



August/Sept 2022

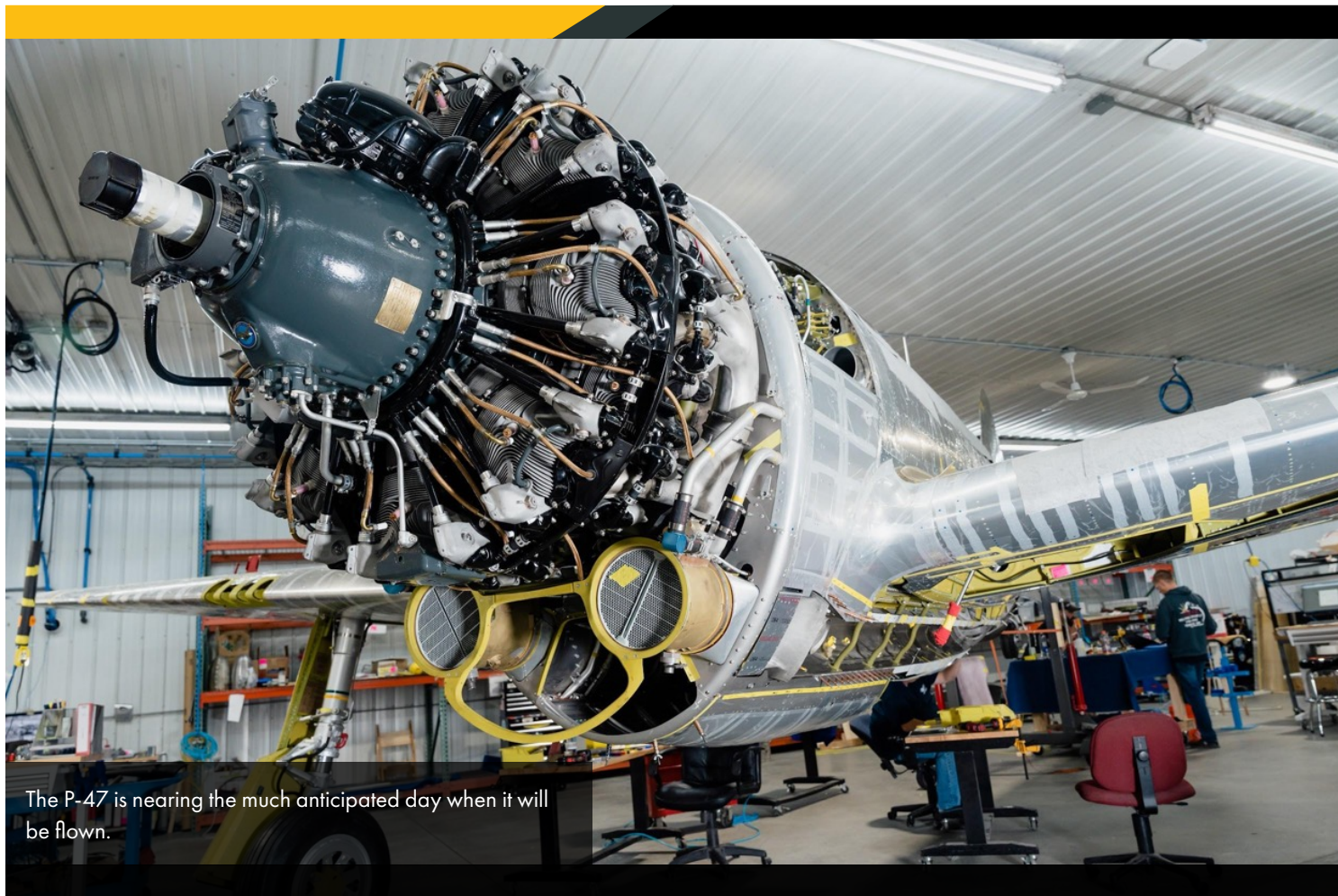
# AUGUST/SEPTEMBER

Dakota Territory Air Museum's P-47 Update

by Chuck Cravens



AIRCORPS AVIATION



The P-47 is nearing the much anticipated day when it will be flown.

