STAYING ALIVE: Briefing for P-51 Instructors

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MANUAL AND ADDITIONAL INFORMATION COURTESY BRUCE LOCKWOOD

As orders for the Allison-powered Mustangs began to flow into North American, factory space was at a premium and much of the final finishing work was completed outdoors, taking advantage of the Southern California weather. As the author notes, the initial design had a combat weight of 8000-lbs and was good for an ultimate pullout factor of 12G.

Early P-51 types, including the P-51, the P-51A, and the A-36, were identical with respect to basic structure and basic powerplant installation. In general, the airplane had a combat weight of 8000-lbs, was powered with an Allison engine, and had a small radiator; the principle differences of engine ratings, armament installations, and dive brakes had little influence on structural strength and flying qualities.

Because the airplane was designed for a combat weight of 8000-lbs, it was good for an ultimate pullout factor of 12G, with a pilot allowable applied factor of 8G. As a result of equipment and fuel tank location, the airplane was positively stable under all conditions of flight.

The word stable in this case simply means that the pilot had to apply a pull force on the stick to produce G, had to push on the rudder to produce yaw, and had to apply a side force on the stick to produce roll. All of these forces were proportional to the result obtained throughout the speed range of the airplane. In other words, the pilot always had to pull more pounds on the stick to produce more G in a turn; when this force was released the airplane immediately stopped turning. The same was true of the aileron and rudder forces.

Up to the normally attained diving speeds of the airplane, very little trouble was encountered with instability or other peculiar flight characteristics generally inherent in most airplanes at higher Mach numbers. This was due principally to the clean lines of the airplane, the relatively lower engine power, and the favorable characteristics of a three-blade narrow chord propeller.

All factors considered, the early P-51 airplanes had just about everything to be desired in a fighter airplane, and in the early stages of the war performed exceptionally well in combat. Fighter pilots liked the airplane because, in addition to its good performance and flying characteristics, its working limits of speed and acceleration could be obtained with a minimum of physical effort on the part of the pilot.

The changes in trim tab settings for climbing and diving were negligible, and since the pilot could obtain high maneuverability with minimum effort, his ability to track and aim on a target was improved as the result of unusually light control forces.

While it is true that these light control forces indirectly caused the loss of a few airplanes through structural failure, either because the pilot was not familiar with the structural limits or failed to realize that the high maneuver factors were so easily obtainable, these losses were so small in proportion to the combat results achieved that the early P-51 airplanes were considered almost perfect for medium and low altitude fighter, tactical, and reconnaissance operations.

However, the progression of the war soon made it apparent that higher performance at altitude was essential for the P-51. To meet these requirements, the heavier, more powerful Packard-built Rolls-Royce engine was installed. The new engine made necessary a heavier