Section 5

WEIGHT AND BALANCE

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Section 5

WEIGHT AND BALANCE

5-1. INTRODUCTION

This section provides information regarding helicopter center of gravity and cockpit and cabin loading. Loading table for pilot and passengers, cargo, and fuel are provided. A sample loading problem is provided to aid in flight planning.

5-2. EMPTY WEIGHT CENTER OF GRAVITY

Weight empty consists of basic helicopter with required equipment, optional equipment kits, transmission and gearbox oils, hydraulic fluid, unusable fuel, undrainable engine oil, and fixed ballast. Weigh empty CG shall be adjusted within limits of applicable Weight empty center of gravity chart in BHT-212-MM.

5-3. GROSS WEIGHT CENTER OF GRAVITY

It shall be pilot responsibility to ensure helicopter is properly loaded so entire flight is conducted within limits of Gross Weight Center of Gravity Chart in Section 1. GW CG may be calculated from helicopter Actual Weight Record (historical records) and loading tables in this section or in appropriate Flight Manual Supplements to assure safe loading.

Locations of crew and passenger seats, baggage compartment, and fuel tanks are shown in helicopter station diagram (figure 5-1).

5-4. DOORS OPEN OR REMOVED

Opening or removing doors results in CG changes. Door configuration shall be symmetrical for both sides of fuselage. Door weights and moments table (table 5-1) lists weight and moment adjustments which should be made in determining GW and CG when doors are opened or removed.

5-5. COCKPIT AND CABIN LOADING

A minimum crew weight of 170 pounds (77.1 kilograms) in cockpit is required. Except for two aft passenger seats, crew and passengers may be loaded in any sequence without exceeding GW CG limits approved for flight.

NOTE

Outboard facing seats should not be occupied unless at least four passengers are seated in forward and/or aft facing seats.

5-5-A. CABIN DECK LOADING

Cabin deck cargo loading limit is 100 pounds per square foot (0.048 kilograms per square centimeter).

WARNING

Helicopter CG shall be computed for all cargo/baggage configurations before flight.

Refer to table 5-2 for personnel weights and moments in English and Metric units.

5-5-B. INTERNAL CARGO LOADING TABLE

Weights at various arms and their moments are listed in 50 pound

increments from 50 through 2000 pounds and in 25-kilogram increments from 25 through 900 kilograms (Table 5-3).

5-6. BAGGAGE COMPARTMENT LOADING

Baggage compartment is accessible from right side of tailboom and contains approximately 28 cubic feet of space. Baggage compartment has a load limit of 400 pounds (181.4 kg) not to exceed 100 pounds per square foot (0.048 kg/cm^2). These are structural limitations only and do not infer that CG will remain within approved limits. When weight is loaded into baggage compartment, indiscriminate crew, passenger, and fuel loading can no longer be assumed, and pilot must compute GW CG to ensure loading is within approved limits.

5-6-A. BAGGAGE LOADING

Loading of baggage compartment should be from front to rear. Load shall be secured to tie-down fittings if shifting of load in flight could result in structural damage to baggage compartment or in GW CG limits being exceeded. If baggage is not secured, CG shall be computed with load in most adverse position.

5-6-B. BAGGAGE LOADING TABLE

Weights at various arms and their moments are listed in 20-pound increments, from 20 through 400 pounds, and in 10-kilogram increments, from 10 through 181.4 kilograms (Table 5-4).

5-7. FUEL LOADING

At the beginning of any flight with full fuel on board, helicopter CG will move forward due to the fact that the CG of fuel on board moves forward as it is consumed. This occurs because fuel is consumed from rear (upper) fuel cells first. Maximum forward CG condition of fuel on board occurs when 72.6 U.S. gallons (274.8 L) remain for helicopters S/N prior to 35049 and at 78.5 U.S. gallons (297.1 L) for helicopters S/N 35049 and subsequent. CG then begins to move rearward as fuel is consumed from forward (lower) fuel cells. With normal crew and passenger loading, GW CG should remain within limits at any fuel quantity.

Fuel quantities are listed with moments in 10-gallon increments, from 10 through 216.8 gallons, and in 40-liter increments, from 40 through 820.7 liters for helicopters S/N prior to 35049 (Table 5-5).

Fuel quantities are listed with moments in 10-gallon increments, from 10 through 218.6 gallons, and in 40-liter increments, from 40 through 827.4 liters for helicopters S/N 35049 and subsequent (Table 5-6).

5-7-A. COMPUTATION OF CG

A sample problem is presented showing calculation of takeoff and landing weights and CG locations for two typical loading conditions.

5-7-B. SAMPLE LOADING PROBLEM

CG of helicopter will move forward as fuel is burned off in flight. This occurs because fuel is burned from upper rear fuel cells first. A maximum forward CG condition occurs when 72.6 gallons (274.8 L) of fuel is on board for helicopters S/N prior to 35049. CG then begins to move rearward as fuel is burned out of lower fuel cells.

