On 4 May 1940, when the Air Corps approved construction of the NA-73 for the British, it asked for the fourth and tenth production aircraft for testing. Few in the AAC fighter development community were then aware of the new aircraft’s potential. Authority for Purchase No 165265, dated 24 July 1940, asked for the two aircraft under the designation XP-51, and on 20 September the official contract was approved by the Assistant Secretary of War.

On 20 May 1941 Robert Chilton made the first flight in Air Corps 41-038 (AG348 in the British production run), the first XP-51. Subsequent delays meant that the aircraft was not flown to Wright Field, Ohio, for official performance tests until 24 August 1941. The second aircraft, 41-039, did not get to Wright until 16 December.

The old story of official neglect of the XP-51 being responsible for the delay to its acceptance by the US Army Air Forces is not confirmed by the documents. The two XP-51s did not sit on the ground at Wright due to lack of interest; there were in fact some genuine problems. The two aircraft 038 at Freeman Field, Indiana, in 1945 after the USAAF had finished with it. Hap Arnold had the foresight to keep the XP-51 from being scrapped, preserving the aircraft along with many other World War II types for the National Air (now Air and Space) Museum. Its sibling was not so fortunate: 41-039 spent most of its wartime career with NACA at Langley Field, Virginia, where it was used for high-speed flight testing, but it was ultimately scrapped. (Haney Collection)

were to have been delivered for testing in February and March of 1941, but they actually arrived much later than that. Even then problems kept cropping up, and most of the tests at Wright were carried out without the second aircraft.

The document reproduced below reveals the events which delayed the entry of the P-51 into the Army Air Force inventory.

DATE July 15, 1942

WAR DEPARTMENT
AIR CORPS, MATERIEL DIVISION
WRIGHT FIELD, DAYTON, OHIO
AIR CORPS TECHNICAL REPORT No. 4801
FINAL REPORT OF INSPECTION
PERFORMANCE AND ACCEPTANCE OF NORTH
AMERICAN AIRPLANE MODEL XP-51
by
Captain W. G. Logan, A. C.

Approved:
H. Z. Bogert, Colonel, Army Air Forces Chief, Technical Staff
By direction of the Chief of the Materiel Division.
F. L. Carroll, Colonel, Army Air Forces

Branch Chief
Chief Experimental Engineering Section

OBJECT
The object of this report is to present a brief resumé of the development of the XP-51 airplane including the procurement, inspection and performance of the airplanes.

Source: Mustang: A Documentary History by Jeffrey Ethell
SUMMARY

Model XP-51, which is the designation for N.A.A. Model NA-73, airplane is a low wing, single engine, single place, all metal monoplane with an Allison V-1710-P, 3R engine with a three blade tractor propeller. The wing and tail surfaces are of full cantilever construction. The airfoil is a modified laminar flow, and was at the time of construction the closest approximation to a true laminar flow yet built. The armament consists of two synchronized automatic gun chargers as developed by the Bendix Corporation. Passive armament consists of self-sealing fuel tanks and lines, bullet-proof glass and armor plates in front of the pilot where the engine does not offer adequate protection. Provisions only were made for the installation of armor plate behind the pilot.

OBJECT OF DEVELOPMENT

This airplane was developed by the contractor primarily for sale to the British Government.

PROCUREMENT

On May 4, 1940, the North American Aviation, Inc. signed a Foreign Release Agreement with the Army Air Forces for the foreign sale of the Model NA-73 airplane that entitled the Army Air Forces to two airplanes of the type contemplated for sale. The release specifically set forth that the Army Air Forces would receive the fourth and tenth articles from the production line. The engines, propellers and other normal items of regular Government furnished equipment specified for Army Air Forces Airplanes were specified as Government furnished equipment for these two airplanes. There were no provisions made for mock-up or 689 inspection of these two airplanes although arrangements were made for process inspection and flight testing of the first airplane by Army Air Forces personnel. Following the completion of negotiations between the North American Aviation Corporation and the Anglo-French Purchasing Commission, Authority for Purchase No. 165265 for two XP-51 airplanes was initiated on July 24, 1940 and followed by a contract which was approved by the Assistant Secretary of War on September 20, 1940. The airplanes were built in accordance with the British Model Specification except that certain modifications were made to accommodate standard Army Air Forces equipment.

Except for minor incidental changes the project progressed at a normal rate. On February 24, 1942 an Engineering Order was issued to remove the original hydraulic gun chargers out of both airplanes and install in lieu thereof fully automatic gun charger equipment which was being developed by the Bendix Corporation in the second airplane. This was done so that the new charging equipment could be flight tested at an early date. Since the delivery date of the automatic hydraulic chargers was such that a delay in delivery of the airplane would result from the installation, it was decided that provision only would be made for the installation of this equipment.

Preliminary flight testing was conducted on the first airplane at the contractor's plant by the contractor's personnel and Government pilots in accordance with the terms of the contract. Considerable trouble was incurred with the Allison engine installation in the early stages of the airplane development. At one particular throttle setting the engine was found to be extremely rough and in one instance the engine completely cut out resulting in a forced landing in a plowed field. This landing was made by the contractor's pilot without damage to property or personal injury although considerable damage was done to the airplane.

