PILOT'S OPERATING HANDBOOK

PIPER CHEROKEE SIX 300

FAA APPROVED IN NORMAL CATEGORY BASED ON CAR 3. THIS HANDBOOK INCLUDES THE MATERIAL REQUIRED TO BE FURNISHED TO THE PILOT BY CAR 3 AND CONSTITUTES THE APPROVED AIRPLANE FLIGHT MANUAL AND MUST BE CARRIED IN THE AIRPLANE AT ALL TIMES.

AIRPLANE SERIAL NO. 32-7840156

AIRPLANE REGISTRATION NO. 156X

PA-32-300
REPORT: VB-830

FAA APPROVED BY: Ward Evans
WARD EVANS
D.O.A. NO. SO-1
PIPER AIRCRAFT CORPORATION
VERO BEACH, FLORIDA

DATE OF APPROVAL: AUGUST 19, 1976

HANDBOOK PART NO. 761 632

PIPER

WARNING

EXTREME CARE MUST BE EXERCISED TO LIMIT THE USE OF THIS HANDBOOK TO APPLICABLE AIRCRAFT. THIS HANDBOOK REVISED AS INDICATED BELOW OR SUBSEQUENTLY REVISED IS VALID FOR USE WITH THE AIRPLANE IDENTIFIED ON THE FACE OF THE TITLE PAGE WHEN OFFICIALLY APPROVED. SUBSEQUENT REVISIONS SUPPLIED BY PIPER AIRCRAFT CORPORATION MUST BE PROPERLY INSERTED.

MODEL PA-32-300, CHEROKEE SIX

PILOT'S OPERATING HANDBOOK, REPORT: VB-830 REVISION _____

PIPER AIRCRAFT CORPORATION
APPROVAL SIGNATURE AND STAMP _____

Published by
PUBLICATIONS DEPARTMENT
Piper Aircraft Corporation
Issued: August 19, 1976

APPLICABILITY

Application of this handbook is limited to the specific Piper PA-32-300 model airplane designated by serial number and registration number on the face of the title page of this handbook.

This handbook cannot be used for operational purposes unless kept in a current status.

REVISIONS

The information compiled in the Pilot's Operating Handbook will be kept current by revisions distributed to the airplane owners.

Revision material will consist of information necessary to update the text of the present handbook and/or to add information to cover added airplane equipment.

I. Revisions

Revisions will be distributed whenever necessary as complete page replacements or additions and shall be inserted into the handbook in accordance with the instructions given below:

1. Revision pages will replace only pages with the same page number.
2. Insert all additional pages in proper numerical order within each section.
3. Page numbers followed by a small letter shall be inserted in direct sequence with the same common numbered page.

II. Identification of Revised Material

Revised text and illustrations shall be indicated by a black vertical line along the outside margin of the page, opposite revised, added or deleted material. A line along the outside margin of the page opposite the page number will indicate that an entire page was added.

Black lines will indicate only current revisions with changes and additions to or deletions of existing text and illustrations. Changes in capitalization, spelling, punctuation or the physical location of material on a page will not be identified by symbols.

ORIGINAL PAGES ISSUED

The original pages issued for this handbook prior to revison are given below:

Title, ii through v, 1-1 through 1-14, 2-1 through 2-10, 3-1 through 3-12, 4-1 through 4-16, 5-1 through 5-30, 6-1 through 6-56, 7-1 through 7-24, 8-1 through 8-16, 9-1 through 9-22, 10-1 through 10-2.

WARNING

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MODEL PA-32-300, CHEROKEE SIX

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PILOT'S OPERATING HANDBOOK LOG OF REVISIONS

Current Revisions to the PA-32-300 Cherokee Six Pilot's Operating Handbook, REPORT: VB-830 issued August 19, 1976.

Revision Number and Code	Revised Pages	Description of Revision	FAA Approval Signature and Date
Rev. 1 - 761 632 (PR770125)	3-4	Revised Open Door procedure.	Ward Evans Ward Evans Jan. 25, 1977
	3-12	Revised para. 3.29 info.	
	4-7	Added Caution to para. 4.9; relocated material to page 4-8.	
	4-8	Added relocated material from page 4-7; revised wording in para. 4.9.	
	4-15	Added Note to para. 4.31.	
	6-4	Added A & B values to Fig. 6-3.	
	6-5	Revised weight and balance formula.	
	6-21	Added Weight, Arm and Moment to item 13a.; added item 13b.; changed existing item 13b. to 13c.	
	6-37	Revised item 115 Dwg. 99002-5 to -8, item 117 Dwg. 99003-5 to -8 and item 119 Cert. Basis - STC C6c, C9c, C52c to TSO C6c, C9c, C52c.	
	7-19	Added info to Note in para. 7.27.	
	10-1	Revised 10.3 (c); relocated material to page 10-2.	
	10-2	Added relocated material from page 10-1.	
Rev. 2 - 761 632 (PR770406)	1-6	Revised item 1.19 (b).	Ward Evans Ward Evans April 6, 1977
	2-5	Revised para. 2.29.	
	6-4	Revised Figure 6-3.	
	6-53	Added 79592-2 seat to item 293; added 79592-3 seat to item 295.	
	7-24	Revised Note.	
Rev. 3-761632 (PR770812)	1-11, 1-12, 1-13, 1-14	Revised para. 1.21, Conversion Factors	
	5-4	Revised footnote figure nos.	
	5-5	Revised item 5.5 (d) and (e) figure nos.	
	5-9	Revised page nos.; revised titles; added pages; added figures.	
	5-21	Revised figure title; added serial nos.	
	5-22	Revised figure title and nos., added serial nos. and relocated existing chart to page 5-24; added new chart (Figure 5-21)	
	5-23	Revised figure no., added serial nos., revised curves and relocated existing chart to page 5-26; added new chart (Figure 5-23)	

PILOT'S OPERATING HANDBOOK LOG OF REVISIONS (cont)

Revision Number and Code	Revised Pages	Description of Revision	FAA Approval Signature and Date
Rev.3-761632 (PR770812) (cont.)	5-24	Revised figure no., added serial nos., revised curves and relocated existing chart to page 5-28; added relocated chart from page 5-22.	
	5-25	Revised figure title and no. and relocated existing chart to page 5-30; added new chart (Figure 5-27)	
	5-26	Revised figure title and no. and relocated existing chart to page 5-31; added relocated chart from page 5-23.	
	5-27	Revised figure no. and relocated existing chart to page 5-32; added new chart (Figure 5-31)	
	5-28	Revised figure no. and relocated existing chart to page 5-33; added relocated chart from page 5-24.	
	5-29	Revised figure no. and relocated existing chart to page 5-34; added new chart (Figure 5-35)	
	5-30	Revised figure no. and relocated existing chart to page 5-35; added relocated chart from page 5-25.	
	5-31	Added page (added relocated chart from page 5-26)	
	5-32	Added page (added relocated chart from page 5-27)	
	5-33	Added page (added relocated chart from page 5-28)	
	5-34	Added page (added relocated chart from page 5-29)	
	5-35	Added page (added relocated chart from page 5-30)	
	6-33	Added items 71 and 73.	
	6-45	Added new item 2.21; revised item nos. from 2.21 on; relocated items.	
	6-46	Revised item nos.; added relocated items; added new items; relocated items; removed footnote; revised footnote.	
	6-47	Revised item nos.; added new items; added relocated items; revised items; relocated items; revised footnote.	
	6-48	Revised item nos., added relocated items; added new items; added footnotes.	
	6-49	Revised item nos.; revised items; added item.	
	6-53	Revised item nos.; revised items.	
	6-54	Revised item nos.	
	6-55	Revised item nos.; revised items; added items.	
	7-9	Revised para. 7.15 item 2.	
	7-10	Added switch panel light description to 7.17 electrical system.	
	7-11	Revised Figure 7-11.	

PILOT'S OPERATION HANDBOOK LOG OF REVISIONS (cont)

Revision Number and Code	Revised Pages	Description of Revision	FAA Approval Signature and Date
Rev. 3-761632 (PR770812) (cont.)	7-12	Added switch panel light to Figure 7-13; added cabin courtesy light description to 7.17, electrical system.	
	7-15	Added switch panel light to Figure 7-17; added no. 44 to list.	
	7-17	Added alternate static source information to 7.23, Pitot Static System.	Ward Evans Ward Evans August 12, 1977
	7-20	Added baggage light information to 7.29, baggage area.	
Rev. 4 - 761 632 (PR780921)	1-2	Revised Fig. 1-1	
	1-3	Added new fuel info. and ser. no. effectivity.	
	1-4	Revised standard airplane weight and baggage space info.	
	1-6	Changed the spelling of celcius to celsius.	
	1-8	Revised definition.	
	1-12	Changed conversion values.	
	2-i	Revised index.	
	2-1	Revised weight.	
	2-2	Revised info.	
	2-3	Revised fuel press. info.	
	2-4	Revised title to 2.19.	
	2-5	Added fuel limitation info. and ser. no. effectivity for 2.25.	
	2-6	Added item 2.29.	
	2-8 thru 2-10	Revised placards.	
	4-i	Revised index.	
	4-3, 4-4	Revised 4.5 and relocated material to pg. 4-5.	
	4-5	Added material from pg. 4-4 and relocated material to pg. 4-6.	
	4-6	Added items from pg. 4-5.	
	4-7 thru 4-9	Revised item 4.9 and relocated items 4.11 and 4.13 to pg. 4-10.	
	4-10	Added item 4.11 from pg. 4-8 and item 4.13 from pg. 4-9. Revised para. and relocated items to pg. 4-11.	
	4-11	Added material from pg. 4-10.	
	4-14	Revised paragraph.	
	5-3	Revised item 5.5 (a) (2).	
	5-5	Revised item 5.5 (e) (5).	
	5-9	Revised List of Figures.	
	5-17	Added note.	
	5-21	Revised weight.	
	5-27	Added ser. no. effectivity to Fig. 5-31 and added note.	
	5-26	Added note.	
	5-28	Relocated Fig. 5-33 to pg. 5-28a; added chart, Fig. 5-32 and added note.	

PILOT'S OPERATING HANDBOOK LOG OF REVISIONS (cont)

Revision Number and Code	Revised Pages	Description of Revision	FAA Approval Signature and Date
Rev. 4 - 761 632 (PR780921) (cont)	5-28a	Added pg. (added relocated chart from pg. 5-28) and added note.	
	5-28b	Added pg. (added relocated chart from pg. 5-29); revised ser. no.; and added note.	
	5-29	Relocated Fig. 5-35 to pg. 5-28b (added new chart, Fig. 5-36); and added note.	
	5-30	Revised ser. no. effectivity.	
	5-30a	Added pg. (added new chart, Fig. 5-38).	
	5-30b	Added pg. (added relocated chart from pg. 5-31).	
	5-31	Relocated Fig. 5-39 to pg. 5-30b (added new chart, Fig. 5-40).	
	5-35	Revised tailwind and headwind values.	
	6-i	Revised item letters.	
	6-3	Added ser. no. effectivity to defueling airplane info.	
	6-7	Added ser. no. effectivity to standard empty weight info.	
	6-11, 6-12	Added ser. no. effectivity to weight and balance chart; added arm aft datum change for new fuel system; removed footnote.	
	6-17	Added material, revised nos., and added letters.	
	6-19	Added items, revised numbers and added letters.	
	6-21	Added items, revised nos., added letters and added weight, arm and moment.	
	6-23	Added items.	
	6-25	Added items, revised nos., added letters and added weight, arm and moment to items.	
	6-27	Added items, revised nos., added letters and added weight, arm and moment to items.	
	6-28	Added items.	
	6-29	Revised heading.	
	6-31	Revised heading and added items.	
	6-33	Revised nos., added letter and revised weight, moment and arm to item 121.	
	6-35	Revised nos., added item 135 (c) and deleted Cert. Basis - TC A3SO on all items.	
	6-36	Revised nos. and deleted Cert. Basis - TC A3SO.	
	6-37	Revised nos., deleted item 113, added: 167 (b), 169 (b) & (c); revised 171 and 173 and added letter to 173. Relocated item 123 to pg. 6-38 and items 127 and 129 to pg. 6-39. Deleted items 125 and 131.	
	6-38	Relocated items 133 and 135 to pg. 6-39 and items 137 and 139 to pg. 6-40; added items 175, 179 and 181; revised item no. and item description for item 177 and added letter to item 177.	

PILOT'S OPERATING HANDBOOK LOG OF REVISIONS (cont)

Revision Number and Code	Revised Pages	Description of Revision	FAA Approval Signature and Date
Rev. 4 - 761 632 (PR780921) (cont)	6-39	Revised title; added relocated items, added new items; revised relocated item nos.	
	6-40	Added relocated items; added new items; revised relocated item nos.	
	6-41	Revised title; added relocated items; added new items; revised relocated item nos.	
	6-43	Added relocated items; revised items; relocated items; revised relocated item nos.	
	6-44	Revised items.	
	6-45	Added relocated items; revised items; revised relocated item nos.	
	6-46	Added relocated items; revised nos.; revised items.	
	6-47	Revised item nos.; added relocated items; revised items; relocated items.	
	6-48	Revised item nos.; added relocated items; revised items; relocated items.	
	6-49	Revised item nos.; added relocated items; revised items; relocated items.	
	6-50	Revised item nos.; added relocated items; relocated items.	
	6-51	Revised item nos.; added relocated items; revised items.	
	6-52	Added relocated item.	
	6-53	Revised item nos.; revised items.	
	6-54	Revised item nos.; revised items.	
	6-55	Revised item nos.; revised items; added new items.	
	7-i	Revised index.	
	7-4	Added ser. no. effectivity for Fig. 7-1.	
	7-4a	Added pg. (added Fig. 7-1a).	
	7-4b	Added pg. (added relocated item from pg. 7-5).	
	7-5	Relocated item 7.11 to pg. 7-4b and added relocated fig. from pg. 7-6.	
	7-6	Relocated Fig. 7-3 to pg. 7-5; added relocated fig. and info. from pg. 7-7.	
	7-7	Relocated Fig. 7-5 and item 7.13 to pg. 7-6; added relocated fig. from pg. 7-8.	
	7-8	Relocated Fig. 7-7 to pg. 7-7 (added Fig. 7-7a).	
	7-9	Added ser. no. effectivity to 7.15 Fuel System.	
	7-10	Relocated 7.17 to pg. 7-10b and added new info. to 7.15 Fuel System.	
	7-10a	Added pg. (added new fuel system info.).	
	7-10b	Added pg. (added 7.17 from pgs. 7-10 and 7-12).	
	7-12	Relocated info. to pg. 7-10b and revised Fig. 7-13.	
	7-14	Revised paragraph.	
	7-15	Added ser. no. effectivity for Fig. 7-17.	
	7-16	Relocated Fig. 7-19 to pg. 7-16b.	
	7-16a	Added pg. (added Fig. 7-17a).	

PILOT'S OPERATING HANDBOOK LOG OF REVISIONS (cont)

Revision Number and Code	Revised Pages	Description of Revision	FAA Approval Signature and Date
Rev. 4 - 761 632 (PR780921) (cont.)	7-16b	Added pg. (added relocated fig. from pg. 7-16).	
	7-20	Relocated 7.29, 7.31 and 7.33 to pg. 7-20a. Added info. to 7.27.	
	7-20a	Added pg. (added relocated items from pg. 7-20).	
	7-20b	Added pg. (added relocated items from pgs. 7-21 and 7-22).	
	7-21	Relocated 7.35 to pg. 7-20b and revised Fig. 7-23.	
	7-22	Relocated info. to pg. 7-20b and added relocated item from pg. 7-23.	
	7-23	Relocated 7.39 to pg. 7-22 and added info. from pg. 7-24; added para. 7-41, Radar.	
	7-24	Relocated info. to pg. 7-23.	
	8-11	Revised and relocated info. to pg. 8-12a.	
	8-12	Relocated info. to pg. 8-12a and revised Fig. 8-3.	
	8-12a	Added pg. (added and revised relocated info. from pgs. 8-11 and 8-12).	
	8-12b	Added pg. (added and revised relocated info. from pg. 8-13).	
	8-13	Relocated info. to pg. 8-12b and added relocated info. from pg. 8-14.	
	8-14	Relocated info. to pg. 8-13.	
	9-i	Revised index.	
	9-13	Added serial no. effectivity and revised item in Supplement 4.	
	9-21	Changed Supplement 5 to 6; relocated Supplement 6 to pg. 9-29 and added new Supplement 5.	
	9-22	Relocated info. to pg. 9-30 and added new info.	
	9-23 thru 9-28	Added pgs. (added new Supplement).	
	9-29	Added pg. (added relocated info.).	
	9-30	Added pg. (added relocated info.).	Ward Evans Ward Evans Sept. 21, 1978
	10-1	Removed info. and added info. from pg. 10-2.	
	10-2	Removed info. and relocated info. to pg. 10-1.	
Rev. 5 - 761 632 (PR790201)	1-13	Changed statue to statute.	
	6-1	Revised paragraphs.	
	6-4	Revised value.	
	6-21	Revised arms and moments for item 33.	
	6-25	Revised items 55 and 63.	
	6-33	Revised arm for item 121.	
	6-41	Revised moment for item 213.	Ward Evans Ward Evans Feb. 1, 1979
	7-10	Revised paragraph.	
	7-10b	Added note.	
	8-11	Revised item 8.21 (b).	

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PILOT'S OPERATING HANDBOOK LOG OF REVISIONS (cont)

Revision Number and Code	Revised Pages	Description of Revision	FAA Approval Signature and Date
Rev. 6 - 761 632 (PR790413)	6-51	Revised item 347; added new item 348; re-numbered item 348 to 349 and item 349 to 350.	Ward Evans Ward Evans April 13, 1979
	7-i	Revised para. 7.41 pg. no.	
	7-22	Revised para. 7.39 info.	
	7-23	Revised para. 7.39 info.; relocated para. 7.41 to pg. 7-24.	
	7-24	Added para. 7.41 from pg. 7-23.	

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SECTION 1

GENERAL

SECTION 1

GENERAL

1.1 INTRODUCTION

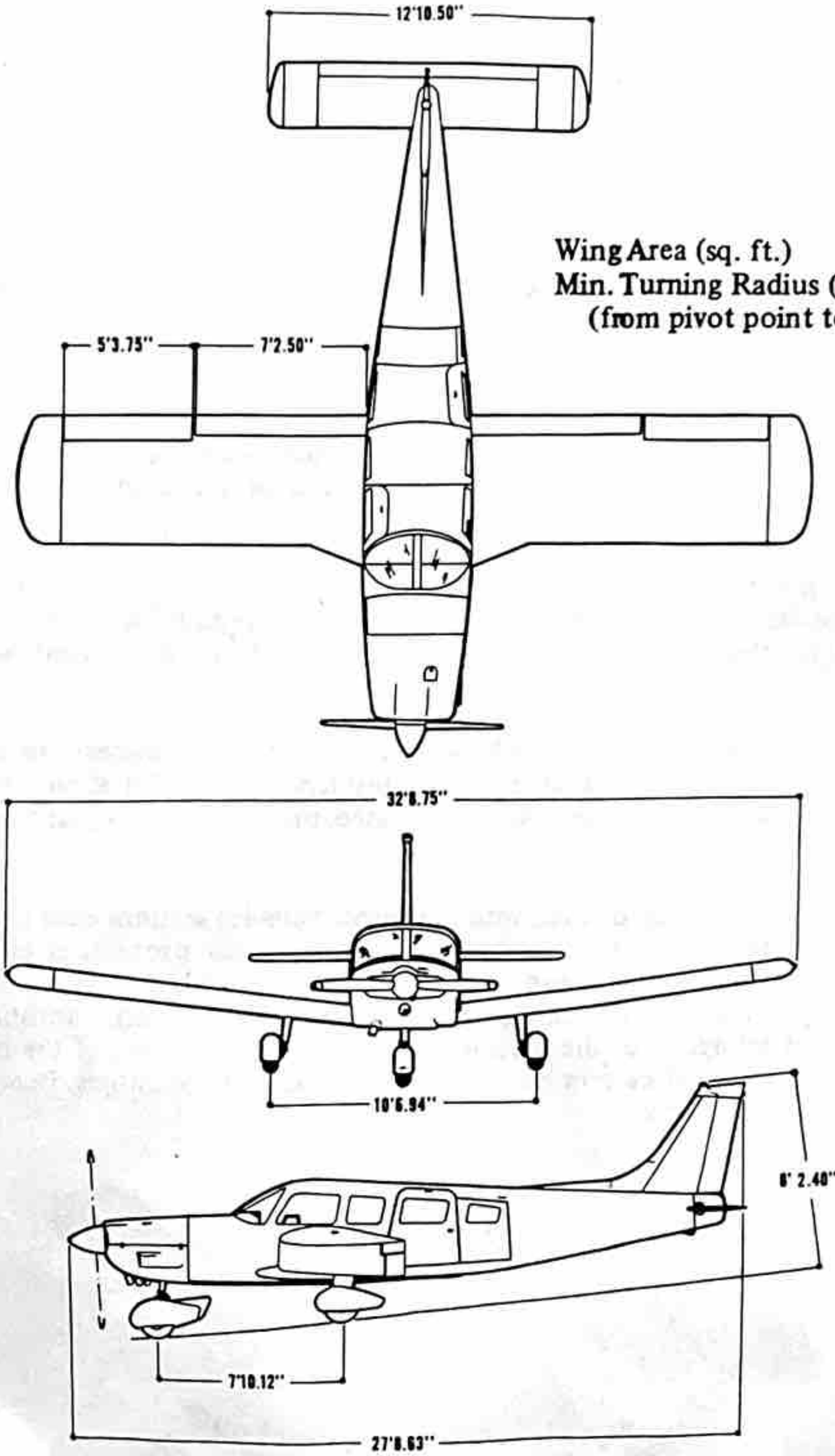
This Pilot's Operating Handbook is designed for maximum utilization as an operating guide for the pilot. It includes the material required to be furnished to the pilot by C.A.R. 3. It also contains supplemental data supplied by the airplane manufacturer.

This handbook is not designed as a substitute for adequate and competent flight instruction, knowledge of current airworthiness directives, applicable federal air regulations or advisory circulars. It is not intended to be a guide for basic flight instruction or a training manual and should not be used for operational purposes unless kept in a current status.

Assurance that the airplane is in an airworthy condition is the responsibility of the owner. The pilot in command is responsible for determining that the airplane is safe for flight. The pilot is also responsible for remaining within the operating limitations as outlined by instrument markings, placards, and this handbook.

Although the arrangement of this handbook is intended to increase its in-flight capabilities, it should not be used solely as an occasional operating reference. The pilot should study the entire handbook to familiarize himself with the limitations, performance, procedures and operational handling characteristics of the airplane before flight.

The handbook has been divided into numbered (arabic) sections each provided with a "finger-tip" tab divider for quick reference. The limitations and emergency procedures have been placed ahead of the normal procedures, performance and other sections to provide easier access to information that may be required in flight. The "Emergency Procedures" Section has been furnished with a red tab divider to present an instant reference to the section. Provisions for expansion of the handbook have been made by the deliberate omission of certain paragraph numbers, figure numbers, item numbers and pages noted as being intentionally left blank.



Wing Area (sq. ft.)	174.5
Min. Turning Radius (ft.) (from pivot point to wing tip)	32

THREE VIEW

Figure 1-1

ISSUED: AUGUST 19, 1976
REVISED: SEPTEMBER 21, 1978

1.3 ENGINES

(a) Number of Engines	1
(b) Engine Manufacturer	Lycoming
(c) Engine Model Number	IO-540-K1G5
(d) Rated Horsepower	300
(e) Rated Speed (rpm)	2700
(f) Bore (inches)	5.125
(g) Stroke (inches)	4.375
(h) Displacement (cubic inches)	541.5
(i) Compression Ratio	8.7:1
(j) Engine Type	Six Cylinder, Direct Drive, Horizontally Opposed, Air Cooled

1.5 PROPELLERS

(a) Number of Propellers	1
(b) Propeller Manufacturer	Hartzell
(c) Blade Model —— HC-C3YR-1RF S/N DY5555B	(ENG IO540K1G5F ~~84195B4~~ S# L-17738-48A 3 2
(d) Number of Blades	
(e) Hub Model	HC-C2YK-1( )F
(f) Propeller Diameter (inches)	
(1) Maximum	80
(2) Minimum	78.5
(g) Propeller Type	Constant Speed, Hydraulically Actuated

1.7 FUEL

(a) Fuel Capacity (U.S. gal) (total)	
S/N 32-7740001 through 32-7840202	84.0
S/N 32-7940001 and up	98.0
(b) Usable Fuel (U.S. gal) (total)	
S/N 32-7740001 through 32-7840202	83.6
S/N 32-7940001 and up	94.0
(c) Fuel Grade, Aviation	
(1) Minimum Octane	100/130 - Green
(2) Specified Octane	100/130 - Green
(3) Alternate Fuels	Refer to latest revision of Lycoming Service Instruction 1070.

1.9 OIL

(a) Oil Capacity (U.S. quarts)	12
(b) Oil Specification	Refer to latest issue of Lycoming Service Instruction 1014.

(c) Oil Viscosity per Average Ambient Temp. for Starting

	SINGLE	MULTI
(1)	Above 60° F	50	40 or 50
(2)	30°F to 90°F	40	40
(3)	0°F to 70°F	30	40 or 20W-30
(4)	Below 10°F	20	20W-30

1.11 MAXIMUM WEIGHTS

(a) Maximum Takeoff Weight (lbs)		3400
(b) Maximum Landing Weight (lbs)		3400
	FORWARD	AFT
(c) Maximum Weights in Baggage Compartments	100	100

1.13 STANDARD AIRPLANE WEIGHTS*

(a) Standard Empty Weight (lbs.) Weight of a standard airplane including unusable fuel, full operating fluids and full oil.	
S/N 32-7740001 through 32-7840202	1856
S/N 32-7940001 and up	~~1905~~
(b) Maximum Useful Load (lbs.): The difference between the Maximum Takeoff Weight and the Standard Empty Weight.	
S/N 32-7740001 through 32-7840202	~~1544~~
S/N 32-7940001 and up	1495

1.15 BAGGAGE SPACE

	FORWARD	AFT
(a) Compartment Volume (cu. ft.)	8.0	17.3
(b) Entry Width (inches)	16.0	48.0
(c) Entry Height (inches)	22.0	26.0

1.17 SPECIFIC LOADINGS

(a) Wing Loading (lbs per sq ft)	19.5
(b) Power Loading (lbs per hp)	11.3

*These values are approximate and vary from one airplane to another. Refer to Figure 6-5 for the Standard Empty Weight value and the Useful Load to be used for C. G. Calculations for the aircraft specified.

1.19 SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

The following definitions are of symbols, abbreviations and terminology used throughout the handbook and those which may be of added operational significance to the pilot.

(a) General Airspeed Terminology and Symbols

CAS	Calibrated Airspeed means the indicated speed of an aircraft, corrected for position and instrument error. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level.
KCAS	Calibrated Airspeed expressed in "Knots."
GS	Ground Speed is the speed of an airplane relative to the ground.
IAS	Indicated Airspeed is the speed of an aircraft as shown on the airspeed indicator when corrected for instrument error. IAS values published in this handbook assume zero instrument error.
KIAS	Indicated Airspeed expressed in "Knots."
M	Mach Number is the ratio of true airspeed to the speed of sound.
TAS	True Airspeed is the airspeed of an airplane relative to undisturbed air which is the CAS corrected for altitude, temperature and compressability.
V_A	Maneuvering Speed is the maximum speed at which application of full available aerodynamic control will not overstress the airplane.
V_{FE}	Maximum Flap Extended Speed is the highest speed permissible with wing flaps in a prescribed extended position.
V_{NE}/M_{NE}	Never Exceed Speed or Mach Number is the speed limit that may not be exceeded at any time.
V_{NO}	Maximum Structural Cruising Speed is the speed that should not be exceeded except in smooth air and then only with caution.
V_S	Stalling Speed or the minimum steady flight speed at which the airplane is controllable.
V_{SO}	Stalling Speed or the minimum steady flight speed at which the airplane is controllable in the landing configuration.
V_X	Best Angle-of-Climb Speed is the airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance.
V_Y	Best Rate-of-Climb Speed is the airspeed which delivers the greatest gain in altitude in the shortest possible time.

(b) Meteorological Terminology

ISA	International Standard Atmosphere in which: The air is a dry perfect gas; The temperature at sea level is 15° Celsius (59° Fahrenheit); The pressure at sea level is 29.92 inches hg. (1013 mb); The temperature gradient from sea level to the altitude at which the temperature is -56.5°C (-69.7°F) is -0.00198°C (-0.003566°F) per foot and zero above that altitude.
OAT	Outside Air Temperature is the free air static temperature, obtained either from inflight temperature indications or ground meteorological sources, adjusted for instrument error and compressibility effects.
Indicated Pressure Altitude	The number actually read from an altimeter when the barometric subscale has been set to 29.92 inches of mercury (1013 millibars).
Pressure Altitude	Altitude measured from standard sea-level pressure (29.92 in. Hg) by a pressure or barometric altimeter. It is the indicated pressure altitude corrected for position and instrument error. In this handbook, altimeter instrument errors are assumed to be zero.
Station Pressure	Actual atmospheric pressure at field elevation.
Wind	The wind velocities recorded as variables on the charts of this handbook are to be understood as the headwind or tailwind components of the reported winds.

(c) Power Terminology

Takeoff Power	Maximum power permissible for takeoff.
Maximum Continuous Power	Maximum power permissible continuously during flight.
Maximum Climb Power	Maximum power permissible during climb.
Maximum Cruise Power	Maximum power permissible during cruise.

(d) Engine Instruments

EGT Gauge	Exhaust Gas Temperature Gauge

(e) Airplane Performance and Flight Planning Terminology

Climb Gradient	The demonstrated ratio of the change in height during a portion of a climb, to the horizontal distance traversed in the same time interval.
Demonstrated Crosswind Velocity	The demonstrated crosswind velocity is the velocity of the crosswind component for which adequate control of the airplane during takeoff and landing was actually demonstrated during certification tests.
Accelerate-Stop Distance	The distance required to accelerate an airplane to a specified speed and, assuming failure of an engine at the instant that speed is attained, to bring the airplane to a stop.
MEA	Minimum en route IFR altitude.
Route Segment	A part of a route. Each end of that part is identified by: (1) a geographical location; or (2) a point at which a definite radio fix can be established.

(f) Weight and Balance Terminology

Reference Datum	An imaginary vertical plane from which all horizontal distances are measured for balance purposes.
Station	A location along the airplane fuselage usually given in terms of distance in inches from the reference datum
Arm	The horizontal distance from the reference datum to the center of gravity (C.G.) of an item.
Moment	The product of the weight of an item multiplied by its arm. (Moment divided by a constant is used to simplify balance calculations by reducing the number of digits.)
Center of Gravity (C.G.)	The point at which an airplane would balance if suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane.
C.G. Arm	The arm obtained by adding the airplane's individual moments and dividing the sum by the total weight.
C.G. Limits	The extreme center of gravity locations within which the airplane must be operated at a given weight.
Usable Fuel	Fuel available for flight planning.
Unusable Fuel	Fuel remaining after a runout test has been completed in accordance with governmental regulations.
Standard Empty Weight	Weight of a standard airplane including unusable fuel, full operating fluids and full oil.
Basic Empty Weight	Standard empty weight plus optional equipment.
Payload	Weight of occupants, cargo and baggage.
Useful Load	Difference between takeoff weight, or ramp weight if applicable, and basic empty weight.
Maximum Ramp Weight	Maximum weight approved for ground maneuver. (It includes weight of start, taxi and run up fuel.)
Maximum Takeoff Weight	Maximum weight approved for the start of the takeoff run.
Maximum Landing Weight	Maximum weight approved for the landing touchdown.
Maximum Zero Fuel Weight	Maximum weight exclusive of usable fuel.

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1.21 CONVERSION FACTORS

MULTIPLY	BY	TO OBTAIN
acres	0.4047	ha
	43560	sq. ft.
	0.0015625	sq. mi.
atmospheres (atm)	76	cm Hg
	29.92	in. Hg
	1.0133	bar
	1.033	kg/cm^2
	14.70	lb./sq. in.
	2116	lb./sq. ft.
bars (bar)	0.98692	atm.
	14.503768	lb./sq. in.
British Thermal Unit (BTU)	0.2519958	kg-cal
centimeters (cm)	0.3937	in.
	0.032808	ft.
centimeters of mercury at 0°C (cm Hg)	0.01316	atm
	0.3937	in. Hg
	0.1934	lb./sq. in.
	27.85	lb./sq. ft.
	135.95	kg/m^2
centimeters per second (cm/sec.)	0.032808	ft./sec.
	1.9685	ft./min.
	0.02237	mph
cubic centimeters (cm^3)	0.03381	fl. oz.
	0.06102	cu. in.
	3.531×10^{-5}	cu. ft.
	0.001	l
	2.642×10^{-4}	U.S. gal.
cubic feet (cu.ft.)	28317	cm^3
	0.028317	m^3
	1728	cu. in.
	0.037037	cu. yd.
	7.481	U.S. gal.
	28.32	l
cubic feet per minute (cu. ft./min.)	0.472	l/sec.
	0.028317	m^3/min.

MULTIPLY	BY	TO OBTAIN
cubic inches (cu. in.)	16.39	cm^3
	1.639×10^{-5}	m^3
	5.787×10^{-4}	cu. ft.
	0.5541	fl. oz.
	0.01639	l
	4.329×10^{-3}	U.S. gal.
	0.01732	U.S. qt.
cubic meters (m^3)	61024	cu. in.
	1.308	cu. yd.
	35.3147	cu. ft.
	264.2	U.S. gal.
cubic meters per minute (m^3/min.)	35.3147	cu. ft./min.
cubic yards (cu. yd.)	27	cu. ft.
	0.7646	m^3
	202	U.S. gal.
degrees (arc)	0.01745	radians
degrees per second (deg./sec.)	0.01745	radians/sec.
drams, fluid (dr. fl.)	0.125	fl. oz.
drams, avdp. (dr. avdp.)	0.0625	oz. avdp.
feet (ft.)	30.48	cm
	0.3048	m
	12	in.
	0.33333	yd.
	0.0606061	rod
	1.894×10^{-4}	mi.
	1.645×10^{-4}	NM
feet per minute (ft./min.)	0.01136	mph
	0.01829	km/hr.
	0.508	cm/sec.
	0.00508	m/sec.

