

Propeller - Maintenance Practices

(f) Using a dial indicator of the type used by machinists, check the runout of the low pitch stop collar. The total runout should not exceed 0.010 inch. In the event of excessive runout, adjust the three remaining B3002-2 rods and jam nuts as required to obtain the specified runout.

(g) Torque the three remaining jam nuts to 12 foot-pounds.

Note: In the event that the black colored jam nut (coated with Loctite) becomes loose by accident or mistake, it can be repositioned at the exact point on the rod by measuring the distance between the outer surface of the low pitch stop collar (brass ring) and the outer surface of the propeller flange (Ref. Figure 203). The distance must be 1.88 inch.

(h) Torque the nut on the front of each B3002-2 rod to 12 foot-pounds.

(4) Pull the low pitch stop collar fully forward with beta system puller (P/N CST2987) or the feedback ring puller (P/N TK1573-918-1) (Ref. Figure 202).

(5) Install new prop shim between propeller and engine shaft as per P&WC S.B. 13116R2.

(6) Install the propeller on the engine by inserting the two mounting studs on the propeller into the mounting holes on the drive shaft of the engine.

(7) Coat the entire shaft of the eight propeller mounting bolts, threaded and unthreaded section, and the washer with antiseize thread compound, graphite petrolatum (76, Table 1, Chapter 91-00-00).

(8) Install the eight propeller mounting bolts and washers, with the chamfered edge of the washer toward the bolt head, through the engine mount flange into the propeller mount flange.

(9) Using a torque adapter (26 or 27, Table 7, Chapter 91-00-00) torque all bolts to 40 foot-pounds and then to 80 foot-pounds following torque sequence A (Ref. Figure 201).

(10) Final torque all bolts to 100 to 105 foot-pounds following torque sequence B (Ref. Figure 201). After final torque, lockwire (178, Table 1, Chapter 91-00-00) all mounting bolts (Ref. Chapter 20-07-00, LOCKWIRE).

Caution: The torque on the bolts shall not exceed 105 foot-pounds.

(11) Remove the feedback ring puller and connect the propeller reversing lever to the propeller control linkage.

Caution: With the carbon brush block held against the low pitch stop collar, check the clearance between the low pitch stop collar and the metal retaining clip of the carbon block. If at any point this clearance is 0.005 inch or less, replace the carbon block to prevent damage to the low pitch stop collar by the retaining clip. Give clearance between carbon brush block and brass ring wall at the nearest point.

(12) Install the deicer brush block assembly (Ref. Chapter 30-60-00, PROPELLER DEICER BRUSH REPLACEMENT).

(13) Check the propeller reversing linkage on the front end of the engine for proper rigging.

(14) Position spinner dome and install the screws and fiber washers around the circumference.

(15) Install lower forward engine cowling (Ref. Chapter 71-10-00, COWLING INSTALLATION).

(16) Perform the necessary engine run up checks as outlined in the applicable Pilot's Operating Handbook.

(17) Install upper forward engine cowling (Ref. Chapter 71-10-00, COWLING INSTALLATION).

D. Inspection

Check propellers for condition, and attachment; check condition of mechanical feedback ring and stop rods and springs; check reversing linkage for evidence of binding and security of attachment; check the valve and plumbing

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the input lever on the input lever shaft.

- (17) Once the amount of dead-band travel has been properly set, the dead-band travel can be repositioned between ground fine and idle by adjusting the serrated washer on the upper fuel control arm (Ref. [Figure 206](#)). A movement of one serration will result in a 0.6° change in the position of the input arm. Fine adjustments of the position of the dead band may be made by adjusting the length of the interconnect rod.

Note: If it is impossible to position the dead band between idle and ground fine, it is permissible to widen the dead band by an amount not to exceed 1° forward of the idle detent or 1° aft of the ground fine detent.

Caution: Once the beta cable is connected to the cambox lever, no further attempts to place the power levers in reverse should be made unless the engine is running.

- (18) Connect the beta cable to the cambox cam in the second hole from the top.

Note: When lengthening the beta cable by adjusting the rod ends, leave at least one thread visible inside the inspection hole.

