

PPL (H) – Flight Performance and Planning



FLIGHT CREW LICENSING DEPARTMENT

Theoretical Knowledge Examination for obtaining PPL (H)

**Subject:
FLIGHT PERFORMANCE AND PLANNING**

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NOTE:

The correct answer is under letter **a**. During exam the order of answers will be different

1. Maximum Landing Mass (MLM) is best defined as:
 - a. Maximum permissible total mass on landing under normal operating conditions.
 - b. Maximum permissible total mass on landing.
 - c. Maximum permissible total mass on the approach to land.
 - d. Maximum permissible total mass on taxiing to park.

2. Helicopter Power Graph shows Rotor Profile Power and Induced Power with letters: (fig. PPL (H) FPP-2)
 - a. "B" and "A"
 - b. "B" and "C"
 - c. "C" and "A"
 - d. "C" and "B"

3. Helicopter Power Graph shows Rotor Profile Power and Parasite Power with letters: (fig. PPL(H) FPP-2)
 - a. "B" and "C"
 - b. "B" and "A"
 - c. "C" and "A"
 - d. "C" and "B"

4. What name is given to the load at which the aircraft structure will fail?
 - a. Ultimate Load.
 - b. Safety Factor Load.
 - c. Limit Load.
 - d. Maximum Load.

5. An aircraft which has been grossly overloaded will:
 1. Require increased take-off and landing distances.
 2. Have a reduced IGE hover ceiling.
 3. Have a reduced maximum level flight speed.
 4. Have increased range and endurance.
 5. Have a reduced rate of climb and operating ceiling.Which of the above are correct?
 - a. 1, 2, 3, & 5.
 - b. 1, 2, 4 & 5.
 - c. 2, 4 & 5.
 - d. 1, 2, 3 & 4.

6. Maximum Zero Fuel Mass (MZFM) is best defined as:
 - a. Maximum permissible mass of the aircraft with no useable fuel.
 - b. Maximum permissible mass of the aircraft with no passengers or fuel.
 - c. Maximum permissible mass of the aircraft with no crew or fuel.

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- d. Maximum permissible mass of the aircraft without occupants and baggage.
7. Maximum Take of Mass (MTOM) is best defined as:
- Maximum permissible total mass at the start of the take off run.
 - Maximum permissible total mass prior to taxiing.
 - Maximum permissible total mass prior to take off.
 - Maximum permissible total mass at the point of transition from hover to forward flight.
8. Which of the following situations may, under certain conditions, result in structural damage occurring?
- An aircraft being flown above its maximum all up mass.
 - An aircraft in the utility category being flown at its maximum permissible mass.
 - An aircraft being flown above its maximum landing mass.
 - An aircraft in the normal category being flown at its maximum permissible mass.
9. Never exceed speed (V_{NE}) is the red radial line on the ASI and marks the speed at which:
- Flight is permitted in smooth conditions only.
 - Prolonged flight is unsafe.
 - Flight is prohibited.
 - Structural damage will occur.
10. Helicopter Power Graph shows Induced Power and Parasite Power with letters: (fig. PPL (H) FPP-2)
- "A" and "C"
 - "B" and "A"
 - "A" and "A"
 - "C" and "B".
11. Your aircraft has an oil reservoir with a capacity of 3 imp/gal which is positioned 20 inches aft of the datum. Given that the oil weighs 9.1 lbs/gal, the reservoir will possess a moment of:
- 546 lb in.
 - 60 lb in.
 - 27.3 lb in.
 - 182 lb in.
12. Rotor Profile Power is:
- Power required to drive the main rotor, tail rotor and ancillary equipment.
 - Power required to induce flow and produce rotor thrust.
 - Power required to overcome fuselage parasite drag.
 - Power required to maintain good landing profile.
13. An aircraft is loaded such that its C of G is on the aft limit:
- It is significant to command stick in reverse to keep the helicopter hovering.
 - It is significant to command stick in forward to keep the helicopter hovering.

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- III) During take off it is possible to have a contact of tail rotor with the ground.
 - IV) Stick forces increase, which is a negative factor.
 - a. Only II and III are correct.
 - b. All of the above are correct.
 - c. Only I and IV are correct.
 - d. Only II and IV are correct.
14. Certification requirements stipulate that when loading a light aircraft:
- a. The C of G should remain within the defined limits and the Maximum Take-off Mass must not be exceeded.
 - b. All seats, baggage compartments and fuel tanks are contained within the C of G limits so that it is impossible to load the aircraft beyond its limits.
 - c. With maximum traffic load and full fuel the aircraft will not exceed the authorised Maximum Takeoff Mass.
 - d. That the Maximum Take-off Mass is not exceeded, and the C of G remains at least 5% inside the C of G limits.
15. Induced Power is the:
- a. Power required to induce flow and produce rotor thrust.
 - b. Power required to drive the main rotor, tail rotor and ancillary equipment.
 - c. Power required to overcome fuselage parasite drag.
 - d. Power required to induce alternating current AC.
16. DOM (Dry Operating Mass) is defined as:
- a. The total mass of the aircraft ready for a specific type of operation including crew, crew baggage and special equipment but excluding useable fuel and traffic load.
 - b. The total mass of the aircraft ready for a specific type of operation including: crew and crew baggage, catering and removable passenger service equipment and fuel.
 - c. The total mass of the aircraft ready for a specific type of operation including: crew and crew baggage, catering and removable passenger service equipment and traffic load.
 - d. The total mass of the aircraft ready for a specific type of operation including: crew and crew baggage, catering and removable passenger service equipment, traffic load and fuel.
17. An aircraft loaded in a dangerous manner, so that its C of G is beyond its forward limit will:
- a. Will require longer available distance for landing due to limited possibility for flare.
 - b. While cruising and in a condition with strong gusting wind, would prevent us to pitch up.
 - c. Require less effort to rotate on take off.
 - d. Have both an increased range and endurance.
18. The flight characteristics of an aircraft which has its C of G at the forward limit will be:
- a. Insensitivity to Pitch Control and great Longitudinal Stability.
 - b. Insensitivity to Pitch Control and little Longitudinal Stability.

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- c. Sensitivity to Pitch Control and little Longitudinal Stability.
 - d. Sensitivity to Pitch Control and great Longitudinal Stability.
19. An aircraft weighing 2000 lbs with a total C of G moment of + 169400 lb in uplifts 440 lbs of fuel. If the effective arm of the fuel is 88.5 inches aft of the datum, what will be the aircraft's new mass and C of G moment?
- a. 2440 lbs +208340 lb in.
 - b. 1560 lbs +208340 lb in.
 - c. 2440 lbs +169488.5 lb in.
 - d. 1560 lbs +169488.5 lb in.
20. You plan to carry your aircraft's maximum permissible 'Traffic Load'. Your principal consideration during your flight planning will be that:
- a. Your fuel load may have to be limited to prevent you exceeding the Maximum All Up
 - b. Weight /Mass.
 - c. It is mandatory to carry a full fuel load when carrying passengers.
 - d. The fuel load is accounted for in 'Traffic Load' calculations.
 - e. The 'Traffic Load' may have to be reduced to allow for the full fuel load.
21. Traffic Load:
- a. Is the total mass of passengers, baggage and freight.
 - b. Includes drinkable water and lavatory chemicals.
 - c. Is the total mass of passengers, baggage and freight and fuel.
 - d. Includes the Basic Empty Mass.
22. The consequences of operating a helicopter with the C of G beyond the aft limit will be:
- I) During take off it is possible to have a contact of tail rotor with the ground.
 - II) It is significant to command stick in forward to keep the helicopter hovering.
 - III) While cruising and in a condition with strong gusting wind, would prevent us to pitch up.
- a. All statements are correct.
 - b. Only statement I) is correct.
 - c. Only statements I) and IV) are correct.
 - d. Only statements II) and III) are correct.
23. Parasite Power is:
- a. Power required to overcome fuselage parasite drag.
 - b. Power required to induce flow and produce rotor thrust.
 - c. Power required to drive the main rotor, tail rotor and ancillary equipment.
 - d. Power required for ground taxi.
24. Using density altitude chart (fig. PPL (H) FPP-3) determine density altitude for given conditions:
- Elevation of heliport = 3000ft
 - QNH = 29.92 in
 - OAT = +9°C

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- a. 3000ft
 - b. 4000ft
 - c. 5000ft
 - d. 2000ft.
25. What is used as the aircraft reference for the C of G limit?
- a. Datum
 - b. MR shaft
 - c. TR shaft
 - d. The most forward or most rearward point of helicopter.
26. C of G limits are set by the manufacturer and:
- a. Are mandatory.
 - b. Have only a forward limit.
 - c. Are a guide only.
 - d. Have only an aft limit
27. Your aircraft has:
- A Take-off Mass of = 2353 lbs
 - A calculated C of G for departure = 89.75 inches aft of the datum
 - An estimated fuel burn = 200 lbs with a C of G 85.00 inches aft of datum.
- The position of the C of G on landing will be?
- a. 90.19 inches aft of the datum.
 - b. 82.52 inches aft of the datum.
 - c. 105.98 inches aft of the datum.
 - d. 96.97 inches aft of the datum.
28. Using density altitude chart (fig. PPL(H) FPP-3) determine density altitude for given conditions:
- Elevation of heliport = 3000ft
 - QNH = 28.85 in
 - OAT = -1°C
- a. 3000ft.
 - b. 4000ft.
 - c. 5000ft.
 - d. 2000ft.
29. When calculating the MZFM (maximum zero fuel mass), the following are included:-
- a. Crew, Passengers, Baggage & Catering.
 - b. Crew, Passengers & Baggage.
 - c. Crew, Passengers, Baggage, Catering & Fuel.
 - d. Drinkable water and lavatory chemicals.
30. Using density altitude chart (fig. PPL (H) FPP-3), determine density altitude for given conditions:
- Elevation of heliport = 6000ft
 - QNH = 29.4 in
 - OAT = +20°C

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- a. 8500ft
 - b. 8000ft
 - c. 6700ft
 - d. 7200ft.
31. What is the effect of runway slope on the take-off?
- a. An uphill slope will increase the take-off distance.
 - b. An uphill slope will increase the take-off performance.
 - c. A downhill slope will increase the take-off distance
 - d. A downhill slope will decrease the take-off performance.
32. That part of a runway surface which is used for normal operations during take-off, excluding any clearway or stopway, is referred to as:
- a. The take-off run available (TORA).
 - b. The landing distance available (LDA).
 - c. The take-off distance available (TODA).
 - d. The emergency distance available (EMDA).
33. If the density of the atmosphere is reduced, the take-off distance will be:
- a. Increased.
 - b. Decreased.
 - c. Unaffected.
 - d. Controlled by wind.
34. If the density of the air is increased above ISA conditions, the effect will be:
- a. To increase the take-off performance.
 - b. To increase the take-off distance.
 - c. To decrease the take-off performance.
 - d. To decrease just the take-off run.
35. When the density of the atmosphere is relatively low, the resulting reduction in:
- a. Both lift and engine power will require a longer take-off distance.
 - b. Thrust and drag has no apparent effect on the take-off distance required.
 - c. Have an increased OGE hover ceiling.
 - d. Drag offsets the loss of engine power giving improved acceleration.
36. Using Hover Ceiling vs. Gross Weight graph determine ceiling hover in-ground effect for given conditions: (fig. PPL(H) FPP-4)
- All up weight = 1225 lb
 - OAT = +25°C
 - a. 6.750 ft
 - b. 5.000 ft
 - c. 8.000 ft
 - d. 7.250 ft.
37. Increasing the aircraft's gross weight will have what effect on the take-off?
- a. Decreasing acceleration and increasing the take-off distance required.
 - b. Decrease the Initial climb angle and decrease the take-off distance required.

