

The XP-54 is shown in a closed-off, secure location for Vultee on the Ontario Army Air Field, used for flight test and maintenance. This outdoor approach was common to aircraft companies in Southern California. Note the rudders have been painted a lighter color than shown in the photos on pages 34-36. (USAF via San Diego Air & Space Museum)



class aircraft. Another problem surfaced; the XH-2470-1 with a 2.6:1 gear ratio could swing a smaller propeller at higher rpm, which was consistent with the XP-54 configuration. The Tornado with a 4:1 gear ratio would require a larger propeller, due to its lower rpm. After discussion of the preceding information and seemingly to ignore the work completed to that point in time, the Pursuit Project Officer informed Vultee that they should design the XP-54 to incorporate the larger propeller, and to equip the airplane with four .50-cal. machine guns and two 37mm cannons in the design useful load.

During the conference on 11 September, Vultee notified the Pursuit Project Officer that it was impossible to use the larger propeller as it could not be swung between the booms of the existing design configuration of the XP-54. Vultee offered a counter proposal to use the H-2470-4 engine, which incorporated two-speed reduction gears and was supposed to be available in February 1942. The advantages of the -4 engine were the improvement of rate-of-climb and reduced takeoff distance with little or no change in top speed. However, the -4 engine was another “promised” engine, being built under a Navy contract of questionable viability; as such it carried no assurance of being available for the project. Agreement was finally reached whereby Vultee would continue with studies around the XH-2470-1, and include provisions for the future installation of the Tornado engine at such time as it would be fitted with counter-rotating propellers.

Engine issues were still unresolved as the 13 September conference demonstrated. During the conference it was noted that considerable weight savings were available if the airplane was designed around the XH-2470-1, and structure for the anticipated Tornado eliminated while leaving space for the future engine’s installation. This was considered satisfactory and space provisions were also included for the cooling requirements of the undefined 2,500-hp engine. Final solutions were still victimized by adverse circumstances; it was noted that the turbo superchargers specified in Model Specification 575 would not be available in time to be installed on the aircraft. All of this resulted in reduced performance in terms of critical altitude and service ceiling.

Design Reassessment

Changing requirements and vacillating engine configurations were brought back into perspective in the conference held on 16 September with Lt. Col. F. O. Carroll and Lt. Col. H. Z. Bogert of the Pursuit Project Office. It was pointed out that the R40-C version of the XP-54 had changed considerably. The model specification for the R40-C winner claimed a speed of 510 mph at 15,000 feet which was now considered as a medium altitude, high speed, fighting airplane. Later changes to incorporate a pressure cabin (subsequently deferred), turbo-superchargers, and improved radio equipment, resulted in considerable weight growth. Additional redesign for engine alternatives redefined the XP-54 as a high speed, high altitude, heavily armored fighter weighing 18,000 pounds. During this last of the conference series, it was brought out that the redesigned airplane would have a takeoff distance too long for a fighter; a rate-of-climb too slow for an interceptor; and did not

carry enough fuel for one hour’s flight at full throttle at 40,000 feet. As events materialized, adverse production schedules of government furnished equipment (GFE) prevented the XP-54 from becoming an efficient airplane. Expected performance was contingent upon the availability of the Tornado engine with a two-speed gearbox and counter-rotating propellers (a reality never achieved).

Final decisions issuing from these conferences culminated in the procurement of two airplanes powered with the XH-2470-1 supercharged engine, with provisions for the -4 Lycoming engine, which was expected to be available for the second XP-54 (research efforts have not found any further reference to the -4 engine). Both airplanes were to have space provisions for the Tornado engine with two-speed gearing and counter-rotating propellers, in addition to cooling provisions for an “undefined” engine of 2,500 hp. A critical altitude of approximately 30,000 feet and a service ceiling of 40,000 feet were required for both airplanes. A fuel supply to provide one hour’s flight at full rated horsepower at critical altitude was also required as part of the “design useful load.” An alternative fuel requirement was specified for a fuel supply sufficient to climb to the combat ceiling at military power plus 20 minutes at maximum cruising speed. Both aircraft were to be equipped with pressure cabins which would maintain a cabin pressure of 10,000 feet pressure altitude at 35,000 feet, and maintain a constant pressure differential to the service ceiling. In order to minimize weight, reduced fuel and armament loads were acceptable to produce an airplane weighing an estimated 15,000 pounds, producing a wing loading between 36 and 37 pounds per square foot. The armament was to be two 37mm cannons with 60 rounds per gun (rpg) and two .50-cal. machine guns with 500 rpg,



The XP-54 in a secure final assembly and checkout enclosure at the Vultee facility in Downey, California. The large size of the XP-54 is evident when compared to the mechanics working around the aircraft. Note the canopy enclosure has not been installed. (Convair)