

DUPLICATE

PILOT'S OPERATING HANDBOOK

PIPER CHEROKEE ARCHER II



FAA APPROVED IN NORMAL AND UTILITY CATEGORIES BASED ON CAR 3 AND FAR PART 21, SUBPART J. THIS HANDBOOK INCLUDES THE MATERIAL REQUIRED TO BE FURNISHED TO THE PILOT BY CAR 3 AND FAR PART 21, SUBPART J AND MUST BE CARRIED IN THE AIRPLANE AT ALL TIMES.

PA-28-181
REPORT: VB-760

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

AIRPLANE SERIAL NO. 28-7690149

AIRPLANE REGISTRATION NO. SE-GNF

DATE OF APPROVAL: AUGUST 15, 1975


Eijörn Pettersson
Inspector
Luftfartstyrelsen



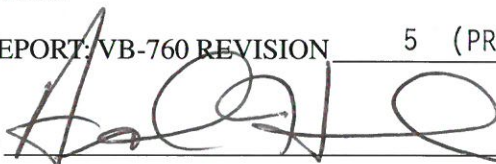

WARNING

EXTREME CARE MUST BE EXERCISED TO LIMIT THE USE OF THIS MANUAL TO APPLICABLE AIRCRAFT. THIS MANUAL 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-28-181, CHEROKEE ARCHER II

PILOT'S OPERATING HANDBOOK, REPORT: VB-760 REVISION 5 (PR900608)

PIPER AIRCRAFT CORPORATION
APPROVAL SIGNATURE AND STAMP

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Piper Aircraft, Inc.

Issued: August 15, 1975

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APPLICABILITY

The aircraft serial number eligibility bracket for application of this handbook is 28-7690001 through 28-7690467. The specific application of this handbook is limited to the Piper PA-28-181 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.

ORIGINAL PAGES ISSUED

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

Title, ii through v, 1-1 through 1-14, 2-1 through 2-8, 3-1 through 3-12, 4-1 through 4-16, 5-1 through 5-26, 6-1 through 6-52, 7-1 through 7-26, 8-1 through 8-16, 9-1 through 9-14, 10-1 through 10-2.

PILOT'S OPERATING HANDBOOK LOG OF REVISIONS

Current Revisions to the PA-28-181 Cherokee Archer II Pilot's Operating Handbook, REPORT: VB-760 issued August 15, 1975.

Revision Number and Code	Revised Pages	Description of Revision	FAA Approval Signature and Date
Rev. 1 - 761 619 (PR760106)	6-i 6-37 6-44 6-46 7-25 8-5	Revised wording of 6.9 (a). Removed Piper Dwg. No. from item 155. Added items 236 and 238. Revised item 263. Revised ELT pilot's remote switch info. Revised 8.7 (a), items (1), (2), and (3).	<i>Ward Evans</i> Ward Evans Jan. 6, 1976
Rev. 2 - 761 619 (PR761112)	3-3 3-8 3-9 4-14 5-4 5-9 5-13 5-14 5-14a 5-14b 5-25 5-26 6-35 6-36 6-46 7-24 7-25	Revised checklist. Revised wording of 3.11. Revised 3.15 info. Revised approach speed in 4.29. Revised takeoff performance. Added Fig. 5-6, 5-8, and 5-30. Revised Fig. 5-5. Added Fig. 5-6 (Flaps Up Ground Roll). Added page (added revised Fig. 5-7). Added page (added Fig. 5-8 - 25° Ground Roll). Revised Fig. 5-29. Added Fig. 5-30 (Landing Ground Roll). Added items 114 and 116. Relocated items 127 and 129, added items 131 and 133. Added PAL transmitter item 263 (c), revised item 263 (c) to 263 (d). Revised ELT transmitter info. Revised ELT pilot's remote switch info.	<i>Ward Evans</i> Ward Evans Nov. 12, 1976
Rev. 3 - 761 619 (PR770601)	4-1 4-4 4-9	Revised item 4.3 (c). Revised Starting Engine When Hot. Revised item 4.13 (b)	<i>Ward Evans</i> Ward Evans June 1, 1977
Rev. 4 - 761 619 (PR790316)	iii 1-4 4-5 5-5 5-14 5-14b 6-1 6-3 7-10	Added serial no. effectivity. Revised para. 1.13 and footnote. Revised para. 4.5. Revised para. 5.5. Revised Fig. 5-6. Revised Fig. 5-8. Revised para. 6.1. Added Caution to para. 6.3. Added Warning to para. 7.15.	

