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#### WEIGHT AND BALANCE

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**SECTION 6  
WEIGHT AND BALANCE**

**6.1 GENERAL**

In order to achieve the performance and good 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 insure 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 6-5) and the Weight and Balance Record (Figure 6-7). 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.

### **6.3 AIRPLANE WEIGHING PROCEDURE**

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 (5.0 gallons total, 2.5 gallons each wing).

*CAUTION*

Whenever the fuel system is completely drained and fuel is replenished it will be necessary to run the engines for a minimum of 3 minutes at 1000 RPM on each tank to insure no air exists in the fuel supply lines.

- (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.

(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.

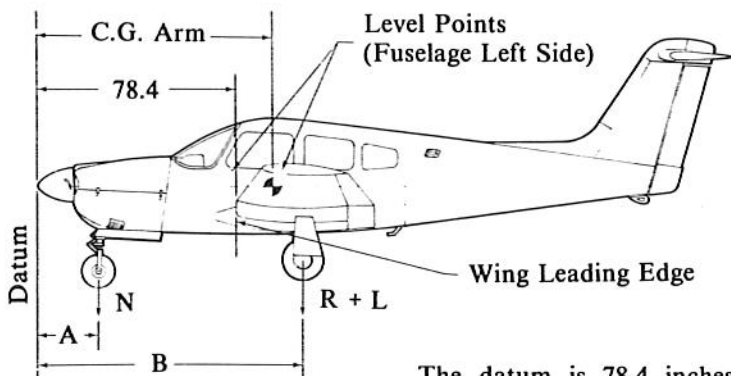
Scale Position and Symbol	Scale Reading	Tare	Net Weight
Nose Wheel (N)			
Right Main Wheel (R)			
Left Main Wheel (L)			
Basic Empty Weight, as Weighed (T)			

**WEIGHING FORM**

Figure 6-1

(d) Basic Empty Weight Center of Gravity

- (1) The following geometry applies to the PA-28RT-201 airplane when it is level. Refer to Leveling paragraph 6.3 (b).



A = 15.6  
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

- (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:  $T = N + R + L$

### 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.

**SECTION 6  
WEIGHT AND BALANCE**

**PIPER AIRCRAFT CORPORATION  
PA-28RT-201, ARROW IV**

**MODEL PA-28RT-201 ARROW IV**

Airplane Serial Number 28 R-7918100

Registration Number HB-PIX

Date 3/9/79

**AIRPLANE BASIC EMPTY WEIGHT**

Item	C.G. Arm		
	Weight x (Inches Aft = Moment (Lbs)	of Datum)	(In-Lbs)
Standard Empty Weight* <sup>Actual</sup> <sub>Computed</sub>	1641.0	86.8	142361
Optional Equipment	125.6	96.4	12103
Basic Empty Weight	1766.6	87.4	154464

\*The standard empty weight includes full oil capacity and 5.0 gallons of unusable fuel.

**AIRPLANE USEFUL LOAD - NORMAL CATEGORY OPERATION**

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

(2750 lbs.) - ( 1766.6 lbs.) = 983.4 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

PIPER AIRCRAFT CORPORATION  
PA-28RT-201, ARROW IV

WEIGHT AND BALANCE RECORD

PA-28RT-201		Serial Number	28R-7918100	Registration Number	N2187Y	Page Number	
Date	Item No.	Description of Article or Modification		Added (+) Removed (-)	Wt. (Lb.)	Arm (In.)	Moment /100
					Wt. (Lb.)	Moment (Lb.)	Running Basic Empty Weight
					1766.6	1544.64	1587.84
3/9/79		AS REWEIGHED					
4/15/86		Autopilot Edo Aire		-	9.6	77.60	
12/11/86		Trim Piper Pitch		-	4.3	155.30	
		Autopilot KAP 150		+	23.9	139.92	3'344
		Radio Master King		+	0.4	51.00	20
		Cooling Fan KA-33		+	1.2	50.50	61
12/11/86		Neues Rüstgewicht					1807.4
24/06/91		Flugstundenzähler			1.24	60.3	74.77
							186
23/06/93		Neues Rüstgewicht		+	2.00	89.1	239.62
06/02/95		Ex. COM/NAV (KX155)		-	6.3	87.46	551.0
12/02/02		Einbau Stormscope WX 500		+	2.6	128.15	333.2
26/06/02		Change RDF		+/-			1807.9
13/11/03		Einbau GMS 430		+/-			1799.4
20.12.04		Exchange XPDR					1800.2
31.1.08		Liese Silencer Removed		-	3.1	29.0	90
							1797.1
							16072.05

WEIGHT AND BALANCE RECORD

Figure 6-7



SECTION 6  
WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION  
PA-28RT-201, ARROW IV

