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PIPER AIRCRAFT CORP.
DEVELOPMENT CENTER, VERO BEACH, FLA.

Airplane Flight Manual
Model PA-28-180

REPORT VB-437

PAGE

AIRPLANE FLIGHT MANUAL

MODEL PA-28-180

FAA IDENTIFICATION NO. N15472

SERIAL NO. 28-7305081

THIS DOCUMENT MUST BE KEPT IN AIRPLANE AT ALL TIMES.

FAA APPROVED:

H. W. Barnhouse

H. W. Barnhouse, FAA DOA SO-1
Piper Aircraft Corporation

DATE:

May 22, 1972

N15472
PIPER PA-28-180
SERIAL# 7305081

ENGINE

Engine: Lycoming Model 0-360-A4A; Serial# RL-31737-36A
Carburetor: PAM; PN 71098-85; Serial# G486585
LH Magneto: Slick 4373; Serial # 08062744
RH Magneto: Slick 4370; Serial # 08062960
Alternator: ESI; Model 3656624; Serial #A062567
Starter: ESI; Model 31A22470; Serial # B082603
Vacuum Pump: Airborne 211CC; Serial # 7B11005

AIRFRAME

Wheels: Cleveland PN 40-86
Brakes: Cleveland PN 30-55
ELT: Ameri-King AK 450

PROPELLER

Propeller: Sensenich Model76EM855-0-60; Serial# 100779K

#1 Nav/Com/GPS Garmin GNS 430-W; PN 011-01060-00; Serial # 23435427
#1 Nav Indicator King KI206; Serial # 10958
#2 Com King KY92; Serial # 21477
#2 Nav/Indicator Narco Nav 11A
Audio Panel Garmin GMA-340; PN 011-00401-10; Serial # 96293350
Transponder King KT76; Serial # 3521

GPS Antenna Garmin GA35; PN 013-00235-00; Serial # 81284
#1 Com Antenna CI121; Serial # 358927
#2 Com Antenna
Transponder Antenna

Altimeter Aero Mechanism Model 8140B-15; Serial# 3618 w/
ACK Technologies Mod-9 Blind Encoder Model A-30;
Serial # 127120

Vertical Speed Indicator Piper Dwg. 99480-0 or -2
Airspeed Indicator Piper Dwg. 62143-2 or -13
Artificial Horizon Piper Dwg. 99002-2, -3, -4, or -5
Turn & Bank Coord. Century I 52D75-4M; Serial # 2935E
Direction Gyro Piper Dwg. 99003-2, -3, -4, or -5
Exhaust Gas Temp Piper Dwg. 99026
Suction Gauge Piper Dwg. 99480-0, or -2

Hobbs Meter

Aircraft Weight and Balance Revision

Tail Number: N15472			Date: 9-7-16		
Prepared by: ABOVE & BEYOND, INC.			Work Order No:		
			Type Certificate Data No:		
Aircraft Make: PIPER	Model: PA-28-180	Serial No: 28-7305081		Time: 4267.0	
Registered Owner:			Address:		
Maximum Weight 2450		CG Range FWD		AFT	
As Received; Date of Previous Weight and Balance: 7-23-13		Useful Load: 975.23	EW: 1474.77	EWCG: 86.29	Moment: 127264.8
Notes: REMOVED WHEEL FAIRINGS					
			Weight	Arm	Moment
NOSE WHEEL FAIRING			-3.8	29.8	-113.24
MAIN WHEEL FAIRINGS			-7	109.6	-767.20
			0.00	0.00	0.00
			0.00	0.00	0.00
			0.00	0.00	0.00
			0.00	0.00	0.00
			0.00	0.00	0.00
			0.00	0.00	0.00
			0.00	0.00	0.00
			0.00	0.00	0.00
<input checked="" type="checkbox"/> As Calculated <input type="checkbox"/> As Weighed		Moment 126384.36 <hr/> Weight 1463.97	New Empty Weight CG 86.33		New Useful Load 986.03
Signature <i>[Handwritten Signature]</i> 3595343 AD					
Repair Agency or License No:					

Mid-South Avionics Inc.

4800 Carter Drive
Tuscaloosa, Alabama 35401
205-349-3502

Weight & Balance

Reg. Number: N15472
Make/Model: PIPER PA-28-180
Year: 1987
Serial Number: 28-7305081

Date: 07-23-2013
Tach: 4090.8
Max Weight: 2450
Work Order: 2024

New A/C Empty Weight: 1474.77 Landing C.G. Range:
New A/C Empty C.G.: 86.29 Gear Extended C.G. Range:
New A/C Useful Load: 975.23 Empty Weight C.G. Range:

Description	Serial Number	Weight	Arm	Moment	Installed	Removed
Previous Aircraft Empty	28-7305081	1474.47	86.30	127246.8	n/a	n/a
Removed						
Installed ACK A-30 MOD 9 BLIND ENCODER	127120	0.30	60.00	18.0	X	
New Aircraft Values		1474.77	86.29	127264.8		

*SUPERCEDED
9-7-16*

James Hutchinson
Jim Hutchinson, ZY4R717M

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Piper Model PA-28-180
Normal and Utility Categories

AIRPLANE FLIGHT MANUAL

1. Limitations Section The following limitations must be observed in the operation of this airplane:
- Engine Lycoming O-360-A4A with carburetor setting IO-3878
- Engine Limits For all operations,
2700 rpm, 180 hp.
- Fuel 100/130 minimum octane aviation fuel.
- Propeller Sensenich M76EMMS or 76EM8S5. Maximum diameter 76 inches, minimum diameter 76 inches. Static RPM at maximum permissible throttle setting. Not over 2425, not under 2325. No additional tolerance permitted.
- Power Instruments
- Oil Temperature: GREEN arc (normal operating range)
75° to 245°
RED line (maximum) 245°F
- Oil Pressure: GREEN arc (normal operating range)
60 psi to 90 psi
YELLOW arc (caution range)
25 psi to 60 psi
RED line (minimum) 60 psi
RED line (maximum) 90 psi
- Fuel Pressure: GREEN arc (normal operating range)
.5 psi to 8 psi
RED line (minimum) .5 psi
RED line (maximum) 8 psi
- Tachometer: GREEN arc (normal operating range)
500 to 2700 rpm
RED line (maximum continuous power)
2700 rpm

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Airspeed Limits	Never exceed Maximum structural cruise Maneuvering Flaps extended Maximum positive load factor Maximum positive load factor Maximum negative load factor	171 mph 140 127 115 3.8 Normal Category 4.4 Utility Category No inverted maneuvers approved
-----------------	--	--

Maximum Weight 2450 lbs - Normal Category; 1950 lbs - Utility Category.