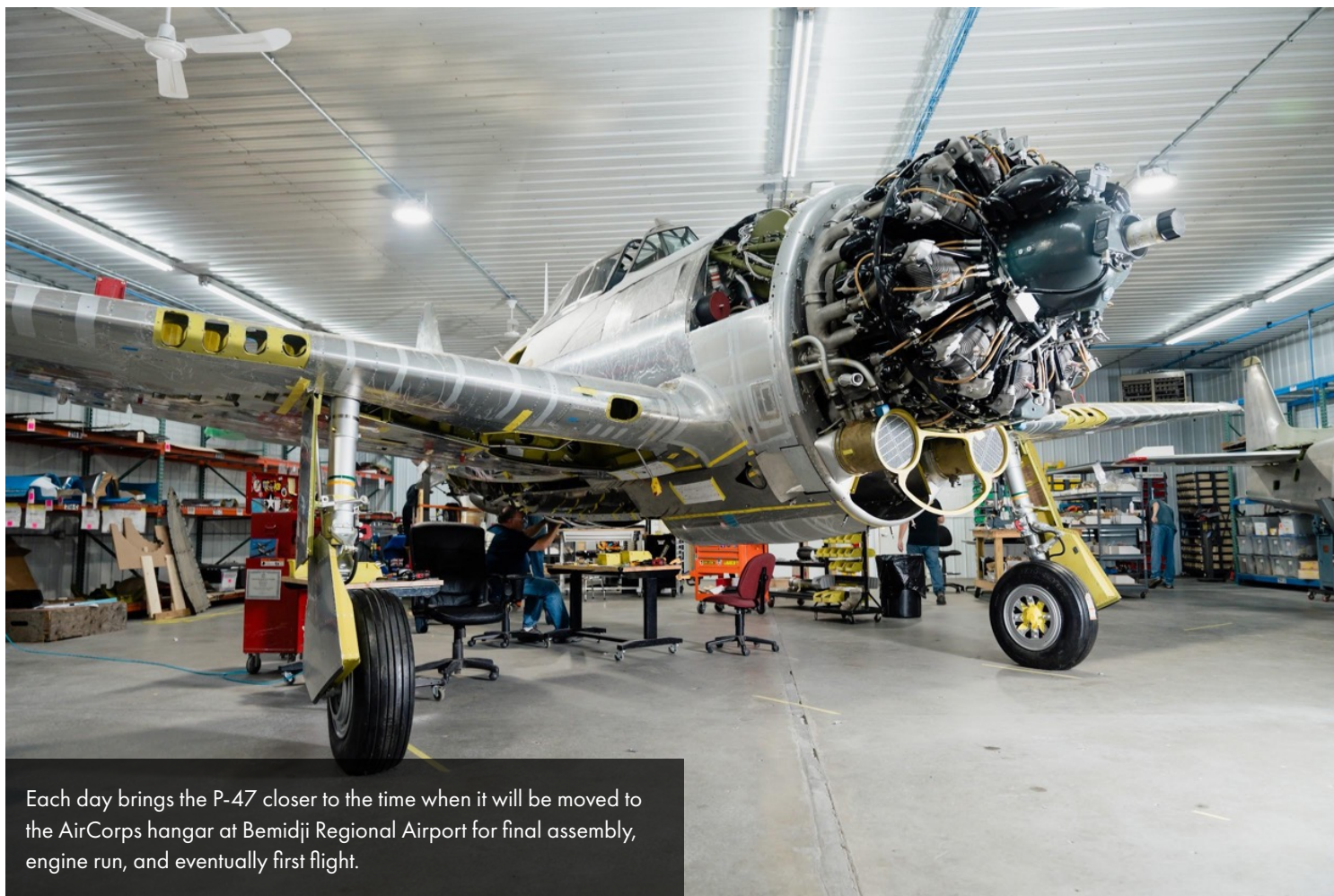


[www.dakotaterritoryairmuseum.com](http://www.dakotaterritoryairmuseum.com)



## Update

In late August and early September wing root fairings, and final main landing gear preparation were important aspects of the restoration work. The skins for the underside of the fuselage, the ducting covers, and the cowling also received a lot of attention.



Each day brings the P-47 closer to the time when it will be moved to the AirCorps hangar at Bemidji Regional Airport for final assembly, engine run, and eventually first flight.





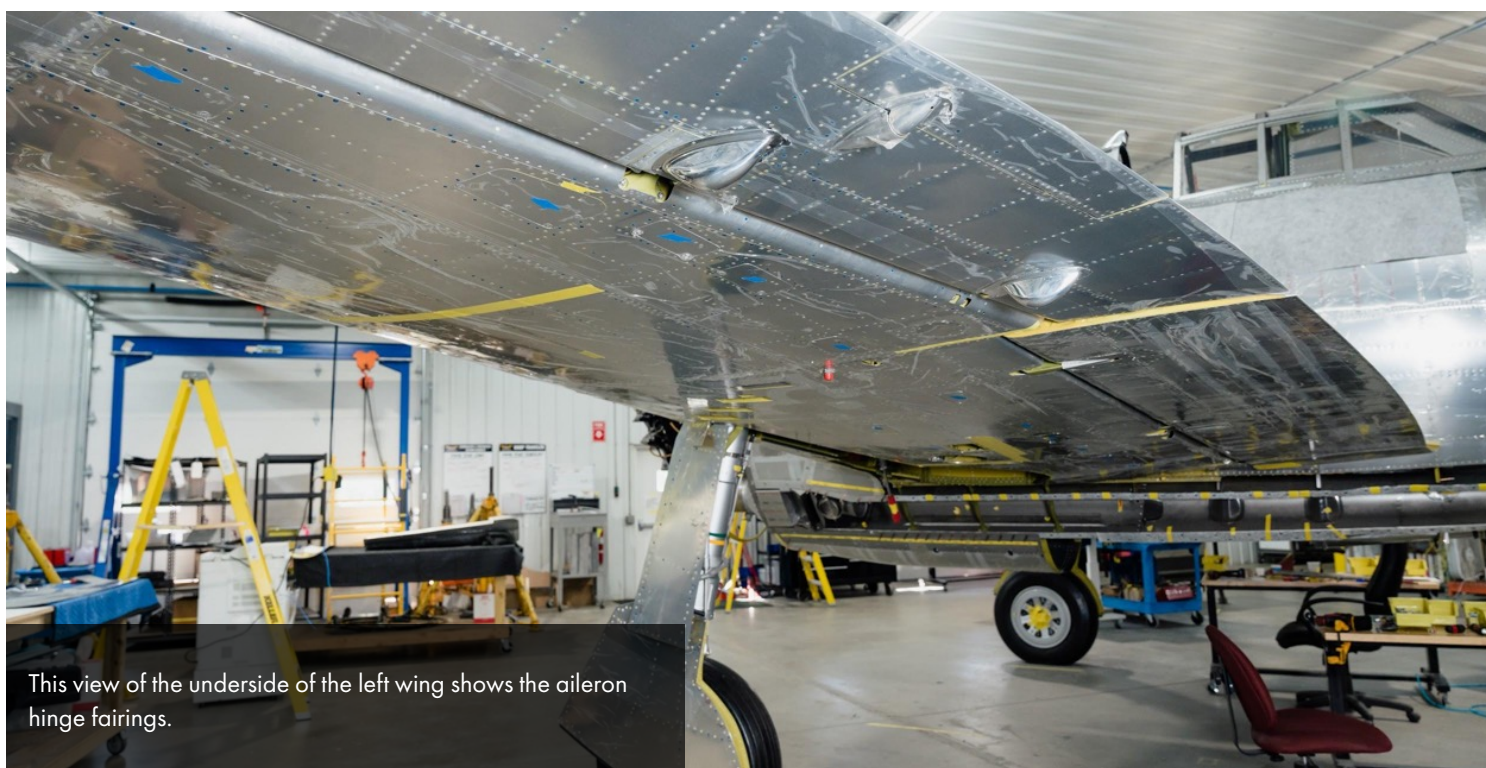
All of us here at AirCorps can't wait to hear the R-2800 come to life!





