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ASI-7-1-1

PERIODIC (100-HR / ANNUAL) INSPECTION & SERVICE CHECKLIST

PROCEDURE

SUBJECT:	
Service & Maintenance	
ASSEMBLY NO:	**APPLICABILITY:**
AP-xxx	All propeller models

1. TOPIC

1.1 Introduction

This document covers the recommended inspection and maintenance procedures for an Airmaster propeller. This work should be performed at the first 25, 50 and 100 hours, then subsequently at 100-hour intervals (or annually).

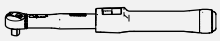
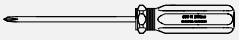
This procedure can be performed with the propeller hub mounted to the engine flange. Operators should refer to the assembly drawings booklet throughout this procedure to identify those propeller parts which are acknowledged throughout.

2. MATERIAL REQUIREMENTS

2.1 Parts

ITEM	QTY	PART NO.	DESCRIPTION	IMAGE
1.	1	AH-xxx	Airmaster Hub Assembly	
2.	As applicable	AB-xxx	Airmaster Blade Assembly	
3.	1	AS-xxx	Airmaster Spinner Assembly	
4.	1	AR-xxx	Airmaster Slipring Assembly	
5.	1	A0120 or A0122	Airmaster Sensor-Brush Assembly	

2.2 Tooling

ITEM	QTY	DESCRIPTION	IMAGE
1.	1	Torque Wrench (1/2” Socket) **Size requirements may vary*	
2.	As required	Crow’s Foot Extension (1/2”) **Size requirements may vary*	
3.	1	Blade Assembly C-Spanner	
4.	1	9/64” Hex Key	
5.	1	PH2 Screwdriver	
6.	1	Inspection Torch	
7.	1	Feeler Gauge Set	

2.3 Consumables

ITEM	QTY	DESCRIPTION	IMAGE
1.	As required	Cleaning Agent (Non-Corrosive) *(e.g. Loctite® SF 7063, Methylated Spirits)*	
2.	As required	Paper Towels, Clean Cloth (or similar)	
3.	As required	Torque-Seal	
4.	As required	Loctite 243	

2.4 Paperwork

ITEM	QTY	CODE	DESCRIPTION
1.	1	AH-xxx	Airmaster Hub Assembly Drawing & BoM
2.	1	AB-xxx	Airmaster Blade Assembly Drawing & BoM
3.	1	AS-xxx	Airmaster Spinner Assembly Drawing & BoM
4.	1	AR-xxx	Airmaster Slipring Assembly Drawing & BoM

2.5 PPE

ITEM	QTY	DESCRIPTION	IMAGE
1.	As required	Protective Gloves	

3. INSPECTION PROCEDURE

3.1 Overview

While inspecting the condition of the propeller, any indication of the following defects should be considered significant, requiring closer inspection and rectification before next flight. Contact Airmaster if any of the following defects are suspected.

WARNING *Ensure that aircraft power is turned off throughout this procedure.*

- **Loose Fasteners:**
  Check associated components and fasteners for damage before resecuring any loose fasteners. Nyloc nuts and Nord-Lock® washers may only be reused once. Confirm the propeller has been dynamically balanced.

- **Moisture Ingress:**
  Dry all moisture, then inspect components for damage or corrosion. Check integrity of sealing components. Replace any electrical components affected.

- **Grease Expulsion:**
  Some grease expulsion is normal after the propeller is first flown or recently serviced. Excessive seepage of grease may indicate that blades are improperly installed, the hub is over-greased, or a retention nut seal is defective.

- **Cracks:**
  No cracking is acceptable for any propeller component, and no repair is permitted. Replace with new, airworthy components.

- **Corrosion:**
  Light corrosion may be removed with scotch pad and monitored. Heavy corrosion, pitting or any corrosion observed in the hub or blade retention components is unacceptable.

- **Incorrect Use of Nord-Lock® Washers:**
  Replace with a new pair of Nord-lock® washers.

- **Damaged Electrical Wiring:**
  No damage is acceptable to electrical wiring looms or their connectors. Replace with new, airworthy components.

- **Damaged Engine Flange:**
  Report any suspected damage to the engine manufacturer or appropriate service centre. Do not operate the propeller until damage is rectified.

- **Blade Damage:**
  Seek blade manufacturer's advice on airworthiness and recommendations on whether blade repair or touch-up may be administered in the field.

