OFF when EMPTY light comes on.

FUEL MANAGEMENT (CONT)
FUEL CROSSFLOW (WING-TO-WING FUEL TRANSFER)
CAUTION

Do not crossflow with jet pump inoperative. Engine starvation may occur due to fuel being pumped through open crossflow valve into opposite wing.

1. CROSSFLOW Switch — OPEN.
2. STANDBY PUMP Switch (heavy wing) — ON.
3. STANDBY PUMP Switch (light wing) — Off.
4. CROSSFLOW Switch — CLOSE after fuel balance is obtained.
5. STANDBY PUMP Switches — Off.
6. If the preceding procedure fails to balance fuel, unequal power settings may be used to balance fuel load.

REFUELING

The airplane is refueled through filler caps on the tip tanks. Fuel gravity flows from the tip tanks to wing tanks. The wing fuel pumps are used to fill the fuselage tank. Refer to Addendum — FUEL SERVICING for refueling procedures.

To prevent fuel filter icing and possible engine flameout, anti-icing additive must be blended with the fuel in the concentration specified in FUEL LIMITS, Section I.

The electronic fuel computers must be adjusted to the recommended specific gravity position as specified in FUEL LIMITS, Section I. Refer to Addendum — FUEL SERVICING for adjustment procedures

ICE DETECTION

Identification of ice on aircraft surfaces can be accomplished by the following methods:

1. Ice formation on the lower corners of the windshield or nose of the tip tank.
2. During night flights, two red ice detect lights will cause red areas approximately 1-1/2 inches (38.1 mm) in diameter to appear on the windshield when particles of ice or moisture adhere to the windshield. The light on the pilot's side is located in the defog airstream and the copilot's light is located outside the defog airstream; therefore, the copilot must monitor the light on his side when the windshield heat or alcohol de-ice systems are operating. The windshield ice detect lights will indicate ice encounters when OAT is below freezing and moisture encounters when OAT is above freezing. Refer to figure in Section V entitled RAM AIR — OUTSIDE AIR TEMPERATURE CONVERSION for RAT to OAT conversion.
3. Wing and horizontal stabilizer temperature conditions where icing may occur can be identified through the use of the WING TEMP and STAB TEMP indicators. When the indicator pointer is in the green arc, the wing or stabilizer structure is above 35°F (1.7°C) and is warm enough so that ice will not adhere to the surface. When the pointer is in the yellow area the structure is approaching a "too hot" condition. When the pointer is in the red arc, the structure is below 35°F (1.7°C) and indicates the anti-ice system should be used, if flying through visible moisture.
4. A visual inspection may be used to check for ice accumulations on the wing leading edges.

- *On aircraft 35-067 thru 35-415 and aircraft 36-018 thru 36-047, the optional wing inspection light on the right fuselage below the emergency exit may be used to check for ice buildup on the wings during night operations. The wing inspection light, in itself, is inadequate for detecting the presence of ice near the wing tips. The wing inspection light is illuminated by setting the WING INSPECTION switch (pedestal) to ON.*



If the presence of ice on the wing leading edge is suspected during night operations in atmospheric conditions conducive to icing, the normal approach speeds must be increased per the WING HEAT FAILURE LANDING procedure in Section IV — ABNORMAL PROCEDURES.

ICE DETECTION (CONT)

- *On aircraft 35-416 and subsequent and aircraft 36-048 and subsequent, an optional wing inspection light on the right forward fuselage may be used to check for ice buildup on the wings during night operations. The light illuminates a black dot placed on the out-board wing leading edge to enhance visual detection of ice accumulation. The wing inspection light is illuminated by pressing the WING INSP LT switch (copilot's dimmer panel). The light is extinguished when the switch is released.*



If the presence of ice on the wing leading edge is detected, the normal approach speeds must be increased per the WING HEAT FAILURE-LANDING procedure in Section IV — ABNORMAL PROCEDURES.

ANTI-ICE SYSTEMS

Anti-ice systems should be turned on prior to operation in icing conditions. Icing conditions exist when the outside air temperature is 10°C to -40°C and visible moisture in any form is present (such as clouds, rain, snow, sleet, ice crystals, or fog with visibility of 1 mile or less.)

If icing conditions are encountered and the anti-ice systems have not been energized, turn them on prior to significant ice accumulation. Observe recommendations for normal use of all anti-ice systems.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can also cause angle-of-attack indicator information to be unreliable.

Minimize the duration of icing encounters as much as practical. Minimize holding in icing conditions with flaps extended. This includes requesting an altitude above or below icing conditions, if practical.

Intermittently operating with the autopilot off will allow more readily detectable changes in flight control feel.

If flight has been conducted in icing conditions, remove any accumulated ice prior to next flight.

In the event of significant ice accumulation or failure of any portion of the anti-ice system, refer to INADVERTENT ICING ENCOUNTER and/or appropriate Anti-Ice System Failure procedures in Section IV.

When using anti-ice systems at high altitude, the cabin altitude may exceed 8000 feet unless engine speed is increased to compensate for the additional bleed air extraction.

Aircraft anti-icing is accomplished through the use of electrically heated anti-ice systems, engine bleed-air heated anti-ice systems, and alcohol anti-ice systems. Electrically heated systems include static ports, pitot tubes, engine inlet air-temperature and pressure sensor, and stall warning vanes. Engine bleed air is utilized to heat the wing leading edge, horizontal stabilizer leading edge, windshield and engine anti-icing. An alcohol anti-ice system is installed for radome anti-ice and as a back-up for windshield bleed air anti-ice system.

NOTE

In icing conditions above approximately 12,000 feet, ice buildup may occur at the junction of the wings and tip tanks. Satisfactory handling qualities have been demonstrated with this ice accumulation. Below approximately 12,000 feet, using normal descent procedures, all wing leading edge ice will be removed.

ANTI-ICE SYSTEMS (CONT)

On aircraft incorporating AAK 86-1 or SB 35/36-21-17, a combination of bleed air (heated with a supplemental electric heater) and air conditioned air provides defogging of the windshield interior in addition to the normal defogging provided by cabin airflow.

Systems controls and control functions are as follows:

1. STAB WING HEAT Switch — Controls wing and horizontal stabilizer heat systems (bleed air).
2. NAC HEAT Switches — Control engine anti-icing (bleed air) and engine inlet air temperature/pressure sensor electric heaters. On aircraft 35-067 thru 35-244 and 36-018 thru 36-044 not incorporating AAK 79-4, the engine spinner anti-ice is also activated.
3. PITOT HEAT Switches — Energize pitot tube, stall warning vane heaters, and total temperature probe (if installed) heaters.
4. WSHLD & RADOME — RADOME or RAD Switch — Controls windshield and radome alcohol anti-ice system.
5. • On aircraft 35-067 thru 35-112 except 35-107, 36-018 thru 36-031, WSHLD HEAT Switches and IN NORMAL OUT DEFOG Knob — Control bleed air to the windshield for defog, anti-ice and rain removal.
• On aircraft 35-107, 35-113 & subsequent and 36-032 & subsequent, WSHLD HT ON-HOLD-OFF Switch — Controls bleed air to the windshield for defog, anti-ice and rain removal.
6. On aircraft incorporating AAK 86-1 or SB 35/36-21-17, W/S AUX DEFOG HEAT - CKPT Switch — Controls the supplemental electric heater and Freon cooling system for additional windshield defogging.
7. Static port heaters and red ice detect lights are energized whenever the battery switches are On.

ANTI-ICE SYSTEMS (CONT)

EXTERIOR WINDSHIELD DEFOG, ANTI-ICE, AND RAIN REMOVAL

- *Aircraft 35-067 thru 35-112 except 35-107 not incorporating AMK 91-2. Aircraft 36-018 thru 36-031 not incorporating AMK 91-2.*

AUTOMATIC OPERATION

1. IN NORMAL OUT DEFOG Knob — Pull out.
2. WSHLD HEAT AUTO-MAN Switch — AUTO. The green WSHLD HEAT light will come on when the control valve begins to open. The valve will go to full open. If the red WSHLD OV HT light comes on, the airflow will automatically stop until the windshield has cooled sufficiently, then resume.
3. Automatic operation is recommended when constant use of the system is required.
4. To de-energize the system:
 - a. AUTO-MAN Switch — MAN.
 - b. ON-OFF Switch — Hold to OFF until the airflow stops.

NOTE

If the system continually cycles to the WSHLD OV HT mode after prolonged use, it can be prevented by switching the AUTO-MAN switch to MAN and holding the ON-OFF switch to OFF for reduced defog flow.

MANUAL OPERATION

1. IN NORMAL OUT DEFOG Knob — Pull out.
2. WSHLD HEAT AUTO-MAN Switch — MAN.
3. WSHLD HEAT ON-OFF Switch — Hold ON until the desired amount of airflow is obtained. As the valve opens, the green WSHLD HT light will illuminate and the defog flow will remain at the level it is when the ON-OFF switch is released. If the red WSHLD OV HT light comes on, the airflow will automatically stop until the windshield has cooled sufficiently, then resume.

NOTE

If the system continually cycles to the WSHLD OV HT mode after prolonged use, windshield airflow may be decreased by holding the WSHLD HT ON-OFF switch to OFF until desired airflow is reached and then releasing switch.

IF AIRFLOW SHOULD FAIL

The pilot's windshield may be anti-iced by the following:

1. WSHLD & RADOME/RADOME Switch — WSHLD & RADOME. This will anti-ice the radome and the pilot's windshield and give alcohol flow for approximately 45 minutes. The amber ALC AI light will come on when alcohol is depleted.
2. WSHLD & RADOME/RADOME Switch — OFF when ALC AI light illuminates or clear of icing conditions.

ANTI-ICE SYSTEMS (CONT)

- *Aircraft 35-067 thru 35-112 except 35-107 incorporating AMK 91-2. Aircraft 36-018 thru 36-031 incorporating AMK 91-2.*

AUTOMATIC OPERATION

1. IN NORMAL OUT DEFOG Knob — Pull out.
2. WSHLD HEAT AUTO-MAN Switch — AUTO. The green WSHLD HEAT light will illuminate.



The overheat shutoff valve may cycle to prevent overheating of the windshield. When the overheat shutoff valve cycles closed, the green WSHLD HEAT light will extinguish. The system will automatically reset (green WSHLD HEAT light will illuminate) after the system cools.

3. Automatic operation is recommended when constant use of the system is required.
4. To reduce flow in the event of excessive noise or system cycling:
 - a. AUTO-MAN Switch — MAN.
 - b. ON-OFF Switch — Hold to OFF until flow is acceptable. Flow will remain at the level it is when the ON-OFF switch is released.

MANUAL OPERATION

1. IN NORMAL OUT DEFOG Knob — Pull out.
2. WSHLD HEAT AUTO-MAN Switch — MAN.
3. WSHLD HEAT ON-OFF Switch — Hold ON (green WSHLD HEAT light will illuminate) until the desired amount of airflow is obtained. Flow will remain at the level it is when the ON-OFF switch is released.

IF WSHLD OV HT LIGHT ILLUMINATES

1. AUTO-MAN Switch — MAN.
2. ON-OFF Switch — Hold to OFF until WSHLD OV HT light extinguishes. Flow will remain at the level it is when the ON-OFF switch is released.

TO DEACTIVATE THE SYSTEM

1. AUTO-MAN Switch — MAN.
2. ON-OFF Switch — Hold to OFF until flow stops.

ANTI-ICE SYSTEMS (CONT)

IF AIRFLOW SHOULD FAIL

The pilot's windshield may be anti-iced by the following:

1. WSHLD & RADOME/RADOME Switch — WSHLD & RADOME.
This will anti-ice the radome and the pilot's windshield and give alcohol flow for approximately 45 minutes. The ALC AI light will come on when alcohol is depleted.
2. WSHLD & RADOME/RADOME Switch — OFF when ALC AI light illuminates or clear of icing conditions.

- ***Aircraft 35-107, 35-113 & Subsequent not incorporating AMK 91-2. Aircraft 36-032 & Subsequent not incorporating AMK 91-2.***

The WSHLD HT switch has three positions labeled ON, HOLD, OFF. In the OFF position, no windshield airflow is available. In the ON position, the control valve is fully open allowing maximum airflow to the windshield. The HOLD position is used to stop the control valve in any position between fully closed and fully open. If a change in airflow is desired, set switch to OFF or ON until desired airflow is obtained then set switch to HOLD.

TO ACTIVATE THE SYSTEM

1. WSHLD HT Switch — ON. The green WSHLD HT light will come on when the control valve begins to open. If the red WSHLD OV HT light comes on, the overheat shutoff valve will automatically close until the windshield has cooled, then open again.
2. To reduce flow in the event of excessive noise or system cycling: WSHLD HT Switch — OFF, until flow is acceptable, then HOLD.

TO DEACTIVATE THE SYSTEM:

1. WSHLD HT Switch — OFF.

IF AIRFLOW SHOULD FAIL

The pilot's windshield may be anti-iced by the following:

1. WSHLD/RADOME-RAD Switch — WSHLD/RADOME. This will anti-ice the radome and pilot's windshield and give alcohol flow for approximately 45 minutes. The amber ALC AI light will illuminate when alcohol level is low.
2. WSHLD/RADOME-RAD Switch — OFF when alcohol is depleted or clear of icing conditions.

ANTI-ICE SYSTEMS (CONT)

- **Aircraft 35-107, 35-113 & Subsequent incorporating AMK 91-2. Aircraft 36-032 & Subsequent incorporating AMK 91-2.**

The WSHLD HT switch has three positions labeled ON, HOLD, OFF. In the OFF position, no windshield airflow is available. In the ON position, the control valve is fully open allowing maximum airflow to the windshield. The HOLD position is used to stop the control valve in any position between fully closed and fully open. If a change in airflow is desired, set switch to OFF or ON until desired airflow is obtained then set switch to HOLD. Illumination of the red WSHLD OV HT light indicates a windshield heat system failure.

TO ACTIVATE THE SYSTEM:

1. WSHLD HT Switch — ON. The green WSHLD HT light will illuminate.



The overheat shutoff valve may cycle to prevent overheating of the windshield. When the overheat shutoff valve cycles closed, the green WSHLD HT light will extinguish. The system will automatically reset (green WSHLD HT light will illuminate) after the system cools.

2. To reduce flow in the event of excessive noise or system cycling: WSHLD HT Switch — OFF until flow is acceptable, then HOLD.

IF WSHLD OV HT LIGHT ILLUMINATES:

1. WSHLD HT Switch — OFF until red WSHLD OV HT light extinguishes, then HOLD.

TO DEACTIVATE THE SYSTEM:

1. WSHLD HT Switch — OFF.

IF AIRFLOW SHOULD FAIL

The pilot's windshield may be anti-iced by the following:

1. WSHLD/RADOME-RAD Switch — WSHLD/RADOME. This will anti-ice the radome and pilot's windshield and give alcohol flow for approximately 45 minutes. The amber ALC AI light will illuminate when alcohol level is low.
2. WSHLD/RADOME-RAD Switch — OFF when alcohol is depleted or clear of icing conditions.

ANTI-ICE SYSTEMS (CONT)

INTERIOR WINDSHIELD AND PASSENGER WINDOW DEFOG

The windshield interior and passenger windows are normally defogged by normal cabin airflow. On aircraft incorporating AAK 86-1 or SB 35/36-21-17, additional windshield defogging is provided by the windshield auxiliary defog heat system.

TO PROVIDE ADDITIONAL WINDSHIELD DEFOGGING (Aircraft incorporating AAK 86-1 or SB 35/36-21-17):

1. W/S AUX DEFOG HEAT Switch — DEFOG HEAT. This adds additional heat to the cabin air normally used to defog the windshield and activates the freon cooling system (below 18,000 feet) to dehumidify the cabin air.

NOTE

With COOL-FAN switch in OFF position, the cool air from the freon system is diverted between the cabin headliner and the fuselage skin to prevent lowering the cabin temperature.

2. If operation of the freon cooling system is not desired, W/S AUX DEFOG HEAT Switch — CKPT.

NOTE

Power for the windshield auxiliary defog heat system must be supplied by an engine generator or GPU.

FOR MAXIMUM WINDSHIELD DEFOGGING (Aircraft incorporating AAK 86-1 or SB 35/36-21-17):

1. Approximately 15 minutes prior to descent, W/S AUX DEFOG HEAT Switch — DEFOG HEAT.
2. At start of descent:
 - a. Cockpit Shoulder and Ankle Eyeball Outlets — Close.
 - b. Windshield Heat — On.
3. On aircraft incorporating FCN 89-1, at FL350:
 - a. COOL-FAN Switch — COOL.

NOTE

Switching the cabin blower switch (on the blower duct in the aft cabin) to OFF will divert airflow from the evaporator for passenger comfort.

- b. Cockpit Air Control — Low.
4. Leave Cabin Air, Windshield Auxiliary Defog Heat and Windshield Heat on until shutdown.

ANTI-ICE SYSTEMS (CONT)**RADOME ANTI-ICE**

- ***Aircraft 35-067 thru 35-112 except 35-107. Aircraft 36-018 thru 36-031.***

Anti-icing the radome prevents ice from shedding off the nose and entering the engines. Anti-icing the radome is accomplished by setting the WSHLD & RADOME/RADOME switch to RADOME. Alcohol for radome anti-icing only will last for approximately 1-1/2 hours. The ALC AI light will illuminate when alcohol is depleted. Set WSHLD & RADOME/RADOME switch OFF when ALC AI light illuminates or clear of icing conditions.



Use WSHLD & RADOME position of the switch if bleed airflow for windshield anti-ice has failed, or as needed.

- ***Aircraft 35-107, 35-113 and subsequent. Aircraft 36-032 and subsequent.***

Anti-icing the radome prevents ice from shedding off the nose and entering the engines. Anti-icing the radome is accomplished by setting the WSHLD/RADOME/RAD switch to RAD. Alcohol for radome anti-icing only will last for approximately 2 hours 9 minutes. The ALC AI light will illuminate when alcohol level is low. Set WSHLD/RADOME/RAD switch OFF when alcohol is depleted or clear of icing conditions.



Use WSHLD/RADOME position of the switch if bleed air for the windshield anti-ice has failed or as needed.

WING AND HORIZONTAL STABILIZER ANTI-ICE

Wing and horizontal stabilizer anti-ice systems utilize engine bleed air directed through diffuser tubes in the leading edges for anti-icing.

1. STAB WING HEAT Switch — ON.
2. Monitor WING TEMP and STAB TEMP Indicators and WING OV HT and STAB OV HT lights. Maintain the indicators in the green range. Adjust power as necessary to maintain anti-icing and pressurization. If indicators progress to the yellow range, structure is approaching "too hot" condition. Corrective action can be taken by turning the STAB WING HEAT switch OFF and/or reducing engine RPM until indicators are back into the green range.



If the system is on and the WING TEMP or STAB TEMP indicator is in the red range, a system failure is indicated.

ANTI-ICE SYSTEMS (CONT)

NACELLE HEAT

The NAC HEAT switches energize both nacelle heat and engine inlet air pressure and temperature sensor heat. If installed, the NAC HEAT ON light or optional L or R NAC HEAT lights will illuminate anytime a NAC HEAT switch is set On. *On aircraft 35-067 thru 35-244 and 36-018 thru 36-044 not incorporating AAK 79-4, the NAC HEAT switches also energize engine anti-ice.*

CAUTION

To prevent damage to the engine inlet sensor heating element, nacelle heat operation should be limited to 30 seconds if the engine is not running.

NOTE

- Illumination of the L or R ENG ICE lights with the NAC HEAT switches On indicates that bleed air pressure is not being applied to the nacelle heat anti-ice system due to a malfunction.
- Illumination of the L or R ENG ICE lights with the NAC HEAT switches OFF indicates that bleed air pressure is being applied to the nacelle heat system due to a malfunction.

ANTI-ICE SYSTEMS (CONT)**PITOT HEAT**

Anti-ice protection for pitot head, stall warning vanes, total temperature probe heater (if installed) is accomplished by setting the L and R PITOT HEAT switches On.

PITOT HEAT MONITOR (If installed)

A dual pitot heat monitor system may be installed to provide the crew with a means of determining if sufficient current is being applied to the pitot head heating elements.

- *On aircraft equipped with Single PITOT HEAT light*, with the BAT and PITOT HEAT switches On, illumination of the PITOT HEAT light indicates insufficient current is being applied to a pitot head heating element. A failure in either system will cause the light to illuminate. The light will also illuminate whenever the BAT switches are On and either PITOT HEAT switch is OFF.
- *On aircraft equipped with L & R PITOT HEAT lights*, a failure in a pitot head heating system will illuminate the applicable light. The applicable light will also illuminate whenever the BAT switches are On and the corresponding PITOT HEAT switch is OFF.

STATIC PORT HEAT

Heating elements for static ports are energized whenever the BAT switches are On. Therefore, no management by the crew is required.

AUDIO CONTROL SYSTEM PANEL

The audio control system panels provide a means of controlling communications and/or navigation audio information being received or transmitted. The panel also controls audio communication within the cabin.

SWITCH FUNCTION

VOLUME CONTROLS

1. **MASTER VOL** — This control regulates the volume level of all audio input except sidetone audio, PASS SPKR audio, aural warning signals, and microphone or headphone audio when the SPKR/PHONE-PH-EMER switch is in the EMER position.
2. **PASS SPKR VOL** — This control regulates the volume level of the ADF in the cockpit speaker when the ADF switch is in the PASS position and the PASS SPKR-VOL ADJ-OFF switch is in the OFF or VOL ADJ position. The control also regulates the volume level of the ADF in the passenger speakers when the PASS SPKR switch is in the PASS SPKR position. Additionally, the control regulates passenger speaker volume while addressing passengers when the Mic Function Selector is in the PASS SPKR position. This control does not affect headphone, aural warning, or microphone audio when the microphone is being used in VHF 1 or 2, HF, or INPH on the Mic Function Selector.
3. **Sidetone** — Two small holes are provided on the front of the Audio Control Panel (Figure 2-4) for insertion of a screwdriver to adjust speaker and phone sidetone levels. Sidetone adjustments should be made to a comfortable level without acoustical feedback with the engines running. It is suggested that sidetone level be adjusted using VHF 1. This will simultaneously adjust sidetone for VHF 2, HF (if applicable), and INPH.



The MASTER VOL and PASS SPKR VOL adjustments have no effect on sidetone volume.

4. **Aural Warning Volume** — Two small holes are provided on the front of the Audio Control Panel (Figure 2-4) for insertion of a screwdriver to adjust speaker and phone aural warning volume. Aural warning volume adjustments should be made with the engines running.

AUDIO CONTROL SYSTEM PANEL (CONT)**SPKR/PHONE-PH-EMER SWITCH**

1. **SPKR/PHONE Position** — When the switch is in this position and any mixer switch is on, audio is fed to the headphones and cockpit speaker.
2. **PH Position** — When the switch is in this position and any mixer switch is on, audio is fed to the headphones only.
3. **EMER Position** — When the switch is in this position, audio is fed directly into the headphones, bypassing all AUDIO CONTROL Panel amplifiers.

MIXER SWITCHES

Ten mixer switches on the audio control panel are labeled and perform the following functions:

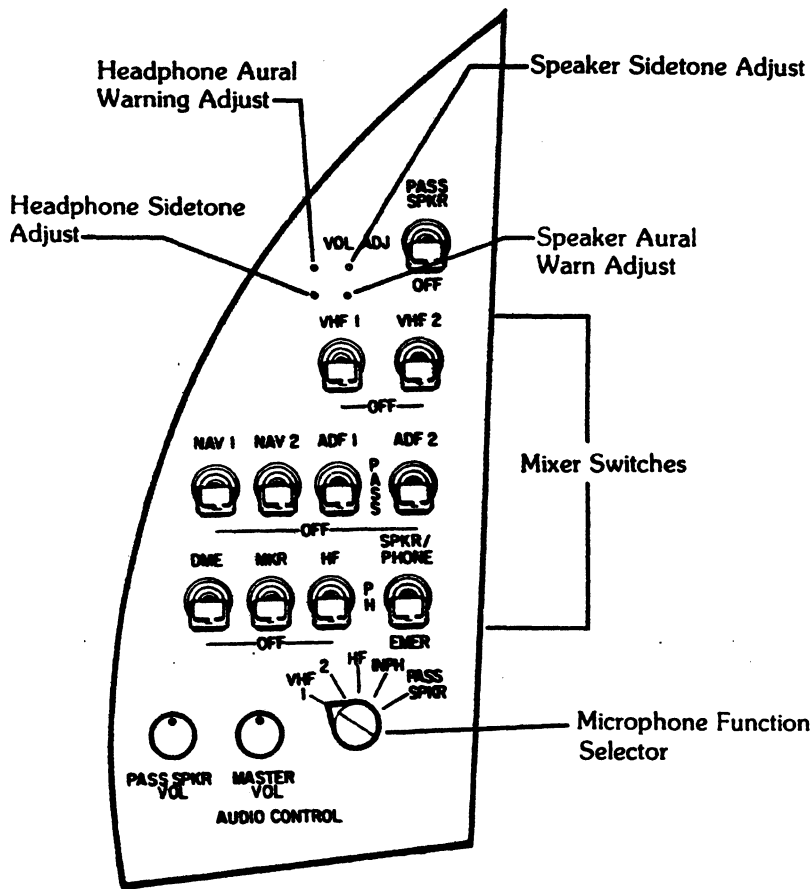
1. **VHF 1 and VHF 2 Switches** — When in the On (up) position, provide audio from the VHF 1 and VHF 2 transceivers respectively.
2. **NAV 1 and NAV 2 Switches** — When in the On (up) position, provide audio from the NAV 1 and NAV 2 receivers respectively.
3. **ADF 1 and ADF 2 Switches** — These are three position switches. The PASS (center) position provides audio to the passenger speaker when the PASS SPKR-VOL ADJ OFF switch is in the PASS SPKR position. The up position provides headphone and cockpit speaker audio only. When in the up position, these switches provide audio from the ADF 1 and ADF 2 receivers respectively. The up position is the normal mixer function.
4. **DME Switch** — When in the On (up) position, provides audio identification signals from the DME receiver.



On aircraft equipped with dual DME, the number 1 DME audio will be provided by the pilot's Audio Control Panel and the number 2 DME audio will be provided by the copilot's Audio Control Panel.

5. **MKR Switch** — When in the On (up) position, provides "marker" audio from the marker beacon receiver.
6. **HF Switch** — When in the On (up) position, provides audio from HF transceiver (if installed).

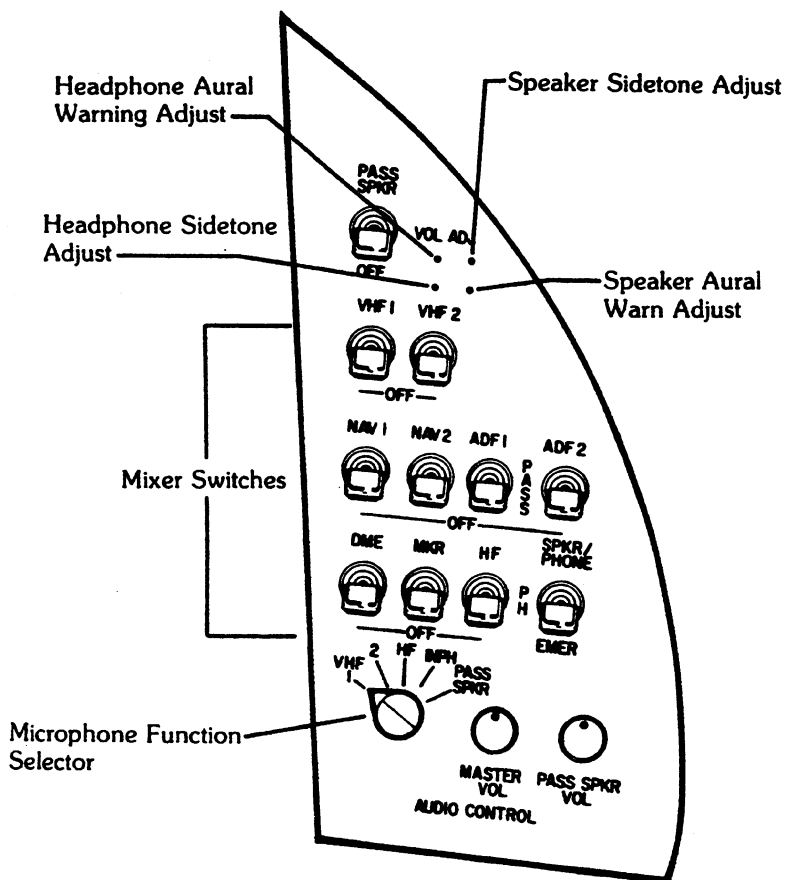
AUDIO CONTROL SYSTEM PANEL (CONT)



PILOT'S AUDIO CONTROL PANEL

Figure 2-4 (Sheet 1 of 2)

AUDIO CONTROL SYSTEM PANEL (CONT)



COPILOT'S AUDIO CONTROL PANEL

Figure 2-4 (Sheet 2 of 2)

AUDIO CONTROL SYSTEM PANEL (CONT)

7. **PASS SPKR-VOL ADJ-OFF Switch** — This is a three position switch and is used only when an ADF switch is set to PASS position; otherwise the switch should be in the OFF position.
 - a. **VOL ADJ** position is used to monitor ADF audio over the cockpit speaker for adjustment with the PASS SPKR VOL control.
 - b. **PASS SPKR** position transfers ADF audio from the cockpit speaker to passenger speaker and mutes ADF "mixer" audio to the cockpit speaker.

MICROPHONE FUNCTION SELECTOR

The Microphone Function Selector is a five-position rotary-type switch and is labeled VHF 1 and 2, HF, INPH, and PASS SPKR. This switch provides the proper microphone audio inputs for the five functions.

1. **VHF 1, VHF 2, and HF Positions** — When any of these positions are selected, microphone inputs are provided for the respective transceiver.
2. **INPH Position** — When this position is selected on one AUDIO CONTROL Panel, interphone is provided. If the opposite Microphone Function Selector is in the VHF 1 or 2, HF, or INPH position, audio will be provided to the opposite speaker and headphones. If the opposite Microphone Function Selector is in the PASS SPKR position, headphone audio only will be provided.
3. **PASS SPKR Position** — When this position is selected, the pilot or copilot, utilizing this function, may speak to the passengers through the passenger speaker. If ADF is being transmitted through the passenger speaker, it will automatically be disconnected when the Microphone Function Selector is in the PASS SPKR position. When the passenger speaker is in use, aural warning is automatically transferred to the cockpit speaker and not transmitted to the passengers.

AUDIO CONTROL SYSTEM PANEL (CONT)**FLIGHT OPERATION**

1. MASTER VOL and PASS SPKR VOL Controls — Rotate to a comfortable listening level.
2. Applicable Mixer Switches — Set “on” (except PASS ADF) and adjust audio gain controls on each system for comfortable volume level.

NOTE

The VHF 1 and VHF 2 volume controls do not affect sidetone levels. The HF volume control will affect the sidetone level on most models since audio and sidetone utilize a common line from the transceivers. Some HF transceivers do not have sidetone capabilities.

3. Microphone Function Selector — Rotate to desired position.
4. To provide ADF audio to the PASS SPKR:
 - a. ADF 1 or ADF 2 (if installed) Mixer Switch — Set to PASS position.
 - b. PASS SPKR-VOL ADJ Switch — Set to VOL ADJ.
 - c. PASS SPKR VOL Control — Rotate to approximate “mid” position.
 - d. Tune in desired station on ADF receiver and adjust cockpit speaker volume utilizing ADF system volume control.
 - e. PASS SPKR-VOL ADJ Switch — Set to PASS SPKR. ADF audio will be transferred to passenger speakers.
 - f. Adjust passenger speaker volume with PASS SPKR VOL control or ADF system volume control. The audio mixer inputs and microphone can be used in the normal manner but received audio will be through speaker and headphones.

EMERGENCY LIGHTING SYSTEM (IF INSTALLED) Aircraft 35-067 thru 35-415 and aircraft 36-018 thru 36-047

The emergency lighting system consists of two batteries, a wing inspection light, a door light, upper center panel lights, and three system switches. The system provides cabin lighting in the event of a failure of the normal electrical system and lighting for passenger egress through the emergency exit or cabin door. Switch function is as follows:

WING INSPECTION LIGHT

When the WING INSPECTION switch is set to ON, the wing inspection light on the right side of the fuselage below the emergency exit will illuminate. This light may be used to visually inspect the wing for ice accumulation or for illumination during passenger egress through the emergency exit.

EMER LT TEST-ARM-DISARM SWITCH

The EMER LT TEST-ARM-DISARM switch provides the test function for the system and for automatic illumination of the emergency lights in the event of an interruption of normal electrical power. For operation of the emergency lighting system, at least one aircraft battery switch must be in the On position prior to activating any of the EMER LT TEST-ARM-DISARM switch functions. Setting the switch to TEST simulates a power failure of the normal electrical system and illuminates the wing inspection light, door light, and upper center panel lights. Setting the switch to ARM will arm the system to illuminate the emergency lights in the event of a power failure of the normal electrical system. Setting the switch to DISARM isolates the emergency lights from the emergency power supply.

The switch should be set to ARM prior to takeoff. When the switch is in the DISARM position and the aircraft battery switches are On, an amber light adjacent to the switch will illuminate to indicate the switch should be set to ARM.

For normal operations, after landing, the switch must be set to DISARM prior to setting battery switches OFF.

EMER LTS-NORM SWITCH

The EMER LTS-NORM switch provides for manual illumination of the emergency lights. When the switch is set to EMER LTS, the wing inspection, cabin door, and upper center panel lights will illuminate. For normal operation, the switch should be set to NORM. Setting the switch to NORM does not hinder automatic illumination in the event of a power interruption of the normal electrical system.

**EMERGENCY LIGHTING SYSTEM (IF INSTALLED) Air-
craft 35-416 & subsequent and aircraft 36-048 & subsequent**

The emergency lighting system consists of two batteries, an emergency exit light, a door light, upper center panel lights, and two system switches. The system provides cabin lighting in the event of a failure of the normal electrical system and lighting for passenger egress through the emergency exit or cabin door. Switch function is as follows:

EMER LT TEST-ARM-DISARM SWITCH

The EMER LT TEST-ARM-DISARM switch (pedestal) provides the test function for the system and for automatic illumination of the emergency lights in the event of an interruption of normal electrical power. For operation of the emergency lighting system, at least one aircraft battery switch must be in the On position prior to activating any of the EMER LT TEST- ARM-DIS-ARM switch functions. Setting the switch to TEST simulates a power failure of the normal electrical system and illuminates the emergency exit light, door light, and upper center panel lights. Setting the switch to ARM will arm the system to illuminate the emergency lights in the event of a power failure of the normal electrical system. Setting the switch to DISARM isolates the emergency lights from the emergency power supply.

The switch should be set to ARM prior to takeoff. If the switch is in the DIS-ARM position and the BATTERY switches are ON an amber light adjacent to the switch will illuminate to indicate the switch should be set to ARM.

For normal operations, after landing, the switch must be set to DISARM prior to setting battery switches OFF.

EMER LTS-NORM SWITCH

The EMER LTS-NORM switch (LH service cabinet) provides for manual illumination of the emergency lights. When the switch is set to EMER LTS, the emergency exit, cabin door, and upper center panel lights will illuminate. For normal operation, the switch should be set to NORM. Setting the switch to NORM does not hinder automatic illumination in the event of a power interruption of the normal electrical system.

ANNUNCIATOR PANEL

The annunciator panel lights may be tested by pressing the test switch under the glareshield which causes the lights to illuminate. Photoelectric cells, outboard of each FIRE PULL or ENG FIRE PULL T-Handle, automatically dim the lights to a level corresponding to existing light in the cockpit or to a minimum preset level for a totally dark cockpit. If an annunciator light illuminates and the condition is corrected, the light will extinguish. If the condition recurs, the light will again illuminate. Any time a red annunciator light illuminates, the MSTR WARN lights on the pilot's and copilot's instrument panel will also illuminate and flash. Depressing the MSTR WARN light will extinguish the MSTR WARN light, however, the annunciator light will remain on as long as the condition exists.

NOTE

For aircraft serials 35-067 thru 35-431 and 36-018 thru 36-049, the MSTR WARN light may not be resettable if:

1. SPOILER light is flashing.
2. Either FIRE PULL or ENG FIRE PULL T-Handle light is flashing.
3. L or R STALL light is flashing.

ENGINE SYNCHRONIZER

The engine synchronizer consists of the R ENG indicator, two ENG SYNC switches below the thrust levers, an amber ENG SYNC light on the glareshield annunciator panel, and an engine synchronizer control box. During flight, the engine synchronizer, if selected, will maintain the right engine Fan Speed (N1) or Turbine Speed (N2) in sync with left engine Fan Speed (N1) or Turbine Speed (N2). The engine synchronizer must not be used during takeoff, landing or during single-engine operations.

The amber ENG SYNC light will be illuminated whenever the nose gear is down and the ENG SYNC SYNC-OFF switch is in the SYNC position.

The R ENG indicator provides an indication of right engine synchronization with left engine Fan (N1) or Turbine (N2) speed. The indicator indicates fan sync when the ENG SYNC selector switch is in the FAN position and turbine sync when the selector switch is in the TURB position. The indicator can be used to manually synchronize the engine or to monitor operation of the automatic synchronizer. The indicator is operative whenever the right fuel computer is On and operative.

Automatic engine synchronization can be utilized whenever both fuel computers are On and operating and the ENG SYNC SYNC-OFF switch is set to SYNC. Since the engine synchronizer authority is limited, the operator should manually synchronize the desired parameter (N1 or N2) within approximately 2.5% before selecting SYNC.



The engine synchronizer also provides electrical filtering to prevent HF radio transmission interference with the engine fuel computers.

SECTION III — EMERGENCY PROCEDURES**TABLE OF CONTENTS****Electrical**

Complete AC Power Failure — Loss of all Inverters	3-1
Battery Overheat	3-2
Current Limiter Failure/Illumination of CUR LIM (CUR LIMITER) Light in Flight	3-3
DC Power Loss — Essential Bus Aircraft 35-067 thru 35-201, 35-205, and Aircraft 36-018 thru 36-040 except when these Aircraft Incorporate AMK 78-13	3-4
Aircraft 35-202 thru 35-204, 35-206 & Subsequent, Aircraft 36-041 & Subsequent, and Prior Aircraft Incorporating AMK 78-13	3-6
Dual Generator Failure	3-8

Engine

Engine Failure	3-11
Engine Fire — Shutdown	3-14
Engine Airstarts	3-15
Relight Envelope (Figure 3-3)	3-16
Starter-Assist Airstart (Fuel Computer On)	3-17
Windmilling Airstart (Fuel Computer On)	3-20
Starter-Assist Airstart (Fuel Computer Off)	3-22
Windmilling Airstart (Fuel Computer Off)	3-26
Oil Pressure Light Illuminated	3-27

Environmental/Doors

BLEED AIR Light Illuminated	3-28
Cabin Altitude Warning Horn Activates or Cabin Altitude Exceeds 10000 Feet (Emergency Descent)	3-29
DOOR Light Illuminated	3-30

Fire

Cabin/Cockpit Fire, Smoke, or Fumes	3-31
---	------

Flight Controls

Control System Jam	3-35
Aileron Jam	3-35
Elevator Jam	3-35
Rudder Jam	3-36

TABLE OF CONTENTS (Cont)

Overspeed Recovery — Overspeed Warning Horn Activates	3-37
Pitch Axis Malfunction	3-38
Roll or Yaw Axis Malfunction	3-41

Fuel

FUEL PRESS Light Illuminated	3-42
------------------------------------	------

Landings

Ditching.....	3-43
Emergency Braking	3-45
Emergency Evacuation	3-45
Landing — Both Engines Inoperative	3-46

Stall Warning Activates	3-47
--------------------------------------	------

Takeoff

Aborted Takeoff	3-48
-----------------------	------

INTRODUCTION TO EMERGENCY PROCEDURES

The procedures in this section of the manual have been developed by Learjet Inc. for certification of this aircraft. This section contains those operating procedures requiring the use of special systems and/or regular systems in order to protect the occupants and the aircraft from harm during a critical situation requiring immediate response. Procedures or parts of procedures in this section emphasized by enclosure in a box such as this  should be accomplished without reference to this manual.

The procedures located in this section supplement Normal Procedures when an emergency condition exists. Use of Normal Procedures should be continued when applicable. Sound judgement, as well as thorough knowledge of the aircraft, its characteristics, and the flight manual procedures are essential in the handling of any emergency situation.

OVERRIDING CONSIDERATIONS

In all emergencies, the overriding consideration must be to:

- Maintain Airplane Control
- Analyze the Situation
- Take Proper Action

TERMINOLOGY

Many emergencies require some urgency in landing the aircraft. The degree of urgency required varies with the emergency; therefore, the terms "land as soon as possible" and "land as soon as practical" are employed. These terms are defined as follows:

Land as soon as possible — A landing should be accomplished at the nearest suitable airfield considering the severity of the emergency, weather conditions, field facilities, ambient lighting, and aircraft gross weight.

Land as soon as practical — Emergency conditions are less urgent, and although the mission is to be terminated, the degree of the emergency is such that an immediate landing at the nearest adequate airfield may not be necessary.

COMPLETE AC POWER FAILURE — LOSS OF ALL INVERTERS

1. Maintain aircraft control by reference to the emergency attitude gyro.
2. Avoid flight in instrument weather conditions.
3. AC BUS TIE Circuit Breaker (copilot's panel) — Pull, if not open.
4. INV (main power bus) and AC BUS (ac bus) Circuit Breakers — Reset, if open.
5. Reduce AC load.
6. INVERTER Switches — OFF, then On.

If AC power is not regained:

7. INV Circuit Breakers — Pull and reset.
8. If AC power is not regained, the following partial list of equipment will **not** be usable:
 - a. Vertical and directional gyros.
 - b. Autopilot and yaw dampers.
 - c. Mach Trim System.
 - d. Avionics displays.
 - e. Electrical servoed altimeter(s).
 - f. Engine oil pressure indicators.
 - g. Spoilerons.
 - h. Spoilers (inoperative in flight only).

NOTE

Spoilers will operate normally on ground.

- i. Nose wheel steering.
9. Mach Trim will be inoperative. **Do not exceed MMO (0.74 M₁).**
10. Maintaining not less than 250 KIAS until approach will improve stability.

BATTERY OVERHEAT

(Aircraft with Nickel-Cadmium Batteries)



If either BAT 140 or BAT 160 light illuminates during flight, both batteries must be checked per Chapter 12 of the Maintenance Manual after landing.

BAT 140 LIGHT ILLUMINATED

1. BAT TEMP Indicator — Monitor to determine affected battery.
2. Affected Battery Switch — OFF.
3. Land as soon as practical.

BAT 160 LIGHT ILLUMINATED

1. BAT TEMP Indicator — Monitor to determine affected battery.
2. Affected Battery Switch — OFF.
3. Land as soon as possible.

**CURRENT LIMITER FAILURE/ILLUMINATION OF CUR
LIM (CUR LIMITER) LIGHT IN FLIGHT**

A battery charging bus current limiter (275-amp) failure is evidenced by illumination of the red CUR LIM light (*aircraft 35-370, 35-390 and subsequent and aircraft 36-048 and subsequent*) or amber L CUR LIMITER or R CUR LIMITER light (*aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047 incorporating AMK 80-17 or AAK 81-1*), or failure to successfully complete the battery charging bus current limiter check after a starter-assist airstart. Should a battery charging bus current limiter fail:

1. DC Voltmeter — Check. Failure of both 275-amp current limiters is indicated when the DC voltmeter indicates battery voltage (25 volts or less).
2. • **If one 275-amp current limiter has failed:**
 - a. Electrical Load — Reduce if required to observe generator limits.
 - b. Continue flight but monitor electrical loads.
- **If both 275-amp current limiters have failed — Aircraft not incorporating AMK 85-1:**
 - a. Electrical Load — Reduce.

NOTE

Electrical power to the essential buses is being supplied by the ship's batteries. All nonessential equipment should be turned off or circuit breakers pulled. Fully charged batteries should power the minimum electrical equipment for night instrument flight for approximately 30 minutes.

- b. Land as soon as practical.
- **If both 275-amp current limiters have failed — Aircraft incorporating AMK 85-1:**
 - a. COOL-FAN Switch — OFF.
 - b. On aircraft incorporating AAK 86-1 or SB 35/36-21-17, W/S AUX HEAT DEFOG Switch — OFF.
 - c. RECOG LT Switch — OFF.
 - d. AUX HT Switch (if installed) — OFF.

NOTE

Electrical power to the battery charging bus is being supplied by the ship's batteries. If the batteries should become depleted, primary pitch trim and stall warning systems will be inoperative.

3. After landing, replace failed 275-amp current limiter(s) prior to next flight.

DC POWER LOSS — ESSENTIAL BUS (Aircraft 35-067 thru 35-201, 35-205, and aircraft 36-018 thru 36-040 except when these aircraft incorporate AMK 78-13)

The pilot's and copilot's essential buses are tied together through the ESS BUS TIE Circuit Breaker located on the copilot's circuit breaker panel.

Upon loss of either ESS BUS Circuit Breaker, the ESS BUS TIE Circuit Breaker will normally open also. The open ESS BUS TIE Circuit Breaker will isolate the pilot's and copilot's essential buses.

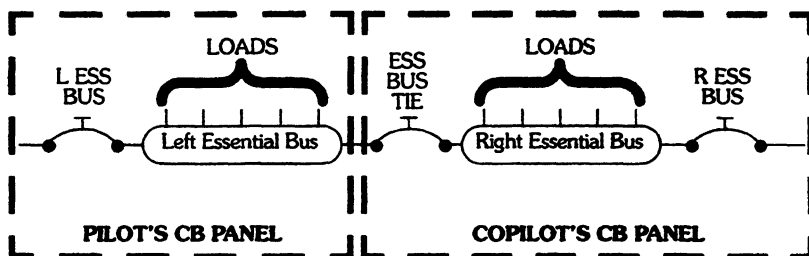


Figure 3-1

IF AN ESS BUS CIRCUIT BREAKER OPENS IN FLIGHT:

Affected Essential Bus:

1. ESS BUS TIE Circuit Breaker (copilot's panel) — Pull, if not already open.



Do not reset the ESS BUS TIE Circuit Breaker.

2. Essential Bus electrical load — Reduce as follows:
 - a. AUTOPILOT Switch — OFF.
 - b. Instrument panel light rheostats — OFF if conditions permit.
 - c. Restrict operation of the following systems to one at a time.
 - (1) Pitch, roll and yaw trims.
 - (2) Communication transmissions.
 - (3) Fuel transfer and standby pumps.
 - (4) Flaps.
 - (5) Landing Gear.
3. ESS BUS Circuit Breaker — Reset.

**DC POWER LOSS — ESSENTIAL BUS (Aircraft 35-067 thru 35-201, 35-205, and aircraft 36-018 thru 36-040 except when these aircraft incorporate AMK 78-13)
(CONT)**

If ESS BUS Circuit Breaker Does Not Hold:

4. Wait at least one minute before attempting reset.

If ESS BUS Circuit Breaker Holds After Being Reset:

5. Add loads only as necessary for safe operation.



Do not reset the open ESS BUS TIE Circuit Breaker.

If ESS BUS Circuit Breaker Opens Again:

6. Essential Bus Electrical Load — Reduce as follows:
 - a. AUTOPILOT Switch — OFF.
 - b. Select PH on both audio panels (use headphones for communication).
 - c. Instrument panel light rheostats — OFF if conditions permit.
 - d. Restrict operation of the following systems to one at a time.
 - (1) Pitch, roll and yaw trims.
 - (2) Communication transmissions.
 - (3) Fuel transfer and standby pumps.
 - (4) Flaps.
 - (5) Landing Gear.
 - e. Pull the following circuit breakers on the failed essential bus.
 - (1) COMM.
 - (2) S WARN HT.
 - (3) PITOT HT.
 - (4) Yaw damper.
 - f. Select the following primary or secondary systems for operation from the remaining essential bus.
 - (1) Pitch trim.
 - (2) ATC transponder (if dual).
 - (3) COMM 1 or COMM 2.
 - (4) Yaw damper.
 - g. ESS BUS TIE Circuit Breaker (copilot's panel) — Reset.



Cross-check airspeed/Mach, altitude and angle-of-attack displays against opposite system on frequent basis. Use reference from system on remaining essential bus if differences exist and icing conditions are present.

DC POWER LOSS — ESSENTIAL BUS (Aircraft 35-202 thru 35-204, 35-206 & subsequent, aircraft 36-041 & subsequent, and prior aircraft incorporating AMK 78-13)

The pilot's and copilot's Essential A and Essential B Buses are tied together through the ESS A BUS TIE and ESS B BUS TIE Circuit Breakers (copilot's panel) respectively.

Upon loss of one ESS BUS Circuit Breaker, the corresponding ESS BUS TIE Circuit Breaker will normally open also. The open ESS BUS TIE Circuit Breaker will isolate the pilot's and copilot's essential buses.

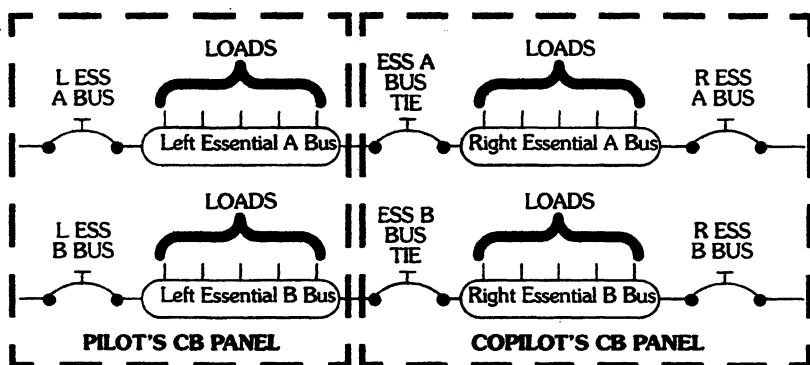


Figure 3-2

IF AN ESS BUS CIRCUIT BREAKER OPENS IN FLIGHT:

Affected Essential Bus:

1. ESS BUS TIE Circuit Breaker (copilot's panel) — Pull, if not already open.



Do not reset the ESS BUS TIE Circuit Breaker.

2. Essential Bus electrical load — Reduce by pulling unnecessary systems circuit breaker.



Essential bus system loads are protected by circuit breakers on the same row as the essential bus circuit breaker.

3. ESS BUS Circuit Breaker — Reset.

DC POWER LOSS — ESSENTIAL BUS (Aircraft 35-202 thru 35-204, 35-206 & subsequent, aircraft 36-041 & subsequent, and prior aircraft incorporating AMK 78-13) (CONT)

4. Restrict operation of the following systems to one at a time.
 - a. Pitch, roll and yaw trims.
 - b. Fuel transfer and standby pumps.
 - c. Flaps.
 - d. Landing gear.

If ESS BUS Circuit Breaker Does Not Hold:

5. Wait at least one minute before attempting reset.

If ESS BUS Circuit Breaker Holds After Being Reset:

6. Add loads only as necessary for safe operation.



Do not reset ESS BUS TIE Circuit Breaker.

If ESS BUS Circuit Breaker Opens Again:

7. Reduce electrical load on essential bus to a minimum.
8. ESS BUS Circuit Breaker — Reset.

If ESS BUS Circuit Breaker Will Not Stay Closed and It Is Desired To Operate A Load Connected To That Bus Only:

9. Reduce loads on both affected ESS BUS Circuit Breakers to a minimum.
10. ESS BUS TIE Circuit Breaker (copilot's panel) — Reset.
11. If the ESS BUS TIE Circuit Breaker opens, leave open.



Cross-check airspeed/Mach, altitude, and angle-of-attack displays against opposite system on a frequent basis. Use references from systems on opposite essential bus if differences exist and icing conditions are present.

DUAL GENERATOR FAILURE

1. Electrical Load — Reduce.
 - a. COOL-FAN Switch — OFF.
 - b. AUX HT Switch (if installed) — OFF.
 - c. *On aircraft incorporating AAK 86-1 or SB 35/36-21-17, W/S AUX HEAT DEFOG Switch — OFF.*
2. L and R IGN & ST Circuit Breakers (main power bus) — Check and reset.
3. START-GEN Switches — GEN.

NOTE

START-GEN switch must be in GEN for the respective generator RESET switch to be effective.

4. GEN RESET Switches — Depress momentarily.

CAUTION

Depressing and holding the GEN RESET switch longer than one-half second, or multiple activations, may cause damage to the electrical system.

If Generators Do Not Reset:

5. Turbine Speed (N₂) — 80% RPM or above.
6. START-GEN Switches — OFF, then GEN.
7. GEN RESET Switches — Depress momentarily.

If Generators Do Not Reset:

8. START-GEN Switches — OFF.
9. JET PUMP Switches — Check, ON.
10. Both FUEL CMPTR Switches — OFF, one at a time. Control engines manually.

CAUTION

- Engine response will be much slower with the fuel computers OFF.
- Monitor Fan Speed (N₁) indicators. If an engine accelerates uncontrolled, immediately set applicable FUEL CMPTR switch(es) — On.

11. If there is fuel in the fuselage tank:
 - Aircraft not equipped with FUS VALVE switch:
 - a. FUS TANK XFER-FILL Switch — XFER.
 - b. FUSLG PMP Circuit Breaker (copilot's main bus) — Pull.
 - Aircraft equipped with FUS VALVE switch:
 - a. FUS VALVE Switch — OPEN.

NOTE

Approximately 162 pounds of fuselage fuel will be unusable.

12. Land as soon as practical.

DUAL GENERATOR FAILURE (CONT)

13. Electrical power will be supplied by the ship's batteries. All nonessential equipment should be turned off or circuit breakers pulled. Fully charged batteries should power the minimum electrical equipment for night instrument flight for approximately 30 minutes.

If Ship's Batteries are Depleted:

14. If the ship's batteries are depleted, the only electrical power available will be from the Emergency Power Supply.
- EMER BAT or EMER PWR Switch — STBY.
 - EMER BAT or EMER PWR Switch — On, prior to operating gear or flaps.

**EQUIPMENT AND TOTAL OPERATING TIME
FOR SINGLE INSTALLATION**

Switch Position	Third Attitude Gyro	Gear	Flaps	Operating Time
ON	●	●	●	30 minutes
STBY	●			3 hrs. 45 min.

15. Second EMER PWR Switch (if installed) — On.



The equipment powered by the second Emergency Power Supply is dependent upon owner preference. The operating time for the second Emergency Power Supply will vary with the amount of equipment powered and the total electrical draw of that equipment.

16. The following is a list of conditions that will exist:
- Flight control trim will remain at its last setting.
 - All engine instruments will be inoperative or unreliable.
 - The engines will revert to the fuel computer off (manual) mode of operation.



Engine response is much slower with the engine fuel computer OFF and response may be hard to detect with engine instruments inoperative.

- d. • *On aircraft 35-067 thru 35-112 except 35-107. 36-018 thru 36-031, pressurization AUTO mode will not be affected and cabin temperature will remain at the last setting.*

DUAL GENERATOR FAILURE (CONT)

- On aircraft 35-107, 35-113 and subsequent, and 36-032 and subsequent, the emergency pressurization valves will reposition to emergency. Bleed-air for wing, windshield, and stabilizer anti-ice as well as temperature control will not be available. Pressurization AUTO mode will not be affected.
- e. Autopilot and yaw dampers will be inoperative.
- f. The jet pumps will supply fuel to the engines. Fuel system valves will remain in their last position.
- g. Fuel Quantity, Fuel Flow, and Fuel Counter indicators will be inoperative.
- h. Mach Trim and stick puller will be inoperative. **Do not exceed Mmo (0.74 Mi).**
- i. All AC electrical systems will be inoperative.
- j. Spoilers will be inoperative.
- k. Stall warning system will be inoperative. Maintain adequate margin above stall speed by reference to the airspeed indicator.
- l. Engine fire detect and extinguishing systems will be inoperative.
- m. Nose wheel steering and anti-skid will be inoperative for landing. Refer to Section V for increased landing distance requirements.

ENGINE FAILURE**DURING TAKEOFF****BELOW V₁ SPEED**

- 1. Thrust Levers — IDLE.**
- 2. Wheel Brakes — Apply.**
- 3. Spoilers — EXT.**
- 4. Drag Chute or Thrust Reversers (if installed) — Deploy, if necessary.**

ABOVE V₁ SPEED

- 1. Rudder and Ailerons — As required, for directional control.**
 - 2. Accelerate to VR.**
- NOTE** → Directional control is improved if the nose wheel is kept on the runway until VR.
- 3. Rotate at VR; Climb at V₂.**
 - 4. GEAR — UP, when positive rate of climb is established.**
 - 5. When clear of obstacles, accelerate to V₂ + 30 and retract flaps.**

NOTE → Lateral control is improved with tip tanks empty. If time permits, it is recommended that tip tank fuel be jettisoned.

- 6. FUEL JTSN Switch — ON (lights on); Off prior to touchdown.** Time to reduce aircraft weight from maximum takeoff weight to maximum landing weight is approximately 40 minutes. Time to jettison fuel from tip tanks is approximately 5 minutes.
- 7. Refer to ENGINE SHUTDOWN IN FLIGHT procedure, Section IV, or ENGINE FIRE — SHUTDOWN procedure, this section.**

ENGINE FAILURE (CONT)

IN FLIGHT

1. Control Wheel Master Switch (MSW) — Depress and release. Yaw damper and autopilot will disengage.
2. Rudder and Ailerons — As required, for directional control.
3. Thrust Lever (operative engine) — Increase as required.
4. ENG SYNC Switch — OFF.
5. Rudder Trim — As required.
6. Yaw Damper — Engage.
7. Autopilot — As desired.
8. Refer to ENGINE SHUTDOWN IN FLIGHT procedure, Section IV.

DURING APPROACH

1. Control Wheel Master Switch (MSW) — Depress and release. Yaw damper and autopilot will disengage.
2. Thrust Lever (operative engine) — Increase as required.
3. Flaps — 20° maximum.

NOTE

If aircraft is configured with landing flaps (DN) when engine failure occurs, thrust increase (on operative engine) and flap retraction to 20° should be near simultaneous actions.

4. Airspeed — $V_{REF} + 10$ minimum.

5. Rudder Trim — As required.

NOTE

During a coupled approach, full rudder trim may be required with an actual engine failure. Use rudder pedal force as necessary to maintain slip indicator ball centered.

6. Yaw Damper — Engage.
7. Autopilot — As desired.
8. Refer to either of the following procedures as applicable:
 - SINGLE-ENGINE LANDING, Section IV.
 - GO AROUND, Section II, and ENGINE SHUTDOWN IN FLIGHT, Section IV.

INTENTIONALLY LEFT BLANK

ENGINE FIRE — SHUTDOWN

NOTE

An engine fire is usually accompanied by other indications, such as: excessive Turbine Temperature (ITT), erratic or rough engine operation, fluctuating engine indications, or smoke in the cabin.

Affected Engine:

1. Thrust Lever — IDLE, unless a critical thrust situation exists.
2. • If fire continues more than 15 seconds or there are other indications of fire:
 - a. Thrust Lever — CUTOFF.
 - b. FIRE PULL or ENG FIRE PULL T-Handle — Pull.

NOTE

Pulling the FIRE PULL or ENG FIRE PULL T-Handle stops the flow of fuel and hydraulic fluid to the engine, shuts off bleed air from the engine, and arms the fire extinguishing system.

- c. ARMED Light — Depress one.
- d. • If fire continues:
 - (1) Depress remaining ARMED light.
 - (2) Land as soon as possible.
 - (3) Go to step e.
- If fire extinguishes:
 - (1) Land as soon as practical.
 - (2) Go to step e.
- e. AIR IGN Switch — OFF.
- f. ENG SYNC Switch — OFF.
- g. Yaw Damper — OFF, retrim as desired; then Yaw Damper — Engage.
- h. JET PUMP Switch — Off; STANDBY PUMP Switch — Off.
- i. START-GEN Switch — OFF.
- j. Electrical Load — Reduce.

CAUTION

During single-engine operation, the COOL-FAN switch should be placed to the OFF position in order to prevent overloading the operating generator.

- k. CROSSFLOW Switch — OPEN. Monitor fuel balance. Cross-flow as required.

NOTE

During single-engine operation, maintain slip indicator ball centered.

- l. Refer to SINGLE-ENGINE LANDING, Section IV.

ENGINE FIRE — SHUTDOWN (CONT)

• If fire extinguishes in less than 15 seconds:

- a. Leave thrust lever at IDLE, unless a critical thrust situation exists.
- b. ENG SYNC Switch — OFF.
- c. Yaw Damper — OFF, retrim as desired; then Yaw Damper — Engage.
- d. Monitor fuel balance. Crossflow as required.
- e. Land as soon as practical.
- f. Refer to SINGLE-ENGINE LANDING, Section IV.

ENGINE AIRSTARTS

The following information is applicable to **all** airstart procedures.

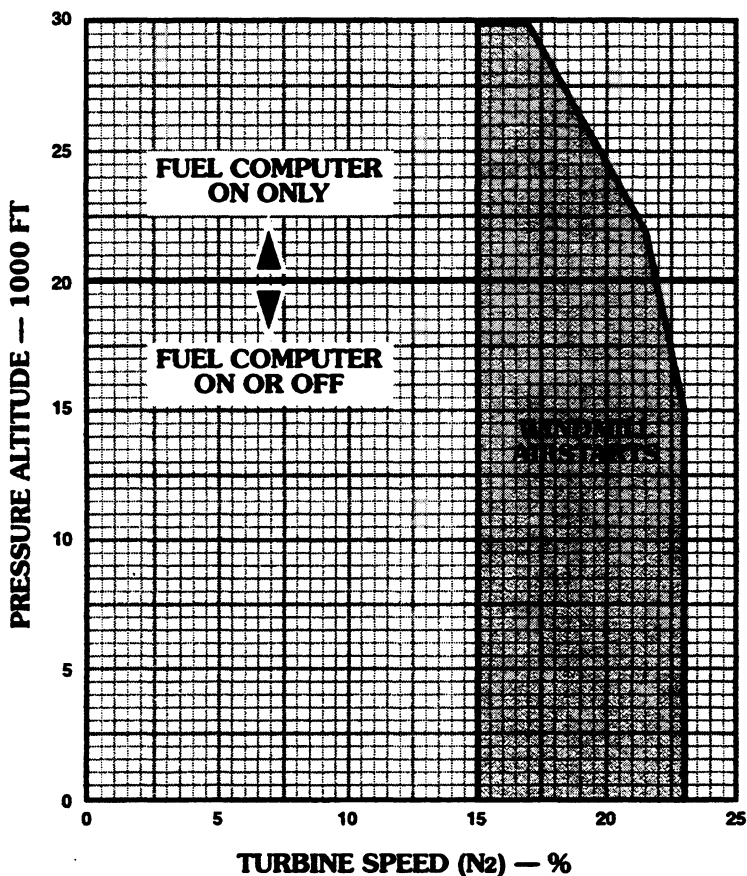
 WARNING

Do not attempt an airstart following an engine failure which was accompanied by indications of internal engine damage or fire.

 CAUTION

- **Do not** attempt an airstart without an indication of fan rotation.
- If Turbine Temperature (ITT) is approaching the limit and rising rapidly, immediately place Thrust Lever in CUTOFF position and abort start.
- At least one inverter must be operating to energize oil pressure indicator. If oil pressure is not indicated within 10 seconds, abort start.
- If the malfunction is isolated to the fuel computer, use FUEL COMPUTER OFF starting procedure and remain in the FUEL COMPUTER OFF mode for remainder of the flight.

RELIGHT ENVELOPE



- Fuel computer ON starter-assist airstarts may be made at any stabilized Turbine Speed (N2) up to 45% and any altitude up to 30,000 feet.
- Maintaining an airspeed which will maintain a minimum stabilized Turbine Speed (N2) of 15% RPM will enhance airstart capability.
- **Do not** attempt fuel computer OFF airstart above 20,000 feet.

Figure 3-3

ENGINE AIRSTARTS (CONT)**STARTER-ASSIST AIRSTART (FUEL COMPUTER ON)****CAUTION**

- Starter-assist airstarts may be used at any Turbine Speed (N2) below 45%. Starter-assist airstarts must be used when stabilized Turbine Speed (N2) is below 15%.
- Maintaining an airspeed sufficient to maintain a stabilized Turbine Speed (N2) of 15% minimum will enhance airstart capability.

Affected Engine:

1. Ensure that aircraft is within RELIGHT ENVELOPE as shown in Figure 3-3, this section, if conditions permit.
2. Thrust Lever — CUTOFF. Wait 10 seconds to allow fuel to drain from engine.
3. Fuel Supply — Check.
 - a. Fuel available from wing tank.
 - b. FIRE PULL or ENG FIRE PULL T-Handle — Push in.
4. Fuel Panel Switches — As follows:
 - a. Either JET PUMP Switch or STANDBY PUMP Switch — Check, ON.
 - b. CROSSFLOW Switch — CLOSE.
 - c. FUS TANK XFER-FILL Switch — OFF.
 - d. FUS VALVE Switch (if installed) — CLOSE.
5. Electrical Load — Reduce.
6. NAC HEAT Switch — OFF.
7. BLEED AIR Switch — OFF.
8. START-GEN Switch — START. Starter engaged light (if installed) will illuminate.
9. Thrust Lever (at minimum 10% Turbine Speed [N2] and indication of Fan Speed [N1] rotation) — IDLE.
10. AIR IGN Light and FUEL FLOW — Check.
11. Turbine Temp (ITT) — Check rise within 5 seconds.
12. If light-off has not occurred within 5 seconds after the thrust lever is placed in IDLE position; SPR Switch — Energize, then release at 300°-400° Turbine Temp (ITT). Check rise within 5 seconds.
13. At approximately 45% or 50% Turbine Speed (N2), the starter will automatically disengage. Check:
 - a. AIR IGN Light — Extinguished.
 - b. Starter Engaged Light (if installed) — Extinguished. If starter engaged light remains illuminated, refer to STARTER ENGAGED LIGHT REMAINS ILLUMINATED AFTER START, Section IV.

ENGINE AIRSTARTS (CONT)

14. START-GEN Switch — GEN at idle.
15. Engine Instruments — Normal indications.
16. BLEED AIR Switch — On.
17. NAC HEAT Switch — On as required.

If No Indication of Light Off is Obtained in 10 Seconds:

18. Thrust Lever — CUTOFF.
19. START-GEN Switch — OFF.
20. Repeat STARTER-ASSIST AIRSTART (FUEL COMPUTER ON) procedure.

CAUTION

No more than three consecutive starter-assist airstarts should be attempted to prevent severe battery drain and generator burnout.

If Engine Will Not Restart:

21. Perform WINDMILLING AIRSTART (FUEL COMPUTER ON) procedure, this section.

After Both Engines Are Operating:

22. *On aircraft 35-067 thru 35-389 except 35-370 and aircraft 36-018 thru 36-047 except aircraft incorporating AMK 80-17 or AAK 81-1, Starter Disengagement Check:*
 - a. AUX HT (if installed) and COOL-FAN Switches — OFF.
 - b. Battery Switches — OFF.
 - c. Ammeter — Check total current indication is less than 100 amps.
 - If total current indication is greater than 100 amps:
 - (1) Battery Switches — On.
 - (2) Land as soon as practical.
 - (3) **Do not** attempt further flights until trouble has been corrected.

NOTE

A total ammeter indication greater than 100 amps indicates that a starter has not disengaged and subsequent starter and/or engine damage may occur.

- If total current indication is less than 100 amps; set battery switches — On.

ENGINE AIRSTARTS (CONT)

23. Battery Charging Bus Current Limiter Check:

CAUTION

Failure to successfully complete the following current limiter checks indicates a malfunction. In this event, refer to CURRENT LIMITER FAILURE/ILLUMINATION OF CUR LIM (CUR LIMITER) LIGHT IN FLIGHT procedure, this section.

- *Aircraft 35-067 thru 35-147 and aircraft 36-018 thru 36-035 except aircraft incorporating AMK 80-17 or AAK 81-1:*
 - a. MAIN BUS TIE Circuit Breaker (copilot's panel) — Pull.
 - b. One START-GEN Switch — OFF. Check ammeter reading on opposite generator, approximately doubles, then switch back to GEN.
 - c. Opposite START-GEN Switch — OFF. Check ammeter reading on opposite generator, approximately doubles, then switch back to GEN.
 - d. MAIN BUS TIE Circuit Breaker — Reset.
- *Aircraft 35-148 thru 35-389 except 35-370 and aircraft 36-036 thru 36-047 except aircraft incorporating AMK 80-17 or AAK 81-1:*
 - a. TEST Selector Switch — Rotate to L CUR LIM.
 - b. TEST Button — Depress. Green current limiter light will illuminate and remain on while button is held. L GEN light will illuminate and right generator voltage may be reduced approximately 2 vdc.
 - c. TEST Selector Switch — Rotate to R CUR LIM.
 - d. TEST Button — Depress. Green current limiter light will illuminate and remain on while button is held. R GEN light will illuminate and left generator voltage may be reduced approximately 2 vdc.
- *Aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047 incorporating AMK 80-17 or AAK 81-1:*
 - a. L CUR LIMITER and R CUR LIMITER Lights — Check extinguished.
- *Aircraft 35-370, 35-390 and subsequent and aircraft 36-048 and subsequent:*
 - a. CUR LIM Light — Check extinguished.

ENGINE AIRSTARTS (CONT)

WINDMILLING AIRSTART (FUEL COMPUTER ON)



Do not attempt windmilling airstart with fuel computer ON unless airspeed is sufficient to maintain a stabilized Turbine Speed (N₂) of 15% minimum and indication of fan rotation. Starter assist airstarts **must** be used when stabilized Turbine Speed (N₂) is below 15%.

Affected Engine:

1. Ensure that aircraft is within RELIGHT ENVELOPE as shown in Figure 3-3, this section.
2. Thrust Lever — CUTOFF. Wait 10 seconds to allow fuel to drain from engine.
3. Fuel Supply — Check.
 - a. Fuel available from wing tank.
 - b. FIRE PULL or ENG FIRE PULL T-Handle — Push in.
4. Fuel Panel Switches — As follows:
 - a. JET PUMP Switch — ON.
 - b. STANDBY PUMP Switch — ON.
 - c. CROSSFLOW Valve — CLOSED.
 - d. FUS TANK XFER-FILL Switch — OFF.
 - e. FUS VALVE (if installed) — CLOSED.
5. START-GEN Switch — OFF.
6. Electrical Load — Reduce.
7. NAC HEAT Switch — OFF.
8. BLEED AIR Switch — OFF.
9. AIR IGN Switch — ON, check AIR IGN light illuminated.
10. Thrust Lever — IDLE. Check FUEL FLOW indication.
11. Turbine Temp (ITT) — Check rise within 5 seconds.
12. If light-off has not occurred within 5 seconds after the thrust lever is placed in IDLE position; SPR Switch — Energize, then release at 300°-400° Turbine Temp (ITT). Check rise within 5 seconds.
13. AIR IGN Switch — OFF at 45% Turbine Speed (N₂). Check AIR IGN light extinguished.
14. START-GEN Switch — GEN at idle.
15. Engine Instruments — Normal indications.
16. STANDBY PUMP Switch — Off.
17. BLEED AIR Switch — ON.
18. NAC HEAT Switch — On as required.

ENGINE AIRSTARTS (CONT)**If No Indication of Light-Off Is Obtained in 10 Seconds:**

19. Thrust Lever — Cutoff.
20. AIR IGN Switch — OFF.
21. Repeat WINDMILLING AIRSTART (FUEL COMPUTER ON) or
STARTER-ASSIST AIRSTART (FUEL COMPUTER ON)
procedure.

