PROFILE

Focke Wulf FW 190A

Editors

Nico Braas

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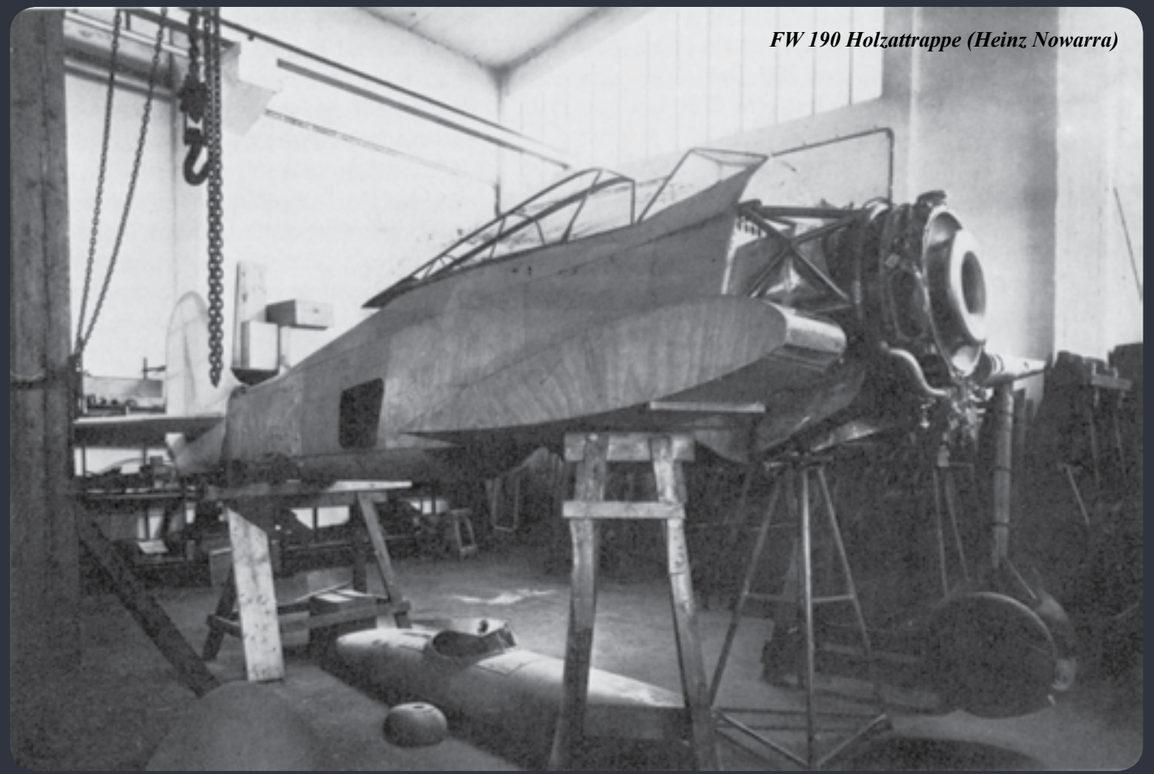
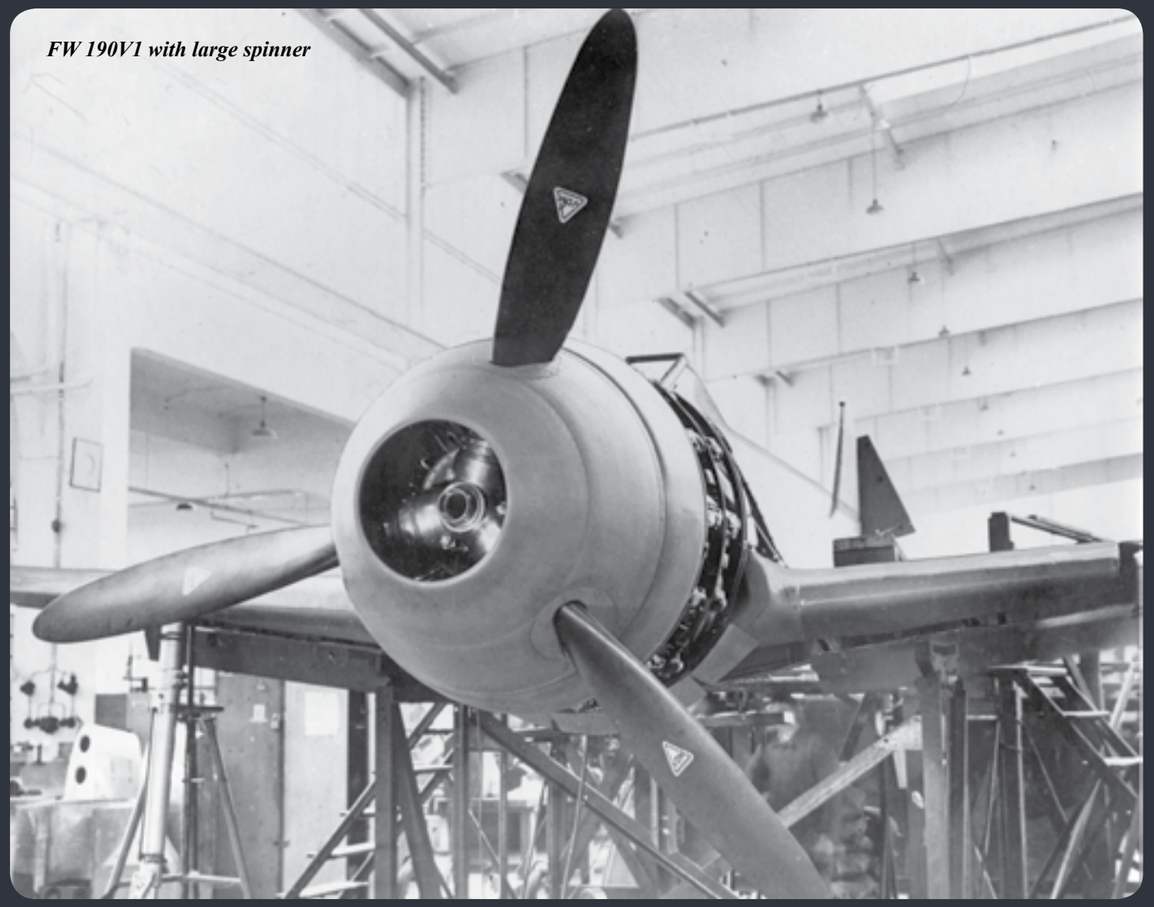
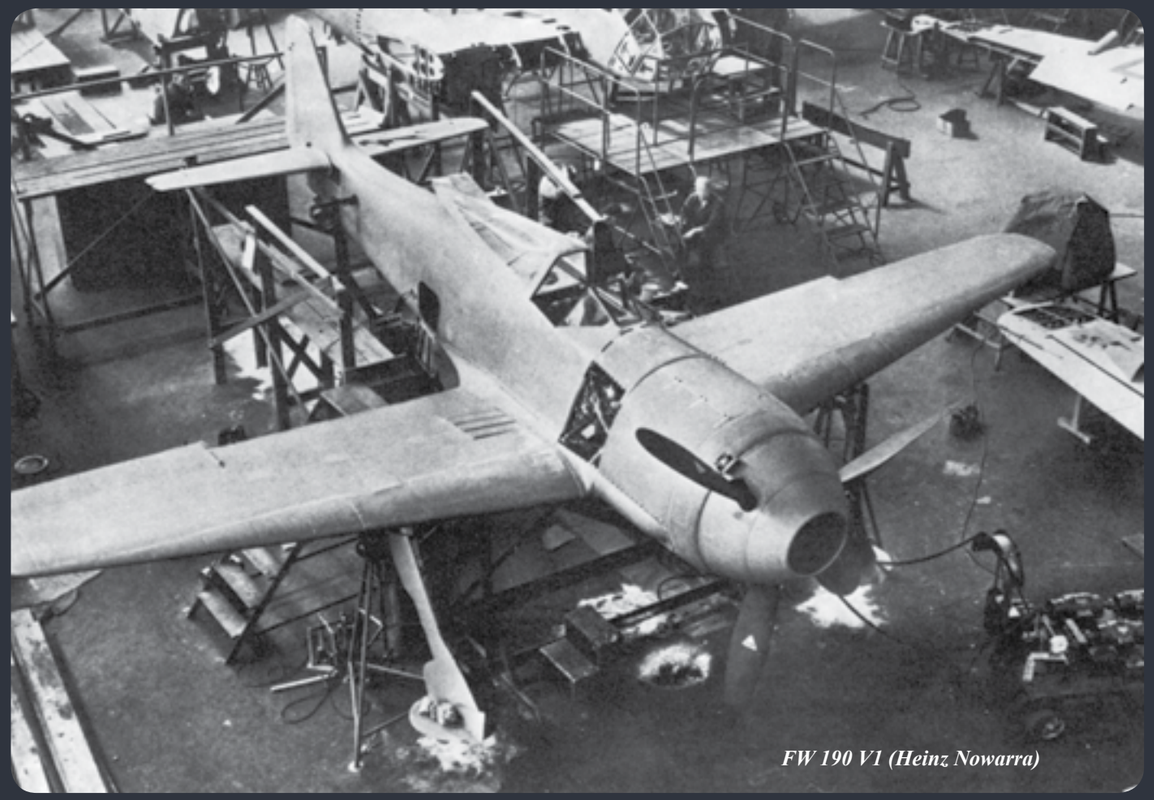


