AAIB Bulletin No: 3/93 **Ref: EW/G92/10/15** **Category: 1c**

Aircraft Type and Registration:	Piper PA-28RT-201 Cherokee Arrow IV, G-BMVE
No & Type of Engines:	1 Lycoming IO-360-C1C6 piston engine
Year of Manufacture:	1979
Date & Time (UTC):	31 October 1992 at 1835 hrs
Location:	Cardiff Airport, Wales
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Severe structural damage to left wing aft of main spar and outboard of wheel bay; left gear leg sliding element bent aft
Commander's Licence:	Commercial Pilot's Licence with Instrument, IMC, Night and Instructor ratings
Commander's Age:	36 years
Commander's Flying Experience:	2371 hours (of which 20 were on type) Last 90 days - 92 hours Last 28 days - 41 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and examination of the aircraft wing by the AAIB

The aircraft was returning from a solo cross country flight from Cardiff to Norwich. During the take-off from Norwich, the pilot felt a 'bump' which he described as being similar to what is felt when the nosewheel runs over a runway centreline light. He continued the take-off and during the climb-out he cycled the landing gear. This did not result in any unusual indications and the landing gear appeared to operate normally. The flight onwards to Cardiff was uneventful.

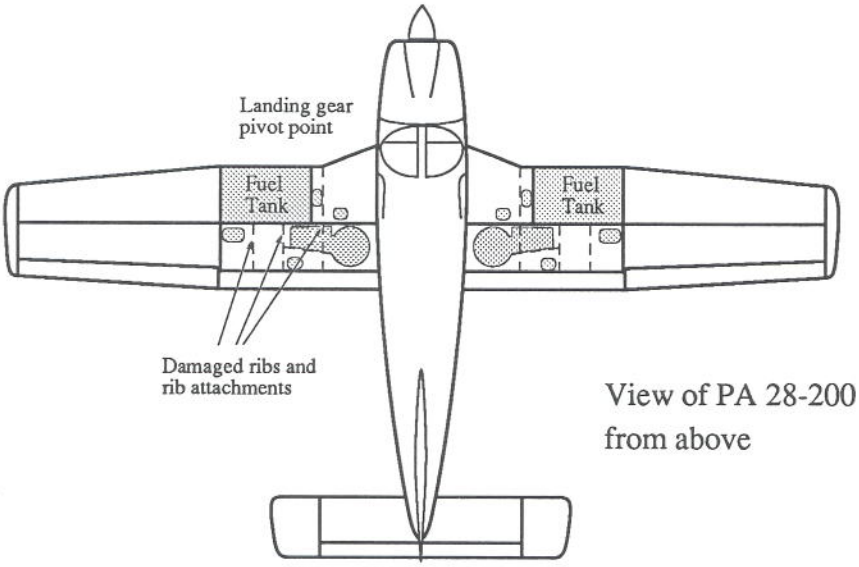
On approach to Cardiff the landing gear extended without any apparent problem and a normal approach to runway 30 was made with a reported surface wind of 240°/12 kt. Just before landing the pilot used the rudder to correct drift and touched down initially on the left mainwheel, followed by the right main and then the nosewheel. The aircraft slowed to a stop quite rapidly, without the brakes being used, and the pilot found that he had to apply considerable right rudder to keep it straight on the runway. The aircraft had stopped opposite the turn-off to the flying club apron and when the pilot looked out to his left to check that it was clear to turn off, he then noticed that the upper surface of the left wing was

severely rippled. Since the aircraft's behaviour during the landing run had appeared to be consistent with landing with a flat tyre and believing that the wing skin rippling was indicative of structural damage, the pilot taxied the aircraft clear of the runway, shut down the engine and asked for assistance to be moved on to the apron.

