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INTRODUCTION

The Douglas DC-3 is equipped with full feathering Hamilton Standard Hydromatic 3-blade constant speed propellers. This chapter provides a general overview of the DC-3 Propeller System as well as normal operations and limitations.

GENERAL

PROPELLER GOVERNOR

The propeller governor is mounted on the engine nose case and uses oil from the bottom of the engine oil tank to control engine speed from 1200 to 2700 RPM. Levers installed on the left side of the control pedestal operate cables which adjust the governor to the desired RPM.

A balance spring in the governor system will stabilize the engine at approximately 2050 RPM if the control cable or governor pulley shaft fails. The prop governor has a governing range of 18 to 23 degrees, with high pitch (feathered) set at 88 degrees.

FEATHERING SYSTEM

Feathering Controls

Two red buttons are mounted on the overhead panel for operating the respective propeller feathering systems. These buttons are spring-loaded to the OFF position. When pushed in, they are held by a solenoid and the propeller feathering pump for that respective engine is activated. When released by the solenoid or manually pulled out, the propeller feathering pump is deactivated.

When the propeller feathering system is activated, normal pressure to the propeller governor is removed and oil pressure to the feathering mechanism is applied. Once the propeller is fully feathered, pressure in the feathering system begins to increase.

When the feathering system pressure reaches approximately 460 psi during automatic operation, a pressure-sensing switch activates a circuit to release the propeller feathering button solenoid. When the solenoid is released, the spring-loaded propeller feathering button snaps back to the OFF position and the propeller feathering pump is deactivated.

If the feather button fails to snap out after the propeller is feathered, the button may be manually pulled to the OFF position. This will prevent the propeller from attempting to unfeather.

To unfeather a propeller on an engine that is not rotating, the button must be pushed in and held until sufficient RPM is achieved and the engine begins to run on its own power.

Feathering Pump

The propeller feathering pumps are 24 VDC 3 HP electric pumps capable of producing 1200 PSI. They are located in the landing gear wheel well of each engine.

The propeller feathering pump uses oil from the bottom of its respective engine oil tank to feather the propeller. The oil tank is designed to reserve 2.8 gallons of oil for the feather pump in the event of an engine oil system leak.

The propeller feathering pump has a maximum duty cycle of 60 seconds and has no circuit protection.

OPERATION

PROPELLER GOVERNOR CONTROLS

Set propeller controls for the desired operating RPM.

WARNING

A propeller may become uncontrollable and overspeed if the Oil & Hydraulic Shutoff Valve Handle is turned OFF before the propeller is feathered.