REPORT: VB-760

PILOT'S OPERATING MANUAL LOG OF REVISIONS (cont)

Revision Number and Code	Revised Pages	Description of Revision	FAA Approval Signature and Date
Rev. 4 - 761 619 (PR790316) (cont)	7-11 7-21 7-24 8-13 8-14 8-15	Revised para 7.15. Added Caution to para. 7.23. Revised para. 7.37. Added Caution to para. 8.21; reJocled info to pg. 8-14. Added info. from pg. 8-13; relocated info. to pg. 8-15 Added info. from pg. 8-14.	<i>Ward Evans</i> Ward Evans March 16, 1979
Rev. 5 - 761 619 (PR900608)	1-3 8-1 8-3 8-4 8-11 8-11a 8-11b 8-12	Revised para. 1.9, item (c). Revised para. 8.1. Revised para. 8.3. Revised para. 8.5. Revised para 8.19. Revised para 8.21, item b. Relocated para. 8.21, item (c) to pg. 8-12. Added page. Added page. Added Fuel Comparison Chart. Added info. to para. 8.21, item (b). Added relocated para. 8.21, item (c) from pg. 8-11	<i>D.H. Trompler</i> D.H. Trompler July 30, 1990
Rev. 6 - 761 619 (PR190401)	ii iv-a 5-3 8-10	Updated copyright. Added Rev. 6 to L of R. Revised Para. 5.5. Revised Para. 8.15.	<i>Eric A. Wright</i> Eric A. Wright April 1, 2019

ISSUED: AUGUST 15, 1975
REVISED: APRIL 1, 2019

REPORT: VB-760
iv-a

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GENERAL

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SECTION 1

GENERAL

1.1 INTRODUCTION

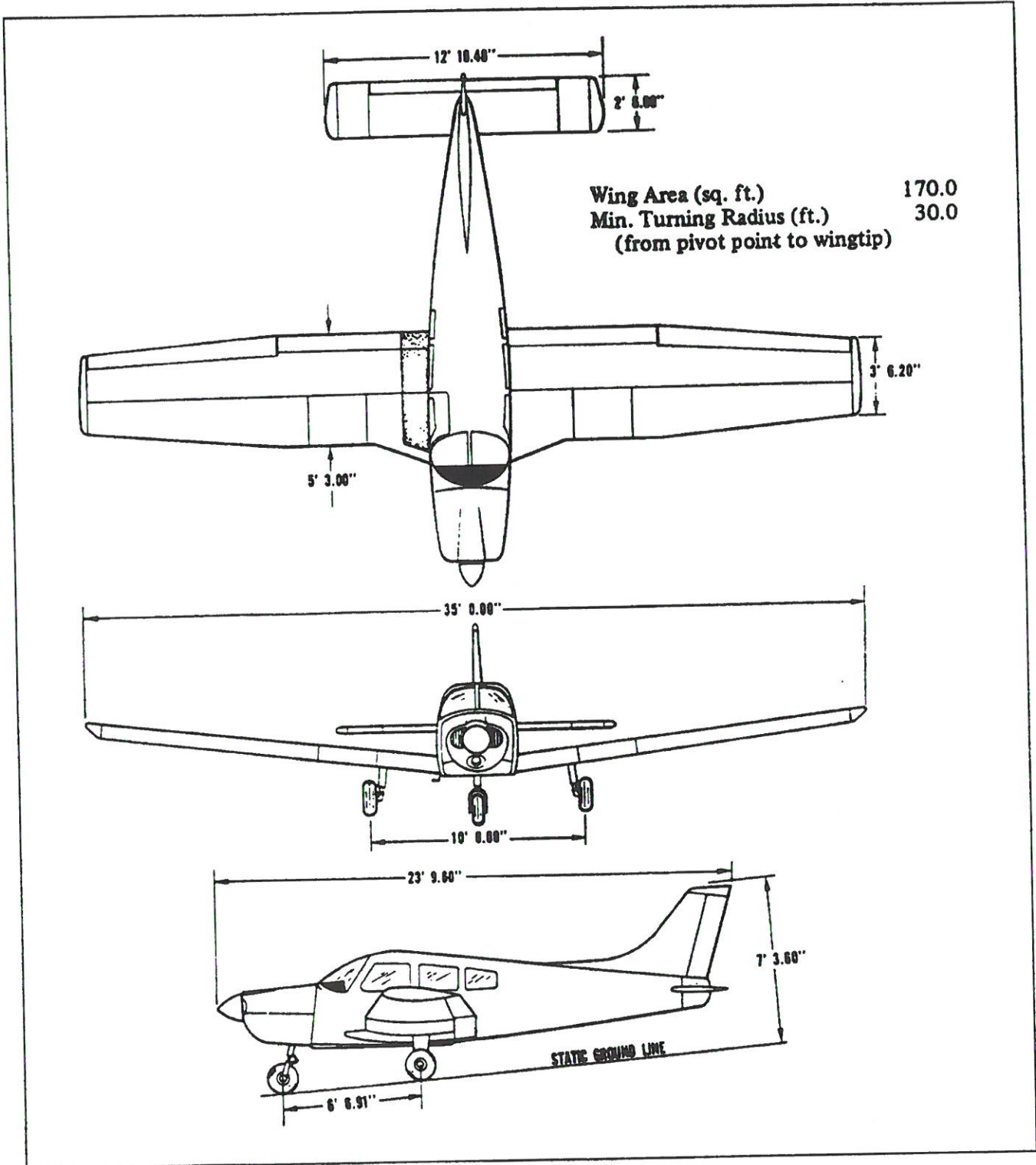
This Pilot's Operating Handbook is designed for maximum utilization as an operating guide for the pilot. It includes the material required to be furnished to the pilot by C.A.R. 3 and FAR Part 21, Subpart J. It also contains supplemental data supplied by the airplane manufacturer.