PA-28RT-201		Serial Number		Registration Number			Page Number	
Date	Item No.	Description of Article or Modification	Added (+) Removed (-)	Wt. (Lb.)	Weight Change		Running Basic Empty Weight	
					Arm (In.)	Moment / 100	Wt. (Lb.)	Moment
26.06.85		Replace ELT by Arlex NE406	+/-	AVIONTEC AD CH.145.01187			1795.7	160368.45
25.6.86		Replace Propeller / Spinner	+/-	CH.MF.4001			1816.3	160340.83
04.04.88		Neuwaigung wagen Neu lackierung Kompress					1798.6	158823.56

WEIGHT AND BALANCE RECORD (cont)

Figure 6-7 (cont)

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	1766.6	87.4	154464
Pilot and Front Passenger	340.0	80.5	27370
Passengers (Rear Seats)	340.0	118.1	40154
Fuel (72 Gallons Maximum)	303.4	95.0	28823
Baggage (200 Lbs. Maximum)		142.8	
Moment due to Retraction of Landing Gear			819
Total Loaded Airplane	2750	91.2	250811

The center of gravity (C.G.) of this sample loading problem is at 91.2 inches aft of the datum line. Locate this point ( 91.2 ) 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)

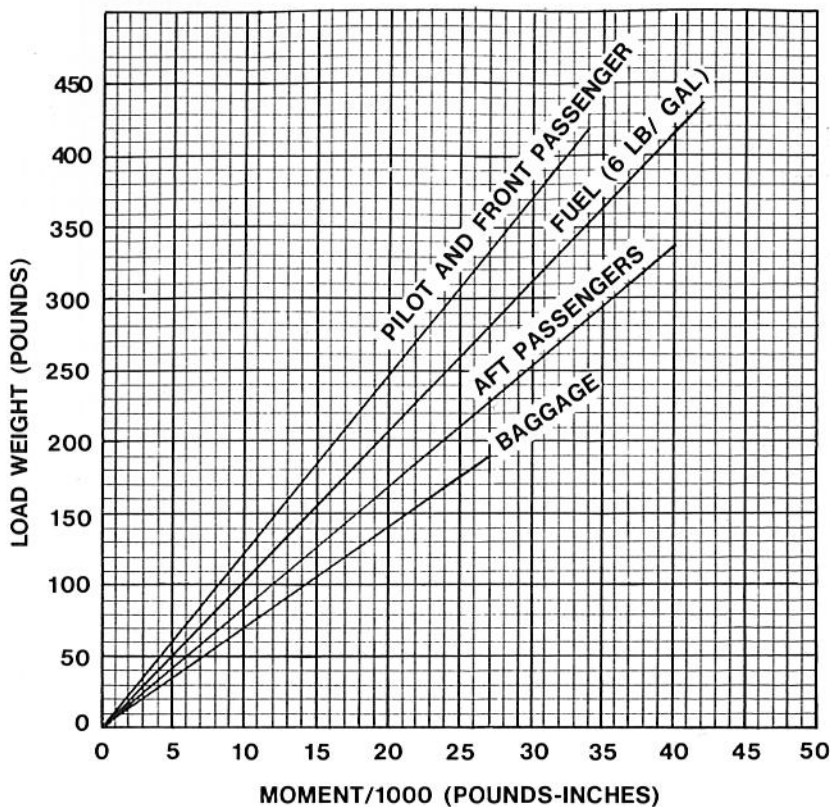
Figure 6-9

**SECTION 6  
WEIGHT AND BALANCE****PIPER AIRCRAFT CORPORATION  
PA-28RT-201, ARROW IV**

	Weight (Lbs)	Arm Aft Datum (Inches)	Moment (In-Lbs)
Basic Empty Weight	1853	88.22	163469.8
Pilot and Front Passenger		80.5	
Passengers (Rear Seats)		118.1	
Fuel (72 Gallons Maximum)		95.0	
Baggage (200 Lbs. Maximum)		142.8	
Moment due to Retraction of Landing Gear			819
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

