

**COMMERCIAL PILOT LICENSE HELICOPTER****(030 00 00 00 - FLIGHT PERFORMANCE AND PLANNING)**

<b>JAR-FCL REF NO</b>	<b>LEARNING OBJECTIVES</b>	<b>REMARKS</b>
<b>034 00 00 00</b>	<b><u>PERFORMANCE HELICOPTERS</u></b>	
<b>034 01 00 00</b>	<b><u>AIRWORTHINESS REQUIREMENTS</u></b>	
<b>034 01 01 00</b>	<b><u>Definition of terms and speeds used in:</u></b>	
	<p>JAR FAR 27.1</p> <ul style="list-style-type: none"> <li>- Discuss the applicability to small rotorcraft</li> <li>- State weight limitations</li> <li>- Explain the need to meet Appendix C requirements to operate in Category A</li> </ul> <p>JAR FAR 29.1</p> <ul style="list-style-type: none"> <li>- Discuss the applicability to large rotorcraft with 10 Passengers or more</li> <li>- State weight and passenger numbers limitations</li> <li>- Explain that large rotorcraft may be operated in both Category A and B with different limitations</li> <li>- Discuss the operation of large rotorcraft with 9 Passengers or less</li> <li>- Discuss the operation of large rotorcraft with 10 Passengers or more to operate under Category A</li> </ul>	
<b>034 02 00 00</b>	<b><u>DEFINITIONS OF TERMS</u></b>	
	<p>Define the following terms</p> <ul style="list-style-type: none"> <li>- Masses</li> <li>- Density altitude</li> <li>- Climb gradient</li> <li>- Unaccelerated flight</li> <li>- <math>V_{LE}</math></li> <li>- <math>V_{LO}</math></li> <li>- <math>V_x</math></li> <li>- <math>V_y</math></li> <li>- <math>V_{TOSS}</math></li> <li>- <math>V_{NE}</math></li> </ul>	

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	<ul style="list-style-type: none"> <li>- <math>V_{NO}</math></li> <li>- <math>V_{min}</math></li> </ul> Define $V_{maxRange}$ (speed for maximum range) and $V_{maxEnd}$ (speed for maximum endurance) Discuss where they are to be found on a power required or fuel flow chart Define and understand the following terms: <ul style="list-style-type: none"> <li>- AEO</li> <li>- OEI</li> <li>- Altitude: Discuss that maximum operating altitudes must be defined and shown in the Helicopter Flight Manual</li> <li>- <u>Performance Class 1, 2, and 3 operation:</u> Discuss that these are defined in ICAO Annex 6 Part III and JAR-OPS 3 Subpart F, G, H, &amp; I</li> </ul>	
<b>034 03 00 00</b>	<b><u>TAKE-OFF, CRUISE – LANDING PERFORMANCE</u></b>	
	<ul style="list-style-type: none"> <li>- Use and interpretation of diagrams and tables associated with CAT A, CAT B, procedures in order to select and develop class 1, 2, 3 performance profiles according to available heliport size and location (surface or elevated). See JAR-OPS 3 Subpart F, G, H, I</li> <li>- Interpret charts showing minimum clearances associated with Category A &amp; B procedures as defined in JAR-OPS 3 Subpart F, G, H &amp; I.</li> </ul>	Given relevant charts
<b>034 04 00 00</b>	<b><u>PERFORMANCE OF HELICOPTERS JAR OPS 3. SUBPARTS F:G:H:I</u></b>	
<b>034 04 01 00</b>	<b><u>Applicability Performance class1,2 and 3</u></b>	
	Define in which class helicopters must be operated and understand why	
<b>034 04 02 00</b>	<b><u>General</u></b>	
	State the rules regarding helicopter mass <ul style="list-style-type: none"> <li>- at the start off take-off</li> <li>- in the event of re-planning the operational flight plan</li> </ul>	