## Wing and Landing Gear

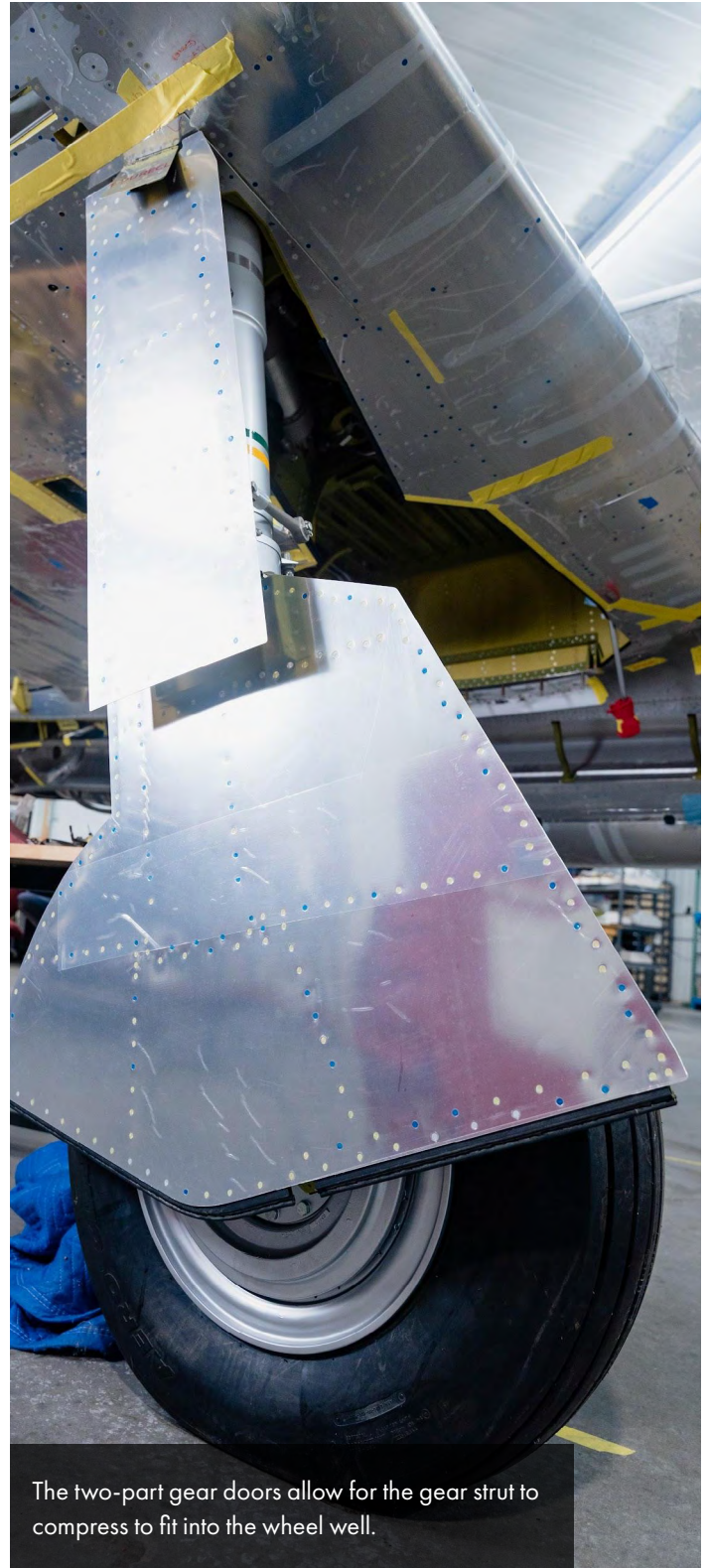
Most of the work on the wings during this month was related to finalizing the main landing gear installation and fitting the wing root fairings.







The link between the gear strut and the gear door on the right main landing gear is seen here.



The two-part gear doors allow for the gear strut to compress to fit into the wheel well.



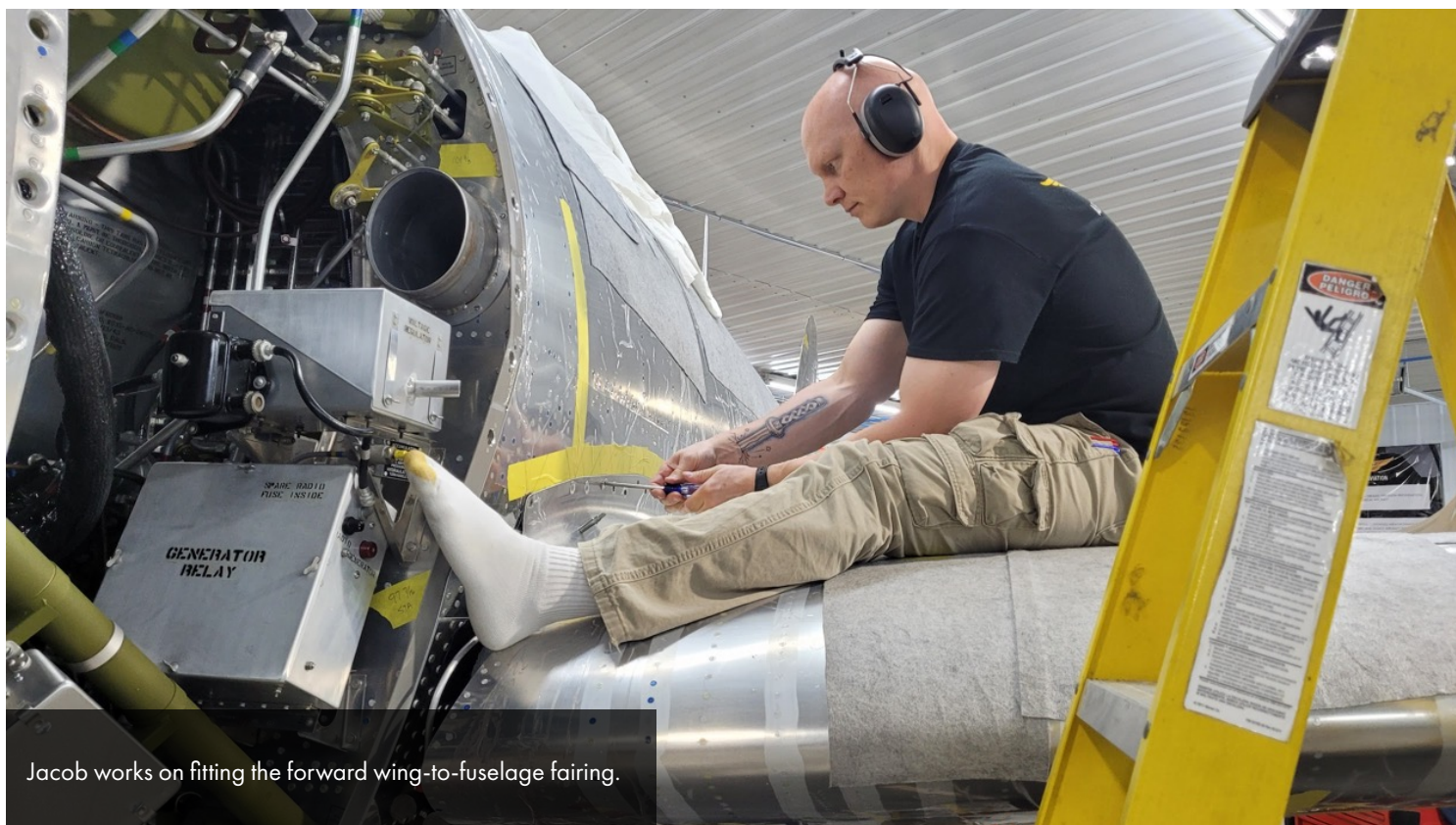


The left main gear is a mirror image of the right.