Baggage Capacity 200 lbs.

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

1. <u>Normal Category</u>			
	<u>Weight</u>	<u>Forward Limit</u>	<u>Rearward Limit</u>
	(Pounds)	(In. Aft of Datum)	(In. Aft of Datum)
	2450	87.4	93.0
	2050	82.0	93.0
2. <u>Utility Category</u>			
	<u>Weight</u>	<u>Forward Limit</u>	<u>Rearward Limit</u>
	(Pounds)	(In. Aft of Datum)	(In. Aft of Datum)
	1950	82.0	86.5

Straight line variation between points given.

NOTE: It is the responsibility of the airplane owner and the pilot to insure that the airplane is properly loaded. See weight and balance section for proper loading instructions.

- Maneuvers
1. Normal Category - All acrobatic maneuvers including spins prohibited
 2. Utility Category - Approved maneuvers for Utility Category only.

	<u>Entry Speed</u>
Steep Turns.....	127 mph
Lazy Eights.....	127
Chandelles.....	127

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Placards

1. In Full View of the Pilot:

"THIS AIRPLANE MUST BE OPERATED AS A NORMAL OR UTILITY CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS.

ALL MARKINGS AND PLACARDS ON THIS AIRPLANE APPLY TO ITS OPERATION AS A UTILITY CATEGORY AIRPLANE. FOR NORMAL AND UTILITY CATEGORY OPERATIONS, REFER TO THE AIRPLANE FLIGHT MANUAL.

NO ACROBATIC MANEUVERS ARE APPROVED FOR NORMAL CATEGORY OPERATIONS. SPINS ARE PROHIBITED FOR BOTH NORMAL AND UTILITY CATEGORIES."

2. In full view of the pilot, the following takeoff and landing checklists will be installed:

TAKEOFF CHECKLIST

Fuel on proper tank	Mixture set	Fasten belts/harness
Electric fuel pump on	Seat backs erect	Trim tab - set
Engine gauges checked		Controls - free
Flaps - set		Door - latched
Carb heat off		Air Conditioner - off

LANDING CHECKLIST

Fuel on proper tank		Flaps - set (115 mph)
Mixture rich	Seat backs erect	Fasten belts/harness
Electric fuel pump on		Air Conditioner - off

The "AIR COND OFF" item in the above takeoff and landing checklists is mandatory for air conditioned aircraft only.

3. In full view of the pilot, in the area of the air conditioner control panel when the air conditioner is installed:

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

4. Adjacent to upper door latch: "ENGAGE LATCH BEFORE FLIGHT."

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Placards
(cont'd)

5. On inside of the baggage compartment door:
 - "BAGGAGE MAXIMUM 200 LBS. "
 - "UTILITY CATEGORY OPERATION - NO BAGGAGE OR AFT PASSENGERS ALLOWED. NORMAL CATEGORY OPERATION - SEE AIRPLANE FLIGHT MANUAL WEIGHT AND BALANCE SECTION FOR BAGGAGE AND AFT PASSENGER LIMITATIONS. "

6. In full view of the pilot:
 - "ROUGH AIR OR MANEUVERING SPEED - 127 MPH. "
 - "UTILITY CATEGORY OPERATION - NO AFT PASSENGERS ALLOWED. "

7. On the instrument panel in full view of the pilot when the oil cooler winterization kit is installed:
 - "OIL COOLER WINTERIZATION PLATE TO BE REMOVED WHEN AMBIENT TEMPERATURE EXCEEDS 50°F. "

8. On the instrument panel in full view of the pilot when the autoflite is installed:
 - "FOR HEADING CHANGES: PRESS DISENGAGE SWITCH ON CONTROL WHEEL. CHANGE HEADING, RELEASE DISENGAGE SWITCH. "

9. In full view of the pilot: "Utility Category Only."
 - Acrobatic maneuvers are limited to the following:

	<u>Entry Speed</u>
Steep Turns	127 mph
Lazy Eights	127
Chandelles	127

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Placards
(cont'd)

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

"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."

11. 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."

Airspeed
Instrument
Markings

RED radial line	Never Exceed	171 mph (148 knots)
YELLOW arc	Caution Range (Smooth Air Only)	140 to 171 mph (121 to 148 knots)
GREEN arc	Normal Operating Range	68 to 140 mph (59 to 121 knots)
WHITE arc	Flap Down Range	61 to 115 mph (53 to 100 knots)

Air Conditioned
Airplanes.

Air Conditioner must be off for takeoff and landing.

2. Procedures
Section

1. The stall-warning system is inoperative with the master switch off.
2. Electric fuel pump must be on for both landing and takeoff.
3. The PA-28-180 airplane is approved under FAA Regulation CAR 3 which prohibits intentional spins for both normal and utility category operation. The following information is noteworthy:
 - a. The stall characteristics of the PA-28-180 are normal with the nose pitching down moderately following the stall, occasionally with a moderate roll which can be corrected by normal use of ailerons and rudder against the roll.

