



June/July 2020

# JUNE/JULY

Dakota Territory Air Museum's P-47 Update

by Chuck Cravens



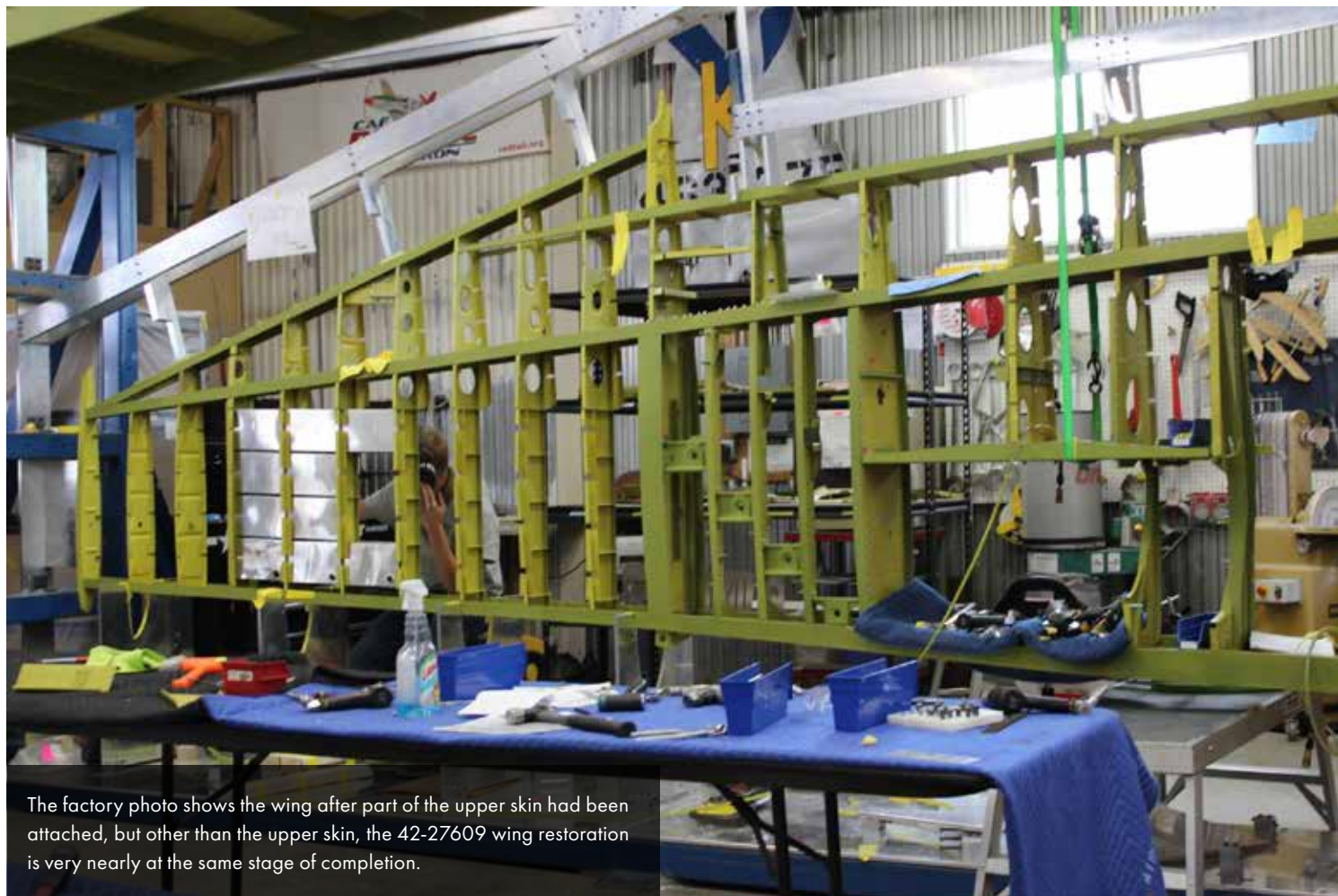
AIRCORPS AVIATION



A P-47 wing in its fixture at the Evansville, Indiana Republic factory.  
Photo courtesy Harold Morgan



[www.dakotaterritoryairmuseum.com](http://www.dakotaterritoryairmuseum.com)



The factory photo shows the wing after part of the upper skin had been attached, but other than the upper skin, the 42-27609 wing restoration is very nearly at the same stage of completion.

