REVISION	CHANGE	APPROVED	DATE
0	Initial release	JTS	11/06/2024
1	Published release	JTS	26/11/2025

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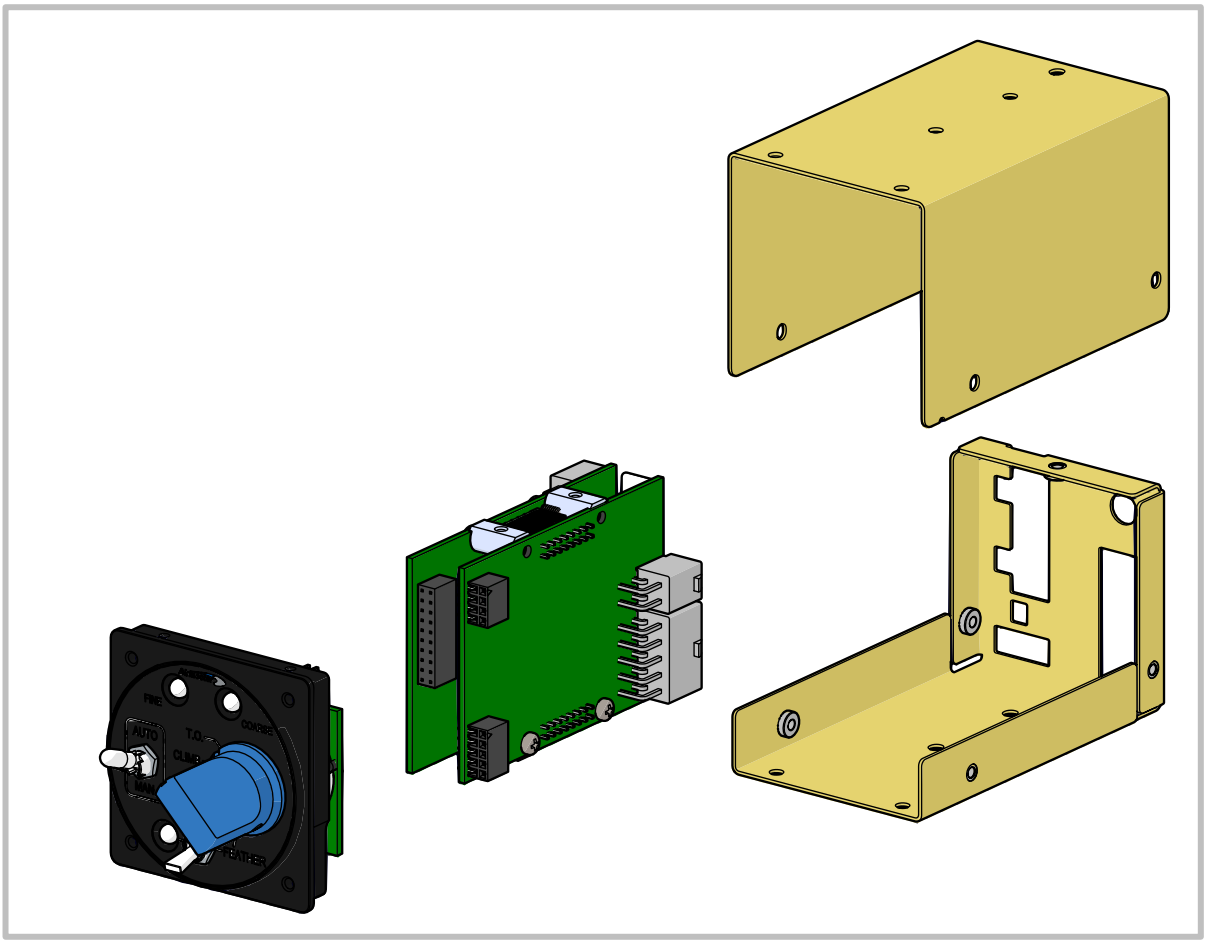
ASI-7-5-3

CONTROLLER PCB REPLACEMENT

PROCEDURE



SUBJECT:	
Repairs & Upgrades	
ASSEMBLY NO:	**APPLICABILITY:**
A0110x or A0170x	All AC200 & AC300 controllers

1. TOPIC

1.1 Introduction

This document covers the procedure for dismantling and reassembling an Airmaster 'SmartPitch' controller. This may be required for a variety of service work such as replacement of the internal controller hardware comprising of the front switch-PCB, micro-PCB, or power-PCB.

