

SNOW ENGINEERING CO. WICHITA FALLS, TEXAS	ENGINEERING REPORT ORDER <table border="1"> <tr><td></td></tr> <tr><td>X</td></tr> </table>			X	NUMBER SL 304
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SUBJECT: Establishing and Operating with a Special Purpose Operating Weight for Air Tractor Aircraft

REFERENCE:

- [1] FAA Civil Aeronautics Manual 8 (CAM 8) dated March 1959
- [2] FAA Advisory Circular AC 20-33B dated May 1, 1975
- [3] FAA Type Certificate Data Sheet #A9SW
- [4] FAA Type Certificate Data Sheet #A17SW

MODELS:

This Service Letter is applicable to all serial numbers of the following Air Tractor models:

AT-300, AT-301, AT-302, AT-400, AT-400A, and AT-250

Certification basis for these models is FAR 21.25(a)(1)
 FAA TCDS #A9SW

**AT-401, AT-401A, AT-401B, AT-402, AT-402A, AT-402B,
 AT-501, AT-502, AT-502A, AT-502B, AT-503, AT-503A, and AT-504**

Certification basis is FAR 21.25(a)(1), (b)(1), (b)(2)
 FAA TCDS #A17SW

SUMMARY:

The purpose of this Service Letter is to describe the proper procedure for establishing a special purpose operating weight that is higher than the FAA certificated gross weight of the aircraft listed above. Service Letter #80AA was previously issued to address this subject, but the subject is worth additional discussion and clarification.

The above-listed Air Tractor aircraft are certificated in the FAA's RESTRICTED category, which allows the aircraft to be used for agricultural dispersal purposes. When these aircraft are operating in the RESTRICTED category, the operator may use the guidance provided in CAM 8 and FAA Advisory Circular No. 20-33B to operate at weights higher than the certificated gross weight that is listed in the Flight Manual.

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The methods described in CAM 8 should be used to approve your aircraft for operation at these higher weights. This service letter provides guidance and clarification that will assist you in properly following the CAM 8 methods.

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FOR AT-250, AT-300, AT-301, AT-302, AT-400, & AT-400A AIRCRAFT:

The operator is allowed to increase the maximum weight of the aircraft to accommodate agricultural missions. Using the airplane's original limit load factor of 3.8 G's, CAM 8 recommends that the maximum gross weight can be increased up to 31% over certificated gross weight. (Ref: Figure 7.1 of CAM 8, Appendix A)

1. To approve the aircraft to operate at a higher gross weight, a flight check should be performed by an appropriately rated pilot. This flight check should be performed to determine that the aircraft is safely controllable and operates satisfactorily in flight under the most adverse (weight and CG) loading conditions anticipated in service. The hopper should be loaded to the maximum anticipated weight and discharged in flight. The flight check should be completed with the aircraft in the configuration that it will be used (i.e. spray equipment or spreader).

If there is any doubt concerning the controllability or performance of the airplane, then the aircraft should be loaded in stages, working up to the maximum weight and edges of the CG envelope.

The takeoff should be made from a runway of ample size or over suitable open terrain. The flight check should include maneuvers simulating the type of agricultural work the aircraft will be used for. The maneuvers should first be performed at a safe altitude over open terrain. Any undue tendency to go into a stall or dive (instability) or to roll should be considered unsatisfactory.

2. After completing the flight check, the pilot should make an entry in the aircraft logbook similar to the following:

"Aircraft flight checked on _____ (date) by _____ (pilot name) _____ (pilot certificate number) in accordance with CAM 8.10-3(e) and found to be safely controllable and to operate satisfactorily with the following hopper load: _____, and aircraft total weight: _____."

3. Also after completing the flight check, a placard should be placed on the hopper that lists the tested maximum hopper load (in pounds) and the maximum aircraft weight that was tested.

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4. Record of these flight checks do not need to be filed with the FAA.
5. When operating at weights over the certificated maximum weight, the aircraft should never be flown faster than the design Maneuvering Speed, V_A , of 140 mph (CAS).
6. CAM 8.10-4(b)(2) states that the aircraft *"operator is responsible for adjusting the actual operating weight to provide safe margin of performance for the existing flight conditions. Appendix A [of CAM 8] contains information from which the effects of drag, weight, altitude, and temperature on aircraft performance may be estimated."*

When planning your next load, be sure to take into account density altitude, runway length/conditions, and terrain. Reduce your aircraft weight as necessary to allow for a safe flight.

A copy of CAM 8 can be found in the Owner's Section of the Air Tractor website: www.airtractor.com. You can request a login and password if you don't already have one.

MODEL	CERTIFICATED MAXIMUM WEIGHT*	MAXIMUM RECOMMENDED OPERATING WEIGHT PER CAM 8 (31% OVERLOAD)
AT-250	4,500 LBS	5,895 LBS
AT-300/301/301A/	5,000 LBS	6,550 LBS
302/400/400A	6,000 LBS	7,860 LBS

*See aircraft Flight Manual to determine Certificated Max Weight

When operating at weights above the certificated maximum weight, please note that the stall speeds will increase from the published stall speed numbers in the Airplane Flight Manual. For example, when operating at a 31% overload weight, the stall speed will be approximately 15% higher than at the certificated maximum weight. During the required flight check, the new stall speeds should be determined.

