No: 8/89 **Ref: EW/G89/06/18** **Category: 1a**

Aircraft Type and Registration:	BAe. 146-100, G-BKHT
No & Type of Engines:	4 Lycoming ALF 502 turbofan engines
Year of Manufacture:	1983
Date and Time (UTC):	26 June 1989 at 0905 hrs
Location:	Amsterdam Schipol Airport
Type of Flight:	Airline Scheduled Pax
Persons on Board:	Crew - 5 Passengers - 83
Injuries:	Crew - None Passengers - None
Nature of Damage:	Nose wheel leg broken off, skin wrinkled and holed in the area of the nose wheel bay
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	37 years
Commander's Total Flying Experience:	8,015 hours (of which 172 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

The aircraft was standing beside the air jetty, with all passengers and baggage loaded and doors closed. There was a tug positioned in front of the nose of the aircraft and the commander, wishing to ensure that everything was ready for the planned push-back at 0915 hrs, attempted to contact the ground engineer on the intercommunication system provided for that purpose. This was unsuccessful, but the engineer then appeared at the side of the aircraft wearing his headset, which was not plugged into the aircraft.

The commander attracted the engineer's attention by sounding the ground-call horn and indicated to him, by pointing at his own microphone, that he wished to speak to him. The engineer then walked back towards the nose of the aircraft and disappeared from the commander's sight. Assuming that the engineer had gone to plug in his headset, the commander again tried to speak to him on the intercom, but there was no reply. There was then a slight bump, typical of a tug being coupled to the aircraft, followed a few seconds later by several violent pushes from the tug, culminating in a loud bang from underneath the cockpit, the illumination of the nose gear unsafe light and the sounding of the associated warning horn. The nose of the aircraft then settled to the ground such that the under side of the fuselage was resting on the two nose wheels.

When the nose of the aircraft had been supported on an airbag and was stable, the passengers disembarked from the rear door without event.

The commander has stated that, at the time of this accident, the rotating beacon was not switched on and he had neither begun the 'Pre-start' checklist nor requested clearance from ATC to push back the aircraft off the stand.

It is reported that the engineer subsequently said that the commander had given him the 'brakes off' signal. The commander however states that, whilst pointing with one finger to his microphone in the attempt to persuade the engineer to plug in his headset, the remainder of his hand was firmly clenched. The significance of this statement is that the accepted manual signal from the commander, for the engineer to effect 'pushback', is to present a clenched hand which is then opened to a flat hand, indicating that the brakes are released and thereby implying that pushback may begin. This must be acknowledged by the engineer repeating the signal. On this occasion, no such signal was acknowledged by the engineer.

Subsequent examination of the aircraft revealed that the nose gear leg had broken off in the area of the steering box and that the fuselage skin had been wrinkled by contact with the tyres and punctured by the nose gear torque link. The nose gear leg was replaced at Amsterdam and the aircraft was ferried back to its base at Gatwick.

No: 8/89 **Ref: EW/C1103** **Category: 1a**

Aircraft Type and Registration:	Boeing 747-131, N53110
No & Type of Engines:	4 Pratt and Whitney JT9D-7A turbofan engines
Year of Manufacture:	1970
Date and Time (UTC):	20 April 1989 at 1147 hrs
Location:	Approaching London/Heathrow Airport
Type of Flight:	Scheduled Public Transport
Persons on Board:	Crew - 16 Passengers - 297
Injuries:	Crew - None Passengers - None
Nature of Damage:	Portion of No.16 Krueger (leading edge) flap damaged and further damage to flap, to leading edge of wing and to fuselage
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	57 years
Commander's Total Flying Experience:	25,000 hours (of which 4,800 hours were on type)
Information Source:	AAIB Field Investigation

The aircraft was on a scheduled public transport flight from Los Angeles to London/Heathrow with a total of 313 persons on board. Take off from Los Angeles was at 0122 hrs and the flight proceeded normally until approaching Heathrow with the commander flying a manual Instrument Landing System (ILS) approach to runway 09L. As the aircraft was turning onto the ILS centre line, and shortly after the flaps had been moved from 10 degrees to 20 degrees, a bang was heard to come from the right side of the aircraft with an accompanying light vibration throughout the aircraft. At the same time three flight stewardesses working the right side of the aircraft reported hearing a bang which they initially took to be a bird strike. There were no indications on the flight deck of any abnormality and the commander reported that he had no difficulty in controlling the aircraft. The landing was normal and the aircraft was taxied to the stand where the passengers disembarked without further incident.

The first indications to the flight crew of the nature of the damage was when the ground crew advised them of damage to the No.16 leading-edge Krueger flap (figure 1), adjacent to the No.3 engine. It was evident that this section of Krueger flap had been able to rise above its normal position and that the 'bull-nose' portion had scraped against the engine pylon; this caused a piece of the 'bull-nose' to break off and strike the fuselage about 10 feet forward of the R4 door, slightly penetrating the skin.

Subsequent examination showed that the extra movement of the Krueger flap had been initiated by the failure of the gimbal fitting (figures 1 and 2) which links the ballscrew transmission system, mounted in the wing, with the support arms of the Krueger flap. Following the failure of the fitting, the section of Krueger flap was free to move upwards and to allow the outboard section of 'bull-nose' to scrape against the engine pylon.

Detailed metallurgical examination showed a small area of fatigue cracking around an area of undercut on one of the side-plates : fatigue fracture in this Titanium material is characterized by an extremely small critical crack length and the side-plate then failed in rapid overload. The missing sections of the fitting and of the Krueger flap were not recovered.

The manufacturer has attributed past failures of this fitting to looseness or fracture of one or more of the 8 gimbal attachment bolts on each fitting (6 fittings per aircraft). The original attachment bolts were manufactured from H11 steel, which, according to the manufacturer and CAA Airworthiness Notice No.12, Appendix 35, is susceptible to stress corrosion.

This accident was almost identical to one on 11.2.88, reported in AAIB Bulletin 11/88, occurring to a British-registered 747-136, G-AWNA, on approach to Heathrow. Following that accident the operator of G-AWNA instituted a Special Check and the following steps:

1) replacement of the original (H11 steel) gimbal attachment bolts with their Inconel equivalent,

2) changing of all gimbal assemblies which the Special Check identified as having attachment bolt torque below 95 in-lbs and

3) amendment of the maintenance schedule to include a periodic torque check at Inter check frequency.

At the time of the accident to G-AWNA (11.2.88) the appropriate Service Bulletin was SB 747-27-2148, which simply required a one-time torque check on the attachment bolts. On 6.10.88, therefore, AAIB made two formal recommendations to the CAA:

(i) that the CAA ensure that any future operator of 747-100 series aircraft institute similar procedures (see above) to that of G-AWNA's operator and

(ii) that the CAA draw the attention of the FAA (Federal Aviation Administration) to the shortcomings of SB 747-27-2148.

On 23.11.88 the manufacturer issued Revision 3 to this Service Bulletin, specifying the use of

Inconel bolts as replacements for the existing (H11) bolts and recommending the replacement of all the existing bolts. The Revision does not, however, call for any repetition of the check. Following the accident to N53110 (20.4.89), therefore, AAIB repeated the two recommendations. These have been accepted by the CAA, who have asked the manufacturer and the FAA to improve the Service Bulletin and are processing a CAA Additional Airworthiness Directive to ensure compliance for all aircraft of this type on the British register.