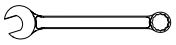
Operators should refer to the tasks within this instruction that are relevant for the intended service work. Ensure that anti-static measures are followed when handling controller hardware.

2. MATERIAL REQUIREMENTS

2.1 Parts

ITEM	QTY	PART NO.	DESCRIPTION	IMAGE
1.	1	A0110*x* or A0170*x*	AC200 or AC300 Controller	
2.	As required	A0104*x* or A0164x	AC200 or AC200 Front Switch PCB Assembly	
3.	As required	A0105(H) or A0165	AC200 or AC300 Control PCB Assembly	
4.	As required	A0106(H) or A0166	AC200 or AC300 Power PCB Assembly	

2.2 Tooling

ITEM	QTY	DESCRIPTION	IMAGE
1.	1	PH1 Screwdriver	
2.	1	Torque Screwdriver (PH1 Bit)	
3.	As Required	1/16" Hex Key	
4.	As Required	Torque Screwdriver (1/16" Hex Bit)	
5.	As Required	14mm Deep Socket Screwdriver	
6.	As Required	8mm Spanner	

2.3 Consumables

ITEM	QTY	DESCRIPTION	IMAGE
1.	As required	Loctite 222	
2.	As required	Contact Cleaner	

2.4 PPE

ITEM	QTY	DESCRIPTION	IMAGE
1.	As required	Protective Gloves	
2.	As required	Anti-Static Mat	

3. PROCEDURE

> ⚠ ***Caution***
> *The controller circuit boards (PCBs) can be damaged by static discharge. Ensure that the chosen workspace is statically protected (grounded) before dismantling the controller.*

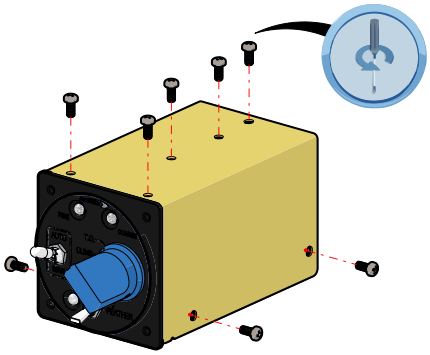
3.1 Remove Controller Front Panel

PROCEDURE

Step 1 Dismantle Upper Case

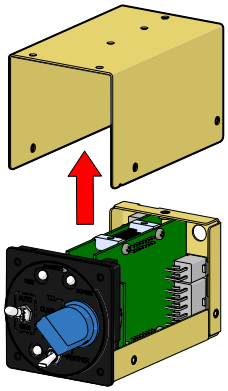
- Remove (9) 4-40 UNC screws retaining the upper casing of the controller.

> ⓘ *Attention* *PH1 Screwdriver*



Step 2 Remove Upper Case

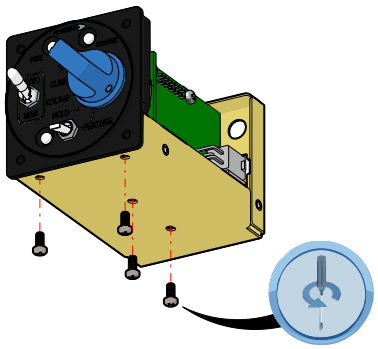
- Lift upper casing and set aside.



Step 3 Dismantle Lower Case

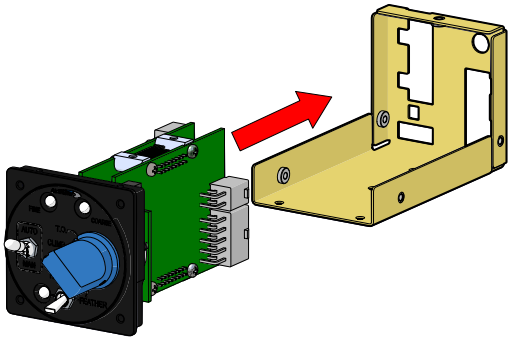
- Remove (4) screws retaining the lower casing of the controller.

> ⓘ *Attention* *PH1 Screwdriver*



Step 4 Remove Lower Case

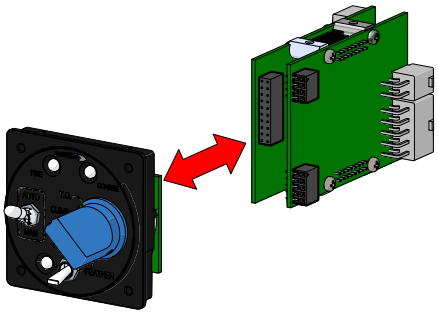
- Slide off the lower casing and set aside.



