Borescope
Inspection in aviation

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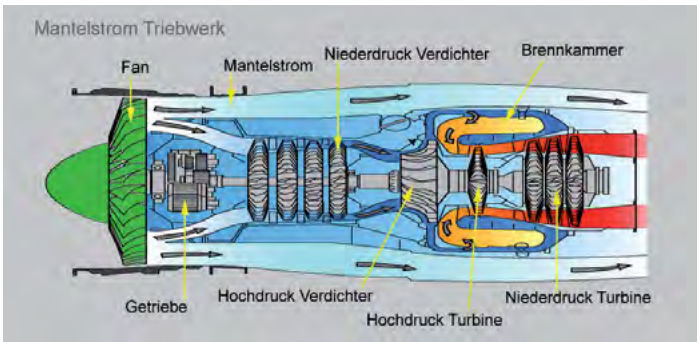
The visual inspection of components, especially of the drives (gas turbines) with an borescope is a very important part of the function test. Dozens of thousands of aircraft operations in transportation of the passengers as well as in the field of transportation of goods require one hundred percent availability. Periodic inspections are essential. Primarily, the gas turbine must be checked. In this connection endoscopes of different types (rigid, flexible) with different levels of image resolutions for recognition of hairline cracks in the critical parts can be used. Modern endoscopes with side vision function (secondary camera) or fully swiveling camera heads make the use of mirrors unnecessary.

During the inspection of turbines (impeller, compressor stages, combustion chamber, turbine set and nozzle)e.g. a large number of blades (parts loosened by the birds hits) should be analyzed. If the turbine disks (blisks) are examined when, representing a turning of the gas turbine.

Normal state requires an endoscopic inspection rotating the turbine shaft in order to check all sites and parts.



Picture Source: US Federal Aviation Administration(FAA)

The number of these blades often leads to confusion. Each PCE Instruments endoscope has got software for documentation / reporting. Photos and videos can be saved, comments can be edited. A pictorial documentation also facilitates the comparison with the condition during the previous inspection. Thus, the degree of wear can be recognized. The parts that are obviously wear out faster, could become loose and lead to failure of the turbine. Small foreign parts, loosened screws,

which could end up in the turbines, damages due to foreign bodies (Foreign Object Damage) may be identified very well. More construction parts can be checked. So it is possible for the examiners to inspect the presence of cracks in the interior of airframes.

In addition to the visual inspection of gas turbines, the inspection of turboprop engines (especially in the military field) and propeller engines also plays a very important role in aviation. In propeller engines (usually these are piston-driven internal combustion engines) pistons, valves, gear units are tested by means of endoscopes. Since the mechanical use of that type of airplanes is not as high as in jet engines and the drive concept is similar to a car drive, the inspection corresponds mostly to the automotive engine.