



Cutaway of -2 Series Constant Speed, Feathering Propeller (HC-)(Y)-2
Figure 2-2

B. Constant Speed, Feathering Propellers ()HC-()Y(-)-2

- (1) Refer to Figure 2-2. The -2 Series propellers are constant speed propellers that use an air charge, spring, and counterweights (if installed) to move the blades to high pitch/feather position. Blade centrifugal twisting moment acts to move the blades to low pitch, but the air charge, spring, and counterweights overcome this force. Oil pressure against a propeller mounted hydraulic piston opposes the counterweight, spring, and air charge forces to move the blades to low blade angle (low pitch).
- (2) The action of the air charge, spring, and counterweights tends to move the blades to a higher blade angle (high pitch), reducing engine RPM. Oil pressure toward low pitch increases engine RPM.
- (3) If oil pressure is lost during operation, the propeller will feather. Feathering occurs because the air charge, spring, and blade counterweights are no longer opposed by hydraulic oil pressure. The air charge, spring and blade counterweights are then free to increase blade pitch to the feathering (high pitch) stop.
- (4) Normal in-flight feathering of these propellers is accomplished when the pilot retards the propeller pitch control past the feather detent. This allows control oil to drain from the cylinder and return to the engine sump. The engine can then be shut down.
- (5) Normal in-flight unfeathering is accomplished when the pilot positions the propeller pitch control into the normal flight (governing) range and an engine restart is attempted.
- (6) Some aircraft are equipped with a hydraulic accumulator, which stores a supply of oil under pressure. This oil supply is released to unfeather the propeller during an in-flight engine restart. Pressurized oil is directed to the propeller, resulting in blade angle decrease. The propeller begins to windmill, and engine restart is possible.

- I (7) When the engine is stopped on the ground, it is undesirable to feather the propeller, as the high blade angle inhibits engine starting. To prevent feathering during normal engine shutdown on the ground, the propeller incorporates spring energized latches. If propeller rotation is approximately 800 RPM or above, the latches are disengaged by centrifugal force acting on the latches to compress the springs. When RPM drops below 800 RPM (and blade angle is typically within 7 degrees of the low pitch stop), the springs overcome the latch weight centrifugal force and move the latches to engage the high pitch stops, preventing blade angle movement to feather during normal engine shutdown.