

Advisory Wire

REFERENCE NO:	AW000-25-0001 Rev. 6	INFORMATION TYPE:	Maintenance
ATA:	25-00	EFFECTIVITY:	All Learjet models All Challenger models All Global models
SUBJECT:	2019 Novel Coronavirus (COVID-19)		

1. REFERENCES:

- Center for Disease Control and Prevention (CDC):
 - <https://www.cdc.gov/coronavirus/2019-ncov/about/prevention-treatment.html>
 - <https://www.cdc.gov/quarantine/air/managing-sick-travelers/ncov-airlines.html>
- World Health Organization (WHO):
 - <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>
- International Air Transport Association (IATA)
 - <https://www.iata.org/en/programs/safety/health/diseases/#tab-2>
- HID_High Consequence Infectious Diseases Form Rev4_01Oct2019_o_A (available on Customer Portal with AW)
- [Travel Restrictions by Country](#)
- EASA; [Coronavirus COVID-19](#)
- FAA; [Coronavirus \(COVID-19\) Information from the FAA](#)
- Honeywell SIL; Alternate Cleaning Solution Usage in Flight Deck; dated 20 April 2020 (available on Customer Portal with AW)
- [Garmin Service Advisory 2051: Cleaning/Disinfecting Guidance](#)

2. INTRODUCTION:

This AW revision reflects updated information on:

- disinfectants
- cabin filters
- AMS specifications
- latest technologies being investigated by Bombardier
- avionics manufacturers statements on the use of ozone.

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With the increased actions undertaken by authorities around the 2019 Novel Coronavirus (COVID-19) outbreak, Bombardier's highest priority is protecting the health and safety of its employees and customers as we safeguard business and support continuity. These measures include:

- Increasing the frequency of our stringent cleaning and disinfection measures across our offices, production sites and maintenance facilities.
- Implementing thorough, tip-to-tail aircraft sanitization protocols for all new aircraft deliveries and in our maintenance facilities where all incoming aircraft are required to undergo mandatory sanitization procedures, which are also available for aircraft returning to service (see below for additional information on aircraft sanitization protocols).
- Adhering to strict precautionary protocols for our employees with regards to routine handwashing, travel, working from home and limited social gatherings.

While all our customer service and support touchpoints remain operational, Bombardier is applying screening measures for all visitors wishing to access our sites. If you are planning to visit a Bombardier facility, we encourage you to reach out to a Bombardier representative for the latest version of the questionnaire prior to travelling to any of our sites. While we understand this may be an inconvenience, Bombardier Aviation is committed to ensuring the health and safety of its customers, employees and visitors.

Stringent health and safety protocols also extend to our Mobile Response Team (MRT). The Customer Response Center (CRC) and Maintenance Control Centers (MCCs), are limiting the contamination between teams, are practicing social distancing and have implemented increased sanitation procedures. At our two main parts hubs in Chicago and Frankfurt, we have also created a modified shift pattern and operations schedule to minimize the risk of the virus spreading.

We are committed to remain flexible and proactive to ensure business continuity at all our service touchpoints. It's also important to note, that all of our service facilities, part depots in Chicago and Frankfurt, and our Mobile Response Team services remain open, and we are continuing to support all of our customers' aftermarket needs.

Moreover, all companies in the transportation and logistics industry in the U.S. have been deemed essential services and as such, are critical to the infrastructure of the U.S. economy. This includes aerospace companies like Bombardier Aviation.

Customers can contact their Field Service Representatives or the Customer Response Center 24/7 at 1-866-538-1247 for more information on how Bombardier can help customers manage their aircraft during this time. In order to assist customers with their trip planning during this exceptional time, links to the latest travel restrictions (Ref. 5) and a list of high-risk airports (Ref. 6) are included.

We also continue to receive inquiries regarding procedures to manage aircraft that may have been affected by COVID-19 and the following information is provided for organizations receiving or dispatching aircraft.

3. DESCRIPTION:

The most current and comprehensive sources of information on COVID-19 are the Center for Disease Control and Prevention (CDC) and the World Health Organization (WHO) available via the links above.

The WHO is working closely with the International Air Transport Association (IATA), and they have jointly developed a guidance document to provide advice to cabin crew and airport workers.