If Engine Will Not Restart:

22. Perform ENGINE SHUTDOWN IN FLIGHT procedure, Section IV. **I**

ENGINE AIRSTARTS (CONT)

STARTER-ASSIST AIRSTART (FUEL COMPUTER OFF)



- Fuel computer OFF airstarts should **only** be attempted when fuel computer ON operation is not available.
- Starter-assist airstarts may be used at any Turbine Speed (N₂) below 45%. Starter-assist airstarts **must** be used when stabilized Turbine Speed (N₂) is below 15%.
- Maintaining an airspeed sufficient to maintain a stabilized Turbine Speed (N₂) of 15% or above will enhance airstart capability.

Affected Engine:

1. Ensure that aircraft is within RELIGHT ENVELOPE (below 20,000 feet) as shown in Figure 3-3, this section, if conditions permit.
2. FUEL CMPTR Switch — OFF.
3. Thrust Lever — CUTOFF. Wait 10 seconds to allow fuel to drain from engine.
4. Fuel Supply — Check.
 - a. Fuel available from wing tank.
 - b. FIRE PULL or ENG FIRE PULL T-Handle — Push in.
5. Fuel Panel Switches — As follows:
 - a. STANDBY PUMP Switch — ON.
 - b. JET PUMP Switch — Off.
 - c. CROSSFLOW Valve — CLOSED.
 - d. FUS TANK XFER-FILL Switch — OFF.
 - e. FUS VALVE (if installed) — CLOSED.
6. Electrical Load — Reduce.
7. NAC HEAT Switch — OFF.
8. BLEED AIR Switch — OFF.
9. START-GEN Switch — START. Starter engaged light (if installed) will illuminate.
10. Thrust Lever (at 10% Turbine Speed [N₂] and indication of Fan Speed [N₁] rotation) — IDLE.
11. AIR IGN Light and FUEL FLOW — Check.
12. Turbine Temp (ITT) — Check rise within 10 seconds.



- If light-off has not occurred within 10 seconds after Thrust Lever is placed in IDLE, abort start.
- If engine accelerates above 80% Fan Speed (N₁) with Thrust Lever in IDLE, abort start.

ENGINE AIRSTARTS (CONT)

13. START-GEN Switch — GEN at 45% Turbine Speed (N₂).

CAUTION

Set Starter-Generator Switch to OFF or GEN at 45% Turbine Speed (N₂) since there is no overspeed protection for the starter. The fuel computer speed switch function is inoperative during fuel computer off mode of operation.

14. After START GEN Switch is set to GEN, check:
- AIR IGN Light — Extinguished.
 - Starter Engaged Light (if installed) — Extinguished. If starter engaged light remains illuminated, refer to STARTER ENGAGED LIGHT REMAINS ILLUMINATED AFTER START, Section IV.
15. Engine Instruments — Normal indications. (Monitor. Fuel computer limiting functions are inoperative in fuel computer OFF mode of operation.)
16. BLEED AIR Switch — ON.
17. NAC HEAT Switch — On as required.

If No Indication of Light Off is Obtained in 10 Seconds:

18. Thrust Lever — CUTOFF.
19. START-GEN Switch — OFF.
20. Repeat STARTER-ASSIST AIRSTART (FUEL COMPUTER OFF) procedure.

CAUTION

Not more than three consecutive starter-assist airstarts should be attempted to prevent severe battery drain and generator burnout.

If Engine Will Not Restart:

21. Perform WINDMILLING AIRSTART (FUEL COMPUTER OFF) procedure, this section.

After Both Engines Are Operating:

22. On aircraft 35-067 thru 35-389 except 35-370; and 36-018 thru 36-047 except aircraft incorporating AMK 80-17 or AAK 81-1, Starter Disengagement Check:
- AUX HT (if installed) and COOL-FAN Switches — OFF.
 - Battery Switches — OFF.
 - Ammeter — Check total current indication less than 100 amps.

ENGINE AIRSTARTS (CONT)

- If total current indication is greater than 100 amps:
 - (1) Battery Switches — On.
 - (2) Land as soon as practical.
 - (3) Do not attempt further flights until trouble has been corrected.



A total ammeter indication greater than 100 amps indicates that a starter has not disengaged and subsequent starter and/or engine damage may occur.

- If total current indication is less than 100 amps; set Battery Switches — On.

23. Battery Charging Bus Current Limiter Check:



Failure to successfully complete the following current limiter checks indicates a malfunction. In this event, refer to CURRENT LIMITER FAILURE/ILLUMINATION OF CUR LIM (CUR LIMITER) LIGHT IN FLIGHT procedure, this section.

- *Aircraft 35-067 thru 35-147 and aircraft 36-018 thru 36-035 except aircraft incorporating AMK 80-17 or AAK 81-1:*
 - a. MAIN BUS TIE Circuit Breaker (copilot's panel) — Pull.
 - b. One START-GEN Switch — OFF. Check ammeter reading on opposite generator, approximately doubles, then switch back to GEN.
 - c. Opposite START-GEN Switch — OFF. Check ammeter reading on opposite generator, approximately doubles, then switch back to GEN.
 - d. MAIN BUS TIE Circuit Breaker — Reset.
- *Aircraft 35-148 thru 35-389 except 35-370 and aircraft 36-036 thru 36-047 except aircraft incorporating AMK 80-17 or AAK 81-1:*
 - a. TEST Selector Switch — Rotate to L CUR LIM.
 - b. TEST Button — Depress. Green current limiter light will illuminate and remain on while button is held. L GEN light will illuminate and right generator voltage may be reduced approximately 2 vdc.
 - c. TEST Selector Switch — Rotate to R CUR LIM.
 - d. TEST Button — Depress. Green current limiter light will illuminate and remain on while button is held. R GEN light will illuminate and left generator voltage may be reduced approximately 2 vdc.

ENGINE AIRSTARTS (CONT)

- Aircraft 35-067 thru 35-389 except 35-370 and aircraft 36-018 thru 36-047 incorporating AMK 80-17 or AAK 81-1:
 - a. L CUR LIMITER and R CUR LIMITER Lights — Check extinguished.
- Aircraft 35-370, 35-390 and subsequent and aircraft 36-048 and subsequent:
 - a. CUR LIM Light — Check extinguished.

ENGINE AIRSTARTS (CONT)

WINDMILLING AIRSTART (FUEL COMPUTER OFF)

CAUTION

- Fuel computer OFF airstarts should only be attempted when fuel computer ON operation is not available.
- **Do not** attempt windmilling airstart with fuel computer OFF unless airspeed is sufficient to maintain a stabilized Turbine Speed (N2) of 15% and Fan Speed (N1) of 10% minimum. Starter assist airstarts **must** be used when stabilized Turbine Speed (N2) is below 15%.

Affected Engine:

1. Ensure that aircraft is within RELIGHT ENVELOPE (below 20,000 feet) as shown in Figure 3-3, this section.
2. FUEL CMPTR Switch — OFF.
3. Thrust Lever — CUTOFF. Wait 10 seconds to allow fuel to drain from engine.
4. Fuel Supply — Check.
 - a. Fuel available from wing tank.
 - b. FIRE PULL or ENG FIRE PULL T-Handle — Push in.
5. Fuel Panel Switches — As follows:
 - a. JET PUMP Switch — Off.
 - b. STANDBY PUMP Switch — ON.
 - c. CROSSFLOW Valve — CLOSED.
 - d. FUS TANK XFER-FILL Switch — OFF.
 - e. FUS VALVE (if installed) — CLOSED.
6. START-GEN Switch — OFF.
7. Electrical Load — Reduce.
8. NAC HEAT Switch — OFF.
9. BLEED AIR Switch — OFF.
10. AIR IGN Switch — ON. Check AIR IGN light illuminated.
11. Thrust Lever — IDLE, check FUEL FLOW indication.
12. Turbine Temp (ITT) — Check rise within 10 seconds.

CAUTION

- If light-off has not occurred within 10 seconds after Thrust Lever is placed in IDLE, abort start.
- If engine accelerates above 80% Fan Speed (N1) with Thrust Lever in IDLE, abort start.

ENGINE AIRSTARTS (CONT)

13. Engine Instruments — Normal indications. (Monitor, fuel computer limiting functions are inoperative in fuel computer OFF mode of operation.)
14. AIR IGN Switch — OFF at 45% Turbine Speed (N₂). Check AIR IGN light extinguished.
15. START-GEN Switch — GEN.
16. BLEED AIR Switch — ON.
17. NAC HEAT Switch — On as required.

If No Indication of Light-Off Is Obtained in 10 Seconds:

18. Thrust Lever — CUTOFF.
19. AIR IGN Switch — OFF.
20. Repeat WINDMILLING AIRSTART (FUEL COMPUTER OFF) or STARTER-ASSIST AIRSTART (FUEL COMPUTER OFF) procedure.

If Engine Will Not Restart:

21. Perform ENGINE SHUTDOWN IN FLIGHT procedure, Section IV.

OIL PRESSURE LIGHT ILLUMINATED

Illumination of an Oil Pressure light indicates that engine oil pressure is below 25 psi. Several configurations of the oil pressure light exist:

- Single LO OIL PRESS light on the annunciator panel. Illumination of this light indicates oil pressure of either engine is below 25 psi.
 - Single OIL PRESS light on the annunciator panel. Illumination of this light indicates oil pressure of either engine is below 25 psi.
 - L LO OIL and R LO OIL lights on the glareshield panel. Illumination of one of these lights indicates oil pressure of the associated engine is below 25 psi.
1. OIL PRESS Indicator — Check to determine oil pressure of both engines.

Affected Engine:

2. OIL TEMP Indicator — Check to determine oil temperature.
3. • **Oil pressure is less than 25 psi:**
If flight conditions permit, a precautionary engine shutdown is advised. Refer to ENGINE SHUTDOWN IN FLIGHT procedure, Section IV.

OIL PRESSURE LIGHT ILLUMINATED (CONT)

- **Oil pressure is between 25 and 38 psi or oil temperature is high:**

If flight conditions permit, reduce power to maintain oil temperature limits.

- **Oil pressure and oil temperature are normal:**

Continue to monitor engine operation.

BLEED AIR LIGHT ILLUMINATED

- *Aircraft 35-067 thru 35-081, 35-083 thru 35-086, and 36-018 thru 36-022 except aircraft incorporating AMK 76-7:*

If either the BLEED AIR L or BLEED AIR R light illuminates, either the primary pressure regulator of the respective air modulating valve has failed or an overheat sensor has tripped the light.

1. Corresponding BLEED AIR Switch — OFF.

- *Aircraft 35-082, 35-087 thru 35-106, 35-108 thru 35-112 and 36-023 thru 36-031 and previous aircraft incorporating AMK 76-7:*

If both the BLEED AIR L and BLEED AIR R lights illuminate, the secondary pressure regulator of one of the air modulating valves has failed.

1. R BLEED AIR Switch — OFF.
 - If both lights go out, continue flight in this configuration.
 - If both lights do not go out, proceed to step 2.
2. R BLEED AIR Switch — On, and L BLEED AIR Switch — OFF.
 - If both lights go out, continue flight in this configuration.
 - If both lights do not go out, proceed to step 3.
3. Reduce power alternately on each engine until both lights go out. Continue flight with the appropriate engine at reduced power.

If either the BLEED AIR L or BLEED AIR R light illuminates, an overheat sensor has tripped the light.

1. Corresponding BLEED AIR Switch — OFF.

- *Aircraft 35-107, 35-113 and subsequent, and 36-032 and subsequent:*

If either the BLEED AIR L or BLEED AIR R warning light illuminates, an overheat sensor in the bleed air ducting or the pylon structure has tripped the light.

1. Corresponding BLEED AIR Switch — OFF.

CABIN ALTITUDE WARNING HORN ACTIVATES OR CABIN ALTITUDE EXCEEDS 10000 FEET (EMERGENCY DESCENT)

1. Oxygen Masks — Don. Select 100% oxygen.
2. Thrust Levers — IDLE.
3. Autopilot — Disengage.
4. SPOILER Switch — EXT.
5. LANDING GEAR Switch — DN below MMO or VLE as appropriate for altitude. Keep sideslip angles to a minimum (ball centered) when extending gear.
6. Descend at MMO or VLE as appropriate, but *not* below minimum safe altitude.
7. PASS OXY Valve — NORM.
8. PASS MASK Valve — MAN.

WARNING

If pressurization loss is due to structural failure, limit speeds and maneuvering loads as much as possible in descent.

NOTE

- Descent from 45,000 feet to 15,000 feet requires approximately 2 minutes 45 seconds.
- Hats and "ear-muff" type headsets must be removed prior to donning crew oxygen masks.
- The HORN SILENCE switch will mute the cabin altitude warning horn for 60 seconds.

9. Pilot and Copilot OXY-MIC Switches — ON.

NOTE

Communication between crew members can be accomplished by using the INPH function of the AUDIO CONTROL PANEL and increasing the MASTER VOL level.

If Time and Conditions Permit:

10. Transponder — Emergency 7700.
11. Notify controlling agency.
12. Check condition of passengers and provide assistance if conditions permit.

NOTE

Communication with passengers can be accomplished by using PASS SPKR function of the AUDIO CONTROL Panel and adjusting the PASS SPKR VOL level.

DOOR LIGHT ILLUMINATED

Illumination of the red DOOR light indicates that one or more of the cabin entry door locking pins may not be fully engaged, or the cabin entry door actuator hook(s) are still engaged. During flight, the door should not be approached if the red DOOR light is illuminated; however, while on the ground, door latch pin engagement may be visually verified. The cabin entry door has 10 latch pins. *On aircraft with a 36-inch cargo door*, the six pins on the upper portion can be viewed through ports in the door upholstery. *On aircraft with a 24-inch executive door*, only one of the six pins on the upper portion can be viewed through a port in the door upholstery. Two pins in the lower portion may be viewed by opening the inspection doors on the step to reveal the pin mechanism. Ensure that white lines on door structure align with white lines on latch pins. Two latch pins located at the upper/lower door interface, are visible through the upholstery gap at the interface and do not have white lines. If all latch pins are fully engaged and door actuator hook(s) are disengaged, the most probable cause of an illuminated DOOR light is a latch pin switch malfunction.

If light was accompanied by evidence of door failure:

WARNING

Door failure may be indicated by loud noise, pressurization leak, or rumble emanating from door area. **Do not approach door.**

1. FASTEN SEAT BELT Switch — On.
2. Cabin Altitude — Up to maximum possible.

NOTE

- *Aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031*, increasing cabin altitude to 9,000 feet will reduce differential pressure while avoiding deactivation of the automatic pressurization system.
- *Aircraft 35-107, 35-113 & subsequent and 36-032 & subsequent*, increasing cabin altitude to 9,000 feet will reduce differential pressure while avoiding actuation of the emergency pressurization system. The amber CAB ALT light will illuminate.

3. Airspeed — Reduce.
4. Establish descent.
5. Land as soon as practical.

If light was not accompanied by evidence of door failure:

WARNING

Do not approach door.

1. FASTEN SEAT BELT Switch — On.
2. Continue flight. The most probable cause is a latch pin switch malfunction.

CABIN/COCKPIT FIRE, SMOKE, OR FUMES

1. **Crew Oxygen Masks — Don. Select 100% oxygen.**
2. **Smoke Goggles — Don, if available.**
3. **Pilot and Copilot OXY-MIC Switches — ON.**

NOTE

It may be necessary to select EMER or EMERGENCY on 6600214 series or Scott ATO mask regulator if the mask does not seal properly.

Whether or not smoke has dissipated, if it cannot be visibly verified that the fire has been extinguished:

4. Cockpit Door/Curtain — Open.
5. Land as soon as possible.
6. **If source is known:**
 - a. Extinguish fire using hand held extinguisher or eliminate the source of smoke or fumes.

NOTE

Crew exposure to high levels of Halon fire extinguisher vapors may result in dizziness, impaired coordination and reduced mental alertness.

- b. • *If fire is not extinguished:*
 - (1) Land as soon as possible.
 - (2) This checklist is complete.
- *If fire has been extinguished and can be visibly verified:*
 - (1) Land as soon as practical. At the crew's discretion, the oxygen system may be returned to normal.
 - (2) This checklist is complete.

If smoke or fumes continue:

7. • *Aircraft 35-067 thru 35-112 except 35-107, and aircraft 36-018 thru 36-031, CABIN AIR Switch — MAX until smoke or fumes are eliminated.*
 - *Aircraft 35-107, 35-113 and subsequent and aircraft 36-032 and subsequent, One or Both BLEED AIR Switches — EMER until smoke or fumes are eliminated. Advancing thrust levers will increase airflow.*
8. AUTO-MAN Switch — MAN.
9. UP-DN Manual Control (red) — Up; maximum 13,000 feet.

CABIN/COCKPIT FIRE, SMOKE, OR FUMES (CONT)

If time and conditions permit:

10. Isolate source of smoke or fumes.
 - If Bleed Air System is suspected source: R BLEED AIR Switch — OFF. If smoke is reduced, continue operation with switch OFF. If smoke is not reduced, R BLEED AIR Switch — ON and L BLEED AIR Switch — OFF. If smoke is reduced, continue operation with switch OFF.
 - If smoke or fume source is electrical:
 - a. All Non-essential Electrical Equipment — OFF.
 - b. Isolate defective systems bus as follows:



The following steps separate the pilot and copilot electrical systems. If the electrical smoke or fume source is positively identified on the pilot side, pull all BUS TIE circuit breakers on the copilot circuit breaker panel and proceed with step (4).

- (1) Copilot's Circuit Breaker Panel — Pull the following circuit breakers.
 - *On aircraft 35-067 thru 35-201, 35-205 and aircraft 36-018 thru 36-040 except aircraft modified per AMK 78-13:*

TOP ROW

- AC BUS TIE
- R AC BUS
- R AUX AC BUS (if installed)
- 26 VAC BUS

2ND ROW

- MAIN BUS TIE
- R MAIN BUS
- R IGN & ST
- SEC INV

3RD ROW

- ESS BUS TIE
- R ESS BUS
- R STALL WARN
- AUX INV (if installed)

CABIN/COCKPIT FIRE, SMOKE, OR FUMES (CONT)

- On aircraft 35-202 and subsequent except 35-205, aircraft 36-041 and subsequent, and prior aircraft modified per AMK 78-13:

TOP ROW

- AC BUS TIE
- R AC BUS
- R AUX AC BUS (if installed)
- 26 VAC BUS

2ND ROW

- MAIN BUS TIE
- R MAIN BUS
- R IGN & START
- SEC INV

3RD ROW

- ESS A BUS TIE
- R ESS A BUS
- R STALL WARN

BOTTOM ROW

- ESS B BUS TIE
- R ESS B BUS
- AUX INV (if installed)



All electrical power from the copilot's circuit breaker panels is now off. Allow time for smoke or fumes to dissipate.

If electrical smoke or fumes continue:

- (2) All BUS TIE Circuit Breakers — Leave pulled, do not reset.
- (3) All other Copilot Circuit Breakers — Reset.



This procedure reinstates power to the copilot's circuit breaker panel.

- (4) Pilot's Circuit Breaker Panel — Pull the following circuit breakers:
 - On aircraft 35-067 thru 35-201, 35-205, and aircraft 36-018 thru 36-040 except aircraft modified per AMK 78-13:

TOP ROW

- L AC BUS
- L AUX AC BUS (if installed)
- 26 VAC BUS

3RD ROW

- L ESS BUS
- L STALL WARN
- DOOR ACTR
- ENTRY LT

2ND ROW

- L MAIN BUS
- L IGN & ST
- PRI INV

CABIN/COCKPIT FIRE, SMOKE, OR FUMES (CONT)

- On aircraft 35-202 and subsequent except 35-205, aircraft 36-041 and subsequent, and prior aircraft modified per AMK 78-13:

TOP ROW

- L AC BUS
- L AUX AC BUS (if installed)
- 26 VAC BUS

3RD ROW

- L ESS A BUS
- L STALL WARN
- DOOR ACTR
- ENTRY LT

2ND ROW

- L MAIN BUS
- L IGN & START
- PRI INV

BOTTOM ROW

- L ESS B BUS

NOTE

All electrical power from the pilot's circuit breaker panel is now off. Allow time for smoke or fumes to dissipate.

If electrical smoke or fumes continue, the malfunctioning system is connected to the Emergency Power Supply(ies). In this event:

- (5) EMER BAT or EMER PWR Switch(es) — OFF.

To restore unaffected electrical systems if necessary (determination of defective system):

11. All BUS TIE Circuit Breakers — Leave pulled, do not reset.
12. All Circuit Breakers on panel with power removed — Pull.
13. One (DC) BUS Circuit Breaker — Reset. Then, reset circuit breakers powered by that BUS circuit breaker.

NOTE

- Pause after resetting each circuit breaker to determine defective system.
- Whenever high electrical loads or smoke or fumes occur, pull the last circuit breaker reset.
- Hot-wired circuit breakers (L and R STALL WARN, DOOR ACTR, ENTRY LT, PRI INV and SEC INV circuit breakers) should be reset in sequence with the other circuit breakers on that bus row.

14. Repeat step 13 for each (DC) BUS circuit breaker.
15. R AC BUS or L AC BUS Circuit Breaker (as applicable) — Reset. Then, reset circuit breakers powered by that AC bus circuit breaker. (Refer to notes under step 13 above).
16. EMER BAT or EMER PWR Switch(es) — On, one at a time. If smoke and fumes recur, set switch off.
17. Third Attitude Gyro — *If emergency power has been restored*, cage then uncage to erect gyro.

CONTROL SYSTEM JAM

Perform PITCH AXIS MALFUNCTION or ROLL OR YAW AXIS MALFUNCTION procedure in this section as applicable to attempt to clear difficulty. If problem is not corrected, attempt to overpower jam. If jam can be overpowered, make a normal landing.



For landing with a control jam, fly a long straight-in approach and establish final aircraft configuration at a safe altitude, well before landing.

AILERON JAM



For landing, a wide runway with minimum turbulence and crosswind is recommended.

1. Rudder — As required to control roll and track.



- Yaw damper should be on to minimize roll oscillations.
- For prolonged flight in a sideslip, set CROSSFLOW switch to OPEN and both STANDBY PUMP switches to ON.

2. Final Approach Configuration — Gear - DN, Flaps - 20°.
3. Final Approach Speed — $V_{REF} + 10$.
4. Maintain power to touchdown and do not flare.

ELEVATOR JAM

1. Primary Pitch Trim — As required for pitch control.
2. Final Approach Configuration — Gear - DN, Flaps - 20°.
3. Final Approach Speed — $V_{REF} + 10$.



Fly a long straight-in approach to minimize pitch changes and establish final aircraft configuration at a safe altitude, well before landing.

4. Maintain power to touchdown and do not flare.

CONTROL SYSTEM JAM (CONT)**RUDDER JAM**

For landing, a wide runway with minimum turbulence and crosswind is recommended.

1. Aileron — As required to control track.
2. Use asymmetric power if required to minimize sideslip.



For prolonged flight in a sideslip, set CROSSFLOW switch to OPEN and both STANDBY PUMP switches to ON.

3. Final Approach Configuration — Gear - DN, Flaps - 20°.
4. Final Approach Speed — $V_{REF} + 10$.
5. Maintain power to touchdown and do not flare.
6. After landing, maintain directional control with differential braking.



If asymmetric power is used, do not retard power until directional control is established.

**OVERSPEED RECOVERY — OVERSPEED WARNING
HORN ACTIVATES**

If VMO or MMO is inadvertently exceeded:

WARNING

Do not extend the spoilers, or operate with the spoilers deployed, at speeds above VMO/MMO due to significant nose-down pitching moment associated with spoiler deployment.

1. Thrust Levers — IDLE.
2. Autopilot — Disengage.
3. Identify aircraft pitch and roll attitude.

NOTE

- In any aircraft, attitude (particularly roll attitude) may be difficult to identify from visual and instrument references in an extreme nose-down condition.
- Do not apply elevator force until bank angle is reduced to less than 90°. A pull elevator force when the bank angle is greater than 90° will increase the nose-down attitude.

4. Level wings.
5. Elevator and pitch trim — As required to raise the nose.

WARNING

On any speed excursions beyond MMO, the elevator control must be smoothly and steadily applied to prevent encountering excessive aileron activity and airframe buffet. Beyond MMO, a 1.5 g pullup may be sufficient to excite aileron activity and the g level must be limited to that required to maintain lateral control.

If Mach or airspeed is severe or if pitch and/or roll attitude is extreme or unknown:

6. Landing Gear Switch — Down. Lowering the landing gear at high speed will increase drag and cause a moderate nose-up pitching moment which is easily controllable, but should be anticipated.

Extending the landing gear has been flight tested to 0.85 Mi and 320 KIAS. Analysis of flight test data indicates that this procedure is applicable at higher speeds.

CAUTION

Minor damage to the landing gear doors may be experienced when the gear is lowered at very high speed. Do not retract landing gear for remainder of flight. After landing, a thorough inspection of the landing gear and doors for condition must be made.

PITCH AXIS MALFUNCTION

A nose-up pitch axis malfunction or nose-up pitch trim system runaway can result in extremely high pitch attitudes, heavy airframe buffet, and require control forces in excess of 75 pounds for recovery.

A nose-down pitch axis malfunction, nose-down pitch trim system runaway, or nose-down overspeed can result in extremely high airspeeds and require control forces in excess of 75 pounds for recovery.

A binding elevator is evidenced by difficulty in moving the control column when making manual pitch changes.

WARNING

- **Do not** extend spoilers during any nose-down pitch upset at any speed due to significant nose-down pitching moment associated with spoiler deployment.
- On any speed excursion beyond MMO, the elevator control must be smoothly and steadily applied to prevent encountering excessive aileron activity and airframe buffet. Beyond MMO, a 1.5 g pull-up may be sufficient to excite aileron activity and the g level must be limited to that required to maintain lateral control.

NOTE

Control pressures may be heavy. Copilot assistance is recommended with this procedure.

1. Control Wheel Master Switch (MSW) — Depress and hold.

NOTE

- Yaw damper and autopilot will disengage.
- PRI pitch trim will be inoperative while the switch is held.

2. Attitude Control — As required to maintain aircraft control.

- If in nose-up attitude, roll into bank or maintain existing bank until the aircraft nose passes through the horizon.
- If in nose-down attitude, level the wings before pulling the nose up.

3. Thrust Levers — As required.

- If in high-speed nose-down attitude, immediately reduce thrust levers to IDLE position.
- If near stall, advance thrust levers as required to accelerate out of stall regime.

PITCH AXIS MALFUNCTION (CONT)

4. **STALL WARNING Switches — OFF.**
5. **PITCH TRIM Switch (pedestal) — OFF.**
6. **AUTOPILOT Switch — OFF.**

7. Control Wheel Master Switch (MSW) — Release.
8. Yaw Damper (PRI or SEC) — Engage.

If flight conditions permit, isolate malfunction as follows:

9. Pitch Trim System: PITCH TRIM Switch (pedestal) — Operate to PRI then SEC to isolate malfunctioning trim system.
 - If malfunction recurs in PRI pitch trim:
 - a. PITCH TRIM Switch (pedestal) — SEC.
 - b. NOSE DN-NOSE UP Switch (pedestal) — Operate to retrim aircraft as required.
 - c. PITCH TRIM Circuit Breaker (pilot's ess bus) — Pull.

NOTE

Mach trim will be inoperative. If autopilot is not engaged, **Do not exceed MMO (0.74 Mi).**

- If malfunction recurs in SEC pitch trim:
 - a. PITCH TRIM Switch (pedestal) — PRI.
 - b. Control Wheel Trim Switch — Operate to retrim aircraft as required.
 - c. SEC PITCH TRIM Circuit Breaker (copilot's ess bus) — Pull.

NOTE

Autopilot trim will be inoperative. If Mach trim has been disabled also, **Do not exceed MMO (0.74 Mi).**

- If malfunction does not recur:
 - a. PITCH TRIM Switch (pedestal) — PRI or SEC as desired.
 - b. Maintain aircraft trim with selected trim system.

NOTE

Probable cause of malfunction was autopilot (if autopilot was engaged). **Do not engage autopilot.**

- If neither PRI nor SEC pitch trim can be restored, refer to JAMMED STABILIZER LANDING, Section IV.

PITCH AXIS MALFUNCTION (CONT)

10. **Stall Warning System:** STALL WARNING Switches — ON, one at a time, to isolate malfunctioning system. If malfunction recurs, set appropriate switch OFF.



- An abrupt nose-down control column movement is evidence of a stick pusher malfunction.
- Below MMO, a nose-up tendency is evidence of a stick puller malfunction.

• If both STALL WARNING switches are OFF:

- a. Maintain airspeed at least 30 knots above stall speeds shown in Section V. VREF may be maintained on final approach in the landing configuration.
- b. Limit bank angles to 30° maximum.

• If L STALL WARNING switch is OFF, stick puller is inoperative — **Do not exceed MMO (0.74 Mi).**

• If malfunction does not recur, probable cause of malfunction was the autopilot (if autopilot was engaged). **Do not engage autopilot.**

11. If malfunction has not been isolated to autopilot:

- a. AUTOPILOT Switch — On.
- b. Autopilot — As desired.

12. Yaw Damper (PRI or SEC) — Check engaged.



If malfunction was isolated to L STALL, use SEC yaw damper. If malfunction was isolated to R STALL use PRI yaw damper.

ROLL OR YAW AXIS MALFUNCTION

1. **Control Wheel Master Switch (MSW)** — Depress. Yaw damper and autopilot will disengage and correct the malfunction if either was the cause.
2. **Attitude Control** — As required to maintain aircraft control.

If control force continues:

3. **Airspeed** — Reduce to minimize force.
4. **ROLL TRIM or YAW TRIM Circuit Breaker (pilot's ess bus)** — Pull affected axis.

5. • If malfunction was isolated to yaw damper:

- a. Select opposite yaw damper.

• If malfunction was isolated to autopilot:

- a. Do not engage autopilot.
- b. Engage yaw damper.

• If malfunction was isolated to roll or yaw trim system:

- a. Use asymmetric thrust and fuel imbalance, as required to minimize mistrim.
- b. Land as soon as practical.

NOTE

A normal approach and landing can be made with only light control forces to overcome full roll or yaw trim.

FUEL PRESS LIGHT ILLUMINATED

Illumination of a red FUEL PRESS light is an indication of loss of fuel pressure to the engine. Probable cause is jet pump failure.

Affected Engine:

1. Thrust Lever — Retard.
2. STANDBY PUMP Switch — ON.
3. AIR IGN Switch — On.
4. CROSSFLOW Switch — CLOSE.
5. FUS TANK XFER-FILL Switch — OFF.



Fuselage fuel transfer deactivates the wing standby pumps. The fuel in the fuselage tank will not be available above 25,000 feet. Below 25,000 feet the engine-driven fuel pump will suction feed sufficient fuel to supply the engine and fuselage fuel transfer can be accomplished. Replan flight accordingly.

6. FUS VALVE Switch (if installed) — CLOSE.
7. JET PUMP Switch — ON for tip tank fuel transfer.

If FUEL PRESS light does not extinguish:

8. JET PUMP Switch — Off.

If FUEL PRESS light does not extinguish:

9. Descend to 25,000 feet or lower.



The engine-driven fuel pump will suction feed sufficient fuel to supply the engine at altitudes of 25,000 feet or below.

DITCHING

This aircraft has not been certified for ditching under all the applicable provisions of FAR 25. However, a successful ditching has been conducted in a similar model Learjet. The following procedure will enhance the probability of a successful ditching.

Plan the descent to ensure minimum fuel remaining and improve buoyancy. Ensure sufficient fuel for controlled, power-on approach. This aircraft exhibits good buoyancy properties, floating near level or slightly tail low. After ditching, the airplane may remain afloat for some time if it does not sustain serious damage on landing.

1. If time and conditions permit:
 - a. Head toward nearest land or vessel.
 - b. Notify controlling agency.
 - c. Transponder — Emergency 7700.
 - d. ELT Switch (if installed) — ON.
 - e. Life vests — On.



Inform passengers **not** to inflate life vests while inside aircraft.

- f. Brief passengers as required.
 - (1) Use of available flotation equipment.
 - (2) Location and operation of emergency exits. **Do not** open lower cabin door at any time.
 - (3) All loose items — secure.
 - (4) Emergency landing brace position.
 - (5) Several impacts may be felt, depending on the sea conditions. Do not release seat belts after first impact is felt.
 - g. NO SMOKING/FASTEN SEAT BELTS Switch — ON.
 - h. Seat belts — On until aircraft comes to a complete stop.
 - i. FUEL JTSN Switch — ON (lights on). Set switch Off (lights off) when jettison is complete or prior to touchdown.
2. LANDING GEAR Switch — UP.
 3. Flaps — DN.



The landing gear warning horn will sound with landing gear up and flaps down.

4. CABIN AIR or CAB AIR Switch — OFF.

DITCHING (CONT)

5. EMER BAT or EMER PWR Switch(es) — OFF.
6. Perform normal power-on approach at VREF.



Plan landing direction as follows:

- a. Calm Sea — Into wind.
 - b. Moderate Swells — Parallel to swells.
 - c. High Winds — Into wind, attempting to land on up-wind (far) side of swell.
7. Thrust Levers — CUTOFF at touchdown.
 8. FIRE PULL or ENG FIRE PULL T-Handles — Pull.
 9. Battery Switches — OFF.
 10. Emergency Exit(s) — Open after airplane comes to a complete stop. **Do not** open lower cabin door at any time.

In the event of failure of the normal brake system, emergency brakes can be used to stop the airplane. When using emergency braking, anti-skid protection is not available, and the anti-skid OFF corrections presented in Section V will be applicable.

- 1. Pull EMER BRAKE handle out of recess.**
- 2. Push downward on handle to apply brake pressure.**

NOTE

- The EMER BRAKE handle must be pushed down approximately 2 inches before braking action begins. To realize the optimum benefit from the emergency braking system, the following technique should be employed:
 - a. Apply the brakes smoothly with small movements to produce improved feel and reduce the probability of tire skid. Do not pump the brake handle.
 - b. Avoid taxiing if sufficient brake pressure is not available.
 - An emergency air bottle charged to the lower end of the green segment (1800 psi) will provide for landing gear extension using the abnormal procedure and approximately 10 brake applications.
3. Rudder and/or nose wheel steering — As required for directional control.

EMERGENCY EVACUATION

- 1. Stop the aircraft.**
- 2. PARKING BRAKE — Set.**
- 3. Thrust Levers — CUTOFF.**
- 4. • If an engine fire is suspected:**
 - a. Applicable FIRE PULL or ENG FIRE PULL T-Handle — Pull.**
 - b. Either ARMED Light — Depress.**
 - c. Other FIRE PULL or ENG FIRE PULL T-Handle — Pull.**
- If engine fire is not suspected:**
 - a. Both FIRE PULL or ENG FIRE PULL T-Handles — Pull.**
- 5. Both Battery Switches — OFF.**

6. Evacuate the aircraft:
 - a. Cabin Entry Door — Open and exit aircraft. The upper door is openable with the landing gear retracted.
 - b. Aft Cabin Emergency Exit — Open and exit using the wing step area.

LANDING — BOTH ENGINES INOPERATIVE

Airplane best glide speed, in the clean configuration, is $V_{REF} + 60$. The still-air gliding distance is approximately 2 nm per 1000 feet of altitude.

1. If time permits:
 - a. Transponder — Emergency 7700.
 - b. Advise controlling agency.
 - c. Prepare passengers for emergency landing.
 - d. NO SMOKING/FASTEN SEAT BELTS Sign — ON.
2. FUEL JTSN Switch — ON (lights on). Set switch Off (lights out) after jettisoning is complete or prior to touchdown.
3. HYD PUMP Switch — On.
4. LANDING GEAR Switch — DN.
5. Flaps — DN.
6. FIRE PULL or ENG FIRE PULL T-Handles — Pull.

NOTE

Pulling the FIRE PULL or ENG FIRE PULL T-Handles stops the flow of fuel and hydraulic fluid to the engines, shuts off bleed air from the engines and arms the engine fire extinguisher systems.

7. START-GEN Switches — OFF.
8. Battery Switches — OFF.
9. EMER BAT or EMER PWR Switch(es) — OFF prior to touchdown.
10. Touch down in normal landing attitude.
11. After touchdown, Cabin Door and Emergency Exit — Open.

STALL WARNING ACTIVATES

The stall warning computer has sensed a limit angle of attack. The red STALL lights will flash, the control column stick shaker will activate, and the angle-of-attack indicators will be in the yellow segment. If the angle of attack continues to increase, the stick pusher will activate.



If the pusher has activated, or the aircraft is decelerating rapidly below shaker, priority must be given to immediately reducing the angle of attack rather than attempting to maintain altitude. If the aircraft is forced beyond the pusher angle of attack, a deep stall is possible, which may result in insufficient nose-down elevator authority to recover from a stall. In this event, retracting the flaps (if extended) may improve the elevator authority sufficiently to recover.

- 1. Lower the pitch attitude to reduce angle of attack.**
- 2. Thrust Levers — Set to takeoff power.**
- 3. Level the wings.**
- 4. Accelerate out of the stall condition.**

ABORTED TAKEOFF

1. **Thrust Levers — IDLE.**
2. **Wheel Brakes — Apply.**
3. **Spoilers — EXT.**

4. Drag Chute or Thrust Reversers (if installed) — Deploy, if necessary.
5. • *If rejected takeoff was made at a speed of less than 40 knots, one subsequent takeoff attempt may be made without any waiting period.*
 - *If rejected takeoff was made at a speed of between 40 and 80 knots, a 20-minute waiting period must be observed, and the main gear tires, wheels and brakes must be visually inspected before a subsequent takeoff attempt is made.*
 - *If rejected takeoff was made at a speed of greater than 80 knots, but with the airplane below the maximum landing brake energy weight (see applicable LANDING WEIGHT LIMITS chart in Section V), a 1-hour waiting period must be observed, and the main gear tires, wheels and brakes must be visually inspected before a subsequent takeoff attempt is made.*
 - *If a rejected takeoff was made at a speed of greater than 80 knots and with the airplane at or above the maximum landing brake energy weight (see applicable LANDING WEIGHT LIMITS chart in Section V), see maintenance personnel to perform the High Energy Stop inspection.*

NOTE

- If the stop was conducted above the landing maximum brake energy limit, it is recommended that the PARKING BRAKE be released and chocks used. This will increase the brake cooling efficiency and reduce the possibility of wheel fuse plug release and brake/tire fire.
- Do not attempt a third takeoff after two rejected takeoffs without a 4-hour waiting period and another visual inspection of the main gear tires, wheels, and brakes.

SECTION IV — ABNORMAL PROCEDURES

TABLE OF CONTENTS

Anti-Icing

ALC AI Light Illuminated	4-1
Engine Ice Ingestion	4-1
ENG ICE Light Illuminated	4-2
Inadvertent Icing Encounter	4-3
Pitot Heat Light Illuminated (if installed)	4-4
Stabilizer Heat Failure	4-4
STAB OV HT Light Illuminated	4-5
Wing Heat Failure	4-6
WING OV HT Light Illuminated	4-7
Windshield Heat Failure	4-7
WSHLD OV HT Light Illuminated	4-8

Electrical

Single Generator Failure	4-9
Inverter Failure — Partial AC Power Loss	4-10

Engine

Abnormal Engine Operation	4-11
FUEL CMPTR Light Illuminated	4-11
ENG CHIP Light Illuminated	4-12
Engine Overspeed	4-13
Engine Shutdown in Flight	4-13
Starter Engaged Light Remains Illuminated After Start	
<i>Aircraft 35-067 thru 35-389 except 35-370</i>	
<i>and 36-018 thru 36-047 when incorporating</i>	
<i>AMK 80-17 but not incorporating AAK 81-1</i>	4-14
<i>Aircraft 35-370, 35-390 & Subsequent,</i>	
<i>and 36-048 & Subsequent and prior aircraft</i>	
<i>incorporating AAK 81-1</i>	4-15

Environmental

Failure to Depressurize on the Ground	4-16
Inadvertent Activation of Emergency Airflow — Aircraft 35-107,	
35-113 & Subsequent and Aircraft	
36-032 & Subsequent	4-16
Overpressurization	4-17

TABLE OF CONTENTS (Cont)

Cabin Altitude Exceeds 8500 Feet — Aircraft 35-067 thru 35-112 except 35-107 and Aircraft 36-018 thru 36-031	4-18
CAB ALT Light Illuminated or Cabin Altitude Exceeds 8500 Feet — Aircraft 35-107, 35-113 & Subsequent and Aircraft 36-032 & Subsequent	4-19
Oxygen Duration	
Aircraft with ZMR 100 Series Crew Masks (Figure 4-1)	4-22
Aircraft with 6600214 Series Crew Masks (Figure 4-2)	4-23
Aircraft with Scott ATO Crew Masks (Figure 4-3)	4-24
To Return to Automatic Pressurization Mode — Aircraft 35-067 thru 35-112 except 35-107 and Aircraft 36-018 thru 36-031	4-25
To Return to Normal Pressurization Airflow — Aircraft 35-107, 35-113 & Subsequent and Aircraft 36-032 & Subsequent	4-26

Flight Controls

AUG AIL Light Illuminated	4-27
Mach Trim Malfunction — Aircraft 35-247 & Subsequent, Aircraft 36-045 & Subsequent, and Prior Aircraft Incorporating SB 35/36-22-4	4-27
Stall Warning System Failure	4-28
Yaw Damper Failure	4-28

Fuel

Crossflow Valve Fails to Open	4-29
FUEL FILTER Light Illuminated	4-29
Fuel Imbalance During Fuel Transfer	4-30
Fuel Jettison	4-31
Fuel Transfer Valve Fails to Close	4-32
Fuel Valve Lights	4-32
LOW FUEL Light Illuminated	4-32
Normal Fuel Transfer System Failure	
Aircraft with FUS VALVE Switch	4-33
Aircraft without FUS VALVE Switch	4-33
Standby Pump Fails to Shut Off — Aircraft Incorporating SB 35/36-28-11	4-34
Tip Tank Fails to Transfer Fuel	4-34

Hydraulic

Hydraulic System Failure/Alternate Gear Extension	4-35
Low Hydraulic Pressure Light Illuminated	4-36

TABLE OF CONTENTS (Cont)

Instruments/Avionics

Pitot-Static System Malfunction.....	4-37
Vertical Gyro Monitor Light Illuminated	4-38

Landing Gear

Alternate Gear Extension/Electrical Malfunction.....	4-39
Alternate Gear Extension/Hyd Malfunction..... (See Hydraulic System)	
ANTI-SKID GEN Light Illuminated — Anti-Skid Off Operation	4-39
Nose Wheel Steering Malfunction	4-40

Landings

Gear Up Landing.....	4-40
Hydraulic System Failure Landing	4-42
Jammed Stabilizer Landing.....	4-43
One or Both Spoilers Up Landing.....	4-43
Partial Flap Landing.....	4-44
Single-Engine Landing	4-44
Stabilizer Heat Failure — Landing	4-45
Wing Heat Failure — Landing.....	4-45
Wing and Stab Heat Failure — Landing.....	4-45

Turbulent Air Penetration	4-46
--	-------------

Operation With One Fuel Computer Inoperative	4-47
---	-------------

Starting Engines	4-47
Before Taxi	4-48
Taxi.....	4-48
Takeoff	4-48
Cruise.....	4-49
Approach	4-49
Go Around (One or Two Engine)	4-49

Operation With Nose Wheel Steering Inoperative	4-50
---	-------------

Taxi.....	4-50
Runway Lineup	4-50
Takeoff	4-50

INTRODUCTION TO ABNORMAL PROCEDURES

The procedures in this section of the manual have been developed by Learjet Inc. for certification of this aircraft. This section contains those operating procedures requiring the use of special systems and/or alternate use of regular systems which, if followed, will maintain an acceptable level of airworthiness or reduce operational risk resulting from a failure condition. Procedures or parts of procedures in this section emphasized by enclosure in a box such as this  should be accomplished without reference to this manual.

The procedures located in this section supplement Normal Procedures when a failure condition exists. Use of Normal Procedures should be continued when applicable. Sound judgement, as well as thorough knowledge of the aircraft, its characteristics, and the flight manual procedures are essential in the handling of any failure condition.

OVERRIDING CONSIDERATIONS

In all emergencies, the overriding consideration must be to:

- Maintain Airplane Control
- Analyze the Situation
- Take Proper Action

TERMINOLOGY

Some abnormal procedures require that a landing be made as soon as practical. Refer to emergency procedures (page III-3) for complete definitions of the terms “land as soon as possible” and “land as soon as practical.”

ALC AI LIGHT ILLUMINATED

Illumination of the amber ALC AI light indicates the alcohol level in the windshield/radome alcohol reservoir is low or depleted.

1. WSHLD/RADOME Switch — OFF when alcohol stops flowing.
2. After landing, assure alcohol reservoir is properly replenished.

ENGINE ICE INGESTION

Engine ice ingestion can result in fan damage and abnormal engine operation. Engine ice ingestion can be suspected whenever ice is shed from the wing, fuselage, windshield, or nacelle. This may occur when anti-ice systems are energized after significant ice accumulation has occurred on the above surfaces. Ice ingestion may be evident by a change in engine sound or frequency, audible report, sharp rise in Turbine Temperature (ITT), or RPM hang-up.

Experience to date has shown that, if proper procedures are observed, there is a very high probability of satisfactory engine operation after experiencing foreign object damage from ice in the engine fan. Such damage can reduce the compressor stall margin so that the engine could become more sensitive to rapid thrust lever movements, inlet pressure profile variation due to maneuvering, and high RPM operation. Some compressor stalls will result in engine flameout.

1. AIR IGN Switches — On. Leave On for the duration of the condition.
2. Thrust Lever movements should be slow and cautious.
3. Engine RPM — Set as low as possible to maintain anti-icing heat and cabin pressure.
4. Avoid any abrupt changes in pitch, yaw or roll.
5. To determine extent of engine damage due to ice ingestion, proceed as follows:
 - a. Thrust Levers (one at a time) — Retard to flight idle. Then cautiously advance and check for any vibration or abnormal noise on each engine.



If compressor stall is encountered, retard thrust lever until smooth operation is obtained. (If any of the fan blades have been damaged, the noise level and frequency will increase with an increase of RPM).

ENGINE ICE INGESTION (CONT)

- b. If either engine flames out, airstart in accordance with ENGINE AIRSTART procedure, Section III. After restart, repeat step 5, but stay below engine speed at which engine flamed out.
- c. If ice damage has been experienced, land as soon as practical and within limitations of operating capacity of engine as defined by this procedure.



After landing, inspect engine for damage any time inadvertent icing conditions have been encountered.

ENG ICE LIGHT ILLUMINATED

A failure of the nacelle heat system (bleed air) is indicated by illumination of the amber L or R ENG ICE light. Two types of failures are annunciated with these lights. The first is an uncommanded application of nacelle heat, and the second is a failure of nacelle heat to activate when commanded.

Affected Engine:

1. NAC HT Circuit Breaker (Main Bus) — Pull and/or reset.

If light remains illuminated:

2. • If associated NAC HEAT switch is OFF, Engine RPM — Reduce to minimum required.
- If associated NAC HEAT switch is On, Engine RPM — Increase to improve airflow. Fly out of icing conditions if possible.

INADVERTENT ICING ENCOUNTER

• If icing is inadvertently encountered:

1. All Anti-Ice Systems — Activate immediately to preclude ice accumulation.

If approach and landing must be made with any amount of ice on the airframe:

- a. Do not extend flaps beyond 20°.
- b. Use landing procedure for a wing and stabilizer heat failure. Refer to LANDINGS, this section.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can cause angle-of-attack indicator information to be unreliable.

NOTE

Ice accumulation on the stabilizer may cause deterioration in trim speeds and changes in handling characteristics. Low speed flight should be approached with care so that detection of abnormal flying qualities can be obtained. It may be necessary to land with flaps at 20° as some buffet and/or some nose pitch may be encountered with the flaps full down.

• If heavy ice accumulation has occurred, proceed as follows:

If en route and destination temperatures remain below freezing, consideration should be given to landing with ice on the wings.

• If landing with ice on the wings and stabilizer:

1. Use landing procedure for a wing and stabilizer heat failure. Refer to LANDINGS, this section.

• If attempting to remove ice accumulation:

1. AIR IGN Switches — On.
2. Engine RPM — Set as low as possible to maintain anti-icing heat and cabin pressure.
3. NAC HEAT Switch (for one engine) — On; wait until satisfactory engine operation is apparent, then opposite engine NAC HEAT Switch — On; observe Turbine Temperature (ITT) rise and ENG ICE light out for operation of engine anti-ice.
4. After satisfactory engine operation is apparent, STAB WING HEAT Switch — On.
5. After satisfactory engine operation is again apparent, energize remaining anti-ice systems, one system at a time, waiting for satisfactory engine operation between energizing each system.

PITOT HEAT LIGHT ILLUMINATED (If Installed)

Illumination of a Pitot Heat light indicates that one or more of the pitot tube heaters are inoperative or one or both PITOT HEAT switches are OFF. Several configurations of the pitot heat monitor exist:

- Single PITOT HEAT light on the instrument panel
 - L PITOT HEAT and R PITOT HEAT lights on the instrument panel
 - Single PITOT HT light on the annunciator panel
1. PITOT HEAT Switches — Check, On.
 2. L and R PITOT HT Circuit Breakers (Ess Bus) — Check, In.
 3. Pilot's and Copilot's Air Data Instruments — Crosscheck.

STABILIZER HEAT FAILURE

With the STAB WING HEAT switch On, a stabilizer heat failure is indicated by the STAB TEMP Indicator remaining in the red (below 35°F [1.7°C]) range.

1. STAB & WING HT Circuit Breaker (copilot's main bus) — Check and reset if necessary.
2. Engine RPM — Adjust as required to maintain STAB TEMP indicator in the green range.
3. If STAB TEMP indicator remains in the red range:
 - a. Fly out of icing conditions, if possible.
 - b. Do not extend flaps beyond 20°.
4. On aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031, if cabin altitude climbs to an unacceptable level, CABIN AIR Switch — MAX. Descend to an acceptable level.

Ice accumulation on the stabilizer may cause deterioration in trim speeds and changes in handling characteristics. Low speed flight should be approached with care so that detection of abnormal flying qualities can be obtained. It may be necessary to land with flaps at 20° as some buffet and/or some nose pitch may be encountered with the flaps full down.

For landing procedure with a stabilizer heat failure, refer to LANDINGS, this section.

STAB OV HT LIGHT ILLUMINATED

Illumination of the STAB OV HT light indicates that the horizontal stabilizer structure has reached a temperature of 215°F (102°C).

1. STAB TEMP Indicator — Check.
2. If STAB TEMP indicator is approaching or in the yellow range, a stabilizer overheat condition exists:
 - a. Engine RPM — Reduce until STAB TEMP indicator is back in the green range.
 - b. *If overheat condition remains:*
 - (1) STAB WING HEAT Switch — OFF.
 - (2) Fly out of icing conditions.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can cause angle-of-attack indicator information to be unreliable.

If approach and landing must be made with any ice (or suspected ice during night operations) on the wing leading edge, refer to LANDINGS, this section.

WING HEAT FAILURE

With the STAB WING HEAT switch On, a failure is indicated by the WING TEMP indicator remaining in the red (below 35°F [1.7°C]) range and/or visual indications of ice accumulation.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can cause angle-of-attack indicator information to be unreliable.

1. STAB & WING HT Circuit Breaker (copilot's main bus) — Check and reset if necessary.
2. Engine RPM — Adjust as required to maintain WING TEMP indicator in the green range.
3. If WING TEMP indicator remains in the red range and/or visual indications of ice accumulation remain, fly out of icing conditions.
4. *On aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031*, if cabin altitude climbs to an unacceptable level, CABIN AIR Switch — MAX. Descend to an acceptable level.

If approach and landing must be made with any ice (or suspected ice during night operations) on the wing leading edge, refer to LANDINGS, this section.

WING OV HT LIGHT ILLUMINATED

Illumination of the WING OV HT light indicates that the wing structure has reached a temperature of 215°F (102°C).

1. WING TEMP Indicator — Check.
2. If WING TEMP indicator is approaching or in the yellow range, a wing overheat condition exists:
 - a. Engine RPM — Reduce until WING TEMP indicator is back in the green range.
 - b. *If overheat condition remains:*
 - (1) STAB WING HEAT Switch — OFF.
 - (2) Fly out of icing conditions.

WARNING

Even **small** accumulations of ice on the wing leading edge can cause aerodynamic stall prior to activation of the stick shaker and/or pusher. These ice accumulations can cause angle-of-attack indicator information to be unreliable.

If approach and landing must be made with any ice (or suspected ice during night operations) on the wing leading edge, refer to LANDINGS, this section.

WINDSHIELD HEAT FAILURE

With the windshield heat system activated, a failure is indicated by the formation of ice on the heated portion of the windshield.

1. WSHLD HT Circuit Breaker (pilot's main bus) — Check and reset if necessary.
2. • Aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031, WSHLD HEAT AUTO-MAN Switch — AUTO.
• Aircraft 35-107, 35-113 & subsequent and 36-032 & subsequent, WSHLD HT Switch — ON.
3. Engine RPM — Increase as required to improve airflow.
4. On aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031, if cabin altitude climbs to an unacceptable level, CABIN AIR Switch — MAX. Descend to an acceptable level.

WINDSHIELD HEAT FAILURE (CONT)

If system fails to anti-ice the windshield:

5. • Aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031, WSHLD & RADOME/RADOME Switch — WSHLD & RADOME, if required. This will anti-ice the radome and windshield with alcohol flow for approximately 45 minutes.
- Aircraft 35-107, 35-113 & subsequent and 36-032 & subsequent, WSHLD/RADOME-RAD Switch — WSHLD/RADOME, if required. This will anti-ice the radome and windshield with alcohol flow for approximately 45 minutes.
6. • Aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031, WSHLD & RADOME/RADOME Switch — OFF when ALC AI light illuminates or clear of icing conditions.
- Aircraft 35-107, 35-113 & subsequent and 36-032 & subsequent, WSHLD/RADOME-RAD Switch — OFF when ALC AI light illuminates or clear of icing conditions.

WSHLD OV HT LIGHT ILLUMINATED

Illumination of the WSHLD OV HT light indicates the bleed air temperature in the windshield nozzles has exceeded the system limits. Airflow should automatically shut off when the WSHLD OV HT light illuminates.

If airflow did not shut off when WSHLD OV HT light illuminated:

1. • Aircraft 35-067 thru 35-112 except 35-107 and 36-018 thru 36-031:
 - a. WSHLD HEAT AUTO-MAN Switch — MAN.
 - b. WSHLD HEAT ON-OFF Switch — Hold to OFF until airflow stops.
 - c. **If WSHLD OV HT light remains on**, reduce engine power and/or push in IN NORMAL OUT DEFOG knob to reduce hot airflow to windshield.
- Aircraft 35-107, 35-113 & subsequent and 36-032 & subsequent, WSHLD HT Switch — OFF.

SINGLE GENERATOR FAILURE

1. Electrical Load — Reduce.
 - a. COOL-FAN-OFF Switch — OFF.
 - b. Shed other loads as required to observe generator limits.
2. IGN & ST Circuit Breaker (main power bus) — Check and reset.
3. START-GEN Switch — GEN.

NOTE

START-GEN switch must be set to GEN for GEN RESET switch to be effective.

4. GEN RESET Switch — Depress momentarily.

CAUTION

Depressing and holding the GEN RESET switch longer than one-half second, or multiple activations, may cause damage to the electrical system.

If Generator Does Not Reset:

5. Turbine Speed (N2) — 80% or greater.
6. START-GEN Switch — OFF, then GEN.
7. GEN RESET Switch — Depress momentarily.

If Generator Does Not Reset:

8. START-GEN Switch — OFF.

INVERTER FAILURE — PARTIAL AC POWER LOSS

An inverter system failure is indicated by illumination of the PRI INV, SEC INV, and/or AUX INV (if installed) lights. An INV light will illuminate whenever the associated inverter is on and voltage and/or current flow on the corresponding AC bus falls below a minimum value. The most likely cause is either an inverter failure or open AC BUS circuit breaker. The PRI and SEC INV lights will also illuminate whenever the BATTERY switches are on and the respective INVERTER switch is OFF.

FAILURE OF PRI OR SEC INVERTER SYSTEM

1. INV (main power bus) and AC BUS (ac bus) Circuit Breakers — Check and reset.



Allow approximately one minute cooling time before re-setting either INV circuit breaker.

2. Failed INVERTER Switch — OFF, then On.
3. Failed INV Circuit Breaker — Pull, then reset.

If malfunction does not clear:

4. Failed INVERTER Switch — OFF.
5. Corresponding AC BUS Circuit Breaker — Pull.
6. AC BUS TIE Circuit Breaker (copilot's panel) — Check and reset. If it opens after resetting, leave it open.



If only one inverter is operational, reduce load on both AC buses. Both AC buses will be powered by the operating inverter providing the AC BUS TIE circuit breaker is closed.

7. AUX INVERTER Bus Switch (if installed) — Select failed bus (L or R BUS).



Malfunction of the auxiliary inverter system, after being connected to the failed AC bus, indicates a fault on the AC bus.

INVERTER FAILURE — PARTIAL AC POWER LOSS (CONT)

If auxiliary inverter system malfunctions:

- a. AUX AC BUS Circuit Breaker (ac bus) associated with failed AC bus — Pull.
- b. AUX INVERTER Bus Switch — Select opposite AC bus.
- c. AUX INV Circuit Breaker (copilot's ess bus) — Check and reset. Allow approximately one minute cooling time before resetting.

FAILURE OF AUXILIARY INVERTER SYSTEM (If Installed)

1. AUX INVERTER Switch — OFF.
2. L and R AUX AC BUS Circuit Breakers (ac bus) — Pull.

ABNORMAL ENGINE OPERATION

(FAN SPEED [N1] OR TURBINE SPEED [N2] DECREASING OR INAPPROPRIATE FOR THRUST LEVER POSITION)

Affected Engine:

1. Thrust Lever — IDLE.
2. FUEL CMPTR Switch — OFF.
3. If engine characteristics appear normal, continue flight with fuel computer in manual mode. Follow the appropriate sections of FUEL CMPTR LIGHT ILLUMINATED procedure, this section.

FUEL CMPTR LIGHT ILLUMINATED

Illumination of an amber FUEL CMPTR light indicates that the corresponding fuel computer has failed or the corresponding FUEL CMPTR switch is OFF. Automatic fuel regulation functions of the affected engine are lost and engine operation reverts to fuel computer off mode. Engine instruments must be monitored to ensure limits are maintained.

Engine thrust may tend to increase or decrease depending on ambient temperature and flight conditions.



Engine acceleration with fuel computer inoperative is much slower than with fuel computer on.

FUEL CMPTR LIGHT ILLUMINATED (CONT)

Affected Engine:

1. FUEL CMPTR Circuit Breaker (ess bus) — Check and reset if necessary.
2. FUEL CMPTR Switch — Cycle once. If fuel computer does not come back on line, FUEL CMPTR Switch — OFF.



Fan Speed (N1) must be 50% to 60% when switching from Fuel Computer OFF to Fuel Computer On operation. This procedure prevents RPM droop caused by rapid dropout of the manual mode governor and the lag setup of the computer governor.

3. CROSSFLOW Switch — CLOSE.
4. FUS TANK Switches — As follows:
 - a. XFER-FILL Switch — OFF.
 - b. FUS VALVE Switch (if installed) — CLOSE.
5. STANDBY PUMP Switch — ON.
6. JET PUMP Switch — Off.



Use of the standby pump as the primary pump on the engine with the inoperative fuel computer will prevent fuel control pneumatic circuit icing by recirculating fuel within the fuel control.

To crossflow or transfer fuel:



- Monitor turbine (N2) and fan (N1) speed during fuel transfer.
- Before switching JET PUMP switch to ON, ensure steady engine operation at 80% N1 or above.

7. JET PUMP Switch (affected engine) — ON.
8. STANDBY PUMP Switch (affected engine) — Off.
9. Crossflow or transfer fuel as required.
10. STANDBY PUMP Switch (affected engine) — ON.
11. JET PUMP Switch (affected engine) — Off.

ENG CHIP LIGHT ILLUMINATED

Illumination of either the LH or RH ENG CHIP light (if installed) indicates the presence of metallic particles in the engine oil.

1. Engine Instruments — Monitor for indication of malfunction.
2. Investigate cause at earliest possible maintenance.

ENGINE OVERSPEED

Affected engine:

1. Thrust Lever — Retard.



Do not set affected engine FUEL CMPTR switch OFF. The fuel computer provides additional overspeed protection which may be beneficial.

2. If engine does not respond to thrust lever movement — shutdown engine. Refer to ENGINE SHUTDOWN IN FLIGHT procedure, this section.

ENGINE SHUTDOWN IN FLIGHT

Affected Engine:

1. ENG SYNC Switch — OFF.
2. Thrust Lever — CUTOFF.



The engine fuel and hydraulic pumps will continue to operate with a windmilling engine. Prolonged operation without fluid available to the pumps may cause damage. Therefore, the FIRE PULL or ENG FIRE PULL T-Handle should not be pulled unless a fuel or hydraulic leak is suspected.

3. Rudder Trim — As required.
4. Yaw Damper — Engage.
5. AIR IGN Switch — OFF.
6. START-GEN Switch — OFF.
7. Electrical Load — Reduce.



During single-engine operation, the COOL-FAN switch should be placed to OFF to prevent overloading the operating generator.

8. BLEED AIR Switch — OFF.
9. CROSSFLOW Switch — OPEN. Monitor fuel balance. Crossflow as required.



During single-engine operation, maintain slip indicator ball centered.

10. Refer to ENGINE AIRSTARTS, Section III or SINGLE-ENGINE LANDING, this section.

STARTER ENGAGED LIGHT REMAINS ILLUMINATED AFTER START

(Aircraft 35-067 thru 35-389 except 35-370 and 36-018 thru 36-047 when incorporating AMK 80-17 but not incorporating AAK 81-1)

GROUND START (Fuel Computer ON or OFF)

1. Affected START-GEN Switch — GEN.
 - **If Starter Engaged light remains illuminated**, the starter has not disengaged.
2. Shut down affected engine.
3. Turn off all electrical power.
4. **Do not dispatch** until trouble has been corrected.

STARTER-ASSIST AIRSTART (Fuel computer ON or OFF)

1. Complete airstart procedure.
2. Affected START-GEN Switch — GEN.
 - **If Starter Engaged light goes out**, the starter has disengaged.
 - a. Continue flight.
 - b. Correct trouble before next flight.
 - **If Starter Engaged light remains illuminated**, the starter has not disengaged.
 - a. Affected IGN & ST Circuit Breaker (applicable main bus) — Pull.

NOTE

Opening an IGN & ST circuit breaker will render the corresponding generator inoperative and cause the corresponding GEN light to illuminate.

- **If Starter Engaged light goes out**, the starter has disengaged.
 - (1) Continue flight.
 - (2) Refer to SINGLE GENERATOR FAILURE, this section.
 - (3) Correct problem before next flight.
- **If Starter Engaged light remains illuminated**, the starter has not disengaged.
 - (1) Affected IGN & ST Circuit Breaker — Reset.
 - (2) Land as soon as practical.
 - (3) Correct problem before next flight.

**STARTER ENGAGED LIGHT REMAINS ILLUMINATED
AFTER START**

(Aircraft 35-370, 35-390 & subsequent; 36-048 & subsequent
and prior aircraft incorporating AAK 81-1)

GROUND START (Fuel Computer ON or OFF)

1. Affected START-GEN Switch — GEN.
 - **If Starter Engaged light remains illuminated**, both contactors have failed and starter is still engaged.
 - **If Starter Engaged light goes out**, one contactor has failed and starter has disengaged. The starter will be energized anytime the START-GEN Switch is in the OFF or START positions.
2. Shut down affected engine.
3. Turn off all electrical power.
4. **Do not dispatch** until trouble has been corrected.

STARTER-ASSIST AIRSTART (Fuel Computer ON or OFF)

1. Complete airstart procedure.
2. Affected START-GEN Switch — GEN.
 - **If Starter Engaged light goes out**, one contactor has failed and starter has disengaged. The starter will be energized anytime the START-GEN Switch is in the OFF or START position.
 - a. Continue flight.
 - b. Correct trouble before next flight.
 - **If Starter Engaged light remains illuminated**, both contactors have failed and starter is still engaged.
 - a. Affected IGN & ST Circuit Breaker (applicable main bus) — Pull.

NOTE

Opening an IGN & ST circuit breaker will render the corresponding generator inoperative and cause the corresponding GEN light to illuminate.

- **If Starter Engaged light goes out**, the starter has disengaged.
 - (1) Continue flight.
 - (2) Refer to SINGLE GENERATOR FAILURE, this section.
 - (3) Correct problem before next flight.
- **If Starter Engaged light remains illuminated**, the starter has not disengaged.
 - (1) Affected IGN & ST Circuit Breaker — Reset.
 - (2) Land as soon as practical.
 - (3) Correct problem before next flight.

FAILURE TO DEPRESSURIZE ON THE GROUND

1. CABIN AIR or CAB AIR Switch — OFF.
2. Both BLEED AIR Switches — OFF.

INADVERTENT ACTIVATION OF EMERGENCY AIRFLOW (Aircraft 35-107, 35-113 & subsequent and aircraft 36-032 & subsequent)

1. Retard power to 90% RPM or below if practical.
2. • Aircraft not incorporating AMK 90-3, reset L.H. MOD VAL circuit breaker (pilot's main bus) or R.H. MOD VAL circuit breaker (copilot's main bus) if tripped.
- Aircraft incorporating AMK 90-3, reset L EMER PRESS circuit breaker (pilot's main bus) or R EMER PRESS circuit breaker (copilot's main bus) if tripped.



Emergency airflow is activated with the loss of electrical power.

If emergency airflow continues:

3. One BLEED AIR Switch — OFF. If emergency flow stops, continue with BLEED AIR Switch — OFF.

If emergency airflow continues:

4. BLEED AIR Switch — On and other BLEED AIR Switch — OFF.

OVERPRESSURIZATION (Differential pressure exceeds red arc)

1. AUTO MAN Switch — MAN.
2. UP DN Manual Control (red) — UP as required to maintain satisfactory pressurization.

If unable to regulate the overpressurization in manual mode:

3. One BLEED AIR Switch — OFF.
4. Adjust power on opposite engine to control cabin pressurization.

CABIN ALTITUDE EXCEEDS 8500 FEET (Aircraft 35-067 thru 35-112 except 35-107 and aircraft 36-018 thru 36-031)

1. Crew Oxygen Masks — Don. Select 100% oxygen.

NOTE

At 10,000 (± 500) feet cabin altitude, control pressure to the outflow valve is trapped. This deactivates the Automatic Mode and stops cabin altitude from rising higher if the failure is in the automatic control system.

2. If aircraft is climbing, stop climbing and level off at (or descend to) the nearest appropriate altitude.
3. Pilot and Copilot OXY-MIC Switches — ON.

NOTE

Communication between crew members can be accomplished by using the INPH function of the AUDIO CONTROL PANEL and increasing the MASTER VOL level.

4. CABIN AIR Switch — NORM.
5. L and R BLEED AIR Switches — On.
6. Cabin Altitude — Check.
7. • **If cabin altitude continues to climb:**
 - a. AUTO-MAN Switch — MAN.
 - b. UP-DN Manual Control (red) — As required to maintain satisfactory pressurization.
- **If cabin altitude continues to climb:**
 - c. Engine RPM — Maintain.
 - d. IN NORMAL OUT DEFOG Knob — Push in.
 - e. WSHLD HEAT Switch — AUTO.
 - f. CABIN AIR Switch — OFF.
- **If cabin altitude stabilizes at a safe altitude:**
 - a. Continue flight. Continued use of the oxygen system is at the crew's discretion.

CAB ALT LIGHT ILLUMINATED OR CABIN ALTITUDE EXCEEDS 8500 FEET (Aircraft 35-107, 35-113 & subsequent and aircraft 36-032 & subsequent)

1. Crew Oxygen Masks — Don. Select 100% oxygen.



Whenever cabin altitude exceeds 8,750 (± 250) feet, the amber CAB ALT light illuminates and control pressure to the outflow valve is trapped. This deactivates the Automatic Mode and stops cabin altitude from rising higher if failure is in automatic control system.

2. If aircraft is climbing, stop climbing and level off at (or descend to) the nearest appropriate altitude.
3. Pilot and Copilot OXY-MIC Switches — ON.
4. CAB AIR Switch — ON.
5. L and R BLEED AIR Switches — ON.
6. Cabin Altitude — Check.

Continued

CAB ALT LIGHT ILLUMINATED OR CABIN ALTITUDE EXCEEDS 8500 FEET (*Aircraft 35-107, 35-113 & subsequent and aircraft 36-032 & subsequent*) (CONT)

7. • If cabin altitude continues to climb:

- a. AUTO MAN Switch — MAN.
- b. UP DN Manual Control (red) — UP or DN as required to maintain satisfactory pressurization.

If cabin altitude continues to climb:

- c. L and R BLEED AIR Switches — EMER.

NOTE

- Windshield and stab/wing bleed air anti-ice are not available with both left and right bleed air systems in the emergency pressurization mode. Nacelle Heat and Windshield/Radome alcohol anti-ice will be available.
- The emergency pressurization valves will automatically reposition to the emergency mode and route full bleed air into the cabin at 9,500 (± 250) feet cabin altitude with the BLEED AIR switches in the ON position and the EMER PRESS switches (if applicable) in the NORMAL position.

• If cabin altitude stabilizes at a safe altitude:

- a. Continue flight. Continued use of the oxygen system is at the crew's discretion.
- b. If cabin temperature becomes hot from the use of EMER BLEED AIR:
 - (1) One BLEED AIR Switch — OFF. Ensure cabin pressure is maintained. It is recommended that the Left BLEED AIR switch be set to OFF first because the RH air distribution system delivers air more evenly to the crew compartment and cabin and is required for internal defog of the windshield.
 - (2) If temperature is still too high, reduce power on engine supplying bleed air.