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 left blank intentionally.



THREE VIEW

Figure 1-1

1.3 ENGINES

(a) Number of Engines	1
(b) Engine Manufacturer	Lycoming
(c) Engine Model Number	O-360-A4M
(d) Rated Horsepower	180
(e) Rated Speed (rpm)	2700
(f) Bore (inches)	5.125
(g) Stroke (inches)	4.375
(h) Displacement (cubic inches)	361.0
(i) Compression Ratio	8.5:1
(j) Engine Type	Four Cylinder, Direct Drive Horizontally Opposed, Air Cooled

1.5 PROPELLERS

(a) Number of Propellers	1
(b) Propeller Manufacturer	Sensenich
(c) Model	76EM8S5-0-60
(d) Number of Blades	2
(e) Propeller Diameter (inches)	
(1) Maximum	76
(2) Minimum	76
(f) Propeller Type	Fixed Pitch

**1.7 FUEL
AVGAS ONLY**

(a) Fuel Capacity (U.S. gal.) (total)	50
(b) Usable Fuel. (U.S. gal.) (total)	48
(c) Fuel Grade. Aviation (min. octane)	100/130 Green

1.9 OIL

(a) Oil Capacity (U.S. Quarts)	8
(b) Oil Specification	Refer to latest issue of Lycoming Instruction No. 1014.
(c) Oil Viscosity per Average Ambient Temp. for Starting	

	MIL-L-6082B Mineral SAE Grade	MIL-L-22851 Ashless Dispersant SAE Grades
(1) All Temperatures		15W-50 or 20W-50
(2) Above 80°F	60	60
(3) Above 60°F	50	40 or 50
(4) 30°F to 90°F	40	40
(5) 0°F to 70°F	30	30, 40 or 20W-40
(6) 0°F to 90°F	20W-50	20W-50 or 15W-50
(7) Below 10°F	20	30 or 20W-30

When operating temperatures overlap indicated ranges, use the lighter grade oil.