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	<p>Explain the factors likely to affect the mass</p> <ul style="list-style-type: none"> <li>- effect of altitude</li> <li>- temperature</li> <li>- humidity and density Subpart G, H, &amp; I</li> <li>-</li> </ul> <p>State the location of the approved performance data in the Helicopter Flight Manual</p>	
<b>034 04 03 00</b>	<p><b><u>Terminology</u></b></p>	
	<p>Define the following terms used in JAR-OPS 3, Subparts F, G, H, &amp; I that are not defined in JAR 1</p> <ul style="list-style-type: none"> <li>- Category A</li> <li>- Category B</li> <li>- Committal Point</li> <li>- Congested Area</li> <li>- Defined Point After Take-off (DPATO) Class 2 only</li> <li>- Defined Point Before Landing (DPBL) Class 2 only</li> <li>- Distance DR</li> <li>- Elevated Heliport</li> <li>- Exposure Time –Class 2</li> <li>- Helideck</li> <li>- Heliport</li> <li>- Hostile Environment</li> <li>- Landing Decision Point</li> <li>- Landing Distance Available</li> <li>- Maximum Approved Passenger Seating Configuration</li> <li>- Maximum Permitted Exposure Time</li> <li>- Non –hostile Environment</li> <li>- Obstacle</li> <li>- Performance Class 1, 2, 3</li> <li>- Rejected Take-off Distance Required (RTODR)</li> </ul>	

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	<ul style="list-style-type: none"> <li>- Reported Headwind Component</li> <li>- Rotation Point</li> <li>- R.</li> <li>- Safe Forced Landing</li> <li>- Take-off Decision Point (TDP)</li> <li>- Take-off Distance Required</li> <li>- Take-off Mass</li> <li>- Touchdown and Lift-off Area</li> </ul>	
<b>034 05 00 00</b>	<b><u>PERFORMANCE CLASS 1 SUBPART G</u></b>	
<b>034 05 01 00</b>	<b><u>General and Applicability</u></b>	
	<p>State in which category Performance Class 1 helicopters are certified</p> <p>Define operator responsibilities regarding:</p> <ul style="list-style-type: none"> <li>- Take-off mass with reference to: <ul style="list-style-type: none"> <li>• Pressure altitude</li> <li>• Ambient temperature</li> </ul> </li> <li>- Surface level heliports: <ul style="list-style-type: none"> <li>• rejected take-off distance</li> <li>• take-off distance required</li> </ul> </li> <li>- Elevated heliports/helidecks: <ul style="list-style-type: none"> <li>• critical power unit failure at or before TDP</li> <li>• critical power unit failure at or after TDP</li> <li>• obstacle clearance margins in general and local additional clearances</li> </ul> </li> </ul>	
<b>034 05 02 00</b>	<b>Take-off</b> (This paragraph line is missing in the syllabus)	
<b>034 05 02 01</b>	<b>Account of affecting parameters</b>	

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	<p>Show take-off mass compliance taking account of:</p> <ul style="list-style-type: none"> <li>- pressure altitude</li> <li>- ambient temperature</li> <li>- take-off technique to be used</li> <li>- percentage of head/tail wind that may be used</li> <li>- remaining visual up to TDP</li> </ul>	
<b>034 05 02 02</b>	<b>Take-off Flight Path</b>	
	<p>Explain the effect of the failure of one power unit (OEI) on:</p> <ul style="list-style-type: none"> <li>- the reduction in acceleration and vertical performance</li> <li>- the rate of climb required</li> <li>- obstacle clearances both lateral and vertical</li> </ul> <p>Use charts to assess vertical and horizontal clearances</p> <p>Use charts for both surface level and elevated heliports and helidecks</p>	<p>Given relevant charts</p> <p>Given relevant charts</p>
<b>034 05 03 00</b>	<b><u>En-route Critical Power Unit Inoperative</u></b>	
	<p>Discuss how helicopter performance is affected generally by the critical power unit being inoperative when enroute</p> <p>Reference Helicopter Flight Manual</p> <ul style="list-style-type: none"> <li>- for helicopter limitations</li> <li>- required performance for Category A operations</li> </ul>	
<b>034 05 03 01</b>	<b>En-route Flight Path</b>	
	<p>Learn the rates of climb and lateral clearances required:</p> <ul style="list-style-type: none"> <li>- when not visual with the surface</li> <li>- when visual with the surface</li> </ul> <p>Learn the descent flight path clearances when not visual with the surface</p> <p>Learn the flight path clearance required in the descent when visual with the surface</p>	