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- b. Prolonged use of full rudder during stall practice may result in a rapid roll followed by a spin and should be avoided. Recovery from an incipient spin may be effected in less than one additional turn by use of opposite rudder followed by full forward control wheel.
- c. In the event that a fully developed spin is inadvertently experienced, recovery is best made by using full opposite rudder followed by full forward wheel and full opposite aileron. The control positions against the spin should be maintained during the entire recovery, which may require several turns and a substantial loss of altitude if the airplane is loaded heavily with a rearward center of gravity.
- 4. Except as noted above, all operating procedures for this airplane are normal.
- 5. (Electric Pitch Trim Installation Only with Pitch Trim Switch)

The following emergency information applies in case of electric pitch trim malfunction:
 - a. In case of malfunction, disengage electric pitch trim by pushing pitch trim switch on instrument panel to OFF position.
 - b. In an emergency, electric pitch trim may be overpowered using manual pitch trim.
 - c. In cruise configuration, malfunction results in 10° pitch change and 200 ft. altitude variation.
 - d. In approach configuration, a malfunction can result in a 5° pitch change and 50 ft. altitude loss.
- 6. (Autoflite Installation Only)

The following emergency information applies in case of autoflite malfunction:
 - a. In case of malfunction PRESS disconnect switch on pilot's control wheel.
 - b. Rocker switch on instrument panel - OFF.
 - c. Unit may be overpowered manually.

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Procedures
Section
(cont'd)

- d. In climb, cruise or descending flight an autopilot runaway, with a 3 second delay could result in a 50° bank, and 190 ft. altitude loss.
 - e. In approach configuration an autopilot runaway, with a 1 second delay could result in a 15° bank and 40 ft. altitude loss.
7. (AutoControl III Installation Only)
- I. Limitations: Autopilot off during takeoff and landing.
Autopilot use prohibited above 160 mph CAS.
 - II. Procedures:
 - a. Normal Operation

Refer to Manufacturer's Operation Manual
 - b. Emergency
 - 1. In case of malfunction, turn off autopilot.
 - 2. In emergency, autopilot may be overpowered manually.
 - 3. In climb, cruise or descending flight an autopilot runaway, with a 3 second delay could result in 60° bank and 100 ft. altitude loss.
 - 4. In approach configuration an autopilot runaway, with a 1 second delay could result in 10° bank and 10 ft. altitude loss.
8. (AutoFlite II Installation Only)
- I. Limitations: AutoFlite off for takeoff and landing.
AutoFlite use prohibited above 160 mph CAS.
 - II. Procedures:
 - a. Normal Operation - Refer to Manufacturer's Operation Manual.
 - b. Emergency
 - 1. In case of malfunction PRESS disconnect switch on pilot's control wheel.
 - 2. Rocker switch on instrument panel - OFF.

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Procedures
Section
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- 3. Autopilot may be overpowered manually.
- 4. In climb, cruise or descending flight an autopilot runaway, with a 3 second delay could result in 60° bank, and 190 ft. altitude loss.
- 5. In approach configuration an autopilot runaway, with a 1 second delay results in 15° bank and 40 ft. altitude loss.

9. (Air Conditioned Models Only)

Prior to takeoff, the air conditioner should be checked for proper operation as follows:

- a. Check aircraft master switch on
- b. Turn the air conditioner control switch to "AIR COND" - the "AIR COND DOOR OPEN" warning light will turn on, thereby indicating proper air conditioner condenser door actuation.
- c. Turn the air conditioner control switch to OFF - the "AIR COND DOOR OPEN" warning light will go out, thereby indicating the air conditioner condenser door is in the up position.
- d. If the "AIR COND DOOR OPEN" light does not respond as specified above, an air conditioner system or indicator bulb malfunction is indicated and further investigation should be conducted prior to flight.

The above operational check may be performed during flight if an inflight failure is suspected.

- 10. Air Conditioned Models only: Warning - The air conditioner must be off to insure normal takeoff performance.

3. Performance
Section

The following performance figures were obtained during FAA type tests and may be realized under conditions indicated with the airplane and engine in good condition and with average piloting technique. All performance is given for 2450 pounds.

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Performance
Section

Loss of altitude during stalls varied from 100 to 250 feet, depending on configuration and power.

Stalling speeds, in mph, power off, versus angle of bank
 (Calibrated Airspeed):

Angle of bank	0	20	40	50	60
Flaps Up	68	70	78	85	96
Flaps Down	61	--	--	--	--

Air Conditioned Models only:

When the full throttle position is not used or in the event of a malfunction which causes the compressor to operate and the condenser door to remain extended, a decrease in rate of climb of as much as 100 fpm can be expected at all altitudes.

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Weight and Balance Data
Model PA-28-180

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PAGE Title

REPORT VB-439

WEIGHT & BALANCE DATA

AND

EQUIPMENT LIST

MODEL PA-28-180

DATE May 17, 1972

PREPARED	PIPER AIRCRAFT CORP. Development Center, Vero Beach, Fla.	Weight and Balance Data Model PA-28-180
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WEIGHT AND BALANCE DATA

MODEL PA-28-180 CHEROKEE

Airplane Serial Number 28-7305081

Registration Number N15472

Date 11-3-72

*SUPPLEMENTED
9-7-16*

AIRPLANE EMPTY WEIGHT

Item	Weight (lbs)	x C.G. Arm (Inches Aft of Datum)	= Moment (In-Lbs)
*Empty Weight	1385.0 XXXXXXX Computed	85.6	118633
Unusable Fuel (13- 1/3 pints)	10.0	103.0	1030
Standard Empty Weight	1395.0	86.0	119663
Optional Equipment	73.9	98.1	7252
Licensed Empty Weight	1468.9	86.4	126915

1465.3 86.47 126712

*Empty weight is defined as dry empty weight (including paint and hydraulic fluid) plus 1.8 lbs. undrainable engine oil

AIRPLANE USEFUL LOAD

	(Gross Weight)	-	(Licensed Empty Weight)	= Useful Load
Normal Category:	(2450 lbs)	-	<i>1465.3</i> (1468.9 lbs)	<i>784.7</i> = 981.1 lbs.
Utility Category:	(1950 lbs)	-	<i>1465.3</i> (1468.9 lbs)	<i>484.7</i> = 481.1 lbs.