MULTIPLY	BY	TO OBTAIN
feet per second (ft./sec.)	0.6818	mph
	1.097	km/hr.
	30.48	cm/sec.
	0.5921	kts.
foot-pounds (ft.-lb.)	0.138255	m-kg
	3.24×10^{-4}	kg-cal
foot-pounds per minute (ft.-lb./min.)	3.030×10^{-5}	hp
foot-pounds per second (ft.-lb./sec.)	1.818×10^{-5}	hp
gallons, Imperial (Imperial gal.)	277.4	cu. in.
	1.201	U.S. gal.
	4.546	l
gallons, U.S. dry (U.S. gal. dry)	268.8	cu. in.
	1.556×10^{-1}	cu. ft.
	1.164	U.S. gal.
	4.405	l
gallons, U.S. liquid (U.S. gal.)	231	cu. in.
	0.1337	cu. ft.
	4.951×10^{-3}	cu. yd.
	3785.4	cm^3
	3.785×10^{-3}	m^3
	3.785	l
	0.83268	Imperial gal.
	128	fl. oz.
gallons per acre (gal./acre)	9.353	l/ha
grams (g)	0.001	kg
	0.3527	oz. avdp.
	2.205×10^{-3}	lb.
grams per centimeter (g/cm)	0.1	kg/m
	6.721×10^{-2}	lb./ft.
	5.601×10^{-3}	lb./in.
grams per cubic centimeter (g/cm^3)	1000	kg/m^3
	0.03613	lb./cu. in.
	62.43	lb./cu. ft.

MULTIPLY	BY	TO OBTAIN
hectares (ha)	2.471	acres
	107639	sq. ft.
	10000	m^2
horsepower (hp)	33000	ft.-lb./min.
	550	ft.-lb./sec.
	76.04	m-kg/sec.
	1.014	metric hp
horsepower, metric	75	m-kg/sec.
	0.9863	hp
inches (in.)	25.40	mm
	2.540	cm
	0.0254	m
	0.08333	ft.
	0.027777	yd.
inches of mercury at 0°C (in. Hg)	0.033421	atm
	0.4912	lb./sq. in.
	70.73	lb./sq. ft.
	345.3	kg/m^2
	2.540	cm Hg
	25.40	mm Hg
inch-pounds (in.-lb.)	0.011521	m-kg
kilograms (kg)	2.204622	lb.
	35.27	oz. avdp.
	1000	g
kilogram-calories (kg-cal)	3.9683	BTU
	3087	ft.-lb.
	426.9	m-kg
kilograms per cubic meter (kg/m^3)	0.06243	lb./cu. ft.
	0.001	g/cm^3
kilograms per hectare (kg/ha)	0.892	lb./acre
kilograms per square centimeter (kg/cm^2)	0.9678	atm
	28.96	in. Hg
	14.22	lb./sq. in.
	2048	lb./sq. ft.

MULTIPLY	BY	TO OBTAIN
kilograms per square meter (kg/m^2)	2.896×10^{-3}	in. Hg
	1.422×10^{-3}	lb./sq. in.
	0.2048	lb./sq. ft.
kilometers (km)	1×10^{-5}	cm
	3280.8	ft.
	0.6214	mi.
	0.53996	NM
kilometers per hour (km/hr.)	0.9113	ft./sec.
	58.68	ft./min.
	0.53996	kt
	0.6214	mph
	0.27778	m/sec.
	16.67	m/min.
knots (kt)	1	nautical mph
	1.689	ft./sec.
	1.1516	statute mph
	1.852	km/hr.
	51.48	m/sec.
liters (l)	1000	cm^3
	61.02	cu. in.
	0.03531	cu. ft.
	33.814	fl. oz.
	0.264172	U.S. gal.
	0.2200	Imperial gal.
	1.05669	qt.
liters per hectare (l/ha)	13.69	fl. oz./acre
	0.107	gal./acre
liters per second (l/sec.)	2.12	cu. ft./min.
meters (m)	39.37	in.
	3.280840	ft.
	1.0936	yd.
	0.198838	rod
	6.214×10^{-4}	mi.
	5.3996×10^{-4}	NM
meter-kilogram (m-kg)	7.23301	ft.-lb.
	86.798	in.-lb.

MULTIPLY	BY	TO OBTAIN
meters per minute (m/min.)	0.06	km/hr.
meters per second (m/sec.)	3.280840	ft./sec.
	196.8504	ft./min.
	2.237	mph
	3.6	km/hr.
microns	3.937×10^{-5}	in.
miles, statute (mi.)	5280	ft.
	1.6093	km
	1609.3	m
	0.8684	NM
miles per hour (mph)	44.7041	cm/sec.
	4.470×10^{-1}	m/sec.
	1.467	ft./sec.
	88	ft./min.
	1.6093	km/hr.
	0.8684	kt
miles per hour square (m/hr. sq.)	2.151	ft./sec. sq.
millibars	2.953×10^{-2}	in. Hg
millimeters (mm)	0.03937	in.
millimeters of mercury at 0°C (mm Hg)	0.03937	in. Hg
nautical miles (NM)	6080	ft.
	1.1516	statute mi.
	1852	m
	1.852	km
ounces, avdp. (oz. avdp.)	28.35	g
	16	dr. avdp.
ounces, fluid (fl. oz.)	8	dr. fl.
	29.57	cm^3
	1.805	cu. in.
	0.0296	l
	0.0078	U.S. gal.

MULTIPLY	BY	TO OBTAIN
ounces, fluid per acre (fl. oz./ acre)	0.073	l/ha
pounds (lb.)	0.453592	kg
	453.6	g
	3.108×10^{-2}	slug
pounds per acre (lb./acre)	1.121	kg/ha
pounds per cubic foot (lb./cu. ft.)	16.02	kg/m^3
pounds per cubic inch (lb./cu. in.)	1728	lb./cu. ft.
	27.68	g/cm^3
pounds per square foot (lb./sq. ft.)	0.1414	in. Hg
	4.88243	kg/m^2
	4.725×10^{-4}	atm
pounds per square inch (psi or lb./sq. in.)	5.1715	cm Hg
	2.036	in. Hg
	0.06804	atm
	0.0689476	bar
	703.1	kg/m^2
quart, U.S. (qt.)	0.94635	l
	57.749	cu. in.
radians	57.30	deg. (arc)
	0.1592	rev.
radians per second (radians/sec.)	57.30	deg./sec.
	0.1592	rev./sec.
	9.549	rpm
revolutions (rev.)	6.283	radians
revolutions per minute (rpm or rev./min.)	0.1047	radians/sec.
revolutions per second (rev./sec.)	6.283	radians/sec.

MULTIPLY	BY	TO OBTAIN
rod	16.5	ft.
	5.5	yd.
	5.029	m
slug	32.174	lb.
square centimeters (cm^2)	0.1550	sq. in.
	0.001076	sq. ft.
square feet (sq. ft.)	929	cm^2
	0.092903	m^2
	144	sq. in.
	0.1111	sq. yd.
	2.296×10^{-5}	acres
square inches (sq. in.)	6.4516	cm^2
	6.944×10^{-3}	sq. ft.
square kilometers (km^2)	0.3861	sq. mi.
square meters (m^2)	10.76391	sq. ft.
	1.196	sq. yd.
	0.0001	ha
square miles (sq. mi.)	2.590	km^2
	640	acres
square rods (sq. rods)	30.25	sq. yd.
square yards (sq. yd.)	0.8361	m^2
	9	sq. ft.
	0.0330579	sq. rods
yards (yd.)	0.9144	m
	3	ft.
	36	in.
	0.181818	rod

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SECTION 2

LIMITATIONS

SECTION 2

LIMITATIONS

2.1 GENERAL

This section provides the "FAA Approved" operating limitations, instrument markings, color coding and basic placards necessary for the safe operation of the airplane and its systems.

Limitations associated with those optional systems and equipment which require handbook supplements can be found in Section 9 (Supplements).

2.3 AIRSPEED LIMITATIONS

SPEED	KIAS	KCAS
Never Exceed Speed (V_{NE}) - Do not exceed this speed in any operation.	192	184
Maximum Structural Cruising Speed (V_{NO}) - Do not exceed this speed except in smooth air and then only with caution.	149	146
Design Maneuvering Speed (V_A) - Do not make full or abrupt control movements above this speed.		
At 3400 lbs.	131	129
At 2400 lbs.	114	114

CAUTION

Maneuvering speed decreases at lighter weight as the effects of aerodynamic forces become more pronounced. Linear interpolation may be used for intermediate gross weights. Maneuvering speed should not be exceeded while operating in rough air.

Maximum Flaps Extended Speed (V_{FE}) - Do not exceed this speed with the flaps extended.	109	109

2.5 AIRSPEED INDICATOR MARKINGS

MARKING	IAS
Red Radial Line (Never Exceed)	192 KTS
Yellow Arc (Caution Range - Smooth Air Only)	149 KTS to 192 KTS
Green Arc (Normal Operating Range)	54 KTS to 149 KTS
White Arc (Flap Down)	47 KTS to 109 KTS

2.7 POWER PLANT LIMITATIONS

(a)	Number of Engines	1
(b)	Engine Manufacturer	Lycoming
(c)	Engine Model No.	IO-540-K1G5
(d)	Engine Operating Limits	
	(1) Maximum Horsepower	300
	(2) Maximum Rotation Speed (RPM)	2700
	(3) Maximum Oil Temperature	245° F
(e)	Oil Pressure	
	Minimum (red line)	25 PSI
	Maximum (red line)	either 90 PSI or 100 PSI
(f)	Fuel Pressure	
	Minimum (red line)	either 12 PSI or 18 PSI
	Maximum (red line)	40 PSI
(g)	Fuel Grade (minimum octane)	100/130 - Green
(h)	Number of Propellers	1
(i)	Propeller Manufacturer	Hartzell
(j)	Propeller Hub and Blade Model	HC-C2YK-1( )F/F8475D-4
(k)	Propeller Diameter	
	Minimum	78.5 IN.
	Maximum	80 IN.
(l)	Blade Angle Limits	
	Low Pitch Stop	13.5° ± .2°
	High Pitch Stop	34° ± 1°

2.9 POWER PLANT INSTRUMENT MARKINGS

(a) Tachometer	
Green Arc (Normal Operating Range)	500 to 2700 RPM
Red Line (Maximum Continuous Power)	2700 RPM
(b) Oil Temperature	
Green Arc (Normal Operating Range)	75° to 245°F
Red Line (Maximum)	245°F
(c) Oil Pressure	
Green Arc (Normal Operating Range)	60 PSI to 90 PSI
Yellow Arc (Caution Range) (Idle)	either 25 PSI to 60 PSI or 25 PSI to 60 PSI and 90 PSI to 100 PSI
Red Line (Minimum)	25 PSI
Red Line (Maximum)	either 90 PSI or 100 PSI
(d) Fuel Pressure	
Green Arc (Normal Operating Range)	18 PSI to 40 PSI
Red Line (Minimum) (idle)	either 12 PSI or 18 PSI
Red Line (Maximum)	40 PSI
Yellow Arc (Idle Range)	12 PSI to 18 PSI

2.11 WEIGHT LIMITS

(a) Maximum Weight	3400 LBS
(b) Maximum Baggage (100 lbs each compartment)	200 LBS

NOTE

Refer to Section 5 (Performance) for maximum weight as limited by performance.

2.13 CENTER OF GRAVITY LIMITS

Weight Pounds	Forward Limit Inches Aft of Datum	Rearward Limit Inches Aft of Datum
3400	91.4	95.5
3300	89.0	96.2
2900	80.0	96.2
2400	76.0	96.2

NOTES

Straight line variation between points given.

The datum used is 78.4 inches ahead of the wing leading edge at the intersection of the straight and tapered section.

It is the responsibility of the airplane owner and the pilot to insure that the airplane is properly loaded. See Section 6 (Weight and Balance) for proper loading instructions.

2.15 MANEUVER LIMITS

No acrobatic maneuvers including spins approved.

2.17 FLIGHT LOAD FACTORS

(a) Positive Load Factor (Maximum) 3.8 G
(b) Negative Load Factor (Maximum) No inverted maneuvers approved

2.19 TYPES OF OPERATION

The airplane is approved for the following operations when equipped in accordance with FAR 91 or FAR 135.

(a) Day V.F.R.
(b) Night V.F.R.
(c) Day I.F.R.
(d) Night I.F.R.
(e) Non Icing

2.21 FUEL LIMITATIONS

(a) Total Capacity	
S/N 32-7740001 through 32-7840202	84 U.S. GAL
S/N 32-7940001 and up	98 U.S. GAL
(b) Unusable Fuel	
S/N 32-7740001 through 32-7840202	.4 U.S. GAL
The unusable fuel for the above airplanes has been determined as .2 U.S. gallons in each wing.	
S/N 32-7940001 and up	4 U.S. GAL
The unusable fuel for the above airplanes has been determined as 2.0 U.S. gallons in each wing.	
(c) Usable Fuel	
S/N 32-7740001 through 32-7840202	83.6 U.S. GAL
The usable fuel for the above airplanes has been determined as 41.8 U.S. gallons in each wing.	
S/N 32-7940001 and up	94 U.S. GAL
The usable fuel for the above airplanes has been determined as 47 U.S. gallons in each wing.	

2.23 FLIGHT WITH REAR CABIN DOOR OR REAR CABIN DOOR AND CARGO DOOR REMOVED

The following limitations must be observed in the operation of this airplane with the rear cabin door or rear cabin door and cargo door removed:

(a) The airplane may be flown with the rear cabin door or rear cabin door and cargo door removed. Flight with the front door removed is not approved.
(b) Maximum speed - 145 KIAS.
(c) No smoking.
(d) All loose articles must be tied down and stowed.
(e) Jumper's static lines must be kept free of pilot's controls and control surfaces.
(f) Operation approved VFR flight conditions only.

2.25 LOADING LIMITATIONS (SERIAL NUMBERS 32-7740001 THROUGH 32-7840202)

The following loading limitations must be observed in the operation of this airplane.

(a) Fill tip tanks first: use main tanks first.
(b) This airplane must not be operated at gross weights in excess of 3112 pounds unless the weight over 3112 pounds is fuel weight only.
(c) Remove fuel from the main tanks first when required for proper weight and balance.

2.27 NOSE WHEEL FAIRING REMOVED

When the nose wheel fairing is removed, two nose wheel centering springs (part number 67168) must be installed.

2.29 NOISE LEVEL

The noise level of this aircraft is 79.27 d B(A).

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

The above statement not withstanding the noise level stated above has been verified by and approved by the Federal Aviation Administration in noise level test flights conducted in accordance with FAR 36, Noise Standards - Aircraft Type and Airworthiness Certification. This aircraft model is in compliance with all FAR 36 noise standards applicable to this type.

2.31 PLACARDS

In full view of the pilot:

THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS. NO ACROBATIC MANEUVERS, INCLUDING SPINS, APPROVED.

THIS AIRCRAFT APPROVED FOR V.F.R., I.F.R., DAY AND NIGHT NON-ICING FLIGHT WHEN EQUIPPED IN ACCORDANCE WITH FAR 91 OR FAR 135.

In full view of the pilot, the following takeoff and landing check lists will be installed:

TAKEOFF CHECK LIST

Fuel on Proper Tank
Electric Fuel Pump - On
Engine Gauges - Checked
Alternate Air - Closed
Seat Backs Erect
Mixture - Set
Propeller - Set
Fasten Belts/Harness
Flaps - 10° (1st notch)
Trim Tab - Set
Controls - Free
Doors - Latched
Air Conditioner - Off

LANDING CHECK LIST

Seat Backs Erect
Fasten Belts/Harness
Air Conditioner - Off
Fuel on Proper Tank
Electric Fuel Pump - On
Mixture Rich
Propeller Set
Flaps Down (109 KIAS MAX.)

The "AIR CONDITIONER OFF" item in the above takeoff and landing check lists is mandatory for air conditioned aircraft only.

On the instrument panel in full view of the pilot:

MANEUVERING SPEED
131 KIAS AT 3400
LBS. (SEE P.O.H.)

On the instrument panel in full view of the pilot:

DEMONSTRATED CROSSWIND COMPONENT 17 KNOTS

In full view of the pilot: (For operation with the rear door removed)

FOR FLIGHT WITH THE DOOR REMOVED, SEE THE LIMITATIONS AND PROCEDURES SECTIONS OF THE PILOT'S OPERATING HANDBOOK.

On the fuel selector valve cover (serial numbers 32-7740001 through 32-7840202):

ALL WEIGHT IN EXCESS OF 3112
POUNDS MUST BE FUEL WEIGHT ONLY
FILL TIP TANKS FIRST
USE MAIN TANKS FIRST
RESTRICT PASSENGER WEIGHTS OR CARGO
WEIGHT AS REQUIRED FOR COMPLIANCE.

On the instrument panel in full view of the pilot when the AutoFlite II is installed:

OPERATION

TURN AUTOFLITE ON. ADJUST TRIM KNOB FOR MINIMUM HEADING CHANGE: FOR HEADING CHANGE, PRESS DISENGAGE SWITCH ON CONTROL WHEEL, CHANGE HEADING, RELEASE SWITCH. ROTATE TURN KNOB FOR TURN COMMANDS. PUSH TURN KNOB IN TO ENGAGE TRACKER. PUSH TRIM KNOB IN FOR HI SENSITIVITY. LIMITATIONS AUTOFLITE OFF FOR TAKEOFF AND LANDING.

On the instrument panel in full view of the pilot when the supplementary white strobe lights are installed:

WARNING - TURN OFF STROBE LIGHTS WHEN TAXIING IN VICINITY OF OTHER AIRCRAFT, OR DURING FLIGHT THROUGH CLOUD, FOG OR HAZE.

In full view of the pilot, in the area of the air conditioner controls when the air conditioner is installed:

WARNING - AIR CONDITIONER MUST BE OFF TO INSURE NORMAL TAKEOFF CLIMB PERFORMANCE.

On the inside of the forward baggage compartment:

MAXIMUM BAGGAGE THIS COMPARTMENT 100 LBS.
SEE THE LIMITATIONS SECTION OF THE
PILOT'S OPERATING HANDBOOK.

On aft baggage closeout:

MAXIMUM BAGGAGE THIS COMPARTMENT
100 LBS. NO HEAVY OBJECTS ON HAT
SHELF.

Adjacent to outboard fuel filler caps:

S/N 32-7740001 through 32-7840202

FUEL -100/130 AVIATION GRADE MIN. -
CAPACITY 17 GAL.

Adjacent to inboard fuel filler caps:

S/N 32-7740001 through 32-7840202

FUEL - 100/130 AVIATION GRADE MIN. - MAXIMUM
CAPACITY 25 GAL. CAPACITY TO BOTTOM
OF FILLER NECK INDICATOR 18 GAL.

Adjacent to fuel tank filler caps:

S/N 32-7940001 and up

FUEL - 100/130 AVIATION GRADE - USABLE CAPACITY
47.0 GAL.

On storm window:

DO NOT OPEN ABOVE 129 KIAS.

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SECTION 3

EMERGENCY PROCEDURES

SECTION 3

EMERGENCY PROCEDURES

3.1 GENERAL

The recommended procedures for coping with various types of emergencies and critical situations are provided by this section. All of the required (FAA regulations) emergency procedures and those necessary for the safe operation of the airplane as determined by the operating and design features of the airplane are presented.

Emergency procedures associated with those optional systems and equipment which require handbook supplements are provided by Section 9 (Supplements).

The first portion of this section consists of an abbreviated emergency check list which supplies an action sequence for critical situations with little emphasis on the operation of systems.

The remainder of the section is devoted to amplified emergency procedures containing additional information to provide the pilot with a more complete understanding of the procedures.

These procedures are suggested as the best course of action for coping with the particular condition described, but are not a substitute for sound judgment and common sense. Since emergencies rarely happen in modern aircraft, their occurrence is usually unexpected and the best corrective action may not always be obvious. Pilots should familiarize themselves with the procedures given in this section and be prepared to take appropriate action should an emergency arise.

Most basic emergency procedures, such as power off landings, are a normal part of pilot training. Although these emergencies are discussed here, this information is not intended to replace such training, but only to provide a source of reference and review, and to provide information on procedures which are not the same for all aircraft. It is suggested that the pilot review standard emergency procedures periodically to remain proficient in them.

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3.3 EMERGENCY PROCEDURES CHECK LIST

ENGINE FIRE DURING START

Starter . . . . . crank engine
Mixture . . . . . idle cut-off
Throttle . . . . . open
Electric fuel pump . . . . . OFF
Fuel selector . . . . . OFF
Abandon if fire continues

ENGINE POWER LOSS DURING TAKEOFF

If sufficient runway remains for a normal landing, land straight ahead.

If area ahead is rough, or if it is necessary to clear obstructions, maintain a safe airspeed and make only a shallow turn if necessary to avoid obstructions. Use of flaps depends upon circumstances. Normally, flaps should be fully extended for touchdown.

If sufficient altitude has been gained to attempt a restart:
Maintain safe airspeed
Fuel selector . . . . . switch to tank containing fuel
Electric fuel pump . . . . . check ON
Mixture . . . . . check RICH
Alternate air . . . . . OPEN
If power is not regained, proceed with power off landing.

ENGINE POWER LOSS IN FLIGHT

Fuel selector . . . . . switch to tank containing fuel
Electric fuel pump . . . . . ON
Mixture . . . . . RICH
Alternate air . . . . . OPEN
Engine gauges . . . . . check for indication of cause of power loss
If no fuel pressure is indicated, check tank selector position to be sure it is on a tank containing fuel.

When power is restored:
Alternate air . . . . . CLOSED
Electric fuel pump . . . . . OFF
If power is not restored prepare for power off landing.
Trim for 87 KIAS

POWER OFF LANDING

Locate suitable field.
Establish spiral pattern.
1000 ft. above field at downwind position for normal landing approach.
When field can easily be reached slow to 80 KIAS for shortest landing.

Touchdowns should normally be made at lowest possible airspeed with full flaps.

When committed to landing:
Ignition . . . . . OFF
Master switch . . . . . OFF
Fuel selector . . . . . OFF
Mixture . . . . . idle cut-off
Seat belt and harness . . . . . tight

FIRE IN FLIGHT

Source of fire . . . . . check

Electrical fire (smoke in cabin):
Master switch . . . . . OFF
Vents . . . . . open
Cabin heat . . . . . OFF
Land as soon as practicable.

Engine fire:
Fuel selector . . . . . OFF
Throttle . . . . . CLOSED
Mixture . . . . . idle cut-off
Electric fuel pump . . . . . check OFF
Heater and defroster . . . . . OFF
Proceed with power off landing procedure.

LOSS OF OIL PRESSURE

Land as soon as possible and investigate cause.
Prepare for power off landing.

LOSS OF FUEL PRESSURE

Electric fuel pump . . . . . .ON
Fuel selector . . . . . .check on full tank

HIGH OIL TEMPERATURE

Land at nearest airport and investigate the problem.
Prepare for power off landing.

ALTERNATOR FAILURE

Verify failure
Reduce electrical load as much as possible.
Alternator circuit breakers . . . . . .check
Alt switch . . . . . .OFF (for 1 second), then on
If no output:
Alt switch . . . . . .OFF

Reduce electrical load and land as soon as practical.

PROPELLER OVERSPEED

Throttle . . . . . .retard
Oil pressure . . . . . .check
Prop control . . . . . .full DECREASE rpm, then set if any control available
Airspeed . . . . . .reduce
Throttle . . . . . .as required to remain below 2700 rpm

SPIN RECOVERY

Throttle . . . . . .idle
Ailerons . . . . . .neutral
Rudder . . . . . .full opposite to direction of rotation
Control wheel . . . . . .full forward
Rudder . . . . . .neutral (when rotation stops)
Control wheel . . . . . .as required to smoothly regain level flight altitude

OPEN DOOR

If both upper and side latches are open, the door will trail slightly open and airspeeds will be reduced slightly.

To close the door in flight:
Slow airplane to 87 KIAS
Cabin vents . . . . . .close
Storm window . . . . . .open

If upper latch is open . . . . . .latch
If side latch is open . . . . . .pull on armrest while moving latch handle to latched position

If both latches are open . . . . . .latch side latch then top latch

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3.5 AMPLIFIED EMERGENCY PROCEDURES (GENERAL)

The following paragraphs are presented to supply additional information for the purpose of providing the pilot with a more complete understanding of the recommended course of action and probable cause of an emergency situation.

3.7 ENGINE FIRE DURING START

Engine fires during start are usually the result of overpriming. The first attempt to extinguish the fire is to try to start the engine and draw the excess fuel back into the induction system.

If a fire is present before the engine has started, move the mixture control to idle cut-off, open the throttle and crank the engine. This is an attempt to draw the fire back into the engine.

If the engine has started, continue operating to try to pull the fire into the engine.

In either case (above), if fire continues more than a few seconds, the fire should be extinguished by the best available external means.

The fuel selector valves should be "OFF" and the mixture at idle cut-off if an external fire extinguishing method is to be used.

3.9 ENGINE POWER LOSS DURING TAKEOFF

The proper action to be taken if loss of power occurs during takeoff will depend on the circumstances of the particular situation.

If sufficient runway remains to complete a normal landing, land straight ahead.

If the area ahead is rough, or if it is necessary to clear obstructions, maintain a safe airspeed and maneuver gently to avoid obstacles, making only shallow turns if necessary. Use of flaps depends upon circumstances. Normally, flaps should be fully extended for touchdown.

If sufficient altitude has been gained to attempt a restart, maintain a safe airspeed and switch the fuel selector to another tank containing fuel. Check the electric fuel pump to insure that it is "ON" and that the mixture is "RICH." The alternate air should be "OPEN."

If engine failure was caused by fuel exhaustion, power will not be regained after switching fuel tanks until the empty fuel lines are filled. This may require up to ten seconds.

If power is not regained, proceed with the Power Off Landing procedure (refer to the emergency check list and paragraph 3.13).

3.11 ENGINE POWER LOSS IN FLIGHT

Complete engine power loss is usually caused by fuel flow interruption and power will be restored shortly after fuel flow is restored. If power loss occurs at a low altitude, the first step is to prepare for an emergency landing (refer to paragraph 3.13). An airspeed of at least 87 KIAS should be maintained.

If altitude permits, switch the fuel selector to another tank containing fuel and turn the electric fuel pump "ON." Move the mixture control to "RICH" and the alternate air to "OPEN." Check the engine gauges for an indication of the cause of the power loss. If no fuel pressure is indicated, check the tank selector position to be sure it is on a tank containing fuel.

When power is restored move the alternate air to the "CLOSED" position and turn "OFF" the electric fuel pump.

If the preceding steps do not restore power, prepare for an emergency landing.

If time permits, turn the ignition switch to "L" then to "R" then back to "BOTH." Move the throttle and mixture control levers to different settings. This may restore power if the problem is too rich or too lean a mixture or if there is a partial fuel system restriction. Try other fuel tanks. Water in the fuel could take some time to be used up, and allowing the engine to windmill may restore power. If power loss is due to water, fuel pressure indications will be normal.

If engine failure was caused by fuel exhaustion power will not be restored after switching fuel tanks until the empty fuel lines are filled. This may require up to ten seconds.

If power is not regained, proceed with the Power Off Landing procedure (refer to the emergency check list and paragraph 3.13).

3.13 POWER OFF LANDING

If loss of power occurs at altitude, trim the aircraft for best gliding angle (87 KIAS, Air Cond. off) and look for a suitable field. If measures taken to restore power are not effective, and if time permits, check your charts for airports in the immediate vicinity; it may be possible to land at one if you have sufficient altitude. At best gliding angle, with the engine windmilling, and the propeller control in full "DECREASE rpm," the aircraft will travel approximately 1.5 miles for each thousand feet of altitude. If possible, notify the FAA by radio of your difficulty and intentions. If another pilot or passenger is aboard, let him help.

When you have located a suitable field, establish a spiral pattern around this field. Try to be at 1000 feet above the field at the downwind position, to make a normal landing approach. When the field can easily be reached, slow to 80 KIAS with flaps down for the shortest landing. Excess altitude may be lost by widening your pattern, using flaps or slipping, or a combination of these.

Touchdown should normally be made at the lowest possible airspeed.

When committed to landing, close the throttle control and shut "OFF" the master and ignition switches. Flaps may be used as desired. Turn the fuel selector valve to "OFF" and move the mixture to idle cut-off. The seat belts and shoulder harness (if installed) should be tightened. Touchdown should be normally made at the lowest possible airspeed.

3.15 FIRE IN FLIGHT

The presence of fire is noted through smoke, smell and heat in the cabin. It is essential that the source of the fire be promptly identified through instrument readings, character of the smoke, or other indications since the action to be taken differs somewhat in each case.

Check for the source of the fire first.

If an electrical fire is indicated (smoke in the cabin), the master switch should be turned "OFF." The cabin vents should be opened and the cabin heat turned "OFF." A landing should be made as soon as possible.

If an engine fire is present, switch the fuel selector to "OFF" and close the throttle. The mixture should be at idle cut-off. Turn the electric fuel pump "OFF." In all cases, the heater and defroster should be "OFF." If radio communication is not required select master switch "OFF." If the terrain permits, a landing should be made immediately.

NOTE

The possibility of an engine fire in flight is extremely remote. The procedure given is general and pilot judgment should be the determining factor for action in such an emergency.

3.17 LOSS OF OIL PRESSURE

Loss of oil pressure may be either partial or complete. A partial loss of oil pressure usually indicates a malfunction in the oil pressure regulating system, and a landing should be made as soon as possible to investigate the cause and prevent engine damage.

A complete loss of oil pressure indication may signify oil exhaustion or may be the result of a faulty gauge. In either case, proceed toward the nearest airport, and be prepared for a forced landing. If the problem is not a pressure gauge malfunction, the engine may stop suddenly. Maintain altitude until such time as a dead stick landing can be accomplished. Don't change power settings unnecessarily, as this may hasten complete power loss.

Depending on the circumstances, it may be advisable to make an off airport landing while power is still available, particularly if other indications of actual oil pressure loss, such as sudden increases in temperatures, or oil smoke, are apparent, and an airport is not close.

If engine stoppage occurs, proceed with Power Off Landing.

3.19 LOSS OF FUEL PRESSURE

If loss of fuel pressure occurs, turn "ON" the electric fuel pump and check that the fuel selector is on a full tank.

If the problem is not an empty tank, land as soon as practical and have the engine-driven fuel pump and fuel system checked.

3.21 HIGH OIL TEMPERATURE

An abnormally high oil temperature indication may be caused by a low oil level, an obstruction in the oil cooler, damaged or improper baffle seals, a defective gauge, or other causes. Land as soon as practical at an appropriate airport and have the cause investigated.

A steady, rapid rise in oil temperature is a sign of trouble. Land at the nearest airport and let a mechanic investigate the problem. Watch the oil pressure gauge for an accompanying loss of pressure.

3.23 ALTERNATOR FAILURE

Loss of alternator output is detected through zero reading on the ammeter. Before executing the following procedure, insure that the reading is zero and not merely low by actuating an electrically powered device, such as the landing light. If no increase in the ammeter reading is noted, alternator failure can be assumed.

The electrical load should be reduced as much as possible. Check the alternator circuit breakers for a popped circuit.

The next step is to attempt to reset the overvoltage relay. This is accomplished by moving the "ALT" switch to "OFF" for one second and then to "ON." If the trouble was caused by a momentary overvoltage condition (16.5 volts and up) this procedure should return the ammeter to a normal reading.

If the ammeter continues to indicate "O" output, or if the alternator will not remain reset, turn off the "ALT" switch, maintain minimum electrical load and land as soon as practical. All electrical load is being supplied by the battery.

3.25 PROPELLER OVERSPEED

Propeller overspeed is caused by a malfunction in the propeller governor or low oil pressure which allows the propeller blades to rotate to full low pitch.

If propeller overspeed should occur, retard the throttle and check the oil pressure. The propeller control should be moved to full "DECREASE rpm" and then set if any control is available. Airspeed should be reduced and throttle used to maintain 2700 RPM.

3.27 SPIN RECOVERY

Intentional spins are prohibited in this airplane. If a spin is inadvertently entered, immediately move the throttle to idle and the ailerons to neutral.

Full rudder should then be applied opposite to the direction of rotation followed by control wheel full forward. When the rotation stops, neutralize the rudder and ease back on the control wheel as required to smoothly regain a level flight attitude.

3.29 OPEN DOOR

The cabin door on the Cherokee is double latched, so the chances of its springing open in flight at both the top and side are remote. However, should you forget the upper latch, or not fully engage the side latch, the door may spring partially open. This will usually happen at takeoff or soon afterward. A partially open door will not affect normal flight characteristics, and a normal landing can be made with the door open.

If both upper and side latches are open, the door will trail slightly open, and airspeed will be reduced slightly.

To close the door in flight, slow the airplane to 87 KIAS, close the cabin vents and open the storm window. If the top latch is open, latch it. If the side latch is open, pull on the armrest while moving the latch handle to the latched position. If both latches are open, close the side latch then the top latch.

3.31 ENGINE ROUGHNESS

Engine roughness may be caused by dirt in the injector nozzles, induction system icing, or ignition problems.

First adjust the mixture for maximum smoothness. The engine will run rough if the mixture is too rich or too lean.

Move the alternate air to "OPEN" and then turn "ON" the electric fuel pump.

Switch the fuel selector to another tank to see if fuel contamination is the problem.

Check the engine gauges for abnormal readings. If any gauge readings are abnormal proceed accordingly.

The magneto switch should then be moved to "L" then "R," then back to "BOTH." If operation is satisfactory on either magneto, proceed on that magneto at reduced power with full "RICH" mixture to a landing at the first available airport.

If roughness persists, prepare for a precautionary landing at pilot's discretion.

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SECTION 4

NORMAL PROCEDURES

SECTION 4

NORMAL PROCEDURES

4.1 GENERAL

This section clearly describes the recommended procedures for the conduct of normal operations for the Cherokee Six. All of the required (FAA regulations) procedures and those necessary for the safe operation of the airplane as determined by the operating and design features of the airplane are presented.

Normal procedures associated with those optional systems and equipment which require handbook supplements are provided by Section 9 (Supplements).

These procedures are provided to present a source of reference and review and to supply information on procedures which are not the same for all aircraft. Pilots should familiarize themselves with the procedures given in this section in order to become proficient in the normal operations of the airplane.

The first portion of this section consists of a short form check list which supplies an action sequence for normal operations with little emphasis on the operation of the systems.

The remainder of the section is devoted to amplified normal procedures which provide detailed information and explanations of the procedures and how to perform them. This portion of the section is not intended for use as an in-flight reference due to the lenthly explanations. The short form check list should be used for this purpose.

