Special Flight Conditions

Full Fuselage Tank

Special care must be taken with the control stick when the fuselage tank contains more than 25 gallons of gas. In such cases, the flying characteristics of the aircraft change considerably – increasingly so as the amount of fuel in the tank is increased. When carrying more than 40 gallons of fuel in the fuselage tank, it's necessary to avoid any high performance maneuvers. The fuel weight shifts the CG back, making the aircraft highly unstable during maneuvering.

Reversibility

With the fuselage tank full, the CG of the aircraft moves back so far that it is nearly impossible to trim for hands-off level flight. Also, as soon as a sharp pull or turn is attempted, the stick forces reverse due to the effects of high G on an aft-positioned CG airframe. For example, once the G is loaded into a turn, the aircraft will naturally tighten the pull and may require pushing *forward* on the stick to balance. Similarly, when recovering from a dive with an aft-positioned CG, the aircraft tends to recover too sharply and may require changing from pulling the stick back to pushing it *forward* to maintain a desirable pullout rate.

The tendency for the CG to affect stick forces to the point of reversing them is called Reversibility. In the P-51, this effect can be expected when the fuselage tank is loaded with a significant quantity of fuel. Reversibility is reduced rapidly as the fuel quantity in the fuselage tank drops to half and below. Additionally, the P-51D features a bobweight added to the elevator control system bellcrank. This weight reduces the amount of forward pressure required to overcome reversibility tendencies.

Drop Tanks

When equipped with drop tanks, only normal flight attitudes are permitted. Only normal climbing turns and descents should be performed when carrying drop tanks.

Low Level Flight

When flying at extremely low altitudes, the aircraft should be trimmed slightly tail-heavy to avoid dropping the nose toward the ground in case the pilot's attention is momentarily taken away from aircraft control.

High Altitude Flight Characteristics

The P-51D's 2-stage, 2-speed supercharger provides plentiful power up to well above 35,000 feet. As a general rule, the greater the altitude, the greater the control movement required to achieve the same response.

The supercharger blower will automatically shift into high speed at between 14,500 and 19,500 feet. This change will be accompanied by a momentary surge in power and increase in manifold pressure, until the manifold pressure regulator catches up. There is no noticeable effect when the supercharger