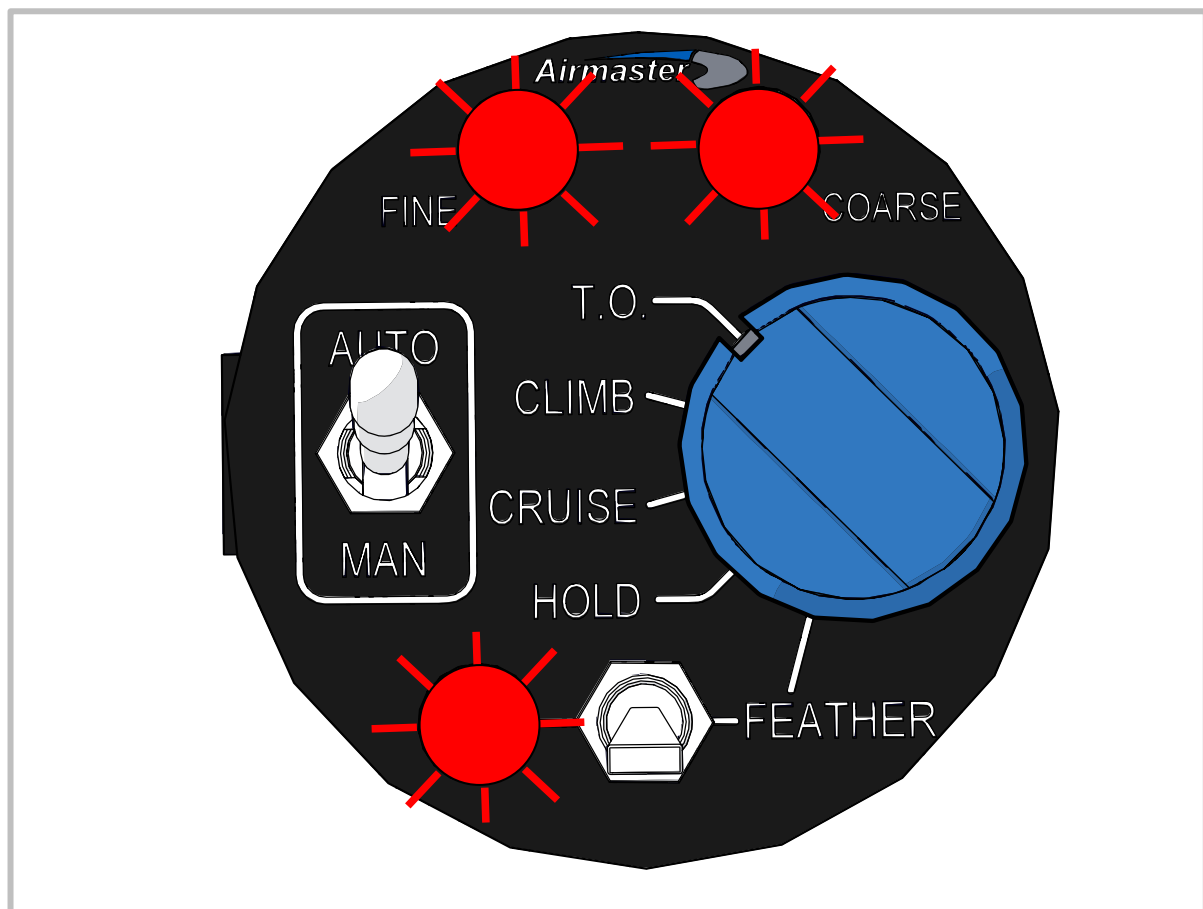


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ASI-7-3-3

TROUBLESHOOTING OPEN CIRCUIT ALARM (WITH DC MOTOR)

PROCEDURE



SUBJECT:

Troubleshooting

ASSEMBLY NO:

AP-xxx

APPLICABILITY:

All propeller models excl DSD
propeller models.

1. TOPIC

1.1 Introduction

This document covers the recommended procedure for troubleshooting an open circuit alarm for Airmaster propellers using a DC motor (not applicable for DSD propeller models). This procedure is only applicable while the open circuit condition is in effect and may be invalid for intermittent faults.

