

The Crash Report – Flamingo R2764

SERVICE Accident Report No. W-1226

ACCIDENT INVESTIGATION BRANCH

AIRCRAFT: D.H. 95 (Flamingo) R.2764

ENGINES Perseus XIIC Port No. 20540/A.198954 Stbd No. 20552/F.248308

UNIT: No. 24 (Communication) Squadron, Hendon.

<u>CREW:</u>	Pilot and Captain:	Pilot Officer I. Ramsey	Killed
	Observer:	Sergeant Smith, J.B.	–
	W/T Operator:	Flight Sergerant Stripp, A.J.	–
	Fitter:	L.A.C. Lewis,J.	–

<u>PASSENGERS:</u>	Air Ministry Signals (Plans)	Squadron Leader K.W. Edwards	–
	Air Ministry (A.F.L.7)	Flight Lieutenant F.W. Wilton	–
	Representatives of the		
	Russian Military Mission	Colonel Pugatchev	–
		Major Asyamov	–
		Major P. Baranov	–
		Major B. Shvetsov	–

¼ mile E.N.E. of Great Ouseburn Village, Yorks at about 17-25 hrs on 30th April, 1942.

1. Notification

By telephone from D. Of I.(S) to C.I. (Accident) at 10-50 hrs on 01.05.1942 at 12-00 hrs on the same date the Unit Casualty Signal was received. The accidents investigator proceeded to investigate p.m. the same day.

2. CIRCUMSTANCES OF THE ACCIDENT

The object of the flight was to take four Russian Military Officers on a tour of inspection. The aircraft had earlier in the day flown from Hendon to Kirton-of-Tealing and thence to East Fortune. It was refuelled at Tealing and was not serviced in any way at East Fortune.

At 16-25 hrs the captain took off from East Fortune to fly back to Hendon.

When approximately 3 ½ miles north of Great Ouseburn, York's and flying at a height of about 2000ft. a defect developed in the starboard engine which caused No.7 cylinder to become detached from the crankcase. A fire broke out almost immediately in the neighbourhood of the starboard

engine nacelle and was of sufficient intensity to cause the starboard wing to break off at a point just outboard of the engine bearers and also to cause the starboard engine to break away. The fuselage, port wing, port engine and port undercarriage unit fell to the ground and burst into flames. All the occupants were killed.

3. FURTHER DETAILS

(A) The airframe

The airframe was constructed by the De Havilland Aircraft Co. in accordance with Air Ministry Contract No. I.T.P./8999/39. It passed its final flight test at Hatfield on 10.2.1940 on 03.04.1940 it was requisitioned by the Air Ministry and flown to Hendon for R.A.F. use. On 17.04.1942 (???) a major inspection was carried out and the engines were changed. It had then completed 208 hours flying. On 13.01.1942 a second major inspection was carried out. Its flying time was then 454 hours. On 31.03.1942 the engines were again changed, No.20540/A.198954 being installed in the port and No.20552/A.248308 in the starboard nacelle. On 24.04.1942 a 30 hour inspection was carried out and from then until the date of the accident it had only flown for five hours. A daily inspection was completed at 9-00hrs on 30.04.1942 the total flying time of this aircraft up to the time of the crash was 488 hours. The load carried did not exceed the maximum permissible.

(B) Engines

1. Port Perseus XIIC.R.20540/A.198954.

This engine passed the makers final test on 15.06.1938, after completing 100 hours running time it was overhauled by Bristol Aeroplane Co. on 29.05.1940 when it had completed 305 hours running time. It was requisitioned by the Air Ministry for R.A.F. use and transferred to No. 24 Squadron, Hendon. On 01.09.1941 the hydromatic reduction gear was removed and replaced by the standard PerseusXII type and at the same time it received a makers overhaul. On completion of this overhaul it was installed in the port nacelle of Flamingo R.2764 on 31.03.1942. Apart from routine inspections, no entries in form 700 affecting its serviceability were made subsequent to maker's overhaul. Up to the time of the accident it had completed 38 hours running time since the last overhaul.