3.2 Inspect Spinner Assembly

3.2.1 Checklist

Note *Refer to Airmaster spinner assembly drawing (AS-xxx).*

STEP	ACTION	☑
1.	Gently wobble nose of spinner cone by hand ensuring it feels snug and there is no slop.	☐
2.	Check spinner cone fasteners for signs of loosening.	☐
3.	Remove spinner cone from backplate via truss head screws.	☐
4.	Inspect spinner cone closely for cracks under good illumination. Pay close attention to spinner cone mounting holes and edges of blade cutouts.	☐
5.	Check inside of spinner cone for signs of heavy wear by the spinner front support, which may indicate that spinner cone is improperly fitted, and adjustment is required.	☐
6.	Check inside of spinner cone for signs of grease expulsion, which may indicate that blades are improperly seated inside hub, or blades seals are defective.	☐
7.	Inspect front support for cracks, deformation, or wear around the edges. Replace with new, airworthy part if damage is suspected. Heavy wear indicates the spinner cone is not fitted properly, and the front support requires adjustment.	☐
8.	Check screws retaining front support are lock-wired and lockwire is intact.	☐
9.	Loosely refit spinner cone to backplate and check corresponding holes align concentrically. Hole misalignment indicates that front support requires adjustment.	☐
10.	Inspect backplate for damage or deformation. Check nut-plates and rivets are secure and free from corrosion. Replace with new, airworthy part if damage is suspected.	☐

3.2.2 Figures

Examples of unacceptable conditions of the spinner assembly are shown below:

Figure 1.
Cracks originating from spinner cone mounting holes.

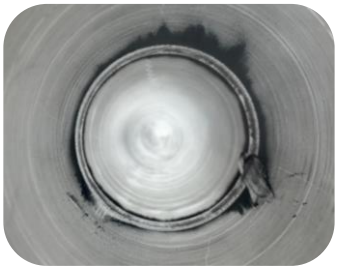


Figure 2.
Significant wear of front support observed inside spinner cone.

Figure 3.
Misaligned spinner mounting holes. Readjustment required.

3.3 Inspect Blade Assemblies

3.3.1 Checklist

Note *Refer to Airmaster blade assembly (AB-xxx) and sub-assembly drawings.*

STEP	ACTION	☑
1.	While blades are installed, examine each assembly for signs of grease expulsion, focusing on the sealing areas located at the inner and outer diameter of the retention nut.	☐
2.	Examine all blade surfaces for damage including cracks, gouges, debonding, paint peeling or any condition exceeding normal wear and tear.	☐
3.	Inspect leading-edge shields for corrosion, penetrative damage, or delamination.	☐
4.	Remove each blade assembly from the propeller hub. Refer to ***ASI-7-6***.	☐
5.	Use a clean cloth to wipe grease from outer surfaces of each blade retention assembly.	☐
6.	Inspect retention nut closely for cracks, particularly around the lightning holes and threads, or damage to the outer edge. No damage is acceptable.	☐
7.	Slide retention nut towards ferrule nut to open the thrust bearing pack.	☐
8.	Separate thrust bearing elements: (1) thrust roller bearing, (2) thrust bearing washers, (1) spacer ring. Use a clean cloth to wipe grease off these surfaces.	☐
9.	Inspect both sides of (2) thrust bearing washers for cracks, heavy indentations, uneven wear patterns, or corrosion (beyond minor staining).	☐
10.	Examine thrust bearing for cracks or damaged rollers.	☐
11.	Inspect the painted surface on the underside of the retention nut (after removing grease) for heavy or uneven wear patterns. This may indicate improper blade installation or that the propeller is suffering damage from engine operation (‘hammering effect’).	☐
12.	Inspect blade ferrule for cracking or corrosion. Neither condition is acceptable. Pay close attention to the shot-peened fillet area (between the flange at the inner end and the main cylindrical section), this is the principal load bearing area. This area can be observed by sliding the thrust bearing pack forward. It is normal to observe some wear beneath the thrust bearing position. This is acceptable so long as there is no evidence of cracks.	☐
13.	Inspect alignment bearing (base of blade) for damage or corrosion. Check for smooth rotation by hand. Inspect the bearing seals for damage (e.g. wavy appearance).	☐
14.	Examine plastic cam follower (base of blade) for cracks and the steel stud (over which it is fitted) for corrosion or deformation. Check retaining circlip is properly fitted.	☐
15	Inspect cam plate for damage and deformation around the cam stud area (e.g. wavy appearance). Check cam plate is seated flush against base of blade (no gap).	☐

3.3.2 Figures

Examples of unacceptable conditions of the blade assembly are shown below.