1.1.1 Symptoms

- All lamps flashing red on the controller (1Hz).
- No automatic (AUTO) or manual (MAN) operation of the propeller is possible.

1.1.2 Possible Causes

Generally, open circuits are caused by the eventual wearing of the carbon brushes acting on the propeller slipring, which have a prescribed service life. Other possible causes of an open circuit include:

- Broken or worn PC motor brush.
- Damaged electrical wiring to the propeller.
- Damaged electrical wiring within the propeller.
- Incorrectly inserted sensor-brush assembly cable or extension loom connector(s).

Operators should begin by inspecting the brushes and electrical hardware incorporated with the propeller before proceeding.

1.2 Prerequisites

Complete the following tasks before proceeding:

- Inspect all electrical looms to the propeller and wiring inside the propeller for signs of damage, corrosion, moisture ingress or loose connection.
- With power to the propeller turned off, unplug the connectors at each end of the sensor-brush assembly cable (A0120) and the extension loom (A0125-x). Check all pins are inserted properly into their receptacle and appear in good condition.

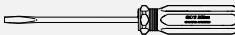
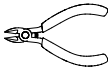
Note Refer to control system assembly drawing (AC-xxx).

- Inspect sensor-brush assembly in accordance with procedure **ASI-7-4-1**.

Note The expected service life for brushes is approximately 600hrs with a mini slipring assembly and 300hrs with a standard slipring assembly. Environmental factors also influence service life.

2. MATERIAL REQUIREMENTS

2.1 Tooling

ITEM	QTY	DESCRIPTION	IMAGE
1.	1	Digital Multimeter (with probes)	
2.	1	PH2 Screwdriver	
3.	1	Flathead Screwdriver	
4.	1	Wire Cutter	
5.	As required	12V, 21W bulb (with clip leads soldered)	

2.2 Paperwork

ITEM	QTY	CODE	DESCRIPTION
1.	1	-	Airmaster Control System Circuit Diagram
2.	1	AC-xxx	Airmaster Control System Assembly Drawing & BoM

3. PROCEDURE

3.1 Overview

This troubleshooting procedure is only applicable while the open circuit alarm is displayed on the controller (all lamps flashing red). If this indication is intermittent, the operator should attempt to recreate those conditions which instigate the alarm.

During this procedure, electrical voltage is sequentially measured across the propeller slipring, hub, and pitch change motor, while an assistant operates the manual control switch inside the cockpit to adjust propeller pitch. Propeller pitch must remain between the fine and coarse pitch limit stops at all times.

The earliest occurrence of a 0V reading signifies the offending circuit region, and further inspection or testing may be performed to diagnose the component at fault.

Note

Ensure that the propeller does not reach the fine or coarse pitch limit stops while measuring voltage (indicated by a solid green lamp on the controller), as this will produce an elusive 0V reading. The propeller must remain between these limits and should not enter the feather or beta pitch zone during the test (if applicable).

Note

Refer to the propeller's control circuit diagram throughout this procedure.

3.2 Preparation

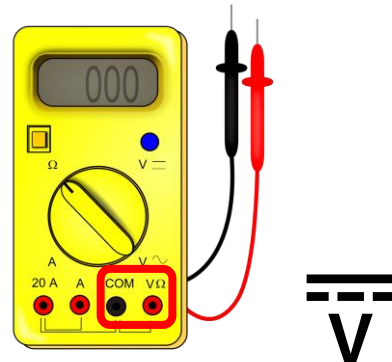
PROCEDURE

Step 1 Multimeter Setup

- Connect two probes to digital multimeter ('COM' and 'V').
- Set multi-meter to DC voltage mode.

Note

If a multimeter is unavailable, use a 21W bulb soldered with clip leads to probe across the three circuit regions, while an assistant observes the controller inside the cockpit to check when the open circuit alarm clears (and the bulb illuminates).



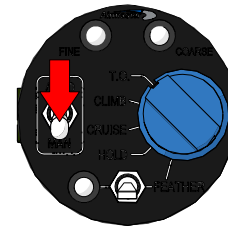
Step 2 Aircraft Setup

- Engine OFF.
- Apply power to the propeller.