2. Starboard Perseus XIIC.P.R.20552/A.248308.

Before 01.05.1941 no historical records of this engine are available. On 19.04.1941 this engine was despatched from the Bristol Aeroplane Company's works at Filton to No.24 Squadron, Hendon, on completion of maker's overhaul in accordance with Air Ministry Contract No. B.125427/40 dated 01.07.40. On 31.03.1942 it was installed in the starboard nacelle of Flamingo R.2764. apart from the renewal of the rear sparking plugs on 24.04.1942 and routine inspections, no entries in Form 700 affecting its serviceability were made subsequent to maker's overhaul. Up to the time of the accident it had completed 38 hours running time since the last overhaul.

3. Propellers

De Havilland controllable pitch constant speed 3-bladed propellers were fitted. These were not of the fully feathering type.

(C) Pilot

Pilot Officer I. Ramsey was an ex-Sergeant pilot who had completed a total of 3755 hours flying at the time of his death. The only available flying log commences with a carry-forward total of 3244 hours. Between March and November, 1941 he flew 330 hours as pilot in Wellingtons of No.22 Squadron, being assessed as "Above the average" both as G.R. pilot and as a navigator. In November 1941 he was posted to No24 (Communications) Squadron, where he had several months intensive practice on cross-country flights in various multi-engine types. He had recently flown such important people as Prince Bernhard, Lord Sherwood, Sir Archibald Sinclair and Lord Louis Mountbatten. Pilot Officer Ramsey was a very experienced and capable pilot who was fully qualified to carry out the duties assigned to him on this flight.

(C) The Weather

The weather locally at the time of the accident was fine, with good visibility and very little cloud. Surface wind was 068° at 15m.p.h. and at 2000 ft. from 80° at 20-25 m.p.h.

(D) Examination of wreckage at the scene of the accident

The fuselage was completely gutted by fire. The port engine was buried in the ground to a depth of 4 ft. and it was evident that the propeller had been revolving in coarse pitch when it hit the ground. Numerous portions of the airframe had become detached in flight and, according to eye witnesses, fabric parts were still descending after the aircraft had hit the ground. The most important of these parts fell as described below in relation to the main wreckage:-

No.7 cylinder of the starboard engine	3 1/10 miles N.
Starboard undercarriage unit	200 yards S.E.
Outer port elevator	220 yards S.S.E.
Starboard engine minus No.7 cylinder and various accessories, and top part of port rudder	240 yards S.E.
Outer starboard elevator	307 yards S.E.
Part tailplane and fin	270 yards S.
Starboard tailplane and fin	233 yards S.
Starboard mainplane with aileron	293 yards S.W.
Port rudder middle and lower portion	385 yards S.S.W
Starboard inner flap	400 yards S.W.
Starboard rudder	475 yards S.W.
Pilot escape hatch	410 yards S.
Inner port elevator	590 yards S.S.W.

Starboard outer flap

450 yards S.W.

In addition, pieces of cowling and assessed skin of all sizes had fallen between Myton-on-Swale and Great Ouseburn, a distance of approximately 3 miles.

(E) Subsequent detailed examination of wreckage

After being identified, marked and photographed, all parts of aircraft which fell away from the main wreckage were examined in detail at the R.A.F. Station, Linton-on-Ouse. The starboard mainplane had broken away in flight from a point just outboard of the starboard engine. Main and auxiliary spars showed unmistakable signs of having been fused by intense heat; ribs and formers for a distance of several feet from the inboard end were distorted and bent downwards and the fabric had been burnt away. No marks could be found on this wing to suggest it had struck other parts of the aircraft. The following parts, however, bore unmistakable evidence of having been struck – possibly by the engine – before hitting the ground:

1. 1. Port fin and tailplane
2. 2. Starboard elevator
3. 3. Port rudder
4. 4. Starboard rudder

(F) Parachutes

The remains of nine back pack type parachutes and one chest type were found among the main wreckage. It was clear that no attempt had been made to use these. All harness webbing had been destroyed by fire but ten sets of fittings were found and in only one case was the snap-hook fastened.