Step 5 Remove Front Panel

- Carefully remove front panel from micro/power-PCB assembly by slowly separating header pin connections in a careful, parallel motion.

> ⚠ ***Caution***
> *Do not twist or shear the parts as this may damage the connector pins.*



3.2 Remove Front-Switch PCB from Face Plate (As Required)

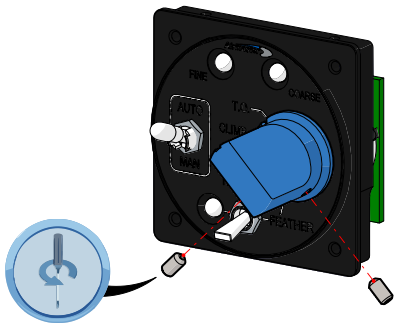
> **Note**
> *This task is only required when the front switch-PCB is replaced, and the face plate shall be reused.*

PROCEDURE

Step 1 Remove Control Knob Screws

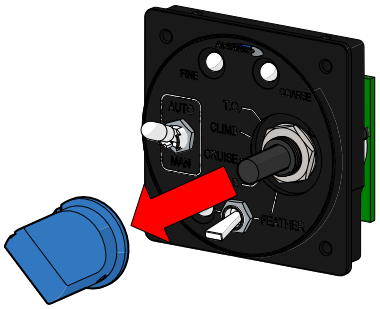
- Remove (2) 6-32 UNC setscrews retaining the blue control knob.

Attention *1/16" Hex-Key*



Step 2 Remove Control Knob

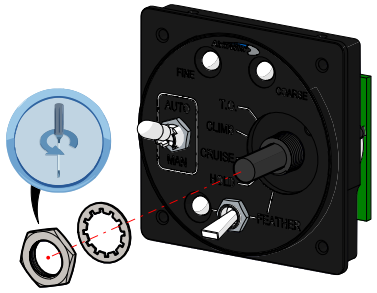
- Remove control knob from rotary switch shaft.



Step 3 Remove Rotary Switch Nut & Washer

- Remove the nut retaining the rotary switch to the face plate.
- Remove spring washer beneath nut.

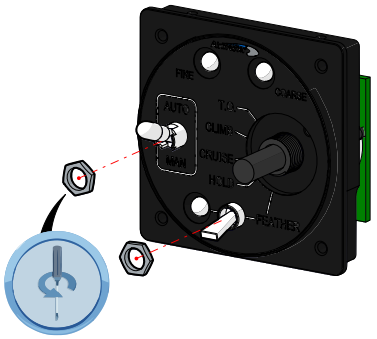
Attention *14mm Deep Socket Screwdriver*



Step 4 Remove Nuts from Toggle Switches

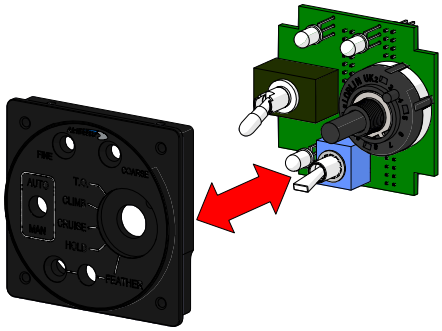
- Remove the nuts retaining (2) toggle switches to face plate.

Attention *8mm Spanner*



Step 5 Remove Front Switch-PCB

- Set latching AUTO/MAN switch to downward position (MAN).
- Gently separate face plate from front-switch PCB.



3.3 Assemble Front-Switch PCB to Face Plate (As Required)

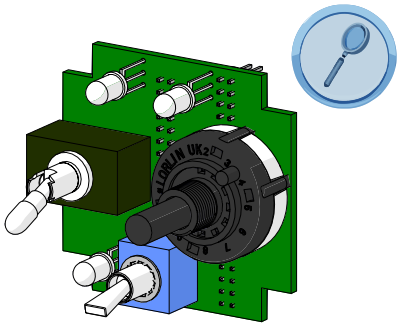
Note *This task is only required if the front switch-PCB must be reassembled to the face plate.*

PROCEDURE

Step 1 Inspect Front-Switch PCB

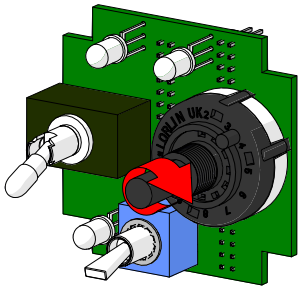
- Inspect front switch PCB and its assembled components for signs of damage or defect e.g. bent connector pins/LEDs, poor solder connection.
- If fitted, remove the tabbed locking washer from the rotary switch.

