

AIRCRAFT STORAGE AND RETURN TO SERVICE



With COVID-19, the airlines have seen the demand for flights drastically diminished. Instead of flying, many aircraft are now being sent to storage, for short or longer periods of time. In order to preserve, in preparedness for airworthiness state, operators must follow detailed procedures and tasks. Should you choose to store aircraft outside of our MHIRJ Service Centers the procedures to minimize the deterioration of the aircraft and its systems while it is not in use need to be abided by in preserving the safety and airworthiness of these aircraft.

Preparing your aircraft for storing is not as easy as simply parking it! Thankfully, your team at MHIRJ have all the support and technical approved data you need to be successful at storing your aircraft for any length of time under the approvals deemed necessary.

HAVE A LOOK AT THE FOLLOWING USEFUL INFORMATION FOUND IN THE AMM!

- > PARKING AND RETURN TO SERVICE AFTER PARKING OR MOORING
- > SHORT-TERM STORAGE AND AIRCRAFT PREPARATION FOR OPERATION
- > LONG-TERM STORAGE AND AIRCRAFT PREPARATION FOR OPERATION
- > DEVIATIONS TO AIRCRAFT MAINTENANCE MANUALS (AMM) TASKS UNDER STORAGE
- > STORAGE – CHECKS AND ENGINE RUN DEVIATION
- > STORAGE – AUXILIARY POWER UNIT (APU)
- > LANDING GEAR
- > HYDRAULIC & FLIGHT CONTROL SYSTEMS
- > FUEL SYSTEM
- > FREQUENTLY ASKED QUESTIONS

Should you need assistance, please do not hesitate to contact:

- > **CUSTOMER RESPONSE CENTER - CRC** for any aircraft-related request you may have.

The CRC for CRJ Series can be reached 24/7/365

| | |
|---------------|-----------------------------------|
| Toll free | +1 844 CRC CRC0 (+1 844 272 2720) |
| North America | or direct +1 514 855 8500 |
| International | +1 514 855 8500 |

| | |
|-----|-------------------|
| Fax | +1 514 855 8501 |
| @ | thd.crj@MHIRJ.com |

Implementation of the recommendations (per AMM or deviations) contained herein (or communicated otherwise via AOM, REO, RIL or other), and the restoration of the aircraft to an airworthy condition, is the sole responsibility of the operator of the aircraft, and MHIRJ shall have no liability for any failure by the operator or any third party to implement the recommendations contained herein or to otherwise restore the aircraft to an airworthy condition or the manner in which such recommendations are implemented and/or the aircraft is restored to an airworthy condition.

TECHNICAL DOCUMENTATION

> **CUSTOMER SERVICES PORTAL (PRIVATE)**

Our Customer Services Portal has a comprehensive database and several useful applications. This is the place to search and find all information about your aircraft.

- > **ACCESS THE AIRCRAFT MAINTENANCE MANUALS (AMM TASKS)**
- > **ACCESS THE AIRCRAFT OPERATOR MESSAGES (AOM)**
- > **ACCESS THE FLIGHT OPERATION NOTIFICATIONS (FON)**
- > **ACCESS THE REFERENCE INSTRUCTION LETTERS (RIL)**

If you have an issue trying to find it or accessing the Portal, you can always rely on the following teams:

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PARKING AND RETURN TO SERVICE AFTER PARKING OR MOORING

The AMM Chapter 10 documents provide recommended maintenance steps to protect your aircraft from environmental damage when your aircraft is parked for 7 days or less.

SHORT-TERM STORAGE AND AIRCRAFT PREPARATION FOR OPERATION

The AMM Chapter 10 documents provide recommended maintenance steps to minimize deterioration of the aircraft and systems while it is not in use for up to 28 days.



LONG-TERM STORAGE AND AIRCRAFT PREPARATION FOR OPERATION

The AMM Chapter 10 documents provide maintenance steps instruction for long-term storage to minimize deterioration of your aircraft. More precisely for:

- Aircraft prolonged: 240 Days Maximum; and
- Long-Term Storage: 2 Years Max Program.