(G) Detailed examination of Starboard engine

The Starboard engine was subsequently examined at the works of the Bristol Aeroplane Co. Owing to the mechanical damage that had taken place inside the engine and the fact that a large portion of the articulating system was missing, it has been impossible to establish the primary cause of its failure. Certain general conclusions have been arrived at which indicate a sequence of failure, but the initiating factor cannot be found.

The following is an extract from the Firm's report:-

“The break up of the articulating system had been rapid and it is thought that all the artic rods fractured above the wrist pin eyes at the same time. For this to occur it is necessary that the master rod should be free of the piston in its locating cylinder. That this had taken place is evidenced by the severe damage sustained by both sides of No.6 sleeve and cylinder and the sides of No.5 and 7 cylinders adjacent to No.6.

Before the master rod could drive up through No.6 sleeve the upper end would have to be free piston which therefore points to No.6 piston being in a distressed condition prior to any of the internal break-up of the articulating system. After No.6 piston failed, the master rod, and it is

believed with the gudgeon pin in position, hammered the sleeve until the ends of the gudgeon pin fractured and started to tear face of the internal diameter of the sleeve.

Following this, the master rod tore through both sides of No. 6 sleeve and the crankcase, became free of No.6 assembly and broke through the crankcase at No.5 and 7 cylinder locations. As a result of these violent impacts the master rod shank fractured until only a very small portion remained in the vicinity of the wrist pin flanges.

Of particular interest was the deposit of metal alloy found on the inside diameter of No.6 sleeve, this being obviously piston material. A film of piston metal could have only been formed whilst the engine was running and the piston itself must have been in a distressed condition. Further evidence of this was found in the rolling of the piston, whilst the fact that the metal film was formed approximately parallel to the centre line of sleeve being out of operation, at least during the final stages of running, before the piston became detached from the master rod.

Summarising the known facts it is considered that the mechanical failure occurred in the following sequence:

For reason not known, distressed running of the piston commenced, which was, in turn, responsible for the break-up of the piston skirt and the turning of the upper half of the piston on the gudgeon pin, such that the crown became approximately parallel to the centre line of the sleeve. Due to the overloading of the sleeve under those conditions, the sleeve crank torsionally sheared, just to the rear of the driving gear locating splines. Although the sleeve was out of operation, the piston continued to operate in the sleeve until the gudgeon pin bosses fractured. Following the fracturing of the gudgeon pin bosses, the master rod was free in the sleeve and succeeded in damaging it, eventually tearing through sleeve and the crankcase. Secondary to this was the violent blow at No.7 cylinder location which knocked the cylinder completely off of the crankcase. This blow may have been the same one which fractured the crankcase between No.6 and 7 cylinders. No.6 cylinder had been driven off the crankcase by this time but it remained attached to the engine by the cowling securing fittings.

Immediately there was no location position for the master rod the big end turned on the crankpin, locking all the artic rods on each other, eventually causing them to shock fracture by leverage. This internal damage occurred whilst the engine was in flight, and the metal fragments of the artic system must have fallen out of No.6 and 7 cylinder location.

As previously stated, it has been impossible to give any reason why No.6 piston should fail, and the engine failure has been investigated with respect to all known possible causes that could have initiated the break up of this component. However, no evidence was found to suggest that the maintenance or handling of the engine was in any way at fault, neither was there anything to point to unusual running conditions being set up by reason of accidental causes, such as entry of foreign bodies, by any method, into the engine.

In view of the fact reported by Accidents Investigation Branch, that a fierce fire had taken place in the wing section adjacent to this engine's position, particular attention was given to the effects of fire on the engine. This was found to be extremely slight, it being concentrated around the fracture faces of No.6 cylinder, adjacent to No.7 cylinder, with scorching and slight burning extending from

this position on the crankcase back over the volute casing, and had affected the starboard side of the carburettor linkage cover.