## Update

Restoration milestones attained this month were the installation of two different tanks. The water injection system came closer to completion with the installation of the water injection tank. The Christmas tree tank, unique to the 5th Air Force, was also permanently installed.

The complex and time consuming wing structure assembly occupied much of the restoration technicians' time this month as it has for several months.



The water injection tank has been painted the correct silver color.

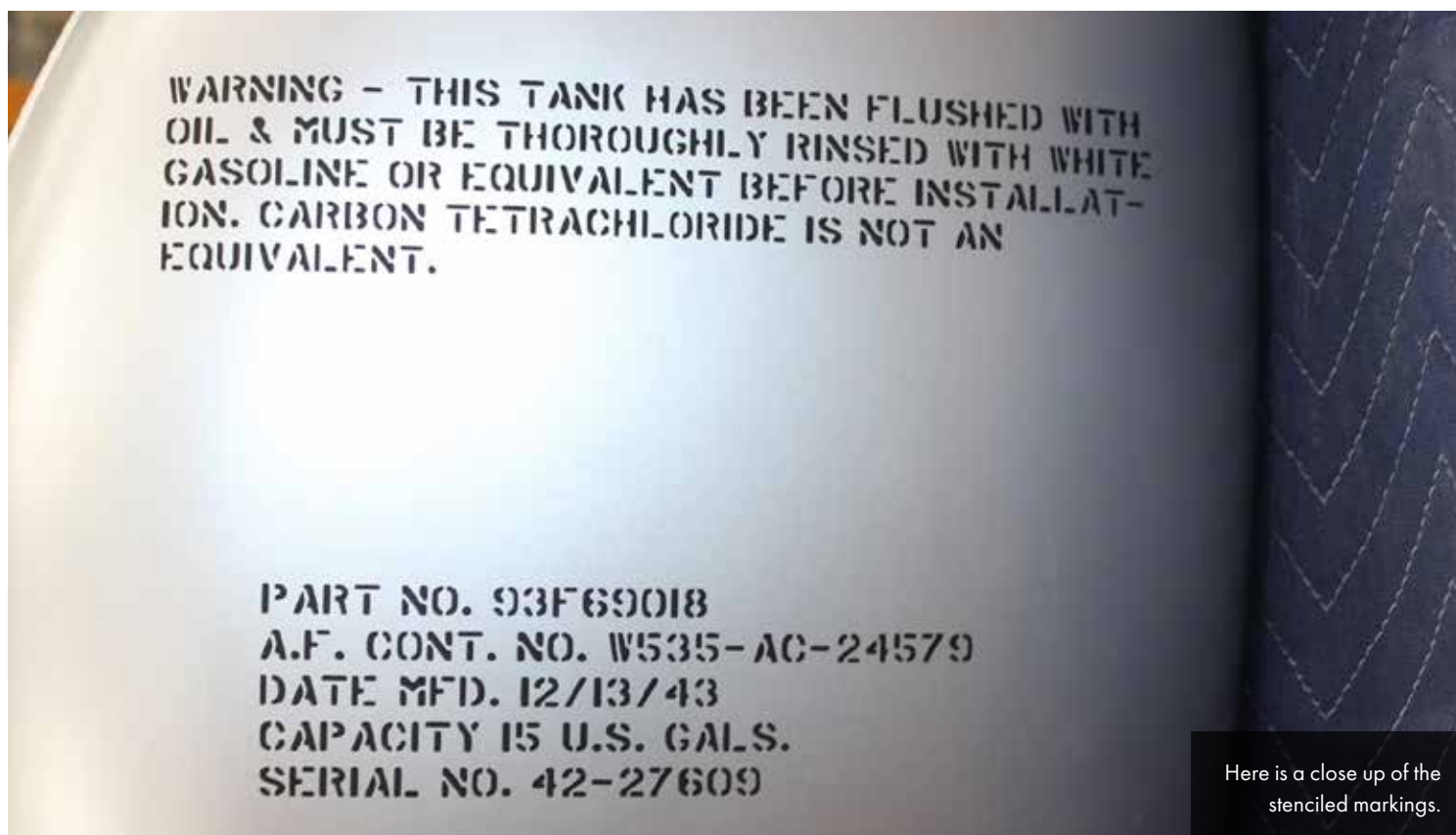
## Water Injection System Tank Installation

The water injection system, first introduced on the P-47-5RE, increased engine power to 2250 hp for short periods by allowing higher manifold pressures without detonation.