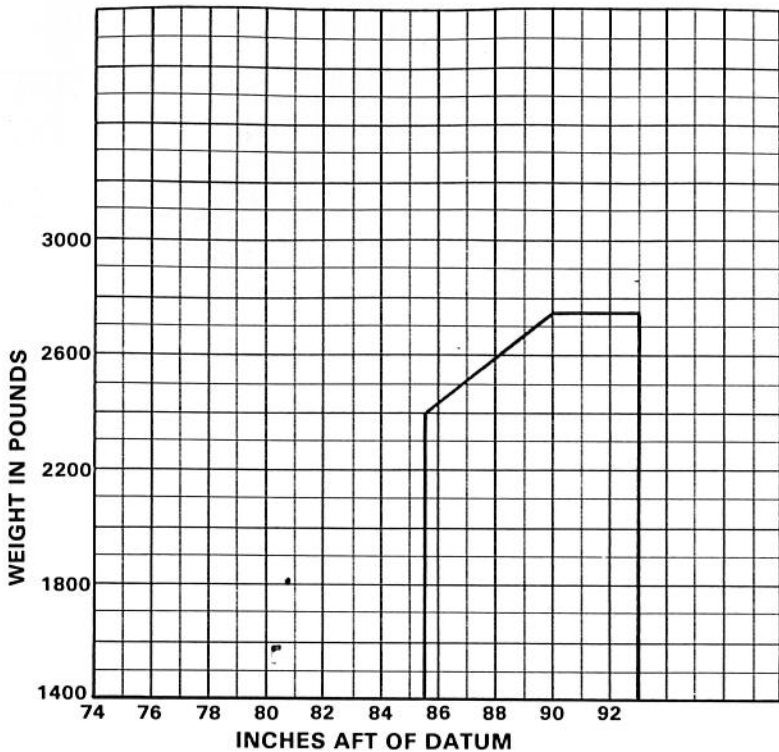


**LOADING GRAPH**

Figure 6-13

**SECTION 6  
WEIGHT AND BALANCE**

**PIPER AIRCRAFT CORPORATION  
PA-28RT-201, ARROW IV**



Moment due to retracting landing gear = +819 in.-lbs.

**C.G. RANGE AND WEIGHT**  
Figure 6-15

### 6.9 EQUIPMENT LIST

The following is a list of equipment which may be installed in the PA-28RT-201. 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 certifying 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 and 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-28RT-201 ARROW IV

SERIAL NO. 28 R-7918100 REGISTRATION NO. HB-PIX DATE: 3/9/79

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Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
<b>(a) Propeller and Propeller Accessories</b>					
1	A Propeller				
	a. McCauley B2D34C213/90DHA-16 Cert. Basis - TC P7EA	<u>X</u>	49.0	-1.9	-93
	b. Hartzell HC-C2YK-1( ) F/F7666A-2R Cert. Basis - TC P920	X	55.0 72.4	-1.9 -1.3	-105 -137.56
	c. <i>Hartzell HC-C3YR-127</i>				
3	Spinner Installation Piper Dwg. 35828-2 (McCauley Prop) or Piper Dwg. 99374 (Hartzell Prop)				
	a. Spinner Dome and Forward Bulkhead (McCauley Prop)	<u>X</u>	2.8	-6.0	-17
	b. Spinner Dome and Forward Bulkhead (Hartzell Prop)		3.1	-5.6	-17
	c. Aft Bulkhead		1.9	3.4	6
5	A Propeller Governor Hartzell Model F-2-7( ) Piper Dwg. 66634-4 Cert. Basis - TC P7EA				

Item No.	(b) Engine and Engine Accessories	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
9	A	Engine - Lycoming Model IO-360-C1C6 Cert. Basis - TC 1E10		329.0	15.2	5001
11	A	Engine Driven Fuel Pump Lycoming P/N 75247 or LW-15473 Cert. Basis - TC 1E10	*			
13	A	Electric Fuel Pump (Weldon P/N 8120-G)		2.2	42.3	93
15	A	Fuel Valve Piper Dwg. 66945-0 (System Components Corp. P/N SP 2378-B3)		0.6	61.9	37
17	A	Oil Coolers Piper Dwg. 67848-0 (Harrison P/N 8537820)		4.1	42.0	173

\*Included in basic engine dry weight.



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**(b) Engine and Engine Accessories (cont)**

Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
19 A	Air Filter (Fram P/N CA-144PL)		0.9	20.0	19
21 B	Alternator Piper Dwg. 99945-0 a. Chrysler P/N 3656624 b. Chrysler P/N 411810	— —	12.7 13.5	9.3 9.3	118 126
23 A	Starter (Prestolite P/N MZ4218) Cert. Basis - TC 1E10		*		
25 A	Oil Filter Lycoming P/N LW-13215 (Champion P/N CH-48110) or Lycoming P/N 15624) Cert. Basis - TC 1E10		*		

\*Included in basic engine dry weight.

Item No.	(c) Landing Gear and Brakes	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
35	A	Two Main Wheel Assemblies a. Cleveland Aircraft Products Wheel Assy. No. 40-86 Brake Assy. No. 30-55 Cert. Basis - TSO C26a b. 6.00-6 Type III 6 Ply Rating Tires with Reg. Tubes Cert. Basis - TSO C62		5.4 3.6	109.7 109.7	592 395
37	A	Nose Wheel Assembly a. Cleveland Aircraft Products Wheel Assy. No. 40-77 Cert. Basis - TSO C26a b. McCauley Industrial Corp. Wheel Assy. No. D-30500 Cert. Basis - TSO C26b c. 5.00-5 Type III 4 Ply Rating Tire with Reg. Tube Cert. Basis - TSO C62	<del>X</del>	2.6 3.6 5.8	15.6 15.6 15.6	41 56 90
39	A	Handbrake Master Cylinder Cleveland Aircraft Products No. 10-22		0.6	60.9	37