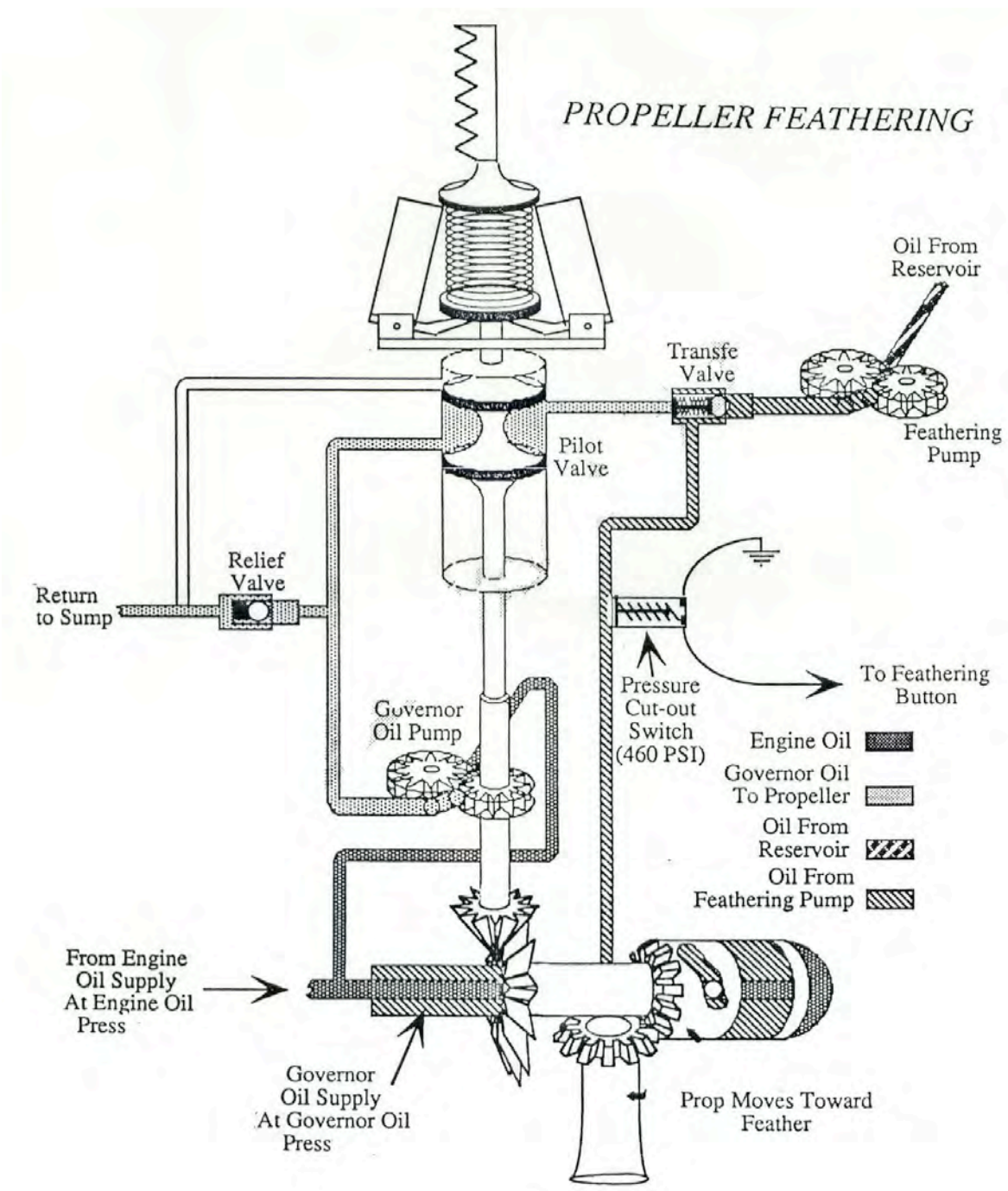
WARNING

If engine oil pressure is lost, the propeller governors will have no oil supply and the propeller will overspeed. Immediately reduce power, reduce airspeed, and feather the propeller.

