



**U.S. DEPARTMENT OF TRANSPORTATION**  
**FEDERAL AVIATION ADMINISTRATION**  
National Policy

**ORDER**  
**8400.34**

Effective Date:  
7/5/18

**SUBJ: Fixed-Wing External Loads in Alaska**

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This order describes Federal Aviation Administration (FAA) policy for authorizing the carriage of external loads on airplanes in Alaska as a restricted category special purpose operation. This includes eligibility requirements for the airplane and its operator, the steps for authorizing fixed-wing aircraft to carry external loads, and additional requirements for Title 14 of the Code of Federal Regulations (14 CFR) part 135 fixed-wing external load (FWEL) operations. This order also contains suggestions for operators to improve the safety of FWEL operations. This order applies to Aircraft Certification Service (AIR) and Flight Standards Service (FS) personnel, and persons designated by the Administrator.

A handwritten signature in cursive script, reading "John S. Duncan", is positioned above the printed name.

John S. Duncan  
Executive Director, Flight Standards Service

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## Chapter 1. General Information

**1. Purpose of This Order.** This order describes Federal Aviation Administration (FAA) policy for carrying external loads on airplanes and is applicable to airplane external load operations solely within the State of Alaska. This includes eligibility requirements for the airplane and the operator, the steps for approving airplane external load operations, additional requirements for operations conducted under Title 14 of the Code of Federal Regulations (14 CFR) part 135, as well as best practices for safe airplane external load operations.

**2. Audience.** The audience for this order is the Flight Standards offices within Alaska, principal inspectors (PI) outside of Alaska, Anchorage Aircraft Certification Office (ACO) personnel, and designees who issue aircraft airworthiness certificates as authorized by the Administrator.

**3. Where You Can Find This Order.** You can find this order on the MyFAA employee website at [https://employees.faa.gov/tools\\_resources/orders\\_notices](https://employees.faa.gov/tools_resources/orders_notices). Inspectors can access this order through the Flight Standards Information Management System (FSIMS) at <http://fsims.avs.faa.gov>. Operators can find this order on the FAA's website at <http://fsims.faa.gov>. This order is available to the public at [http://www.faa.gov/regulations\\_policies/orders\\_notices](http://www.faa.gov/regulations_policies/orders_notices).

**4. What This Order Cancels.** This order replaces all previous policy and guidance on airplane external load operations in Alaska.

### 5. Background.

**a. Alaskan Supplement No. 1.** On June 14, 1978, the Alaskan Supplement No. 1 to FAA Order 8130.2B, Airworthiness Certification of Aircraft and Related Approvals, was adopted. On March 22, 1993, it was approved for use by the Acting Alaska Flight Standards Division Manager, for Alaska operations only. The supplement replaced earlier policy that gave guidance to the aviation safety inspectors (ASI) on approving airplane external load operations. This policy demonstrated that, with care, diligence, and experience, airplanes can safely carry external loads unique to operations in Alaska.

**b. Previous Guidance.** Additional previous guidance on fixed-wing external loads (FWEL) included FAA Notices N 8900.272, Airplane External Load Operations Within the State of Alaska, dated August 7, 2014; and N 8900.314, Airplane External Load Operations Within the State of Alaska, dated August 12, 2015.

**c. Federal Register Notice.** On July 7, 2015, the FAA published a Federal Register Notice requesting comments on the proposed authorization of Alaskan FWEL as a new restricted category special purpose operation, pursuant to 14 CFR part 21, § 21.25(b)(7), for operations within the State of Alaska. Following the close of the comment period, Alaskan FWEL was established as a restricted category special purpose operation.

## 6. Special Purpose Operations.

**a. Restricted Category.** A restricted category special purpose operation for an aircraft must be approved under § 21.25(b). FAA Order 8110.56, Restricted Category Type Certification, describes the special purposes and special purpose operations which have been approved for aircraft to be operated in the restricted category. Restricted category aircraft are prohibited from carrying passengers.

**Note:** Title 14 CFR part 91, § 91.313(d) states that all persons on board must be flightcrew members, flightcrew member trainees, persons who perform an essential function in connection with the special purpose operation, or persons necessary to accomplish the work activity directly associated with the special purpose operation.

**b. Alaskan Fixed-Wing External Loads (FWEL) Per Order 8110.56.** As stated in Order 8110.56, Alaskan FWEL is the carriage of external loads temporarily attached to small, fixed-wing aircraft operating within the State of Alaska.

(1) Small Airplanes Only. This operation is approved only for small propeller-driven airplanes with a maximum gross weight of 12,500 pounds or less; type certificated in accordance with 14 CFR part 23 (or its predecessor regulations) in the normal, utility, or acrobatic category; and that have a valid airworthiness certificate in that category.

(2) Section 21.25(a)(1) Aircraft Only. This operation is approved only for § 21.25(a)(1) aircraft and aircraft issued an equivalent restricted category type certificate (TC). Do not approve this operation for § 21.25(a)(2) aircraft.

(3) Within the State of Alaska Only. This approval is limited to operations within the State of Alaska only. Alaska has a unique dependence on aviation for delivery of essential supplies to remote villages that are not serviced by roads or rail. The remoteness and limited transportation infrastructure means that air transportation is the only method to deliver supplies to these areas during many times of the year.

(4) Operations under this special purpose operation must be performed in conjunction with the procedures contained in this order (Order 8400.34, or its successor policy).

(5) The operating limitations issued with the airworthiness certificate must include a requirement for training in the carriage of FWEL. The pilot must have sufficient knowledge of:

- (a) External load attaching methods,
- (b) The airplane's operating limitations issued for the external load operation, and
- (c) How the external load may affect the flight characteristics of the airplane.

**Note:** Airplane Handling and Flight Characteristics: When carrying external loads, aerodynamic forces and the weight of an external load change an airplane's handling and flight characteristics. These forces can negatively affect airplane

performance (takeoff, climb, cruise, and landing), airplane stability, flight control effectiveness, vibration, fuel consumption, and engine cooling, among other characteristics. The operator must take care when selecting and mounting an external load, and must also exercise prudence to avoid operation outside the airplane's Weight and Balance (W&B) envelope and avoid aerodynamic effects that make operations unsafe.

(6) The aircraft must be operated in accordance with the gross weight and flight envelope limitations when in restricted category.

(7) Noise Requirements. Aircraft approved for Alaskan FWELs must comply with applicable requirements of 14 CFR part 36 (i.e., the basic aircraft without an external load attached).

## **7. Airplane Handling and Flight Characteristics When Carrying External Loads.**

**a. Aerodynamic Effects.** Aerodynamic forces and the weight of an external load change an airplane's handling and flight characteristics. These forces can negatively affect airplane performance (takeoff, climb, cruise, and landing), airplane stability, flight control effectiveness, vibration, fuel consumption, and engine cooling, among other characteristics. The operator must take care when selecting and mounting an external load and also exercise prudence to avoid operation outside the airplane's W&B envelope, and to avoid aerodynamic effects that make operations unsafe.

### **b. Center of Gravity (CG).**

(1) Due to the nature of airplane external loads, the longitudinal CG considerations are nominal and can be easily calculated using the manufacturers' W&B data. However, the majority of airplane external loads are more likely to effect the lateral CG. Refer to FAA-H-8083-1, Weight and Balance Handbook, for guidance on how to compute lateral and longitudinal CG.

(2) Airplane manufacturers normally do not provide lateral CG charts or limits. Therefore, it is essential to determine what effect external loads will have on the lateral CG of the airplane. An understanding of the loads effect on lateral CG could be attained prior to attaching at a specific location by consulting with pilots having previous experience with similar aircraft and configuration, or by conducting an operational flight check of the aircraft with the load installed.

**c. Load Limitations.** The maximum size and weight of the external load, as well as limitations on the positioning of the load, must be determined. The effect of the asymmetric load must be addressed when the load is carried on one side of the aircraft. The maximum asymmetric weight that can be carried may be limited due to displaced aileron authority. If significant aileron is required to compensate for an asymmetric load there may not be enough remaining for normal maneuvering in flight and/or crosswind conditions during takeoff and landing. By design, this issue would be more prominent in FWELs on floatplanes. This applies particularly when a dense load, such as lumber, is being carried.

## 8. Definitions.

**a. External Load.** As defined in 14 CFR part 1, § 1.1, an external load is a load that is carried, or extends, outside of the aircraft.

**b. Fixed-Wing External Load (FWEL).** FWEL means an external load carried on fixed-wing aircraft. For the purposes of this order, an external load may only be property and may not be persons or live animals.

**c. Restricted Category.** Restricted category, as used in this order, means the category of aircraft that are eligible to receive special (restricted) airworthiness certificates. Refer to 14 CFR part 21, §§ 21.25, 21.175, 21.185, and 21.187.

**d. Standard Category.** Standard category, as used in this order, means the category of aircraft eligible to receive Standard Airworthiness Certificates. Standard category aircraft are aircraft type certificated in the normal, utility, acrobatic, commuter, and transport categories. Refer to §§ 21.25, 21.175, and 21.183.

## 9. Abbreviations.

- 14 CFR Title 14 of the Code of Federal Regulations.
- ACO Aircraft Certification Office.
- AIR Aircraft Certification Service.
- ASI Aviation Safety Inspector.
- CG Center of Gravity.
- FAA Federal Aviation Administration.
- FS Flight Standards Service.
- FWEL Fixed-Wing External Load.
- KTS Knots.
- MPH Miles Per Hour.
- PIC Pilot in Command.
- STC Supplemental Type Certificate.
- TC Type Certificate.
- W&B Weight and Balance.

## 10. Related Guidance (current editions).

- FAA Order 8130.2, Airworthiness Certification of Aircraft.
- FAA Order 8110.56, Restricted Category Type Certification.
- Advisory Circular (AC) 20-106, Aircraft Inspection for the General Aviation Aircraft Owner.
- AC 43.13-1, Acceptable Methods, Techniques, and Practices—Aircraft Inspection and Repair.
- AC 43.13-2, Acceptable Methods, Techniques, and Practices—Aircraft Alterations.

- AC 61-98, Currency Requirements and Guidance for the Flight Review and Instrument Proficiency Check.
- FAA-H-8083-1, Weight and Balance Handbook.

**11. Directive Feedback Information.** Direct questions or comments to the Aircraft Maintenance Division at 202-267-1675. For your convenience, FAA Form 1320-19, Directive Feedback Information, is the last page of this order. Note any deficiencies found, clarifications needed, or suggested improvements regarding the contents of this order on FAA Form 1320-19.



## Chapter 2. Eligibility, Load Classification, and Authorization

**1. Airplane Eligibility.** Aircraft must meet the airplane eligibility requirements in order to be authorized to conduct any FWEL operations. An airplane eligible for the carriage of external loads must:

- Be a propeller-driven airplane type certificated in accordance with 14 CFR part 23 (or its predecessor regulations) in the normal, utility, or acrobatic category, and have a valid airworthiness certificate in that category;
- Have a maximum certificated takeoff weight of 12,500 pounds or less; and
- Be registered in the United States.

**2. Load Classification.** Depending on the load's classification, the FWEL operation can be conducted using either a Standard Airworthiness Certificate or a Special Airworthiness Certificate in the restricted category.