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FOR AT-401, AT-401A, AT-401B, AT-402, AT-402A, AT-402B, AT-501, AT-502, AT-502A, AT-502B, AT-503, AT-503A, AT-504 AIRCRAFT:

During the original certification of these models, the FAA allowed Air Tractor to conduct a flight check per CAM 8.10-3(e). The results of these flight checks are listed in the aircraft Type Certificate Data Sheet (TCDS). As a result of these flight checks, the aircraft is allowed to operate in the RESTRICTED category at weights up to those shown during the flight test. The data listed in the TCDS is:

MODEL	CERTIFICATED MAXIMUM WEIGHT (LBS)	DEMONSTRATED (per CAM 8.10-3(e))			
		MAXIMUM OPERATING WEIGHT (LBS)	RUNWAY ELEVATION & OAT	DENSITY ALTITUDE (FT)	STALL SPEED MPH (CAS)
AT-401	6,000	7,860	1,300 FT @ 90°F	3,870	84
AT-401A	6,000	7,860	1,300 FT @ 90°F	3,870	84
AT-401B	6,000 [1]	7,860	1,300 FT @ 90°F	3,870	84
	7,000 [2]	7,860	1,300 FT @ 90°F	3,870	84
AT-402	6,000	7,860	1,300 FT @ 90°F	3,870	84
AT-402A	6,000 [1]	7,860	1,300 FT @ 90°F	3,870	84
	7,000 [2]	7,860	1,300 FT @ 90°F	3,870	84
AT-402B	6,000 [1]	7,860	1,300 FT @ 90°F	3,870	84
	7,000 [2]	9,170	1,300 FT @ 90°F	3,870	88
AT-501	6,500	8,500	1,300 FT @ 90°F	3,870	86
AT-502	6,500 [3]	8,500	1,300 FT @ 90°F	3,870	86
	8,000 [4]	9,200	1,300 FT @ 90°F	3,870	89
AT-502A	8,000	10,480	1,300 FT @ 90°F	3,870	95
AT-502B	8,000	9,400	1,300 FT @ 90°F	3,870	90
AT-503	8,000	10,480	1,300 FT @ 90°F	3,870	97
AT-503A	8,000	9,200	1,300 FT @ 90°F	3,870	89
AT-504	8,000	9,600	1,300 FT @ 85°F	3,519	91

- [1] Certificated gross weight for the AT-401B, 402A, and 402B is 6,000 lbs for S/N -0738 thru -1020 except for -1015.
- [2] Certificated gross weight for the AT-401B, 402A, and 402B is 7,000 lbs for S/N -1015 & -1021 and subs if the P/N 40059-21 main landing gear are installed.
- [3] Certificated gross weight for the AT-502 is 6,500 lbs for S/N -0001 thru -0061.
- [4] Certificated gross weight for the AT-502 is 8,000 lbs for S/N -0062 and subs.

Based on the chart above, the operator is allowed to operate the aircraft at the maximum operating weight that was demonstrated by Air Tractor and recorded in the TCDS. No logbook entry is necessary to approve operation up to these weights. These aircraft were delivered

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from the factory with a placard on the hopper that lists these maximum weights and lists the maximum hopper load.

When operating the aircraft at weights above the certificated maximum weight, the operator is responsible for the following:

1. The maximum hopper load is: 3,250 lbs for all AT-401/402 models
4,100 lbs for all AT-501/502/503/504 models
2. When operating at weights over the certificated maximum weight, the aircraft should never be flown faster than the design Maneuvering Speed, V_A , of 140 mph (CAS). This speed is 148 mph (CAS) for the AT-503 only.
3. CAM 8.10-4(b)(2) states that the aircraft *"operator is responsible for adjusting the actual operating weight to provide safe margin of performance for the existing flight conditions. Appendix A [of CAM 8] contains information from which the effects of drag, weight, altitude, and temperature on aircraft performance may be estimated."* When planning your next load, be sure to take into account density altitude, runway length/conditions, and terrain. Reduce your aircraft weight as necessary to allow for a safe flight.
4. Air Tractor recommends that the operator use caution when operating the aircraft from unfamiliar runways or at elevations higher than 1,300 ft. When operating the aircraft from any new location, it is recommended that the operator begin operations with a lightly loaded aircraft and work up to a higher weight in increments. Although a flight check is not required by CAM 8, it would be prudent for the operator to test the capabilities of the aircraft from the runway to be used. A record of this flight check can be made in the aircraft logbooks, detailing the elevation and length of the runway used.

If desired, the operator may choose to approve an operating weight higher than the weight which was demonstrated by Air Tractor. Air Tractor does not recommend this, but it may be done by following the guidance of CAM 8 and discussed on pages 3-4 of this Service Letter.

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