The painted inside and retracting mechanisms of the gear door can be seen here.





Jacob works on fitting the forward wing-to-fuselage fairing.



The support structure for the aft upper wing fairing is visible in this image.





Neil is fitting the aft section of the upper wing fairing.



The fairing is in place, secured with clecoes, in preparation for permanent riveting





The area where the right side wing-to-fuselage fairing will be installed is laid out with tape.



The very complex shape of the leading edge wing-to-fuselage fairing is complete.



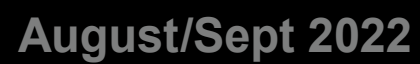


Cory spot welds on one of the bottom wing root fairings.

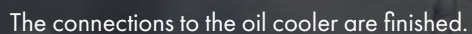
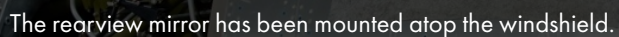


The bottom wing root fairings await installation.





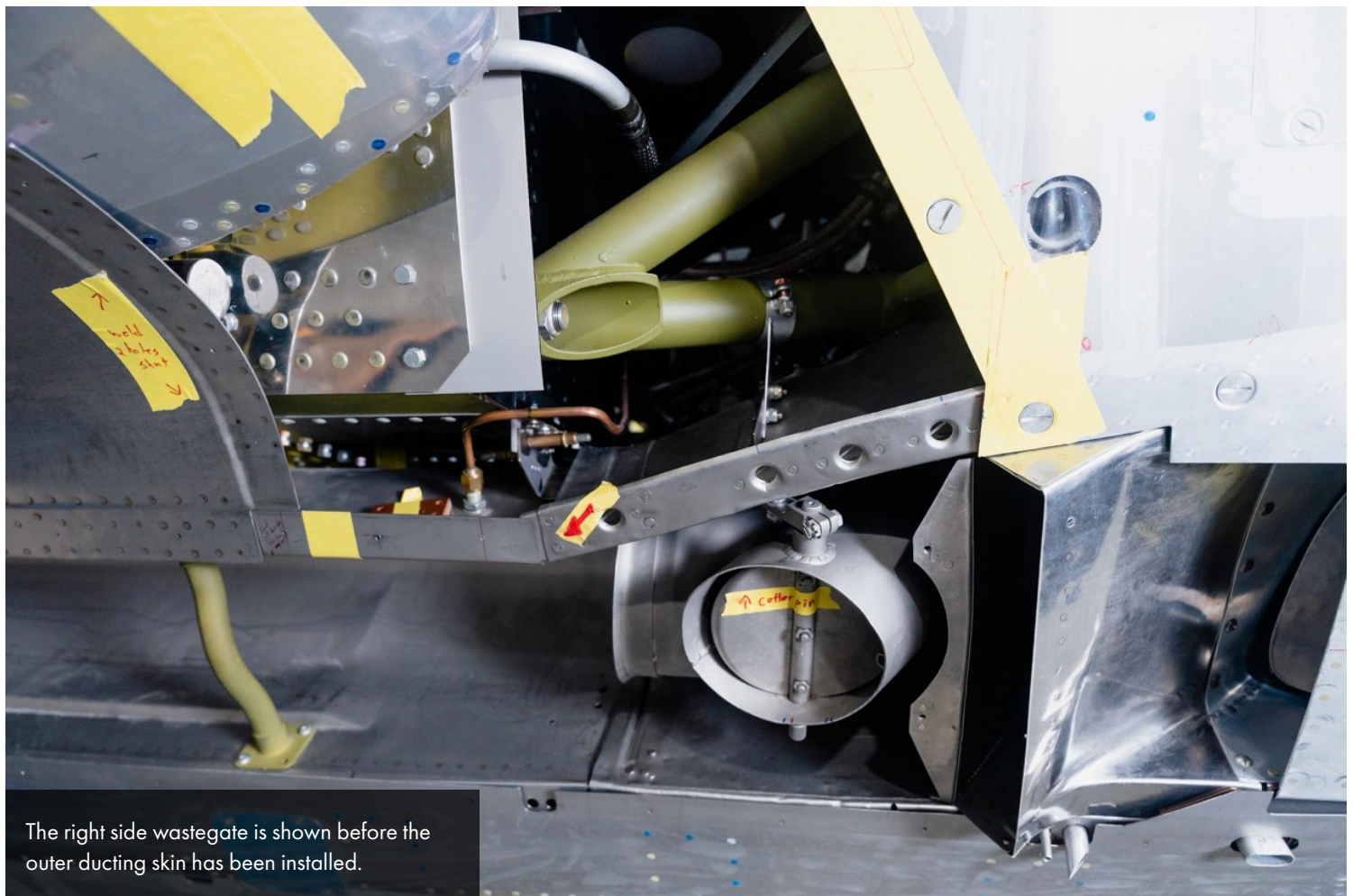
On the fuselage, some system connections were finalized this month, but the main focus was on the ducting and outer belly skins underneath the fuselage.





