Aircraft Parking and Storage

Facing the unprecedented and massive fleet storage worldwide which is needed in the current COVID-19 pandemic, Airbus has launched an active support to all operators about the grounding, parking and storage conditions.

To complement this on-going effort, this article aims at reminding some of the key safety considerations for a proper parking and storage.

This article is also available on safetyfirst.airbus.com and on the Safety first app for iOS and Android devices.
PARKING AND STORAGE PROCEDURES

The AMM/MP/AMP provides operators with detailed procedures for parking and storage. It is essential that these procedures are followed to preserve the safety, airworthiness and value of the aircraft.

Depending on the duration of the out-of-operation period and on the need for readiness of the aircraft for return into service, several options are available for aircraft preservation in either Parking in “flight-ready” condition or storage.

Parking

In some cases, the aircraft needs to be kept in a condition that enables quick resumption of operations. In this case, the parking procedure is applicable so that the number of tasks needed to prepare the aircraft for flight operations is minimised. It must be noted that aircraft with only parking procedures applied still require a number of recurring maintenance actions that ensures the aircraft remains in a “ready for flight” condition.

A320 family, A330, A340, A350, A380 aircraft

Which AMM/MP to apply will depend on if the aircraft will be parked for less than one-month or more than one-month.

Here are the two AMM/MP references:

- 10-10-00 Parking and storage procedures
- 10-11-00 Parking Procedure

A220 aircraft

Three procedures are available in the AMP depending on the duration of the parking: Parking 7 days, 15 days or 12 weeks.

AMP references:
● Parking (Maximum 7 days) BD500-A-J10-14-00-01AAA-890A-A
● Parking (Maximum 15 days) BD500-A-J10-10-00-01AAA-890A-A
● Parking (Maximum 12 weeks) BD500-A-J10-11-00-01AAA-890A-A

Storage

The storage procedure is for the preservation of parked aircraft that are unlikely to return into service in the short-term. This means that the tasks in the storage procedure will have more detailed steps to follow and require more time to complete compared to the parking procedure. However, the number of recurring maintenance tasks is reduced, meaning less interventions are required on aircraft that are stored. For example, engine runs and a number of other operational checks are not required on an aircraft preserved in accordance with a storage procedure, as it is the case when engines, avionics computers or other major components are removed from the aircraft.

A320 family, A330, A340, A350, A380 aircraft

Two storage procedures are available in the AMM, one for aircraft that will be stored for less than one-year and a procedure for aircraft stored for periods more than a year.

AMM/MP references:

● 10-10-00 Parking and storage procedures
● 10-12-00 Storage Procedure

A220 aircraft

Two storage procedures are available in the AMP depending on the duration of the storage: Storage 6 months and 2 years.

AMP references:

● Storage (Maximum 6 months) BD500-A-J10-30-00-01AAA-890A-A
● Storage (Maximum 2 years) BD500-A-J10-31-00-01AAA-890A-A

KEY SAFETY CONSIDERATIONS FOR PARKING & STORAGE

The application of the AMM/MP/AMP parking and storage procedures ensures the preservation of the aircraft systems. For example, using engines and APU inlet and outlet protection.

There are key safety aspects that are part of the AMM/MP/AMP procedures and must be considered when preparing an aircraft for parking or storage and during the recurring maintenance tasks. These are highlighted below.

Storage location

Aircraft should be ideally parked or stored on a flat surface with the nose pointing in the direction of the prevailing winds to limit the effect of wind and gusts on the aircraft.
Landing gear safety devices

Landing gear safety devices must be put in place to prevent unwanted landing gear retraction.

Use of Chocks

On A300, A310, A320, A330, A340, A350 and A380, the parking brake will be ineffective as there will be no hydraulic pressure in the system.

The AMM/MP parking and storage procedures both recommend the use of chocks at the wheels to hold the aircraft in its parked position. The procedure for wheel chocks installation is available in the AMM/MP 10-11-00 Parking Procedure.

The A220 being equipped with an electrical brake system, Airbus recommends to apply the parking brake in addition to the chocks. The brake force will remain constant throughout the parking/storage duration. For A220 wheel chocks installation, refer to the AMP Parking Procedures previously listed above.

You will find complementary information about the design and correct use of chocks in the Safety first article titled, “Safe Aircraft Parking”.