INTENTIONALLY LEFT BLANK

OXYGEN DURATION — MINUTES

Aircraft with ZMR 100 Series Crew Masks

FULLY CHARGED SYSTEM

Final Stabilized Cabin Altitude — 1000 Feet		2 Crew —	2 Crew 2 Pass	2 Crew 4 Pass	2 Crew 6 Pass	2 Crew 8 Pass	2 Crew 9 Pass	2 Crew 11 Pass
	40	251	80	48	35	28	25	22
	35	182	71	45	33	26	24	20
	30	135	63	42	32	26	23	20
	25	105	56	39	30	25	23	20
	20	175	73	47	35	29	26	23
		84	51	37	29	25	23	20
	15	124	63	44	34	28	26	23
		67	45	34	28	24	23	20
	10	91	PASSENGER OXYGEN NOT REQUIRED					
54								
8	82							
	50							
7	78							
	48							

- **Bold** face numbers (xxx) indicate 100% oxygen (100% OXY position on regulator).
- Light face numbers (xxx) indicate Diluter Demand (NORMAL position on regulator).
- Crew and passenger oxygen masks are not approved for use above 40,000 feet cabin altitude. **Passenger durations above 30,000 feet cabin altitude are provided for information only. Passenger masks will not provide sufficient oxygen for prolonged operation above 34,000 feet cabin altitude. Prolonged operation above 25,000 feet cabin altitude with passengers on board is not recommended.**
- Prior to overwater flights, plan oxygen requirements to provide sufficient oxygen for all occupants in the event of a pressurization failure. Additional oxygen may be required to assure that both oxygen duration and range (fuel) requirements are satisfied.
- For cabin altitudes of 10,000 feet and above, the oxygen duration times include cabin altitude ascent time from 8000 feet to final stabilized cabin altitude.
- To calculate oxygen duration for a less than fully charged system the following formula may be used:

$$\text{Duration} = \text{Duration from chart} \times (\text{system pressure} \div 1850)$$

Figure 4-1

OXYGEN DURATION — MINUTES

Aircraft with 6600214 Series Crew Masks

FULLY CHARGED SYSTEM

Final Stabilized Cabin Altitude — 1000 Feet		2 Crew —	2 Crew 2 Pass	2 Crew 4 Pass	2 Crew 6 Pass	2 Crew 8 Pass	2 Crew 9 Pass	2 Crew 11 Pass
	40	267	84	51	36	29	26	22
		251	79	47	34	27	24	21
	35	195	76	48	35	28	26	22
		182	71	45	33	26	24	21
	30	219	73	49	36	29	26	22
		135	64	42	32	26	23	20
	25	252	83	50	37	29	26	22
		105	56	39	30	25	23	20
	20	228	81	51	37	30	27	24
84		50	37	29	25	23	20	
15	192	77	50	37	31	28	24	
	67	45	34	28	24	23	20	
10	163	PASSENGER OXYGEN NOT REQUIRED						
	54							
8	153							
	50							
7	148							
	48							

- **Bold face numbers (xxx)** indicate 100% oxygen.
- **Light face numbers (xxx)** indicate Diluter Demand.
- Crew and passenger oxygen masks are not approved for use above 40,000 feet cabin altitude. **Passenger durations above 30,000 feet cabin altitude are provided for information only. Passenger masks will not provide sufficient oxygen for prolonged operation above 34,000 feet cabin altitude. Prolonged operation above 25,000 feet cabin altitude with passengers on board is not recommended.**
- Prior to overwater flights, plan oxygen requirements to provide sufficient oxygen for all occupants in the event of a pressurization failure. Additional oxygen may be required to assure that both oxygen duration and range (fuel) requirements are satisfied.
- For cabin altitudes of 10,000 feet and above, the oxygen duration times include cabin altitude ascent time from 8000 feet to final stabilized cabin altitude.
- To calculate oxygen duration for a less than fully charged system the following formula may be used:

$$\text{Duration} = \text{Duration from chart} \times (\text{system pressure} \div 1850)$$

Figure 4-2

OXYGEN DURATION — MINUTES

Aircraft with Scott ATO Crew Masks

FULLY CHARGED SYSTEM

		2 Crew	2 Crew	2 Crew	2 Crew	2 Crew	2 Crew	2 Crew
		—	2 Pass	4 Pass	6 Pass	8 Pass	9 Pass	11 Pass
40	261	82	56	30	28	25	22	
	251	78	48	35	27	25	21	
35	192	76	47	35	28	25	22	
	182	73	45	35	25	24	20	
30	145	68	45	37	27	25	22	
	135	64	42	32	25	24	20	
25	153	70	46	34	28	25	22	
	105	56	39	30	25	24	20	
20	203	78	49	37	29	27	23	
	84	50	36	29	24	23	20	
15	261	86	53	39	32	29	25	
	67	45	34	28	24	23	20	
10	253	PASSENGER OXYGEN NOT REQUIRED						
	54							
8	153							
	50							
7	148							
	48							

- **Bold face numbers (xxx)** indicate 100% oxygen.
- **Light face numbers (xxx)** indicate Diluter Demand.
- Crew and passenger oxygen masks are not approved for use above 40,000 feet cabin altitude. **Passenger durations above 30,000 feet cabin altitude are provided for information only. Passenger masks will not provide sufficient oxygen for prolonged operation above 34,000 feet cabin altitude. Prolonged operation above 25,000 feet cabin altitude with passengers on board is not recommended.**
- Prior to overwater flights, plan oxygen requirements to provide sufficient oxygen for all occupants in the event of a pressurization failure. Additional oxygen may be required to assure that both oxygen duration and range (fuel) requirements are satisfied.
- For cabin altitudes of 10,000 feet and above, the oxygen duration times include cabin altitude ascent time from 8000 feet to final stabilized cabin altitude.
- To calculate oxygen duration for a less than fully charged system the following formula may be used:

$$\text{Duration} = \text{Duration from chart} \times (\text{system pressure} \div 1850)$$

Figure 4-3

**TO RETURN TO AUTOMATIC PRESSURIZATION MODE
(Aircraft 35-067 thru 35-112 except 35-107 and air-
craft 36-018 thru 36-031)**

If cabin pressurization control is regained in the manual mode, and it is desired to return to automatic mode of operation, proceed as follows:

NOTE

Whenever cabin altitude increases to 10,000 (± 500) feet or above, the automatic mode is deactivated until the cabin altitude is decreased to 7500 feet or below.

1. CABIN ALT Controller — Set at or below 7500 feet.
2. RATE Knob — Turn to full INCR.
3. UP DN Manual Control (red) — Control to altitude selected on CABIN ALT Controller.
4. CABIN CLIMB Indicator — Stabilize at Zero.
5. RATE Knob — Reset to nominal position.
6. AUTO MAN Switch — AUTO.
7. CABIN ALT Controller — Reset (if required) to appropriate cabin altitude for flight altitude.

**TO RETURN TO NORMAL PRESSURIZATION AIRFLOW
(Aircraft 35-107, 35-113 & subsequent and aircraft
36-032 & subsequent)**

If cabin altitude exceeds 8750 (± 250) feet, the Automatic Pressurization mode is deactivated and the amber CAB ALT light will illuminate. Automatic mode operation will not be available until the cabin altitude is decreased to extinguish the CAB ALT light.

If normal operation is assured and the CAB ALT light is out, the following procedure accomplishes resetting emergency pressurization valves and reactivation of automatic pressurization mode.

1. CAB AIR Switch — ON.
2. AUTO MAN Switch — MAN.
3. UP DN Manual Control (red) — UP or DN as required to maintain cabin altitude below 7,200 feet.
4. One BLEED AIR Switch — OFF then ON.
5. Other BLEED AIR Switch — OFF then ON.
6. UP DN Manual Control (red) — UP or DN as required to maintain cabin altitude appropriate for flight altitude.

Return To Automatic Mode if Desired

7. CABIN CONTROLLER — Set appropriate cabin altitude for flight altitude (at or below 7,200 feet).
8. UP DN Manual Control (red) — UP or DN as required to obtain cabin altitude selected on CABIN CONTROLLER.
9. AUTO MAN Switch — AUTO.

AUG AIL LIGHT ILLUMINATED

If the aileron augmentation system malfunctions, the AUG AIL light will illuminate and the spoilers will retract. Actuating the SPOILERON RESET switch will restore normal operation if the system malfunction clears.

NOTE

Landing on a wide runway of sufficient length with minimum turbulence and crosswind is recommended.

1. SPOILER Switch — RET.
2. SPOILERON RESET Switch — Hold momentarily to RESET.
3. If AUG AIL light illuminates again, pull the SPOILERON circuit breaker (copilot's ac bus).

WARNING

Do not reset the SPOILERON circuit breaker after it has been pulled. The monitor may be affected.

- a. Spoilers will be inoperative in flight.
- b. Spoilerons will be inoperative in flight.
- c. Spoilers will function normally during ground operations.

MACH TRIM MALFUNCTION — (Aircraft 35-247 & subsequent, aircraft 36-045 & subsequent, and prior aircraft incorporating SB35/36-22-4)

A Mach trim malfunction will be indicated by illumination of the red MACH TRIM warning light and, if above 0.74 MI with autopilot not engaged, the overspeed warning horn will sound:

1. Airspeed — Below 0.74 MI.
2. Check that Primary Pitch Trim is available:
 - a. PITCH TRIM Switch — PRI.
 - b. Primary PITCH Trim Circuit Breaker (pilot's ess bus) — Closed.
3. MACH TRIM Circuit Breaker (pilot's ac bus) — Check:
 - If the MACH TRIM circuit breaker is open:
 - a. Reset the MACH TRIM circuit breaker.
 - b. TEST Selector Switch — Rotate to MACH TRIM.
 - c. TEST Button (center of TEST selector switch) — Press, then release to resynchronize the system.
 - d. If the MACH TRIM circuit breaker opens again, leave it open.
 - If the MACH TRIM circuit breaker is closed, the Mach Trim Monitor has deactivated the system.
 - a. If it is desired to reset the Mach Trim Monitor:
 - (1) TEST Selector Switch — Rotate to MACH TRIM.
 - (2) TEST Button (center of TEST selector switch) — Press, then release to resynchronize the system.

MACH TRIM MALFUNCTION (CONT)

- b. If the MACH TRIM warning light continues to illuminate, MACH TRIM Circuit Breaker — Pull.



With the Mach trim system inoperative, flight above 0.74 Mi is permitted when the autopilot is engaged.

STALL WARNING SYSTEM FAILURE

If both left and right stall warning systems fail, the angle-of-attack indicator will also be inoperative and stalls may be avoided by reference to the air-speed indicator only. In this event:

1. Maintain airspeed at least 30 knots above stall speeds shown in Section V. Normal landing approach speed may be maintained on final approach in the landing configuration.
2. Limit bank angles to 30° maximum.
3. If L STALL WARNING switch is OFF, stick puller is inoperative, **Do not exceed MMO (0.74 Mi).**

If the left stall warning system should fail, primary yaw damper authority will not be reduced during approach to a stall. If the right stall warning system should fail, secondary yaw damper authority will not be reduced during approach to a stall. Therefore:

- If L STALL Fails:
 1. Select SEC yaw damper.
 2. If L STALL WARNING switch is OFF, stick puller is inoperative, **Do not exceed MMO (0.74 Mi).**
- If R STALL Fails:
 1. Select PRI yaw damper.

YAW DAMPER FAILURE

SINGLE YAW DAMPER FAILURE

1. Engage remaining yaw damper.
2. Avoid flight into areas of moderate/severe turbulence.
3. **Do not** initiate further flight until trouble has been located and corrected.

DUAL YAW DAMPER FAILURE**NOTE**

- Maintaining higher airspeed (250 KIAS or higher where applicable) will improve Dutch roll stability.
 - Landing with minimum tip fuel will improve Dutch roll stability and lateral control. With both yaw dampers inoperative, plan flight so as to land with both tip tanks empty.
1. Avoid flight into areas of moderate/severe turbulence.
 2. Land as soon as practical.
 3. **Do not** initiate further flight until trouble has been located and corrected.

CROSSFLOW VALVE FAILS TO OPEN

1. Maintain wing fuel balance by adjusting power setting.
2. • *On aircraft without FUS VALVE switch*, transferring fuselage fuel will result in a right wing heavy condition.
- *On aircraft with FUS VALVE switch*, transfer fuselage fuel using the following procedure:
 - a. FUS TANK XFER-FILL Switch — XFER. Fuel will gravity flow into the left wing tank.
 - b. FUS VALVE Switch — OPEN. Fuel will gravity flow into the right wing tank.
 - c. Monitor individual wing fuel indications to ensure fuel balance.
 - d. • If right wing becomes heavy during fuel transfer:
 - (1) FUS VALVE Switch — CLOSE.
 - (2) When wing tanks are balanced, FUS VALVE Switch — OPEN.
 - If left wing becomes heavy during fuel transfer:
 - (1) FUS TANK XFER-FILL Switch — OFF.
 - (2) When wing tanks are balanced, FUS TANK XFER-FILL Switch — XFER.

FUEL FILTER LIGHT ILLUMINATED

On aircraft with replaceable paper fuel filter elements: This is an indication that a filter element is clogging. Fuel filter elements should be replaced prior to the next flight.

On aircraft with cleanable metal fuel filter elements: This is an indication that a primary filter element is clogged and is being bypassed; however, the secondary element is still filtering fuel. The fuel filter elements should be cleaned prior to the next flight.

1. STANDBY PUMP Switches — ON, when possible.

FUEL IMBALANCE DURING FUEL TRANSFER

1. FUS TANK XFR-FILL Switch — OFF.
2. FUS VALVE Switch (if installed) — CLOSE.
3. STANDBY PUMP Switch (heavy wing) — ON.
4. STANDBY PUMP Switch (light wing) — Off.
5. CROSSFLOW Switch — OPEN.
6. Monitor fuel balance.
7. • *If fuel load balances:*
 - a. CROSSFLOW Switch — CLOSE.
 - b. Both STANDBY PUMP Switches — Off.
 - c. Monitor fuel balance when transferring fuselage fuel.
- *If fuel load does **not** balance:*
 - a. STBY PMP Circuit Breaker (light wing) (ess bus) — Pull.
 - b. STANDBY PUMP Switch (heavy wing) — Check, On.
 - c. CROSSFLOW Switch — Check, OPEN.
 - d. Monitor fuel balance.
- e. • *If fuel load balances:*
 - (1) CROSSFLOW Switch — CLOSE.
 - (2) Both STANDBY PUMP Switches — Off.

NOTE

The problem is a system failure allowing the standby pump to run whenever the circuit breaker is in. In this event, the following conditions will exist:

- Fuselage fuel transfer may be used while the affected STBY PMP circuit breaker is pulled.
 - STBY PMP circuit breaker must be reset for conditions requiring the use of the standby pump (i.e., airstarts and loss of fuel pressure).
 - STBY PMP circuit breaker must be reset to transfer fuel from the affected wing (crossflow).
- *If fuel load still does **not** balance:*
 - (1) CROSSFLOW Switch — CLOSE.
 - (2) Both STANDBY PUMP Switches — Off.

NOTE

- Fuel cannot be transferred to the affected wing and fuselage fuel transfer will aggravate the fuel imbalance. Plan flight accordingly.
- Unequal power settings may be used to balance fuel load.

FUEL JETTISON

Fuel jettisoning is applicable to the tip tanks only and can be accomplished with any combination of flaps, landing gear and speeds. Fuel jettisoning will be faster and the most fuel will be jettisoned while the aircraft is in a nose-up attitude. Time to jettison fuel from tip tanks is approximately 5 minutes.

NOTE

If it is desired to jettison fuel from one tip tank only, pull the opposite FUEL JTSN circuit breaker (ess bus) prior to setting FUEL JTSN Switch — ON.

1. FUEL JTSN Switch — ON (both lights on).
2. L and R FUEL JTSN Lights — Check both ON. If only one light illuminates, it indicates that only one valve has opened. FUEL JTSN Switch — Off.
3. Observe aft edge of tip tanks and fuel quantity indicator after actuating the FUEL JTSN switch. Assure that fuel is flowing from both tanks. Monitoring fuel quantity indicator is useful at night or other times when visibility is reduced.
4. FUEL JTSN Switch — Off. When jettison is complete, check both FUEL JTSN Lights — Out.

NOTE

Jettisoned fuel is not recorded on the fuel counter. Therefore, the fuel counter reading should not be used to compute fuel remaining or aircraft weight after jettisoning fuel.

FUEL TRANSFER VALVE FAILS TO CLOSE

If the left transfer valve (XFER-FILL valve) fails to close after completion of fuel transfer, the crossflow valve will also remain open. In this event, operation of either standby pump will transfer some fuel back into the fuselage tank. Additionally, fuel may gravity flow from both wings into the fuselage tank.

If the right transfer valve (FUS VALVE) (if installed) fails to close after completion of fuel transfer, the crossflow valve will close normally. In this event, operation of the right standby pump will transfer fuel from the right wing into the fuselage tank. Additionally, fuel may gravity flow from the right wing into the fuselage tank.

1. Fuel crossflow operations should be conducted with caution as standby pump operation will transfer fuel back into the fuselage.
2. Periodically transfer fuel back into wings.



Since continuous operation of a standby pump may not be possible, a descent to 25,000 feet or below will be required if a jet pump should fail.

FUEL VALVE LIGHTS

Steady illumination of any of the amber fuel valve lights (except FUEL JTSN lights) on the fuel control panel indicates the corresponding valve is not in the position selected. Momentary illumination while the corresponding valve is in transit after switching modes indicates proper operation.

LOW FUEL LIGHT ILLUMINATED

The LOW FUEL light on the glareshield annunciator panel will illuminate when the fuel level in either wing tank is approximately 400-500 pounds (181-227 kilograms) and the aircraft is in level flight.

1. Fuel Quantities — Check. Correct fuel distribution, if required:
 - a. Balance wing fuel. Refer to FUEL CROSSFLOW procedure in Section II.
 - b. Transfer fuselage fuel to the wings. Refer to NORMAL FUSELAGE FUEL TRANSFER procedure in Section II.
2. Replan flight if necessary.

NORMAL FUEL TRANSFER SYSTEM FAILURE — Aircraft with FUS VALVE Switch**CAUTION**

If the aircraft was loaded with additional fuselage fuel in excess of the Maximum Zero Wing and Tip Fuel Weight (13,500 pounds), this additional fuel must be transferred prior to reaching a total wing fuel quantity of 2250 pounds. If unable to transfer this additional fuel, **do not exceed 325 KIAS**.

1. FUS VALVE Switch — OPEN.

NOTE

Approximately 162 pounds of fuselage fuel will be unusable using this fuel transfer method.

2. FUS VALVE Switch — CLOSE, when gravity transfer is complete, or prior to approach.

NORMAL FUEL TRANSFER SYSTEM FAILURE — Aircraft without FUS VALVE Switch**CAUTION**

If the aircraft was loaded with additional fuselage fuel in excess of the Maximum Zero Wing and Tip Fuel Weight (13,500 pounds), this additional fuel must be transferred prior to reaching a total wing fuel quantity of 2250 pounds. If unable to transfer this additional fuel, **do not exceed 325 KIAS**.

TRANSFER VALVE LIGHT REMAINS ILLUMINATED

Steady illumination of the transfer valve light after transfer is selected indicates failure of the transfer valve to open. Fuselage fuel will be unusable.

1. XFER-FILL Switch — OFF.
2. Replan flight accordingly.

TRANSFER VALVE LIGHT GOES OUT

The transfer valve has opened and the most probable cause of system malfunction is fuselage pump failure. Fuel will gravity flow at a reduced rate. Approximately 162 pounds of fuselage fuel will be unusable.

1. Fuselage Pump Circuit Breaker (copilot's main bus) — Pull.
2. XFER-FILL Switch — Leave in XFER.
3. XFER-FILL Switch — OFF, when gravity transfer is complete, or prior to approach.

STANDBY PUMP FAILS TO SHUT OFF (*Aircraft incorporating SB 35/36-28-11*)

Operation of the electric standby fuel pumps is indicated by illumination of the annunciator light in the corresponding STANDBY PUMP switch. The pumps are turned on manually with the corresponding STANDBY PUMP switch and automatically during starter-assisted engine starts and during fuselage tank FILL.

If standby pump annunciator light does not extinguish when pump is selected off:

1. Corresponding STANDBY PUMP Switch — Cycle.

If standby pump annunciator light does not extinguish:

2. Corresponding STBY PMP Circuit Breaker (ess bus) — Pull.

TIP TANK FAILS TO TRANSFER FUEL

Should a tip tank jet pump fail, fuel will gravity flow to approximately one half tip tank.

Replan for landing with one tip tank one-half full or jettison fuel remaining in the affected tip tank to maintain balance and execute normal landing.



Maximum demonstrated fuel imbalance for landing was approximately 600 pounds (one tip tank half full and the other tip tank empty). However, for best lateral control it is recommended that the tip fuel be jettisoned to balance. This is particularly important if landing is to be made in strong gusty crosswinds or with spoilers inoperative.

- **If it is decided to jettison fuel:**

1. Follow FUEL JETTISON procedure, this section.
2. Ensure that FUEL JTSN switch is Off prior to landing.
3. Execute normal landing.

- **If it is decided not to jettison fuel:**

1. Final Approach Configuration — Gear — DN, Flaps — 40° DN.
2. Final Approach Speed — VREF + 10.
3. Landing Distance — Multiply by 1.10.

HYDRAULIC SYSTEM FAILURE/ALTERNATE GEAR EXTENSION

Either engine-driven hydraulic pump will supply sufficient pressure to operate all hydraulic systems.

Hydraulic system failure is indicated by a loss of hydraulic pressure. Landing gear, flap, spoiler, and wheel brake systems will be affected. If engine-driven hydraulic pressure is not regained, spoilers will not be available. If neither engine-driven nor auxiliary hydraulic pressure is regained, emergency brakes will be required after landing.

1. SPOILER Switch — RET.

On approach:

2. Airspeed VLO or less (VREF + 30 recommended).
3. LANDING GEAR Switch — DN.
4. GEAR Circuit Breaker (copilot's ess bus) — Pull.
5. SPOILERON Circuit Breaker (copilot's ac bus) — Pull.
6. FLAP Switch — DN.
7. Extend Landing Gear as follows:
 - a. EMER GEAR Lever (right side of pedestal) — Push **full down** to latched position.
 - b. Check, three green LOCKED DN and two red (main gear) UNSAFE lights illuminated.

CAUTION

Do not attempt to retract landing gear once emergency gear extension has been selected. To do so may cause excessive air pressure to be introduced into the hydraulic return lines, thereby rupturing the reservoir.

NOTE

The two red UNSAFE lights will remain illuminated after emergency gear extension because the inboard gear doors remain open.

- c. After gear is down and locked, EMER GEAR Lever — Return to the full up (latched) position. This is accomplished by lifting the ratchet release (small metal tab accessible through hole forward of emergency gear extension handle) and then pulling the lever to the full up (latched) position.

WARNING

The EMER GEAR lever must be returned to the up position or air pressure for emergency braking will not be available in the event there is a leak in the air line.

- d. • *If all of the three green LOCKED DN light are illuminated, refer to HYDRAULIC SYSTEM FAILURE LANDING procedure, this section.*
• *If any gear is not down and locked, refer to GEAR UP LANDING procedure, this section.*

I LO HYD (pressure) LIGHT ILLUMINATED (If Installed)

The Low Hydraulic Pressure light illuminates to indicate loss of hydraulic system pressure.

Either engine-driven hydraulic pump will supply sufficient pressure to operate all hydraulic systems. However, the low hydraulic pressure light may illuminate during single hydraulic pump operation.

If hydraulic pressure is not regained, landing gear, flaps, spoilers, and brakes may be affected. Landing distance with no flaps, no spoilers and no anti-skid will be greatly increased.

1. HYDRAULIC PRESSURE — Check.
2. • *If pressure is normal*, continue to monitor.
 - *If pressure is low*, refer to HYDRAULIC SYSTEM FAILURE/ALTERNATE GEAR EXTENSION procedure and HYDRAULIC SYSTEM FAILURE — LANDING procedure, this section.

PITOT-STATIC SYSTEM MALFUNCTION

Static pressure for the pilot's instruments is supplied by a static port on each side (L and R) of the aircraft. Static pressure for the copilot's instruments is supplied by another static port on each side of the aircraft. An alternate static source is provided for the pilot's static system.

If pitot-static source malfunction is known or suspected:

1. Maintain aircraft control with safe attitude and thrust setting.
2. Compare pilot's and copilot's pitot-static data. A pitot pressure malfunction will affect airspeed and Mach indications. A static pressure malfunction will affect airspeed, Mach, altitude, and vertical speed indications.
3. Pitot Heat:
 - a. PITOT HEAT Switches — Check, On.
 - b. L & R PITOT HEAT Circuit Breakers (ess bus) — Check, In.
4. Determine malfunctioning system:
 - a. Cross-check angle-of-attack indicators.
 - b. Compare indications with estimated performance for existing conditions (attitude, thrust setting, weight, temperature, and altitude).
 - c. Compare data from other available sources.

NOTE

The overspeed warning horn and stick puller are actuated by switches in the copilot's pitot-static system.

Speed data may be obtained from the following:

- FMS and SAT/TAS systems (if installed) provide a source for true airspeed from the pilot's pitot-static system.
- DME systems and ground based radar provide a source for ground speed. By applying the winds to the ground speed, the aircraft's airspeed may be calculated.
- Pitot-static data to the autopilot/flight director is provided by the copilot's pitot-static system and shoulder static ports.

PITOT-STATIC SYSTEM MALFUNCTION (CONT)

If static pressure malfunction is determined or suspected:

5. • *Malfunction on copilot's side:*
 - a. Refer to pilot's instruments.
- *Malfunction on pilot's side:*
 - a. ALTERNATE STATIC SOURCE Handle — OPEN. This connects a static source, in the nose section, to the pilot's instruments only.
 - b. Pilot's Altimeter — STBY.



When the alternate static source is OPEN, see figure entitled AIRSPEED CALIBRATION — ALTERNATE SYSTEM, Section V, for Airspeed Correction and figure entitled ALTITUDE POSITION CORRECTION — ALTERNATE SYSTEM, Section V, for Altitude Position Correction.

VERTICAL GYRO MONITOR LIGHT ILLUMINATED

On aircraft with J.E.T. VG-206 vertical gyros, illumination of an amber L or R V.G. MON light indicates one wheel of the affected gyro has failed. The remaining wheel is still operative and the gyro is still reliable. However, the gyro should be replaced as soon as practical.

**ALTERNATE GEAR EXTENSION/ELECTRICAL
MALFUNCTION**

1. Airspeed — VLO or less.
2. LANDING GEAR Switch — DN.
3. GEAR Circuit Breaker (copilot's ess bus) — Pull.
4. Extend landing gear as follows:
 - a. EMER GEAR Lever (right side of pedestal) — Push **full down** to latched position.
 - b. Check, three green LOCKED DN and two red outboard UNSAFE lights illuminated.

CAUTION

Do not attempt to retract landing gear once emergency gear extension has been selected. To do so may cause excessive air pressure to be introduced into the hydraulic return lines, thereby rupturing the reservoir.

NOTE

The two red UNSAFE lights will remain illuminated after emergency gear extension because the inboard gear doors remain open.

- c. *If any gear is not down and locked, refer to GEAR UP LANDING procedure, this section.*

**ANTI-SKID GEN LIGHT ILLUMINATED — ANTI-SKID
OFF OPERATION**

Illumination of any ANTI-SKID GEN light indicates an anti-skid problem with the associated wheel. If ANTI-SKID switch is OFF, all four ANTI-SKID GEN lights will illuminate. When anti-skid (for any wheel) is inoperative, care must be used during brake application and stopping distances will be increased. Refer to Section V for increased stopping distances for takeoff and landing.

1. ANTI-SKID Switch — OFF, then On. This should clear the system.

If any ANTI-SKID GEN light(s) remain illuminated:

- a. ANTI-SKID Switch — OFF. Refer to Section V for increased stopping distances for takeoff and landing.
- b. Cautiously apply brakes as required.

CAUTION

With anti-skid inoperative, heavy brake pressures may skid the tires and cause tire blow-out. During flight tests, it was determined that modulating toe-brake pressures will produce improved feel and reduce the probability of tire skid.

- c. Be prepared to use EMERGENCY BRAKING Procedure, Section III, if necessary.

NOSE WHEEL STEERING MALFUNCTION

A nose wheel steering malfunction is indicated by an unwanted swerve in either direction. In the event of a nose wheel steering malfunction:

NOTE

- If STEER LOCK switch was used to engage nose wheel steering, depressing and then releasing the control wheel master switch (MSW) will disengage steering.
- If control wheel master switch (MSW) was used to engage nose wheel steering, releasing MSW will disengage steering.

At Normal Taxi Speeds:

1. Nose Wheel Steering — Disengage (use MSW).
2. Thrust Levers — IDLE.
3. Brake to a stop.
4. Taxi using differential braking and thrust.

During Takeoff:

1. Nose Wheel Steering — Disengage immediately (use MSW).
2. Continue takeoff using rudder and/or brakes for directional control.

GEAR UP LANDING

If a gear up landing must be made, select a long, wide runway with as little crosswind as possible. If time and conditions permit, plan the descent to ensure minimum fuel remaining on the aircraft. Ensure sufficient fuel for controlled, power-on approach.

CAUTION

If emergency gear extension has been selected, **do not** attempt to retract the landing gear. To do so may cause excessive air pressure to be introduced into the hydraulic system return lines, thereby rupturing the reservoir.

1. Notify controlling agency of the emergency.
2. Brief passengers as required:
 - a. Location and operation of emergency exits.
 - b. All loose items — Secure.
 - c. Shoulder harness and seat belts — Secure.
 - d. Emergency landing brace position.
3. NO SMOKING FASTEN SEAT BELT Switch — On.

GEAR UP LANDING (CONT)

4. CABIN AIR or CAB AIR Switch — OFF. The aircraft should be depressurized prior to landing.
5. Flaps — DN.

NOTE

The landing gear warning will sound and will not be mutable with any landing gear not down and the flaps full down.

6. EMER BAT or EMER PWR Switch(es) — OFF.
7. • **If no gear have extended**, touch down slightly nose high.
 - **If the nose gear fails to extend:**
 - a. Relocate passengers aft to obtain aft CG, if possible.
 - b. HYD PUMP Switch — On.
 - c. Hold the nose off the runway as long as elevator control is available. If hydraulic pressure is available, normal braking may be available. Use rudder and/or brakes for directional control. Be prepared to use EMER BRAKE, refer to EMERGENCY BRAKING, Section III.
 - **If a main gear fails to extend**, land on the same side of the runway as the extended gear.
 - a. HYD PUMP Switch — On.
 - b. ANTI-SKID Switch — OFF.
 - c. Hold the applicable wing up as long as possible. Maintain directional control with rudder and nose wheel steering. If hydraulic pressure is available, braking (anti-skid off) may be available. Refer to ANTI-SKID OFF OPERATION, this section. Be prepared to use EMER BRAKE, refer to EMERGENCY BRAKING, Section III.
8. Perform normal power-on approach at VREF and touch down at the lowest possible airspeed with minimum sink rate. Do **not** decelerate below shaker speed.
9. Thrust Levers — CUT-OFF at touchdown.
10. ENG PULL or ENG FIRE PULL T-handles — Pull.
11. After aircraft stops, Battery Switches — OFF.
12. Evacuate the aircraft:
 - a. Cabin Entry Door — Open and exit aircraft. The upper door is openable with the landing gear retracted.
 - b. Emergency Exit Window — Open and exit using the wing step area.

HYDRAULIC SYSTEM FAILURE LANDING

1. HYD PUMP Switch — On.
2. • **If auxiliary hydraulic pressure is available:**
 - a. FLAP Switch — DN.
 - b. When maximum flap angle is obtained:
 - (1) FLAP Switch — Neutral (if applicable).
 - (2) HYD PUMP Switch — OFF.
 - (3) Go to step 3.
- **If auxiliary hydraulic pressure is *not* available:**
 - a. HYD PUMP Switch — OFF.
 - b. Go to step 3.
3. Final Approach Speed — As appropriate for flap deflection:
 - Flaps — UP, VREF + 30.
 - Flaps — 8°, VREF + 20.
 - Flaps — 20°, VREF + 10.
 - Flaps — DN, VREF.
4. Landing Distance — Multiply by 2.
5. Crew Approach Briefing — Complete.
6. EMER BRAKE Handle — Pull out of recess.

Just prior to landing:

7. HYD PUMP Switch — On.

After touchdown:

8. • **If Hydraulic Pressure is being maintained:**
 - a. SPOILER Switch — EXT.
 - b. Brakes — As required.
- **If Hydraulic Pressure is *not* being maintained:**
 - a. EMER BRAKE Handle — Push down slowly to apply brake pressure (handle must be pushed downward approximately 2 inches [5 centimeters] before braking action begins.) Apply brakes smoothly with small movements to produce improved feel and reduce the probability of tire skid. Do **not** pump the brake handle.
 - b. Rudder and/or Nose Wheel Steering — As required for directional control.



Use of drag chute or thrust reversers (if installed) is recommended.

JAMMED STABILIZER LANDING

IF ELEVATOR PULL FORCE IS ENCOUNTERED — Stabilizer jammed in nose-down trim position (aircraft in climb or cruise configuration):

WARNING

Control pressure will be heavy. Copilot assistance with this procedure is recommended. Anticipate highest pull forces (approximately 75 pounds) at landing flare.

1. Move C.G. aft if possible. Transfer fuel to the fuselage tank if possible.
2. Land as soon as practical to minimize forward C.G. movement.
3. Final Approach Configuration — Gear - DN, Flaps - 20°.
4. Final Approach Speed — $V_{REF} + 20$.
5. Landing Distance — Multiply by 1.20.

IF ELEVATOR PUSH FORCE IS ENCOUNTERED — Stabilizer jammed in nose-up trim position (aircraft in landing configuration):

1. Move C.G. forward if possible. Transfer fuel to the wing tanks if possible.
2. Final Approach Configuration — Gear - DN, Flaps - DN.
3. Final Approach Speed — V_{REF} .

ONE OR BOTH SPOILERS UP LANDING

1. Final Approach Configuration — Gear - DN, Flaps - UP.
2. Final Approach Speed — $V_{REF} + 40$.
3. Landing Distance — Multiply by 1.50.

NOTE

- Aerodynamic braking at higher speeds will cause the aircraft to become airborne even with the spoilers extended.
- Use of drag chute or thrust reversers (if installed) is recommended.

PARTIAL FLAP LANDING

1. HYDRAULIC PRESSURE — Check.
If pressure is low, refer to HYDRAULIC SYSTEM FAILURE/ALTERNATE GEAR EXTENSION procedure and HYDRAULIC SYSTEM FAILURE — LANDING procedure, this section.
If pressure is normal,
Final Approach Configuration — Gear - DN.
2. Final Approach Speed — As appropriate for flap deflection. If actual flap deflection falls between those listed, use the final approach speed for the lesser flap deflection.
3. Landing Distance — As appropriate for flap deflection.

Flap Deflection	Final Approach Speed	Multiply Landing Distance By
UP	VREF + 30	1.35
8°	VREF + 20	1.30
20°	VREF + 10	1.20



Use of drag chute or thrust reversers (if installed) is recommended.

SINGLE-ENGINE LANDING

1. Final Landing Configuration — Gear - DN, Flaps - 20°.
2. Approach Speed — VREF + 10.
3. Yaw Damper — OFF prior to landing.
4. Landing Distance — Multiply by 1.20.

STABILIZER HEAT FAILURE — LANDING

When landing with the flaps at 20° proceed as follows:

1. Final Approach Configuration — Gear - DN, Flaps - 20°.
2. Final Approach Speed — VREF + 10.
3. Landing Distance — Multiply by 1.10.

WING HEAT FAILURE — LANDING

1. Final Approach Configuration — Gear - DN, Flaps - DN.
2. Final Approach Speed — VREF + 15.
3. Touchdown Speed — 15 knots above normal.
4. Landing Distance — Multiply by 1.20.

WING AND STAB HEAT FAILURE — LANDING

1. Final Approach Configuration — Gear - DN, Flaps - 20°.
2. Final Approach Speed — VREF + 25.
3. Touchdown Speed — 25 knots above normal.
4. Landing Distance — Multiply by 1.30.

TURBULENT AIR PENETRATION

Flight through severe turbulence should be avoided if possible. When flying at 30,000 feet or higher, it is not advisable to avoid a turbulent area by climbing over it unless it is obvious that it can be overflown well in the clear. For turbulence of the same intensity, greater buffet margins are achieved by flying the recommended speeds at reduced altitude.

1. Airspeed — 250 KIAS or 0.73 Mi whichever is less. Severe turbulence will cause large and often rapid variations in indicated airspeed. **Do not chase the airspeed.**
2. Thrust — AIR IGN Switches — On. Make an initial thrust setting for the target airspeed. **Change thrust only in the case of extreme airspeed variation.**
3. Attitude — Maintain wings level and desired pitch attitude. Use attitude indicator as the primary instrument. In extreme drafts, large altitude changes may occur. **Do not use sudden large control movements.**
4. Stabilizer — Maintain control of the airplane with the elevators. After establishing the trim setting for penetration speed, **do not change the stabilizer trim.**
5. Altitude — Allow the altitude to vary. Large altitude variations are possible in severe turbulence. Sacrifice altitude in order to maintain the desired attitude and airspeed. **Do not chase altitude.**
6. Autopilot and Yaw Damper:
 - PRI or SEC Yaw Damper — Engaged. Controllability of the aircraft in severe turbulence becomes more difficult with the yaw damper Off.
 - If severe turbulence is penetrated with Autopilot on, use attitude hold mode with soft (SOFT) mode engaged.

OPERATION WITH ONE FUEL COMPUTER INOPERATIVE

The following text (operation with one fuel computer inoperative) is applicable to ferry flight only per applicable regulations.

In the event the electronic fuel computer becomes inoperative, the engine will be controlled manually. The protection offered by the electronic fuel computer will not be available when in the fuel computer off mode of operation or if the fuel computer is inoperative. Therefore, to complete a flight mission, the following procedures should be adhered to and extra caution must be exercised to ensure that engine limits are not exceeded.

Engine acceleration with the fuel computer off or inoperative is considerably slower than with the fuel computer on.



The fuel computer provides electronic overspeed protection when the computer is inoperative. To obtain this protection, the manual mode dispatch switch on the face of the fuel computer should be set to the MANUAL position and the FUEL CMPTR switch set to On.

STARTING ENGINES

The engine with an inoperative fuel computer may be started using a GPU assist or from the aircraft batteries. Follow procedure for a normal engine start as outlined under STARTING ENGINES in SECTION II except for the following:

1. Affected engine FUEL CMPTR Switch — OFF. Note FUEL CMPTR light illuminated.



If the manual mode switch on the face of the fuel computer has been set to MANUAL, set the FUEL CMPTR switch ON. In this configuration, electronic overspeed protection will be provided.

2. SPR is a fuel computer function and will be inoperative during fuel computer off mode.

OPERATION WITH ONE FUEL COMPUTER INOPERATIVE (CONT)

3. The fuel computer speed switch function which disengages the starter at 45% or 50% Turbine Speed (N2) will be inoperative. Therefore, during the start sequence perform the following:
 - a. At 45% Turbine Speed (N2), START-GEN Switch — OFF. Check AIR IGN and START lights (if installed) out.



If START light remains illuminated, refer to START LIGHT REMAINS ILLUMINATED AFTER START in this section.

BEFORE TAXI

Refer to BEFORE TAXI checklist in Section II and accomplish the fuel control governor check on appropriate engine.

TAXI

Taxi operations are conducted as described in Section II except as follows:

1. STANDBY PUMP Switch (affected engine) — ON.
2. JET PUMP Switch (affected engine) — Off.



By using the standby pump as the primary pump on the engine with the inoperative fuel computer, fuel control pneumatic circuit icing is prevented by recirculating fuel within the fuel control.

TAKEOFF

A takeoff using one engine with an inoperative fuel computer is accomplished in the same manner as a normal two engine takeoff; however, take-off should be made from a standing start.



Do not dispatch if the required (full-rated or partial power) takeoff Fan Speed (N1) setting cannot be obtained.



- Thrust lever mismatch may occur with both engines operating at takeoff power.
- Monitor engine instruments to ensure engine limits are not exceeded.

**OPERATION WITH ONE FUEL COMPUTER
INOPERATIVE (CONT)****CRUISE**

Cruise operations with one fuel computer inoperative are conducted as described in Section II except for fuel transfer. Normal fuel transfers may be accomplished at cruise power settings with one fuel computer off as follows:



- Monitor turbine (N2) and fan (N1) speed during fuel transfer.
 - Before switching JET PUMP switch to ON, ensure steady engine operation at 80% N1 or above.
1. JET PUMP Switch (affected engine) — ON.
 2. STANDBY PUMP Switch (affected engine) — Off.
 3. Crossflow or transfer fuel as required.
 4. STANDBY PUMP Switch (affected engine) — ON.
 5. JET PUMP Switch (affected engine) — Off.

APPROACH

Refer to Section II for Approach checklist. If required, accomplish fuel balance in accordance with fuel transfer procedures under CRUISE above.

GO AROUND (ONE OR TWO ENGINE)

A go-around with one fuel computer inoperative is flown as described in Section II.



Engine acceleration is considerably slower with the fuel computer inoperative.



Monitor engine instruments while advancing thrust levers.

OPERATION WITH NOSE WHEEL STEERING INOPERATIVE

The aircraft may be operated with the nose wheel steering inoperative provided DC power is available to supply nose wheel shimmy damping.

TAXI

Taxi operations are relatively easy using differential braking and power. Avoid sharp turns, if possible.



When taxiing without the nose wheel steering system engaged, it is possible to cause the nose wheel to turn 180° from the desired straight ahead position as the nose wheel free castors when the electric steering system is not engaged. If takeoff is performed with the nose wheel in this position, the uplock will not engage.

RUNWAY LINEUP

Visually ensure nose gear uplock is forward.

TAKEOFF

For takeoff, taxi on runway centerline for a short distance to ensure the nose wheel is straight, before applying takeoff power.

SECTION V — PERFORMANCE DATA

TABLE OF CONTENTS

Introduction to Performance Data

Regulatory Compliance	5-1
Standard Performance Conditions	5-1
Variable Factors Affecting Performance	5-1
Definitions	5-2
Airspeeds	5-2
Weights	5-3
Distances	5-4
Meteorological	5-5
Miscellaneous	5-5
Noise Levels	5-8

General

Relation of Temperature to ISA (Figure 5-1)	5-9
Temperature Conversion (Figure 5-2)	5-10
Ram Air to Outside Air Temperature Conversion (RAT to OAT) (Figure 5-3)	5-11
Airspeed Calibration — Normal System	
Flaps — Up, Gear — Up (Figure 5-4)	5-12
Flaps — (8° or 20°) Gear — Up or Down (Figure 5-5)	5-13
Flaps — Down (40°) Gear — Down (Figure 5-6)	5-14
Airspeed Calibration — Alternate System (Figure 5-7)	5-15
Ground Airspeed Calibration	
Flaps — (8° or 20°) Gear — Down (Figure 5-8)	5-16
Mach Calibration — Normal System	
Flaps — Up, Gear — Up (Figure 5-9)	5-17
Altitude Position Correction — Normal System	
Flaps — Up, Gear — Up (Figure 5-10)	5-18
Flaps — 8°, Gear — Up or Down (Figure 5-11)	5-19
Flaps — 20°, Gear — Up or Down (Figure 5-12)	5-20
Flaps — Down (40°), Gear — Down (Figure 5-13)	5-21
Altitude Position Correction — Alternate System (Figure 5-14)	5-22
Wind Components (Figure 5-15)	5-23
Stall Speeds, Gear — Up or Down	
(Aircraft 35-067 thru 35-278 and 36-018 thru 36-044 not incorporating AAK 79-10 or AMK 83-5) (Figure 5-16)	5-24
(Aircraft 35-279 & subsequent, 36-045 & subsequent and prior aircraft incorporating AAK 79-10 or AMK 83-5) (Figure 5-17)	5-25

TABLE OF CONTENTS (Cont)

Stall Speeds — Turning Flight, Gear — Up Or Down, Level Coordinated Turn <i>(Aircraft 35-067 thru 35-278 and 36-018 thru 36-044 not incorporating AAK 79-10 or AMK 83-5)</i> (Figure 5-18)	5-26
<i>(Aircraft 35-279 & subsequent, 36-045 & subsequent and prior aircraft incorporating AAK79-10 or AMK 83-5)</i> (Figure 5-19)	5-27
Low Speed Buffet Boundary (Figure 5-20)	5-28

Thrust

Thrust Setting Procedure	5-29
Takeoff	5-29
Partial Power Takeoff Procedure (Optional)	5-29
Climb Procedure	5-29B
Maximum Climb	5-29B
Alternate Climb Power Management Procedure	5-29B
Climb Power Management Procedure for Anti-Ice Operation	5-29C
Takeoff Power Setting	
Anti-Ice — Off (Figure 5-21)	5-30
Nacelle Heat Only (Figure 5-22)	5-31
Full Anti-Ice (Figure 5-23)	5-32
Partial Power Takeoff N1 Setting (Figure 5-24)	5-33
Maximum Continuous Thrust for Climb (N1)	
All Engine (Figure 5-26)	5-35
Single Engine (Figure 5-27)	5-36

Takeoff

Use of Takeoff Charts	5-37
Maximum Takeoff Weight	5-37
Takeoff Distance Charts	5-37
Takeoff Procedure	5-37A
Calculation of Corrections for Runway with a Gradient	
Greater than 2.0% and Less than or Equal to 2.4%	5-37B
Takeoff Flight Path Charts	5-38
Climb Gradient Charts	5-39
Determination of Takeoff Flight Path for Obstacle Clearance	5-39
Takeoff Profile (Figure 5-28)	5-41
Takeoff Weight Limit, Flaps — 8°	
Anti-Ice — Off (Figure 5-29)	5-42
Anti-Ice — On (Figure 5-30)	5-43
Takeoff Distance, Flaps — 8° (Figure 5-31)	5-44
Critical Engine Failure Speed (V1), Flaps — 8° (Figure 5-32)	5-45

TABLE OF CONTENTS (Cont)

Rotation Speed (VR), Flaps – 8° (Figure 5-33)	5-46
Takeoff Safety Speed (V ₂), Flaps – 8° (Figure 5-34)	5-47
Close In Takeoff Flight Path, Flaps – 8° (Figure 5-35)	5-48
Distant Takeoff Flight Path, Flaps – 8° (Figure 5-36)	5-49
First Segment Climb Gradient, Flaps – 8° (Figure 5-37).....	5-50
Second Segment Climb Gradient, Flaps – 8° (Figure 5-38)	5-51
Takeoff Weight Limit, Flaps – 20°	
Anti-Ice – Off (Figure 5-39).....	5-52
Anti-Ice – On (Figure 5-40).....	5-53
Takeoff Distance, Flaps – 20° (Figure 5-41)	5-54
Critical Engine Failure Speed (V ₁), Flaps – 20° (Figure 5-42)	5-55
Rotation Speed (VR), Flaps – 20° (Figure 5-43)	5-56
Takeoff Safety Speed (V ₂), Flaps – 20° (Figure 5-44)	5-57
Close In Takeoff Flight Path, Flaps – 20° (Figure 5-45)	5-58
Distant Takeoff Flight Path, Flaps – 20° (Figure 5-46)	5-59
First Segment Climb Gradient, Flaps – 20° (Figure 5-47).....	5-60
Second Segment Climb Gradient, Flaps – 20° (Figure 5-48)	5-61
Final Segment Climb Gradient (Figure 5-49).....	5-62

Enroute

Enroute Climb Speed Schedule (Figure 5-50)	5-63
Enroute Climb Gradient, Single Engine (Figure 5-51)	5-64

Approach and Landing

Use of Approach and Landing Charts.....	5-65
Maximum Landing Weight.....	5-65
Landing Distance Chart.....	5-65
Landing Procedure	5-66
Landing on Wet or Contaminated Runway	5-66
Approach Climb and Landing Climb Gradient Charts.....	5-66
Calculation of Corrections for Runway with a Gradient	
Greater than 2.0% and Less than or Equal to 2.4%	5-66A
Approach Climb Speed and Landing Climb Speed (Figure 5-52)	5-67
Approach Climb Gradient (Figure 5-53).....	5-68
Landing Climb Gradient (Figure 5-54).....	5-69
Landing Weight Limit	
Anti-Ice – Off (Figure 5-55).....	5-70
Anti-Ice – On (Figure 5-56).....	5-71
Landing Approach Speed V _{REF} (Figure 5-57).....	5-72
Actual Landing Distance (Figure 5-58)	5-73
Factored Landing Distance (Figure 5-59).....	5-74

INTRODUCTION TO PERFORMANCE DATA

REGULATORY COMPLIANCE

Information in this section is presented for the purpose of compliance with the appropriate performance criteria and certification requirements of FAR 25.

STANDARD PERFORMANCE CONDITIONS

All performance in this section is based on the following performance conditions:

1. Pertinent thrust ratings less installation, airbleed, and accessory losses.
2. Full temperature accountability within the operational limits for which the airplane is certified.



Should OAT be below the lowest temperature shown on the performance charts, use performance at the lowest temperature shown.

3. Wing flap positions are as follows:

Takeoff.....	8° or 20°
Enroute	UP — 0°
Approach	20°
Landing	DN — 40°
4. Power settings (N₁) from the appropriate charts or tables.

VARIABLE FACTORS AFFECTING PERFORMANCE

Details of variables affecting performance are given with the charts to which they apply. Conditions which relate to all performance calculations are:

1. Cabin pressurized.
2. Effect of humidity.
3. Winds, for which graphical correction is presented on the charts, are to be taken as the tower winds (20 feet above runway surface). Factors for 50% headwind component and 150% tailwind component have been applied as prescribed in pertinent regulations.
4. The percentages of stall speed are calculated from speeds as expressed in calibrated airspeed (KCAS).

DEFINITIONS

The following definitions apply to terms used throughout this manual.

AIRSPEEDS

CAS	Calibrated Airspeed — The airspeed indicator reading corrected for instrument and position error. KCAS is calibrated airspeed expressed in knots.
IAS	Indicated Airspeed — The airspeed indicator reading as installed in the airplane. KIAS is indicated airspeed expressed in knots. The information in this manual is presented in terms of indicated airspeed, unless otherwise stated, and assumes zero instrument error.
M	Calibrated Mach Number — The Machmeter reading corrected for instrument and position error.
M_I	Indicated Mach Number — The Machmeter reading as installed in the airplane. Zero instrument error is assumed for presentations in this section of the manual.
V_A	Maneuvering Speed — V _A is the highest speed that full aileron and rudder control can be applied without overstressing the aircraft, or the speed at which the aircraft will stall with the load factor of 3.0 g's, whichever is less.
V_{LOF}	Liftoff Speed — The actual speed of the aircraft at lift-off.
V_{S0}	V _{S0} is the stalling speed in the landing configuration.
V_{S1}	V _{S1} is the stalling speed in the appropriate gear/flap configuration.
V_{MCA}	Minimum Control Speed, Air — The minimum flight speed at which the airplane is controllable with 5° of bank when one engine suddenly becomes inoperative and the remaining engine is operating at takeoff thrust.
V_{MCG}	Minimum Control Speed, Ground — The minimum speed on the ground at which control can be maintained using aerodynamic controls alone, when one engine suddenly becomes inoperative and the remaining engine is operating at takeoff thrust.

DEFINITIONS (CONT)

VMO/MMO	Maximum Operating Limit Speed — The speed that shall not be deliberately exceeded in any regime of flight (climb, cruise or descent) unless a higher speed is authorized for flight test. VMO is expressed in knots and MMO is expressed in Mach number.
V1	Critical Engine Failure Speed — The speed at which, due to engine failure, the pilot is assumed to elect to stop or continue the takeoff. If engine failure occurs at V1 the distance to continue the takeoff to 35 feet above the runway surface will be equal to the distance to bring the airplane to a full stop. V1 must not be less than the critical minimum control speed (VMCG) or greater than the rotation speed (VR).
VR	Rotation Speed — The speed at which rotation is initiated during takeoff to attain V2 at or before a height of 35 feet above the runway surface.
V2	Takeoff Safety Speed — The actual speed at 35 feet above the runway surface as demonstrated in flight during single-engine takeoff. V2 must not be less than 1.2 times the stalling speed, or less than 1.1 times the air minimum control speed (VMCA), or less than the rotation speed (VR) plus an increment in speed attained prior to reaching a 35-foot height above the runway surface.
VAPP	Approach Climb Speed — The airspeed equal to 1.3 VS1 (airplane in the approach configuration).
VREF	Landing Approach Speed — The airspeed equal to 1.3 VS0 (airplane in the landing configuration).

DEFINITIONS (CONT)

WEIGHTS

Maximum Allowable Takeoff Weight The maximum allowable takeoff weight at the start of takeoff roll is limited by the most restrictive of the following requirements:

- Maximum Certified Takeoff Weight.
- Maximum Takeoff Weight (Climb or Brake Energy Limited) for altitude and temperature as determined from the applicable figure entitled TAKEOFF WEIGHT LIMITS in Section V.
- Maximum Takeoff Weight for the runway and ambient conditions as determined from the applicable figure entitled TAKEOFF DISTANCE in Section V.
- Maximum Takeoff Weight for obstacle clearance as determined from the applicable TAKEOFF FLIGHT PATH and CLIMB GRADIENT figures in Section V. (FAR 121 and 135 as applicable to U.S. registered aircraft.)

Maximum Allowable Landing Weight The maximum allowable landing weight is limited by the most restrictive of the following requirements:

- Maximum Certified Landing Weight.
- Maximum Landing Weight for the runway and ambient conditions as determined from the applicable ACTUAL LANDING DISTANCE and FACTORED LANDING DISTANCE (if applicable) charts in Section V.
- Maximum Landing Weight (Approach Climb or Brake Energy Limited) for altitude and temperature as determined from the applicable figure entitled LANDING WEIGHT LIMITS in Section V.

DEFINITIONS (CONT)

DISTANCES

Accelerate-Stop Distance	The accelerate-stop distance is the horizontal distance traversed from brake release to the point at which the airplane comes to a complete stop on a takeoff during which one engine fails at V1 and the pilot elects to stop.
Engine-Out Accelerate-Go Distance	The engine-out accelerate-go distance is the horizontal distance traversed from brake release to the point at which the airplane attains a height of 35 feet above the runway surface, on a takeoff during which one engine fails at V1 and the pilot elects to continue.
Takeoff Field Length	The takeoff field lengths presented in this section are based on a smooth, dry, paved runway. The takeoff field length given for each combination of airplane weight, atmospheric temperature, altitude, wind, and runway gradient is the greatest of the following: 1. 115% of the all-engine takeoff distance from start to a height of 35 feet above the runway surface. 2. The accelerate-stop distance. 3. The engine-out accelerate-go distance. No specific identification is made on the charts as to which of the above distances governs a specific case. However, in all cases for which charts are furnished, the field length is governed by either 2 or 3 above as the all-engine takeoff distance is shorter than either.
Actual Landing Distance	The actual landing distances presented in this section are based on a smooth, dry, paved runway. The landing field length is equal to the horizontal distance from a point 50 feet above the runway surface to the point at which the airplane would come to a full stop on the runway.
Factored Landing Distance	The factored landing distances presented in this section are equal to the actual landing distance divided by 0.60 (multiplied by 1.67).

DEFINITIONS (CONT)**METEOROLOGICAL**

ISA	International Standard Atmosphere.
OAT	Outside Air Temperature — The free air static temperature obtained from either ground meteorological sources or from inflight temperature indications adjusted for instrument error and compressibility effects.
RAT	Ram Air Temperature — The static air temperature corrected for full adiabatic compression rise corresponding to the calibrated Mach number, and multiplied by a recovery factor.
Altitude	All altitudes given in this section are pressure altitudes unless otherwise stated.
Wind	The wind velocities recorded as variables on the charts of this section are to be understood as the headwind or tailwind components of the actual winds at 20 feet above the runway surface (tower winds).
Demonstrated Crosswind	The demonstrated crosswind velocity of 24.7 knots is the velocity of the reported tower winds (measured at a 20-foot height) for which adequate control of the airplane during takeoff and landing was actually demonstrated during certification tests. The value shown is not considered to be limiting.

MISCELLANEOUS

Position Correction	Static Position Correction — A correction applied to indicated airspeed or altitude to eliminate the effect of the location of the static pressure source on the instrument reading. Since all airspeeds and altitudes in this section are presented as “indicated” values, no position corrections need be made when reading from the charts. Any change in the airspeed-altitude system external to the airplane, or locating any external object near the pressure pickup sources, requires calibration of the system and revision of the charts.
Runway Gradient	Change in runway elevation per 100 feet of runway length. The values given are positive for uphill gradients and negative for downhill gradients.

DEFINITIONS (CONT)

Gradient of Climb	The ratio of the change in height during a portion of the climb to the horizontal distance traversed in the same time interval.
Gross Climb Gradient	The climb gradient that the airplane can actually achieve given ideal conditions.
Net Climb Gradient	The gross climb gradient reduced by 0.8% during the takeoff phase and 1.1% enroute. This conservatism is required by FAR 25 for terrain clearance determination to account for variables encountered in service.
First Segment Climb	Climb from the point at which the airplane becomes airborne to the point at which the landing gear is fully retracted. The gross climb gradient must be positive, without ground effect. This requirement is satisfied by observing the TAKEOFF WEIGHT LIMITS Chart. Velocity increase is from VLOF to V2 with gradient calculated at liftoff velocity (VLOF).
Second Segment Climb	Climb extending from the end of the first segment to a height of at least 400 feet. The gross climb gradient may not be less than 2.4%. This requirement is satisfied by observing the TAKEOFF WEIGHT LIMITS Chart. Velocity for this segment is V2.
Final Segment Climb	Climb extending from the end of the second segment to a height of at least 1500 feet. The gross climb gradient may not be less than 1.2%. This requirement is satisfied by observing the TAKEOFF WEIGHT LIMITS Chart. Velocity for this segment is 1.25 VS1.
Enroute Climb	Climb with flaps UP (0°), landing gear retracted and maximum continuous thrust on one engine. There is no minimum requirement for enroute climb gradients. The enroute net climb gradients are presented for pilot's reference. Velocity is presented in ENROUTE CLIMB SPEED SCHEDULE Chart.
Approach Climb	Climb from a missed or aborted approach with approach (20°) flaps, landing gear retracted, and takeoff thrust on one engine. The gross climb gradient may not be less than 2.1%. This requirement is satisfied by observing the LANDING WEIGHT LIMITS Chart. Velocity for this segment is 1.3 VS1.

DEFINITIONS (CONT)

Landing Climb Climb from an aborted landing with landing flaps DN (40°), landing gear extended, and takeoff thrust on both engines. The gross climb gradient may not be less than 3.2%. This requirement is satisfied by observing the LANDING WEIGHT LIMITS Chart. Velocity for this segment is 1.3 VS0.

Configurations The configurations referred to by name in the charts correspond to the following settings:

Configuration	No. of Engines Operating	Thrust	Flap Setting	Gear
1st Segment Takeoff Climb	1	Takeoff	8° or 20°	DN
2nd Segment Takeoff Climb	1	Takeoff	8° or 20°	UP
Final Segment Climb	1	Max. Cont.	UP-0°	UP
Enroute Climb	1	Max. Cont.	UP-0°	UP
Approach Climb	1	Takeoff	20°	UP
Landing Climb	2	Takeoff	DN-40°	DN

NOISE LEVELS

The noise levels are in compliance with the requirements of FAR 36 (Stage 3) which are essentially equivalent to the requirements outlined in ICAO Annex 16, Chapter 3.

NOISE LEVEL IN EPNdb

CONDITION	ACTUAL	MAXIMUM ALLOWABLE
Takeoff (no thrust cutback)		
18,000 lb	83.6	93
18,300 lb	83.9	93
Takeoff (thrust cutback)		
18,000 lb	78.7	93
18,300 lb	79.2	93
Sideline		
18,000 lb	87.4	102
18,300 lb	86.7	102
Approach		
14,300 lb	91.3	102
15,300 lb	91.4	102

No determination has been made by the Federal Aviation Administration that the noise levels in this manual are or should be acceptable or unacceptable for operation at, into, or out of any airport. These noise values are stated for reference conditions of standard atmospheric pressure at sea level, 77°F (25°C) ambient temperature, 70% relative humidity, and zero wind.

Takeoff and sideline noise levels were obtained at the maximum takeoff weights of 18,000 pounds (8165 Kg) and 18,300 pounds (8300 Kg), V₂ + 10 knots climb speed, 8° flaps, anti-ice system off, and all engine takeoff with takeoff thrust setting. Thrust cutback was not required for compliance.

Thrust cutback noise levels were obtained by initiating cutback at approximately 2800 feet above runway elevation for 18,000 pound (8165 Kg) takeoff weight and approximately 2750 feet for 18,300 pound (8300 Kg) takeoff weight. Thrust cutback power settings were 85.5% N₁ and 85.9% N₁ respectively.

Landing approach noise levels were established on a 3° glideslope, gear down, maximum landing weight of 14,300 pounds (6486 Kg) and 15,300 pounds (6940 Kg), approach speed of 1.3 V_S + 10 knots, and 40° flaps. No special noise abatement procedures were used.

RELATION OF TEMPERATURE TO ISA

EXAMPLE:

OAT-22°C
 Altitude 17,000 FT
 Temperature ISA -4°C

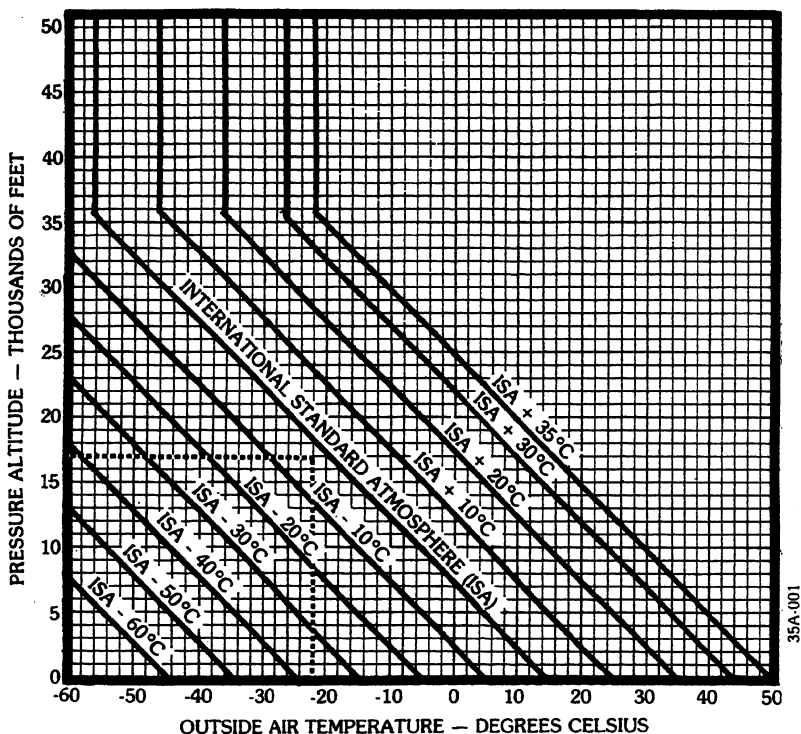


Figure 5-1

TEMPERATURE CONVERSION

- To convert from Celsius to Fahrenheit, find, in the bold face columns, the number representing the Celsius temperature to be converted. The equivalent Fahrenheit temperature is read in the adjacent column headed °F.
- To convert from Fahrenheit to Celsius, find, in the bold face columns, the number representing the Fahrenheit temperature to be converted. The equivalent Celsius temperature is read in the adjacent column headed °C.

