

## **Titel: FLIGHT PERFORMANCE AND PLANNING (1)**

Dokument-Nr.: DC\_PEL\_ATPL\_031  
Version: 1.0  
Status: Freigegeben  
Klassifizierung: Uneingeschränkt  
Prozess: -  
Seiten: 5  
Verteilung: Original: JAA  
Verteiler: Internet  
Anlagen: -

Abstrakt: Themenbezogene Sammlung von ATPL-Prüfungsfragen, ohne Gewähr auf Aktualität bzw. Vollständigkeit

Gleichbehandlungsklausel: Der einfacheren Lesbarkeit halber werden personenbezogene Bezeichnungen in grammatikalisch geschlechtsneutraler oder männlicher Form verwendet. Die gewählte Form gilt jedoch stets für beide Geschlechter und soll keinerlei Diskriminierung zum Ausdruck bringen.

Rechtliche Hinweise: Dieses Dokument sowie die enthaltenen Informationen sind Eigentum der Austro Control. Der Inhalt dieses Dokuments darf ohne Zustimmung des Dokumentinhabers weder kopiert, veröffentlicht oder in irgendeiner Weise an Personen weitergegeben werden, die nicht in der Verteilerliste ausdrücklich angeführt sind. Gedruckte Ausgaben dieses Dokuments unterliegen keinem Änderungsdienst, außer dies wurde ausdrücklich am Deckblatt vermerkt.  
© Austro Control 2008

## FLIGHT PERFORMANCE AND PLANNING (1) MASS AND BALANCE

---



- 1 The centre of gravity of an aircraft
- A is in a fixed position and is unaffected by aircraft loading.
  - B must be maintained in a fixed position by careful distribution of the load.
  - C can be allowed to move between defined limits.
  - D may only be moved if permitted by the regulating authority and endorsed in the aircraft's certificate of airworthiness.
- 2 During take-off you notice that, for a given elevator input, the aeroplane rotates much more rapidly than expected. This is an indication that:
- A the aeroplane is overloaded.
  - B the centre of gravity may be towards the aft limit.
  - C the centre of pressure is aft of the centre of gravity.
  - D the centre of gravity is too far forward.
- 3 The floor limit of an aircraft cargo hold is 5 000 N/m<sup>2</sup>. It is planned to load-up a cubic container measuring 0,4 m of side. It's maximum gross mass must not exceed: (assume  $g=10\text{m/s}^2$ )
- A 80 kg
  - B 800 kg
  - C 32 kg
  - D 320 kg
- 4 An aeroplane is weighed and the following recordings are made:
- |                                 |          |
|---------------------------------|----------|
| nose wheel assembly scale       | 5330 kg  |
| left main wheel assembly scale  | 12370 kg |
| right main wheel assembly scale | 12480 kg |
- If the 'operational items' amount to a mass of 1780 kg with a crew mass of 545 kg, the empty mass, as entered in the weight schedule, is
- A 32505 kg
  - B 31960 kg
  - C 28400 kg
  - D 30180 kg
- 5 The take-off mass of a helicopter is 8600 kg which includes a traffic load of 1890 kg and a usable fuel load of 1230 kg. If the standard mass for the crew is 190 kg the dry operating mass is
- A 5290 kg
  - B 5480 kg
  - C 8410 kg
  - D 6710 kg
- 6 The zero fuel mass of an aeroplane is always:
- A The maximum take-off mass minus the take-off fuel mass.
  - B The take-off mass minus the fuselage fuel mass.
  - C The take-off mass minus the wing fuel mass.
  - D The take-off mass minus the take-off fuel mass.
-