Helicopter is chartered to transport nine passengers and 180 pounds (82 kg) of baggage for a trip that will require approximately 155 gallons (586.8 L) of fuel. Pilot, weighing 180 pounds (82 kg), will return alone. Determine extreme CG conditions for both trips.

From GW CG charts in Section 1, it can be determined that CG is within limits for first leg of flight and that loading of passengers in five man and four man seats will be satisfactory for first leg.

From GW CG charts, it can also be determined that CG is within limits for second leg of flight, thus, entire operation can be completed.

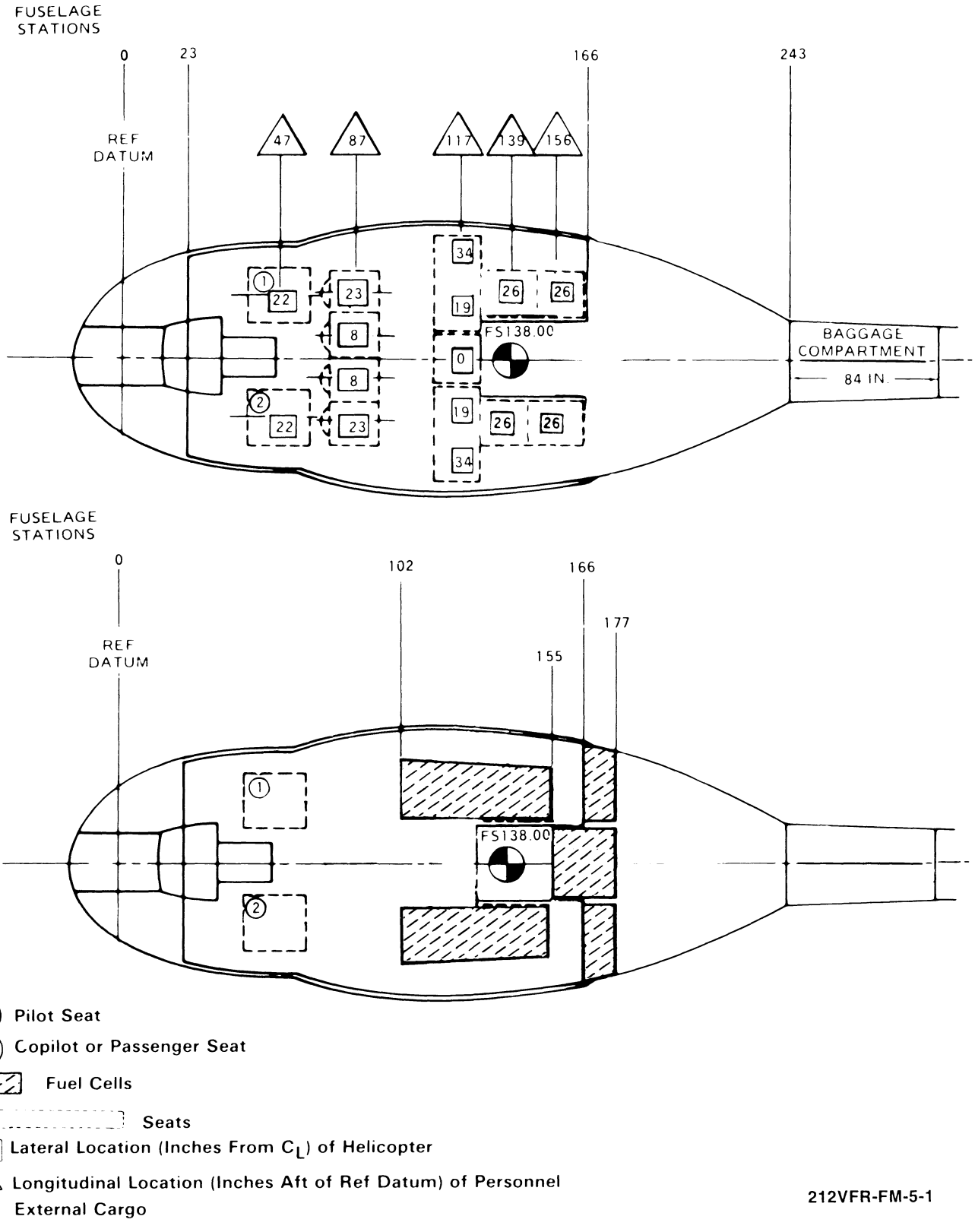

Figure 5-1. Helicopter station diagram

Table 5-1. Door weights and moments

ENGLISH

DOOR CONFIGURATION	WEIGHT CHANGE (POUNDS)	ARM (INCHES)	MOMENT CHANGE (IN-LB)
Both crew doors removed	-39.0	46.2	-1802
Both hinged panels removed	-20.4	85.0	1734
Both sliding doors removed	-90.4	130.0	-11,752
Both sliding doors full open	0	202.0	+6509

