

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
KANSAS CITY, MISSOURI 64106

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In the matter of the petition of *
*
AIR TRACTOR INCORPORATED *
* Regulatory Docket No. 111CE
for an exemption from § 23.49(b)(1), *
of the Federal Aviation Regulations *
*

GRANT OF EXEMPTION

By letter dated November 11, 1992, Mr. Leland Snow, President of Air Tractor Incorporated, Post Office Box 485, Olney, Texas 76374, petitioned for an exemption from § 23.49(b)(1) of the Federal Aviation Regulations (FAR) to permit certification of the Air Tractor model AT-802A with stall speeds (V_{so}) greater than the 61 knot requirement.

The petitioner requires relief from the following regulation(s):

Section 23.49(b)(1) of the Federal Aviation Regulations (FAR) requires, in pertinent part, that the stalling speed (V_{so}) of a single-engine airplane at maximum weight may not exceed 61 knots.

The petitioner supports its request with the following information:

The petitioner states under this exemption that the special purpose operations of the Air Tractor model AT802 would be fire fighting, agricultural, or drug eradication.

The Air Tractor model AT802A is a prototype single place airplane that is nearing its completion for FAA type certification. The airplane will be FAA approved up to 16,000 pounds gross weight and will be powered by a variety of Pratt & Whitney PT6A engines ranging from 1100 SHP to 1424 SHP or more. Hopper capacity for these models is 800 U.S. gallons and the airplane will be used for both liquid

and solid material dispensing in the agricultural versions. As presently designed, the airplane will meet the 61 knot stall speed requirement at weights up to 9,850 pounds but at 16,000 pounds the stall speed will be 77 knots.

The petitioner states that the Pratt & Whitney PT6A engines have an in-flight shutdown rate of one per 200,000 hours, which offers a reliability level at least equal to twin engine airplanes that are exempt under certain conditions from meeting the 61 knot stall speed limit.

The petitioner states that in order to meet the 61 knot stall speed requirement, a larger, heavier, and more expensive airplane will be required. The larger airframe will have the following negative effects:

1. Locating the pilot aft of the hopper will require excessive ballast forward of the firewall in a larger airframe.
2. Lower climb performance due to increased weight and drag will result, which has a negative effect on safety when fighting a fire in mountainous terrain.
3. Lower cruise speeds will lower effectiveness in early fire suppression techniques, as it is imperative to reach the fire as soon as possible to contain it in the early stages.
4. Increased cost will result from the larger airframe, with a substantial possibility that the planned P & W PT6A engine, which is relatively inexpensive, will have to be abandoned in favor of a much more expensive P & W series engine.

The petitioner states additional compensating crashworthiness design features that this airplane employs are as follows:

1. The airplane does not have significant items of mass located behind the cockpit, as the hopper is forward of the cockpit. The top longeron in the cockpit area is of 1 3/8 X .058 4130 N tubing having a compression allowable of 14,400 pounds per side, 28,800 pounds total. When considering pilot weights of 170 pounds, and aft structure and tail weight of 200 pounds along the top longeron, the top longerons will withstand over 53 g's of compressive load.
2. Massive overturn structure prevents occupant injury in case of overturns. The structure will have a combined allowable load (both cockpits) exceeding 75,000 pounds

down (6 g's at 12,500 pounds), and forward/side load exceeding 37,500 pounds.

3. The airplane employs the American Safety part number 443220 seat belt and part number 500702 shoulder harness. This is a 5,000 pound restraint system consisting of a 3-inch military style over-center steel latch seat belt and a 2-inch shoulder harness which meets TSO-C-22e. The airplane also has an Air Tractor part number 10529-1 seat structure, which the petitioner states is a copy of the Spinks Industries part number AL-1021-1 bucket seat, except the wall thickness of the primary structural tubes has been increased for greater strength. The Spinks Industries seat is designed for high vertical crash loads, such as in military helicopter application. A proof of crashworthiness of the seat design was demonstrated in an accident with high vertical impact.
4. In accordance with § 23.967(e)(1) of the FAR, the fuel tanks must be designed, located, and installed so as to retain the fuel under the forward inertia forces of 9 g. The integral fuel tanks have been tested without failure to 60 psi pressure, which is the equivalent to 80 g forward and 195 g vertical inertia forces with jet fuel.
5. All fuel lines are constructed of high pressure flexible hose with fixed-end fittings (Stratoflex part number 11417-12D) to allow fuselage distortion after impact without fuel line rupture. There is a physical separation of fuel lines and electrical cables of approximately 54 inches. All the electrical cables are routed down the right side of the airplane and the fuel lines are routed on the left side. Electrical cables that might stretch or fall short during fuselage distortion are separated by the maximum distance from the source of fuel.
6. Spring steel landing gear are used to absorb crash energy. There is no bottoming out of the spring at the end of the stroke as in oleo type or other fixed-stroke shock absorbers in landing gears. The spring steel type landing gear will continue to flex and absorb energy until the fuselage attach bolts fail.

The petitioner provides the additional supportive information as follows:

1. The AT-802A is planned as a more suitable replacement for military surplus aircraft such as the Grumman Tracker aircraft in service with the California

Department of Forestry (CDF) with has 700 to 800 gallon hoppers installed.

2. The petitioner has been dealing with forestry officials for many years and has noted excessive attention to cost, as evidenced by the fact that CDF presently operates military surplus equipment instead of the Canadair CL-215, which is designed specifically for fire bombing.
3. The AT-802A represents an alternative to the Canadair CL-215 amphibious water bomber, which has a 1,425 gallon hopper. Two AT-802A's will represent the same hopper capacity, the same crew, but only 20 percent of the cost of a single CL-215.
4. The Grumman TBF single-engine military surplus airplane has long been used in the fire bombing role and this airplane, when at gross weight, does not meet the stall speed limit.

