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Number 2138

30 SEPTEMBER  
& 1 OCTOBER 2017

**EXCLUSIVE**

# Cabin air health warning

» Growing concern among scientists and pilots about  
low-level contaminants from engine

» 'There is real worry, from passengers to the air crew'



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## COVER STORY

# Frequent flyer health warning over cabin air

By Tom Bawden

ENVIRONMENT CORRESPONDENT

Pregnant women and frequent flyers face an increased risk of health problems, from headaches to chronic fatigue and cancer, from engine fumes polluting the cabin air – and airlines are “in denial” about the threat, experts have told.

An investigation has revealed huge concerns among scientists, pilots and unions about cabin air quality that airlines have long denied are a problem – with one engineering design professor going so far as to say that in his world “everybody has a concern about this issue”.

They say the problem stems from the source of the air, which is drawn from the engines and directed into the passenger cabin and cockpit. Experts fear this air is being contaminated with low levels of engine oil, hydraulic fluids and lubricant seeping through the engine seals.

The most comprehensive study into cabin air pollution, published in June, examined the impact of a variety of reported engine fume leaks of differing magnitudes on 200 pilots and cabin crew.

## Air supply How it works

The air in the cabin and cockpit has to be pressurised because at high altitude it is too thin to breathe. The jet engine must also compress the air it needs for combustion, so pressurised air is drawn from the engine just before combustion and piped into the aircraft.

But while this incredibly hot air – known as bleed air – is cooled it is not filtered and can get contaminated with engine oil and other chemicals. Air in the cabin is recirculated for a while before being let out and replaced by more bleed air. The cabin is typically a mixture of newly arrived bleed air and older air on its way back round. The older air has been filtered, which removes bacteria but not engine fumes.

It identified a pattern of acute and chronic symptoms, ranging from headaches and dizziness to breathing and vision problems. Problems also included damage to the brain and nervous system, heart arrhythmias, fatigue and long-term gastrointestinal problems.

While that study focused on reported “fume events”, its lead author Dr Susan Michaelis, told she was concerned that much smaller leaks are happening all the time.

“Oil seals are not a foolproof design and so the air breathed on every flight will contain low levels of leaked oil,” said Dr Michaelis, who is an air accident investigator.

“Cabin and crew are a particular concern. But so are frequent flyers and some particularly susceptible individuals, such as pregnant women,” she said.

Some of the substances in the oils, such as tricresyl phosphate (TCP), are listed under the EU hazard classification regulations as possibly causing harm to the unborn or impairing fertility.

Dr Michaelis’s fears are shared by many people within the airline industry. “There is real concern about air quality. In the world I move in, everybody has a concern about this issue,” said Peter Childs, a professor of engineering design at Imperial College London.

Colin Soskolne, a health professor at the University of Alberta, said: “The reality of the air they are breathing should be of concern to passengers. It is clearly shown that it can contain very harmful contaminants that can severely impact the health of susceptible passengers.”

“The public needs to be very concerned about how airline companies are disregarding these concerns.”

The Unite union has 90 legal cases relating to cabin air pollution.