4.3 AIRSPEEDS FOR SAFE OPERATIONS

The following airspeeds are those which are significant to the safe operation of the airplane. These figures are for standard airplanes flown at gross weight under standard conditions at sea level.

Performance for a specific airplane may vary from published figures depending upon the equipment installed, the condition of the engine, airplane and equipment, atmospheric conditions and piloting technique.

(a)	Best Rate of Climb Speed	89 KIAS
(b)	Best Angle of Climb Speed	79 KIAS
(c)	Turbulent Air Operating Speed (See Subsection 2.3)	131 KIAS
(d)	Maximum Flap Speed	109 KIAS
(e)	Landing Final Approach Speed (Flaps 40°)	80 KIAS
(f)	Maximum Demonstrated Crosswind Velocity	17 KTS

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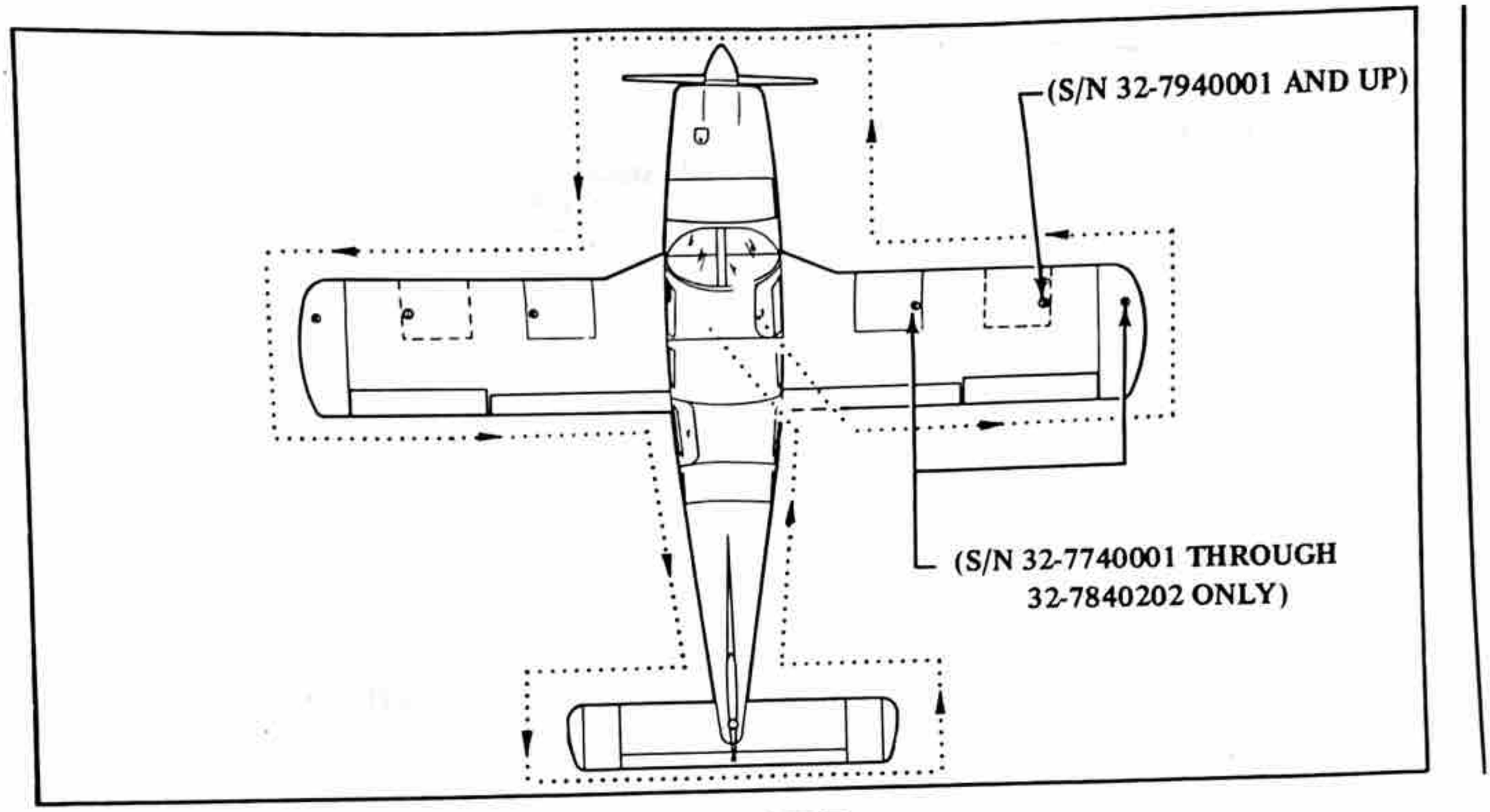

WALK-AROUND

Figure 4-1

4.5 NORMAL PROCEDURES CHECK LIST

PREFLIGHT CHECK

COCKPIT

Control wheel ..... release restraints
Parking brake ..... set
All switches ..... OFF
Mixture ..... IDLE CUT-OFF
Master switch ..... ON
Fuel gauges ..... check
Annunciator panel ..... check
Master switch ..... OFF
Primary flight controls ..... proper operation
Flap control ..... proper operation
Trim control ..... neutral
Windows ..... check clean
Required papers ..... on board
Tow bar and baggage ... stowed properly and secure

RIGHT WING

Surface condition ..... check
Flap and hinges ..... check
Aileron and hinges ..... check
Wing tip and lights ..... check
Fuel tank ..... check supply visually - secure cap
Fuel vent opening ..... unobstructed
Fuel tank sumps ..... drain
Fuel quantity gauge (late models only) ..... check
Tie down and chocks ..... remove
Main gear strut ..... proper inflation (4.5 in.)
Tire ..... check
Brake block and disc ..... check
Fresh air inlet ..... clear

NOSE SECTION

Cowling ..... check
Windows ..... clean
General condition ..... check
Fuel strainer drain ..... place container under
Forward baggage door ..... close and secure
Propeller and spinner ..... check for nicks
Alternator belt ..... check tension
Air inlets ..... clear
Chocks ..... remove
Nose wheel strut ..... check proper inflation (3.25 in.)
Nose wheel tire ..... check
Oil ..... check quantity
Dipstick ..... properly seated
Oil check door ..... close and secure
Landing light ..... check

LEFT WING

Fresh air inlet ..... check
Chocks and tie down ..... remove
Main gear strut ..... proper inflation (3.25 in.)
Tire ..... check
Brake block disc ..... check
Fuel tank sumps ..... drain
Fuel vent ..... clear
Fuel quantity gauge ..... check
Fuel tank ..... check supply visually - secure cap
Pitot ..... remove cover - holes clear
Wing tip and lights ..... check
Surface conditions ..... check
Aileron and hinges ..... check
Flap and hinges ..... check

EMPENNAGE

Antennas ..... check
General condition ..... check
Baggage ..... check
Tail lights ..... check
Elevator ..... check
Rudder ..... check
Tie down ..... remove

MISCELLANEOUS

Fuel strainer ..... drain
Master switch ..... ON
Pitot heat switch ..... ON and check
Interior lighting ..... ON and check
Exterior lighting switches ..... visually check
Fuel strainer drain ..... contents of container and dispose-valve secure
Pitot ..... check-warm
Stall warning horn ..... check
All lighting switches ..... OFF
Pitot heat switch ..... OFF
Master switch ..... board
Passengers ..... close and secure
All doors ..... fastened-check
Seat belts and harness ..... inertia reel

BEFORE STARTING ENGINE

Brakes ..... set
Propeller ..... full INCREASE rpm
Fuel selector ..... desired tank

STARTING ENGINE WHEN COLD

Throttle ..... 1/2" open
Master switch ..... ON
Electric fuel pump ..... ON
Mixture ..... prime - then idle cut-off
Starter ..... engage
Mixture ..... full RICH
Throttle ..... adjust
Oil pressure ..... check

STARTING ENGINE WHEN HOT

Throttle ..... 1/2" open
Master switch ..... ON
Electric fuel pump ..... idle cut-off
Mixture ..... engage
Starter ..... advance
Mixture ..... as required
Throttle ..... check
Oil pressure

STARTING ENGINE WHEN FLOODED

Throttle . . . . . open full
Master switch . . . . . .ON
Electric fuel pump . . . . . .OFF
Mixture . . . . . idle cut-off
Starter . . . . . .engage
Mixture . . . . . advance
Throttle . . . . . retard
Oil pressure . . . . . check

STARTING WITH EXTERNAL POWER SOURCE

Master switch . . . . . .OFF
All electrical equipment . . . . . .OFF
Terminals . . . . . connect
External power plug . . . . . .insert in fuselage

Proceed with normal start
Throttle . . . . . .lowest possible RPM
External power plug . . . . . disconnect from fuselage
Master switch . . . . . .ON - check ammeter
Oil pressure . . . . . check

WARM-UP

Throttle . . . . . 1000 to 1200 RPM

TAXIING

Chocks . . . . . .removed
Taxi area . . . . . .clear
Throttle . . . . . apply slowly
Prop . . . . . .high RPM
Brakes . . . . . check
Steering . . . . . check

GROUND CHECK

Propeller . . . . . full INCREASE
Throttle . . . . . 2000 RPM
Magnetos . . . . . .max. drop 175 RPM -max. diff. 50 RPM
Vacuum . . . . . .5.0" Hg. ± .1
Oil temp . . . . . check
Oil pressure . . . . . check

Air conditioner . . . . . check
Annunciator panel . . . . . .press-to-test
Propeller . . . . . exercise - then full INCREASE
Alternate air . . . . . check
Engine is warm for takeoff when throttle can be opened without engine faltering.
Electric fuel pump . . . . . .OFF
Fuel pressure . . . . . check
Throttle . . . . . retard

BEFORE TAKEOFF

Master switch . . . . . .ON
Flight instruments . . . . . check
Fuel selector . . . . . .proper tank
Electric fuel pump . . . . . .ON
Engine gauges . . . . . check
Alternate air . . . . . CLOSED
Seat backs . . . . . .erect
Mixture . . . . . .set
Prop . . . . . .set
Belts/harness . . . . . .fastened
Empty seats . . . . . seat belts snugly fastened
Flaps . . . . . set 10°
Trim tab . . . . . .set
Controls . . . . . free
Doors . . . . . latched
Air conditioner . . . . . .OFF

TAKEOFF

NORMAL

Flaps . . . . . set 10°
Tab . . . . . .set
Accelerate to 55 to 62 KIAS
Control wheel . . . . . back pressure to rotate to climb attitude

SHORT FIELD, OBSTACLE CLEARANCE

Flaps . . . . . 25° (second notch)
Accelerate to 55 to 62 KIAS depending on aircraft weight
Control wheel . . . . . back pressure to rotate to climb attitude

After breaking ground, accelerate to 79 KIAS and climb past obstacle.
Accelerate to best rate of climb speed - 89 KIAS and slowly retract the flaps.

SHORT FIELD, NO OBSTACLE

Flaps . . . . . 25° (second notch)
Accelerate to 55 to 62 KIAS depending upon aircraft weight.
Control wheel . . . . . back pressure to rotate to climb attitude

Accelerate to best rate of climb speed - 89 KIAS and slowly retract the flaps while climbing out.

SOFT FIELD, OBSTACLE CLEARANCE

Flaps . . . . . 25° (second notch)
Accelerate; pull nose wheel off as soon as possible.
Control wheel . . . . . lift off at lowest possible airspeed

Just above the ground, accelerate to best angle of climb speed - 79 KIAS and climb past obstacle.
Continue climb while accelerating to best rate of climb speed - 89 KIAS.
Flaps . . . . . .retract slowly

SOFT FIELD, NO OBSTACLE

Flaps . . . . . 25° (second notch)
Accelerate; pull nose wheel off as soon as possible.
Control wheel . . . . . lift off at lowest possible airspeed

Just above the ground, accelerate to best rate of climb speed - 89 KIAS and climb out.
Flaps . . . . . .retract slowly

CLIMB

Best rate (3400 lb) . . . . . 89 KIAS
Best angle (3400 lb) . . . . . 79 KIAS
En route . . . . . 100 KIAS
Electric fuel pump . . . . . OFF at desired altitude

CRUISING

Reference performance charts, Avco-Lycoming Operator's Manual and power setting table.
Normal max. cruise power 75%
Power . . . . . set per power table
Mixture . . . . . adjust

APPROACH AND LANDING

Fuel selector . . . . . .proper tank
Seat backs . . . . . .erect
Belts/harness . . . . . fasten
Electric fuel pump . . . . . .ON
Mixture . . . . . .set
Propeller . . . . . .set
Flaps . . . . . down - 109 KIAS max
Air conditioner . . . . . .OFF
Trim to 80 KIAS

STOPPING ENGINE

Flaps . . . . . .retract
Electric fuel pump . . . . . .OFF
Air conditioner . . . . . .OFF
Radios . . . . . full INCREASE
Propeller . . . . . .full a
Throttle . . . . . .idle cut-o
Mixture . . . . . .OF
Magnetos . . . . . .OFF
Master switch

PARKING

Parking brake . . . . . secured with belts
Control wheel . . . . . .fu
Flaps . . . . . .in
Wheel chocks . . . . . .secur
Tie downs

4.7 AMPLIFIED NORMAL PROCEDURES (GENERAL)

The following paragraphs are provided to supply detailed information and explanations of the normal procedures necessary for the safe operation of the airplane.

4.9 PREFLIGHT CHECK

The airplane should be given a thorough preflight and walk-around check. The preflight should include a check of the airplane's operational status, computation of weight and C. G. limits, takeoff and landing distances, and in-flight performance. A weather breifing should be obtained for the intended flight path and any other factors relating to safe flight should be checked before takeoff.

CAUTION

The flap position should be noted before boarding the airplane. The flaps must be placed in the UP position before they will lock and support weight on the step.

COCKPIT

Upon entering the cockpit, release the seat belts securing the control wheel. Check that all switches are turned "OFF" and the mixture control is in the IDLE CUT-OFF position. Turn "ON" the master switch and check the fuel quantity gauges for sufficient quantity. Check the annunciator panel - all lights should be "ON". Turn "OFF" master switch and begin preliminary control systems check by moving the wheel through its full travel. Move the flap handle through its full travel and adjust the trim control to neutral. The completion of the initial cockpit check is accomplished by checking the windows for cleanliness and cracks and be sure all the required airplane papers are on board. Prior to beginning the walk-around stow all baggage and the tow bar.

RIGHT WING

Begin the walk-around at the trailing edge of the right wing by checking the wing surface, aileron, flap and hinges for damage and operational interference. The wing and control surfaces should be free of ice, mud or snow and other extraneous substances. Static wicks should be firmly attached and in good condition. Check the wing tip and lights for damage. Visually inspect the fuel tank for quantity and color of fuel. Be sure to secure the cap properly. Check the fuel indicator gauge (only on serial numbers 32-7940001 and up). Each inboard tank is furnished with an external fuel quantity indicator to assist the pilot in determining fuel quantities of less than 25 gallons. The fuel vent should be clear of obstructions.

Drain the two fuel sumps on the underside of the right wing to remove water and/or sediment. The fuel system should be drained daily prior to the first flight and after refueling to avoid the accumulation of water and/or sediment. Each fuel tank is equipped with an individual quick drain located at the lower inboard rear corner of the tank. The fuel strainer and a system quick drain valve are located in the fuselage at the lowest point of the fuel system. It is important that the system quick drain be the last portion of the fuel system to be drained. (See "Miscellaneous" in the check list for appropriate procedure.)

CAUTION

When draining any amount of fuel, care should be taken to insure there is no fire hazard before starting engine.

A complete check of the landing gear is conducted by examining the main gear shock strut for proper inflation. There should be 4.5 inches of strut exposure under a normal static load. Check the tire for cuts and wear and insure proper inflation. Make a visual check of the brake blocks for wear or damage and check for any fluid leaks in the strut and brake area. Check fresh air inlet for obstructions.

NOSE SECTION

Continue from the right wing forward around the nose section of the airplane. The cowling should be checked for security and proper seating, the windows should clean and not cracked, and the general condition of the nose should appear sound. Check the security of the forward baggage compartment contents and close and lock the door.

Place a container under the fuel system quick drain valve located under the fuselage.

The propeller blades and spinner should be free of cracks, nicks, dents, or other defects. Check the tension of the alternator belt and be sure the air inlets are clear. Remove the chocks from the nose wheel and examine the landing gear. The gear strut should be inflated to show about 3.25 inches of strut exposure under a normal static load. Check the tire for cuts and wear and insure proper inflation. No leakage of fluids should be present. The landing light should be clean and intact. Oil quantity can be checked by opening the access port on top of the nacelle and removing the combination oil cap/dipstick. After the oil is checked, be sure the cap is secure.

LEFT WING

Continuing aft around the left wing, the air inlet should be checked for obstructions and the tie down and chocks should be removed. A complete check of the landing gear is conducted by examining the ma gear shock strut for proper inflation. There should be 4.5 inches of strut exposure under a normal sta load. Check tire for cuts and wear and insure proper inflation. Make a visual check of the brake blocks for wear or damage and check for any fluid leaks on the strut or brake block area.

Drain the two fuel sumps on the underside of the left wing to remove water and/or sediment. The fue system should be drained daily prior to the first flight and after refueling to avoid the accumulation of water and/or sediment. (See RIGHT WING for further description of fuel system.)

CAUTION

When draining any amount of fuel, care should be taken to insure there is no fire hazard before starting engine.

The fuel vent should be checked for obstructions and the fuel quantity gauge (only on serial numbers 32-7940001 and up) on the wing should be checked. Visually inspect the fuel tank for quantity and color of fuel. Be sure to secure the cap properly. If the pitot is covered, be sure to remove the cover and inspect the pitot opening for obstructions. Check the wing tip and lights for damage and the static wicks for attachment and condition. Check the wing surface, aileron, flap and hinges for damage and operational inteference. The wing surface and control surfaces should be free of ice, mud or snow and other extraneous substances.

EMPENNAGE

Check the condition of any antennas located on the fuselage. All surfaces of the empennage should be examined for damage and operational interference. Fairings and access covers should be attached properly. Check the baggage to be sure it is stowed properly. Check that the lights on the tail are clean and intact. The elevator and rudder should be operational and free from interference of any type. Check the condition of the tabs and insure that all hinges and push rods are sound and operational. If the tail has been tied down, remove the tie down rope.

MISCELLANEOUS

Enter the cockpit and drain the fuel strainer by pressing down on the lever located on the right hand side of the cabin, below the forward edge of center seat. For airplanes with serial numbers 32-7740001 through 32-7840202, the fuel selector should be positioned in the following sequence while draining the strainer: "OFF," "LEFT TIP," "LEFT MAIN," "RIGHT MAIN" and "RIGHT TIP." For airplanes with serial numbers 32-7940001 and up, the fuel selector should be positioned in the following sequence while draining the strainer: "OFF," "LEFT" and "RIGHT." This is done to insure that the fuel in the lines between each tank outlet and the fuel strainer is drained, as well as the fuel in the fuel strainer. When the fuel tanks are full, it will take approximately six seconds to drain all the fuel in one of the lines from a tank to the fuel strainer. If the fuel tanks are less than full, it will take a few seconds longer. After draining the fuel strainer, check for leakage at the drain under the aircraft with the fuel selector on a tank position.

Turn the master switch "ON" and begin checking the interior lights by turning "ON" the necessary switches. After the interior lights are checked, turn "ON" the pitot heat switch and the exterior light switches. Next perform a walk-around check on the exterior lights and examine and dispose of the contents in the container placed under the fuel strainer drain.

Check the stall warning horn by moving the lift detector slightly up. Check the heated pitot head for proper heating.

CAUTION

Care should be taken when an operational check of the heated pitot head is being performed. The unit becomes very hot. Ground operation should be limited to three minutes maximum to avoid damaging the heating elements.

When all passengers are on board, the pilot should check the cabin doors for proper closing and latching procedures. The rear door should be closed and the overhead latch button turned to the "LOCK" position. The front door should be gently pulled shut, the door handle firmly latched and the overhead latch button turned to the "LOCK" position. All passengers should fasten their seat belts and shoulder harnesses. Check the inertia reel by pulling sharply on the strap. Seat belts on empty seats should be snugly fastened.

4.11 BEFORE STARTING ENGINE

Before starting the engine the brakes should be set "ON" and the propeller lever moved to the full "INCREASE" RPM position. The fuel selector should then be moved to the fullest tank.

4.13 STARTING ENGINE

(a) Starting Engine When Cold

Open the throttle lever approximately 1/2 inch. Turn "ON" the master switch and the electric fuel pump. Move the mixture control to full "RICH" until an indication is noted on the fuel flow meter. The engine is now primed.

Move the mixture control to idle cut-off and engage the starter by rotating the magneto switch clockwise. When the engine fires, release the magneto switch, advance the mixture control to full "RICH" and move the throttle to the desired setting.

If the engine does not fire within five to ten seconds, disengage the starter and reprime.

(b) Starting Engine When Hot

Open the throttle approximately 1/2 inch. Turn "ON" the master switch and the electric fuel pump. Move the mixture control lever to idle cut-off and engage the starter by rotating the magneto switch clockwise. When the engine fires, release the magneto switch, advance the mixture and move the throttle to the desired setting.

(c) Starting Engine When Flooded

The throttle lever should be full "OPEN". Turn "ON" the master switch and turn "OFF" the emergnecy fuel pump. Move the mixture control lever to idle cut-off and engage the starter by rotating the magneto switch clockwise. When the engine fires, release the magneto switch, advance the mixture and retard the throttle.

(d) Starting Engine With External Power Source

An optional feature called the Piper External Power (PEP) allows the operator to use an external battery to crank the engine without having to gain access to the airplane's battery.

Turn the master switch OFF and turn all electrical equipment OFF. Connect the RED lead of the PEP kit jumper cable to the POSITIVE (+) terminal of an external 12-volt battery and the BLACK lead to the NEGATIVE (-) terminal. Insert the plug of the jumper cable into the socket located on the fuselage. Note that when the plug is inserted, the electrical system is ON. Proceed with the normal starting technique.

After the engine has started, reduce power to the lowest possible RPM, to reduce sparkin and disconnect the jumper cable from the aircraft. Turn the master switch ON and che alternator ammeter for an indication of output. DO NOT ATTEMPT FLIGHT IF THERE IS N INDICATION OF ALTERNATOR OUTPUT.

NOTE

For all normal operations using the PEP jumper cables, the master switch should be OFF, but it is possible to use the ship's battery in parallel by turning the master switch ON. This will give longer cranking capabilities, but will not increase the amperage. CAUTION: Care should be exercised because if the ship's battery has been depleted, the external power supply can be reduced to the level of the ship's battery. This can be tested by turning the master switch ON momentarily while the starter is engaged. If cranking speed increases, the ship's battery is at a higher level than the external power supply.

When the engine is firing evenly, advance the throttle to 800 RPM. If oil pressure is not indicated within thirty seconds, stop the engine and determine the trouble. In cold weather it will take a few seconds longer to get an oil pressure indication. If the engine has failed to start, refer to the Lycoming Operating Handbook, Engine Troubles and Their Remedies.

Starter manufacturers recommend that cranking periods be limited to thirty seconds with a two minute rest between cranking periods. Longer cranking periods will shorten the life of the starter.

4.15 WARM-UP

Warm-up the engine at 1000 to 1200 RPM. Avoid prolonged idling at low RPM, as this practice may result in fouled spark plugs.

Takeoff may be made as soon as the ground check is completed, provided that the throttle may be opened fully without backfiring or skipping, and without a reduction in engine oil pressure.

Do not operate the engine at high RPM when running up or taxiing over ground containing loose stones, gravel or any loose material that may cause damage to the propeller blades.

4.17 TAXIING

Before attempting to taxi the airplane, ground personnel should be instructed and approved by a qualified person authorized by the owner. Ascertain that the propeller back blast and taxi areas are clear.

Power should be applied slowly to start the taxi roll. Taxi a few feet forward and apply the brakes to determine their effectiveness. Taxi with the propeller set in low pitch, high RPM setting. While taxiing, make slight turns to ascertain the effectiveness of the steering.

Observe wing clearances when taxiing near buildings or other stationary objects. If possible, station an observer outside the airplane.

Avoid holes and ruts when taxiing over uneven ground.

Do not operate the engine at high RPM when running up or taxiing over ground containing loose stones, gravel or any loose material that may cause damage to the propeller blades.

4.19 GROUND CHECK

The magnetos should be checked at 2000 RPM with the propeller set at high RPM. Drop off on either magneto should not exceed 175 RPM and the difference between the magnetos should not exceed 50 RPM. Operation on one magneto should not exceed 10 seconds.

Check the vacuum gauge; the indicator should read 5.0" ± .1" Hg at 2000 RPM.

Check the annunciator panel lights with the press-to-test button. Also check the air conditioner and the alternate air.

The propeller control should be moved through its complete range to check for proper operation, and then placed in full "INCREASE" rpm for takeoff. To obtain maximum rpm, push the pedestal mounted control fully forward on the instrument panel. Do not allow a drop of more than 500 RPM during this check. In cold weather the propeller control should be cycled from high to low RPM at least three times before takeoff to make sure that warm engine oil has circulated.

The electric fuel pump should be turned "OFF" after starting or during warm-up to make sure that the engine driven pump is operating. Prior to takeoff the electric pump should be turned ON again to prevent loss of power during takeoff should the engine driven pump fail. Check both oil temperature and oil pressure. The temperature may be low for some time if the engine is being run for the first time of the day. The engine is warm enough for takeoff when the throttle can be opened without the engine faltering.

4.21 BEFORE TAKEOFF

All aspects of each particular takeoff should be considered prior to executing the takeoff procedure.

If the airplane is to be operated with the rear cabin door removed, it is recommended that all passengers wear parachutes.

After all aspects of the takeoff are considered, a pretakeoff check procedure must be performed.

Turn "ON" the master switch and check and set all of the flight instruments as required. Check the fuel selector to make sure it is on the proper tank (fullest). Turn "ON" the electric fuel pump and check the engine gauges. The alternate air should be in the "CLOSED" position.

All seat backs should be erect.

The mixture and propeller control levers should be set and the seat belts and shoulder harness fastened. Fasten the seat belts snugly around the empty seats.

Exercise and set the flaps and trim tab. Insure proper flight control movement and response.

All doors should be properly secured and latched.

On air conditioned models, the air conditioner must be "OFF" to insure normal takeoff performance.

4.23 TAKEOFF

The normal takeoff technique is conventional for the Cherokee Six. The tab should be set slightly aft of neutral, with the exact setting determined by the loading of the airplane. Allow the airplane to accelerate to 55 to 62 KIAS depending on the weight of the aircraft and ease back on the control wheel to rotate to climb attitude. Takeoffs are normally made with the flaps extended 10° (first notch).

Short Field, Obstacle Clearance:

Lower flaps to 25° (second notch), accelerate aircraft to 55 to 62 KIAS and ease back on the wheel to rotate. After breaking ground, accelerate to best angle of climb speed, 79 KIAS, and climb past obstacle. Continue climb and accelerate to best rate of climb speed, 89 KIAS, and slowly retract the flaps.

Short Field, No Obstacle:

Lower flaps to 25° (second notch), accelerate aircraft to 55 to 62 KIAS and ease back on the wheel to rotate. After breaking ground, accelerate to best rate of climb speed, 89 KIAS, and slowly retract the flaps while climbing out.

Soft Field, Obstacle Clearance:

Lower flaps to 25° (second notch), accelerate aircraft, pull nose gear off as soon as possible and lift off at lowest possible airspeed. Accelerate just above the ground to best angle of climb speed, 79 KIAS, to climb past obstacle clearance height. Continue climb while accelerating to best rate of climb speed, 89 KIAS, and slowly retract the flaps.

Soft Field, No Obstacle:

Lower flaps to 25° (second notch), accelerate aircraft, pull nose gear off as soon as possible and lift off at lowest possible airspeed. Accelerate just above the ground to best rate of climb speed, 89 KIAS, and climb out while slowly retracting the flaps.

4.25 CLIMB

The best rate of climb at gross weight will be obtained at 89 KIAS. The best angle of climb may be obtained at 79 KIAS. At lighter than gross weight these speeds are reduced somewhat*. For climbing en route, a speed of 100 KIAS is recommended. This will produce better forward speed and increased visibility over the nose during the climb.

When reaching the desired altitude, the electric fuel pump may be turned off.

*To obtain the performance presented in the Performance Section of this handbook, full power (full throttle and 2700 RPM) must be used.

4.27 CRUISING

The cruising speed of the Cherokee Six is determined by many factors, including power setting, altitude, temperature, loading and equipment installed in the airplane.

The normal maximum cruising power is 75% of the rated horsepower of the engine. When selecting cruising RPM below 2300, limiting manifold pressure for continuous operation, as specified by the appropriate "Avco-Lycoming Operator's Manual," should be observed.

To obtain the desired power, set the manifold pressure and RPM according to the power setting table in this manual.

Use of the mixture control in cruising flight reduces fuel consumption significantly, especially at higher altitudes. The mixture should be leaned during cruising operation above 5000 ft. altitude and at pilot's discretion at lower altitudes when 75% power or less is being used. If any doubt exists as to the amount of power being used, the mixture should be in the full "RICH" position for all operations under 5000 feet.

To lean the mixture, disengage the lock and pull the mixture control until the engine becomes rough, indicating that the lean mixture limit has been reached in the leaner cylinders. Then enrich the mixture by pushing the control towards the instrument panel until engine operation becomes smooth. The fuel flow meter will give a close approximation of the fuel being consumed. The low side of the power setting, as shown on the fuel flow meter, indicates best economy for that percent of power while the high side indicates best power.

If the airplane is equipped with the optional exhaust gas temperature (EGT) gauge, a more accurat means of leaning is available to the pilot. For this procedure, refer to the "Avco-Lycoming Operator's Manual."

For airplanes with serial numbers 32-7740001 through 32-7840202 lateral trim is best maintained by usin fuel alternately from each main tank, and when these are nearly exhausted, from each tip tank. It is recom mended that one main tank be used for one hour after takeoff, the other main tank used until nearly exhausted then return to the first main tank. When nearly exhausted, turn to one tip tank and alternate at one-half ho intervals to maintain lateral trim.

For airplanes with serial numbers 32-7940001 and up, lateral trim is best maintained by using fuel ternately from each tank at one hour intervals.

Always remember that the electric fuel pump should be turned "ON" before switching tanks, and should be left on for a short period thereafter. To preclude making a hasty selection, and to pro continuity of flow, the selector should be changed to another tank before fuel is exhausted from the in use. The electric fuel pump should be normally "OFF" so that any malfunction of the engine driven pump is immediately apparent. If signs of fuel starvation should occur at any time during flight, exhaustion should be suspected, at which time the fuel selector should be immediately positioned to tank and the electric fuel pump switched to the "ON" position. Fuel tank selection at low altitude is n recommended, since little recovery time is available in the event of an error in tank selection. switching tanks, make sure that the selector drops into a detent and is lined up with the desired tank

4.29 APPROACH AND LANDING

Check to insure the fuel selector is on the proper (fullest) tank and that the seat backs are erect. The seat belts and shoulder harness should be fastened and the inertia reel checked.

Turn "ON" the electric fuel pump and turn "OFF" the air conditioner. The mixture should be set in the full "RICH" position and the propeller at full "INCREASE" rpm to facilitate ample power for an emergency go-around.

The airplane should be trimmed to a final approach speed of 80 KIAS with flaps extended. The flaps can be lowered at speeds up to 109 KIAS, if desired.

* The amount of flap used during landings and the speed of the aircraft at contact with the runway should be varied according to the landing surface and conditions of wind and airplane loading. It is generally good practice to contact the ground at the minimum possible safe speed consistent with existing conditions.

Normally, the best technique for short and slow landings is to use full flap and enough power to maintain the desired airspeed and approach flight path. Mixture should be full "RICH," fuel on the fullest tank, and electric fuel pump "ON." Reduce the speed during the flareout and contact the ground close to the stalling speed (47 to 54 KIAS). After ground contact hold the nose wheel off as long as possible. As the airplane slows down, gently lower the nose and apply the brakes. Braking is most effective when flaps are raised and back pressure is applied to the control wheel, putting most of the aircraft weight on the main wheels. In high wind conditions, particularly in strong crosswinds, it may be desirable to approach the ground at higher than normal speeds with partial or no flaps.

4.31 STOPPING ENGINE

At the pilot's discretion, the flaps should be raised and the electric fuel pump turned "OFF."

NOTE

The flaps must be placed in the "UP" position for the flap step to support weight. Passengers should be cautioned accordingly.

The air conditioner and radios should be turned "OFF," the propeller set in the full "INCREASE" position, and the engine stopped by disengaging the mixture control lock and pulling the mixture control back to idle cut-off. The throttle should be left full aft to avoid engine vibration while stopping. Then the magneto and master switches must be turned "OFF."

4.33 PARKING

If necessary, the airplane should be moved on the ground with the aid of the nose wheel tow bar provided with each airplane and secured behind the rear seats. The parking brake should be set. The aileron and stabilator controls should be secured by looping the safety belt through the control wheel and pulling it snug. The flaps are locked when in the "UP" position and should be left retracted.

Tie downs can be secured to rings provided under each wing and to the tail skid. The rudder is held in position by its connections to the nose wheel steering and normally does not have to be secured.

4.35 STALLS

The stall characteristics of the Cherokee Six are conventional. An approaching stall is indicated by a stall warning horn which is activated between five and ten knots above stall speed. Mild airframe buffeting and gentle pitching may also precede the stall.

The gross weight stalling speed of the Cherokee Six with power off and full flaps is 47 KIAS. With the flaps up this speed is increased 7 KTS. Loss of altitude during stalls can be as great as 350 feet, depending on configuration and power.

NOTE

The stall warning system is inoperative with the master switch "OFF."

During preflight, the stall warning system should be checked by turning the master switch "ON," lifting the detector and checking to determine if the horn is actuated. The master switch should be returned to the "OFF" position after the check is complete.

4.37 TURBULENT AIR OPERATION

In keeping with good operating practice used in all aircraft, it is recommended that when turbulent air is encountered or expected, the airspeed be reduced to maneuvering speed to reduce the structural load caused by gusts and to allow for inadvertent speed build-ups which may occur as a result of the turbulence or of distractions caused by the conditions.

4.39 WEIGHT AND BALANCE

It is the responsibility of the owner and pilot to determine that the airplane remains within the allowable weight vs. center of gravity envelope while in flight.

For weight and balance data, refer to Section 6 (Weight and Balance).

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SECTION 5

PERFORMANCE

SECTION 5

PERFORMANCE

5.1 GENERAL

All of the required (FAA regulations) and complementary performance information applicable to the Cherokee Six is provided by this section.

