BULLETIN ADDENDUM

AAIB File:	**EW/G92/11/11**
Aircraft Type and Registration:	**Piper PA38-112 Tomahawk, G-BSVW**
Date & Time (UTC):	**13 November 1992 at 1630 hrs**
Location:	**Leicester Airport, Leicestershire**
Type of Investigation:	**Aircraft Accident Report Form submitted by the pilot and examination of failed nose leg**

SYNOPSIS (AAIB Bulletin 2/93 refers)

Following a normal touchdown, the nose landing gear leg detached. Although the propeller and lower cowling were damaged, the student pilot was uninjured. Subsequent metallurgical examination of the fractured leg, at the Materials and Structures Department at DRA Farnborough, found that the leg had failed due to pre-existing fatigue cracking which had emanated from multiple origins within a lubrication groove which had been machined into the outer diameter of the oleo cylinder. The absence of blending radii within this groove had generated the fatigue cracking, which was almost identical to that found on other PA38 aircraft (Bulletin 3/91).

Maintenance Manual inspection deficiency

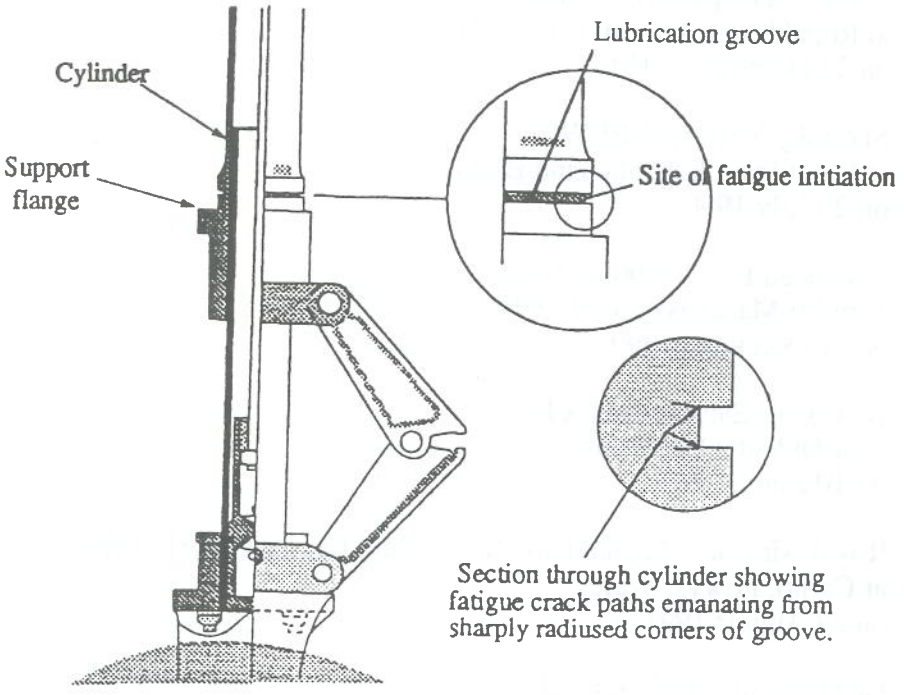
As the Tomahawk fleet continues to accumulate time in service it is probable that the incidence of nose landing gear failures will increase. The underlying problem of the lack of any blend radii in the base of the lubrication groove (Fig. 1) is compounded by the lack of any Maintenance Manual requirement to subject this component to a periodic crack detection process. The ideal solution would be the introduction of a modified leg which incorporated blend radii in the groove. However, the US aircraft manufacturer, which is currently in 'Bankruptcy Protection', is unlikely to be able to offer such a modification in the near future. In the meantime, it is probable that the incidence of similar failures could be prevented by the introduction of periodic crack detection inspection.

AAIB Safety Recommendation

In view of the above findings on the incidence of cracked nose landing gear legs on PA38 Tomahawk aircraft, the following Safety Recommendation is made:

93-7 The CAA should introduce a service maintenance requirement for a periodic dye penetrant inspection of the lubrication groove at the lower end of the nose leg oleo cylinder on Piper PA38 Tomahawk aircraft, in order to reduce the incidence of associated nose leg failure due to fatigue cracking initiation from the sharp radii at the base of this groove. (Issued 19 April 1993)

Fig. 1



Half Section of PA38
(Tomahawk) Nose Leg