METRIC

DOOR CONFIGURATION	WEIGHT CHANGE (KILOGRAMS)	ARM (MILLIMETERS)	MOMENT CHANGE (KG • MM/100)
Both crew doors removed	-17.7	1173	-207.6
Both hinged panels removed	- 9.3	2159	200.8
Both sliding doors removed	-41.0	3302	-1353.8
Both sliding doors full open	0	5131	+749.9

(TABLE I.D. 911208)

Table 5-2. Crew and passenger table of moments

CREW AND PASSENGER TABLE OF MOMENTS (ENGLISH)							
Weight (Pounds)	Pilot and Copilot* FS 47	Passenger (4 - Man Seat Facing Aft) FS 87	Passenger (5 - Man Seat Facing Fwd) FS 117	Passenger Facing Outboard		Litter Patient	
				Fwd Seat FS 139	Aft Seat FS 156	Lateral Loaded FS 117	Longitudinal Loaded FS 120
100	4700	8700	11700	13900	15600	11700	12000
110	5170	9570	12870	15290	17160	12870	13200
120	5640	10440	14040	16680	18720	14040	14400
130	6110	11310	15210	18070	20280	15210	15600
140	6580	12180	16380	19460	21840	16380	16800
150	7050	13050	17550	20850	23400	17550	18000
160	7520	13920	18720	22240	24960	18720	19200
170	7990	14790	19890	23630	26520	19890	20400
180	8460	15660	21060	25020	28080	21060	21600
190	8930	16530	22230	26410	29640	22230	22800
200	9400	17400	23400	27800	31200	23400	24000
210	9870	18270	24570	29190	32760	24570	25200
220	10340	19140	25740	30580	34320	25740	26400

*Left Forward Seat

(TABLE I.D. 911209)

Table 5-2. Crew and passenger table of moments (Cont)

CREW AND PASSENGER TABLE OF MOMENTS (METRIC) (KG • MM/100)							
Weight (Kilograms)	Pilot and Copilot* 1194 MM	Passenger (4 - Man Seat Facing Aft) 2210 MM	Passenger (5 - Man Seat Facing Fwd) 2972 MM	Passenger Facing Outboard		Litter Patient	
				Fwd Seat 3531 MM	Aft Seat 3962 MM	Lateral Loaded 2972 MM	Longitudinal Loaded 3048 MM
45	537.3	994.5	1337.4	1589.0	1782.9	1337.4	1371.6
50	597.0	1105.0	1486.0	1765.5	1981.0	1486.0	1524.0
55	656.7	1215.5	1634.6	1942.1	2179.1	1634.6	1676.4
60	716.4	1326.0	1783.2	2118.6	2377.2	1783.2	1828.8
65	776.1	1436.5	1931.8	2295.2	2575.3	1931.8	1981.2
70	835.8	1547.0	2080.4	2471.7	2773.4	2080.4	2133.6
75	895.5	1657.5	2229.0	2648.3	2971.5	2229.0	2286.0
80	955.2	1768.0	2377.6	2824.8	3169.6	2377.6	2438.4
85	1014.9	1878.5	2526.2	3001.4	3367.7	2526.2	2590.8
90	1074.6	1989.0	2674.8	3177.9	3565.8	2674.8	2743.2
95	1134.3	2099.5	2823.4	3354.5	3763.9	2823.4	2895.6
*Left Forward Seat							

(TABLE I.D. 911210)

Table 5-3. Internal cargo loading

INTERNAL CARGO LOADING TABLE (ENGLISH)						
CARGO WEIGHT (POUNDS)	CARGO CENTER OF GRAVITY (FS)					
	75	90	105	120	135	150
	CARGO MOMENT (IN-LB)					
50	3750	4500	5250	6000	6750	7500
100	7500	9000	10500	12000	13500	15000
150	11250	13500	15750	18000	20250	22500
200	15000	18000	21000	24000	27000	30000
250	18750	22500	26250	30000	33750	37500
300	22500	27000	31500	36000	40500	45000
350	26250	31500	36750	42000	47250	52500
400	30000	36000	42000	48000	54000	60000
450	33750	40500	47250	54000	60750	67500
500	37500	45000	52500	60000	67500	75000
550	41250	49500	57750	66000	74250	82500
600	45000	54000	63000	72000	81000	90000
650	48750	58500	68250	78000	87750	97500
700	52500	63000	73500	84000	94500	105000
750	56250	67500	78750	90000	101250	112500
800	60000	72000	84000	96000	108000	120000
850	63750	76500	89250	102000	114750	127500
900	67500	81000	94500	108000	121500	135000
950	71250	85500	99750	114000	128250	142500
1000	75000	90000	105000	120000	135000	150000
1050	78750	94500	110250	126000	141750	157500
1100	82500	99000	115500	132000	148500	165000
1150	86250	103500	120750	138000	155250	172500
1200	90000	108000	126000	144000	162000	180000
1250	93750	112500	131250	150000	168750	187500
1300	97500	117000	136500	156000	175500	195000
1350	101250	121500	151750	162000	182250	202500
1400	105000	126000	147000	168000	189000	210000
1450	108750	130500	152250	174000	195750	217500
1500	112500	135000	157500	180000	202500	225000
1550	116250	139500	162750	186000	209250	232500
1600	120000	144000	168000	192000	216000	240000
1650	123750	148500	173250	198000	222750	247500
1700	127500	153000	178500	204000	229500	255000
1750	131250	157500	183750	210000	236250	262500
1800	135000	162000	189000	216000	243000	270000
1850	138750	166500	194250	222000	249750	277500
1900	142500	171000	199500	228000	256500	285000
1950	146250	175500	204750	234000	263250	292500
2000	150000	180000	210000	240000	270000	300000