Performance information associated with those optional systems and equipment which require handbook supplements is provided by Section 9 (Supplements).

5.3 INTRODUCTION TO PERFORMANCE AND FLIGHT PLANNING

The performance information presented in this section is based on measured Flight Test Data corrected to I.C.A.O. standard day conditions and analytically expanded for the various parameters of weight, altitude, temperature, etc.

The performance charts are unfactored and do not make any allowance for varying degrees of pilot proficiency or mechanical deterioration of the aircraft. This performance, however, can be duplicated by following the stated procedures in a properly maintained airplane.

Effects of conditions not considered on the charts must be evaluated by the pilot, such as the effect of soft or grass runway surface on takeoff and landing performance, or the effect of winds aloft on cruise and range performance. Endurance can be grossly affected by improper leaning procedures, and inflight fuel flow and quantity checks are recommended.

REMEMBER! To get chart performance, follow the chart procedures.

The information provided by paragraph 5.5 (Flight Planning Example) outlines a detailed flight plan using the performance charts in this section. Each chart includes its own example to show how it is used.

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5.5 FLIGHT PLANNING EXAMPLE

(a) Aircraft Loading

The first step in planning our flight is to calculate the airplane weight and center of gravity by utilizing the information provided by Section 6 (Weight and Balance) of this handbook.

The basic empty weight for the airplane as delivered from the factory has been entered in Figure 6-5. If any alterations to the airplane have been made effecting weight and balance, reference to the aircraft logbook and Weight and Balance Record (Figure 6-7) should be made to determine the current basic empty weight of the airplane.

Make use of the Weight and Balance Loading Form (Figure 6-11) and the C.G. Range and Weight graph (Figure 6-15) to determine the total weight of the airplane and the center of gravity position.

After proper utilization of the information provided we have found the following weights for consideration in our flight planning example.

The landing weight cannot be determined until the weight of the fuel to be used has been established [refer to item (g)(1)] .

(1)	Basic Empty Weight	1954.8 lbs.
(2)	Occupants	1020 lbs.
(3)	Baggage and Cargo	100 lbs.
(4)	Fuel (6 lb./gal. x 54)	324 lbs.
(5)	Takeoff Weight	3398.8 lbs.
(6)	Landing Weight (a)(5) minus (g)(1), (3398.8 lbs. minus 213.6 lbs.)	3185.2 lbs.

Our takeoff weight is below the maximum of 3400 lbs. and our weight and balance calculations have determined our C.G. position within the approved limits.

(b) Takeoff and Landing

Now that we have determined our aircraft loading, we must consider all aspects of our takeoff and landing.

All of the existing conditions at the departure and destination airport must be acquired, evaluated and maintained throughout the flight.

Apply the departure airport conditions and takeoff weight to the appropriate Takeoff Performance graph (Figures 5-5, 5-7, 5-9 and 5-11) to determine the length of runway necessary for the takeoff and/or the barrier distance.

The landing distance calculations are performed in the same manner using the existing conditions at the destination airport and, when established, the landing weight.

The conditions and calculations for our example flight are listed below. The takeoff and landing distances required for our example flight have fallen well below the available runway lengths.

	Departure Airport	Destination Airport
(1) Pressure Altitude	1000 ft.	3000 ft.
(2) Temperature	70°F	60°F
(3) Wind Component	0 KTS	15 KTS Hdwind
(4) Runway Length Available	3600 ft.	7600 ft.
(5) Runway Required		
Ground Roll	1275 ft.*	560 ft.**
Total	1900 ft.*	840 ft.***

NOTE

The remainder of the performance charts used in this flight plan example assume a no wind condition. The effect of winds aloft must be considered by the pilot when computing climb, cruise and descent performance.

(c) Climb

The next step in our flight plan is to determine the necessary climb segment components.

The desired cruise pressure altitude and corresponding cruise outside air temperature va... are the first variables to be considered in determining the climb components from the Time, Distance, and Fuel to Climb graph (Figure 5-15). After the time, distance and fuel for the cruise pressure altitude and outside air temperature values have been established, apply the existing conditions at the departure field to graph (Figure 5-15). Now, subtract the values obtained fro... the graph for the field of departure conditions from those for the cruise pressure altitude.

The remaining values are the true time, distance and fuel components for the climb segm... of the flight plan corrected for field pressure altitude and temperature.

The following values were determined from the above instructions in our flight plan... example:

(1) Cruise Pressure Altitude	7000 ft.
(2) Cruise OAT	7.5 min.
(3) Time to Climb (9.0 min. minus 1.5 min.)	12.5 nautical mi...
(4) Distance to Climb (15.5 nautical miles minus 3.0 nautical miles)	3...
(5) Fuel to Climb (3.5 gal. minus 0.5 gal.)	

*reference Figure 5-5
**reference Figure 5-47
***reference Figure 5-45

(d) Descent

The descent data will be determined prior to the cruise data to provide the descent distance for establishing the total cruise distance.

Utilizing the cruise pressure altitude and OAT we determine the basic time, distance and fuel for descent (Figure 5-41). These figures must be adjusted for the field pressure altitude and temperature at the destination airport. To find the necessary adjustment values, use the existing pressure altitude and temperature conditions at the destination airport as variables to find the time, distance and fuel values from the graph (Figure 5-41). Now, subtract the values obtained from the field conditions from the values obtained from the cruise conditions to find the true time, distance and fuel values needed for the flight plan.

The values obtained by proper utilization of the graphs for the descent segment of our example are shown below.

(1) Time to Descend (15.5 min. minus 8.0 min.)	7.5 min.
(2) Distance to Descend (39 nautical miles minus 19 nautical miles)	20 nautical miles
(3) Fuel to Descend (4.5 gal. minus 2.5 gal.)	2.0 gal.

(e) Cruise

Using the total distance to be traveled during the flight, subtract the previously calculated distance to climb and distance to descend to establish the total cruise distance. Refer to the appropriate Avco Lycoming Operator's Manual and the Power Setting Table (Figure 5-17) when selecting the cruise power setting. The established pressure altitude and temperature values and the selected cruise power should now be utilized to determine the true airspeed from the appropriate Cruise Performance graph (Figure 5-19, 5-21, 5-23, 5-25 or 5-27).

Calculate the cruise fuel flow for the cruise power setting from the information provided by the Avco Lycoming Operator's Manual.

The cruise time is found by dividing the cruise distance by the cruise speed and the cruise fuel is found by multiplying the cruise fuel flow by the cruise time.

The cruise calculations established for the cruise segment of our flight planning example are as follows:

(1) Total Distance	300 nautical miles
(2) Cruise Distance (e)(1) minus (c)(4) minus (d)(2), (300 nautical miles minus 12.5 nautical miles minus 20 nautical miles)	267.5 nautical miles
(3) Cruise Power	65% rated power
(4) Cruise Speed	139 KTS TAS*
(5) Cruise Fuel Consumption	16.1 GPH
(6) Cruise Time (e)(2) divided by (e)(4), (267.5 nautical miles divided by 139 KTS)	1.9 hrs. (1 hr., 54 min.)
(7) Cruise Fuel (e)(5) multiplied by (e)(6), (16.1 GPH multiplied by 1.9 hrs.)	30.6 gal.

*reference Figure 5-19

(f) Total Flight Time

The total flight time is determined by adding the time to climb, the time to descend and the cruise time. Remember! The time values taken from the climb and descent graphs are in minutes and must be converted to hours before adding them to the cruise time.

The following flight time is required for our flight planning example.

(1) Total Flight Time — 2.15 hrs. (2 hrs.,9 min.)
(c)(3) plus (d)(1) plus (e)(6),(125 hrs. plus .125 hrs. plus 1.9 hrs.)
(7.5 min. plus 7.5 min. plus 1 hr., 54 min.)

(g) Total Fuel Required

Determine the total fuel required by adding the fuel to climb, the fuel to descend and the cruise fuel. When the total fuel (in gallons) is determined, multiply this value by 6 lb./gal. to determine the total fuel weight used for the flight.

The total fuel calculations for our example flight plan are shown below.

(1) Total Fuel Required — 35.6 gal. / 213.6 lbs.
(c)(5) plus (d)(3) plus (e)(7), (3.0 gal. plus 2.0 gal. plus 30.6 gal.)
(35.6 gal. multiplied by 6 lb./gal.)

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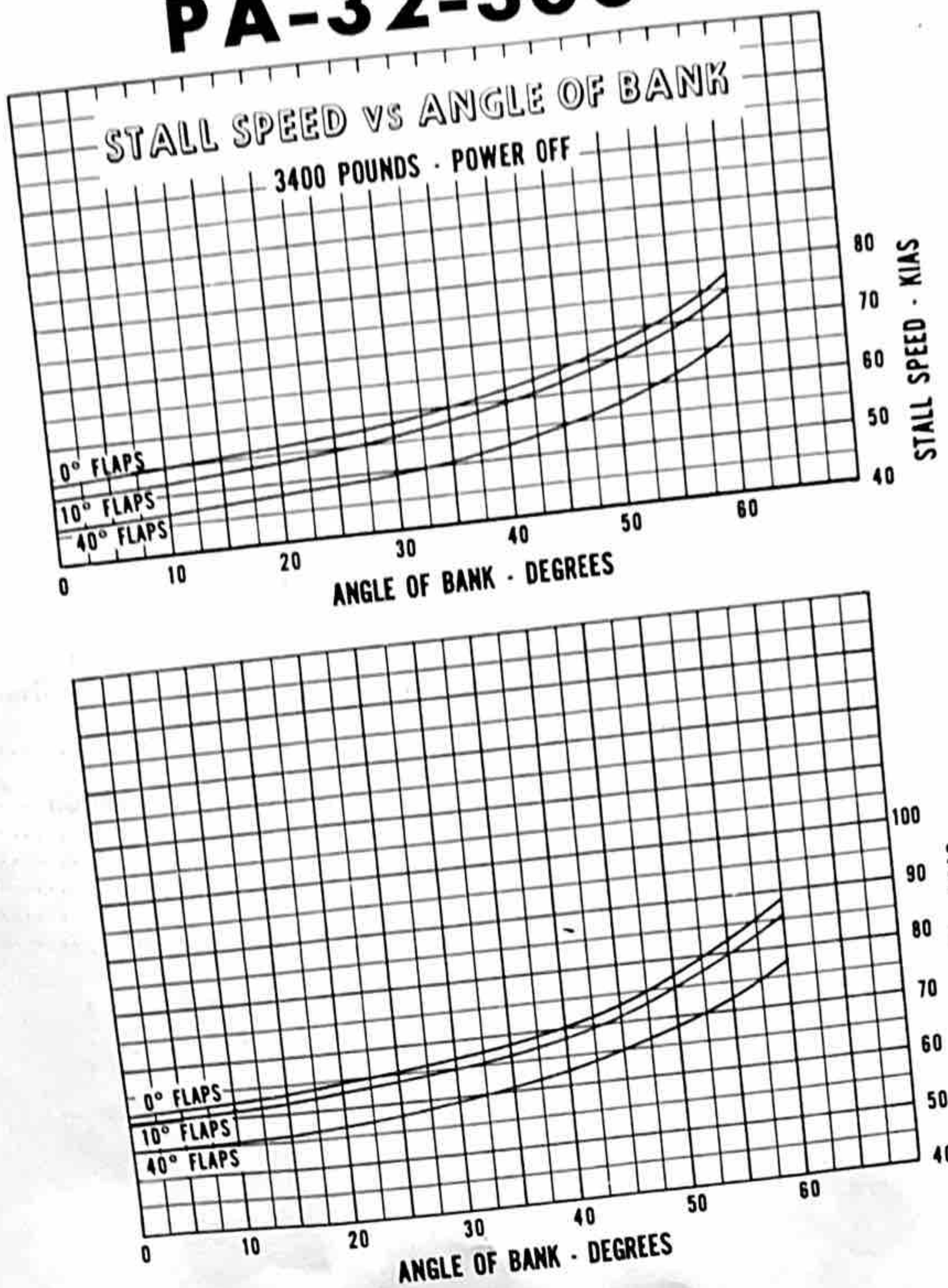
5.7 PERFORMANCE GRAPHS

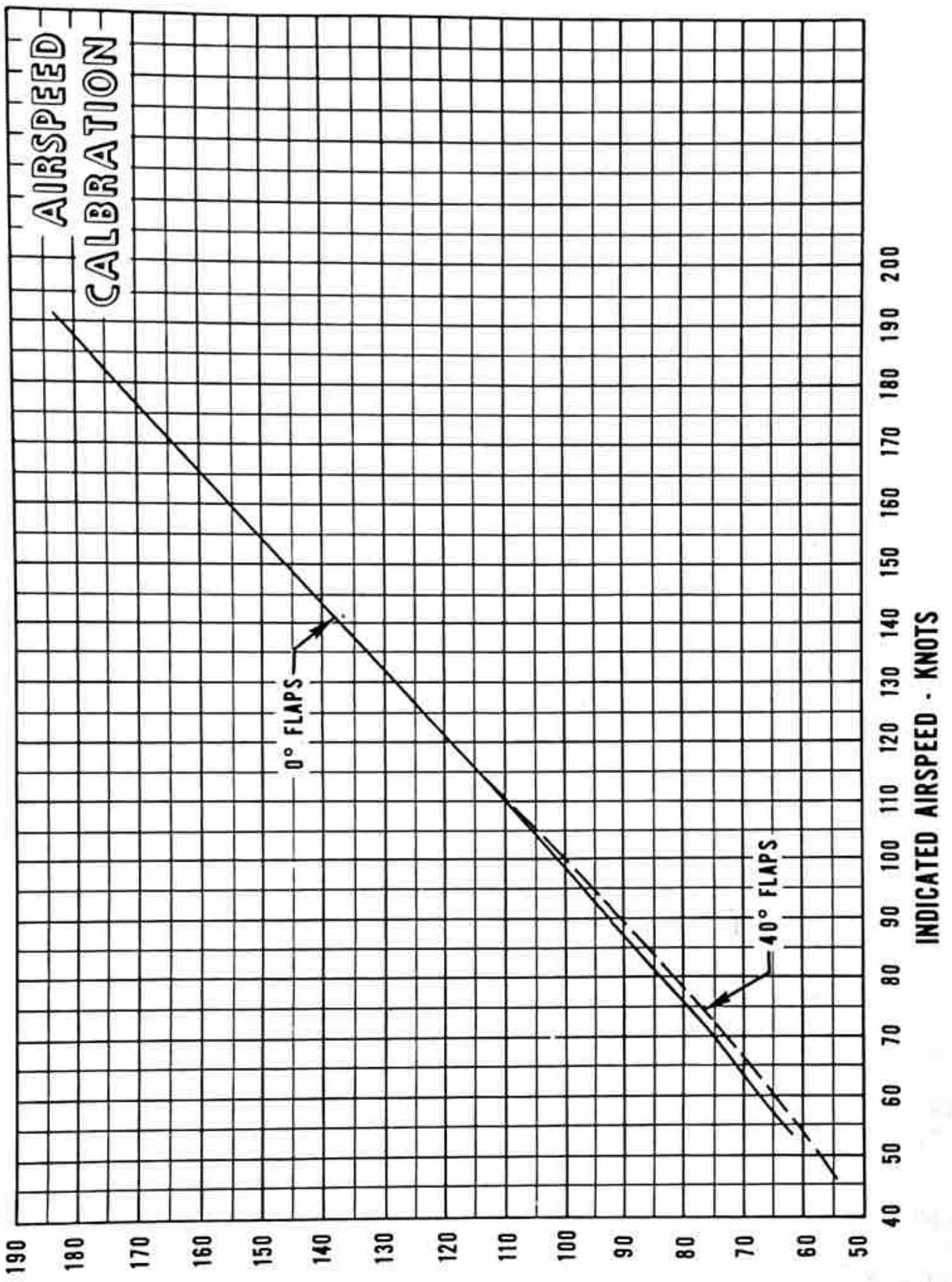
LIST OF FIGURES

PA-32-300



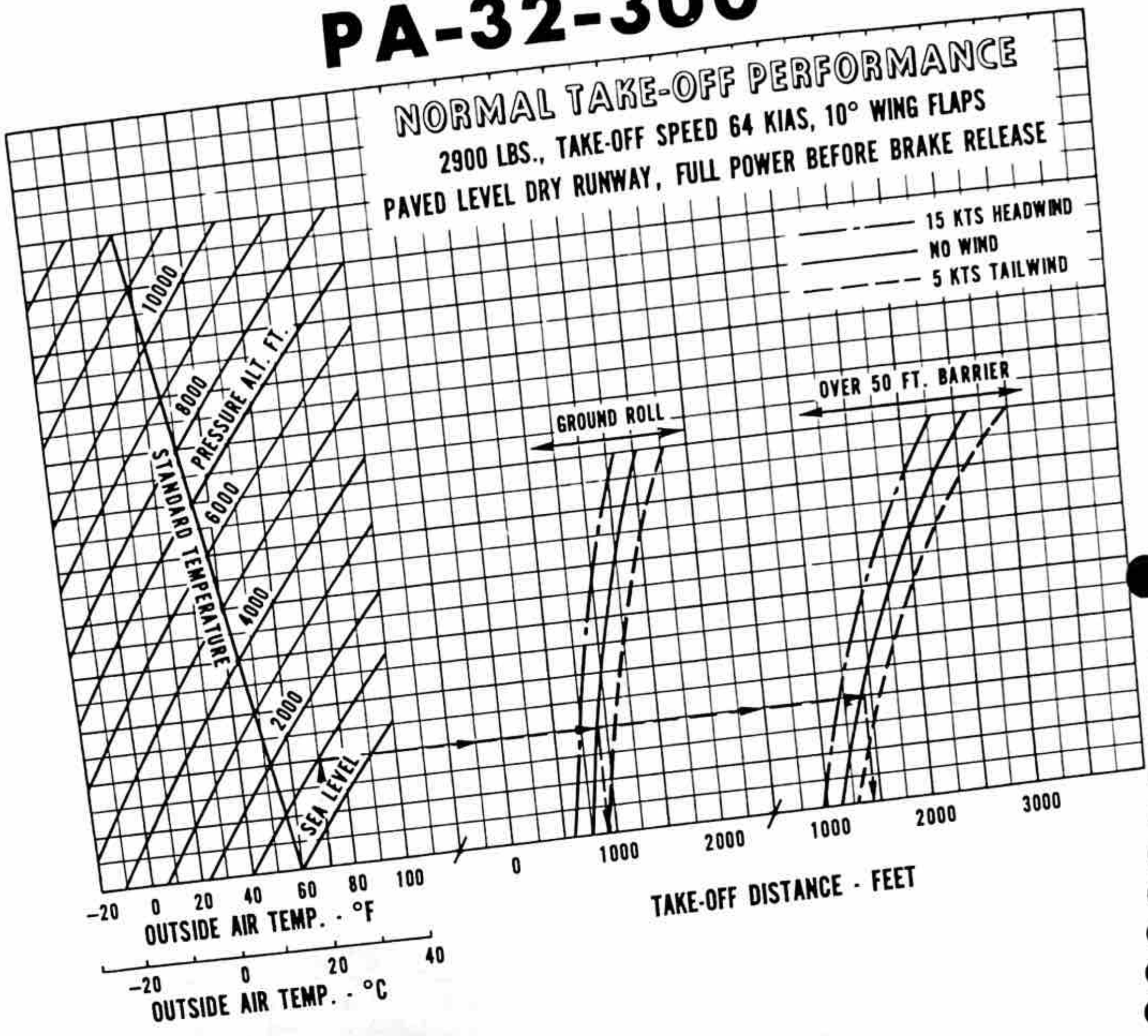
STALL SPEED VS ANGLE OF BANK

Figure 5-3



AIRSPEED CALIBRATION

Figure 5-1

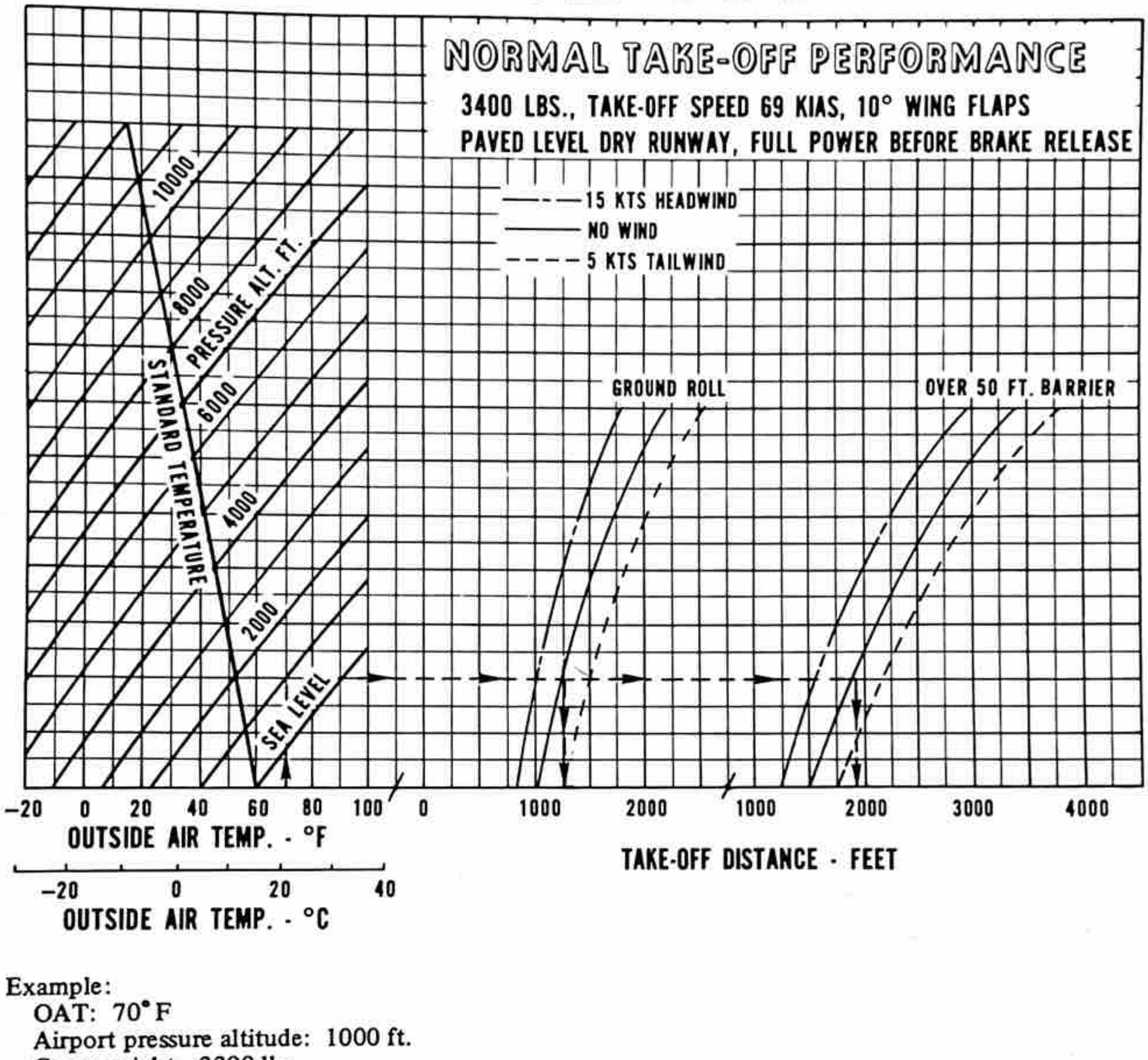


Example:
OAT: 70° F
Airport pressure altitude: 1000 ft.
Gross weight: 2900 lbs.
Wind component: 0 knots
Ground roll: 900 ft.
Distance over 50 ft. barrier: 1400 ft.

NORMAL TAKEOFF PERFORMANCE (2900 LBS.)
Figure 5-7

AIRPORT: VB-830

PA-32-300

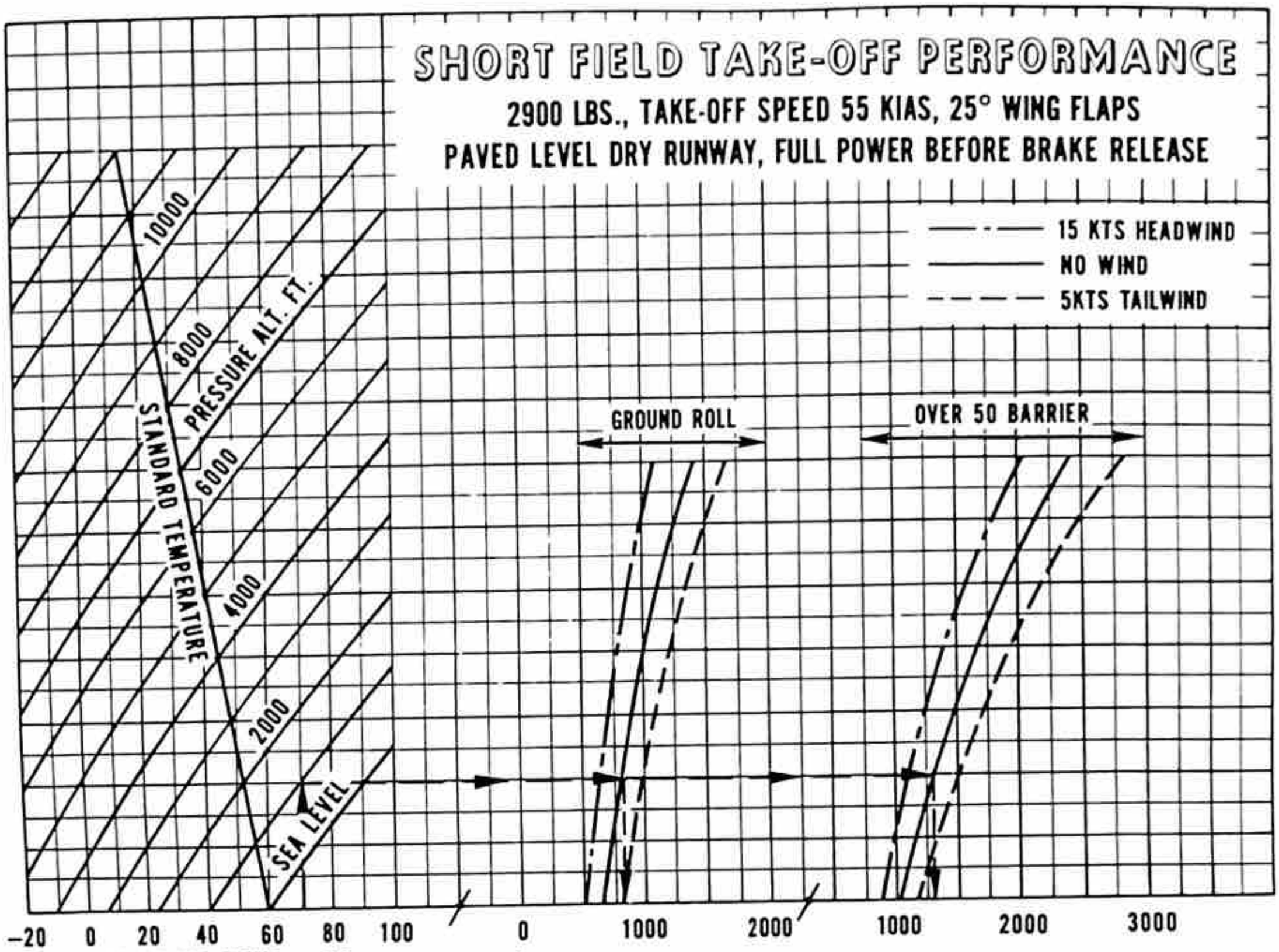


Example:
OAT: 70° F
Airport pressure altitude: 1000 ft.
Gross weight: 3399 lbs.
Wind component: 0 knots
Ground roll: 1250 ft.
Distance over 50 ft. barrier: 1900 ft.

NORMAL TAKEOFF PERFORMANCE (3400 LBS.)

Figure 5-5

PA-32-300

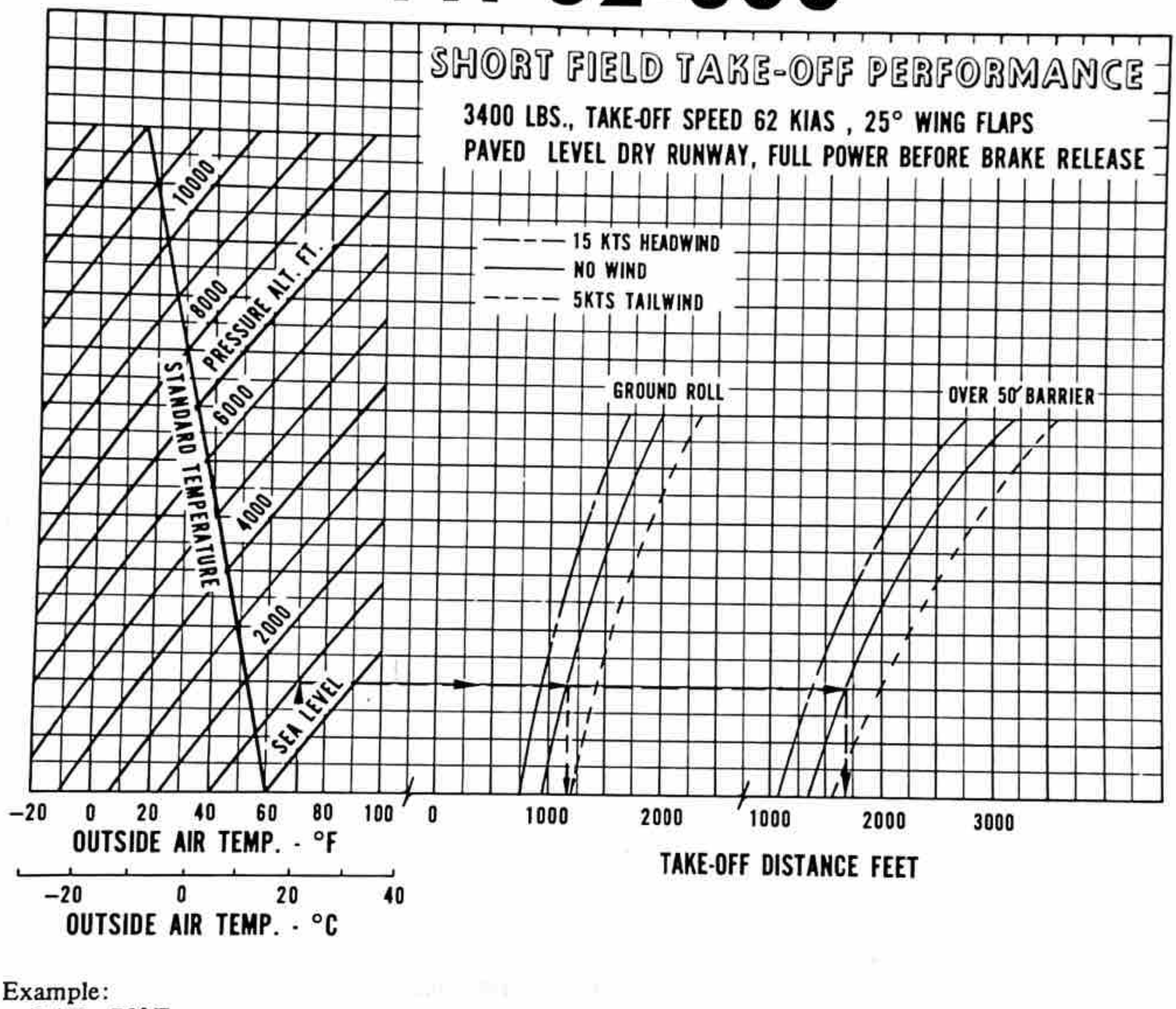


Example:
OAT: 70° F
Airport pressure altitude: 1000 ft.
Gross weight: 2900 lbs.
Wind component: 0 knots
Ground roll: 800 ft.
Distance over 50 ft. barrier: 1300 ft.

SHORT FIELD TAKEOFF PERFORMANCE (2900 LBS.)

Figure 5-11

PA-32-300

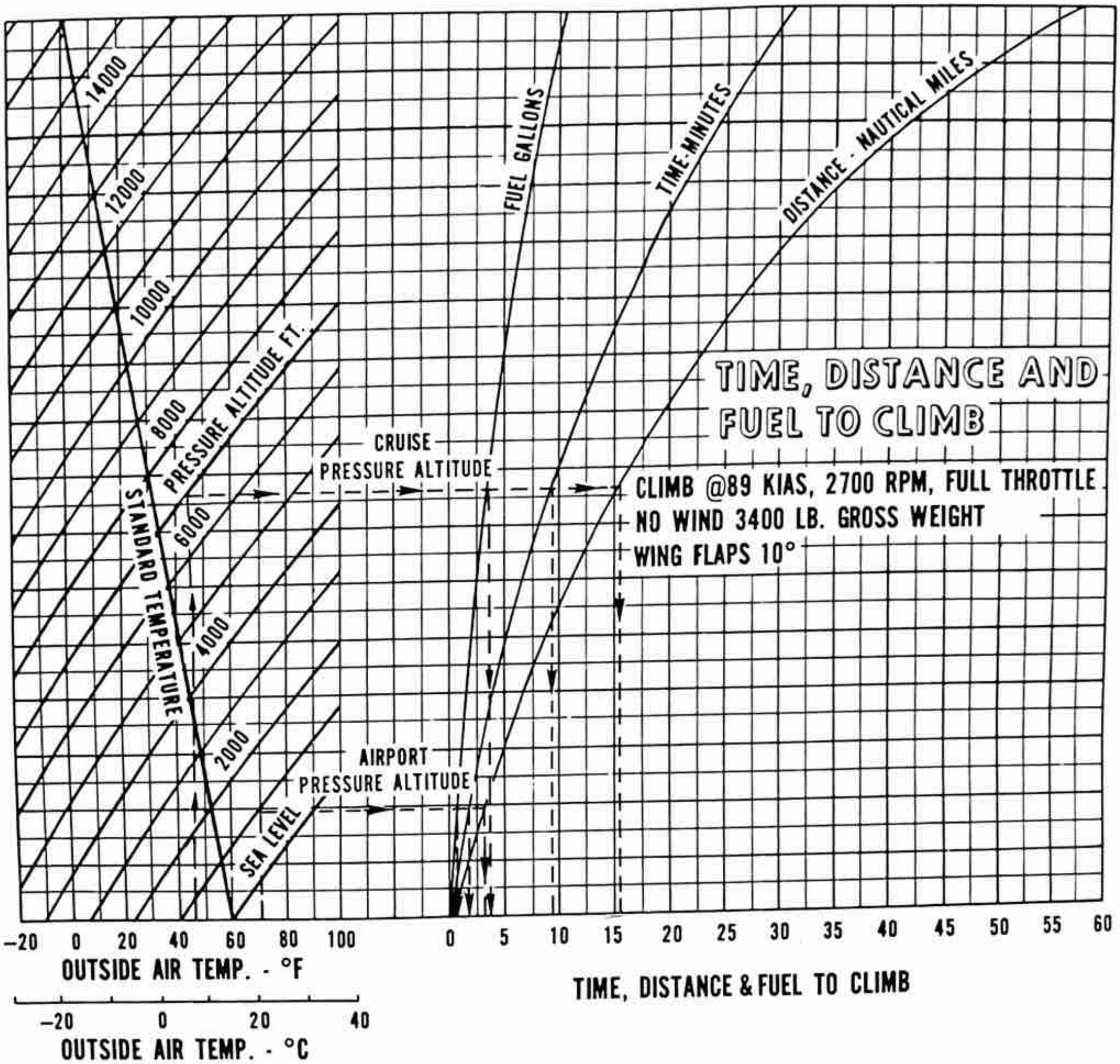


Example:
OAT: 70° F
Airport pressure altitude: 1000 ft.
Gross weight: 3400 lbs.
Wind component: 0 knots
Ground roll: 1200 ft.
Distance over 50 ft. barrier: 1700 ft.

