## 3.3 Weight and Balance

In order to compute the weight and balance of this aircraft, we have provided the following loading charts. This will reduce the amount of math you need. To compute weight and balance use the formula:

Weight * Arm = Moment.

| Pilot & Passenger | | | |
|---|---|---|---|
| eight (lbs) | Moment (lbs x in) | Weight (lbs) | Moment (lbs x in) |
| 10 | 748 | 260 | 19448 |
| 20 | 1496 | 270 | 20196 |
| 30 | 2244 | 280 | 20944 |
| 40 | 2992 | 290 | 21692 |
| 50 | 3740 | 300 | 22440 |
| 60 | 4488 | 310 | 23188 |
| 70 | 5236 | 320 | 23936 |
| 80 | 5984 | 330 | 24684 |
| 90 | 6732 | 340 | 25432 |
| 100 | 7480 | 350 | 26180 |
| 110 | 8228 | 360 | 26928 |
| 120 | 8976 | 370 | 27676 |
| 130 | 9724 | 380 | 28424 |
| 140 | 10472 | 390 | 29172 |
| 150 | 11220 | 400 | 29920 |
| 160 | 11968 | 410 | 30668 |
| 170 | 12716 | 420 | 31416 |
| 180 | 13464 | 430 | 32164 |
| 190 | 14212 | 440 | 32912 |
| 200 | 14960 | 450 | 33660 |
| 210 | 15708 | 460 | 34408 |
| 220 | 16456 | 470 | 35156 |
| 230 | 17204 | 480 | 35904 |
| 240 | 17952 | 490 | 36652 |
| 250 | 18700 | 500 | 37400 |

| Fuel | | |
|---|---|---|
| Gallons | Weight (lbs) | Moment |
| 1 | 6,26 | 544 |
| 2 | 12,52 | 1089 |
| 3 | 18,78 | 1633 |
| 4 | 25,04 | 2178 |
| 5 | 31,3 | 2722 |
| 6 | 37,56 | 3267 |
| 7 | 43,82 | 3811 |
| 8 | 50,08 | 4355 |
| 9 | 56,34 | 4900 |
| 10 | 62,6 | 5444 |
| 11 | 68,86 | 5989 |
| 12 | 75,12 | 6533 |
| 13 | 81,38 | 7078 |
| 14 | 87,64 | 7622 |
| 15 | 93,9 | 8166 |
| 16 | 100,16 | 8711 |
| 17 | 106,42 | 9255 |
| 18 | 112,68 | 9800 |
| 19 | 118,94 | 10344 |
| 20 | 125,2 | 10889 |
| 21 | 131,46 | 11433 |
| 22 | 137,72 | 11978 |
| 23 | 143,98 | 12522 |
| 24 | 150,24 | 13066 |
| 25 | 156,5 | 13611 |
| 26 | 162,76 | 14155 |
| 27 | 169,02 | 14700 |
| 28 | 175,28 | 15244 |
| 29 | 181,54 | 15789 |
| 30 | 187,80 | 16333 |
| 31 | 194,06 | 16877 |
| 32 | 200,32 | 17422 |

| Baggage | |
|---|---|
| Weight (lbs) | Moment (lbs x in) |
| 5 | 476 |
| 10 | 952 |
| 15 | 1427 |
| 20 | 1903 |
| 25 | 2379 |
| 30 | 2855 |
| 35 | 3331 |
| 40 | 3806 |
| 44 | 4187 |

| | Meter | Inches |
|---|---|---|
| PAX | 1.900 | 74,80 |
| FUEL | 2.209 | 86,97 |
| BAGGAGE | 2.417 | 95,16 |



To compute weight and balance:

1. Get moments from loading charts
2. Obtain the empty weight and moment from the most recent weight and balance
3. Insert the weights and the moments for fuel, occupants and baggage from the previous chart
4. Total the weight and the moment columns
5. Divide the total moment by the total weight to get the arm
6. Check that the total weight does not exceed maximum gross weight of 1320 pounds
7. Check that the arm falls within the C.G. range

| CoG Position Computation Chart | | | |
|---|---|---|---|
| | Weight (lbs) | Arm (inches)* | Moment |
| Empty Weight | | | |
| Fuel | | 86.97 | |
| Pilot & Passenger | | 74.80 | |
| Baggage | | 95.16 | |
| Total MOMENT | | | |
| Total WEIGHT | | | |
| Distance "D"= MOMENT/WEIGHT | | | |

*ADD to the distance "D" the value 1567mm (62in)

| C.G.Range | | |
|---|---|---|
| Meters | 1.842 | 2.020 |
| Inches | 72.50 | 79.5 |
| Max Weight | Pounds | Kilograms |
| | 1320.00 | 600.00 |

| Example Problem | | | |
|---|---|---|---|
| | Weight (lbs) | Arm (inches) | Moment |
| Empty Weight | 813,5 | 77,13 | 62741,99 |
| Fuel | 150 | 86,97 | 13045,50 |
| Pilot & Passenger | 300 | 74,80 | 22440,00 |
| Baggage | 20 | 95,16 | 1903,20 |
| Totals | 1283,5 | 78,01 | 100130,69 |