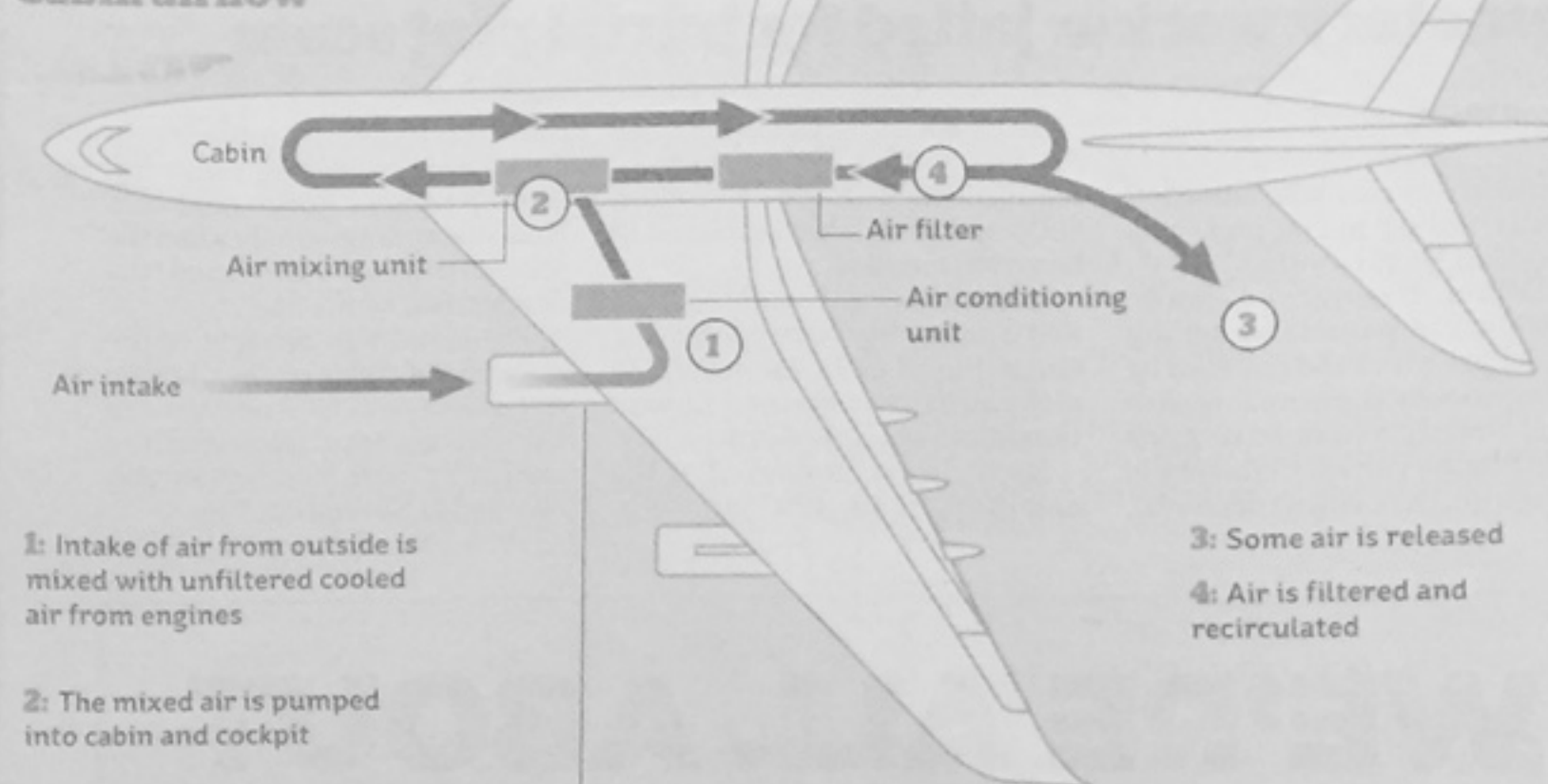
The airlines deny there is a problem. “Independent medical research has found no evidence for [these claims] and concluded that long-term toxic effects would not be expected,” said easyJet.

of the city with poor air quality because of the fine particle pollution it causes.

He also wants tougher controls on the sale of wood-burning stoves, allowing only low-emission versions to remain on the market.

Under the proposals, there would

## Cabin airflow



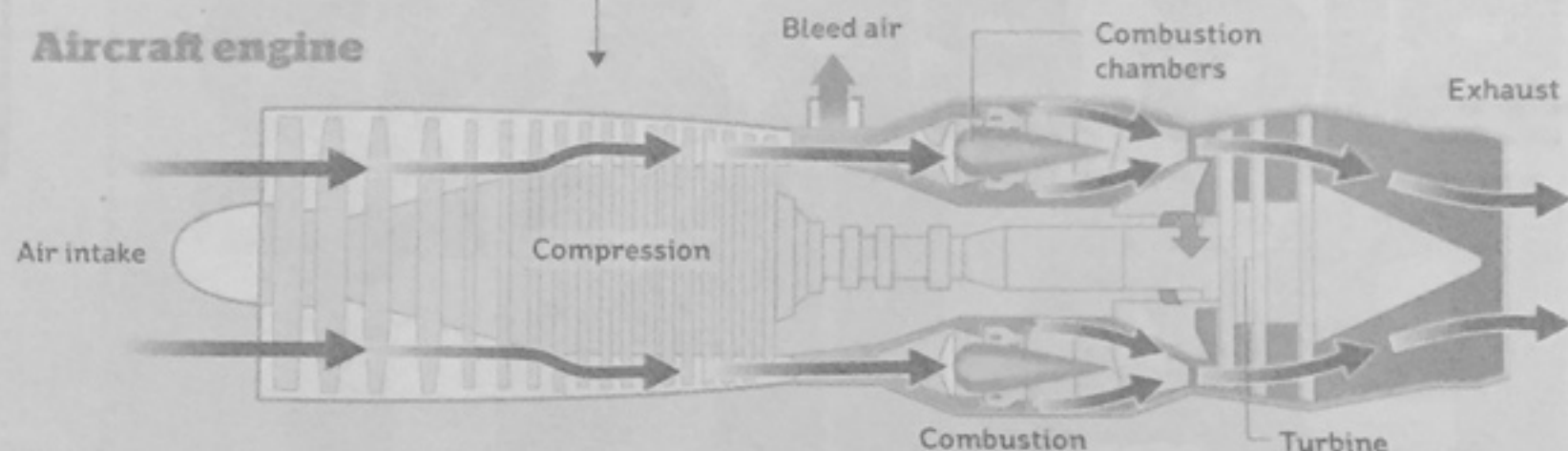
1: Intake of air from outside is mixed with unfiltered cooled air from engines