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- c. Increase the Initial climb angle and decrease the take-off run required.
 - d. Decrease the take-off speed and decrease the take-off distance required.
38. Using Hover Ceiling vs. Gross Weight graph determine ceiling hover out-ground effect
- All up weight = 1175 lb
 - OAT = +35°C
- a. 5.250 ft
 - b. 7.250 ft
 - c. 8.000 ft
 - d. 6.250 ft.
39. Climbing at V_y will achieve:
- a. The greatest increase in altitude in a given period of time.
 - b. The maximum angle of climb.
 - c. The maximum increase in height in the shortest horizontal distance.
 - d. The best obstacle clearance performance.
40. To gain the greatest amount of height in the shortest time period the aircraft should be flown at:
- a. The best rate of climb speed (V_y).
 - b. 60 KT
 - c. The best angle of climb speed (V_x).
 - d. At the speed for maximum endurance.
41. Calculate the rate of climb for an aircraft operating at 5000ft with an outside air temperature of 0°C. (See fig. PPL FPP-8e)
- a. 530 fpm.
 - b. 585 fpm.
 - c. 475 fpm.
 - d. 470 fpm.
42. Increasing the mass (and, therefore, weight) of the aircraft will:
- a. Decrease the rate and angle of climb.
 - b. Increase the rate and angle of climb.
 - c. Increase the rate of climb and decrease the angle of climb.
 - d. Decrease the rate of climb and increase the angle of climb.
43. Using Hover Ceiling vs. Gross Weight graph determine ceiling hover in-ground effect for given conditions: (fig. PPL(H) FPP-4)
- All up weight = 1275 lb
 - OAT = -13°C
- a. 7.900 ft.
 - b. 6.200 ft.
 - c. 9.000 ft.
 - d. 7.250 ft.

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44. Using Hover Ceiling vs. Gross Weight graph determines ceiling hover out-ground effect for given conditions: (fig. PPL(H) FPP-4)
All up weight = 1225 lb
OAT = +25°C
- 5.000 ft.
 - 7.250 ft.
 - 8.000 ft.
 - 6.750 ft.
45. What is the max speed we can achieve during level flight at determined altitude? (fig. PPL(H) FPP-1)
- At the point where power curves cross each other (D).
 - At the point where power curves are most distant from each other (A).
 - Where power required curve is at lowest point (B).
 - At the point where the power required curve touches the tangent drawn from the origin of the graph (C).
46. Which speed is required for maximal endurance? (fig. PPL(H) FPP-1)
- Where power required curve is at lowest point (B).
 - At the point where power curves are most distant from each other (A).
 - At the point where the power required curve touches the tangent drawn from the origin of the graph (C).
 - At the point where power curves cross each other (D).
47. Climbing at V_x will achieve:
- The maximum angle of climb.
 - The best time to height.
 - The greatest increase in altitude in a given period of time.
 - The maximum horizontal distance for a given vertical distance.
48. What is the best rate of climb speed (V_{broc})? (Fig. PPL (H) FPP-1)
- At the point where power curves are most distant from each other (A).
 - Where power required curve is at lowest point (B).
 - At the point where the power required curve touches the tangent drawn from the origin of the graph (C).
 - At the point where power curves cross each other (D).
49. What is the maximum range speed? (Fig. PPL (H) FPP-1)
- At the point where the power required curve touches the tangent drawn from the origin of the graph (C).
 - At the point where power curves are most distant from each other (A).
 - At the point where power curves cross each other (D).
 - Where power required curve is at lowest point (B).
50. Who is responsible before a flight that the load is safely distributed and secured?
- The Commander of the intended flight. I
 - Any licensed mechanic.

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- c. The Company Load master.
 - d. The Company licensed engineer.
51. What is the weight of 33 US Gallons of Av Gas at a specific gravity of 0.715?
- a. 197 lb.
 - b. 201 kg.
 - c. 155 lb.
 - d. 179 kg.
52. A pilot wishes to fly at a speed which will give him maximum range. He knows that he is flying with a tailwind. How will the speed selected by the pilot compare with the maximum range speed for still air?
- a. It will be decreased by a margin slightly less than the amount of tailwind.
 - b. It will be increased by a margin slightly less than the amount of tailwind.
 - c. It will be the same as for still air.
 - d. It will be decreased by a margin slightly more than the amount of tailwind.
53. Which of the next cases will result in worsening of performance and possibility of exceeding structural limitations of helicopter?
- a. Helicopter is loaded over maximal allowed weight.
 - b. Helicopter climbing at V_{broc} with maximal allowed weight.
 - c. Helicopter flying over maximal landing weight.
 - d. Helicopter with higher weight at take off than landing.
54. What is the effect of head wind on glide angle and range in autorotation?
- a. Glide angle is increasing and range is decreasing.
 - b. Glide angle and range stay unchanged.
 - c. Glide angle and range are both increasing.
 - d. Glide angle and range are both decreasing.
55. What is the weight of 165 liters of Av Gas at a specific gravity of 0.715?
- a. 118 kg.
 - b. 118 lb.
 - c. 155 lb.
 - d. 179 kg.
56. What is the weight of 49 US Gallons of Av Gas at a specific gravity of 0.715?
- a. 292 lb.
 - b. 292 kg.
 - c. 179 lb.
 - d. 179 kg.
57. With weight increase a helicopter range is:
- a. Decreased.
 - b. Unchanged.
 - c. Increased.
 - d. Decreasing, if RRPM is decreased.

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58. Helicopter covered with small amount of ice will result in:
- Increase of drag and weight.
 - Increase of weight and lift.
 - Increase of lift and drag.
 - Increase of weight and decrease of drag.
59. What is the weight of 185 liters of Av Gas at a specific gravity of 0.715?
- 132 kg.
 - 132 lb.
 - 179 lb.
 - 179 kg.
60. An aerodrome which is 1800 feet above mean sea level has an observed QNH of 998 mb. What is the approximate pressure altitude?
- 2250 feet.
 - 2107 feet.
 - 1580 feet.
 - 1956 feet.
61. What would be the effect of an increase in temperature upon the air density and aircraft performance?
- Reduced density and reduced aircraft performance.
 - Increased density and reduced aircraft performance.
 - Increased density and increased aircraft performance.
 - Reduced density and increased in aircraft performance.
62. An aerodrome which is 1000 feet above mean sea level has an observed QNH of 1000 mb. What is the approximate pressure altitude?
- 1390 feet.
 - 610 feet.
 - 1580 feet.
 - 1956 feet.
63. An aerodrome which is 1000 feet above mean sea level has an observed QNH of 1026 mb. What is the approximate pressure altitude?
- 610 feet.
 - 1390 feet.
 - 2107 feet.
 - 1580 feet.
64. An aerodrome which is 1800 feet above mean sea level, has an observed QNH of 1028 mb. What is the approximate pressure altitude?
- 1350 feet.
 - 2250 feet.
 - 1580 feet.
 - 1956 feet.

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65. What is the effect of an increase in mass on the hover in ground effect (HIGE) and landing distance required?
- Decreased HIGE Ceiling and increased landing distance.
 - Increased HIGE Ceiling and decreased landing distance.
 - Decreased HIGE Ceiling and decreased landing distance.
 - Increased HIGE Ceiling and increased landing distance.
66. Refer to the helicopter power graph fig. PPL (H) FPP-5) and answer the question:
To fly for maximum range, the best speed would be:
- D
 - B
 - C
 - A
67. Refer to the helicopter power graph fig. PPL(H) FPP-5) and answer the question:
To fly for maximum rate of climb, the best speed would be:
- C
 - B
 - D
 - A
68. The V_{NE} of a helicopter is determined by:
- Retreating blade stall.
 - Compressibility effects at the rotor tips.
 - The power of the engine.
 - The tail rotor limitation to control the effects of main rotor torque at high speed.
69. If a helicopter is hovering over a fixed position, and there is a wind blowing, which is the most critical position of the Centre of Gravity?
- Close to the aft limit.
 - Close to the forward limit.
 - Is of no consequence when hovering in ground effect.
 - Aft limit in a headwind, forward limit in a tailwind.
70. A helicopter is loaded longitudinally and laterally as below:

ITEM	Mass(lb)	Long. Arm	Long. Moment	Lat. Arm	Lat. Moment
Basic mass	1200	+91.4		+0.28	
Pilot	150	+70.0		+11.8	
Passenger	150	+70.0		-11.8	
Freight	100	+82.0		-8.1	
Fuel	180	+92.6		-9.8	
TOTAL's					

Calculate the C of G's and answer the following question:
The Longitudinal C of G is:

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- a. 86.88 inches Aft of datum.
- b. 79.12 inches Aft of datum.
- c. 87.38 inches Aft of datum.
- d. 89.35 inches Aft of datum.

71. A helicopter is loaded longitudinally and laterally as below:

ITEM	Mass(lb)	Long. Arm	Long. Moment	Lat. Arm	Lat. Moment
Basic mass	1200	+91.4		+0.28	
Pilot	150	+70.0		+11.8	
Passenger	150	+70.0		-11.8	
Freight	100	+82.0		-8.1	
Fuel	180	+92.6		-9.8	
TOTAL's					

Calculate the C of G's and answer the following question:

The Lateral C of G is:

- a. 0.812 inches Right of datum.
- b. 1.257 inches Left of datum.
- c. 0.964 inches Left of datum.
- d. 1.655 inches Right of datum.