**a. Aircraft Alteration (Minor).** An airplane carrying an external load which is not classified as a major alteration, as defined by 14 CFR part 1, § 1.1, may conduct those operations using a Standard Airworthiness Certificate in the normal, utility, or acrobatic category. The external load must be small, lightweight, and detachable or temporarily attached. The following items have been evaluated and are typically not considered to be major alterations, as defined by § 1.1:

(1) Temporarily Attached. Items in this group are small, lightweight, and temporarily attached with bungee cords, straps, ropes, etc. Below is a list of items that are examples that may be carried under a Standard Airworthiness Certificate. For the purpose of this order, these temporarily-attached items are not considered design changes or alterations.

- Cross-country skis.
- Snowshoes.
- Rifle scabbard.
- Backpack frame.
- Small camera.
- Cans of animal repellent, such as bear spray or pepper spray.
- Fishing pole tube (diameter not to exceed 6 inches).

**Note:** These items are not considered to be installed equipment, and no further action is required. The FAA may evaluate and authorize other items that are similar in size and weight.

(2) Detachable Units. Items in this group are small, lightweight items that are detachable from their mounting hardware. The mounting hardware is a minor alteration and must be documented in the aircraft records (logbook). The detachable unit is the external load, and the aircraft may be operated when issued a Standard Airworthiness Certificate with or without the unit attached. A logbook entry is not required when the unit is detached from, or attached to, the mounting hardware. The following are examples that may be carried as detachable items that are not considered design changes or alterations:

- Small game-tracking antenna.
- Small fish-tracking antenna.

**Note:** The FAA may evaluate and authorize other items that are similar in size and weight.

**Note:** Units with integral mounting hardware that are attached permanently with brackets or bolts are minor alterations. These items are not external loads. A logbook entry is required when the unit is attached or removed from the aircraft.

**b. Aircraft Alteration (Major).**

(1) An airplane carrying an external load which is classified as a major alteration to the aircraft (as defined by § 1.1) must conduct those operations in accordance with the external load provisions which were approved as part of either:

- The aircraft's type certificate (TC);
- A Supplemental Type Certificate (STC); or
- A Special Airworthiness Certificate, in the restricted category, for the special purpose of Alaskan FWELs.

**Note:** Some STCs may only approve a fixture, such as a lumber rack, and do not specifically approve carriage of the external load. In these cases, the approval enables operators to fly the aircraft when issued a Standard Airworthiness Certificate with the empty fixture installed. To carry an external load on the fixture, the operator must operate in the restricted category under a FWEL authorization.

(2) The following examples are typical items considered to be major alterations when attached to the aircraft:

- Game antlers;
- Canoe/boat;
- Lumber/plywood; and
- Other items that might appreciably affect weight, balance, structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting the airworthiness of the airplane.

**3. Airplane Authorization.** No additional airplane authorization is required when the external load can be carried on an airplane that is operated with a Standard Airworthiness Certificate as described in subparagraph 2a. Aircraft carrying loads requiring a restricted category airworthiness certificate with the Alaskan FWEL special purpose need authorization for the airplane in the form of a Special Airworthiness Certificate (FAA Form 8130-7) in the restricted category, for the special purpose of Alaskan FWELs, along with issuance of operating limitations specific for that special purpose.

**a. Airworthiness Certificates.**

(1) The airworthiness certificate appropriate to the operations being conducted must be displayed in the aircraft in accordance with 14 CFR part 91, § 91.203(b). When operating in the restricted category, the airplane must display the restricted identification markings as required by 14 CFR part 45, § 45.23(b).

(2) In accordance with 14 CFR part 21, § 21.181(a), a termination date has been established for the restricted airworthiness certificate. The certificate will become invalid upon transfer of ownership of the airplane; the termination date of the restricted category certificate is the date of transfer to the new owner. The operating limitations, which are a part of the Special Airworthiness Certificate issued to the aircraft, require that the current aircraft owner, prior to transferring ownership of the airplane, must surrender the certificate and operating limitations to the FAA.

**b. Restricted Category.** A restricted category Special Airworthiness Certificate, for the special purpose of carrying FWELs in Alaska, may be issued if the airplane can be converted to the restricted category in accordance with §§ 21.25, 21.185, and 21.187.

(1) Section 21.25 for Restricted Category TCs. (Refer to FAA Order 8110.56, Restricted Category Type Certification.) Section 21.25 describes when a restricted category TC may be issued. Aircraft previously type certificated in a standard category, under 14 CFR part 23 (or its predecessor regulations) in the normal, utility, or acrobatic category, and having a valid airworthiness certificate in that category, can be issued restricted category certification for the Alaskan FWEL special purpose operation. Aircraft that were manufactured in accordance with the requirements of and accepted for use by an Armed Force of the United States and have been later modified for a special purpose are not eligible for the FWEL special purpose.

(a) To satisfy the regulatory requirement for a restricted category TC, before issuing an airworthiness certificate under § 21.185(b), the standard category TC together with the restricted STC are considered to be an equivalent restricted category TC. It is not necessary to issue a new restricted category TC. The two methods below are referred to as “Equivalent Restricted Category TCs.”

1. Incorporation of a restricted STC effectively moves a previously standard category aircraft into restricted category, and the aircraft can be issued a special/restricted airworthiness certificate.

2. When the modification is not a major design change, other FAA-approved data may take the place of the restricted STC. In this case, an ASI can issue the restricted category certification (i.e., field approval of data on FAA Form 337, Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance)). See Figure 3-2 for an example.

**Note:** Aircraft that have not been previously type certificated in a standard category and are type certificated in the restricted category only are ineligible to be issued an airworthiness certificate for the FWEL special purpose without an amended TC or issuance of an STC authorizing FWEL as a restricted category special purpose.

(b) Section § 21.25(b) lists types of special purpose operations. Section 21.25(b)(7) lists “any other operation specified by the FAA.” The special purpose of “Alaskan Fixed-Wing External Loads” became a special purpose following its publication in the Federal Register and the associated comment period. Order 8110.56 includes the list of special purposes that are approved under § 21.25(b)(7).

(2) Section 21.185 for Restricted Category Airworthiness Certificates. Section 21.185 allows aircraft with a restricted category TC to be issued a restricted category airworthiness certificate for the special purpose(s) for which it was certificated. This section also states the requirements to allow aircraft previously type certificated in another category to be issued a restricted airworthiness certificate.

(3) Section 21.187 for Multiple Airworthiness Certificates. An airplane certificated in the normal, utility, acrobatic, transport, or limited category may be issued multiple airworthiness certificates. Section 21.187 outlines the requirements for the issuance of a multiple airworthiness certificates.

(a) Aircraft may only be issued multiple airworthiness certificates when it has been shown that the aircraft can be converted from one category to another by removing or adding equipment by simple mechanical means.

(b) The operator of the aircraft must have the aircraft inspected by the FAA, or by a certificated mechanic with an appropriate airframe rating, to determine airworthiness each time the aircraft is converted from the restricted category to another category for the carriage of passengers for compensation or hire, unless the FAA finds this unnecessary for safety in a particular case.

**Note:** When the conversion from the restricted category Special Airworthiness Certificate to the Standard Airworthiness Certificate involves only the removal of the external load via simple attachment methods, this inspection is unnecessary. If the conversion requires maintenance or preventive maintenance actions, then the aircraft must be inspected prior to the carriage of passengers for compensation or hire.

**4. FWEL Using Multiengine Airplanes.** Multiengine airplanes present additional hazards related to FWEL operations, such as aircraft controllability and emergency procedures related to engine failures. Due to the risk associated with those hazards, carriage of external loads on multiengine aircraft is prohibited unless those items/loads comply with a TC, STC, or other FAA approved data, and any associated Airplane Flight Manual (AFM) limitations.

## Chapter 3. Airplane Certification

### 1. Certification Procedures.

**a. General Procedures.** This chapter describes the general procedures for issuing a Special Airworthiness Certificate, in the restricted category, for the purpose of Alaskan FWELs. These procedures are the responsibility of an Airworthiness ASI; however, issuance of operating limitations may require coordination with an Operations ASI.

**b. FAA Order 8130.2.** The ASI must follow the procedures for issuance of an airworthiness certificate contained in Order 8130.2, Airworthiness Certification of Aircraft. This includes following any common policy and procedures for issuing an airworthiness certificate (chapter 2), procedures specific to Special Airworthiness Certificates (chapter 4), procedures specific to Special Airworthiness Certificates in the restricted category (chapter 6), procedures for issuance of operating limitations for nonstandard aircraft (appendix D), and when applicable, procedures for issuance of multiple airworthiness certificates (chapter 7).

**2. Application.** An applicant for a restricted category Special Airworthiness Certificate must make application to the FAA. The applicant must be the aircraft owner or their authorized agent. The application package should consist of the following documents.

**a. FAA Form 8130-6.** A completed FAA Form 8130-6, Application for U.S. Airworthiness Certificate. For a FWEL, the applicant must select the restricted category special purpose of “Other”, and must specify “Alaskan Fixed-Wing External Loads.” The form should be completed as illustrated in Figure 3-1, Sample FAA Form 8130-6, Application for U.S. Airworthiness Certificate (For Multiple Airworthiness Certificate External Load).

**b. FAA Form 337.** An FAA Form 337, Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance), describing alterations made to the aircraft to support its operation in the restricted category. When applicable, instructions for converting from one category certificate to another must be included on FAA Form 337. These instructions must be referenced in the operating limitations issued to the aircraft. A completed example is shown in Figure 3-2, Sample FAA Form 337, Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance) (For Equivalent Restricted Category Type Certificate). The applicant will leave Section 6, Conformity Statement, and Section 7, Approval for Return to Service, blank.

### 3. Inspect the Aircraft.

**a. Inspection Requirements.** Title 14 CFR part 21, § 21.185 requires the aircraft to be inspected by the FAA, found to be in a good state of preservation and repair, and in a condition for safe operation to be eligible for a restricted category Special Airworthiness Certificate. Order 8130.2, Chapter 2, Common Policies and Procedures for Issuing an Airworthiness Certificate, outlines requirements for a physical inspection of the aircraft for issuance of an airworthiness certificate.

**b. Aircraft on 14 CFR Part 135 Operations Specifications (OpSpecs).** A part 135 operator that is authorized to use an Approved Aircraft Inspection Program (AAIP) (OpSpec D073) or a Continuous Airworthiness Maintenance Program (CAMP) (OpSpec D072)

must determine if there are any additional inspection requirements for the aircraft and/or its maintenance personnel, identify those requirements within its program, and submit its revised program for approval and/or authorization for use.

**4. Forms Review and Completion.** The FAA Airworthiness inspector must review and complete the following forms:

**a. FAA Form 337.** The inspector will review the submitted form and any attached or referenced data to ensure any alterations to the aircraft are appropriately described, including any conversion procedures, for the restricted category and then complete the form by signing Block 7, Approval for Return to Service. The signed FAA Form 337, plus the original type certificate (TC), constitute an equivalent restricted category TC for that airplane for the carriage of external loads (see Figure 3-2).

**b. FAA Form 8130-6.** The inspector must review the form for completeness and accuracy and complete sections V and VIII, with respect to the certification as appropriate (see Figure 3-1).