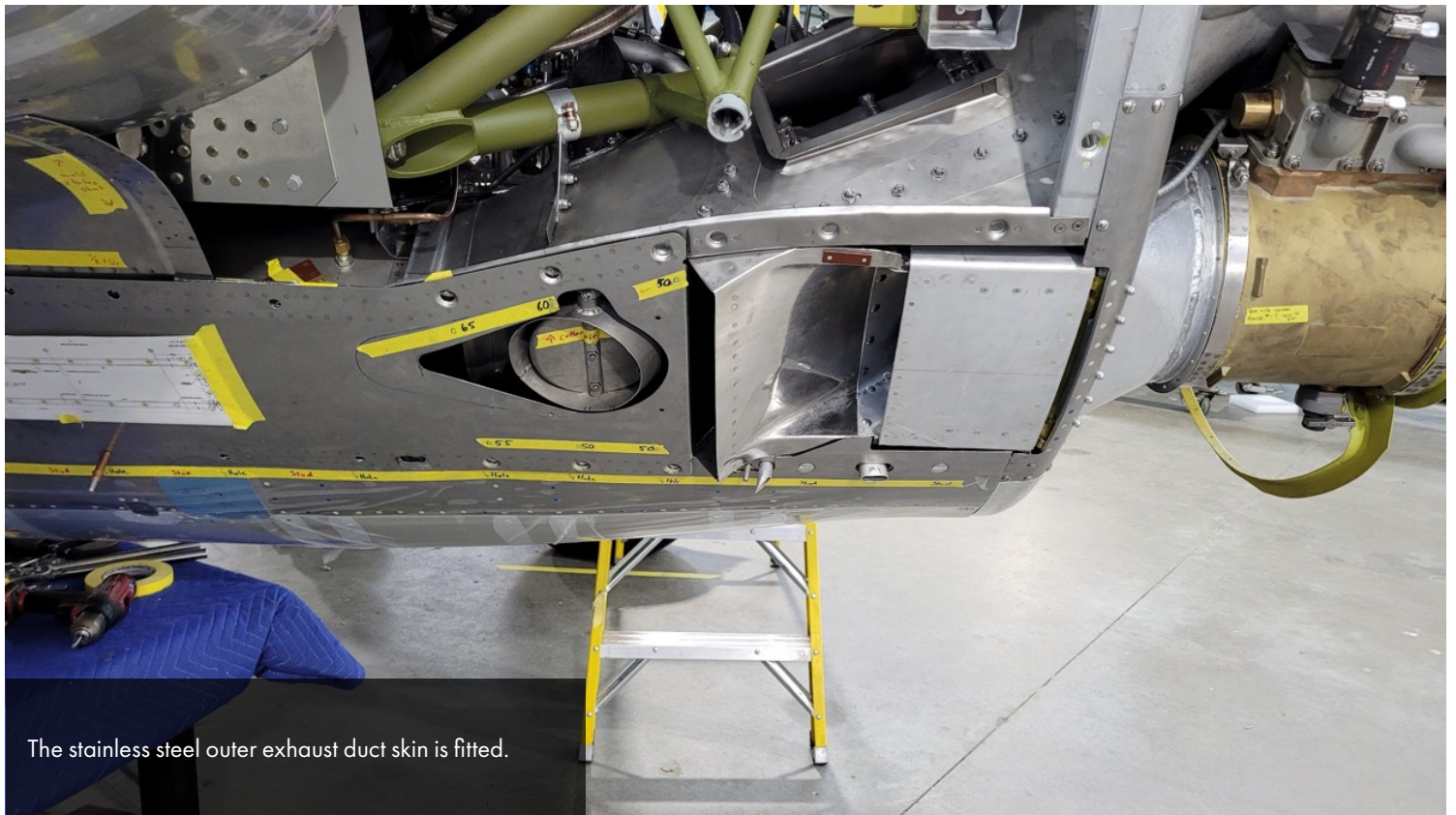


This is the left side wastegate and exhaust duct.



The right side wastegate is shown before the outer ducting skin has been installed.





The stainless steel outer exhaust duct skin is fitted.



Here is another angle on the exhaust skin.





Fuel drains, labeled with waterslide decals, are a part of the under-fuselage work.



Mark works on installing the sealing gasket between the duct and the outer duct cover.



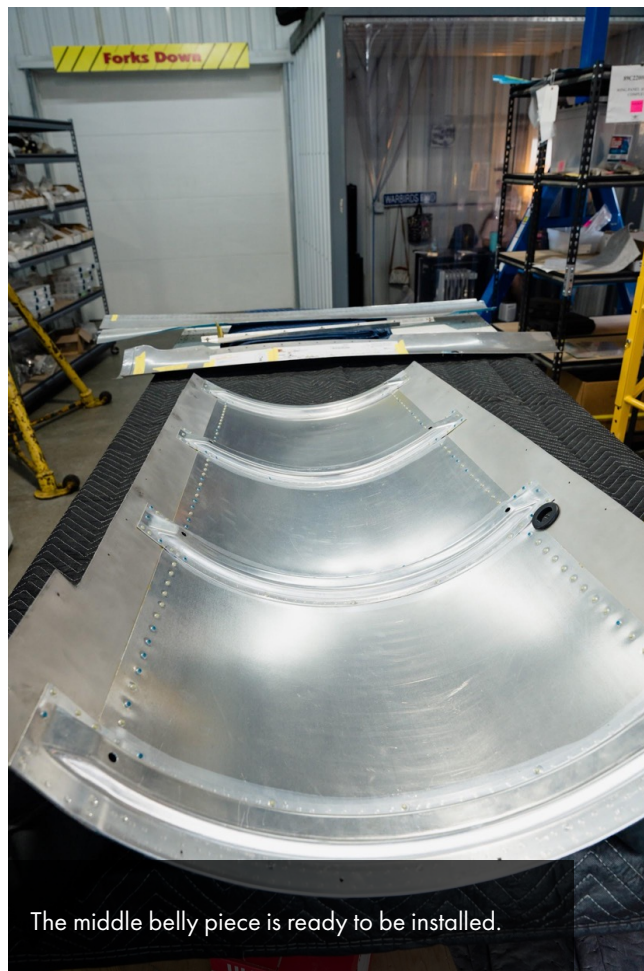


The gaskets are installed. Originally, these gaskets were made of asbestos, but our new versions are composed of a synthetic heatproof fiber backed by rubber. Of course these modern replacement parts are superior, as they are not hazardous to the health of those who work on the P-47.

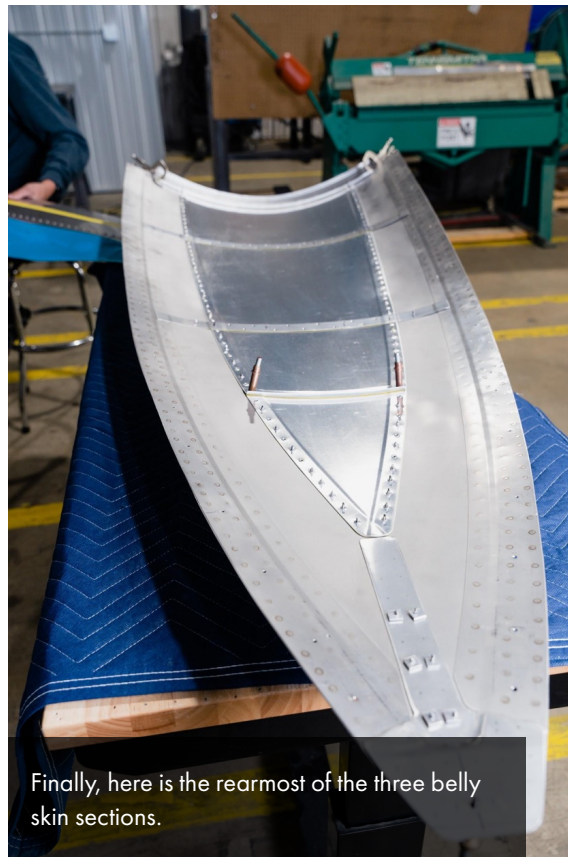


There are three sections of belly skin in front of the turbosupercharger. The forward section has been installed and is visible in this photo.