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Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
(c)	Landing Gear and Brakes (cont)				
41	A Toe Brake Cylinders a. Cleveland Aircraft Products No. 10-27 b. Gar-Kenyon Instruments 17000	<u>    </u> <u>  X  </u>	0.7 0.4	53.0 53.0	37 21
43	A Landing Gear Hydraulic Pump Piper Dwg. 67509-0 (Prestolite 105255B)		9.0	159.0	1431
45	A Main Gear Hydraulic Cylinders (2) Piper Dwg. 96860-0 (Synco Devices SFA 232-3)		2.2	108.0	238
47	A Nose Gear Hydraulic Cylinder Piper Dwg. 35797-2 (Gar-Kenyon 94951)		2.0	41.8	84

Item No.	Electrical Equipment Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
55 A	Voltage Regulator Piper Dwg. 68804-3		0.5	53.4	27
57 B	Battery (Rebat S-25)		21.9	43.2	946
59 A	Starter Relay Piper Dwg. 99130-2 (RBM Control P/N 111-111)		1.0	45.7	46
61 A	Overvoltage Relay Piper PS50034-1 (Prestolite "Wico Div." P/N FOC-4002B)		0.5	51.2	26

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(e) Item No.	Instruments Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
71 B	Altimeter Piper PS50008-2 (United Instruments UI5934-P or UI5934P-1) Cert. Basis - TSO C10b	—	1.1	60.9	67
73 B	Airspeed Indicator Piper PS50049-50S (United Instruments 8025-B.363) Cert. Basis - TSO C2b	—	0.6	61.8	37
75 A	Manifold Pressure and Fuel Flow Indicator Piper PS50031-6 (United Instruments 6092-H.55 or 6331-H.55) Cert. Basis - TSO C45 & C47		1.2	60.8	73
77 A	Compass Piper Dwg. 67462-6 (Airpath P/N C-2200-L4-B) Cert. Basis - TSO C7c		0.9	59.9	54
79 A	Tachometer Piper Dwg. 62177-3 Stewart Warner 551-WE(N)		0.7	61.2	43

Item No.	Instruments (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
81	A Left Engine Cluster Piper Dwg. 95241-11		0.8	62.4	50
83	A Right Engine Cluster Piper Dwg. 95241-23, Plus 38224-3 (2)		0.8	62.4	50
85	FLIGHT TIME COUNTER " WINTER" 1510	X	0.3	61.0	18.3

4.2.05  
  


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Item No.	Miscellaneous Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
89 B	Left Front Seat Piper Dwg. 79337-21	—	15.5	84.0	1302
91	Right Front Seat Piper Dwg. 79337-22		15.5	84.0	1302
93	Left Rear Seat Piper Dwg. 96827-22		14.5	123.0	1784
95	Right Rear Seat Piper Dwg. 96827-23		14.5	123.0	1784

Item No.	Miscellaneous (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
97 A	Front Seat Belts (2) Piper PS50039-4-2A (American Safety Eqpt. Corp. 449965 Black) Cert. Basis - TSO C22f		1.8	84.0	151
99 A	Aft Seat Belts (2) Piper PS50039-4-3A (American Safety Eqpt. Corp. 44996B Black) Cert. Basis - TSO C22f		1.6	123.0	197
101 A	Shoulder Harness (2) (Front Seats Only) Piper PS50039-4-21 (Pacific Scientific 1107447-05 Black)		1.4	119.5	167
103 A	Baggage Straps Piper Dwg. 66804-0 and 66805-0		1.3	142.8	186
105	Tow Bar Piper Dwg. 67336-0		2.2	156.0	343



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(g) Propeller and Propeller Accessories  
(Optional Equipment)

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

Item No.	Engine and Engine Accessories (Optional Equipment)	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
137	Vacuum Pump					
	a. Piper Dwg. 79399-0 (Airborne P/N 211CC)		X	1.8	40.0	72
	b. Piper Dwg. 36535-2 (Edo-Aire P/N IU128A)			2.2	40.0	88
139	Exhaust Gas Temperature Gauge Installation Piper Dwg. 69190-0, Alcor Indicator P/N 202A-7A or P/N 202B-7A Probe Model "A" Lead Assembly 90.00		X	0.7	55.4	39

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(i)	Landing Gear and Brakes (Optional Equipment)	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
(j)	Electrical Equipment (Optional Equipment)	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
151	Instrument Panel Lights	Instl.	X	0.3	62.8	19
153	Instrument Light (Grimes 15-0083-7)	Instl.	X	0.1	99.0	10
155	Cabin Light Piper Dwg. 79247	Instl.	X	0.3	99.0	30