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	Discuss: <ul style="list-style-type: none"> <li>- the effect of wind on the flight path at single engine speed in relation to high ground</li> <li>- the necessity to jettison fuel to reduce helicopter mass</li> <li>- the minimum fuel to which jettison can be made with regard to onshore and offshore alternate heliports / helidecks</li> </ul> Explain drift down techniques (JAR-OPS AMC 3295.d) Learn the reduction in flight path width when navigational accuracy can be achieved	
<b>034 05 04 00</b>	<u><b>Landing: to surface level heliports; to elevated heliports/helidecks; with critical power failure prior LDP and after LDP</b></u>	
	Use charts to establish parameters for selection of surface heliports and elevated heliports / helidecks. Discuss critical power unit failure prior to and after Landing Decision Point	Given relevant charts
<b>034 05 04 01</b>	<b>Account off affecting parameters</b>	
	Discuss the affect of the following on the helicopter performance during landing and why they are important to ensure compliance with the regulations: <ul style="list-style-type: none"> <li>- pressure altitude of the heliport</li> <li>- the expected ambient temperature</li> <li>- the landing technique to be used</li> <li>- the wind components</li> <li>- the landing mass</li> </ul> Explain that the portion of flight after LDP must be carried out visually.	
<b>034 06 00 00</b>	<b>PERFORMANCE CLASS 2 SUBPART H</b>	
<b>034 06 01 00</b>	<b>General and Applicability</b>	
	Discuss: <ul style="list-style-type: none"> <li>- that it is not always possible to reject or ensure a continued take-off with a critical power unit failure</li> </ul>	

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	<ul style="list-style-type: none"> <li>- the approval to operate with exposure time</li> </ul> <p>Explain:</p> <ul style="list-style-type: none"> <li>- who may grant the approval</li> <li>- under what circumstances the approval may be granted</li> <li>- the current validity of the approvals (JAR-OPS3, Subpart H, 3.517)</li> </ul> <p>Re-state the definitions of</p> <ul style="list-style-type: none"> <li>- NON hostile environment</li> <li>- NON congested hostile environment</li> </ul> <p>Introduce the following Class 2 definitions:</p> <ul style="list-style-type: none"> <li>- Defined Point After Take-off (DPATO)</li> <li>- Defined Point Before Landing (DPBL)</li> </ul>	
<b>034 06 02 00</b>	<b>Take-off</b>	
	<p>Explain rates of climb and compare with Class 1</p> <p>Surface level heliports – operations without exposure time</p> <p>In the event of a critical power unit failure state action:</p> <ul style="list-style-type: none"> <li>- up to and including DPATO</li> <li>- after DPATO</li> </ul> <p>Operations with exposure time JAR-OPS 3 3.520(a)(3 &amp; 4):</p> <p>Elevated heliports or helidecks in a NON hostile environment</p> <ul style="list-style-type: none"> <li>- Explain the requirements after exposure time up to the DPATO</li> <li>- Explain the requirements after DPATO</li> <li>- Explain the possibilities during exposure time</li> </ul> <p>Elevated heliports or helidecks in a NON congested hostile environment</p> <p>Explain that:</p> <ul style="list-style-type: none"> <li>- the helicopter must be able to continue flight at the end of exposure time</li> <li>- during exposure time a safe forced landing may not be possible</li> </ul>	

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	<p>Show take-off mass compliance taking account of:</p> <ul style="list-style-type: none"> <li>- pressure altitude</li> <li>- ambient temperature</li> <li>- take-off procedure to be used</li> <li>- percentage of head/tail wind that may be used</li> <li>- remaining visual up to DPATO</li> </ul>	
<b>034 06 02 01</b>	<b>Take-off Flight Path</b>	
	<p>Explain that the distance clearance parameters are the same as Class 1  State that the factors to be considered are the same as in 034 06 02 00</p>	
<b>034 06 03 00</b>	<b>En-route</b>	
	<p>Learn the minimum rate of climb in the case of a power unit failure  Learn the lateral zone of obstacles to be considered  Consider:</p> <ul style="list-style-type: none"> <li>- Drift down techniques</li> <li>- Fuel jettison</li> <li>- Navigational accuracy</li> </ul>	
<b>034 06 04 00</b>	<b>Landing</b>	
<b>034 06 04 01</b>	<b>Landing mass</b>	
	<p>Explain that the landing mass must be adjusted to achieve 150 ft/ min at 300 m (1000 ft) with a critical power unit inoperative (OEI). Taking into account:</p> <ul style="list-style-type: none"> <li>- pressure altitude of the heliport</li> <li>- the expected ambient temperature</li> <li>- the landing technique to be used</li> <li>- the wind component</li> <li>- changes in the mass of the helicopter in flight the flight must be carried out visually from DPBL to touchdown</li> </ul> <p>Explain that landing techniques vary depending on the location as follows:</p> <ul style="list-style-type: none"> <li>• <b>Surface Level Heliports (without exposure time)</b></li> </ul>	