The petitioner takes the position that it is in the public interest to protect forests and rangeland with modern reliable turbine-powered equipment as opposed to thirty-year-old radial engine powered military surplus airplanes, such as those types presently in operation.

The petitioner also notes that any economic studies conducted by the CDF or any other state or U.S. government forestry service will compare operating costs and acquisition costs of the AT-802A with those costs of operating present surplus equipment.

The petitioner estimates that the AT-802A aircraft in the present airframe size and engine concept will have a selling price of \$650,000.00 but with a larger airframe and the P & W 100 series engine installed the price would be \$1,000,000 or more, which is not in the public's best interest.

The petitioner concludes that the AT-802A is designed to be purchased by the public, to be used on public forests and rangelands, and that presently used military surplus aircraft lack safety, reliability, and economy and should be replaced by modern reliable turbine-powered aircraft, and that small efficient and economical turbine-powered aircraft may be used for this replacement providing that exemption is granted for stall speed requirements, all such factors being in the public interest.

The Federal Aviation Administration's (FAA) analysis is as follows:

To obtain the exemption, the petitioner must show, as required by § 11.25(b)(5) of the Federal Aviation Regulations, that: (1) granting the request is in the public interest; and (2) the grant of the exemption would not adversely affect safety, or that a level of safety will be provided equal to that provided by the rule from which the exemption is sought.

The FAA has carefully reviewed all of the information contained in the petitioner's request for exemption, current FAA policy related to restricted category certification for agricultural and fire fighting purposes, and the intended operation of this airplane.

The Air Tractor model AT-802A is planned to be type certificated at 12,500 pounds gross weight and meeting the restricted category requirements of § 21.25 of Part 21 of the FAR. Section 21.25 requires, in pertinent part, that an airplane may be type certificated in the restricted category for special purposes, such as fire fighting or agricultural operations, if there is no feature or characteristic of the airplane that makes it unsafe when it is operated under the limitations prescribed for its intended use, and that the airplane meets the airworthiness standards for an aircraft category except those requirements that the Administrator finds inappropriate for the special purpose for which the airplane is to be used. The FAA has determined that the stalling speed airworthiness requirements are appropriate for agricultural airplanes and similar special purpose airplanes in the restricted category.

The FAA agrees that the proposed exemption would be in the public interest provided operations are limited to those operations in the petition. As noted by the petitioner, these airplanes will be operated for the purpose of fire fighting, agricultural, and narcotic crop eradication programs.

The FAA recognizes that the demonstrated ability to jettison 100 percent of the fire retardant in the hopper within 2 seconds far exceeds the requirement for operation over congested areas. In addition, the FAA recognizes that the airplane complies with the 61 knot maximum stall speed limit with an empty hopper. The FAA agrees that the ability to dump the hopper in the short time discussed, the massive overturn structure, the pilot restraint system, and the additional crashworthiness design features provide some compensation for the reduction in the level of safety caused by the increased stall speed.

In addition, the FAA finds that, pursuant to § 11.27(j)(3)(i) and (ii) of the FAR, the publication and comment procedures of § 11.25(c) are not required. Specifically, this petition for exemption and the reasons presented in it are almost identical to an exemption granted earlier to the Air Tractor model AT-802. Furthermore, any delay in acting on this petition for exemption, resulting from publication, would be detrimental to the petitioner.

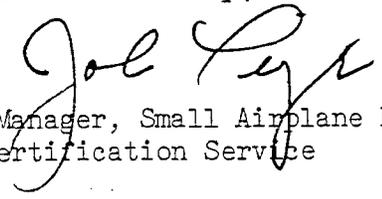
In consideration of the foregoing, I find that a grant of exemption is in the public interest. Pursuant to the authority contained in §§ 313(a) and 601(c) of the Federal Aviation Act of 1958, as amended, delegated to me by the Administrator (14 CFR 11.53), Air Tractor Incorporated is hereby granted an exemption from § 23.49(b)(1) of the Federal Aviation Regulations (FAR) to the extent required to permit certification of the model AT-802A airplane having a stall speed (V_{so}) greater than the 61 knot requirement. This exemption is subject to the following conditions and limitations.

1. The maximum certificated weight must not exceed 12,500 pounds.
2. The type certificate must contain a limitation that the affected airplane is to be operated at gross weights in excess of the certificated weight when the airplane does not meet the stall speed requirement of § 23.49(b)(1) only when it is used for fire fighting, agricultural, or narcotic crop eradication purposes and its gross weight does not exceed 16,000 pounds.
3. The airplane must comply with the stall speed requirements of § 23.49(b)(1) of the Federal Aviation Regulations at the certificated gross weight with the hopper installed and empty.
4. The pilot must be provided with a pilot restraint system consisting of an Air Tractor design pilot seat, part number 10529-1, and an American Safety (Flight Systems, Inc.) seat belt, part number 443220, and shoulder harness system, part number 500702.
5. It must be demonstrated that the pilot can jettison the entire contents of the fire retardant in the hopper within two seconds.

6. In case of an emergency condition, a usable designated drop zone must be established near the takeoff area.

Issued in Kansas City, Missouri on December 11, 1992.

John Tighe
Assistant Manager, Small Airplane Directorate
Aircraft Certification Service

A handwritten signature in cursive script, appearing to read "John Tighe", is written over the typed name and title.