Item No.	Electrical Equipment (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
157	Landing Light Piper PS10008-4509 (G.E. Model 4509)	X	0.5	10.0	5
159	Navigation Lights (Wing) (2) Whelen P/N A429PR-D-14 (Red) and P/N A429PG-D-14 (Green)	X	0.4	106.6	43
161	Navigation Light (Rear) (2) Grumes Model A2064 (White)	X	0.4	292.0	117
163	Anti-Collision Lights (Wing Tip) (Whelen) Piper Dwg. 79850-14 & -15 Cert. Basis - STC SA615EA	X	5.7	157.9	900

SECTION 6  
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PIPER AIRCRAFT CORPORATION  
PA-28RT-201, ARROW IV

Item No.	Electrical Equipment (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
165	Heated Pitot Installation Piper Dwg. 35896-4 & -5	X	0.4	100.0	40
167	Piper Pitch Trim <del>Piper Dwg. 67496-5</del>	X	4.3	155.3	668
169 C	Battery 12v 35 A.H. (Rebat R35)	X	*6.5	43.2	281
171	Auxiliary Power Receptacle Piper Dwg. 35842	X	2.7	62.7	169
173	External Power Cable Piper Dwg. 62355-2		4.6	142.8	657
175	Lighter (Casco P/N 200462)	X	0.2	62.9	13

\*Weight and moment difference between standard and optional equipment.

Item No.	Instruments (Optional Equipment) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
191	Attitude Gyro a. Piper Dwg. 99002-3 (Edo-Aire P/N 5000B-9) b. Piper Dwg. 99002-8 (Aeritalia S.P.A. P/N 36101P) Cert. Basis - TSO C4c	—	1.9	59.4	113
193	Directional Gyro a. Piper Dwg. 99003-3 (Edo-Aire P/N 4000B-9) b. Piper Dwg. 99003-7 (Aeritalia S.P.A. P/N 31101P) Cert. Basis - TSO C5c	—	2.4	59.7	143
195	Horizontal Situation Indicator (HSI) (Mitchell P/N NSD-360A) Cert. Basis - TSO C6c, C9c, C52c	—	1.9	59.7	113
197 C	Tru-Speed Indicator Piper PS50049-50T (United Instruments P/N 8125-B.364) Cert. Basis - TSO C2b	X	4.6	59.9	276

(Same as standard equipment)

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WEIGHT AND BALANCE

PIPER AIRCRAFT CORPORATION  
PA-28RT-201, ARROW IV

Item No.	Instruments (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
199 C	Altimeter Piper PS50008-3 (United Instruments P/N UI5934-PM or P/N UI5934-PM-1) Cert. Basis - TSO C10b	X			
201 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 & C88		*0.9	60.3	54
202	Altitude Digitizer (United Instruments P/N 5125-P3) Cert. Basis - TSO C88		1.0	51.5	52

(Same as standard equipment)

\*Weight and moment difference between standard and optional equipment.

Item No.	Instruments (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
203	Rate of Climb Piper Dwg. 99010-5 (United Instruments P/N UI-7000) Cert. Basis - TSO C8b	X	1.0	60.9	61
205	Alternate Static Source Installation Piper Dwg. 35896-3 & -5	X	0.4	61.0	24
207	Turn and Slip Indicator Piper PS50030-2 (R. C. Allen P/N A2475-2) Cert. Basis - TSO C3b		2.6	59.7	155
209	Turn Coordinator Piper PS50030-3 (Electric Gyro Corp. P/N 1394T100) Cert. Basis - TSO C3b	X	2.6	59.7	155
211	MK 10 Radar Altimeter Piper Dwg. 37693-7  Sandia Altitude Digitizer SAE S-25		5.4	156.3	844
		X	0.9	51.5	46.3



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Item No.	Instruments (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
213	Engine Hour Meter Piper Dwg. 79548-3	—	0.3	61.2	18
215	Clock Piper Dwg. 79621-4	X	0.4	62.4	25
217	Outside Air Temperature Gauge Piper Dwg. 79316-0 (Dresser Industries P/N NHM-70)	X	0.2	72.6	15
219	Gyro Suction Gauge Piper Dwg. 99480-0 (Airborne P/N IG10-1) or (AN Std. P/N AN577-11)	X	0.5	62.2	31
221	Vacuum Regulator (Airborne P/N 2H3-19)	X	0.6	49.6	30
223	Vacuum Filter Piper Dwg. 66673-0 (Airborne P/N 1J7-1)	X	0.3	49.6	15
4.2.05	Häftiger Flugzeiten zählen C/M 643 Hörsli-ITC 273-3	X	1.24	60.3	74.77

