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AEROSPACE INFORMATION REPORT

AIR 1389

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Revised

FAA REGULATIONS COVERING THE USE OF OXYGEN IN AIRCRAFT

1. INTRODUCTION: This document presents paraphrased in tabulated form, the Federal Aviation Regulations (FAR's) for aircraft oxygen systems. It is intended as a ready reference for those considering the use of oxygen in aircraft and those wishing to familiarize themselves with the systems requirements for existing aircraft. This document is not intended to replace the oxygen related FAR's but rather to index them in some order. For detailed information the user is referred to the current issue of the relevant FAR paragraph referenced in the report.

2. REGULATIONS COVERED:

FAR 23 - Airworthiness Standards: Normal, Utility and Acrobatic
FAR 25 - Airworthiness Standards: Transport Category Airplanes
FAR 91 - General Operating and Flight Rules
FAR 121 - Certification and Operations: Air Carriers and Commercial Operators of Large Aircraft
FAR 135 - Air Taxi Operators and Commercial Operators of Small Aircraft
JAR 25 - European Joint Air Regulations*

*JAR 25 is included with the FAR 25 section. The requirements are essentially similar except for slight differences which have been noted.

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AIRCRAFT OXYGEN EQUIPMENT

OXYGEN EQUIPMENT & FLOW REQUIREMENTS FOR FAA CERTIFICATED AIRCRAFT

FAR PART	ALTITUDE, FEET: CABIN, MSL	ALTITUDE, FEET: OPERATION/ CERTIFICATION	Oxygen Requirements MINIMUM (4): CREW	Oxygen Requirements MINIMUM (4): PAX	O_2 MASK TYPE: CREW	O_2 MASK TYPE: PAX	PAX SYSTEM: MASK CONNECTED	PAX SYSTEM: MASK AUTO PRESENT	FAR PARA. REF.	REMARKS
23 Airworthiness: Normal, Utility Aircraft	≤ 12,500-25,000	≤ 25,000	Continuous Flow Rates in ℓ/min. vs. Cabin Pressure Altitude are Specified in FAR 23.1443		CF(1)	CF	NO	NO	-	a. Portable Equipment Acceptable (23.1441(a))
		>25,000 ≤ 30,000			CF(1)	CF	YES	NO	23.1447(b)	b. O_2 Qty. indication to crew required (23.1441(c))
					CF(1)	CF	YES	YES(3)	23.1447(c)	c. Flow indication required (23.1449)
	>40,000	>40,000	(1)		(1)	(1)	YES	YES(3)	23.1441(d)	d. Manual override reqd. for Automatic Presentation System (23.1447(d))
25 & (JAR-25) Airworthiness: Transport Aircraft	≤ 25,000		149 mm Hg pO_2	-	CF	-			25.1443(a)	a. Portable oxygen is acceptable for crew and passengers (25.1443(e) & 25.1445(b))
			122 mm Hg pO_2	-	DF	-			25.1443(b)	
	25,000-35,000		122 mm Hg pO_2	-	DF/QD	-			25.1443(b)	
	35,000-40,000		95% O_2	-	DF/QD	-			25.1443(b)	
	10,000-18,500		-	100 mm Hg pO_2	-	CF			25.1443(c)(1)	b. Separate or separable crew and passenger O_2 supply systems required (25.1445(a))
	>18,500-40,000		-	83.8 mm Hg pO_2	-	CF			25.1443(c)(2)	
		≤ 25,000			CF/DF	CF	NO	NO	25.1447(b)	c. Qty. of O_2 supply must be determinable (25.1441(c))
		>25,000-30,000			DF/QD	CF	YES	NO	25.1447(c)	
		>30,000-40,000			DF/QD	CF	YES	YES(3)	25.1447(c)	d. Qty. of passenger masks shall exceed seats by 10% (25.1447(c)(1))
		>40,000 (1)			(1)	(1)	YES	YES(3)	25.1441(d)	e. First aid oxygen reqd. 4ℓ/min STPD (4.3ℓ/min, NTPD) for each user (25.1443(d))
										f. 2 masks per washroom/ lavatory above 25,000 ft. (25.1447(c)(3)) JAR 25.1447(c)(3) includes Galley work areas
										g. Chemical oxygen is acceptable (25.1450)
										h. Portable equipment must be available for each cabin attendant above 25,000 (25.1447(c)(4))
										i. Oxygen delivery verification to crew (25.1449)
Protective Breathing (2)	8,000		300 liters	-	DF	-	-	-	25.1439(b)(5)	a. JAR 25.1439(b)(5) requires supply to provide 15 minutes O_2 at 8000 ft. at 30 lpm. No inboard mask leakage allowed.
			600 liters	-	CF	-	-	-		