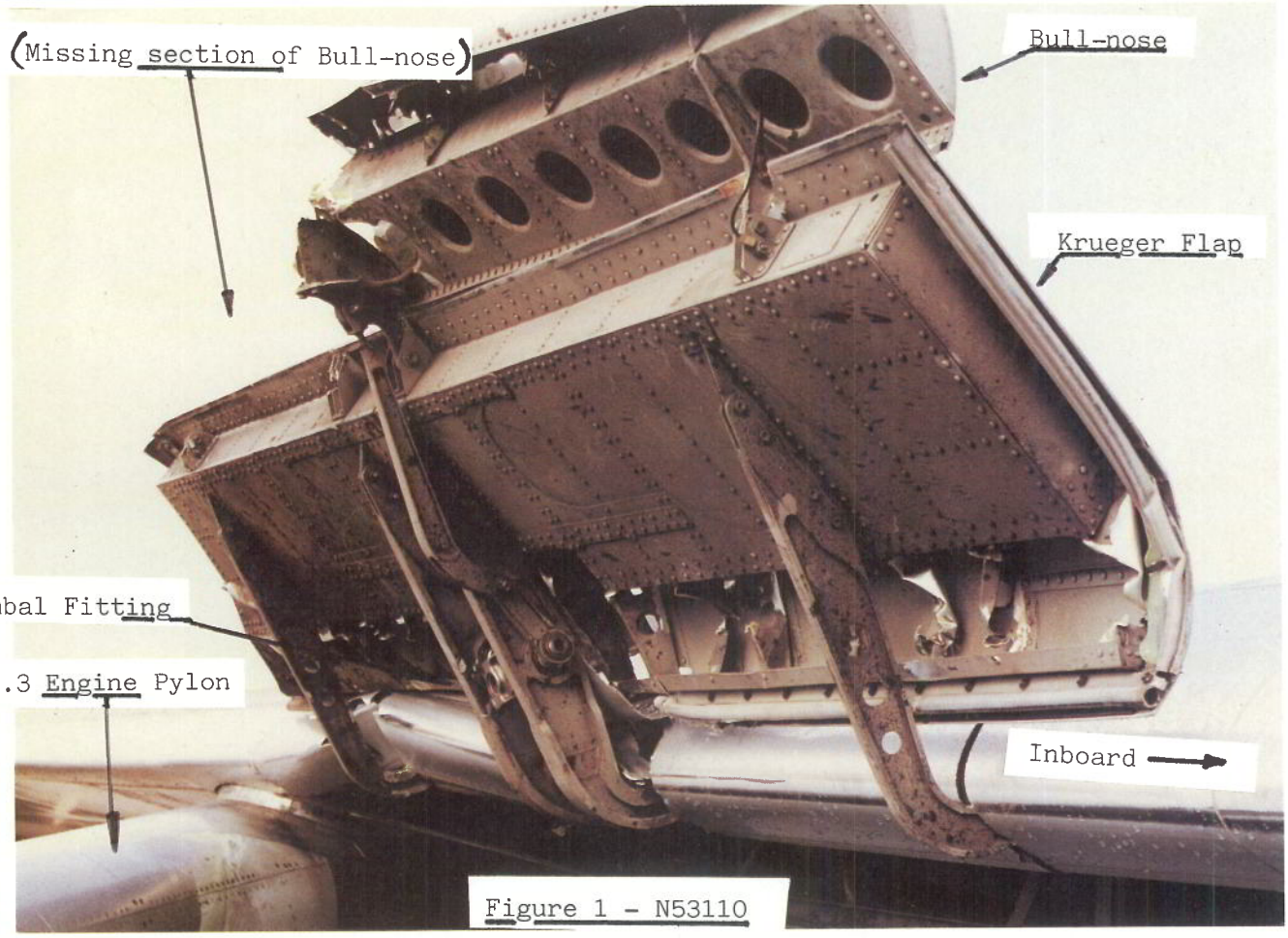


Figure 1 - N53110

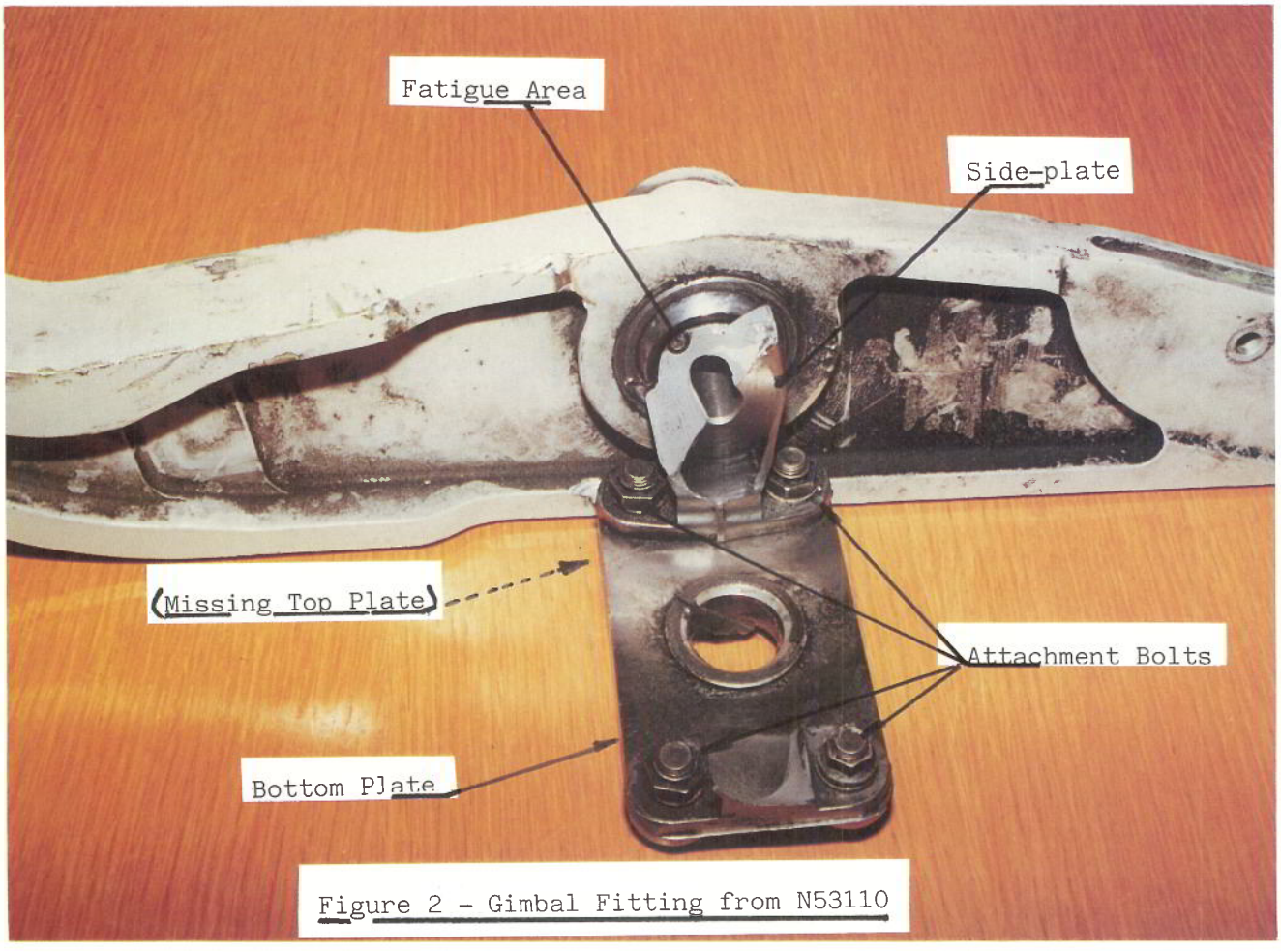


Figure 2 - Gimbal Fitting from N53110

No: 8/89	**Ref: EW/G89/03/10**	**Category: 1b**
Aircraft Type and Registration:	Cessna 421C, G-BKSO	
No & Type of Engines:	2 Continental Motors Corp GTSIO-520-N piston engines	
Year of Manufacture:	1983	
Date and Time (UTC):	23 March 1989 at 1215 hrs	
Location:	Newcastle Airport	
Type of Flight:	Private (pleasure)	
Persons on Board:	Crew - 1	Passengers - 2
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Right main wheel, brake unit and shock strut	
Commander's Licence	Airline Transport Pilot's Licence with Instrument Rating	
Commander's Age:	37 years	
Commander's Total Flying Experience:	5,000 hours (of which 600 were on type)	
Information Source:	Aircraft Accident Report Form submitted by the pilot and engineering examination by AAIB.	

After backtracking along runway 25 the pilot lined up the aircraft with the runway centreline in preparation for take off. As he lined up, the pilot felt a vibration from the right main landing gear. He noticed that the right wing had adopted a low attitude and thought that the right tyre had punctured. The pilot informed ATC of the problem and requested permission to vacate the runway so that he could shut down the engines and inspect the aircraft. The aircraft was cleared to turn around and taxy to a holding point. As the aircraft completed the turn, the right landing gear partially collapsed.

Unfortunately the recovery from the runway of the failed parts associated with the right landing gear was incomplete. Those items that were recovered were given a detailed examination which included metallurgical examination of the right wheel inner rim. The failures associated with this wheel rim were caused by fatigue cracking which emanated from the wheel rim bead radius. Due to the damage present on the fractured surfaces, it was not possible to identify the origins of the fatigue.

Sections of the failed wheel rim appeared to have fouled the right brake disc and caliper, causing the latter to be torn from its mounting. The brake caliper had then rotated and contacted the shock strut, rupturing its lower attachment. This had caused the collapse of the right landing gear leg.

No: 8/89 **Ref: EW/G89/05/08** **Category: 1b**

Aircraft Type and Registration:	Piper PA-23-250, G-AZBK
No & Type of Engines:	2 Lycoming IO-540-C4B5 piston engines
Year of Manufacture:	1971
Date and Time (UTC):	17 May 1989 at 0945 hrs
Location:	Cambridge Airport
Type of Flight:	Private (business)
Persons on Board:	Crew - 1 Passengers - 3
Injuries:	Crew - None Passengers - None
Nature of Damage:	Damage to the right undercarriage, right engine, propeller and right wing
Commander's Licence:	Commercial Pilot's Licence with Instrument Rating
Commander's Age:	43 years
Commander's Total Flying Experience:	1,675 hours (of which 900 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot and examination of the aircraft by AAIB

Following an uneventful flight from Blackbushe, the aircraft made a normal touchdown at Cambridge Airport. During the landing run and before use of the brakes, the aircraft began to veer to the right and the right wing began to drop. The pilot kept the aircraft straight and shut down the engines, followed by the fuel and electrics when the aircraft came to rest. The passenger door was found to be jammed, so the pilot and the three occupants vacated through the emergency exit. As the aircraft was later jacked up the passenger door became free.

Examination of the right undercarriage revealed that the drag stay had failed, which in turn had allowed the undercarriage leg to pivot rearwards and jam under the wing. Specifically, the centre pivot bolt of the drag stay was found to have failed close to its mid point.

Figure 1 shows a cross section of the drag brace centre joint and, as may be seen, it is made up from three forged aluminum alloy links pivoted about a common 9/16" diameter bolt.

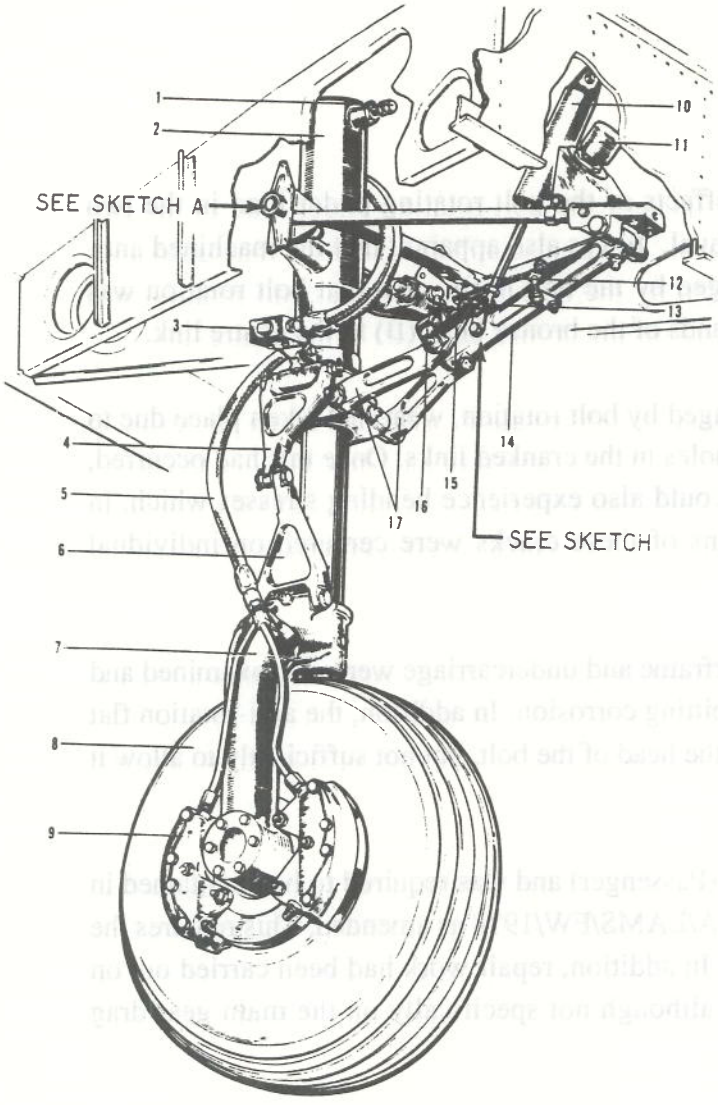
Detailed examination of this bolt revealed that it had failed in reverse bending fatigue and also that it was in poor condition generally. It was apparent that most of the shank showed signs of pitting corrosion

and there was surface damage consistent with the effects of the bolt rotating under load in the two cranked links. The bolt holes in these links (*) were oval. It was also apparent that the machined anti-rotation flat on the inboard link (A) had been damaged by the bolt head, such that bolt rotation was possible. Ovality was also present towards the outer ends of the bronze bush (B) in the centre link.