SHORT FIELD TAKEOFF PERFORMANCE (3400 LBS.)

Figure 5-9

PA-32-300



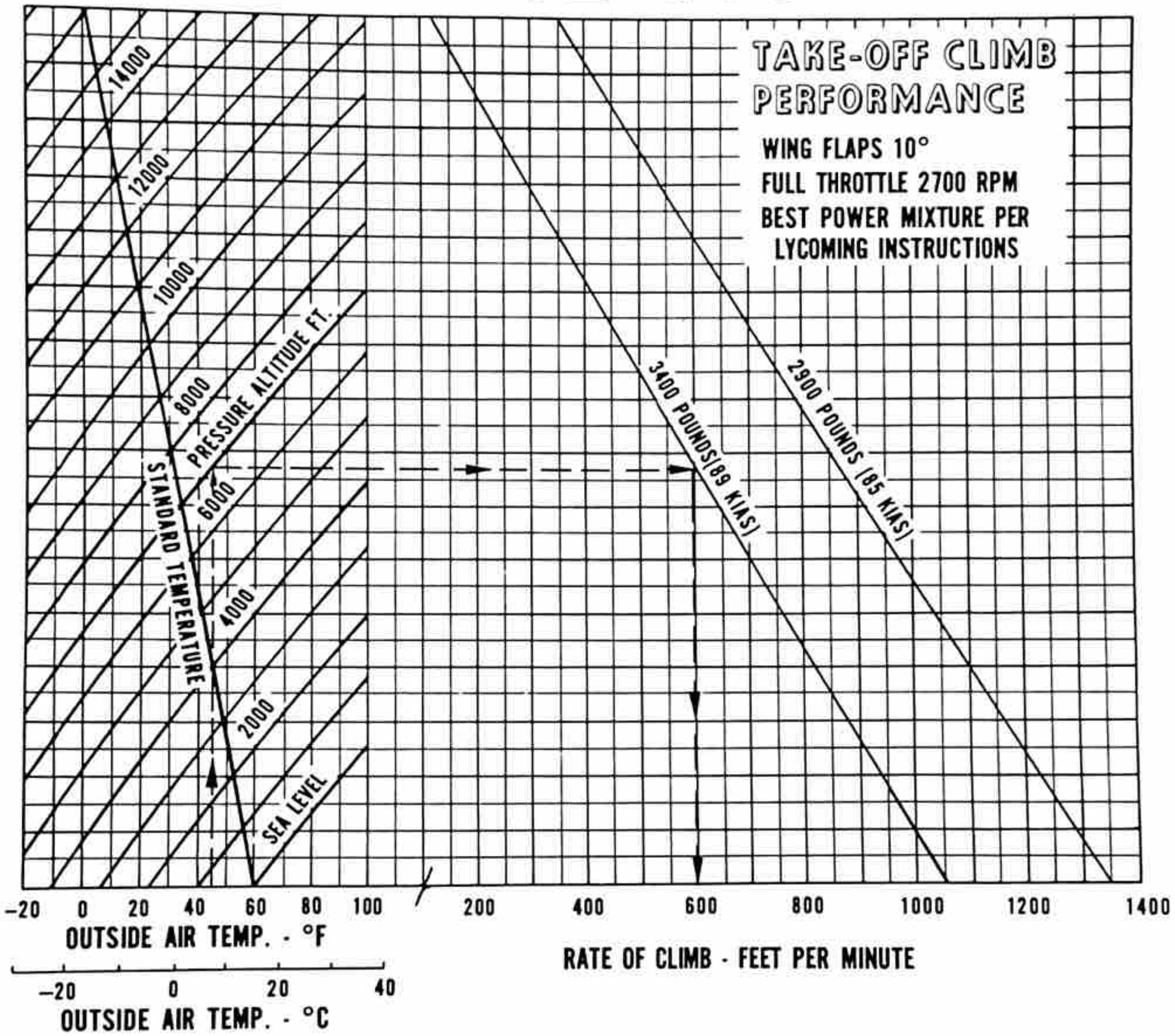
Example:
Departure airport pressure altitude: 1000 ft.
Departure airport temperature: 70°F
Cruise pressure altitude: 7000 ft.

Cruise OAT: 45°F
Time to climb: (9 min. minus 1.5 min.) = 7.5 min.
Distance to climb: (15.5 miles minus 3 miles) = 12.5 miles
Fuel to climb: (3.5 gal. minus .5 gal.) = 3.0 gal.

TIME, DISTANCE AND FUEL TO CLIMB

Figure 5-15

PA-32-300



Example:
Climb pressure altitude: 7000 ft.
OAT: 45° F
Gross weight: 3400 lbs.
Rate of climb: 600 F.P.M.

Note: On serial numbers 32-7840001 and up, reduce rate of climb by 27 F.P.M. when the wheel fairings are removed.

TAKEOFF CLIMB PERFORMANCE

Figure 5-13

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Power Setting Table - Lycoming Model IO-540-K,-L,-M Series, 300 HP Engine

Press. Alt Feet	Std Alt Temp °F	165 HP – 55% Rated RPM AND MAN. PRESS. 2100	2200	2300	2400	195 HP – 65% Rated RPM AND MAN. PRESS. 2100	2200	2300	2400	225 HP – 75% Rated RPM AND MAN. PRESS. 2200	2300	2400	Press. Alt Feet
SL	59	22.5	21.8	21.2	20.7	25.6	24.7	23.8	23.2	27.6	26.6	25.8	SL
1,000	55	22.3	21.6	21.0	20.5	25.3	24.4	23.5	22.9	27.3	26.3	25.5	1,000
2,000	52	22.1	21.4	20.7	20.2	25.1	24.2	23.3	22.7	27.1	26.1	25.2	2,000
3,000	48	21.9	21.2	20.5	20.0	24.8	23.9	23.0	22.5	26.8	25.8	24.9	3,000
4,000	45	21.7	21.0	20.3	19.8	24.6	23.7	22.8	22.2	26.5	25.6	24.6	4,000
5,000	41	21.5	20.8	20.1	19.6	24.3	23.5	22.5	22.0	–	25.3	24.4	5,000
6,000	38	21.3	20.6	19.8	19.3	24.0	23.2	22.3	21.7	–	25.0	24.1	6,000
7,000	34	21.0	20.4	19.6	19.1	23.7	22.9	22.0	21.5	–	–	23.8	7,000
8,000	31	20.8	20.2	19.4	18.9	–	22.5	21.8	21.2				8,000
9,000	27	20.6	20.0	19.2	18.6	–	–	21.5	21.0				9,000
10,000	23	20.4	19.8	19.0	18.4	–	–	21.2	20.7				10,000
11,000	19	20.2	19.6	18.7	18.2	–	–	–	20.4				11,000
12,000	16	20.0	19.4	18.5	18.0								12,000
13,000	12	–	19.2	18.3	17.7								13,000
14,000	9	–	–	18.0	17.3								14,000
15,000	5	–	–	–	16.9								15,000

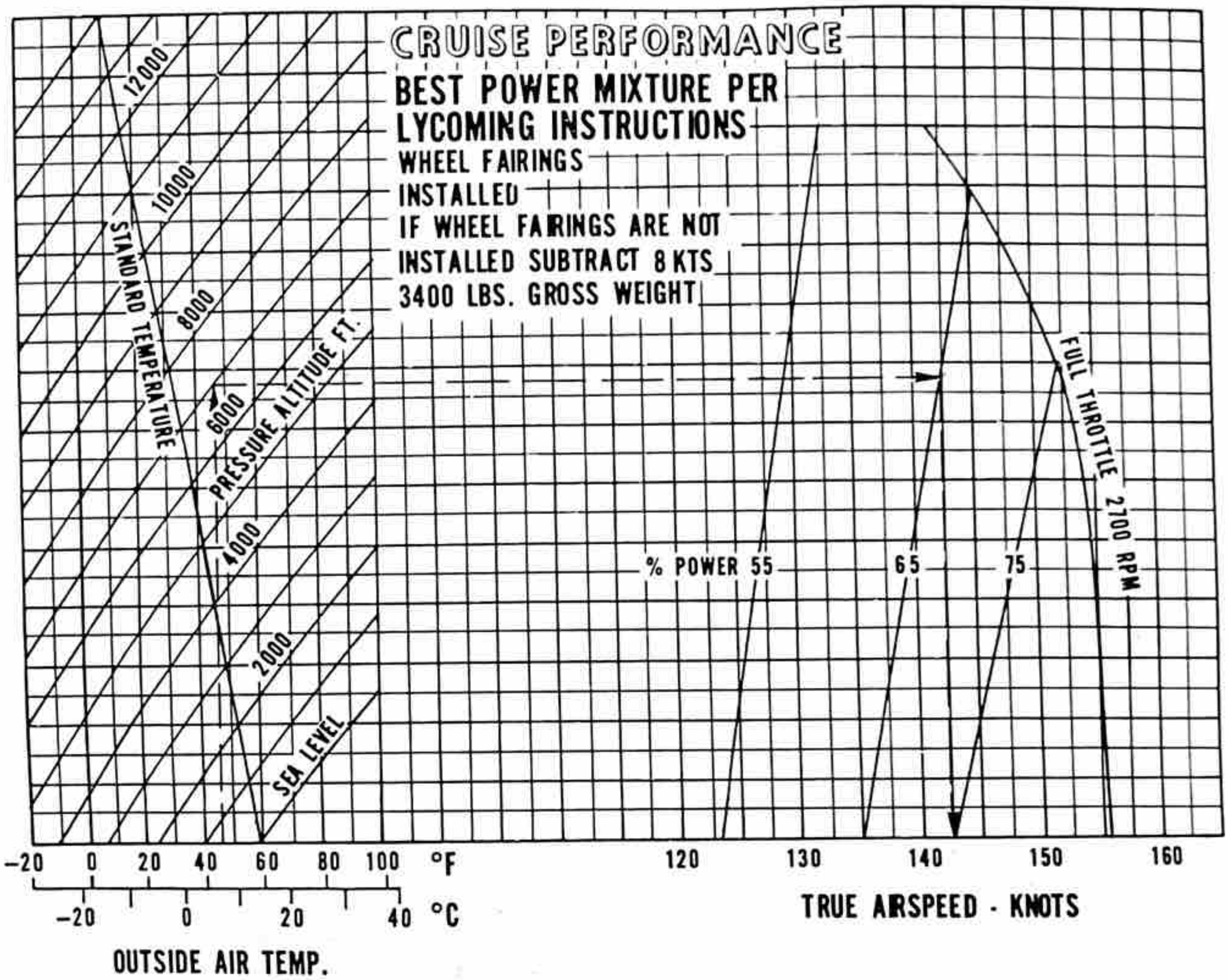
To maintain constant power, correct manifold pressure approximately 0.18" Hg for each 10° F variation in induction air temperature from standard altitude temperature. Add manifold pressure for air temperature above standard; subtract for temperature below standard.

NOTE: Full throttle manifold pressure values may not be obtainable when atmospheric conditions are non-standard.

POWER SETTING TABLE

Figure 5-17

PA-32-300

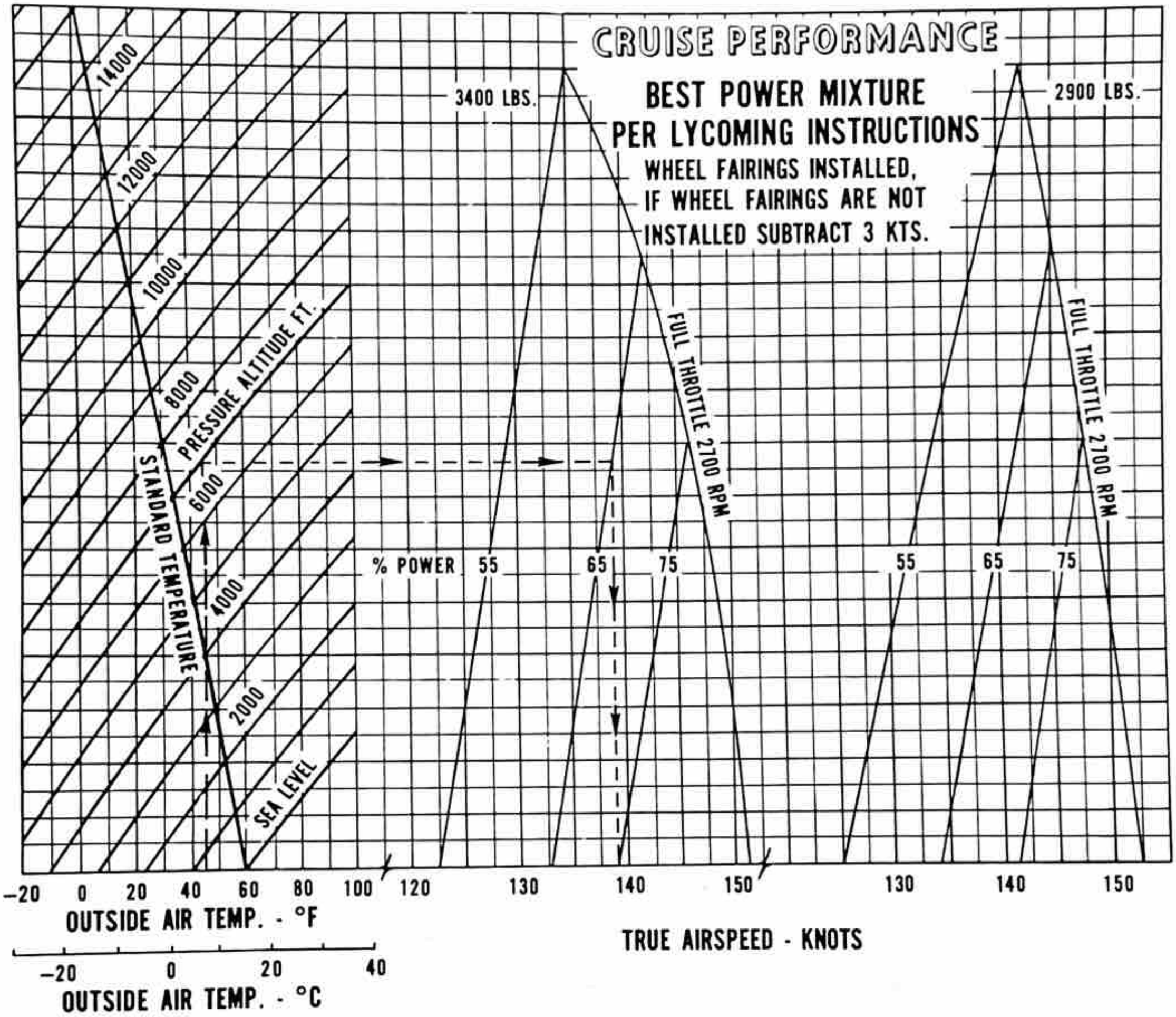


Example:
Cruise pressure altitude: 7000 ft.
Cruise OAT: 45° F
Gross weight: 3400 lbs.
Power: 65%
True airspeed: 142.5 knots

CRUISE PERFORMANCE - BEST POWER (3400 LBS.) (SERIAL NOS. 32-7840001 AND UP)

Figure 5-21

PA-32-300

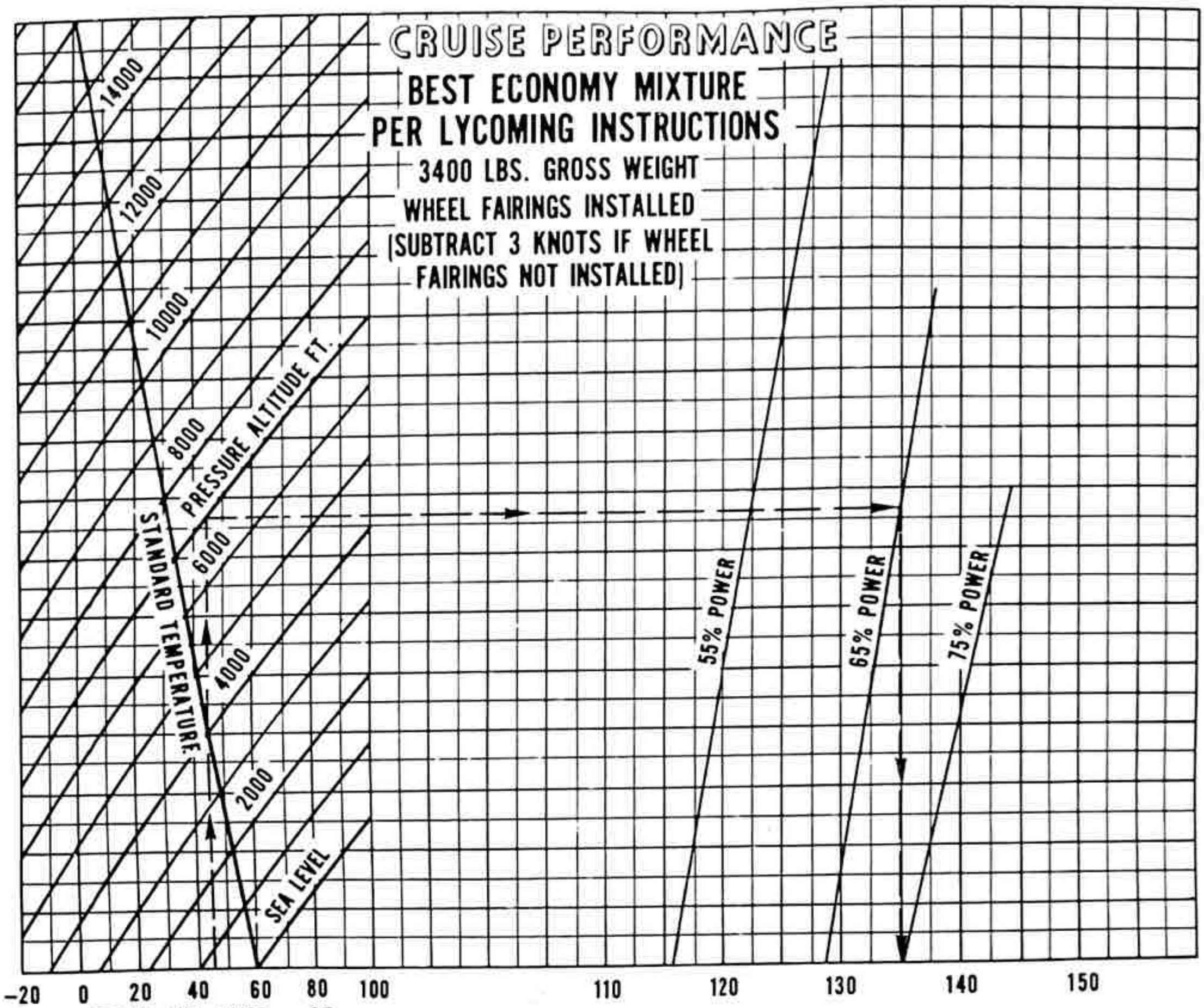


Example:
Cruise pressure altitude: 7000 ft.
Cruise OAT: 45°F
Gross weight: 3400 lbs.
Power: 65%
True airspeed: 139 knots

CRUISE PERFORMANCE - BEST POWER (3400 LBS., 2900 LBS.)
(SERIAL NUMBERS 32-7740001 THROUGH 32-7740113)

Figure 5-19

PA-32-300

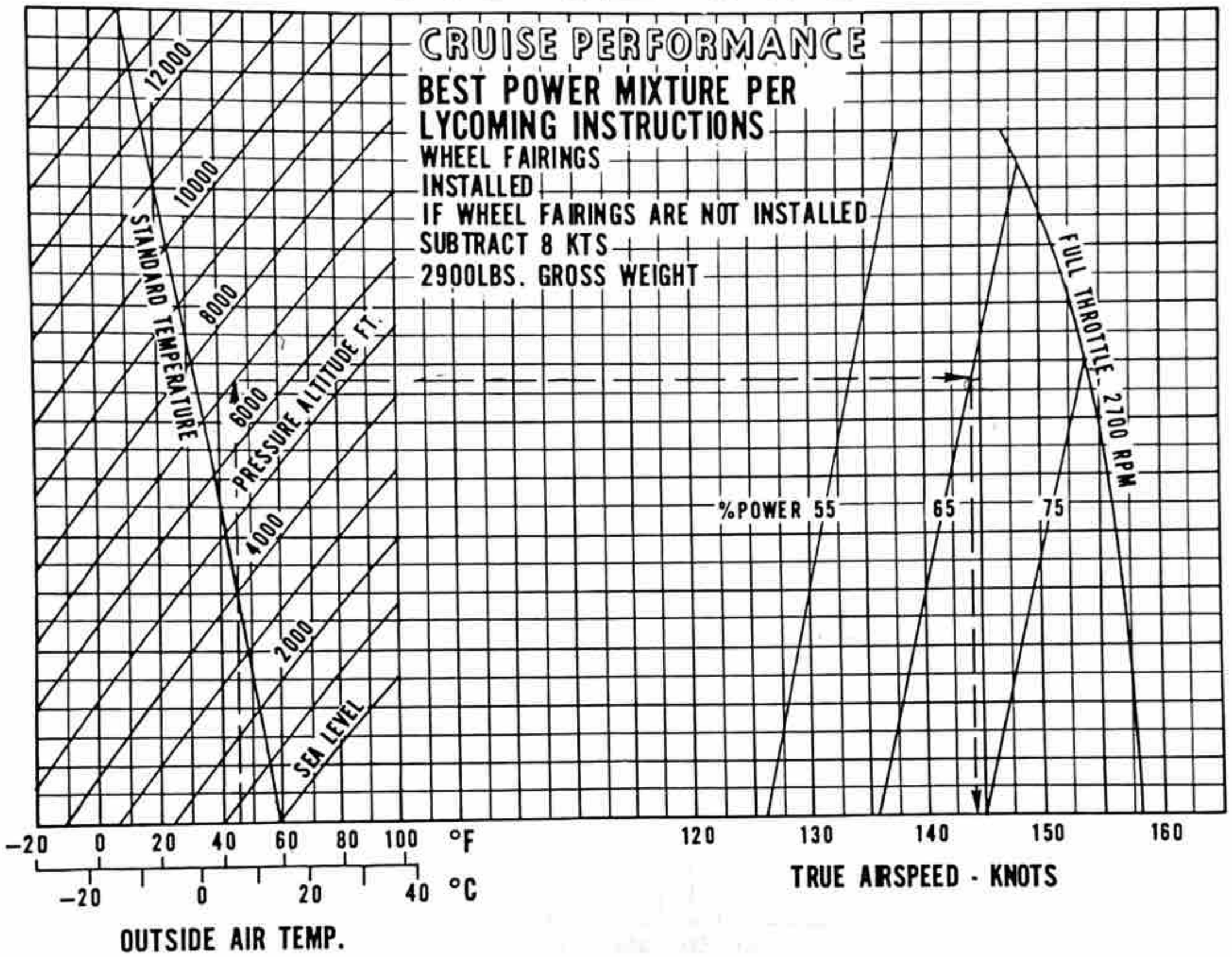


Example:
Cruise pressure altitude: 7000 ft.
Cruise OAT: 45°F
Power: 65%
True airspeed: 135 knots

CRUISE PERFORMANCE - BEST ECONOMY (SERIAL NOS. 32-7740001 THROUGH 32-7740113)

Figure 5-25

PA-32-300

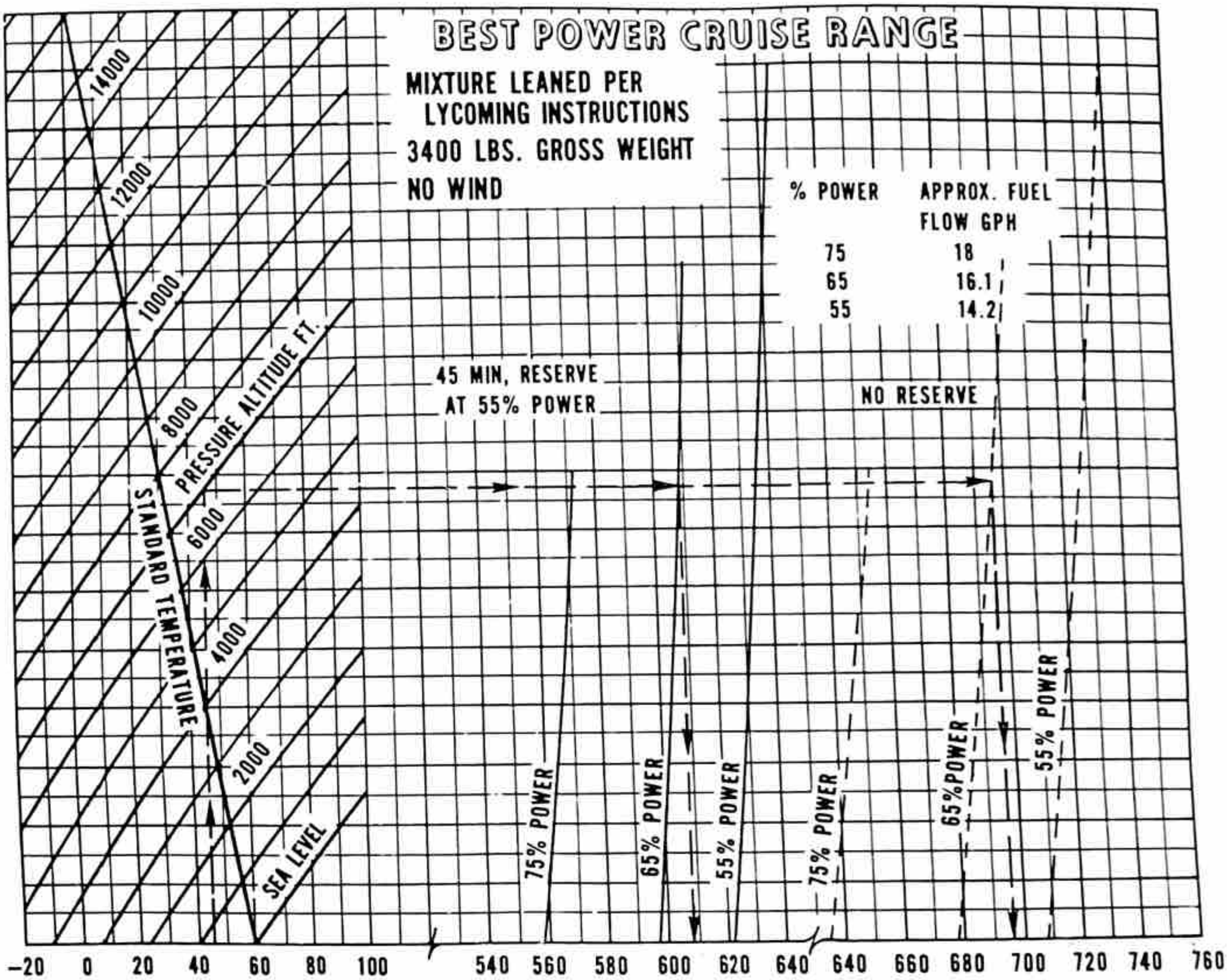


Example:
Cruise pressure altitude: 7000 ft.
Cruise OAT: 45 ° F
Gross weight: 2900 lbs.
Power: 65%
True airspeed: 143.5 knots

CRUISE PERFORMANCE - BEST POWER (2900 LBS) (SERIAL NOS. 32-7840001 AND UP)

Figure 5-23

PA-32-300



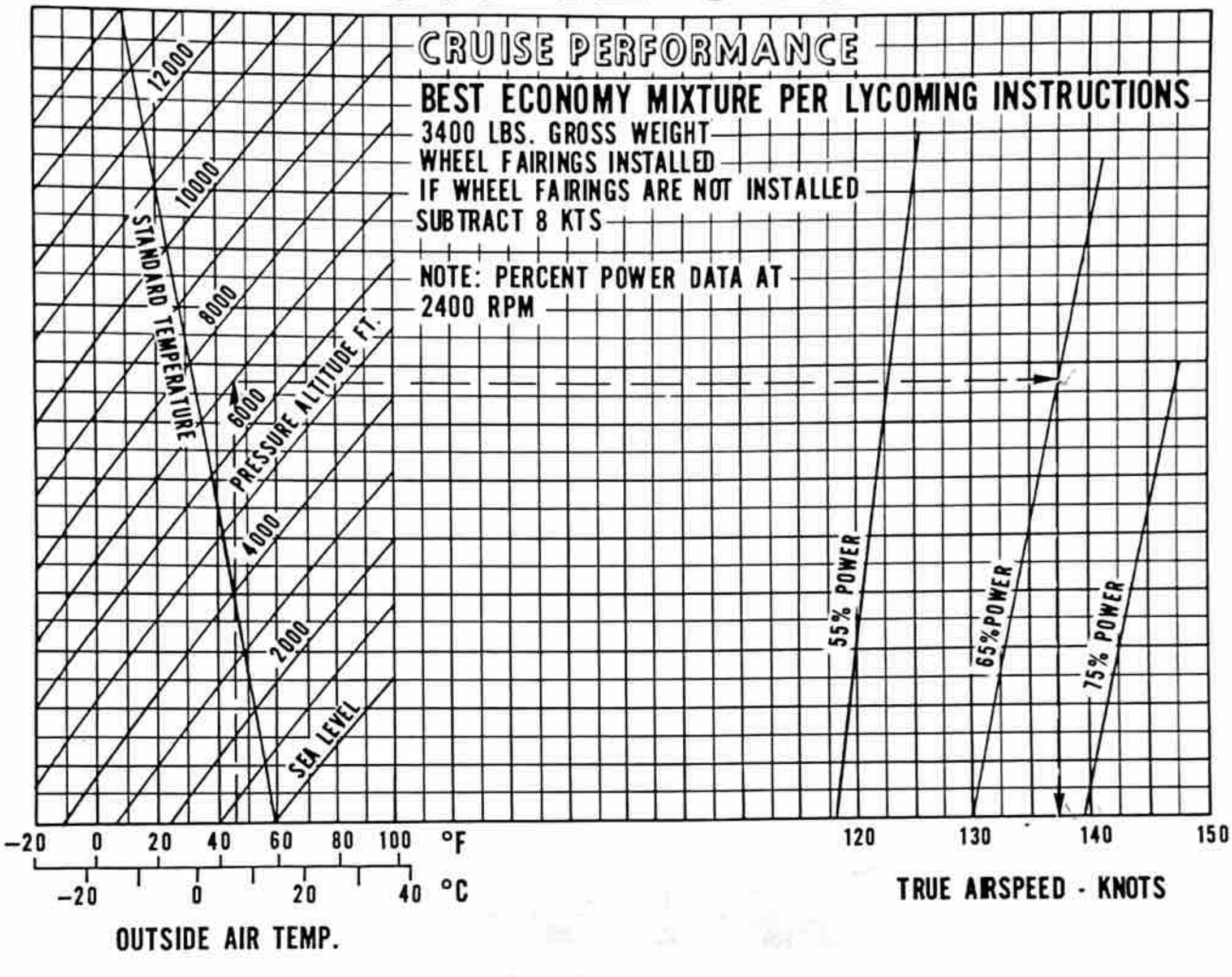
Example:
Cruise pressure altitude: 7000 ft.
Cruise OAT: 45°F
Power: 65%
Range (with reserve): 608 nautical miles
Range (no reserve): 696 nautical miles

Note: Range may be reduced by up to 3% if wheel fairings are not installed.