Step 3 Set Controller to MAN

- Set controller to manual over-ride mode (**MAN**) for the duration of this test.



3.3 Measure Slipping Voltage

PROCEDURE

Step 1 Locate Slipping Assembly

- Locate the propeller's slipping assembly:

Standard Slipping:

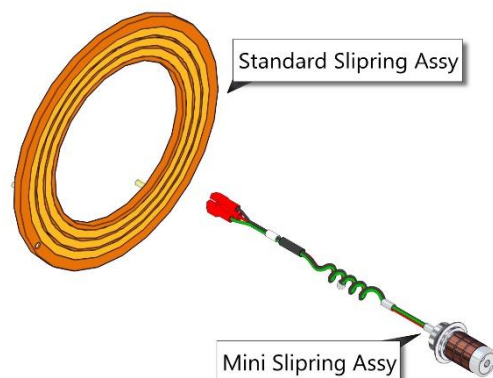
Fitted to spinner backplate or mount kit assembly (or inside starter ring gear for Lycoming engines).

Mini Slipping:

Fitted behind engine gearbox shaft.

Note

Refer to slipping assembly drawing (AR-xxx).



Step 2 Measure Slipring Voltage

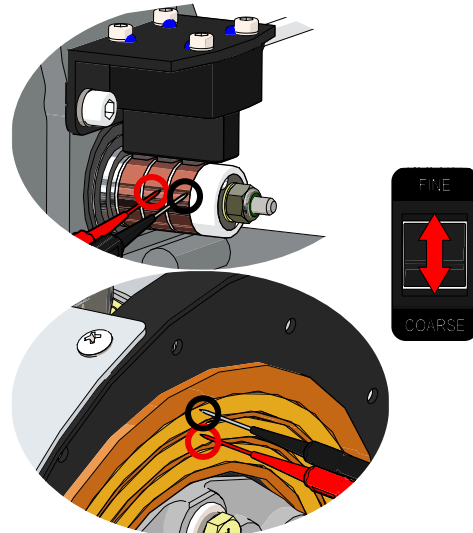
- Contact multimeter probes across the fine (outermost) and coarse (centre) sliprings.
- Operate manual control switch and check voltage across sliprings is $\pm 11\text{--}13\text{V}$.

$V_{SR} = \text{_____ V}$

Note

Top: Mini slipring assembly shown.

Bottom: Standard slipring assembly shown.



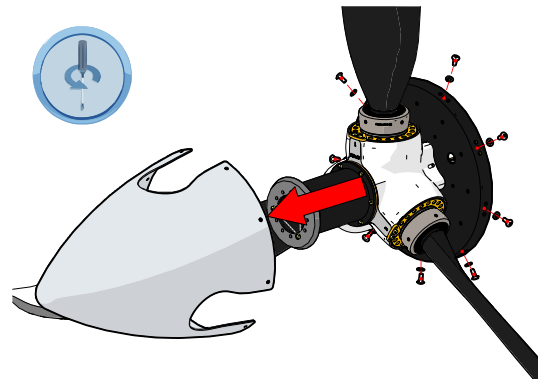
3.4 Measure Hub Voltage

PROCEDURE

Step 1 Remove Spinner Cone

- Remove spinner cone from backplate via truss-head screws.

Attention PH2 Screwdriver



Step 2 Remove Motor Cap

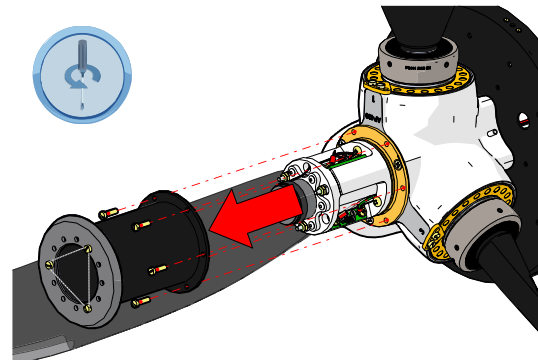
- Remove any lock-wire retaining motor cap screws.
- Remove motor cap from hub via (6) fillister-head screws.

Note

Do not remove front support from motor cap.

