

§ 23.1105

may discharge where it will cause a fire hazard.

(b) Each duct connected to components between which relative motion could exist must have means for flexibility.

(c) Each flexible induction system duct must be capable of withstanding the effects of temperature extremes, fuel, oil, water, and solvents to which it is expected to be exposed in service and maintenance without hazardous deterioration or delamination.

(d) For reciprocating engine installations, each induction system duct must be—

(1) Strong enough to prevent induction system failures resulting from normal backfire conditions; and

(2) Fire resistant in any compartment for which a fire extinguishing system is required.

(e) Each inlet system duct for an auxiliary power unit must be—

(1) Fireproof within the auxiliary power unit compartment;

(2) Fireproof for a sufficient distance upstream of the auxiliary power unit compartment to prevent hot gas reverse flow from burning through the duct and entering any other compartment of the airplane in which a hazard would be created by the entry of the hot gases;

(3) Constructed of materials suitable to the environmental conditions expected in service, except in those areas requiring fireproof or fire resistant materials; and

(4) Constructed of materials that will not absorb or trap hazardous quantities of flammable fluids that could be ignited by a surge or reverse-flow condition.

(f) Induction system ducts that supply air to a cabin pressurization system must be suitably constructed of material that will not produce hazardous quantities of toxic gases or isolated to prevent hazardous quantities of toxic gases from entering the cabin during a powerplant fire.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-7, 34 FR 13095, Aug. 13, 1969; Amdt. 23-43, 58 FR 18974, Apr. 9, 1993]

§ 23.1105 Induction system screens.

If induction system screens are used—

14 CFR Ch. I (1-1-13 Edition)

(a) Each screen must be upstream of the carburetor or fuel injection system.

(b) No screen may be in any part of the induction system that is the only passage through which air can reach the engine, unless—

(1) The available preheat is at least 100 °F.; and

(2) The screen can be deiced by heated air;

(c) No screen may be deiced by alcohol alone; and

(d) It must be impossible for fuel to strike any screen.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964; 30 FR 258, Jan. 9, 1996, as amended by Amdt. 23-51, 61 FR 5137, Feb. 9, 1996]

§ 23.1107 Induction system filters.

If an air filter is used to protect the engine against foreign material particles in the induction air supply—

(a) Each air filter must be capable of withstanding the effects of temperature extremes, rain, fuel, oil, and solvents to which it is expected to be exposed in service and maintenance; and

(b) Each air filter shall have a design feature to prevent material separated from the filter media from interfering with proper fuel metering operation.

[Doc. No. 26344, 58 FR 18974, Apr. 9, 1993, as amended by Amdt. 23-51, 61 FR 5137, Feb. 9, 1996]

§ 23.1109 Turbocharger bleed air system.

The following applies to turbocharged bleed air systems used for cabin pressurization:

(a) The cabin air system may not be subject to hazardous contamination following any probable failure of the turbocharger or its lubrication system.

(b) The turbocharger supply air must be taken from a source where it cannot be contaminated by harmful or hazardous gases or vapors following any probable failure or malfunction of the engine exhaust, hydraulic, fuel, or oil system.

[Amdt. 23-42, 56 FR 354, Jan. 3, 1991]

§ 23.1111 Turbine engine bleed air system.

For turbine engine bleed air systems, the following apply:

(a) No hazard may result if duct rupture or failure occurs anywhere between the engine port and the airplane unit served by the bleed air.

(b) The effect on airplane and engine performance of using maximum bleed air must be established.

(c) Hazardous contamination of cabin air systems may not result from failures of the engine lubricating system.

[Amdt. 23-7, 34 FR 13095, Aug. 13, 1969, as amended by Amdt. 23-17, 41 FR 55465, Dec. 20, 1976]

EXHAUST SYSTEM

§ 23.1121 General.

For powerplant and auxiliary power unit installations, the following apply—

(a) Each exhaust system must ensure safe disposal of exhaust gases without fire hazard or carbon monoxide contamination in any personnel compartment.

(b) Each exhaust system part with a surface hot enough to ignite flammable fluids or vapors must be located or shielded so that leakage from any system carrying flammable fluids or vapors will not result in a fire caused by impingement of the fluids or vapors on any part of the exhaust system including shields for the exhaust system.

(c) Each exhaust system must be separated by fireproof shields from adjacent flammable parts of the airplane that are outside of the engine and auxiliary power unit compartments.

(d) No exhaust gases may discharge dangerously near any fuel or oil system drain.

(e) No exhaust gases may be discharged where they will cause a glare seriously affecting pilot vision at night.

(f) Each exhaust system component must be ventilated to prevent points of excessively high temperature.

(g) If significant traps exist, each turbine engine and auxiliary power unit exhaust system must have drains discharging clear of the airplane, in any normal ground and flight attitude, to prevent fuel accumulation after the failure of an attempted engine or auxiliary power unit start.

(h) Each exhaust heat exchanger must incorporate means to prevent

blockage of the exhaust port after any internal heat exchanger failure.

(i) For the purpose of compliance with § 23.603, the failure of any part of the exhaust system will be considered to adversely affect safety.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-7, 34 FR 13095, Aug. 13, 1969; Amdt. 23-18, 42 FR 15042, Mar. 17, 1977; Amdt. 23-43, 58 FR 18974, Apr. 9, 1993; Amdt. 23-51, 61 FR 5137, Feb. 9, 1996]

§ 23.1123 Exhaust system.

(a) Each exhaust system must be fireproof and corrosion-resistant, and must have means to prevent failure due to expansion by operating temperatures.

(b) Each exhaust system must be supported to withstand the vibration and inertia loads to which it may be subjected in operation.

(c) Parts of the system connected to components between which relative motion could exist must have means for flexibility.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-43, 58 FR 18974, Apr. 9, 1993]

§ 23.1125 Exhaust heat exchangers.

For reciprocating engine powered airplanes the following apply:

(a) Each exhaust heat exchanger must be constructed and installed to withstand the vibration, inertia, and other loads that it may be subjected to in normal operation. In addition—

(1) Each exchanger must be suitable for continued operation at high temperatures and resistant to corrosion from exhaust gases;

(2) There must be means for inspection of critical parts of each exchanger; and

(3) Each exchanger must have cooling provisions wherever it is subject to contact with exhaust gases.

(b) Each heat exchanger used for heating ventilating air must be constructed so that exhaust gases may not enter the ventilating air.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-17, 41 FR 55465, Dec. 20, 1976]