Figure 4.
Heavy corrosion on blade ferrule nut.

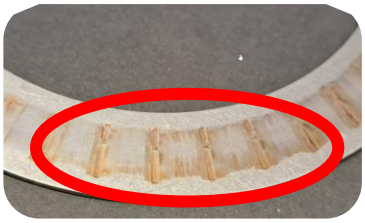


Figure 5.
Heavy indentations (brinelling) on thrust bearing washer.

Figure 6.
Crack emanating from fillet region of (legacy) blade ferrule.

3.4 Inspect Hub Assembly

3.4.1 Checklist

> ⓘ *Note* *Refer to Airmaster hub assembly (AH-xxx) and sub-assembly drawings.*

STEP	ACTION	☑
1.	Inspect exterior hub shell for corrosion. Heavy corrosion is unacceptable; light corrosion may be removed with fine scotch pad and the surface protected afterwards.	☐
2.	Inspect exterior hub shell for cracks, paying close attention to the outer cylindrical surface of each hub port. No cracking is acceptable.	☐
3.	Check screws retaining motor cap are lock-wired and lockwire is intact.	☐
4.	Use a clean, lint-free cloth to wipe old grease out of each port and the internal area of the hub. Wipe flat surfaces of pitch change slide (new grease will be applied).	☐
5.	Examine internal surfaces of each hub port for signs of corrosion or damage (e.g. nicks, burrs, galling). Pay close attention to the threads and cylindrical bores.	☐
6.	Examine internal area of hub containing the pitch change mechanism. Check for signs of cracking, corrosion, water ingress or bent pitch change rods.	☐
7.	Inspect pitch change slide for cracks.	☐
8.	Inspect the area where each pitch feedback rod attaches to the pitch change slide, checking for signs that the rod may have loosened (visible threads, broken torque-seal).	☐
9.	Inspect lead screw threads for deformation, corrosion and sufficient lubrication.	☐
10.	Check torque setting of six hub mounting bolts. These bolts must be lock wired if they aren't fitted with Nord-Lock® washers.	☐

3.4.2 Figures

Examples of unacceptable conditions of the hub assembly are shown below.

Figure 7.
Crack in hub shell (grease emanating)

Figure 8 .
Cracked pitch change slide.

Figure 9.
Galling inside hub bore from alignment bearing.

3.5 Inspect Slipring Assembly

3.5.1 Checklist

Note *Refer to Airmaster slipring assembly drawing (AR-xxx).*

STEP	ACTION	☑
1.	Inspect the slipring assembly for damage e.g. cracks, gouges, corrosion or lifted tracks. No repair is permitted besides removal of light corrosion with scotch pad.	☐
2.	Check the slipring assembly is mounted securely. For mini sliprings, gently wobble the barrel to check there is no free movement and confirm it is restrained by the nylock nut.	☐
3.	If fitted, check ring connectors are secure and there is no gap underneath.	☐
4.	Confirm the sensor magnet is embedded in the slipring (for mini sliprings, this magnet resides underneath the outboard plastic ring and can be checked with a magnetic tip).	☐
5.	Use a clean cloth to wipe any grease, oil or debris from the slipring tracks.	☐
6.	Clean slipring tracks with methylated spirits or contact cleaner.	☐

3.5.2 Figures

Examples of unacceptable conditions of the slipring assembly are shown below.

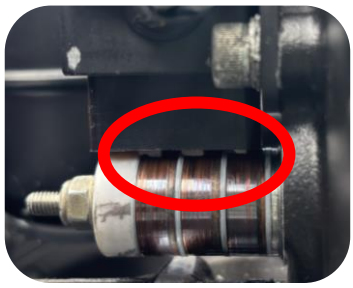


Figure 10.
Brushes off-centre with (mini) slipring tracks (close to overlap)

