

Mechanics of Materials, what it is for?

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EG1101 – Mechanical Engineering – Mechanics of Materials

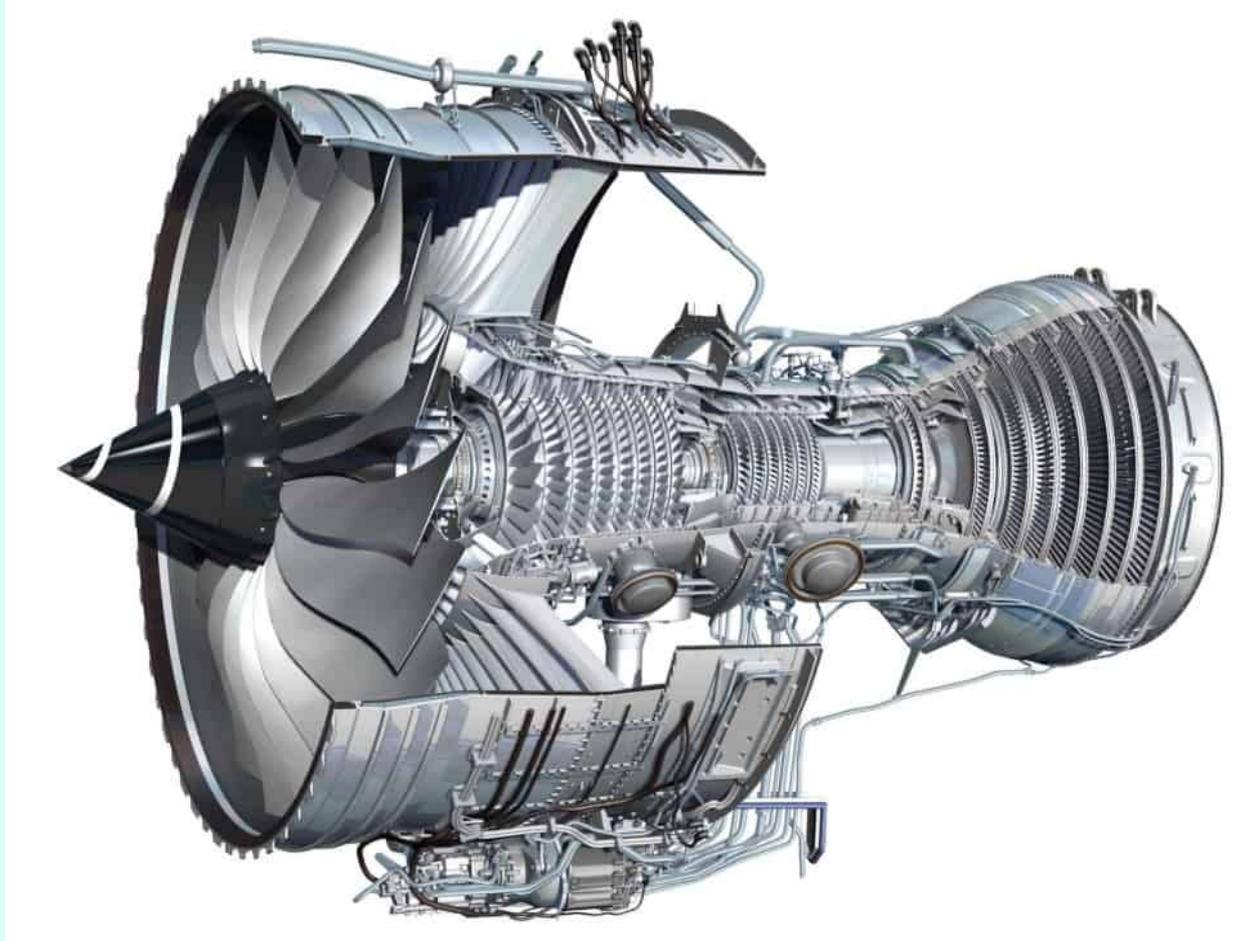
Mechanics of materials

- Archimedes c. 287 – c. 212 BC
 - Equilibrium, centres of gravity
 - The method of mechanical theorems: breaking up a figure into an infinite number of infinitely small parts can be used to determine its area or volume
- Galileo Galilei 1564-1642
 - Beam theory
- Modern day mechanical engineers
 - Deformation
 - Failure
 - Multi-physics



Galileo's illustration of bending test, "Two New Sciences"