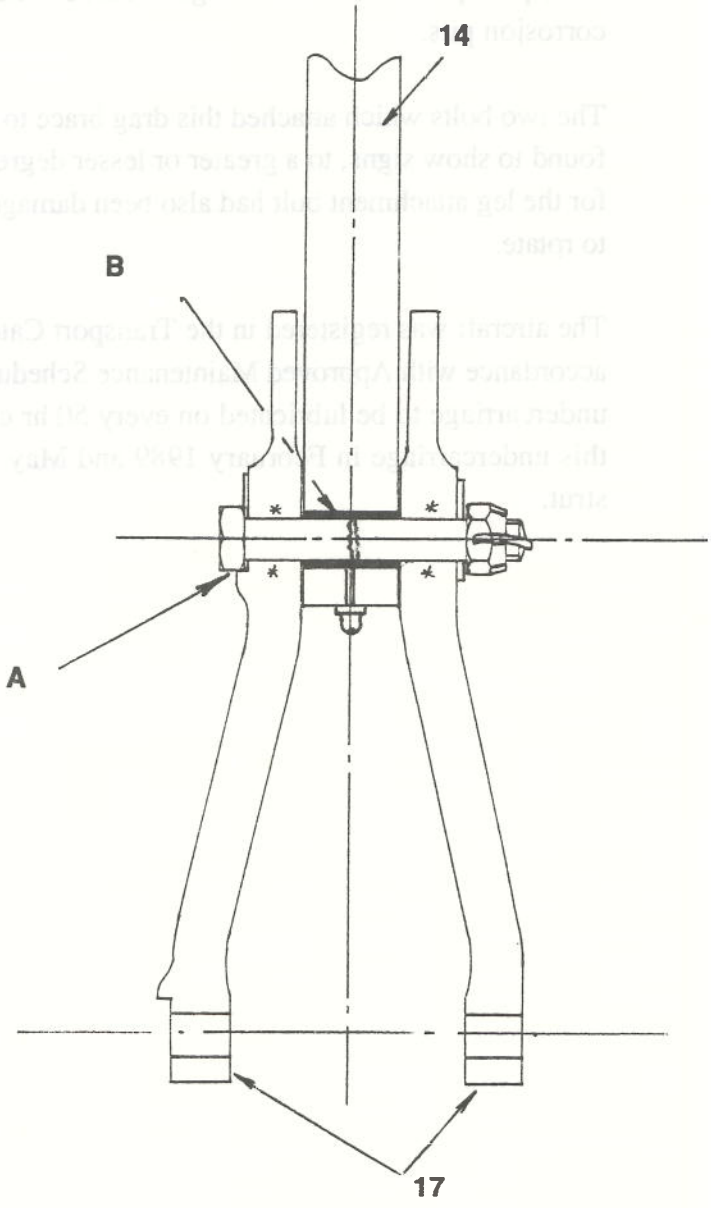
It was thus apparent that, after the flat had been damaged by bolt rotation, wear had taken place due to continued rotation in the unbushed and unlubricated holes in the cranked links. Once this had occurred, the bolt was no longer working purely in shear but could also experience bending stresses which, in turn, precipitated the two fatigue cracks. The origins of these cracks were centered on individual corrosion pits.

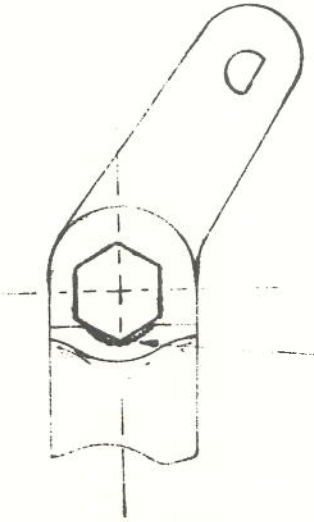
The two bolts which attached this drag brace to the airframe and undercarriage were also examined and found to show signs, to a greater or lesser degree, of pitting corrosion. In addition, the anti-rotation flat for the leg attachment bolt had also been damaged by the head of the bolt, but not sufficiently to allow it to rotate.

The aircraft was registered in the Transport Category (Passenger) and was required to be maintained in accordance with Approved Maintenance Schedule CAA/LAMS/FW/1978 as amended. This requires the undercarriage to be lubricated on every 50 hr check. In addition, repair work had been carried out on this undercarriage in February 1989 and May 1988, although not specifically on the main gear drag strut.



1. AIRCHARGE VALVE
2. GEAR STRUT HOUSING
3. ANTI-RETRACTION VALVE
4. TORQUE LINK, UPPER
5. BRAKE LINE
6. TORQUE LINK, LOWER
7. FORK ASSEMBLY
8. TIRE
9. BRAKE HOUSING
10. GEAR ACTUATING CYLINDER
11. TIME DELAY VALVE
12. RETRACTION ROD
13. LATCH ASSEMBLY
14. DRAG LINK, UPPER
15. SPRINGS
16. INDICATING SWITCH
17. DRAG LINK, LOWER





DAMAGE TO ANTI-ROTATION 'FLAT'

VIEW ON A

FIGURE 1

No: 8/89 **Ref: EW/C1122** **Category: 1b**

Aircraft Type and Registration:	Spitfire Mk 5C, G-MKVC	
No & Type of Engines:	1 Rolls-Royce Merlin 35/2 piston engine	
Year of Manufacture:	1942 (rebuilt 18 November 1988)	
Date and Time (UTC):	1 July 1989 at 1757 hrs	
Location:	Hartley Wintney, Hampshire	
Type of Flight:	Private (pleasure)	
Persons on Board:	Crew - 1	Passengers -None
Injuries:	Crew - 1 (fatal)	Passengers -N/A
Nature of Damage:	Aircraft destroyed	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	46 years	
Commander's Total Flying Experience:	518 hours (of which 101 were on type)	
Information Source:	Air Accidents Investigation Branch Field Investigation	

Progress of the Investigation

The aircraft took-off from its base at Roundwood, Micheldever, Hampshire at about 1730 hrs. At about 1745 hrs it was in the Wokingham, Berkshire area where it carried out a series of climbing and turning manoeuvres at between 1000 and 1500 feet. Witnesses saw or heard nothing which indicated that the aircraft was performing other than normally. It flew off in the direction of Hook in Hampshire, where several witnesses heard the engine spluttering and misfiring and saw a trail of vapour coming from the aircraft. A Mayday call from G-MKVC was heard which said that an attempt was to be made to land at Blackbushe Airfield. This was followed, within seconds, by another call which changed the landing point to a field to the west of Blackbushe. The aircraft was seen, with the propeller stopped, to just clear some high tension cables, bank left at an angle estimated as almost 90° and fly along the perimeter of a the field with the wing tip only a few feet above the ground. At the last second the pilot levelled the wings and the aircraft struck the ground in a nose-down attitude. It caught fire immediately and the complete centre section was destroyed. The last contact recorded from the Heathrow radar indicated that the accident occurred at about 1757 hrs.

The impact had been taken primarily by the engine, which was embedded in the ground at an angle of 22 degrees below the horizontal; the propeller blades had failed in a rearwards direction and had not been under power at impact. The leading edges of both wings had been deformed upwards by the

impact and this corresponded to ground marks which indicated that the aircraft had struck with wings approximately level on a heading of 274 degrees magnetic.
A fuel fire had destroyed the centre section of the aircraft, leaving the tail section, starboard wing, outer port wing and the engine. The starboard tailplane upper and lower surfaces were contaminated by oil. The canopy had fragmented and a number of fragments had been thrown clear of the fire; some of those to the right hand side were covered in oil. Although the engine was half buried an oil deposit was observed in the exhaust stub from cylinder 1A, and the fractured end of a blade-type connecting rod was found lodged outside the crankcase. When the engine was lifted the crankcase was found to be holed on both sides. The engine was removed for strip examination the results of which will be published later.

Article in the Daily Telegraph

Some readers of the AAIB bulletin may have seen the article on this accident that appeared in the Daily Telegraph on Monday, 3rd July which contained statements alleged to have been made by "an AAIB engineer". This article was the subject of comment by Group Captain David Green of the Spitfire Society in a letter published on 11th July. Being concerned that the Daily Telegraph article might have been accepted by readers as in fact being based on information from AAIB the Chief Inspector of Air Accidents faxed the following letter to the Daily Telegraph on 12th July. As this letter has not been published at the time of going to press it is reproduced here for the information of Bulletin readers who might be concerned about the content of the Daily Telegraph article:-

"Like Group Captain Green I was myself surprised to see the statement on the opinions of the Air Accidents Investigation Branch in your article two days after the recent fatal Spitfire accident.