72. A helicopter is loaded longitudinally and laterally as below:

ITEM	Mass(lb)	Long. Arm	Long. Moment	Lat. Arm	Lat. Moment
Basic mass	1200	+91.4		+0.28	
Pilot	150	+70.0		+11.8	
Passenger	150	+70.0		-11.8	
Freight	100	+82.0		-8.1	
Fuel	180	+92.6		-9.8	
TOTAL's					

Assume that the maximum Aft C of G is 86.5 inches, how far would the freight have to be moved in order to bring the Longitudinal C of G within limits:

- a. 14.98 inches rearward.
- b. 16.71 inches rearward.
- c. 14.68 inches forward.
- d. 15.78 inches forward.

73. Given the following tabulation of Helicopter masses and arms, what is the position of the C of G?

ITEM	Mass(lb)	Arm (in)	Moment
Basic mass	1196	80	
Pilot	160	63	
Freight	50	72	
Fuel	185	84	
TOTAL's			

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- a. 78.50 inches aft of datum.
- b. 80.42 inches aft of datum.
- c. 83.97 inches aft of datum.
- d. 79.28 inches aft of datum.

74. Determine if the aircraft mass is inside the limits (normal category) (See fig. PPL FPP-17e)

item	Mass (lb)	Moment/1000 (lb in)
Empty mass	1,350 lb	5 1.5 lb in
Pilot and front passenger	360 lb	
Rear passengers	280 lb	
Fuel	30 US gal	
Oil	8 qt	-0.2

- a. Inside limits.
- b. Forward of the forward limit.
- c. Inside limits, close to the forward limit.
- d. Aft of the aft limit.

75. What is the maximum amount of fuel that may be aboard the airplane on takeoff if loaded as follows? (See fig. PPL FPP-17e)

item	Mass (lb)	Moment/1000 (lb in)
Empty mass	1,350 lb	5 1.5 lb in
Pilot and front passenger	340 lb	
Rear passengers	310 lb	
Baggage	45 lb	
Oil	8 qt	-0.2

- a. 40 USA gal.
- b. 24 USA gal.
- c. 34 USA gal.
- d. 46 USA gal.

76. Given:

	Mass (lb)	Arm (in)	moment(lb in)
Empty mass	1,495lb	101.4	151,593.0
Pilot and passenger	380 lb	64.0	
Fuel	30 US gal	96.0	

The CG is located how far aft of datum?

- a. 94.01 in.
- b. 92.44 in.
- c. 119.80 in.

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d. 135.00 in.

77. Determine the moment with the following data: (See fig. PPL FPP-17e)

item	Mass (lb)	Moment/1000 (lb in)
Empty mass	1,350 lb	5 1.5 lb in
Pilot and front passenger	340 lb	
Rear passengers	280lb	
Fuel	(full std. tanks)	
Oil	8 qt	-0.2

- a. 74.9 lbxin.
- b. 38.7 lbxin.
- c. 69.9 lbxin.
- d. 77.0 lbxin.

78. What is the maximum amount of baggage that may be loaded aboard the normal category airplane for CG to remain inside proper limits? (See fig. PPL FPP-17e)

item	Mass (lb)	Moment/1000 (lb in)
Empty mass	1,350 lb	5 1.5 lb in
Pilot and front passenger	250 lb	
Rear passengers	400 lb	
Fuel	30 US gal	
Oil	8 qt	-0.2
Baggage		

- a. 105 lbs.
- b. 120 lbs.
- c. 90 lbs.
- d. 75 lbs.

79. The easiest way to determine the pressure altitude is setting an altimeter to:

- a. 1013.2 hPa and reading the altitude.
- b. The airport elevation and reading the altitude.
- c. The airport elevation and reading the value in the barometric window.
- d. Zero and reading the value in the barometric window.

80. The basic reason for calculating the density altitude is determining by:

- a. The aircraft performance.
- b. The pressure altitude.
- c. The flight levels above the transition altitude.
- d. The safe altitude over mountainous terrain.

81. What is pressure altitude?

- a. The altitude indicated when the barometric pressure scale is set to 1013.2 hPa.

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- b. The indicated altitude corrected for position and installation error.
 - c. The indicated altitude corrected for nonstandard temperature and pressure.
82. Under which condition will pressure altitude be equal to true altitude?
- a. When standard atmospheric conditions exist.
 - b. When the atmospheric pressure is 1013.2 hPa.
 - c. When indicated altitude is equal to the pressure altitude.
83. Which of the factors below increases the density altitude of an airport?
- a. Increase of temperature.
 - b. Increase of atmospheric pressure.
 - c. Decrease of relative humidity of the air.
 - d. Decrease of temperature.
84. Under what condition is indicated altitude the same as true altitude?
- a. When at sea level under standard conditions.
 - b. If the altimeter has no mechanical error.
 - c. With the altimeter set at 1013.2 hPa.
85. If the outside air temperature (OAT) at a given altitude is lower than standard, the density altitude is:
- a. Higher than pressure altitude.
 - b. Lower than pressure altitude and approximately equal to true altitude.
 - c. Higher than true altitude and lower than pressure altitude.
 - d. Lower than true altitude.
86. What is density altitude?
- a. The pressure altitude corrected for nonstandard temperature.
 - b. The height above the standard datum plane.
 - c. The altitude read directly from the altimeter.
87. Determine approximately density altitude of an airport, where the temperature is standard and an altimeter set to 1011hPa, reads 1,300 ft.
- a. 1,360 ft.
 - b. 1,240 ft.
 - c. 1,300 ft.
 - d. 1,400 ft.
88. What is increase in density altitude if a temperature increases from 0 to 10°C and if the pressure altitude of an airport remains 3,000 ft?
- a. 1,200 ft.
 - b. 3,000 ft.
 - c. 2,200 ft.
 - d. 2,000 ft.
89. Determine the pressure altitude with an indicated altitude 1,380 ft with an altimeter setting of 1013.2 hPa at standard temperature.
- a. 1,380 ft.

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- b. 1,280 ft.
 - c. 1,480 ft.
 - d. 1,580 ft.
90. What is the effect of a temperature increase of 12°C on the density altitude?
- a. 1,440-foot increase.
 - b. 1,650-foot decrease.
 - c. 1,340-foot decrease.
 - d. 1,650-foot increase.
91. Determine the density altitude of an airport for these conditions:
QNH = 1025 hPa
Temperature = -4°C
Elevation = 3,850 ft
- a. 2,050 ft.
 - b. 2,900 ft.
 - c. 3,500 ft.
 - d. 3,800 ft.
92. What is the approximate pressure altitude if an altimeter is set to 1010 hPa and indicates 1,380 ft?
- a. 1,470 ft.
 - b. 1,200 ft.
 - c. 1,300 ft.
 - d. 1,400 ft.
93. Determine the density altitude of an airport for these conditions:
QNH = 1010 hPa
temperature = 27°C
elevation = 5,250 ft
- a. 7,890 ft.
 - b. 4,600 ft.
 - c. 5,875 ft.
 - d. 8,800 ft.
94. The density altitude could be approximately calculated from the pressure altitude without using a navigation calculator by:
- a. Increasing/decreasing the pressure altitude by 120 ft for each °C deviation above/below the standard temperature.
 - b. Increasing/decreasing the altitude above the sea level for the difference between the standard and actual atmospheric pressure, converted into an altitude.
 - c. Increasing the pressure altitude by 4% for each 10°C deviation from the standard temperature.
95. Air density is reduced by:
- a. Increase in temperature, increased humidity and decrease in pressure.
 - b. Decrease in temperature, decrease in humidity and decrease in pressure.

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- c. Increase in temperature, decrease in humidity and increase in pressure.
- d. Increase in altitude, decrease in humidity and decrease in temperature.

96. How does higher air humidity affect aircraft take-off performance?

Take-off distances are:

- a. Longer due to thinner air.
- b. Longer due to denser air.
- c. Shorter due to denser air.

97. Which combination of atmospheric conditions will reduce aircraft takeoff and climb performance?

- a. High temperature, high relative humidity and high density altitude.
- b. Low temperature, low relative humidity and low density altitude.
- c. High temperature, low relative humidity and low density altitude.
- d. Low temperature, high relative humidity and high density altitude.

98. Given the following tabulation of Helicopter masses and arms, if the Aft C of G limit was 79.10 inches Aft of the datum, how far should the freight be moved in order to bring the Longitudinal C of G within limits:

ITEM	Mass(lb)	Arm (in)	Moment
Basic mass	1196	80	
Pilot	160	63	
Freight	50	72	
Fuel	185	84	
TOTAL's			

- a. 6.83 inches forwards.
- b. 17.96 inches aft.
- c. 3.14 inches aft.
- d. 15.78 inches forwards.

99. What effect does an uphill runway slope have on takeoff performance?

- a. Increases takeoff distance.
- b. Increases takeoff speed.
- c. Decreases takeoff distance.

100. What effect does high density altitude have on aircraft performance?

- a. It reduces climb performance.
- b. It increases engine performance.
- c. It increases takeoff performance.

101. Refer to Longitudinal and Lateral C of G envelopes for a typical light helicopter (fig. PPL (H) FPP-7). If the helicopter had a take-off mass of 1430lb and the Longitudinal C of G is 87 inches Aft of the datum, and the Lateral C of G is 1.4 inches right of the datum, which of the following statements is correct?

- a. Longitudinal and lateral limits are safe for take-off.
- b. Longitudinal limits are unsafe, but the lateral limits are safe.