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	<p>State that landing must permit:</p> <ul style="list-style-type: none"> <li>- OEI before DPBL, continue the flight</li> <li>- OEI at or after DPBL, a safe forced landing on the heliport or surface</li> </ul> <p>• <b>Helidecks or Elevated Heliports in a NON hostile environment</b></p> <p>State that landing mass must permit:</p> <ul style="list-style-type: none"> <li>- OEI before DPBL, continue the flight</li> <li>- OEI between the DPBL and exposure time, carryout a safe forced landing on the heliport or surface</li> <li>- OEI during exposure time, a safe forced landing may not be possible</li> </ul> <p>• <b>Helidecks and Elevated Heliports in a non-congested Hostile Environment</b></p> <p>State that landing mass must permit:</p> <ul style="list-style-type: none"> <li>- OEI up to the beginning of exposure time, continue the flight clearing all obstacles</li> <li>- OEI during the exposure time, a safe forced landing may not be possible</li> </ul> <p>Factors to be taken into account:</p> <ul style="list-style-type: none"> <li>- pressure altitude of the heliport</li> <li>- the expected ambient temperature</li> <li>- the landing technique to be used</li> <li>- the wind component</li> <li>- the landing mass</li> </ul>	
<b>034 07 00 00</b>	<b>PERFORMANCE CLASS 3 SUBPART I</b>	
<b>034 07 01 00</b>	<b>General</b>	
	<p>Explain that helicopters are certified in either Category A or B</p> <p>Explain that operations are only from/to heliports and over such routes, areas and diversions contained in a NON hostile environment where a safe forced landing can be carried out.</p> <p>(Consider exception: operations may be conducted in a hostile environment when approved under JAR-OPS 30005(e))</p>	
<b>034 07 01 01</b>	<b>Operations – ceiling and visibility limits</b>	
	Explain that operations may be conducted over water in a hostile environment beyond safe forced	

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	<p>landing distance from land but not for more than 10 minutes in any one flight</p> <p>State Minimum Limits for Operation:</p> <ul style="list-style-type: none"> <li>- ceiling 600 feet</li> <li>- visibility 800 m</li> <li>- operations always conducted in sight of the surface</li> <li>- night operations not permitted</li> <li>- operations not permitted from/to helidecks</li> </ul>	
<b>034 07 01 02</b>	<p><b>Operations with exposure time</b></p> <p>Explain that approval is required to operate to/from elevated heliports in a non-hostile environment with exposure time to a power unit failure</p> <p>Explain the time frame of the clearance and the purpose of the review scheduled</p>	
<b>034 07 02 00</b>	<p><b>Take-off</b></p> <p>Discuss the mass restrictions to hover IGE with AEO at take-off power</p> <p>Take into account:</p> <ul style="list-style-type: none"> <li>- pressure altitude</li> <li>- ambient temperature</li> </ul> <p>Discuss if HIGE cannot be established then restrict mass to HOG E</p>	
<b>034 07 03 00</b>	<p><b>En-route</b></p> <p>State that the helicopter must be capable of flying its intended track without flying below the appropriate minimum flight altitude and the performing a safe forced landing</p>	
<b>034 07 04 00</b>	<p><b>Landing</b></p> <p>Explain that mass has to be restricted to HIGE</p> <p>Explain that if HIGE is unlikely to be achieved then restrict mass to HOG E</p>	