2: The mixed air is pumped into cabin and cockpit

3: Some air is released

4: Air is filtered and recirculated

## Aircraft engine



SOURCE: FLIGHTGLOBAL, PALL AIRBUS

## TRAVEL

## EasyJet designs new system to filter air

By Tom Bawden

EasyJet will trial a new air filtration system on its planes that will remove any engine fumes that find their way into the cabin and cockpit.

The move has been widely welcomed by scientists, engineers and airline staff who are concerned that repeated exposure to low levels of engine oil, lubricants and other contaminants are causing health problems for frequent flyers and vulnerable passengers.

During high-altitude flight the atmosphere is too thin to breathe and so compressed air is drawn from the

planes engines and pumped into the cabin. This air is not filtered and can become contaminated with chemicals emitted by the engine.

Assuming the trial is successful, the easyJet filters will solve this problem by removing any leaks from the air supply – raising hopes that the other airlines will soon follow suit.

“We have to know that it works. But if it works this is a good development,” said Professor Vyvyan Howard, professor of toxicology at the University of Ulster. “And now that one’s taken the plunge

the others should follow. In my experience, once one jumps they all jump.”

Some critics have suggested easyJet’s decision confirms what they have been saying for years: that prolonged exposure to low-level engine fumes is dangerous.

An easyJet spokesman denied this, saying that the filters were needed to prevent major leaks.

“EasyJet is working to identify and reduce incidents of unusual smell and fumes. These can have short term effects on health and can lead to flight disruption,” he said.



## Cabin fever Why risks of catching a common cold or the flu are low

Ask most people about the dangers of cabin air and they will probably talk about catching a virus or bug. This concern is based on the idea that the air is recirculated, passing colds and flu between every passenger.

But these fears are greatly exaggerated, experts say. Of course, sitting

near to somebody with something nasty for any period of time will greatly increase your chance of catching it, but the risk is no greater than it would be from being in the same situation in an office or on the train. That is because, while the air is recirculated, it is filtered for bacteria

pretty effectively, meaning that they are mostly removed.

However, if you are really unlucky and the plane stalls on the runway for ages, the chance of contagion could rise considerably as the power supply is switched off and the bug filters are deactivated.

## ENVIRONMENT

## Wood fires face ban in London mayor's pollution crackdown

By Tess de la Mare

Wood burning could be banned in some of the most polluted areas of London under new restrictions proposed by the capital's mayor.

Sadiq Khan wants the power to ban the burning of wood in parts

of the city with poor air quality because of the fine particle pollution it causes.

He also wants tougher controls on the sale of wood-burning stoves, allowing only low-emission versions to remain on the market.

Under the proposals, there would

be a network of “zero-emission zones” where the burning of wood or coal would be completely prohibited. There are currently 187 areas in London where pollution regularly exceeds European limits.

In a letter to Environment Secretary Michael Gove on Thursday, Mr

Khan (inset) asked for greater powers to tackle non-traffic sources of air pollution.

Around 200,000 wood-burning stoves are sold each year, and there are 1.5 million across Britain.

The practice is most popu-



lar in the South East, where 16 per cent of households own a stove, with many mistakenly believing it is more environmentally friendly, compared with less than 5 per cent in northern England and Scotland.