BULLETIN ADDENDUM

AAIB File:	**EW/G94/05/01**
Aircraft Type and Registration:	**Cessna 195, G-BBYE**
Date & Time (UTC):	**1 May 1994 at 1555 hrs**
Location:	**HMS Daedalus, Lee-on-Solent, Hampshire**
Type of Investigation:	**Aircraft Accident Report Form submitted by the pilot and metallurgical examination of the failed component**

AAIB Bulletin No 7/94, page 41 refers

Following receipt of the AAIB bulletin the CAA wrote to the aircraft manufacturer, enclosing the bulletin and the metallurgical report, and asked for comments. The manufacturer reported that the manufacturing drawing for Cessna 195 main gear legs did call for shot-peening only on the lower surfaces (and sand-blasting on the upper) as had been found on the leg from G-BBYE. The manufacturer also reported that ultimate tensile strength (UTS) of the material, 6150 modified chromium vanadium steel, should lie in the range of 225,000 to 246,000 psi. The hardness tests performed on the unpeened upper surface of the failed leg had been consistent with a UTS of only 115,000 psi and so some further investigation was carried out to understand this anomaly. The hardness tests on the upper surface were repeated and a hardness traverse carried out across a section of the leg. The previous results for the top surface were confirmed and it was found that the core of the leg was to the required hardness (and strength) but that in a surface layer about 0.85 mm thick the hardness decreased. Etching of the section also revealed changes in the material's characteristics near the surface and these appeared to be due to decarburisation of the surface, probably during heat treatment. These effects could decrease the tensile fatigue limiting stress by approximately 50% and produce a finite fatigue life even if the component's fatigue life, as designed, was infinite. Other factors were also present, corrosion, fretting and pitting, which are commonly found in this type of component after long service and which can materially affect the item's susceptibility to fatigue.