BEST POWER CRUISE RANGE (SERIAL NOS. 32-7740001 THROUGH 32-7740113)

Figure 5-29

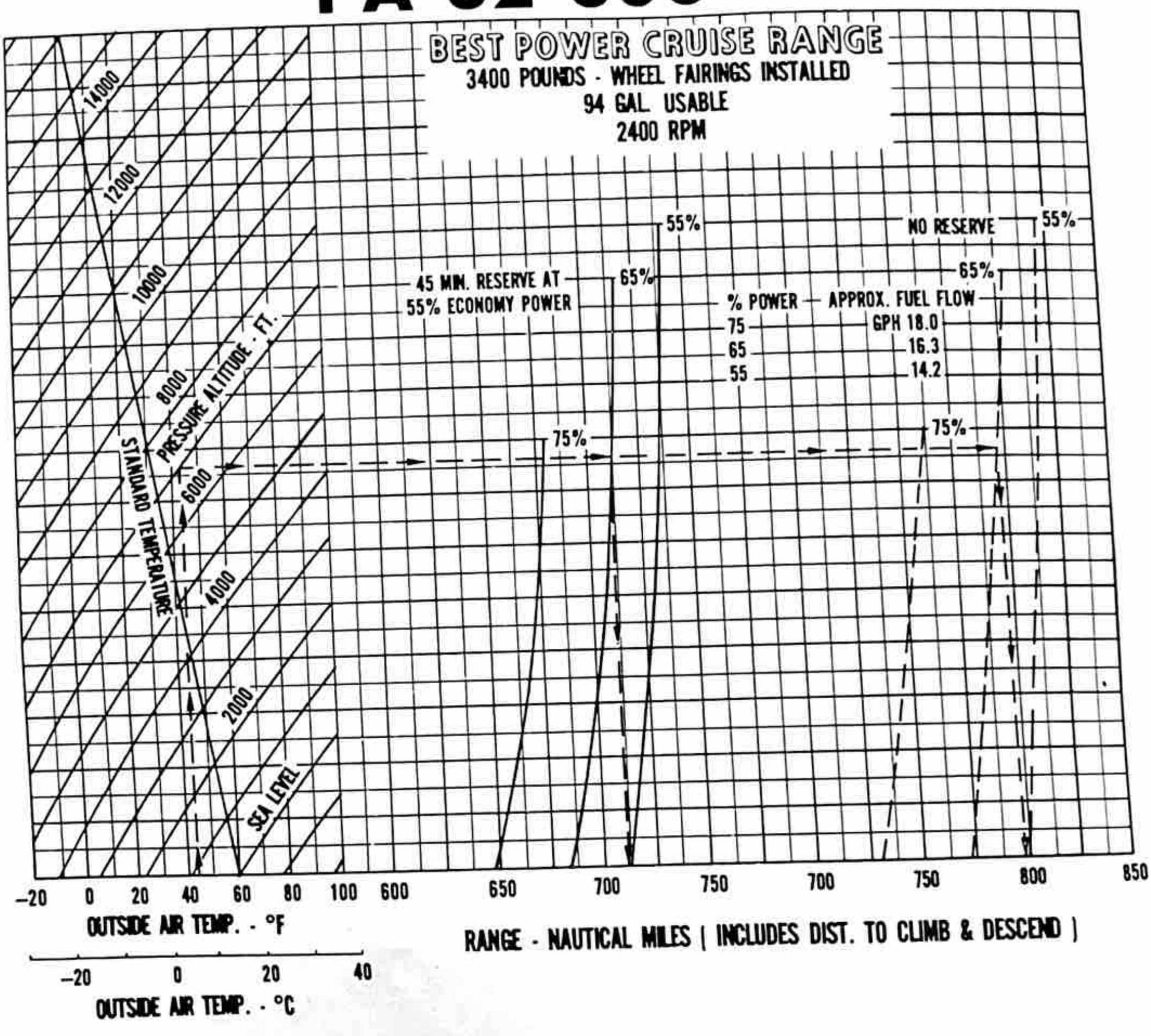
PA-32-300



Example:
Cruise pressure altitude: 7000 ft.
Cruise OAT: 45 °F
Power: 65%
True airspeed: 137.5 knots

CRUISE PERFORMANCE - BEST ECONOMY (SERIAL NOS. 32-7840001 AND UP)

Figure 5-27

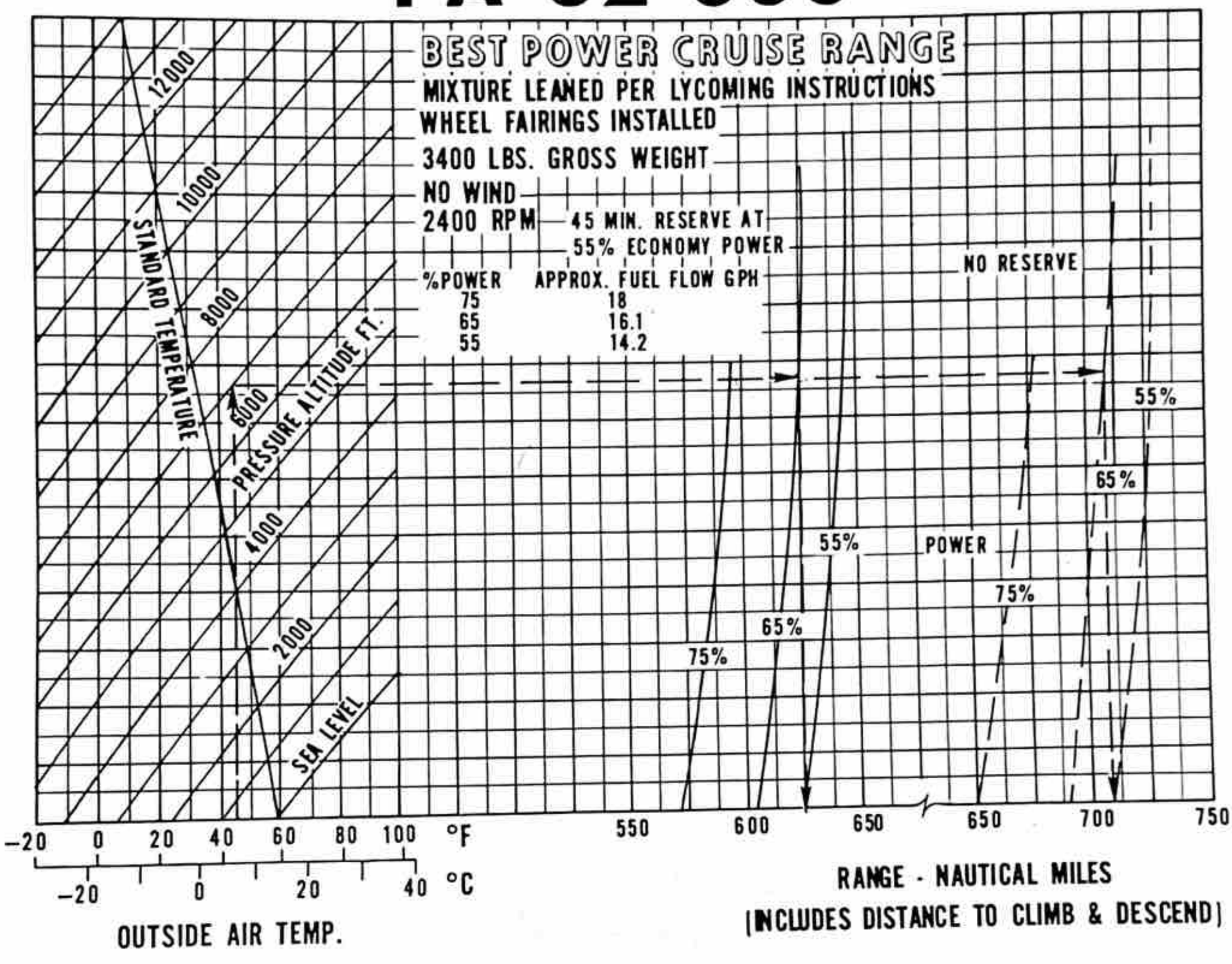


Note: Range may be reduced by up to 7% if wheel fairings are not installed.

BEST POWER CRUISE RANGE (SERIAL NOS. 32-7940001 AND UP)

Figure 5-32

PA-32-300



Example:
Cruise pressure altitude: 7000 ft.
Cruise OAT: 45 ° F
Power: 65%
Range (with reserve): 625 nautical miles
Range (no reserve): 710 nautical miles

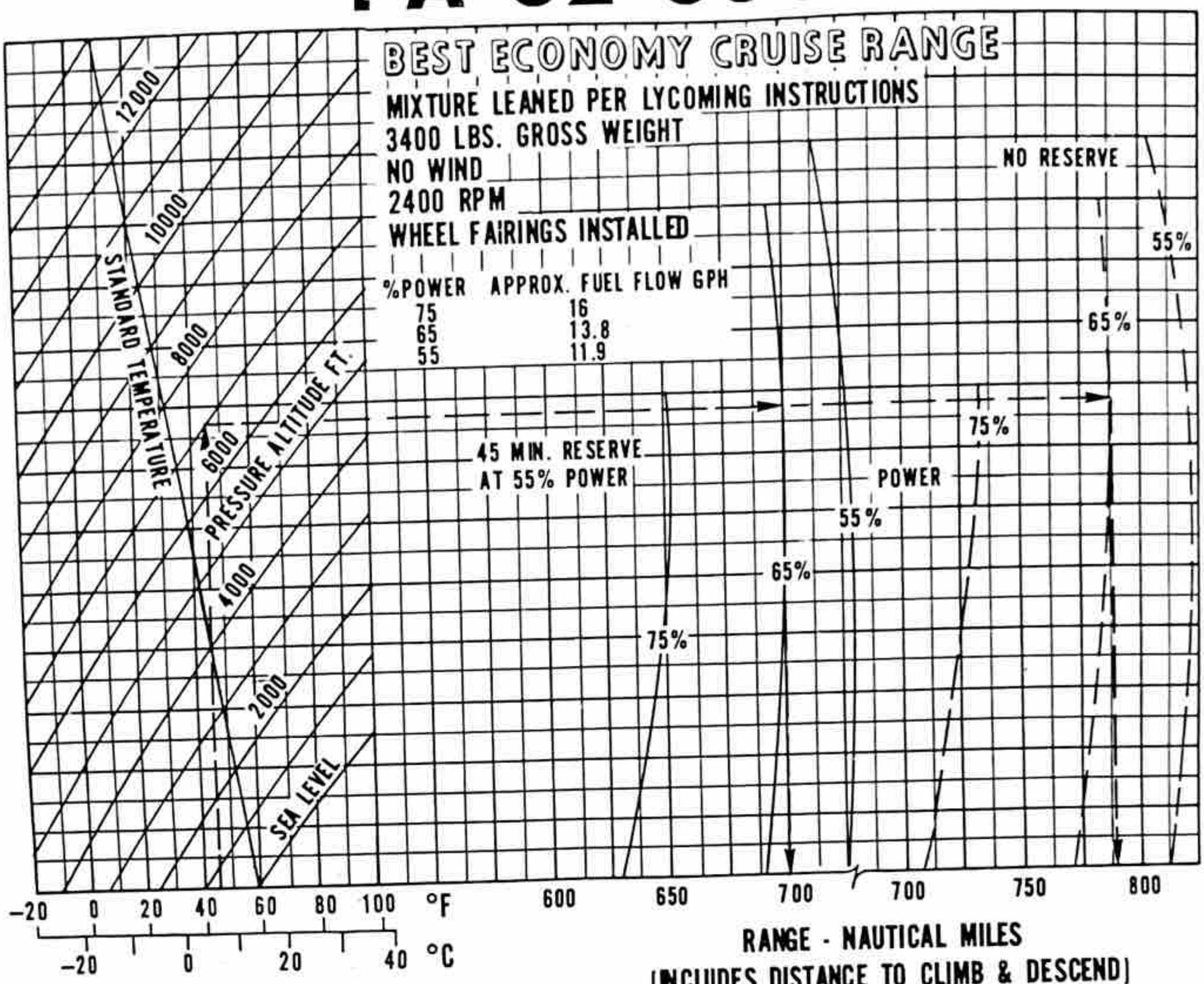
Note: Range may be reduced by up to 7% if wheel fairings are not installed.

BEST POWER CRUISE RANGE (SERIAL NOS. 32-7840001 THROUGH 32-7840202)

156

Figure 5-31

PA-32-300



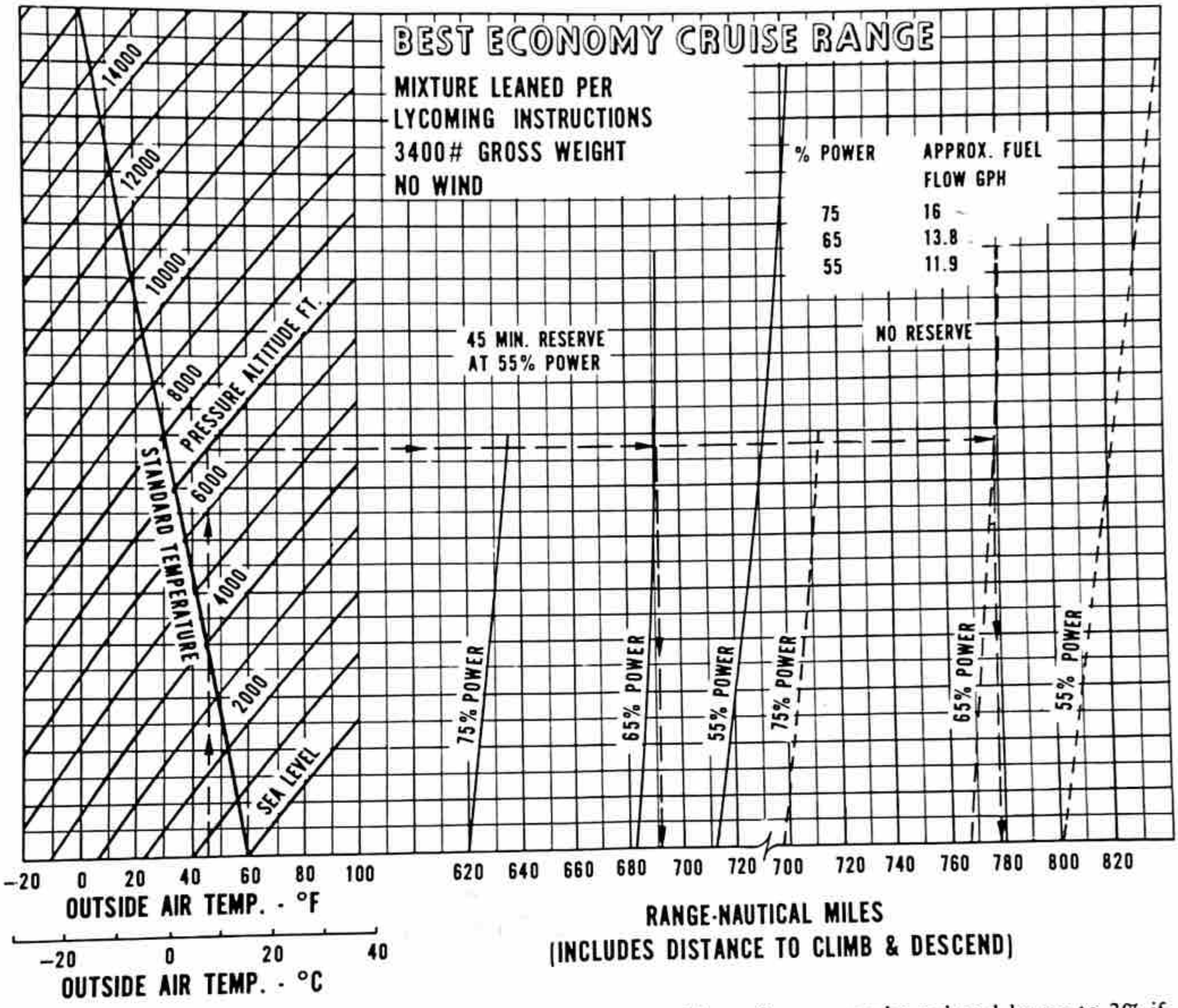
Example:
Cruise pressure altitude: 7000 ft.
Cruise OAT: 45° F
Power: 65%
Range (with reserve): 700 nautical miles
Range (no reserve): 790 nautical miles

Note: Range may be reduced by up to 7% if wheel fairings are not installed.

BEST ECONOMY CRUISE RANGE (SERIAL NOS. 32-7840001 THROUGH 32-7840202)

Figure 5-35

PA-32-300



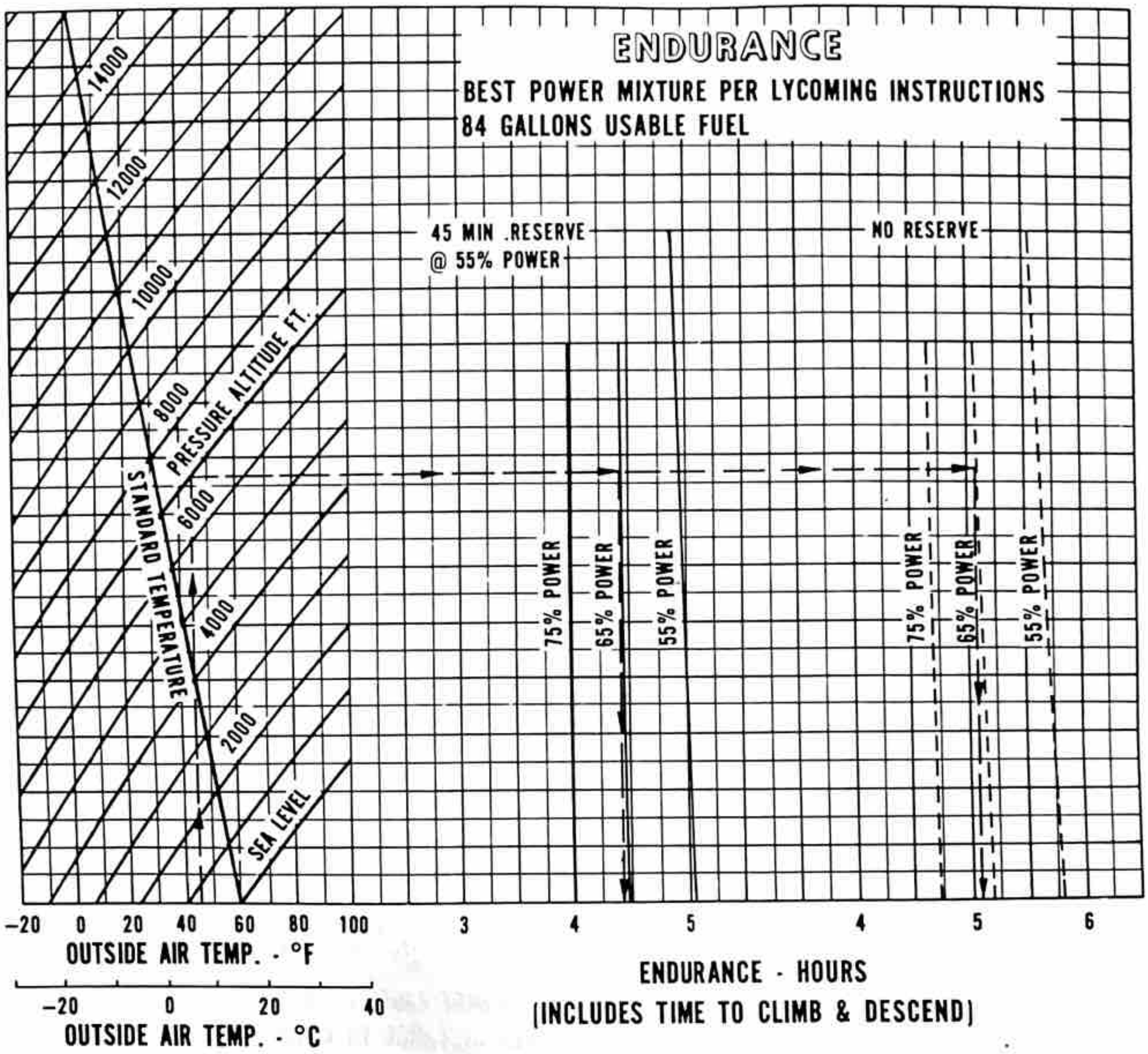
Example:
Cruise pressure altitude: 7000 ft.
Cruise OAT: 45° F
Power: 65%
Range (with reserve): 691 nautical miles
Range (no reserve): 777 nautical miles

Note: Range may be reduced by up to 3% if wheel fairings are not installed.

BEST ECONOMY CRUISE RANGE (SERIAL NOS. 32-7740001 THROUGH 32-7740113)

Figure 5-33

PA-32-300



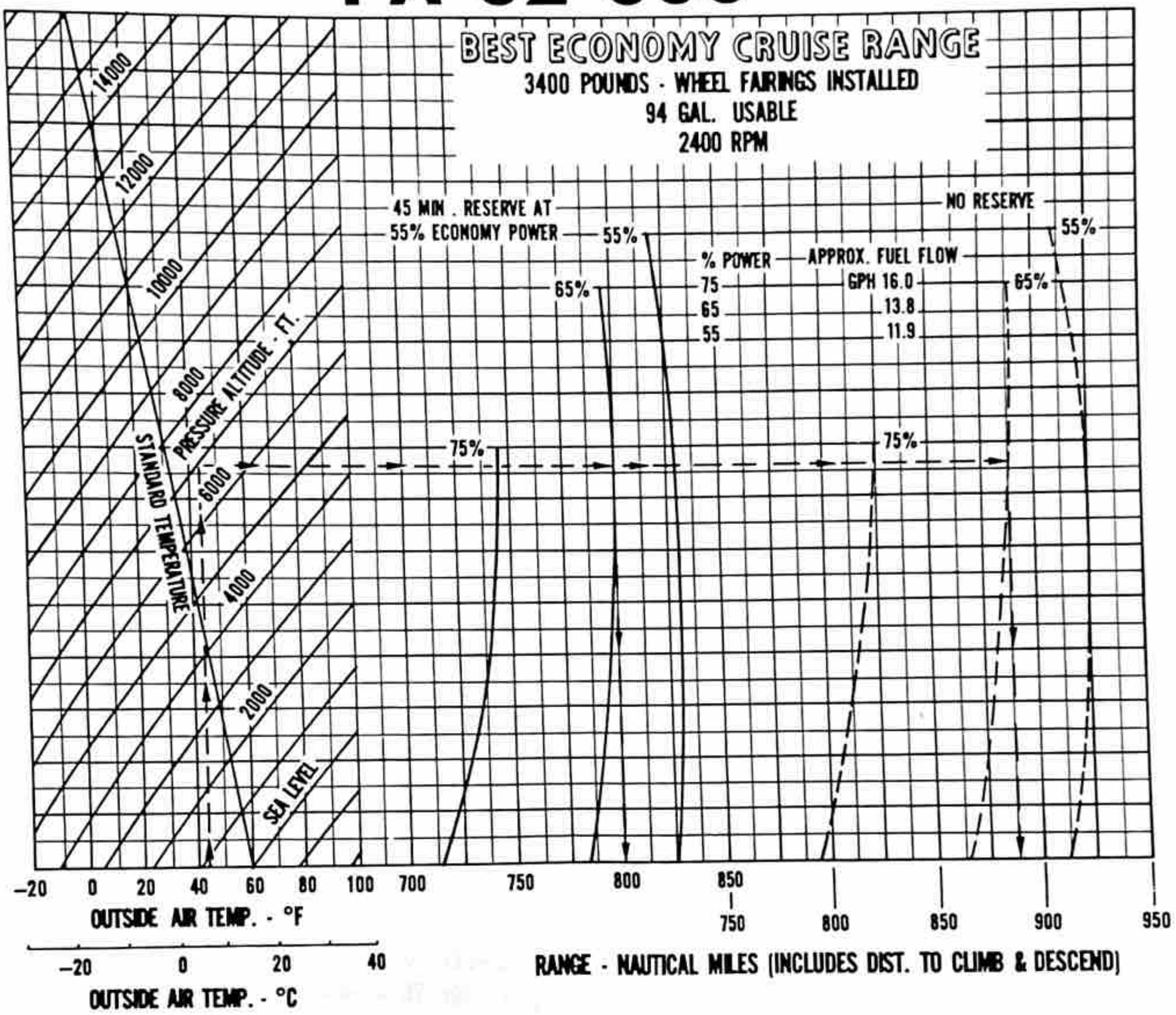
Example:
Cruise pressure altitude: 7000 ft.
Cruise OAT: 45°F
Power: 65%

Endurance (with reserve): 4.4 hours
Endurance (no reserve): 5.1 hours

ENDURANCE - BEST POWER (SERIAL NOS. 32-7740001 THROUGH 32-7840202)

Figure 5-37

PA-32-300

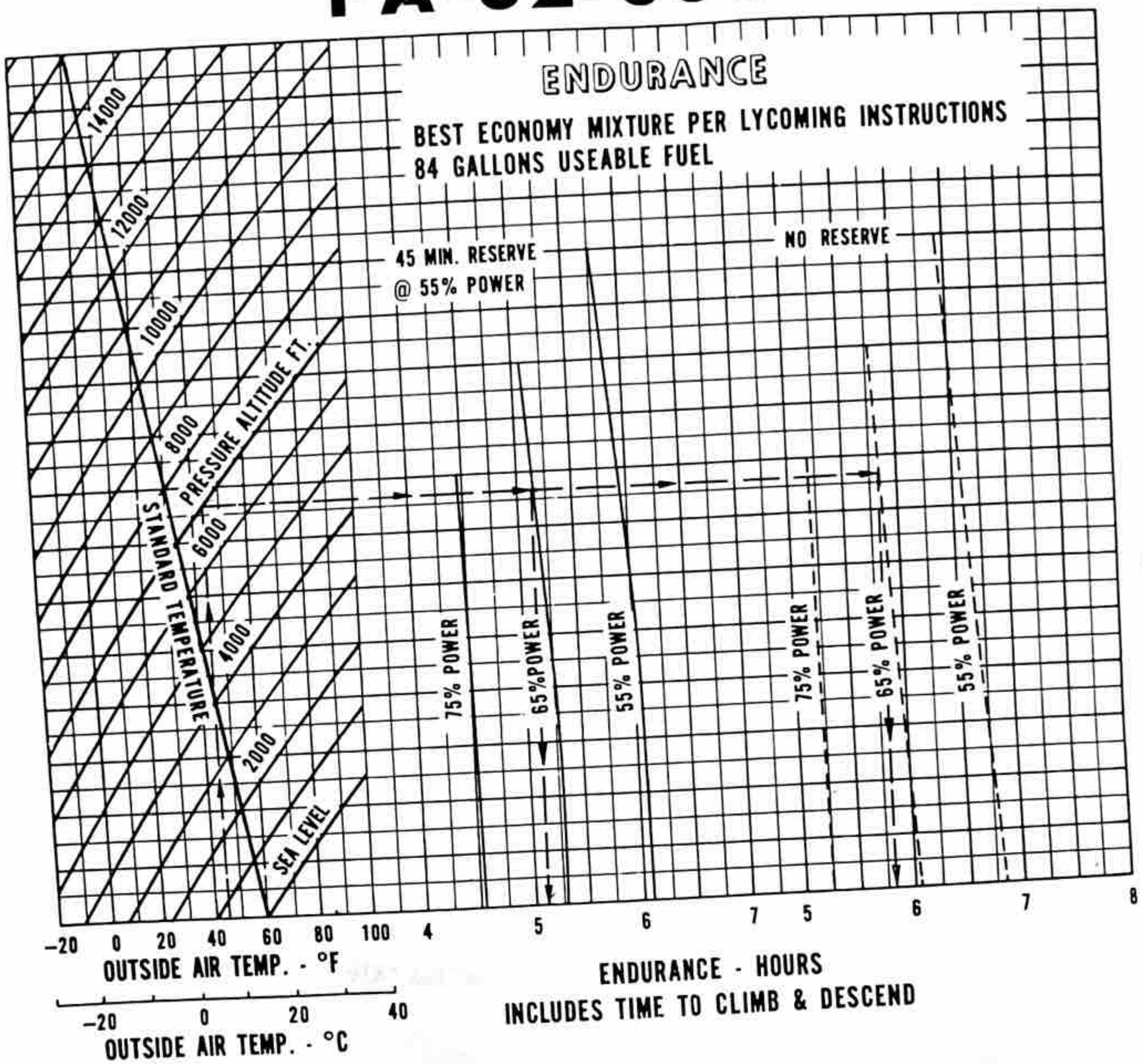


Note: Range may be reduced by up to 7% if wheel fairings are not installed.

BEST ECONOMY CRUISE RANGE (SERIAL NOS. 32-7940001 AND UP)

Figure 5-36

PA-32-300

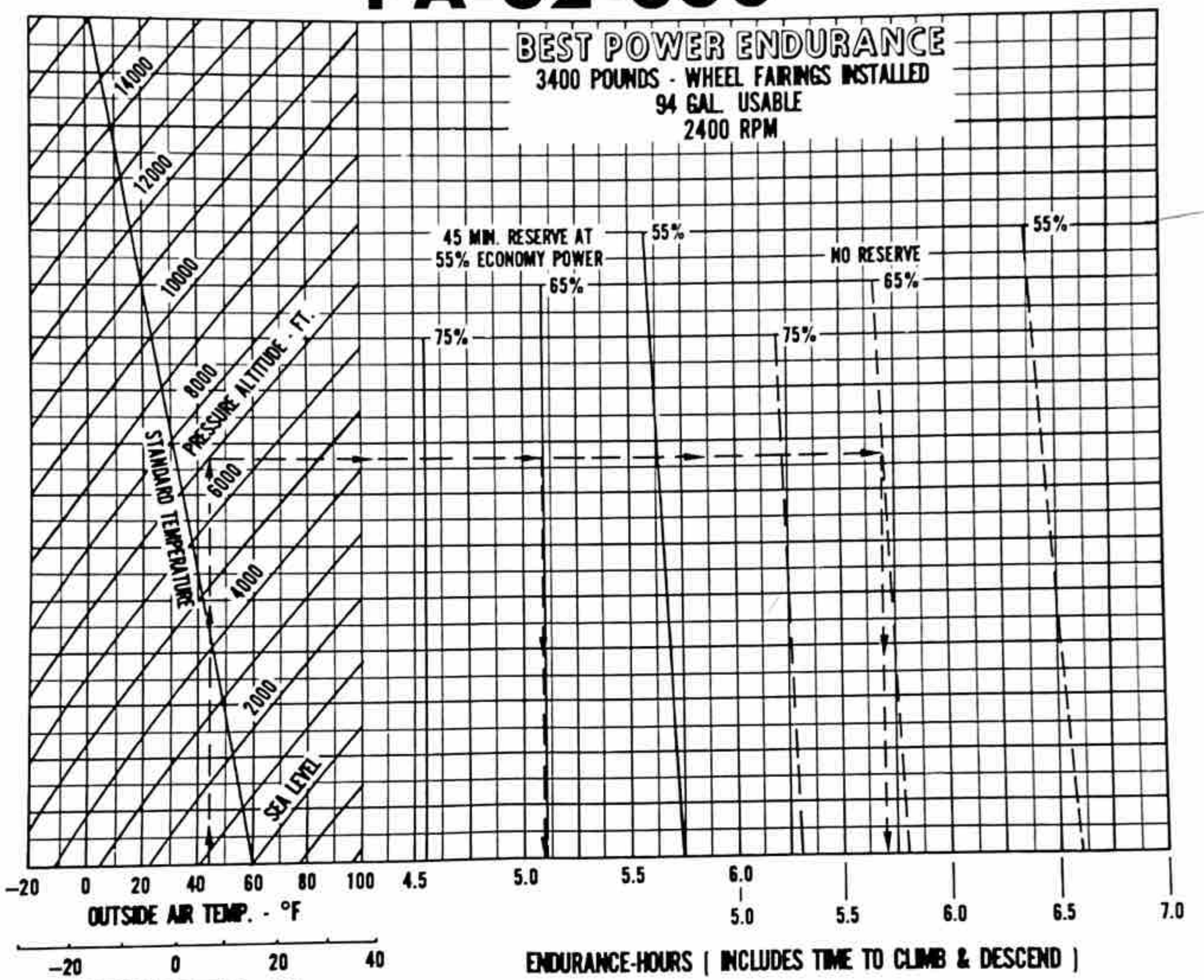


Example:
Cruise pressure altitude: 7000 ft.
Cruise OAT: 45°F
Power: 65%
Endurance (with reserve): 5.15 hours
Endurance (no reserve): 5.80 hours

ENDURANCE - BEST ECONOMY (SER. NOS. 32-7740001 THROUGH 32-7840202)

Figure 5-39

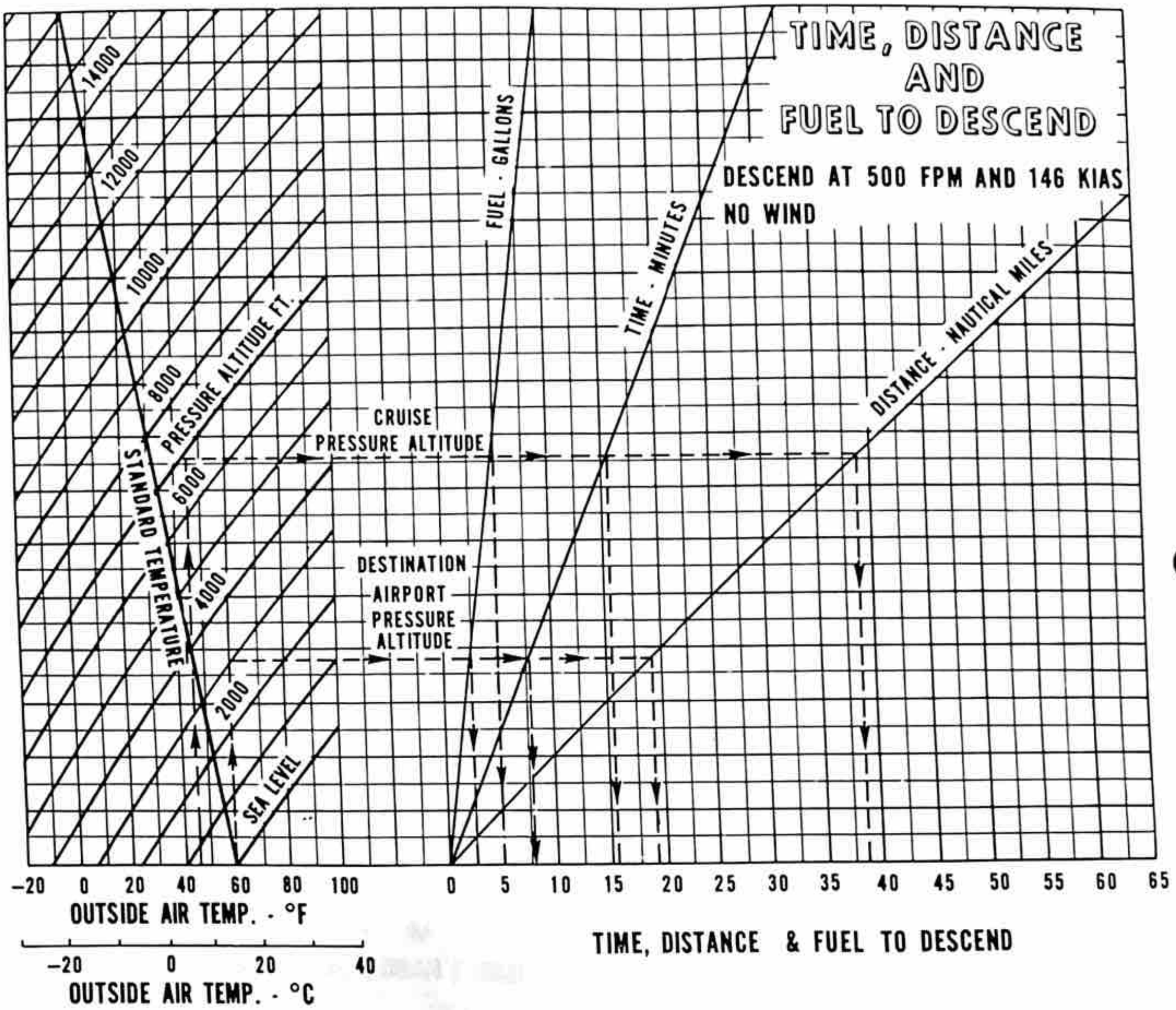
PA-32-300



ENDURANCE - BEST POWER (SERIAL NOS. 32-7940001 AND UP)