Finally, here is the rearmost of the three belly skin sections.



Mark and Randy are installing the rearmost of the three belly skins.





The turbosupercharger is permanently installed.



The upturned tube (left center) will bring cool air into the turbosupercharger exhaust to help lower the temperature of the gasses as they are expelled.





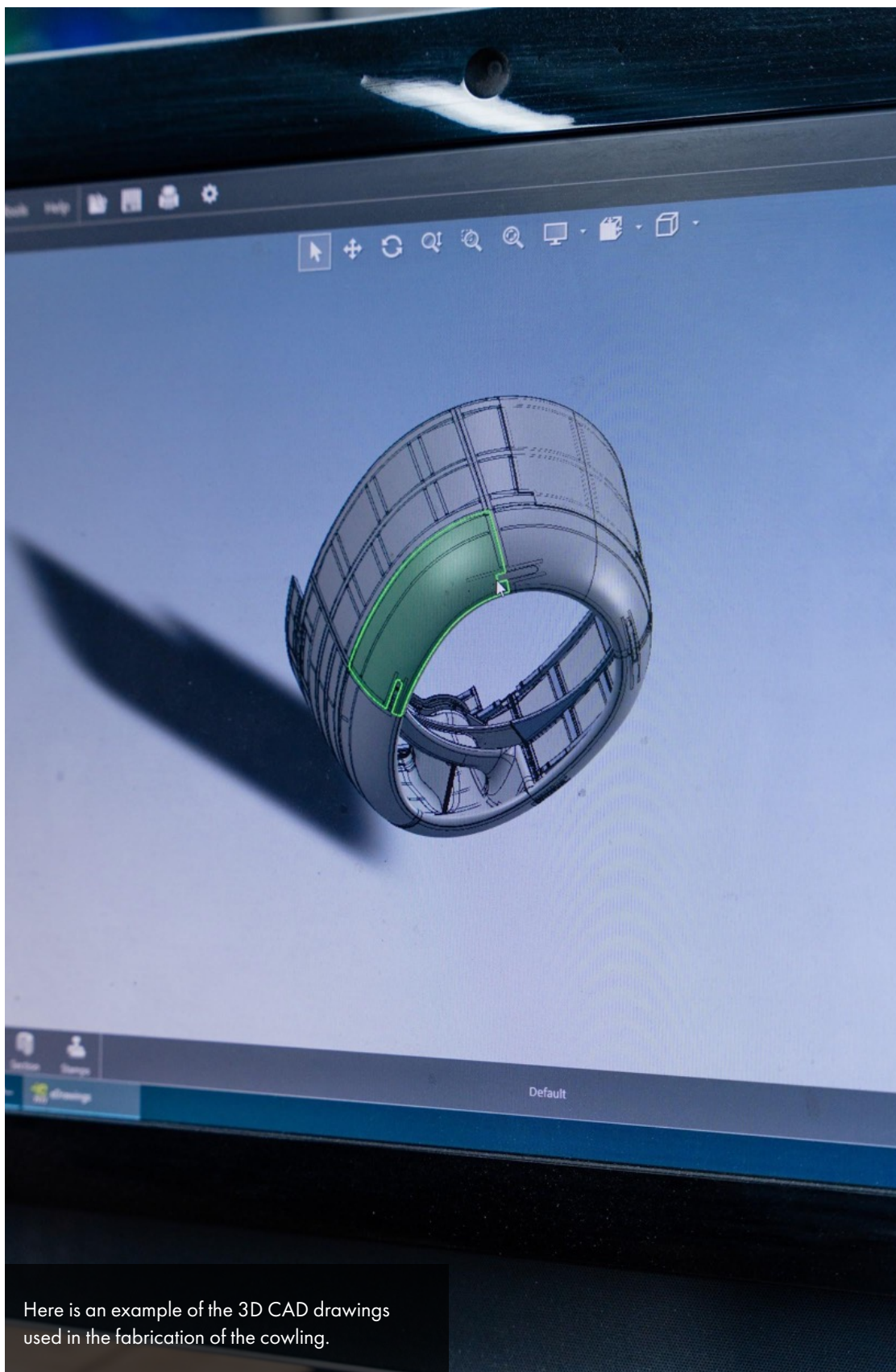
## Cowling

Mike's work on the cowling is progressing nicely.



Mike examines CAD drawings as he works on the cowling.





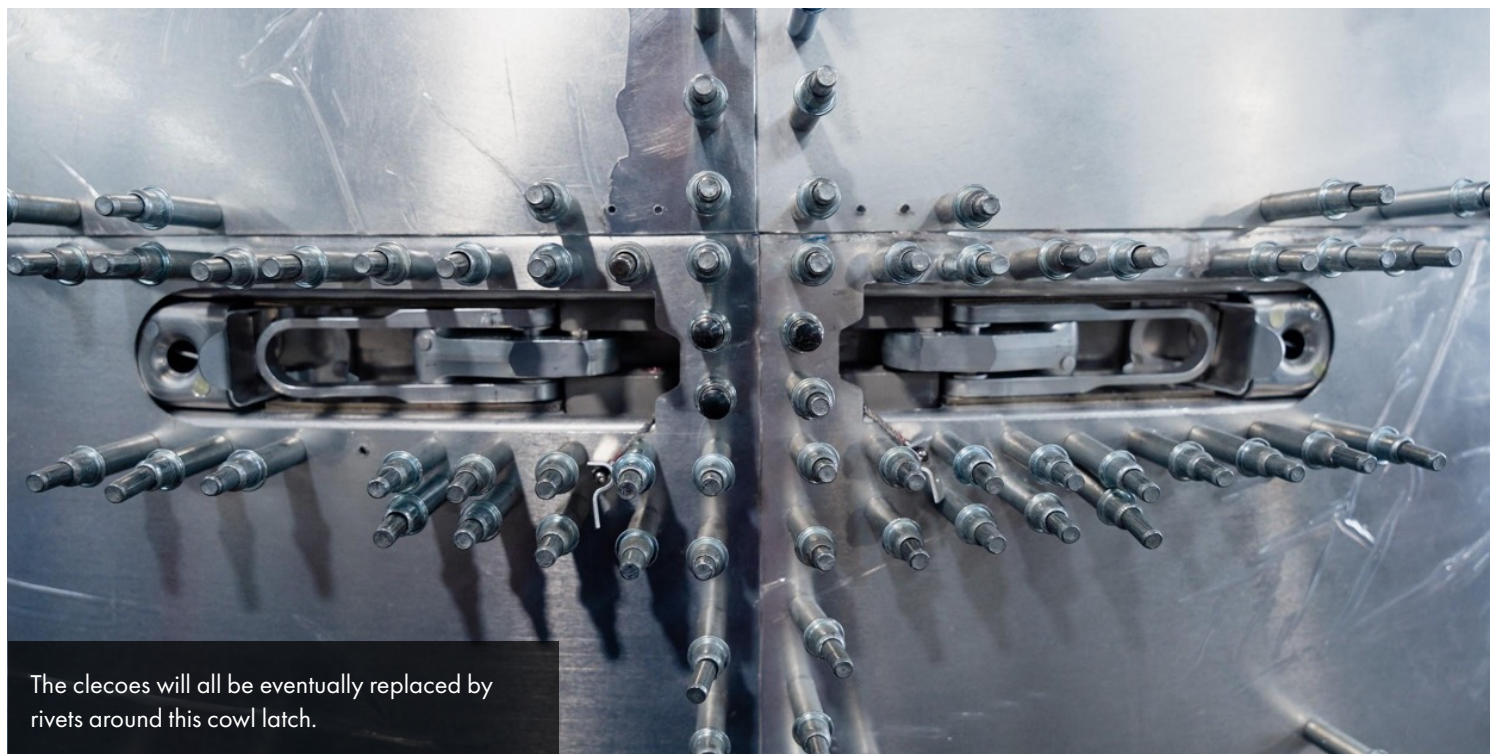
Here is an example of the 3D CAD drawings used in the fabrication of the cowl.