(TABLE I.D. 911214)

Table 5-3. Internal cargo loading (Cont)

INTERNAL CARGO LOADING TABLE (METRIC)						
CARGO WEIGHT (KG)	CARGO CENTER OF GRAVITY (MM)					
	1905	2286	2667	3048	3429	3810
	CARGO MOMENT (KG • MM/100)					
25	476.3	571.5	666.8	762.0	857.3	952.5
50	952.5	1143.0	1333.5	1524.0	1714.5	1905.0
75	1428.8	1714.5	2000.3	2286.0	2571.8	2857.5
100	1905.0	2286.0	2667.0	3048.0	3429.0	3810.0
125	2381.3	2857.5	3333.8	3810.0	4286.3	4762.5
150	2857.5	3429.0	4000.5	4572.0	5143.5	5715.0
175	3333.8	4000.5	4667.3	5334.0	6000.8	6667.5
200	3810.0	4572.0	5334.0	6096.0	6858.0	7620.0
225	4286.3	5143.5	6000.8	6858.0	7715.3	8572.5
250	4762.5	5715.0	6667.5	7620.0	8572.5	9525.0
275	5238.8	6286.5	7334.3	8382.0	9429.8	10477.5
300	5715.0	6858.0	8001.0	9144.0	10287.0	11430.0
325	6191.3	7429.5	8667.8	9906.0	11144.3	12382.5
350	6667.5	8001.0	9334.5	10668.0	12001.5	13335.0
375	7143.8	8572.5	10001.3	11430.0	12858.8	14287.5
400	7620.0	9144.0	10668.0	12192.8	13716.0	15240.0
425	8096.3	9715.5	11334.8	12954.0	14573.3	16192.5
450	8572.5	10287.0	12001.5	13716.0	15430.5	17145.0
475	9048.8	10858.5	12668.3	14478.0	16287.8	18097.5
500	9525.0	11430.0	13335.0	15240.0	17145.0	19050.0
525	10001.3	12001.5	14001.8	16002.0	18002.3	20002.5
550	10477.5	12573.0	14668.5	16764.0	18859.5	20955.0
575	10953.8	13144.5	15335.3	17526.0	19716.8	21907.5
600	11430.0	13716.0	16002.0	18288.0	20574.0	22860.0
625	11906.3	14287.5	16668.8	19050.0	21431.3	23812.5
650	12382.5	14859.0	17335.5	19812.0	22288.5	24765.0
675	12858.8	15430.5	18002.3	20574.0	23145.8	25717.5
700	13335.0	16002.0	18669.0	21336.0	24003.0	26670.0
725	13811.3	16573.5	19335.8	22098.0	24860.3	27622.5
750	14287.5	17145.0	20002.5	22860.0	25717.5	28575.0
775	14763.8	17716.5	20669.3	23622.0	26574.8	29527.5
800	15240.0	18288.0	21336.0	24384.0	27432.0	30480.0
825	15716.3	18859.5	22002.8	25146.0	28289.3	31432.5
850	16192.5	19431.0	22669.5	25908.0	29146.5	32385.0
875	16668.8	20002.5	23336.3	26670.0	30003.8	33337.5
900	17145.0	20574.0	24003.0	27432.0	30861.0	34290.0

(TABLE I.D. 911215)

Table 5-4. Baggage loading

BAGGAGE LOADING TABLE (ENGLISH) LOAD BAGGAGE FROM FORWARD END OF COMPARTMENT 400 POUND MAXIMUM					
WEIGHT (LB)	APPROX. CG (FS)	MOMENT	WEIGHT (LB)	APPROX. CG (FS)	MOMENT
20	245	4900	220	265	58300
40	247	9880	240	267	64080
60	249	14940	260	269	69940
80	251	20080	280	271	75880
100	253	25300	300	273	81900
120	255	30600	320	275	88000
140	257	35980	340	277	94180
160	259	41440	360	279	100440
180	261	46980	380	281	106780
200	263	52600	400	283	113200