Protection against strong winds

If the aircraft is stored in an area known to be windy, or if strong wind conditions are expected, it is necessary to check and improve aircraft’s stability (AMM/MP 05-57-00) and moor the aircraft if needed (AMM/MP procedure 10-20-00 Mooring). However, if the expected winds are above the aircraft’s stability limits, Airbus recommends to move the aircraft to another airport when possible.

On A220 aircraft, similar safety precautions should be followed as recommended above. In addition, the Flight By Wire architecture being susceptible to high winds, it is important to be aware of the Parking and mooring gust limits provided in AMP BD500-A-J10-20-00-02AAA-030A-A.
Post high-wind inspection

It is important to perform the “post high wind event” inspection (05-51-42) when the aircraft is unmoored to ensure that the aircraft was not damaged including an assessment of the entire aircraft checking for excessive loads as well as inspections of the flight controls and landing gear structure.

For A220 aircraft, follow Severe winds on the ground - Special irregular inspection per AMP BD500-A-J05-51-32-01AAA-284A-A if limits are exceeded.

What if strong winds are expected and my aircraft is parked/stored in an area with no mooring attachment point?

Operators should contact Airbus Customer Support to define an alternate solution. At the time of authoring this article, Airbus was updating its detailed guidance for aircraft stability recommendations, which will address fuel and ballast as well as regular and alternative mooring schemes.

Grounding/earthing of the aircraft

It is highly recommended to permanently ground/earth the aircraft when parked or stored to avoid damage caused by lightning in storms.

It is mandatory to ground/earth the aircraft during the periodic ground checks to ensure safety of the maintenance personnel and avoid damage to the aircraft systems.

Protecting air data probes

Air Data probes need to be protected to prevent dust or insects from causing an obstruction. Approved probe covers must be used. They can normally be found in each aircraft’s fly-away kit.

Some precautions must be taken when using alternative means like plastic foil when the approved covers are unavailable. These materials can damage the probes. For example, using plastic foil to cover the angle-of-attack probes can...
cause water to ingress inside the probe when water accumulates inside the plastic foil if the foil is not properly sealed with the fuselage and not equipped with drain holes. This can result in a blocked probe in flight when the aircraft returns to service.

It was also reported that the pressure increased in the total pressure line when sliding certain unapproved protections on the pitot tubes, simulating airspeed reading. This led to an unexpected Ram Air Turbine (RAT) extension when power was applied to the aircraft.

Finally, there is a risk that the tape or foil will not be seen by the ground or flight crews and it will remain on the aircraft when it returns to service. This could lead to incorrect indications for the flight crew and the associated system effects.

**What if the approved air probe covers are not available?**

If the approved probe covers are not available, the advice is not to use an improvised or unapproved cover, and it is preferred that the probe remains uncovered when the aircraft is parked. It will then be necessary to carry out an inspection and/or a flushing procedure on the associated pressure line before returning to service.

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**Closure of the outflow valves**

The parking/storage procedures request closing the outflow valves using the DITCHING pushbutton. Care should be used during maintenance on the aircraft if pre-conditioning the cabin with the aircraft doors closed using a ground cart connected to the low pressure port. The potential for pressure to build up in the cabin may cause the passenger cabin doors to open violently if operated by ground personnel. The maintenance personnel must ensure that at least one passenger door, or the forward avionics compartment access door, is open before connecting the ground cart and remains open for as long as the cart is connected to the aircraft.

Refer to the “Preventing Violent Door Opening Due to Residual Cabin Pressure” Safety first article published in October 2018.
Certain situations will require the parking or storage of aircraft for a given period of time. The AMM/MP/AMP parking/storage procedures must be followed to ensure that the aircraft's safety, airworthiness and value is maintained during any extended period on the ground. This will ensure that any aircraft, which was parked or in storage can safely return to service when required to do so.

It is strongly advised that operators avoid using improvised or unapproved items to protect the aircraft and its components. In any situation where there are unprecedented numbers of aircraft being parked or stored around the world, it is crucial that where AMM/MP/AMP procedures cannot be correctly applied, that operators contact Airbus to seek advice on what approved alternative procedures may be applicable.
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Airbus - Product Safety department (W)
1, rond point Maurice Bellonte
31707 Blagnac Cedex - France
safetycommunication@airbus.com

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