°F	°C	°F	°C	°F	°C	°F	°C	°F	°C
-148.0	-100	-73.3	-50	-45.6	32.0	0	-17.8	122.0	50
-146.2	-99	-72.8	-49	-45.0	33.8	1	-17.2	123.8	51
-144.4	-98	-72.2	-48	-44.4	35.6	2	-16.7	125.6	52
-142.6	-97	-71.7	-47	-43.9	37.4	3	-16.1	127.4	53
-140.8	-96	-71.1	-46	-43.3	39.2	4	-15.6	129.2	54
-139.0	-95	-70.6	-45	-42.8	41.0	5	-15.0	131.0	55
-137.2	-94	-70.0	-44	-42.2	42.8	6	-14.4	132.8	56
-135.4	-93	-69.4	-43	-41.7	44.6	7	-13.9	134.6	57
-133.6	-92	-68.9	-42	-41.1	46.4	8	-13.3	136.4	58
-131.8	-91	-68.3	-41	-40.6	48.2	9	-12.8	138.2	59
-130.0	-90	-67.8	-40	-40.0	50.0	10	-12.2	140.0	60
-128.2	-89	-67.2	-39	-39.4	51.8	11	-11.7	141.8	61
-126.4	-88	-66.7	-38	-38.9	53.6	12	-11.1	143.6	62
-124.6	-87	-66.1	-37	-38.3	55.4	13	-10.6	145.4	63
-122.8	-86	-65.6	-36	-37.8	57.2	14	-10.0	147.2	64
-121.0	-85	-65.0	-35	-37.2	59.0	15	-9.4	149.0	65
-119.2	-84	-64.4	-34	-36.7	60.8	16	-8.9	150.8	66
-117.4	-83	-63.9	-33	-36.1	62.6	17	-8.3	152.6	67
-115.6	-82	-63.3	-32	-35.6	64.4	18	-7.8	154.4	68
-113.8	-81	-62.8	-31	-35.0	66.2	19	-7.2	156.2	69
-112.0	-80	-62.2	-30	-34.4	68.0	20	-6.7	158.0	70
-110.2	-79	-61.7	-29	-33.9	69.8	21	-6.1	159.8	71
-108.4	-78	-61.1	-28	-33.3	71.6	22	-5.6	161.6	72
-106.6	-77	-60.6	-27	-32.8	73.4	23	-5.0	163.4	73
-104.8	-76	-60.0	-26	-32.2	75.2	24	-4.4	165.2	74
-103.0	-75	-59.4	-25	-31.7	77.0	25	-3.9	167.0	75
-101.2	-74	-58.9	-24	-31.1	78.8	26	-3.3	168.8	76
-99.4	-73	-58.3	-23	-30.6	80.6	27	-2.8	170.6	77
-97.6	-72	-57.8	-22	-30.0	82.4	28	-2.2	172.4	78
-95.8	-71	-57.2	-21	-29.4	84.2	29	-1.7	174.2	79
-94.0	-70	-56.7	-20	-28.9	86.0	30	-1.1	176.0	80
-92.2	-69	-56.1	-19	-28.3	87.8	31	-0.6	177.8	81
-90.4	-68	-55.6	-18	-27.8	89.6	32	0.0	179.6	82
-88.6	-67	-55.0	-17	-27.2	91.4	33	0.6	181.4	83
-86.8	-66	-54.4	-16	-26.7	93.2	34	1.1	183.2	84
-85.0	-65	-53.9	-15	-26.1	95.0	35	1.7	185.0	85
-83.2	-64	-53.3	-14	-25.6	96.8	36	2.2	186.8	86
-81.4	-63	-52.8	-13	-25.0	98.6	37	2.8	188.6	87
-79.6	-62	-52.2	-12	-24.4	100.4	38	3.3	190.4	88
-77.8	-61	-51.7	-11	-23.9	102.2	39	3.9	192.2	89
-76.0	-60	-51.1	-10	-23.3	104.0	40	4.4	194.0	90
-74.2	-59	-50.6	-9	-22.8	105.8	41	5.0	195.8	91
-72.4	-58	-50.0	-8	-22.2	107.6	42	5.6	197.6	92
-70.6	-57	-49.4	-7	-21.7	109.4	43	6.1	199.4	93
-68.8	-56	-48.9	-6	-21.1	111.2	44	6.7	201.2	94
-67.0	-55	-48.3	-5	-20.6	113.0	45	7.2	203.0	95
-65.2	-54	-47.8	-4	-20.0	114.8	46	7.8	204.8	96
-63.4	-53	-47.2	-3	-19.4	116.6	47	8.3	206.6	97
-61.6	-52	-46.7	-2	-18.9	118.4	48	8.9	208.4	98
-59.8	-51	-46.1	-1	-18.3	120.2	49	9.4	210.2	99
								212.0	100
								213.8	101
								215.6	102
								217.4	103
								219.2	104
								221.0	105
								222.8	106
								224.6	107
								226.4	108
								228.2	109
								230.0	110
								231.8	111
								233.6	112
								235.4	113
								237.2	114
								239.0	115
								240.8	116
								242.6	117
								244.4	118
								246.2	119
								248.0	120
								249.8	121
								251.6	122
								253.4	123
								255.2	124
								257.0	125
								258.8	126
								260.6	127
								262.4	128
								264.2	129
								266.0	130
								267.8	131
								269.6	132
								271.4	133
								273.2	134
								275.0	135
								276.8	136
								278.6	137
								280.4	138
								282.2	139
								284.0	140
								285.8	141
								287.6	142
								289.4	143
								291.2	144
								293.0	145
								294.8	146
								296.6	147
								298.4	148
								300.2	149

Figure 5-2

RAM AIR TO OUTSIDE AIR TEMPERATURE CONVERSION (RAT TO OAT)

EXAMPLE:

1. Indicated RAT 40°C
2. Indicated Mach No. 0.50 M
3. OAT 25.4°C

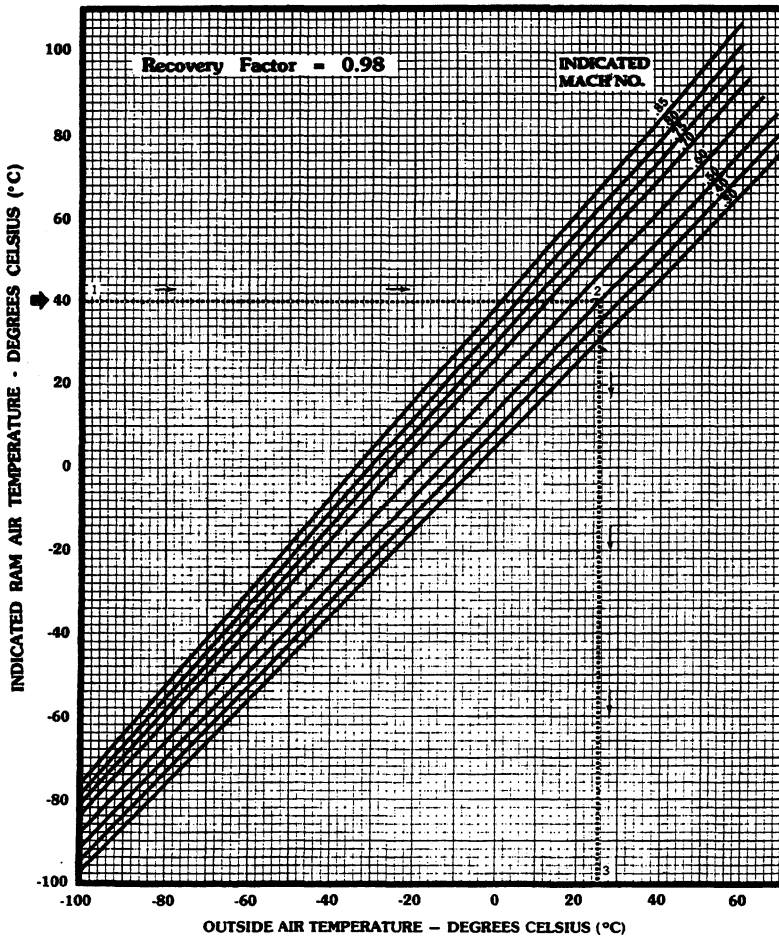


Figure 5-3

AIRSPEED CALIBRATION – NORMAL SYSTEM FLAPS UP – GEAR UP

EXAMPLE:

Indicated Airspeed 250 KIAS
Calibrated Airspeed 246 KCAS
Position Correction (Minus) 4 KTS

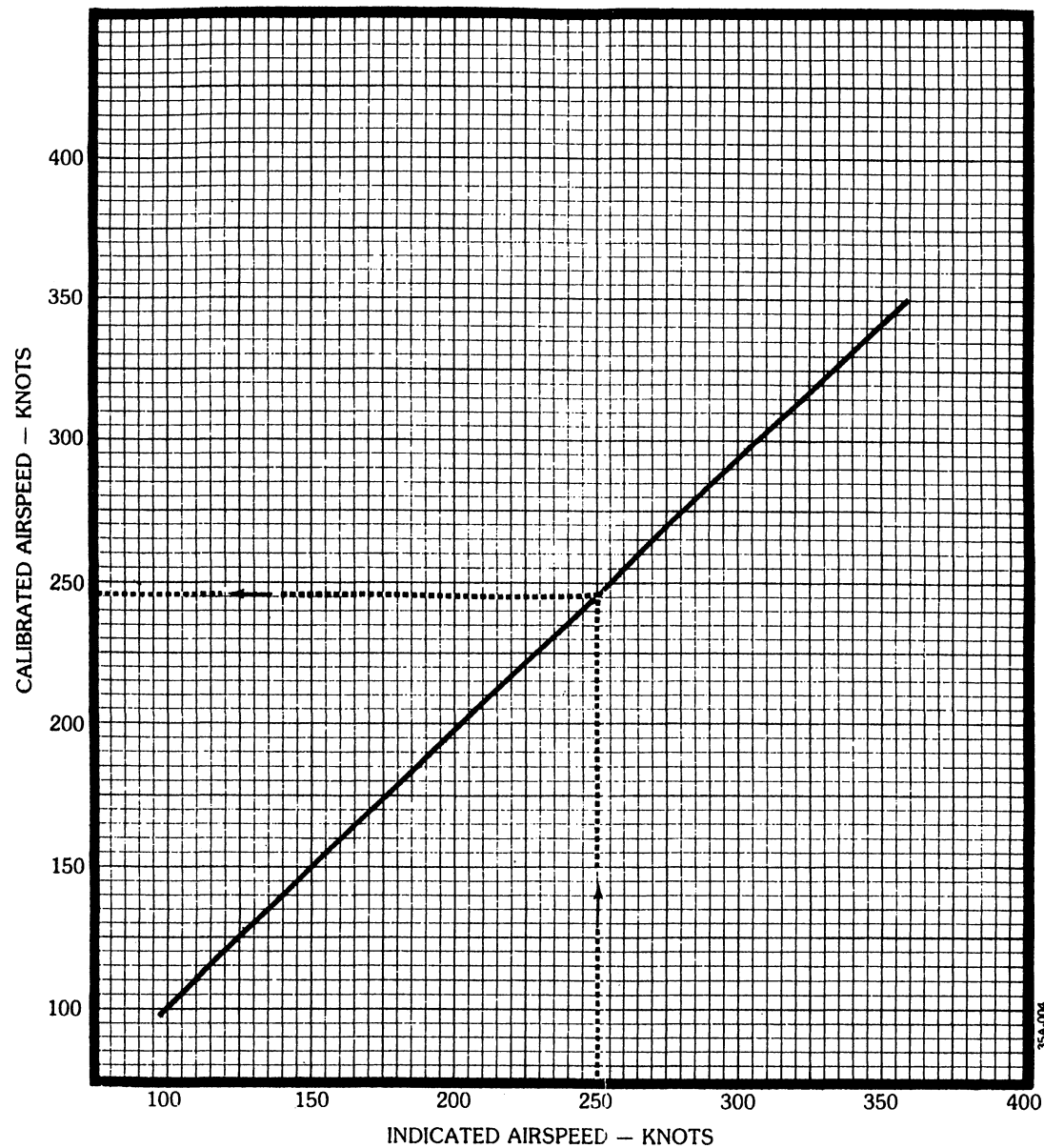


Figure 5-4

AIRSPEED CALIBRATION – NORMAL SYSTEM FLAPS – T.O. (8° or 20°) APPR – (20°) GEAR UP or DN

EXAMPLE:

Indicated Airspeed 160 KIAS
Calibrated Airspeed 159 KCAS
Position Correction (Minus) 1 KT

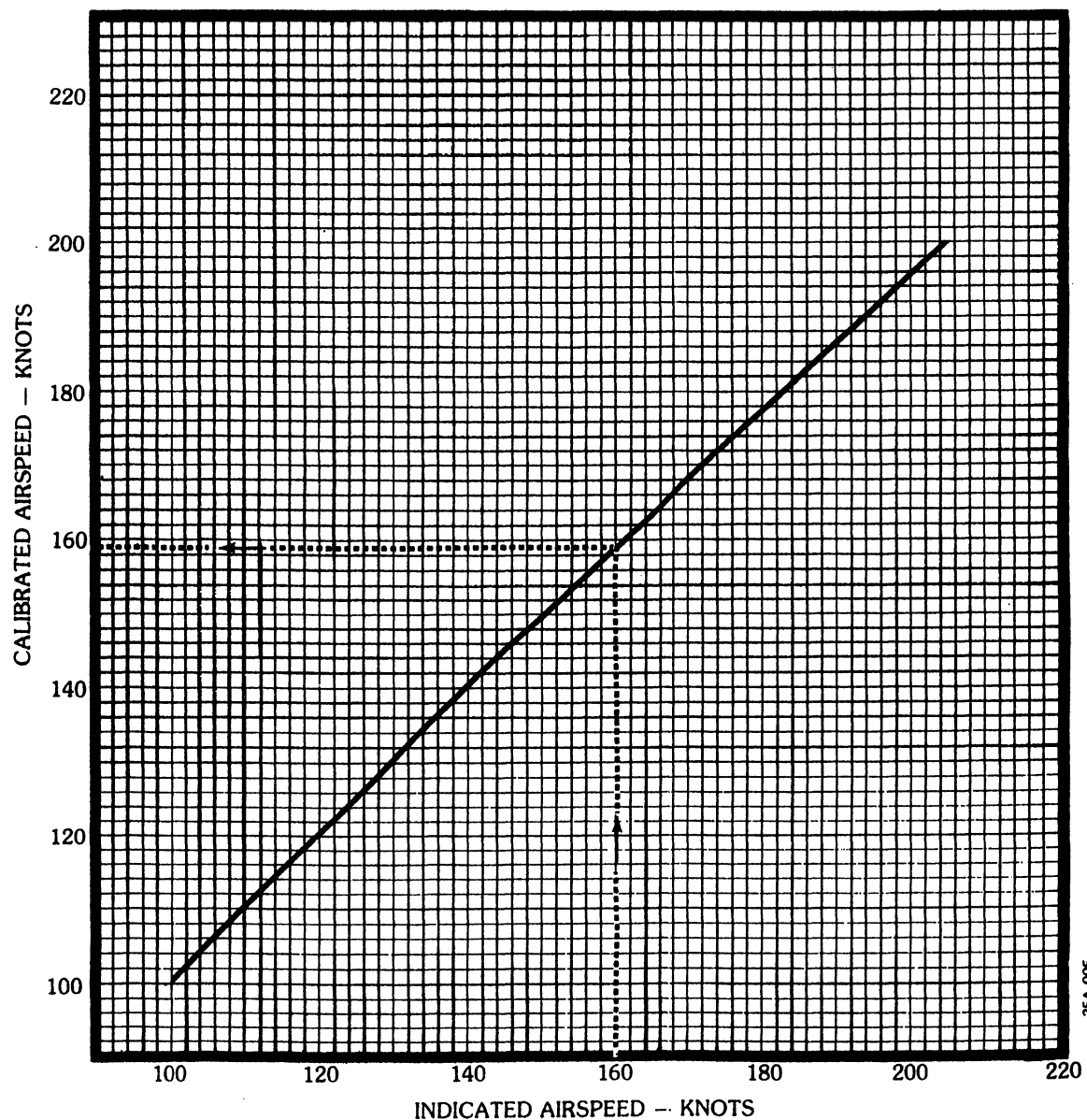


Figure 5-5

AIRSPEED CALIBRATION – NORMAL SYSTEM
FLAPS – FULL DOWN GEAR – DOWN

EXAMPLE:

Indicated Airspeed 130 KIAS
Calibrated Airspeed 129 KCAS
Position Correction (Minus) 1 KT

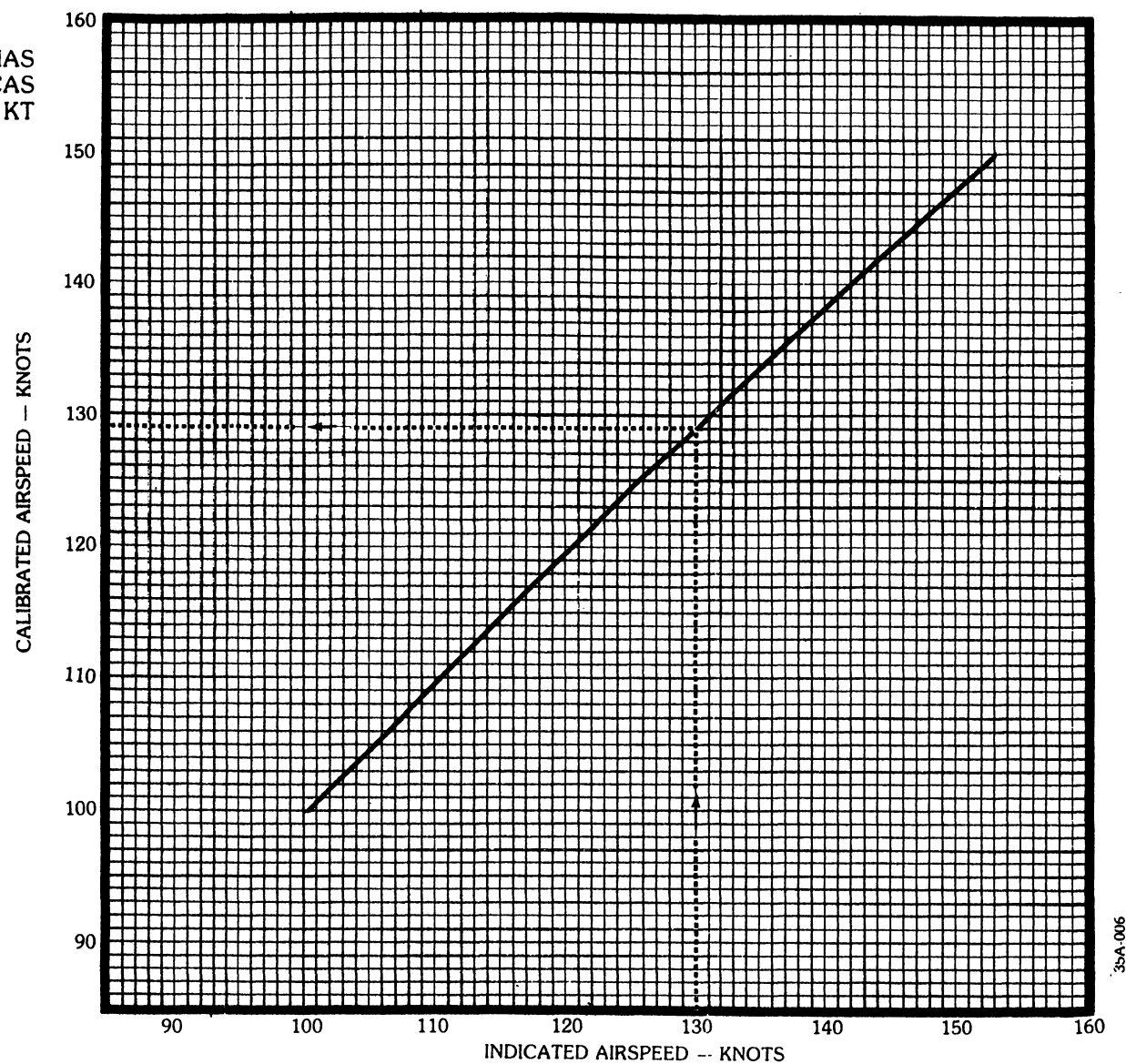


Figure 5-6

AIRSPEED CALIBRATION – ALTERNATE SYSTEM

EXAMPLE 1:

Flaps — APPR, Gear — DN

Indicated Airspeed 150 KIAS

Calibrated Airspeed 154 KCAS

Position Correction (Plus) 4 KTS

EXAMPLE 2:

Flaps — UP, Gear — UP

Indicated Airspeed 300 KIAS

Calibrated Airspeed 291 KCAS

Position Correction (Minus) 9 KTS

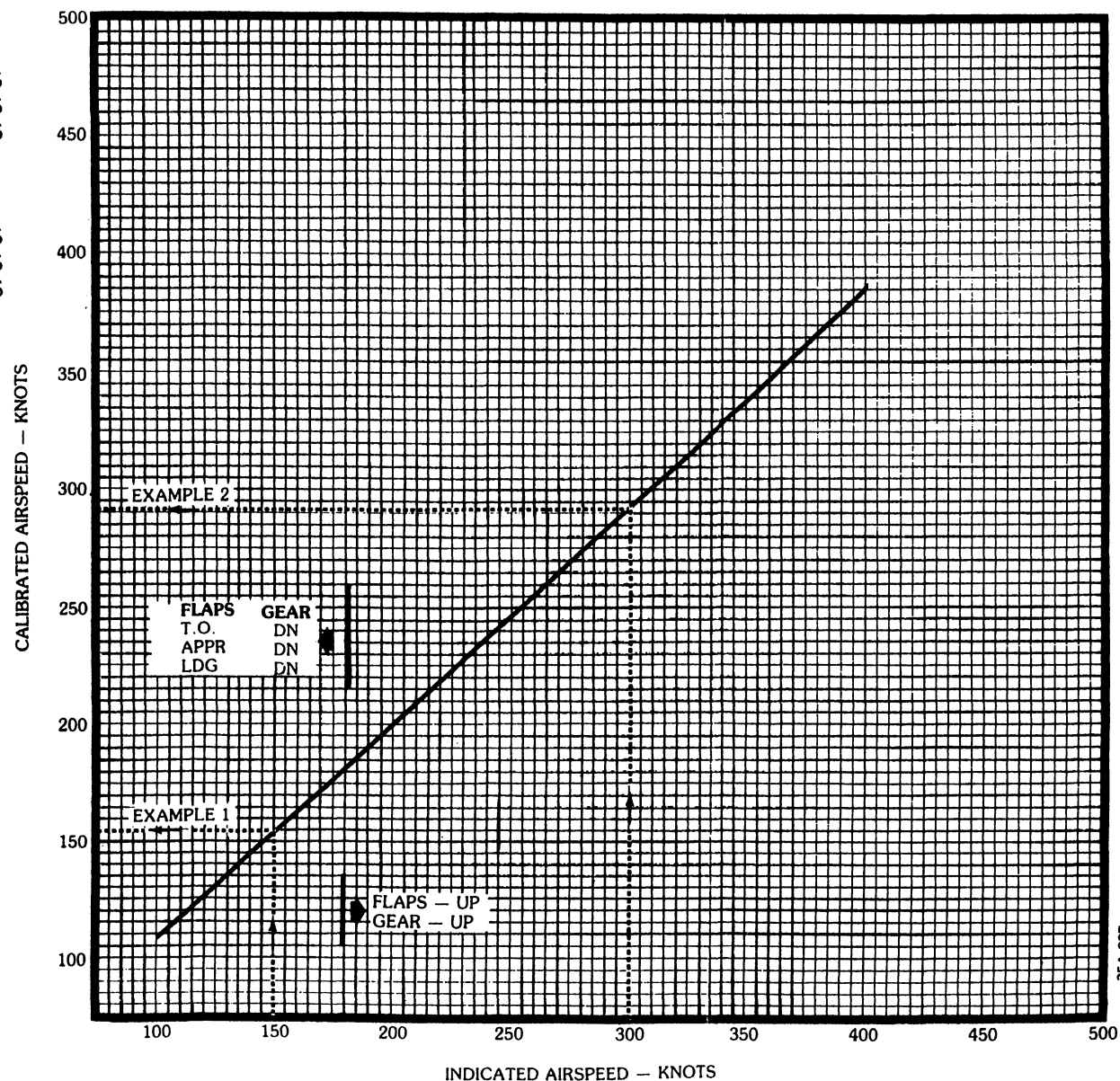


Figure 5-7

GROUND AIRSPEED CALIBRATION FLAPS – T.O. (8° or 20°) GEAR DOWN

EXAMPLE:

Indicated Airspeed 120 KIAS
Calibrated Airspeed 118.5 KCAS
Position Correction (Minus) 1.5 KTS

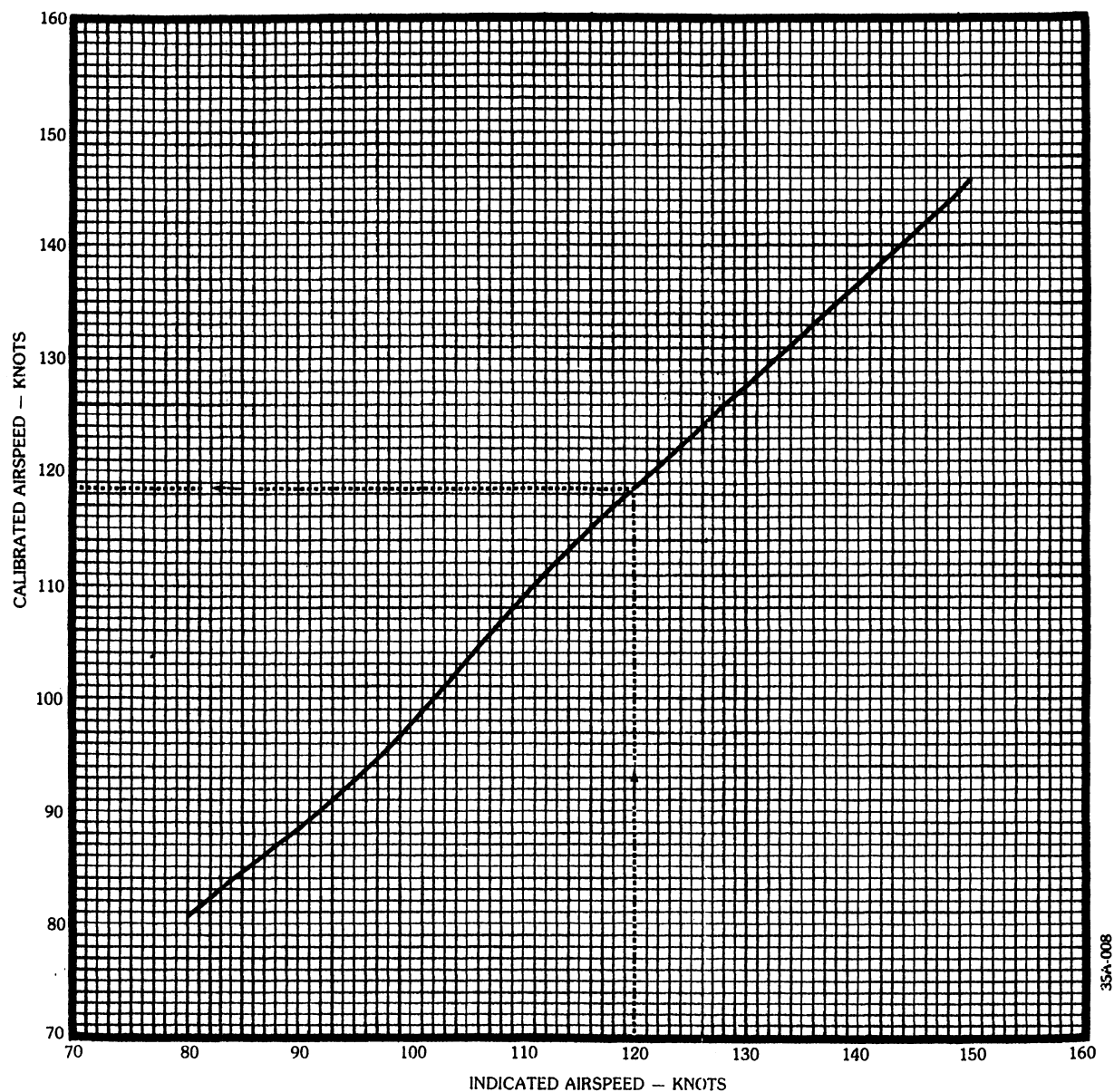


Figure 5-8

MACH CALIBRATION – NORMAL SYSTEM FLAP UP – GEAR UP

EXAMPLE:

Indicated Mach No. 0.75 M_I
 Indicated Altitude 45000 FT
 Calibrated Mach No. 0.74 M_C
 Position Correction (Minus) 0.01 MACH

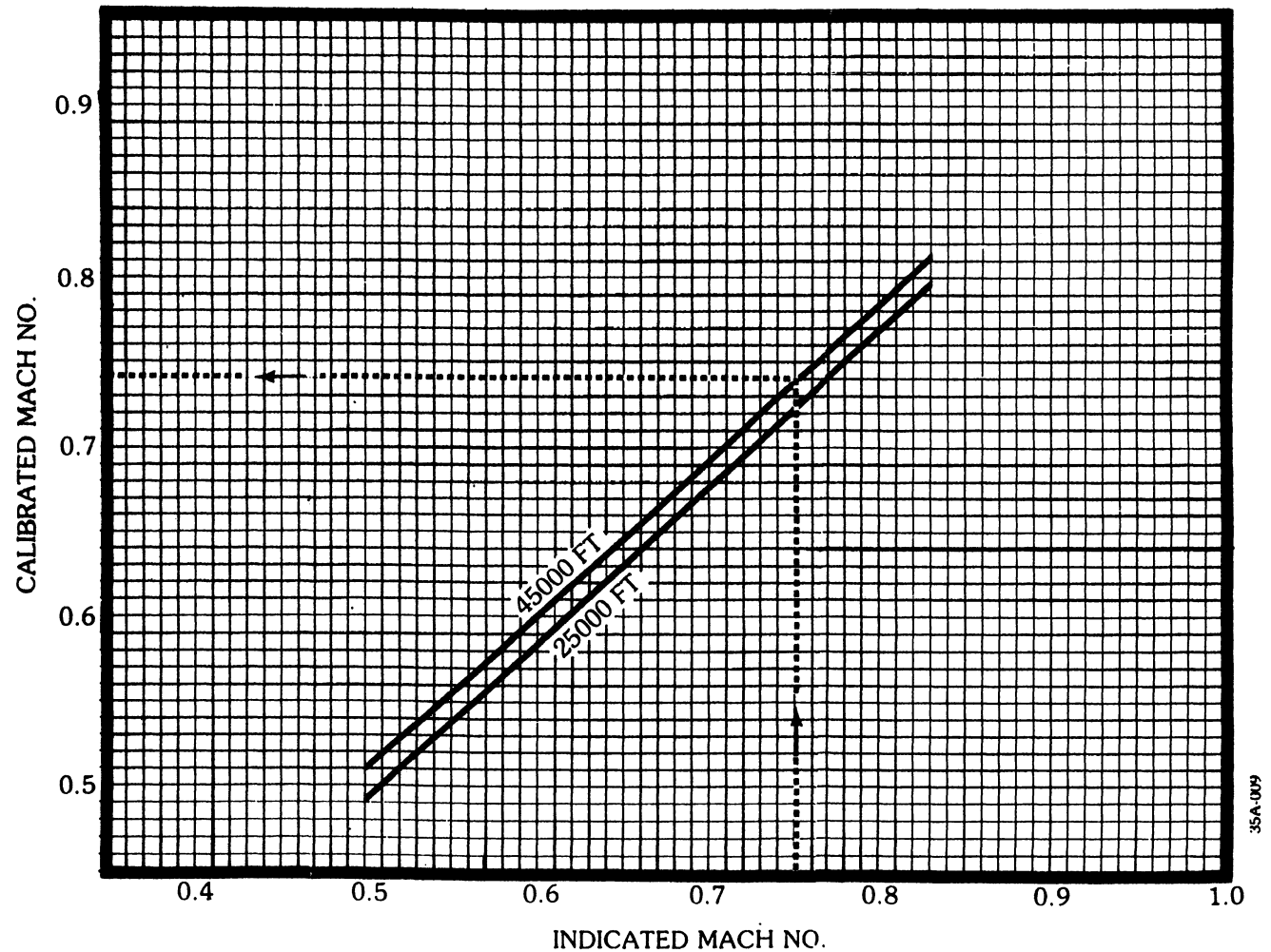


Figure 5-9

EXAMPLE:

Indicated Altitude 20000 FT
 Indicated Airspeed 300 KIAS
 Position Correction (Minus) 445 FT
 Actual Altitude 19555 FT

NOTE: THE CORRECTIONS ON THIS CHART APPLY TO THE COPILOT'S ALTIMETER INDICATIONS AT ALL TIMES AND THE PILOT'S ALTIMETER INDICATIONS WHEN THE PILOT'S ALTIMETER NORM-STBY SWITCH IS IN THE STBY POSITION. WITH THE SWITCH IN THE NORM POSITION THE CORRECTION IS NEGLIGIBLE.

ALTITUDE POSITION CORRECTION – NORMAL SYSTEM FLAPS UP – GEAR UP PILOT'S ALTIMETER – STBY & COPILOT'S ALTIMETER

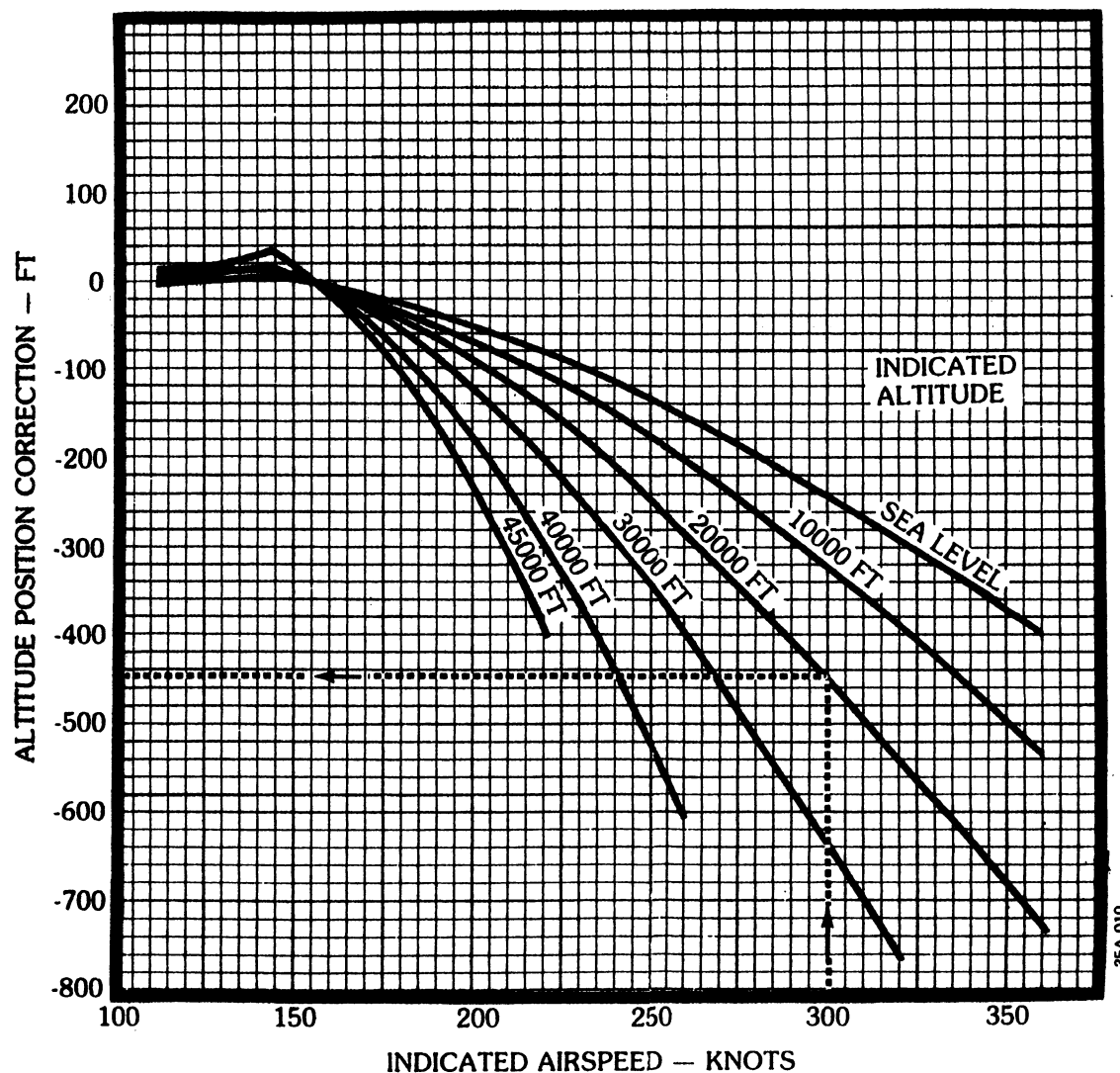


Figure 5-10

ALTITUDE POSITION CORRECTION – NORMAL SYSTEM FLAPS – T.O. (8°) GEAR UP or DN PILOT'S ALTIMETER – STBY & COPILOT'S ALTIMETER

EXAMPLE:

Indicated Altitude 15000 FT
Indicated Airspeed 170 KIAS
Position Correction (Minus) 30 FT
Actual Altitude 14970 FT

NOTE: THE CORRECTIONS ON THIS CHART APPLY TO THE COPILOT'S ALTIMETER INDICATIONS AT ALL TIMES AND THE PILOT'S ALTIMETER INDICATIONS WHEN THE PILOT'S ALTIMETER NORM-STBY SWITCH IS IN THE STBY POSITION. WITH THE SWITCH IN THE NORM POSITION THE CORRECTION IS NEGLIGIBLE.

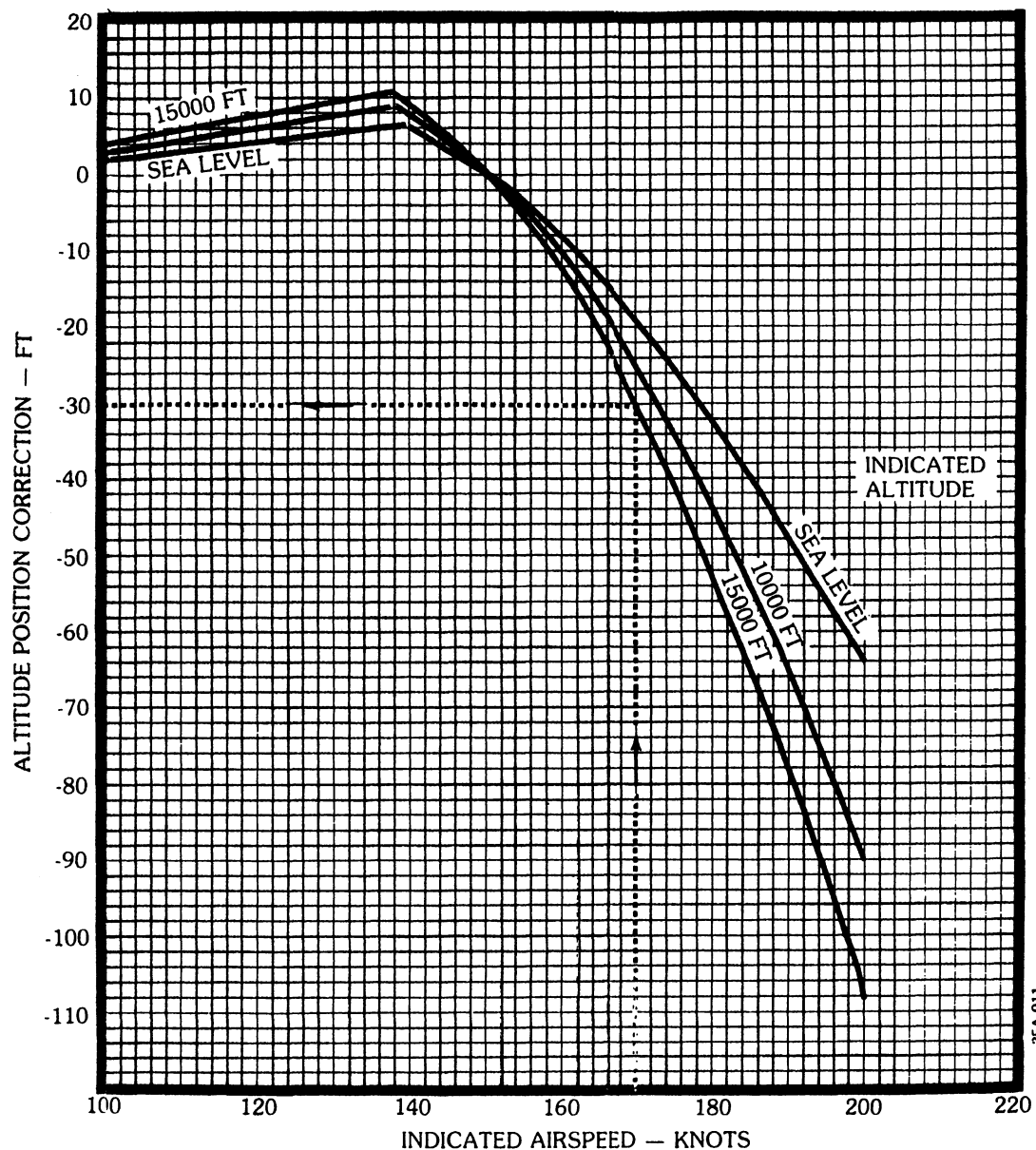


Figure 5-11

ALTITUDE POSITION CORRECTION – NORMAL SYSTEM FLAPS – T.O. (20°) APPR (20°) GEAR UP or DN PILOT'S ALTIMETER – STBY & COPILOT'S ALTIMETER

EXAMPLE:

Indicated Altitude 15000 FT
Indicated Airspeed 170 KIAS
Position Correction (Minus) 56 FT
Actual Altitude 14944 FT

NOTE: THE CORRECTIONS ON THIS CHART APPLY TO THE COPILOT'S ALTIMETER INDICATIONS AT ALL TIMES AND THE PILOT'S ALTIMETER INDICATIONS WHEN THE PILOT'S ALTIMETER NORM-STBY SWITCH IS IN THE STBY POSITION. WITH THE SWITCH IN THE NORM POSITION THE CORRECTION IS NEGLIGIBLE.

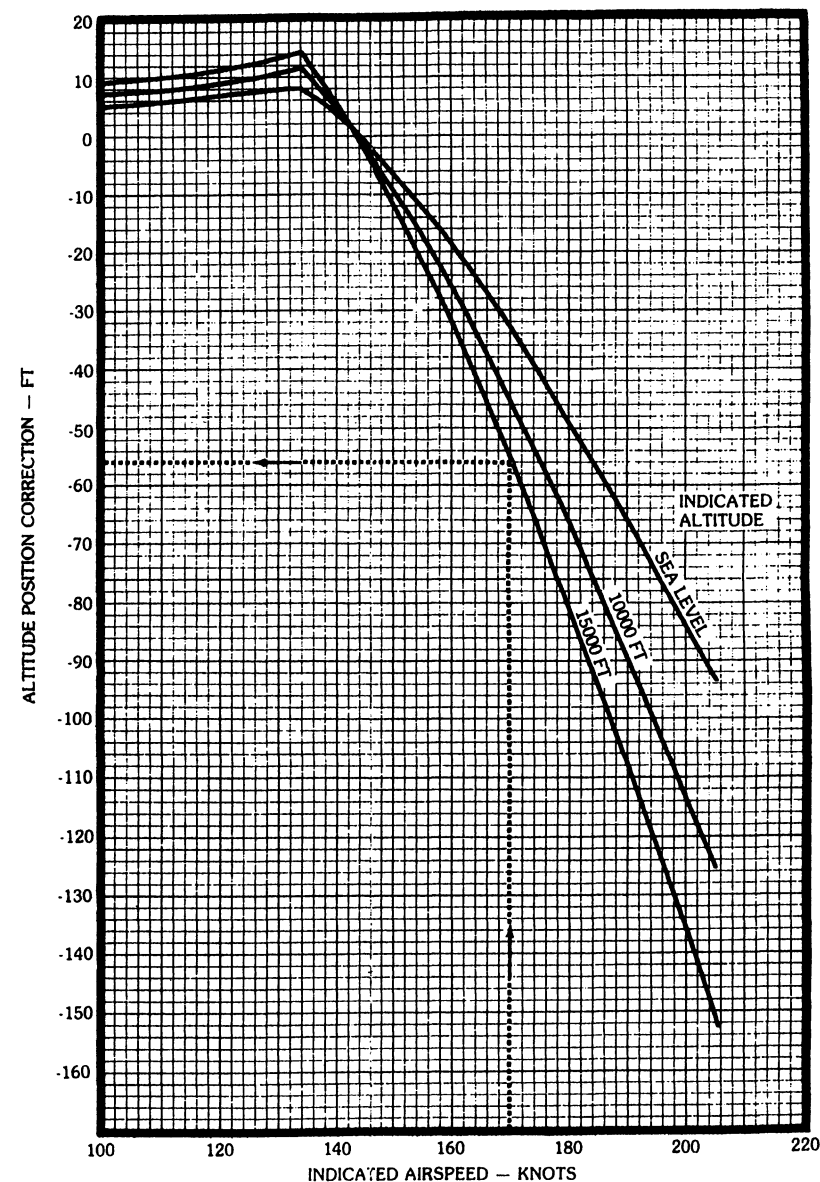


Figure 5-12

ALTITUDE POSITION CORRECTION – NORMAL SYSTEM FLAPS – FULL DN GEAR – DN PILOT'S ALTIMETER – STBY & COPILOT'S ALTIMETER

EXAMPLE:

Indicated Altitude 15000 FT
Indicated Airspeed 130 KIAS
Position Correction (Minus) 16 FT
Actual Altitude 14984 FT

NOTE: THE CORRECTIONS ON THIS CHART APPLY TO THE COPILOT'S ALTIMETER INDICATIONS AT ALL TIMES AND THE PILOT'S ALTIMETER INDICATIONS WHEN THE PILOT'S ALTIMETER NORM-STBY SWITCH IS IN THE STBY POSITION. WITH THE SWITCH IN THE NORM POSITION THE CORRECTION IS NEGLIGIBLE.

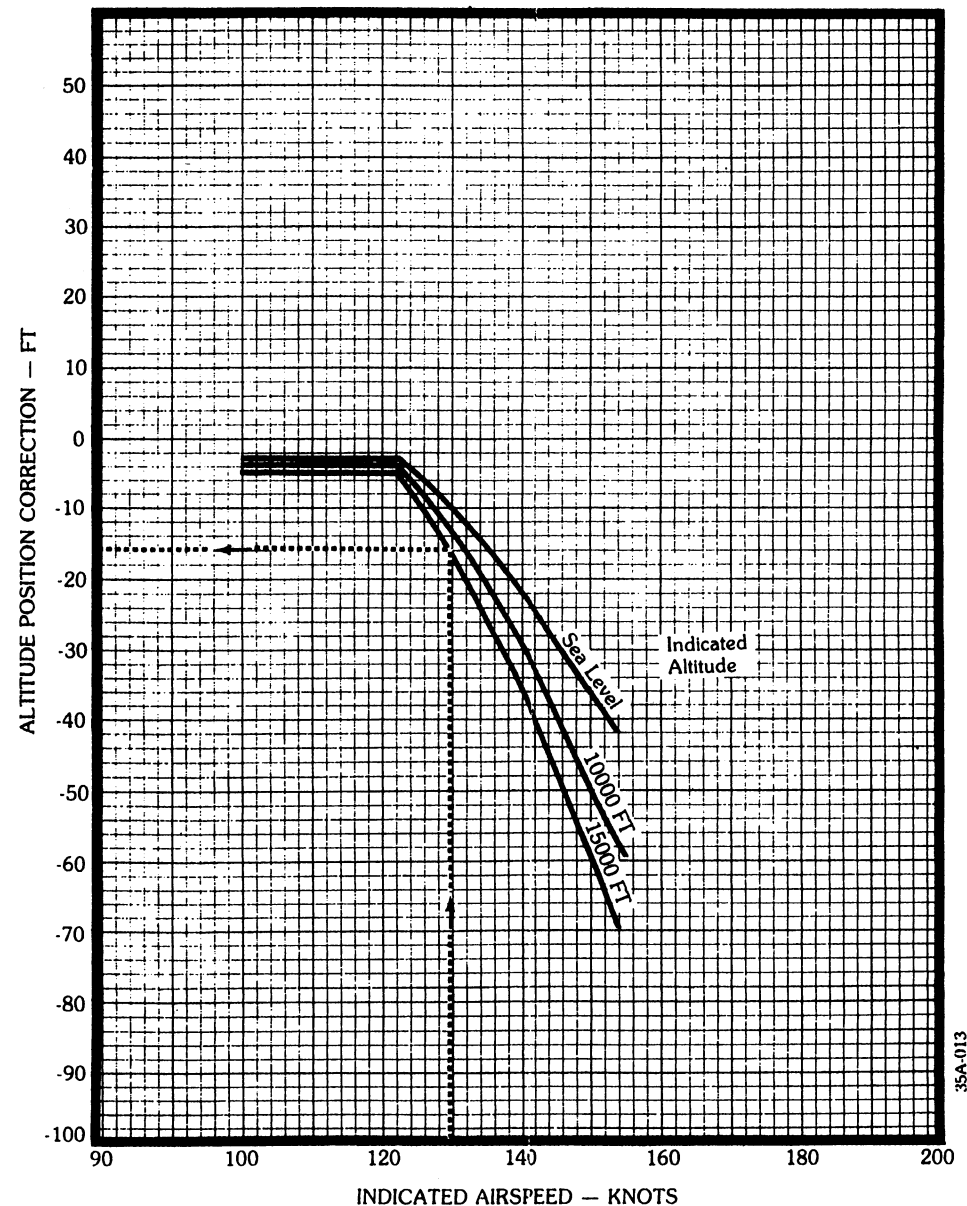


Figure 5-13

ALTITUDE POSITION CORRECTION - ALTERNATE SYSTEM PILOT'S ALTIMETER - STBY

EXAMPLE:

Indicated Altitude 40000 FT
Indicated Airspeed 250 KIAS
Position Correction (Minus) 480 FT
Actual Altitude 39520 FT

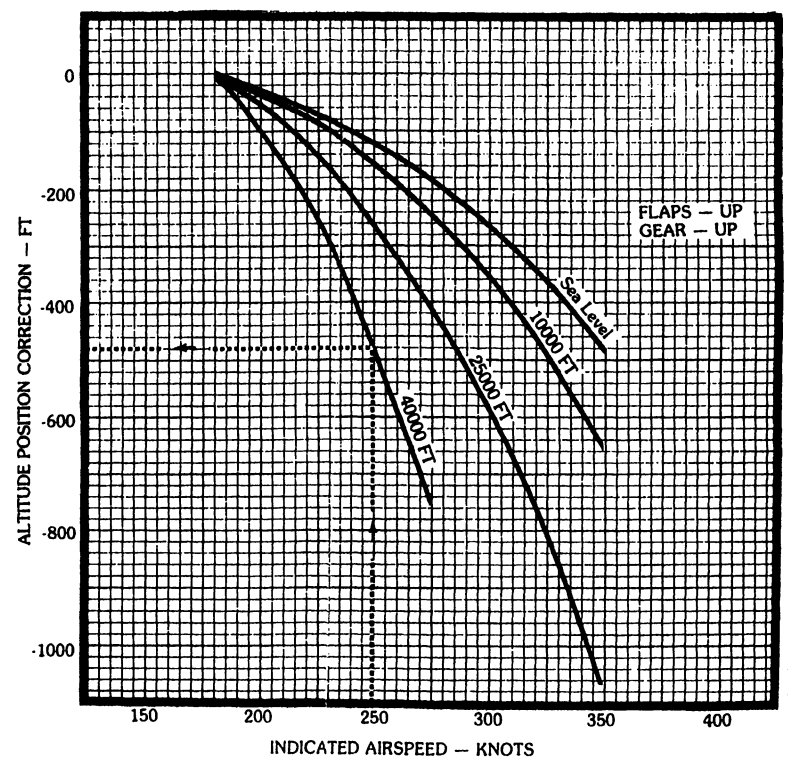
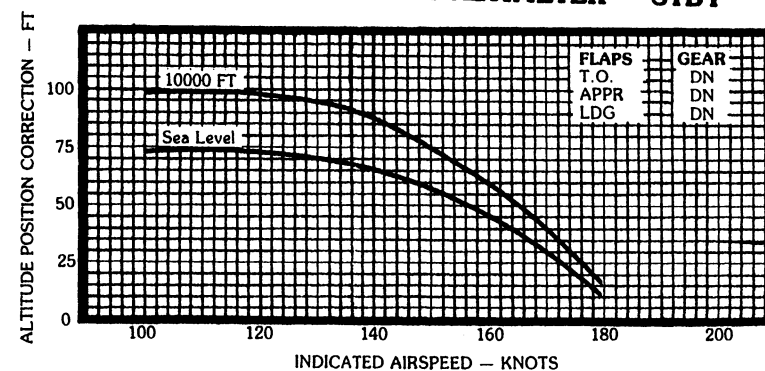


Figure 5-14

WIND COMPONENTS

CONDITIONS:

1. Wind Velocity — 35 KTS
2. Wind Direction — 300°
3. Runway Heading — 340°

EXAMPLE:

1. Wind Direction From Runway (340°-300°) 40°
2. Wind Velocity 35 KTS
3. Headwind Component 26.7 KTS
4. Crosswind Component 22.5 KTS

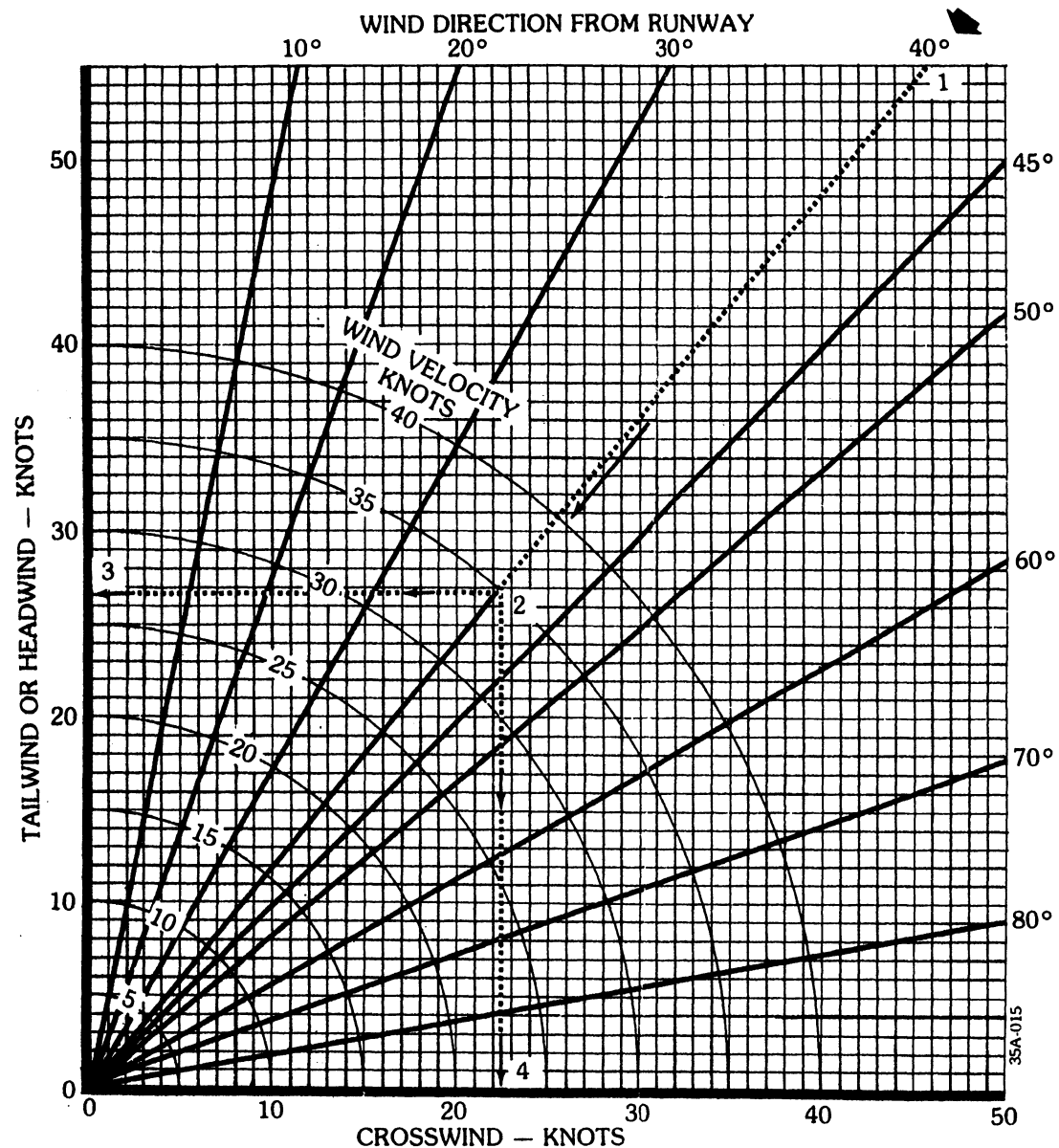


Figure 5-15

STALL SPEEDS GEAR UP or DN

EXAMPLE:

Weight 13000 LBS
Flaps UP
Stall Speed 112 KIAS

This chart effective for aircraft 35-067 through 35-278 and aircraft 36-018 through 36-044 when not incorporating AAK 79-10 or AMK 83-5.

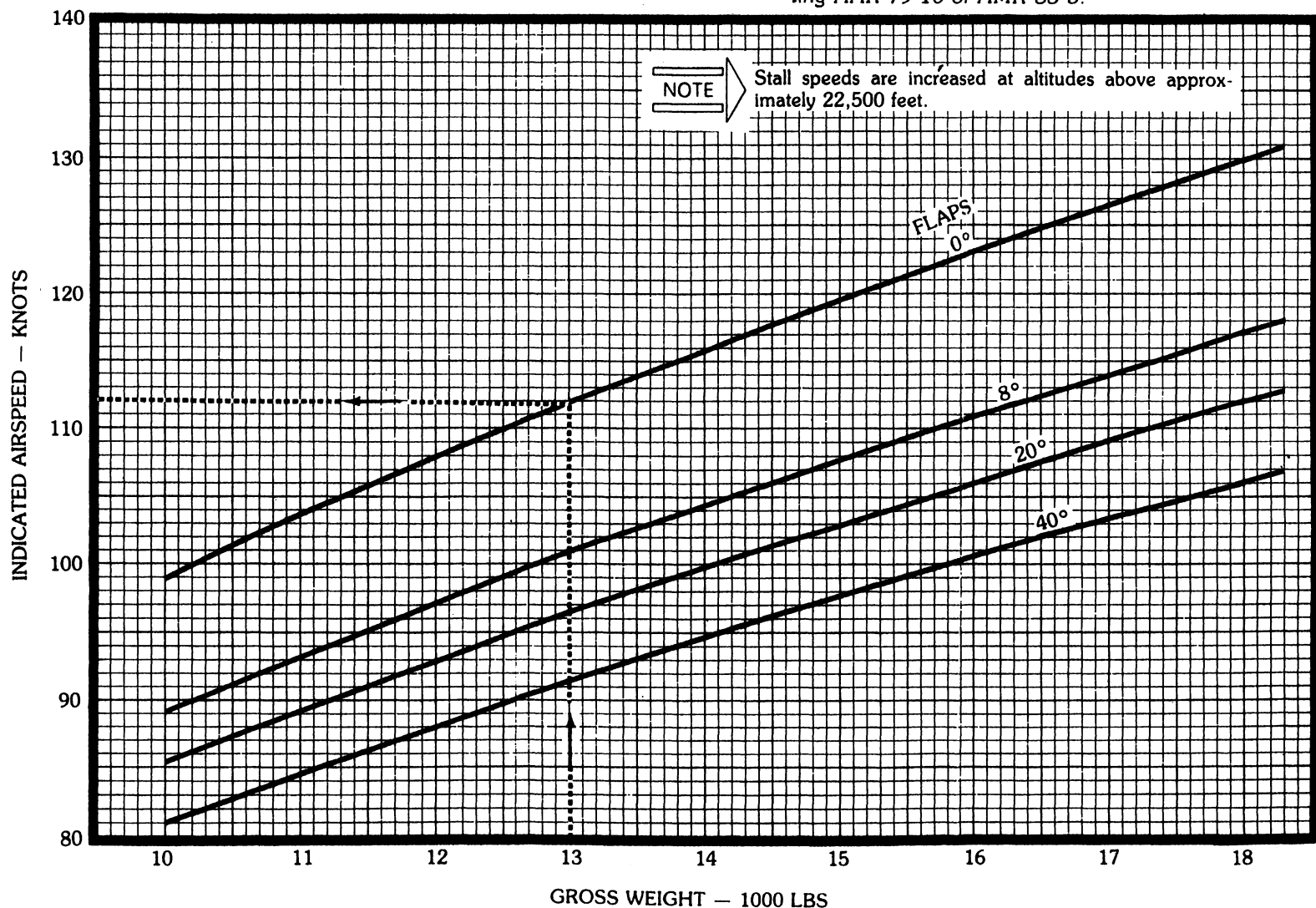


Figure 5-16

STALL SPEEDS – GEAR UP or DN

EXAMPLE:

Weight 16,000 Lb
Flaps 20°
Stall Speed 107.0 KIAS

This chart effective for aircraft 35-279 and subsequent, 36-045 and subsequent, and prior aircraft when incorporating AAK 79-10 or AMK 83-5.

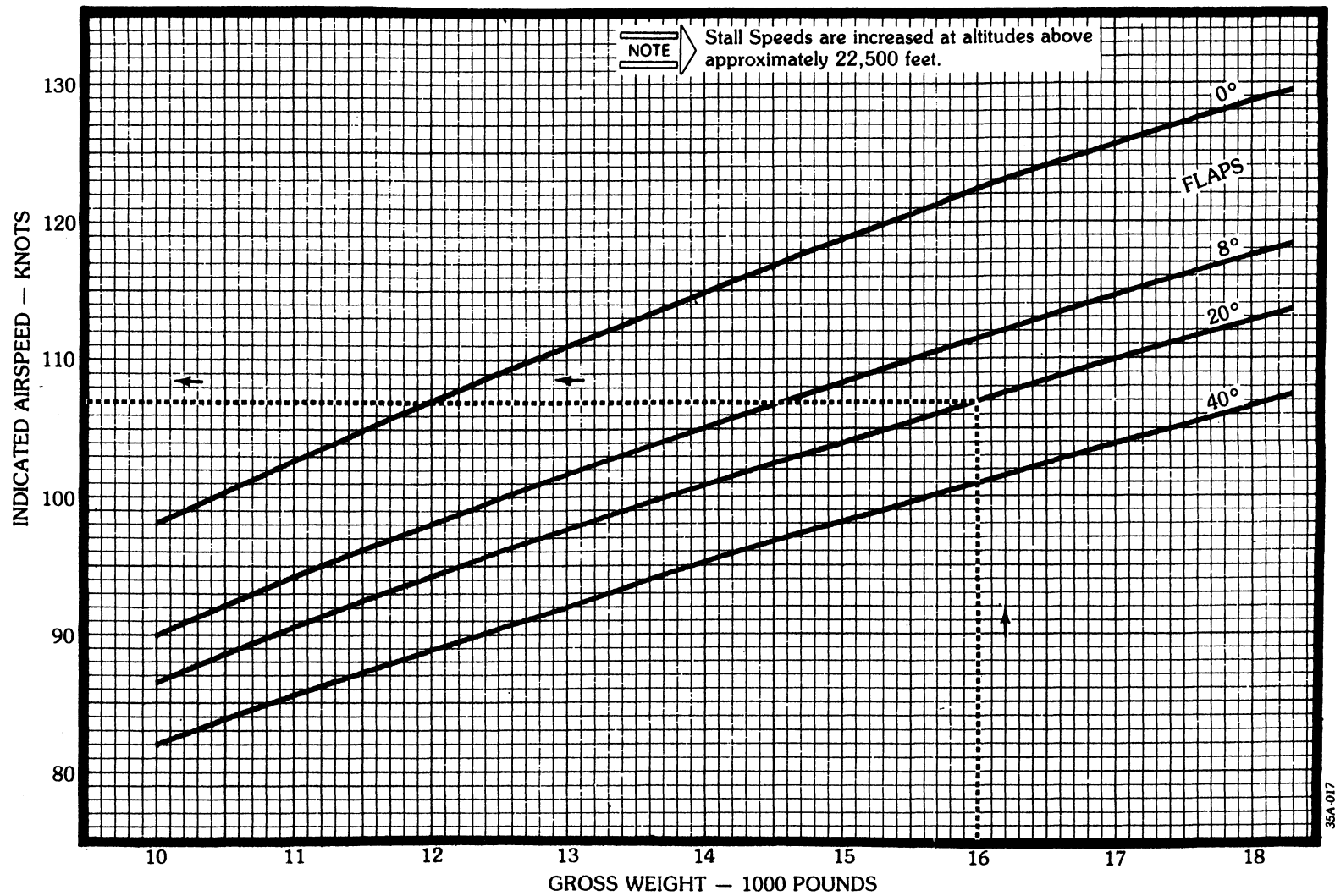


Figure 5-17

EXAMPLE:

Bank Angle 40°
Weight 15000 LBS
Flaps UP
Stall Speed 136.0 KIAS

STALL SPEEDS – TURNING FLIGHT GEAR UP or DN LEVEL COORDINATED TURN

This chart effective for aircraft 35-067 through 35-278
and aircraft 36-018 through 36-044 when **not** incorporating
AAK 79-10 or AMK 83-5.

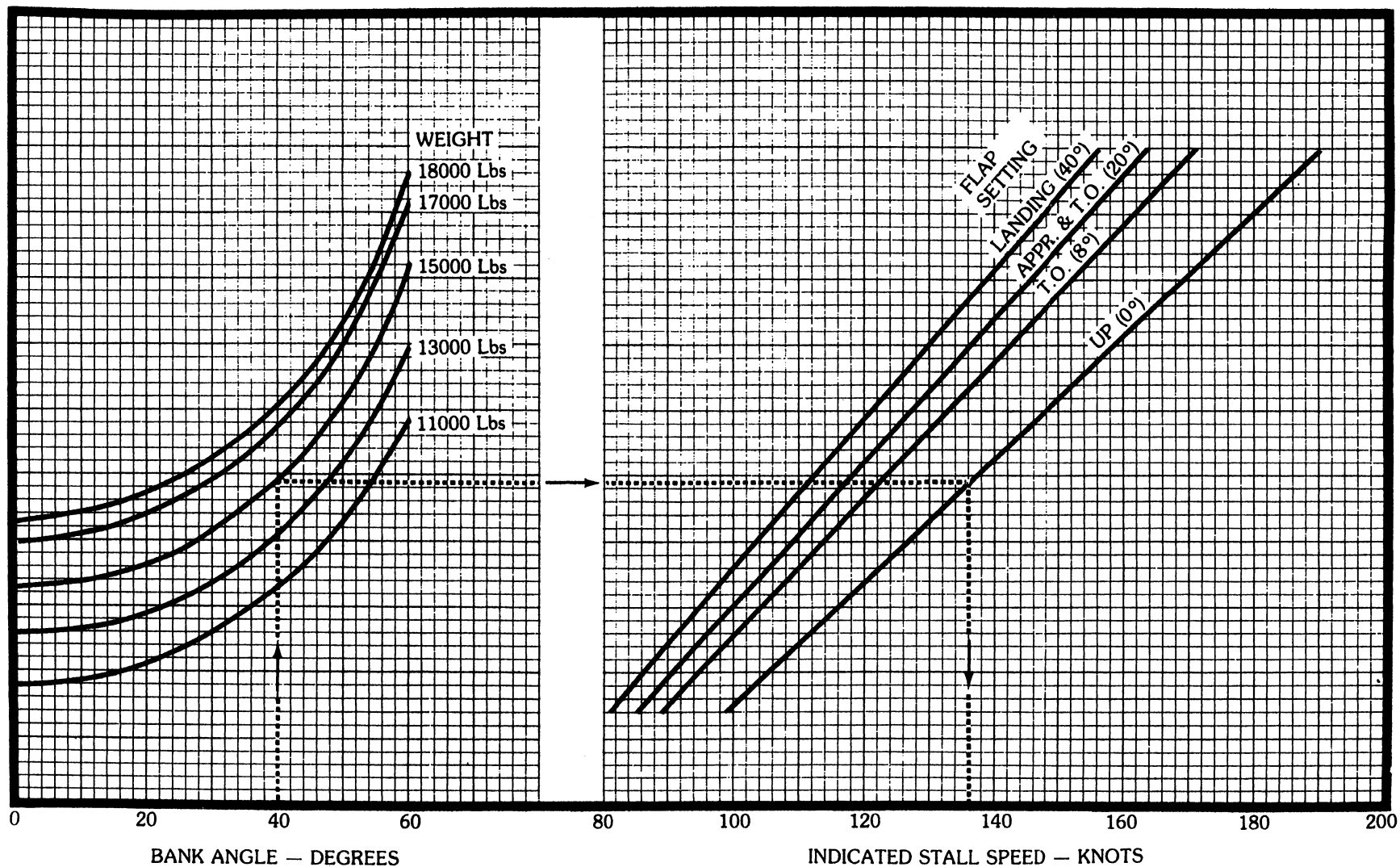


Figure 5-18

EXAMPLE:

Bank Angle 30°
Weight 15000 Lb
Flaps 40°
Stall Speed 106.0 KIAS

STALL SPEEDS - TURNING FLIGHT GEAR UP or DN LEVEL COORDINATED TURN

This chart effective for aircraft 35-279 and subsequent,
36-045 and subsequent, and prior aircraft when incor-
porating AAK 79-10 or AMK 83-5.

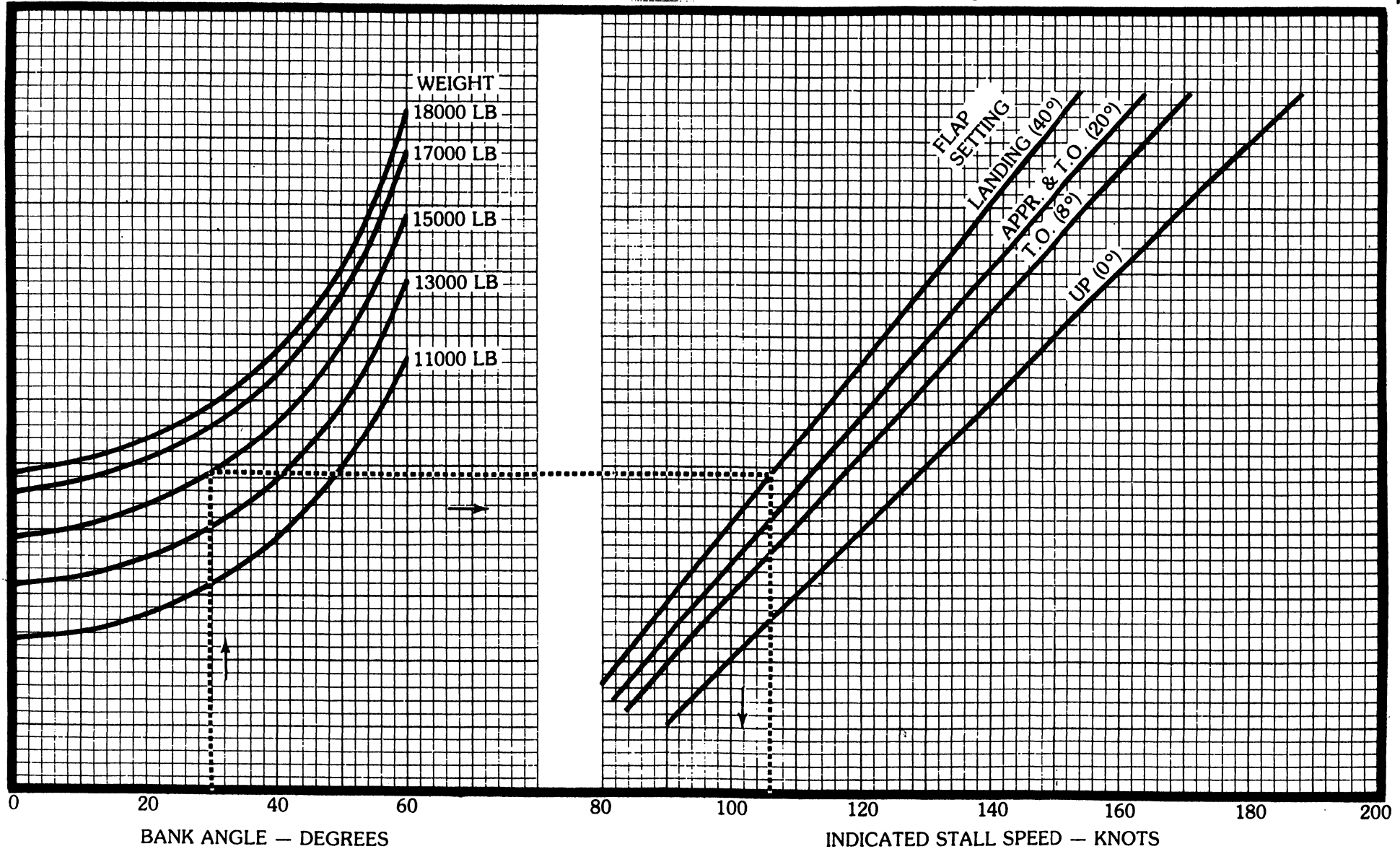


Figure 5-19

LOWSPEED BUFFET BOUNDARY 1.5 g's

EXAMPLE:

1. Altitude 30,000 FT
2. Weight 14,000 LB
3. Buffet Onset
 - Calibrated Mach 0.49 M_I
 - Indicated Airspeed 182 KIAS

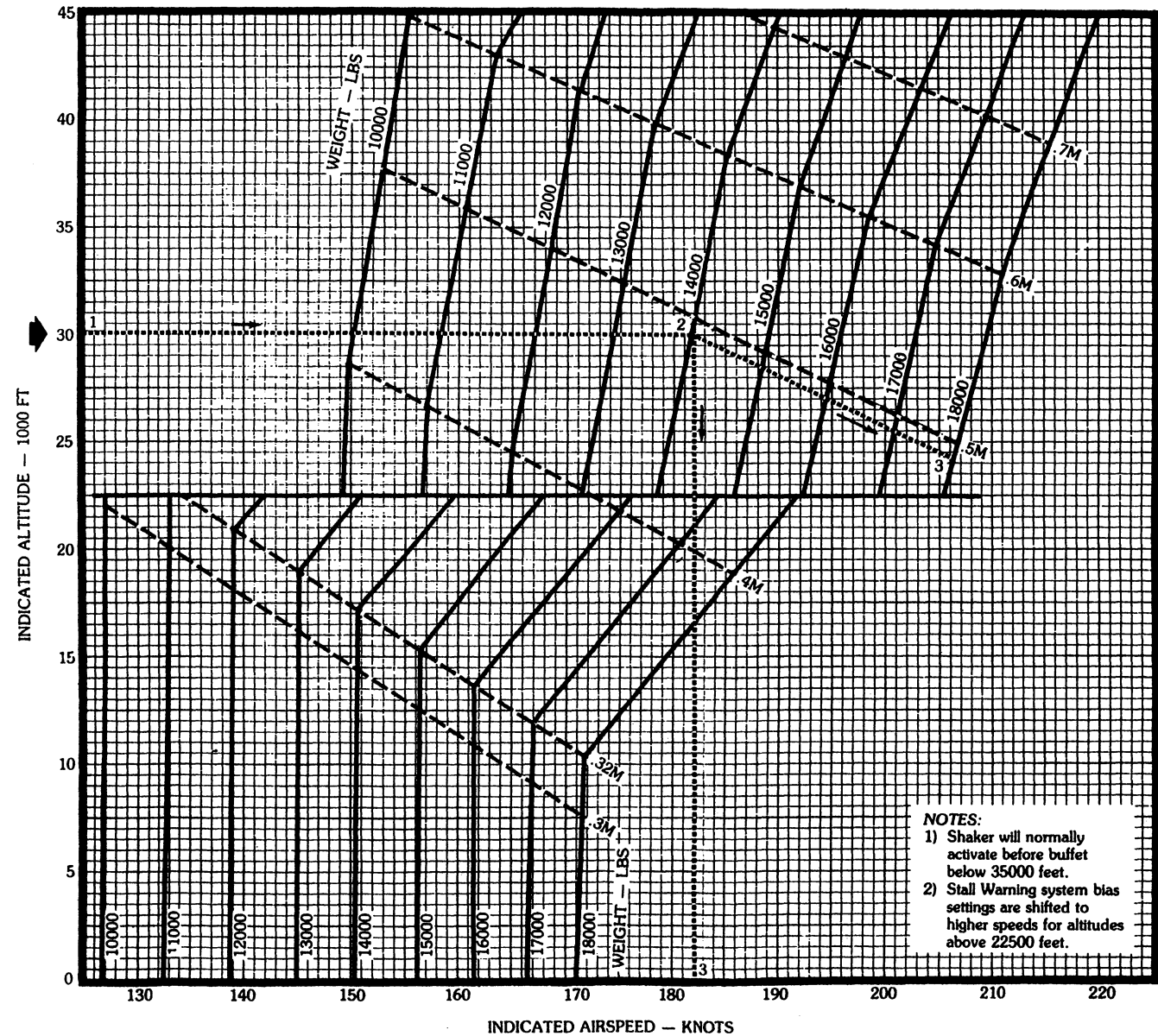


Figure 5-20

THRUST SETTING PROCEDURE

TAKEOFF

From the applicable Takeoff Power Setting Chart of Fan Speed, N₁, vs. Outside Air Temperature, determine the N₁ setting for temperature and altitude. Thrust is set by moving the thrust lever until N₁ indicator aligns with chart value.



In order to meet the performance shown on the takeoff distance charts and for takeoff power setting technique, refer to TAKEOFF PROCEDURE, this section.

N₁ is the value where the temperature line intersects the pressure altitude line. N₁'s above this line may exceed the engine manufacturer's limit. N₁'s below this line may not meet the performance in this section.

Operation at a specific N₁ should always be within the Turbine Temperature (ITT) Limits. Turbine Temperature (ITT) Limit must be observed.

PARTIAL POWER TAKEOFF PROCEDURE (OPTIONAL)

Reduced thrust takeoffs are permitted within the parameters outlined in the following information. A takeoff N₁ setting based upon an assumed temperature higher than the existing ambient temperature may be used provided the performance weight limitations equal or exceed actual takeoff weight of the aircraft. Performance weight limitations must be determined at both ambient and assumed temperatures.



The use of reduced thrust during takeoff is always at the discretion of the pilot.

A reduced thrust takeoff may be used only if:

- The runway surface is hard-paved and dry.
- Bleed Air Anti-Ice Systems are OFF.
- The Anti-Skid System is ON and operative.
- Thrust reduction does not exceed 25 percent of rated takeoff thrust for the existing ambient conditions.
- A full rated-thrust takeoff has been accomplished within the preceding 30 days to ensure that no engine deterioration has occurred.

THRUST SETTING PROCEDURE (CONT)

When planning for a PARTIAL POWER TAKEOFF, the following procedure should be used:

1. From the applicable TAKEOFF WEIGHT LIMIT chart, determine the maximum takeoff weight permitted for existing field and ambient conditions.
2. Using the actual aircraft weight, from the applicable TAKEOFF DISTANCE chart, determine the required runway length for existing field and ambient conditions.
3. If the weight from Step 1 is greater than actual takeoff weight, and the distance from Step 2 is less than actual runway length, a reduced thrust takeoff is permitted.
4. Determine the highest ambient temperature at which the actual takeoff weight is permitted by using the actual runway length and working in reverse from the applicable TAKEOFF DISTANCE chart.
5. From the applicable TAKEOFF WEIGHT LIMIT chart, determine the allowable takeoff weight using the temperature obtained from Step 4.
6. Ensure that the allowable takeoff weight determined in Step 5 is equal to or greater than the actual aircraft takeoff weight. Use the temperature obtained in Step 4 as the assumed temperature for remaining calculations.
7. Using the assumed temperature and existing ambient temperature, determine the reduced power takeoff setting from the PARTIAL POWER TAKEOFF N1 SETTING chart.
8. Using existing ambient temperature and field pressure altitude, determine the maximum takeoff power setting from the applicable TAKEOFF POWER SETTING chart.