**SECTION 1
GENERAL**

**PIPER AIRCRAFT CORPORATION
PA-28-181, CHEROKEE ARCHER II**

1.11 MAXIMUM WEIGHTS

	NORMAL	UTILITY
(a) Maximum Takeoff Weight (lbs)	2550	1950
(b) Maximum Landing Weight (lbs)	2550	1950
(c) Maximum Weights in Baggage Compartment	200	0

1.13 STANDARD AIRPLANE WEIGHTS*

(a) Standard Empty Weight (lbs): Weight of a standard airplane including unusable fuel, full operating fluids and full oil	1390
(b) Maximum Useful Load (lbs): The difference between the Maximum Takeoff Weight and the Standard Empty Weight	1160

1.15 BAGGAGE SPACE

(a) Compartment Volume (cubic feet)	24
(b) Entry Width (inches)	22
(c) Entry Height (inches)	20

1.17 SPECIFIC LOADINGS

(a) Wing Loading (lbs per sq ft)	15.0
(b) Power Loading (lbs per hp)	14.2

*These values are approximate and may vary from one aircraft to another. Refer to Figure 6-5 for the Standard Empty Weight value and Useful Load value to be used for C.G. calculation 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 compressibility.
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	<p>International Standard Atmosphere in which: The air is a dry perfect gas; The temperature at sea level is 15° Celcius (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.</p>
OAT	<p>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.</p>
Indicated Pressure Altitude	<p>The number actually read from an altimeter when the barometric subscale has been set to 29.92 inches of mercury (1013 millibars).</p>
Pressure Altitude	<p>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.</p>
Station Pressure	<p>Actual atmospheric pressure at field elevation.</p>
Wind	<p>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.</p>

(c) Power Terminology (Specific)

Takeoff Power	Maximum Rated Power (180 HP @ 2700 RPM)
Maximum Continuous Power	Maximum Rated Power (180 HP @ 2700 RPM)
Maximum Climb Power	Maximum Rated Power (180 HP @ 2700 RPM)
Maximum Cruise Power	Maximum Rated Power (180 HP @ 2700 RPM)
Flight Idle Power	Throttle Closed
Ground Idle Power	Throttle Closed

(d) Engine Instruments

EGT Gauge	Exhaust Gas Temperature Gauge
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(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 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

<u>MULTIPLY</u>	<u>BY</u>	<u>TO OBTAIN</u>	<u>MULTIPLY</u>	<u>BY</u>	<u>TO OBTAIN</u>
atmospheres	76.00 29.92 14.696 21.116 1.033	cm Hg at 0°C in. Hg at 0°C lb/sq in. lb/sq ft kg/sq cm	feet	3.048×10^{-1} 3.333×10^{-1} 1.894×10^{-4} 1.646×10^{-4}	meters yards miles nautical miles
centimeters	0.3937 3.281×10^{-2}	in. ft	ft/min	1.136×10^{-2} 1.829×10^{-2} 5.080×10^{-1}	mph km/hr cm/sec
cm Hg	1.934×10^{-1} 27.85 135.95	lb/sq in. lb/sq ft kg/sq m	ft/sec	.6818 1.097 30.48 .5925	mph km/hr cm/sec knots
cm/second	3.281×10^{-2} 2.237×10^{-2}	ft/sec mph	ft/lb	1.383×10^{-1}	m-kg
cu centimeters	10^{-3} 6.102×10^{-2} 2.642×10^{-4}	liters cu in. U.S. gal	ft-lb/min	3.030×10^{-5}	hp
cu ft	2.832×10^{-4} 1,728 3.704×10^{-2} 7.481 28.32	cu cm cu in. cu yards U.S. gal liters	ft-lb/sec	1.818×10^{-3}	hp
cu ft/min	4.719×10^{-1} 2.832×10^{-2}	liters/sec cu m/min	fluid oz	8 29.6	dram cu cm
cu in.	16.39 1.639×10^{-2} 4.329×10^{-3} 1.732×10^{-2}	cu cm liters U.S. gal quarts	gal, Imperial	277.4 1.201 4.546	cu in. U.S. gal liters
cu meters	61,023 1.308 35.31 264.2	cu in. cu yards cu ft U.S. gal	gal, U.S. dry	268.8 1.556×10^{-1} 1.164 4.405	cu in. cu ft U.S. gal liquid liters
cu yards	27.0 7.646×10^{-1} 2.022×10^{-2}	cu ft cu meters U.S. gal	gal, U.S. liquid	231.0 1.337×10^{-1} 3.785 8.327×10^{-1} 1.280×10^{-2}	cu in. cu ft liters Imperial gal fluid oz
deg (arc)	1.745×10^{-2}	radians	grams/cm	0.1 6.721×10^{-2} 5.601×10^{-3}	kg/m lb/ft lb/in.
			grams/cu cm	1,000 62.43	kg/cu m lb/cu ft

