



EASA Safety Information

No.: 2006 - 03

Issued: 19 May 2006

Subject: Repairs for Messier-Bugatti carbon brakes by third parties invalidating the ETSO Authorisation

Reference AD : None

Introduction: According to Article 15(1) of Regulation (EC) No 1592/2002 of the European Parliament and of the Council of 15 July 2002 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, EASA has only taken over Member States obligations that are design approval related. EASA only has competence to issue AD's related to type design. EASA has been notified by Messier-Bugatti about repairs by third parties to carbon brakes manufactured by Messier-Bugatti which are not covered by the appropriate ETSOA. This actual case is a serious safety issue and this Safety Information has been issued accordingly. The National Aviation Authorities may adopt necessary actions under their State of registry responsibility.

Applicability: **Messier Bugatti carbon brakes with the following P/Ns might be affected**

C20225() : carbon brake
C20449() : carbon brake
C20524() : carbon brake
C20534() : carbon brake
C20194() : carbon brake
C20210() : carbon brake

The following repairs to Messier-Bugatti carbon brakes have been seen which are not covered under the existing EASA ETSO authorisations:

- Initially, "unknown source" parts were: (*see attached photos*)
 - Metallic disc clips and disc rivets - locally manufactured
 - Unbalanced "2 for 1" disc thicknesses (*instead of 50/50*)
 - "3 for 1" refurbished discs (*non-existing OEM configuration*)
 - Refurbished disc assembled using worn discs made from two different Messier-Bugatti carbon materials
 - Heat sink assembled using various discs made from up to three different Messier-Bugatti carbon materials
 - Locally produced (reddish) carbon oxidation inhibitor
 - No markings on parts - on some parts, only the (partially) remaining Messier-Bugatti markings are visible)

- Starting mid-2003, one-part discs of locally produced carbon material have been reported in worn heat sinks received by Messier-Bugatti

Characteristics of the above mentioned repairs/parts

- C 1. different metallic hardware, clips and rivets
 - different manufacturing details - no part number
- C 2. different (unknown) oxidation inhibitor
 - reddish colour instead of colourless inhibitor
 - unknown inhibitor penetration and coverage
- C 3. refurbished disc-halves of unequal thicknesses:
 - two disc-halves of different thicknesses (instead of identical-50/50)
- C 4. three-part (instead of two) refurbished discs
- C 5. lateral stators (pressure/end plates) made of two disc-halves
 - certified configuration is "one-part" lateral stator disc
- C 6. refurbished discs made of two disc halves from two different Messier-Bugatti carbon materials
- C 7. one-part discs of unknown carbon material
- C 8. common characteristic: no markings on parts

Consequences:

- C 1. increased wheel interface friction resulting in decreased brake efficiency
- C 2. possible very detrimental effect on friction if inhibitor is not correctly deposited, even if protection against carbon oxidation is satisfactory
- C 3. modified dynamic thermal balance of disc resulting in well known reduced friction coefficient, and reduced braking performance.
Reported worn disc-half of extreme low thickness (1.5mm) could have resulted in disc failure with subsequent brake failure with total loss of brake efficiency and tire and wheel threats
- C 4. thermal barriers created in disc by additional interfaces resulting in known loss of friction coefficient, much more severe than in above (c 3) also, same concern as above (c 3) regarding mechanical failure with much higher probability of occurrence
- C 5. thermal barrier created in stator disc by the interface resulting in known loss of friction coefficient
- C 6. untested configuration at Messier-Bugatti - expected loss of friction coefficient
- C 7. new carbon material means new brake of totally unknown performances

All the above characteristics, not including effects of brake intermixing on the airplane, are known to be the cause of:

- decreased brake friction with :
 - unnoticeable effects during taxi
 - noticeable effect on landing distances with possible overrun on short runways
 - definite detrimental effect on RTO braking distance
- disc and subsequent brake mechanical failures
- degraded brake compatibility with braking system
 - decreased anti-skid efficiency resulting in longer braking distances, particularly on contaminated runways
 - degraded airplane controllability

- modified dynamic brake stability with possible friction induced brake vibrations
- brake fitted with new carbon material must be considered as a completely new brake of unknown performances

The repairs have not been designed by Messier-Bugatti and have not been approved by EASA. As such they invalidate the EASA ETSOA according to Part 21A.611, as only the manufacturer (ETSOA holder) is allowed to design changes to the ETSO equipment. So the carbon brakes should have no ETSO marking.