Figure 5-38

PA-32-300



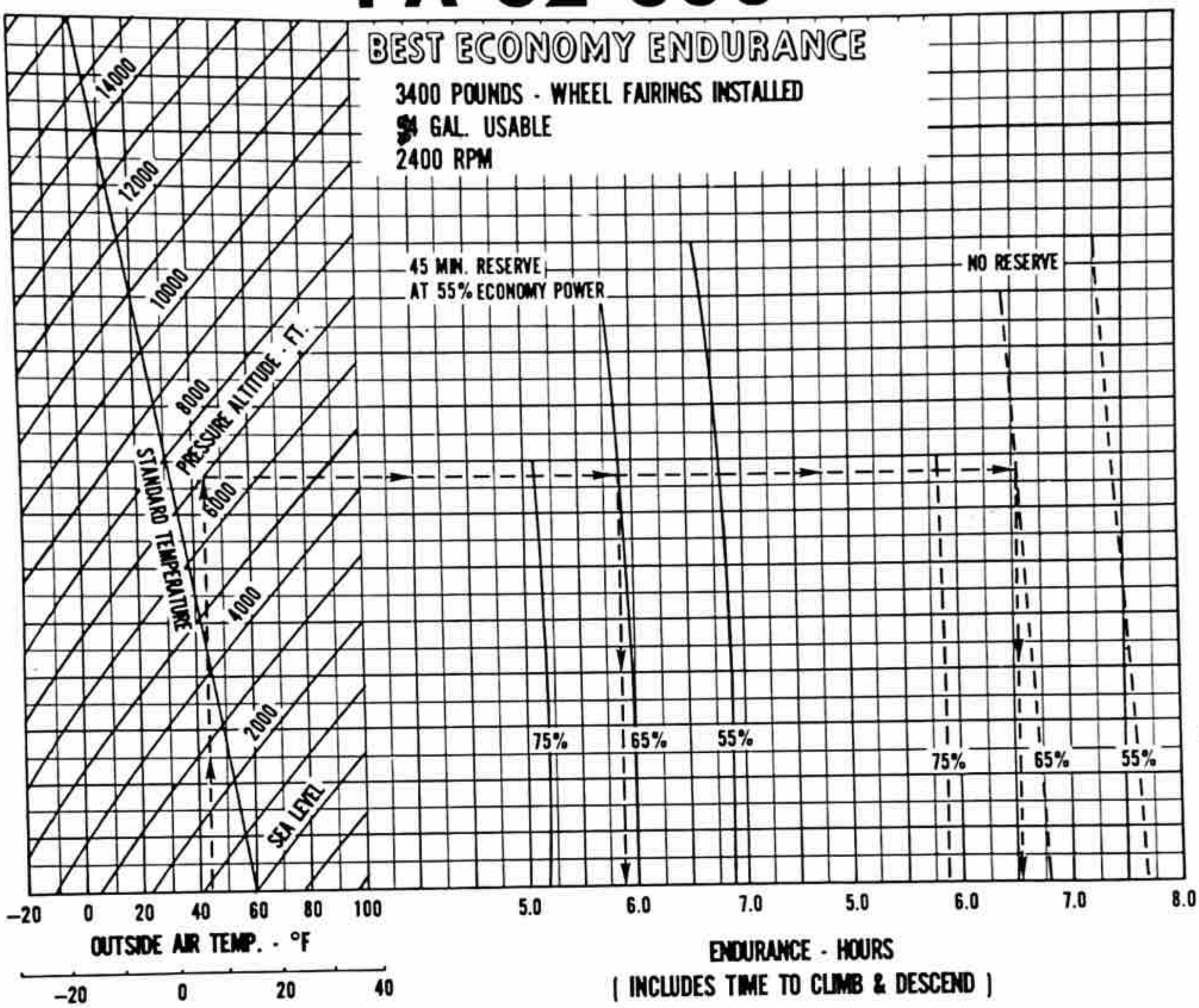
TIME, DISTANCE & FUEL TO DESCEND

Example:

Cruise pressure altitude: 7000 ft.
Cruise OAT: 45°F
Destination airport pressure altitude: 3000 ft.
Destination airport temperature: 60° F
Fuel to descend: (4.5 gal. minus 2.5 gal.) = 2.0 gal.
Time to descend: (15.5 min. minus 8 min.) = 7.5 min.
Distance to descend: (39 nautical miles minus 19 nautical miles) = 20 nautical miles

TIME, DISTANCE AND FUEL TO DESCEND

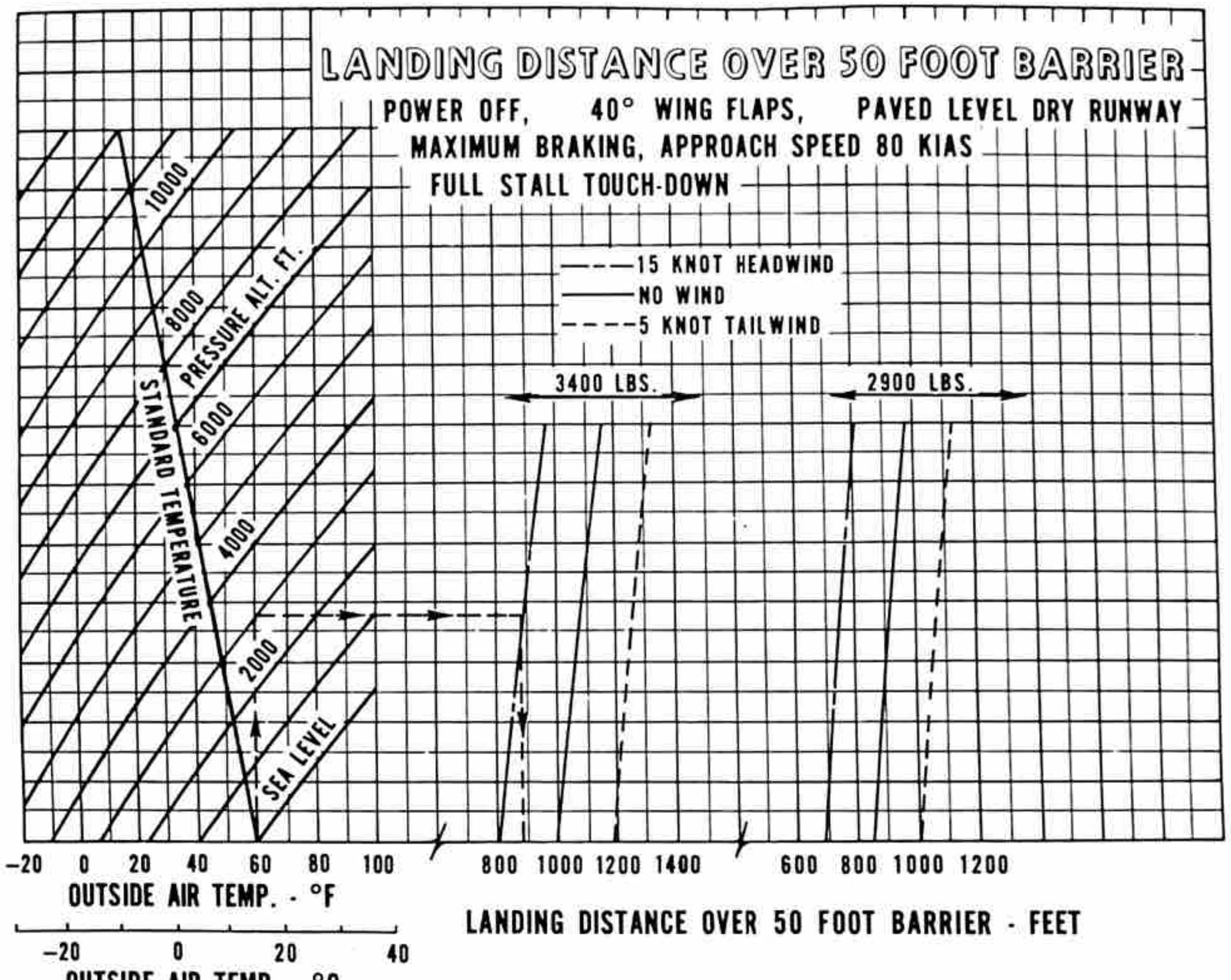
Figure 5-41



ENDURANCE - BEST ECONOMY (SERIAL NOS. 32-7940001 AND UP)

Figure 5-40

PA-32-300

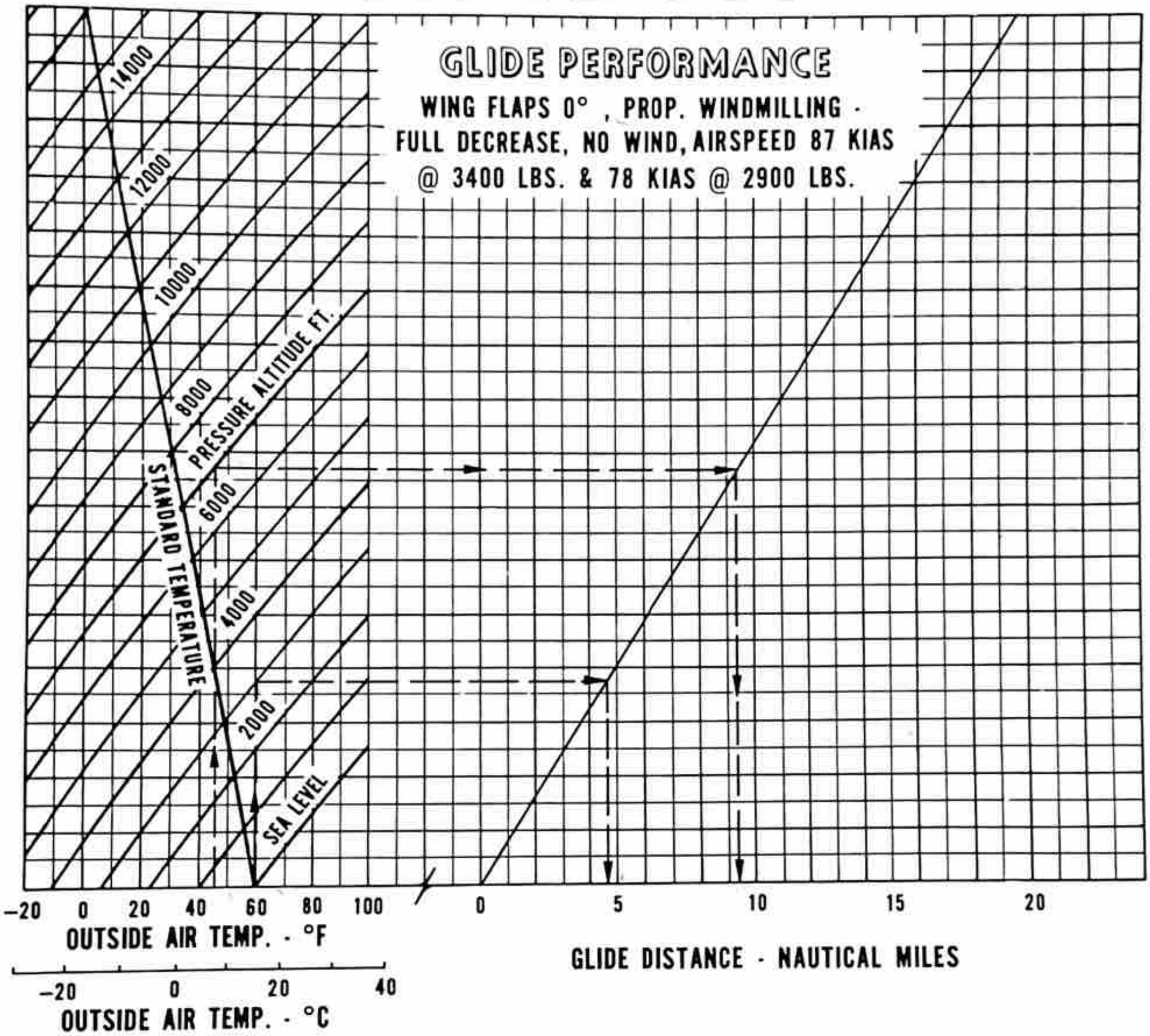


Example:
Airport pressure altitude: 3000 ft.
Temperature: 60° F
Gross weight: 3400 lbs.
Wind component: 15 knots headwind
Landing Distance over 50 ft. barrier: 840 ft.

LANDING DISTANCE OVER 50 FOOT BARRIER

Figure 5-45

PA-32-300

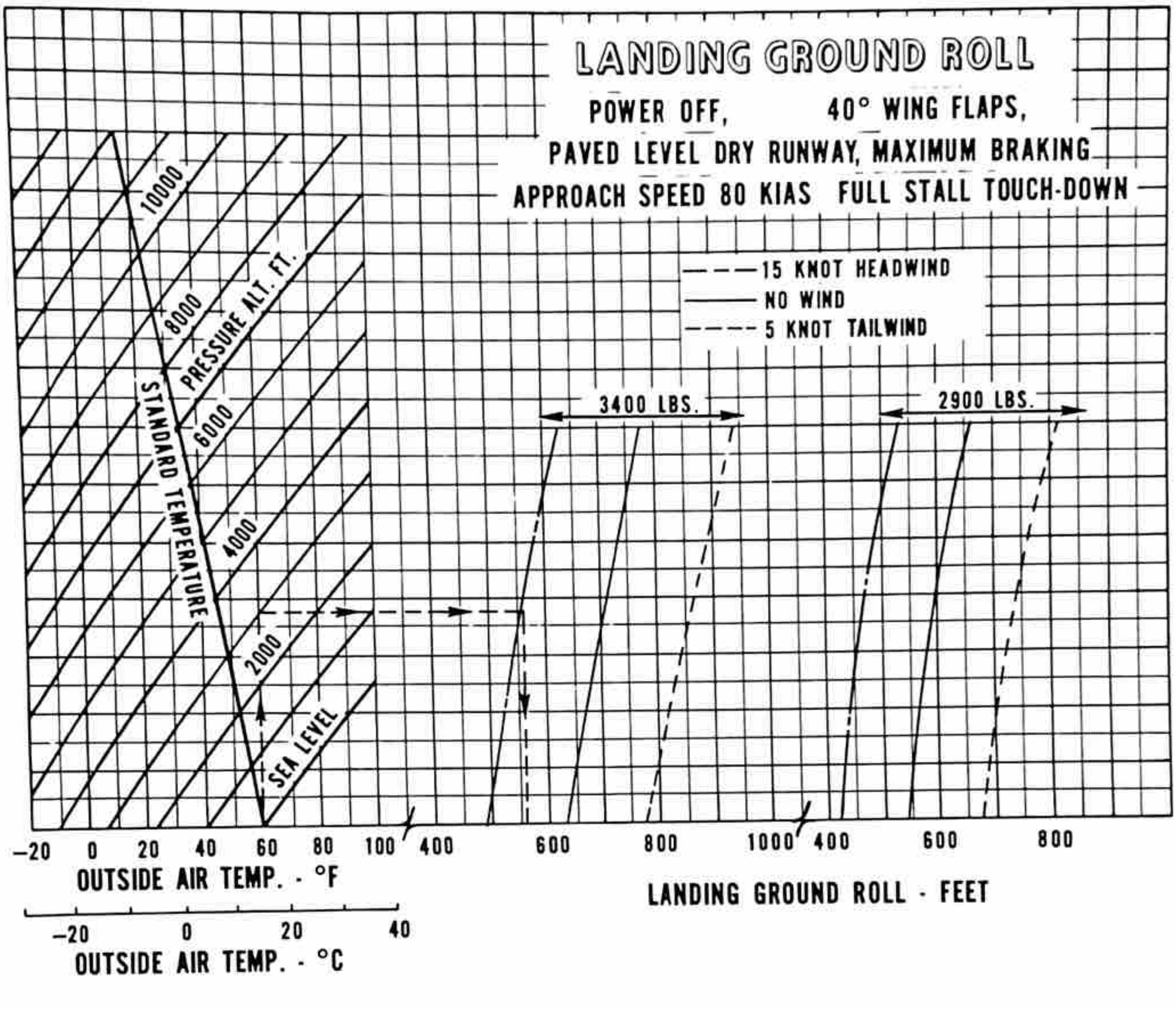


Example:
Cruise pressure altitude: 7000 ft.
Cruise OAT: 45°F
Terrain pressure altitude: 3000 ft.
Terrain temperature: 60°F
Glide Range: (9.3 nautical miles minus 4.8 nautical miles) = 4.5 nautical miles

GLIDE PERFORMANCE

Figure 5-43

PA-32-300



Example:
Airport pressure altitude: 3000 ft.
Temperature: 60° F
Gross weight: 3400 lbs.
Wind: 15 Knot Headwind
Ground roll: 560 ft.

LANDING GROUND ROLL

Figure 5-47

TABLE OF CONTENTS

SECTION 6

WEIGHT AND BALANCE

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SECTION 6

WEIGHT AND BALANCE

6.1 GENERAL

In order to achieve the performance and flying characteristics which are designed into the airplane, it must be flown with the weight and center of gravity (C.G.) position within the approved operating range (envelope). Although the airplane offers a tremendous flexibility of loading, it cannot be flown with the maximum number of adult passengers, full fuel tanks and maximum baggage. With the flexibility comes responsibility. The pilot must ensure that the airplane is loaded within the loading envelope before he makes a takeoff.

Misloading carries consequences for any aircraft. An overloaded airplane will not take off, climb or cruise as well as a properly loaded one. The heavier the airplane is loaded, the less climb performance it will have.

Center of gravity is a determining factor in flight characteristics. If the C.G. is too far forward in any airplane, it may be difficult to rotate for takeoff or landing. If the C.G. is too far aft, the airplane may rotate prematurely on takeoff or tend to pitch up during climb. Longitudinal stability will be reduced. This can lead to inadvertent stalls and even spins; and spin recovery becomes more difficult as the center of gravity moves aft of the approved limit.

A properly loaded airplane, however, will perform as intended. Before the airplane is delivered, it is weighed, and a basic empty weight and C.G. location is computed (basic empty weight consists of the standard empty weight of the airplane plus the optional equipment). Using the basic empty weight and C.G. location, the pilot can easily determine the weight and C.G. position for the loaded airplane by computing the total weight and moment and then determining whether they are within the approved envelope.

The basic empty weight and C.G. location are recorded in the Weight and Balance Data Form (Figure 6-7) and the Weight and Balance Record (Figure 6-9). The current values should always be used. Whenever new equipment is added or any modification work is done, the mechanic responsible for the work is required to compute a new basic empty weight and C.G. position and to write these in the Aircraft Log Book and the Weight and Balance Record. The owner should make sure that it is done.

A weight and balance calculation is necessary in determining how much fuel or baggage can be boarded so as to keep within allowable limits. Check calculations prior to adding fuel to insure against improper loading.

The following pages are forms used in weighing an airplane in production and in computing basic empty weight, C.G. position, and useful load. Note that the useful load includes usable fuel, baggage, cargo and passengers. Following this is the method for computing takeoff weight and C.G.

(c) Weighing - Airplane Basic Empty Weight

(1) With the airplane level and brakes released, record the weight shown on each scale. Deduct the tare, if any, from each reading.

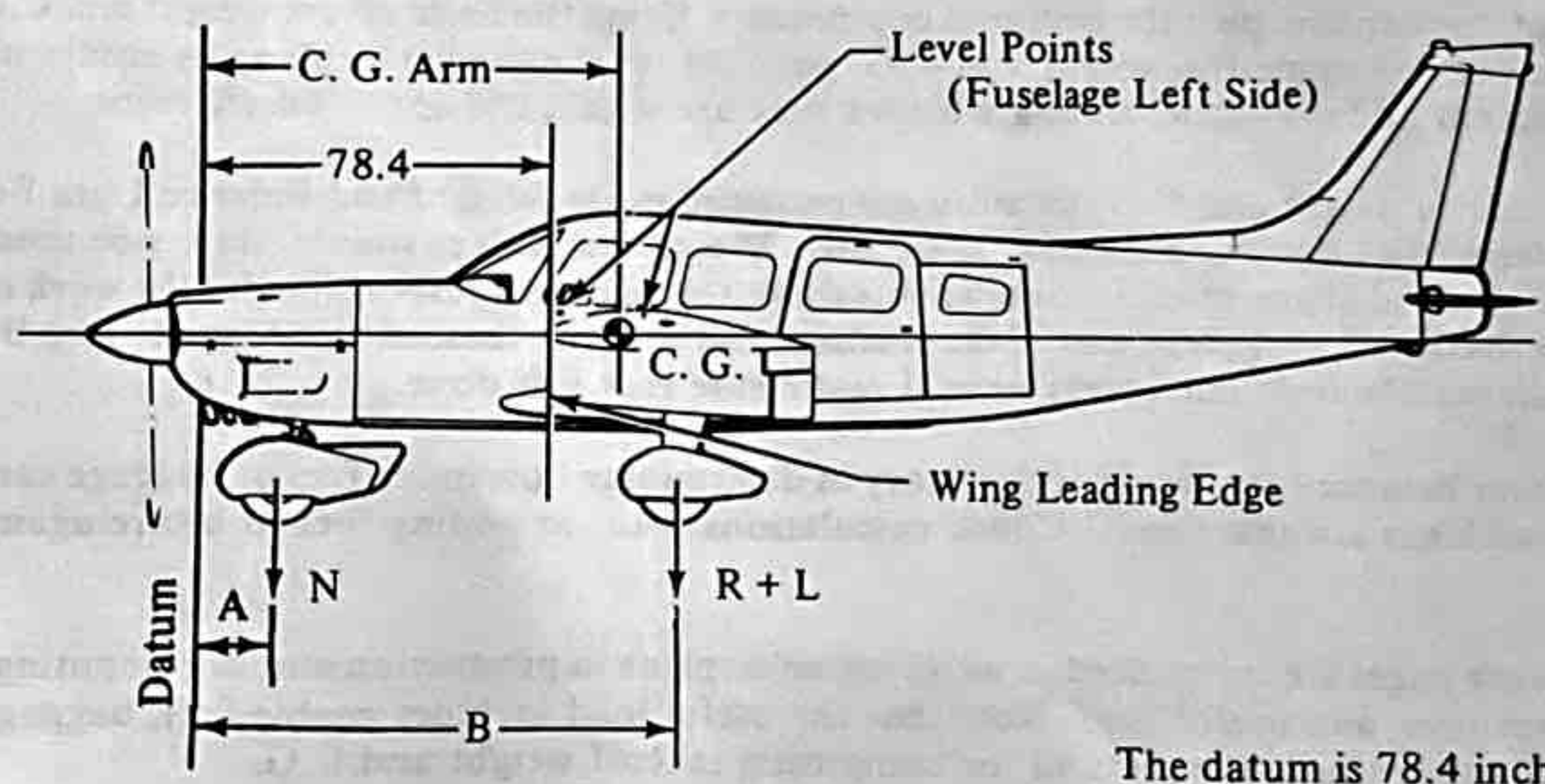
Scale Position and Symbol	Scale Reading	Tare	Net Weight
Nose Wheel (N)			
Right Main Wheel (R)			
Left Main Wheel (L)			
Airplane Empty Weight, as Weighed (T)	—— ——	—— ——	

WEIGHING FORM

Figure 6-1

(d) Basic Empty Weight Center of Gravity

(1) The following geometry applies to the PA-32-300 airplane when it is level. Refer to Leveling paragraph 6.3 (b).



A = 16.3

B = 109.7

The datum is 78.4 inches ahead of the wing leading edge at the intersection of the straight and tapered section.

LEVELING DIAGRAM

Figure 6-3

6.3 AIRPLANE WEIGHING PROCEDURES

At the time of delivery, Piper Aircraft Corporation provides each airplane with the basic empty weight and center of gravity location. This data is supplied by Figure 6-5.

The removal or addition of equipment or airplane modifications can affect the basic empty weight and center of gravity. The following is a weighing procedure to determine this basic empty weight and center of gravity location:

(a) Preparation

(1) Be certain that all items checked in the airplane equipment list are installed in the proper location in the airplane.

(2) Remove excessive dirt, grease, moisture, foreign items such as rags and tools from the airplane before weighing.

(3) Defuel airplane. Then open all fuel drains until all remaining fuel is drained. Operate engine on each tank until all undrainable fuel is used and engine stops. Then add the unusable fuel per the following:
Serial numbers 32-7740001 through 32-7840202 - 0.4 gallons total, 0.2 gallons each wing.
Serial numbers 32-7940001 and up - 4.0 gallons total, 2.0 gallons each wing.

(4) Fill with oil to full capacity.

(5) Place pilot and copilot seats in fourth (4th) notch, aft of forward position. Put flaps in the fully retracted position and all control surfaces in the neutral position. Tow bar should be in the proper location and all entrance and baggage doors closed.

(6) Weigh the airplane inside a closed building to prevent errors in scale readings due to wind.

(b) Leveling

(1) With airplane on scales, block main gear oleo pistons in the fully extended position.

(2) Level airplane (refer to Figure 6-3) deflating nose wheel tire, to center bubble on level.

6.5 WEIGHT AND BALANCE DATA AND RECORD

The Basic Empty Weight, Center of Gravity Location and Useful Load listed in Figure 6-5 are for the airplane as delivered from the factory. These figures apply only to the specific airplane serial number and registration number shown.

The basic empty weight of the airplane as delivered from the factory has been entered in the Weight and Balance Record (Figure 6-7). This form is provided to present the current status of the airplane basic empty weight and a complete history of previous modifications. Any change to the permanently installed equipment or modification which affects weight or moment must be entered in the Weight and Balance Record.

(2) The basic empty weight center of gravity (as weighed including optional equipment, full oil and unusable fuel) can be determined by the following formula:

$$\text{C.G. Arm} = \frac{N(A) + (R+L)(B)}{T} \quad \text{inches}$$

Where: $T = N + R + L$

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MODEL PA-32-300 CHEROKEE SIX

Airplane Serial Number _____

Registration Number _____

Date _____

AIRPLANE BASIC EMPTY WEIGHT

Item		Weight (Lbs)	x	C.G. Arm (Inches Aft of Datum)	=	Moment (In-Lbs)
Standard Empty Weight*	Actual / Computed					
Optional Equipment						
Basic Empty Weight						

*The standard empty weight includes full oil capacity and unusable fuel per the following: (Serial numbers 32-7740001 through 32-7840202, 0.4 gallons and serial numbers 32-7940001 and up, 4.0 gallons).

AIRPLANE USEFUL LOAD - NORMAL CATEGORY OPERATION

(Gross Weight) - (Basic Empty Weight) = Useful Load

(3400 lbs) - (lbs) = lbs.

THIS BASIC EMPTY WEIGHT, C.G. AND USEFUL LOAD ARE FOR THE AIRPLANE AS DELIVERED FROM THE FACTORY. REFER TO APPROPRIATE AIRCRAFT RECORD WHEN ALTERATIONS HAVE BEEN MADE.

WEIGHT AND BALANCE DATA FORM

Figure 6-5

PA-32-300			Serial Number	Registration Number						Page Number	
Date	Item No.		Description of Article or Modification	Weight Change						Running Basic Empty Weight	
				Added (+)			Removed (-)				
	In	Out		Wt. (Lb.)	Arm (In.)	Moment /100	Wt. (Lb.)	Arm (In.)	Moment /100	Wt. (Lb.)	Moment /100
			As Delivered								

WEIGHT AND BALANCE RECORD (cont)
Figure 6-7 (cont)

PA-32-300			Serial Number	Registration Number						Page Number	
Date	Item No.		Description of Article or Modification	Weight Change						Running Basic Empty Weight	
				Added (+)			Removed (-)				
	In	Out		Wt. (Lb.)	Arm (In.)	Moment /100	Wt. (Lb.)	Arm (In.)	Moment /100	Wt. (Lb.)	Moment /100
			As Delivered								

WEIGHT AND BALANCE RECORD
Figure 6-7

	Weight (Lbs)	Arm Aft Datum (Inches)	Moment (In-Lbs)
Basic Empty Weight			
Pilot and Front Passenger		85.5	
Passengers (Center Seats) (Forward Facing)		118.1	
Passengers (Center Seats) (Aft Facing) (Optional)		119.1	
Passengers (Rear Seats)		157.6	
Passenger (Jump Seat) (Optional)		118.1	
Fuel (Ser. nos. 32-7740001 through 32-7840202 - 84 Gallons Maximum)		95.0	
Fuel (Ser. nos. 32-7940001 and up - 98 Gallons Maximum)		93.6	
Baggage (Forward)		42.0	
Baggage (Aft)		178.7	
Total Loaded Airplane			

Totals must be within approved weight and C.G. limits. It is the responsibility of the airplane owner and the pilot to insure that the airplane is loaded properly. The Basic Empty Weight C.G. is noted on the Weight and Balance Data Form (Figure 6-5). If the airplane has been altered, refer to the Weight and Balance Record for this information.

WEIGHT AND BALANCE LOADING FORM

Figure 6-11

6.7 WEIGHT AND BALANCE DETERMINATION FOR FLIGHT

(a) Add the weight of all items to be loaded to the basic empty weight.

(b) Use the Loading Graph (Figure 6-13) to determine the moment of all items to be carried in the airplane.

(c) Add the moment of all items to be loaded to the basic empty weight moment.

(d) Divide the total moment by the total weight to determine the C.G. location.

(e) By using the figures of item (a) and item (d) (above), locate a point on the C.G. range and weight graph (Figure 6-15). If the point falls within the C.G. envelope, the loading meets the weight and balance requirements.

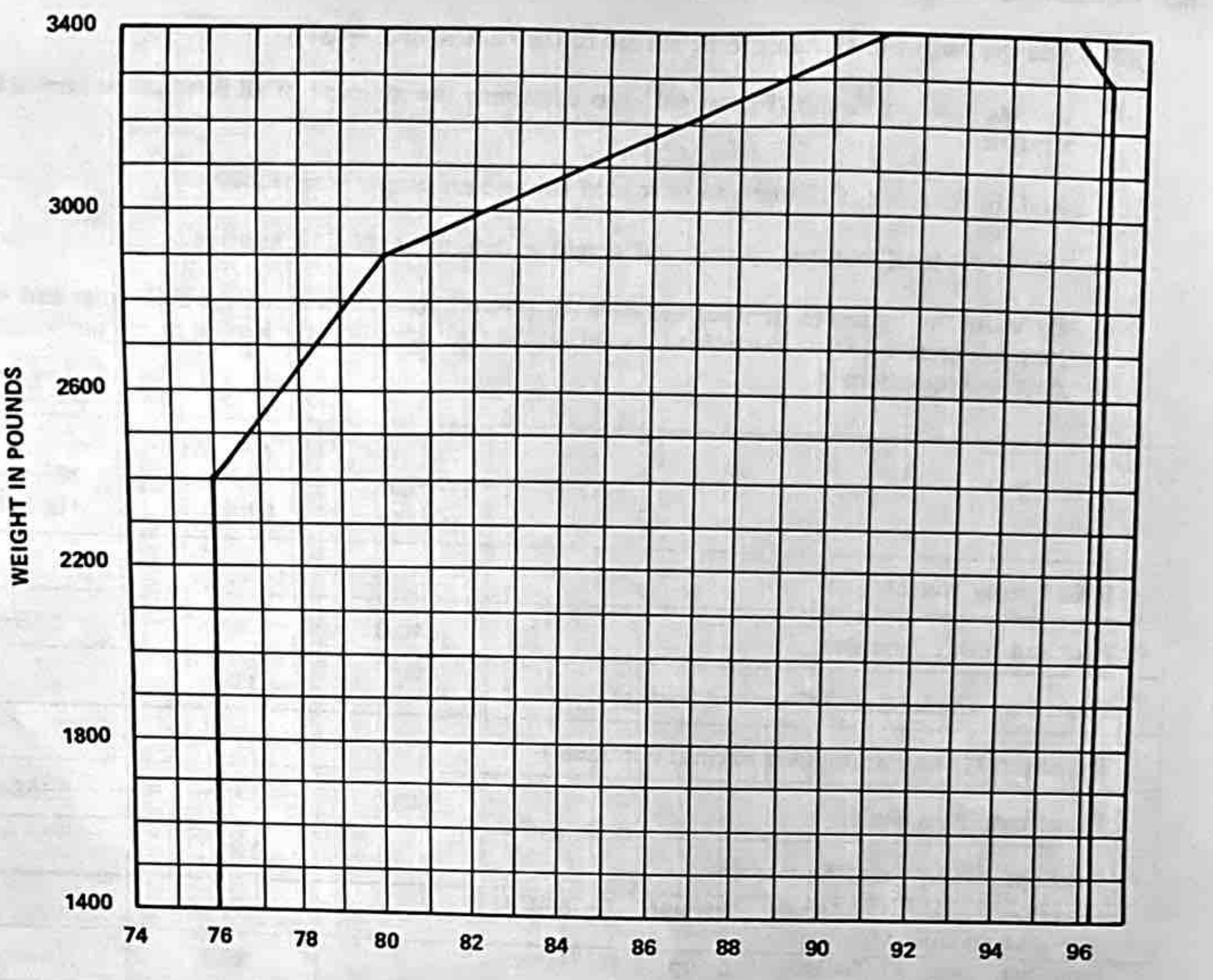
	Weight (Lbs)	Arm Aft Datum (Inches)	Moment (In-Lbs)
Basic Empty Weight			
Pilot and Front Passenger	340.0	85.5	29070
Passengers (Center Seats) (Forward Facing)		118.1	
Passengers (Center Seats) (Aft Facing) (Optional)		119.1	
Passengers (Rear Seats)	340.0	157.6	53584
Passenger (Jump Seat) (Optional)		118.1	
Fuel (Ser. nos. 32-7740001 through 32-7840202 - 84 Gallons Maximum)		95.0	
Fuel (Ser. nos. 32-7940001 and up - 98 Gallons Maximum)		93.6	
Baggage (Forward)		42.0	
Baggage (Aft)		178.7	
Total Loaded Airplane			

The center of gravity (C.G.) of this sample loading problem is at inches aft of the datum line. Locate this point ( ) on the C.G. range and weight graph. Since this point falls within the weight - C.G. envelope, this loading meets the weight and balance requirements.