ABBREVIATIONS:

CF	Continuous Flow
DF	Demand Flow
DF/QD	Demand FLow/Quick Don (5 sec)
MSL	Mean Sea Level
PAX	Passenger
FAR	Federal Aviation Regulations

REF: ALTITUDE EQUIVALENT OF TRACHEAL pO2, mm Hg

149 mm	Sea Level
122 mm	5000 Feet
100 mm	10,000 Feet
83.8 mm	14,000 Feet

NOTES:

(1) Demand flow equipment and systems above 40,000 feet must be separately approved.
(2) If Class A, B or E cargo compartment exists or in isolated separate compartment, e.g. Lower Galley.
(3) Masks must drop by 15,000 per FAR 23.1447(c) & FAR 25.1447(c)(1) by 14,000 ft. per JAR 25.1447(c)(1).
(4) Where oxygen partial pressures are shown, values are for tracheal pressure.

OXYGEN EQUIPMENT & FLOW REQUIREMENTS FOR FAA CERTIFICATED AIRCRAFT

FAR PART	ALTITUDE, FEET: CABIN, MSL	ALTITUDE, FEET: FLIGHT	O_2 USAGE: CREW	O_2 USAGE: PAX	O_2 SUPPLY REQT.: CREW	O_2 SUPPLY REQT.: PAX	FAR REF. PARAGRAPH	REMARKS
91	>12,500-14,000	-	After 30 Minutes	NO	(1)	(1)	91.32(a)(1)	
General Operating & Flight Rules	>14,000-15,000	-	YES	NO	(1)	(1)	91.32(a)(2)	
	>15,000	-	YES	YES	(1)	(1)	91.32(a)(3)	
	Pressurized	-FL250	NO	NO	10 Minute	10 Minute	91.32(b)(1)(i)	a. 10 minute supply is in addition to that required for flight at cabin altitudes above 12,500 feet
	Pressurized	>FL350-410	YES(2)(3)	NO	-	-	91.32(b)(1)(ii)	
	Unpressurized	-					135.157(a)	
135 Air Taxi & Commercial Operators of Small Aircraft	>10,000-12,000	Same as Cabin Altitude	After 30 Minutes	10% of PAX After 30 Min.	(1)	(1)	135.89(a)(1) 135.157(a)(1)	a. Oxygen Supply pressure gages required (135.157(c)(1))
	>12,000-15,000		YES	10% of PAX After 30 Min.	(1)	(1)	135.89(a)(2) 135.157(a)(1)	b. Mask flow indicators required (135.157 (c)(2))
	>15,000		YES	YES	(1)	(1)	135.157(a)(2)	c. If flight is above 10,000 ft. briefing on oxygen is reqd. (135.81(f))
	Pressurized	-					135.157(b)	
	<10,000	>10,000 to 15,000	NO	NO	(1)	(1)	135.157(b)(2)(i)	d. Oxygen for Medical use by passengers is described in (139.91)
		>15,000	NO	NO	(1)	60 Min. (4)	135.157(b)(2)(ii)	
		>25,000	NO	NO	2 hours	10 Min. (6)	135.157(b)(2)	e. Above 25,000 feet pilots shall have access to undiluted oxygen at their discretion (135.157(c)(3))
		>25,000 to 35,000	YES(2)(3)				135.89(b)(2)	
		>35,000	YES(5)				135.89(b)(3)	

NOTES:

(1) As required by Flight Profile at these cabin altitudes.

(2) One pilot must wear and use oxygen mask unless there are two pilots with QD masks available. (135.89(b)(2)(i)).

(3) One pilot must wear and use oxygen mask if for any reason other pilot must leave his station. (135.89(b)(4)).

(4) If descent can be made to 15,000 within 4 minutes only a 30 minute supply is required. If flight is between 10,000-15,000 ft. oxygen supply shall be adequate for 10% of occupants after 30 minutes.

(5) One pilot must wear and use oxygen mask. (135.89(b)(3)).

(6) For descent profile.