Aaron holds up the freshly painted water injection tank.

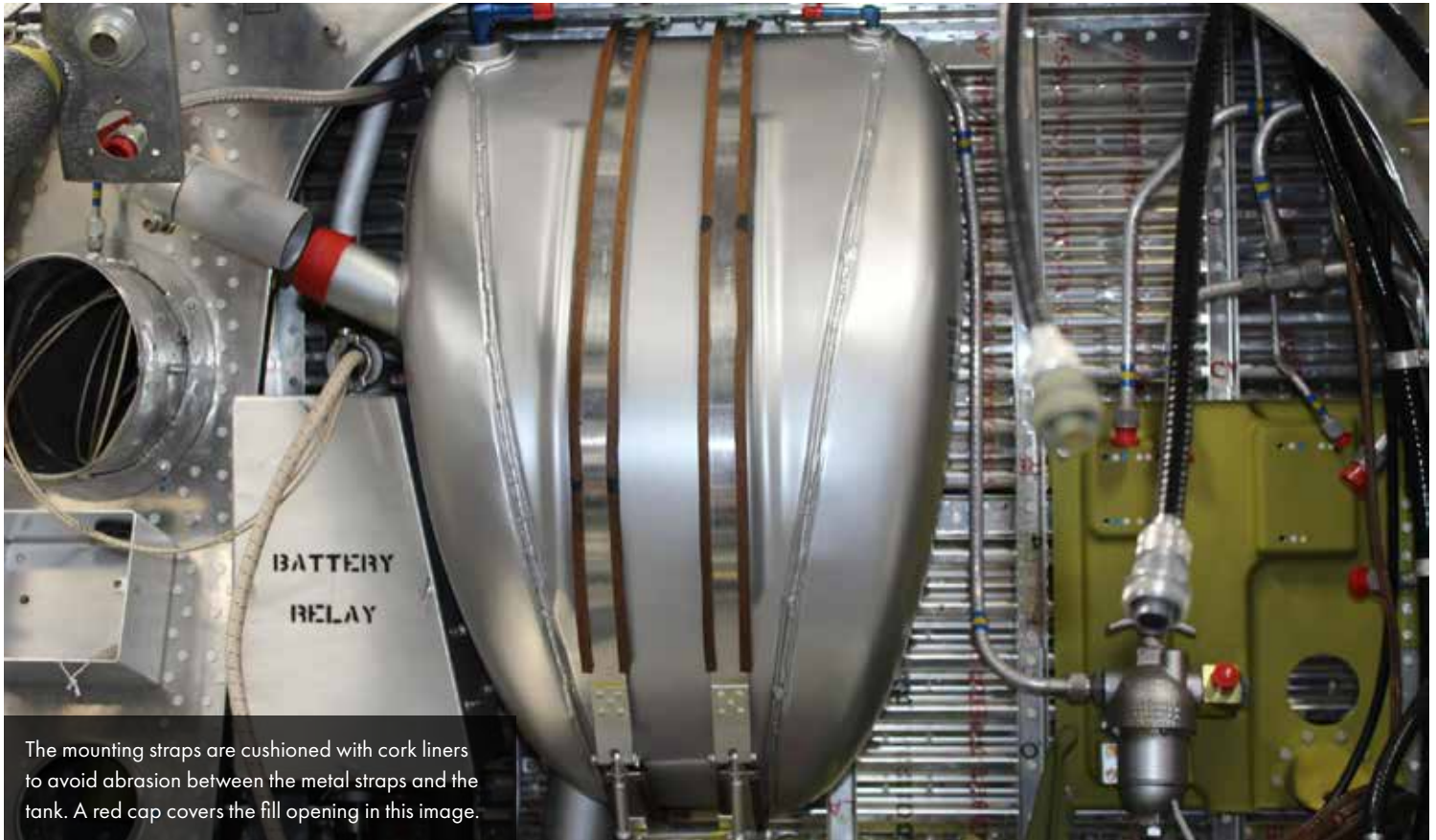






The water injection tank has been installed in the accessory section ahead of the firewall.