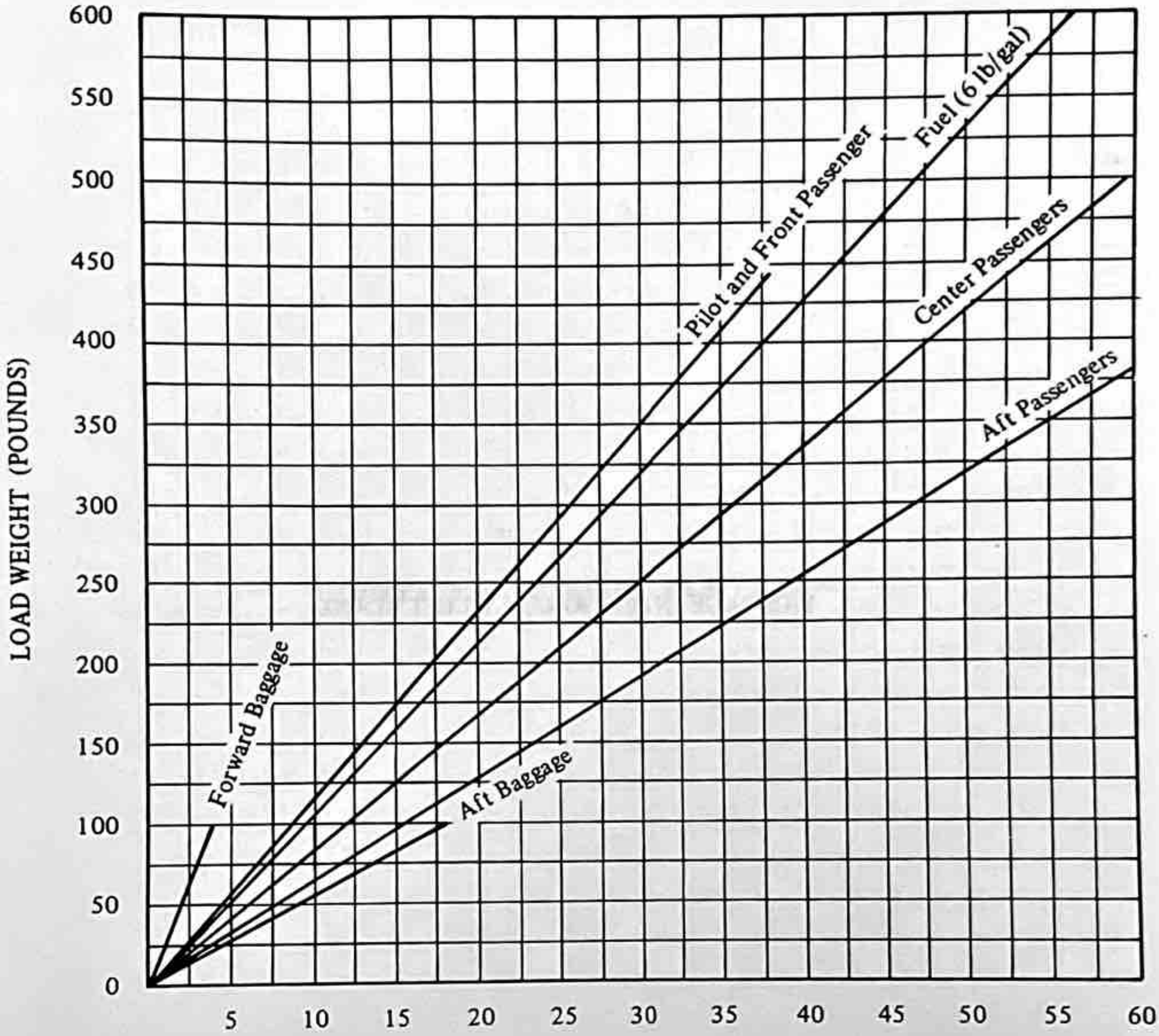
IT IS THE RESPONSIBILITY OF THE PILOT AND AIRCRAFT OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY.

SAMPLE LOADING PROBLEM (NORMAL CATEGORY)

Figure 6-9



C.G. RANGE AND WEIGHT
Figure 6-15



MOMENT/1000 (POUNDS-INCHES)

LOADING GRAPH

Figure 6-13

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6.9 EQUIPMENT LIST

The following is a list of equipment which may be installed in the PA-32-300. It consists of those items used for defining the configuration of an airplane when the basic empty weight is established at the time of delivery. Only those standard items which are alternate standard items and those required to be listed by the certificating authority (FAA) are presented. Items marked with an "X" are those items which were installed on the airplane described below as delivered by the manufacturer.

Where the letter "A," "B," or "C" precedes an item; "A" denotes an item which is required equipment that must be installed in the aircraft; "B" denotes an item which is required equipment that must be installed in the aircraft unless replaced by an optional equivalent item; "C" denotes an optional item which replaces a required item of standard equipment. Where no letter precedes an item, that item is not required equipment.

Unless otherwise indicated, the installation certification basis for the equipment included in this list is the aircraft's approved type design.

PIPER AIRCRAFT CORPORATION — PA-32-300 CHEROKEE SIX

SERIAL NO._____ REGISTRATION NO._____ DATE: _____

(a) Propeller and Propeller Accessories

Item No.		Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
1	A	Propeller, Hartzell (HC-C2YK-1( )F/F8475D-4) Cert. Basis - TC P920		51.0	-12.1	-618
3		Spinner Piper Dwg. 99374-0		4.8	-13.2	-63
5	A	Propeller Governor Piper Dwg. 66634-8 (Hartzell F-4-11 ( )) Cert. Basis - TC P920		4.5	-3.1	-14

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(b) Engine and Engine Accessories,

Item No.		Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
7	A	Engine (Lycoming Model IO-540-K1G5) Cert. Basis - TC 1E4	—	468.8	11.25	5274
9	A	Engine Driven Fuel Pump (Lycoming P/N 75247) Cert. Basis - TC 1E4		*1.7	27.6	47
11	A	Electric Fuel Pump (Airborne P/N 1B5-6)		3.0	112.6	338
13	A	Fuel Valve Piper Dwg. 69735-5 (Airborne P/N 1-H65-5)		2.4	110.8	266
15	A	Oil Coolers (2) Piper Dwg. 16599-0 (Harrison P/N C-8529245)		4.2	22.5	94
17	A	Air Filter (Fram P/N CA-161PL)		1.0	16.0	16
19	B	Alternator Piper Dwg. 99945-0 (Chrysler P/N 3656624)	———	*12.7	-2.5	-32
21	A	Starter (Lycoming P/N 76211) (Prestolite P/N MZ 4206) Cert. Basis - TC 1E4		*18.0	0.7	13
23	A	Oil Filter (Lycoming P/N 63459) Cert. Basis - TC 1E4		*1.6	43.5	70

*Included in basic engine dry weight.

(c) Landing Gear and Brakes

Item No.		Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
				32.9	109.8	3612
31	A	Two Main Wheel Assemblies a. Cleveland Aircraft Products Wheel Assy. No. 40-90 Brake Assy. No. 30-65 Cert. Basis - TSO C26a b. 6.00-6 Type III 6 Ply Rating Tires with Regular Tubes Cert. Basis - TSO C62				
33	B	Nose Wheel Assembly a. Cleveland Aircraft Products Wheel Assy. No. 38501 or 40-76F Cert. Basis - TSO C26a	———	4.3	16.3	70
		b. McCauley Industrial Corp. Wheel Assy. No. D-30625 or D-30665 Cert. Basis - TSO C26b	———	5.5	16.3	90
		c. 6.00-6 Type III 4 Ply Rating Tire with Regular Tube Cert. Basis - TSO C62	———	9.0	16.3	147
35	A	Handbrake Master Cylinder Cleveland Aircraft Products No. 10-22		0.6	60.9	37
37	A	Toe Brake Cylinders a. Cleveland Aircraft Products No. 10-27	———	0.7	55.1	39
		b. Gar-Kenyon Instruments 17000	———	0.4	55.1	22

(d) Electrical Equipment

Item No.		Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
41	A	Voltage Regulator Piper Dwg. 68804-3		0.5	19.4	10
43	B	Battery (Rebat S-25)	———	21.9	41.4	907
45	A	Starter Relay Piper Dwg. 99130-2 (Rebat P/N 111-111)		1.0	32.4	33
47	A	Over Voltage Relay Piper PS50034-1 (Prestolite, Wico Div., P/N X16799)	—	0.5	23.0	12

(e) Instruments

Item No.		Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
51	B	Altimeter Piper PS50008-2 (United Instrument UI5934-P or UI5934P-1) Cert. Basis - TSO C10b	_____	1.1	65.9	73
53	B	Airspeed Indicator Piper PS50049-35S (United Instruments 8025-B.280) Cert. Basis - TSO C2b	_____	0.6	66.8	40
55	A	Manifold & Fuel Flow Indicator Cert. Basis - TSO C45 and C47 a. Piper PS50031-7 (United Instruments 6082-H.56 or 6331-H.56) b. Piper PS50031-16 (United Instruments 6331-H.95)		1.2	66.2	80
57	A	Compass Piper Dwg. 67462-6 (Airpath P/N C-2200-L4-B) Cert. Basis - TSO C7c		0.9	64.9	59
59	A	Tachometer Piper Dwg. 62177-2 (AC 6411622) or Piper Dwg. 62177-3 (Stewart Warner 551-WE(N)		0.7	66.2	47
61	A	Left Engine Cluster Piper Dwg. 95241-20		0.8	67.4	54
63	A	Right Engine Cluster Piper Dwg. 95211-19 or -28		0.8	67.4	54

(f) Miscellaneous

Item No.		Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
85	B	Left Front Seat Piper Dwg. 79337-19	_____	15.5	93.0	1442
87		Right Front Seat Piper Dwg. 79337-20		15.5	93.0	1442
89		Left Middle Seat Piper Dwg. 96827-24		13.5	124.1	1676
91		Right Middle Seat Piper Dwg. 96827-25		13.5	124.1	1676
93		Left Rear Seat Piper Dwg. 79479-2		14.5	155.7	2258
95		Right Rear Seat Piper Dwg. 79479-3		14.5	155.7	2258
97	A	Front Seat Belts (2) Piper PS50039-4-2A (American Safety Eqpt. Corp. 449965 Black) Cert. Basis - TSO C22f		1.8	86.9	156
99	A	Center Seat Belts (2) Piper PS50039-4-3A (American Safety Eqpt. Corp. 500577 Black) Cert. Basis - TSO C22f		1.6	123.0	197
101	A	Aft Seat Belts (2) Piper PS50039-4-4A (American Safety Eqpt. Corp. 500576 Black) Cert. Basis - TSO C22f		1.6	163.0	261

(f) Miscellaneous (cont)

Item No.		Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
103	A	Shoulder Harness (2) (Front Seats Only) Piper PS50039-4-21 (Pacific Scientific 1107447-05 Black)		1.4	120.1	169
105	A	Baggage Straps Piper Dwg. 66804-0 and 66805-0		1.3	177.0	230
107		Tow Bar Piper Dwg. 69975-2		2.3	193.9	452

(g) Propeller and Propeller Accessories
(Optional Equipment)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)

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(h) Engine and Engine Accessories
(Optional Equipment)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
111	Vacuum Pump				
	a. Piper Dwg. 26749-3 (Airborne P/N 200CC)	_____	3.6	27.4	99
	b. Piper Dwg. 79399-0 (Airborne P/N 211CC)	_____	1.8	27.4	50
	c. Piper Dwg. 36535-02 (Edo-Aire P/N 1U128A)	_____	2.2	27.4	60
113	Exhaust Gas Temperature Gauge Installation Piper Dwg. 69185-3, Alcor Indicator P/N 202A-7A or P/N 202B-7A Probe Model "A" Lead Assembly 90.00	_____	0.7	60.4	42

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(i) Landing Gear and Brakes
(Optional Equipment)

Item No.		Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
121	C	Nose Wheel Assembly a. Cleveland Aircraft Products Wheel Assy. No. 38501 Cert. Basis - TSO C26a b. 6.00-6 Type III 6 Ply Rating Tire with Regular Tube Cert. Basis - TSO C62	_____	*0.3	16.3	5
123		Nose Wheel Fairing Piper Dwg. 76416	_____	3.6	23.1	83
125		Main Wheel Fairings (2) Piper Dwg. 65237	_____	7.6	113.6	863
127		Nose Wheel Fairing Piper Dwg. 37896-5	_____	10.3	23.1	238
128		Main Wheel Fairings (2) Piper Dwg. 37885-2, -3	_____	20.6	113.6	2340
129		Nose Wheel Fairing Piper Dwg. 35944-12	_____	7.0	23.1	162
130		Main Wheel Fairings (2) Piper Dwg. 79893-2, -3	_____	17.0	113.6	1931

*Weight and moment difference between standard and optional equipment.

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(j) Electrical Equipment
(Optional Equipment)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
131	Instrument Panel Lights	_____	0.3	67.8	20
133	Instrument Lights (2) Grimes 15-0083-7	_____	0.2	99.0	20
135	Reading Lights				
	a. (2) Grimes #10-0154-1	_____	0.5	149.3	75
	b. (2) Grimes #10-0154-1	_____	0.5	115.0	58
	c. (4) Grimes #10-0644-1	_____	0.6	133.3	80
137	Forward Baggage Light Piper Dwg. 68697	_____	0.2	43.5	9
139	Landing Light Piper PS10008-4509 (G.E. Model 4509)	_____	0.5	-2.6	-1
141	Navigation Lights (Wing) (2) Grimes Model A1285 (Red and Green)	_____	0.4	106.6	43
143	Navigation Light (Rear) (1) Grimes Model A2064 (White)	_____	0.2	311.7	62
145	Rotating Beacon Piper Dwg. 79850-17	_____	1.5	290.3	435
147	Anti-Collision Lights (Fin Tip Only) Piper Dwg. 99033-2	_____	3.1	241.6	749
149	Anti-Collision Lights (Wing and Fin Tips) Piper Dwg. 99033-7	_____	6.3	197.8	1246

(j) Electrical Equipment
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
151	Heated Pitot Head Piper Dwg. 65797-5	_____	0.4	100.0	40
153	Piper Pitch Trim Piper Dwg. 69378	_____	4.4	191.5	843
155	Battery 12V 35 A.H. Rebat R35 (Wt. 28.4 lbs.)	_____	*6.5	41.4	269
157	Auxiliary Power Receptacle Piper Dwg. 68815	_____	2.6	48.4	126
159	External Power Cable Piper Dwg. 62355-2	_____	4.3	42.0	181
161	Lighter #200462, 12 Volt Universal	_____	.2	67.9	14

*Weight and moment difference between standard and optional equipment.

(k) Instruments
(Optional Equipment)

Item No.		Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
167		Attitude Gyro a. Piper Dwg. 99002-3 (Edo-Aire P/N 5000B-9)	———	1.9	64.4	122
		b. Piper Dwg. 99002-2 or -8 (Aeritalia S.P.A. P/N 36101P)	———	2.2	64.4	142
		Cert. Basis - TSO C4c				
169		Directional Gyro a. Piper Dwg. 99003-2 or -3 (Edo-Aire P/N 4000B-9)	———	2.4	64.7	156
		b. Piper Dwg. 99003-4 (Aviation Inst. Mfg. Corp. P/N 200-5)	———	2.8	64.7	181
		c. Piper Dwg. 99003-7 (Aeritalia S.P.A. P/N 31101P)	———	1.9	64.7	123
		Cert. Basis - TSO C5c				
171		Horizontal Situation Indicator (HSI) (Mitchell P/N NSD-360A) Cert. Basis - TSO C6c, C9c, C52c	———	4.6	64.9	299
173	C	Tru-Speed Indicator Piper PS50049-35T (United Instruments P/N 81 25-B.275) Cert. Basis - TSO C2b	———	(Same as standard equipment)		

(k) Instruments
(Optional Equipment) (cont)

Item No.		Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)	
175	C	Altimeter Piper PS50008-3 (United Instruments P/N UI5934-PM or P/N UI5934PM-1) or Piper PS50008-4 (United Instruments P/N UI5934-PA or P/N UI5934PA-1) or Piper PS50008-5 (United Instruments P/N 5934-PAM-1) Cert. Basis - TSO C10b	_____	(Same as standard equipment)			
177	C	Encoding Altimeter Piper PS50008-6 (United Instruments P/N UI5035P-P23) or Piper PS50008-7 (United Instruments P/N UI5035PM-P24) Cert. Basis - TSO C10b and C88	_____	*0.7	65.3	46	
179		Altitude Reporter (Narco AR-500) Piper Dwg. 69875-3 Cert. Basis - TSO C88	_____	1.0	56.2	57	
181		Rate of Climb a. Piper Dwg. 99010-3 (Standard Precision Co. P/N SP-1403(1)-PIP) b. Piper Dwg. 99010-4 or -5 (United Instruments P/N UI-7000) Cert. Basis - TSO C8b	_____ _____	0.5 0.7	67.2 65.9	34 4[illegible]	

*Weight and moment difference between standard and optional equipment.

(k) Instruments
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
183	Alternate Static Source Installation Piper Dwg. 67479-2	———	0.4	66.0	26
185	Turn and Slip Indicator a. Piper PS50030-2 (R. C. Allen P/N A2475-2)	———	2.9	64.7	188
	b. Piper PS50030-2 (Electric Gyro Corp. P/N 1234T100-5(P)	———	1.1	64.7	72
	c. Piper PS50030-2 (Electric Gyro Corp. P/N 1234T100-5(PTE) Cert. Basis - TSO C3b	———	1.1	64.7	72
187	Turn Coordinator a. Piper PS50030-3 (R. C. Allen P/N RCA 80A-9)	———	2.9	64.7	188
	b. Piper PS50030-3 (Electric Gyro Corp. P/N 1394T100-3(5P)	———	1.1	64.7	72
	c. Piper PS50030-3 (Brittain (AIM) P/N 600-009-900)	———	2.1	64.7	136
	d. Piper PS50030-3 (Electric Gyro Corp. P/N 1394T100-3(5PE) Cert. Basis - TSO C3b	———	1.1	64.7	72
189	MK 10 Radar Altimeter Piper Dwg. 37693-2 or -8	———	5.4	181.3	979
191	Engine Hour Meter Piper Dwg. 69889-0	———	0.3	66.2	20

(k) Instruments
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
193	Clock Piper Dwg. 69920-3 or Piper Dwg. 99478-0 (Wakman P/N AN5743-L2) or (Aircraft Instruments and Dev. Inc. 1G10-1)	_____	0.4	67.4	27
195	Outside Air Temperature Gauge Piper Dwg. 79316-0 (Dresser Industries P/N NHM-70)	_____	0.2	77.6	16
197	Gyro Suction Gauge Piper Dwg. 99480-0 (Airborne P/N 1G10-1) or (AN Std. P/N AN577-11)	_____	0.5	67.2	34
199	Vacuum Regulator (Airborne P/N 2H3-19)	_____	0.6	53.2	32
201	Vacuum Filter Piper Dwg. 66673-0 (Airborne P/N 1J7-1)	_____	0.3	53.5	16

(l) Autopilots
(Optional Equipment)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
207	AutoFlite II Cert. Basis - STC SA1157SW	_____	6.6	93.9	620
209	AutoControl IIIB	_____	7.4	88.5	655
	a. Directional Gyro #52D54	_____	3.1	64.0	198
	b. Omni Coupler IC-388	_____	0.9	64.3	58
	Cert. Basis - STC SA1406SW				
211	AltiMatic IIIC	_____	22.8	103.3	2355
	a. Directional Gyro #52D54	_____	3.1	64.9	201
	b. Omni Coupler IC-388	_____	0.9	64.3	58
	c. GS Coupler IC-493	_____	1.5	56.7	85
	Cert. Basis - STC SA3011SW				
213	Altimatic IIIC	_____	21.3	103.3	2200
	a. Directional Gyro #52D54	_____	3.1	64.9	201
	b. Omni Coupler IC-388	_____	0.9	64.3	58
	c. GS Coupler IC-493	_____	1.5	56.7	85
	Cert. Basis - STC SA 3305SW/D				

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(m) Radio Equipment
(Optional Equipment)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
219	Collins VHF-250 or VHF-251 Comm Transceiver				
	a. Single	_____	4.0	61.9	248
	b. Dual	_____	8.1	61.9	502
	Cert. Basis - TSO C37b, C38b				
221	Collins VIR-350 or VIR-351 Nav Receiver				
	a. Single	_____	3.9	62.4	243
	b. Dual	_____	7.9	62.4	493
	Cert. Basis - TSO C40a, C36c				
223	Collins IND-350 VOR/LOC Indicator				
	a. Single	_____	1.0	65.2	65
	b. Dual	_____	2.0	65.2	130
	Cert. Basis - TSO C40a, C36c				
225	Collins IND-351 VOR/LOC/ GS Indicator				
	Cert. Basis - TSO C40a, C36c	_____	1.3	65.2	85
227	Collins GLS-350 Glide Slope Receiver				
	Cert. Basis - TSO C34c	_____	2.0	41.6	83
228	Collins DCE 400 Distance Computing Equipment				
	Cert. Basis - TSO C40a	_____	2.1	63.9	134
229	Collins RCR-650 ADF Receiver and Antenna and IND-650 Indicator				
	Cert. Basis - TSO C41c	_____	7.7	122.1	941
231	Collins AMR-350 Audio/Marker Panel				
	Cert. Basis - TSO C35d, C50b	_____	*3.3	123.9	409

*Weight includes antenna and cable.

(m) Radio Equipment
(Optional Equipment)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
233	Collins TDR-950 Transponder Cert. Basis - TSO C74c	_____	*2.8	62.4	175

*Weight includes antenna and cable.

(m) Radio Equipment
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
239	King KX 170( ) VHF Comm/Nav				
	Transceiver, Single	———	7.3	61.6	450
	Transceiver, Dual	———	15.0	61.6	924
241	King KX 175( ) VHF Transceiver,	———	11.4	61.6	703
	King KN 72 VOR/LOC Converter,	———	2.8	38.7	108
	King KN 73 Glide Slope Receiver,	———	2.8	39.9	111
	King KN 75 Glide Slope Receiver,	———	2.0	39.5	79
	King KN 77 VOR/LOC Converter,	———	3.1	38.7	120
	King KI 204 VOR/ILS Indicator,	———	1.7	65.5	111
	King KNI 520 VOR/ILS Indicator	———	1.7	65.5	111
	Cert. Basis - TSO C3bc, C37b, C38b, C40a				
243	King KX 175( ) VHF Transceiver (2nd),	———	10.0	61.6	616
	King KN 72 VOR/LOC Converter,	———	2.8	38.7	108
	King KN 77 VOR/LOC Converter,	———	3.5	38.7	135
	King KI 203 VOR/LOC Indicator	———	1.7	65.5	111
	King KNI 520 VOR/ILS Indicator	———	1.7	65.5	111
	Cert. Basis - TSO C36c, C37b, C38b, C40a				
245	King KI 201( ) VOR/LOC Indicator				
	a. Single	———	2.4	64.9	156
	b. Dual	———	5.0	64.9	325
247	King KI 208 VOR/LOC Indicator				
	a. Single	———	1.0	64.9	65
	b. Dual	———	2.0	64.9	130

(m) Radio Equipment
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
249	King KI 209 VOR/LOC/GS Indicator Cert. Basis - TSO C34c, C36c, C40a	_____	1.2	64.9	78
251	King KI 213 VOR/LOC/GS Indicator	_____	2.5	64.9	162
253	King KI 214( ) VOR/LOC/GS Indicator	_____	2.9	64.9	189
255	King KN 74 R-Nav	_____	4.7	61.3	288
257	King KI 206 R-Nav Indicator	_____	1.3	61.6	80
259	King KN 61 DME Cert. Basis - TSO C66a	_____	13.3	189.5	2520
261	King KN 65A DME Cert. Basis - TSO C66a	_____	13.8	185.4	2559
263	King KR 85 Digital ADF	_____	8.6	96.6	831
	a. Audio Amplifier Cert. Basis - TSO C41b	_____	0.8	54.1	43
265	King KR 86 ADF				
	a. First	_____	6.7	104.8	702
	b. Second	_____	9.7	108.9	1057
	c. Audio Amplifier	_____	0.8	54.1	43
267	King KMA 20( ) Audio Panel Cert. Basis - TSO C35c, C50b	_____	*3.7	74.9	277
269	King KT 76( )/78( ) Transponder Cert. Basis - TSO C74b	_____	*3.1	63.1	196

*Weight includes antenna and cable.

(m) Radio Equipment
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
275	Narco Comm 10A VHF Transceiver	_____	3.9	62.4	243
277	Narco Comm 11A VHF Transceiver				
	a. Single	_____	3.6	62.4	225
	b. Dual	_____	7.1	62.4	443
279	Narco Comm 11B VHF Transceiver				
	a. Single	_____	3.9	62.4	243
	b. Dual	_____	7.8	62.4	487
281	Narco Comm 111 VHF Transceiver				
	a. Single	_____	4.0	62.4	250
	b. Dual	_____	8.0	62.4	500
	Cert. Basis - TSO C37b, C38b				
283	Narco Comm 111B VHF Transceiver				
	a. Single	_____	3.9	62.4	243
	b. Dual	_____	7.8	62.4	487
	Cert. Basis - TSO C37b, C38b				
285	Narco Comm 120 VHF Transceiver				
	a. Single	_____	4.8	61.9	297
	b. Dual	_____	8.6	62.4	537
	Cert. Basis - TSO C37b, C38b				
287	Narco Nav 10 VHF Receiver	_____	1.9	63.6	121
289	Narco Nav 11 VHF Receiver				
	a. Single	_____	2.8	63.6	178
	b. Dual	_____	5.6	63.6	356

(m) Radio Equipment
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
291	Narco Nav 12 VHF Receiver	_____	3.4	63.6	216
293	Narco Nav 14 VHF Receiver	_____	2.5	62.4	156
295	Narco Nav 111 Cert. Basis - TSO C36c, C40a, C66a	_____	2.5	63.6	159
297	Narco Nav 112 Receiver Cert. Basis - TSO C36c, C40a, C66c, C34c	_____	3.3	63.6	210
299	Narco Nav 114 VHF Receiver Cert. Basis - TSO C38b, C40a, C36c, C34c, C66a	_____	2.5	62.4	156
301	Narco Nav 121 VHF Receiver a. Single b. Dual Cert. Basis - TSO C36c, C40c, C66a	_____ _____	3.1 6.2	63.5 63.4	197 393
303	Narco Nav 122 VHF Receiver a. Single b. Dual Cert. Basis - TSO C35d, C36c, C40c, C66a	_____ _____	*5.3 *8.8	105.7 87.5	560 770
305	Narco Nav 122A VHF Receiver a. Single b. Dual Cert. Basis - TSO C34c, C35d, C36c, C40c, C66a	_____ _____	*5.4 *9.0	104.6 86.8	565 781
307	Narco Nav 124A VHF Receiver a. Single b. Dual Cert. Basis - TSO C35d, C36c, C40a, C66a	_____ _____	*6.4 *11.1	100.3 84.2	642 935

*Weight includes marker antenna and cable.

(m) Radio Equipment
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
309	Narco Nav 124R VHF Receiver Cert. Basis - TSO C36c, C40a, C66a	_____	4.4	62.4	275
311	Narco ID 124 VOR/LOC/GS Indicator				
	a. Single	_____	1.2	65.5	79
	b. Dual	_____	2.4	65.5	157
	Cert. Basis - TSO C34c, C35d, C36c, C40c				
313	Narco OC-110 Converter and Mount Cert. Basis - TSO C36c, C40a	_____	2.1	231.5	486
315	Narco UGR-2A Glide Slope				
	a. Single	_____	3.0	40.0	120
	b. Dual	_____	7.0	131.6	921
	Cert. Basis - TSO C34b				
317	Narco UGR-3 Glide Slope	_____	2.9	40.0	116
319	Narco MBT-12-R, Marker Beacon	_____	4.0	77.7	311
321	Narco CP-125 Audio Selector Panel	_____	2.2	76.2	168
323	Narco CP-135 Audio Selector Panel Cert. Basis - TSO C50b	_____	2.2	76.2	168
325	Narco CP-135M Audio Selector Panel Cert. Basis - TSO C50b, C35d	_____	*3.9	132.6	517
327	Narco CLC-60A R-Nav	_____	11.5	133.9	1540
	a. Narco SA-11 Adapter	_____	0.8	45.5	36

*Weight includes marker antenna and cable.

(m) Radio Equipment
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
329	Narco DME-190	_____	*5.9	65.9	389
331	Narco DME-190 TSO Cert. Basis - TSO C66a	_____	*5.9	65.9	389
333	Narco DME-195 Receiver and Indicator Cert. Basis - TSO C66a	_____	*10.8	193.5	2090
335	Narco ADF-140 a. Single b. Dual Cert. Basis - TSO C41c	_____ _____	6.0 **17.9	94.3 109.9	566 1967
337	Narco ADF-141 a. Single b. Dual Cert. Basis - TSO C41c	_____ _____	6.4 **17.9	94.3 109.9	604 1967
339	Narco AT50A Transponder Cert. Basis - TSO C74b	_____	*3.0	62.3	187
341	Narco AT150 Transponder Cert. Basis - TSO C74c	_____	*3.2	62.3	200

*Weight includes antenna and cable.
**Weight includes dual antenna and cable.

(m) Radio Equipment
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
343	Antenna and Cable				
	a. Nav Receiving	_____	1.3	209.4	273
	b. #1 VHF Comm	_____	0.6	146.3	88
	c. #2 VHF Comm	_____	0.9	181.1	163
	d. Glide Slope (Single)	_____	0.9	96.7	87
	e. Glide Slope (Dual)	_____	2.8	180.0	504
	f. Single ADF Sense	_____	0.4	160.0	64
345	Anti-Static Antenna and Cable				
	a. #1 VHF Comm	_____	1.5	162.7	252
	b. #2 VHF Comm	_____	1.6	192.5	308
	c. Single ADF Sense	_____	0.6	160.0	96
347	Emergency Locator Transmitter (C.C.C. Model CIR-11-2)	_____	1.7	267.2	454
	a. Antenna and Coax	_____	0.2	255.4	51
	b. Shelf and Access Hole	_____	0.5	266.4	133
	Cert. Basis - TSO C91				
348	Emergency Locator Transmitter (Narco Model ELT-10)	_____	3.5	267.2	935
	a. Antenna and Coax	_____	0.3	255.4	77
	b. Shelf and Access Hole	_____	0.5	266.4	133
349	RCA Radar Piper Dwg. 36885-2	_____	23.0	81.0	1863
350	Microphone				
	a. Piper Dwg. 68856-10	_____	0.3	69.9	21
	b. Piper Dwg. 68856-11	_____	0.6	74.9	45
	c. Piper Dwg. 68856-12	_____	0.3	69.9	21
351	Boom Microphone - Headset Piper Dwg. 37921-3	_____	0.3	85.5	26
353	Cabin Speaker Piper Dwg. 63239-2	_____	0.8	97.5	78
355	Headset Piper Dwg. 68856-10	_____	0.5	65.0	33

(m) Radio Equipment
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)

(n) Miscellaneous
(Optional Equipment)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
363	Zinc Chromate Finish Piper Dwg. 79700-2	———	7.5	113.2	849
365	Stainless Steel Control Cables Piper Dwg. 79700-10	———	—	—	—
367	Air Conditioner Piper Dwg. 99750	———	70.4	114.5	8061
369	Ground Ventilating Blower Piper Dwg. 79273-5, -11 or -18	———	8.6	204.0	1754
371	Assist Step Piper Dwg. 65384 or 37846-3	———	1.5	147.5	221
373	Super Cabin Sound Proofing a. Piper Dwg. 78480 b. Piper Dwg. 79601-7	——— ———	24.4 19.0	107.2 107.2	2616 2037
375 C	Adjustable Front Seat (Left) Piper Dwg. 79592-0 or 79592-2	———	*4.6	84.7	390
377	Adjustable Front Seat (Right) Piper Dwg. 79592-1 or 79592-3	———	*4.6	84.1	387
379	Jump Seat (With Seat Belts) Piper Dwg. 69595-4	———	9.2	122.3	1125
381	Club Seating (Includes oversize headrest center seats) Piper Dwg. 37825-2	———	*14.2	90.4	1284

*Weight and moment difference between standard and optional equipment.

(n) Miscellaneous
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
383	Inboard Armrest - Aft Piper Dwg. 79479-7	_____	2.6	152.0	395
385	Headrests (2) Front Piper Dwg. 79337-18	_____	2.0	99.5	199
387	Headrests (2) Center Piper Dwg. 79337-18	_____	2.0	132.1	264
389	Headrests (2) Rear Piper Dwg. 79337-18	_____	2.0	171.5	343
391	Oversize Headrests - Front (2) Piper Dwg. 79764-2	_____	3.2	99.5	318
393	Oversize Headrests - Center (2) (Fwd. Facing Seats Only) Piper Dwg. 79764-2	_____	3.2	132.1	423
395	Oversize Headrests - Aft (2) Piper Dwg. 79764-2	_____	3.2	171.5	549
397	Inertia Safety Belts - Center (2) Piper PS50039-4-15 (Pacific Scientific P/N 1107319-03 Black) or (American Safety Eqpt. Corp. P/N 500853-403)	_____	1.5	133.9	201
399	Inertia Safety Belts - Rear (2) Piper PS50039-4-14 (Pacific Scientific P/N 1107319-01 Black) or (American Safety Eqpt. Corp. P/N 500853-401)	_____	1.6	181.5	290
401	Assist Straps (2) Piper Dwg. 79455-0	_____	0.3	120.0	36

(n) Miscellaneous
(Optional Equipment) (cont)

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
403	Curtain and Rod Installation Piper Dwg. 79721-2	_____	1.9	143.6	273
405	Curtain and Rod Installation Piper Dwg. 67955-3	_____	5.2	143.6	747
407	Refreshment Console Piper Dwg. 37825-5	_____	7.0	118.5	830
409	Cabin Work Table Installation Piper Dwg. 37825-6	_____	3.9	**185.6	724
411	Deluxe Carpeting	_____	*-3.6	113.9	-410
413	Luxurious Interior Piper Dwg. 67953-3	_____	*25.0	113.9	2848
415	Fire Extinguisher Installation				
	a. Piper Dwg. 35680-14 (Graviner P/N HA1014-01)	_____	5.6	62.8	352
	b. Piper Dwg. 76167-2 (W. Kiddie P/N 2¾DCK-6)	_____	4.6	71.0	327
417	Clip Installation - Map Piper Dwg. 37907-2	_____	0.1	75.0	8
	TOTAL OPTIONAL EQUIPMENT	_____	_____	_____	_____

*Weight and moment difference between standard and optional equipment.
**Stowed position.

EXTERIOR FINISH

Base Color _____

Trim Color _____

Accent Color _____

Registration No. Color _____

Type Finish _____

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