Rolls Royce Trent 1000 engine

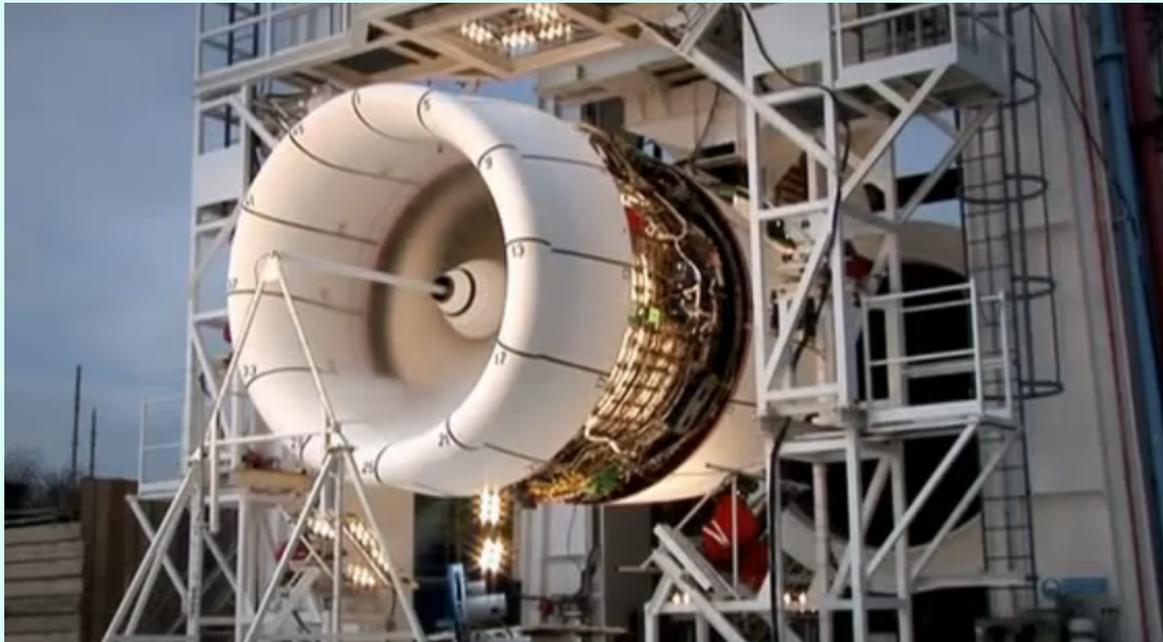


Airbus A380



Fan blade off test by Rolls Royce

It is a regulator requirement to carry out this test for any newly designed engine.



Rolls-Royce, How To Build A Jumbo Jet Engine



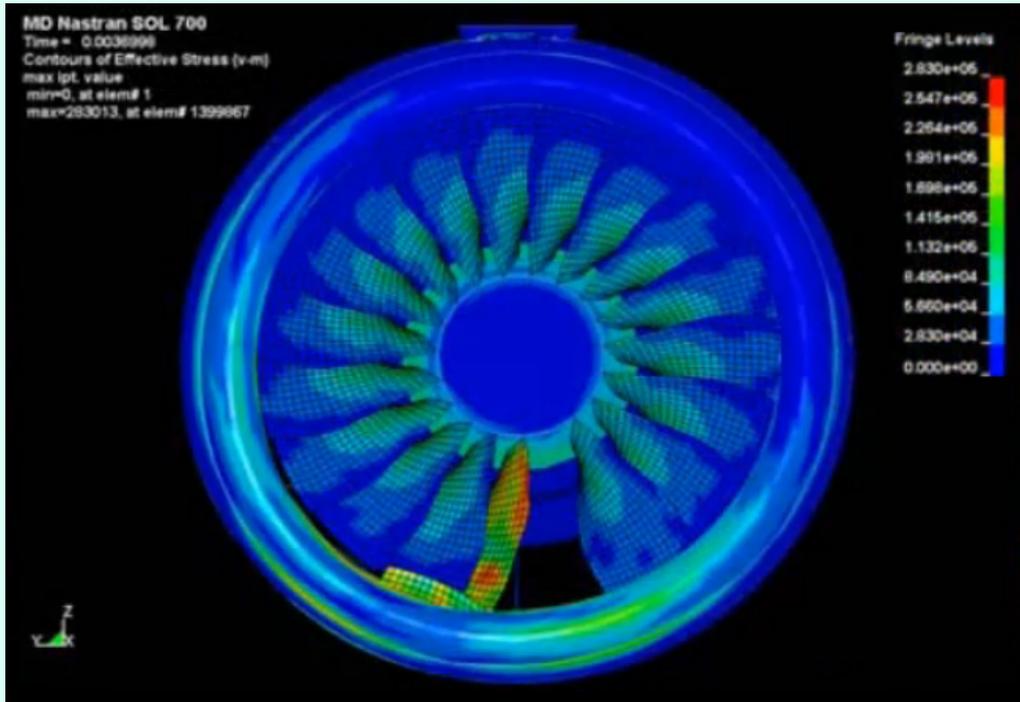
Fan blade off test by Rolls Royce

The test costs £9 million, the engine is completely destroyed.



Fan blade off simulation

Hundreds of hours of finite element modelling made this possible



Nastran



Rolls-Royce, *How To Build A Jumbo Jet Engine*