

# Rolls-Royce Under Fire For More Faulty Jet Engines

Kristen Gelineau, Associated Press

SYDNEY (AP) — Tests uncovered oil stains in three Rolls-Royce engines on Singapore Airlines' A380 superjumbos, prompting the airline to yank the planes from service Wednesday just two days after Qantas announced troubling oil leaks on its A380s.

The oil on the Qantas and Singapore planes was discovered during tests prompted by the explosion of a Rolls-Royce engine on a Qantas A380 during a flight from Singapore to Sydney last week. The plane made a safe emergency landing in Singapore, but the Australian airline immediately grounded its entire fleet of A380s while it investigated the cause.

Singapore Airlines said it does not know whether the oil stains found in its engines have any connection to the engine oil leaks found on Qantas, but was temporarily pulling the planes from service as a precaution. The planes, in Melbourne, Sydney and London, will be flown to Singapore without passengers, where they'll be fitted with new engines.

"We apologize to our customers for flight disruptions that may result and we seek their understanding," airline spokesman Nicholas Ionides said in a statement.

Twenty planes operated by Qantas, Germany's Lufthansa and Singapore Airlines use the Trent 900 engines. With the decision by Singapore, nine aircraft with the engines have been grounded.

On Monday, Qantas CEO Alan Joyce said tests had uncovered oil leaks in the turbine area of three engines on three different A380s. The leaks were abnormal and should not be occurring on new engines, he said. All six of the Australian airline's A380s remained grounded Wednesday.

London-based Rolls-Royce, an aerospace, power systems and defense company that is separate from the manufacturer of Rolls-Royce cars, had recommended a series of checks for the Trent 900 engines used in the A380s operated by Qantas, Singapore Airlines and Germany's Lufthansa.

Singapore Airlines grounded its entire fleet of 11 A380s following last Thursday's engine explosion on Qantas, but after initial checks, returned them to service Friday. However, on Wednesday, based on fresh analysis of the tests, Singapore took three of its A380s out of service again, because of oil stain results.

Singapore's eight other A380s, also flying with Trent 900 engines, remain in service.

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Lufthansa spokesman Thomas Jachnow said the airline was aware of the Singapore problem, but its maintenance crews had not found any oil leaks in their Trent 900 engines. However, the German airline did say it had replaced the Rolls-Royce engine on one of its A380s after detecting a problem it said was not connected to the oil leaks that grounded the Qantas and Singapore superjumbos.

The most likely cause of an oil leak or stain is a tiny crack in the oil supply pipe that lubricates the engine's bearings, said John Page, an aircraft designer and senior lecturer in aerospace engineering at the University of New South Wales in Sydney.

Oil leaks in an engine's turbine area can spark fires, which could then put too much stress on the rapidly spinning engine parts and lead to a breakdown. There are many possible culprits behind a crack, such as poor design or chafing from the pipe rubbing against another engine part.

However, Page said, trace amounts of oil are not necessarily considered a serious issue.

"Normally it's not a critical problem, but if it's associated with a growing crack, then obviously it becomes a problem," Page said. "If it's a first indication it's a growing crack, then it's serious."

The Australian Transport Safety Bureau is leading an international investigation of the incident. The agency has said it is trying to find a missing piece of a turbine disc that could help explain what happened.

The bureau released a photo of a jagged and bent piece of turbine disc from the Trent 900 that seems to indicate a failure of the metal disc at the center of the turbine. Turbines spin at extremely fast speeds during takeoff and initial climb, generating massive centrifugal forces.

Martin Chalk, president of the Brussels-based European Cockpit Association that represents 38,200 pilots from 36 European nations, said it was unlikely that a single cause such as an oil leak could have been responsible for the Qantas incident.

"Normally, when these things happen, it's a series of factors that contribute to an accident," Chalk said.

Meanwhile, Singapore plans to replace the affected engines on its A380s with other Trent 900s, said Bryony Duncan-Smith, a Sydney-based spokeswoman for Singapore Airlines. The airline does not know how long that will take, she said.

Rolls-Royce did not immediately respond to a request seeking comment Wednesday. On Monday, it issued a statement saying it had made progress in understanding what caused the Qantas engine to burst, but offered no details on what that cause might be.

Singapore said the engine changes don't affect its eight other A380s at this point.

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The Qantas and Singapore incidents are not the first problems Rolls-Royce have faced with its engines. In September 2009, a Singapore Airlines A380 was forced to return to Paris mid-flight after an engine malfunction. Last August, a Lufthansa crew shut down one of its engines as a precaution before landing in Frankfurt after receiving confusing information on a cockpit indicator.

On Tuesday, the European Aviation Safety Agency said it was closely monitoring the probe into the Qantas incident. The agency issued orders twice this year advising airlines about extra inspections or repairs needed for the Trent 900s.

A380s flown by Emirates and Air France use engines manufactured by the Engine Alliance, a 50/50 joint venture between GE Aircraft Engines and Pratt & Whitney.

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*AP Aviation Writer Slobodon Lekic contributed to this report from Brussels.*

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