NOTE

The reduced N1 setting may not be greater than the maximum N1 setting for existing ambient conditions.

9. Subtract 7.7% from the N1 setting obtained in Step 8. Use the greater of the settings determined between this step and Step 7 as the reduced thrust N1 setting.

NOTE

In no case may the N1 reduction exceed 7.7% rpm. This ensures that the thrust at the reduced setting will be at least 75 percent of the rated takeoff thrust for the existing ambient conditions.

THRUST SETTING PROCEDURE (CONT)

10. Using the assumed temperature and existing field and aircraft conditions, determine V₁ using the applicable CRITICAL ENGINE FAILURE SPEED (V₁) chart.



The purpose of the above calculation is to permit take-off performance with one engine inoperative and the operative engine at the reduced thrust setting.



If full-thrust is applied, increased yaw must be anticipated.

11. Using the assumed temperature, check obstacle clearance requirements.
12. Complete flight planning using normal procedures.

CLIMB PROCEDURE**MAXIMUM CLIMB**

From the applicable Maximum Continuous Thrust (N₁) table, determine the Fan Speed (N₁) setting for estimated temperature and altitude at the start of the climb. Adjust Fan Speed (N₁) for temperature and altitude during climb. Turbine Temperature (ITT) Limit must be observed.

ALTERNATE CLIMB POWER MANAGEMENT PROCEDURE

An alternate climb power management procedure may be employed for climb above 15,000 feet. This is accomplished by setting the required Fan Speed (N₁) at 15,000 feet and observing the resulting Turbine Temperature (ITT). This Turbine Temperature (ITT) setting may be used for duration of the climb and will result in Fan Speed (N₁) values close to the chart values.



A slightly different Fan Speed (N₁) Turbine Temperature (ITT) relationship may exist between engines; however, each engine should be operated at the Turbine Temperature which provided the required N₁ at 15,000 feet.

THRUST SETTING PROCEDURE (CONT)**CLIMB POWER MANAGEMENT PROCEDURE FOR ANTI-ICE
OPERATION**

A climb power management procedure for anti-ice operation during climb may be accomplished. Using the applicable Maximum Continuous Thrust (N1) table, determine the recommended Full Anti-ice On Fan Speed (N1) for the estimated temperature and altitude. Prior to reducing power and selecting anti-ice, note the ITT. Select anti-ice on and reset power to determined anti-ice on N1 value. If the resulting ITT is higher than the noted anti-ice off ITT, maintain the full anti-ice on N1 adjusting for ambient temperature and altitude during climb. Operation should always be within the ITT limits. If the resulting ITT is lower than the noted anti-ice off ITT, N1 can then be reset up to the noted anti-ice off ITT.

TAKEOFF POWER SETTING
ANTI-ICE - OFF
STANDARD NOZZLE

EXAMPLE:

1. Temperature 66°F
2. Altitude 4000 FT
3. Takeoff Power Setting 97.5% N₁

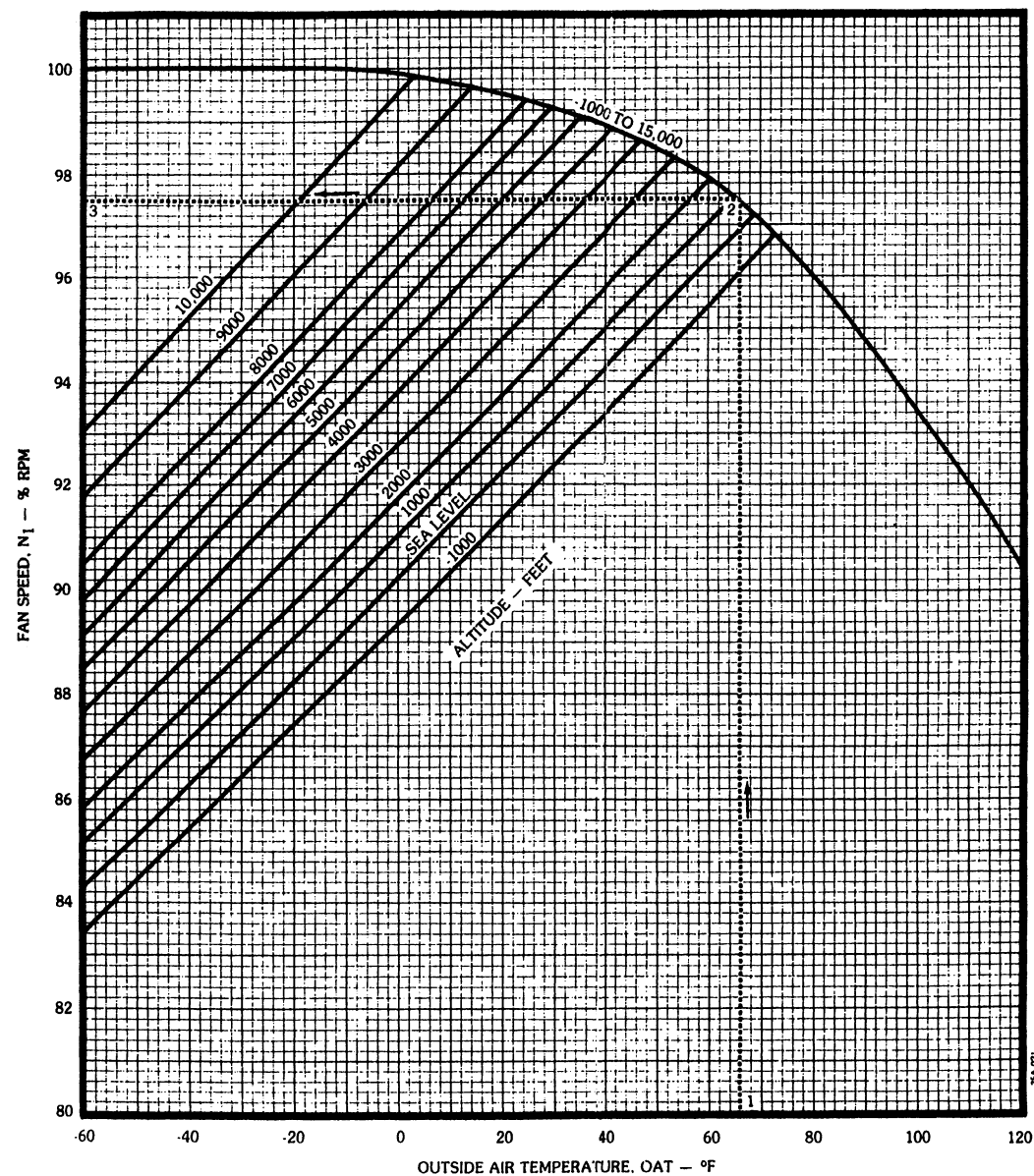


Figure 5-21

TAKEOFF POWER SETTING NACELLE HEAT ONLY STANDARD NOZZLE

EXAMPLE:

1. Temperature 30°F
2. Altitude 8000 FT
3. Takeoff Power Setting 99.0% N₁

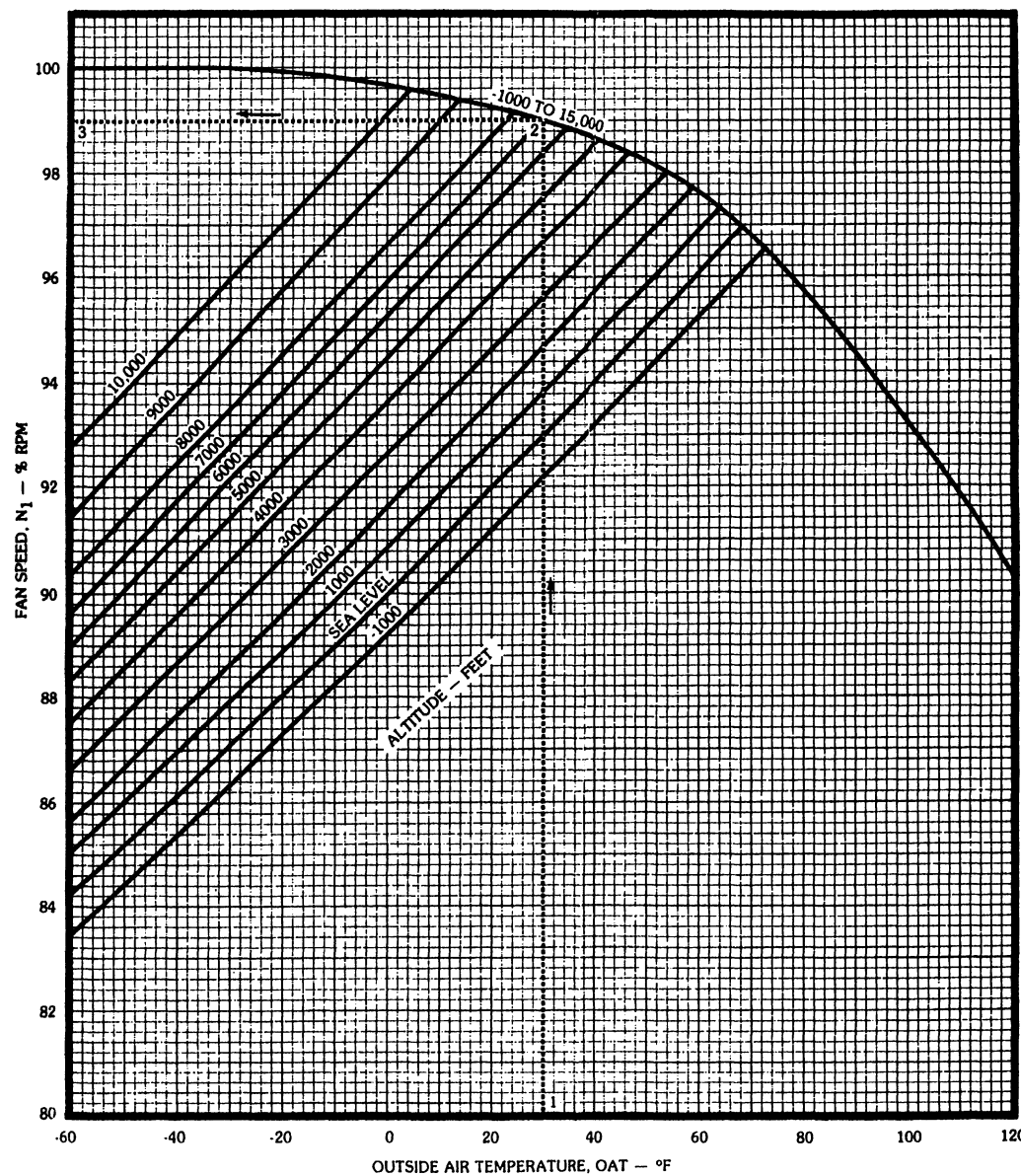


Figure 5-22

TAKEOFF POWER SETTING FULL ANTI-ICE STANDARD NOZZLE

EXAMPLE:

1. Temperature 0°F
2. Altitude 4000 FT
3. Takeoff Power Setting 91.2% N₁

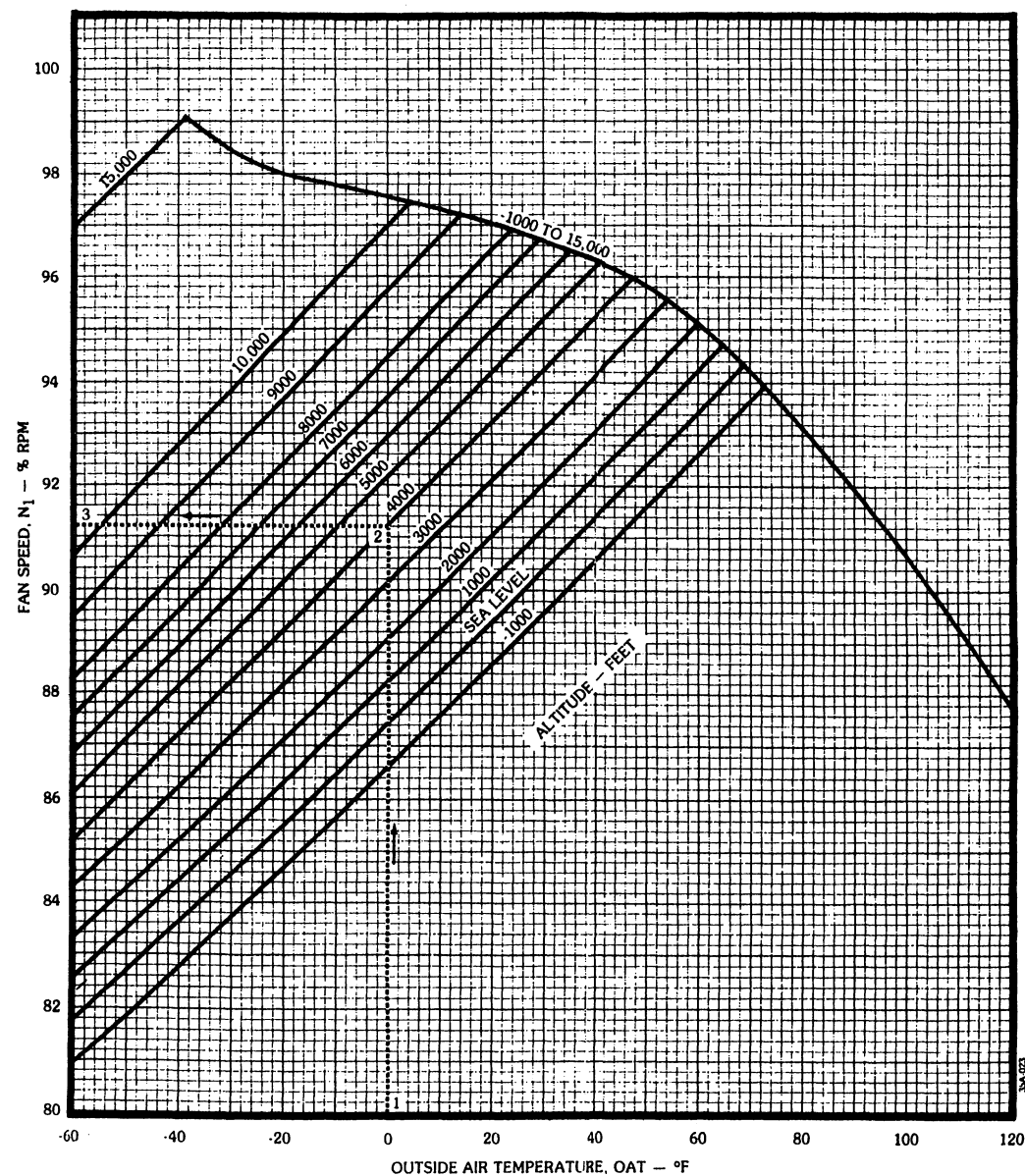


Figure 5-23

**PARTIAL POWER TAKEOFF
N₁ SETTING
STANDARD NOZZLE**

EXAMPLE:

1. Assumed Temperature82°F
2. Ambient Temperature50°F
3. Reduced Thrust Setting93.2% N₁

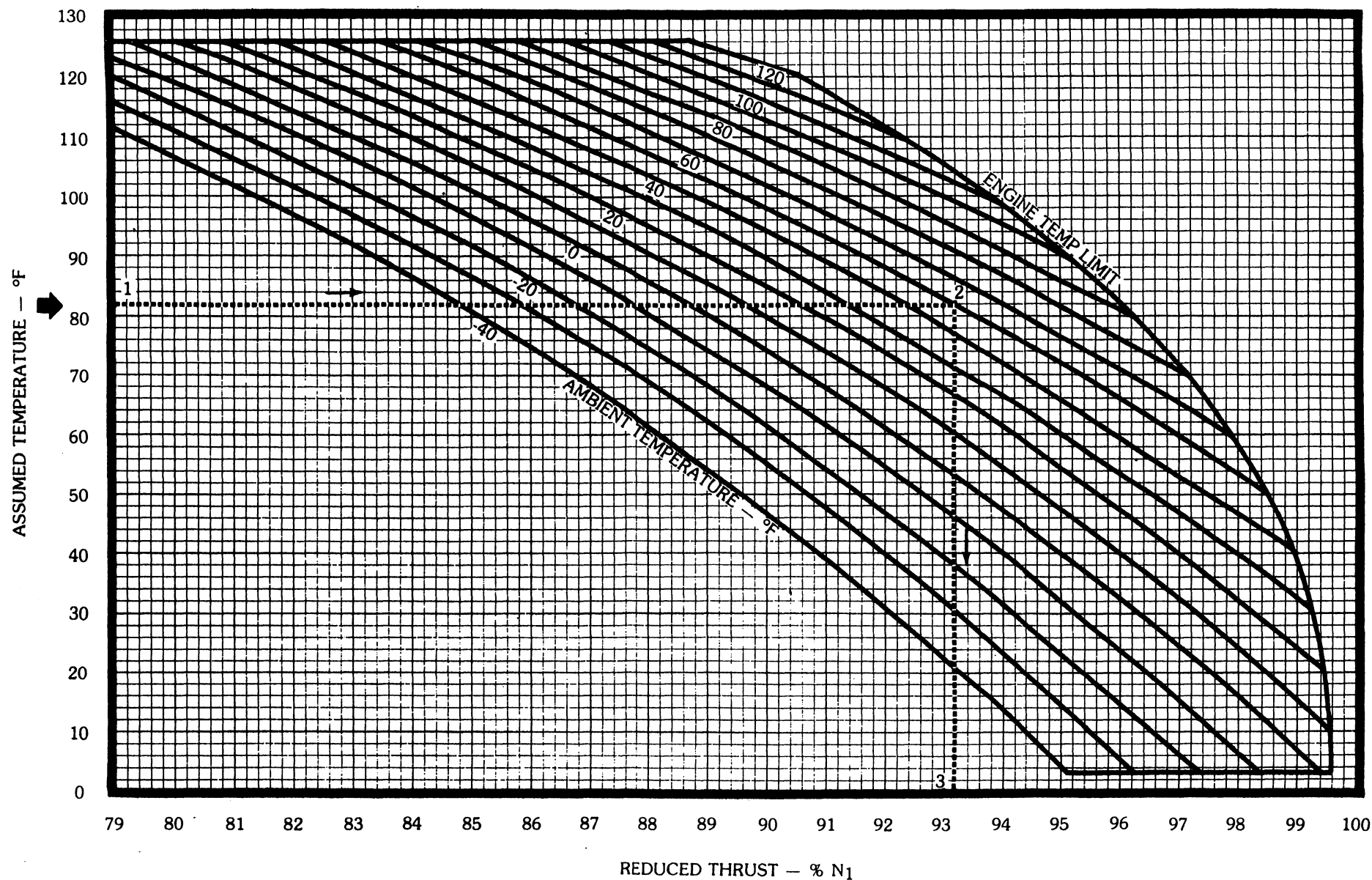


Figure 5-24

INTENTIONALLY LEFT BLANK

Figure 5-25

MAXIMUM CONTINUOUS THRUST FOR CLIMB (N1)

ALL ENGINE

STANDARD NOZZLE

		ALTITUDE — 1000 FEET									
		S.L.	5	10	15	20	25	30	35	40	45
RAM AIR TEMPERATURE — °C	45	91.2 88.0	91.6 88.6	92.1 89.1							
	40	92.4 89.1	92.8 89.6	93.1 90.1							
	35	93.5 90.2	93.8 90.7	94.1 91.1	94.4 91.5						
	30	94.4 91.2	94.7 91.7	94.9 92.0	95.1 92.4						
	25	95.3 92.1	95.5 92.5	95.6 92.8	95.7 93.1	95.6 93.4					
	20	95.6 92.8	96.1 93.2	96.2 93.4	96.3 93.7	96.2 93.9					
	15	94.8 92.5	96.6 93.8	96.7 94.0	96.7 94.2	96.6 94.4	96.6 94.4				
	10	93.9 91.6	97.1 94.2	97.1 94.4	97.1 94.6	97.0 94.7	97.0 94.7	96.6 94.6			
	5	93.0 90.7	96.5 94.5	97.4 94.8	97.4 94.9	97.3 95.0	97.3 95.0	97.0 94.8	96.3 94.3		
	0	92.2 89.8	95.7 93.6	97.6 95.1	97.6 95.2	97.5 95.2	97.5 95.2	97.3 95.0	96.6 94.6	94.7 93.4	
	-5	91.3 89.0	94.7 92.7	97.8 95.3	97.8 95.4	97.7 95.4	97.7 95.4	97.5 95.2	97.0 94.8	95.2 93.7	93.1 92.3
	-10	90.4 88.1	93.8 91.8	97.5 95.5	97.9 95.5	97.9 95.5	97.8 95.5	97.8 95.3	97.2 95.0	95.6 94.1	93.7 92.8
	-15	89.5 87.2	93.0 91.0	96.6 94.5	98.1 95.6	98.0 95.6	98.0 95.6	97.8 95.5	97.4 95.2	96.0 94.3	94.2 93.1
	-20	88.6 86.3	92.1 90.0	95.7 93.6	98.3 95.7	98.2 95.7	98.2 95.7	98.0 95.6	97.7 95.3	96.4 94.5	94.7 93.4
	-25	87.8 85.5	91.2 89.1	94.7 92.7	98.6 95.8	98.5 95.8	98.5 95.8	98.3 95.7	97.9 95.4	96.7 94.7	95.1 93.6
	-30	87.0 84.6	90.3 88.2	93.8 91.8	98.4 95.7	98.8 95.9	98.8 95.9	98.6 95.8	98.3 95.5	97.1 94.9	95.5 93.8
	-35	86.1 83.8	89.4 87.4	92.9 90.9	97.5 94.8	99.3 96.1	99.3 96.1	99.3 95.9	98.7 95.7	97.6 95.0	95.9 94.0
	-40	85.2 83.0	88.5 86.5	91.9 90.0	96.5 94.0	99.8 96.3	99.8 96.3	99.6 96.2	99.3 95.9	98.1 95.2	96.4 94.2

35A-028

XX.X ANTI-ICE OFF or NACELLE HEAT ONLY
XX.X FULL ANTI-ICE ON

SPEED SCHEDULE

- 250 KIAS to 32,000 ft
- 0.7 Mi to 45,000 ft

Figure 5-26

MAXIMUM CONTINUOUS THRUST FOR CLIMB (N1) SINGLE ENGINE STANDARD NOZZLE

		ALTITUDE — 1000 FEET									
	RAM AIR TEMPERATURE — °C	S.L.	5	10	15	20	25	30	35	40	45
		91.4 86.8	91.4 87.1	92.0 87.6							
45											
40		92.6 88.0	92.6 88.2	93.1 88.7							
35		92.6 89.1	92.6 89.4	93.0 89.7	93.4 90.1						
30		93.7 90.1	93.7 90.4	94.0 90.7	94.2 91.1						
25		94.7 91.2	94.7 91.4	94.9 91.7	95.0 92.0						
20		95.5 92.1	95.5 92.4	95.6 92.6	95.7 92.8	95.6 92.8					
15		95.4 92.7	96.2 93.2	96.2 93.3	96.3 93.5	96.2 93.5					
10		94.5 91.9	96.8 93.8	96.7 94.0	96.7 94.1	96.7 94.1	96.6 94.1				
5		93.5 91.0	97.2 94.3	97.1 94.4	97.1 94.5	97.1 94.5	96.9 94.5	96.5 94.2			
0		92.6 90.1	96.6 94.3	97.4 94.8	97.4 94.9	97.4 94.9	97.2 94.9	96.8 94.5	95.6 93.6		
-5		91.7 89.2	95.6 93.4	97.6 95.1	97.6 95.1	97.6 95.1	97.4 95.1	97.1 94.8	96.1 94.0	94.4 93.3	
-10		90.8 88.4	94.8 92.5	97.8 95.3	97.8 95.4	97.8 95.4	97.6 95.4	97.3 95.0	96.5 94.3	94.9 93.6	93.3 92.5
-15		89.9 87.5	93.8 91.6	97.4 95.2	98.0 95.5	98.0 95.5	97.8 95.5	97.5 95.2	96.8 94.6	95.2 93.8	93.8 92.8
-20		89.1 86.7	92.9 90.7	96.4 94.2	98.1 95.6	98.1 95.6	97.9 95.6	97.7 95.3	97.1 94.8	95.6 94.0	94.3 93.1
-25		88.2 85.8	92.0 89.8	95.5 93.3	98.3 95.6	98.3 95.6	98.2 95.6	98.0 95.4	97.3 94.9	96.0 94.2	94.8 93.3
-30		87.3 85.0	91.0 88.9	94.5 92.4	98.7 95.8	98.7 95.8	98.5 95.8	98.3 95.5	97.7 95.1	96.4 94.4	95.2 93.6
-35		86.4 84.1	90.1 88.0	93.6 91.4	99.1 95.9	99.1 95.9	98.9 95.9	98.7 95.7	98.1 95.3	96.9 94.5	95.6 93.7
-40		85.6 83.3	89.2 87.1	92.6 90.5	98.5 95.5	99.6 96.2	99.4 96.2	99.2 95.9	98.6 95.5	97.4 94.7	96.1 93.9

XX.X ANTI-ICE OFF or NACELLE HEAT ONLY
XX.X FULL ANTI-ICE ON

SPEED SCHEDULE

- 200 KIAS to 26,700 ft
- 0.5 Mi to 33,500 ft
- 170 KIAS to 45,000 ft

Figure 5-27

USE OF TAKEOFF CHARTS

MAXIMUM TAKEOFF WEIGHT

The charts on the following pages present the information necessary to determine the maximum allowable takeoff weight as limited by gross climb performance or brake energy limits. The climb limitations portion of the charts do not specify the limiting climb segment, only that any one or a combination of the takeoff climb segments (first, second or final) are limiting.

Takeoff must be made within the limitations of the maximum takeoff weight, TAKEOFF WEIGHT LIMITS chart, and by the performance determined from the TAKEOFF DISTANCE chart.

Example:

1. Maximum takeoff weight is 17,000; 18,000; or 18,300 pounds.
2. From the applicable TAKEOFF WEIGHT LIMITS chart, determine maximum takeoff weight for airport altitude and temperature.
3. From the applicable TAKEOFF DISTANCE chart, determine the maximum takeoff weight for the runway and ambient conditions.
4. For FAR 121 and 135 as applicable to U.S. registered aircraft, from the applicable TAKEOFF FLIGHT PATH and CLIMB GRADIENT charts, determine the maximum takeoff weight for obstacle clearance.
5. The lowest of the weights from steps 1, 2, 3 and 4 is the heaviest allowable weight at which the airplane can take off.

TAKEOFF DISTANCE CHARTS

The TAKEOFF DISTANCE Charts in this manual are presented for 8° or 20° flap settings and show required field length in terms of altitude, temperature, weight, wind, runway gradient, anti-skid on or off, and anti-ice systems on or off. These charts may be used to determine either of the following:

1. The runway length required given the airplane weight, runway gradient, pressure altitude, temperature, and wind. The example on the applicable chart illustrates determination of runway length required.
2. The maximum airplane takeoff weight corresponding to a specific runway length, runway gradient, pressure altitude, temperature, and wind. Takeoff weight for runway length available may be determined by working through the chart in the opposite manner as finding runway length.

TAKEOFF PROCEDURE

The takeoff distances on the TAKEOFF DISTANCE charts can be realized by following the ENGINE FAILURE DURING TAKEOFF procedure in Section III and using the following technique from a standing start with brakes set:

1. Run engines at 750°C ITT for 15 seconds to stabilize Fan Speed (N₁). Then, set takeoff Fan Speed (N₁).
2. After brake release, continuously adjust Fan Speed (N₁) up to 80 KIAS.
3. • For engine failure above V₁:
 - a. Rotate to approximately 9° nose up at V_R.
 - b. Accelerate to V₂ then increase pitch as required to maintain V₂ through a height of 35 feet.
- For rejected takeoff (engine failure below V₁):
 - a. Braking Techniques:
 - Anti-skid operative — Apply maximum anti-skid braking until the airplane stops.
 - Anti-skid inoperative — Apply brakes judiciously to prevent tire skid or failure. Modulating brake pressures will improve feel and reduce the probability of tire skid.

CALCULATION OF CORRECTION FOR RUNWAYS WITH A GRADIENT GREATER THAN 2.0% AND LESS THAN OR EQUAL TO 2.4%

The information provided here is used to calculate takeoff corrections for dry conditions with runway gradients $>2.0\%$ and $\leq 2.4\%$.

DOWNHILL (NEGATIVE) GRADIENT

Takeoff Weight Limit

It is not necessary to make corrections to the Takeoff Weight Limit for runways with a downhill gradient.

Takeoff Distance

Determine Takeoff Distance using the appropriate chart in this section and assume runway has a -2.0% gradient. Additional correction is not required.

Critical Engine Failure Speed

Determine Critical Engine Failure Speed (V_1) using the appropriate chart in this section and assume runway has a -2.0% gradient. Additional correction is not required.

UPHILL (POSITIVE) GRADIENT

Takeoff Weight Limit

Determine Climb Weight Limit using the appropriate chart in this section. Adjust the Climb Weight Limit by subtracting the appropriate weight from the table below.

Takeoff Weight Limit	
Uphill Gradient	Climb Weight Correction
+2.1%	Subtract 125 pounds (56.7 kg)
+2.2%	Subtract 250 pounds (113.4 kg)
+2.3%	Subtract 375 pounds (170.1 kg)
+2.4%	Subtract 500 pounds (226.8 kg)

Determine the Brake Energy Weight Limit using the appropriate chart in this section. Additional correction is not required.

Takeoff Distance

Determine Takeoff Distance using the appropriate chart in this section. Correct for wind and runway gradient assuming a $+2.0\%$ gradient. Stop and multiply the Takeoff Distance by 1.03. Continue across the chart with the corrected value making corrections for Anti-Skid, Anti-Ice, and Altitude as needed. Refer to the example on the following page.

Critical Engine Failure Speed

Determine Critical Engine Failure Speed (V_1) using the appropriate chart in this section and assume runway has a $+2.0\%$ gradient. Adjust the Critical Engine Failure Speed (V_1) by adding 1 knot.

Example:**(For runways with positive [uphill] gradient)**

1. Value obtained from Takeoff Distance chart given the Altitude/Temperature and Gross Weight
2. Headwind 20 kt
3. Runway Gradient Reference Line
4. Runway Gradient 2.2% UP
5. Takeoff Field Length Corrected for
Wind and 2.0% Gradient 7,300 ft
Answer from Step 5 Multiplied by 1.03 7,519 ft
6. Anti-Skid System Reference Line enter at 7,519 ft
7. Anti-Skid System ON
8. Anti-Ice System Reference Line
9. Anti-Ice System OFF
10. Altitude Reference Line
11. Altitude 8,000 ft
12. Corrected Takeoff Field Length 7,519 ft

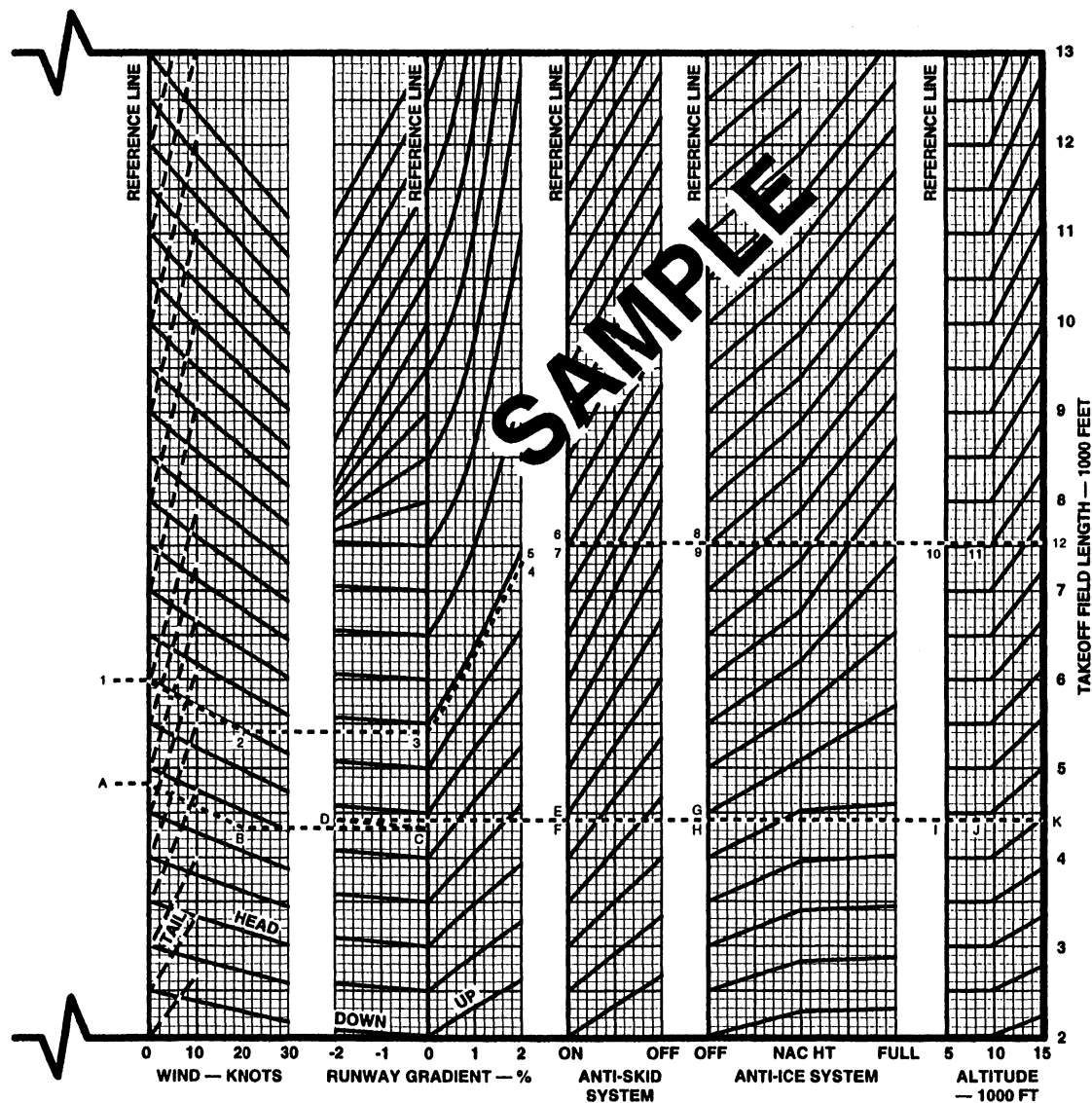
Example:**(For runways with negative [downhill] gradient)**

- A. Value obtained from Takeoff Distance chart given the Altitude/Temperature and Gross Weight
- B. Headwind 20 kt
- C. Runway Gradient Reference Line
- D. Runway Gradient -2.2% DOWN

NOTE: Use -2.0% for all gradients >2.0% and ≤2.4%.

- E. Anti-Skid System Reference Line
- F. Anti-Skid System ON
- G. Anti-Ice System Reference Line
- H. Anti-Ice System OFF
- I. Altitude Reference Line
- J. Altitude 8,000 ft
- K. Corrected Takeoff Field Length 4,400 ft

CALCULATION OF CORRECTION FOR RUNWAYS WITH A GRADIENT GREATER THAN 2.0% AND LESS THAN OR EQUAL TO 2.4% (Cont)



TAKEOFF FLIGHT PATH CHARTS

The takeoff flight path is divided into segments defined by changes in the airplane configuration. The terms used in flight path plotting are defined as follows and illustrated on the TAKEOFF PROFILE figure.

Reference Zero A point 35 feet above the runway surface at the final point of the takeoff run (takeoff distance).

First Segment Segment extending from the 35-foot height at the end of the takeoff run (Reference Zero) to the height at the end of gear retraction.



The First Segment of the Takeoff Flight Path represents only a portion of the First Segment Climb as shown on the TAKEOFF PROFILE figure.

Second Segment Segment beginning at the end of gear retraction (end of first segment) and continuing to a height of 1500 feet above the runway at V_2 speed. It is noted that in the TAKEOFF PROFILE figure, the second segment is shown only to a height of 400 feet. However, this is a **minimum** requirement, and for simplified flight planning the Takeoff Flight Path Charts in this manual present the second segment required gradients to the 1500-foot point for obstacle clearance considerations.

Effect of Wind on Flight Path The effect of wind is to increase or decrease the apparent climb gradients or horizontal distances on each segment of the flight path.

The TAKEOFF FLIGHT PATH Charts presented in this manual are separated into CLOSE-IN and DISTANT flight paths for 8° and 20° flap settings. The CLOSE-IN TAKEOFF FLIGHT PATH Charts facilitate determination of required gradients within approximately two miles horizontal distance from Reference Zero. The DISTANT TAKEOFF FLIGHT PATH CHARTS facilitate determination of required gradients to nearly eight miles from Reference Zero.

On these charts each flight path line is marked with numbers showing the net climb gradients required for obstacle clearance at the end of the first and second segment climb. The origin of each line is Reference Zero, and the slope of the line segments (scale vertical distance divided by scale horizontal distance) are the slopes of the required climb segments in space in zero wind conditions. Since the zero wind first and second segment climbs are uniquely related to each other for each airplane weight and environment, it can be seen that the actual flight path in still air can be obtained from the TAKEOFF FLIGHT PATH Charts by knowing only one of the applicable gradients.

CLIMB GRADIENT CHARTS

Climb performance charts for 8° and 20° flap settings are presented in terms of altitude, temperature, weight, wind, and anti-ice systems on or off. The gradients for First, Second, and Final Segments are read at the temperature and pressure altitude for the departure airport and are the net gradients that will be achieved at the appropriate segment of the Takeoff Flight Path; e.g., for departure from an airport pressure altitude of 2000 feet the gradients read from the charts will be the gradients achieved at 2000 feet, 2400 feet, and 3500 feet for First, Second, and Final Segments respectively.

These charts show the net gradients available and are to be used with the TAKEOFF FLIGHT PATH Charts which show the required net gradients when flight planning for obstacle clearance.

DETERMINATION OF TAKEOFF FLIGHT PATH FOR OBSTACLE CLEARANCE

The weight used for the following determination is defined as the airplane weight at the beginning of the takeoff roll. Using this weight for each climb segment will result in some small conservatism, since the gradients are presented in terms of instantaneous gross weight rather than the weight at the beginning of takeoff roll.

When flight path planning for obstacle clearance is desired, the following procedure may be used:

1. From the applicable TAKEOFF WEIGHT LIMITS Chart, determine the highest weight at which a takeoff may be made for the local temperature and pressure altitude.
2. From the applicable TAKEOFF DISTANCE Chart, determine the highest weight at which a takeoff may be made using the runway gradient, appropriate wind component, field pressure altitude, and local temperature. The lower of this weight and the weight from the TAKEOFF WEIGHT LIMITS Chart is the first trial takeoff gross weight.
3. Determine the horizontal distance of the obstacle from reference zero.
4. From the applicable TAKEOFF FLIGHT PATH Chart, for the first or second segment, depending on where the critical obstacle is considered to be, determine the required climb gradient for obstacle clearance (zero wind gradient).

**DETERMINATION OF TAKEOFF FLIGHT PATH FOR OBSTACLE
CLEARANCE (CONT)**

5. From the applicable CLIMB GRADIENT Chart, determine the aircraft climb gradient performance.



It is noted at this point that a head wind serves to increase climb gradient performance, whereas a tail wind decreases climb gradient performance.

6. • If step 5 (climb gradient performance) is more than step 4 (required gradient), obstacle clearance is satisfactory.
- If step 5 (climb gradient performance) is less than step 4 (required gradient), obstacle clearance is unsatisfactory and procedures must be repeated using a lesser weight. When weight is reduced to achieve obstacle clearance, note that the horizontal distance between the obstacle and reference zero increases, since the takeoff field length is less. Consequently an interpolative process is required to find the exact minimum gradient and maximum weight for obstacle clearance.

TAKEOFF PROFILE

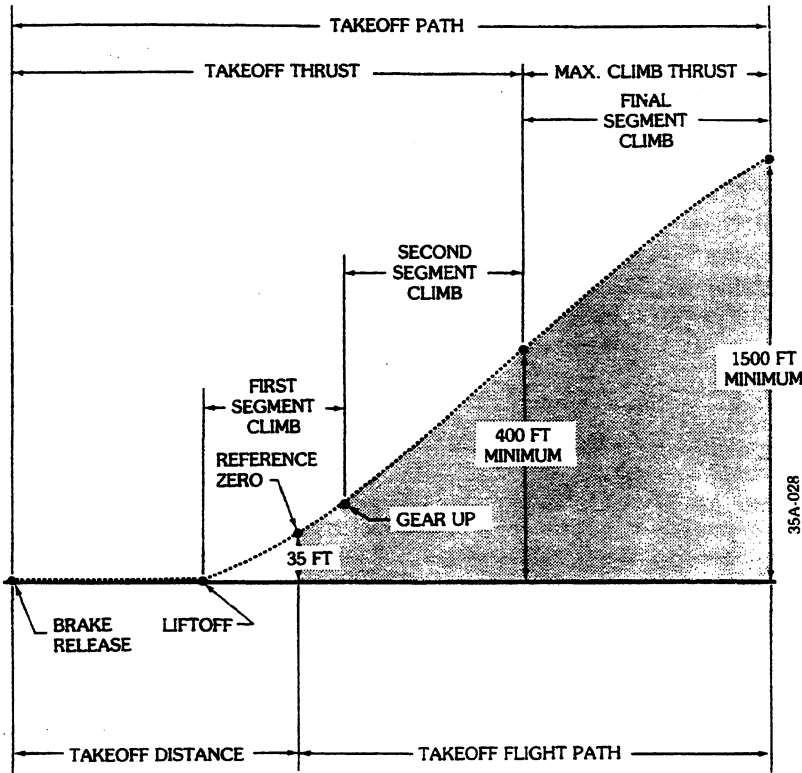


Figure 5-28

TAKEOFF WEIGHT LIMIT FLAPS 8° ANTI-ICE — OFF

EXAMPLE:

1. Temperature 50°F
2. Altitude 10,000 ft
3. Takeoff Climb Weight Limit 17,850 lb
4. Wind Reference Line
5. Headwind 20 kt
6. Brake Energy Weight Limit 18,250 lb

The most limiting condition is takeoff climb.

- Takeoff Weight Limit 17,850 lb

NOTE: THE VALUE OBTAINED FROM THIS CHART MAY NOT BE THE LIMITING WEIGHT. TAKEOFF WEIGHT IS ALSO LIMITED BY THE MAXIMUM CERTIFIED TAKEOFF WEIGHT AND THE TAKEOFF WEIGHT FOR THE RUNWAY LENGTH AVAILABLE.

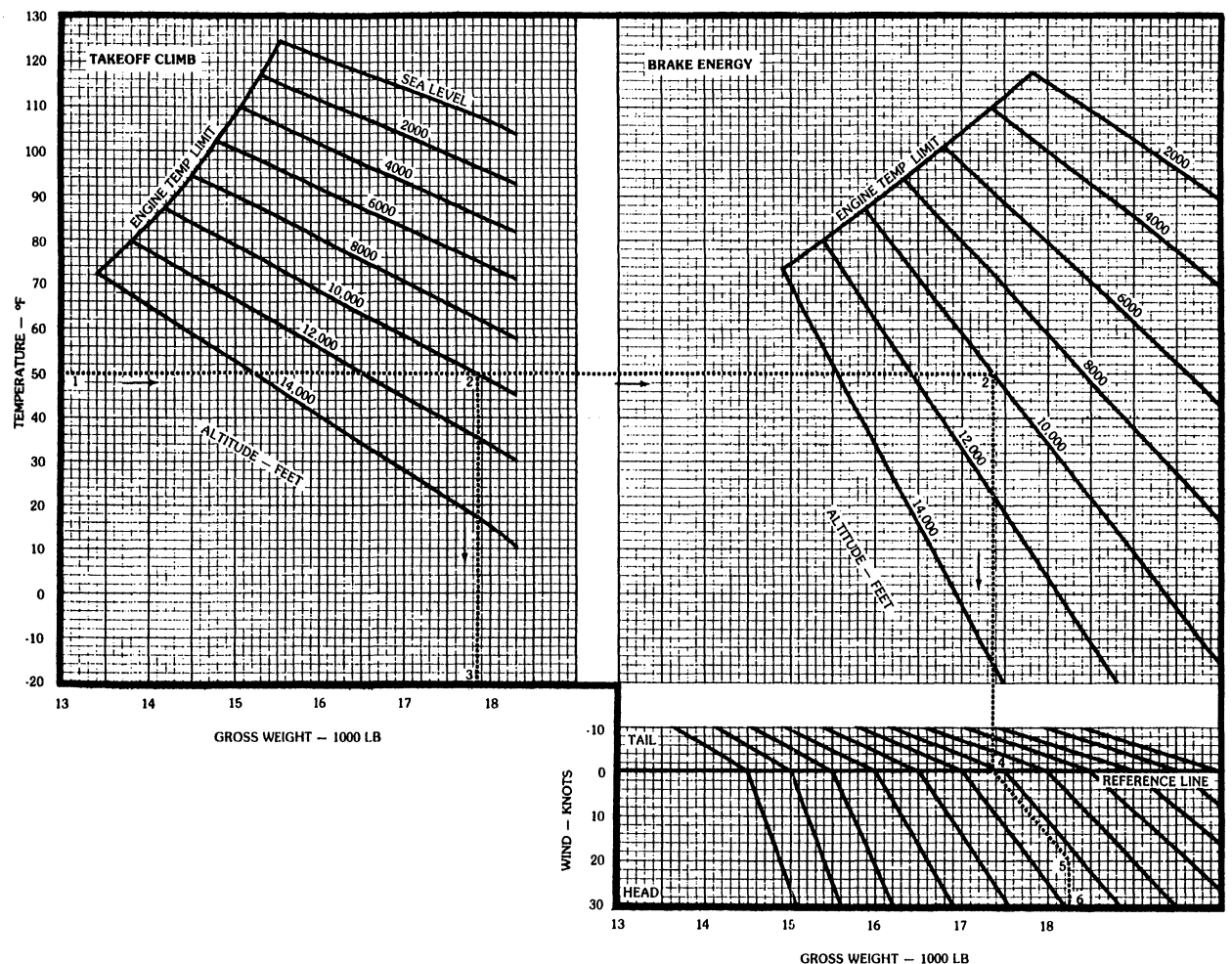
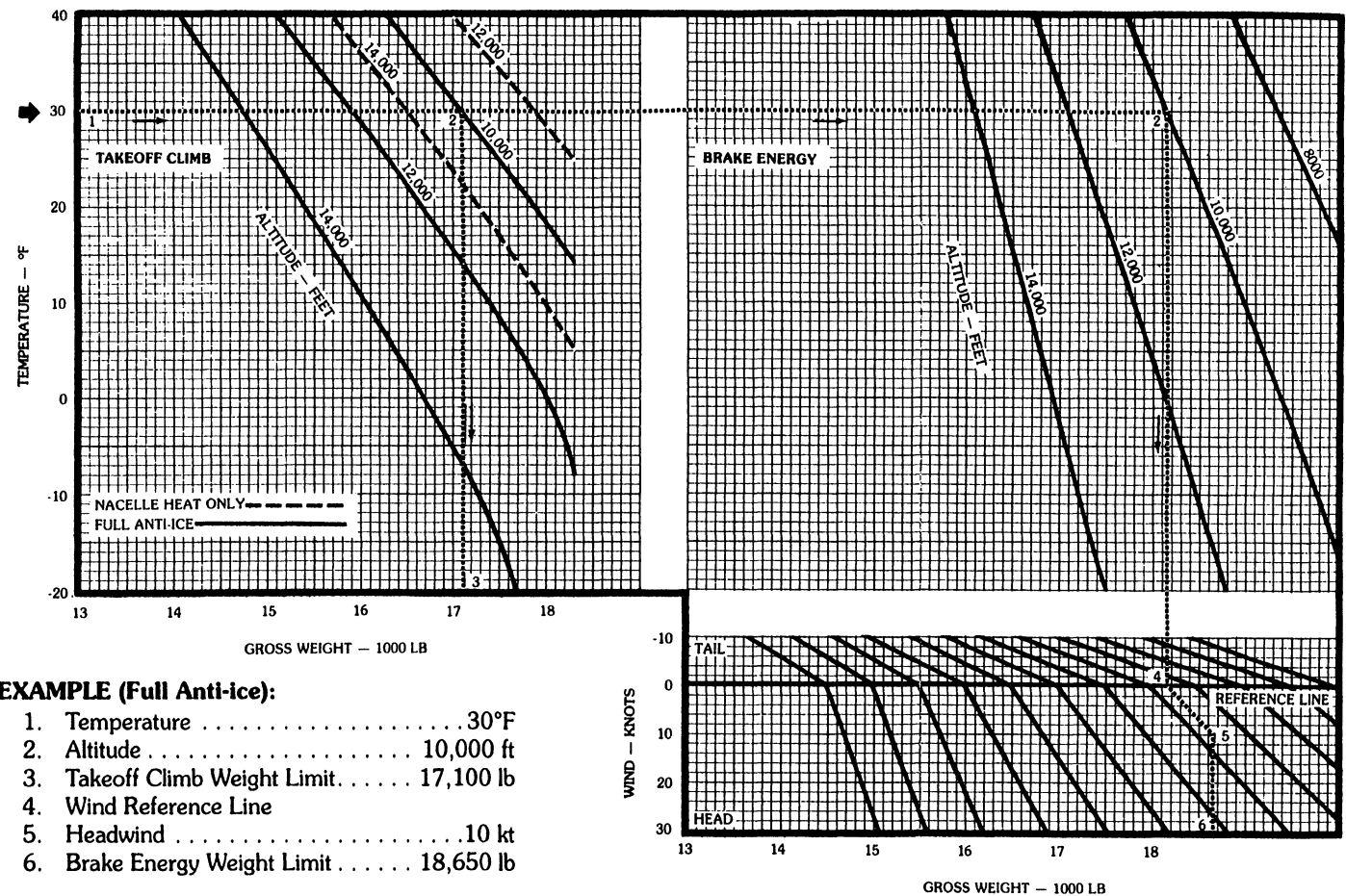


Figure 5-29

TAKEOFF WEIGHT LIMIT
FLAPS 8° ANTI-ICE — ON**EXAMPLE (Full Anti-ice):**

1. Temperature 30°F
2. Altitude 10,000 ft
3. Takeoff Climb Weight Limit. 17,100 lb
4. Wind Reference Line
5. Headwind 10 kt
6. Brake Energy Weight Limit 18,650 lb

The most limiting condition is takeoff climb.

- Takeoff Weight Limit 17,100 lb

NOTE: THE VALUE OBTAINED FROM THIS CHART MAY NOT BE THE LIMITING WEIGHT. TAKEOFF WEIGHT IS ALSO LIMITED BY THE MAXIMUM CERTIFIED TAKEOFF WEIGHT AND THE TAKEOFF WEIGHT FOR THE RUNWAY LENGTH AVAILABLE.

Figure 5-30

EXAMPLE (Takeoff Weight):

- | | | |
|---------------------------------------|--------------------------------|-----------------------------------|
| A. Takeoff Field Length . . . 7000 FT | G. Anti-skid Ref. Line | L. Temperature 80°F |
| B. Altitude 4000 FT | H. Runway Gradient . . . 9% UP | M. Altitude 4000 FT |
| C. Altitude Ref. Line | I. Runway Gradient Ref. Line | N. Weight Ref. Line |
| D. Anti-ice OFF | J. Headwind 20 KTS | O. Intersection Point |
| E. Anti-ice Ref. Line | K. Wind Ref. Line | P. Takeoff Weight . . . 17,100 LB |
| F. Anti-skid ON | | |

[illegible]

flight manual

EXAMPLE:

1. Temperature50°F

2. Altitude6000 FT

3. Weight Ref. Line

4. Weight15,000 LB
5. Wind Ref. Line

6. Tailwind10 KTS

7. Runway Gradient Ref. Line

8. Runway Gradient1% UP
9. Anti-ice Ref. Line

10. Anti-iceOFF

11. Anti-skid Ref. Line

12. Anti-skidON

13. Critical Engine Failure Speed119 KIAS

CRITICAL ENGINE FAILURE
SPEED (V₁)
FLAPS - 8°

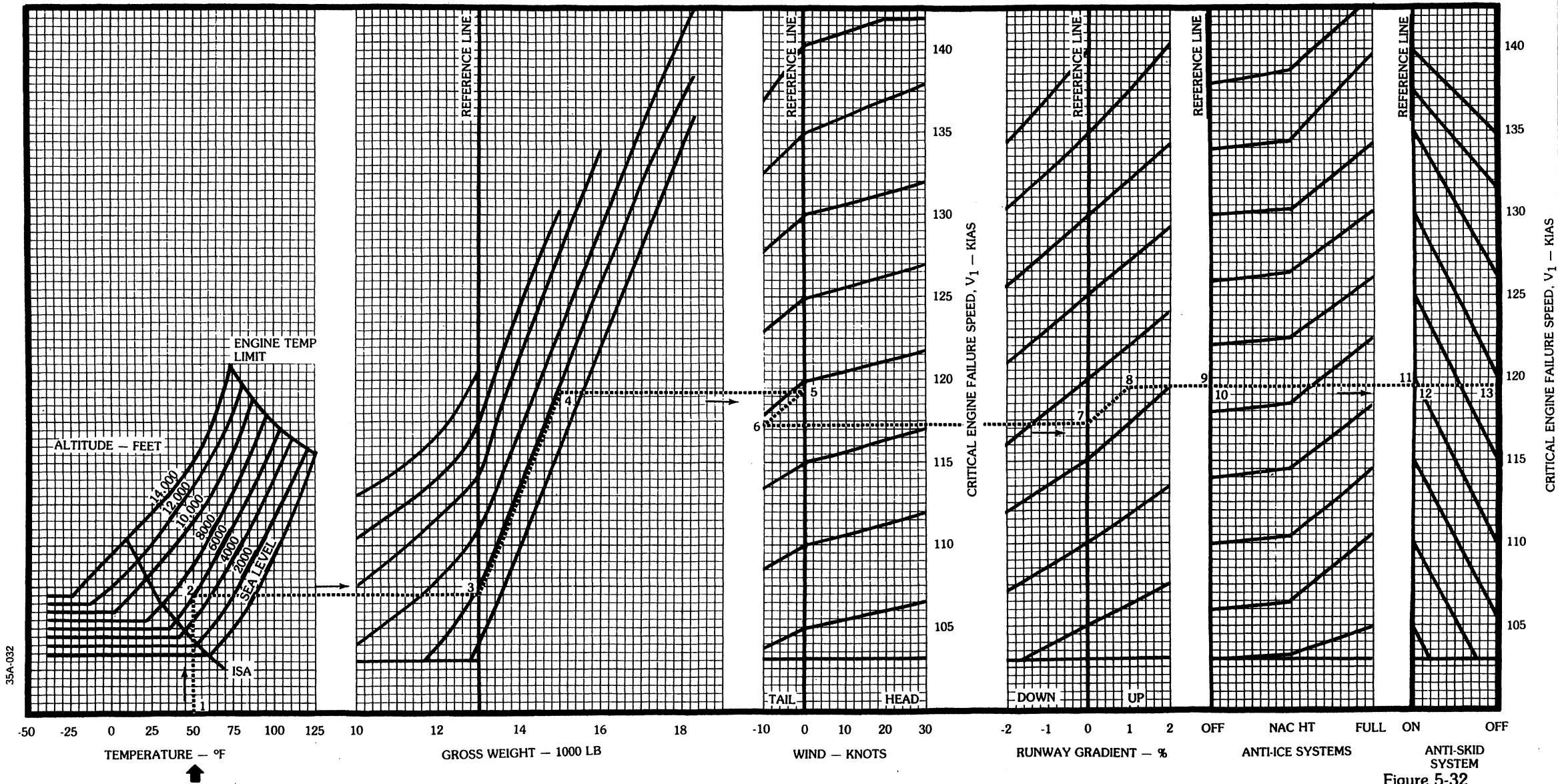


Figure 5-32

ROTATION SPEED (V_R) FLAPS - 8°

EXAMPLE:

1. Weight 15,000 LB
2. Rotation Speed 130.0 KIAS

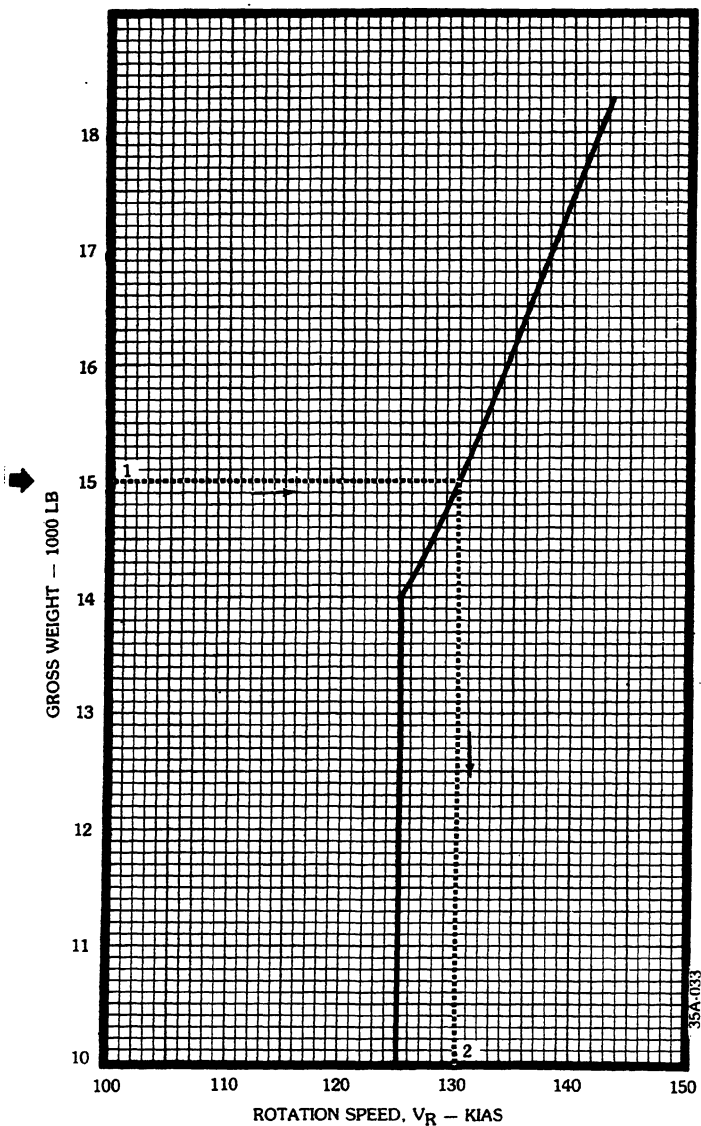


Figure 5-33

TAKEOFF SAFETY SPEED (V_2) FLAPS - 8°

EXAMPLE:

1. Weight 15,000 LB
2. Engine Out Safety Speed 132.5 KIAS

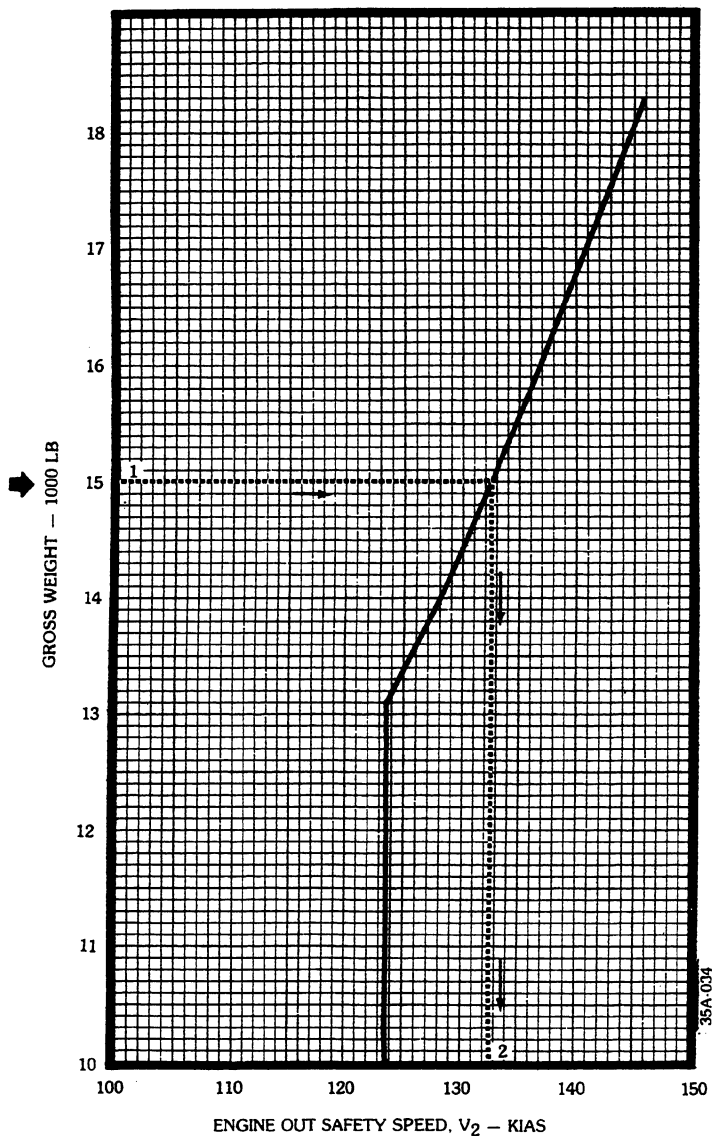


Figure 5-34

CLOSE IN TAKEOFF FLIGHT PATH
FLAPS - 8°

EXAMPLE:

- A. Obstacle Distance
(Horizontal From Ref Zero) 5,200 FT
- B. Obstacle Height
(Above Runway Surface) 370 FT
- C. Required Net Climb Gradient 8.1%

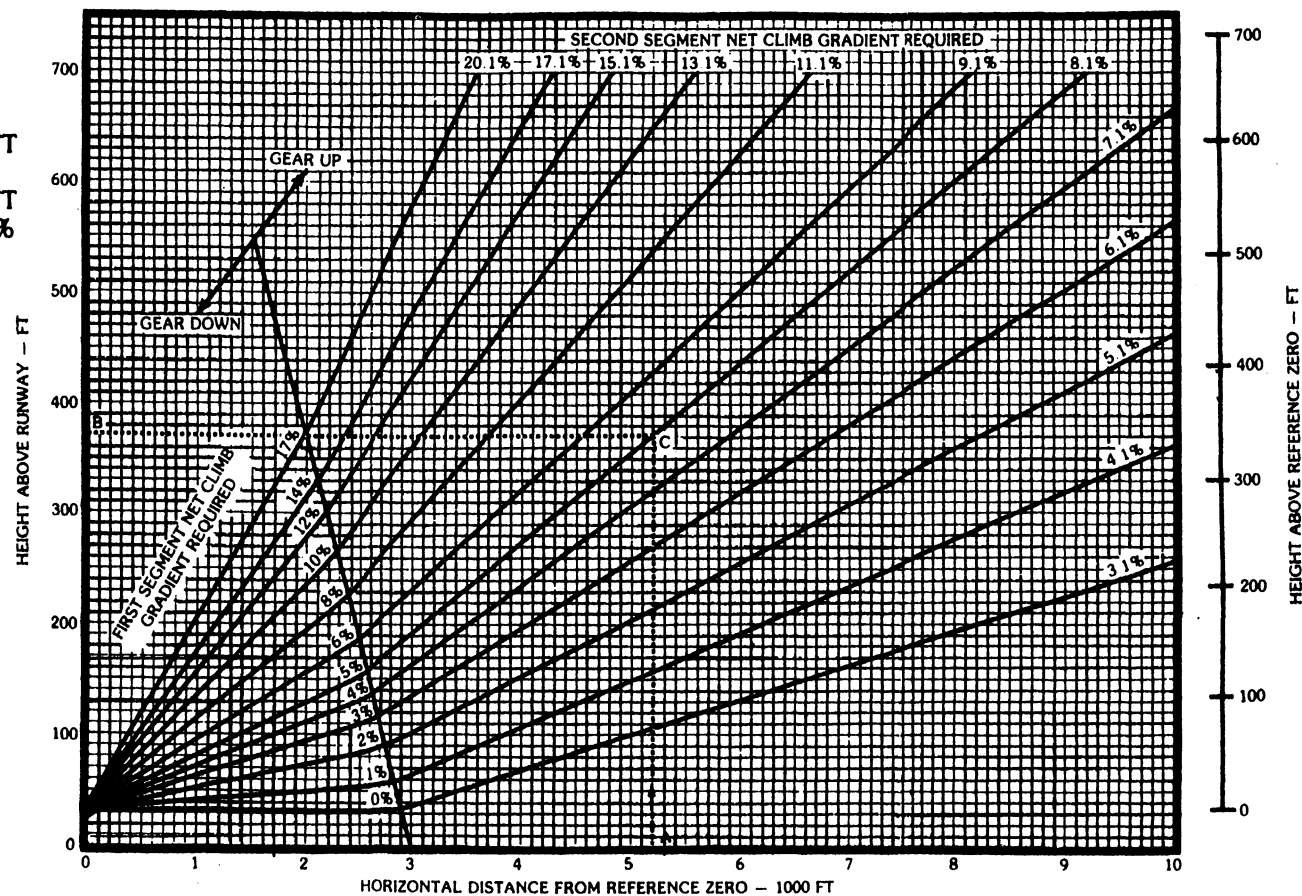


Figure 5-35

DISTANT TAKEOFF FLIGHT PATH FLAPS - 8°

EXAMPLE:

- A. Obstacle Distance
(Horizontal From Ref Zero) 21.900 FT
- B. Obstacle Height
(Above Runway Surface) 580 FT
- C. Required Net Climb Gradient 3%

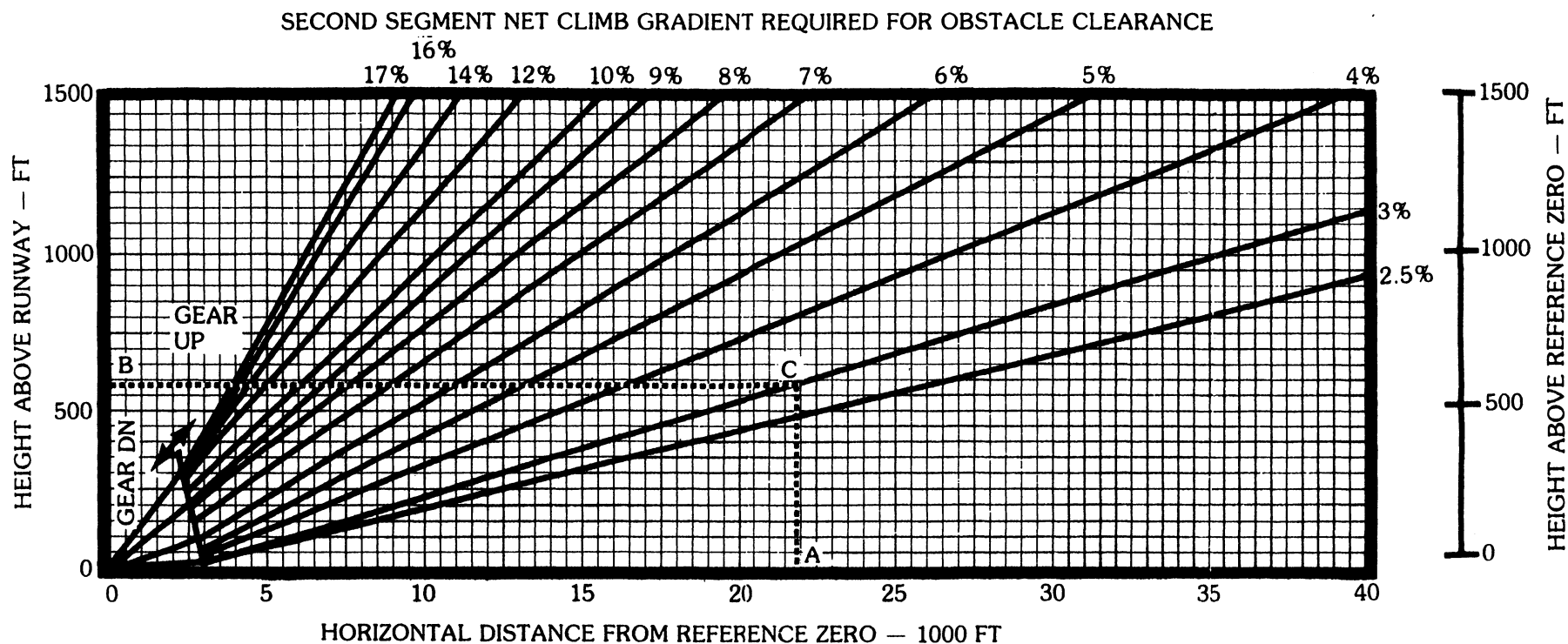


Figure 5-36

FIRST SEGMENT CLIMB GRADIENT FLAPS - 8°

CONDITIONS:

1. Single Engine
2. Takeoff Thrust
3. Gear — Down
4. Flaps — 8°
5. Speed — V_{LOF}

EXAMPLE:

1. Temperature 50°F
2. Altitude 6000 FT
3. Weight Ref. Line
4. Weight 13,000 LB
5. Wind Ref. Line
6. Wind 0 KTS
7. Anti-ice Ref. Line
8. Anti-ice OFF
9. Net Climb Gradient 7.6%

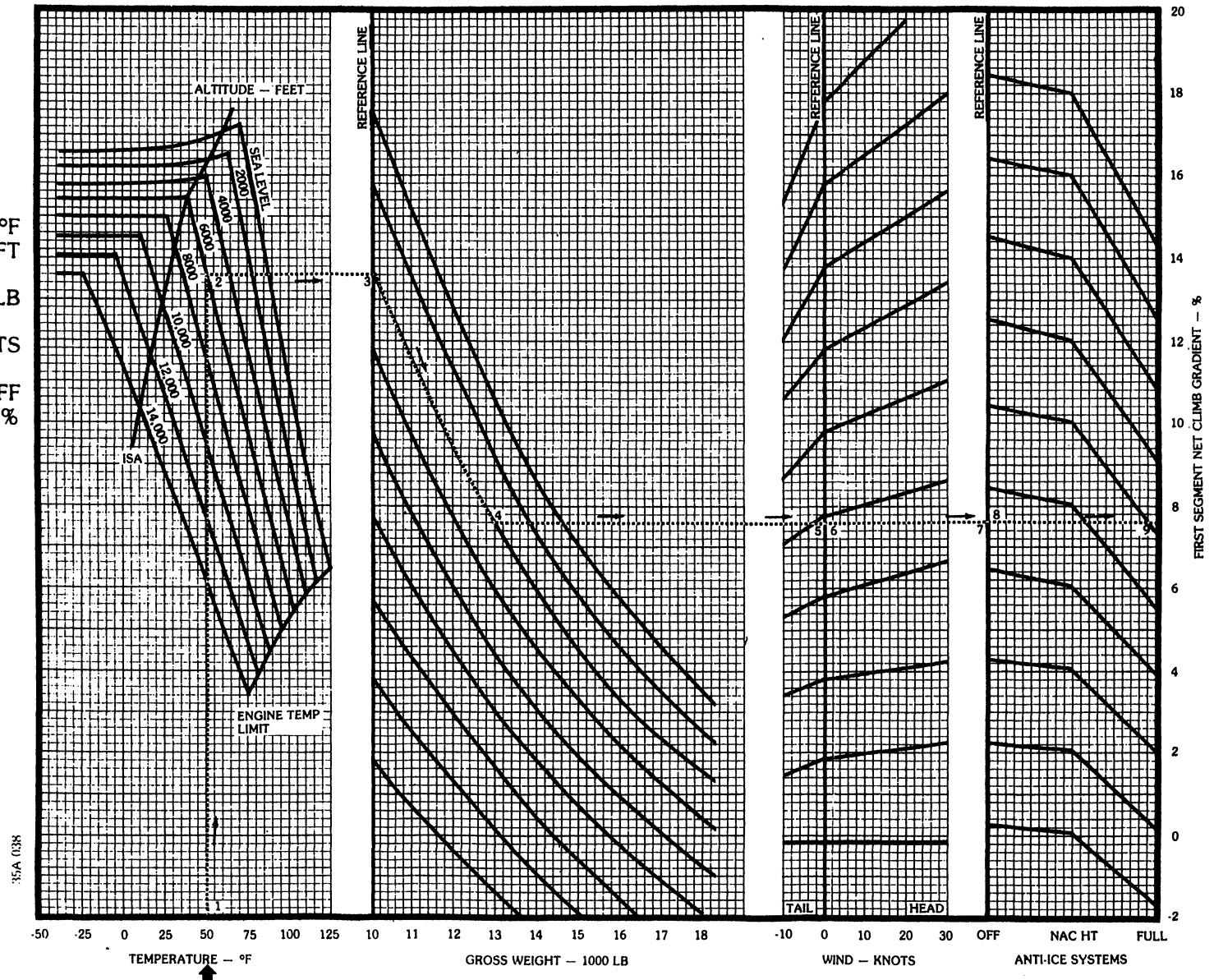


Figure 5-37

SECOND SEGMENT CLIMB GRADIENT FLAPS - 8°

CONDITIONS:

1. Single Engine
2. Takeoff Thrust
3. Gear - Up
4. Flaps - 8°
5. Speed - V_2

EXAMPLE:

1. Temperature 30°F
2. Altitude 10,000 FT
3. Weight Ref. Line
4. Weight 13,000 LB
5. Wind Ref. Line
6. Headwind 20 KTS
7. Anti-ice Ref. Line
8. Anti-ice FULL
9. Net Climb Gradient 6.9%

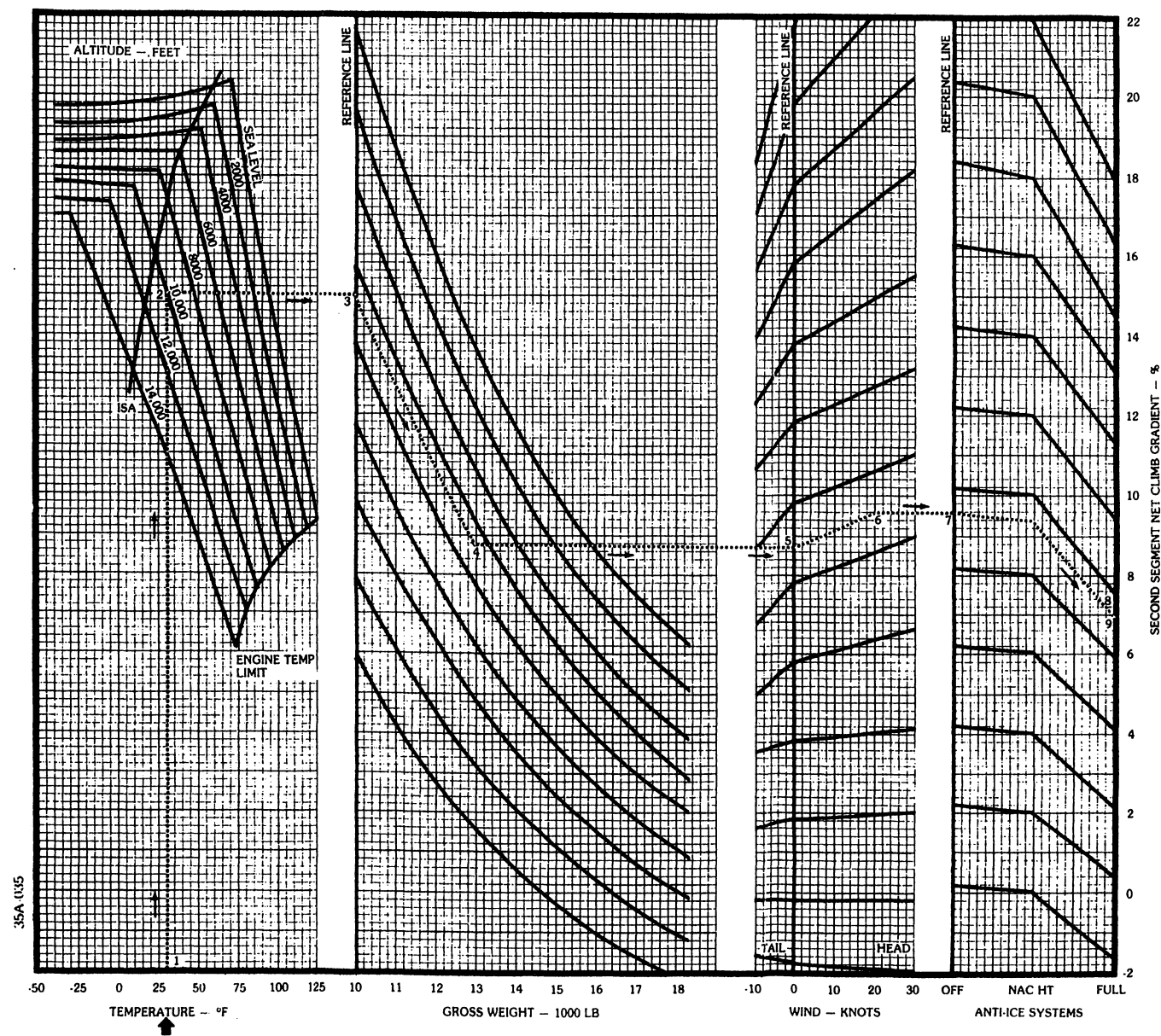


Figure 5-38

TAKEOFF WEIGHT LIMIT
FLAPS - 20° ANTI-ICE - OFF

EXAMPLE:

1. Temperature 60°F
2. Altitude 8000 FT
3. Takeoff Weight Limit 15,880 LB

NOTE: THE VALUE OBTAINED FROM THIS CHART MAY NOT BE THE LIMITING WEIGHT. TAKEOFF WEIGHT IS ALSO LIMITED BY THE MAXIMUM CERTIFIED TAKEOFF WEIGHT AND THE TAKEOFF WEIGHT FOR THE RUNWAY LENGTH AVAILABLE.