Attention

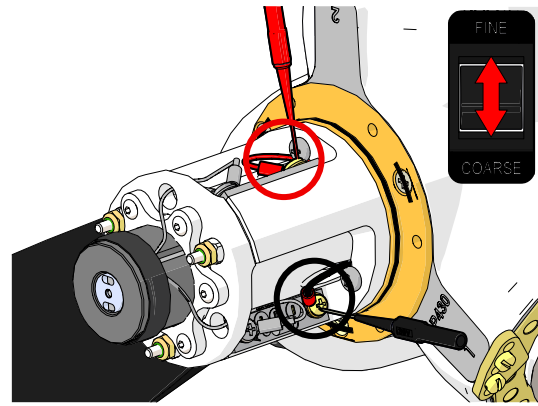
Wire Cutter, Pliers, Flathead Screwdriver



Step 3 Measure Hub Voltage

- Contact multimeter probes across the black and red hub wire terminals located at the aft end of the microswitch mount.
- Operate manual control switch and check voltage across hub wires is $\pm 11\text{--}13\text{V}$.

$V_{\text{HUB}} = \underline{\hspace{2cm}} \text{ V}$



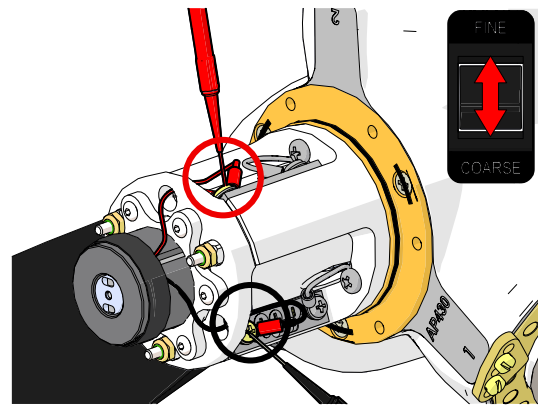
3.5 Measure PC Motor Voltage

PROCEDURE

Step 1 Measure PC Motor Voltage

- Contact multimeter probes across the black and red motor wire terminals located at the fore-end of the microswitch mount.
- Operate manual control switch and check voltage across PC motor is $\pm 11\text{--}13\text{V}$.

$V_{\text{PCM}} = \underline{\hspace{2cm}} \text{ V}$



3.6 Check PC Motor Operation (As Required)

Note Only perform this task if 11-13V was measured across PC motor terminals previously.

PROCEDURE

Step 1 Check PC Motor Operation

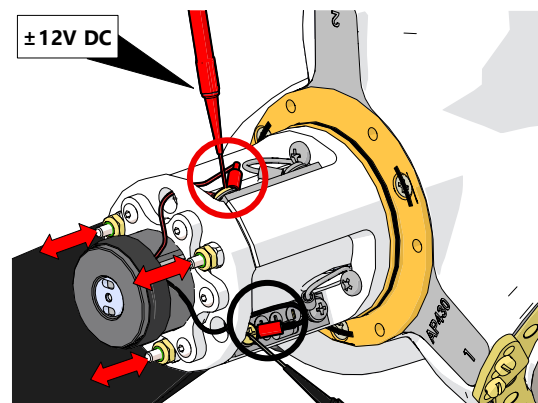
- Retrieve a 12V DC power supply (e.g. battery) with leads. Turn off power.
- Contact power leads to the black and red motor wire terminals located at the fore-end of the microswitch mount.

⚠ Caution

Do not turn on power supply until leads are contacting terminals as sparking will occur.

⚠ Caution

Do not use a power supply exceeding 12V. Follow proper safety precautions when handling.



- Briefly turn on power supply (~2 sec) and confirm that PC motor operates smoothly:

Yes | No

- Turn off power supply. Swap power leads.
- Briefly turn on power supply (~2s) and confirm that PC motor operates smoothly in the opposite direction:

Yes | No

**Caution**

The propeller's fine and coarse pitch limit stops are inactive when power is applied this way. Ensure that the pitch change mechanism does not impact the hard stops at either end of the pitch traverse range, as indicated by a laboured sound by the PC motor (if operable).