The mounting straps are cushioned with cork liners to avoid abrasion between the metal straps and the tank. A red cap covers the fill opening in this image.



The water injection filler neck and cap have been connected to the tank.



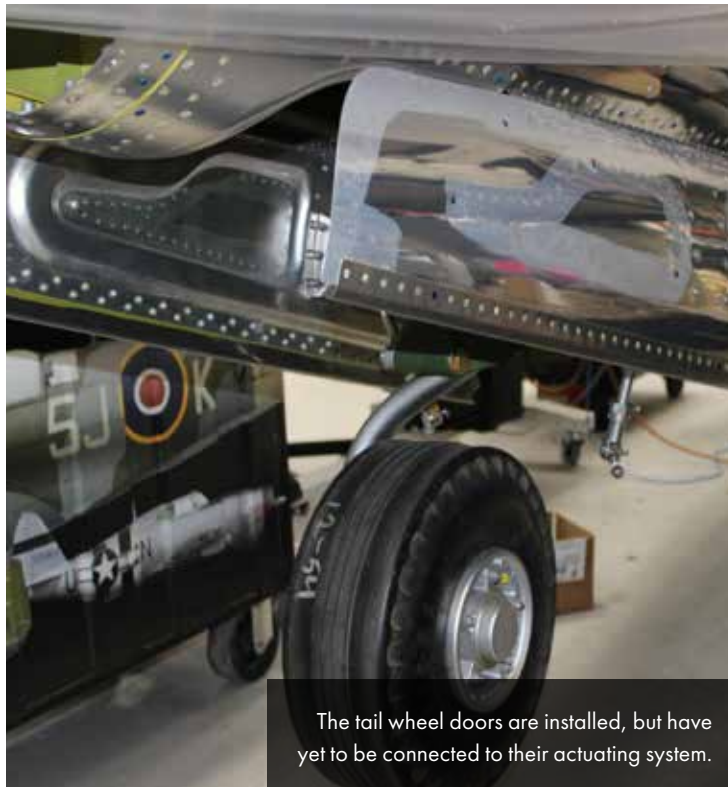


## Rear Fuselage Work

Systems installation continues in the entire fuselage.



The natural aluminum upper half of the large turbo supercharger housing is installed on the mounting ring in the rear of the fuselage.



The tail wheel doors are installed, but have yet to be connected to their actuating system.



The actuating rod for the tail wheel door hangs down in this image.



## Christmas Tree Tank

The main complaint against the P-47 when the 5th Air Force began operating Thunderbolts was that they lacked the necessary range needed to reach the Japanese bases. One of the attempted solutions was adding a tank behind the pilot in the upper turtledeck. The space available dictated the shape of the tank, which ended up being reminiscent of a Christmas tree.

The new tank was problematic, causing fire hazard issues, and a rearward center of gravity. Because of these problems, nearly all of the tanks were removed. However, 42-27609 still had the tank installed when it was recovered from Papua New Guinea.

The range problem was eventually solved using lean cruising techniques and with large drop tanks. As many as three at a time were carried on long missions.



The Christmas Tree tank has been slid into place and fits snugly. The radio junction box appears at the lower right.

World War II self-sealing tanks were made with multiple layers of rubber and reinforcing fabric. The outer layers were vulcanized rubber, and the inner layers were untreated natural rubber. When punctured, the inner natural rubber layer swelled from contact with the fuel and sealed the bullet holes.





The Christmas Tree tank housing cover has been installed. The straps mounted on the cover's face are for mounting the supercharger oil tank.



The Christmas tree tank filler opening is located atop the razorback.