None of the information in fact came from the AAIB. The article does not reflect current AAIB thinking".

No: 8/89 **Ref: EW/G89/06/11** **Category: 1c**

Aircraft Type and Registration:	Auster AOP9, G-BGTC	
No & Type of Engines:	1 Blackburn Bombardier 20801 piston engine	
Year of Manufacture:	1961	
Date and Time (UTC):	13 June 1989 at 1743 hrs	
Location:	Tollerton, Nottingham	
Type of Flight:	Private (pleasure)	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damage to port wing, port landing gear and propeller.	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	60 years	
Commander's Total Flying Experience:	328 hours (of which 25 were on type)	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

The aircraft was landing on runway 09 in a wind of 160°/10 to 20 kt.. The pilot reported that the landing was heavy and that, after touchdown, the aircraft swung sharply to starboard. The port landing gear shock absorber strut sheared causing the drag link strut and the landing gear attachment bracket to shear. Following this failure, the port wing and the propeller struck the ground.

No: 8/89 **Ref: EW/G89/06/17** **Category: 1c**

Aircraft Type and Registration:	Auster 5J1, G-AHSP
No & Type of Engines:	1 Blackburn Cirrus Minor 2 piston engine
Year of Manufacture:	1946
Date and Time (UTC):	26 June 1989 at 1620 hrs
Location:	Durleigh Marsh Farm, Rogate
Type of Flight:	Private (pleasure)
Persons on Board:	Crew - 1 Passengers -None
Injuries:	Crew - None Passengers -N/A
Nature of Damage:	Damage to propeller, fin and rudder, wings and cockpit canopy
Commander's Licence:	Private Pilot's Licence
Commander's Age:	58 years
Commander's Total Flying Experience:	851 hours (of which 80 were on type)
Information Source:	Aircraft Accident Report From submitted by the pilot

The aircraft was landing on a private grass strip in clear weather conditions and light winds. Late on finals the pilot encountered a crosswind, which caused him to drift to the right just before touch-down. The aircraft touched down on soft, ploughed earth beside the strip, turned over and came to rest on its back. The pilot was secured by a lap strap and a diagonal shoulder strap and was able to leave the aircraft unaided and without injury.

No: 8/89 **Ref: EW/G89/06/14** **Category: 1c**

Aircraft Type and Registration:	Beech 76, G-JLRW
No & Type of Engines:	2 Lycoming O-360-A1G6D (Left) LO-360-A1G6D (Right) piston engines
Year of Manufacture:	1979
Date and Time (UTC):	18 June 1989 at 0848 hrs
Location:	Radlett (disused airfield) nr St Albans, Herts
Type of Flight:	Private (pleasure)
Persons on Board:	Crew - 1 Passengers - 3
Injuries:	Crew - None Passengers - None
Nature of Damage:	Substantial to propellers, underside of skin, left flap bracket, engines shock-loaded
Commander's Licence:	Private Pilot's Licence
Commander's Age:	41 years
Commander's Total Flying Experience:	211 hours (of which 132 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot and AAIB telephone enquiry

The aircraft took off from Leavesden with the pilot in the front left seat, his 12 year old daughter in the front right seat, and his wife and younger daughter occupying the rear seats.

At an altitude of 1,000 feet during the initial climb, the right main door opened, and the girl in the right seat attempted to hold the door closed, assisted by the pilot. Because he was unsure of how long the door could be physically held, or what the outcome would be if the door detached, he decided to land as soon as possible.

The aircraft was close to Radlett and the pilot decided to attempt a landing there. Due to his concern about the aircraft, the runway state at Radlett, and associated factors, he failed to lower the landing gear and the aircraft landed wheels up, causing substantial damage.

The occupants who were wearing lap and diagonal harnesses were uninjured, and there was no fire.

No: 8/89 **Ref: EW/G89/04/27** **Category: 1c**

Aircraft Type and Registration:	Cessna 152, G-BMTB
No & Type of Engines:	1 Lycoming O-235-L2C piston engine
Year of Manufacture:	1978
Date and Time (UTC):	7 April 1989 at 1420 hrs
Location:	Shoreham Airport
Type of Flight:	Training
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Substantial damage to nose landing gear
Commander's Licence:	Private Pilot's Licence with IMC, Night, and Assistant Instructor Ratings
Commander's Age:	36 years
Commander's Total Flying Experience:	508 hours (of which 435 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

The instructor and his student were flying a detail which involved touch-and-go landings on runway 25 at Shoreham Airport. The surface wind was reported to have been 240°/20 kt. On the first two landings the student showed a tendency to round-out too high, so the instructor pointed this out and advised him to start the flare nearer the ground. On the subsequent landing the student over-corrected and the instructor took control too late to prevent the aircraft landing heavily on the nose wheel. The Airport Fire Service attended promptly and the two occupants, who were wearing diagonal upper torso restraint, escaped without injury.

No: 8/89 **Ref: EW/G89/06/07** **Category: 1c**

Aircraft Type and Registration:	Cessna 172P, G-BOLH	
No & Type of Engines:	1 Lycoming O-320-D2J piston engine	
Year of Manufacture:	1981	
Date and Time (UTC):	18 June 1989 at 1255 hrs	
Location:	Downton Farm, Near Walton, Powys	
Type of Flight:	Private (pleasure)	
Persons on Board:	Crew - 2	Passengers - 1
Injuries:	Crew - None	Passengers - 1 (minor)
Nature of Damage:	Extensive damage to wings and landing gear	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	36 years	
Commander's Total Flying Experience:	84 hours (of which 10 were on type)	
Information Source:	Aircraft Accident Report Form submitted by the pilot, information from the operator and photographs provided by the Central Counties Air Operations Unit	

Prior to a flight from Shobden to Aberystwyth (and return), which the pilot estimated would require approximately 1 hours total flying time, he carried out a thorough pre-flight check of the aircraft, including a visual check of fuel quantity. Both the visual check and the fuel contents gauges indicated that the aircraft had "½ to ⅔ full" fuel tanks.

During the course of the flight, after turning overhead Aberystwyth and during a climb from 1500 feet to 5000 feet, the pilot noted that both fuel gauges were indicating nearly empty. The pilot continued back towards Shobden, flying at a height of 5,000 feet. Approximately two minutes after passing overhead Radnor NDB, the engine failed. Having checked that the fuel was selected to ON and that the mixture was selected to fully RICH, the pilot deduced that the engine had failed due to lack of fuel. A forced landing was carried out in fields some two miles north of Old Radnor. After initial contact with the ground in the intended landing field, the aircraft bounced and collided with a hedge and tree before coming to rest in an adjoining field.

On site examination, by the operators staff, found no fuel in the aircraft's fuel tanks and no external indications of a fuel leak. Examination of aerial photographs of the accident site showed that both fuel

tank caps were present. Unfortunately no fuel system leak checks or inspection of the fuel tank caps fit were made prior to dismantling the aircraft and removing it from the accident site.

Inquiries and checks of fuel uplift, and the aircraft flying records, by the operators Chief Flying Instructor established that the aircraft had departed from Shobden with sufficient fuel for the flight, including a fully adequate reserve.

No: 8/89 **Ref: EW/G89/05/07** **Category: 1c**

Aircraft Type and Registration:	Cessna T210F, D-EDWB
No & Type of Engines:	1 Teledyne Continental TSIO-520-C piston engine
Year of Manufacture:	1966
Date and Time (UTC):	5 May 1989 at 1110 hrs
Location:	Jersey Airport
Type of Flight:	Private (pleasure)
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Propeller and nose landing gear leg and doors damaged, engine shock-loaded
Commander's Licence:	Private Pilot's Licence with Instrument Rating
Commander's Age:	53 years
Commander's Total Flying Experience:	4,000 hours (of which 2,200 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot and telephone enquiries of repair organisation

The German registered and operated aircraft was on a flight from France to Jersey, for the 35th Jersey International Air Rally. It was the pilot's thirteenth entry in the Rally. He made an approach for Runway 09 as a participant in a spot-landing competition forming part of the Rally. The runway is of smooth tarmacadam, 1,706 x 46 metre; the wind was from 080° Magnetic at 18 kt and the weather was good. The pilot reported that the aircraft, with full flap deployed, touched down a little hard on the main landing gears due to a gust and the nose dropped until the propeller contacted the runway at about 40 kt groundspeed. The aircraft came to rest after a 20 metre slide on the nose and both occupants evacuated without difficulty.

The pilot believed that the nose landing gear had failed to extend and that in his concentration on the spot-landing he had ommitted to check the green landing gear extension light. Examination reportedly found that a bracket locating one end of the nose landing gear oleo extension strut, which acts to lock the leg down, was broken off.

No: 8/89 **Ref: EW/G89/06/06** **Category: 1c**

Aircraft Type and Registration:	Jodel DR105A, G-AXUE
No & Type of Engines:	1 Continental Motors Corporation O-200-A piston engine
Year of Manufacture:	1959
Date and Time (UTC):	11 June 1989 at 1720 hrs
Location:	Bagby Airstrip Thirsk, North Yorks
Type of Flight:	Private (pleasure)
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - 1 (serious) Passengers - N/A
Nature of Damage:	Aircraft damaged beyond economical repair
Commander's Licence:	Private Pilot's Licence
Commander's Age:	49 years
Commander's Total Flying Experience:	158 hours (of which 39 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

After a normal approach to land on runway 06 the pilot crossed the threshold at 60 kt and began to round out at a height of approximately 10 feet. The aircraft descended rapidly and, when full power was applied, the left wing dropped and the aircraft began to climb on a track some 45° to the left of the runway heading. It reached a height of 25 to 30 feet and then began to sink rapidly. The pilot reported that the engine was at full power at this time, there was no stall warning but the airbrake was extended. The aircraft travelled some 200 metres from the runway before the left wing struck a tree. The aircraft struck the ground and came to rest 7 metres beyond the tree, having turned through 180°.

The temperature was 21°C, the surface wind was reported to be 190°/8 kt but gusts up to 20 kt had been recorded during the day. Runway 06 ran uphill and it was customary to use this runway unless the tailwind component exceeded 10 kt.