FW 190 Holzattrappe (Heinz Nowarra)



FW 190V1 with large spinner



FW 190 V1 (Heinz Nowarra)

The Focke-Wulf Fw 190 Würger (English: Shrike) was a German single-seat, single-engine fighter aircraft designed by Kurt Tank in the late 1930s and widely used during World War II. Along with its well-known counterpart, the Messerschmitt Bf 109, the Fw 190 became the backbone of the Luftwaffe's Jagdwaffe (Fighter Force). The twin-row BMW 801 radial engine that powered most operational versions enabled the Fw 190 to lift larger loads than the Bf 109, allowing its use as a day fighter, fighter-bomber, ground-attack aircraft and, to a lesser degree, night fighter.

The Fw 190A started flying operationally over France in August 1941, and quickly proved superior in all but turn radius to the Royal Air Force's main front-line fighter, the Spitfire Mk. V, especially at low and medium altitudes. The 190 maintained superiority over Allied fighters until the introduction of the improved Spitfire Mk. IX in July 1942. In November/ December 1942, the Fw 190 made its air combat debut on the Eastern Front, finding much success in the specialised ground attack units called Schlachtgeschwader (Battle Wings or Strike Wings) from October 1943 onwards, following the redesignation of all former Sturzkampfgeschwader dive-bomber wings at that time.

Though Soviet pilots considered the Bf 109 the greater threat, the Fw 190 and its pilots proved just as capable as the "lean" (to VVS pilots) inverted V-12 inline-powered Messerschmitt in aerial combat. In the opinion of German pilots who flew both, the Fw 190 provided increased firepower and manoeuvrability at low to medium altitude. Still, it never entirely replaced the Bf 109. The Fw 190A series' performance decreased at high altitudes (usually 6,000 m (20,000 ft) and above), which reduced its effectiveness as a high-altitude interceptor, but this problem was mostly rectified in later models, particularly in the Junkers Jumo 213 inline-engine Focke-Wulf Fw 190D series, which was introduced in September 1944 and restored relative parity with Allied opponents.