**5. Certificate Issuance.** The FAA Airworthiness inspector must complete the following for certificate issuance.

**a. FAA Form 8130-7.** The inspector must complete FAA Form 8130-7, Special Airworthiness Certificate, issued in the restricted category for the special purpose of “Alaskan Fixed-Wing External Loads” (see Figure 3-3, Sample FAA Form 8130-7, Special Airworthiness Certificate (Issued in the Restricted Category for FWEL)).

**Note:** Aircraft may only be issued multiple airworthiness certificates when it has been shown that the aircraft can be converted from one category to another by removing or adding equipment by simple mechanical means.

**b. Operating Limitations.** The inspector must determine the applicability of each operating limitation and issue the appropriate operating limitations, as outlined in Table 3-1, Airplane Restricted Category External Load Operating Limitations, for a restricted category airplane conducting external loads. Some operating limitations may require additional information or limitations to be entered by the inspector. The operating limitations are a part of FAA Form 8130-7, are to be carried in the aircraft at all times, and must be available to the pilot in command (PIC) of the aircraft (see Table 3-1). The operating limitations will either be listed as part of FAA Form 8130-7 when created using the fillable PDF version (see Figure 3-3), or they may be referenced on FAA Form 8130-7 and listed on a separate sheet.

**c. Logbook Entry.**

(1) After completion of the certification steps, the issuing Airworthiness inspector will make the following, or similarly worded, statement:

“I find that this airplane meets the requirements for the certification requested and have issued a Special Airworthiness Certificate and operating limitations dated \_\_\_\_\_. The next inspection is due \_\_\_\_\_.  
Signed: Jon Smith, Aviation Safety Inspector, AL-01.”

(2) The entry for the next inspection due will vary depending on the specific inspection requirements applicable to the aircraft and/or selected by the aircraft operator under 14 CFR part 91, § 91.409. The intent is to ensure that the aircraft’s next inspection is accomplished based on the previously accomplished inspection that was of similar scope and detail to an annual inspection, and not based on the FAA inspection that was conducted for the issuance of the restricted category airworthiness certificate. The inspector must refer to the aircraft’s maintenance records to determine when the next inspection is due.

**d. Distribution of Copies.** The forms and copies will be distributed as follows:

(1) Applicant. Provide the applicant with the following:

- Original FAA Form 337 completed by the FAA.
- Issued FAA Form 8130-7, Special Airworthiness Certificate.
- Issued operating limitations.

(2) Aircraft Registration Branch. Send the following documents to the Aircraft Registration Branch:

- Original FAA Form 8130-6 (application).
- A copy of FAA Form 337 completed by the FAA.
- A copy of issued FAA Form 8130-7 (airworthiness certificate).
- A copy of the issued operating limitations.

(3) Local FAA Flight Standards District Office (FSDO)/Certificate-Holding District Office (CHDO). Retain a copy of each document in the FSDO/CHDO files.

**Table 3-1. Airplane Restricted Category External Load Operating Limitations**

No.	Notes/ Applicability	Operating Limitation
1	All nonstandard aircraft; Order 8130.2, Appendix D	This aircraft does not meet the airworthiness standards of Annex 8 to the Convention on International Civil Aviation. Operations in airspace outside of the United States will require the permission of the applicable foreign authority. That permission must be carried aboard the aircraft together with this U.S. airworthiness certificate and, upon request, be made available to an FAA inspector or the applicable foreign authority in the country of operation. Operations may be further restricted by the applicable foreign authority. This may include not allowing use of an airport, requiring specific routing, and restricting flight over specific areas. The operator must comply with any additional limitation prescribed by the applicable foreign authority when operating in its airspace.
2	All nonstandard aircraft; Order 8130.2, Appendix D	These operating limitations do not provide any relief from any applicable law or regulation. This aircraft must be operated per applicable regulations and the additional limitations prescribed herein. Note that a clearance from air traffic control (ATC) is not authorization for a pilot to deviate from any rule, regulation, operating limitation, or minimum altitude, or to conduct unsafe operation of the aircraft. If ATC issues a clearance that would cause a pilot to deviate from a rule, regulation, or operating limitation, or in the pilot's opinion, would place the aircraft in jeopardy, it is the pilot's responsibility to request an amended clearance. These operating limitations are a part of FAA Form 8130-7 and are to be carried in the aircraft at all times and to be available to the pilot in command (PIC) of the aircraft.
3	All nonstandard aircraft; Order 8130.2, Appendix D	Application to amend these operating limitations must be made to the local Flight Standards District Office (FSDO) or Manufacturing Inspection District Office (MIDO).
4	Applicable to aircraft having multiple airworthiness certificates; Order 8130.2, Appendix D	<p>Conversion from one category certificate to the other must be accomplished per <i>[reference the applicable instructions (dated)]</i>.</p> <p>Each conversion from one category certificate to the other must be documented via a maintenance record entry. The entry must include:</p> <ul style="list-style-type: none"> <li>• A description of the work performed,</li> <li>• The date of completion of the work,</li> <li>• The signature, certificate number, and certificate type of the person making the conversion.</li> </ul>
5	Applicable to aircraft having multiple airworthiness certificates.	<p>The operator of this aircraft must have the aircraft inspected by the FAA, or by a certificated mechanic with an appropriate airframe rating, to determine airworthiness each time the aircraft is converted from the restricted category to another category <b>for the carriage of passengers for compensation or hire.</b></p> <p>Note: When the conversion from the restricted category Special Airworthiness Certificate to the Standard Airworthiness Certificate involves only the removal of the external load via simple attachment methods, this inspection is unnecessary. If the conversion requires maintenance or preventive maintenance actions, then the aircraft must be inspected prior to the carriage of passengers for compensation or hire.</p>



No.	Notes/ Applicability	Operating Limitation
6	Aircraft that may be equipped with operational, jettisonable stores; Order 8130.2, Appendix D	When equipped with operational jettisonable stores, flight operations are restricted to areas that meet § 91.305 and flight over densely populated areas is prohibited at all times.
7	FWEL	This airplane is issued a restricted category airworthiness certificate for the carriage of external loads. The restricted category airworthiness certificate associated with these operating limitations is valid only when the airplane is operated within the State of Alaska. This airplane must not be operated in the restricted category for other than the special purpose for which it was certificated.
8	FWEL	<p>No person may operate a restricted category civil aircraft carrying persons onboard except for the following:</p> <ul style="list-style-type: none"> <li>a) Flightcrew member;</li> <li>b) Flightcrew member trainee;</li> <li>c) Person(s) performing essential functions in connection with the carriage of the external load for which the airplane is certificated; or</li> </ul> <p>Note: An observer on board the aircraft to monitor the external load during flight is performing an essential function associated with the special purpose and is permitted to be onboard the aircraft during the flight.</p> <ul style="list-style-type: none"> <li>d) Person(s) necessary to accomplish the work activity directly associated with the special purpose.</li> </ul> <p>Note: Person(s) essential to loading and/or unloading the external load may be permitted to be onboard the aircraft during flight.</p>
9	FWEL	<p>The PIC operating the airplane with an external load must:</p> <ul style="list-style-type: none"> <li>a) Hold a private, commercial, or Airline Transport Pilot (ATP) Certificate, with appropriate ratings and currency for the airplane type and operation. Part 135 operations require a commercial or ATP certificate.</li> <li>b) Have at least 250 hours of flight time.</li> <li>c) Have at least 50 hours as PIC in the make and model airplane used for the external load.</li> <li>d) Have training that ensures adequate knowledge of: <ul style="list-style-type: none"> <li>1) External load attaching methods;</li> <li>2) The airplane operating limitations issued for the external load operation; and</li> <li>3) How the external load may affect the flight characteristics of the airplane.</li> </ul> </li> <li>e) Operate the airplane in accordance with these operating limitations when in the restricted category.</li> </ul>
10	FWEL	Takeoffs and landings will be made to provide the least possible exposure to people and property on the ground. Takeoff, landing, and en route flight paths will be planned so that any inadvertent or accidental release of the external load will not present a hazard to persons or property on the surface.
11	FWEL	No flights will be made over densely populated areas or in a congested airway.


No.	Notes/ Applicability	Operating Limitation
12	FWEL	Except for takeoffs and landings, operations must not be conducted near a busy airport where passenger transport operations are conducted.
13	FWEL	When airplanes with external loads are being operated to and from tower-controlled airports, the PIC must advise the tower that the airplane is operating in the restricted category and clearance over densely populated areas cannot be accepted.
14	FWEL; Issue if limiting operations to a specific departure and/or approach direction.	For operations to and from <u>[enter airport designator or name]</u> , all takeoffs and landings must be made toward <u>[enter limitations]</u> .
15	FWEL	<p><b>FWEL Operational Flight Check.</b></p> <p>It is the responsibility of the PIC conducting the operation to ensure that the external load is properly secured to prevent it from shifting or coming loose during flight.</p> <p>It is also the responsibility of the PIC conducting the operation to ensure that the airplane is safely controllable and has no adverse flight characteristics while carrying an external load. This determination must be made by conducting a flight check of the airplane with the external loads that will be carried. The results and operating parameters of the check must be recorded in the airplane records as required by operating limitation #17.</p> <p>Note: If the FWEL operational flight check is satisfactory, the pilot may continue to the destination and record the results of the flight check immediately after landing.</p> <p>A FWEL operational flight check is not required if:</p> <ul style="list-style-type: none"> <li>• The airplane has previously carried the same (or similar) external load configuration,</li> <li>• The PIC requirements of operating limitation #16 are met, and</li> <li>• The results and parameters required by operating limitation #17 have been documented in the aircraft's maintenance records.</li> </ul> <p>Note: An external load configuration is considered similar if the external load size, weight, drag, attachment location, and attachment means are approximately the same as the previous load.</p>
16	FWEL	<p>If the PIC conducting the operation changes, or if there are changes/alterations to the external load, attaching means, and/or to the airplane which may affect the flight characteristics, the FWEL operational flight check must be conducted and recorded again.</p> <p>Note: For part 135 operations, the FWEL operational flight check does not need to be conducted again for a PIC change as long as:</p> <ul style="list-style-type: none"> <li>• Each PIC has been trained in accordance with the certificate holders approved training program;</li> <li>• Each PIC follows the FWEL procedures established by the certificate holder; and</li> <li>• Prior to conducting the flight the new PIC receives, as a minimum, the FWEL operational flight check information that is required to be recorded in the airplane records.</li> </ul>

No.	Notes/ Applicability	Operating Limitation
17	FWEL	<p><b>Recording of the FWEL Operational Flight Check.</b></p> <p>Upon completion of a satisfactory flight check, the following information must be recorded in the airplane's maintenance records by the PIC conducting the check:</p> <ul style="list-style-type: none"> <li>• Airplane N-Number.</li> <li>• Date of flight check.</li> <li>• Description of external load configuration (i.e., type of load, weight of load, location installed).</li> <li>• Air turbulence (i.e., non, light, moderate, or severe).</li> <li>• Airspeed range (i.e., mph or kts).</li> <li>• Max takeoff flap setting (i.e., degrees).</li> <li>• Max landing flap setting (i.e., degrees).</li> <li>• Observed rate of climb (i.e., feet per minute).</li> <li>• Increase in takeoff distance (i.e., (Negligible &lt;5%), (Minimal 5-15%), (Moderate 15-25%), (Significant &gt;25%)).</li> <li>• Additional observations or adverse effects, if any.</li> <li>• Pilot's name, signature, certificate number, and certificate type.</li> </ul> <p>Note: If the FWEL operational flight check is satisfactory, the pilot may continue to the destination and record the results of the flight check immediately after landing.</p>
18	FWEL	Operations following a satisfactory FWEL operational flight check must not be conducted at speeds exceeding that for which safe controllability has previously been demonstrated during an operational check flight and logged as described in limitation #17 above.
19	FWEL	Intentional spins and slips are prohibited.
20	FWEL	The gross weight and operating limitations of the airplane must not be exceeded.
21	FWEL	The maximum bank angle during external load carriage must not exceed 30 degrees.
22	FWEL	The word "restricted" must be displayed on the airplane near each entrance to the cabin or cockpit in letters not less than 2 inches nor more than 6 inches in height.
23	FWEL; Issue as applicable to aircraft equipment and load configuration.	External load operations with this airplane are to be conducted under visual flight rules (VFR) <u>[insert "day" or "day/night"]</u> operation only.
24	FWEL	This restricted category Special Airworthiness Certificate will become invalid upon transfer of ownership of the airplane. The aircraft owner, prior to transferring ownership of the airplane, must surrender the certificate and operating limitations to the nearest FSDO.