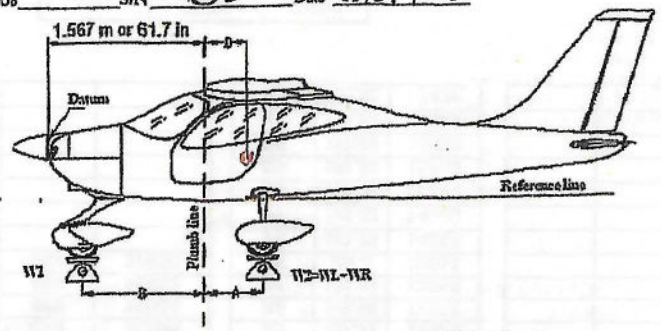
In this example, the gross weight is under the max gross weight of 1320 pounds and the Arm or C.G. is within the C.G. range listed above.

### 3.3.1 Loading

Baggage compartment is designed for a maximum load of 44 pounds. Baggage size shall prevent excessive loading of utility shelf (maximum pressure 12.5 kg/dm²). Maximum baggage size is: 80x45x32 cm . Baggage shall be secured using a tie-down net to prevent any baggage movement during maneuvers.

## 3.2 Weighing report

Model P2008 S/N 133 Date 22/07/2021




*Datum*: Propeller support flange w/o spacer. - *Equipment list*, date: 22/07/2021

| | Kg or lbs | | Meters or Inches |
|---|---|---|---|
| Nose wheel weight | $W_1$ = 2195 | Plumb bob distance LH wheel | $A_L$ = 26,61 |
| LH wheel weight | $W_L$ = 334 | Plumb bob distance RH wheel | $A_R$ = 26,61 |
| RH wheel weight | $W_R$ = 340,5 | Average distance $(A_L+A_R)/2$ | A = 26,61 |
| $W_2 = W_L+W_R$ = | 674,5 | Bob distance from nose wheel | B = 42,13 |

Empty weight (1) We = $W_1 + W_2$ = 885

$D = \frac{W_2 \cdot A - W_1 \cdot B}{We}$ = in

$D = \frac{W_2 \cdot A - W_1 \cdot B}{We}$ = in 10,26

[in] → $D\% = \frac{D}{1.373} \cdot 100$ =

[in] → $D\% = \frac{D}{54} \cdot 100$ = 19 %

Empty weight moment: M = [(D+1.567)·We] = Kg·m

Empty weight moment: M = [(D+61.7)·We] = lbs·in 63 684,6

| | | |
|---|---|---|
| Maximum takeoff weight | $W_T$ = | 600 kg (1323 lbs) |
| Empty weight | We = | 885 |
| Maximum payload $W_T$ - We | Wu = | 438 |

Sign: TECNAM

1 - Including unusable fuel

NOTE: The distances A and B vary from the aircraft with pivoting NLG configuration and the aircraft with steerable NLG. This weighing report remains valid.

### 3.2.1 Center of Gravity Limits

| | |
|---|---|
| Forward limit | 20% MAC for all weights |
| Aft limit | 33% MAC for all weights |
| Datum | Propeller support flange w/o spacer |
| Bubble Level | Cabin floor |

### 3.2.2 Distances from the datum

The mean distances of the occupants, baggage and fuel from the datum are:

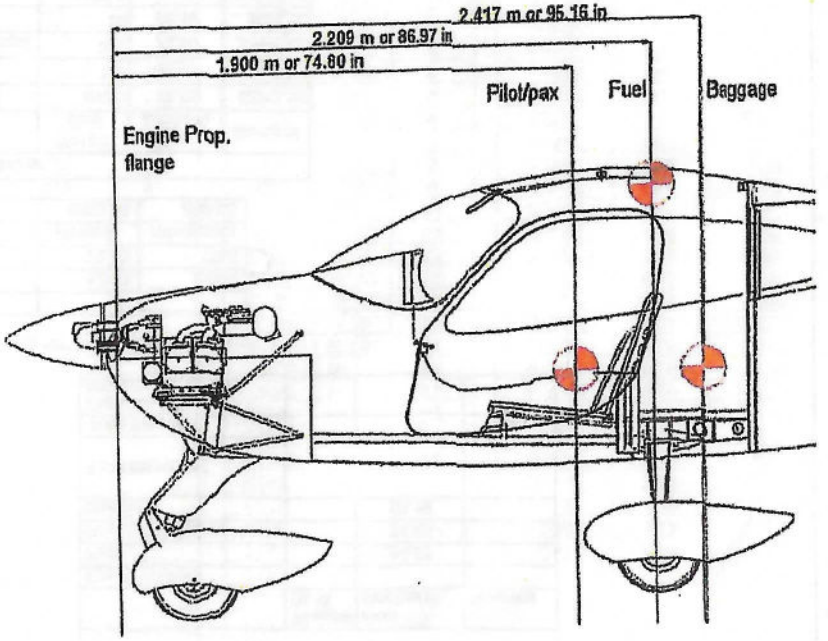



Figure 3-1