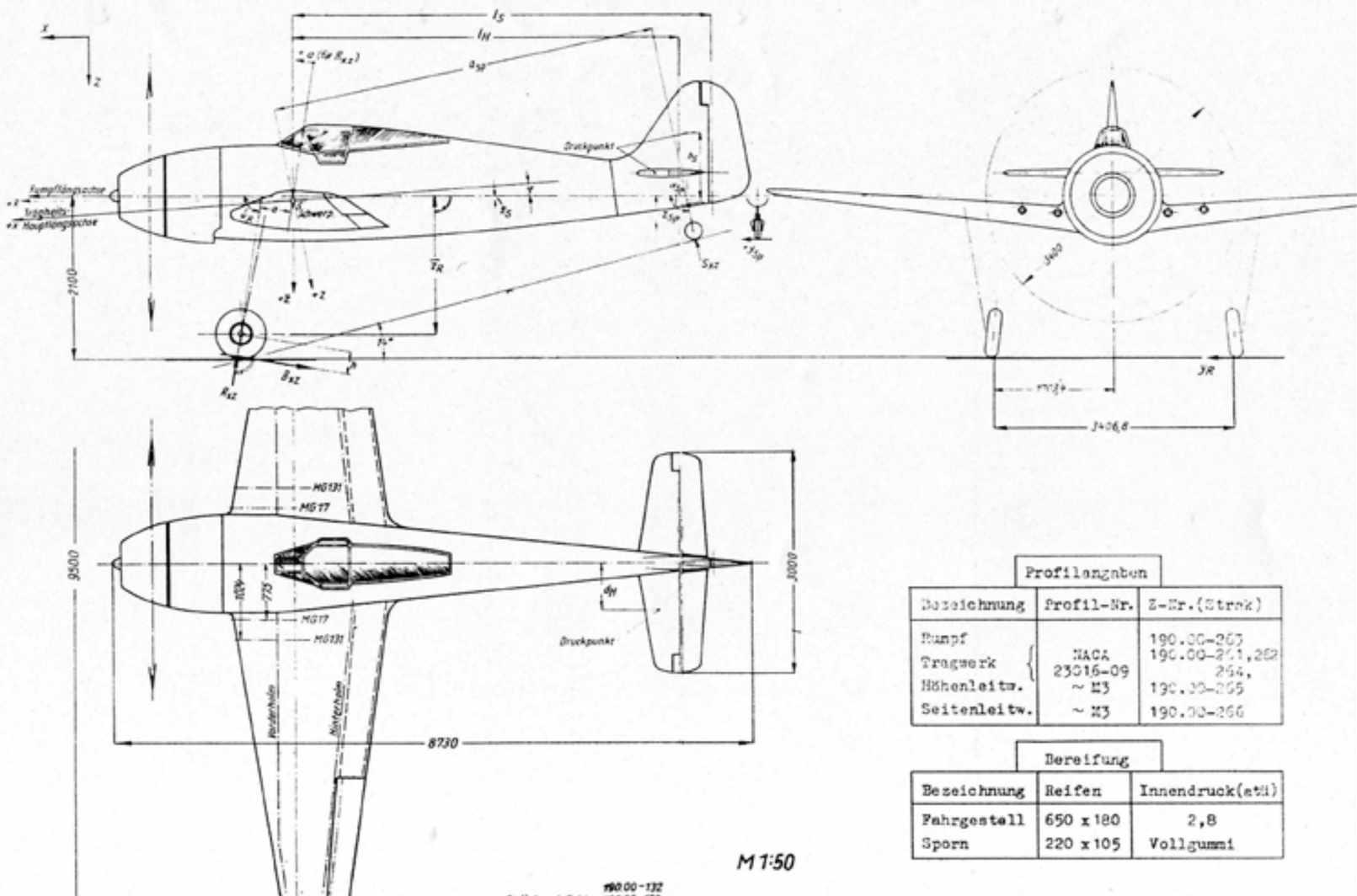
The Fw 190 was well-liked by its pilots. Some of the Luftwaffe's most successful fighter aces claimed a great many of their kills while flying it, including Otto Kittel, Walter Nowotny and Erich Rudorffer.

Early development

In autumn 1937, the German Ministry of Aviation asked various designers for a new fighter to fight alongside the Messerschmitt Bf 109, Germany's front line fighter. Although the Bf 109 was an extremely competitive fighter, the Ministry of Aviation was worried

FOCKE-WULF FLUGZEUGBAU G.m.b.H. BREMEN

Fw 190 V1



Profiltangaben		
Bezeichnung	Profil-Nr.	Z-Nr.(Strak)
Rumpf		190.00-203
Tragwerk	NACA 23016-09	190.00-201,202 204,
Höhenleitw.	~ M3	190.00-205
Seitenleitw.	~ M3	190.00-206

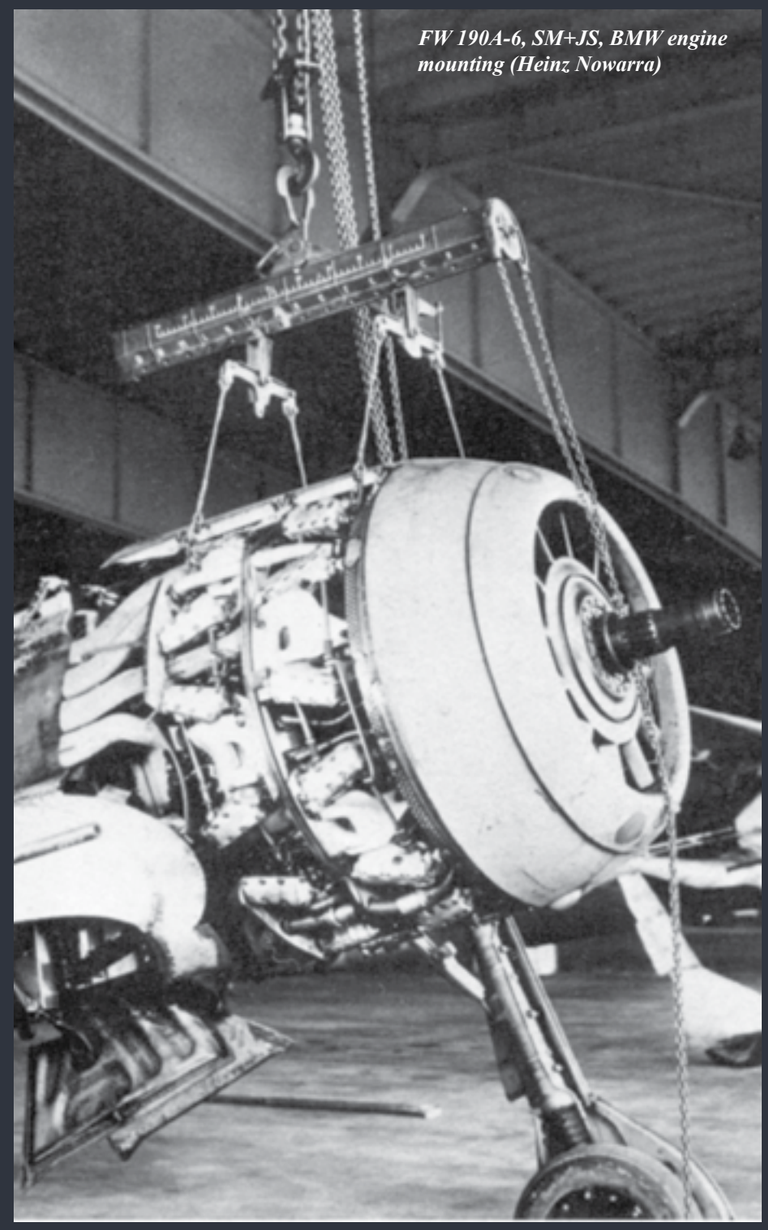
Bereifung		
Bezeichnung	Reifen	Innendruck(at)
Fahrgestell	650 x 180	2,8
Sporn	220 x 105	Vollgummi