AIRCRAFT RETURN TO SERVICE

The Maintenance Requirements Manuals (MRM) require a calendar inspection tasks be completed before the aircraft returns to service. Please refer to AOM 1722 and AOM 700-1162 for more information.

DEVIATIONS TO AIRCRAFT MAINTENANCE MANUALS (AMM) TASKS UNDER STORAGE

Operators can request deviations to AMM TASK for storage. In-Service Engineering will then provide recommendations to allow application of short-term storage aircraft maintenance tasks and additional checks, without initiation of long term-storage program, by issuing a Reference Instruction Letter (RIL) or a Concession Support Letter (CSL).

Any deviation needs to be analyzed and possibly be addressed according to return to service (RTS) requirements.

Operators can have the ability to customize their aircraft Storage Program. For more information, please refer to AOM 1198 and AOM 700-0528.

EXTEND AIRCRAFT SHORT TERM STORAGE BEYOND THE 28 DAYS DUE TO UNCERTAINTY SURROUNDING THE COVID-19 SITUATION

Because several operators requested a guidance to avoid initiation of the long-term storage maintenance program your In-Service Engineering (ISE) team provides recommendations to allow application of short-term storage of your aircraft maintenance tasks and additional checks, without initiation of long term-storage program. There are several additional maintenance checks introduced at return to service.

STORAGE – CHECKS AND ENGINE RUN DEVIATION

Regular engine runs minimize possible corrosion development on internal engine parts due to drained off engine oil during engine inactivity, exposing internal parts to corrosion. Fungus and other microbes can also grow in the fuel lines. Some Line Replacement Units (LRU) might require replace during return to service (RTS) checks, or Mean Time Between Unscheduled Removals (MTBUR) could be affected after return to service. Additional checks will be required at return to service if no engine runs at 70%N1 are not completed during storage checks.

Regular desiccant check and replacement are necessary based on weather conditions. Detailed Visual Inspection and corrosion repair, if found will be required before a/c return to service if temporary protection was not applied.

For more information about the storage tasks, please refer to the AMM Chapter 71.

STORAGE – AUXILIARY POWER UNIT (APU)

Honeywell VSB49-7997 and AOM 700-1175A provides standardized preservation and storage guidelines for installed APUs. See AMM Chapter 49.

LANDING GEAR

Aircraft Return to Service Checks after storage for extended, more than 29 days without initiation of the AMM long-terms storage program requires tasks identified in AMM Chapter 32.

Deviations from landing gear (LG) Extension/retraction is not considered feasible.

Check of landing gear system to address possible drying out and degradation of the seals in landing gear extension/retraction actuators, up-locks and landing gear system valves, during extended storage of the aircraft the landing gear actuators and valves are not exercised.

Degraded seals can cause hydraulic leakage and improper operation of these components.

Possible development of corrosion of the metal rods in the actuators and valves.

- During frequent actuation of the LG shock strut and hydraulic seals are pressurized and “wetted” with hydraulic fluid, thus maintaining seal’s swollen state, metal rods are covered with a film of hydraulic fluid protecting steel from atmospheric corrosion.
- During extended storage of the a/c the LG actuators and valves are not exercised.
- Landing Gear cycling confirms proper operation of the system and ensures that possible component degradation has not adversely affected system performance, no hydraulic leakages were observed, before aircraft return to service.

HYDRAULIC & FLIGHT CONTROL SYSTEMS

During Short-Term Storage: 7-Day and 21-Day Maintenance Checks (all), pressurize hydraulic systems and do 5 cycles of flight control surfaces.

Aircraft returning to service after storage period of more than 29 days without initiation of the AMM long-terms storage program require to complete the tasks mentioned under AMM Chapter 27.

Reduced frequency of Power Control Unit (PCU) rod end bearing activation during storage may lead to development of corrosion in the inner race of the rod end at spherical bearing installation, subsequent seizure of the bearing and unnoticed Power Control Unit (PCU) rod end damage, disconnect from flight control surface.

