



Airmaster Propellers Ltd

Variable Pitch Constant Speed Propellers for Light Aircraft

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SERVICE BULLETIN

APL-SB-10

Date of Issue: 18 December 2001

Applicability: Propeller Models: First four production AP332s
Serial Numbers: 89, 90, 92 & 100

Compliance: Initial: Before first flight, or at or before next Periodic Inspection (100 hour check).
Subsequent: Nil.

SUBJECT: UPGRADE OF PITCH CHANGE MOTOR BRUSHES AND SPRINGS (AP332)

Reason

1. The commutator brushes and springs contained within the pitch change motor of the propeller have exhibited the following characteristics in some situations:
 - a. The braided copper leads to the brushes may fail in service after a period of time on some engine types, due to the high vibration environment and the light gauge of the leads. This leads to a failure of the pitch change motor.
 - b. The brushes may lift off the motor commutator due to a centrifugal effect combined with low tension springs, when the propeller is operated at high rotational speeds. This can lead to a loss of pitch control at high rotational speeds (ie above approximately 3000rpm propeller speed).
2. An alternative brush and spring assembly has been developed incorporating a brush with a substantially more robust lead, and a spring with higher tension. This assembly may be retrofitted to the same pitch change motor, while the motor is still on the propeller hub.
3. This change has been incorporated at manufacture in all AP332 propellers other than the first four production examples.

Materials and Parts Required

4. Replacement pitch change motor brush holder assembly, including brush holder, brushes, leads and springs (shipped with this service bulletin).
5. General purpose medium strength thread-locking compound. Loctite product 'Threadlocker 243' is recommended.

Action

6. Remove spinner and spinner front support.
7. Remove the motor cap from the propeller hub.
8. Carefully inspect the layout of the motor assembly and wiring found under the motor cap. Note the routing of the wires from the motor to the connection studs at the top of the white plastic micro-switch mount.
9. Disconnect the motor wires (red and black) from the hub wiring by undoing the brass lock-nuts on the applicable connection studs.
10. Remove the motor top support from the top of the motor. This item is a white plastic part combined with a o-ring that sit on the top of the motor.
11. Remove the black plastic end-cap from the end of the motor by unscrewing the two long motor assembly screws. Take care with this component, as it is delicate.
12. Carefully note the position of the components found under the motor end-cap, particularly the paper gasket and the thrust washers on the end of the motor shaft. Put the paper gasket to one side.
13. Using a small instrument such as tweezers, pull the existing brushes from between the springs and commutator. Remove the brushes and their leads, and the springs from the brush holder. Then lift out the brush holder (black plastic component).
14. Take replacement brush holder assembly and fit to motor in same location as original. Note orientation of brush holder; lug on brush holder matches notch on motor body, and red wire protrudes from this same side.
15. Using tweezers, pull back spring, and position brush against commutator and in slot of new brush holder. Note the correct orientation; the brush should be positioned so that the lead exits the brush at the side furthest from the propeller hub, and the end of the spring should lie in the slot at the rear of the brush.
16. Ensure that the wires, brushes and springs are all positioned well, and do not protrude above the plastic brush holder. Push parts down into cavities provided if required.

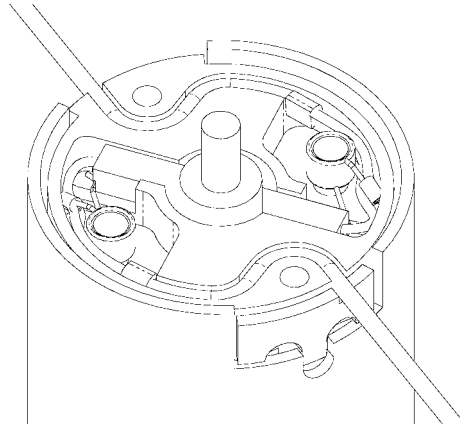


Figure 1 - Illustration of Replacement Brush Holder Assembly, with leads, brushes and springs positioned correctly

17. Take black plastic motor end-cap that was previously removed from the motor. Modify this component by removing the protruding semi-circular lugs on the inner surface of the end-cap that previously mated with the spring posts of the old brush holder. This may be done by carefully cutting, sanding, grinding or filing away the lugs. If possible avoid removing the small lug at one side of the end-cap that corresponds to the positive lead of the motor.
18. Replace the paper gasket in the same position. Ensure that the thrust washers on the end of the motor shaft are in the same position as previously.
19. Replace the motor end-cap (now modified as above). Note orientation; the positive marking and corresponding lug goes on the side of the red lead. Install the two long motor assembly screws with thread-locking compound. Only tighten these screws gently, as the motor end-cap is delicate and prone to cracking if these screws are over-tightened.
20. Reconnect the motor wires to the hub wiring in the same manner to previously. Ensure that the wire terminals are aligned so that the wires do not interfere with the operation of the pitch feedback rods. Ensure that the brass lock-nuts are firmly tightened ensuring a good connection.
21. Using the manual mode of the control system, operate the pitch change motor and pitch change mechanism in both directions through the full range of movement. Ensure that the motor operates correctly, and at a normal pitch change rate, without producing a laboured sound from the motor. Ensure that the pitch change mechanism operates in the correct sense or direction.
22. As the mechanism is moved through the pitch range during the previous step, observe the movement of the three pitch feedback rods. Ensure that they are not obstructed.
23. Refit the motor top-support and o-ring as previously.
24. Refit the motor cap to the propeller hub with the six screws. Lock the six screws with 0.024" lock-wire (assuming propeller pitch stops have been set previously).
25. Refit spinner front support and spinner.

Recording

26. Record completion of service bulletin APL-SB-10 in propeller logbook.