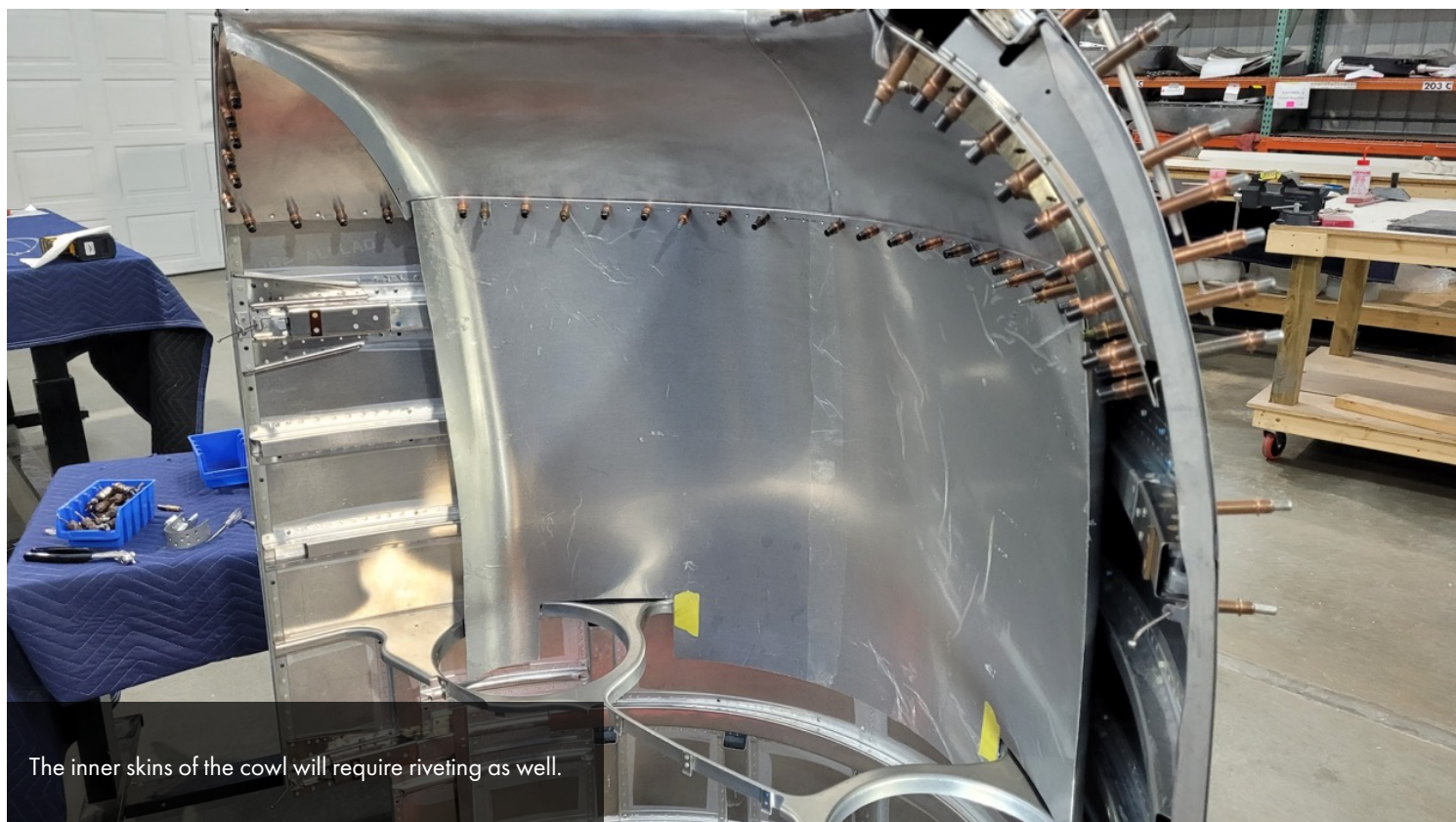


The number of clecoes required to hold the complexly curved cowl skins in place is truly remarkable.













## P-47 Bombing Tactics in the Pacific Theater



A variety of ordnance and delivery techniques were used by P-47 units in the Southwest Pacific.

### Glide Bombing

Glide bombing is a tactic that uses a reduced dive angle and power reduction to manage speed and still deliver the ordnance on target.

Experiments with the technique known as glide bombing began when pilots found that dive bombing in a P-47 wasn't very suitable. The problem with dive bombing was that the Thunderbolt gained too much speed. The excessive speed meant that the pilot had difficulty concentrating on his target because of fear of being unable to recover from the 60-degree dive necessary for acceptable accuracy. On aircraft specifically designed for dive bombing, speed is kept under control with dive brakes. In any dive of 60 degrees or steeper with no dive brakes, speed build up became unmanageable in the P-47. Another problem that arose with P-47 dive bombing was also related to the speed issue. At dive speeds over 325 to 350 mph, aileron buffeting occurred when the Thunderbolts carried 1000 wing bombs or 165 gallon wing tanks.<sup>1</sup>

<sup>1</sup>Tony Holmes, *Twelve to One, V Fighter Command Aces of the Pacific*, Osprey Publishing, Midland House, West Way, Botley, Oxford, UK 2004, p.79





165 gallon P-38 drop tanks are seen on these Thunderbolts. USAAF photo

However, the switch to glide bombing was not without difficulties. The disadvantage of glide bombing is that the aircraft is exposed to enemy ground fire for a longer period than in a steeper dive bombing attack.

