SECTION 6

WEIGHT AND BALANCE

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SECTION 6

WEIGHT AND BALANCE

GENERAL

The helicopter must be flown only within weight and balance limits specified in Section 2. Loadings outside these limits can result in insufficient control travel for safe operation.

The center of gravity may be adjusted by adding removable ballast (any appropriate item of mass) to the baggage compartment and any under seat stowage area. Recalculate weight and balance after adding ballast, and verify ballast meets baggage compartment/stowage area limits given in Section 2.

Loaded helicopter weight and balance can be determined using the method given under LOADING INSTRUCTIONS.

In accordance with FAA procedures, the detail weight and balance data of this section are not subject to FAA approval. The loading instructions of this section, however, have been approved by the FAA as satisfying all requirements for instructions on loading of the rotorcraft within approved limits of weight and center of gravity and on maintaining the loading within such limits.

CAUTION

Fuel burn causes CG to move forward during flight. Always determine safe loading with empty fuel as well as with takeoff fuel. Payload may be limited by forward CG as fuel is burned.

WEIGHT AND BALANCE RECORD

The following form should be used to maintain a continuous record of your helicopter's weight and balance. Each time an item of equipment is removed or installed, an entry must be made and the new empty CG determined. The original factory weight and configuration is supplied with each helicopter on the Weight and Balance Summary/Equipment List (RF 134) at the end of this section. The RF 134 Weight and Balance Summary provides the first entry in the Weight and Balance Record.

NOTE

Calculated CG of empty weight plus 160 lb pilot must be STA 102.5 or forward. Following modification, adjustment to fixed nose ballast may be required. See R66 Maintenance Manual.

WEIGHT AND BALANCE RECORD (cont'd)

WEIGHT AND BALANCE RECORD

(Continuous History of Changes in Structure or Equipment Affecting Weight and Balance)

HELICOPTER MODEL R66 | SERIAL NUMBER:

DATE	DESCRIPTION OF ARTICLE OR MODIFICATION	WEIGHT CHANGE					RUNNING BASIC EMPTY WEIGHT				
		ADDED (+) REMOVED (-) WEIGHT (lb)	LONGITUDINAL		LATERAL (+ = RIGHT SIDE)		WEIGHT (lb)	LONGITUDINAL		LATERAL	
			Arm (in.)	Moment (in-lb)	Arm (in.)	Moment (in-lb)		Arm (in.)	Moment (in-lb)	Arm (in.)	Moment (in-lb)
	HELICOPTER AS WEIGHED										

LOADING INSTRUCTIONS

The following table may be used when calculating loaded helicopter weight and CG position.

COMMON ITEM WEIGHT & CG

Item	Weight (lb)	Longitudinal arm (in.)	Lateral arm (in.) (+ = right side)
Pilot (right forward seat)		49.0*	12.2
Left forward passenger		49.0*	–12.2
Aft outboard passengers		80.0	±16.0
Aft center passenger		78.0	0.0
Baggage under forward seats		42.0	±12.2
Baggage under aft seats		82.0	±15.0
Baggage in baggage compartment		107.0	0.0
Fuel		102.5	–3.0
Forward doors	7.5 each	49.5	±26.8
Aft doors	7.0 each	75.2	±27.2
Removable cyclic	0.6	35.3	–8.0
Removable collective	0.8	46.5	–21.0
Removable pedals (both pedals)	0.8	16.3	–9.5

*If additional backrest cushion is used, subtract thickness of compressed cushion.

LOADING INSTRUCTIONS (cont'd)

The following sample calculation demonstrates how to determine loaded helicopter weight and longitudinal center of gravity. A worksheet is provided on the page following the sample calculation for a weight and balance calculation for your helicopter. These may be compared with the CG limits given in Section 2 to determine safe loading. Both takeoff and empty fuel conditions must be within limits.

Lateral CG usually falls well within limits for conventional loadings. If an unusual lateral installation or loading occurs, lateral CG should be checked against the CG limits given in Section 2. The lateral reference datum is the aircraft centerline with items to the right positive and items to the left negative.

LOADING INSTRUCTIONS (cont'd)

SAMPLE LOADING CALCULATION

Item	Weight (lb)	Location		Moment	
		Long. Arm (in.)	Lat. Arm (in.) + = Right Side	Long. (in-lb)	Lat. (in-lb)
Basic empty weight	1290			140610	431
Remove forward right door	–7.5	49.5	26.8	–371	–201
Remove forward left door		49.5	–26.8		
Remove aft right door		75.2	27.2		
Remove aft left door		75.2	–27.2		
Remove cyclic		35.3	–8.0		
Remove collective		46.5	–21.0		
Remove pedals (both)		16.3	–9.5		
Pilot (forward right seat)	170	49.0	12.2	8330	2074
Left forward passenger	170	49.0	–12.2	8330	–2074
Aft right passenger	170	80.0	16.0	13600	2720
Aft center passenger	130	78.0	0.0	10140	0
Aft left passenger	170	80.0	–16.0	13600	–2720
Baggage under forward right seat	10	42.0	12.2	420	122
Baggage under forward left seat	10	42.0	–12.2	420	–122
Baggage under aft right seat	10	82.0	15.0	820	150
Baggage under aft left seat	10	82.0	–15.0	820	–150
Baggage in main baggage comp.	50	107.0	0.0	5350	0
Zero usable fuel weight and CG	**2182.5**	**92.6**	**0.1**	202069	230
Usable fuel quantity at 6.7 lb/gal	493.1	102.5	–3.0	50543	–1479
Takeoff Gross Weight and CG	**2675.6**	**94.4**	**–0.5**	**252612**	–1249

Notes: CG location (arm) for loaded helicopter is determined by dividing total moment by total weight.

LOADING INSTRUCTIONS (cont'd)

LOADING CALCULATION WORKSHEET

Item	Weight (lb)	Location		Moment	
		Long. Arm (in.)	Lat. Arm (in.) + = Right Side	Long. (in-lb)	Lat. (in-lb)
Basic empty weight					
Remove forward right door		49.5	26.8		
Remove forward left door		49.5	−26.8		
Remove aft right door		75.2	27.2		
Remove aft left door		75.2	−27.2		
Remove cyclic		35.3	−8.0		
Remove collective		46.5	−21.0		
Remove pedals (both)		16.3	−9.5		
Pilot (forward right seat)		49.0	12.2		
Left forward passenger		49.0	−12.2		
Aft right passenger		80.0	16.0		
Aft center passenger		78.0	0.0		
Aft left passenger		80.0	−16.0		
Baggage under forward right seat		42.0	12.2		
Baggage under forward left seat		42.0	−12.2		
Baggage under aft right seat		82.0	15.0		
Baggage under aft left seat		82.0	−15.0		
Baggage in main baggage comp.		107.0	0.0		
Zero usable fuel weight and CG					
Usable fuel quantity at 6.7 lb/gal		102.5	−3.0		
Takeoff Gross Weight and CG					

Notes: CG location (arm) for loaded helicopter is determined by dividing total moment by total weight.

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