The black rubber part is called the scupper. Its function is to catch fuel overflow. Remarkably for a rubber part, this one survived in usable condition and is an original component of 42-27609.



Below the trim control box is a mounting plate with six cutouts for cables. These cutouts are where the bomb and drop tank arming and release controls will be mounted.



This view from under the fuselage shows three openings to the main fuel tank.

The larger opening to the left of center is the hole for the fuel level sending unit, while the one in the upper right corner is for the fill. The smaller hole in between the two is for the vent.



## Wings

Alexander Kartveli, the P-47's designer, favored a wing plan shared by the prewar P-35: a straight leading edge with curved tips and semi-elliptical trailing edge. This design gave an elliptical area distribution without the manufacturing difficulties of a curved leading edge.<sup>1</sup>

Kartveli's design created a much more complex structure than the straight trailing edge of the P-51 wing.

<sup>1</sup> <https://www.airspacemag.com/flight-today/perfect-airplane-wing-180971225/>, Smithsonian Air & Space webpage, accessed 7/15/2020



It is hard to imagine the effort it would take to hand start a R-2800, even with a geared crank!





Cory and Randy drive wing rivets.





Randy bucks a rivet as Cory drives it.





The left main gear wheel will retract into this opening in the wing.



The ammunition boxes are in place temporarily.



The gun mounts have been permanently riveted in place.



Cory rivets the auxiliary landing gear spar, which supports and braces the landing gear bearing box.



Here is a closer view of the rivet squeezer in action.





Randy works on the outer leading edge skin.



The painted inner structure is visible in this view of the outer leading edge section.





The inner leading edge, seen here from the rear, is much thicker than the outer leading edge section.