waiting image

Figure 11.
Damaged slipring tracks

Figure 12.
Snapped stud on standard slipring assembly

3.6 Inspect Sensor-Brush Assembly

3.6.1 Checklist

STEP	ACTION	☑
1.	Check brushes align centrally with sliprings and do not overlap. Modifications to the mounting bracket may be required. Note 0.5mm spacers are supplied with mini slipring.	☐
2.	Ensure sliprings and brushes are clean and free from oils or grease.	☐
3.	Remove the sensor-brush assembly from its mounting bracket.	☐
4.	Replace carbon brushes at prescribed service intervals: 300 hours for standard sliprings, or 600 hours for mini sliprings. Refer to procedure ***ASI-7-1-2***.	☐
5.	Inspect brushes for wear, ensuring they protrude at least 6mm from front of block.	☐
6.	Inspect brushes under good illumination for damage e.g. cracking.	☐
7.	Compress brushes through brush holder to check they travel smoothly and evenly.	☐
8.	Slide metal casing over the front of the brush block and remove plastic cover.	☐
9.	Inspect brush channels. Check for damaged/fraying brush leads, damaged springs, accumulation of carbon dust, or melted brush holder channels.	☐
10.	Gently tug each brush to check the brush lead is intact and secure.	☐
11	Use a multimeter to check there is no continuity between brushes and ground.	☐

3.6.2 Figures

Examples of unacceptable conditions of the sensor-brush assembly are shown below.

Figure 13.
Sticky brush.

Figure 14.
Damaged sensor-brush assembly cable.

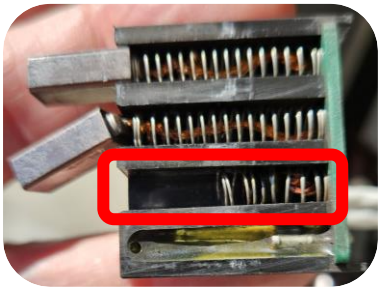


Figure 15.
Broken brush lead and stuck spring.

4. MAINTENANCE PROCEDURE

4.1 Propeller Servicing Tasks

While the propeller is partially disassembled from performing the previous inspections, perform the following servicing tasks.

STEP	ACTION	☑
1.	Wipe old grease out of propeller hub bores and blade retention assemblies using a clean, lint-free cloth.	☐
2.	Lubricate propeller hub and blade assemblies with new grease in accordance with procedure ***ASI-4-5*** (mobilgrease28 recommended).	☐
3.	Replace carbon brushes in sensor-brush assembly at prescribed service intervals (or earlier, if required) in accordance with procedure ***ASI-7-1-2***. For standard sliprings, replace brushes every 300hrs, for mini sliprings this is every 600hrs.	☐
4.	Check the Airmaster website for release of service bulletins affecting propeller and perform compliance tasks as necessary.	☐
6.	Check the Airmaster website for release of updated controller firmware version. Update controller firmware as applicable.	☐
7.	For DSD propeller models, check the Airmaster website for release of updated hub firmware version. Update hub as applicable.	☐
8.	Create an entry in the propeller logbook to record the work carried out.	☐

4.2 Propeller Reassembly

Reassemble the propeller as follows:

- Reattach sensor-brush assembly to mounting bracket in accordance with procedure ***ASI-4-8-1***. Then, remount the assembly to the engine in the reverse sequence of the removal process.
- Install blade assemblies into propeller hub in accordance with procedure ***ASI-4-6.***
- Reattach spinner cone in accordance with procedure ***ASI-4-7-1***, ensuring it is fitted properly. If required, adjust the spinner front support in accordance with procedure ***ASI-4-7-2.***

> ⓘ *Note*
> *Non-caustic soap solution may be used to wash one blade at a time. Orient the blade towards the floor, ensuring that moisture drains away from the propeller hub and avoids the blade retention components. Wipe the blades dry.*

> ⚠ ***Caution*** *Do not use high pressure or abrasive washing equipment.*

4.3 Propeller Setup Tasks

STEP	ACTION	☑
1.	Test propeller function with engine off in accordance with procedure ***ASI-5-1-1*****.** Ensure that all criteria pass.	☐
2.	Tether the aircraft securely and test propeller function with the engine running in accordance with procedure ***ASI-5-1-2*****.** Ensure that all criteria pass.	☐
3.	With the aircraft securely tethered, perform static ground tests to verify that the maximum rpm attainable for take-off is correct as follows: • Set controller to manual over-ride mode (MAN). • Gently advance engine to full power (WOT). • Drive propeller to fine pitch limit (FINE lamp illuminates green on controller) whilst monitoring engine speed (RPM). Ensure that take-off rpm can be reached and engine does not exceed permissible limits.	☐
4.	For DSD propeller systems, verify that the controller does not indicate a hub miscalibration error. This is observed as a double red flash of the FEATHER or REVERSE lamp (as applicable). If observed, recalibrate the hub in accordance with procedure ***ASI-5-4***.	☐