BAGGAGE LOADING TABLE (METRIC) LOAD BAGGAGE FROM FORWARD END OF COMPARTMENT 181.4 KILOGRAMS MAXIMUM					
WEIGHT (KG)	APPROX. CG (MM)	MOMENT (KG • MM/100)	WEIGHT (KG)	APPROX. CG (MM)	MOMENT (KG • MM/100)
10	6228	622.8	110	6789	7467.9
20	6284	1256.8	120	6845	8214.0
30	6340	1902.0	130	6901	8971.3
40	6396	2558.4	140	6957	9739.8
50	6452	3226.0	150	7013	10519.5
60	6507	3904.2	160	7069	11310.4
70	6563	4594.1	170	7125	12112.5
80	6619	5295.2	180	7181	12925.8
90	6675	6007.5	181.4	7188	13039.0
100	6734	6734.0			

(TABLE I.D. 911213)

Table 5-5. Fuel Loading Helicopters S/N Prior to 35049

ENGLISH							
ASTM D-1655 JET A, A-1, JP-5, AND JP-8 (6.8 LB/GAL)				ASTM D-6615 JET B AND JP-4 (6.5 LB/GAL)			
QUANTITY (U.S. GAL)	WEIGHT (LB)	CG (IN)	MOMENT (IN•LB)	QUANTITY (U.S. GAL)	WEIGHT (LB)	CG (IN)	MOMENT (IN•LB)
10	68	143.3	9765	10	65	143.6	9334
20	136	143.6	19530	20	130	143.6	18668
30	204	140.2	28601	30	195	140.2	27339
40	272	134.8	36666	40	260	134.8	35048
50	340	131.6	44744	50	325	131.6	42770
60	408	129.4	52795	60	390	129.4	50466
70	476	127.9	60880	70	455	127.9	58195
72.6*	494	127.6	63034	72.6*	472	127.6	60227
80	544	128.3	69795	80	520	128.3	66716
90	612	130.6	79927	90	585	130.6	76401
100	680	134.6	91528	100	650	134.6	87490
110	748	137.8	103074	110	715	137.8	98527
120	816	140.4	114566	120	780	140.4	109512
130	884	142.6	126058	130	845	142.6	120497
140	952	144.6	137659	140	910	144.6	131586
150	1020	146.1	149022	150	975	146.1	142448
160	1088	147.6	160589	160	1040	147.6	153504
170	1156	148.8	172013	170	1105	148.8	164424
180	1224	149.9	183478	180	1170	149.9	175383
190	1292	150.9	194963	190	1235	150.9	186362
200	1360	151.9	206584	200	1300	151.9	197470
210	1428	152.7	218056	210	1365	152.7	208436
216.8**	1474	153.3	225964	216.8**	1409	153.3	216000

* Most critical fuel amount for most forward flight condition.

** Most critical fuel amount for most aft flight condition.

NOTE: All data above represents usable fuel based on nominal density at 15°C (59°F).

Table 5-5. Fuel Loading Helicopters S/N Prior to 35049 (Cont)

METRIC							
ASTM D-1655 JET A, A-1, JP-5, AND JP-8 (0.815 KG/L)				ASTM D-6615 JET B AND JP-4 (0.779 KG/L)			
LITERS	WEIGHT (KG)	CG (MM)	MOMENT KG•MM 100	LITERS	WEIGHT (KG)	CG (MM)	MOMENT KG•MM 100
40	32.6	3647	1188.9	40	31.2	3647	1137.9
80	65.2	3647	2377.8	80	62.3	3647	2272.1
120	97.8	3541	3463.1	120	93.5	3541	3310.8
160	130.4	3399	4432.3	160	124.6	3399	4235.2
200	163.0	3322	5414.9	200	155.8	3322	5175.7
240	195.6	3272	6400.0	240	187.0	3272	6118.6
274.8*	224.0	3241	7259.8	274.8*	214.1	3241	6939.0
280	228.2	3246	7407.4	280	218.1	3246	7079.5
320	260.8	3277	8546.4	320	249.3	3277	8169.6
360	293.4	3368	9881.7	360	280.4	3368	9443.9
400	326.0	3470	11312.2	400	311.6	3470	10812.5
440	358.6	3541	12698.0	440	342.8	3541	12138.5
480	391.2	3609	14118.4	480	373.9	3609	13494.1
520	423.8	3665	15532.3	520	405.1	3665	14846.9
560	456.4	3708	16923.3	560	436.2	3708	16174.3
600	489.0	3744	18308.2	600	467.4	3744	17499.5
640	521.6	3777	19700.8	640	498.6	3777	18832.1
680	554.2	3805	21087.3	680	529.7	3805	20155.1
720	586.8	3833	22492.0	720	560.9	3833	21499.3
760	619.4	3858	23896.5	760	592.0	3858	22839.4
800	652.0	3884	25323.7	800	623.2	3884	24205.1
820.7**	668.9	3894	26047.0	820.7**	639.3	3894	24894.3

* Most critical fuel amount for most forward flight condition.