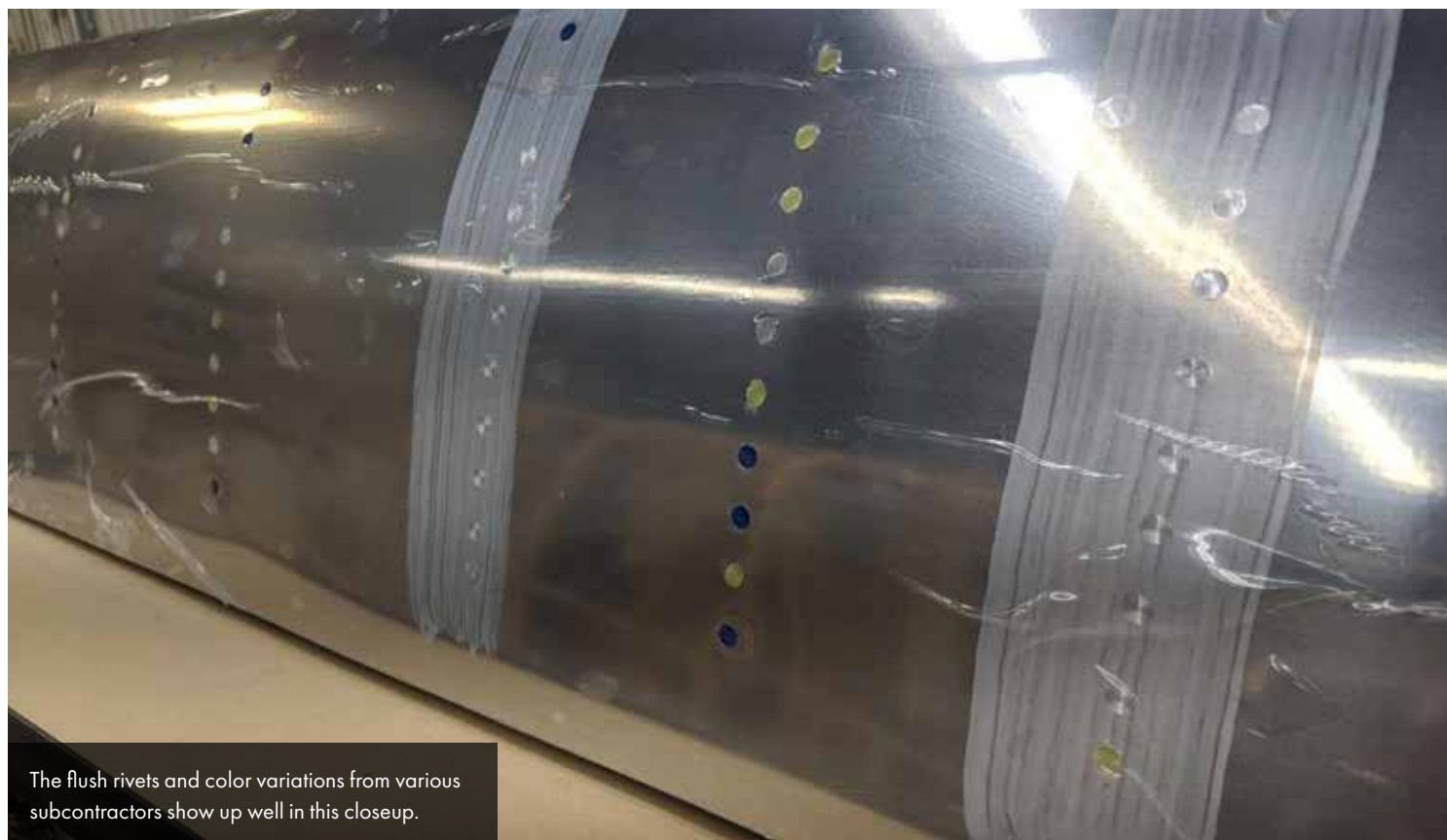


The same leading edge section is shown from the front.





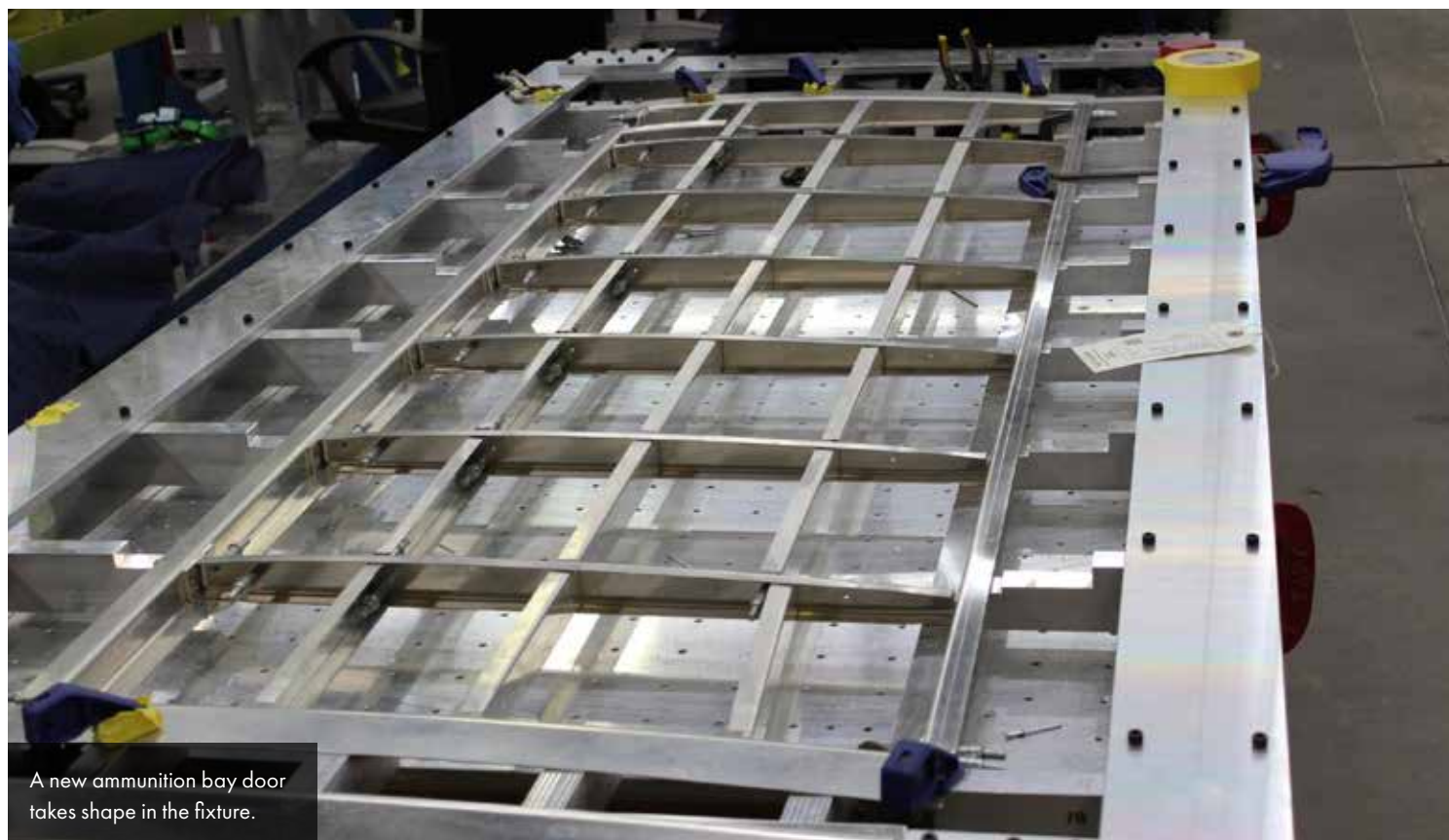
This leading edge assembly has been permanently riveted, stored on a shelf, and awaits its time for final installation onto the wing.