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- c. Longitudinal limits are safe, but the lateral limits are not.
 - d. Longitudinal and lateral limits are unsafe for take-off.
102. Which speed would provide the greatest gain in altitude in the shortest distance during climb after takeoff?
- a. Best angle-of-climb speed (V_x).
 - b. Best climb speed (V_Y).
 - c. Maneuvering speed (V_A).
103. The aircraft's rate-of-climb during a steady climb depends on
- a. Excess of power.
 - b. Power available .
 - c. Power required.
104. After takeoff, which airspeed would the pilot use to gain the most altitude in a given period of time?
- a. Best climb speed (V_Y).
 - b. Best angle-of-climb speed (V_x).
 - c. Maneuvering speed (V_A).
105. What is the proper use for the best-rate-of-climb speed (V_y)?
- a. When trying to get cruising altitude quickly.
 - b. When clearing an obstacle.
 - c. When approaching high mountains.
 - d. When trying to avoid an excessive pitch attitude during a climb.
106. What is the influence of the wind on an airplane's rate of climb?
- a. No effect.
 - b. A headwind will increase the rate of climb.
 - c. A tailwind will decrease the rate of climb.
 - d. A tailwind will increase the rate of climb.
107. What influence does the wind have on an airplane's angle-of-climb?
- a. A headwind will steepen the angle-of-climb.
 - b. No effect.
 - c. A headwind will lessen the angle-of-climb.
 - d. A tailwind will steepen the angle-of-climb.
108. A helicopter is flying at a constant speed and altitude and in a correctly balanced turn. Which of the following is correct?
- a. The total rotor thrust is greater than the mass of the helicopter.
 - b. The horizontal thrust component is greater than the total drag.
 - c. The total rotor thrust is equal to the mass of the helicopter.
 - d. In a 30° banked turn, the apparent increase in all up mass is 25%.
109. The service ceiling of a helicopter is defined as:
- a. The altitude where the rate of climb can no longer be maintained at a minimum of 100 feet per minute.

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- b. The highest altitude where the engine operating at maximum continuous power maintains a constant altitude.
 - c. The altitude where at climbing power the rate of climb is zero.
 - d. The altitude where a set engine boost is maintained at a given engine speed.
110. During landing on an airport with high elevation the true air speed (TAS) of an aircraft is higher than normal. What indicated speed (IAS) should be kept in such cases?
- a. Normal speed.
 - b. Lower than normal.
 - c. Higher than normal.
 - d. Increased for 5kts for each 1,000 ft of airport elevation.
111. Helicopter climb performance is most adversely affected by:
- a. Higher than standard temperature and high relative humidity.
 - b. Higher than standard temperature and low relative humidity.
 - c. Lower than standard temperature and high relative humidity.
 - d. Lower than standard temperature and low relative humidity.
112. If the QFE at the departure point is 1000 mb and at the destination is 1013 mb, and assuming the temperature at both points is the same, which of the following is correct?
- a. The helicopter performance at the destination point would be worse than at the departure point.
 - b. The helicopter performance at the destination point would be better than at the departure point.
 - c. The helicopter performance at the destination point would be the same as the departure. Point, because the temperatures are the same.
 - d. The helicopter performance at the destination point is the same as at the departure point.
113. Why should speeds in flight above VNE be avoided?
- a. The design limit factor may be exceeded, if gusts are encountered.
 - b. Excessive induced drag will result in a structural failure.
 - c. Control effectiveness is so impaired that the aircraft becomes uncontrollable.
114. A helicopter moves forward from a hover condition to forward flight. Which of the following is correct?
- a. The power required decreases, and the total rotor thrust remains constant.
 - b. The total rotor thrust decreases initially, but the power required remains constant.
 - c. Both the power required and the total rotor thrust will effectively increase.
 - d. Both the power required and the total rotor thrust will effectively decrease.
115. Detailed performance information of a specific helicopter variant is listed in which of the following documents?
- a. The Helicopter Flight Manual.
 - b. Certificate of Maintenance Release.
 - c. The Certificate of Airworthiness.
 - d. Manufacturers engineering and performance manual.

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116. A helicopter is operating off cross-sloping ground. As the pilot raises the collective, the helicopter rotates about the higher skid, and the cyclic does not arrest the rolling. The pilot should:
- Lower the collective swiftly.
 - Lift off as soon as possible.
 - Apply yaw pedal towards the slope, then raising the collective, take off *i* as soon as possible.
 - Apply yaw pedals away from the slope, reduce power immediately.
117. How will higher altitude affect the cruising indicated airspeed of an aircraft if a throttle remains unchanged?
- It will be lower.
 - It will be higher.
 - It will stay unchanged.
118. The best rate of climb speed results (V_{broc}) with:
- The greatest increase in height in a given time period.
 - The greatest increase in height with the shortest distance from take-off.
 - The best obstacle clearance flight path.
 - The steepest climbing angle possible under given conditions.
119. A helipad is 850 feet AMSL, the QFE is 976 mb, what is the approximate pressure altitude:
- 1110 feet.
 - 765 feet.
 - 860 feet.
 - 920 feet.
120. The absolute ceiling of a helicopter as specified in its performance data, is the altitude at which the helicopter is:
- No longer able to climb at all.
 - Still able to climb at a rate of 0,5 m/s.
 - Still able to climb at a rate of 500 ft/min.
 - Hardly able to climb.
121. The abbreviation V_y means:
- Speed for best rate of climb.
 - Vertical speed.
 - Speed for best angle of climb.
 - Takeoff safety speed.
122. How do you define V_{NE} ?
- Velocity never exceeded.
 - Velocity not expired.
 - Velocity never expected.
 - Max structural speed.

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123. Maximum endurance:
- Will be achieved by flying with minimum fuel flow (kg/hrs).
 - Will be achieved flying with minimum fuel consumption (kg/NM).
 - Is the same as maximum specific range with wind correction.
 - Is the same as maximum specific range.
124. According to the flight manual diagram (fig. PPL(H) FPP-6), the never-exceed speed V_{NE} at pressure altitude 10.000 ft with an outside air temperature (OAT) of +10 °C and an in-flight mass of 2.050 kg is:
- 115kts.
 - 125kts.
 - 110kts.
 - 105kts.
125. According to the flight manual diagram (fig. PPL(H) FPP-6), the never-exceed speed V_{NE} at pressure altitude 2.000 ft with an outside air temperature (OAT) of +30 °C and an in-flight mass of 2.300 kg is:
- 135kts.
 - 145kts.
 - 125kts.
 - 115kts.
126. According to the flight manual diagram (fig. PPL(H) FPP-6), the never-exceed speed V_{NE} at pressure altitude 10.000 ft with an outside air temperature (OAT) of +10 °C and an in-flight mass of 2.350 kg is:
- 105kts.
 - 115kts.
 - 125kts.
 - 110kts.
127. According to the flight manual diagram (fig. PPL(H) FPP-6) , the never-exceed speed V_{NE} at pressure altitude 2.000 ft with an outside air temperature (OAT) of +30 °C and an in-flight mass of 2.350 kg is:
- 125kts.
 - 135kts.
 - 145kts.
 - 115kts.
128. In cruise, an extreme aft longitudinal centre of gravity:
- Brings the cyclic stick closer to its forward stop and increases the stress in the rotor head.
 - Moves away the cyclic stick from its forward stop and increases the stress in the rotor head.
 - Brings the cyclic stick closer to its forward stop and decreases the stress in the rotor head.
 - Moves away the cyclic stick from its forward stop and decreases the stresses in the head rotors.

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129. A helicopter in the hover that requires an excessive amount of aft and right cyclic may indicate the centre of gravity is too far:
- Forward and laterally too far to the left.
 - Aft and laterally too far to the left.
 - Aft and laterally too far to the right.
 - Forward and laterally too far to the right.
130. A helicopter in the hover that requires an excessive amount of forward and right cyclic may indicate the centre of gravity is too far:
- Aft and laterally too far to the left.
 - Forward and laterally too far to the left.
 - Forward and laterally too far to the right.
 - Aft and laterally too far to the right.
131. A helicopter with its fuel tanks located aft of the centre of gravity is more prone to:
- Exceed its forward centre of gravity limits when landing with little fuel.
 - Exceed its aft centre of gravity limits when landing with little fuel.
 - Exceed its forward centre of gravity limits when taking off with full fuel.
 - Exceed its aft centre of gravity limits when taking off with its fuel tanks less than half full.
132. Exceeding the forward CG limit will result in:
- The helicopter being nose-heavy and the pilot may run out of aft cyclic.
 - The helicopter being nose-heavy and the pilot may run out of forward cyclic.
 - The helicopter being tail-heavy and the pilot may run out of forward cyclic.
 - The helicopter being tail-heavy and the pilot may run out of aft cyclic.
133. Who determines the CG limits for a helicopter?
- The pilot in command.
 - The manufacturer of the helicopter.
 - The licensed engineer carrying out weighing.
 - The national aviation authority.
134. Who is responsible for calculation of CG for a specific flight?
- The pilot in command.
 - The manufacturer of the helicopter.
 - The licensed engineer carrying out weighing.
 - The national aviation authority.
135. Which of the following factors has greatest effect on take-off power?
- Density altitude.
 - Airfield elevation.
 - Humidity.
 - Light precipitation.
136. A headwind will:

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- a. Increase the climb flight-path angle.
 - b. Increase the rate of climb.
 - c. Shorten the time to a given altitude.
 - d. Decrease the rate of climb.
137. What should be done first, following a single engine helicopter's engine failure in flight?
- a. Enter autorotation.
 - b. If have enough height attempt start procedure.
 - c. Move the mixture lever to position FULL RICH.
 - d. Select a suitable field for forced landing.
138. A helicopter will obtain a maximum flight distance at the speed:
- a. For maximum range.
 - b. For minimum hourly fuel flow.
 - c. For maximum endurance.
 - d. The speed for minimum power required.
139. Assume a helicopter is autorotating following an engine failure. The pilot may decide to operate at the shallowest angle of descent (range speed), or the maximum time in the air (endurance speed). Which of the following is correct?
- a. The best still air range speed is slightly higher than the best endurance Speed.
 - b. The best still air range speed and best endurance speed under autorotation is the same as the lowest rate of descent speed.
 - c. The best still air range speed and best endurance speed are virtually the same but a little lower than the lowest rate of descent speed.
 - d. The best endurance is achieved at the tangential point on the 'rate of descent graph'.
140. Who establishes the limits of CG?
- a. The manufacturer.
 - b. The CAD.
 - c. The JAA.
 - d. The insurers.
141. What is the headwind component for a landing on Runway 18 if the tower reports the wind as 220°/30kts? (See fig. PPL FPP-13e)
- a. 23kts.
 - b. 19kts.
 - c. 30kts.
 - d. 34kts.
142. What is the crosswind component for a landing on Runway 18 if the tower reports the wind as 220°/30kts? (See fig. PPL FPP-13e)
- a. 19kts.
 - b. 23kts.
 - c. 30kts.
 - d. 34kts.