Note
A slender flathead screwdriver may be used to remove the locking washer by prying underneath the tab.



Step 2 Set Rotary Switch Position

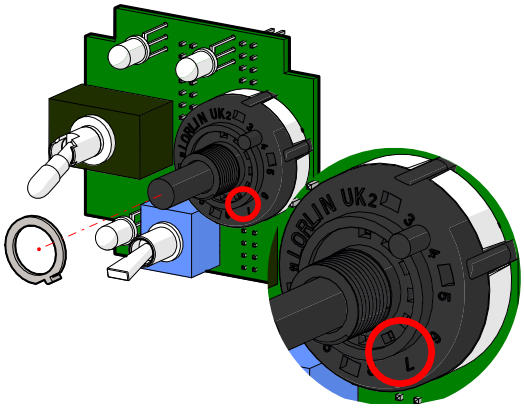
- Rotate rotary switch shaft to extreme clockwise position.



Step 3 Lock Rotary Switch Position

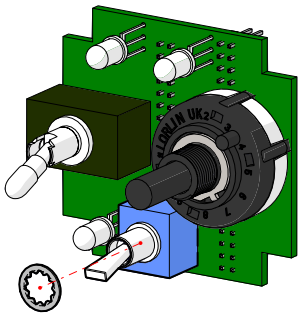
- Fit locking washer tab into hole number 7 of rotary switch.

> *Note*
> *For standard controllers (i.e. not feathering/beta option), lock the washer into position 8 instead.*



Step 4 Fit Spring washer to Lever Switch

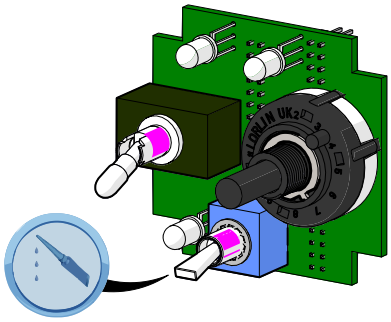
- Fit spring washer over threaded barrel of lever switch.



Step 5 Loctite Threaded Shaft of Switches

- Apply a thin stripe of Loctite 222 to the threaded barrel of the latching switch and the lever switch.

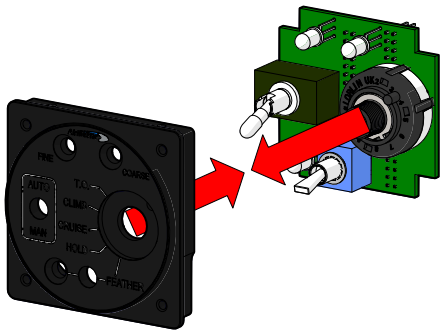
> *Attention* *Loctite 222*



Step 6 Fit Face Plate

- Check LEDs appear straight.
- Carefully fit face plate to front-switch PCB by aligning the switches and LEDs.
- Check both parts are fitted square.

> *Note*
> *Set latching switch to downward position.*

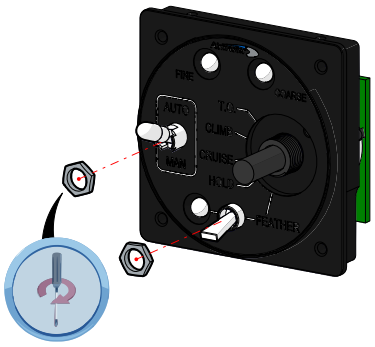


Step 7 Fit Nuts to Toggle Switches

- Fit nuts to latching and lever switches finger tight ensuring that both nuts are oriented in the same orientation.
- Wipe any excess Loctite.

> ⚠ ***Caution***
> *Do not over-tighten nuts as this may crack the face plate label.*

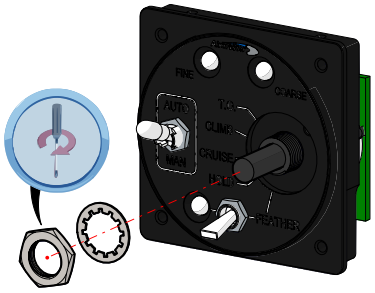
> ⓘ *Attention* *8mm Spanner*



Step 8 Fit Washer & Nut to Rotary Switch

- Fit spring washer to rotary switch shaft.
- Fit nut to rotary switch shaft.
- Torque nut to **0.5Nm**.