84.6.81

PIPER AIRCRAFT CORPORATION  
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(1) Item No.	Autopilots (Optional Equipment) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
233	AutoFlite II Cert. Basis STC SA3162SW-D	—	5.6	91.8	514
235 12/11/86 L+A 186	AutoControl IIIB	X	9.6	77.6	745
	a. Directional Gyro 52D54	X	2.9	60.0	174
	b. Omni Coupler IC-388 Cert. Basis STC SA3161SW-D	—	1.0	60.3	60
237	AltiMatic IIIC	—	24.3	147.7	3589
	a. Directional Gyro 52D54	—	2.9	60.0	174
	b. Omni Coupler IC-388	—	1.0	60.3	60
	c. G/S Coupler IC-493 Cert. Basis STC SA3323SW-D	—	1.4	53.1	74
238 12/11/86 L+A 186	Autopilot King KAP 150	X	23.9	139.92	3344
	Radio Master King Relay+Inst.	X	0.4	51.00	20
	Cooling Fan King KA-33 Fan	X	1.2	50.50	61

ISSUED: NOVEMBER 30, 1978  
REVISED: FEBRUARY 16, 1979

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6-33

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Item No.	Radio Equipment (Optional Equipment) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
243	Collins VHF-250 or VHF-251 Comm Transceiver	—	4.0	56.9	228
	a. Single	—	8.1	56.9	461
	b. Dual Cert. Basis - TSO C37b, C38b	—			
245	Collins VIR-350 or VIR-351 Nav Receiver	—	3.9	57.4	224
	a. Single	—	7.9	57.4	453
	b. Dual Cert. Basis - TSO C40a, C36c	—			
247	Collins IND-350 ( ) VOR/LOC Indicator	—	1.0	60.2	60
	a. Single	—	2.0	60.2	120
	b. Dual Cert. Basis - TSO C40a, C36c	—			
249	Collins IND-351 ( ) VOR/LOC/GS GS Indicator	—	1.3	60.2	78
	a. Single	—			
	b. Dual Cert. Basis - TSO C40a, C36c	—			

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Item No.	Radio Equipment (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
251	Collins GLS-350 Glide Slope Receiver Cert. Basis - TSO C34c	—	2.0	181.8	364
253	Collins DCE 400 Distance Computing Equipment Cert. Basis - TSO C40a	—	2.1	58.9	124
255	Collins RCR-650 ADF Receiver and Antenna and IND-650 Indicator Cert. Basis - TSO C41c	—	7.7	104.8	807
	<i>Collins NBU/COM/GS/GIS GMS 430</i>	X	<i>6.5</i>	<i>56.5</i>	<i>367.3</i>
	<i>Garmin GMS-400. GMS-56</i>	X	<i>0.25</i>	<i>94.9</i>	<i>23.7</i>
	<i>Garmin Mode S XPDR GTX 230</i>	X	<i>4.2</i>	<i>58.1</i>	<i>244</i>

**REPORT: VB-930  
6-34b**

**ISSUED: JUL 20, 1980**

AVIONITEC  
AA/BAZL  
13.11.83

20.12.84  
Aviontec AG FOCA 140  
M. Döppner S 2115

Item No.	Radio Equipment (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
256	Collins RCR-650A ADF Receiver and Antenna and IND-650A Indicator Cert. Basis - TSO C41C	—	8.4	100.9	848
257	Collins AMR-350 Audio/Marker Panel Cert. Basis - TSO C35d, C50b	—	*3.3	110.0	363
259	Collins TDR-950 Transponder Cert. Basis - TSO C74c	—	*2.8	63.2	177
271	King KX 170 ( ) VHF Comm/Nav a. Transceiver, Single b. Transceiver, Dual	—	7.3 14.6	56.6 56.6	413 826
	Stormscope wx 900 Display/Processor Antenna		1.6 1.0	57.0 242.0	91.2 242.0

Avionitec AG FOCA 140  
M. Däppen S 2115

\*Weight includes antenna and cable.

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Item No.	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
273	Radio Equipment (Optional Equipment) (cont)				
	King KX-155 ( ) VHF I				
	a. Transceiver	<input checked="" type="checkbox"/>	3.3	56.6	186.6
	b. King KN 75 Glide Slope Receiver		1.6	184.3	295
	c. King KN 75 Glide Slope Receiver (2nd)		1.6	184.3	295
	d. King KN 72 VOR LOC Converter		1.3	183.6	239
	e. King KI 525 AVOR ILS Indicator	<input checked="" type="checkbox"/>	4.0	58	232
	Cert. Basis - TSO C3bc, C37b, C38b, C40a				
275	King KX 155 ( ) VHF II				
	a. Transceiver (2nd)	<input checked="" type="checkbox"/>	7.4	56.6	419
	b. King KN 72 VOR LOC Converter		1.3	183.6	239
	c. King KI 203 VOR LOC Indicator	<input checked="" type="checkbox"/>	1.6	60.5	97
	Cert. Basis - TSO C36c, C37b, C38b.				
	Intercom	<input checked="" type="checkbox"/>	0.7	64.9	45.43
					25.6.93

