

		Longitudinal	
	Weight (pounds)	Arm (inches)	Moment (lb/inches)
Basic Empty Weight	1,400	107.75	150,850
Pilot	170	49.5	8,415
Fwd Passenger	250	49.5	12,375
Right Fwd Baggage		44	0
Left Fwd Baggage		44	0
Right Aft Passenger		79.5	0
Left Aft Passenger	185	79.5	14,708
Right Aft Baggage	50	79.5	3,975
Left Aft Baggage	50	79.5	3,975
<b>Totals with Zero Fuel</b>	<b>2,105</b>		<b>194,298</b>
Main Fuel Tank	184	106	19,504
Aux Fuel Tank	110	102	11,220
<b>Totals with Fuel</b>	<b>2,399</b>		<b>225,022</b>
CG		93.8	

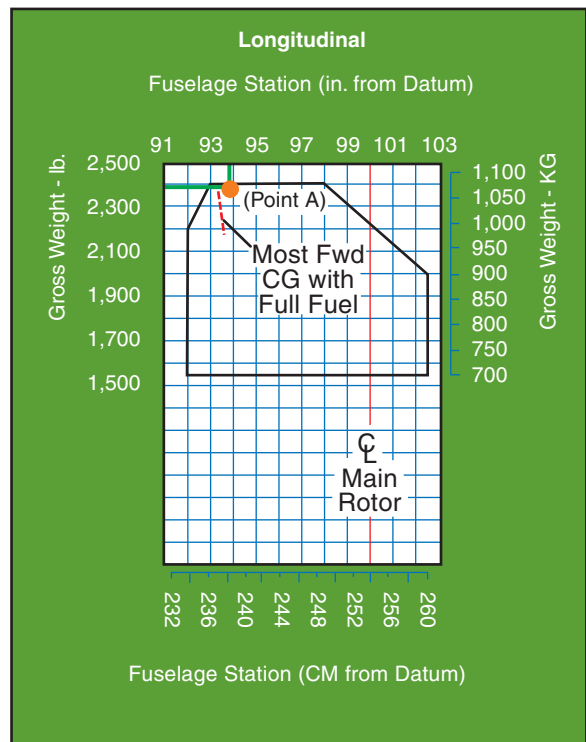


Figure 7-9. Use the longitudinal CG envelope along with the computed CGs to determine if the helicopter is loaded properly.

inches, the CG is 93.8. Plotting this CG against the weight indicates that the helicopter is loaded within the longitudinal limits (point A).

### CALCULATING LATERAL CG

Some helicopter manufacturers require that you also determine the lateral CG limits. These calculations are similar to longitudinal calculations. However, since the lateral CG datum line is almost always defined as the center of the helicopter, you are likely to encounter negative CGs and moments in your calculations. Negative values are located on the left side while positive stations are located on the right.

Refer to figure 7-10. When computing moment for the pilot, 170 pounds is multiplied by the arm of 12.2 inches resulting in a moment of 2,074 pound-inches. As with any weight placed right of the aircraft centerline, the moment is expressed as a positive value. The forward passenger sits left of the aircraft centerline. To compute this moment, multiply 250 pounds by  $-10.4$  inches. The result is in a moment of  $-2,600$  pound-inches. Once the aircraft is completely loaded, the weights and moments are totaled and the CG is computed. Since more weight is located left of the aircraft centerline, the resulting total moment is  $-3,837$  pound-inches. To calculate CG, divide  $-3,837$  pound-inches by the total weight of 2,399 pounds. The result is  $-1.6$  inches, or a CG that is 1.6 inches left of the aircraft centerline.

		Lateral	
	Weight (pounds)	Arm (inches)	Moment (lb/inches)
Basic Empty Weight	1,400	0	0
Pilot	170	12.2	2,074
Fwd Passenger	250	$-10.4$	$-2,600$
Right Fwd Baggage		11.5	0
Left Fwd Baggage		$-11.5$	0
Right Aft Passenger		12.2	0
Left Aft Passenger	185	$-12.2$	$-2,257$
Right Aft Baggage	50	12.2	610
Left Aft Baggage	50	$-12.2$	$-610$
<b>Totals with Zero Fuel</b>	<b>2,105</b>		<b><math>-2,783</math></b>
Main Fuel Tank	184	$-13.5$	$-2,484$
Aux Fuel Tank	110	13	1,430
<b>Totals with Fuel</b>	<b>2,399</b>		<b><math>-3,837</math></b>
CG		$-1.6$	

Figure 7-10. Computed Lateral CG.