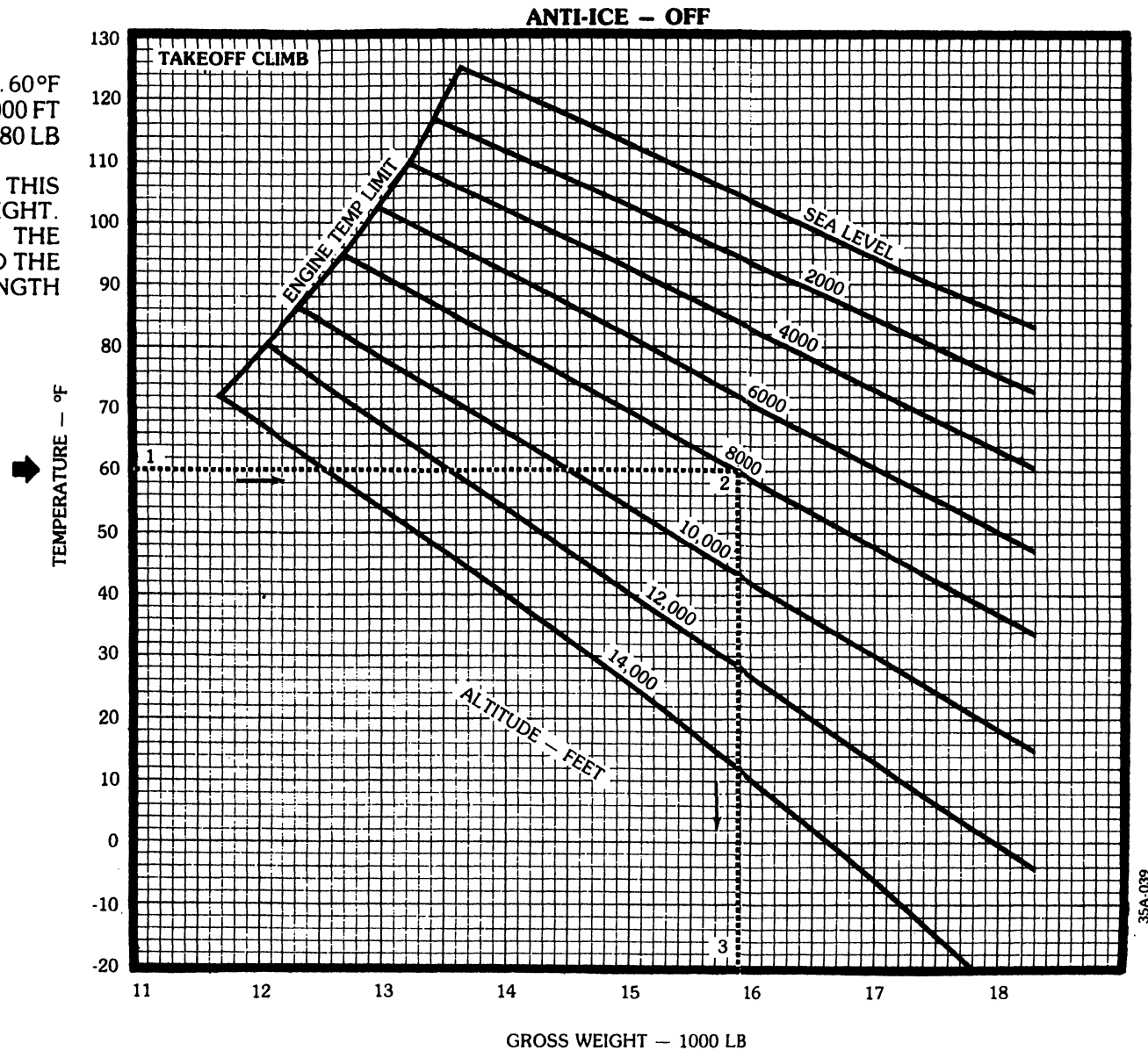


Figure 5-39

TAKEOFF WEIGHT LIMIT FLAPS - 20°, ANTI-ICE - ON

EXAMPLE:

1. Temperature 30°F
2. Altitude 10,000 FT
3. Takeoff Weight Limit
 - Nacelle Heat Only 16,920 LB
 - Full Anti-ice 15,150 LB

NOTE: THE VALUES OBTAINED FROM THESE CHARTS MAY NOT BE THE LIMITING WEIGHT. TAKEOFF WEIGHT IS ALSO LIMITED BY THE MAXIMUM CERTIFIED TAKEOFF WEIGHT AND THE TAKEOFF WEIGHT FOR THE RUNWAY LENGTH AVAILABLE.

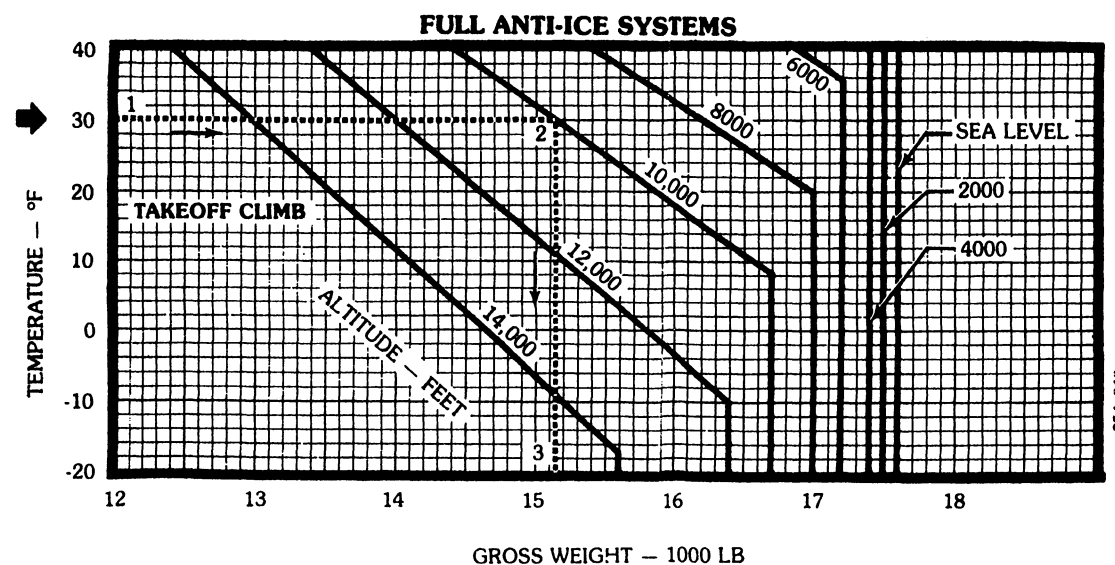
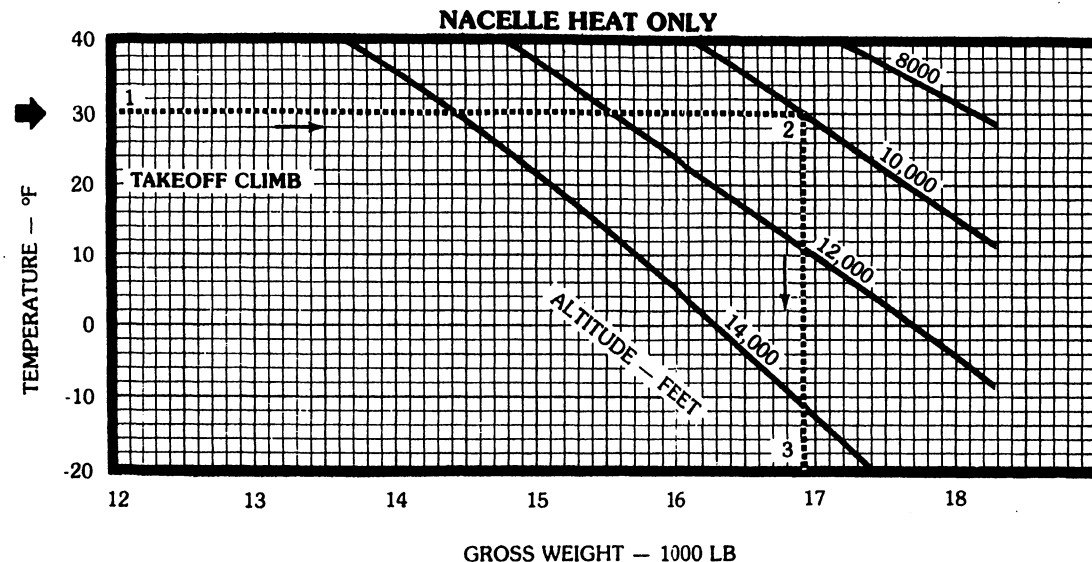


Figure 5-40

TAKEOFF DISTANCE
TAKEOFF WEIGHT
FLAPS - 20°

EXAMPLE (Takeoff Distance):

- | | | |
|-------------------------------|--------------------------------|------------------------------------|
| 1. Temperature 60°F | 6. Headwind 20 KTS | 11. Anti-ice Ref. Line |
| 2. Altitude 4000 FT | 7. Runway Gradient Ref. Line | 12. Anti-ice OFF |
| 3. Weight Ref. Line | 8. Runway Gradient . . . 1% UP | 13. Altitude Ref. Line |
| 4. Weight 15,000 LB | 9. Anti-skid Ref. Line | 14. Altitude 4000 FT |
| 5. Wind Ref. Line | 10. Anti-skid ON | 15. Takeoff Field Length . 3750 FT |

EXAMPLE (Takeoff Weight):

- | | | |
|----------------------------------|----------------------------------|-----------------------------------|
| A. Takeoff Field Length .5100 FT | G. Anti-skid Ref. Line | L. Temperature85°F |
| B. Altitude4000 FT | H. Runway Gradient 1% UP | M. Altitude4000 FT |
| C. Altitude Ref. Line | I. Runway Gradient Ref. Line | N. Weight Ref. Line |
| D. Anti-iceOFF | J. Headwind14 KTS | O. Intersection Point |
| E. Anti-ice Ref. Line | K. Wind Ref. Line | P. Takeoff Weight . . . 15,100 LB |
| F. Anti-skidON | | |

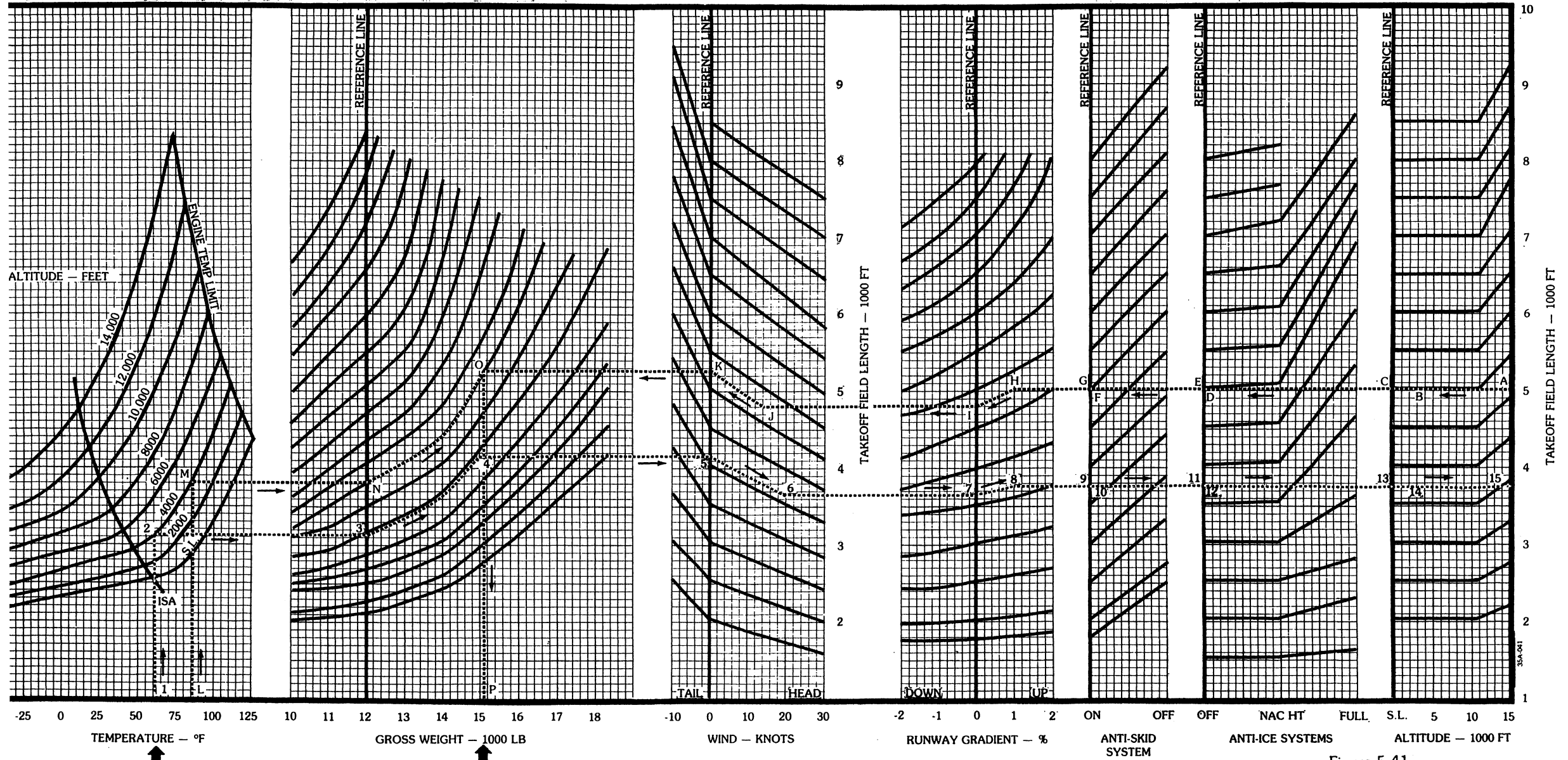


Figure 5-41

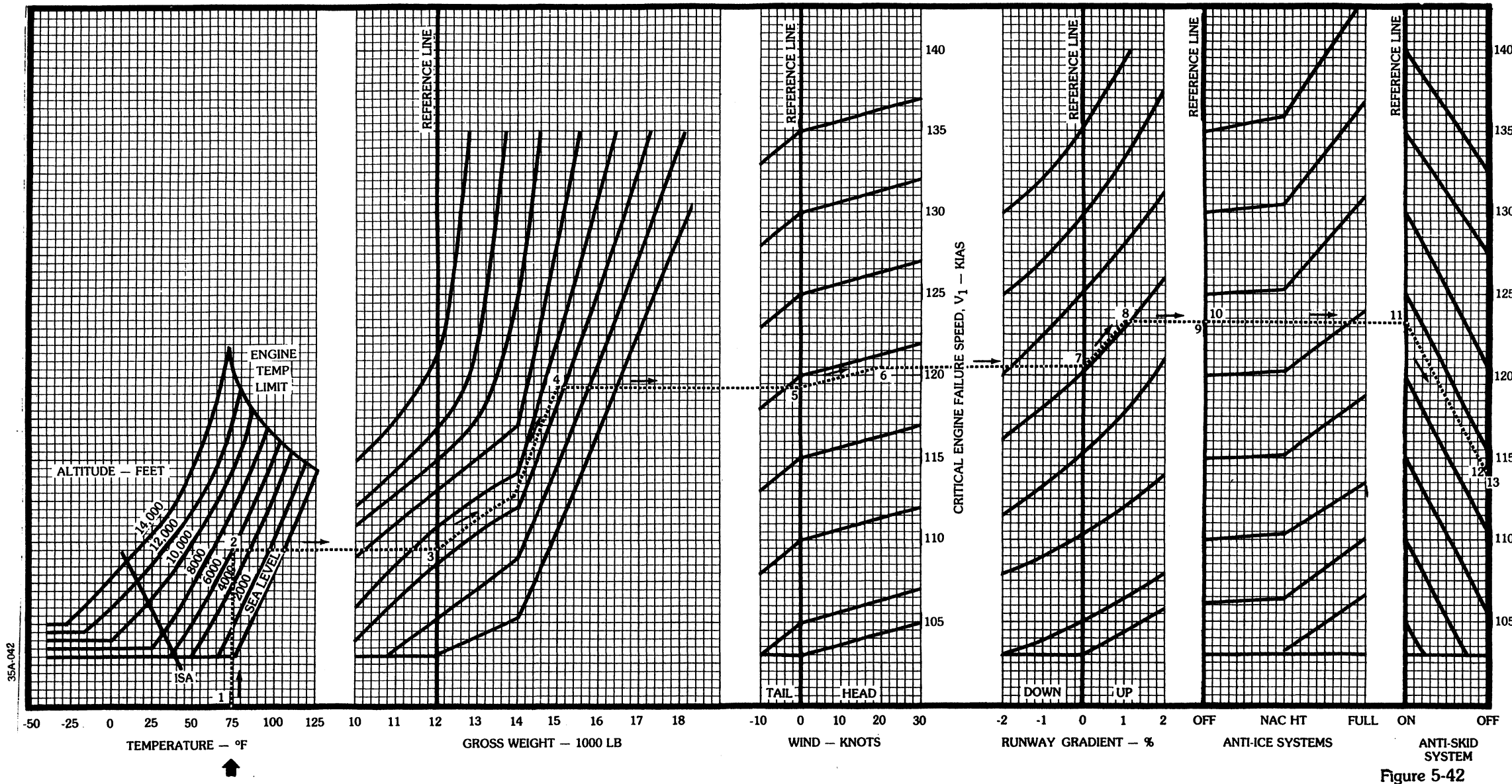
EXAMPLE:

- 1. Temperature75°F
- 2. Altitude6000 FT
- 3. Weight Ref. Line
- 4. Weight15,000 LB

- 5. Wind Ref. Line
- 6. Headwind20 KTS
- 7. Runway Gradient Ref. Line
- 8. Runway Gradient1% UP

- 9. Anti-ice Ref. Line
- 10. Anti-iceOFF
- 11. Anti-skid Ref. Line
- 12. Anti-skidOFF
- 13. Critical Engine Failure Speed114.2 KIAS

CRITICAL ENGINE FAILURE
SPEED V(1)
FLAPS - 20°



ROTATION SPEED (V_R) FLAPS – 20°

EXAMPLE:

- 1. Weight 15,000 LB
- 2. Rotation Speed 127.0 KIAS

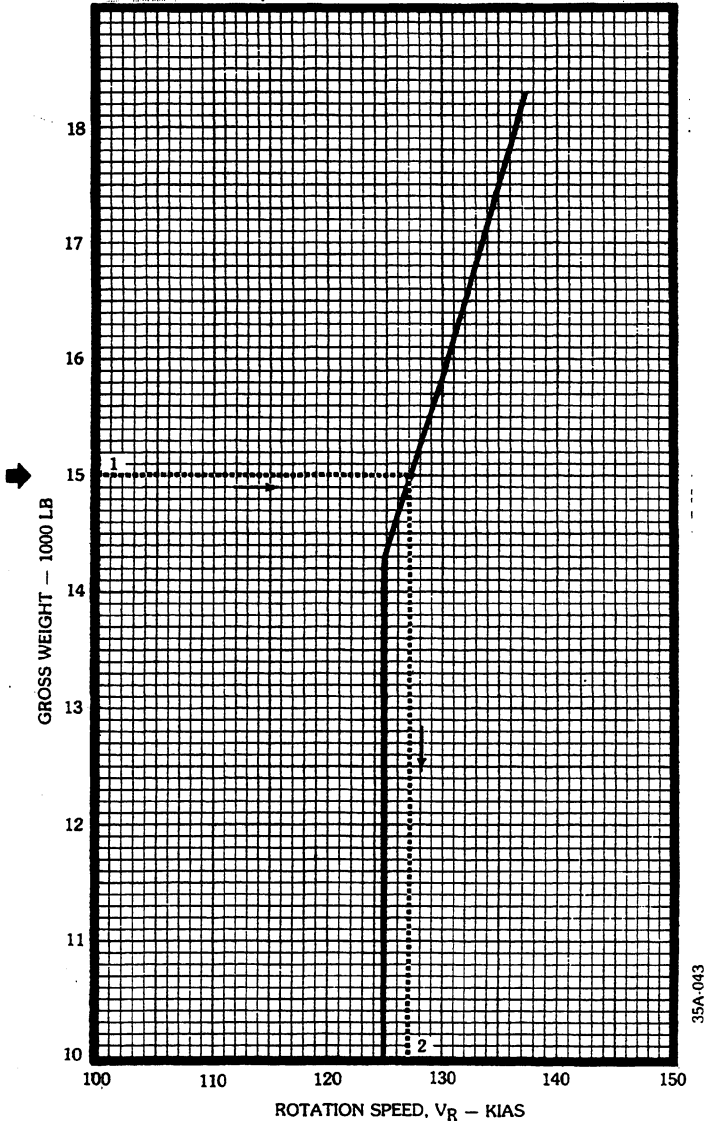


Figure 5-43

TAKEOFF SAFETY SPEED (V₂) FLAPS – 20°

EXAMPLE:

- 1. Weight 15,000 LB
- 2. Engine Out Safety Speed 126.2 KIAS

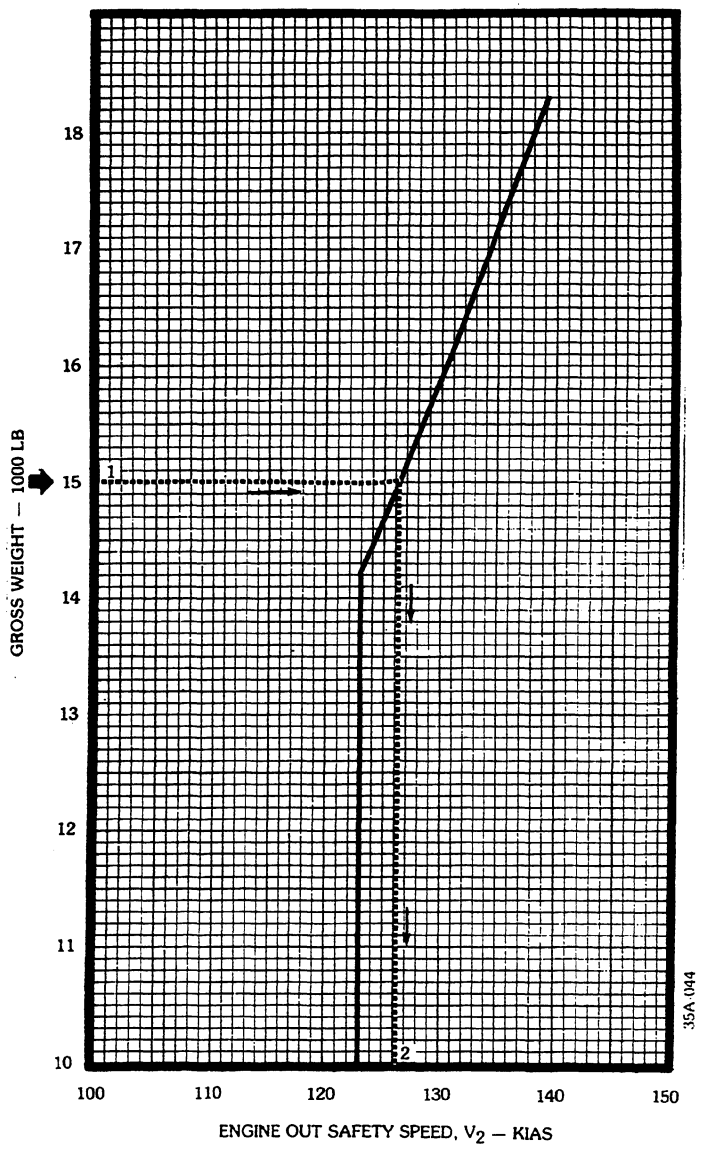


Figure 5-44

CLOSE IN TAKEOFF FLIGHT PATH
FLAPS - 20°

EXAMPLE:

- A. Obstacle Distance
(Horizontal From Ref Zero) 5.290 FT
- B. Obstacle Height
(Above Runway Surface) 360 FT
- C. Required Net Climb Gradient 7.1%

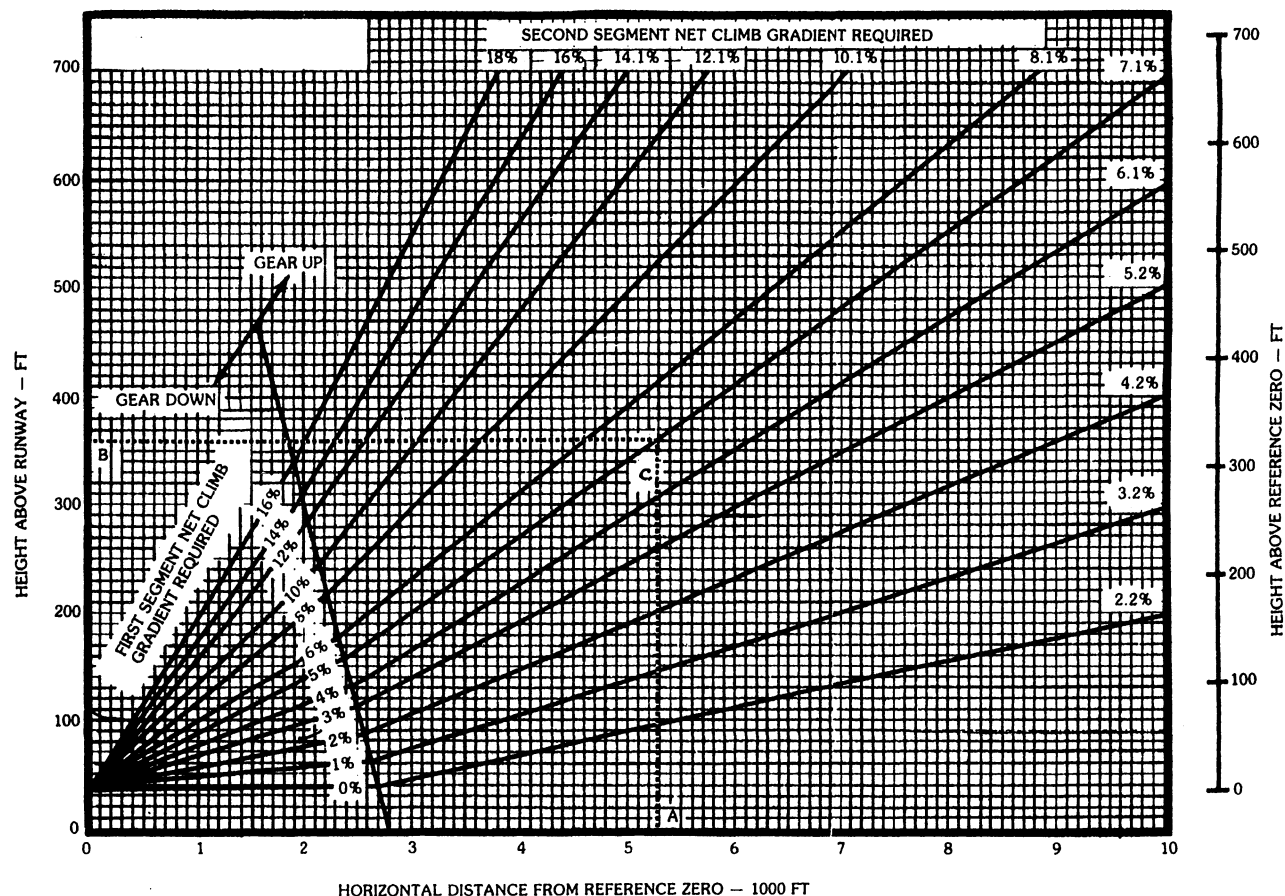


Figure 5-45

DISTANT TAKEOFF FLIGHT PATH
FLAPS - 20°

EXAMPLE:

- A. Obstacle Distance
(Horizontal From Ref Zero) 21,900 FT
- B. Obstacle Height
(Above Runway Surface) 640 FT
- C. Required Net Climb Gradient 3%

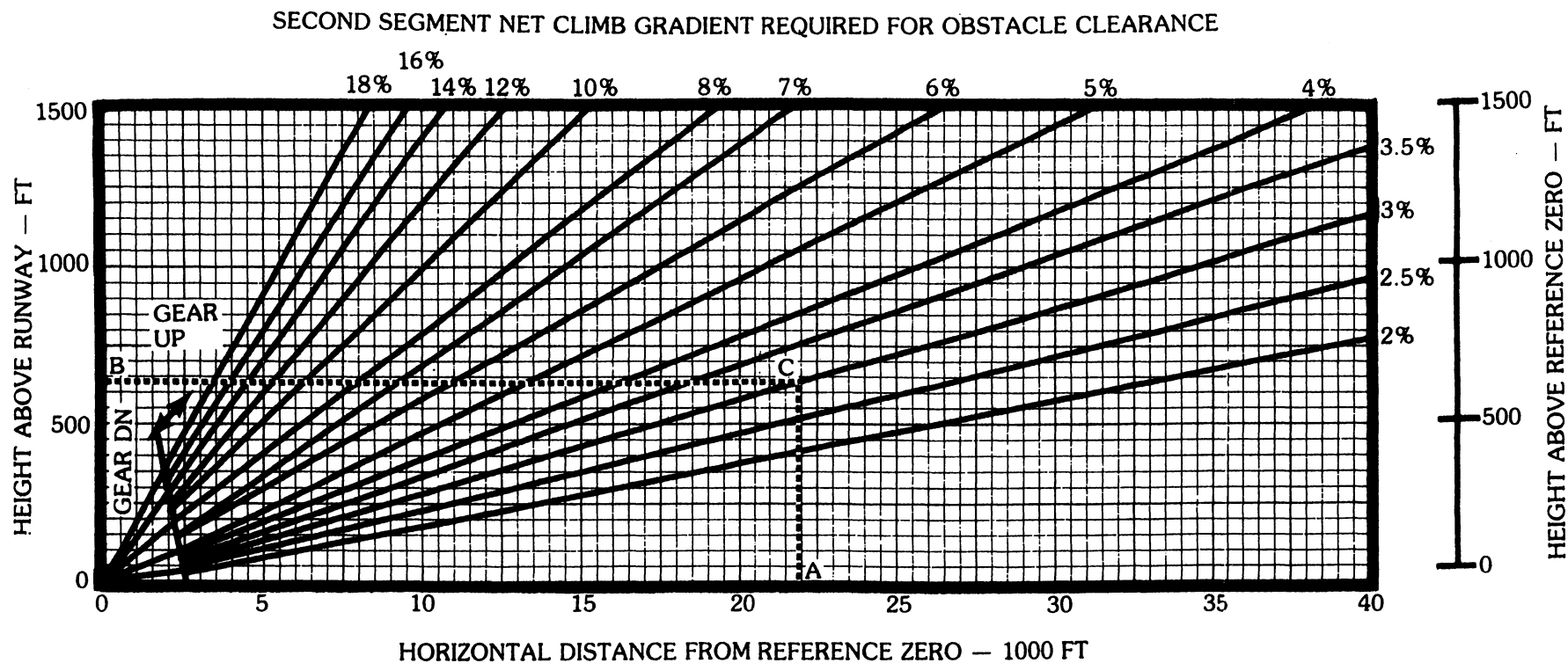


Figure 5-46

FIRST SEGMENT CLIMB GRADIENT FLAPS - 20°

CONDITIONS:

1. Single Engine
2. Takeoff Thrust
3. Gear - Down
4. Flaps - 20°
5. Speed - V_{LOF}

EXAMPLE:

1. Temperature 50°F
2. Altitude 10,000 FT
3. Weight Ref. Line
4. Weight 13,000 LB
5. Wind Ref. Line
6. Wind 0 KTS
7. Anti-ice Ref. Line
8. Anti-ice OFF
9. Net Climb Gradient 3.2%

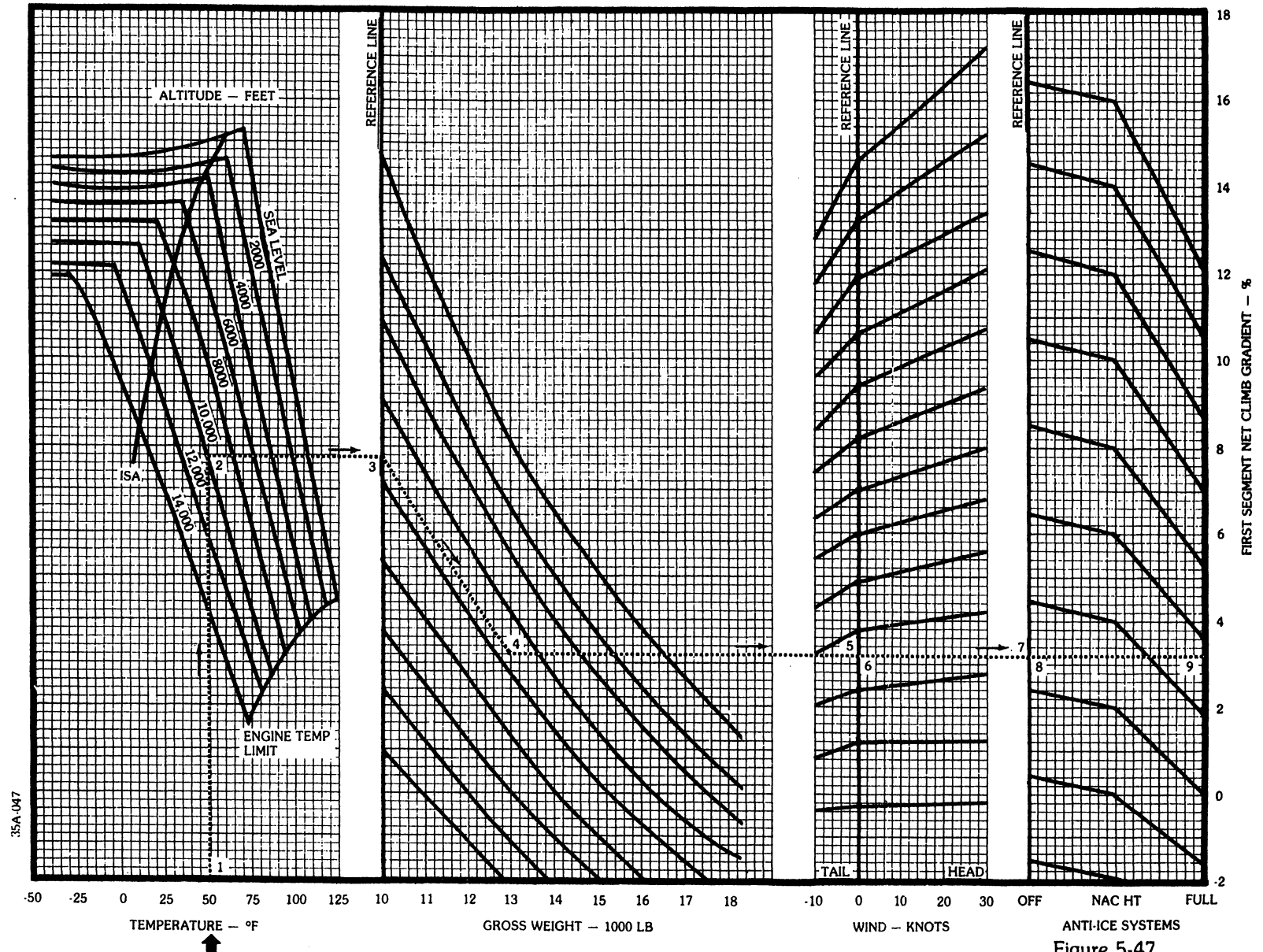


Figure 5-47

CONDITIONS:

1. Single Engine
2. Takeoff Thrust
3. Gear — Up
4. Flaps — 20°
5. Speed — V₂

EXAMPLE:

1. Temperature 50°F
2. Altitude 10,000 FT
3. Weight Ref. Line
4. Weight 13,000 LB

5. Wind Ref. Line
6. Tailwind 10 KTS
7. Anti-ice Ref. Line
8. Anti-ice OFF
9. Net Climb Gradient 4.4%

SECOND SEGMENT CLIMB GRADIENT FLAPS — 20°

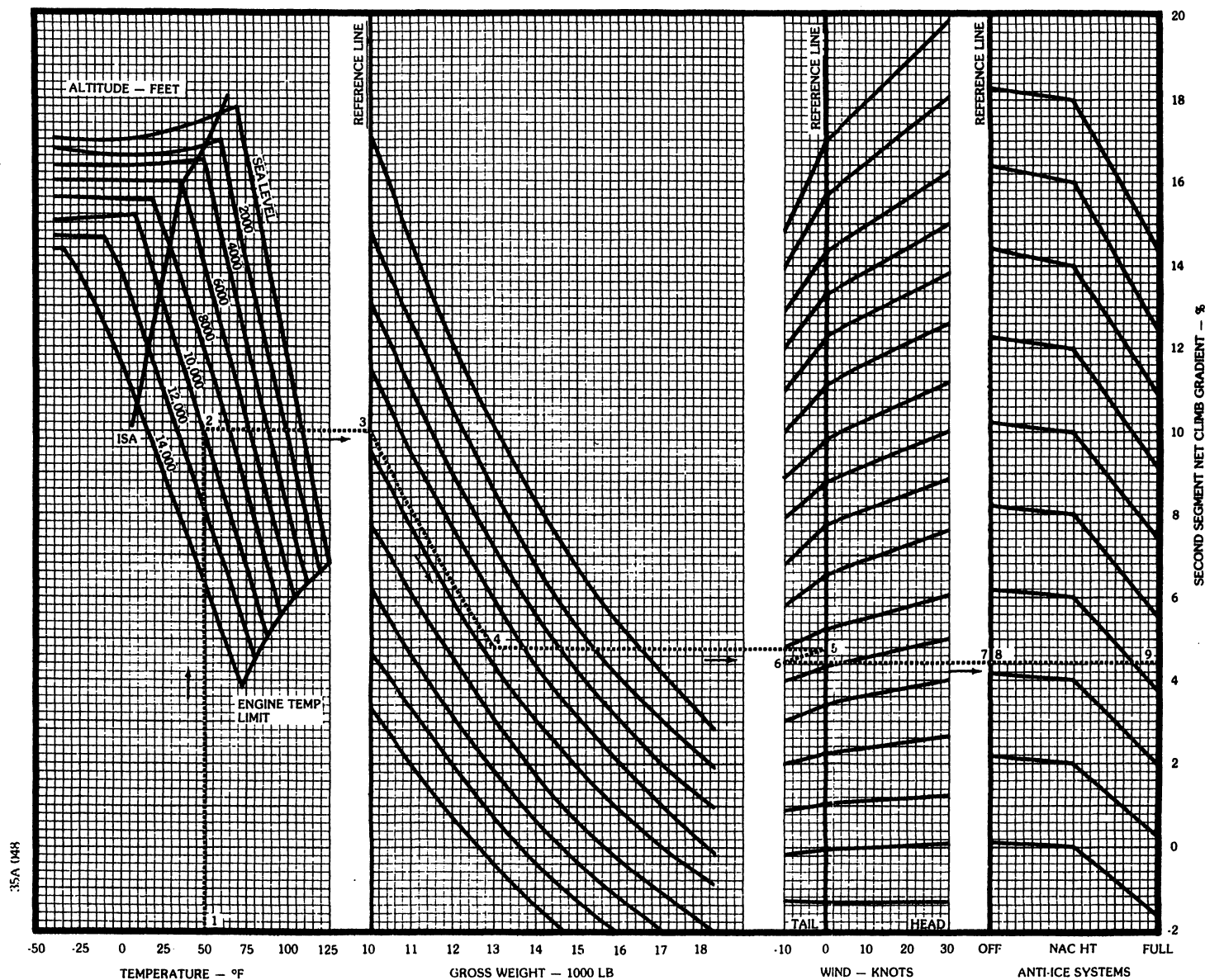


Figure 5-48

FINAL SEGMENT CLIMB GRADIENT

CONDITIONS:

1. Single Engine
2. Maximum Climb Thrust
3. Gear — Up
4. Flaps — Up
5. Speed — $1.25 V_{S1}$

EXAMPLE:

1. Temperature 50°F
2. Altitude 8000 FT
3. Weight Ref. Line
4. Weight 14,000 LB
5. Anti-ice Ref. Line
6. Anti-ice OFF
7. Net Climb Gradient 5.0%

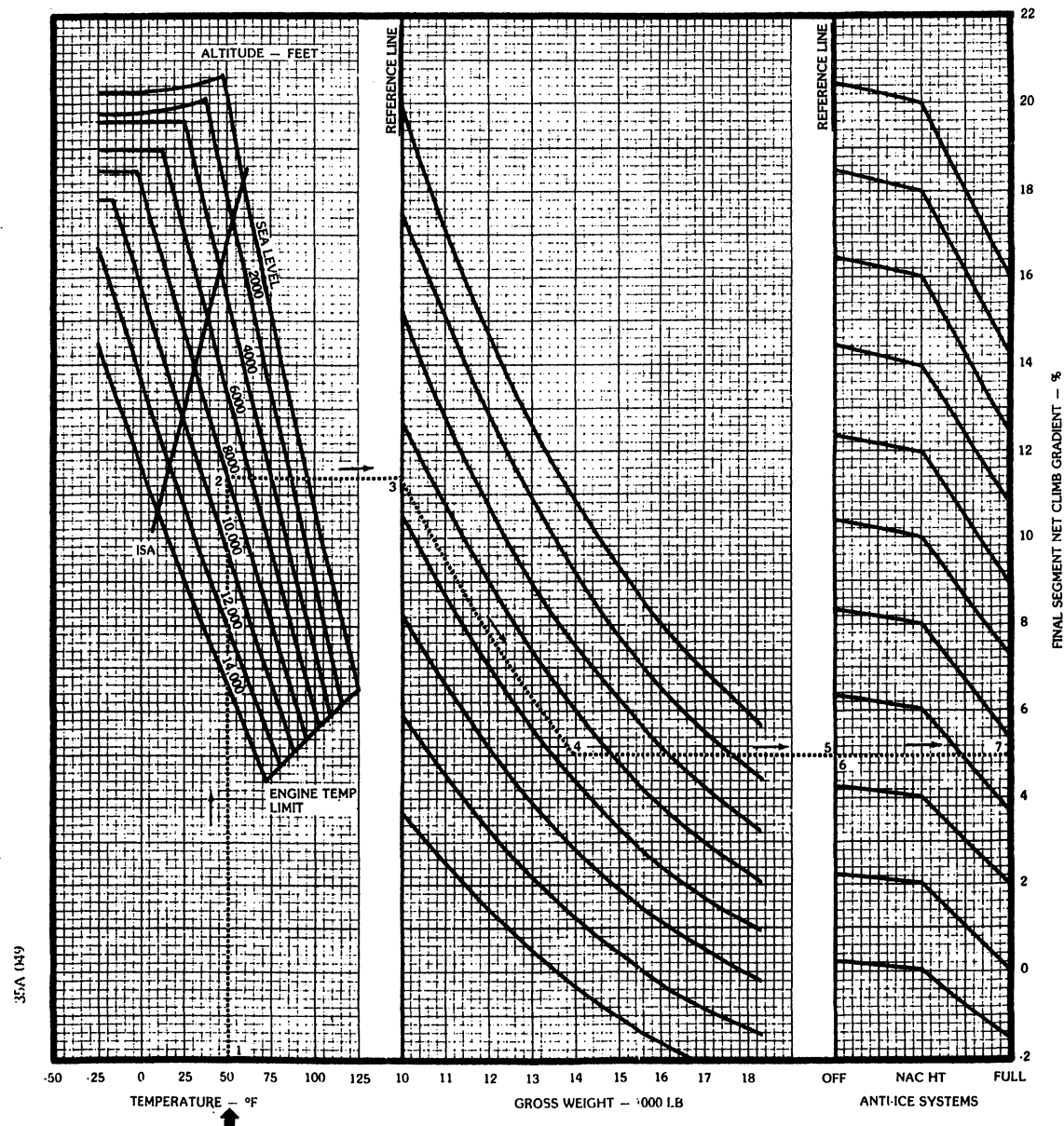


Figure 5-49

ENROUTE CLIMB SPEED SCHEDULE

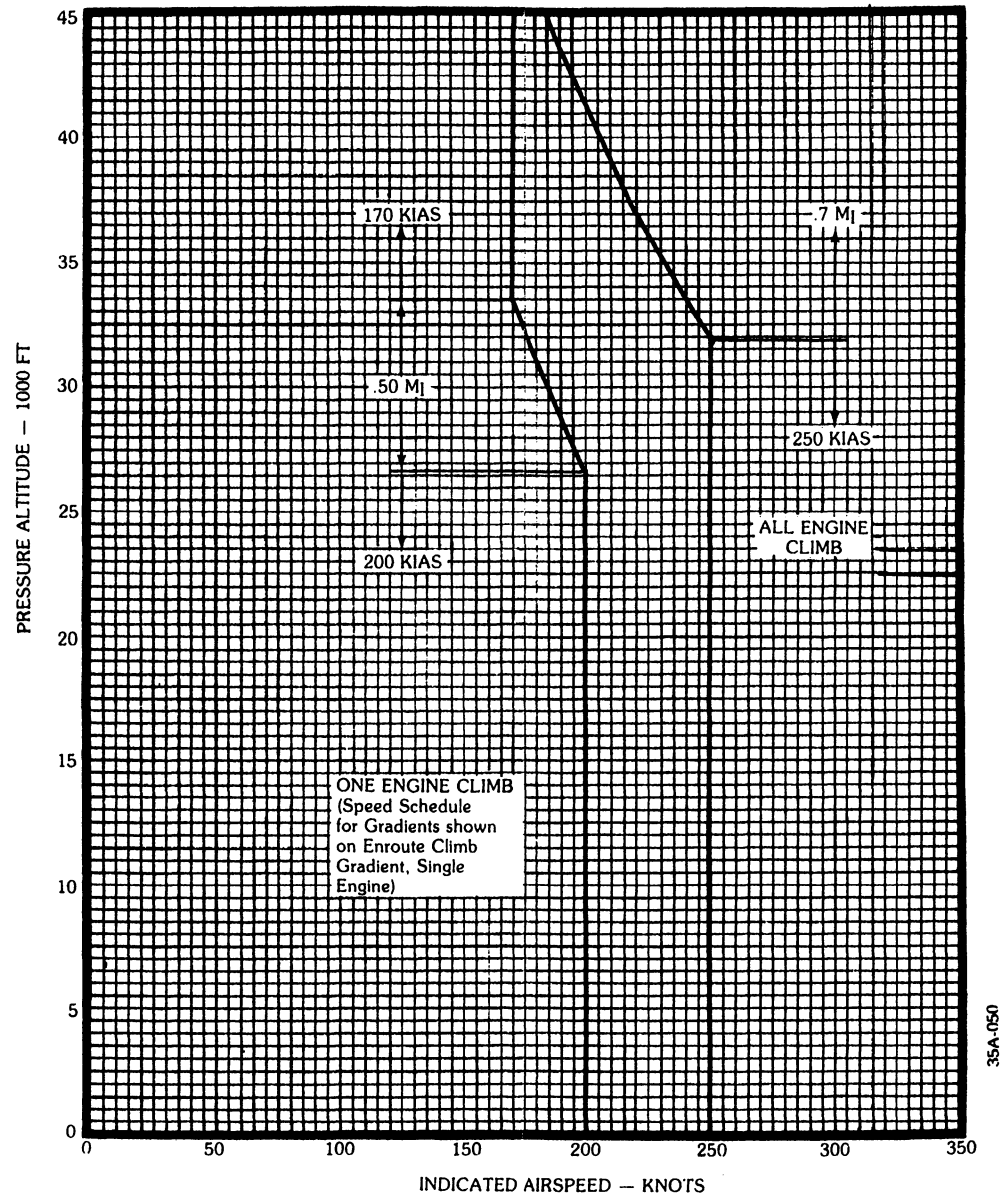


Figure 5-50

ENROUTE CLIMB GRADIENT SINGLE ENGINE

CONDITIONS:

1. Single Engine
2. Maximum Climb Thrust
3. Gear — Up
4. Flaps — Up
5. See ENROUTE CLIMB SPEED SCHEDULE

EXAMPLE:

1. Temperature 50°F
2. Altitude 15,000 FT
3. Weight Ref. Line
4. Weight 15,000 LB
5. Anti-ice Ref. Line
6. Anti-ice OFF
7. Net Climb Gradient -0.2%

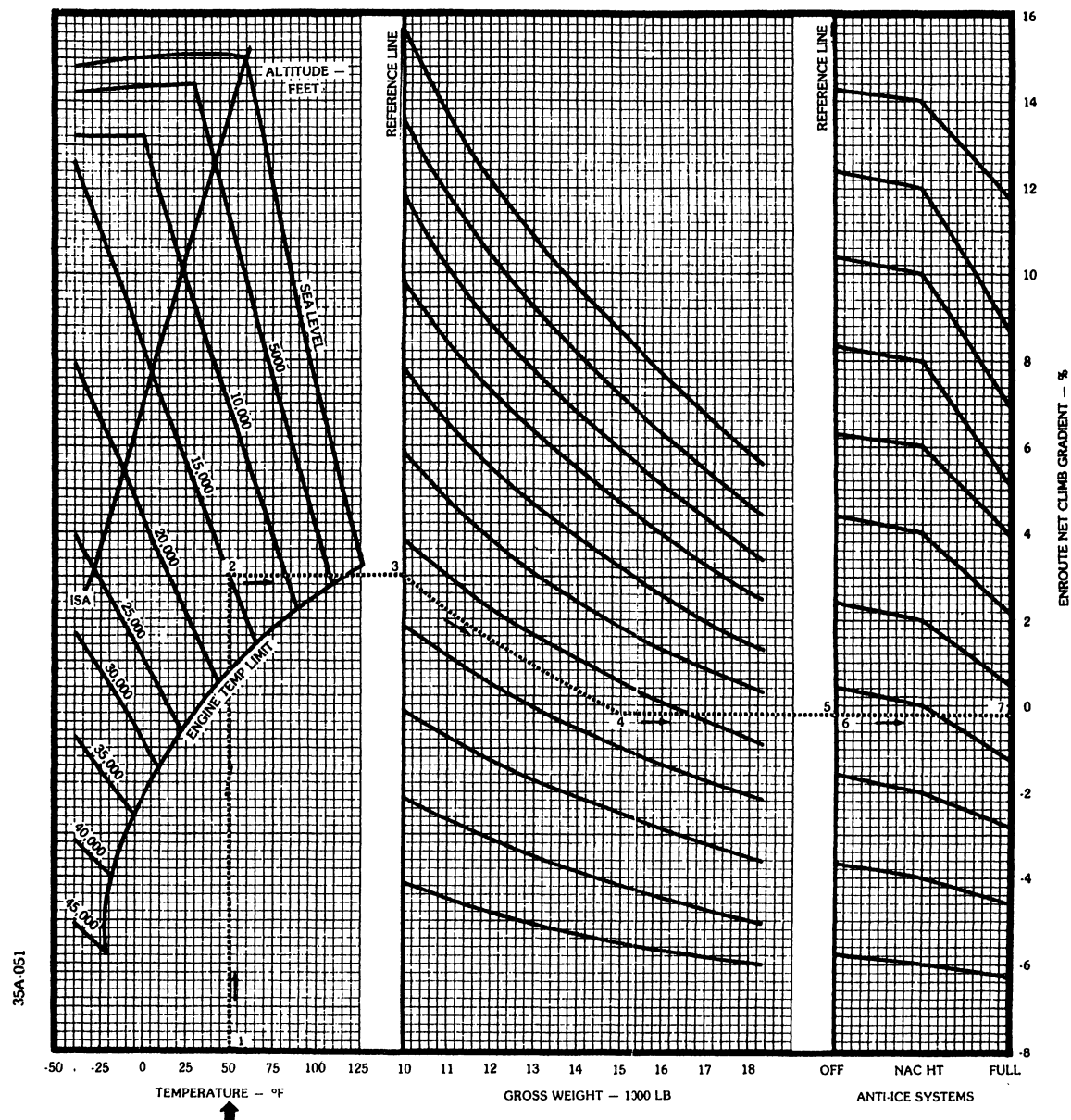


Figure 5-51

USE OF APPROACH AND LANDING CHARTS

The charts on the following pages present approach and landing climb gradients, maximum landing weights as limited by approach and landing climb performance, and landing weights as limited by maximum brake energy.

MAXIMUM LANDING WEIGHT

Landings must be made within the limitations of the maximum landing weight as governed by the LANDING WEIGHT LIMITS Chart and by the performance determined from the ACTUAL LANDING DISTANCE and FACTORED LANDING DISTANCE (if applicable) charts. The heaviest weight at which the aircraft can land is the **lowest** of the following weights:

1. The maximum landing weight (design structural limit for landing) is 14,300 pounds (6,486 Kg) or 15,300 pounds (6,940 Kg).
2. The landing weight limit for airport altitude and temperature as determined from the LANDING WEIGHT LIMITS Chart.
3. The maximum landing weight for the runway and ambient conditions as determined from the ACTUAL LANDING DISTANCE and FACTORED LANDING DISTANCE (if applicable) charts.

NOTE

If the aircraft weight over the destination is greater than the lowest of the above weights, fuel must be burned off until the proper weight is achieved.

LANDING DISTANCE CHART

The ACTUAL LANDING DISTANCE Chart shows demonstrated landing distance in terms of altitude, outside air temperature, weight, wind, runway gradient, and anti-skid on or off. The FACTORED LANDING DISTANCE chart shows the operational landing field length when a factored landing distance is required by applicable regulations. The Factored Landing Distance determined from this chart is equal to the Actual Landing Distance divided by 0.60 (multiplied by 1.67). These charts may be used to determine either of the following:

1. The landing field length required given the airplane weight, runway gradient, pressure altitude, temperature, and wind.
2. The maximum landing weight corresponding to a specific runway length, runway gradient, pressure altitude, temperature, and wind. Landing weight for runway length available may be determined by working through the chart in the opposite manner as finding landing distance. Landing weight determined in this manner may not be the limiting landing weight, refer to MAXIMUM LANDING WEIGHT.

USE OF APPROACH AND LANDING CHARTS (CONT)

LANDING PROCEDURE

The landing distances on the ACTUAL LANDING DISTANCE Chart can be realized when the following procedure is used.

1. Approach through the 50-foot point over the end of the runway at VREF with flaps and gear down, using a 2.5° to 3° glideslope.
2. After passing the 50-foot point, progressively reduce thrust until the thrust levers are at IDLE prior to touchdown.
3. After touchdown, Spoilers — EXT immediately.
4. Wheel Brakes — Apply as soon as practical and continue maximum braking action until the airplane stops.
5. Elevator — Nose up to shift weight to main gear.

LANDING ON WET OR CONTAMINATED RUNWAY

Refer to the WET/CONTAMINATED RUNWAY DATA Addendum for guidance material pertaining to landing on a wet or contaminated runway.

APPROACH CLIMB AND LANDING CLIMB GRADIENT CHARTS

The APPROACH CLIMB GRADIENT and LANDING CLIMB GRADIENT Charts are read at the airport temperature and pressure altitude. The gradients will be achieved using the speeds shown in the APPROACH CLIMB SPEED and LANDING CLIMB SPEED Chart.

CALCULATION OF CORRECTION FOR RUNWAYS WITH A GRADIENT GREATER THAN 2.0% AND LESS THAN OR EQUAL TO 2.4%

The information provided here is used to calculate landing corrections for dry conditions with runway gradients $>2.0\%$ and $\leq 2.4\%$.

DOWNHILL (NEGATIVE) GRADIENT*Landing Weight Limit*

Determine Climb Weight Limit using the appropriate chart in this section. Additional correction is not required.

Determine Brake Energy Weight Limit using the appropriate chart in this section and assume runway has a -2.0% gradient. If necessary, adjust the Brake Energy Weight Limit by subtracting the appropriate weight from the table below.

Landing Weight Limit	
Downhill Gradient	Brake Energy Weight Correction
-2.1%	Subtract 25 pounds (11.3 kg)
-2.2%	Subtract 50 pounds (22.7 kg)
-2.3%	Subtract 75 pounds (34.0 kg)
-2.4%	Subtract 100 pounds (45.4 kg)

Landing Distance

Determine Landing Distance using the appropriate chart in this section and assume runway has a -2.0% gradient. Add 100 feet (30.48 m) to the Landing Distance for runway gradients -2.0% to -2.4% .

UPHILL (POSITIVE) GRADIENT*Landing Weight Limit*

Determine Climb Weight Limit using the appropriate chart in this section. Adjust the Climb Weight Limit by subtracting the appropriate weight from the table below.

Landing Weight Limit	
Uphill Gradient	Climb Weight Correction
+2.1%	Subtract 125 pounds (56.7kg)
+2.2%	Subtract 250 pounds (113.4kg)
+2.3%	Subtract 375 pounds (170.1 kg)
+2.4%	Subtract 500 pounds (226.8 kg)

Determine the Brake Energy Weight Limit using the appropriate chart in this section and assume runway has a $+2.0\%$ gradient. Additional correction is not required.

Landing Distance

Determine Landing Distance using the appropriate chart in this section and assume runway has a $+2.0\%$ gradient. Additional correction is not required.