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AUTOMATIC AG  
JAN 1971 140

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Michel  
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PIPER AIRCRAFT CORPORATION  
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Item No.	Radio Equipment (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
277	King KI 208 VOR/LOC Indicator a. Single b. Dual Cert. Basis - TSO C34c, C36c, C40a	— —	1.0 2.0	59.6 59.9	60 120
279	King KI 209 VOR/LOC/GS Indicator Cert. Basis - TSO C34c, C36c, C40a	—	1.2	59.9	72
281	King KN 74 R-Nav	—	4.7	56.6	266
283	King KI 206 R-Nav Indicator Cert. Basis - TSO C34c, C36c, C40a	—	1.3	56.6	74
285	King KN <sup>87</sup> DME KN 62A Cert. Basis - TSO C66a	X	2.6	57	148
287	King KR 85 Digital ADF a. Audio Amplifier Cert. Basis - TSO C41b Indicator #E 227 Antenna #B 440	X	3.2	57.0	182.4
			8.6	85.2	733
			0.8	51.0	41
		X	0.7	59.0	41.3
		X	4.2	796.0	823.2





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Item No.	Radio Equipment (Optional Equipment) (cont)	Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
289	King KR 86 ADF					
	a. First			6.7	91.6	614
	b. Second			9.7	107.0	1038
	c. Audio Amplifier			0.8	51.0	41
291	King KMA (2+) Audio Panel / MKR Cert. Basis - TSO C35c, C50b			*2.7	70.8	191
293	King KT 76 (A) / 78 ( ) Transponder Cert. Basis - TSO C74b		X	*3.1	70.8 20.12.05 Aviontec AG FOCA 140 M. Döpfer 1-S-21-15-100-180	
305	Narco Comm 120 VHF Transceiver					
	a. Single			4.8	56.9	273
	b. Dual			8.6	57.4	494
	Cert. Basis - TSO C37b, C38b					
307	Narco Nav 121 VHF Receiver					
	a. Single			3.1	58.4	181
	b. Dual			6.2	58.4	362
	Cert. Basis - TSO C36C, C40c, C66a					

\*Weight includes antenna and cable.

Item No.	Radio Equipment (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
309	Narco Nav 122 VHF Receiver a. Single b. Dual Cert. Basis - TSO C35d, C36c, C40c, C66a	_____ _____ _____	*5.1 *8.6	99.4 82.9	507 713
311	Narco Nav 122A VHF Receiver a. Single b. Dual Cert. Basis - TSO C34c, C35d, C36c, C40c, C66a	_____ _____ _____	*5.2 *8.8	98.5 82.2	512 723
313	Narco Nav 124A VHF Receiver a. Single b. Dual Cert. Basis - TSO C35d, C36c, C40a, C66a	_____ _____ _____	*6.2 *10.9	92.3 77.2	572 841
315	Narco Nav 124R VHF Receiver Cert. Basis - TSO C36c, C40a, C66a	_____	4.4	57.5	253

\*Weight includes marker antenna and cable.

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**PIPER AIRCRAFT CORPORATION  
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Item No.	Radio Equipment (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb.-In.)
317	Narco ID 124 VOR/LOC/GS Indicator a. Single b. Dual Cert. Basis - TSO C34c, C35d, C36c, C40c	_____ _____ _____	1.2 2.4	60.5 60.5	73 145
319	Narco UGR-2A Glide Slope a. Single b. Dual Cert. Basis - TSO C34b	_____ _____ _____	4.2 8.4	154.0 220.0	647 1848
321	Narco CP135 Audio Selector Panel Cert. Basis - TSO C50b	_____	2.2	55.0	121
323	Narco CP135M Audio Selector Panel Cert. Basis - TSO C50b, C35d	_____	*3.7	114.3	423
325	Narco CLC-60A R-Nav a. Narco SA-11 Adapter	_____ _____ _____	9.6 0.7	140.1 174.0	1345 122

\*Weight includes marker antenna and cable.

Item No.	Radio Equipment (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
327	Narco DME-190 TSO Cert. Basis - TSO C66a	—	*5.9	60.9	359
329	Narco DME-195 Receiver and Indicator Cert. Basis - TSO C66a	—	*13.2	154.5	2039
331	Narco ADF-141 a. Single b. Dual Cert. Basis - TSO C41c	— — —	*8.9 **17.9	91.2 107.6	812 1926
333	Narco AT150 Transponder Cert. Basis - TSO C74c a. Narco AR-500 Altitude Encoder Cert. Basis - TSO C88	— — —	*3.0	57.3	172
		—	1.0	51.5	52

\*Weight includes antenna and cable.

\*\*Weight includes dual antenna and cable.