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

Jeanne Hartefeld
Inspection Representative

C. G. RANGE AND WEIGHT INSTRUCTIONS

1. Add the weight of all items to be loaded to the licensed empty weight.
2. Use the loading graph to determine the moment of all items to be carried in the airplane.
3. Add the moment of all items to be loaded to the licensed empty weight moment.
4. Divide the total moment by the total weight to determine the C. G. location.
5. By using the figures of Item 1 and Item 4, locate a point on the C. G. range and weight graph. If the point falls within the C. G. envelope, the loading meets the weight and balance requirements.

SAMPLE LOADING PROBLEM (Normal Category)

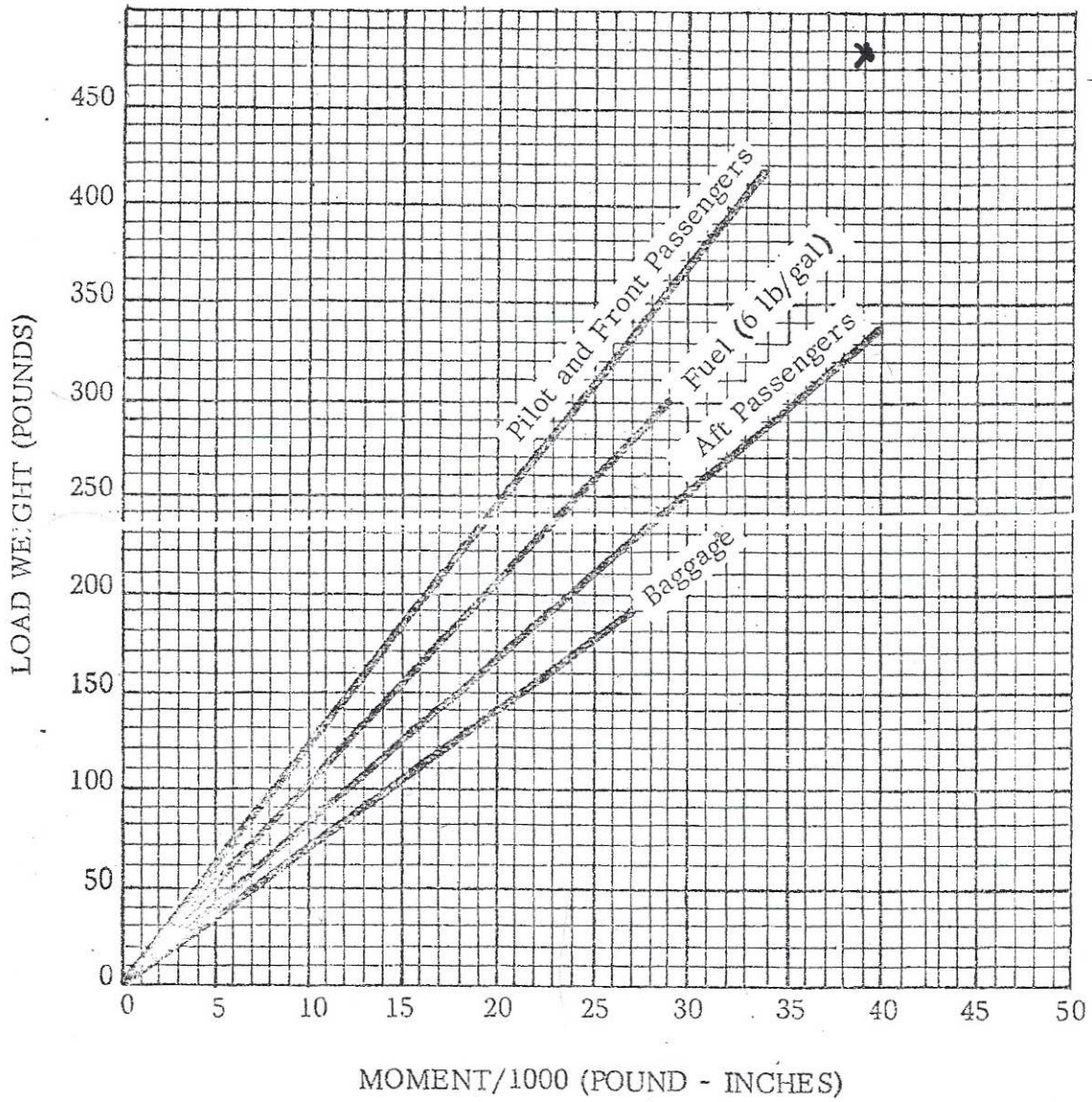
	Weight (lbs)	Arm Aft Datum (Inches)	Moment (In - lbs)
Licensed Empty Weight	1468.9	86.4	126915
Oil (8 quarts)	15	27.5	413
Pilot and Front Passenger	340	80.5	27370
Passengers, Aft* (Rear Seat)	340	118.1	40154
Fuel (50 Gal. Maximum)	200	95.0	19000
Baggage *	86.1	142.8	12295
Total Loaded Airplane	2450.0	92.3	226147

The center of gravity (C. G.) of this sample loading is at 92.3 inches aft of the datum line. Locate this point (92.3) 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.