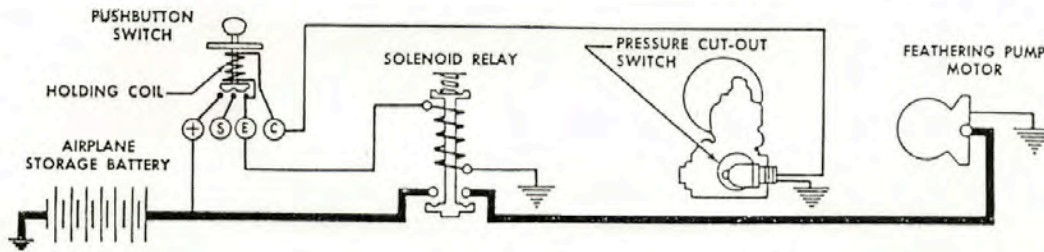
LIMITATIONS

Propeller governing range 1200 – 2700 RPM

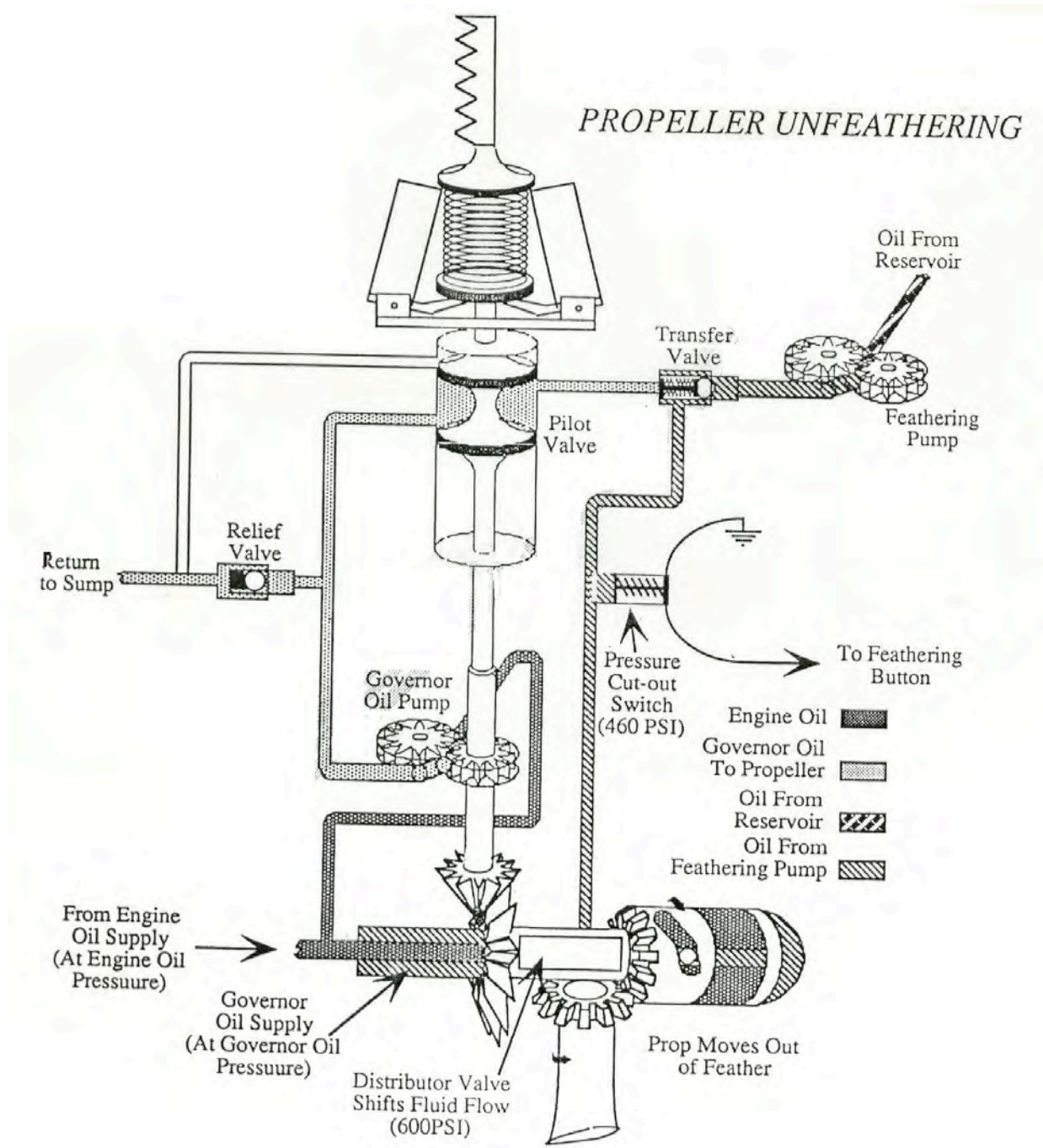
Avoid continuous engine operation between:
 1300 – 1700 RPM
 1900 – 2050 RPM



Propeller Feathering System Diagram



Feather System Electrical Schematic



Propeller Unfeathering Diagram

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