Several in-service events were linked to preceding aircraft prolonged parking and resulted in Maintenance Requirement Manual (MRM) revision, aircraft Return to Service after Long-Term Storage Task amendment (ref. TCCA AD CF-2018-29 or FAA AD 2019-19-08).

FUEL SYSTEM

For Initial Preparation: Short-Term Storage, per AMM Chapter 10, a microbial growth test must be done as described in the AMM Chapter 12. The biocide treatment of the fuel tanks under AMM Chapter 28 as a preventative measure is recommended.

All hydrocarbon fuels have micro-organisms that live and grow in fuels which release sulfur-based by-products into the fuel. All hydrocarbon fuels have water, which when combined with the sulfur-based by-products, release sulfuric acid into the fuel which is a corrosive element.

If microbial growth test cannot be completed at preparation of aircraft for storage, it must be performed before return to service.

Inspections of the engine and auxiliary power unit (APU) fuel filters for slime, biological growth, or excessive corrosion particle contaminants is also required. Significant Maintenance efforts would be required, if biological contamination is found at Return-to-Service (RTS).

FREQUENTLY ASKED QUESTIONS

1 Where can I find the following documents: AMM, AOM, FON, RIL?

- On our Portal

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> ACCESS THE AIRCRAFT OPERATOR MESSAGES (AOM)

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> ACCESS THE REFERENCE INSTRUCTION LETTERS (RIL)

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- > **flycrj@MHIRJ.com** for Portal support:

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2 Can we have aircraft on jacks under long storage?

Yes. It is permissible to have aircraft on jack for storage

3 Can the short-term storage (28 days) be extended?

There are no published instructions to extend the short-term storage over 28 days, however, the Customer Response Center - CRC can develop a Reference Instruction Letter (RIL) to extend the short-term storage calendar.

A RIL is a chargeable service. Please contact Customer Response Center - CRC for any aircraft-related request you may have.

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Note that the Aircraft Operator Message (AOM) can be found on our Customer Services Portal (Private).

> ACCESS THE AIRCRAFT OPERATOR MESSAGES

4 What do we do if there are some storage or return to service tasks that can not be completed, deviated, missed or extended?

RIL, REO or other chargeable solutions will be addressed case by case, please contact:

> **CUSTOMER RESPONSE CENTER - CRC** for any aircraft-related request you may have.

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5 Are we allowed to temporarily suspend maintenance requirements associated with calendar time intervals?

The MHIRJ Aviation group recognizes this is as an unprecedented situation and offers herein:

- A Support Letter to request a one-time two (2) month extension, post-return-to-service to those MRBR calendar items that become due while aircraft are stored and maintained in accordance with the relevant Aircraft Maintenance Manual (AMM) procedures. This will create a 2-month window for operators to accomplish those calendar items post return to service (RTS).

For more information on storage checks, please refer to the following AOMs (Aircraft Operator Message):

- **AOM 1722 (2)**
- **AOM 700-1162 (7/9/10)**

6 Does MHIRJ have Service Centers to support the Short Term and Long Term Storage of aircraft at their location?

Yes, MHIRJ has locations today with qualified licensed technicians to support every aspect of the approved Storage Program and all the necessary tooling and equipment. In addition, MHIRJ is capable of returning your aircraft to service following any Storage Program, returning the aircraft to the Airworthiness state you the customer requires prior to entry into service.

For this support please contact:

> DON NOLAN

DIRECTOR OF SERVICE SALES

Tel +1 520 991 6155
@ don.nolan@mhirj.com

Address 1555 East Aero Park Blvd
Tucson, AZ., 85756

ACCESS THE AIRCRAFT MAINTENANCE MANUALS (AMM) AND MAINTENANCE REQUIREMENT MANUALS (MRM)

To access the Aircraft Maintenance Manuals (AMM TASK or the Maintenance Requirement Manuals (MRM) from the Customer Services Portal, please follow the following steps.