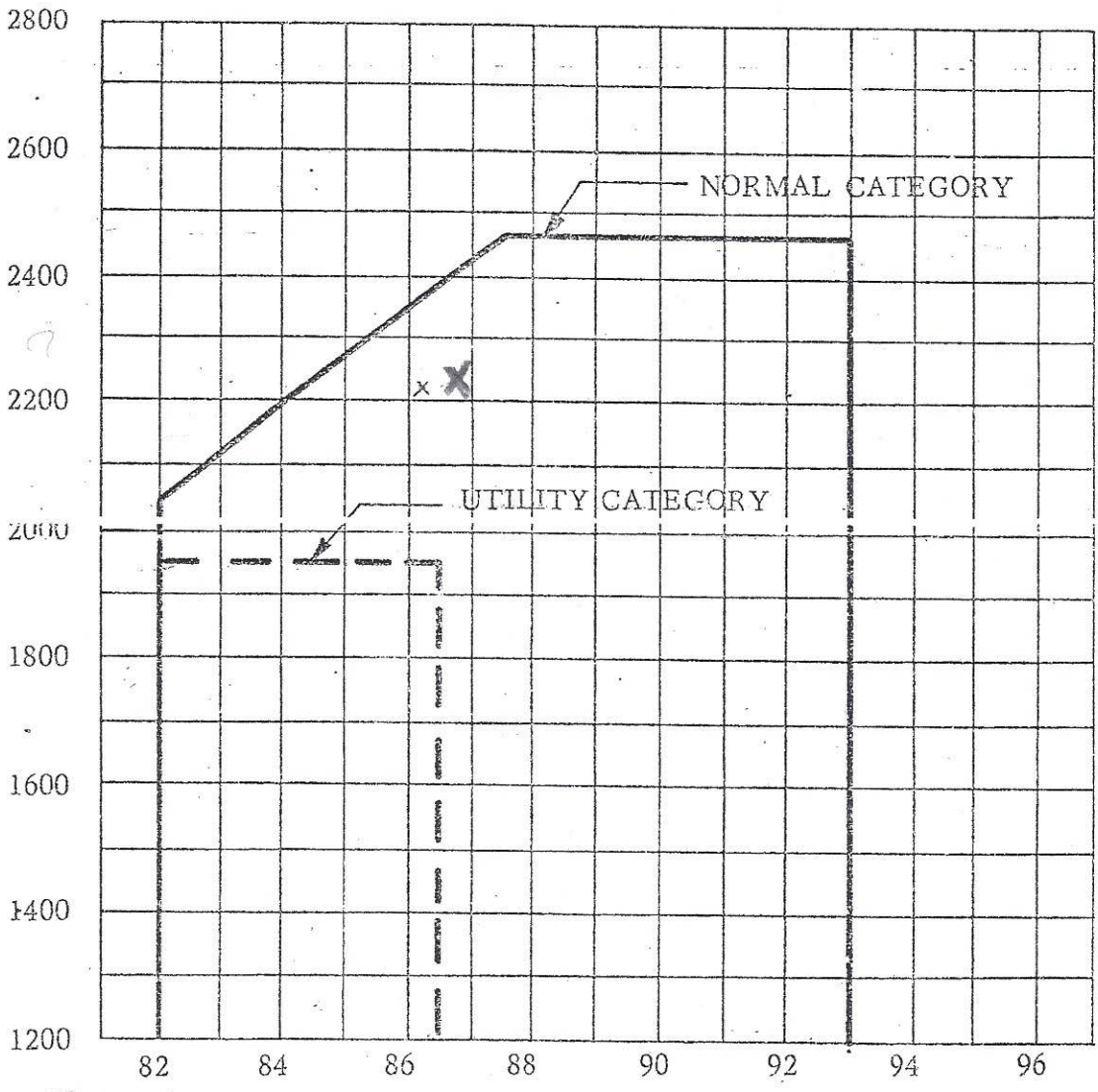
IT IS THE RESPONSIBILITY OF THE PILOT AND AIRCRAFT OWNER TO INSURE THAT THE AIRPLANE IS LOADED PROPERLY.

* Utility Category Operation - No baggage or aft passengers allowed.

LOADING GRAPH



C. G. RANGE AND WEIGHT



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WEIGHT AND BALANCE DATA

WEIGHING PROCEDURE

At the time of delivery, Piper Aircraft Corporation provides each airplane with the licensed empty weight and center of gravity location. This data is on Page 1, Section 1 of this report.

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

1. PREPARATION

- a. Be certain that all items checked in the airplane equipment list are installed in the proper location in the airplane.
- b. Remove excessive dirt, grease, moisture, foreign items such as rags and tools from the airplane before weighing.
- c. 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.
- d. Drain all oil from the engine, by means of the oil drain, with the airplane in ground attitude. This will leave the undrainable oil still in the system. Engine oil temperature should be in the normal operating range before draining.
- e. Place pilot and co-pilot 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.
- f. Weigh the airplane inside a closed building to prevent errors in scale readings due to the wind.

2. LEVELING

- a. With airplane on scales, block main gear oleo pistons in the fully extended position.
- b. Level airplane (see diagram) by deflating nose wheel tire, to center bubble on level.