APPROACH CLIMB SPEED AND LANDING CLIMB SPEED

EXAMPLE:

1. Weight 13,000 LB
2. Approach Climb Speed 125.4 KIAS
3. Landing Climb Speed 119.0 KIAS

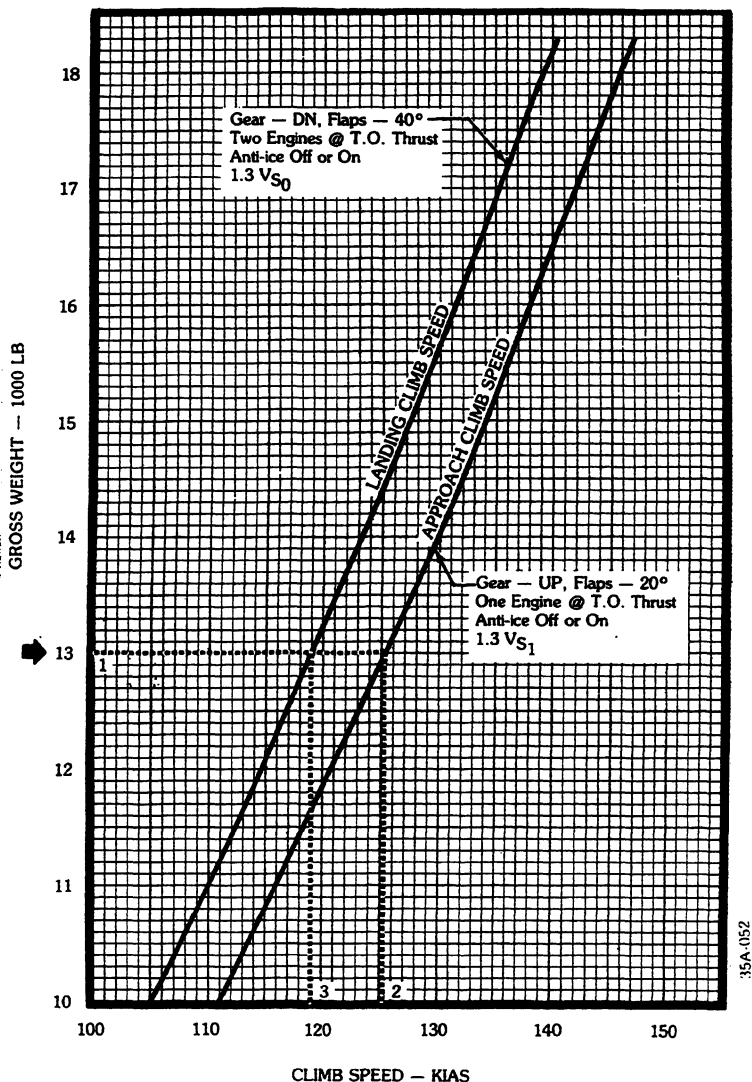


Figure 5-52

APPROACH CLIMB GRADIENT

CONDITIONS:

1. Single Engine
2. Takeoff Thrust
3. Gear — Up
4. Flaps — 20°
5. Speed — 1.3 V_{S1}

EXAMPLE:

1. Temperature 25°F
2. Altitude 10,000 FT
3. Weight Ref. Line
4. Weight 15,000 LB
5. Anti-ice Ref. Line
6. Anti-ice NAC HT ONLY
7. Gross Climb Gradient 4.5%

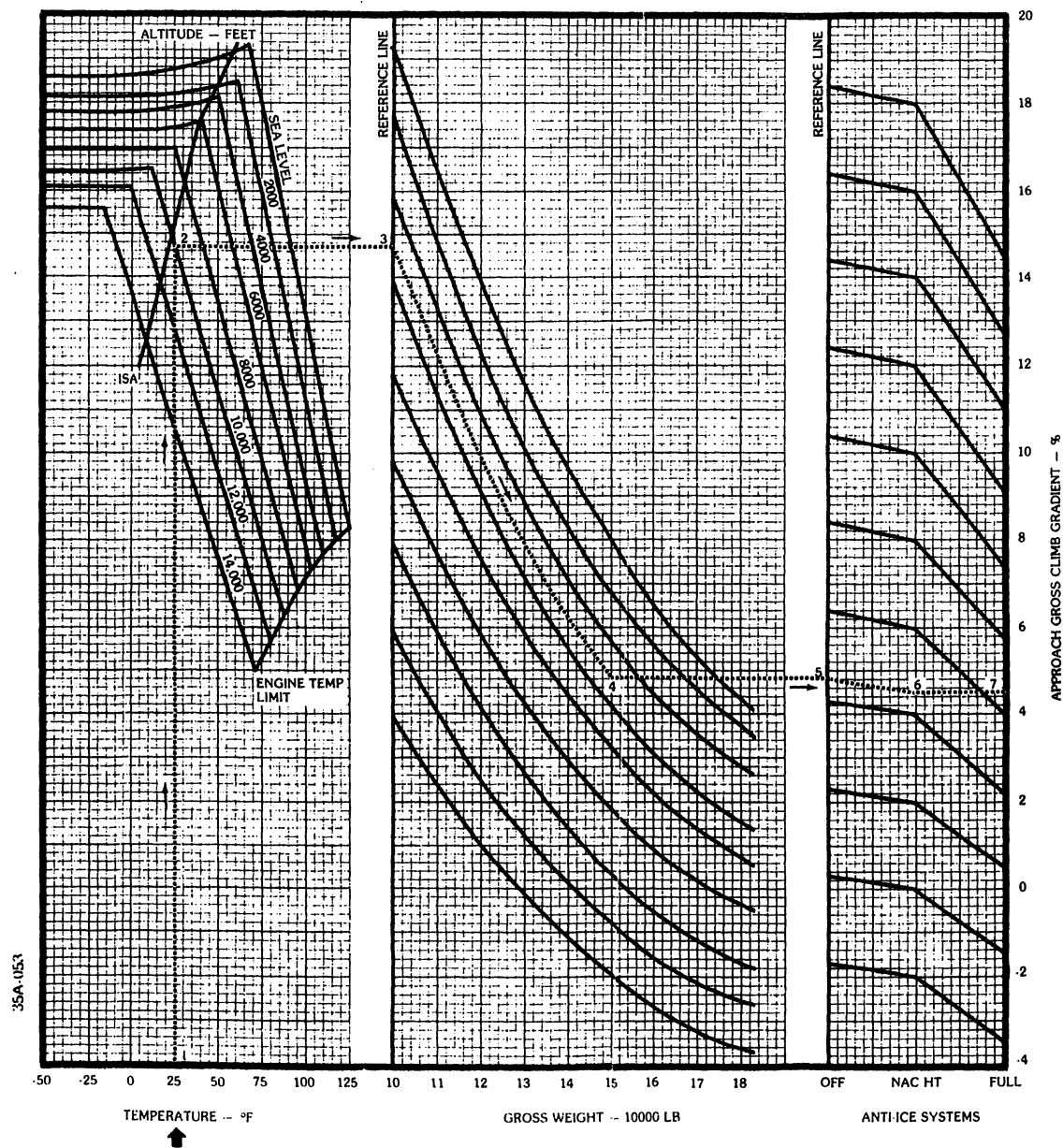


Figure 5-53

LANDING CLIMB GRADIENT

CONDITIONS:

1. Two Engines
2. Takeoff Thrust
3. Gear — Down
4. Flaps — 40°
5. Speed — 1.3 VS₀

EXAMPLE:

1. Temperature 75°F
2. Altitude 6000 Ft
3. Weight Ref. Line
4. Weight 14,000 LB
5. Anti-ice Ref. Line
6. Anti-ice OFF
7. Gross Climb Gradient 14.5%

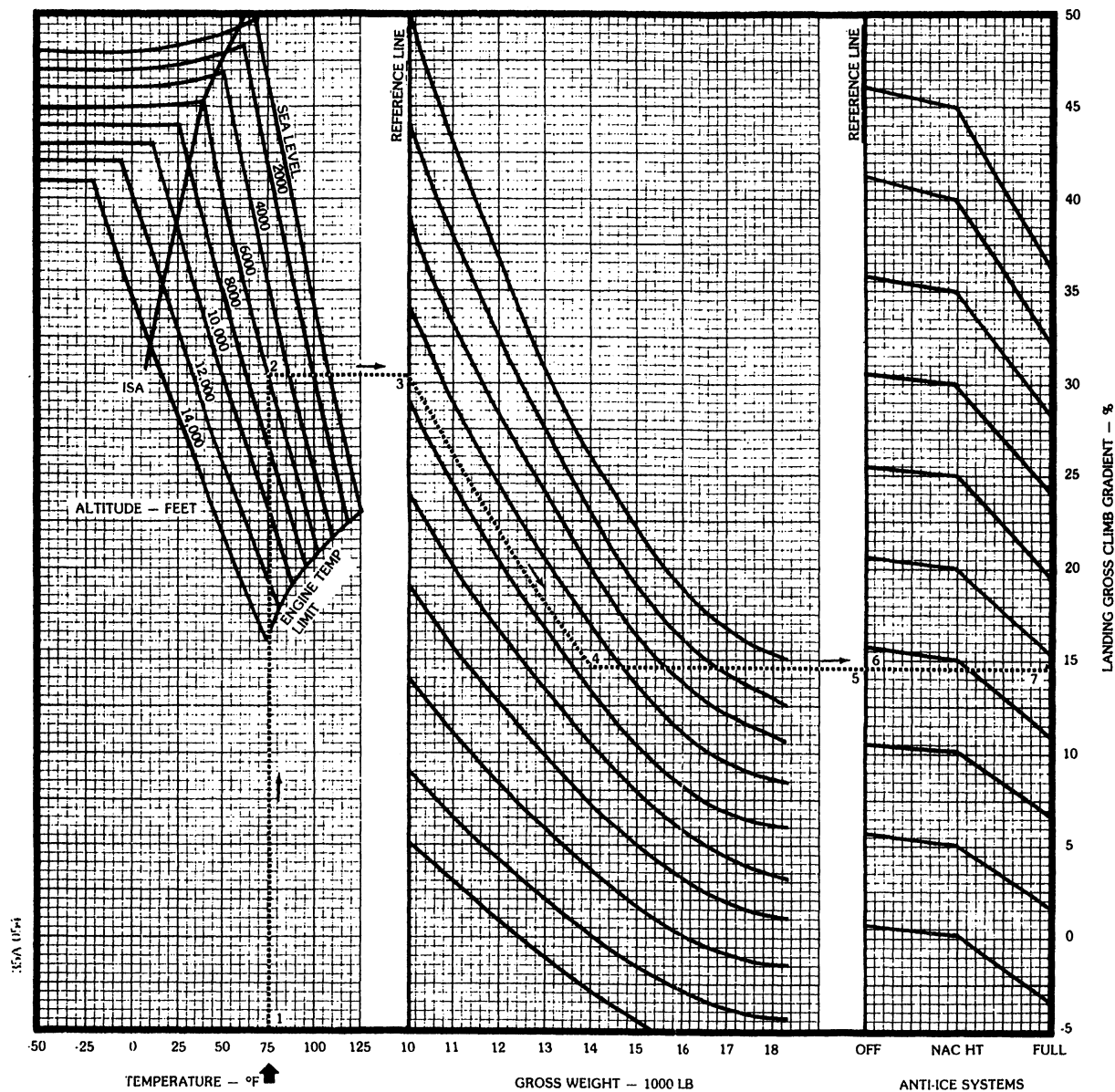


Figure 5-54

LANDING WEIGHT LIMIT ANTI-ICE - OFF

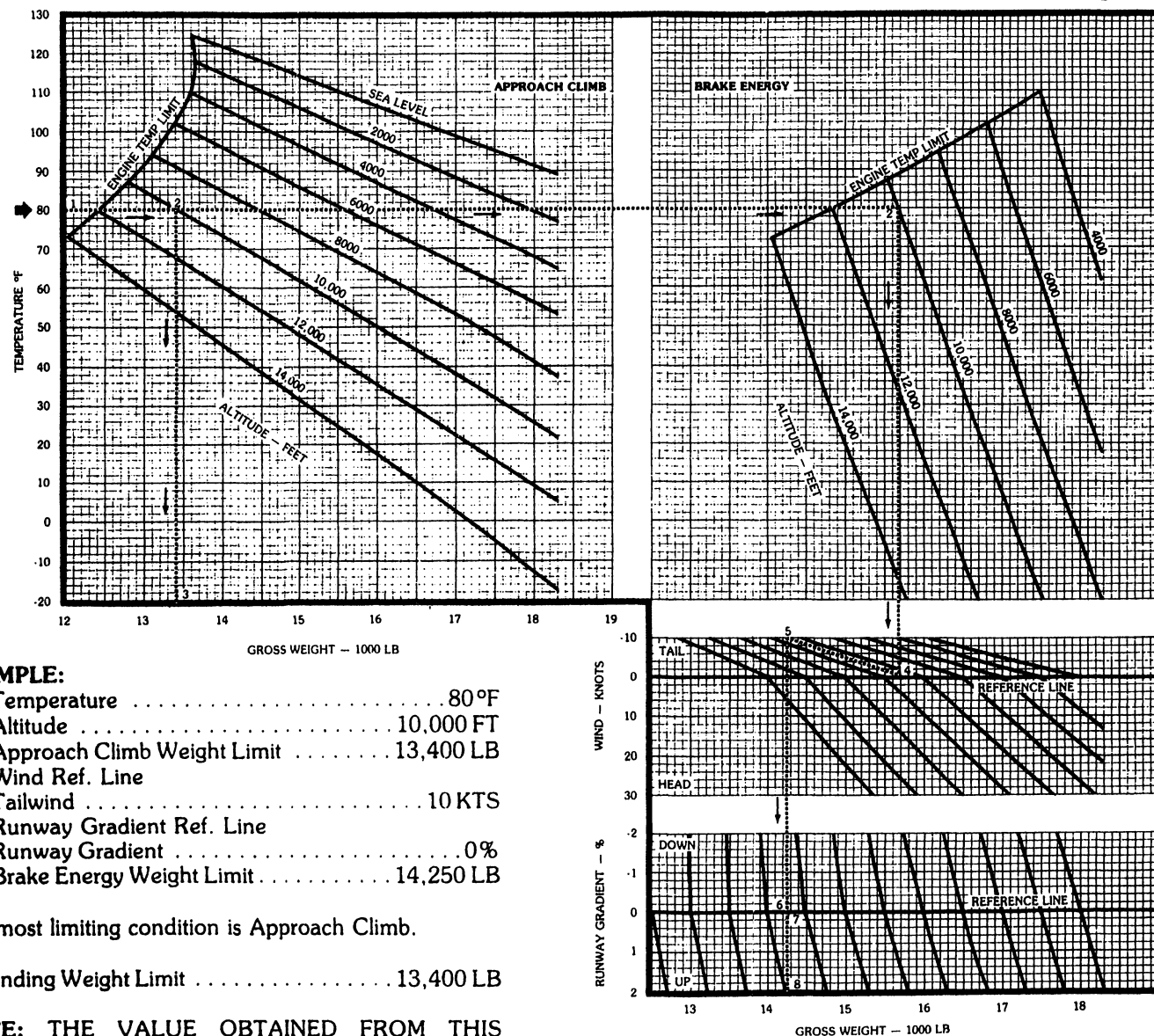


Figure 5-55

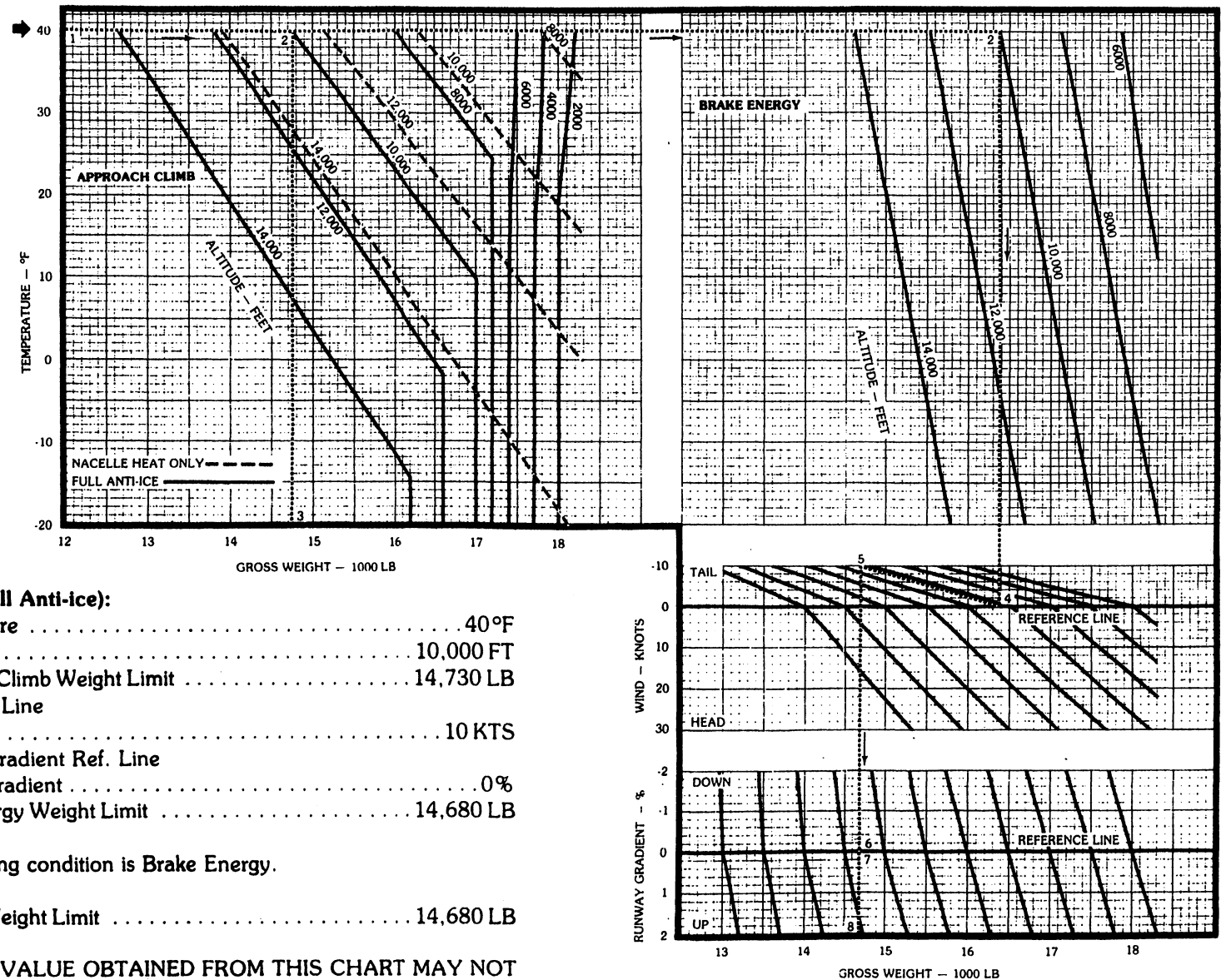
LANDING WEIGHT LIMIT
ANTI-ICE - ON

Figure 5-56

LANDING APPROACH SPEED V_{REF}

EXAMPLE:

1. Weight 14,000 LB
2. V_{REF} 123.2 KIAS

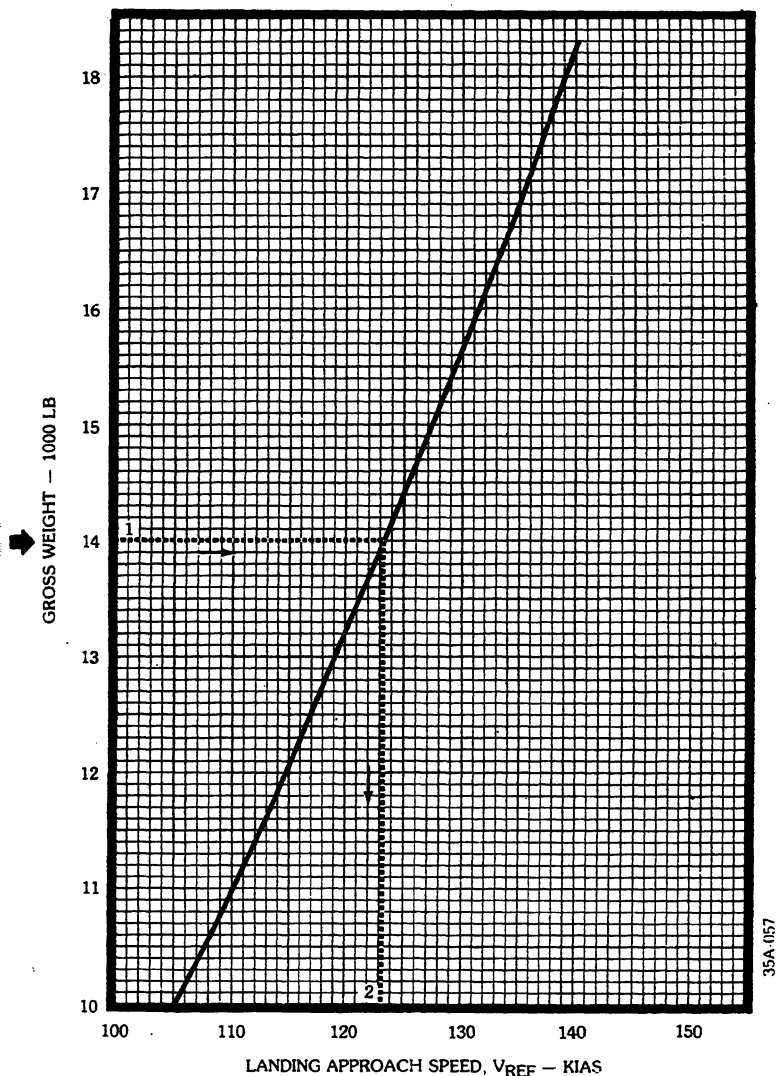


Figure 5-57

flight manual

LEARJET 35A
36A

EXAMPLE:

1. Temperature

2. Altitude

3. Weight Ref. Line

4. Weight
5. Wind Ref. Line

6. Headwind

7. Runway Gradient Ref. Line

8. Runway Gradient

9. Anti-skid Ref. Line
10. Anti-skid

11. Altitude Ref. Line

12. Altitude

13. Actual Landing Distance
- 40°F

8000 FT

13,000 LB

10 KT

2% UP

OFF

8000 FT

4480 FT

ACTUAL LANDING DISTANCE

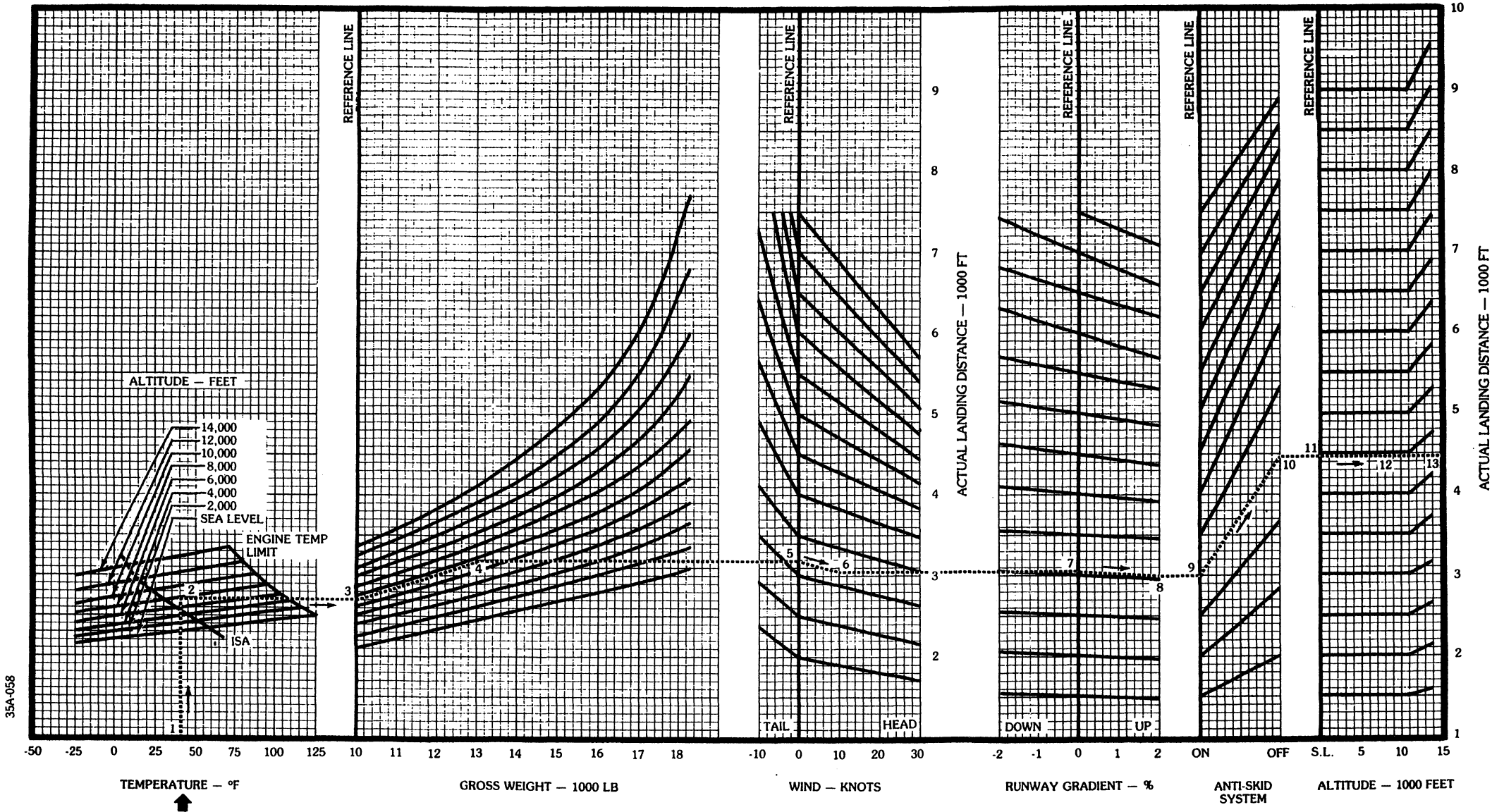


Figure 5-58

EXAMPLE:

1. Actual Landing Distance 3,000 FT (914 M)
2. Factored Landing Distance 5,000 FT (1,524 M)

NOTE: The Factored Landing Distance determined from this chart is equal to the Actual Landing Distance divided by 0.60.

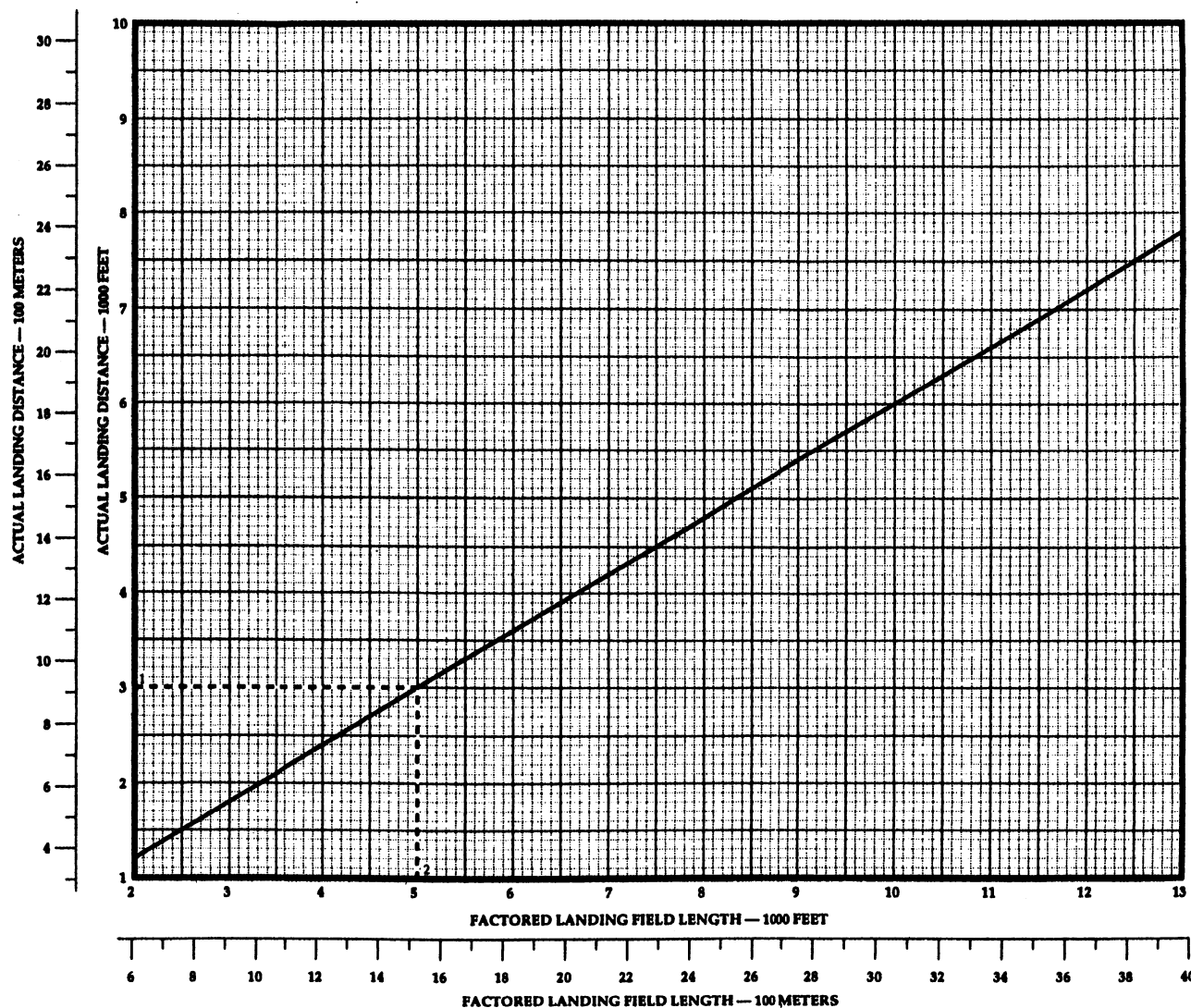


Figure 5-59

**J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM
(AUTOPILOT/FLIGHT DIRECTOR)**

This Supplement supersedes FC-200 Autopilot —
J.E.T. Supplement dated 4-4-80.

When the J.E.T. Model FC-200 Automatic Flight Control System (Autopilot) is installed in the Gates Learjet Model 35A/36A, this Supplement shall be applicable and must be placed in the SUPPLEMENTS section of the FAA Approved Airplane Flight Manual.

The information contained herein supplements the information in the basic Airplane Flight Manual. For limitations, operating procedures, and performance information not contained in this Supplement, consult the applicable basic Airplane Flight Manual.

FAA
APPROVED

Robert A. Gambrell

DATE *2/25/81*

for CHIEF, AIRCRAFT CERTIFICATION PROGRAM
FAA CENTRAL REGION
WICHITA, KANSAS

**J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM
(AUTOPILOT/FLIGHT DIRECTOR)**
TABLE OF CONTENTS

Section I — Limitations	3
Section II — Normal Procedures	4
Autopilot Operational Check	4
To Engage Autopilot	7
To Disengage Autopilot	7
Autopilot Modes	8
Autopilot Maneuver Controls	11
Typical Normal Flight with Autopilot	12
After Takeoff	12
Climb	12
Cruise	12
Descent	13
VOR Approach	13
ILS Approach	13
Flight Director Integration	14
Section III — Emergency Procedures	15
Section IV — Abnormal Procedures	15
Autopilot Malfunction	15
Engine Failure on Coupled Approach	16
Section V — Performance	16
Glideslope Deviation Profile (Figure 1)	16

**J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM
(AUTOPILOT/FLIGHT DIRECTOR)****SECTION I – LIMITATIONS**

1. Maximum Operating Speed V_{MO}/M_{MO} .
2. When using autopilot, the pilot or copilot must be in the respective seat and the seat belt fastened.
3. Autopilot pitch and roll axis must **not** be used for takeoff or landing.
4. **Do not** extend spoilers with autopilot engaged.
5. If heavy precipitation or severe turbulence is encountered, disengage SPD, V/S, ALT, and G/S modes and engage Yaw Damper, LVL and SOFT modes.
6. The autopilot may **not** be used unless the pitch and roll monitors have been checked and are operational.
7. If, upon retraction of flaps after takeoff, the APPR Light stays on, or illuminates in the clean configuration, **do not** use the roll or pitch modes of the autopilot. In maneuvers which involve the flaps beyond 13°, (ILS), the complete autopilot may be used.

**J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM
(AUTOPILOT/FLIGHT DIRECTOR)****SECTION II — NORMAL PROCEDURES**

Before performing engaged preflight tests of the autopilot, ensure that aircraft flight controls are unlocked and full control movement is unrestricted.

AUTOPILOT OPERATIONAL CHECK

1. All Autopilot Circuit Breakers (Pilot's and Copilot's Ess Bus) — Check, in.
2. BAT Switches — On.
3. INVERTER Switch(es) — On.
4. Pitch Trim — T.O.
5. AUTOPILOT Switch — ON. The PWR light on the Autopilot Controller will illuminate.
6. TEST Button — Depress. All lights on the Autopilot Controller must illuminate.
7. Attitude Director Indicator (ADI) flags and Horizontal Situation Indicator (HSI) flags — Check to see that flags have disappeared. This indicates that vertical and directional gyros have been energized long enough to time-out erection cycles (approx. 90 seconds).
8. ENG Button — Depress. The ROLL, PITCH and LVL lights will illuminate. The autopilot will oppose movement of the elevator and aileron.
9. TEST Button — Depress and hold.
10. Control Wheel Trim Switch — Move to the left without depressing the arming button. ROLL light will extinguish and autopilot disconnect horn will sound within 5 seconds.
11. Release TEST Button and Control Wheel Trim Switch.
12. Repeat steps 8, 9, 10, and 11 except move Control Wheel Trim Switch to the right.
13. Repeat steps 8 and 9.
14. Control Wheel Trim Switch — Move to the nose down position without depressing the arming button. PITCH light will go out and the autopilot disconnect horn will sound within 6 seconds. Normally the roll axis will disengage also, but if such disengagement does not occur, it may be disregarded since roll axis disengagement is not required.
15. ENG Button — Depress.

TEMPORARY FLIGHT MANUAL SUPPLEMENT CHANGE

Publication Affected: Gates Learjet Model 35A/36A AFM Supplement
for J. E. T. FC-200 Automatic Flight Control
System (Autopilot/Flight Director).

Description of Change: Revise autopilot pitch monitor check.

Filing Instructions: Insert this page adjacent to page 4 of 16 in the
affected AFM Supplement and retain until further
notice.

Under AUTOPILOT OPERATIONAL CHECK, revise step 14 to read as
follows:

14. Control Wheel Trim Switch - Without depressing arming button,
move switch to NOSE DN position while holding moderate pull
force on control column. PITCH light will go out and the auto-
pilot disconnect horn will sound within 6 seconds.



Normally, the roll axis will disengage along with the
pitch axis. If such disengagement does not occur, it
may be disregarded since roll axis disengagement is
not required.

FAA
APPROVED

Robert H. [Signature]

DATE 3/31/01

for CHIEF, AIRCRAFT CERTIFICATION PROGRAM
FAA CENTRAL REGION
WICHITA, KANSAS

**J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM
(AUTOPILOT/FLIGHT DIRECTOR)****SECTION II — NORMAL PROCEDURES (CONT)**

16. Hold moderate pressure (less than overpower values) on control wheel and column simultaneously. Then depress pilot's Control Wheel Master Switch. Autopilot opposition must disappear from both axes and the ROLL and PITCH ENG lights must go out and autopilot disconnect horn will sound. Release control wheel and column.
17. ENG Button — Depress.
18. Hold moderate pressure on control wheel and column simultaneously. Then depress copilot's Control Wheel Master Switch. Autopilot opposition must disappear from both axes and the ROLL and PITCH ENG lights must go out and autopilot disconnect horn will sound. Release control wheel and column.
19. ENG Button — Depress.
20. Hold moderate pressure on control wheel and column simultaneously. Then depress pilot's Maneuver Control Switch. Autopilot opposition must disappear in roll and pitch axis only.
21. Pilot's Maneuver Control Switch — Release. Autopilot opposition will reappear.
22. Repeat steps 20 and 21 using copilot's Maneuver Control Switch.
23. Continue moderate two-axis force and depress Vertical Sync Switch on pilot's control wheel. Autopilot opposition will disappear in the pitch axis only.
24. Pilot's Vertical Sync Switch — Release. Autopilot opposition will reappear.
25. Pilot's Control Wheel Trim Switch — Move in each of the four directions without depressing the button on top of the switch. The control wheel and column will respond by moving in the direction commanded by the trim switch.
26. Repeat step 25 using the copilot's Control Wheel Trim Switch.

J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM (AUTOPILOT/FLIGHT DIRECTOR)

SECTION II — NORMAL PROCEDURES (CONT)

27. Overpower the autopilot in both pitch directions and both roll directions. It must be possible to move the control wheel and column in both directions in opposition of the autopilot. ROLL and PITCH Force Indicators on the Autopilot Controller will deflect to indicate the direction of input.



A forward or aft overpower force on the control column will, after a short interval, be accepted by the autopilot and autopilot opposing force will disappear. The control column will then remain in the overpower position. Autopilot opposition will then be centered about the 'new' position of the control column.

28. Depress the Trim Arming Button on top of the pilot's Control Wheel Trim Switch and move the Trim Switch in any of the four directions. ROLL and PITCH ENG Lights will go out and opposition to control movement will disappear in the roll and pitch axis and the autopilot disconnect horn will sound.
29. ENG Button — Depress.
30. Repeat steps 28 and 29 using the copilot's Control Wheel Trim Switch.
31. Autopilot ENG Button — Depress.
32. Set the heading bug on the pilot's HSI to the aircraft present heading.
33. Autopilot HDG Button — Depress. The HDG Light will illuminate.
34. Move the heading bug to the left and then right of aircraft heading. Roll axis will correspond to heading changes.
35. Autopilot LVL Button — Depress. LVL Light will illuminate and HDG Light will go out.
36. ALT Button — Depress. ALT Light will illuminate.
37. SOFT Button — Depress. SOFT Light will illuminate. Do not have an ILS frequency tuned on the primary NAV for this check.
38. Depress either Maneuver Control Switch on the control wheel. The LVL and ALT Lights will go out. SOFT Light will remain illuminated.
39. Turn on navigation receiver and tune to VOR frequency. Set HSI heading bug to the present aircraft heading.
40. Autopilot HDG Button — Depress.

**J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM
(AUTOPILOT/FLIGHT DIRECTOR)****SECTION II — NORMAL PROCEDURES (CONT)**

41. Turn HSI course select pointer until the course bar is fully displaced from center in front of HSI aircraft symbol and has just begun movement toward center.
42. Autopilot NAV Button — Depress. NAV ARM Light will illuminate.
43. Gradually move HSI course select pointer to cause the course bar to move toward HSI aircraft symbol. The NAV ARM and HDG lights will go out and the NAV CAPT light will illuminate. The autopilot roll axis will respond by moving the control wheel as though to start a turn toward alignment with the course bar.
44. With the course bar centered, move HSI course select pointer quickly right and left to cause rapid course bar deflections. The NAV CAPT light will go out and the NAV ARM Light will flash while the course bar is being moved. NAV CAPT will engage approximately 20 seconds after the course bar is allowed to stabilize near center.
45. SPD Button — Depress. The IAS Light will illuminate.
46. V/S Button — Depress. The IAS Light will go out and the V/S Light will illuminate.
47. FLAP — Extend beyond approximately 13°. APPR Light will illuminate.
48. Control Wheel Master Switch — Depress to disengage all autopilot functions.

TO ENGAGE AUTOPILOT

1. AUTOPILOT Switch — On.
2. Force Indicators — Bars Centered.
3. ENG Button (on Autopilot Controller) — Depress.

TO DISENGAGE AUTOPILOT

1. Force Indicators — Bars centered.
2. Control Wheel Trim Switch, when depressed and moved in any of the four directions, disengages pitch and roll axis.
3. Control Wheel Master Switch, when depressed, disengages pitch, roll and yaw axis.
4. AUTOPILOT Switch, when set to OFF, disengages pitch and roll axis.
5. Individual axis may be disengaged by pulling the applicable circuit breaker.

**J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM
(AUTOPILOT/FLIGHT DIRECTOR)****SECTION II — NORMAL PROCEDURES (CONT)****AUTOPILOT MODES**

PWR (Power)	This light illuminates when power is available to the pitch and roll axis of the autopilot and to the flight director. It is an indication that the associated AC and DC circuit breakers have been depressed and the AUTOPILOT Switch has been set to On. Autopilot synchronizing circuits are active.
TEST (Test)	When depressed, provides automatic test of all autopilot and flight director systems in the pitch and roll axis. With power on, the PWR light illuminated, depressing the TEST Button will illuminate all lights on the autopilot controller and cause the ROLL and PITCH Force Indicators to oscillate. Failure of any light to illuminate during TEST indicates a malfunction in the autopilot or light is burned-out. TEST may be used before takeoff or anytime while airborne. If TEST is depressed with autopilot engaged, it will not provide any indication on the Force Indicators. With the autopilot engaged on the ground, pitch and roll monitors are armed and are checked by holding TEST and commanding pitch and roll with Control Wheel Trim Switches.
ENG (Engage)	When depressed, the autopilot is engaged. If some condition exists which is indicated by an out-of-null on the PITCH or ROLL Force Indicators, the associated axis will not engage. If only one ROLL or PITCH light illuminates (but both respond to TEST) it is an indication of a problem in the unlighted axis.
SOFT (Soft)	When depressed, the autopilot provides softer responses in the pitch and roll axes for flying through turbulence. The SOFT mode is locked out when primary NAV is on Localizer frequency. The SOFT light illuminates when the SOFT mode is engaged.

**J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM
(AUTOPILOT/FLIGHT DIRECTOR)****SECTION II – NORMAL PROCEDURES (CONT)**

HDG (Heading)	When depressed, commands the autopilot and/or flight director to turn the airplane as necessary and fly a heading selected by position of the heading "bug" on the (HSI) Horizontal Situation Indicator. A light above the HDG Button will illuminate when heading select is engaged.
NAV (Navigation)	When depressed, activates the autopilot and/or flight director function which captures and tracks VOR and LOC. For NAV mode function, the aircraft receiver must be tuned to the frequency of the navigation aid and the HSI must be set to the magnetic heading of the selected radio beam. The initial angle of intercept of the radio beam must be established in the HDG, LVL, or Attitude Hold mode. Activation of the NAV mode will start automatic procedures and the NAV-ARM light will illuminate. When the aircraft turns on the desired track, the NAV-ARM light will go out and the NAV-CAPT light will illuminate. An engaged heading select or level mode will automatically disengage as NAV-CAPT engages.
TRK (Track)	In the NAV-CAPT mode, this light illuminates to indicate that the autopilot and/or flight director have acquired the center of the VOR or LOC beam (TRK illuminated). Crosswind compensation begins when TRK light is illuminated.
REV (Reverse)	The NAV mode must be engaged and the primary NAV must be tuned to a Localizer Frequency for this mode to be operative. When the REV Button is depressed, the light illuminates, the course information to the autopilot and/or flight director is reversed and the glideslope signal is locked out. This function should be used for localizer backcourse approaches only. Disengaging the NAV mode also disengages REV.

J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM (AUTOPILOT/FLIGHT DIRECTOR)

SECTION II — NORMAL PROCEDURES (CONT)

LVL (Level)	When the autopilot is first engaged it automatically enters the level mode if the aircraft is not banking more than five degrees. When LVL Button is depressed, the light illuminates, the autopilot levels the aircraft in roll and maintains the existing heading. This mode may be used to cancel any other roll modes. If, however, the aircraft is in a bank greater than five degrees with either NAV or HDG mode on the flight director engaged, when the autopilot is first engaged the aircraft will roll level and the LVL light will not illuminate.
SPD (Speed)	When depressed, the autopilot and/or flight director pitch axis is coupled to an Air Data Sensor output to maintain speed existing at the time of engagement. At altitudes below 29,000 feet the IAS light will illuminate and airspeed is maintained. Above 29,000 feet the MACH light will illuminate and Mach number is maintained. Speed is maintained by the autopilot by changing pitch attitude as necessary, power must be set by the pilot.
V/S (Vertical Speed)	When depressed, this switch engages autopilot and/or flight director function (within autopilot limits) to hold an established rate-of-climb or rate-of-descent. Before engaging this mode, maintain the desired rate long enough for the rate sensor lag to diminish. The V/S light illuminates when V/S is selected.
G/S (Glideslope)	May be depressed with an active glideslope being received. If the aircraft is not on glideslope when G/S is depressed the amber G/S-ARM light will illuminate and the engaged pitch mode will be maintained. The autopilot and/or flight director will capture and track the glideslope when the beam center is intercepted, the pitch mode will disengage and the G/S-CAPT light will illuminate. If G/S is depressed when the aircraft is on the glideslope, G/S-CAPT is immediate. Glideslope may be armed with no vertical modes engaged and flown to the beam with the Pitch Command Switch.

**J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM
(AUTOPILOT/FLIGHT DIRECTOR)****SECTION II – NORMAL PROCEDURES (CONT)**

ALT (Altitude Hold)	When depressed, the autopilot and/or flight director will maintain the existing pressure altitude. The ALT light illuminates when ALT is selected.
APPR (Approach)	The APPR light is illuminated when the flaps are lowered 13° or more and signals an increase in autopilot and/or flight director gains which compensate for lower airspeed. If the APPR light does not illuminate upon extension of flaps beyond 13°, subsequent performance of the autopilot, with flaps down, will be degraded.
FNL (Final)	The FNL light will illuminate during an ILS approach if the APPR light is illuminated (flaps are down), and the TRK light is illuminated when the outer marker is passed. If no outer marker is available (localizer backcourse as an example) or the TRK or APPR modes are not engaged until after outer marker passage, the FNL mode can be entered by momentarily pressing the primary NAV test button. (This will momentarily light the outer marker light.) It signals an automatic change in autopilot and flight director gains to compensate for increased sensitivity of the ILS signal.
G/A (Go Around)	With the autopilot engaged, the Go Around mode is inoperative. Once the autopilot is disengaged the Go Around mode is available to the flight director by depressing the Go Around button on the thrust lever knob.

AUTOPILOT MANEUVER CONTROLS

Control Wheel Trim Switch	When moved in any of its four directions, without depressing the arming button on top of the switch, will command the autopilot to change attitude of the aircraft. Depressing the arming button and moving the switch in any of its four directions will disconnect the autopilot pitch and roll axes. G/S-ARM will not disconnect when an armed pitch command is given. NAV ARM will not disconnect when an armed roll command is given.
--	--

J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM (AUTOPILOT/FLIGHT DIRECTOR)

SECTION II — NORMAL PROCEDURES (CONT)

Maneuver Control Switch	Depressing this switch on the control wheel will temporarily disconnect the autopilot pitch and roll axis. Manual commands can be made while this switch is depressed. The selected roll and pitch modes will disengage when this switch is depressed. Autopilot will reengage in the attitude hold mode when this switch is released.
---------------------------------------	---

TYPICAL NORMAL FLIGHT WITH AUTOPILOT

The following is a recommended procedure for using the Autopilot. This procedure is for a 'typical flight' and deviation from this procedure will be necessary as conditions dictate.

AFTER TAKEOFF

1. APPR Light (after flap retraction) — Out.
2. Engage autopilot when climb attitude and heading have been established.
3. Set the next desired heading on HSI with heading knob or VOR radial with the course knob. Engage HDG and/or NAV whenever the heading has been established. Maneuvers may be made as described in AUTOPILOT MANEUVER CONTROLS. Heading and course changes may be made with the heading and course knobs on the HSI.

CLIMB

1. Establish desired climb speed and then engage SPD for constant speed climb.

CRUISE

1. Engage ALT when desired altitude is reached. For smoothest 'leveling off' when ALT hold is selected, the rate of climb or rate of descent should be less than 1000 feet per minute. Adjust thrust levers to achieve the desired speed.



Static error may cause a false indication of climb or descent during airspeed change, with ALT engaged.

**J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM
(AUTOPILOT/FLIGHT DIRECTOR)****SECTION II — NORMAL PROCEDURES (CONT)**

2. When HDG is engaged, heading changes may be made by rotating the heading knob on the HSI to set the heading 'bug' or marker to the desired setting.
3. When NAV is engaged, the autopilot will fly chosen VOR radials. An erratic or noisy radio beam, such as exists in cone of confusion over a VOR station, will cause temporary disengagement of NAV CAPT. During such temporary disengagement, the autopilot reverts to heading hold (LVL) and the NAV ARM (flashing) mode as applicable until satisfactory signal is regained. The autopilot automatically returns to beam guidance with the return of a usable signal.

DESCENT

1. Normal descent may be made with autopilot engaged by changing aircraft attitude with Control Wheel Trim Switch, Vertical Sync Switch or Maneuver Control Switch.

VOR APPROACH

1. VOR approach with the autopilot engaged may be accomplished with the HDG and/or NAV modes, as the pilot desires, up to over-the-station passage inbound to the airport.
2. Departure from the VOR inbound should be accomplished in the HDG mode, using the HDG bug to return the aircraft to the desired radial. As the CDI centers, a return to the NAV mode, or a continuation of the approach in the HDG mode are the pilot's options.

ILS APPROACH

1. ILS approach with autopilot engaged must **not** be made at speeds less than normal approach speeds in the Airplane Flight Manual.
2. The localizer beam should be intercepted at an angle less than 90°. The inbound localizer course should be established outside the outer marker. Intercept angle to localizer will be done in the HDG, LVL or attitude hold mode.
3. When NAV is engaged, the autopilot will automatically capture the localizer upon intercept of it if the NAV is channeled to the localizer frequency and the localizer course is set on the course selector.

J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM (AUTOPILOT/FLIGHT DIRECTOR)

SECTION II — NORMAL PROCEDURES (CONT)

4. ALT should be engaged at the proper altitude beneath the glide path for glideslope interception. When possible, this should be done prior to localizer interception.
5. G/S may be engaged when a good glideslope signal is received and must be engaged prior to glideslope intercept if on altitude hold. Altitude hold will disengage when the glideslope needle centers.
6. Prior to intercepting the glide path, extend flaps to desired position and adjust power to obtain the appropriate speed. The APPR light should illuminate as the flaps pass approximately 13°. For the smoothest approach, the flap setting should not be changed or should be changed slowly while flying the glideslope.
7. When the glideslope needle centers, the autopilot will automatically intercept the glide path and the ALT annunciator will go out. When practical, the gear should be lowered prior to the glideslope intercept point. This helps minimize glide path overshoot.

FLIGHT DIRECTOR INTEGRATION



Refer to applicable Flight Director Supplement for specific information regarding the installed Flight Director Indicator.

The Autopilot and Flight Director system functions have been integrated to eliminate Flight Director functions that duplicate Autopilot functions. The AUTOPILOT Switch must be On to power the Flight Director and the PWR light must be illuminated. The Flight Director also acts as a monitor for the autopilot.

Operation:

1. The autopilot, while disengaged, provides flight director signals.
2. The autopilot controller provides mode switching and annunciation for the flight director while the autopilot is disengaged.
3. Flight director modes will not change and flight director information will be retained when the autopilot is disengaged using the Control Wheel Master Switch only. The yaw damper will also disengage.
4. Glideslope deviation, glideslope flag, VOR-LOC Deviation and Heading displays do not depend on the autopilot.
5. Anytime the autopilot is Engaged, the Flight Director is energized. At initial autopilot engagement, the Flight Director system reverts to attitude hold mode. Command bars on the Flight Director Indicator will be centered, indicating proper autopilot operation.

TEMPORARY FLIGHT MANUAL SUPPLEMENT CHANGE

Publication Affected: Gates Learjet Model 35A/36A Supplement for J.E.T. FC-200 Automatic Flight Control System (Autopilot/Flight Director).

Description of Change: Revise ILS Approach procedure to add disengagement requirement.

Filing Instructions: Insert this page adjacent to page 14 of 16 in the affected AFM Supplement and retain until further notice.

Under ILS APPROACH, add step 8 as follows:

8. Autopilot must be disengaged at or above 190 feet AGL.

FAA
APPROVED

Robert A. Lambright

DATE

7/8/81

for CHIEF, AIRCRAFT CERTIFICATION PROGRAM
FAA CENTRAL REGION
WICHITA, KANSAS

**J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM
(AUTOPILOT/FLIGHT DIRECTOR)****SECTION II — NORMAL PROCEDURES (CONT)**

6. With the autopilot engaged, the Go-Around feature is inoperative. However, with the Autopilot disengaged, the Go-Around feature of the Flight Director is functional as follows:
- On aircraft 35-068 through 35-249 and 36-018 through 36-044*, the Go-Around attitude indication starts when the Go-Around button is depressed and the flaps are lowered beyond 13°.
 - On aircraft 35-250 and Subsequent and 36-045 and Subsequent*, the Go-Around attitude indication starts when the Go-Around button is depressed.



To select Flight Director Go-Around mode:

- Autopilot — Disengage.
- Flaps — Check beyond 13° (35-068 through 35-249 and 36-018 through 36-044 only).
- Go-Around Button (on thrust lever knob) — Depress.

**SECTION III — EMERGENCY PROCEDURES — No change from
FAA Approved Airplane Flight Manual.**

SECTION IV — ABNORMAL PROCEDURES**AUTOPILOT MALFUNCTION**

- Flight Controls — As required to maintain aircraft control.



Do not continue to overpower the autopilot without disengaging autopilot. If autopilot is not disengaged, autopilot pitch trim will continue to operate.

- Control Wheel Master Switch (pilot's or copilot's) — Depress to disengage autopilot.
- AUTOPILOT Switch — OFF.
- AFCS PITCH and AFCS ROLL Circuit Breakers (Pilot's AC BUS) — Pull.

J.E.T. FC-200 AUTOMATIC FLIGHT CONTROL SYSTEM (AUTOPILOT/FLIGHT DIRECTOR)

SECTION IV — ABNORMAL PROCEDURES (CONT)

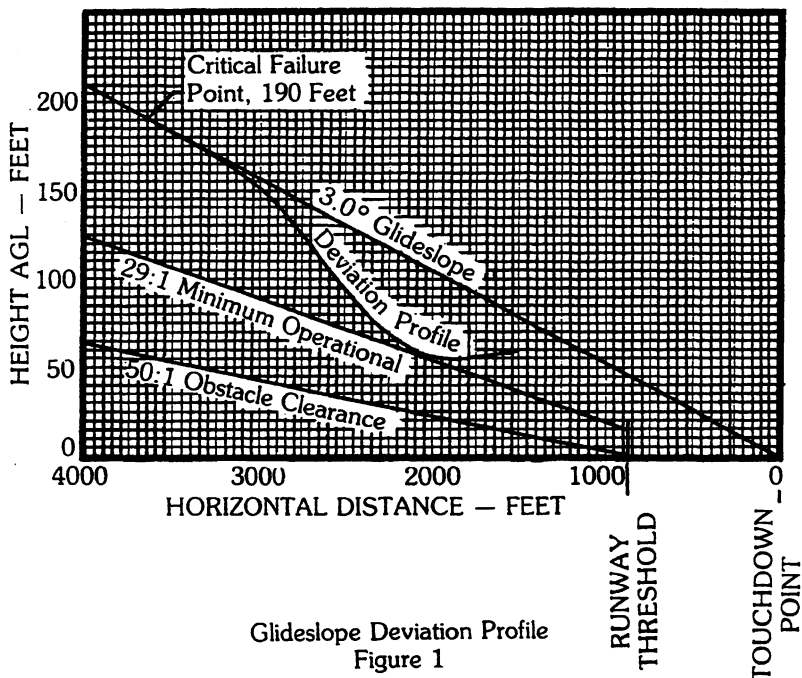
5. AFCS PITCH and AFCS ROLL Circuit Breakers (Pilot's ESS BUS)
— Pull.



- Maximum altitude losses during autopilot malfunction are:
 - a. Cruise: 460 feet at 41,000 feet.
 - b. ILS (both engines operating): 50 feet.
 - c. ILS (one engine operating): 40 feet.
- Refer to Figure 1 for Glideslope Deviation Profile.

ENGINE FAILURE ON COUPLED APPROACH

1. Control Wheel Master Switch — Depress.
2. Retrim aircraft.
3. Refer to ENGINE SHUTDOWN IN FLIGHT, AFM Section III.
4. Autopilot — Engage if desired.



Glideslope Deviation Profile
Figure 1

SECTION V — PERFORMANCE — No change from FAA Approved Airplane Flight Manual.

Gates Learjet 35A & 36A with FC-200 Autopilot

WEIGHT AND BALANCE DATA

MODEL 35A SERIAL NO. _____

MODEL 36A SERIAL NO. _____

DATE _____

LIST OF EFFECTIVE PAGES

WEIGHT AND BALANCE DATA

Dates of issue for Original and Changed pages are:

Original O 2-25-81
 Change 1 9-10-81
 Change 2 8-15-84
 Change 3 1-30-86

Page No.	Change No.	Page No.	Change No.
*Title	3	WB-21	1
*WB-A	3	WB-22	1
*WB-i	3	WB-22A	1
WB-ii	1	WB-23	1
WB-1	2	WB-24	1
WB-2	O	WB-24A	1
WB-3	O	WB-25	1
WB-4	2	WB-26	1
WB-5	O	WB-27	1
WB-6	O	WB-28	1
WB-7	2	WB-28A	1
WB-8	2	WB-29	1
WB-9	2	WB-30	1
WB-10/WB-11	O	WB-31	1
WB-12/WB-13	O	WB-31A	1
*WB-14	3	WB-32	1
*WB-15	3	WB-33	1
*WB-16	3	WB-33A	1
*WB-17	3	WB-34	1
WB-18	O	WB-35	O
*WB-18A Added	3	WB-36	O
*WB-19	3	WB-37	O
WB-20	1		

*Indicates pages changed, added or deleted by the current change. Insert latest changed pages; destroy superseded pages.

WEIGHT AND BALANCE DATA

TABLE OF CONTENTS

Basic Empty Weight	WB-1
C.G.	WB-1
Moment	WB-1
Weight and Center of Gravity Limits	WB-1
Flight Envelope (Figure 1)	WB-2
Flight Envelope (Figure 2)	WB-3
Flight Envelope (Figure 3)	WB-4
Dimensional Data (Figure 4, 2 Sheets)	
Dimensional Data — Model 35A (Sheet 1)	WB-5
Dimensional Data — Model 36A (Sheet 2)	WB-6
Loading Instructions	WB-7
Aircraft Loading Form (Figure 5, 2 Sheets)	
Aircraft Loading Form — Model 35A (Sheet 1)	WB-8
Aircraft Loading Form — Model 36A (Sheet 2)	WB-9
Weight — Moment — C.G. Envelope (Figure 6)	WB-10/WB-11
Center-of-Gravity Table (Figure 7)	WB-12/WB-13
Fuel Moments (Figure 8, 4 Sheets)	
Usable Fuel Moment — Model 35A — Wing and Fuselage Tanks (Sheet 1)	WB-14
Usable Fuel Moment — Model 36A — Wing and Fuselage Tanks (Sheet 2)	WB-15
Usable Fuel Moment — Models 35A/36A — Tip Tanks (Sheet 3)	WB-16
Usable Fuel Moment — Model 35A — Wings, Tip Tanks & Fuselage (Sheet 4)	WB-17
Usable Fuel Moment — Model 36A — Wings, Tip Tanks & Fuselage (Sheet 4)	WB-17
Usable Fuel Moment — Model 35A/36A — Wings & Tip Tanks (Sheet 4)	WB-17
Fuel Tank Capacities — Usable (Figure 9)	WB-18
Fuel Used vs. Moment Loss (For Flight Planning) (Figure 10, 2 Sheets)	WB-18A
Fuselage Tank — Model 35A (Sheet 1)	WB-18A
Fuselage Tank — Model 36A (Sheet 1)	WB-18A
Tip Tanks with RH Recognition Light — Model 35A/36A (Sheet 2)	WB-19
Wing Tanks — Model 35A/36A (Sheet 2)	WB-19

WEIGHT AND BALANCE DATA

TABLE OF CONTENTS (CONT)

Seating Arrangements (Figure 11, 7 Sheets)	
Seating Arrangements — Model 35A (Sheet 1)	WB-20
Seating Arrangements — Model 35A (Cont) (Sheet 2)	WB-21
Seating Arrangements — Model 35A (Cont) (Sheet 3)	WB-22
Seating Arrangements — Model 35A (Cont) (Sheet 4)	WB-22A
Seating Arrangements — Model 36A (Sheet 5)	WB-23
Seating Arrangements — Model 36A (Cont) (Sheet 6)	WB-24
Seating Arrangements — Model 36A (Cont) (Sheet 7)	WB-24A
Payload Moments Chart (Figure 12, 12 Sheets)	
Passenger and Crew Table — Model 35A Standard	
Seating Arrangement (Sheet 1)	WB-25
Passenger Table — Model 35A Alternate	
Seating Arrangement (Sheet 2)	WB-26
Passenger Table — Model 35A Alternate	
Seating Arrangement (Sheet 3)	WB-27
Passenger Table — Model 35A Alternate	
Seating Arrangement (Sheet 4)	WB-28
Passenger Table — Model 35A Alternate	
Seating Arrangement (Sheet 5)	WB-28A
Passenger Table — Model 35A or 36A	
with Jump Seat (Sheet 6)	WB-29
Passenger and Crew Table — Model 36A Standard	
Seating Arrangement (Sheet 7)	WB-30
Passenger Table — Model 36A Alternate	
Seating Arrangement (Sheet 8)	WB-31
Passenger Table — Model 36A Alternate	
Seating Arrangement (Sheet 9)	WB-31A
Baggage Compartment (Sheet 10)	WB-32/WB-32A
Provisions (Sheet 11)	WB-33
Provisions (Cont) (Sheet 12)	WB-33A
Landing Gear Dimension Data (Figure 13)	WB-34
Weighing Instructions	WB-35
Unusable and Trapped Fuel and Oil (Figure 14)	WB-36
Aircraft Weighing Record (Figure 15)	WB-37

BASIC EMPTY WEIGHT

(Includes Unusable Fuel and Full Operating Fluids)

C.G.

MOMENT

It is the responsibility of the aircraft owner and pilot to ensure that the aircraft is loaded properly. The basic empty weight and center of gravity noted are for the aircraft as delivered from the factory. In the event the aircraft is altered, refer to the Aircraft Records.

Owners are advised to contact the aircraft manufacturer when any change is made to the aircraft which would appreciably affect the location of useful load items.

WEIGHT AND CENTER OF GRAVITY LIMITS



- The Normal Empty Weight Center of Gravity may be aft of the Flight Limit.
- For Fuel Used vs. Moment Loss (For Flight Planning), refer to figure 10.

Model 35A: Serials 35-067 and Subsequent not incorporating ECR 1495, ECR 2234, AAK 77-8, or AAK 80-2.

The Forward C.G. Limit is 5% MAC for all weights up to and including 10,000 pounds and tapers through 16.66% at 17,000 pounds (Maximum Certified Takeoff Weight) to 17.09% at 17,250 pounds (Maximum Ramp Weight). The Aft C.G. Limit is 30% for all weights. Refer to Figure 1.

Model 35A: Serials 35-067 thru 35-394 when incorporating ECR 1495 or AAK 77-8. Model 36A: Serials 36-018 thru 36-045 not incorporating AAK 80-2.

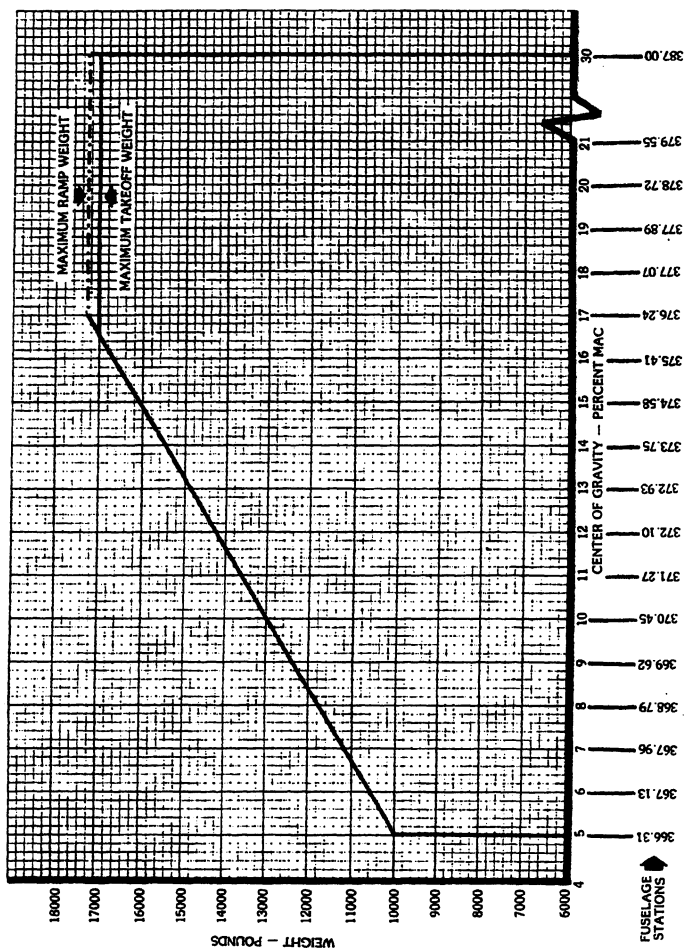
The Forward C.G. Limit is 5% MAC for all weights up to and including 10,000 pounds and tapers through 18.33% at 18,000 pounds (Maximum Certified Takeoff Weight) to 18.76% at 18,250 pounds (Maximum Ramp Weight). The Aft C.G. Limit is 30% for all weights. Refer to Figure 2.

Model 35A: Serials 35-067 thru 35-344 when incorporating AAK 80-2. 35-345 and Subsequent when incorporating ECR 2234. Model 36A: Serials 36-018 thru 36-045 when incorporating AAK 80-2. 36-036 and Subsequent.

The Forward C.G. Limit is 5% for all weights up to and including 10,000 pounds and tapers through 18.83% at 18,300 pounds (Maximum Certified Takeoff Weight) to 19.17% at 18,500 pounds (Maximum Ramp Weight). The Aft C.G. Limit is 30% for all weights. Refer to Figure 3.

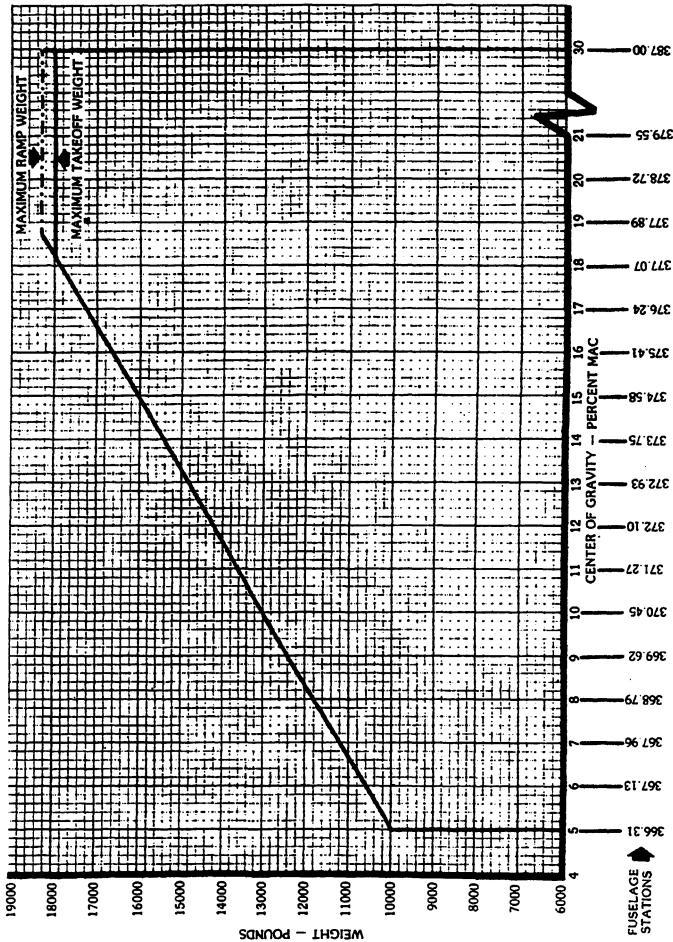
LEARJET 35A 36A

FLIGHT ENVELOPE



Flight Envelope
Model 35A Serials 35-067 and Subsequent not incorporating ECR 1495,
ECR 2234, AAK 77-8, or AAK 80-2.
Figure 1

FLIGHT ENVELOPE



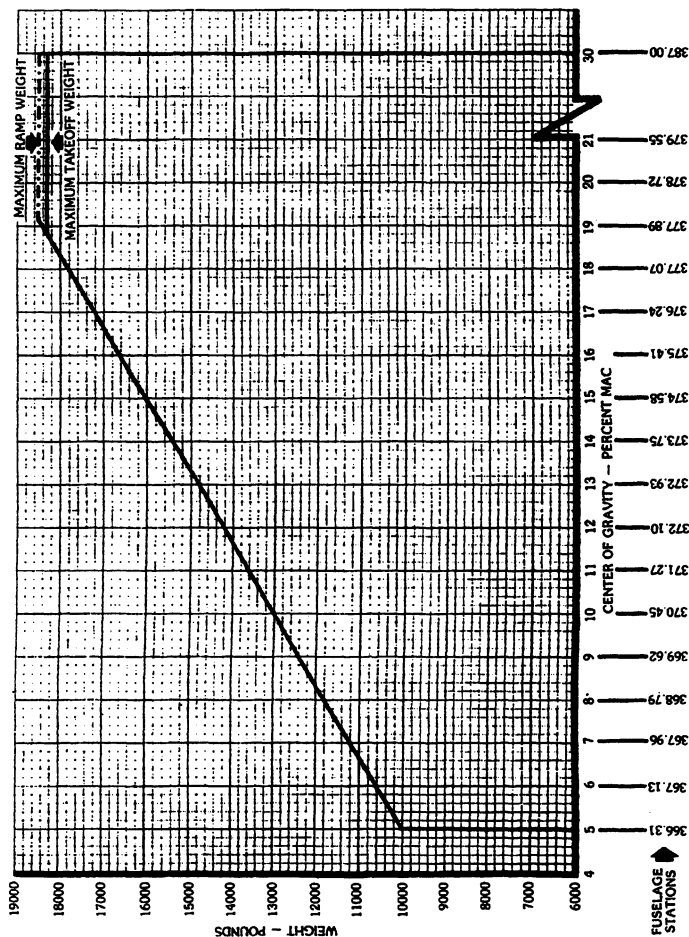
Flight Envelope

Model 35A Serials 35-067 thru 35-394 when incorporating ECR 1495 or AAK 77-8.

Model 36A Serials 36-018 thru 36-045 not incorporating AAK 80-2.

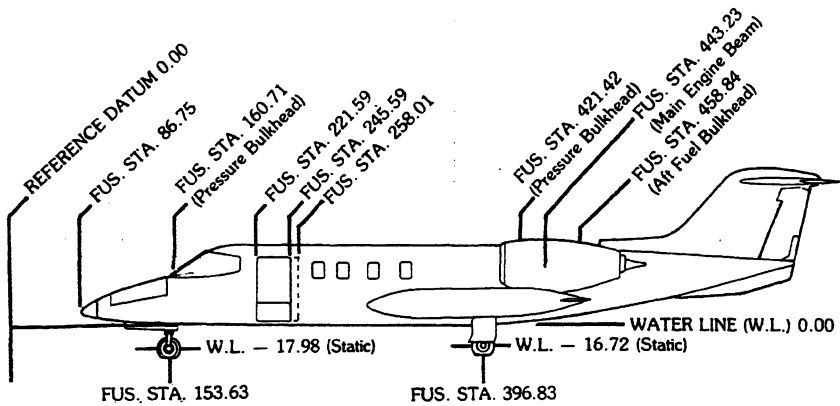
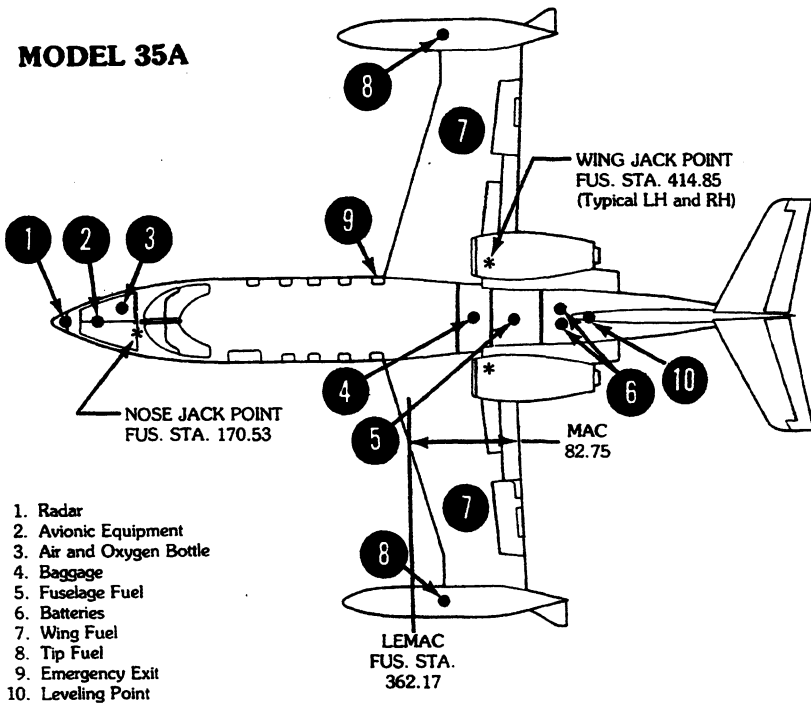
Figure 2

FLIGHT ENVELOPE



Flight Envelope
Model 35A Serials 36-067 thru 35-344 when incorporating AAK 80-2. 35-345 and Subsequent when incorporating ECR 2234.
Model 36A Serials 36-018 thru 36-045 when incorporating AAK 80-2. 36-036 and Subsequent
Figure 3

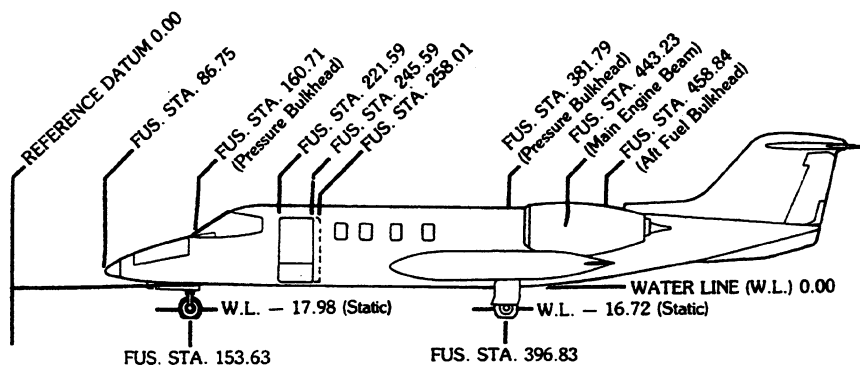
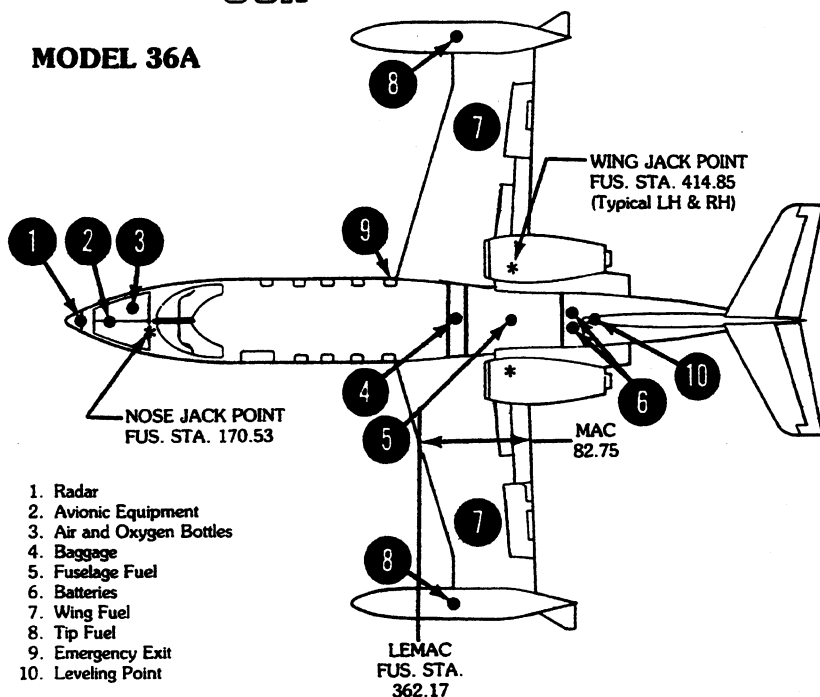
MODEL 35A



Dimensional Data
Figure 4 (Sheet 1 of 2)

LEARJET 35A 36A

MODEL 36A



Dimensional Data
Figure 4 (Sheet 2 of 2)

LOADING INSTRUCTIONS

It is the responsibility of the pilot to see that this aircraft is loaded within the weight and C.G. limits. The loading forms (figure 5) may be used.

1. Enter the BASIC EMPTY WEIGHT and MOMENT from page WB-1 or; in the event the airplane has been altered, enter the BASIC EMPTY WEIGHT and MOMENT from the Aircraft Records.
2. Enter the payload weights and moments (crew, passengers, provisions, baggage, etc.) using the Payload Moments Charts, figure 12.
3. Enter the fuel weights and moments using the Fuel Moments Charts, figure 8.
4. Compute the ZERO FUEL WEIGHT and MOMENT (OPERATING WEIGHT values plus Passenger and Baggage values).
5. Compute ZERO WING & TIP FUEL WEIGHT (ZERO FUEL WEIGHT value plus fuselage tank fuel weight).
6. Compute RAMP WEIGHT and MOMENT (ZERO FUEL WEIGHT values plus fuel values).
7. Compute TAKEOFF WEIGHT and MOMENT (RAMP WEIGHT values minus Taxi Burnoff out of tips).
8. Compare TAKEOFF WEIGHT and MOMENT with weight and C.G. limits from Weight-Moment-C.G. Envelope, figure 6, or Center-of-Gravity Table, figure 7. If not within limits, reduce weight or rearrange load as required to obtain weight and C.G. within limits.
9. LANDING WEIGHT and MOMENT may be calculated by subtracting the fuel used weight and moment from the TAKEOFF WEIGHT and MOMENT.
10. The formula to calculate the C.G. in % MAC is:

$$\text{C.G. in \% MAC} = \left[\frac{\text{Fuselage Station (Center of Gravity)} - 362.17}{82.75} \right] \times 100$$

AIRCRAFT LOADING FORM

Interior Configuration _____

MODEL 35A	WEIGHT	F.S.	MOM/1000	% MAC
BASIC EMPTY WEIGHT				
Missing/ Additional Equipment				—
Crew				—
Provisions — Fwd				—
Provisions — Mid				—
Provisions — Aft				—
Provisions — Toilet				—
Water				—
Miscellaneous				—
				—
OPERATING WEIGHT EMPTY				
Baggage — Fwd				—
Baggage — Aft				—
Passenger — Fwd Sidefacing				—
Passengers — Fwd Swivel				—
Passengers — Aft Swivel				—
Passengers — Divan				—
				—
				—
				—
ZERO FUEL WEIGHT				
Fuselage Tank				—
ZERO WING & TIP FUEL WEIGHT		—	—	—
Wing Tanks				—
Tip Tanks				—
RAMP WEIGHT				
* Taxi Burnoff Out of Tips				—
TAKEOFF WEIGHT				
Fuel Used — Tips				—
— Wings				—
— Fuselage				—
LANDING WEIGHT				

*Fuel burnoff is approximately 3.5 pounds per engine per minute.

