No. 48

Vickers Viscount, G-AOYF, crashed on landing at Jan Smuts Airport, Johannesburg, South Africa, on 20 October 1957. Report released by the Department of Transport, Union of South Africa.

Circumstances

The aircraft was temporarily based at the Jan Smuts Airport where the manufacturers were conducting experimental flights which included measured take-offs and landings. The data had to be obtained for incorporation in the Aircraft Flight Manual to be associated with the certification for public transport operation. The aircraft was being operated in the special categories Research or Experimental and Demonstration.

The captain was cleared to use runway 03, the main instrument runway, and took off at 1040 hours on an experimental flight. After completing a circuit, the captain was cleared to land back on runway 03. He approached the runway, holding at 300 - 400 feet until he passed over the threshold. At this point the angle of descent increased to about 45°. The descent continued until the aircraft was about 70 feet above the surface of the runway where it levelled out, but the path of descent appeared to remain fixed at about 45° until touchdown whereupon the main bogies appeared to move rearwards and inwards with the starboard side moving rearwards somewhat further than the port side. After this the aircraft bounced a few feet before settling down further along the runway. At this stage heavy smoke was emitted from both bogies as the aircraft continued forward. It finally swung to the right and off the runway and came to rest on a heading of 180° M at a point approximately 1 590 yards from the threshold. No one was killed or injured, but the aircraft was substantially damaged.

Investigation and Evidence

Accident Site

The first marks found were those made by the main wheels 352 yards from the threshold. The marks were heavy and broad. Those made by the port wheels were somewhat lighter than those made by the starboard wheels. Metal fragments, later identified as pieces from the starboard undercarriage structure, were found 73 yards further ahead. A large number of sheared rivets were found scattered over a distance of 26 yards. Tire marks indicated heavy braking on the port wheels as well as a swing to the right off the centre of the runway. Deep marks made by the outboard starboard propeller in the hard macadam surface were found 21 yards beyond the scattered rivets. The marks were continuous and evenly spaced for 158 yards, at the end of which the first marks made by the inner propeller on the starboard side were found. For the next 140 yards the starboard propellers had cut deeply into the macadam. The direction lines of the propeller marks were only 6 feet apart at the point where both the starboard propellers had cut into the ground. They converged and finally crossed. This indicated that the nose had swung around to the right, and the aircraft was moving crabwise with the starboard wing pointing down the runway. It was also evident that the starboard bogie was no longer supporting the aircraft from the point where the first propeller marks were found. The marks over the remainder of the distance were erratic up to the point where the aircraft came to rest facing in the opposite direction.

Technical Findings

Special attention was paid to the possibility of the starboard bogie being defective before the initial touchdown. No evidence of any faulty material, malfunctioning or defects was found. The backstay to which the jack was attached was sheared away from the trailing edge member. The jack, oleo leg, and radius rod, as well as the downlock, were satisfactory. The area above the wheel bay and ahead of the trailing edge member had been forced upwards and numerous rivets sheared. A bolted repair in the outer diaphragm of the wheel bay was satisfactory. The skin below this repair was damaged. The outer tire had burst, and the running surface was worn flat. The cross shaft for the leg had sheared away a portion of the metal structure above the bearing. (The piece of sheared metal was found 73 yards beyond the point of initial touchdown.) As a result of this and heavy loading in the diaphragms, the cross shaft slipped out of its outer bearing.

Weather

At 1100 hours the weather conditions were as follows:

Wind WNW	7 knots
Visibility	15 miles
Temperature	24.4°C
Relative Humidity	47%
Dew point	12.3°C
Barometric pressure	837.6 millibars at datum level 5 508 feet
Pressure altitude	5 100 feet
QNH	1 028.3 millibars
QFE	839.8 millibars

Captain's statement

The captain commented on the accident as follows:

"After take-off I climbed to 1 000 feet and carried out a circuit with the intention of approaching on runway 03. Altitude was decreased to 700 feet and descending to 400 feet when I crossed the threshold. At this stage, power was taken off; speed reduced to 125 knots. The approach continued so as to pass at 120 knots over 50 feet. The roundout was misjudged resulting in a heavy landing with consequent collapse of the starboard undercarriage."

Probable Cause

The misjudged roundout resulted in a heavy landing which caused the starboard undercarriage to collapse.

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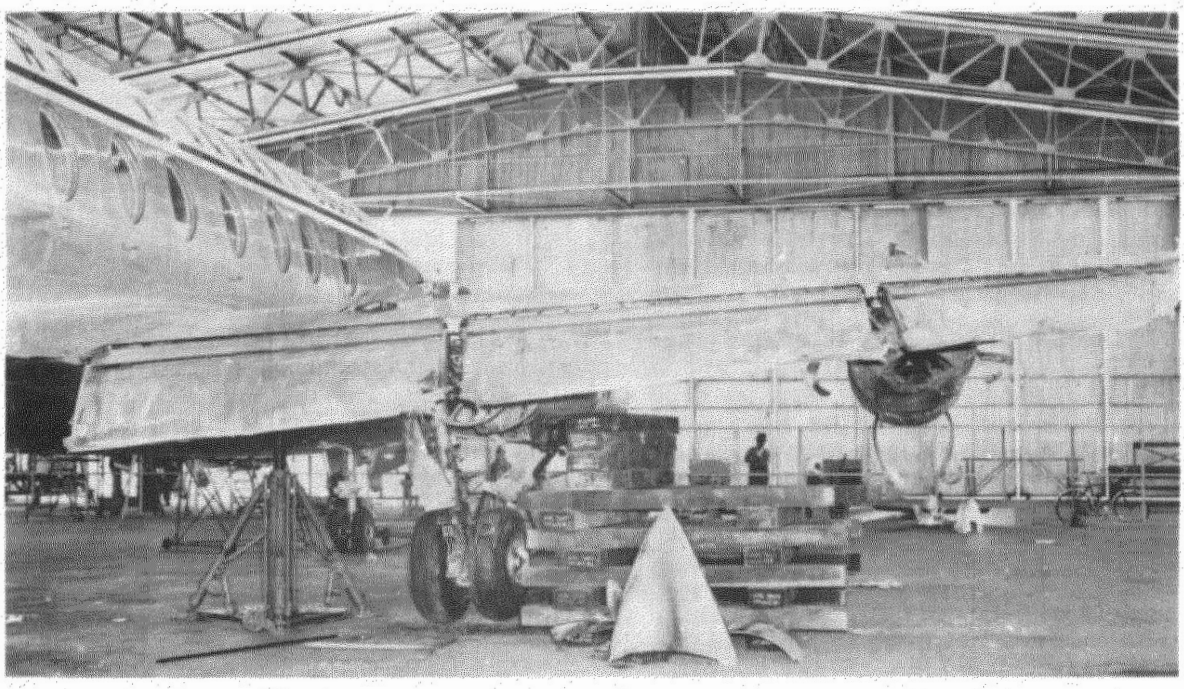

FIGURE 26

GENERAL VIEWS OF THE STARBOARD SIDE OF G-AOYF WHICH WAS DAMAGED WHEN IT MADE A HEAVY LANDING AT JAN SMUTS AIRPORT, JOHANNESBURG, SOUTH AFRICA ON 20 OCTOBER 1957

FIGURE 27