** Most critical fuel amount for most aft flight condition.

NOTE: All data above represents usable fuel based on nominal density at 15°C (59°F).

Table 5-6. Fuel Loading Helicopters S/N 35049 and Subsequent

ENGLISH							
ASTM D-1655 JET A, A-1, JP-5, AND JP-8 (6.8 LB/GAL)				ASTM D-6615 JET B AND JP-4 (6.5 LB/GAL)			
QUANTITY (U.S. GAL)	WEIGHT (LB)	CG (IN)	MOMENT (IN•LB)	QUANTITY (U.S. GAL)	WEIGHT (LB)	CG (IN)	MOMENT (IN•LB)
10	68	143.9	9785	10	65	143.9	9354
20	136	144.0	19584	20	130	144.0	18720
30	204	141.6	28886	30	195	141.6	27612
40	272	135.7	36910	40	260	135.7	35282
50	340	132.2	44948	50	325	132.2	42965
60	408	129.9	52999	60	390	129.9	50661
70	476	128.2	61023	70	455	128.2	58331
78.5*	534	127.3	67953	78.5*	510	127.3	64955
80	544	127.4	69306	80	520	127.4	66248
90	612	129.5	79254	90	585	129.5	75758
100	680	133.4	90712	100	650	133.4	86710
110	748	136.7	102252	110	715	136.7	97741
120	816	139.3	113669	120	780	139.3	108654
130	884	141.7	125263	130	845	141.7	119737
140	952	143.6	136707	140	910	143.6	130676
150	1020	145.2	148104	150	975	145.2	141570
160	1088	146.8	159718	160	1040	146.8	152672
170	1156	148.1	171204	170	1105	148.1	163651
180	1224	149.3	182743	180	1170	149.3	174681
190	1292	150.3	194188	190	1235	150.3	185621
200	1360	151.3	205768	200	1300	151.3	196690
210	1428	152.1	217199	210	1365	152.1	207617
218.6	1486	152.6	226837	218.6	1421	152.6	216829

* Most critical fuel amount for most forward flight condition.

NOTE: All data above represents usable fuel based on nominal density at 15°C (59°F).

Table 5-6. Fuel Loading Helicopters S/N 35049 and Subsequent (Cont)

METRIC							
ASTM D-1655 JET A, A-1, JP-5, AND JP-8 (0.815 KG/L)				ASTM D-6615 JET B AND JP-4 (0.779 KG/L)			
LITERS	WEIGHT (KG)	CG (MM)	MOMENT KG•MM 100	LITERS	WEIGHT (KG)	CG (MM)	MOMENT KG•MM 100
40	32.6	3655	1191.5	40	31.2	3655	1140.4
80	65.2	3658	2385.0	80	62.3	3658	2278.9
120	97.8	3561	3482.7	120	93.5	3561	3329.5
160	130.4	3421	4461.0	160	124.6	3421	4262.6
200	163.0	3340	5444.2	200	155.8	3340	5203.7
240	195.6	3284	6423.5	240	187.0	3284	6141.1
280	228.2	3246	7407.4	280	218.1	3246	7079.5
297.1*	242.1	3233	7827.1	297.1*	231.4	3233	7481.2
320	260.8	3249	8473.4	320	249.3	3249	8099.8
360	293.4	3343	9808.4	360	280.4	3343	9373.8
400	326.0	3434	11194.8	400	311.6	3434	10700.3
440	358.6	3515	12604.8	440	342.8	3515	12049.4
480	391.2	3579	14001.1	480	373.9	3579	13381.9
520	423.8	3635	15405.1	520	405.1	3635	14725.4
560	456.4	3683	16809.2	560	436.2	3683	16065.3
600	489.0	3721	18195.7	600	467.4	3721	17392.0
640	521.6	3757	19596.5	640	498.6	3757	18732.4
680	554.2	3790	21004.2	680	529.7	3790	20075.6
720	586.8	3818	22404.0	720	560.9	3818	21415.2
760	619.4	3843	23803.5	760	592.0	3843	22750.6
800	652.0	3866	25206.3	800	623.3	3866	24092.9
827.4	674.3	3876	26135.9	827.4	644.5	3876	24980.8

* Most critical fuel amount for most forward flight condition.

NOTE: All data above represents usable fuel based on nominal density at 15°C (59°F).