No: 8/89 **Ref: EW/G89/04/03** **Category: 1c**

Aircraft Type and Registration:	Luton LA4A Minor, G-ASEA	
No & Type of Engines:	1 JAP J99 piston engine	
Year of Manufacture:	1966	
Date and Time (UTC):	8 April 1989 at 1420 hrs	
Location:	Mendlesham Airfield, Suffolk	
Type of Flight:	Private (pleasure)	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Damage to the undercarriage, wing and propeller	
Commander's Licence:	Private Pilot's Licence with Night Rating	
Commander's Age:	50 years	
Commander's Total Flying Experience:	912 hours (of which 202 were on type)	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

The pilot moved the aircraft out of its hangar and then carried out the "daily" and "weekly" inspections, which included checking the fuel system drains for evidence of water and sediment.

After starting the engine, full power was checked at 3000 RPM and the magnetos at 1500 RPM. The engine oil pressure and temperature were normal.

After taxying for some 800 metres, carburettor heat was applied for one minute (a placarded requirement for this aircraft) followed by a final full power check. Ten minutes after take-off, when at 1300 ft, the engine began to run roughly. The pilot applied carburettor heat, following which the engine ran smoothly. A few minutes later it ran roughly again and carburettor heat was again applied. However, the engine continued to lose power.

A forced landing was carried out on a road. Immediately after landing, the left wing-tip hit a small sapling, which was supported by a wooden stake. This caused the aircraft to swing off the road, momentarily becoming airborne, before coming to rest inverted in an adjacent ploughed field. The pilot, who was wearing a full harness, was uninjured.

In the absence of any other known problems the pilot considered the cause of the power loss to have been carburettor icing. The air temperature at the time was +8 deg C and the fuel being used was Mogas 4 star. It is an acknowledged characteristic of Mogas that under given conditions it is more likely than Avgas to induce carburettor icing.

No: 8/89 **Ref: EW/G89/05/14** **Category: 1c**

Aircraft Type and Registration:	Morane Saulnier MS.880B Rallye Club, G-BGZO
No & Type of Engines:	1 Continental Motors Corp O-200-A piston engine
Year of Manufacture:	1964
Date and Time (UTC):	10 May 1989 at 1630 hrs
Location:	East Meon, Petersfield, Hampshire
Type of Flight:	Private (pleasure)
Persons on Board:	Crew - 1 Passengers - 2
Injuries:	Crew - None Passengers - None
Nature of Damage:	Damage to underside of fuselage. Bent landing gear and propeller
Commander's Licence:	Private Pilot's Licence
Commander's Age:	41 years
Commander's Total Flying Experience:	204 hours (of which 32 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

The aircraft was taking off from a private strip with a grass surface and available take-off distance of 433 metres. The grass was dry but about 7 inches long and the pilot had calculated that at his operating weight,which was some 200 lb below the maximum permitted take-off weight, the aircraft would require about 374 metres of ground roll. From the wind sock indication the wind appeared to be very light. The aircraft was rotated into the take-off attitude after a ground roll of about 295 metres at an indicated airspeed of 50 mph whereupon the pilot realised that the rate of climb was low. He flew level, attempting to gain airspeed, but the aircraft began to sink and he attempted a landing in the adjacent field. The tail of the aircraft struck the boundary fence and other damage was sustained before the aircraft came to rest.

No: 8/89 **Ref: EW/G89/06/16** **Category: 1c**

Aircraft Type and Registration:	Piper PA17, G-ALIJ
No & Type of Engines:	1 Continental Motors Corp A65-8 piston engine
Year of Manufacture:	1949
Date and Time (UTC):	17 June 1989 at 1145 hrs
Location:	Popham Airfield, Hampshire
Type of Flight:	Private (pleasure)
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - None Passengers - None
Nature of Damage:	Left landing gear collapsed, propeller tips bent and wing bracing strut bent
Commander's Licence:	Private Pilot's Licence
Commander's Age:	30 years
Commander's Total Flying Experience:	160 hours (of which 3 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

At the end of a 1 hr 20 minute flight the pilot made a curving glide approach to the grass runway 08 at Popham airfield. Although the pilot considered that the flight path was slightly low, he did not apply power but allowed the air speed to fall to 55 kt as the aircraft crossed the runway threshold. When he lowered the nose of the aircraft and reduced power, at about 10 feet over the threshold, the aircraft sank rapidly. He applied full power and raised the nose in an attempt to cushion the landing. A heavy bounce resulted, but the pilot was able to regain control and make a three point landing.

After about 3 seconds of the landing run, the aircraft began to pull to the left. The pilot countered this by progressive use of brakes, rudder and aileron until the wing sank to the ground, dragging the aircraft 20 metres to the left of the centre line and yawing it 20° to the left. Both occupants vacated the aircraft without difficulty. There was no fire.

The pilot has subsequently stated that he believes that the accident resulted from not allowing for a heavier than normal passenger and allowing the airspeed to fall below 60 kt during the approach.

No: 8/89 **Ref: EW/G89/05/12** **Category: 1c**

Aircraft Type and Registration:	Piper PA-28-140, G-ATPN
No & Type of Engines:	1 Lycoming O-320-E2A piston engine
Year of Manufacture:	1966
Date and Time (UTC):	30 May 1989 at 1906 hrs
Location:	Near Clacton Airfield, Essex
Type of Flight:	Training
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Substantial - to right wing tip, right tailplane tip, and sheared nose wheel oleo
Commander's Licence:	Private Pilot's Licence with IMC and Assistant Instructor Ratings
Commander's Age:	28 years
Commander's Total Flying Experience:	294 hours (of which 254 were on type)
Information Source:	Aircraft Accident Report Form submitted by the Pilot, CAA Occurrence Report, and AAIB enquiries

The aircraft was on an instructional flight and the instructor had checked that there was approximately 45 minutes fuel endurance in the right tank, and 2 hours 45 minutes in the left tank.

During the flight the instructor had been teaching the student the FREDA (Fuel /Radio/Engine/DGI/Altitude) check. The flight had commenced with the right tank selected, but the instructor was under the impression that the left tank was now selected. After 40 minutes of flight the engine failed, and despite the usual checks, changing of tanks, selection of the fuel pump and reselecting the magneto switch, the engine failed to restart and a forced landing was carried out into a wheatfield. In order to avoid trees at the far end of the field, the aircraft was turned to the left on the ground, and sustained substantial damage.

The occupants were wearing diagonal upper torso restraint and evacuated the aircraft normally. There was no fire.

No: 8/89 **Ref: EW/G89/04/21** **Category: 1c**

Aircraft Type and Registration:	Piper PA28-161, G-BFNI
No & Type of Engines:	1 Lycoming O-320-D3G piston engine
Year of Manufacture:	1978
Date and Time (UTC):	14 April 1989 at 1630 hrs
Location:	Barn Farm, Horton-Cum-Studley
Type of Flight:	Training
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	All 3 landing gears broken off, damage to both wings, engine bulkhead, fuselage skins, stabilator and flaps.
Commander's Licence:	Student Pilot
Commander's Age:	33 years
Commander's Total Flying Experience:	38 hours (all of which were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot and subsequent discussions with the pilot, Chief Flying Instructor and Chief Engineer.

The pilot reported that he had been carrying out practice forced landings (PFL). He had completed several PFLs during the flight but this was the first simulated engine fire. He stated that he closed the throttle at 3000 ft, selected carburettor heat on and simulated the actions required for the engine fire drill. He then assumed that the fire had not extinguished, selected 40° flap and carried out a spiral emergency descent at 95 kts, during which he decided upon a suitable field. At 1500 ft he assumed the simulated fire to be extinguished. He reduced speed to 75 kts. and retracted the flaps. He also momentarily applied power to warm the engine. The pilot then simulated the usual PFL vital actions and turned onto final approach. At 700 ft agl he initiated a go-around, selecting full power, carburettor heat to "off" and flaps to 25°. The engine failed to respond. In subsequent discussion, the pilot agreed that he may have opened the throttle somewhat rapidly. The pilot re-cycled the throttle lever and checked that the electric fuel pump was on. He checked that the mixture was fully rich and re-selected carburettor heat, but the engine still did not respond and eventually stopped. The aircraft landed heavily in a soft field. The pilot switched off the fuel and electrical system before vacating the aircraft.

The aircraft sustained substantial damage to the landing gear and also damage to the lower wing skins, flaps, fuselage, firewall and stabilator. After recovery, the engine was connected to a fuel system rig

for test purposes. It started and ran normally, although the slow running mixture was somewhat rich. This was attributed to distortion of the air induction system in the impact. The fuel system was examined for contamination but none was found. The engine had been investigated in the past due to a tendency towards momentary rough-running as the throttle was advanced.

An aftercast of the weather in the area at the time of the accident was obtained and was as follows:

Nil weather, 20 km visibility, 2 to 3 oktas cumulus base 3500 ft, 4 oktas stratocumulus base 4000ft. At 3000 ft the temperature was 2°C and the relative humidity (RH) was 60%. At 2000 ft the temperature was 5 °C, RH 55%, and at 1000 ft 8°C, RH 58%.

When plotted on a carburretor icing chart, the above conditions fell within the areas designated "Icing - glide and cruise power" and "Serious icing at glide power".

The aircraft was fuelled with Avgas 100LL, DERD 2485

No: 8/89 **Ref: EW/G89/05/16** **Category: 1c**

Aircraft Type and Registration:	Piper PA-28-161, G-BOXB
No & Type of Engines:	1 Lycoming O-320-D3G piston engine
Year of Manufacture:	1988
Date and Time (UTC):	24 May 1989 at 1110 hrs
Location:	Jersey Airport
Type of Flight:	Training
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Substantial damage to the propeller, engine and nosewheel assembly
Commander's Licence:	Student Pilot
Commander's Age:	21 years
Commander's Total Flying Experience:	26 hours (of which all were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

Positioned at the holding point for runway 27, the aircraft was cleared for take-off in a wind from the northwest at 5 kt. There was another aircraft on final approach and the pilot of G-BOXB has stated that, although he had felt slightly rushed, by the time the airspeed had reached about 50 kt he had everything under control. However, at about 60 kt, a slight veer to the left developed and, though trying to correct it, he was reluctant to apply very much right rudder for fear of inducing a swing to the right. The slight veer quickly developed into a 180° ground-loop to the left, onto the grass, and broke the nose landing gear.