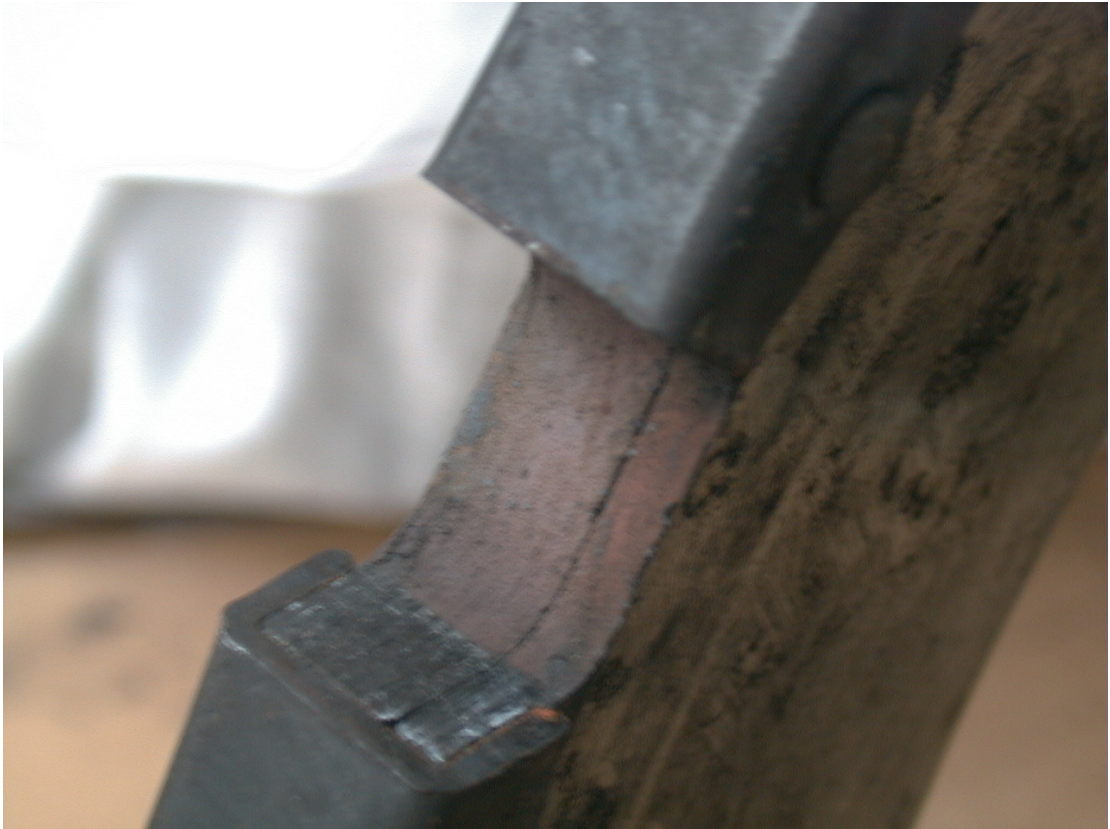
Recommendation: In case a carbon brake that meets the above mentioned criteria and that still contains the ETSO marking is found, please report the case to EASA. In case you find a similar part, it should be tagged as not airworthy. Please inform EASA and the manufacturer immediately at the addresses stated below.

Contact: For further information contact Mr. M. Capaccio, Airworthiness Directives Focal Point – Certification Directorate, EASA. E-mail: ADs@easa.eu.int.

Manufacturer address

MESSIER-BUGATTI
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Contact : <http://www.messier-bugatti.com/contact.php3?&lang=en>



Rotor R2 - Unbalanced " 2 for 1" + reddish Oxidation Inhibitor



Rotor R2 - Unbalanced " 2 for 1" ($t_1=13\text{ mm}$ - $t_2=2.5\text{ mm}$)



Rotor R1 – " 3 for 1" ($t=1.5$ -7- 2.5 mm) + reddish Ox. Inhib.



Lateral Stator in 2 parts (unknown config.)



Carbon Heat-Sink : Unknown carbon material