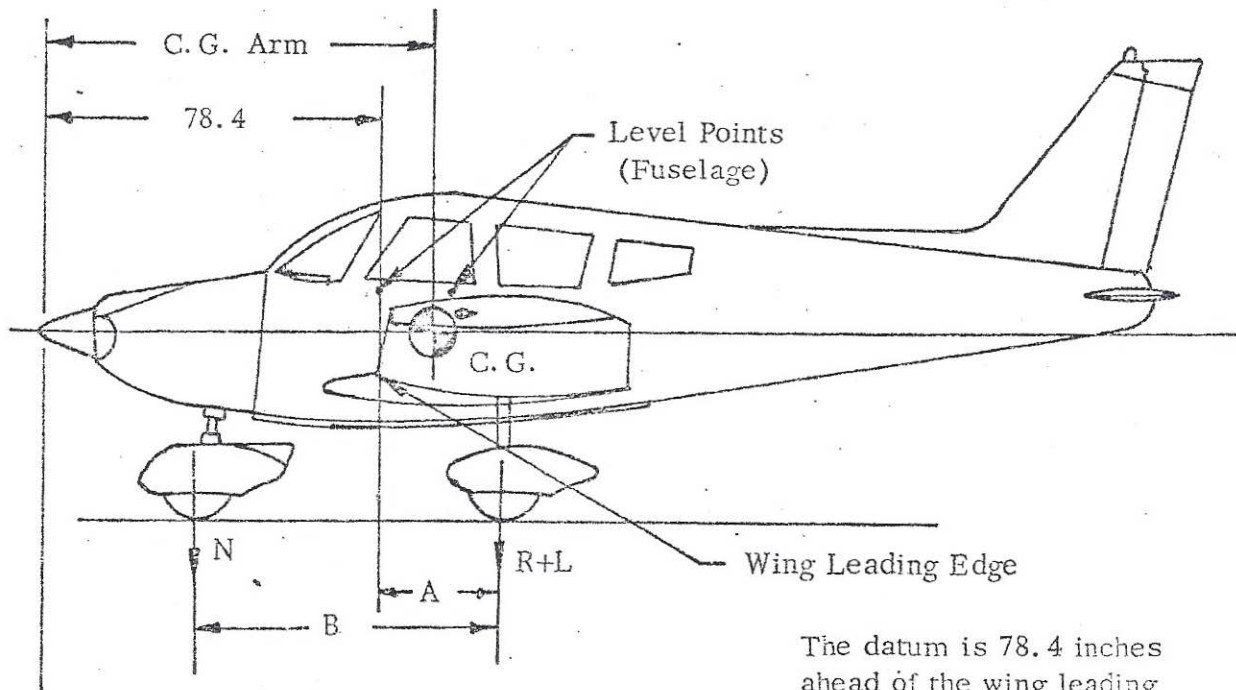
3. WEIGHING - AIRPLANE EMPTY WEIGHT

- a. 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)			

4. EMPTY WEIGHT CENTER OF GRAVITY

- a. The following geometry applies to the PA-28-180-airplane when airplane is level (See Item 2).



A =

B =

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

- b. Obtain measurement "A" by measuring from a plumb bob dropped from one wing leading edge, at the intersection of the straight and tapered section, horizontally and parallel to the airplane centerline, to the main wheel centerline.
- c. Obtain measurement "B" by measuring the distance from the main wheel centerline, horizontally and parallel to the airplane centerline, to each side of nose wheel axle. Then average the measurements.
- d. The empty weight center of gravity (as weighed including optional equipment and undrainable oil) can be determined by the following formula:

$$C. G. \text{ Arm} = 78.4 + A - \frac{B(N)}{T}$$

$$C. G. \text{ Arm} = 78.4 + (\quad) - \frac{(\quad) (\quad)}{(\quad)} = \quad \text{ inches}$$

5. LICENSED EMPTY WEIGHT AND EMPTY WEIGHT CENTER OF GRAVITY

	Weight	Arm	Moment
Empty Weight (as weighed)			
Unusable Fuel (13-1/3 pints)	+10.0	103.0	+1030
Licensed Empty Weight			

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WEIGHT AND BALANCE
STANDARD EQUIPMENT LIST
MODEL PA-28-180

Check if Installed	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
	<u>Engine Accessories</u>			
<u>X</u>	Engine - Lycoming Model O-360-A4A	282.4	21.1	5959
<u>X</u>	Fuel Pump, Electric Auxiliary, Bendix Model 478360	1.8	36.8	66
<u>X</u>	Fuel Pump, Engine Driven, Lycoming Dwg. No. 73297, 74082, 75148 or 75246	1.6	36.3	58
<u>X</u>	Oil Cooler, Piper Dwg., Harrision #C-8526250	2.6	13.1	34
<u>X</u>	Air Filter, Fram Model CA-161 PL or Purolator AFP-2	.9	15.1	14
<u>X</u>	Alternator, 60 Amp., Chrysler No. 2642997	12.5	14.0	175
<u>X</u>	Starter-Lycoming 76211 (Prestolite MZ4206)*	18.0	14.5	261
	<u>Propeller and Propeller Accessories</u>			
<u>X</u>	Propeller, Sensenich 76EM8S5-0-60	38.5	3.8	146
<u>X</u>	Spinner and Attachment Plates	4.3	3.0	13

* Included in Engine Weight.

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Check if Installed	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
	<u>Landing Gear and Brakes</u>			
<u>X</u>	Two Main Wheel Assemblies	32.3	109.6	3540
	(a) Cleveland Aircraft Products Wheel Assembly No. 40-86 Brake Assembly No. 30-55			
	(b) Two Main 4-Ply Rating Tires 6.00-6 with Regular Tubes			
<u>X</u>	One Nose Wheel 6.00-6	12.8	29.8	381
	(a) Cleveland Aircraft Products Wheel Assembly No. 40-76B (Less Brake Drum)			
	(b) One Nose Wheel 4-Ply Rating Tire 6.00-6 with Regular Tube			
	<u>Electrical Equipment</u>			
<u>X</u>	Stall Warning Device, Safe Flight Instrument Corporation No. C52207-4	.2	80.2	16
<u>X</u>	Voltage Regulator, Wico Electric #X-16300B	.5	51.9	26
	Battery 12V, 25A. H., Rebat Model S-25	21.5	168.0	3612
<u>X</u>	Overvoltage Relay, Wico Electric No. X16799	.5	55.4	28