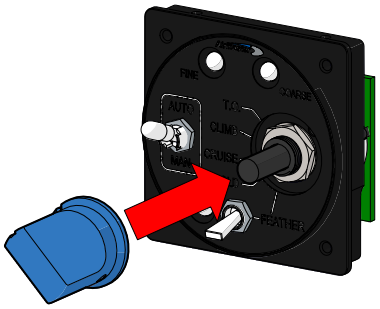
> ⓘ *Attention*
> *Torque Screwdriver (14mm Deep Socket Bit)*



Step 9 Fit Control Knob

- Fit control knob to rotary switch shaft with the pointer at the T.O. position.

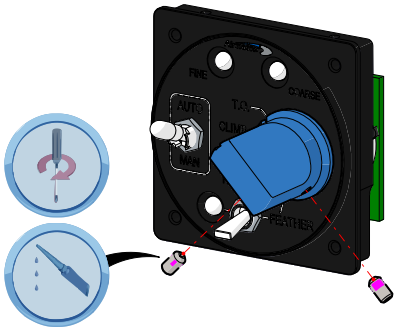
> ⓘ *Note*
> *Leave 0.5mm clearance between the knob and face plate label to prevent the label from being scratched as the knob is rotated.*



Step 10 Attach Control Knob

- Apply a thin stripe of Loctite 222 to the threads of (2) 6-32 UNC setscrews.
- Attach knob to shaft with screws.
- Torque setscrews to **0.5Nm**.

> ⓘ *Attention* *Torque Screwdriver (1/16” Hex Bit)*



3.4 Replace Micro-PCB or Power-PCB (As Required)

Note *This task is only required if either the micro-PCB or power-PCB require replacement.*

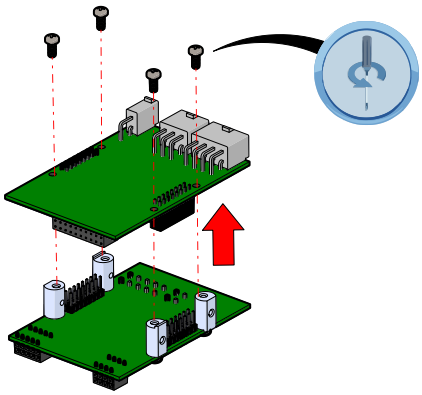
PROCEDURE

Step 1 Separate Micro & Power PCB

- Remove (4) panhead screws from the PCB to be replaced and separate the boards.

Note
Leave the four spacers attached to the PCB that shall be re-used.

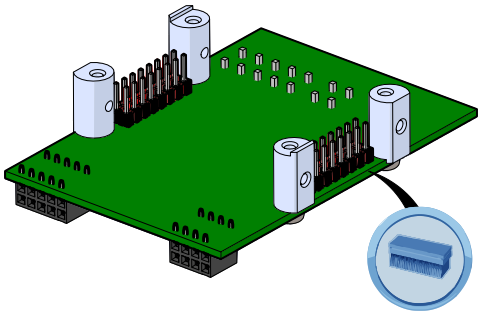
Attention *PH1 Screwdriver*



Step 2 Clean Header Pins

- Gently clean header pins of micro-PCB with contact cleaner.

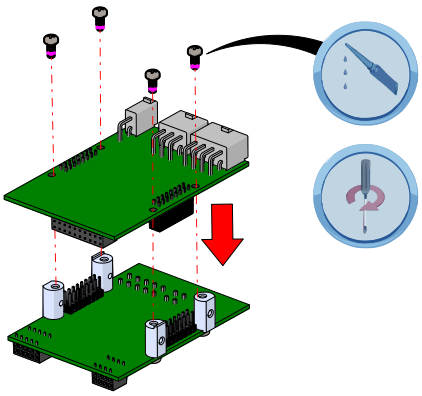
Attention *Contact Cleaner*



Step 3 Assemble New PCB

- Align and attach new PCB board via header pins.
- Apply a thin stipe of Loctite 222 to (4) panhead screws and use to attach the new PCB to the spacers.
- Torque to **0.3Nm**.