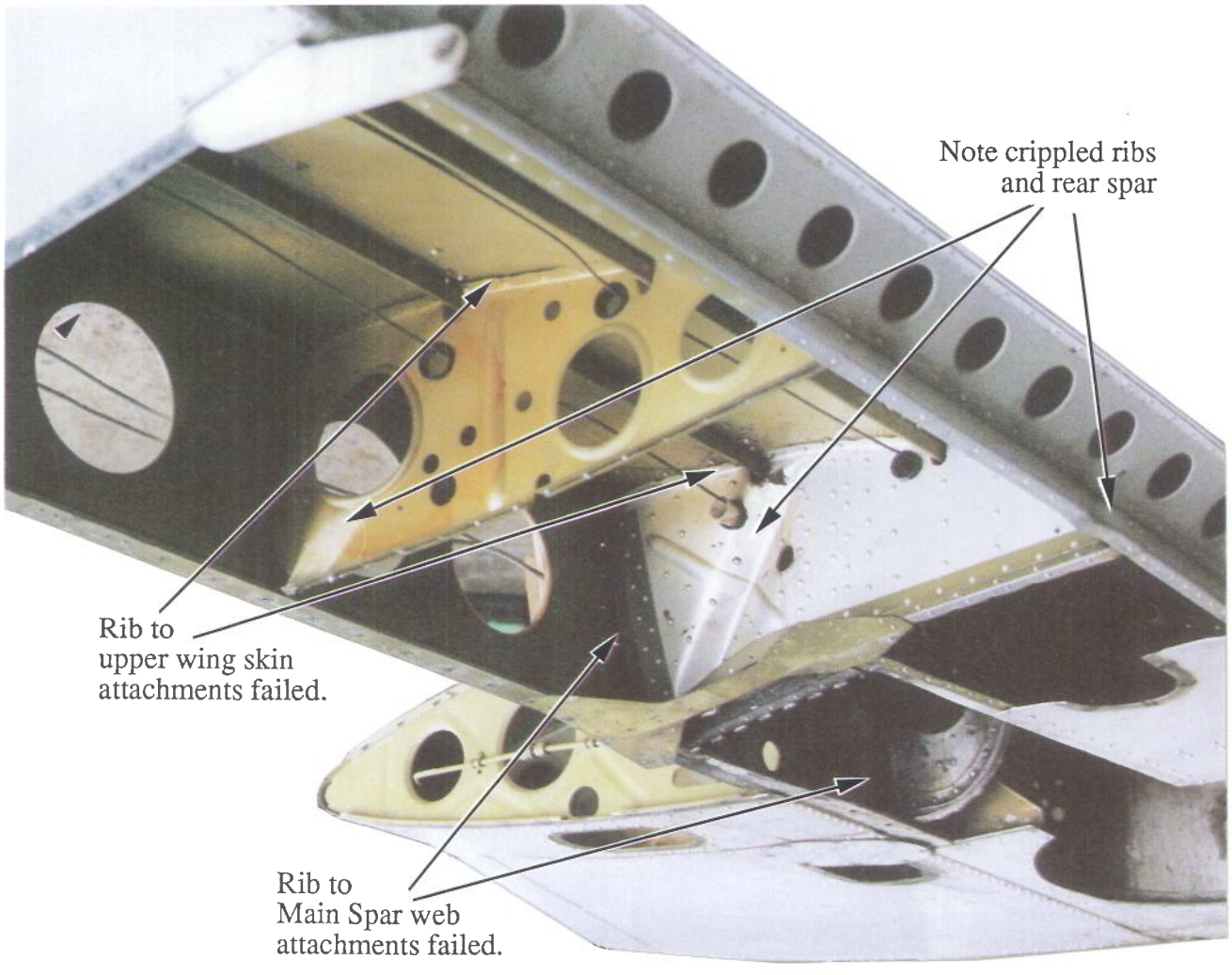
Subsequent examination of the left wing and main landing gear leg revealed that these had both suffered severe damage. Although the cylinder and trunnions of the upper part of the main leg had not been visibly distorted, the sliding element of the leg had been bent aft, with the knee of the bend in a position which was consistent with the oleo having been extended some way from the normal statically compressed position when the load had been applied. The underside skin just aft of the main gear attachment had been severely creased and the upper skin showed evidence of rippling radiating outboard from the landing gear pivot area.

The wing was removed from the aircraft and after further external examination, the wing lower skin was removed from the area behind the fuel tank. Further inspection then revealed evidence of very severe overstressing damage to the box structure aft of the main spar. The damage was mainly outboard of the landing gear attachments, but the rib inboard of the leg attachment had also partially failed along its attachment to the main spar. The damage was consistent with the effects of an instantaneous rearwards force, of some magnitude, on the left mainwheel.

The day after the flight, Air Traffic Control at Norwich were contacted and a runway inspection was performed. No debris was found on runway 27, which had been that used for the take-off.



View of PA 28-200
from above



View looking inboard and forwards on underside of left wing
with landing gear and lower wing skin removed