Despite his lap strap and diagonal upper torso harness, the pilot was thrown forwards and to the right, pushing the control column forward and cutting the power. When the aircraft had come to rest, the pilot turned off the magnetos and the battery master switch, and climbed out of the aircraft.

No: 8/89 **Ref: EW/G89/06/04** **Category: 1c**

Aircraft Type and Registration:	Piper PA-28-161, G-KBPI
No & Type of Engines:	1 Lycoming O-320-D3G piston engine
Year of Manufacture:	1978
Date and Time (UTC):	5 June 1989 at 1235 hrs
Location:	South Harting
Type of Flight:	Training
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Severe damage to left wing
Commander's Licence:	Student Pilot
Commander's Age:	43 years
Commander's Total Flying Experience:	140 hours (of which 103 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

The solo student pilot had conducted a number of practice forced landings from about 2500 feet altitude. Not being satisfied with his final attempt he decided to repeat the exercise into the field which he had just used but without climbing to his previous starting altitude. He established the aircraft downwind at 2000 feet, closed the throttle and selected carburettor air "HOT" and fuel pump "ON". At the end of the downwind leg he opened the throttle briefly to warm the engine and the engine appeared to respond normally. Having established the aircraft on finals with 20° of flap selected the pilot was satisfied that a successful landing could be made into the selected field and he opened the throttle to go-around. The engine did not respond but continued to windmill. The pilot checked the carburettor heat, which was still "HOT", closed the throttle, moved the mixture control to "cut-off", closed the fuel cock, transmitted a "MAYDAY" and landed in the field.

The aircraft touched down, passed partially through, partially over a fence and came to rest slewed 45° to the left having sustained major damage to its left wing in the collision with the fence.

An engineer examined the aircraft before it was salvaged. He confirmed that there was ample fuel in both tanks and that the primer was locked. He carried out an engine ground run and found the idle speed, carburettor heat operation and magneto performance to be satisfactory. Considering the possibility of a "rich cut" from rapid throttle movement he carried out slam accelerations and the engine

responded correctly. The aircraft awaits repair and so far no defect has been found to explain the occurrence.

The reported air temperature (sea level) was +10°C and there were 2 oktas of stratus at 5000 ft.

No: 8/89 **Ref: EW/G89/05/15** **Category: 1c**

Aircraft Type and Registration:	Piper PA-28-161, G-BNJM
No & Type of Engines:	1 Lycoming O-320-O3G piston engine
Year of Manufacture:	1982
Date and Time (UTC):	18 May 1989 at 1000 hrs
Location:	Middleton, Cumbria
Type of Flight:	Private (pleasure)
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - None Passengers - None
Nature of Damage:	Substantial damage to the engine, propeller, nose landing gear and left wing. damage to fuselage and main landing gear
Commander's Licence:	Private Pilot's Licence
Commander's Age:	41 years
Commander's Total Flying Experience:	100 hours (of which 54 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

The pilot obtained a meteorological briefing, by telephone, from the Airmet-North service at about 0800 hrs and the aircraft left Teesside Airport at 0900 hrs on a VFR flight plan to Cork, Republic of Ireland. As the aircraft crossed the eastern edge of the Pennines, the pilot noted that the weather had deteriorated both ahead and behind him. He maintained visual contact with the ground and continued on his planned course. As the flight progressed the conditions deteriorated further and the pilot deviated from his planned flight path in order to maintain visual contact. However, he soon became uncertain of his position and elected to carry out a precautionary landing as soon as practicable. This was accomplished on open, rough ground adjacent to a farm track, at approximately 1300 feet amsl. The aircraft was substantially damaged during the landing but both occupants vacated the aircraft uninjured. The time was about 1000 hrs. After a short while, the pilot re-entered the aircraft and used the radio to alert the emergency services. A police vehicle and a SAR helicopter arrived on the site at about 1145 hrs.

A transcript of the Airmet-North weather report for the period was obtained from the Meteorological Office at Bracknell. The general situation was that a moist west-south-westerly airstream covered the whole region. The surface visibility was forecast to be 12 kilometres reducing to 7 kilometres in rain, locally 1500 metres in drizzle and 200 metres in sea, hill and coastal fog. The cloud was given as broken stratocumulus base 2500 feet, with an occasional broken layer base 1000 feet, top above 15000 feet with embedded cumulus. Cloud was forecast to cover hills in the area.

No: 8/89 **Ref: EW/G89/04/11** **Category: 1c**

Aircraft Type and Registration:	Piper PA-28-181, G-BNNP
No & Type of Engines:	1 Lycoming O-360-A4M piston engine
Year of Manufacture:	1985
Date and Time (UTC):	13 April 1989 at 1325 hrs
Location:	Redhill Aerodrome, Surrey
Type of Flight:	Private (pleasure)
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - None Passengers - None
Nature of Damage:	Slight damage to right flap.
Commander's Licence:	Private Pilot's Licence
Commander's Age:	33 years
Commander's Total Flying Experience:	80 hours (of which 19 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot and telephone inquiries to the maintenance organisation.

On the downwind leg following a normal take off from runway 26R, the control tower advised that one of the aircraft's wheels had detached and was on the runway. During a low approach and go around it was confirmed visually that the right wheel, brake and lower landing gear leg were missing.

Following a number of practice approaches, and with the emergency services in position, the aircraft was landed on runway 26. The aircraft came to a halt, and both occupants vacated it quickly without suffering injury. The aircraft suffered minor damage to the right flap lower skin.

Subsequent examination by the maintenance organisation revealed that the lower torque link bolt was missing, allowing the whole of the lower (sliding) section of the landing gear to separate.

The lower torque link bolt is retained by a nut secured by a split pin. It was subject to a visual inspection some 30 flying hours prior to the accident and had not been mechanically disturbed subsequent to a 150hr inspection, carried out over 100 hours prior to the accident. No definitive explanation was found as to how the bolt came to be missing.

No: 8/89 **Ref: EW/G89/06/22** **Category: 1c**

Aircraft Type and Registration:	Piper PA-34-200T-2, G-OBED
No & Type of Engines:	2 Continental Motors Corp TSIO-360-EB piston engines
Year of Manufacture:	1978
Date and Time (UTC):	23 June 1989 at 0715 hrs
Location:	Wickenby Airfield, Lincolnshire
Type of Flight:	Private (business)
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - None Passengers - None
Nature of Damage:	Damage to nosewheel, port undercarriage and cockpit canopy
Commander's Licence:	Private Pilot's Licence with Night Rating
Commander's Age:	58 years
Commander's Total Flying Experience:	852 hours (of which 287 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

Following a normal approach in conditions of light wind, the aircraft dropped suddenly and landed heavily causing the landing gear to collapse.

No: 8/89 **Ref: EW/G89/05/03** **Category: 1c**

Aircraft Type and Registration:	Reims Cessna F152, G-BHJW
No & Type of Engines:	1 Lycoming O-235-L2C piston engine
Year of Manufacture:	1980
Date and Time (UTC):	5 May 1989 at 1320 hrs
Location:	A field North of Gaulby, Leicester
Type of Flight:	Training
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - 1 (serious) 1 (minor) Passengers - N/A
Nature of Damage:	Extensive damage to fuselage, landing gear torn off, minor damage to tailplane.
Commander's Licence:	Private Pilot's Licence with IMC and Full Instructor Ratings
Commander's Age:	49 years
Commander's Total Flying Experience:	982 hours (of which 800 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

The aircraft was being used for a dual circuit training exercise. After the completion of two normal circuits, the instructor closed the throttle at about 500 to 600 feet agl on the third climb-out, to simulate an engine failure after take-off. The student lowered the nose, to maintain 60 knots airspeed, and selected a field for landing. This field was at the limit of the aircraft's glide range. During the descent he inadvertently allowed the airspeed to decay and, on recognising this at about 300 ft agl, lowered the aircraft nose. A high rate of descent was allowed to develop. The instructor took control of the aircraft, corrected the pitch attitude and opened the throttle to climb away. The engine failed to respond and continued at low rpm.

It became apparent that the aircraft would not reach the intended field. As the aircraft was rounded out for touchdown in an intervening field, the engine suddenly accelerated to full power. The instructor tried to climb the aircraft over a hedge, but it struck the top of this hedge and crash landed in the field beyond. Both occupants were able to evacuate the aircraft without assistance, despite their injuries.

A meteorological aftercast showed that conditions at the time (Ambient Air Temperature of 20-21°C with a Dew Point of 10-11°C) were favourable to the formation of carburettor icing. Additionally, this type

of engine has also been observed to be reluctant to accelerate following very rapid advancement of the throttle from the idling position. Both of these effects lead towards the induction of an over-rich mixture and may combine in leading to poor throttle response.

No: 8/89 **Ref: EW/G89/06/15** **Category: 1c**

Aircraft Type and Registration:	Socata Rallye 110ST, G-BKVB	
No & Type of Engines:	1 Lycoming O-235-L2A piston engine	
Year of Manufacture:	1979	
Date and Time (UTC):	20 June 1989 at 1115 hrs	
Location:	Biggin Hill Airport	
Type of Flight:	Training	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Nose leg collapsed, propeller bent, engine shock-loaded.	
Commander's Licence:	Student Pilot	
Commander's Age:	44 years	
Commander's Total Flying Experience:	34 hours (of which all were on type)	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

After a dual check, the student was briefed to fly circuits and landings on runway 03. The surface wind was 010°/5 kt. After the second landing, the aircraft was observed to bounce and touch down again in a nose-down attitude. The pilot has only a sketchy recollection of subsequent events but the instructor saw the aircraft bounce twice more before landing on its nose landing gear, which then collapsed. The pilot was wearing a full safety harness and evacuated the aircraft without injury.