1. Access the Customer Services Portal and then log in (write your Username and Password).

Already Registered?

Username:

Password:

Login

> Forgot Username?

> Forgot Password?

New User?

All MHI R J Aviation and De Havilland Aircraft of Canada Limited aircraft owners, operators, regulatory authorities and suppliers are eligible to register for an account to access ifybombardier.com and its CRJ Series and Dash 8 (Q Series) aircraft data.

Register for an account

Help

For CRJ Series — MHI R J Aviation:
Contact the ifybombardier Support Team for questions or issues:
#lycrj@MHIRJ.com
Spare Parts: parts@MHIRJ.com

For Dash 8 — De Havilland of Canada:
Contact the ifybombardier Support Team for questions or issues:
eServices@dehavilland.com
Spare Parts: parts@dehavilland.com

> To register for access to A220 aircraft data, please visit A220World.airbus.com.

Airport Publications

> Airplane Rescue and Fire Fighting (ARFF) Information

2. Under 'Publications', click on 'Maintenance and Flight Publications'.

Home **Publications** Technical Support Parts Training Sales News & Events Requests

Quicklinks

Publications Home

Maintenance and Flight Publications

Create Manual Change Request

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Regionalized Best Practices List

Useful Information

Contacts

Frequently Asked Questions

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3. Select the model of your aircraft and the type of documents.

A form with two dropdown menus labeled 'SELECT MODEL' and 'SELECT TYPE', followed by a 'Submit' button. The form is enclosed in a rectangular border.

4. Select a publication and then use the left menu to find the task (document) you are looking for.

- 1. Select a publication.
- 2. Use the left menu to find the task.



ACCESS THE AIRCRAFT OPERATOR MESSAGES (AOM), THE FLIGHT OPERATION NOTIFICATIONS (FON) OR THE REFERENCE INSTRUCTION LETTERS (RIL)

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eServices@dehavilland.com
Spare Parts: parts@dehavilland.com

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Airport Publications

> Airplane Rescue and Fire Fighting (ARFF) Information

2. Under 'Publications', click on 'Service Document Library'.

Home **Publications** Technical Support Parts Training Sales News & Events Requests

Quicklinks

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Document Libraries

- Engineering Document Library
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- Service Document Library**

Technical Publications

- Airport Publications
- Distribution Status
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- Ordering Publications Services
- Performance Software Revision Status
- Products and Services
- Regionalized Best Practices List

Useful Information

- Contacts
- Frequently Asked Questions

A Group Company of **MITSUBISHI HEAVY INDUSTRIES**

3. Select the type of documents you are looking for and use the filters to refine your search.

Service Document Library

This library contains the following document types, available based on their effectivity. Click on one of the items below to filter on a specific document type.

- > Airworthiness Directives
- > All Operator Messages (AOM)
- > Concession Support Letters (CSL)
- > Delivery Documentation
- > Flight Operations Notes (FON)
- > Generic Documents (All Types)
- > Reference Instruction Letters (RIL)
- > Service Letters (SL)
- > Vendor Service Letters (VSL)

To search by **specific** effectivity, select Refine By, then Effectivity, then enter an MSN number. To search for a **generic** document, select Refine By, then Effectivity, then put All

> Watch the [Document Libraries Help Video](#)

> Looking for a specific document type? Refer to the [Document Libraries Search Guide](#)

Applied Filters:

Fleet: **CRJ Series** From: **01/01/1985** To: **09/14/2020** Document Type: **All Operator Message (AOM)** X

Total Documents Available: **12,923**
With Applied Filters: **2,877**

Date Range: From: To:

Refine By: ⓘ

25 Documents Per Page

| Document Number | Rev. | Title | Main ATA/SNS | Document Type | Issued Date | More |
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| 700-1178 | -- | Prolonged Storage AOA vane and Pitot & Static System Return to Service Thales Recommendations | CRJ Series - 10-00 Parking and Mooring - | All Operator Message (AOM) | Sep-14-2020 | +More |

Select the type of documents

Use the filters to refine your search