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143. Which runway (06, 14, 24, 32) will you choose for landing, if tower reports south wind 20kts and if maximum allowed crosswind component for your aircraft is 13kts? (See fig. PPL FPP-13e)
- RWY 14.
 - RWY 06.
 - RWY 24.
 - RWY 32.
144. With the reported wind of 360°/20kts you are approaching an airport. Which runway (06,14, 24 or 32) would you choose for landing, if your airplane had a 13-knots maximum allowed crosswind component on landing? (See fig. PPL FPP-13e)
- RWY 32.
 - RWY 06.
 - RWY 14.
 - RWY 24.
145. What are the headwind and crosswind components with the reported wind of 280°/15kts for a runway with the magnetic direction 220°? (See fig. PPL FPP-13e)
- 7.5kts headwind and 13kts crosswind.
 - 15.5kts headwind and 8kts crosswind.
 - 15.5kts headwind and 15kts crosswind.
 - 13.5kts headwind and 24kts crosswind.
146. Refer to Longitudinal and Lateral C of G envelopes for a typical light helicopter (fig. PPL (H) FPP-7). If the helicopter had a take-off mass of 1460lb and the Longitudinal C of G is 86 inches Aft of the datum, and the Lateral C of G is 1.5 inches left of the datum, which of the following statements is correct?
- Longitudinal limits are unsafe, but the lateral limits are safe.
 - Longitudinal and lateral limits are safe for take-off.
 - Longitudinal limits are safe, but the lateral limits are not.
 - Longitudinal and lateral limits are unsafe for take-off.
147. Refer to Longitudinal and Lateral C of G envelopes for a typical light helicopter (fig. PPL (H) FPP-7). If the helicopter had a take-off mass of 1460 lb, and the Longitudinal C of G is 86 inches Aft of the datum, and the Lateral C of G is 3.2 inches right of the datum, which of the following statements is correct?
- Longitudinal and lateral limits are unsafe for take-off.
 - Longitudinal limits are unsafe, but the lateral limits are safe.
 - Longitudinal and lateral limits are safe for take-off.
 - Longitudinal limits are safe, but the lateral limits are not.
148. Refer to Longitudinal and Lateral C of G envelopes for a typical light helicopter (fig. PPL (H) FPP-7). If the helicopter had a take-off mass of 1400lb, and the Longitudinal C of G is 86 inches Aft of the datum, and the Lateral C of G is 3.2 inches right of the datum, which of the following statements is correct?
- Longitudinal limits are safe, but the lateral limits are not.
 - Longitudinal limits are unsafe, but the lateral limits are safe.

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- c. Longitudinal and lateral limits are safe for take-off.
 - d. Longitudinal and lateral limits are unsafe for take-off.
149. What are the headwind and crosswind components with the reported wind of 030°/10kts for a runway with the magnetic direction 330°? (See fig. PPL FPP-13e)
- a. 5kts headwind and 8kts crosswind.
 - b. 10kts headwind and 8kts crosswind.
 - c. 8kts headwind and 4kts crosswind.
 - d. 8kts headwind and 8kts crosswind.
150. What are the headwind and crosswind components with the reported wind of 130°/20kts for a runway with the magnetic direction 040°? (See fig. PPL FPP-13e)
- a. Zero headwind component; crosswind component 20kts.
 - b. 15kts headwind and 10kts crosswind.
 - c. 10kts headwind and 15kts crosswind.
 - d. 20kts headwind; zero crosswind component.
151. The most unfavorable combination of conditions for helicopter performance is:
- a. High density altitude, high gross weight, and calm wind.
 - b. Low density altitude, low gross weight, and calm wind.
 - c. High density altitude, high gross weight, and strong wind.
 - d. Low density altitude, high gross weight, and strong wind.
152. How does high density altitude affect helicopter performance?
- a. Engine and rotor efficiency is reduced.
 - b. Engine and rotor efficiency is increased.
 - c. Engine efficiency is reduced but rotor efficiency is increased.
 - d. It increases rotor drag, which requires more power for normal flight.
153. As altitude increases, the V_{NE} of a helicopter will:
- a. Decrease.
 - b. Increase.
 - c. Increase up to 6000 ft.
 - d. Remain the same.
154. The most power will be required to hover over which surface?
- a. High grass.
 - b. Concrete.
 - c. Rough/uneven ground.
 - d. Water of lake.
155. The abbreviation V_x means:
- a. Speed for best angle of climb.
 - b. Speed for best rate of climb.
 - c. Takeoff safety speed.
 - d. Vertical speed.

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156. Refer to HELICOPTER WEIGHT AND BALANCE LOADING DATA (fig. PPL (H) FPP-9).

Given:

Weight at take-off = 4,100 lb.

Aft limit is 135.4 in.

Fuel consumption = 225 lb/hr.

After a flight of one hour, the pilot can expect the C of G to:

- Remain the same.
- Move forward to 133.5 in.
- Move aft to 137.5 in.
- Move outside the fore-aft limits.

157. Refer to HELICOPTER WEIGHT AND BALANCE LOADING DATA (Fig. PPL (H) FPP-9).

Maximum Gross T/O Weight - As per Chart

Basic Empty Weight = 2,200 lb.

Pilot = 180 lb.

Front Seat Pac. = 170 lb.

Rear Seat Pac. = 160 lb.

Cabin Freight = 250 lb.

Side Holds = 200 lb.

Rear Hold = 100 lb.

Fuel = 850 lb.

Using the above information the helicopter's C of G is:

- 130.0 in.
- 138.5 in.
- 125.5 in.
- 137.5 in.

158. Refer to HELICOPTER WEIGHT AND BALANCE LOADING DATA (Fig. PPL (H) FPP-9).

Maximum Gross T/O Weight - As per Chart

Basic Empty Weight = 2,200 lb.

Pilot = 200 lb.

Front Seat Pac. = 200 lb.

Rear Seat Pac. = 400 lb.

Cabin Freight = 250 lb.

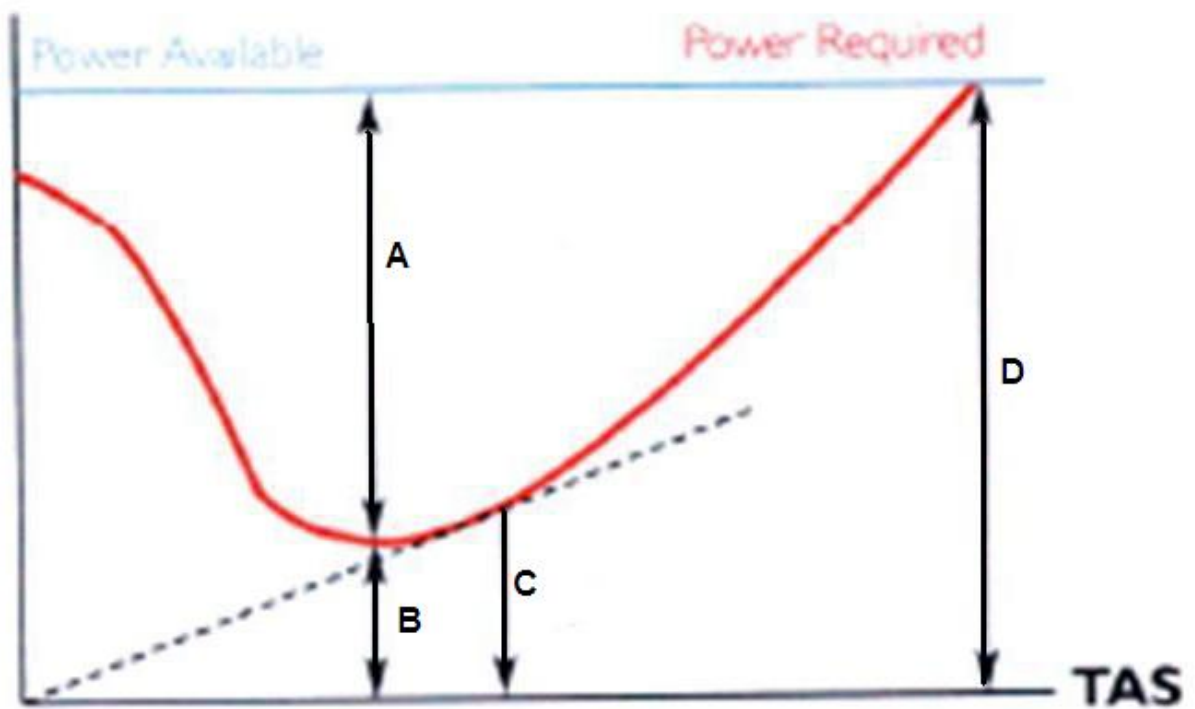
Side Holds = 200 lb.

Fuel = 850 lb.

Using the above information the helicopter's C of G is:

- 126.8in.
- 138.4in.
- 136.8in.
- 137.5in.

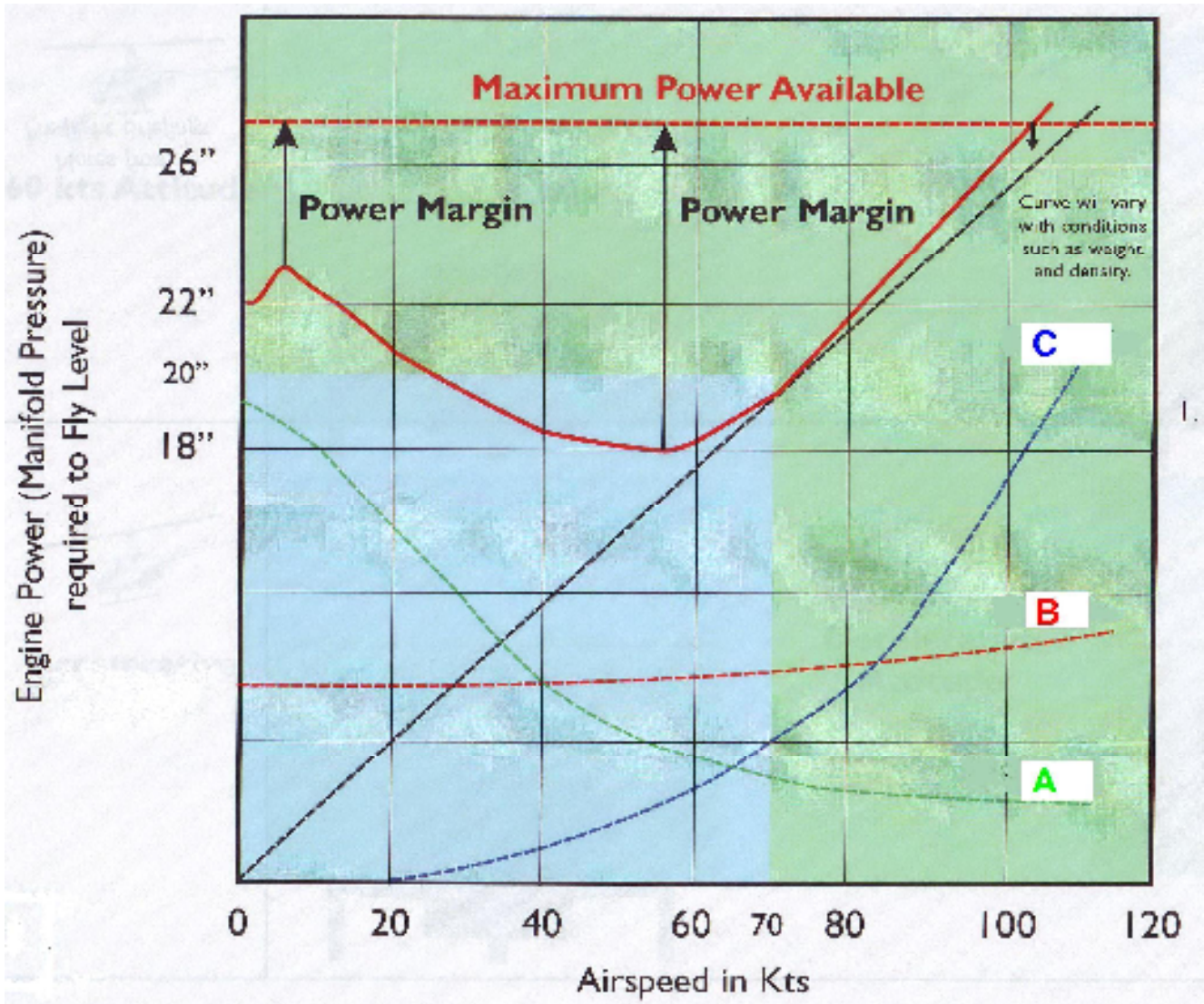
APPENDIXES:



