

CS-E 800 Bird Strike and Ingestion

J. Bruce Cook

Rolls-Royce - Airworthiness Specialist

September 2017

The information contained in this document is rated as "Civil".
This technical information is not controlled under the German export control regulations.

© 2017 Rolls-Royce plc

The information in this document is the property of Rolls-Royce plc and may not be copied or communicated to a third party, or used for any purpose other than that for which it is supplied without the express written consent of Rolls-Royce plc.

This information is given in good faith based upon the latest information available to Rolls-Royce plc, no warranty or representation is given concerning such information, which must not be taken as establishing any contractual or other commitment binding upon Rolls-Royce plc or any of its subsidiary or associated companies.



Rolls-Royce

Bird Strike and Ingestion

Main Requirements

(b) *Single large bird ingestion test.*

(c) *Large flocking bird.*

(d) *Medium and small birds ingestion tests.*

(e) *Impact.*

Bird Strike and Ingestion

Single large bird ingestion test.

Rarely done directly by test.

Mostly done by comparison to effect of single blade Fan Blade Off, which is demonstrated by test.

Bird Strike and Ingestion

Large flocking bird.

Not relevant for RRD engines, as business jet engines are smaller than the intake size threshold.

For large civil engines, compliance is normally by engine test.

A cannon (powered by compressed air) fires the bird into the engine at the agreed location & conditions.

Bird Strike and Ingestion

Medium and small birds ingestion tests.

For medium birds, compliance is demonstrated by full engine test, or by partial test with engine run-on.

Multi-barrel bird cannon (powered by compressed air) fires birds into engine in appropriate timeframe at the agreed locations & engine condition.

Test may be run beyond normal MTO on ground to account for worst case condition demonstration.



Rolls-Royce

Bird Strike and Ingestion

Impact.

Compliance by test, or by reference to relevant existing test data.

For example, derivative engines rarely have significantly different test conditions.



Rolls-Royce