The flush rivets and color variations from various subcontractors show up well in this closeup.



The original ammunition bay doors that are used as templates, rest atop the fixture used to create new ones.



A new ammunition bay door takes shape in the fixture.





## The 39th Fighter Squadron Gets the P-47D-23RA

In June of 1944, the 39th Fighter Squadron was based at Nadzab in the Markham River valley. Nadzab was about 20 miles inland from Lae on the northeast coast of New Guinea. At this time, preparations were under way to move closer to the Japanese bases by transferring to Owi Island, 818 miles to the west.

"Meanwhile the pilots underwent training until the Owi base was ready. On June 25, 1944, seven new P-47D-23s arrived from Finschafen."





"Seven more were added two days later but no missions were flown until August 3, when glide bombing was introduced against Japanese positions on Noemfoor Island and the Vogelkop Peninsula. For the first time, 500 pound bombs were used on the underwing shackles, doubling the P-47s offensive load."<sup>2</sup>

Glide bombing is similar to dive bombing, with the essential difference being a lesser angle of the attacking dive.

The technique normally used during WWII was to fly past the target to one side, then turn into the dive. A dive angle between 30 and 60 degrees was established, and the throttle was cut to prevent problems with overspeeding and compressibility. The bombs were dropped by aiming slightly above the target, and released at an altitude of around 1500 feet (or sometimes lower).

On August 7th, Major Richard Cella led a flight of 26 P-47s on a 900 mile trip from Nadzab to Noemfoor. This mission established that the long range adaptations for the P-47 had been successful.

Over the next 6 weeks, the 39th flew missions guarding against the occasional raids on Middleburg Island airfields by Japanese soldiers.

On August 9th, the 39th FS operated from Noemfoor for the first time when two flights of P-47s covered a convoy off Cape Sansapor. A number of similar missions ensued until August 20th, when the 39th flew a 5 hour and 20 minute fighter sweep to the Moluccas. At the time, this was the longest P-47 mission flown, though later in the year, using 3 external tanks and maximum range techniques demonstrated by Charles Lindbergh, the squadron flew missions of as much as 8 hours.

On September 5th another glide bombing mission was flown, this time to Halmahera. The 800 mile round trip was carried out with no losses.<sup>3</sup>

The move to Morotai began on September 12th, and combat operations were diminished until routine patrol missions resumed on October 5th.

By that time, 42-27609 had been taken out of service (on September 18, 1944).



<sup>2</sup> John Stanaway, "Cobra in the Clouds", (Historical Aviation Album, Temple City, CA 1982) 28

<sup>3</sup> John Stanaway, "Cobra in the Clouds", (Historical Aviation Album, Temple City, CA 1982) 29