Power Required / Power Available graph

Picture PPL(H) FPP-1

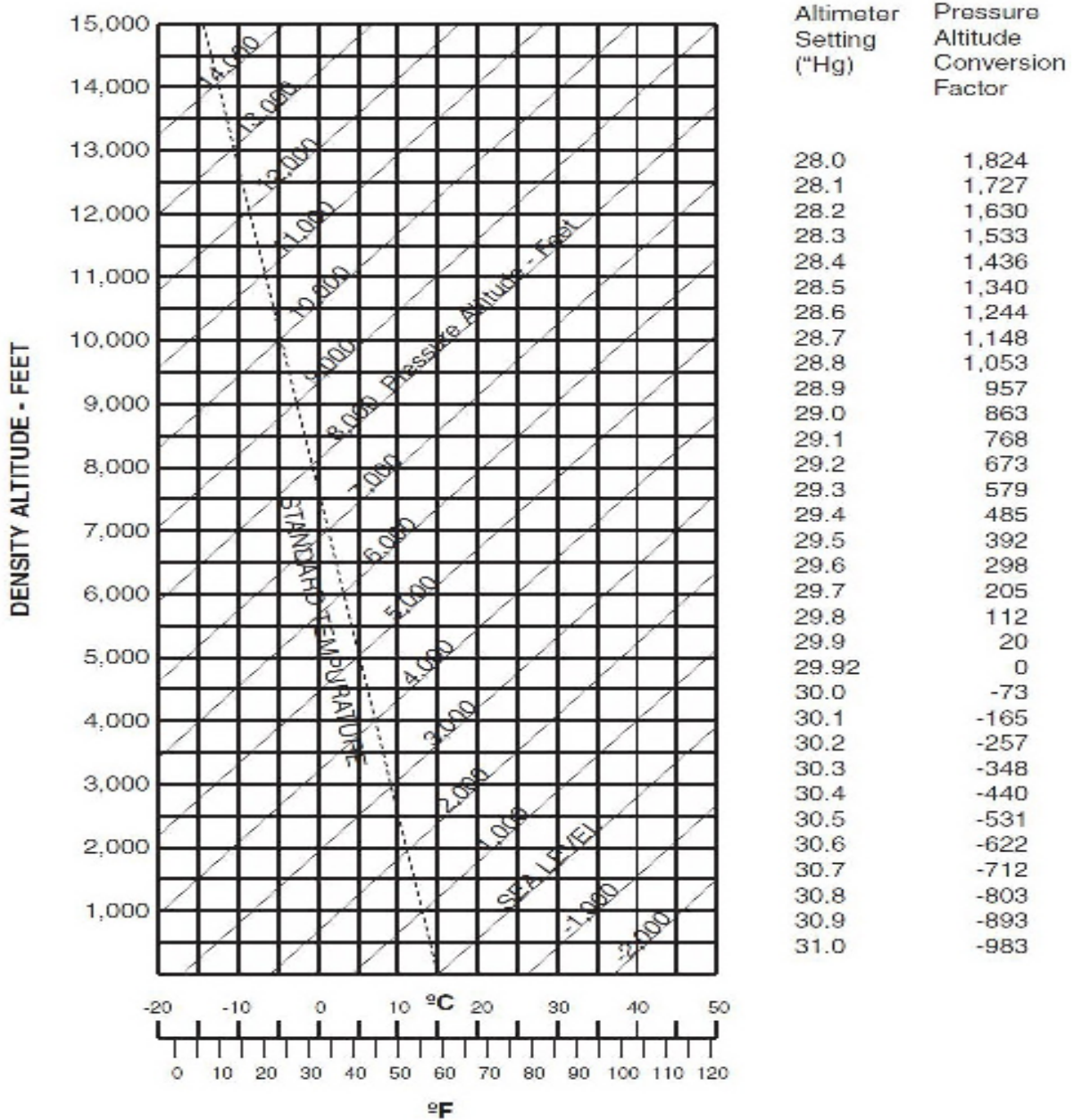
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Picture PPL(H) FPP-2

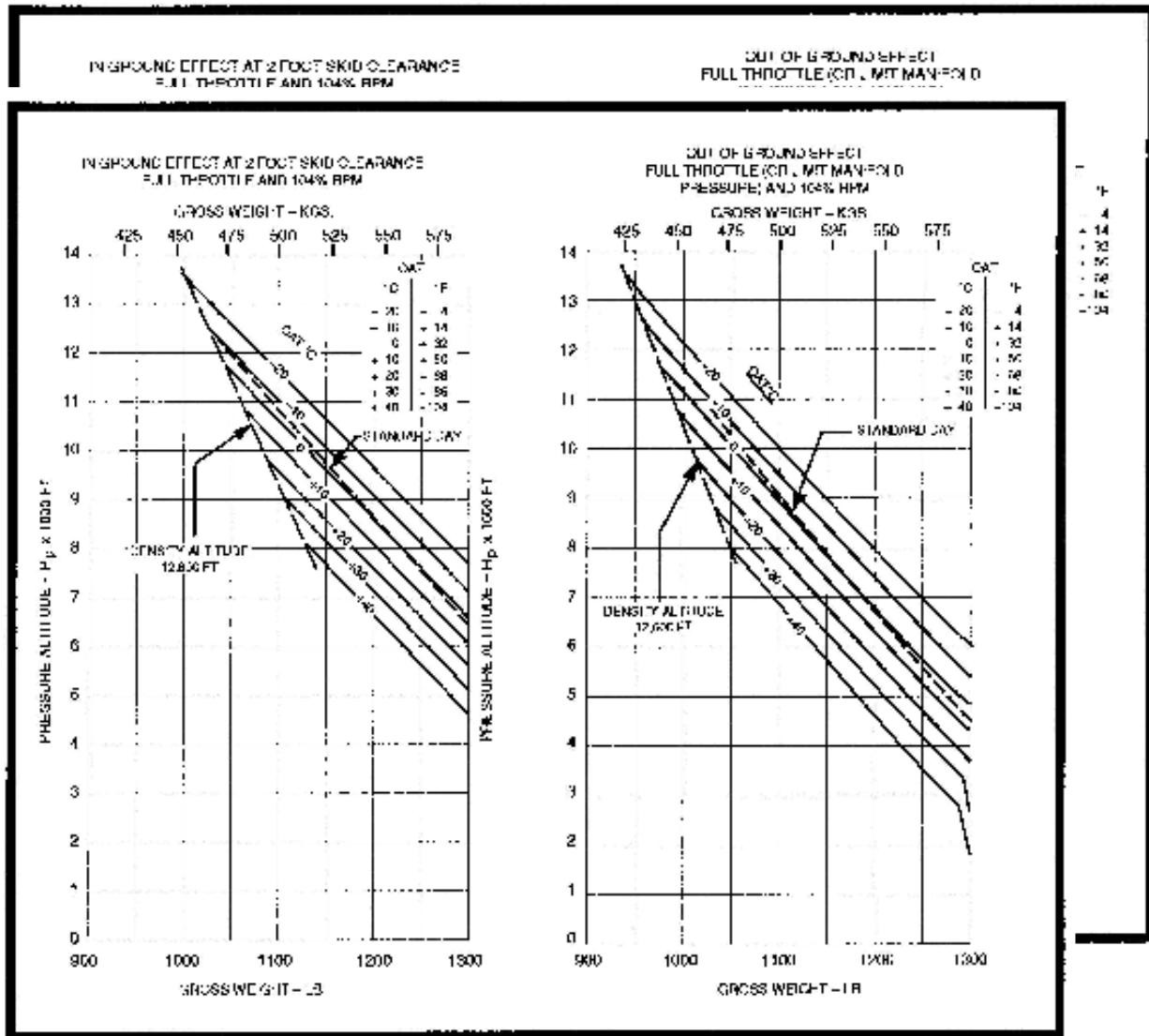
PPL (H) – Flight Performance and Planning