Although no mock-up or 689 inspection was made, a preliminary flutter and vibration survey was made by Army Air Forces personnel prior to any flights by Army Air Forces pilots.

Under the terms of the contract the Army Air Forces were supposed to receive the fourth and tenth production articles. These airplanes were scheduled for delivery in February and March of 1941. The production of the NA-73 airplanes was delayed both by the crash landing of the experimental model and the delay of engines for the British airplanes. To facilitate the delivery of the XP-51 models it was decided to take the fourth and tenth articles from their place in the assembly line and install the Army Air Forces engines in them for delivery to Wright Field. This procedure was followed and the first airplane was accepted at the plant of the contractor and flown to Wright Field on August 24, 1941, for the purpose of conducting official performance tests. The second airplane was accepted and flown to Wright Field on December 16, 1941.

Upon arrival of the first airplane at Wright Field, a safety inspection was conducted. The airplane was next weighed and balanced and an actual weight and balance report prepared. Before flight testing could be conducted, it was necessary to install backfire screens to prevent damage to the airplane due to engine backfire. This work took considerably longer than was anticipated due to the breaking off of studs. It was also necessary to install new aileron and flap bracket bolts to correct an unsatisfactory condition found by N.A.A. in other airplanes. The replacement
parts were furnished by the contractor and installed by Army Air Forces personnel under the supervision of the contractor’s representative.

**MOCK-UP AND ENGINEERING INSPECTION OF THE XP-51 AIRPLANE**

Because of the nature of procurement no mock-up or Engineering Inspection was made on these two airplanes. However, Army Air Forces personnel were granted an opportunity to visit the plant of the contractor to study design details and observe construction.

**CONTRACTOR’S TESTING**

The contractor conducted thorough and complete testing of the airplane and parts during construction and conducted complete flight tests on the first airplane. It was during these flight tests that the airplane was damaged in a forced landing due to the cutting out of the engine. Additional flight tests were conducted on the two airplanes delivered to the Army Air Forces. It was during flight testing of the first Army Air Forces airplane that it was discovered that engine difficulties previously encountered could be overcome by increasing the length of the ramming air intake scoop. It was only after the contractor considered the airplanes to be satisfactory that they were turned over to the Army Air Forces.

**FLIGHT TESTING**

Preliminary performance tests were conducted at the contractor’s plant by personnel on the contractor’s first article during March, 1941. Final official performance flight tests were conducted at Wright Field between October 8 and December 22, 1941. The reason for the long period of flight testing was due to the higher priority of other airplanes to be tested, bad weather and malfunctioning of the coolant scoop control and landing gear retracting mechanism during the cold weather. These difficulties and others of a minor nature were corrected by Army Air Forces personnel and the contractor’s representatives.

The second airplane was thoroughly inspected by the Flying Branch after delivery and was then turned over to the Armament Laboratory for firing tests. The installation and testing of the automatic hydraulic gun chargers will be covered by another report.

**OFFICIAL SUMMARY OF CHARACTERISTICS AIRPLANE**

Manufacturer *North American* Type *Interceptor Fighter Model XP-51* Mfr. Model Spec. No. 1620 Contract No. 15471 Crew / Wing Loading 33.7 lb/sq ft Power Loading 6.90 lb/bhp Design Altitude 15,000 ft Wing Area 233.19 sq ft Span 37.03 ft Aspect Ratio 5.015 Airfoil NAA NACA Weight Empty 6,275 lb Design Gross Weight 7,967 lb Take-off Power at S. L. 1,130 bhp

**OFFICIAL PERFORMANCE SUMMARY**

1. **Level Flight Speed** at Design Altitude of 13,000 ft with Design Gross Weight of 7,934 lb.
   - Maximum Speed 382 mph at 3,000 rpm with 1,110 bhp (MAX % rated)
   - High Speed 370 mph at 3,000 rpm with 1,110 bhp (MAX % rated)
   - Cruising Speed 325-5 mph at 2,280 rpm with 730 bhp (75-2 % rated)

2. **Optimum Range and Endurance** with 170 gal fuel and None lb bombs, 750 bhp
   - At Cruising Speed 780 miles at 4-6 mi/gal or 2-4 hr at 71 gal/hr

3. **Climb Data with Gross Weight of 7,934 lb**
   - Standard Altitude ft 0 5,000 10,000 15,000 20,000 25,000 30,800
   - Climbing Speed mph 178 194 208 222 236 248.5 262
   - Engine Speed rpm 3,000 3,000 3,000 2,600 2,600 2,600 2,600
   - Total Power bhp 1,050 1,095 1,140 820 680 550 —
   - Maximum Rate rpm 2,200 2,270 2,345 1,570 1,070 610 100
   - Minimum Time min 0 2-24 4-41 7-06 10-91 17-03 38-96

4. **Ceiling**: Normal Engine Operation: Service Ceiling 30,800 ft
   - Absolute Ceiling 31,900 ft Supercharger Blower Ratio 8:8:1

5. **Take-off and Landing Distances—To Clear 50 ft. Obstacle at Sea Level (no wind)**
   - Take-off 1,780 ft at 92 mph 15 deg flap Gr. Wt 7,934 lb. Ground run 1,030 ft
   - Land 2,000 ft at 94 mph 50 deg flap Gr Wt 7,934 lb. Ground run 1,495 ft