**Figure 3-1. Sample FAA Form 8130-6, Application for U.S. Airworthiness Certificate  
(Front Side)  
(For Multiple Airworthiness Certificate External Load)**

FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No.  
2120-0018 Expiration Date 01/31/2021

 U.S. Department of Transportation Federal Aviation Administration		<b>APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE</b>		<b>INSTRUCTIONS</b> - Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use attachment. For special flight permits complete Sections II, VI, and VII as applicable.		
I. AIRCRAFT DESCRIPTION	1. REGISTRATION MARK N12345	2. AIRCRAFT BUILDER'S NAME (Make) Piper Aircraft, Inc.	3. AIRCRAFT MODEL DESIGNATION PA-18-150	4. YR. MFR. 1964	FAA CODING	
	5. AIRCRAFT SERIAL NO. 18-12345	6. ENGINE BUILDER'S NAME (Make) Lycoming	7. ENGINE MODEL DESIGNATION O-320			
	8. NUMBER OF ENGINES 1	9. PROPELLER BUILDER'S NAME (Make) Sensenich	10. PROPELLER MODEL DESIGNATION M74D		11. AIRCRAFT IS (Check if applicable) IMPORT	
II. CERTIFICATION REQUESTED	APPLICATION IS HEREBY MADE FOR: (Check applicable items)					
	A <input checked="" type="checkbox"/> 1 STANDARD AIRWORTHINESS CERTIFICATE (Indicate category) <input checked="" type="checkbox"/> NORMAL <input type="checkbox"/> UTILITY <input type="checkbox"/> ACROBATIC <input type="checkbox"/> TRANSPORT <input type="checkbox"/> COMMUTER <input type="checkbox"/> BALLOON <input type="checkbox"/> OTHER					
	B <input checked="" type="checkbox"/> SPECIAL AIRWORTHINESS CERTIFICATE (Check appropriate items)					
	7	PRIMARY				
	9	LIGHT-SPORT (Indicate Class) <input type="checkbox"/> Airplane <input type="checkbox"/> Power-Parachute <input type="checkbox"/> Weight-Shift-Control <input type="checkbox"/> Glider <input type="checkbox"/> Lighter than Air				
	2	LIMITED				
	5	PROVISIONAL (Indicate class) <input type="checkbox"/> CLASS I <input type="checkbox"/> CLASS II				
	3	<input checked="" type="checkbox"/> RESTRICTED (Indicate operation(s) to be conducted)				
	1	AGRICULTURE AND PEST CONTROL				
	2	AERIAL SURVEY				
	3	AERIAL ADVERTISING				
	4	FOREST (Wildlife conservation)				
	5	PATROLLING				
	6	WEATHER CONTROL				
	0	<input checked="" type="checkbox"/> OTHER (Specify) Alaskan Fixed-Wing External Loads				
4	1 RESEARCH AND DEVELOPMENT					
	2 AMATEUR BUILT					
	3 EXHIBITION					
	4 AIR RACING					
	5 CREW TRAINING					
	6 MARKET SURVEY					
	0 TO SHOW COMPLIANCE WITH THE CFR					
	7 OPERATING (Primary Category) KIT BUILT AIRCRAFT					
	8A Existing aircraft without an airworthiness certificate & do not meet § 103.1					
	8B Operating Light-Sport Kit-built					
8C Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.190						
9	9A RESEARCH AND DEVELOPMENT					
	9B MARKET SURVEY					
	9C CREW TRAINING					
8	1 FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE, OR STORAGE					
	2 EVACUATE FROM AREA OF IMPENDING DANGER					
	OPERATION IN EXCESS OF MAXIMUM CERTIFICATED TAKE-OFF WEIGHT					
	DELIVERING OR EXPORTING					
	5 PRODUCTION FLIGHT TESTING					
6 CUSTOMER DEMONSTRATION FLIGHTS						
C	<input checked="" type="checkbox"/> 6 MULTIPLE AIRWORTHINESS CERTIFICATE (Check ABOVE "Restricted Operation" and "Standard" or "Limited" as applicable)					
III. OWNER'S CERTIFICATION	A. REGISTERED OWNER (As shown on certificate of aircraft registration)					
	NAME James Johnson		ADDRESS 2002 W. 33rd Avenue, Anchorage, Alaska 99518			
	B. AIRCRAFT CERTIFICATION BASIS (Check applicable blocks and complete items as indicated)					
	<input checked="" type="checkbox"/> AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET (Give No. and Revision No.) 1A2, Rev. 38		<input checked="" type="checkbox"/> AIRWORTHINESS DIRECTIVES (Check if all applicable ADs are complied with and give the number of the last AD SUPPLEMENT available in the biweekly series as of the date of application) 2018-06			
	<input checked="" type="checkbox"/> AIRCRAFT LISTING (Give page number(s)) N/A		<input checked="" type="checkbox"/> SUPPLEMENTAL TYPE CERTIFICATE (List number of each STC incorporated) N/A			
	C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS					
	<input checked="" type="checkbox"/> CHECK IF RECORDS IN COMPLIANCE WITH 14 CFR section 91.417		TOTAL AIRFRAME HOURS 653		3 EXPERIMENTAL ONLY (Enter hours flown since last certificate issued or renewed)	
	D. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.					
	DATE OF APPLICATION 03/19/2018		NAME AND TITLE (Print or type) James Johnson - Owner		SIGNATURE /James Johnson/	
	A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY: (Complete the section only if 14 CFR part 21.183(d) applies)					
IV. INSPECTION AGENCY VERIFICATION	2	14 CFR part 121 CERTIFICATE HOLDER (Give Certificate No.)	3	CERTIFICATED MECHANIC (Give Certificate No.)	6	CERTIFICATED REPAIR STATION (Give Certificate No.)
	5	AIRCRAFT MANUFACTURER (Give name or firm)				
	DATE		TITLE		SIGNATURE	
V. FAA REPRESENTATIVE CERTIFICATION	(Check ALL applicable block items A and B)					
	A. I find that the aircraft described in Section I or VII meets requirements for <input checked="" type="checkbox"/> THE CERTIFICATE REQUESTED <input type="checkbox"/> AMENDMENT OR MODIFICATION OF CURRENT AIRWORTHINESS CERTIFICATE					
	B. Inspection for a special flight permit under Section VII was conducted by:					
	FAA INSPECTOR		FAA DESIGNEE			
	CERTIFICATE HOLDER UNDER		14 CFR part 65			
			14 CFR part 121 OR 135			
DATE 03/27/2018		MIDO/FSDO OFFICE FSDO AL-01		FAA INSPECTOR'S SIGNATURE or DESIGNEE'S SIGNATURE AND NO. /John H. Jones/ John H. Jones		
				FAA INSPECTOR'S CERTIFICATION FILE REVIEW SIGNATURE /John H. Jones/ John H. Jones		

**Figure 3-1. Sample FAA Form 8130-6, Application for U.S. Airworthiness Certificate  
(Reverse Side)  
(For Multiple Airworthiness Certificate External Load)**

VI. PRODUCTION FLIGHT TESTING	A. MANUFACTURER			
	NAME		ADDRESS	
	B. PRODUCTION BASIS <i>(Check applicable item)</i>			
	<input type="checkbox"/> PRODUCTION CERTIFICATE <i>(Give production certificate number)</i> <input type="checkbox"/> TYPE CERTIFICATE <input type="checkbox"/> OTHER:			
	C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS			
DATE OF APPLICATION		NAME AND TITLE <i>(Print or type)</i>		SIGNATURE
VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST	A. DESCRIPTION OF AIRCRAFT			
	REGISTERED OWNER		ADDRESS	
	BUILDER <i>(Make)</i>		MODEL	
	SERIAL NUMBER		REGISTRATION MARK	
	B. DESCRIPTION OF FLIGHT <span style="float:right">CUSTOMER DEMONSTRATION FLIGHTS <input type="checkbox"/> <i>(Check if applicable)</i></span>			
	FROM		TO	
	VIA		DEPARTURE DATE	DURATION
	C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT			
	<input type="checkbox"/> PILOT	<input type="checkbox"/> CO-PILOT	<input type="checkbox"/> FLIGHT ENGINEER	<input type="checkbox"/> OTHER <i>(Specify)</i>
	D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINESS REQUIREMENTS AS FOLLOWS:			
	E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION: <i>(Use attachment if necessary)</i>			
	F. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 <u>et seq.</u> and applicable Federal Aviation Regulations; and that the aircraft has been inspected and is safe for the flight described.			
	DATE		NAME AND TITLE <i>(Print or type)</i>	
VIII. AIRWORTHINESS DOCUMENTATION <i>(FAA/DESIGNEE use only)</i>	<input checked="" type="checkbox"/>	A. Operating Limitations and Markings in Compliance With 14 CFR Section 91.9, As Applicable		G. Statement of Conformity, FAA Form 8130-9 <i>(Attach when required)</i>
	<input checked="" type="checkbox"/>	B. Current Operating Limitations Attached		H. Foreign Airworthiness Certification for Import Aircraft <i>(Attach when required)</i>
	<input type="checkbox"/>	C. Data, Drawings, Photographs, etc. <i>(Attach when required)</i>		I. Previous Airworthiness Certificate Issued in Accordance With 14 CFR Section _____ CAR _____ <i>(Original attached)</i>
	<input checked="" type="checkbox"/>	D. Current Weight and Balance Information Available in Aircraft		J. Current Airworthiness Certificate Issued in Accordance With 14 CFR Section 21.185(b), 21.187 <i>(Copy attached)</i>
	<input checked="" type="checkbox"/>	E. Major Repair and Alteration, FAA Form 337 <i>(Attach when required)</i>		K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 <i>(Attach when required)</i>
	<input checked="" type="checkbox"/>	F. This inspection Recorded in Aircraft Records		



