AN AMERICAN NATIONAL STANDARD

The Engineering Resource For Advancing Mobility®
400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

AEROSPACE INFORMATION REPORT

AIR 811A
Superseding AIR 811
Issued 1-31-65
Revised 1-1-85

DISPOSITION OF WHEELS WHICH HAVE BEEN OVERHEATED

REAFFIRMED APR 1990

INTRODUCTION: The development and use of brakes with high temperature capabilities has resulted in instances of tire and wheel failures which were attributed to excessive brake heat. These instances have led to the establishment of more stringent wheel requirements and the addition of heat shields, safety devices, auxiliary cooling devices, brake temperature and low tire pressure indication systems.

This Aerospace Information Report has been prepared to assist those who are concerned with the removal, inspection, and disposition of magnesium and aluminum wheels which may have been subjected to excessive temperatures.

1. MAGNESIUM AND ALUMINUM WHEEL MATERIALS: The effect of temperature and heating time on the mechanical properties of a material is a unique function of the material being used. It is therefore, necessary that the wheel manufacturer supply the user with information as to how to detect wheel degradation due to excessive temperature as well as dimensional limits for the wheel. The wheel manufacturer should supply the user with non-destructive test methods and acceptance standard suitable for making proper part disposition.

2. REMOVING WHEELS FROM THE AIRCRAFT FOR INSPECTION:

2.1 Temperature Limitation: If evidence exists, or if it is suspected that the wheel has been heated to temperatures in excess of the limit established, the wheel(s) should be removed from service for inspection.

2.2 Evidence of Excessive Temperatures:

2.2.1 When a temperature sensitive pressure release device (fuse plug) has functioned or is found partially melted as evidenced by tire deflation or wheel inspection.

2.2.2 When a tire shows evidence of having been subjected to excessive temperature on side walls outside of the wheel flanges.

2.2.3 When the paint on the wheel has become discolored and/or blistered.

3. GENERAL NOTES:

3.1 Item 2.2.1 is not indicative of the actual temperature which may have been experienced by the wheel. The brake can continue to raise the wheel temperature after the air has been released.

3.2 As temperature increases, the resistance to creep and permanent yielding decreases. It is, therefore, possible that a wheel can be permanently deformed by a combination of aircraft weight, heat, and tire deflation.

3.3 Document evidence of excessive temperatures. Note location, degree and details of part condition for reference use.

4. INSPECTION PROCEDURE:

4.1 Demount the tire, remove wheel seals and thoroughly clean wheel halves per wheel manufacturer's instructions.

4.2 Remove only sufficient paint (if applicable) and anodic treatment from areas of wheel halves designated by wheel manufacturer to permit the following non-destructive tests to be performed.

4.3 Inspect the wheel as follows:

A) Perform evaluation tests on the wheel using Method I and/or Method II as follows:

1. Method I - Conductivity Test
(Eddy Current)

a. Perform conductivity test in designated areas of wheel according to specified procedures of wheel manufacturer.

CAUTION: In performing conductivity tests, it is important to use test equipment and acceptance values approved by the wheel manufacturer. These values may require adjustment if alternative test equipment is used.

b. Wheels which fail to pass this test may be subjected to the Method II test as a final hardness rejection criteria.

2. Method II - Rockwell or Brinell Hardness Test.

a. Perform Rockwell or Brinell test in designated areas of wheel according to specified procedures of wheel manufacturer.