No: 8/89 **Ref: EW/G89/06/02** **Category: 1c**

Aircraft Type and Registration:	Steen Skybolt, G-BNKG
No & Type of Engines:	1 Lycoming IO-360-A1B6D piston engine
Year of Manufacture:	1975
Date and Time (UTC):	9 June 1989 at 1340 hrs
Location:	Walton Woods
Type of Flight:	Private (business)
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Minor - to propeller and lower left and top right wing extremeties
Commander's Licence:	Private Pilot's Licence
Commander's Age:	45 years
Commander's Total Flying Experience:	416 hours (of which 65 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot, CAA Occurrence Report, and AAIB telephone enquiries

The aircraft was en route from Netherthorpe to Glenrothes via Newcastle. Earlier that day the pilot had been obliged to return to Netherthorpe because of deteriorating weather, and during a second attempt that afternoon in the vicinity of Wetherby, Yorks, decided to divert to Walton Wood near Pontefract in order to await an improvement in the weather to the north.

The pilot had landed there some months previously and overflew the field to re-familiarize himself with the local features. The 650 metre long grass strip is aligned 06/24, and the cloud base at the site was estimated to be at 2,500 feet with a visibility of 10 km and wind 190°/05 kt.

A normal approach was made to runway 24 and the aircraft was flared over the runway at 80 mph, touched down, became airborne again, and started to drift to the right. The pilot initiated a go-around but by this time the aircraft had encountered a 5 foot high crop to the side of the runway, and sank to the ground sustaining minor damage.

The pilot was wearing 2 harnesses, a 5 point harness, a 2 point harness, and a helmet. The pilot was uninjured, there was no fire.

No: 8/89 **Ref: EW/G89/06/01** **Category: 1c**

Aircraft Type and Registration:	Tipsy Nipper T.66 Series 2, G-ARBP
No & Type of Engines:	1 Converted Volkswagen piston engine
Year of Manufacture:	1960
Date and Time (UTC):	4 June 1989 at 1440 hrs
Location:	Newstead
Type of Flight:	Private (pleasure)
Persons on Board:	Crew - 1 Passengers - None
Injuries:	Crew - 1 (minor) Passengers - N/A
Nature of Damage:	Canopy, wing tips, rudder, nose wheel strut, propeller, wing leading edge and elevator
Commander's Licence:	Private Pilot's Licence with IMC Rating
Commander's Age:	61 years
Commander's Total Flying Experience:	6,730 hours (of which 40 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot

The pilot reported that just over 20 minutes into a flight from Sturgate (North West of Lincoln) to Seighford (West of Stafford) he observed a few drops of oil appearing on the top of the engine cowl. He therefore elected to divert to nearby Hucknall at reduced power. At this time, oil pressure and temperature indications (55 psi and 70°C respectively) were normal, however, when about 5 nautical miles from Hucknall, black smoke appeared from the left side of the engine cowl accompanied by a flow of oil over the wing root. At this point the pilot noted that the oil pressure had reduced to 30 psi. As an apparently suitable landing field appeared ahead, the pilot decided to carry out a forced landing. Unfortunately, half-way through the landing run, the aircraft encountered some rough ground, the nosewheel separated and the aircraft overturned.

On subsequent examination it was found that a core-plug in the rear of the engine was missing, permitting loss of oil from the oil gallery system, leading to engine seizure.

The pilot reports that on shutdown at Sturgate prior to this flight, a small oil leak on the left side of the aircraft was observed, prompting the removal of the engine cowls. An examination of the crankshaft oil seal and the region of the core plug was made after cleaning off oil in that area. All appeared normal

and the oil level did not appear to differ from that at the beginning of the previous flight. It was therefore concluded at that time that the visible oil was the result of over-generous replenishment or a consequence of lubrication of the duplex chain before an earlier flight.

No: 8/89 **Ref: EW/G89/06/12** **Category: 2c**

Aircraft Type and Registration:	Robinson R22, G-BLME
No & Type of Engines:	1 Lycoming O-320-A2B piston engine
Year of Manufacture:	1980
Date and Time (UTC):	17 June 1989 at 1309 hrs
Location:	Wycombe Air Park near Marlow, Bucks
Type of Flight:	Private (pleasure)
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - None Passengers - None
Nature of Damage:	Damage to tail rotor blades, hub and gearbox. Skid extensions broken and lower vertical stabiliser bent
Commander's Licence:	Private Pilot's Licence (Group A and Helicopter)
Commander's Age:	48 years
Commander's Total Flying Experience:	Fixed wing :155 hours Rotary wing: 68 hours (of which 65 were on type)
Information Source:	Aircraft Accident Report Form submitted by the pilot and telephone enquiries by AAIB

The helicopter was approaching to land in a designated training area of the airfield. There was no wind and the air temperature was +26° C. At an indicated airspeed of 10 kt and at a height of 10 feet the pilot applied aft cyclic pitch. The tail of the helicopter contacted the ground and it then rotated through 90° to the right bouncing on its right skid. The pilot applied opposite cyclic control, closed the throttle and lowered the collective pitch lever. The helicopter came to rest upright and the pilot completed the shut down drills. The pilot attributes the tail strike to the prevailing conditions of high density altitude with nil wind, a heavily loaded helicopter and his excessive rearwards movement of the cyclic control.

No: 8/89 **Ref: EW/C1117** **Category: 3**

Aircraft Type and Registration:	MBA Tiger Cub 440, G-MMPV
No & Type of Engines:	One MBA modified Fuji Robin EC44PM piston engine
Year of Manufacture:	N/A (Supplied in kit form--uncompleted)
Date and Time (UTC):	19 June 1989 at 1145 hrs
Location:	Wingmore, Elham, Kent
Type of Flight:	Unintentional (Taxying trials)
Persons on Board:	Crew - 1 Passengers -None
Injuries:	Crew - 1 (fatal) Passengers - N/A
Nature of Damage:	Aircraft destroyed
Commander's Licence:	Private Pilot's Licence
Commander's Age:	28 years
Commander's Total Flying Experience:	80 hours (of which none were on type)
Information Source:	AAIB Field Investigation

The pilot had constructed the three axis control microlight biplane and, although the aircraft had been registered, it had not been submitted for airworthiness approval. He had based the aircraft at a farm airstrip and had previously carried out taxying trials up and down that strip. During one such trial the aircraft became momentarily airborne and, in the attempt to replace it on the ground, a severe swing developed and it ran into the airstrip boundary fence. This was the pilot's only experience of flying this type of aircraft prior to the accident flight.

The pilot was a fairly frequent companion of both the owner of the strip and of a locally based licensed engineer (Microlight aircraft) who, when so asked, advised him on matters of construction and airworthiness. About a week prior to the accident, the engineer reminded the pilot that he should not fly the aircraft until it had been properly certificated. Furthermore, as the aircraft lined up on the north-northeasterly strip for what was to become the accident flight, the strip owner confirmed with the pilot that this was to be only a taxying trial.

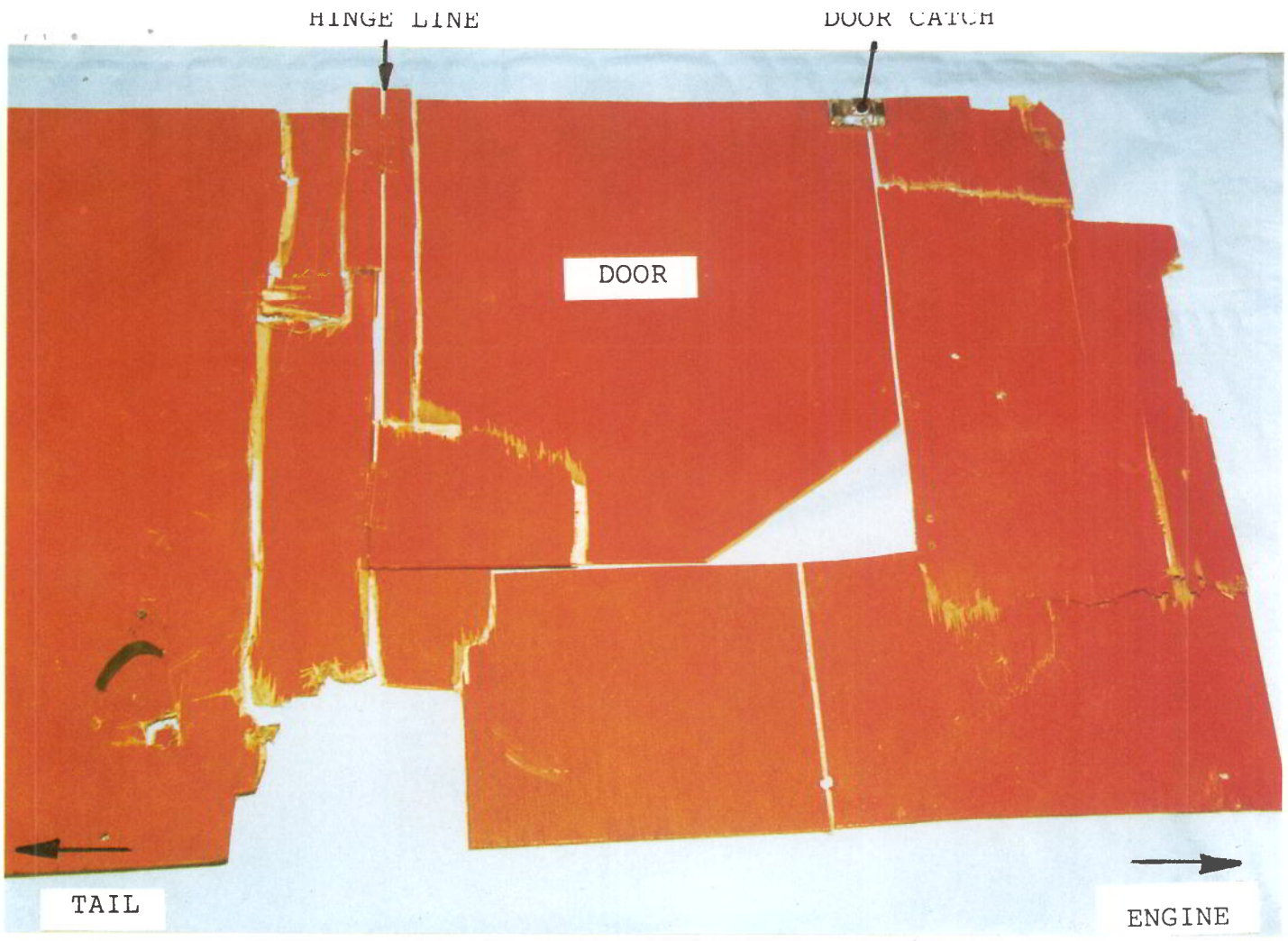
The owner then walked to his tractor positioned behind some trees a little over half way up and to the right of the strip. The threshold of the strip was then hidden from the owner's view by the trees but, a few seconds later, his attention was drawn to the aircraft as it passed abeam his position some 30 feet in the air in a steady and stable climb. The next witness to the progress of the flight lived in a house

directly under the flightpath of the downwind leg of a rather wide circuit. The aircraft passed over the house heading due south in level flight with constant power on the engine but, some 100 metres later, for a few seconds it began to roll from side to side. It then remained stabilised in level flight for one or two seconds before rolling 90° to the right and again levelling the wings. Over the 400 metres remaining to the accident site, the aircraft was seen to descend to the apparent height of some telegraph poles, still with wings level and with unchanged engine note, where it again rolled to the right and spiralled vertically into the ground. There was no fire but the emergency services attended the accident immediately that they were called, when the site had been identified.