The ref. 3.1 document provides guidelines for:

- Maintenance crew who carry out maintenance on an arriving aircraft with a suspected case of communicable disease
- Cargo and baggage handlers that must handle cargo or baggage transported by an aircraft arriving from an affected area or carrying a suspected case of communicable disease
- Cabin crew when managing a suspected case of communicable disease on board
- Cleaning crew who must clean an arriving aircraft with a suspected case of communicable disease

while ref. 6 contains operational recommendations to reduce the risk of spreading COVID-19.

In response to the many inquiries we have received on maintenance/disinfection, please see the FAQ section following Section 4 of this AW.

For aircraft arriving at and departing from Bombardier's Service Centers, interiors are currently being disinfected using conventional means. Starting the week of 23 March, Bombardier will be implementing enhanced procedures utilizing air ionizers in conjunction with conventional disinfection of the hard surfaces and leather.

Bombardier is also investigating the use of ionization in-flight to combat airborne pathogens as well as the possible application of an anti-microbial nano-technology coating to combat surface borne pathogens.

You may contact your Field Service Representative or the Customer Response Center 24/7 at 1-866-538-1247 for more information on how Bombardier can help with aircraft disinfection at one of its Service Centers.

4. ACTION:

Operators should review available material and the FAQ section below in order to establish their internal procedures.

In addition, customers and visitors to Bombardier facilities should be aware of the Visitor Information Form that must be filled out prior to entering the facility.

As this situation is evolving rapidly, we will update this AW as further pertinent information becomes available.

Should you have any questions or require more information, please contact your Bombardier Customer Service Representative or Field Support Representative.

Frequently Asked Questions

1. What procedure should I use to disinfect the aircraft interior?

Disinfection of Aircraft Furnishings

1. Put up warning placards that tell persons about the disinfection of the aircraft.
2. Open the passenger door to let in the air.

WARNING: OBEY THE PRECAUTIONS THAT FOLLOW WHEN YOU USE DISINFECTANTS:

- USE A SAFETY MASK AND EYE PROTECTION
- PUT ON PROTECTIVE CLOTHING
- DO NOT LET DISINFECTANTS TOUCH YOUR SKIN, EYES, AND MOUTH
- DO THE WORK IN AN AREA THAT HAS A GOOD FLOW OF AIR
- OBEY ALL MANUFACTURER'S INSTRUCTIONS
- GET MEDICAL AID IF IRRITATION OCCURS

IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS INJURIES CAN OCCUR.

3. Do the disinfection of the surfaces that do not absorb liquid as follows:
 - i. Clean the surfaces of the furnishings which do not absorb liquid with a natural sponge or a clean low-lint cloth, moist with the disinfectant.
 - ii. Let the disinfectant stay on the surfaces for 2 minutes.
 - iii. Remove the disinfectant from all the surfaces which do not absorb liquid with a clean low-lint cloth moist with water.
 - iv. Dry the surfaces which do not absorb liquid with a clean, dry low-lint cloth.
4. Do the disinfection of the surfaces which absorb liquid with the spray applicator. Apply a spray mist of the disinfectant with the spray applicator to the surfaces that follow:
 - i. The passenger seat cushions
 - ii. The passenger seat backs
 - iii. The textile floor coverings
 - iv. The pilot's and copilot's seats
 - v. All the surfaces that have fabric covers.
5. Let the disinfectant dry on all these surfaces.
6. Remove the warning placards.
7. Remove all tools, equipment, and unwanted materials from the work area.
8. Close the passenger door.

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Disinfection of Cockpit Avionics

References 8 & 9 contain Honeywell and Garmin recommendations for disinfecting cockpit avionics equipment.

Specific recommendations from Collins are as follows:

- As a general guidance, the recommended method to clean is a concentration of greater than 70% Isopropyl Alcohol (IPA), which is an approved cleaning solution for Collins' equipment.
- Additionally, we want to stress the importance of applying IPA on a microfiber cloth, cleaning the equipment in accordance with documented procedures for cleaning to avoid damage to the finishes and scratches to painted and glass surfaces.
- We have not tested impacts of Lysol or Clorox Wipes, so we would advise against using anything else other than IPA (at 70% or higher concentration) and microfiber cloth when cleaning equipment.
- More details pertaining to approved cleaning procedures can be found in product CMMs as applicable.
- As a point of reference, most CMMs refer to ASSP 523-0768039-0300000, which contains details for cleaning procedures.

2. What disinfectants can I use?

A 70/30 mixture of isopropyl alcohol and water can be used as well as commercial disinfectant products. It is important to note that only products conforming to Aerospace Material Specifications (AMS) should be used and the product manufacturer's recommendations must be followed. While these procedures are offered in good faith, no responsibility is accepted for claims arising from the procedures suggested.