**Figure 3-2. Sample FAA Form 337, Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance)  
(Front Side)  
(For Equivalent Restricted Category Type Certificate)**

 US Department of Transportation Federal Aviation Administration		<b>MAJOR REPAIR AND ALTERATION</b> <b>(Airframe, Powerplant, Propeller, or Appliance)</b>		OMB No. 2120-0020 Exp: 5/31/2018	Electronic Tracking Number  
		For FAA Use Only			
INSTRUCTIONS: Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))					
1. Aircraft	Nationality and Registration Mark N12345		Serial No. 18-12345		
	Make Piper Aircraft Inc.		Model PA-18-150	Series	
2. Owner	Name (As shown on registration certificate) James Johnson		Address (As shown on registration certificate) Address 2002 W. 33rd Avenue		
			City Anchorage State Alaska		
			Zip 99518 Country United States		
3. For FAA Use Only  This FAA Form 337, plus the original type certificate, constitutes the restricted category type certificate for this airplane for the carriage of external loads.					
4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input type="checkbox"/>	AIRFRAME	Piper Aircraft Inc.	(As described in Item 1 above)	18-12345
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type		
			Manufacturer		
6. Conformity Statement					
A. Agency's Name and Address			B. Kind of Agency		
Name			U. S. Certified Mechanic		Manufacturer
Address			Foreign Certified Mechanic		C. Certificate No.
City State			Certificated Repair Station		
Zip Country			Certificated Maintenance Organization		
D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.					
Extended range fuel per 14 CFR Part 43 App. B <input type="checkbox"/>		Signature/Date of Authorized Individual			
7. Approval for Return to Service					
Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Rejected					
BY	<input checked="" type="checkbox"/>	FAA Flt. Standards Inspector	Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport
		FAA Designee	Repair Station	Inspection Authorization	Other (Specify)
Certificate or Designation No. AL-01		Signature/Date of Authorized Individual /John H. Jones/ John H. Jones 27 MAR 2018			

**Figure 3-2. Sample FAA Form 337, Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance)  
(Reverse Side)  
(For Equivalent Restricted Category Type Certificate)**

NOTICE	
<i>Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.</i>	
<b>8. Description of Work Accomplished</b> <i>(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)</i>	
<div style="border-bottom: 1px solid black; display: inline-block; width: 150px;">N12345</div> <small>Nationality and Registration Mark</small>	<div style="border-bottom: 1px solid black; display: inline-block; width: 100px;">27 Mar 2018</div> <small>Date</small>
<p>External loads will be temporarily attached to the aircraft. For each load, the aircraft weight and balance envelope and any aerodynamic effects will be considered to ensure safe operation of the aircraft.</p> <p>No permanent alteration of the aircraft has been made, therefore Item 6 need not be completed.</p> <p>Conversion from one category airworthiness certificate to the other must be accomplished per N12345 Conversion Instructions dated 02/21/2018.</p> <p>Refer to issued Operating Limitations when operating the aircraft in the Restricted Category. Operating Limitations are a part of FAA Form 8130-7, Special Airworthiness Certificate, and are to be carried in the aircraft at all times and to be available to the pilot in command of the aircraft.</p>	
<input type="checkbox"/> Additional Sheets Are Attached	

**Figure 3-3. Sample FAA Form 8130-7, Special Airworthiness Certificate  
(Page 1 of 4)  
(Issued in the Restricted Category for FWEL)**

UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION-FEDERAL AVIATION ADMINISTRATION <b>SPECIAL AIRWORTHINESS CERTIFICATE</b>			
CATEGORY/DESIGNATION Restricted			
PURPOSE Alaskan Fixed-Wing External Loads			
MANU-FACTURER	NAME	N/A	
	ADDRESS	N/A	
FLIGHT	FROM	N/A	
	TO	N/A	
N 12345	MODEL	PA-18-150	SERIAL NO. 18-12345
BUILDER Piper Aircraft Inc.			DATE OF ISSUANCE 27 Mar 2018
Unless sooner surrendered, suspended, revoked, or the termination date of (see operating limitations), this airworthiness certificate is effective under the conditions prescribed in 14 CFR, Part 21, Section 21.181 or 21.217.			
SIGNATURE OF FAA REPRESENTATIVE  John H. Jones /John H. Jones/			DESIGNATION OR OFFICE NO.  AL-01
<small>This airworthiness certificate is issued under the authority of Title 49 United States Code 44704 and Title 14 Code of Federal Regulations. Any alteration, misuse or reproduction for a fraudulent purpose of this certificate may be punishable by certificate revocation, fine, and / or imprisonment. THIS PORTION OF THE CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT PER THE APPLICABLE REGULATIONS.</small>			

*-- Conditions and Limitations --*

1. This aircraft does not meet the airworthiness standards of Annex 8 to the Convention on International Civil Aviation. Operations in airspace outside of the United States will require the permission of the applicable foreign authority. That permission must be carried aboard the aircraft together with this U.S. airworthiness certificate and, upon request, be made available to an FAA inspector or the applicable foreign authority in the country of operation. Operations may be further restricted by the applicable foreign authority. This may include not allowing use of an airport, requiring specific routing, and restricting flight over specific areas. The operator must comply with any additional limitation prescribed by the applicable foreign authority when operating in its airspace.
2. These operating limitations do not provide any relief from any applicable law or regulation. This aircraft must be operated per applicable regulations and the additional limitations prescribed herein. Note that a clearance from air traffic control (ATC) is not authorization for a pilot to deviate from any rule, regulation, operating limitation, or minimum altitude, or to conduct unsafe operation of the aircraft. If ATC issues a clearance that would cause a pilot to deviate from a rule, regulation, or operating limitation, or in the pilot's opinion, would place the aircraft in jeopardy, it is the pilot's responsibility to request an amended clearance. These operating limitations are a part of FAA Form 8130-7 and are to be carried in the aircraft at all times and to be available to the pilot in command of the aircraft.
3. Application to amend these operating limitations must be made to the local Flight Standards District Office (FSDO) or Manufacturing Inspection District Office (MIDO).
4. Conversion from one category certificate to the other must be accomplished per N12345 Conversion Instructions dated 02/21/2018. Each conversion from one category certificate to the other must be documented via a maintenance record entry. The entry must include:
  - A description of the work performed,
  - The date of completion of the work,
  - The signature, certificate number, and certificate type of the person making the conversion.



**Figure 3-3. Sample FAA Form 8130-7, Special Airworthiness Certificate  
(Page 2 of 4)  
(Issued in the Restricted Category for FWEL)**

5. The operator of this aircraft must have the aircraft inspected by the FAA, or by a certificated mechanic with an appropriate airframe rating, to determine airworthiness each time the aircraft is converted from the restricted category to another category for the carriage of passengers for compensation or hire.  
*Note:* When the conversion from the restricted category Special Airworthiness Certificate to the Standard Airworthiness Certificate involves only the removal of the external load via simple attachment methods, this inspection is unnecessary. If the conversion requires maintenance or preventive maintenance actions, then the aircraft must be inspected prior to the carriage of passengers for compensation or hire.
6. Not Issued.
7. This airplane is issued a restricted category airworthiness certificate for the carriage of external loads. The restricted category airworthiness certificate associated with these operating limitations is valid only when the airplane is operated within the state of Alaska. This airplane must not be operated in the restricted category for other than the special purpose for which it was certificated.
8. No person may operate a restricted category civil aircraft carrying persons onboard except for the following:
  - a. Flightcrew member;
  - b. Flightcrew member trainee;
  - c. Person(s) performing essential functions in connection with the carriage of the external load for which the airplane is certificated; or  
*Note:* An observer on board the aircraft to monitor the external load during flight is performing an essential function associated with the special purpose and is permitted to be onboard the aircraft during the flight.
  - d. Person(s) necessary to accomplish the work activity directly associated with the special purpose.  
*Note:* Person(s) essential to loading and/or unloading the external load may be permitted to be onboard the aircraft during flight.
9. The PIC operating the airplane with an external load must:
  - a. Hold a private, commercial, or Airline Transport Pilot (ATP) certificate, with appropriate ratings and currency for the airplane type and operation. Part 135 operations require a commercial or ATP certificate.
  - b. Have at least 250 hours of flight time.
  - c. Have at least 50 hours as PIC in the make and model airplane used for the external load.
  - d. Have training that ensures adequate knowledge of:
    - 1) External load attaching methods;
    - 2) The airplane operating limitations issued for the external load operation; and
    - 3) How the external load may affect the flight characteristics of the airplane.
  - e. Operate the airplane in accordance with these operating limitations when in the restricted category.
10. Takeoffs and landings will be made to provide the least possible exposure to people and property on the ground. Takeoff, landing, and en route flight paths will be planned so that any inadvertent or accidental release of the external load will not present a hazard to persons or property on the surface.
11. No flights will be made over densely populated areas or in a congested airway.
12. Except for takeoffs and landings, operations must not be conducted near a busy airport where passenger transport operations are conducted.
13. When airplanes with external loads are being operated to and from tower-controlled airports, the PIC must advise the tower that the airplane is operating in the restricted category and clearance over densely populated areas cannot be accepted.

**Figure 3-3. Sample FAA Form 8130-7, Special Airworthiness Certificate  
(Page 3 of 4)  
(Issued in the Restricted Category for FWEL)**

14. Not issued.

**15. FWEL Operational Flight Check.**

It is the responsibility of the PIC conducting the operation to ensure that the external load is properly secured to prevent it from shifting or coming loose during flight.

It is also the responsibility of the PIC conducting the operation to ensure that the airplane is safely controllable and has no adverse flight characteristics while carrying an external load. This determination must be made by conducting a flight check of the airplane with the external loads that will be carried. The results and operating parameters of the check must be recorded in the airplane records as required by operating limitation #17.

*Note:* If the FWEL operational flight check is satisfactory, the pilot may continue to the destination and record the results of the flight check immediately after landing.

A FWEL operational flight check is not required if:

- The airplane has previously carried the same (or similar) external load configuration,
- The PIC requirements of operating limitation #16 are met, and
- The results and parameters required by operating limitation #17 have been documented in the aircraft's maintenance records.

*Note:* An external load configuration is considered similar if the external load size, weight, drag, attachment location and attachment means are approximately the same as the previous load.

16. If the PIC conducting the operation changes, or if there are changes/alterations to the external load, attaching means, and/or to the airplane which may affect the flight characteristics, the FWEL operational flight check must be conducted and recorded again.

*Note:* For part 135 operations, the FWEL operational flight check does not need to be conducted again for a PIC change as long as:

- Each PIC has been trained in accordance with the certificate holders approved training program
- Each PIC follows the FWEL procedures established by the certificate holder and
- Prior to conducting the flight the new PIC receives, as a minimum, the FWEL operational flight check information that is required to be recorded in the airplane records.

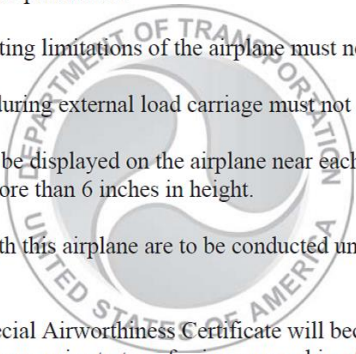
**17. Recording of the FWEL Operational Flight Check.**

Upon completion of a satisfactory flight check, the following information must be recorded in the airplane's maintenance records by the PIC conducting the check.