It is believed that the flame originated from petrol vapour coming out of the broken induction pipes after No.6 and 7 cylinders lifted, which could be set off by spark from a (xxxxxxx H.T. cable when there xxxx xxxx xxxx) out of the brought into contact with a hot flame, and yet none of these components showed even scorching of the protection paint, which appears to indicate that the fire around No.6 cylinder was very small and of extremely short duration.

Therefore, from the examination of this engine, it is not thought that the burning which took place was of sufficient intensity to have affected the nacelle or wing, unless by some means a secondary fire was set up at these positions by reason of the flame produced from the engine fire.

The investigation has been made extremely difficult by the excellent running history of this particular type of engine, there being no background of previous failures of a general nature, or of the pistons in particular, from which any assistance could be obtained.

As far as the records of failures of production engines of this type are concerned, there is no history of a piston failure, and the engine's general failure records is so extremely good that the whole of the examination has had to be carried out without any past experience of a failure in any way resembling the one under review, which might have assisted in the determining of the initiating factors."

(J) W/T Communications

The wireless was tested at Hendon at the commencement of the journey and communication was satisfactory. On the journey north communication was established with Renfrew and at 15-13 hrs a message was transmitted asking that Renfrew should inform Hendon that the aircraft was airborne and on its way to East fortune. There is no record of any other message being sent.

(K) The U.S.S.R. Military Mission

Special Importance is attached to this accident, four officers of the Russian Military Mission were killed. A Court of Inquiry was held at the R.A.F. Linton-on-Ouse, on 05.05.1942 in order that the Russian Government should have no reason to suspect that anything was being hidden from them, permission was given for Captains Borisenko and Diky to attend the proceedings. These Engineer Officers took a keen interest in everything and through a R.A.F. interpreter were encouraged to question witnesses. At Linton-on-Ouse they shown the wreckage of the Flamingo. They were also taken to No.16 M.U. where they were allowed to see the starboard engine before it was despatched to Bristol for examination. Later they visited the Bristol Aeroplane Company's Engine Repair Depot and saw the damaged engine after it had been stripped and laid out for examination.

It must be recorded that the relations with the Soviet representatives were most cordial throughout the proceedings and they seemed to accept readily the finding of the Court, which was formulated in their presence. These findings were as follows:-

"The cause of the accident was, in our opinion, an internal defect in the starboard engine causing No.7 cylinder to break of, resulting in a fire and explosion (presumably of fuel tank) and breaking

away of starboard wing at root and subsequent disintegration of components, details of which will be submitted by Air Ministry (Accident Branch)."

4. CONCLUSIONS

1. The cause of the accident was failure of the starboard engine. The reason for this cannot be stated with certainty but the evidence suggests that No.6 piston failed first and that this was followed by a rapid internal break up resulting in the knocking off of No.7 cylinder. This was followed by fire in the engine nacelle which quickly became very intense – probably as a result of the explosion of a wing fuel tank.

The starboard wing then broke off and the engine fell out. The fuselage and tailplane were struck by some part of the detached wing or by the engine

2. There was no evidence that the servicing of this aircraft had been inadequate.

3. There was no evidence to suggest sabotage.

4. The pilot was experienced and fully qualified to carry out this flight.

5. Apart from this accident and one in October 1940 (Hertfordshire R.2510), the D.H.95 seems to have a good record.

There appears to be no reason for supposing it is not a safe aircraft.

5. RECOMENDATION

It is recommended that all Flamingoes fitted with the Perseus XIIC engines and constant speed propellers should be modified by the fitting of Perseus XVI's and hygromatic (fully feathering) propellers.

Note: It is understood that this is already being done.

VERNON DROWN

Group Captain

CHIEF INSPECTOR

C.I.(Accidents), Air Ministry,

Eastern Avenue, GLOUCESTER.

25th May 1942