SAMPLE LOADING PROBLEM (ENGLISH UNITS)
HELICOPTER SERIAL NUMBERS PRIOR TO 35049

FIRST LEG

		WEIGHT (LBS)	CG (INCHES)	MOMENT (IN-LBS)
Basic Operating Weight	Licensed Empty Weight	6529.4		939996
	+Oil	24.5		4146
Payload	+Pilot	*170.0		7990
	+Passengers (5 man seat)	*850.0		99450
	+Passengers (4 man seat)	*680.0		59160
	+Baggage	*180.0		46980
	Basic Operating Weight + Payload	8433.9		1157722
Takeoff Conditions	Basic Operating Weight + Payload	8433.9		1157722
	+Takeoff Fuel (216.8 gallons Type B)	*1409.0		216000
	Takeoff Weight, CG & Moment	9842.9	139.6	1373722
Most Cricital FWD CG Conditions	Basic Operating Weight + Payload	8433.9		1157722
	+Critical Fuel (72.6 gallons Type B)	*472.0		60227
	Critical Weight, CG & Moment	8905.9	136.8	1217949
Landing Conditions	Basic Operating Weight + Payload	8433.9		1157722
	+Landing Fuel (60 gallons Type B)	*390.0		50466
	Landing Weight, CG & Moment	8823.9	136.9	1208188

(* Information obtained from loading charts)

(TABLE I.D. 911217)

SAMPLE LOADING PROBLEM (ENGLISH UNITS)
HELICOPTER SERIAL NUMBERS PRIOR TO 35049

SECOND LEG

		WEIGHT (LBS)	CG (INCHES)	MOMENT (IN-LBS)
Basic Operating Weight	Licensed Empty Weight	6529.4		939996
	+Oil	24.5		4146
	+Pilot	*170.0		7990
Takeoff Conditions	Basic Operating Weight (No Payload)	6723.9		952132
	+Takeoff Fuel (216.8 gallons Type B)	*1409.0		216000
	Takeoff Weight, CG & Moment	8132.9	143.6	1168132
Most Cricital FWD CG Conditions	Basic Operating Weight (No Payload)	6723.9		952132
	+Critical Fuel (72.6 gallonsType B)	*472.0		60227
	Critical Weight, CG & Moment	7195.9	140.7	1012359
Landing Conditions	Basic Operating Weight (No Payload)	6723.9		952132
	+Landing Fuel (60 gallons Type B)	*390.0		50466
	Landing Weight, CG & Moment	7113.9	140.9	1002598

(TABLE I.D. 911218)

SAMPLE LOADING PROBLEM (METRIC UNITS)
HELICOPTER SERIAL NUMBERS PRIOR TO 35049

FIRST LEG

		WEIGHT (KG)	CG (MM)	MOMENT (KG•MM / 100)
Basic Operating Weight	Licensed Empty Weight	2961.7		108298.7
Payload	+Oil	11.1		477.7
	+Pilot	*90.0		1074.6
	+Passengers (5 man seat)	*375.0		11145.0
	+Passengers (4 man seat)	*300.0		6630.0
	+Baggage	*80.0		5295.2
	Basic Operating Weight + Payload	3817.8		132921.2
Takeoff Conditions	Basic Operating Weight + Payload	3817.8		132921.2
	+Takeoff Fuel (820.7 liters Type B)	*639.3		24894.3
	Takeoff Weight, CG & Moment	4457.1	3541	157815.5
Most Cricital FWD CG Conditions	Basic Operating Weight + Payload	3817.8		132921.2
	+Critical Fuel (274.8 liters Type B)	*214.1		6939.0
	Critical Weight, CG & Moment	4031.9	3469	139860.2
Landing Conditions	Basic Operating Weight + Payload	3817.8		132921.2
	+Landing Fuel (227.1 liters Type B)	*176.9		5814.5
	Landing Weight, CG & Moment	3994.7	3473	138735.7

(* Information obtained from loading charts)

(TABLE I.D. 911219)

SAMPLE LOADING PROBLEM (METRIC UNITS)
HELICOPTER SERIAL NUMBERS PRIOR TO 35049

SECOND LEG

		WEIGHT (KG)	CG (MM)	MOMENT (KG•MM / 100)
Basic Operating Weight	Licensed Empty Weight	2961.7		108298.7
	+Oil	11.1		477.7
	+Pilot	*90.0		1074.6
Takeoff Conditions	Basic Operating Weight (No Payload)	3062.8		109851.0
	+Takeoff Fuel (820.7 liters Type B)	*639.3		24894.3
	Takeoff Weight, CG & Moment	3702.1	3640	134745.3
Most Cricital FWD CG Conditions	Basic Operating Weight (No Payload)	3062.8		109851.0
	+Critical Fuel (274.8 liters Type B)	*214.1		6939.0
	Critical Weight, CG & Moment	3276.9	3564	116790.0
Landing Conditions	Basic Operating Weight (No Payload)	3062.8		109851.0
	+Landing Fuel (227.1 liters Type B)	*176.9		5814.5
	Landing Weight, CG & Moment	3239.7	3570	115665.5

(TABLE I.D. 911220)