## FLIGHT PERFORMANCE AND PLANNING (1) MASS AND BALANCE

---



- 7 The standard mass for a child is
- A 35 kg for holiday charters and 38 kg for all other flights.
  - B 35 kg for all flights.
  - C 30 kg for holiday charters and 35 kg for all other flights.
  - D 38 kg for all flights.
- 8 The Traffic Load is defined as:
- A The total mass of flight crew, passengers, baggage, cargo and usable fuel
  - B The total mass of crew and passengers excluding any baggage or cargo
  - C The total mass of passengers, baggage and cargo, including any non revenue load
  - D The total mass of passengers, baggage, cargo and usable fuel
- 9 Given:
- |                                  |           |
|----------------------------------|-----------|
| Dry Operating Mass=              | 29 800 kg |
| Maximum Take-Off Mass=           | 52 400 kg |
| Maximum Zero-Fuel Mass=          | 43 100 kg |
| Maximum Landing Mass=            | 46 700 kg |
| Trip fuel=                       | 4 000 kg  |
| Fuel quantity at brakes release= | 8 000 kg  |
- The maximum traffic load is:
- A 13 300 kg
  - B 12 900 kg
  - C 14 600 kg
  - D 9 300 kg
- 10 In centre of gravity calculations the datum is
- A The fixed reference about which moments are taken to calculate the position of the centre of pressure
  - B The fixed reference about which moments are taken to calculate the position of the centre of gravity
  - C The horizontal reference used to calculate the helicopter's empty centre of gravity
  - D The point through which the centre of gravity acts

## FLIGHT PERFORMANCE AND PLANNING (1) MASS AND BALANCE

---



- 11 The mass and balance information gives:  
Basic mass: 1 200 kg ; Basic balance arm: 3.00 m

Under these conditions the Basic centre of gravity is at 25% of the mean aerodynamic chord (MAC). The length of MAC is 2m.

In the mass and balance section of the flight manual the following information is given:

Position Arm  
front seats: 2.5 m  
rear seats: 3.5 m  
rear hold: 4.5 m  
fuel tanks: 3.0 m

The pilot and one passenger embark; each weighs 80 kg. Fuel tanks contain 140 litres of petrol with a density of 0.714. The rear seats are not occupied. Taxi fuel is negligible. The position of the centre of gravity at take-off (as % MAC) is:

- A 34 %
  - B 17 %
  - C 22 %
  - D 29 %
- 12 (For this question use annex A)  
Using the data given in the Load & Trim sheet, determine which of the following gives the correct values for the Zero Fuel Mass and position of the centre of gravity (% MAC) at that mass.
- A 51300 Kg and 20,8%
  - B 46130 Kg and 20,8%
  - C 46130 Kg and 17,8%
  - D 41300 Kg and 17,8%

# FLIGHT PERFORMANCE AND PLANNING (1) MASS AND BALANCE



**ANNEX A**

CIVIL AVIATION AUTHORITY  
MASS & BALANCE

DATA SHEET  
MRJT1

Figure 4.14 Load and Trim Sheet (Blank)

For Training and Examination Purposes only      Load & Trim Sheet  
JAA - FCL Twin Jet

OPERATOR		REGISTRATION		DATE		VERSION	
ALL MASSES IN KILOGRAM							
DRY OPERATING MASS	34900	MAXIMUM MASSES FOR ZERO FUEL	57300	TAKE-OFF	52900	LANDING	
Take-off Fuel	9500		9500	Trip Fuel	6500		
OPERATING MASS	44400	Allowed Mass for Take-off (Lowest of a, b, c)	60800	62800	59400		
Notes:				Allowed Traffic Load	15000		
				Total Traffic Load	17230		
				UNDERLOAD before LMC			
DISTRIBUTION MASS		REMARKS		CPL MASS/No.			
Desl	Ma	Fe	Ch	In	Tr	1 7300	
	60	30				4 2370	
						0a 70	
						0b 70	
						0c 70	
						0d 70	
						0e 70	
						0f 70	
						0g 70	
TOTAL		500		670		7560	
T		3670		47300		42370	
M		2500		800		7700	
Passenger Mass		7560		LAST MINUTE CHANGES			
TOTAL TRAFFIC LOAD		17230		Desl	Specification	C/Cpl	plus minus
Dry Operating Mass		34900		LOAD LMC (Total)			
ZERO FUEL MASS		57300		TOP Adjustment			
Max.				TOTAL LMC +/-			
Take-off Fuel		9500		Prepared by:			
TAKE-OFF MASS		52900		Approved by:			
Max.							
Trip Fuel		6500					
LANDING MASS		59400					
Max.							
SI							

  

PASSENGER COMPARTMENT DIVISION							
Cpt.	0a	0b	0c	0d	0e	0f	0g
No. of Seats	15	18	24	24	24	18	18
Row	1-3	4-8	7-10	11-15	16-20	21-23	22-26

  

Group/Coach/Row		DRY OPERATING INDEX
1/2		33.5

  

FOR CREW ONLY: STAB. TRIM UNITS FOR 10% FLAPS 5' ONLY

QUIC