PROPELLER CONTROL - MAINTENANCE PRACTICES

1. General

A. A propeller governor is furnished with the engine for use with either Hartzell or McCauley propeller.

2. Description and Operation

A. The propeller governor combines the function of a normal propeller governor, a beta (reversing) valve, and a power turbine governor. The governor, mounted on the top front of the engine, provides connection for propeller control cable. A beta valve, mounted to the propeller governor, is connected to fuel control unit by adjustable linkage. The beta valve is utilized to reverse pitch angle of propeller blades in order to provide reverse thrust.

B. A propeller overspeed governor is mounted on the left side of the engine reduction gearbox and prevents propeller overspeed if the primary propeller governor fails. The overspeed governor regulates the flow of oil to the propeller pitch change mechanism with a fly weight and speeder spring arrangement similar to that of primary governor. The overspeed unit governs at 104 percent N_g speed (approximately 1976 RPM) for Governor A210507, and 106 percent N_g speed (approximately 2014) for Governor D210507. Since it has no mechanical controls, the overspeed governor has a testing solenoid that resets the governor below its normal overspeed setting for ground test. The overspeed test switch is on left side of instrument panel.

3. Propeller Governor Removal/Installation

A. Remove Propeller Governor.

(1) Remove right nose cap.

(2) Disconnect propeller reversing lever from beta control valve clevis. Refer to Pratt & Whitney Engine Maintenance Manual for propeller reversing lever connection instructions.

(3) Disconnect propeller governor interconnect rod from propeller governor air bleed link.

(4) Remove propeller air pressure tube (P_y) line at propeller governor.

(5) Disconnect propeller control linkage from propeller speed-adjusting lever on governor.

(6) Remove four self-locking nuts and plain washers securing propeller governor to engine reduction gearbox, and withdraw governor and gasket from mounting pad.

B. Install Propeller Governor.

(1) Install new gasket, with raised side of gasket facing upward, over studs on propeller governor mounting pad, located on reduction gearbox.

CAUTION: Make sure the drive splines of the governor are correctly engaged by verifying that the flange of the governor rests on the gasket squarely with no gap. Rotate the propeller to assist engagement, if necessary.

(2) Install propeller governor over studs, onto gasket.

(a) Secure with four washers and self-locking nuts.

(b) Torque nuts to 125 to 135 inch-pounds (14.12 to 15.25 N.m).

(3) Connect beta control valve clevis to propeller reversing lever with clevis pin and secure with washers and cotter pin. Refer to Pratt & Whitney Engine Maintenance Manual for propeller reversing lever connection instructions.

(4) Connect propeller governor interconnect rod to propeller governor air bleed link.

(5) Connect propeller control linkage to propeller speed adjusting lever on propeller governor.

(a) Connect propeller air pressure line (P_y) to the propeller governor.

(6) Install right nose cap.

(7) On airplanes with PT6A-140 engines, complete an Engine Performance Check. Refer to Chapter 71-00-05, Power Plant (PT6A-140) - Adjustment/Test, Engine Performance Check.

4. Propeller Overspeed Governor Removal/Installation

A. Remove Propeller Overspeed Governor (Refer to Figure 201).

(1) Disengage PROP O-SPD TEST circuit breaker.

(2) Open left upper cowling door to gain access.

(3) Remove safety wire and disconnect electrical connector from overspeed governor reset test solenoid.

(4) Remove self-locking nuts and washers securing overspeed governor to engine reduction gearbox mounting pad and remove governor. Discard gasket.

B. Installation of Propeller Overspeed Governor (Refer to Figure 201).

(1) Wipe engine mounting pad clean and place new gasket over engine mounting pad studs.

CAUTION: Do not use sealing compounds of any kind on gasket.

(2) Install overspeed governor on studs, engaging splines on governor drive shaft of engine.

CAUTION: Do not install the overspeed governor on studs with a force-fit.

(3) Install the washers and self-locking nuts that attach the overspeed governor to the engine mounting pad.

(a) For airplanes with the PT6A-114/PT6A-114A engine installed torque the nuts to 20 foot-pounds.

(b) For airplanes with the PT6A-140 engine installed torque the nuts between 14.16 foot-pounds and 15.83 foot-pounds.

(4) Connect the electrical connector to the governor reset test solenoid and safety wire the connector.

(5) Close left upper cowling door.

(6) Reset PROP O-SPD TEST circuit breaker.

5. Propeller Overspeed Governor Functional Check

A. Do a Propeller Overspeed Governor Functional Check.

(1) Start engine in accordance with Pilot's Operating Handbook and Approved Airplane Flight Manual.

(2) Advance propeller control lever to MAX.

(3) Position power lever below 1500 RPM.

(4) Press and hold propeller overspeed governor test switch, located on left side of instrument panel.

NOTE: The A210507 Governor effectivity is for Airplanes 20800001 thru 20800136 and 208B0001 thru 208B0105. The D210507 Governor effectivity is for airplanes 20800137 and On, and 208B0106 and On.

(5) Move the power lever setting and make sure that the propeller RPM becomes stable at 1750 RPM, +20 or -20 RPM for Governor A210507, and 1785 RPM, +20 or -20 RPM for Governor D210507.

(6) Observe ITT and the torque limits.

(a) Make sure the torque limits do not become more than 800 ft lbs.

(7) Make sure the propeller RPM (N_p) does not increase more than 1770 RPM for Governor A210507, and 1805 RPM for Governor D210507.

(8) Reduce power lever setting to 1500 RPM.

(9) Release overspeed governor test switch to normal.

Figure 201 : Sheet 1 : Propeller Overspeed Governor Installation