Aircraft Loading Form
Figure 5 (Sheet 1 of 2)

AIRCRAFT LOADING FORM

Interior Configuration _____

MODEL 36A	WEIGHT	F.S.	MOM/1000	% MAC
BASIC EMPTY WEIGHT				
Missing/Additional Equipment				—
Crew				—
Provisions — Fwd				—
Provisions — Aft				—
Provisions — Toilet				—
Water				—
Miscellaneous				—
				—
OPERATING WEIGHT EMPTY				
Baggage — Fwd				—
Baggage — Aft				—
Passenger — Fwd Swivel — LH				—
— RH				—
Passengers — Divan				—
				—
				—
				—
ZERO FUEL WEIGHT				
Fuselage Tank				—
ZERO WING & TIP FUEL WEIGHT		—	—	—
Wing Tanks				—
Tip Tanks				—
RAMP WEIGHT				
Taxi Burnoff Out of Tips				—
TAKEOFF WEIGHT				
Fuel Used — Tips				—
— Wings				—
— Fuselage				—
LANDING WEIGHT				

*Fuel burnoff is approximately 3.5 pounds per engine per minute

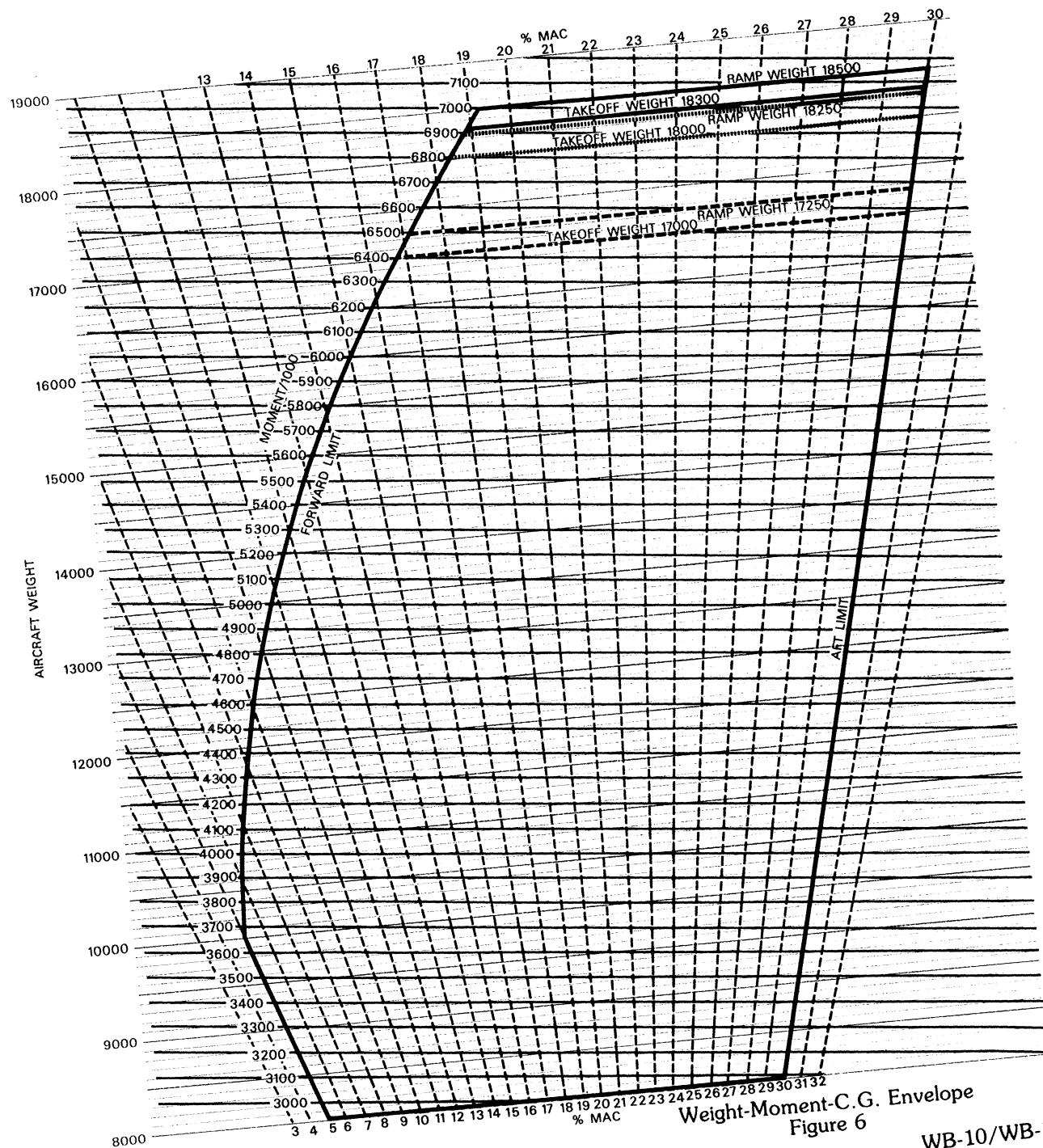
Aircraft Loading Form
Figure 5 (Sheet 2 of 2)

flight manual

ENVELOPE BASED ON THE FOLLOWING
WEIGHT AND CENTER-OF-GRAVITY LIMIT
DATA (Landing Gear Down)

WEIGHT CONDITION	FWD C.G. LIMIT	AFT C.G. LIMIT
10,000 lb or less	5% MAC	30% MAC
14,300 lb (Max. Landing)	12.17% MAC	30% MAC
15,300 lb (Max. Landing)	13.84% MAC	30% MAC
17,000 lb (Max. Takeoff)	16.66% MAC	30% MAC
18,000 lb (Max. Takeoff)	18.33% MAC	30% MAC
18,300 lb (Max. Takeoff)	18.83% MAC	30% MAC
17,250 lb (Max. Ramp)	17.09% MAC	30% MAC
18,250 lb (Max. Ramp)	18.76% MAC	30% MAC
18,500 lb (Max. Ramp)	19.17% MAC	30% MAC

NOTE: LANDING GEAR RETRACTION MOMENT
(MINUS) 2437 INCH-POUNDS.



Weight-Moment-C.G. Envelope
Figure 6

Forward C.G. Limit

WB-12/WB-13

USABLE FUEL MOMENT – MODEL 35A WING AND FUSELAGE TANKS

GALLONS	POUNDS		MOMENT / 1000			
	Kerosene 6.7#/gallon	JP-4 6.5#/gallon	WINGS		FUSELAGE	
			Kerosene	JP-4	Kerosene	JP-4
20	134	130	51.60	50.06	58.80	57.05
40	268	260	103.17	100.09	117.69	114.17
60	402	390	154.62	150.00	176.62	171.34
80	536	520	205.97	199.82	235.55	228.52
100	670	650	257.48	249.79	294.49	285.69
120	804	780	309.04	299.81	353.43	342.88
140	938	910	360.70	349.93	412.36	400.05
160	1072	1040	412.45	400.14	471.30	457.24
180	1206	1170	464.25	450.39	530.22	514.39
200	1340	1300	516.10	500.69	588.99	571.42
220	1474	1430	568.02	551.06		
240	1608	1560	620.12	601.61		
260	1742	1690	672.27	652.20		
280	1876	1820	724.60	702.97		
300	2010	1950	777.06	753.87		
320	2144	2080	829.62	804.85		
340	2278	2210	882.22	855.88		
360	2412	2340	935.01	907.10		
374	2508	2431	972.83	942.95		

Fuel Moments
Figure 8 (Sheet 1 of 4)

USABLE FUEL MOMENT – MODEL 36A WING AND FUSELAGE TANKS

GALLONS	POUNDS		MOMENT /1000			
	Kerosene 6.7#/gallon	JP-4 6.5#/gallon	WINGS		FUSELAGE	
			Kerosene	JP-4	Kerosene	JP-4
20	134	130	51.60	50.06	58.28	56.54
40	268	260	103.17	100.09	117.59	114.08
60	402	390	154.62	150.00	176.56	171.29
72	482	467			211.69	205.10
80	536	520	205.97	199.82	233.88	226.90
100	670	650	257.48	249.79	290.59	281.92
120	804	780	309.04	299.81	347.26	336.89
140	938	910	360.70	349.93	403.55	391.50
160	1072	1040	412.45	400.14	459.82	446.09
180	1206	1170	464.25	450.39	516.01	500.61
200	1340	1300	516.10	500.69	572.18	555.10
220	1474	1430	568.02	551.06	628.31	609.55
240	1608	1560	620.12	601.61	684.43	664.00
260	1742	1690	672.27	652.20	740.50	718.40
280	1876	1820	724.60	702.97	796.57	772.79
300	2010	1950	777.06	753.87	852.58	827.13
320	2144	2080	829.62	804.85	908.13	881.02
340	2278	2210	882.22	855.88	963.50	934.74
360	2412	2340	935.01	907.10	1018.20	987.81
374	2508	2431	972.83	942.95		
379	2542	2466			1070.31	1038.31

Fuel Moments
Figure 8 (Sheet 2 of 4)

USABLE FUEL MOMENT – MODELS 35A/36A – TIP TANKS

STANDARD TIP TANK WITH RECOGNITION LIGHT IN RH TIP TANK AND FUEL DUMP				
GALLONS	KEROSENE 6.7*/GALLON	JP-4 6.5*/GALLON	MOMENT/1000	
			KEROSENE	JP-4
20	134	130	53.20	51.61
40	268	260	106.40	103.22
60	402	390	159.39	154.64
80	536	520	212.09	205.76
100	670	650	264.55	256.65
120	804	780	316.86	307.40
140	938	910	369.01	357.99
160	1072	1040	421.08	408.51
180	1206	1170	473.08	458.96
200	1340	1300	525.01	509.34
220	1474	1430	576.85	559.63
240	1608	1560	628.52	609.73
260	1742	1690	680.16	659.86
280	1876	1820	731.73	709.89
300	2010	1950	783.24	759.86
320	2144	2080	834.55	809.64
340	2278	2210	885.91	859.47
357	2390	2320	928.75	901.55

TIP TANKS WITH RECOGNITION LIGHT IN BOTH TIP TANKS AND FUEL DUMP				
GALLONS	KEROSENE 6.7*/GALLON	JP-4 6.5*/GALLON	MOMENT / 1000	
			KEROSENE	JP-4
20	134	130	53.20	51.61
40	268	260	106.40	103.22
60	402	390	159.39	154.63
80	536	520	212.20	205.87
100	670	650	264.75	256.85
120	804	780	317.14	307.67
140	938	910	369.38	358.36
160	1072	1040	421.42	408.84
180	1206	1170	473.62	459.48
200	1340	1300	525.78	510.08
220	1474	1430	577.84	560.59
240	1608	1560	629.89	611.08
260	1742	1690	681.82	661.47
280	1876	1820	733.63	711.73
300	2010	1950	785.21	761.78
320	2144	2080	836.70	811.72
340	2278	2210	888.08	861.57
351	2350	2280	915.80	888.52

Fuel Moments
Figure 8 (Sheet 3 of 4)

**USABLE FUEL MOMENT – MODEL 35A
– WINGS, TIP TANKS & FUSELAGE**

FUEL	USABLE	
	POUNDS	MOM/1000
KEROSENE (6.7#/GAL)	6238	2490.57
JP-4 (6.5#/GAL)	6051	2415.92

**USABLE FUEL MOMENT – MODEL 36A
– WINGS, TIP TANKS & FUSELAGE**

FUEL	USABLE	
	POUNDS	MOM/1000
KEROSENE (6.7#/GAL)	7440	2971.89
JP-4 (6.5#/GAL)	7217	2882.81

**USABLE FUEL MOMENT – MODEL 35A/36A
– WINGS & TIP TANKS**

FUEL	USABLE	
	POUNDS	MOM/1000
KEROSENE (6.7#/GAL)	4898	1901.58
JP-4 (6.5#/GAL)	4751	1844.50

Fuel Moments
Figure 8 (Sheet 4 of 4)

FUEL TANK CAPACITIES – USABLE

LOCATION	MODEL 35A GALLONS	MODEL 36A GALLONS
Wings	374	374
Tip Tanks	357	357
Fuselage Tank	200	379
TOTAL	931	1110

Fuel Tank Capacities — Usable
Figure 9

FUEL USED vs. MOMENT LOSS (FOR FLIGHT PLANNING)

FUSELAGE TANK (35A)		FUSELAGE TANK (36A)	
FUEL USED POUNDS 6.7#/GALLON	FUSELAGE (35A) MOMENT/1000	FUEL USED POUNDS 6.7#/GALLON	FUSELAGE (36A) MOMENT/1000
134	58.77	130	52.11
268	117.69	264	106.81
402	176.63	398	162.18
536	235.57	532	217.73
670	294.51	666	273.74
804	353.44	800	329.81
938	412.38	934	385.88
1072	471.31	1068	442.00
1206	530.19	1202	498.13
1340	588.99	1336	554.30
		1470	610.49
		1604	666.76
		1738	723.05
		1872	779.52
		2006	836.43
		2060	858.62
		2140	893.75
		2274	952.72
		2408	1012.03
		2542	1070.31

Fuel Used vs. Moment Loss (For Flight Planning)
Figure 10 (Sheet 1 of 2)

**FUEL USED vs. MOMENT LOSS
(FOR FLIGHT PLANNING)**

**TIP TANKS WITH
RH RECOGNITION LIGHT
MODEL 35A/36A**

WING TANKS (35A/36A)

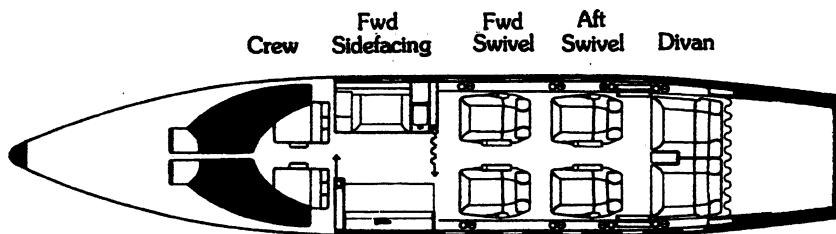
FUEL USED POUNDS 6.7*/GALLON	TIP TANK MOMENT/1000	FUEL USED POUNDS 6.7*/GALLON	WING MOMENT/1000
112	42.84	96	37.82
246	94.20	230	90.60
380	145.51	364	143.21
514	197.02	498	195.76
648	248.59	632	248.22
782	300.23	766	300.55
916	351.90	900	352.70
1050	403.74	1034	404.80
1184	455.67	1168	456.72
1318	507.67	1302	508.56
1452	559.74	1436	560.36
1586	611.89	1570	612.11
1720	664.20	1704	663.77
1854	716.66	1838	715.34
1988	769.36	1972	766.84
2122	822.35	2106	818.18
2256	875.55	2240	869.63
2390	928.75	2374	921.22
		2508	972.83

Fuel Used vs. Moment Loss (For Flight Planning)
Figure 10 (Sheet 2 of 2)

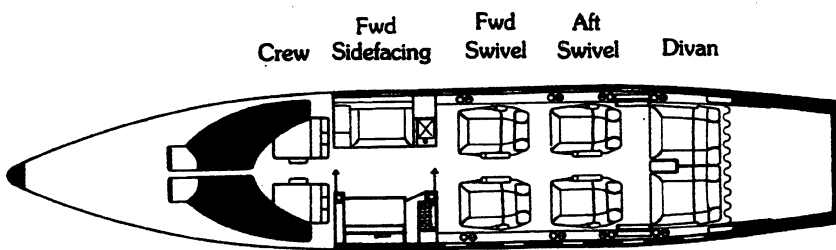
LEARJET 35A
36A

SEATING ARRANGEMENTS – MODEL 35A

CARGO DOOR



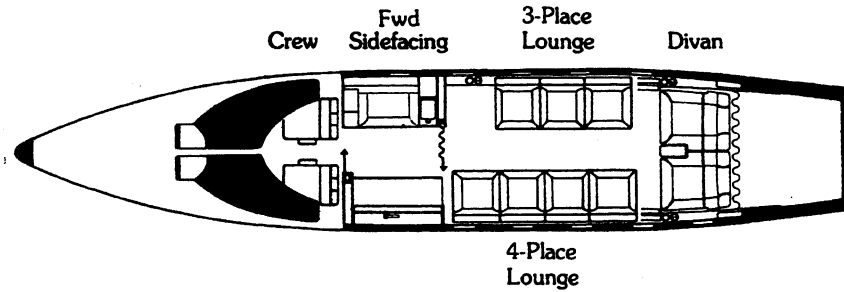
EXECUTIVE DOOR



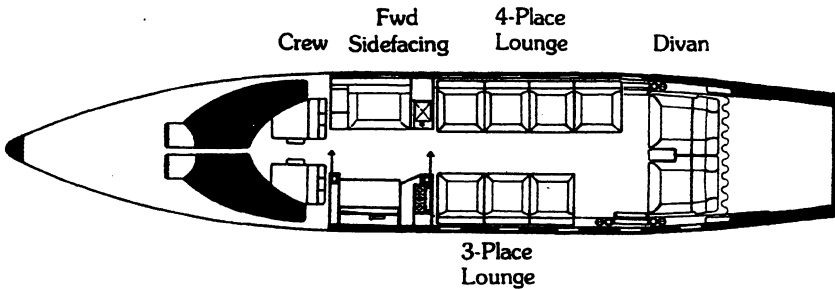
Seating Arrangement
Figure 11 (Sheet 1 of 7)

SEATING ARRANGEMENTS – MODEL 35A (CONT)

CARGO DOOR



EXECUTIVE DOOR



The approved maximum number of people aboard is thirteen. Of these two are crew members and one is an attendant.

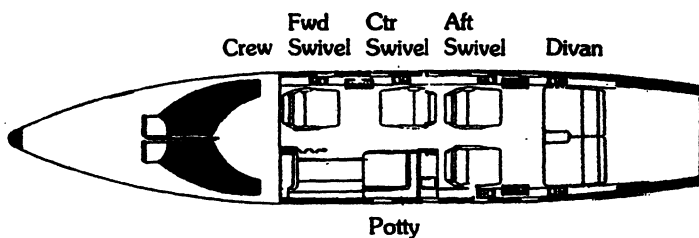
Seating Arrangement
Figure 11 (Sheet 2 of 7)

LEARJET 35A 36A

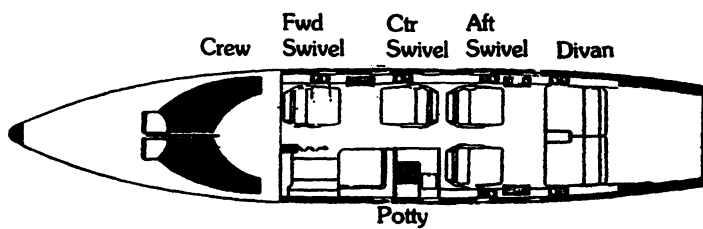
SEATING ARRANGEMENTS – MODEL 35A (CONT)

SEATING MID-CABINET ARRANGEMENT

CARGO DOOR



EXECUTIVE DOOR

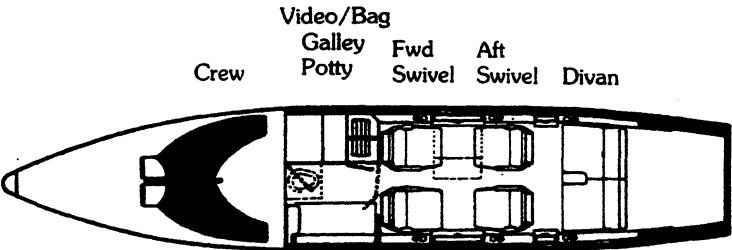


Seating Arrangement
Figure 11 (Sheet 3 of 7)

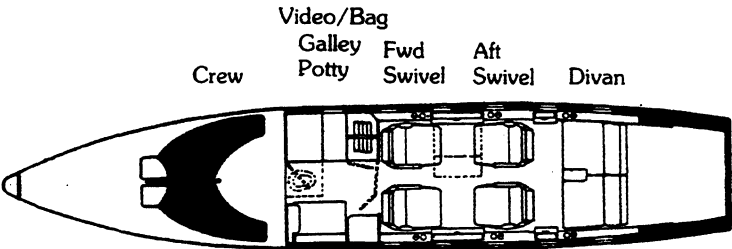
SEATING ARRANGEMENTS – MODEL 35A (CONT)

**SEATING
CLUB INTERIOR ARRANGEMENT**

CARGO DOOR



EXECUTIVE DOOR

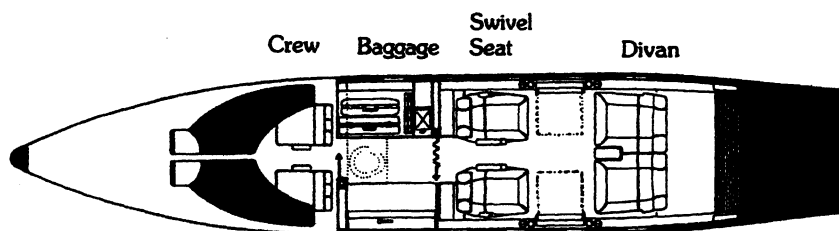


Seating Arrangement
Figure 11 (Sheet 4 of 7)

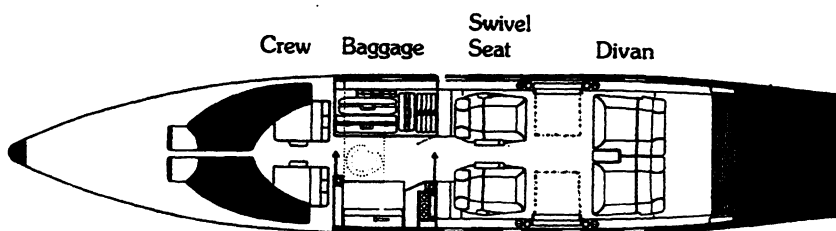
LEARJET 35A
36A

SEATING ARRANGEMENTS – MODEL 36A

CARGO DOOR



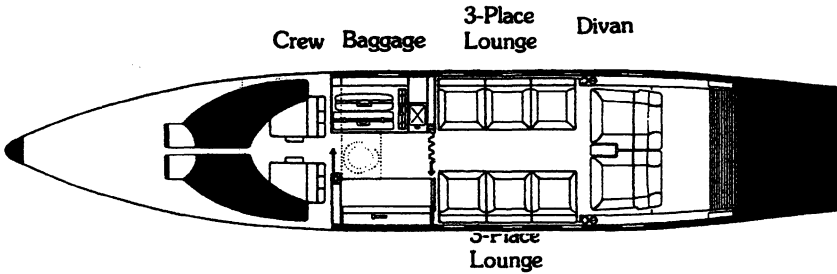
EXECUTIVE DOOR



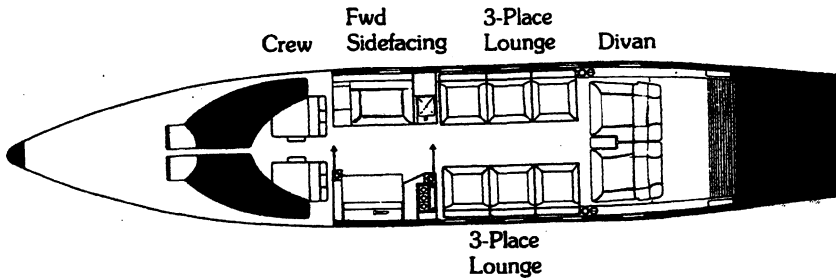
Seating Arrangement
Figure 11 (Sheet 5 of 7)

SEATING ARRANGEMENTS – MODEL 36A (CONT)

CARGO DOOR



EXECUTIVE DOOR



The approved maximum number of people aboard is thirteen. Of these two are crew members and one is an attendant.

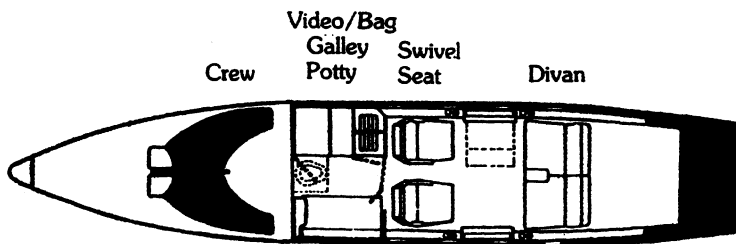
Seating Arrangement
Figure 11 (Sheet 6 of 7)

**LEARJET 35A
36A**

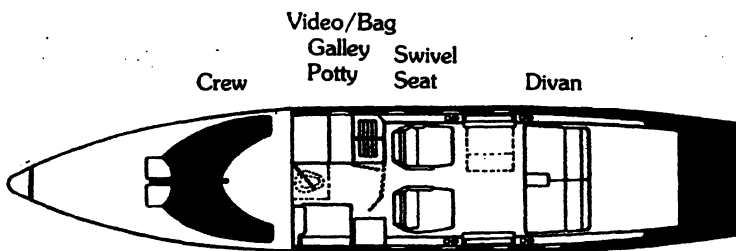
SEATING ARRANGEMENTS – MODEL 36A (CONT)

**SEATING
CLUB INTERIOR ARRANGEMENT**

CARGO DOOR



EXECUTIVE DOOR



Seating Arrangement
Figure 11 (Sheet 7 of 7)

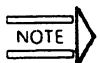
PASSENGER AND CREW TABLE – MODEL 35A STANDARD SEATING – MOMENT/1000

WEIGHT	CREW STA. 204	FWD. SIDEFACING STA. 237.8	FWD. SWIVEL STA. 294	AFT SWIVEL STA. 313.2	DIVAN STA. 362.4
10	2.04	2.38	2.94	3.13	3.62
20	4.08	4.76	5.88	6.26	7.25
30	6.12	7.13	8.82	9.40	10.87
40	8.16	9.51	11.76	12.53	14.50
50	10.20	11.89	14.70	15.66	18.12
60	12.24	14.27	17.64	18.79	21.74
70	14.28	16.65	20.58	21.92	25.37
80	16.32	19.02	23.52	25.06	28.99
90	18.36	21.40	26.46	28.19	32.62
100	20.40	23.78	29.40	31.32	36.24
110	22.44	26.16	32.34	34.45	39.86
120	24.48	28.54	35.28	37.58	43.49
130	26.52	30.91	38.22	40.72	47.11
140	28.56	33.29	41.16	43.85	50.74
150	30.60	35.67	44.10	46.98	54.36
160	32.64	38.05	47.04	50.11	57.98
170	34.68	40.43	49.98	53.24	61.61
180	36.72	42.80	52.92	56.38	65.23
190	38.76	45.18	55.86	59.51	68.86
200	40.80	47.56	58.80	62.64	72.48
210	42.84	49.94	61.74	65.77	76.10
220	44.88	52.32	64.68	68.90	79.73
230	46.92	54.69	67.62	72.04	83.35
240	48.96	57.07	70.56	75.17	86.98
250	51.00	59.45	73.50	78.30	90.60
260	53.04		76.44	81.43	94.22
270	55.08		79.38	84.56	97.84
280	57.12		82.32	87.70	101.47
290	59.16		85.26	90.83	105.10
300	61.20		88.20	93.96	108.72
310	63.24		91.14	97.09	112.34
320	65.28		-94.08	100.22	115.97
330	67.32		97.02	103.36	119.59
340	69.36		99.96	106.49	123.22
350	71.40		102.90	109.62	126.84
360	73.44		105.84	112.75	130.46
370	75.48		108.78	115.88	134.09
380	77.52		111.72	119.02	137.71
390	79.56		114.66	122.15	141.34
400	81.60		117.60	125.28	144.96
410	83.64		120.54	128.41	148.58
420	85.68		123.48	131.54	152.21
430	87.72		126.42	134.68	155.83
440	89.76		129.36	137.81	159.46
450	91.80		132.30	140.94	163.08
460	93.84		135.24	144.07	166.70
470	95.88		138.18	147.20	170.33
480	97.92		141.12	150.34	173.95
490	99.96		144.06	153.47	177.58
500	102.00		147.00	156.60	181.20
510					184.82
520					188.45
530					192.07
540					195.70
550					199.32
560					202.94
570					206.57
580					210.19
590					213.82
600					217.44

Payload Moments Charts
 Figure 12 (Sheet 1 of 12)

PASSENGER TABLE – MODEL 35A ALTERNATE SEATING ARRANGEMENT – MOMENT/1000

A/C with Executive Door RH or LH Lounge A/C with Cargo Door RH Lounge					A/C with Cargo Door LH Lounge			
Weight	Sta. 270	Sta. 290	Sta. 310	Sta. 330	Sta. 280	Sta. 300	Sta. 320	Sta. 340
10	2.7	2.9	3.1	3.3	2.8	3.0	3.2	3.4
20	5.4	5.8	6.2	6.6	5.6	6.0	6.4	6.8
30	8.1	8.7	9.3	9.9	8.4	9.0	9.6	10.2
40	10.8	11.6	12.4	13.2	11.2	12.0	12.8	13.6
50	13.5	14.5	15.5	16.5	14.0	15.0	16.0	17.0
60	16.2	17.4	18.6	19.8	16.8	18.0	19.2	20.4
70	18.9	20.3	21.7	23.1	19.6	21.0	22.4	23.8
80	21.6	23.2	24.8	26.4	22.4	24.0	25.6	27.2
90	24.3	26.1	27.9	29.7	25.2	27.0	28.8	30.6
100	27.0	29.0	31.0	33.0	28.0	30.0	32.0	34.0
110	29.7	31.9	34.1	36.3	30.8	33.0	35.2	37.4
120	32.4	34.8	37.2	39.6	33.6	36.0	38.4	40.8
130	35.1	37.7	40.3	42.9	36.4	39.0	41.6	44.2
140	37.8	40.6	43.4	46.2	39.2	42.0	44.8	47.6
150	40.5	43.5	46.5	49.5	42.0	45.0	48.0	51.0
160	43.2	46.4	49.6	52.8	44.8	48.0	51.2	54.4
170	45.9	49.3	52.7	56.1	47.6	51.0	54.4	57.8
180	48.6	52.2	55.8	59.4	50.4	54.0	57.6	61.2
190	51.3	55.1	58.9	62.7	53.2	57.0	60.8	64.6
200	54.0	58.0	62.0	66.0	56.0	60.0	64.0	68.0
210	56.7	60.9	65.1	69.3	58.8	63.0	67.2	71.4
220	59.4	63.8	68.2	72.6	61.6	66.0	70.4	74.8
230	62.1	66.7	71.3	75.9	64.4	69.0	73.6	78.2
240	64.8	69.6	74.4	79.2	67.2	72.0	76.8	81.6
250	67.5	72.5	77.5	82.5	70.0	75.0	80.0	85.0



The approved maximum number of people aboard is thirteen. Of these two are crew members and one is an attendant.

**PASSENGER TABLE – MODEL 35A
ALTERNATE SEATING ARRANGEMENT – MOMENT/1000**

MID-CABINET CONFIGURATION

(MOMENT/1000)		
WEIGHT	A/C with Exec. Door and Potty on LH Side Aft of Door Potty Pass. Sta. 256.2	A/C with Cargo Door and Potty on LH Side Aft of Door Potty Pass. Sta. 268.2
10	2.56	2.68
20	5.12	5.36
30	7.69	8.05
40	10.25	10.73
50	12.81	13.41
60	15.37	16.09
70	17.93	18.77
80	20.50	21.46
90	23.06	24.14
100	25.62	26.82
110	28.18	29.50
120	30.74	32.18
130	33.31	34.87
140	35.87	37.55
150	38.43	40.23
160	40.99	42.91
170	43.55	45.59
180	46.12	48.28
190	48.68	50.96
200	51.24	53.64
210	53.80	56.32
220	56.36	59.00
230	58.93	61.69
240	61.49	64.37
250	64.05	67.05

Payload Moments Charts
Figure 12 (Sheet 3 of 12)

PASSENGER TABLE – MODEL 35A ALTERNATE SEATING ARRANGEMENT – MOMENT/1000

MID-CABINET POTTY AFT OF DOOR CONFIGURATION

(MOMENT/1000)		
WEIGHT	RH FWD SWIVEL STA. 236	RH CENTER SWIVEL STA. 270
10	2.36	2.70
20	4.72	5.40
30	7.08	8.10
40	9.44	10.80
50	11.80	13.50
60	14.16	16.20
70	16.52	18.90
80	18.88	21.60
90	21.24	24.30
100	23.60	27.00
110	25.96	29.70
120	28.32	32.40
130	30.68	35.10
140	33.04	37.80
150	35.40	40.50
160	37.76	43.20
170	40.12	45.90
180	42.48	48.60
190	44.84	51.30
200	47.20	54.00
210	49.56	56.70
220	51.92	59.40
230	54.28	62.10
240	56.64	64.80
250	59.00	67.50

Payload Moments Charts
Figure 12 (Sheet 4 of 12)

PASSENGER TABLE – MODEL 35A ALTERNATE SEATING ARRANGEMENT – MOMENT/1000

CLUB INTERIOR CONFIGURATION

WEIGHT	FWD. SWIVEL STA. 283	AFT. SWIVEL STA. 317	DIVAN STA. 360
10	2.83	3.17	3.60
20	5.66	6.34	7.20
30	8.49	9.51	10.80
40	11.32	12.68	14.40
50	14.15	15.85	18.00
60	16.98	19.02	21.60
70	19.81	22.19	25.20
80	22.64	25.36	28.80
90	25.47	28.53	32.40
100	28.30	31.70	36.00
110	31.13	34.87	39.60
120	33.96	38.04	43.20
130	36.79	41.21	46.80
140	39.62	44.38	50.40
150	42.45	47.55	54.00
160	45.28	50.72	57.60
170	48.11	53.89	61.20
180	50.94	57.06	64.80
190	53.77	60.23	68.40
200	56.60	63.40	72.00
210	59.43	66.57	75.60
220	62.26	69.74	79.20
230	65.09	72.91	82.80
240	67.92	76.08	86.40
250	70.75	79.25	90.00
260	73.58	82.42	93.60
270	76.41	85.59	97.20
280	79.24	88.76	100.80
290	82.07	91.93	104.40
300	84.90	95.10	108.00
310	87.73	98.27	111.60
320	90.56	101.44	115.20
330	93.39	104.61	118.80
340	96.22	107.78	122.40
350	99.05	110.95	126.00
360	101.88	114.12	129.60
370	104.71	117.29	133.20
380	107.54	144.40	136.80
390	110.37	123.63	140.40
400	113.20	126.80	144.40
410	116.03	129.97	147.60
420	118.86	133.14	151.20
430	121.69	136.31	154.80
440	124.52	139.48	158.40
450	127.35	142.65	162.00
460	130.18	145.82	165.60
470	133.01	148.99	169.20
480	135.84	152.16	172.80
490	138.67	155.33	176.40
500	141.50	158.50	180.00
510			183.60
520			187.20
530			190.80
540			194.40
550			198.00
560			201.60
570			205.20
580			208.80
590			212.40
600			216.00

Payload Moments Charts
Figure 12 (Sheet 5 of 12)

PASSENGER TABLE – MODEL 35A OR 36A WITH JUMP SEAT – MOMENT/1000

Weight	Sta. (227) Mom/1000
10	2.27
20	4.54
30	6.81
40	9.08
50	11.35
60	13.62
70	15.89
80	18.16
90	20.43
100	22.70
110	24.97
120	27.24
130	29.51
140	31.78
150	34.05
160	36.32
170	38.59
180	40.86
190	43.13
200	45.40

**PASSENGER AND CREW TABLE – MODEL 36A
STANDARD SEATING – MOMENT/1000**

WEIGHT	CREW STA. 204	L.H. SWIVEL STA. 287.4	R.H. SWIVEL STA. 287.7	DIVAN STA. 334.1
10	2.04	2.87	2.88	3.34
20	4.08	5.75	5.75	6.68
30	6.12	8.62	8.63	10.02
40	8.16	11.50	11.51	13.36
50	10.20	14.37	14.39	16.71
60	12.24	17.24	17.26	20.05
70	14.28	20.12	20.14	23.39
80	16.32	22.99	23.02	26.73
90	18.36	25.87	25.89	30.07
100	20.40	28.74	28.77	33.41
110	22.44	31.61	31.65	36.75
120	24.48	34.49	34.52	40.09
130	26.52	37.36	37.40	43.43
140	28.56	40.24	40.28	46.77
150	30.60	43.11	43.16	50.12
160	32.64	45.98	46.03	53.46
170	34.68	48.86	48.91	56.80
180	36.72	51.73	51.79	60.14
190	38.76	54.61	54.66	63.48
200	40.80	57.48	57.54	66.82
210	42.84	60.35	60.42	70.16
220	44.88	63.23	63.29	73.50
230	46.92	66.10	66.19	76.84
240	48.96	68.98	69.05	80.18
250	51.00	71.85	71.93	83.53
260	53.04			86.87
270	55.08			90.21
280	57.12			93.54
290	59.16			96.89
300	61.20			100.23
310	63.24			103.57
320	65.28			106.91
330	67.32			110.25
340	69.36			113.59
350	71.40			116.94
360	73.44			120.28
370	75.48			123.62
380	77.52			126.96
390	79.56			130.30
400	81.60			133.64
410	83.64			136.98
420	85.68			140.32
430	87.72			143.66
440	89.76			147.00
450	91.80			150.35
460	93.84			153.69
470	95.88			157.03
480	97.92			160.37
490	99.96			163.71
500	102.00			167.05
510				170.39
520				173.73
530				177.07
540				180.41
550				183.76
560				187.10
570				190.44
580				193.78
590				197.12
600				200.46

**Payload Moments Charts
Figure 12 (Sheet 7 of 12)**

PASSENGER TABLE – MODEL 36A ALTERNATE SEATING ARRANGEMENT – MOMENT/1000

A/C with Executive Door RH or LH Lounge A/C with Cargo Door RH Lounge				A/C with Cargo Door LH Lounge			RH Fwd. Sidefacing No Fwd. Baggage
Weight	Sta. 270	Sta. 290	Sta. 310	Sta. 280	Sta. 300	Sta. 320	Sta. 235
10	2.7	2.9	3.1	2.8	3.0	3.2	2.35
20	5.4	5.8	6.2	5.6	6.0	6.4	4.70
30	8.1	8.7	9.3	8.4	9.0	9.6	7.05
40	10.8	11.6	12.4	11.2	12.0	12.8	9.40
50	13.5	14.5	15.5	14.0	15.0	16.0	11.75
60	16.2	17.4	18.6	16.8	18.0	19.2	14.10
70	18.9	20.3	21.7	19.6	21.0	22.4	16.45
80	21.6	23.2	24.8	22.4	24.0	25.6	18.80
90	24.3	26.1	27.9	25.2	27.0	28.8	21.15
100	27.0	29.0	31.0	28.0	30.0	32.0	23.50
110	29.7	31.6	34.1	30.8	33.0	35.2	25.85
120	32.4	34.8	37.2	33.6	36.0	38.4	28.20
130	35.1	37.7	40.3	36.4	39.0	41.6	30.55
140	37.8	40.6	43.4	39.2	42.0	44.8	32.90
150	40.5	43.5	46.5	42.0	45.0	48.0	35.25
160	43.2	46.4	49.6	44.8	48.0	51.2	37.60
170	45.9	49.3	52.7	47.6	51.0	54.4	39.95
180	48.6	52.2	55.8	50.4	54.0	57.6	42.30
190	51.3	55.1	58.9	53.2	57.0	60.8	44.65
200	54.0	58.0	62.0	56.0	60.0	64.0	47.00
210	56.7	60.9	65.1	58.8	63.0	67.2	49.35
220	59.4	63.8	68.2	61.6	66.0	70.4	51.70
230	62.1	66.7	71.3	64.4	69.0	73.6	54.05
240	64.8	69.6	74.4	67.2	72.0	76.8	56.40
250	67.5	72.5	77.5	70.0	75.0	80.0	58.75



The approved maximum number of people aboard is thirteen. Of these two are crew members and one is an attendant.

PASSENGER TABLE – MODEL 36A ALTERNATE SEATING ARRANGEMENT – MOMENT/1000

CLUB INTERIOR CONFIGURATION

WEIGHT	FWD. SWIVEL STA. 283	DIVAN STA. 334.1
10	2.83	3.34
20	5.66	6.68
30	8.49	10.02
40	11.32	13.36
50	14.15	16.71
60	16.98	20.05
70	19.81	23.39
80	22.64	26.73
90	25.47	30.07
100	28.30	33.41
110	31.13	36.75
120	33.96	40.09
130	36.79	43.43
140	39.62	46.77
150	42.45	50.12
160	45.28	53.46
170	48.11	56.80
180	50.94	60.14
190	53.77	63.48
200	56.60	66.82
210	59.43	70.16
220	62.26	73.50
230	65.09	76.84
240	67.92	80.18
250	70.75	83.53
260	73.58	86.87
270	76.41	90.21
280	79.24	93.54
290	82.07	96.89
300	84.90	100.23
310	87.73	103.57
320	90.56	106.91
330	93.39	110.25
340	96.22	113.59
350	99.05	116.94
360	101.88	120.28
370	104.71	123.62
380	107.54	126.96
390	110.37	130.30
400	113.20	133.64
410	116.03	136.98
420	118.86	140.32
430	121.69	143.66
440	124.52	147.00
450	127.35	150.35
460	130.18	153.69
470	133.01	157.03
480	135.84	160.37
490	138.67	163.71
500	141.50	167.05
510		170.39
520		173.73
530		177.07
540		180.41
550		183.76
560		187.10
570		190.44
580		193.78
590		197.12
600		200.46

Payload Moments Charts
Figure 12 (Sheet 9 of 12)

BAGGAGE COMPARTMENT – MOMENT/1000

Weight	35A or 36A FWD.* Moment/ 1000 Sta. 227	Weight	35A or 36A FWD. Moment/ 1000 Sta. 233	Weight	35A or 36A FWD. Moment/ 1000 Sta. 254	Weight	35A Aft Moment/ 1000 Sta. 402	Weight	36A Aft Moment/ 1000 Sta. 360
10	2.27	10	2.33	10	2.54	10	4.02	10	3.60
20	4.54	20	4.66	20	5.08	20	8.04	20	7.20
30	6.81	30	6.99	30	7.62	30	12.06	30	10.80
40	9.08	40	9.32	40	10.16	40	16.08	40	14.40
50	11.35	50	11.65	50	12.70	50	20.10	50	18.00
60	13.62	60	13.98	60	15.24	60	24.12	60	21.60
70	15.89	70	16.31	70	17.78	70	28.14	70	25.20
80	18.16	80	18.64	80	20.32	80	32.16	80	28.80
90	20.43	90	20.97	90	22.86	90	36.18	90	32.40
100	22.70	100	23.70	100	25.40	100	40.20	100	36.00
		110	25.63			110	44.22	110	39.60
		120	27.96			120	48.24	120	43.20
		130	30.29			130	52.26	130	46.80
		140	32.62			140	56.28	140	50.40
		150	34.95			150	60.30	150	54.00
		160	37.28			160	64.32	160	57.60
		170	39.61			170	68.34	170	61.20
		180	41.94			180	72.36	180	64.80
		190	44.27			190	76.38	190	68.40
		200	46.60			200	80.40	200	72.00
		210	48.93			210	84.42	210	75.60
		220	51.26			220	88.44	220	79.20
		230	52.59			230	92.46	230	82.80
		240	55.92			240	96.48	240	86.40
		250	58.25			250	100.50	250	90.00
		260	60.58			260	104.52	260	93.20
		270	62.91			270	108.54	270	97.20
		280	65.24			280	112.56	280	100.80
		290	67.57			290	116.58	290	104.40
		300	69.90			300	120.60	300	108.00
						310	124.62	310	111.60
						320	128.64	320	115.20
						330	132.66	330	118.80
						340	136.68	340	122.40
						350	140.70	350	126.00
						360	144.72	360	129.60
						370	148.74	370	133.20
						380	152.76	380	136.80
						390	156.78	390	140.40
						400	160.80	400	144.00
						410	164.82	410	147.60
						420	168.84	420	151.20
						430	172.86	430	154.80
						440	176.88	440	158.40
						450	180.90	450	162.00
						460	184.92	460	165.60
						470	188.94	470	169.20
						480	192.96	480	172.80
						490	196.98	490	176.40
						500	201.00	500	180.00

*A/C without Entertainment Center.

Payload Moments Charts
Figure 12 (Sheet 10 of 12)

PROVISIONS - MOMENT/1000

TOILET CHEMICALS

Sta. 235	Mom/1000
4.2 lbs.	1.00

WATER

Sta. 253	Mom/1000
15 lbs.	3.80
Sta. 278	
7.1 lbs	1.97
Sta. 264.8	
7.1 lbs	1.88

PROVISIONS

Fwd. Cabinets (Sta. 219)

Wt.	Mom/1000
5	1.10
10	2.19
15	3.29
20	4.38
25	5.48

PROVISIONS RH OR LH

AFT CABINET (Sta. 253)

Wt.	Mom/1000
5	1.27
10	2.53
15	3.80
20	5.06
25	6.33
30	7.59
32	8.10

MID-CABINET PROVISIONS

AIRCRAFT WITH

EXEC. DOOR CARGO DOOR

Wt.		Mom/1000	Mom/1000
14	Decanters (Full)	3.71(Sta. 265.)	3.90 (Sta. 278.5)
18	Mapco Thermos (Full)	4.18(Sta. 232.2)	5.12 (Sta. 294.4)
16	Small Drawers	4.58(Sta. 286.2)	4.44 (Sta. 277.5)
23	Large Drawer	6.38(Sta. 277.3)	6.45 (Sta. 280.4)

or

Wt.		Mom/1000	Mom/1000
14	Decanters (Full)	3.71(Sta. 265.)	3.90(Sta. 278.5)
15	Mapco Oven	3.98(Sta. 265.3)	4.18(Sta. 278.6)
16	Small Drawers	4.36(Sta. 272.5)	4.58(Sta. 286.2)
23	Large Drawer	6.08(Sta. 264.3)	6.38(Sta. 277.3)

MID-CABINET TOILET CHEMICALS

EXEC. DOOR		CARGO/DOOR	
Sta. 255.2	Mom/1000	Sta. 267.2	Mom/1000
4.2 lbs.	1.07	4.2 lbs	1.12

Payload Moments Charts
Figure 12 (Sheet 11 of 12)

PROVISIONS – MOMENT/1000 (CONT)

CLUB INTERIOR PROVISIONS

WATER

Lbs.	Sta.	Mom/1000
8.6	237.6	2.04
7.6	219.7	1.67

ENTERTAINMENT CENTER (Sta. 226.9)

Wt.	Mom/1000
56 Provisions	12.71

PROVISIONS L.H. FWD CABINET (Sta. 219.4)

Wt.	Mom/1000
14 Decanters Full	3.07

PROVISIONS L.H. AFT CABINET (Sta. 253.6)

Wt.	Mom/1000
5	1.27
10	2.54
15	3.80
20	5.07
25	6.34
30	7.61
35	8.88
40	10.14
45	11.41
50	12.68
55	13.95
60	15.22

RH GALLEY MODULE (Sta. 241)

Wt.	Mom/1000
10 Mapco Oven	2.41
15 Mapco Thermos Full	3.65
6 Upper Storage	1.45
27 Lower Storage	6.53

OR

RH GALLEY MODULE (Sta. 241)

Wt.	Mom/1000
32 Storage	7.74
15 Mapco Thermos Full	3.65
6 Upper Storage	1.45
27 Lower Storage	6.53

OR

PROVISIONS L.H. AFT CABINET (Sta. 253.6)

Wt.	Mom/1000
3 Hotcup	0.70
12 Mini Rack Full	3.00
27 Storage	6.85

Payload Moments Charts
Figure 12 (Sheet 12 of 12)

LANDING GEAR DIMENSION DATA

NOSE WHEEL	Q _L WHEEL		MAIN WHEELS	Q _R WHEEL
	Fus. Sta.			Fus. Sta.
Fully Compressed	153.88		Fully Compressed	397.00
Static	153.63		Static	396.82
Fully Extended	152.62		Fully Extended	396.04

Landing Gear Dimension Data
Figure 13

WEIGHING INSTRUCTIONS

Periodic weighing may be required to keep the Basic Empty Weight current. All changes to the aircraft affecting weight and balance are the responsibility of the aircraft operator. For additional detail information relating to weighing and leveling procedures, refer to 35/36/35A/36A Maintenance Manual, Chapter 8.

1. The Basic Empty Weight is established with the wheels down.
2. Three jackpoints are provided for weighing: Two on the wing at Fuselage Station 414.85, and one on the forward fuselage at Fuselage Station 170.53.
3. Fuel should be drained through the drain valves prior to weighing and with the aircraft in level or static position. If unable to drain fuel, refer to the Unusable Fuel Table to determine weight and balance. Unusable Fuel is part of the Basic Empty Weight.
4. Hydraulic reservoir, accumulator, oxygen bottles, alcohol tank, and gear shock struts must be filled to normal operating capacities.
5. To determine aircraft configuration at time of weighing, installed equipment is checked against the Standard Equipment List and shortages or items in aircraft, but not part of Basic Empty Weight, should be noted and the final Basic Empty Weight shall be corrected for these items. All items should be in their normal place during weighing.
6. The aircraft must be in a level attitude at the time of weighing. Level is determined with a plumb bob attached to a clip on the upper aft side of frame 26A and the level plate hole on the lower portion of the frame.
7. Weighing should always be made in an enclosed area free of drafts. The scales used should be properly certified and calibrated.
8. Weighing the aircraft on wheels.
 - a. Inflate the tires to the proper pressure.
 - b. Deflate the shock struts. This is to establish the fuselage station of the centerline of the nose wheel axle. The fuselage station for the nose wheel axle in this condition is 153.88.
 - c. Leveling is accomplished by inflating the main gear struts.
 - d. Measure the perpendicular distance between the nose and main gear axle center lines (approximately 243.2 inches) if shock struts are inflated. Add this measurement to the nose gear axle position (Fuselage Station 153.88) to obtain the main gear fuselage station.
 - e. Substitute the nose and main gear stations for the jackpoint stations on the Aircraft Weighing Record and proceed as in jackpoint weighing.

UNUSABLE AND TRAPPED FUEL AND OIL

ITEM	GALLONS	WEIGHT (6.7*/Gal. Fuel) (7.5*/Gal. Oil)	MOMENT / 1000
Trapped Fuel	2.58	17.3	6.37
Drainable Sump	4.94	33.1	12.19
Unusable In Flight	12.90	86.4	31.81
Total Fuel Included in Empty Weight	(20.42)	(136.8)	(50.37)
Trapped Oil	2.4	18.0	8.04
Drainable Oil	2.9	21.0	9.52
Total Oil Weight	(5.3)	(39.8)	(17.56)

Unusable and Trapped Fuel and Oil
Figure 14

AIRCRAFT WEIGHING RECORD

Date Weighed		Model 35A/36A		Serial No.	
Place Weighed			Weighing Inspector:		
Reaction	Scale Reading	Tare	Net Weight	Arm	Moment
Left Jack					
Right Jack					
Sub Total				414.85	
Nose Jack				170.53	
Total (As Weighed)					
Total Items Table I			-		
Total Items Table II			+		
Basic Airplane					

TABLE I

Items weighed but not part of basic airplane	Weight	Arm	Moment
jack pads			
TOTAL			

TABLE II

Basic items not in when weighed	Weight	Arm	Moment
unusable fuel			
TOTAL			

Aircraft Weighing Record
Figure 15

Gates Learjet Corporation

WEIGHT AND BALANCE

MODEL 35/36, 35A/36A REPORT NO. 26-WB 10

CERTIFICATION REQUIRED EQUIPMENT LIST

MODELS 35/36 & 35A/36A

REPORT DATE: 2 July 1974, Revised 16 Sep 1975

PREPARED BY: R.S. Roser

PREPARED BY: _____

CHECKED BY: _____

APPROVED BY: C.M. Thompson

APPROVED BY: C.M. Thompson; Chief, Structures & Dynamics

APPROVED BY: R.D. Neal
R.D. Neal, Director, Technical Engineering

REVISIONS

LETTER	DATE	ITEM	BY	APPROVED
A	12-13-74	Added note to pg 3, Added page 4.	VEW	JLD CMT DKC
B	9-15-75	Added Page 5 - Australian Certification Requirements & converts Wts & Arms to metric in addition to Eng- lish units of measure.	<i>ELL</i>	<i>CMT</i>
C	4-29-76	Added 35A & 36A Equipment List, pages 5 through 7	<i>ELL</i>	<i>ELL</i> KC-233 <i>ELL</i> KC-219 <i>ELL</i> KC-231 <i>ELL</i> KC-235 <i>ELL</i> KC-237 <i>ELL</i> KC-238

BY _____ DATE _____

CK _____ DATE _____

 REV C

BY _____

 DATE 4-29-76

REV _____

BY _____

DATE _____

REV _____

BY _____

DATE _____

INTRODUCTION

The equipment listed herein is required for certification of the Model 35/36, and Model 35A/36A to FAR Part 25 standards.

BY _____	DATE _____	REV _____	REV _____	REV _____
CK _____	DATE _____	BY _____	BY _____	BY _____
		DATE _____	DATE _____	DATE _____

Gates Learjet 				REPORT NO.		PAGE	
				26-WB 10(B)		1	
NOMENCLATURE	PART NO. & MFR.	UNIT WT.		ARM			
		Lbs	Kg's	In	MM		
<u>Environmental</u>							
Cabin Safety Valve (35)	102850 AiResearch	1.2	.54	417.0	10591.8		
Cabin Safety Valve (36)	102850 AiResearch	1.2	.54	374.3	9507.2		
Exhaust Valve	102850 AiResearch	1.2	.54	163.8	4160.5		
<u>Electrical</u>							
Starter (2)	6608200-1	28	12.70	432.3	10980.4		
Generator (2)	6608201-2	28	12.70	432.9	10995.7		
Battery (2)	2588074-54 (Learjet) With Bat Temp Ind. (22AH)	48.0	21.77	470.0	11938.0		
Voltage Regulator (2)	6608203-1 Learjet Spec	1.8	.82	487.0	12369.8		
Inverters (2)	6608109 Learjet Spec	24.5	11.11	550.0	13970.0		
<u>Tires, Wheels & Brakes</u>							
Wheel, (Main)(4)	9543991 Goodyear	11.7	5.31	396.8	10078.7		
Brake (4)	9550608 Goodyear	29.0	13.15	396.8	10078.7		
Tire (4)	17.5 x 5.75 Type VII 210 MPH	14.6	6.62	396.8	10078.7		
Wheel (Nose)	9544207 Goodyear	9.5	4.31	153.6	3901.4		
Tire	18 x 4.4 Type VII 10-ply Goodyear (Chine)	12.8	5.81	153.6	3901.4		
<u>Powerplant</u>							
Engine (2)	TFE-731-2-28	750.5	340.43	451.1	11457.9		
Fuel Computer (2)	Garrett AiResearch 949572	9.3	4.22	536.5	13627.1		
<u>Fuel</u>							
Fuel Pump (Main)(2)	2326023-15 Learjet	1.1	.50	373.4	9484.4		
Fuel Pump (Standby)(2)	2380060-21 Learjet	3.6	1.63	374.5	9512.3		
Fuel Pump (Tip Tank)(2)	2326023-12 Learjet	1.1	.50	414.6	10530.8		
Fuel Pump (Fuselage)(1)	2380060-22 Learjet	3.9	1.77	427.7	10863.6		
<u>Miscellaneous</u>							
Emergency Air Bottle	873595 (Walter Kidde)	7.4	3.36	246.5	6261.1		
	or						
	6600194-2	7.4	3.36	246.5	6261.1		
Engine-Driven Hyd Pump (2)	6600301-1	4.0	1.81	435.7	11066.8		
Mach Warning Switch		negligible					
Oxygen Bottle & Regulator	ZC358 Zep Aero	20.5	9.30	148.1	3761.7		
Fire Ext Container (2)	892187 Walter Kidde	7.2	3.27	467.7	11879.6		
Fire Ext - Hand	275R-5C AM LaFrance	5.5	2.49	219.6	5577.8		
Crew Oxygen Masks	Poritan ZMR 158 or 159	.7	.32	202.8	5151.1		
	or						
	6600214	2.3	1.04	202.8	5151.1		
BY _____	DATE _____	REV <u>B</u>	REV _____	REV _____			
CK _____	DATE _____	BY <u>RLR</u>	BY _____	BY _____			
		DATE _____	DATE _____	DATE _____			

Gates Learjet

REPORT NO.

26-WB 10(B)

PAGE

2

NOMENCLATURE	PART NO. & MFR.	UNIT WT.		ARM	
		Lbs	Kg's	In	MM
Miscellaneous (Cont'd)					
Fire Axe	12H1K	1.7	.77	219.0	5562.6
Dual Yaw Computer	501-1111-01	2.0	.91	201.0	5105.4
Stabilizer Actuator	2332540-203	15.5	7.03	599.7	15232.4
Stick Pusher-Puller	501-1112-01	4.2	1.91	529.8	13456.9
Instruments					
Stab. Temp Indicator	6608210-2	.5	.23	167.0	4241.8
Wing Temp Indicator	6608210-1	.5	.23	167.0	4241.8
Instrument Cluster:	6608211-4	2.0	.91	173.3	4401.8
Oil Temp Ind (2)					
Ammeter (2)					
AC Voltmeter (1)					
DC Voltmeter (1)					
Oil Press Indicator	S208-6 Learjet	1.0	.45	173.2	4399.3
*Airspeed/Machmeter (2)	2680003-2	1.4	.64	172.1	4371.3
*Altimeter (1)(Copilot)	2680002-1	1.4	.63	172.1	4371.3
*Altimeter (1)(Pilot)	16007-167 IDC	5.2	2.36	172.1	4371.3
*Altitude Alerter (1)	23989-011 IDC	2.0	.91	172.2	4373.9
Angle of Attack Indicator	6608208-2	.5	.23	171.75	4362.5
Warning Lights	6608215-3	1.3	.59	180.9	4594.9
*Clock (2)	W33-7510-10ET-20	.6	.27	174.0	4419.6
Cabin Pressure Indicator	55050-0107 Aerosonic	1.5	.68	170.2	4323.1
Cabin Altitude Controller	102976-6 Garrett	.4	.18	170.2	4323.1
Cabin Rate Controller	102970-2 Garrett	.7	.32	170.2	4323.1
*Turn & Bank Indicator	S224-3 Learjet	1.2	.54	172.5	4381.5
ITT Indicator (2)	131350-1 AiResearch	1.2	.54	173.25	4400.6
Ram Air Temp Indicator	S215-2	.7	.32	173.25	4400.6
N ₁ Percent RPM Ind.(2)	131346-1 AiResearch	1.2	.54	173.25	4400.6
N ₂ Percent RPM Ind.(2)	131348-1 AiResearch	1.2	.54	173.25	4400.6
Standby Compass	C2340-14M23 Air Path	.7	.32	189.7	4818.4
Fuel Flow Indicator	6608238-1	.6	.27	173.3	4401.8
Fuel Quantity Ind.(M35)	J6911A7	.7	.32	189.8	4820.9
Fuel Quantity Ind.(M36)	J6911A6	.7	.32	189.8	4820.9
Hyd Pressure Indicator	6901-830	.1	.05	173.25	4400.6
Oxy Pressure Indicator	6901-831	.1	.05	173.25	4400.6
Emergency Air Pressure Ind	2680001-1	.1	.05	173.25	4400.6
Flap Position Indicator	6608210-5	.5	.23	167.0	4241.8
*Rate of Climb(Copilot)	2680004-1	1.4	.64	172.8	4389.1
*Rate of Climb (Pilot)	180138-013	1.6	.73	173.3	4401.8
Avionics Equipment					
*Vertical Gyro (2)	(JET VG-206A)	5.1	2.31	147.75	3752.9
*Direcsyn (2)	(JET DN-101D)	10.1	4.58	145.75	3702.1
*VHF Com Transceiver (2)	792-6657-003 (Collins VHF-20)	5.1	2.31	148.75	3778.3
*VHF Nav Transceiver (2)	622-0876-001 (Collins VIR-30)	5.8	2.63	148.75	3778.3
* May be replaced with optional equipment					
BY _____	DATE _____	REV <u>B</u>	REV _____	REV _____	
CK _____	DATE _____	BY <u>RLE</u>	BY _____	BY _____	
		DATE _____	DATE _____	DATE _____	

SPECIAL AUSTRALIAN CERTIFICATION REQUIREMENT

NOMENCLATURE	PART NO. & MFR.	UNIT WT.		ARM	
		Lbs	Kg's	In	MM
Remove Fire Ext.	275R-SCAM LaFrance	5.5	2.49	219.6	5577.8
Add Fire Ext.	892480 Walker Kidde	6.9	3.13	382	9702.8
Add Fire Ext.	991825 Walker Kidde	6.9	3.13	226	5740.4
Emergency Power Supply	15006-18 Survival Products	2.1	.95	204.3	5189.2
Emergency Power Supply	15006-1 Survival Products	2.1	.95	397.6	10099.0
Smoke Goggles	26416 Puritan-Zep	.4	.18	202.8	5151.1
Voice Recorder	523-4057-001 Collins	18.3	8.30	511.7	12997.2
Flight Recorder	402400-7 Lockheed	32.0	14.52	402.5	10223.5
Drag Chute	6600180-1 Learjet	10.2	4.63	484.5	12306.3
Cannister Assembly	2488713-4 & -5 Learjet	1.7	.77	484.5	12306.3
Door Light	15-0070-1 Grimes	.2	.09	257.8	6548.1
Wing Light	15-0070-1 Grimes	.2	.09	326.4	8290.6
2nd Angle of Attack	6608208-2 Learjet	.5	.23	171.75	4362.5

BY _____ DATE _____

CK _____ DATE _____

REV C

BY Ele

DATE 4-29-76

REV _____

BY _____

DATE _____

REV _____

BY _____

DATE _____

NOMENCLATURE	PART NO. & MFR.	UNIT WT.		ARM	
		Lbs	Kg's	In.	MM.
<u>Environmental</u>					
Cabin Safety Valve (35)	102850 AiResearch	1.2	.54	417.0	10591.8
Cabin Safety Valve (36)	102850 AiResearch	1.2	.54	374.3	9507.2
Exhaust Valve	102850 AiResearch	1.2	.54	163.8	4160.5
<u>Electrical</u>					
Starter (2)	6608268-1	30	13.61	432.3	10980.4
Generator (2)	6608201-4	28	12.70	432.9	10995.7
Battery (2)	2588074-54 (Learjet) With Bat. Temp. Ind. (22AH)	48	21.77	470.0	11938.0
Voltage Regulator (2)	6608203-2 Learjet Spec	1.8	.82	487.0	12369.8
Inverters (2)	6608109 Learjet Spec	24.5	11.11	550.0	13970.0
<u>Tires, Wheels & Brakes</u>					
Wheel, (Main)(4)	9543991 Goodyear	11.7	5.31	396.8	10078.7
Brake (4)	5003096 Goodyear	33.3	15.1	396.8	10078.7
Tire (4)	17.5 x 5.75 Type VII 210 MPH	14.6	6.62	296.8	10078.7
Wheel (Nose)	9544207 Goodyear	9.5	4.31	153.6	3901.4
Tire	18 x 4.4 Type VII 10-ply Goodyear (Chine)	12.8	5.81	153.6	3901.4
<u>Powerplant</u>					
Engine (2)	TFE-731-2-28	750.5	340.43	451.1	11457.9
Fuel Computer (2)	Garrett AiResearch 2101142-1	10.6	4.81	536.5	13627.1
<u>Fuel</u>					
Fuel Pump (Main)(2)	2326023-17 Learjet	1.0	.45	373.4	9484.4
Fuel Pump (Standby)(2)	2380060-16 Learjet	3.4	1.54	374.5	9512.3
Fuel Pump (Tip Tank)(2)	2326023-12 Learjet	1.1	.50	414.5	10530.8
Fuel Pump (Fuselage)(1)	2380060-22 Learjet	3.9	1.77	427.7	10863.6
<u>Miscellaneous</u>					
Emergency Air Bottle	873595 (Walter Kidde) or 6600194-2	7.4	3.36	246.5	6261.1
Engine-Driven Hyd Pump(2)	6600301-1	4.0	1.81	435.7	11066.8
Mach Warning Switch	Negligible				
BY _____	DATE _____	REV <u>C</u>	REV _____	REV _____	REV _____
BY _____	DATE _____	BY <u>R</u>	BY _____	BY _____	BY _____
CK _____	DATE _____	DATE <u>4-29-76</u>	DATE _____	DATE _____	DATE _____

NOMENCLATURE	PART NO. & MFR.	UNIT WT.		ARM	
		Lbs	Kg's	In.	MM.
<u>Miscellaneous (Continued)</u>					
Oxygen Bottle & Regulator	ZC358 Zep Aero	20.5	9.30	148.1	3761.7
Fire Ext Container (2)	892187 Walter Kidde or 30402102 Am Std	7.2	3.27	467.7	11879.6
Fire Ext - Hand	275R-5C AM LaFrance	5.5	2.49	219.6	5577.8
Crew Oxygen Masks	Puritan ZMR 158 or 159 or 6600214	.7	.32	202.8	5151.1
Fire Axe	12H1K	2.3	1.04	202.8	5151.1
Dual Yaw Computer	501-1111-01	1.7	.77	219.0	5562.6
Stabilizer Actuator	2332540-211	2.0	.91	201.0	5105.4
Stick Pusher-Puller	501-1112-01	15.5	7.03	599.7	15232.4
Auto Pilot Electrical Box	2618130	4.2	1.91	529.8	13456.9
Stall Warning Computer	6608263-5	2.0	0.91	202.5	5143.5
Mach Switches (2)	6600186	2.0	0.91	125.0	3175.0
		1.6	.63	171.7	4361.2
<u>Instruments</u>					
Stab. Temp Indicator	6608210-11	0.3	0.136	167.0	4241.8
Wing Temp Indicator	6608210-10	0.3	0.136	167.0	4241.8
Instrument Cluster:	6608211-6	2.0	.91	173.3	4401.8
Oil Temp Ind (2)					
Ammeter (2)					
AC Voltmeter (1)					
DC Voltmeter (1)					
Oil Press. Indicator	S208-6 Learjet	1.0	.45	173.2	4399.3
**Airspeed/Machmeter(2)	2680003-2	1.4	.64	172.1	4371.3
**Altimeter (1)(Copilot)	2680002-1	1.4	.63	172.1	4371.3
**Altimeter (1)(Pilot)	16007-187 IDC	5.2	2.36	172.1	4371.3
**Altitude Alerter (1)	23989-011 IDC	2.0	.91	172.2	4373.9
Angle of Attack Ind.(2)	6608208-4	.5	.23	171.75	4362.5
Warning Lights	6608215-7	1.3	.59	180.9	4594.9
**Clock (2)	W33-7510-10ET-20	.6	.27	174.0	4419.6
Cabin Pressure Indicator	55050-0107 Aerosonic	1.5	.68	170.2	4323.1
Cabin Altitude Controller	102976-6 - Garrett	.4	.18	170.2	4323.1
Cabin Rate Controller	102970-2 - Garrett	.7	.32	170.2	4323.1
ITT Indicator (2)	131350-1 AiResearch	1.2	.54	173.25	4400.6
Ram Air Temp Indicator	S215-2	.7	.32	173.25	4400.6
N ₁ Percent RPM Ind. (2)	131346-3 AiResearch	1.2	.54	173.25	4400.6
N ₂ Percent RPM Ind. (2)	131348-3 AiResearch	1.2	.54	173.25	4400.6
Standby Compass	C2340-L4M23 Air Path	.7	.32	189.7	4818.4
Fuel Flow Indicator	6608238-1	.6	.27	173.3	4401.8
Fuel Quantity Ind.(M35)	JG911A7	.7	.32	189.8	4820.9
Fuel Quantity Ind.(M36)	JG911A6	.7	.32	189.8	4820.9
Hyd Pressure Indicator	6901-830	.1	.05	173.25	4400.6
** May be replaced with optional equipment					
BY _____	DATE _____	REV <u>C</u>	REV _____	REV _____	
BY _____	DATE _____	BY <u>RSC</u>	BY _____	BY _____	
CK _____	DATE _____	DATE 4-29-76	DATE _____	DATE _____	

Gates Learjet

REPORT NO.

26-WB 10

PAGE

7

NOMENCLATURE

PART NO. & MFR.

UNIT WT.

ARM

Lbs Kg's

In. MM.

Instruments (Continued)

Oxy Pressure Indicator	6901-831	.1	.05	173.25	4400.6
Emergency Air Pres. Ind.	2680001-3	.1	.05	173.25	4400.6
Flap Position Indicator	6608210-13	0.3	0.136	167.0	4241.8
**Rate Of Climb(Copilot)	2680004-1	1.4	.64	172.8	4389.1
**Rate Of Climb(Pilot)	180138-013 IDC	1.6	.73	173.3	4401.8
**Aux Att. Gyro	AI-804 Jet	2.5	1.13	173.6	4409.4
Temp. Cont. Ind.	6608210-12	0.3	0.14	174.3	4427.2

Avionics Equipment

**Vertical Gyro (2)	(JET VG-206A)	5.1	2.31	147.75	3752.9
**Directisy (2)	(JET DN-1010)	10.1	4.58	145.75	3702.1
**VHF Com Transceiver(2)	622-1879-002				
	(Collins VHF-20A)	5.1	2.31	148.75	3778.3
**VHF Nav Transceiver(2)	622-0876-001				
	(Collins VIR-30)	5.8	2.63	148.75	3778.3
**Flight Director (Pilot)	622-0836-002 Flt Dir Ind	4.7	2.13	172.20	4373.9
	787-6385-005 Course Ind	5.3	2.40	172.10	4371.3
**Flt Director (Copilot)	522-2638-009 Course Ind	3.25	1.47	173.50	4406.9
	5-4000-08 Hor. Gyro	3.00	1.36	173.50	4406.9

** May be replaced with optional equipment

BY _____	DATE _____	REV <u>C</u>	REV _____	REV _____
CK _____	DATE _____	BY <u>RJC</u>	BY _____	BY _____
		DATE <u>4-29-76</u>	DATE _____	DATE _____

GATES LEARJET		REPORT NO. 26-WB10	PAGE 8
<u>NOMENCLATURE</u> <u>Avionics Equipment</u>	<u>PART NO. & MFR.</u>	<u>UNIT</u> <u>WT.</u>	<u>ARM</u>
BY _____ CK _____	DATE _____ DATE _____	REV. _____ BY _____ DATE _____	REV. _____ BY _____ DATE _____

WET & CONTAMINATED RUNWAY DATA

LEARJET

ADDENDA

- FUEL SERVICING
- ENGINE OIL SERVICING
- GROUND DE-ICING/ANTI-ICING

NOTICE

The material in this Section is not FAA Approved data but is included in this manual for convenience.