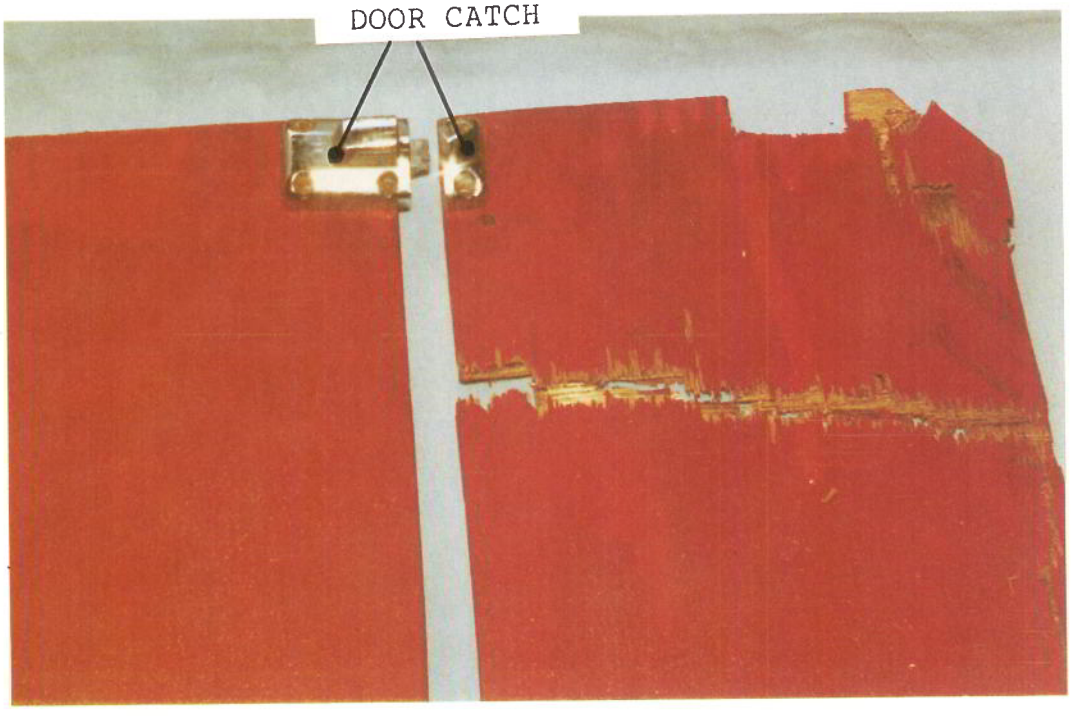
Evidence from the accident site showed the aircraft to have impacted at approximately 35 mph, pitched 90 degrees nose down and rotating to the right. It also showed that the pilot's shoulder harness was incomplete and therefore unuseable: The buckles were later found in the hangar where the aircraft had been stored. Because of the nature of the impact on the propeller it was not possible to assess the engine power. All parts of the aircraft were found at the impact site indicating that nothing had broken and fallen away prior to the impact. There was evidence of fuel being present in the fuel tank at impact. The cockpit door, normally fitted to the right side of the forward fuselage, was found resting on the trailing edge of the left wing.

The wreckage was taken to the AAIB at Farnborough where a more detailed examination was carried out. The area surrounding the cockpit door was assembled (Photograph No 1) and there was very good evidence that the door had been open at impact. This door was mounted with its hinge line to the rear which, if the retaining catch (Photograph No 2) failed, would allow the door to open outwards into the slipstream, possibly fouling the wing rigging wires and producing a very strong airbrake effect on the right side. The design of the door and catch was such that if the door was subsequently slammed closed, there appeared to be nothing to prevent the door passing through the closed position and swinging inwards and rearwards onto the pilot's right leg. Evidence from the wood failures suggested that at impact the door was open inwards. Examination of the throttle system indicated that at impact the throttle was set at a position that would give 89% of the engines full power rpm..

A recommendation was made that the CAA should re-consider the Certification or Approval of rear-hinged doors and the standard of the door catches on microlight aircraft.



PHOTOGRAPH No 1



PHOTOGRAPH No 2

AIRCRAFT ACCIDENT REPORT No 3/89

REPORT ON THE ACCIDENT TO SIKORSKY S61 HELICOPTER, G-BDII, NEAR HANDA ISLAND OFF THE NORTHWEST COAST OF SCOTLAND ON 17 OCTOBER 1988

The Inspector's report on this accident was submitted to the Secretary of State for Transport on 2 June 1989. He has agreed to its publication and the report is now available from HMSO Bookshops and accredited agents.

The duty SAR crew were called out from their base at Stornoway to conduct a Search and Rescue flight for the two occupants of a small fishing boat, which had capsized somewhere in the area of Handa island. Towards the end of the search, whilst performing a hover manoeuvre, a crew member commented that the helicopter was travelling backwards very fast.

The commander's attempted recovery from this manoeuvre resulted in the aircraft striking the sea and immediately rolling over. All four crew members eventually boarded the liferaft and were later rescued by a Sea King SAR helicopter from RAF Lossiemouth which returned them to Stornaway.

The report concludes that the causal factors to the accident were:-

(i) The commander failed to anticipate the effect of the loss of visual references in uncoupled[1] low speed flight at night.

(ii) The commander suffered a degree of spatial disorientation which led to unintended and undetected backward descending flight.

(iii) Following the crewman's warning, there was insufficient height remaining for the recovery to forward climbing flight which was attempted by the commander.

One Safety Recommendation was made:-

It is recommended that the Civil Aviation Authority examine the requirement for the provision of a more accessible rear port emergency exit release mechanism for occasions when the helicopter is flooded whilst inverted, and illuminating it and the existing handles with Exis lights or other means.

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[1] **Uncoupled** refers to flight undertaken with only stabilisation being provided by the Automatic Flight Control System

CORRIGENDUM TO AAIB BULLETIN 4/89

In Bulletin 4/89 reference was made to a Luscombe Silvair 8A, G-AKTI. The registration should have read G-AKTT.

List of Aircraft Accidents Reports issued by AAIB in 1989

2/88	Boeing Vertol BV 234 LR G-BWFC 2.5 miles east of Sumburgh, Shetland Isles, November 1986.	April 1989
7/88	Fokker F27 Friendship G-BMAU 2nm West of East Midlands Airport, January 1987	January 1989
8/88	Boeing 737 G-BGJL at Manchester International Airport, August 1985	March 1989
9/88	Aerospatiale AS 332L Super Puma G-BKZH 35 nm east-north-east of Unst, Shetland Isles, May 1987	February 1989
10/88	Cessna 441 G-MOXY at Blackbushe Airport, April 1987	February 1989
1/89	Airmiss between Tristar G-BBAH and Tupolev 154 LZ-BTE near Lydd, February 1988	February 1989
2/89	Incident involving BAC 1-11 G-AYWB and Boeing 737 EI-BTZ at Gatwick Airport, April 1988	May 1989
3/89	Sikorsky S61N helicopter G-BDII near Handa Island off the north-west coast of Scotland, October 1988	

ABBREVIATIONS COMMONLY USED IN AAIB BULLETINS

ADF	automatic direction finding equipment
AFIS(O)	Aerodrome Flight Information Service (Officer)
AFS	Aerodrome Fire Service
agl	above ground level
AIC	Aeronautical Information Circular
amsl	above mean sea level
ASI	airspeed indicator
ATC(C)	Air Traffic Control (Centre)
CAA	Civil Aviation Authority
CG	centre of gravity
°C,F,M,T	celsius, fahrenheit, magnetic, true
DME	distance measuring equipment
ETA	estimated time of arrival
ETD	estimated time of departure
FL	flight level
g	normal acceleration
gall imp/US	gallons, imperial or United States
hrs	hours
IAS	indicated airspeed
IFR	Instrument Flight Rules
ILS	Instrument landing system
IMC	Instrument Meteorological Conditions
IR	Instrument Rating
IRE	Instrument Rating examiner
kg	kilogram(s)
km	kilometre(s)
kt	knot(s)
lb	pound(s)
mb	millibar(s)
mm	millimetre(s)
MDA	Minimum Descent Altitude
MTWA	Maximum Total Weight Authorised
NDB	non-directional radio beacon
nm	nautical mile(s)
NOTAM	Notice to Airman
OCL	Obstacle Clearance Limit
PAPI	Precision Approach Path Indicator
PAR	precision approach radar
PIC	pilot in command
psi	pounds per square inch
rpm	revolutions per minute
RTF	radiotelephony
RVR	runway visual range
SSR	secondary surveillance radar
TAS	true airspeed
UTC	Universal Time Coordinated
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VHF	very high frequency
VMC	Visual Meteorological Conditions
Vne	never exceed airspeed
VOR	VHF omni range