According to Colonel Gwen G. Atkinson, commanding officer of the 58th Fighter Group from December 1942 until January 1945, in order to minimize losses to ground fire, it was necessary to begin the glide at no less than 15,000 feet, hold airspeed down to below 325 mph, release the bombs between 7,000 and 5,000 feet, and either head for the deck or recover sharply up and to one side.<sup>2</sup>

## Skip Bombing

Another bombing tactic that was used by Pacific Theater P-47s was skip bombing, where bombs were dropped from tree top or mast head altitude. The pilot would approach in a very shallow dive, keeping the speed at about 370 mph carrying a single 500 pound bomb, and under 325 if loaded with the aileron buffet inducing 1000 lb. bombs or 165 gallon wing tanks. As the P-47 approached the target, all eight 50 caliber guns would be fired, very effectively suppressing ground fire. Leveling off at about 50 feet and releasing the bomb load, the bombs would skip over the ground or water surface, allowing the ordnance to stay low enough to impact the side of a ship or building.

<sup>2</sup>Tony Holmes, *Twelve to One, V Fighter Command Aces of the Pacific*, Osprey Publishing, Midland House, West Way, Botley, Oxford, UK 2004, p.79





Preacher's Passion III, 39th Fighter Squadron, with 75-gallon centerline drop tank and cluster bombs

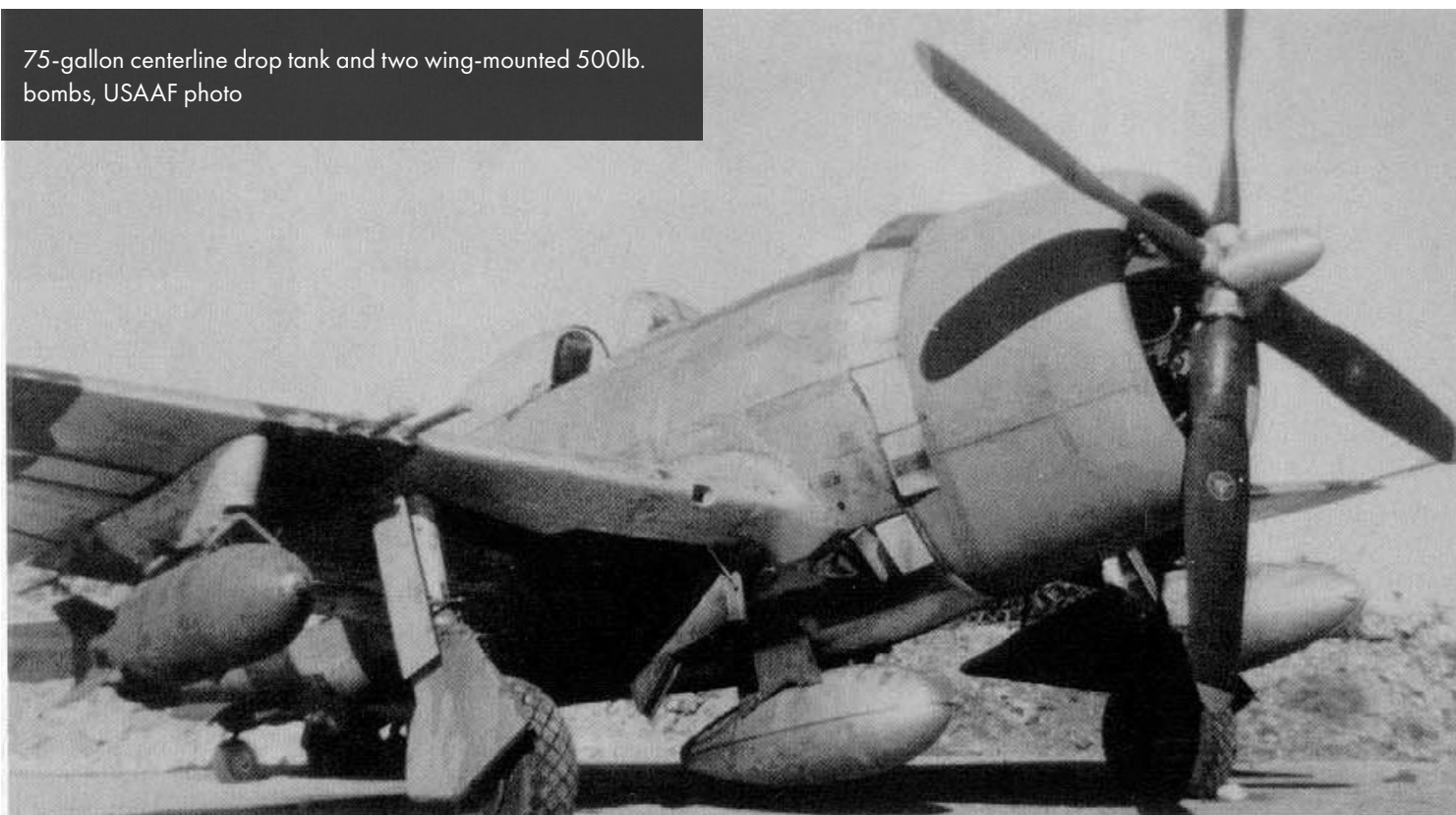


4.5-inch rocket tubes and 500lb. bombs. USAAF photo





75-gallon centerline drop tank and two wing-mounted 500lb. bombs, USAAF photo







500lb. bomb and paper 200 gallon centerline tank, USAAF photo

Lieutenant Colonel Willaim Banks (Deputy Commander of the 348th Fighter Group) described a skip bombing attack on shipping in *Fighter Combat Tactics in the Southwest Pacific* by Ray Merriam.

"A skip bombing target must be studied whenever possible before the mission, especially against shipping or other targets that may have heavy ack-ack."

"The attack should be made out of the sun when possible."

"When the target is sighted, each flight should pick a definite objective. Troop transports can easily be knocked out by two P-47s making a well-timed attack. Destroyers should be attacked by at least four planes."<sup>3</sup>

Lt. Col. Banks goes on to say that the approach should be in a fairly steep dive, leveling out in line abreast formation. Strafing should begin a little out of range to confuse and neutralize the enemy gunners. The bombs should be released at the pull-up point of the attack run.

<sup>3</sup> Ray Merriam, *Fighter Combat Tactics in the Southwest Pacific Area*, Merriam Press Bennington, Vermont, 2012.p. 86