

File

Federal Aviation Agency



ADVISORY CIRCULAR

AC NO: AC 91.29-1

AIRCRAFT

EFFECTIVE :

1/8/68

SUBJECT : SPECIAL STRUCTURAL INSPECTIONS

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1. PURPOSE. This circular discusses occurrences which may cause structural damage affecting the airworthiness of aircraft. It also encourages operators to review their system for handling those occurrences which justify a special structural inspection of the aircraft involved.
 2. REFERENCE. FAR 91, Section 91.29(a).
 3. BACKGROUND. The common operational occurrences which may cause aircraft structural damage are generally familiar to the aviation community and other operators of aircraft for hire. Because of this, it has been a standard practice for many years to inspect an aircraft for evidence of structural damage after it has been subjected to some known or suspected structural overload.
 4. DISCUSSION. Modern aircraft provide inherent structural integrity, but there are occasions when they may suffer structural damage that adversely affects airworthiness. Examples: during hard or overweight landings; during flight in severe turbulence; when specified operating limitations are exceeded. Operators should remain alert to this fact. The following aspects are pertinent:
 - a. Predictability. Because of the many possible variations in aircraft attitude, weight, airspeed, and other factors, including operating technique, experience shows it is not practical to predict just where and how an aircraft will be damaged in one of the above cited instances. Nor, is it possible to predict with acceptable accuracy that an aircraft will not be damaged in the same instances. Inspection of the aircraft involved remains as the only means to determine whether or not damage has been incurred. Such inspection to be of value should be tailored to the aircraft involved and to the type of suspected structural overload.
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- b. Inspection. Fortunately, the state of the maintenance art is such that aircraft structural integrity can be assessed accurately by one or more inspection means in common use by most operators or by means which are available to them. Operators' policies and procedures pertaining to special structural inspections are expected to vary with respect to who will perform such inspections and how the work will be done. However, it is important that special structural inspections be conducted immediately after the causing occurrence and not unduly delayed.
- c. Uncommon Occurrences. Reference has been made to the common operational occurrences which pose a hazard to structural integrity. There are other operational occurrences which can cause structural damage, but because of their subtle nature, are sometimes overlooked. For example, during an aborted overweight landing or in a hard landing, whether or not the aircraft is in fact landed or merely touches down, it may contact the runway so as to incur damage. In the case of a touch and go landing, the aircraft may then proceed to another airport and possibly continue in service without benefit of an inspection which may be warranted.
- d. Airworthiness. The existence of structural damage that could seriously affect the airworthiness of an aircraft involved has been found during routine inspections. In some of these cases, the cause was determined to be an occurrence such as described above that had not been reported. In some cases, the affected aircraft had been operated with impaired structural integrity which could have led to a structural failure.
5. RECOMMENDATION. Each aircraft operator is encouraged to study his policies and procedures concerning those situations in which there is a need for special structural inspections. Timely steps should be taken to correct any noted deficiencies. The study should include at least consideration of the following:
- a. The occurrences such as those described above which would warrant a subsequent structural inspection.
 - b. The adequacy of instructions to all personnel which identify such occurrences and prescribe when and how inspections are to be accomplished.
 - c. Review and assurance that inspection and maintenance personnel are equipped and competent to conduct special structural inspections.
- Operators are encouraged to use or see that their maintenance agencies use information contained in aircraft manufacturers' maintenance manuals or which is otherwise obtainable from the manufacturer pertaining to structural inspections.


Director,
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