

Another Back to the basic's lesson:

## PA -18 Weight and Balance mystery solved

Note: Before attempting to work a Weight and balance on a PA-18 you need to refresh your memory with these basic terms.

**Weight:** Simple, it is the amount in pounds an object weighs

**Arm:** Not the one extending from you shoulder. It is the distance in inches measured from the Datum

**Moment:** Is not a measurement of time. I.e. "Just a moment." It is the product of multiplying the "W" (weight) "X" (times) the "Arm" = Moment

Hence the formula:  $W \times \text{Arm} = \text{Moment}$ .

Total of all Moments added together, Divided by the total weight = "CG" (center of Gravity)

**Datum:** Is the point in space that the measurements for the arms are located. It can be located where ever the manufacturer decides.

You are used to Cessna's and other airplanes CG charts that simplify this issue of Weight and balance.

Piper, in its infinite wisdom, decided when designing the Super Cub (PA-18) to place the Datum 60" ahead of the "Wing leading Edge" Then to add confusion the CG limits or range are in relation to the Wing Leading Edge.

For N917VK the CG ranges on floats @ max gross weight of 1760 lbs. is 16.2 inches to 20 inches aft of the wing leading edge. At 1410 lbs. it is 11.1 inches to 20 inches aft of the wing leading edge.

Bottom line, for you to understand the PA-18 weight and balance solutions. Always, after dividing the total moments by the total weights, subtract the 60" inches from that number to determine if your aircraft is within proper CG range.

Note: The CG range varies with the gross weight of the PA-18. N917VK's gross weight is 1760 lbs. N645DT's gross weight is 2000 lbs. An STC from Whippaire the manufacturer of Whipline Floats make this possible.

# ALASKA FLOAT RATINGS

## WEIGHT AND BALANCE

N645DT

Piper PA -18

Super Cub

ITEM	WT.	ARM	MOMENT
EMPTY WEIGHT	1315.5	71.87	94544.99
PILOT .		71	
PAX REAR		97	
FUEL: ____ GAL.		84	
BAGGAGE		117	
OTHER - POD		90	
TOTALS			

C.G. RANGE ON FLOATS 14.0" - 20.0"  
@ 2000 LBS. MAX GROSS WEIGHT  
@ 1310 LBS. 13.0" TO 20.0"  
OR LESS: STRAIGHT LINE VARIATION  
BETWEEN POINT GIVEN

WT X ARM = MOMENT

TOTAL MOM./TOTAL WT. = C.G.

DATUM IS 60" FORWARD OF WING  
LEADING EDGE

# ALASKA FLOAT RATINGS

## WEIGHT AND BALANCE

N917VK  
#18-7409056

Piper PA -18

Super Cub

ITEM	WT.	ARM	MOMENT
EMPTY WEIGHT	1288	74.3	95698.4
PILOT		71	
PAX REAR		97	
FUEL: _____ GAL.		84	
BAGGAGE		117	
OTHER			
TOTALS			

C.G. RANGE ON FLOATS 16.2" TO 20.0"  
@ 1760 LBS. MAX GROSS WEIGHT  
@ 1410 LBS. 11.1" TO 20.0"  
OR LESS: STRAIGHT LINE VARIATION  
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DATUM IS 60" FORWARD OF WING  
LEADING EDGE