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Check if Installed	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
	<u>Instrument</u>			
<u>X</u>	Compass - Piper Dwg. 67462	.9	59.9	54
	Airspeed Indicator, Piper Dwg. 63205-2	.6	61.8	37
<u>X</u>	Tachometer, Piper Dwg. 62177-3	.7	61.2	43
<u>X</u>	Altimeter, Piper PS50008-2 or -3 ^{Model P10120-12003 SW 9665}	1.0	60.9	61
<u>X</u>	Engine Cluster, Piper Dwg. 95241-4	.8	62.4	50
<u>X</u>	Engine Cluster, Piper Dwg. 95241-2	.8	62.4	50
	<u>Miscellaneous</u>			
<u>X</u>	Forward Seat Belts (2) .75 lbs. each	1.5	81.9	123
<u>X</u>	Inertia Safety Belts (2) 0.9 lbs. each	1.8	119.6	215
<u>X</u>	Rear Seat Belts (2) .70 lbs. each	1.4	123.0	172
<u>X</u>	Rear Seats (2)	22.8	124.2	2832
<u>X</u>	Flight Manual	---	---	---
<u>X</u>	Tow Bar	1.3	161.8	210
<u>X</u>	Nose Wheel Fairing - Piper Dwg. 65348	3.8	29.8	113
<u>X</u>	Main Wheel Fairings - Piper Dwg. 65237	7.0	109.6	767

THE ABOVE ITEMS ARE INCLUDED IN THE AIRPLANE STANDARD EMPTY WEIGHT.

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MODEL PA-28-180

Check if Installed	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
	<u>Engine Accessories</u>			
<u>X</u>	Vacuum Pump, Airborne Mfg. Co. Model No. 10-113A1, 113A5, or 200cc and Drive	5.0	32.0	160
<u>X</u>	Oil Filter - Lycoming No. 75528 (AC #OF5578770)	3.3	35.5	117
<u>X</u>	Vacuum Regulator	.7	52.0	36
<u>X</u>	Vacuum Filter	.3	52.0	16
	<u>Electrical Equipment</u>			
<u>X</u>	Rotating Beacon, Grimes #40-0101-15-12	1.5	263.4	395
<u>X</u>	Landing Light, G.E. Model 4509	.5	13.1	7
<u>X</u>	Navigation Lights (2) Grimes Model A1285 (Red and Green)	.4	106.6	43
<u>X</u>	Navigation Light (Rear) (1) Grimes Model 2064 (White)	.2	281.0	56
<u>X</u>	Battery 12V, 35 A. H. Rebat R-35 (Weight 27.0 lbs.)	5.5	* 168.0	924

*Weight and moment difference between standard and optional equipment.

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Check if Installed	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
	<u>Electrical Equipment (continued)</u>			
<u>X</u>	Cabin Light	.3	99.0	30
<u>X</u>	Cabin Speaker	.8	99.0	79
<u>X</u>	Auxiliary Power Receptacle, Piper Dwg. 65647	2.7	178.5	482
<u>X</u>	External Power Cable 62355-2	4.6	142.8	657
<u>X</u>	Piper Pitch Trim	4.3	155.3	668
<u>X</u>	Heated Pitot Head	.4	100.0	40
	Red Strobe Light, Whelen Engineering Co.			
	Power Supply, Whelen Model HS	2.3	198.0	455
	Light (Fin Tip)	.4	263.4	105
	Cable	.4	230.7	92
	Red/White Strobe Light, Whelen Engineering Co.			
	Power Supply, Whelen Model HD, T3	3.0	198.0	594
	Light (Fin Tip)	.4	263.4	105
	Cable	.4	230.7	92
	Lights (Wing Tip) (2)	.3	106.6	32
	Cables	2.0	115.6	231

	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
Check if Installed	<u>Instruments</u>			
<u>X</u>	Suction Gauge, Piper Dwg. 99480-0 or -2	.5	62.2	31
<u>X</u>	Vertical Speed, Piper Dwg. 99010-2, -4 or -5	1.0	60.9	61
<u>X</u>	Attitude Gyro, Piper Dwg. 99002-2, -3, -4 or 05	2.2	59.4	131
<u>X</u>	Directional Gyro, Piper Dwg. 99003-2, -3 -4, or -5	2.6	59.7	155
<u>X</u>	Air Temperature Gauge, Piper Dwg. 99479 -0 or -2	.2	72.6	15
<u>X</u>	Clock Piper Dwg. 99478	.4	62.4	25
<u>X</u>	Tru-Speed Indicator, Piper Dwg. 62143-2 or -13	(Same as Standard Equipment Weight)		
<u>X</u>	Turn and Slip Indicator, Piper PS50030-2 or -3	2.6	59.7	155
<u>X</u>	Manifold Pressure Gauge, Piper PS50031-3 or -4	.9	60.8	55
<u>X</u>	Exhaust Gas Temperature, Piper Dwg. 99026	.7	55.4	39

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Check if Installed	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
	<u>AutoPilots</u>			
	Autocontrol III			
	Roll Servo, #1C363-1-183R	2.5	122.2	306
	Console, #1C338	1.2	60.1	72
	Cables	.7	95.5	67
	Attitude Gyro, #52D66	2.3	59.4	137
	Directional Gyro, #52D54	3.2	59.0	189
	Omni Coupler, #1C388	.9	59.3	53
X	<u>AutoFlite II</u>			
X	Roll Servo, #1C363-1-183R	2.5	122.2	306
X	Cable	.7	93.4	65
X	Panel Unit, #52D75-3 or -4	2.4	59.4	143

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Check if Installed	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
	<u>Radio</u>			
	Narco Mark 16 (VHF Comm/Nav)			
	Transceiver, Single	7.5	56.9	427
	Transceiver, Dual	15.0	56.9	854
	Narco VOA-50M Omni Converter	2.1	59.9	126
	Narco VOA-40 (M) Omni Converter	1.9	59.9	114
	Narco VOA-40 Omni Converter	1.9	59.9	114
	Narco Comm 10A VHF Transceiver	3.9	57.4	224
	Narco Comm 11A VHF Transceiver	3.6	57.4	207
	Narco Dual Comm 11A VHF Transceiver	7.1	57.4	408
	Narco Nav 10 VHF Receiver	1.9	58.6	111
X	Narco Nav 11 VHF Receiver	2.8	58.6	164
	Narco Nav 12 VHF Receiver	3.4	58.6	199
	Narco Dual Nav 11 VHF Receiver	5.6	58.6	328