Attention *Torque Screwdriver (PH1), Loctite 222*



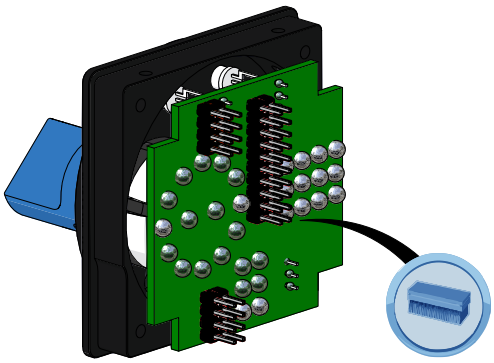
3.5 Assemble Controller

PROCEDURE

Step 1 Clean Header Pins

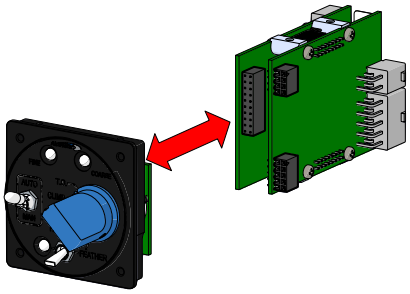
- Gently clean header pins of front-switch PCB with contact cleaner.

Attention *Contact Cleaner*



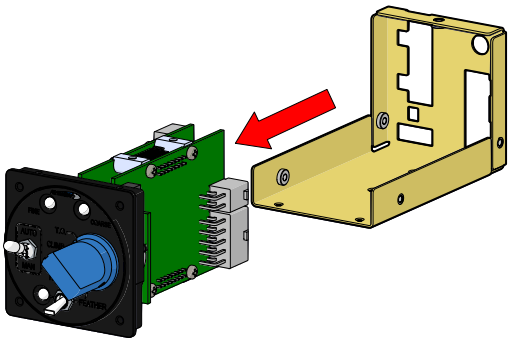
Step 2 Assemble Front Panel

- Carefully align and insert front-switch PCB header pins into the connectors of the micro/power-PCB pair.



Step 3 Fit Lower Case

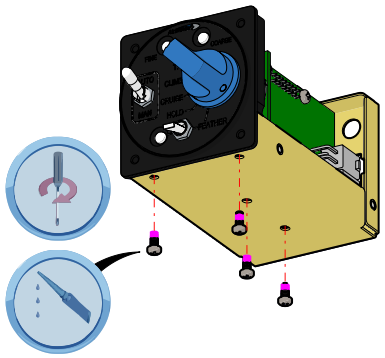
- Fit lower case to controller assembly ensuring that rear connectors align with their respective cut-outs.
- Check all screw holes align and the circuit breaker protrudes through the case.



Step 4 Attach Lower Case

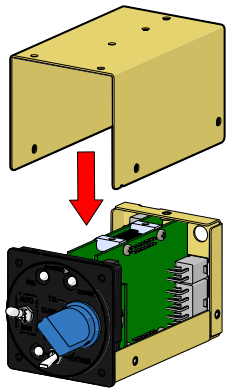
- Apply a thin stripe of Loctite 222 to the threads of (4) 4-40 UNC screws.
- Fit all screws initially to align the case square with the controller assembly.
- Torque screws to **0.3Nm**.

Attention *Torque Screwdriver (PH1), Loctite 222*



Step 5 Fit Upper Case

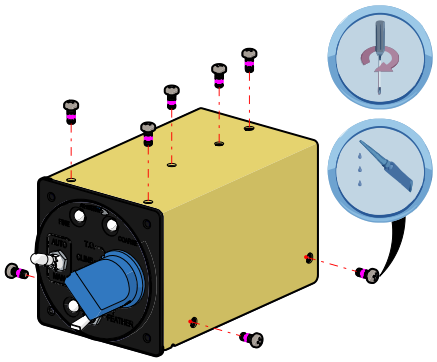
- Fit upper case to controller assembly.
- Check all holes align concentrically.



Step 6 Attach Upper Case

- Apply a thin stripe of Loctite 222 to the threads of (9) 4-40 UNC screws.
- Fit all screws by a few threads initially to align the case square with the controller assembly.
- Torque screws to **0.3Nm**.

Attention *Torque Screwdriver (PH1), Loctite 222*



3.6 Subsequent Action

Perform the following tasks once this procedure is complete:

- Reinstall controller and connect to control system.
- Test propeller function with the engine off in accordance with procedure ***ASI-5-1-1*** to verify correct function of the controller before next flight.
- Test propeller function with the engine running in accordance with procedure ***ASI-5-1-2*** to verify correct function of the controller before next flight.