

## PILOT OPERATING INSTRUCTIONS

### Hartzell Hydro-Selective Propeller (Reversible) Model HC-12X20-2

The Hartzell Hydro-Selective Propeller operates with engine oil pressure to reduce pitch as well as reverse pitch, and centrifugal force created by counterweights to increase pitch and also to return from reverse pitch position. Two controls are furnished: one to actuate the pitch for the flight range, and the other to reverse the pitch when on the ground or water.

Flight Control: A servo valve regulates the oil flow to provide any desired pitch setting within limits. The pilot regulates the valve with a push-pull control, in the same manner that he regulates the throttle. He pushes the control In to Increase RPM and pulls it Out to Decrease RPM. The blade pitch follows the control almost instantly and precisely; the rpm will reflect this movement immediately.

Warm Up: During Warm-up the pitch control should be In. Set RPM at 1500-2000 with the throttle and check pitch change once or twice. This will fill cylinder with warm oil. Check RPM on run-up with control In. This should be approximately 2350. Adjust control if necessary. Check to see that Reverse control is locked.

Take-Off: No pitch control is necessary. The RPM will increase to the desired climbing value by the time the airplane leaves the ground or water; viz 2500-2550.

Climb: If RPM exceeds the limit allowed it may be decreased by pulling back on the pitch control until the desired value is reached.

Cruise: Pull pitch control out to cruise position. If manifold pressure gage is available the RPM and manifold pressure can be correlated with pitch control and throttle as desired.

Landing: Push control in before landing in order to be in a position to take-off again if necessary. Taxi in low pitch.

Reverse Pitch: Before attempting to reverse the pitch the rpm must be reduced to 1200 rpm or less. Generally, the lower the rpm the less is the time for the pitch to go completely into reverse, depending on the oil pressure available at idling speeds.

Unscrew and Push Up the reversing control and slowly push towards the rear. DO NOT FORCE. The pilot can feel the control yield to his pressure indicating that the pitch is changing. When the control is all the way back the pitch is in reverse and the pilot can then apply throttle. UNDER NO CONDITION SHOULD ONE OPEN THE THROTTLE WHILE THE REVERSE CONTROL IS IN AN INTERMEDIATE POSITION. IF there is any doubt about whether the pitch is completely in reverse, open the throttle slowly to avoid the possibility of the engine racing. Never let engine exceed 1750 in Reverse.

IN order to come out of reverse the rpm should be set for at least 1200. The higher the rpm without exceeding the limitation of approximately 1750 the faster the pitch changes.

Apply forward pressure to the reverse control until it slips into the lock position. LOCK. Any momentary rpm increase up to the limitation of the engine is not to be a cause of concern as some speed up is inevitable when the pitch goes through zero.