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(m) Item No.	Radio Equipment (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
345	Antenna and Cable		1.4	195.7	274
	a. Nav Receiving	X			
	b. #1 VHF Comm	X	0.3	<del>125.7</del> 197.9	<del>88</del> 458.32
	c. #2 VHF Comm		0.8	147.5	118 KUHIV
	d. Glide Slope (Single)		0.9	122.2	110
	e. Glide Slope (Dual)		2.8	154.0	431
	f. Single ADF Sense		0.4	147.5	59
347	g. GPS ANT	X	0.7	94.9	66.43 KUHIV
	Anti-Static Antenna and Cable				256.93
	a. #1 VHF Comm	X	1.4	144.3	202
	b. #2 VHF Comm		1.5	170.7	256
349	c. Single ADF Sense		0.5	147.5	74
	Emergency Locator Transmitter (C.C.C. Model CIR-11-2)				
	a. Antenna and Coax		1.7	254.0	432
	b. Shelf and Access Hole Cert. Basis - TSO C91		0.2	240.0	48
350			0.5	253.5	127
	Emergency Locator Transmitter (Nareo Model-ELT-10)	X	3.5	254.0	889
	a. Antenna and Coax	X	0.3	240.0	72
	b. Shelf and Access Hole Cert. Basis - TSO C91 / 2C126	X	0.5	253.5	127
143.29	Artek ME 406 ELT	X	2.1	254.0	533.4

Item No.	Radio Equipment (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
351	Headphone Wm. J. Murdock P/N P-23 300 Ohms with MC162A Cushions or Telex Comm. P/N 61650-03	—	0.5	60.0	30
353	Microphone a. Telex Acoustics P/N 60837-17 (Model 66C) b. Narco P/N M700B c. Telex Acoustics P/N 62800-04 (Model 100T/NH)	X — —	0.3 0.6	64.9 64.9	19 42
355	Boom Microphone - Headset Piper Dwg. 37921-2 Telex 5 x 5 Mark II (P/N 62629-00)	—	0.3	80.5	24
357	Cabin Speaker, Installation Piper Dwg. 99746-0	X	0.8	99.0	79

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Item No.	Miscellaneous (Optional Equipment) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
387	Zinc Chromate Finish Piper Dwg. 79700-2	—	5.0	158.0	790
389	Stainless Steel Control Cables Piper Dwg. 79700-9	—	(Same as standard equipment)		
391	Air Conditioner Piper Dwg. 35878-3	—	69.8	105.7	7378
393	Overhead Vent System Piper Dwg. 76304-23	X	6.4	159.6	1022
395	Overhead Vent System with Ground Ventilating Blower Piper Dwg. 76304-24	—	14.9	172.2	2566
397	Assist Step Piper Dwg. 65384	X	1.8	156.0	281
399	Super Cabin Sound Proofing Piper Dwg. 79601-4	X	18.1	86.8	1571
401 C	Adjustable Front Seat (Left) Piper Dwg. 79591-2	X	*6.6	80.3	530

\*Weight and moment difference between standard and optional equipment.

Item No.	Miscellaneous (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
403	Adjustable Front Seat (Right) Piper Dwg. 79591-3	X	*6.6	79.6	525
405	Headrests (2) Front Piper Dwg. 79337-18	X	2.2	94.5	208
407	Headrests (2) Rear Piper Dwg. 79337-18	X	2.2	132.1	291
409	Oversize Headrest (2) Front Piper Dwg. 79764-2		3.2	94.5	302
411	Oversize Headrests (2) Rear Piper Dwg. 79764-2		3.2	132.1	423
413	Inertia Safety Belts (Rear) (2) 0.8 lbs. each Piper PS50039-4-14 (Pacific Scientific P/N 1107319-01 Black) or (American Safety Eqpt. Corp. P/N 500853-401)		1.6	140.3	224

\*Weight and moment difference between standard and optional equipment.



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Item No.	Miscellaneous (Optional Equipment) (cont) Item	Mark if Instl.	Weight (Pounds)	Arm (In.) Aft Datum	Moment (Lb-In.)
415	Assist Strap Piper Dwg. 79455-0	—	0.2	109.5	22
417	Curtain and Rod Installation Piper Dwg. 67955-2	X	4.2	124.0	521
419	Luxurious Interior Piper Dwg. 67952-3	X	*17.0	101.9	1732
421	Fire Extinguisher Piper Dwg. 37872-2 (Graviner HA1014-01)	—	5.6	57.9	324
422	LIESE Silencer W-60 removed 31.1.08 Häftiger C/M 663	—	31	29.0	90

\*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.)
423	Clip Installation - Map Piper Dwg. 37907-2		0.1	70.0	7
<b>TOTAL OPTIONAL EQUIPMENT</b>			<u>125.6</u>	<u>96.4</u>	<u>121.03</u>

EXTERIOR FINISH

Base Color	Juneau White	Registration No. Color	Black
Trim Color	Hickory Brown Dakota Blac	Type Finish	Lacquer
Accent Color	Hickory Brown		