Density Altitude Chart



Picture PPL(H) FPP-3

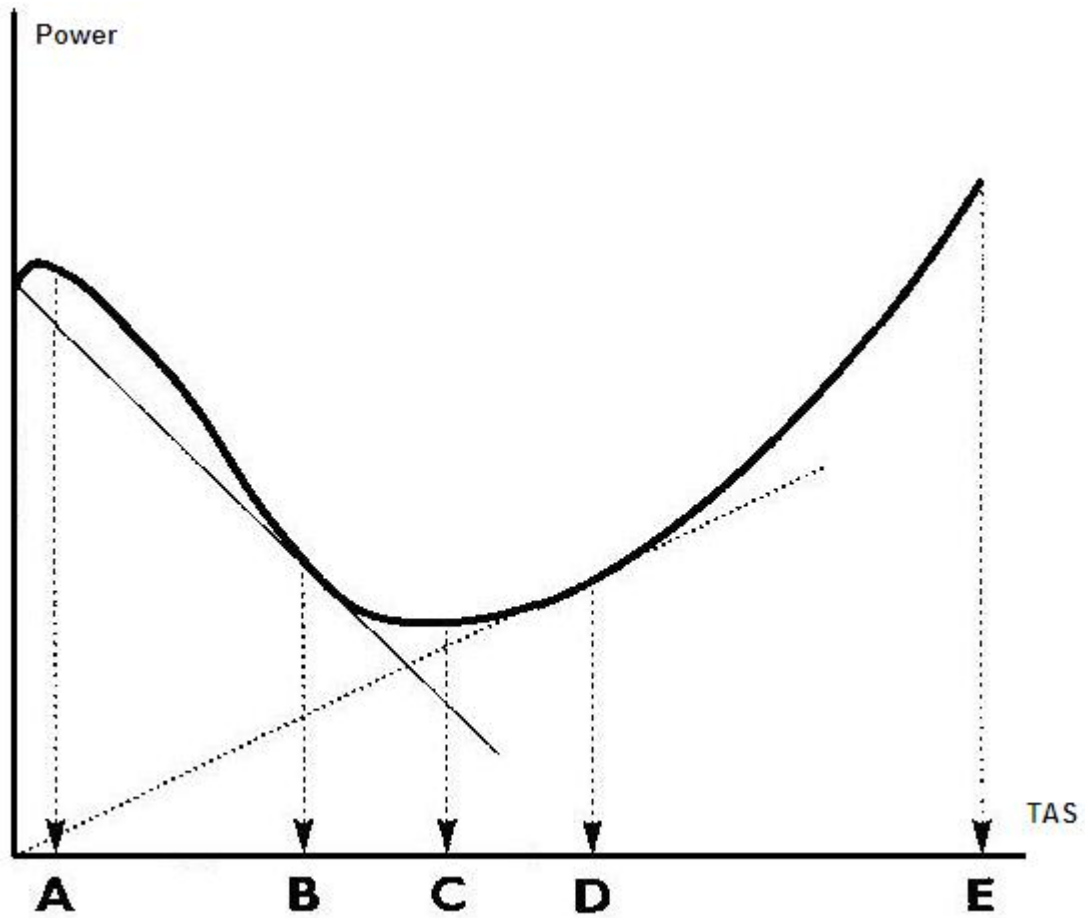
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Hover Ceiling vs. Gross Weight.

Picture PPL(H) FPP-4

PPL (H) – Flight Performance and Planning



Picture PPL(H) FPP-5

PPL (H) – Flight Performance and Planning

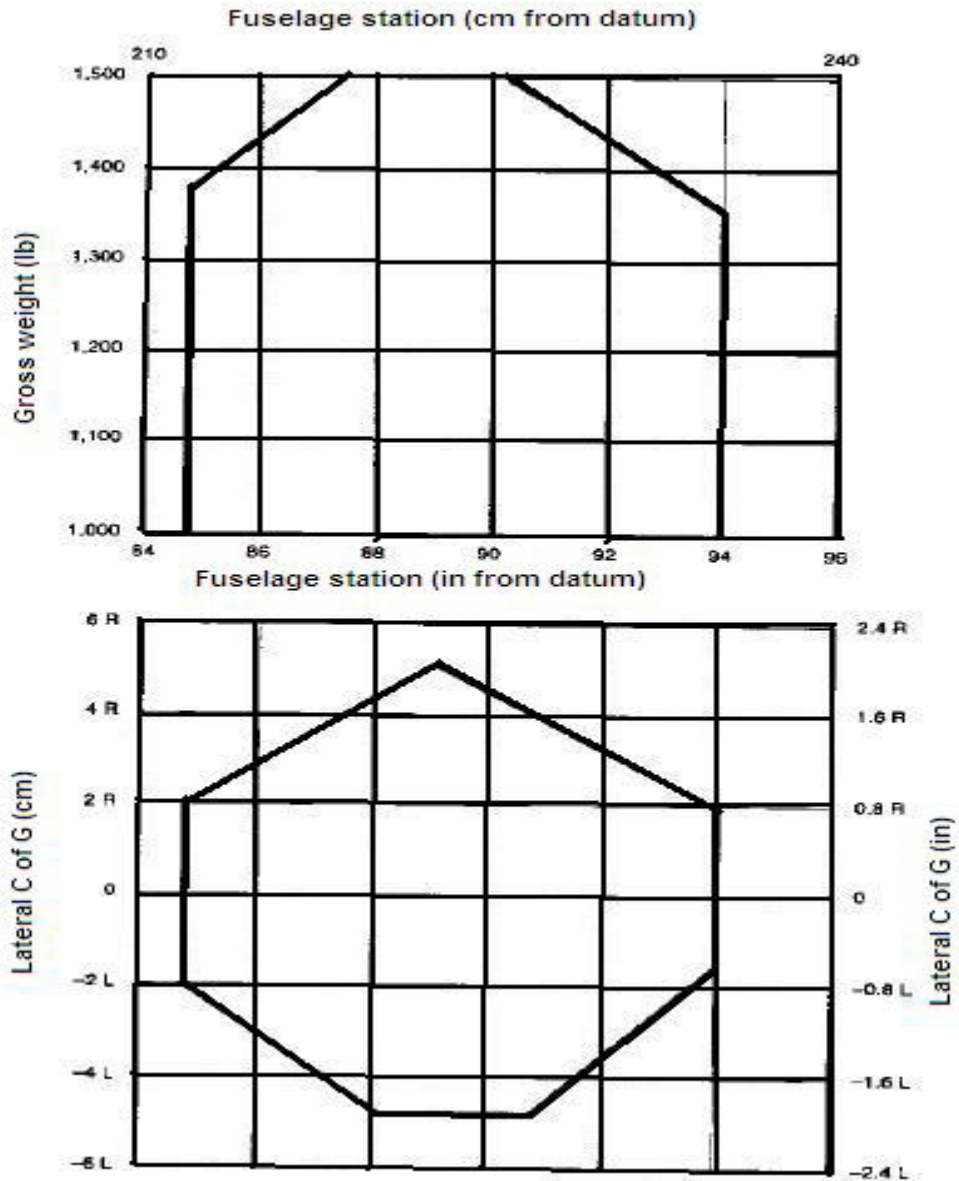
The following table is use in determining the airspeed limits for any gross mass up to 2.500 kg.

AIRSPEED LIMITS (V_{NE}) - KIAS											
GM 2.300 kg											
PA - ft	OAT °C										
	-45	-30	-20	-10	0	+10	+20	+30	+40	+50	+54
SL	145	145	145	145	145	145	145	140	140	135	135
2.000	140	145	145	145	145	140	140	135	135	130	130
4.000	135	145	145	140	140	135	135	130	130	125	-
6.000	130	140	140	135	135	130	130	125	120	115	-
8.000	125	135	135	130	130	125	120	115	110	-	-
10.000	120	130	130	125	120	115	110	105	100	-	-
12.000	115	125	120	115	110	105	100	95	90	-	-
14.000	110	115	110	105	100	95	90	85	-	-	-
16.000	105	105	100	95	90	85	80	-	-	-	-
17.000	100	100	95	90	85	80	80	-	-	-	-

NOTE: At any gross mass above 2.300 kg, decrease V_{NE} by 10 KIAS.

Picture PPL(H) FPP-6

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Picture PPL(H) FPP-7

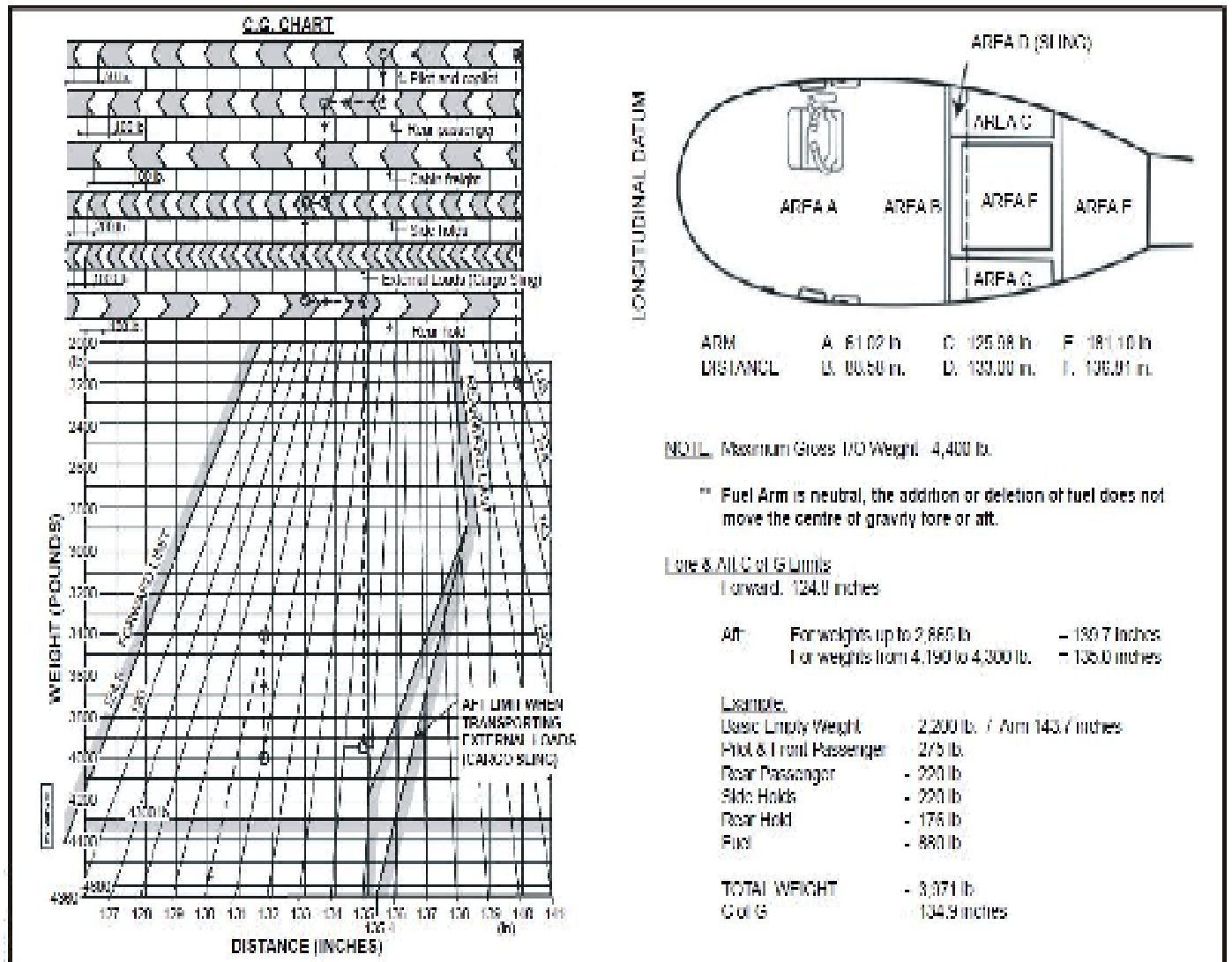
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PRESS ALT FT	CLIMB SPEED KIAS	RATE of CLIMB - FPM			
		-20°C	0°C	20°C	40°C
S.L.	79	830	770	705	640
2000	77	720	655	595	535
4000	76	645	585	525	465
6000	74	530	475	415	360
8000	72	420	365	310	250
10000	71	310	255	200	145
12000	69	200	145

