

**Aviation Safety Investigation Report  
199400519**

**Fokker B.V.  
F50 (Fokker 50)**

**25 February 1994**

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The bearing which had been fitted to the engine since manufacture had been removed, checked and reinstalled during the engine turbine modification upgrade about 530 hours before the incident. Subsequently during the post-incident inspection one of the bearing balls was found to be approximately 1 mm smaller than the remaining balls. The presence of the smaller ball resulted in alternating tensile stress in the bearing cage, resulting in fatigue fracture propagation through the cage ligaments at the smallest ball.

The quantitative fractography of the cage fracture surface concluded that the fatigue crack appeared to have initiated near or shortly after the time of the engine turbine modification upgrade.

#### Significant factors

The following factors are considered relevant to the development of this incident.

1. One ball in the number three bearing cage was 1 mm smaller than the remaining balls.
2. The presence of the smaller ball resulted in alternating tensile stress in the bearing cage, causing fatigue fracture propagation through the cage ligaments at the smallest ball.
3. The failure of the number three bearing allowed the low pressure impeller to move forward relative to its housing causing secondary damage.