- (19) The beta cable should be adjusted at either the forward or aft rod ends so that the flat surface of the clevis on the beta valve plunger is flush with the forward surface of the conical cap nut on the propeller governor beta valve. This adjustment should be made with the propeller solenoids de-energized (Ref. [Figure 207](#)).

- (20) Adjust the airbleed link (lost motion link) until a 0.1-inch gap between the upper and lower halves is apparent.

Note: Three complete turns of either upper or lower end adjustment of the airbleed link is equivalent to 0.1-inch.

6. CONDITION LEVERS

A. Rigging

- (1) Place the condition lever in the LOW IDLE detent.
- (2) Install a rig pin through the rig pin hole in the lever stop assembly on the left side of the fuel control lever (Ref. [Figure 206](#)).
- (3) Adjust the condition lever cable end or the input lever position as necessary and connect the cable to the fuel lever stop assembly.
- (4) Remove the rig pin from the fuel lever stop assembly.

7. PROPELLER LEVERS

A. Rigging

- (1) Place the propeller lever in FEATHER.
- (2) Adjust the cable end so that the feather dump valve plunger is fully compressed and bottomed-out when the cable is connected to the speed adjusting lever on the propeller governor (Ref. [Figure 207](#)).
- (3) Check that the bolt connecting the cable to the governor lever does not strike the governor body.

8. PROPELLER GROUND-FINE SOLENOID

A. Rigging

Warning: Misadjustment of the beta valve can cause unplanned feathering of the propeller. Resulting in a possible hazard to airplane operation and overtorque damage to the engine (Ref. [Figure](#)

208).

- (1) Install the solenoid in the supporting bracket with the aft surface of the solenoid flush with the aft portion of the support bracket.
- (2) Connect the solenoid arm to the propeller reversing lever (Ref. [Figure 207](#)).
- (3) Position the solenoid bracket on the beta cable housing so that the distance between the forward surface of the solenoid and the center of the clevis pin through the end of the solenoid plunger is 0.5-inch.
- (4) Assure that all hardware is tight and that the safety wires are installed at the beta cable end as appropriate.

9. GROUND-FINE

A. Check

- (1) Ground fine check shall be done with full fuel (for UA and UB series airplanes) or full mains (for UC series) with the airplane setting on a flat surface. If any wind exists, the check shall be done in a crosswind condition.

Caution: To avoid overheating the cabin windows, do not run the engines in the feathered position while in a quartering to crosswind condition.
- (2) Check that N_1 remains at idle N_1 setting and N_2 increases slightly, indicating that the propeller pitch has shifted to a lower setting (N_1 should not begin to increase until power levers are lifted and moved aft of the ground fine stop). Advance power levers forward, then pull back to ground idle position.
- (3) Without brakes, advance the condition levers from low idle to high idle. Check that N_2 increases and that the airplane does not move forward or backwards.
- (4) If the airplane has forward movement, reposition the beta cable on the cambox to the next higher hole (Ref. [Figure 205](#)). Adjust the clevis on the aft end of the beta cable so that previous settings are not changed. If the beta cable is in the top hole, no further adjustments are possible. If an adjustment is made, return to Step (2).
- (5) If the airplane has movement aft and the beta cable has just been moved up one hole, no more adjustments are possible and the clevis shall be positioned to the previous hole down. If the airplane has aft movement and the clevis is in the bottom hole, return to the ground fine rigging and power lever rigging position and recheck. If an adjustment has been made, return to Step (2).

10. ENGINE FINAL ADJUSTMENTS

Prior to beginning any final adjustment procedures to the engine controls, a ground performance check must be performed. The ground performance work sheet should be used to record engine performance data. Refer to [Table 201](#). The worksheet may be retained following final engine controls adjustments for the purpose of documentation of proper engine performance and controls rigging.

Warning: Never make adjustments or perform any of these maintenance procedures while the engine is running.

A. Ground Performance Check Procedure

When performing this procedure, it should be noted that at least two of the performance parameters will be outside the expected limits when a fault is in the engine. If only one performance parameter is suspect, it can be assumed that the problem is in the indicating system for that parameter and a check of that system must be performed.

- (1) Install the Bauer Howden Inc. max N_1 shim tool (WT107901) on the condition lever shaft stop tab so the LH side of the tool is flush with the LH side of the stop tab (Ref. [Figure 206](#)).