Picture PPL(H) FPP- 8

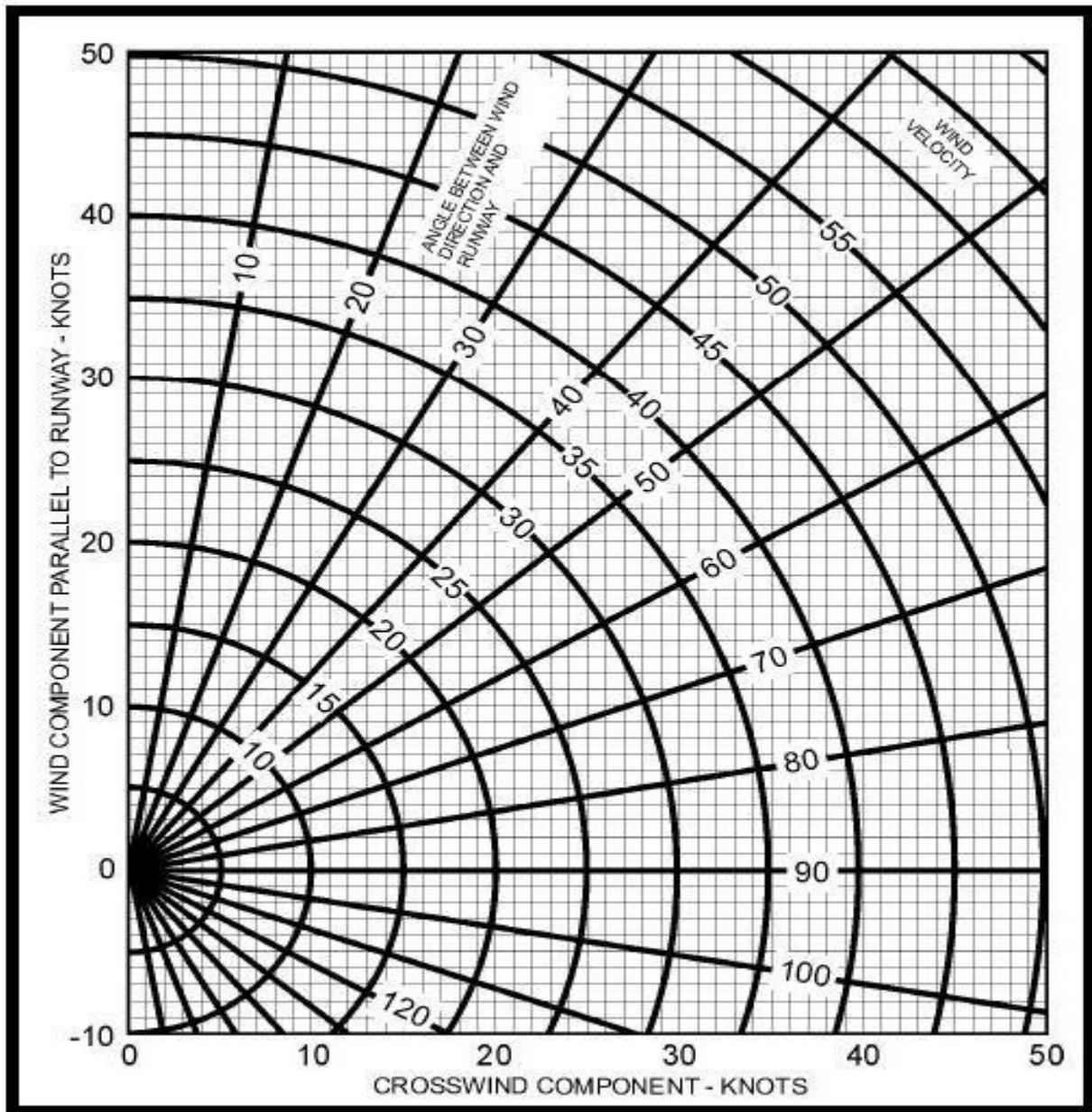
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HELICOPTER WEIGHT & BALANCE LOADING DATA



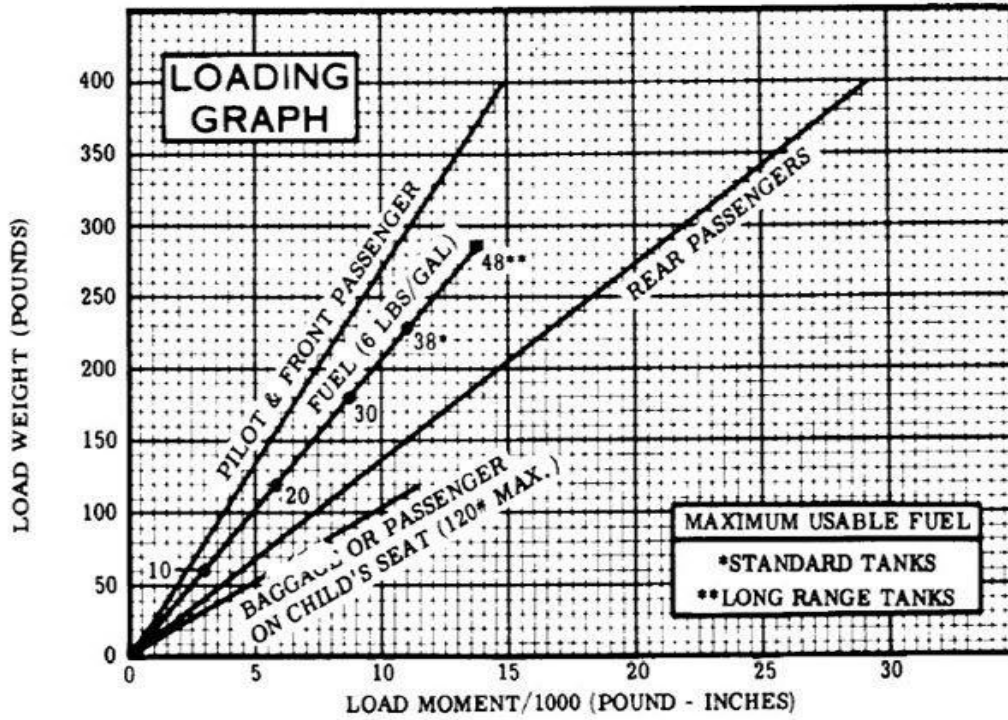
Picture PPL(H) FPP- 9

PPL (H) – Flight Performance and Planning

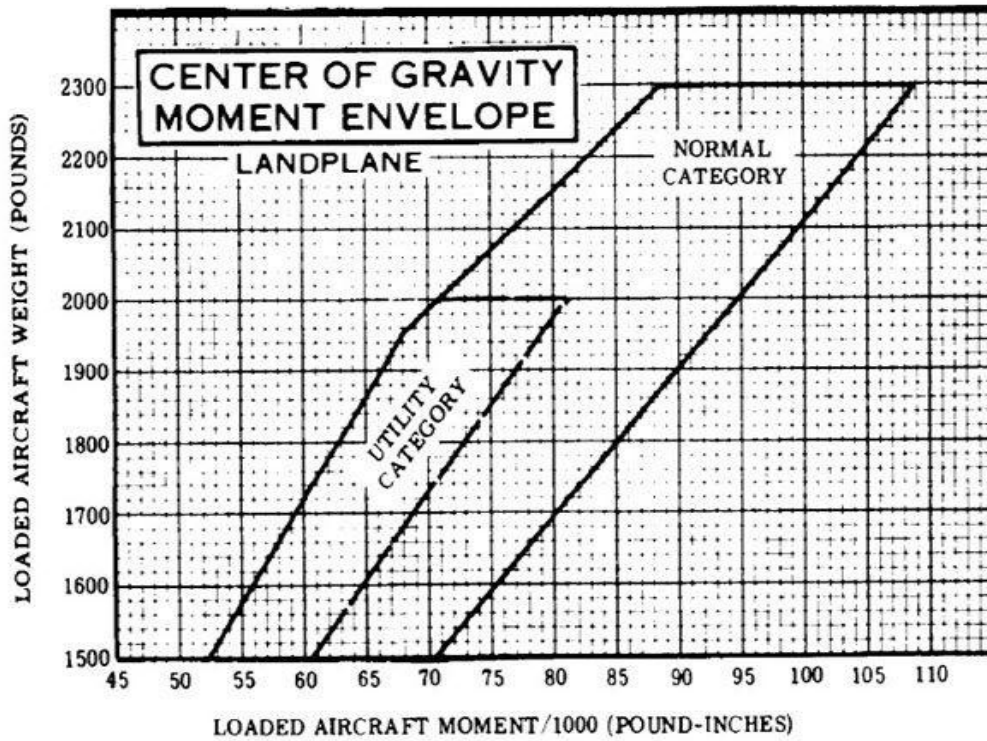


Picture PPL(H) FPP-13

PPL (H) – Flight Performance and Planning



NOTES: (1) Lines representing adjustable seats show the pilot or passenger center of gravity on adjustable seats positioned for an average occupant. Refer to the Loading Arrangements diagram for forward and aft limits of occupant e.g. range. (2) Engine Oil: 8 Qts. = 15 Lbs. at -0.2 Moment/1000.



Picture PPL(H) FPP-17