Products that conform to AMS 1452 - Disinfectant, Aircraft General Purpose and/or AMS 1453 - Disinfectant Cleaner for Aircraft Interior General Purpose Liquid requirements and have been shown to be effective against coronaviruses include:

- Calla 1452
- Bacoban for Aerospace
- Ki-ose 322 Concentrate
- Noviruclean 3471
- Quat Plus TB
- Oxivir® TB Wipes (approved by Townsend Leather for use on their leather products)
- Celeste Sani-Cide EX3
- Celeste Sani-Cide FSC
- Netbiokem DSAM

In addition, Lufthansa Group has published the attached ref. 4 "High Consequence Infectious Diseases Form" provided on Lufthansa Aircraft that identifies additional products.

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Although these types of disinfectant products have been effective in past applications, these products may have unintended effects on delicate materials, particularly soft good materials (namely carpets, sidewalls, window shades, leather, upholstery and varnished elements) used throughout the interior of business aircraft.

Care should be taken to not induce any damage through the application of these products. We recommend that these products are applied in accordance with the Bombardier Interior Grooming Guide & avionics manufacturer recommendations and tested on inconspicuous areas of these soft goods materials prior to widespread application throughout the aircraft interior.

3. Will changing the cabin air filter reduce/eliminate the virus in the cabin air?

Per ref. 6, High Efficiency Particulate Air (HEPA) filters have demonstrated good performance with particles of the SARS-Cov-2 virus size (approximately 70-120 nm). For Global 5500/6500/7500 aircraft and Global 5000/6000 aircraft that have had their recirculation filters changed since 2016, HEPA filters are installed and therefore recirculation fans should not be stopped but increased fresh air flow should be promoted by selecting high PACK FLOW, whenever possible.

As used filters may contain microorganisms trapped in their mesh after hours of filtering activity, it is good practice to apply reasonable precautions when handling them.

There is no need to change filters on an arriving aircraft that has carried a suspected case of communicable disease. Filters should be changed at the regularly scheduled interval.

When replacing filters:

1. Wear disposable gloves and a face mask.
2. Avoid hitting, dropping or shaking the filter.
3. Do not use compressed air to try and clean a filter (it may create an aerosol).
4. The used filter should be disposed of in a sealed plastic bag. A specific biohazard bag is not required. Put the used disposable gloves in the same plastic bag.
5. Wash hands with soap and water when the task is finished

4. Can I use an ozone generator to disinfect the cabin?

Ozone has been shown to be very effective against airborne & surface borne viruses. Commercial ozone generators that produce ozone at sufficient concentrations to kill viruses can be used to disinfect the cabin air and will also kill the majority of surface borne viruses if used in conjunction with high humidity.

It is important to note that these concentrations are harmful to humans and therefore it is important to follow the manufacturer's instructions, particularly with respect to evacuating the area during use and ventilating the treated area after use.

We have received questions on the impact of ozone on avionics equipment and have the following statements from the various avionics manufacturers.

Honeywell

- *Analysis has shown 100% ozone will not have a harmful effect on our avionics in the cockpit. Honeywell is working on a report for OEMs that is expected to be ready in a couple of weeks approximately.*

Collins

- *We understand the objective of using ozone for disinfecting, this is an event that Collins has not fully tested with current DO160 environmental testing and we are therefore unable to comment on long term effects and more frequent usage.*

Garmin

- *The Service Advisory (ref. 9) is what GARMIN has approved.*

5. Can I use an air ionizer to disinfect the cabin?

Air ionizers are also effective against airborne viruses but less effective on surface borne viruses and therefore, Bombardier recommends that hard surfaces and leather continue to be disinfected conventionally. Ionizers can also give off ozone as a by-product so, again, it is important to follow the manufacturer's recommendations with respect to ventilation post-use.

6. I would like to use my aircraft to move supplies during the pandemic. How can I do this?

Bombardier has developed guidelines for the transportation of cargo in the passenger cabin without modifying the aircraft. These guidelines do not result in a cargo compartment that meets all applicable cargo compartment airworthiness standards. These guidelines address key safety risks and may be considered appropriate by your local Airworthiness Authority in this time of crisis.

A support letter containing these guidelines is available for all Challenger & Global models via a free of charge SRPSA.