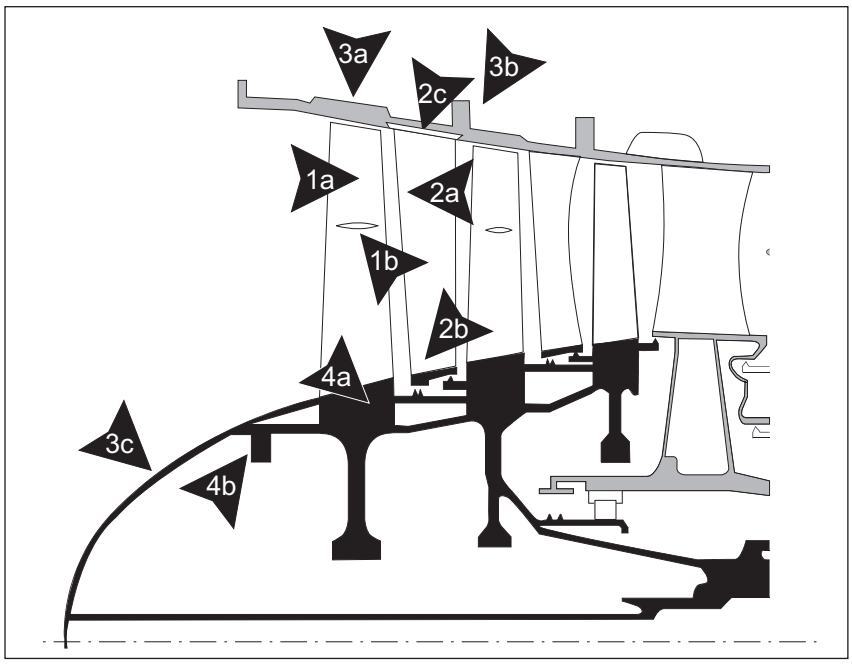
Typical bird strike damage in the front engine area.



Ill. 5.2.2.1-7

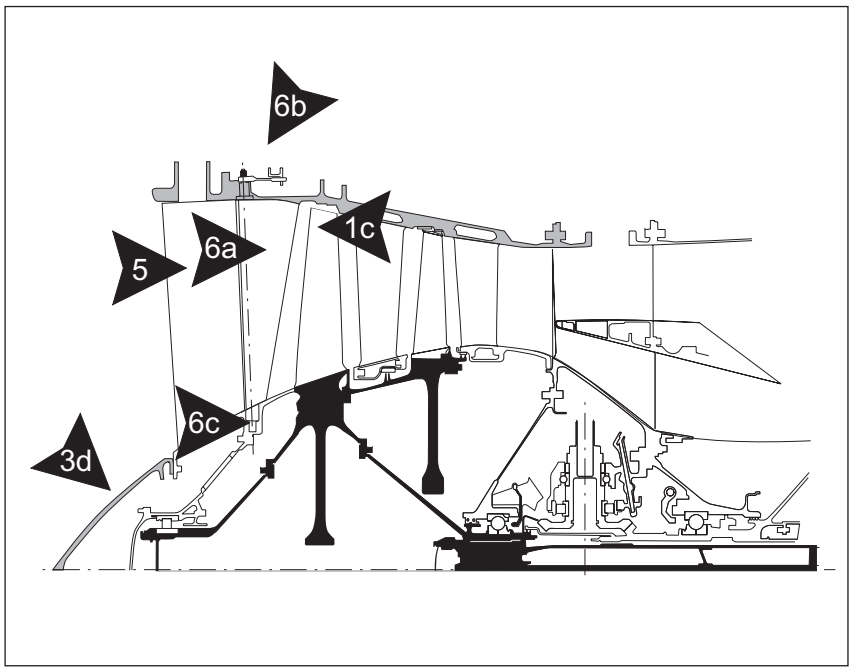


Illustration 5.2.2.1-7: *Bird strikes are especially dangerous for the following typical parts of multiple-shaft fan engines with small bypass ratios (frequently used in Fighter aircraft):*

Engines without inlet guide stars *(top) and no front bearings, but with rotating nose cones (spinners):*

- Deformation or fracture of the fan rotor blades (1a; Ill. 5.2.2.1-8)

- Fracture of the fan rotor blades above the clapper (1b; Ills. 5.2.2.1-9 and 5.2.2.1-12)

- Deformation and fracture of guide vanes at the outer zones, contact with the rotor blades (2a)

- Fracture of guide vanes at the inner shroud (2b)

- Fracture of guide vanes at the connection to the housing (2c)

- Stressing and deformation of the housing after a rotor blade fracture (3a)

- Fracture of threaded connections on the housing due to imbalances (3b)

- Fracture (especially with fiber-reinforced synthetics; Example 5.2.2.1-2) or deformation (especially with metals) of the rotating nose cone (3c). In some cases overloading of the rotor's fixed bearing.

- Overstressing of the axial blade connections (4a)

- Fracture of the spinner connection (4b)

Engines with front bearings *(below), housing struts, adjustable inlet flaps or inlet guide vanes (Ref. 5.2.2.1-14), and fixed inlet cones:*

- Deformation and fracture of the fan rotor blades (1c)

- Fracture or deformation of the fixed nose cone (3d)

- Damage to the housing struts (5) and possibly also the rotor bearings

- Damage (deformation, fracture) to the adjustable inlet flaps/guide vanes (Ill. 5.2.2.1-11) or changes to the blade angle (6a)

- Damage to the adjusment mechansim for the flaps or guide vanes (6b)

- Damage to the inner flap bearings (6c)