- Airplane N-Number.
- Date of flight check.
- Description of external load configuration (i.e., type of load, weight of load, location installed).
- Air turbulence (i.e., non, light, moderate, or severe).
- Airspeed range (i.e., mph or kts).
- Max takeoff flap setting (i.e., degrees).
- Max landing flap setting (i.e., degrees).
- Observed rate of climb (i.e., feet per minute).
- Increase in takeoff distance (i.e., (Negligible <5%), (Minimal 5-15%), (Moderate 15-25%), (Significant >25%)).
- Additional observations or adverse effects, if any.
- Pilot's name, signature, certificate number, and certificate type.

*Note:* If the FWEL operational flight check is satisfactory, the pilot may continue to the destination and record the results of the flight check immediately after landing.

**Figure 3-3. Sample FAA Form 8130-7, Special Airworthiness Certificate  
(Page 4 of 4)  
(Issued in the Restricted Category for FWEL)**

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18. Operations following a satisfactory FWEL operational flight check must not be conducted at speeds exceeding that for which safe controllability has previously been demonstrated during an operational check flight and logged as described in limitation #17 above.
  19. Intentional spins and slips are prohibited.
  20. The gross weight and operating limitations of the airplane must not be exceeded.
  21. The maximum bank angle during external load carriage must not exceed 30 degrees.
  22. The word "restricted" must be displayed on the airplane near each entrance to the cabin or cockpit in letters not less than 2 inches nor more than 6 inches in height.
  23. External load operations with this airplane are to be conducted under visual flight rules (VFR) *day* operation only.
  24. This restricted category Special Airworthiness Certificate will become invalid upon transfer of ownership of the airplane. The aircraft owner, prior to transferring ownership of the airplane, must surrender the certificate and operating limitations to the nearest FSDO.



## Chapter 4. FWEL Operational Requirements

**1. Airplane Handling and Flight Characteristics.** Aerodynamic forces and the weight of an external load change an airplane's handling and flight characteristics. These forces can negatively affect airplane performance (takeoff, climb, cruise, and landing), airplane stability, flight control effectiveness, vibration, fuel consumption, and engine cooling, among other characteristics.

**a. Safety Precautions.** The operator must take care when selecting and mounting an external load and also exercise prudence to avoid operation outside the airplane's Weight and Balance (W&B) center of gravity (CG) envelope, and to avoid aerodynamic effects that make operations unsafe.

**b. Center of Gravity (CG).**

(1) Due to the nature of airplane external loads, the longitudinal CG considerations are nominal and can be easily calculated using the manufacturers' W&B data. However, the majority of airplane external loads are more likely to effect the lateral CG. Refer to FAA-H-8083-1, Weight and Balance Handbook, for guidance on how to compute lateral and longitudinal CG.

(2) Airplane manufacturers normally do not provide lateral CG charts or limits. Therefore, it is essential to determine what effect external loads will have on the lateral CG of the airplane. An understanding of the loads effect on lateral CG can be attained prior to attachment at a specific location by consulting with pilots having previous experience with similar aircraft and configuration, or when conducting an operational flight check of the aircraft with the load attached.

**c. Load Limitations.** The maximum size and weight of the external load, as well as limitations on the positioning of the load, must be determined. The effect of the asymmetric load must be addressed when the load is carried on one side of the aircraft. The maximum asymmetric weight that can be carried may be limited due to displaced aileron authority. If significant aileron is required to compensate for an asymmetric load there may not be enough remaining for normal maneuvering in flight and/or crosswind conditions during takeoff and landing. By design, this issue would be more prominent in FWELs on floatplanes and applies particularly when a dense load, such as lumber, is carried.

**2. Pilot Requirements.** The pilot in command (PIC) of an airplane carrying an external load must:

**a.** Hold a private, commercial, or airline transport pilot (ATP) certificate, with appropriate ratings and currency for the airplane type and operation. For 14 CFR part 135 operations, a commercial or ATP certificate is required.

**Note:** Refer to Advisory Circular (AC) 61-98, Currency Requirements and Guidance for the Flight Review and Instrument Proficiency Check, for determining applicable currency requirements.

**b.** Have at least 250 hours of flight time.

- c. Have at least 50 hours as PIC in the make and model airplane used for the external load.
- d. Have knowledge of:

- (1) External load attaching methods;
- (2) The airplane operating limitations issued for the external load operation; and
- (3) How the external load may affect the flight characteristics of the airplane.

e. Operate the airplane in accordance with the operating limitations issued in 14 CFR part 91, § 91.313 when in restricted category, and in accordance with any additional operating limitations prescribed by the FAA under § 91.9.

**3. Operating Limitations.** The PIC of the airplane carrying an external load must operate the airplane in accordance with the operating limitations in § 91.313 when in restricted category and with any additional operating limitations prescribed by the FAA under § 91.9. The operating limitations shown in Table 3-1, Airplane Restricted Category External Load Operating Limitations, must be issued as appropriate to each aircraft authorized to perform FWEL operations.

**Note:** The operating limitations issued with FAA Form 8130-7, Special Airworthiness Certificate, are considered a part of that certificate. The operating limitations will either be listed as part of FAA Form 8130-7 (when created using the fillable PDF version of the form) or they may be referenced on FAA Form 8130-7 and listed on a separate sheet. The operating limitations are to be carried in the aircraft at all times and must be available to the PIC of the aircraft.

**a. Special Purpose Operation.** Section 91.313(a) and (b) states that an aircraft may be used only for the special purpose operation for which it has been certificated, or to provide flightcrew member training in that special purpose operation.

**Note:** The airplane's Standard Airworthiness Certificate and accompanying privileges no longer apply when the airplane is operated in the restricted category.

**b. Compensation or Hire.** Section 91.313(c) states that a restricted category aircraft cannot be used to carry persons or property for compensation or hire. However, it goes on to say that for the purposes of § 91.313(c), the carriage of persons or materials necessary to accomplish the special purpose is not considered to be the carriage of persons or property for compensation or hire. Therefore, an airplane with a restricted category airworthiness certificate for the special purpose of FWELs may carry FWELs for commercial purposes. Since FWEL operations do not meet any of the exclusions in 14 CFR part 119, § 119.1(e), the operator would need to hold a part 119 Operating Certificate and the operation would need to meet the requirements of part 135.

**c. Persons on Aircraft.** Section 91.313(d) states the carriage of passengers is prohibited when the airplane is being operated in the restricted category. During a FWEL flight or flight check, the aircraft may carry only the following persons:

- (1) Flightcrew members,
- (2) Flightcrew member trainees,
- (3) Person(s) essential to the special purpose operation, and

**Note:** An observer on board the aircraft to monitor the external load during flight is performing an essential function associated with the special purpose and may be permitted to be onboard the aircraft during the flight.

- (4) Person(s) necessary to accomplish the work activity directly associated with that special purpose.

**Note:** Person(s) essential to loading and/or unloading the external load may be permitted to be onboard the aircraft during flight.

**d. Flight Restrictions.** Section 91.313(e) states that unless operating under the terms and conditions of a Certificate of Waiver (CoW) or special operating limitations issued by the Administrator, an operator may not operate:

- (1) Over a densely populated area,
- (2) In a congested airway, or
- (3) Near a busy airport where passenger transport operations are conducted.

**e. Seat Belts.** Section 91.313(g) states that “no person may operate a small restricted category civil airplane manufactured after July 18, 1978, unless an approved shoulder harness or restraint system is installed for each front seat. The shoulder harness or restraint system installation at each flightcrew station must permit the flightcrew member, when seated and with the safety belt and shoulder harness fastened or the restraint system engaged, to perform all functions necessary for flight operation. For purposes of this paragraph:

- (1) The date of manufacture of an airplane is the date the inspection acceptance records reflect that the airplane is complete and meets the FAA-approved type design data; and
- (2) A front seat is a seat located at a flightcrew member station or any seat located alongside such a seat.”

**4. Part 135 Programs and Manuals.** Operations under part 135 may have additional requirements that pilots and other company personnel must comply with when conducting FWEL operations. Required manuals and programs that would have to include information on FWEL operations are the General Operations Manual (GOM), Pilot Training Program, and Maintenance Personnel Training Program. Other policy and procedure(s) developed by the certificate holder for conducting FWEL operations would also have to be complied with.

**5. FWEL Operational Flight Checks.** Operators are required to perform a FWEL operational flight check of all external load configurations and document their results in the aircraft records. The airplane must be controllable and have no adverse flight characteristics while carrying the external load.

**a. Previous Flight Check.** A flight check is not required if the airplane has previously carried the same external load configuration and the results have been documented in the aircraft records.

(1) For part 91 operations, if the PIC conducting the operation changes or if there are changes/alterations to the external load, attaching means, and/or to the aircraft, which may affect the flight characteristics, the flight check must be conducted and recorded again.

(2) For part 135 operations, if the PIC changes, the flight check need not be conducted again as long as:

(a) Any new PIC has been trained in accordance with the certificate holder's approved training program;

(b) The PIC follows the FWEL procedures established by the certificate holder; and

(c) Prior to the flight, the new PIC becomes familiar with, at a minimum, the operational flight check information recorded in the aircraft records from the previous similar flights.

**b. Record of FWEL Operational Flight Check.** A record of the flight check must include the following:

- Airplane N-Number.
- Date of check.
- Description of external load configuration (i.e., type of load, weight of load, location installed).
- Air turbulence (i.e., non, light, moderate, or severe).
- Airspeed range (i.e., mph or kts).
- Maximum takeoff flap setting (i.e., degrees or position).
- Maximum landing flap setting (i.e., degrees or position).
- Observed rate of climb (i.e., feet per minute).
- Increase in takeoff distance (i.e., (Negligible <5%), (Minimal 5-15%), (Moderate 15-25%), (Significant >25%)).
- Additional observations or adverse effects, if any.
- Pilot's name, signature, certificate number, and certificate type.

(1) The aircraft operator must maintain this information in the individual aircraft's maintenance records. The aircraft's record format may vary, based on the recordkeeping system used by the operator. A flight log where the PIC would enter an aircraft discrepancy is typically considered part of the aircraft maintenance records. Operators should clearly specify the desired location if there is uncertainty in the appropriate location for the entry. The information recorded

regarding past operational flight checks must be readily available to subsequent PICs so that a PIC can become aware of all available information prior to flying the load.

(2) If the FWEL operational flight check is satisfactory, the pilot may continue to the destination and record the results of the flight check immediately after landing.

**6. Restricted Category Marking Requirements.** Title 14 CFR part 45, § 45.23(b) requires operators of restricted category aircraft to display their restricted category airworthiness certificate and the aircraft must display the word “restricted” near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches or more than 6 inches high.