SAMPLE LOADING PROBLEM (ENGLISH UNITS)
HELICOPTER SERIAL NUMBERS 35049 AND SUBSEQUENT

FIRST LEG

		WEIGHT (LBS)	CG (INCHES)	MOMENT (IN-LBS)
Basic Operating Weight	Licensed Empty Weight	6529.4		939996
	+Oil	24.5		4146
	+Pilot	*170.0		7990
Payload	+Passengers (5 man seat)	*850.0		99450
	+Passengers (4 man seat)	*680.0		59160
	+Baggage	*180.0		46980
	Basic Operating Weight + Payload	8433.9		1157722
Takeoff Conditions	Basic Operating Weight + Payload	8433.9		1157722
	+Takeoff Fuel (218.6 gallons Type B)	*1421.0		216829
	Takeoff Weight, CG & Moment	9854.9	139.5	1374551
Most Cricital FWD CG Conditions	Basic Operating Weight + Payload	8433.9		1157722
	+Critical Fuel (78.5 gallons Type B)	*510.0		64955
	Critical Weight, CG & Moment	8943.9	136.7	1222677
Landing Conditions	Basic Operating Weight + Payload	8433.9		1157722
	+Landing Fuel (60 gallons Type B)	*390.0		50661
	Landing Weight, CG & Moment	8823.9	136.9	1208383

(* Information obtained from loading charts)

(TABLE I.D. 911328)

SAMPLE LOADING PROBLEM (ENGLISH UNITS)
HELICOPTER SERIAL NUMBERS 35049 AND SUBSEQUENT

SECOND LEG

		WEIGHT (LBS)	CG (INCHES)	MOMENT (IN-LBS)
Basic Operating Weight	Licensed Empty Weight	6529.4		939996
	+Oil	24.5		4146
	+Pilot	*170.0		7990
Takeoff Conditions	Basic Operating Weight (No Payload)	6723.9		952132
	+Takeoff Fuel (218.6 gallons Type B)	*1421.0		216829
	Takeoff Weight, CG & Moment	8144.9	143.5	1168961
Most Cricital FWD CG Conditions	Basic Operating Weight (No Payload)	6723.9		952132
	+Critical Fuel (78.5 gallonsType B)	*510.0		64955
	Critical Weight, CG & Moment	7233.9	140.6	1017087
Landing Conditions	Basic Operating Weight (No Payload)	6723.9		952132
	+Landing Fuel (60 gallons Type B)	*390.0		50661
	Landing Weight, CG & Moment	7113.9	141.0	1002793

(TABLE I.D. 911327)

SAMPLE LOADING PROBLEM (METRIC UNITS)
HELICOPTER SERIAL NUMBERS 35049 AND SUBSEQUENT

FIRST LEG

		WEIGHT (KG)	CG (MM)	MOMENT (KG•MM / 100)
Basic Operating Weight	Licensed Empty Weight	2961.7		108298.7
Payload	+Oil	11.1		477.7
	+Pilot	*90.0		1074.6
	+Passengers (5 man seat)	*375.0		11145.0
	+Passengers (4 man seat)	*300.0		6630.0
	+Baggage	*80.0		5295.2
	Basic Operating Weight + Payload	3817.8		132921.2
Takeoff Conditions	Basic Operating Weight + Payload	3817.8		132921.2
	+Takeoff Fuel (827.4 liters Type B)	*644.5		24980.8
	Takeoff Weight, CG & Moment	4462.3	3539	157902.0
Most Cricital FWD CG Conditions	Basic Operating Weight + Payload	3817.8		132921.2
	+Critical Fuel (297.1 liters Type B)	*231.4		7481.2
	Critical Weight, CG & Moment	4049.2	3467	140402.4
Landing Conditions	Basic Operating Weight + Payload	3817.8		132921.2
	+Landing Fuel (227.1 liters Type B)	*176.9		5838.8
	Landing Weight, CG & Moment	3994.7	3474	138760.0

(* Information obtained from loading charts)

(TABLE I.D. 911326)

SAMPLE LOADING PROBLEM (METRIC UNITS)
HELICOPTER SERIAL NUMBERS 35049 AND SUBSEQUENT

SECOND LEG

		WEIGHT (KG)	CG (MM)	MOMENT (KG•MM / 100)
Basic Operating Weight	Licensed Empty Weight	2961.7		108298.7
	+Oil	11.1		477.7
	+Pilot	*90.0		1074.6
Takeoff Conditions	Basic Operating Weight (No Payload)	3062.8		109851.0
	+Takeoff Fuel (827.4 liters Type B)	*644.5		24980.8
	Takeoff Weight, CG & Moment	3707.3	3637	134831.8
Most Cricital FWD CG Conditions	Basic Operating Weight (No Payload)	3062.8		109851.0
	+Critical Fuel (297.1 liters Type B)	*231.4		7481.2
	Critical Weight, CG & Moment	3294.2	3562	117332.2
Landing Conditions	Basic Operating Weight (No Payload)	3062.8		109851.0
	+Landing Fuel (227.1 liters Type B)	*176.9		5838.8
	Landing Weight, CG & Moment	3239.7	3571	115689.8

(TABLE I.D. 911325)