**SECTION 1
GENERAL**

**PIPER AIRCRAFT CORPORATION
PA-28-181, CHEROKEE ARCHER II**

<u>MULTIPLY</u>	<u>BY</u>	<u>TO OBTAIN</u>	<u>MULTIPLY</u>	<u>BY</u>	<u>TO OBTAIN</u>
horsepower	33,000	ft-lb/min	liters	10 ³	cu cm
	550	ft-lb/sec		61.03	cu in.
	76.04	m-kg/sec		3.532 x 10 ⁻²	cu ft
	1.014	metric hp		2.642 x 10 ⁻¹	U.S. gal
horsepower, metric	75.0	m-kg/sec	meters	2.200 x 10 ⁻¹	Imperial gal
	9.863 x 10 ⁻¹	hp		1.057	quarts
inches	2.540	cm	meter-kilogram	39.37	in.
	83.33 x 10 ⁻³	ft		3.281	ft
in. Hg at 0 C	3.342 x 10 ⁻²	atmospheres		1.094	yards
	4.912 x 10 ⁻¹	lb/sq in.		6.214 x 10 ⁻⁴	miles
	70.73	lb/sq ft	meter/sec	7.233	ft-lb
3.453 x 10 ⁻²	kg/sq m	3.281		ft/sec	
kilograms	2.205	lb	2.237	miles/hr	
	35.27	oz	3.600	km/hr	
	10 ³	grams	microns	3.937 x 10 ⁻⁵	in.
kg-calories	3087	ft-lb		miles	5280
	4.269 x 10 ⁻²	m-kg		1.609	km
kg/cu m	62.43 x 10 ⁻³	lb/cu ft		8.690 x 10 ⁻¹	nautical miles
	10 ⁻³	grams/cu m	mph	1.467	ft/sec
kg/sq cm	14.22	lb/cu ft		4.470 x 10 ⁻¹	m/sec
	2.048 x 10 ³	lb/sq ft	1.609	km/hr	
	28.96	in. Hg at 0°C	8.690 x 10 ⁻¹	knots	
kilometers	3.281 x 10 ⁻³	ft	miles/hr sq	2.151	ft/sec sq
	6.214 x 10 ⁻¹	miles	millibars	2.953 x 10 ⁻²	in. Hg at 0 C
	5.400 x 10 ⁻¹	nautical miles	nautical miles	6076.1	ft
	10 ⁵	centimeters		1.151	miles
km/hr	9.113 x 10 ⁻¹	ft/sec		1852	m
	5.396 x 10 ⁻¹	knots	ounces, fluid	29.57	cu cm
	6.214 x 10 ⁻¹	mph		1.805	cu in.
	2.778 x 10 ⁻¹	m/sec	lb/cu ft	16.02	kg/cu m
knots	1.0	nautical mph	lb/cu in.	1728	lb/cu ft
	1.688	ft/sec		27.68	grams/cu cm
	1.151	mph			
	1.853	km/hr			
	5.148 x 10 ⁻¹	m/sec			

<u>MULTIPLY</u>	<u>BY</u>	<u>TO OBTAIN</u>
lb/sq in.	2.036 6.805×10^{-2} 7.031×10^2	in. Hg at 0°C atmospheres kg/sq m
radians	57.30	deg (arc)
radians/sec	57.30 15.92×10^{-2} 9.549	deg/sec rev/sec rev/min
revolutions	6.283	radians
rev/min	1.047×10^{-1}	radians/sec
rod	16.5 5.5	ft yd
slug	32.174	lb
sq cm	1.550×10^{-1} 1.076×10^{-3}	sq in. sq ft
sq ft	929.0 144.0 1.111×10^{-1} 2.296×10^{-5}	sq cm sq in. sq yards acres
sq in.	6.452	sq cm
sq kilometers	3.861×10^{-1}	sq miles
sq meters	10.76 1.196	sq ft sq yards
sq miles	2.590 640	sq km acres
sq rods	30.25	sq yd
sq yards	8.361×10^{-1} 9	sq m sq ft
yards	9.144×10^{-1} 3.0 36.0	meters ft in.

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