## **7. Maintenance and Inspection Requirements.**

**a. Aircraft Weight and Balance (W&B).** The aircraft must always be operated in accordance with the gross weight and flight envelope limitations. Any alterations to the aircraft to facilitate the carriage of an external load that are not considered negligible must include an update to the aircraft’s W&B information. (Refer to AC 43.13-1, Acceptable Methods, Techniques, and Practices—Aircraft Inspection and Repair, Chapter 10, paragraph 10-2c.) The aircraft equipment list should reflect the current configuration of the aircraft and be readily available to the pilot so that accurate information can be used to determine any W&B changes and limitations when the external load is attached to the airplane. Maintenance personnel are not expected to evaluate W&B effects for each load that is attached to the aircraft; this is the responsibility of the pilot conducting the FWEL operation.

**Note:** The aircraft’s weight limits and CG limits may not be exceeded with the external load attached. Refer to AC 43.13-1 for W&B computation procedures.

### **b. Continued Airworthiness of the Aircraft.**

(1) Aircraft being used for FWEL operations must continue to be inspected in accordance with the inspection requirements applicable to that aircraft under § 91.409 or part 135, § 135.411 or § 135.419.

(2) The aircraft operator is encouraged to conduct additional inspections based on FWEL frequency or other factors in the FWEL operational environment. These additional inspections may include:

- Increased inspection frequency of any cargo attach points;
- Increased inspection frequency of flight controls and control cables that are routed near external loads; and
- Inspection, or increased inspection frequency, of any other areas of the aircraft that could be affected by the external load.

**Note:** Refer to AC 20-106, Aircraft Inspection for the General Aviation Aircraft Owner, for additional information on aircraft inspection.



**c. Multiple Airworthiness Certificates.** Aircraft that have been issued multiple airworthiness certificates can be converted from one category to another in order to operate under the authority of a particular airworthiness certificate.

(1) Before the aircraft is issued multiple airworthiness certificates, written instructions must be developed describing the requirements of the conversion, if any. Those instructions are referenced in the operating limitations issued to the aircraft and must be followed each time the aircraft is converted from one category to another.

(2) Under part 91, a pilot may conduct the conversion when the conversion requirements are considered preventive maintenance. If the aircraft is operated under part 135, pilots are not authorized to perform preventive maintenance (per 14 CFR part 43, § 43.3), therefore an appropriately rated mechanic must accomplish the conversion requirements if those requirements involve maintenance or preventive maintenance.

(3) A maintenance record entry must be made to document the conversion from one category to another. The entry should be made by the person performing the conversion (pilot or mechanic), and must include a description of the work performed, the date the work was performed, and the signature, certificate number, and certificate type of the person performing the work.

**Note:** Typically, the conversion only involves attachment or removal of the external load via simple mechanical means, performed by the pilot of the aircraft. The pilot must ensure the record entry is made each time the aircraft conversion is conducted.

(4) The aircraft may have to be inspected by the FAA, or by a certificated mechanic with an appropriate airframe rating, to determine airworthiness each time the aircraft is converted from the restricted category to another category for the carriage of passengers for compensation or hire.

(a) When the conversion from the restricted category Special Airworthiness Certificate to the Standard Airworthiness Certificate involves only the removal of the external load via simple attachment methods, this inspection is unnecessary.

(b) If the conversion requires maintenance or preventive maintenance actions, then the aircraft must be inspected prior to the carriage of passengers for compensation or hire.

## Chapter 5. Additional Part 135 Requirements

**1. General Discussion.** Title 14 CFR part 91, § 91.313(c) prohibits the use of a restricted category aircraft to carry persons or property for compensation or hire. However, subparagraph (c) goes on to discuss that, for the purposes of § 91.313(c), the carriage of certain persons or materials during a special purpose operation is not considered “for compensation or hire.” This allowance is only in regard to the limitations in § 91.313(c). Therefore, an airplane operating in accordance with the conditions and limitations of a restricted category airworthiness certificate, for the special purpose of Alaskan FWELs, is not prohibited from carrying external loads for commercial gain. Conduct of commercial operations is addressed within 14 CFR part 119. Since Alaskan FWEL operations do not meet any of the exclusions in part 119, § 119.1(e), any commercial FWEL operations must also comply with part 119 and the operating rules of 14 CFR part 135. All commercial restricted category Alaskan FWEL operations must meet the eligibility and operational requirements outlined in the previous chapters of this order as well as the additional requirements contained in this chapter for part 135 operations.

**Note:** Under § 91.313(c), any persons onboard a restricted category aircraft conducting Alaskan FWEL operations must be flightcrew members, flightcrew member trainees, persons who perform an essential function in connection with the Alaskan FWEL operations, or persons necessary to accomplish the work activity directly associated with the Alaskan FWEL operation.

**2. Hazard and Risk.** The carriage of a FWEL has associated hazards and risks that must be mitigated to ensure an equivalent level of safety as with other non-FWEL part 135 operations. One of the mitigations for operating standard category aircraft not certificated to carry external loads (i.e., per type certificate (TC) or Supplemental Type Certificate (STC)) is that the aircraft must be operated in the restricted category. To ensure safety, restricted category aircraft are prohibited from carrying passengers and are issued additional operating limitations. Effective crew training and certificate holder procedures are other mitigations that can reduce the hazards and risks of these types of operations. A certificate holder-developed risk-based decision tool can further reduce risk and enhance the safety of each individual FWEL operation. Some of the hazards and risks of FWEL operations are:

- The carriage of external loads can affect aircraft performance by increasing drag and disrupting airflow over the airframe.
- Undesirable airflow turbulence.
- Introduction of adverse aircraft handling and flight characteristics.
- Reduced flight control effectiveness and/or increased airframe vibration.
- Reduced performance in all phases of flight (takeoff, climb, cruise, landing) due to the increase in drag.
- Adverse impact on engine cooling, especially during climb.
- Increased fuel consumption.
- Improper attachment or securing of the external load.

**3. Authorization of Aircraft.** All airplanes used under part 135, including those used for FWELs, must be authorized for use in the certificate holder’s OpSpecs.

**a. U.S. Registered.** The airplane must be U.S. registered. While 14 CFR part 135, § 135.25(d) allows a part 135 operator to use a foreign-registered aircraft, a foreign-registered aircraft would not meet the requirement of having a valid airworthiness certificate in the normal, utility, or acrobatic category and would not be eligible to be issued a restricted category Special Airworthiness Certificate for the Alaskan FWEL special purpose.

**b. Previously-Issued FWEL Special Purpose.** If the airplane has previously been issued a Special Airworthiness Certificate for the FWEL special purpose in accordance with previous FAA guidance, the operating limitations may need to be amended to allow operations under part 135 and to include any part 135 specific limitations. The aircraft operator must submit a request for an amended airworthiness certificate and operating limitations, which must be issued in accordance with current FWEL guidance.

#### **4. Part 135 Programs and Manuals.**

**a. Manuals/Procedures.** Policy and procedures specific to FWELs should be developed by the part 135 air carrier/operator and submitted to the FAA for review and acceptance.

**b. Training Program.** The certificate holder's training program must be revised as described in paragraph 6 of this chapter, and submitted to the FAA for review and approval.

**c. Inspection and/or Maintenance Programs.** A part 135 operator that is authorized to use an Approved Aircraft Inspection Program (AAIP) (OpSpec D073) or a Continuous Airworthiness Maintenance Program (CAMP) (OpSpec D072) must determine if there are any additional inspection requirements for the aircraft and/or its maintenance personnel, identify those requirements within its program, and submit its revised program for approval and/or authorization for use.

**5. Certificate Holder Requirements to Conduct Part 135 FWEL Operations.** While all applicable parts 43, 91, 119, and 135 regulations must be complied with during any FWEL operation, the following paragraphs highlight additional requirements and areas of operational risk that must be addressed by the certificate holder.

**a. Preflight Inspection.** Any additional preflight inspection items that would be required before conducting FWEL operations should be provided to flightcrew members and incorporated into the aircraft preflight checklist and certificate holder's manual. This should include items such as attachment points and external fixtures, damage assessment, FWEL securing and suitability, as well as conversion and return to passenger-for-hire operations procedures, and logbook entries/maintenance release requirements.

**b. Preflight Planning.** Performance degradation due to the FWEL must be accounted for to ensure regulatory compliance for adequate take-off and landing distances available, and fuel requirements for the flight. Certificate holders must establish procedures to enable the flightcrew to determine this required information. Additionally, there should be procedures for the flight crew to determine when a certificate holder's historical data for a particular FWEL combination may be used, or if an operational flight check is required.

**c. Aircraft Loading and Weight and Balance (W&B).** Operators must develop W&B procedures to ensure that the aircraft is operated within the aircraft's W&B envelope. Loading procedures should include a description of allowable tiedown devices of sufficient strength to ensure that the FWEL remains securely attached to the airplane under anticipated flight and ground conditions and description of all allowable attachment points. The pilot in command (PIC) is responsible to ensure these procedures are used for all FWEL flights. Advisory Circular (AC) 43.13-2, Acceptable Methods, Techniques, and Practices—Aircraft Alterations, Chapter 12, Cargo Tiedown Device Installations, contains more information on acceptable methods, techniques, and practices for cargo tiedown device installations.

**d. FWEL Operational Flight Check Procedures.** The certificate holder must provide flightcrew member procedures for determining when a flight check is required prior to conducting a FWEL operation. The maneuvers and procedures required on a flight check should be provided to the flightcrew member(s) and documented in the certificate holder's manual. Certificate holders should address the following:

(1) FWEL operations where the same or similar external load configuration had been satisfactorily flight checked on that airplane and the results have been properly documented as required by this order.

(2) FWEL operations without a previously documented satisfactory FWEL operational flight check on that model of airplane.

(3) Proper conduct, documentation, and recording of a FWEL operational flight check.

**e. Emergency Procedures.** Certificate holders should develop emergency procedures that could be required when conducting FWELs. Examples of required emergency procedures include:

(1) The FWEL attachment/security is compromised during flight.

(2) The FWEL departs the aircraft during flight.

(3) Marginal or loss of control due to the FWEL during flight.

(4) Emergency egress/evacuation procedural changes due to the FWEL's location on the aircraft.

**f. Postflight Requirements.** Any additional postflight procedures that are required after completing a FWEL operation should be documented in the certificate holder's manual. These should include aircraft post-flight inspection requirements to ensure no damage has occurred as a result of carrying the FWEL, and procedures to report and correct any aircraft damage. Another requirement should be the inspection and confirmation that all attaching devices and hardware have been removed and stowed after flight, if appropriate. Any postflight required maintenance actions should also be addressed.

## 6. Part 135 Training and Qualification Requirements.

**a. Training Subjects.** The aircraft operating limitations issued as a part of the Special Airworthiness Certificate, for the special purpose of conducting FWELs, contain the minimum training requirements for pilots conducting FWEL operations. Pilots authorized to conduct FWEL operations must complete training on at least the following.

(1) External load attachment methods. This should include items such as:

- Section 135.87 requirements;
- Attachment locations and considerations;
- Devices used to attach the FWEL and proper selection of those securing devices;
- Proper fastening procedures and confirmation of load security;
- Special, oversized, or abnormal FWEL considerations and placement; and
- Hazards of improperly attached FWEL(s).

(2) The airplane operating limitations issued for the external load operations.

(3) How the external load may affect the flight characteristics of the airplane. This should include items such as:

- Takeoff and landing distance calculations,
- Required fuel calculations,
- Aerodynamic considerations, and
- FWEL operational flight check requirements and procedures.