	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
Check if Installed	<u>Radio</u> (continued)			
_____	Genave 200A (VHF Comm/Nav)	5.9	57.7	340
_____	Genave 300 (VHF Comm/Nav)	5.9	57.7	340
_____	Genave Alpha 360	5.0	56.9	285
_____	Genave Theta 100	1.6	59.6	95
<input checked="" type="checkbox"/>	King KX KX /175 () (VHF Comm/Nav)			
_____	Transceiver, Single	7.5	56.6	425
_____	Transceiver, Dual	15.0	56.6	849
<input checked="" type="checkbox"/>	King KI 201 () VOR/LOC Ind.	2.5	59.6	149
_____	King Dual KI 201 () VOR/LOC Ind.	5.0	59.9	300
_____	King KI 211 () VOR/LOC/GS Ind.	3.3	59.9	198
_____	Nav Receiving Antenna	.5	265.0	133
_____	Cable, Nav Antenna	.9	157.0	141
_____	#1 VHF Comm Antenna	.3	157.8	47
_____	Cable, Antenna #1 VHF	.4	118.0	47
_____	#2 VHF Comm Antenna	.3	192.8	58
_____	Cable, Antenna #2 VHF	.5	135.0	68
_____	KI-206	1.3	59.6	78
_____	KMA 24	1.7	60.2	102
_____	King KY 92	2.8	60.2	169
_____	King KNS-80	6.0	56.6	340

	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
Check if Installed	<u>Radio</u> (continued)			
_____	Narco ADF-31			
_____	Panel Unit	5.0	58.5	293
_____	Sensor Unit	2.5	162.7	407
_____	Sensor Cable	2.3	100.6	231
_____	Sense Antenna and Cable	.4	150.0	60
_____	Bendix ADF-T-12C			
_____	Bendix ADF-T-12D			
_____	Receiver	5.5	59.4	208
_____	Audio Amplifier	.8	52.4	42
_____	Servo Indicator	1.7	60.9	104
_____	Loop Antenna	1.3	160.8	209
_____	Cable, Interconnecting	2.3	108.0	248
_____	Sense Antenna and Cable	.4	150.0	60
_____	King KR-85			
_____	Receiver	4.3	59.4	255
_____	Servo Indicator	1.2	61.3	74
_____	Loop Antenna	1.3	161.5	210
_____	Loop Cable	1.8	108.0	194
_____	Audio Amplifier	.8	51.0	41
_____	Sense Antenna and Cable	.4	150.0	60

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Check if Installed	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
	<u>Radio</u> (continued)			
	PM-1 Marker Beacon			
	Receiver	1.1	121.3	133
	Remote Unit	.3	128.4	39
	Cable	.3	80.0	24
	UGR-2 Glide Slope			
	Receiver	2.4	173.8	417
	Cable	1.8	128.0	230
	Antenna	.4	87.4	35
	Cable, Antenna	.5	145.0	73
	Narco AT6-A Transponder			
	Panel Unit	2.0	59.4	119
	Remote Unit	5.7	203.0	1157
	Antenna and Cable	.3	197.0	59
	Cable, Interconnecting	.4	133.7	53

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Check if Installed	ITEM	WEIGHT (LBS)	ARM. AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
	<u>Radio</u> (continued)			
	Narco AT50 Transponder			
	Panel Unit	* 3.0	57.3	172
X	King KT76/78 Transponder			
X	Panel Unit	3.1	58.1	180
X	Antenna & Cable	---	--	---
	King KMA-20 Audio Panel	2.8	60.2	169
	Antenna	.5	116.3	58
	Cable	.4	87.5	35
X	King KR-86 ADF	5.1	73.1	
X	King TY-195 TRANSMITTER	6.0	58.0	

* Weight includes Antenna and Cable

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Check if Installed	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
	<u>Radio</u> (continued)			
	King KN60C DME			
	Receiver	6.8	56.7	386
	Antenna	.2	107.1	21
	Cable, Antenna	0.3	80.6	24
X	Piper Automatic Locator			
X	Transmitter	1.7	236.2	402
X	Antenna and Cable	.2	224.4	45
X	Shelf and Access Plate	.3	235.4	71
	Audio Selector Panel, Piper Dwg. 99395-0, -2, or -3	.7	61.3	43
X	Microphone	.5	70.0	35
X	Headset	.5	60.0	30
	<u>Miscellaneous</u>			
X	Fire Extinguisher - Kidde Compact VI (with brackets)	5.3	71.0	376
	Toe Brakes (Dual)	10.5	49.6	521
X	Toe Brakes (Single)	5.0	49.6	248
X	Assist Step	1.8	156.0	281
	Inertia Safety Belts (Rear) (2) 0.8 lbs. each	1.6	140.3	224

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Weight and Balance Data

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Check if Installed	ITEM	WEIGHT (LBS)	ARM AFT DATUM (INCHES)	MOMENT (POUND- INCHES)
	<u>Miscellaneous</u> (continued)			
<u>X</u>	Lighter	.2	62.9	13
<u>X</u>	Assist Strap and Coat Hook	.2	109.5	22
<u>X</u>	Overhead Vent System	1.2	130.0	156
	Alternate Static Source	.4	61.0	24
	Calibrated Alternate Static Source			
	Placard Required: Yes _____ No _____			
<u>X</u>	Headrest (2) (Front)	2.2	94.5	208
	Headrest (2) (Rear)	2.2	132.1	291
	Air Conditioning Installation 99575-0	67.4	102.8	6929
	Zinc Chromate Finish	5.0	158.0	790
	TOTAL OPTIONAL EQUIPMENT	73.9	98.1	7252

EXTERIOR FINISHBase Color Juneau WhiteRegistration No. Color Dakota BlackTrim Color Pontiac RedType Finish LacquerAccent Color Dakota Black