**b. Additional Training Subjects.** In addition to the training required by the FWEL operating limitations, the approved Pilot Training Program must include the following:

(1) W&B considerations (§ 135.345). This should include items such as:

- Computing W&B for a FWEL operation,
- Lateral center of gravity (CG) limitations and considerations, and
- Potential hazards of operating at the extremes of the W&B envelope.

(2) Additional preflight and postflight requirements when conducting FWEL operations, including the requirements for converting to/from the restricted category, which include any required actions prior to conducting passenger-carrying operations-for-hire (§ 135.323(a)(1)).

(3) FWEL emergency operations and procedures (§ 135.345).

### c. Qualification Requirements.

(1) In accordance with § 135.293(a)(1)–(3) and (8), the written or oral test must include testing of a pilot's knowledge of FWEL operations.

(2) It is recommended that a pilot complete a minimum of one supervised flight conducted while carrying a FWEL. The operator must determine who has the appropriate qualifications and experience to supervise the flight.

**d. Certificate Holders Required to Have a Training Program.** Certificate holders required to have a training program must develop FWEL special training, which includes at least the training subjects listed in subparagraphs 6a and 6b. This special training must be submitted to the FAA for approval. Principal operations inspectors (POI) should follow the process in FAA Order 8900.1, Volume 3, Chapter 19, Section 2, Safety Assurance System: Training Approval Process, for approval of training program revisions.

**e. Certificate Holders Not Required to Have a Training Program.** The aircraft operating limitations issued as a part of the Special Airworthiness Certificate, for the special purpose of conducting FWELs, include minimum training requirements for pilots conducting FWEL operations. The operator must be able to show that the PIC has trained, at a minimum, on the training subjects described in subparagraph 6a.

**7. Continued Operational Safety (COS).** The recording of surveillance conducted for part 135 FWEL authorizations and continuing operations is accomplished using the Safety Assurance System (SAS).

## Chapter 6. Operational Considerations

**1. General.** The information in this chapter is nonregulatory and provides recommendations and “best practices” gained from industry stakeholders.

**a. Damage Prevention.** Consider that anything attached to the struts may vibrate and cause damage. Some type of protective material should be applied at the wear spots. After the external load has been removed, the area under the protective material should be inspected for damage. Refer to Advisory Circular (AC) 20-106, Aircraft Inspection for the General Aviation Aircraft Owner, for additional information on inspections.

**b. Attachment Methods.** Attachment methods are varied and numerous. AC 43.13-2, Acceptable Methods, Techniques, and Practices—Aircraft Alterations, Chapter 12, Cargo Tiedown Device Installations, describes acceptable methods, techniques, and practices for cargo tiedown device installations. A single failure of a tiedown strap, rope, or fitting must not be hazardous. The use of bungee cords has gained acceptance in recent years because they do not have a tendency to loosen like other methods and are easier to remove.

**c. Flight Control Cables.** On some airplanes, the aileron cables are attached to the outside of the wing strut. Care should be exercised to avoid wrapping the tiedown around the cable. Restricting the aileron cable could cause an airplane control problem and also may cause the cable to cut through the bungee, resulting in an inadvertent load release.

**d. Egress.** Emergency entry to or egress from the aircraft must not be unduly impeded by carriage of the external load, particularly in the takeoff and landing configurations. Any special procedures required or alternate egress routes must be clearly marked on the aircraft, must be readily visible to persons attempting to leave the aircraft, and should be briefed by the PIC to all persons onboard prior to the flight.

**e. Load Positioning.** The position of the external load must not adversely affect the following:

- The travel of the flight controls,
- The operation of the undercarriage or flaps,
- The airflow in the vicinity of the pitot or static air sources,
- The propeller thrust, and
- The airflow in the vicinity of any air intake or exhaust port.

**f. Side Placement.** Loads can be carried on either side of the airplane. Some pilots prefer to carry a load on the right side to balance the airplane, while others prefer the left to better monitor the load. The pilot may elect which side to place the load, depending on airplane performance and previous experience with a particular load.

**g. Recommendations and Safety.** It is recommended that pilots seek the advice and experience of others to develop loading methods and procedures. Above all, safety is of the utmost concern.

**h. Display “Restricted.”** Title 14 CFR part 45, § 45.23(b) requires that the word “restricted” be displayed when operating in that category. One method of compliance is the display of temporary signs in both side windows of the airplane.

**2. Additional Considerations for New and Unknown Load Effects.** It is the responsibility of the operator to ensure the flight is conducted safely and in compliance with all applicable regulations. The pilot in command (PIC) must be familiar with published aircraft performance data and operating limitations that were approved as part of a FWEL type certificate (TC) or Supplemental Type Certificate (STC) approval. When attaching new loads that may have unknown takeoff effects, it is recommended that the operator incorporate additional limitations when conducting the operational flight check. Some examples of additional limitations that may be prudent for the operation include:

**a.** Operating from a location which is at least twice as long as that which would be needed, when not carrying an external load, to take off, fly out of ground effect (at the operating weight), and land straight ahead; or

**b.** Reducing the airplane’s maximum gross takeoff weight by twice the weight of any attached external load.

### **3. Load-Specific Considerations.**

**CAUTION:** The same external load can have very different performance and handling effects depending upon which specific airplane it is attached to. The majority of experience with airplane external loads is with high-wing, float-equipped airplanes. Some external loads that can be safely carried on high-wing, float-equipped airplanes might not be safely carried on an airplane without floats.

**a. Rifle Scabbards.** When attaching a rifle scabbard to the wing struts, it is good practice to ensure that the rifle is not going to come out of the scabbard; this may be hazardous to people and property on the ground.

**b. Snowshoes.** When attaching snowshoes, the bungee should pass through the webbing at least once and continue around the complete snowshoe enough times to hold it in place securely.

**c. Backpack Frames.** Backpack frames can be attached in the same manner as snowshoes, using a bungee cord and wrapping it around enough times to ensure that it is secure. On some airplanes, the aileron cables are attached to the outside of the wing strut. Care should be exercised to avoid wrapping the bungee around the cable. Restricting the aileron cable could cause an airplane control problem and also may cause the cable to cut through the bungee, resulting in an inadvertent release.

**d. Seaplanes.** For seaplanes, the load must be positioned so that it will not catch and retain water during takeoff and landing. A load may either be secured directly to the seaplane float struts or other special provisions (e.g., boat rack) made for the carriage of external loads. A repeatable means of securing the load to the aircraft must be determined. The load must be tightly restrained and held immobile. The aircraft’s structural limitations must not be exceeded



and an external load must not be attached to the wing struts in any way that could compromise the structural performance of the aircraft.

**e. Plywood/Lumber.** Comments received from users reveal that Piper PA-18 Super Cubs are capable of carrying a considerable amount of plywood on the spreader bars. The amount should be dictated by the performance factors and limitations of the airplane.

(1) Some type of protection for the spreader bars is needed at the wear spots, such as tape or rubber sheeting.

(2) The plywood can be nailed together to prevent shifting, and then be properly attached. Webbed tiedown straps with a built-in ratchet device have proven successful as an attachment method.

(3) Some operators have incorporated a piece of metal formed into a “V” that is screwed to the leading edge of the wood to streamline it; the frontal height should be kept to 6 to 8 inches.

(4) The carriage of dimensional lumber can be treated like plywood and may be secured to the top of the floats in some instances.

(5) Stacked lumber must be fastened together to form a unit such that no single piece(s) may come loose from the stack.

(6) Lightweight material, such as Styrofoam sheets, can be placed between plywood or lumber to reduce vibration. Metal roofing can be sandwiched between plywood sheets for rigidity. The supporting materials must be securely fastened to the wood to prevent them from sliding out.

**f. Canoes/Boats.** The carriage of watercraft may be conducted safely as long as appropriate precautions are taken. Boats and canoes should be carried partially inverted with the stern forward to provide smoother airflow around the tail of the aircraft.

**g. Antlers.** The carriage of antlers may be challenging because of their shape, but this also allows for numerous fastening points. Bungee cords, parachute cord, and nylon rope have proven adequate for secure attachment. Antlers can be carried on the wing struts or on the floats. Moose antlers are particularly heavy and, while they can be attached to the wing struts, the extra weight is a consideration. Flight with heavy antlers in turbulent air or during a hard landing will impose additional loads that could result in bent wing struts, rendering the airplane unairworthy. It has been reported that, on some airplanes, antlers secured to the wing struts can cause a significant air flow disturbance to the tail surfaces. Antlers can also cause a significant amount of drag, which reduces airspeed, which should be considered in flight planning.

#### **4. Maintenance Considerations.**

**a. Securing of Cargo.** Maintenance personnel may be asked to assist in the securing of an external load to the airplane. AC 43.13-2, chapter 12 describes acceptable methods, techniques, and practices for cargo tiedown device installations.

**b. Airplane Aerodynamics and Structure.**

(1) Attaching external loads to the airplane may produce local loads, vibrational stresses, and impulse loads that the original designers may not have taken into consideration. This is especially critical for wing struts. Wing struts are designed for tension and compression loads. Attaching excessive weight could result in strut attachment wear, strut damage, and possible strut failure, leading to catastrophic wing failure.

(2) Anything attached to the struts may vibrate and cause damage. Some type of protective material should be applied at the wear spots. After the external load has been removed, the area under the protective material should be inspected for damage.

(3) Flights with heavy loads in turbulent air or during a hard landing will impose additional loads that could result in bent wing struts, rendering the airplane unairworthy.

**5. Records of FWEL Operational Flight Checks.** FWEL operational flight checks must be recorded in the aircraft records (i.e., maintenance records) as described in the operating limitations issued to the aircraft. Operators authorized to conduct FWEL operations with more than one aircraft may elect to maintain an overall fleet log for FWEL operational check flights. Having a compiled record of the results of all FWEL operational flight checks readily available could assist PICs in their decision making for a particular FWEL flight. The certificate holder could choose to record in the fleet log any additional parameters for a FWEL operational flight check that they think will enhance the overall safety of their FWEL operations. Any fleet log or similar document does not negate the requirement for any record entry required by the aircraft's operating limitations.



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

**FAA Form 1320-19, Directive Feedback Information**

Please submit any written comments or recommendations for improving this directive, or suggest new items or subjects to be added to it. Also, if you find an error, please tell us about it.

Subject: FAA Order 8400.34, Fixed-Wing External Loads in Alaska

To: Flight Standards Directives Management Officer at 9-AWA-AFB-140-Directives@faa.gov

*(Please check all appropriate line items)*

☐ An error (procedural or typographical) has been noted in paragraph \_\_\_\_\_ on page \_\_\_\_\_.

☐ Recommend paragraph \_\_\_\_\_ on page \_\_\_\_\_ be changed as follows:  
*(attach separate sheet if necessary)*

☐ In a future change to this directive, please include coverage on the following subject  
*(briefly describe what you want added):*

☐ Other comments:

☐ I would like to discuss the above. Please contact me.

Submitted by: \_\_\_\_\_ Date: \_\_\_\_\_

FTS Telephone Number: \_\_\_\_\_ Routing Symbol: \_\_\_\_\_