190.00-132
angefertigt nach Zeichn. 190.00-138
190.00-139

28.9.38 / 24.11.39 Kurd. Sk. Nr. 13-190-2

FW 190A3, WNr130471, in flight, 1 Juni 1942 (Heinz Nowarra)

FW 190A-6, SM+JS, BMW engine mounting (Heinz Nowarra)



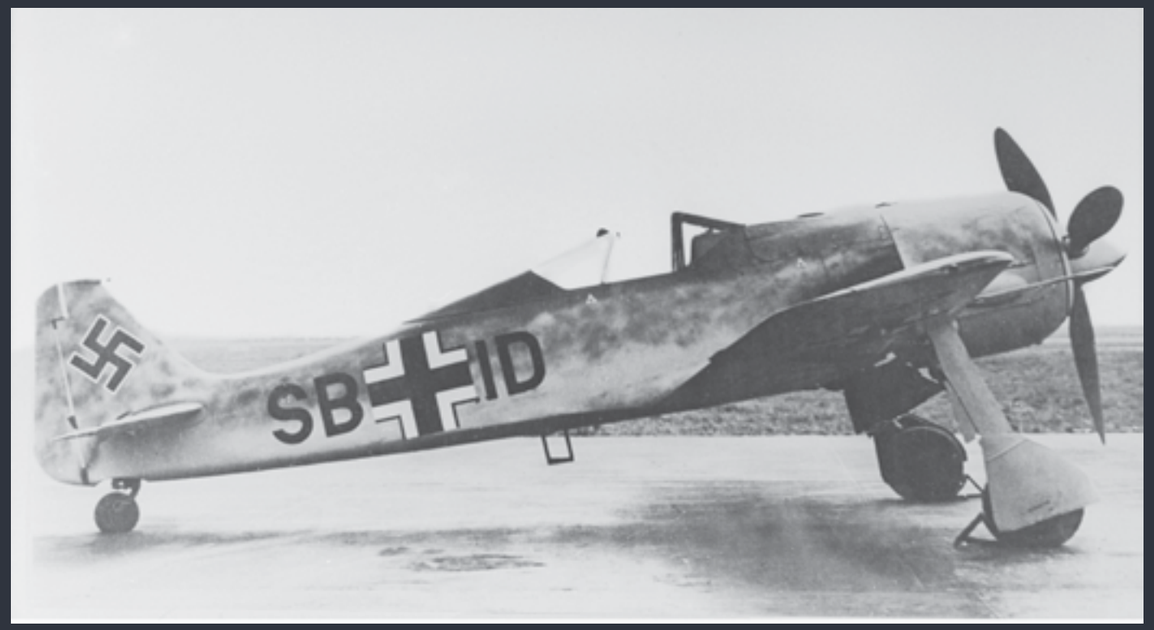
that future foreign designs might outclass it, and wanted to have new aircraft under development to meet these possible challenges.

Kurt Tank responded with a number of designs, most incorporating liquid-cooled inline engines. However, it was not until a design was presented using the air-cooled, 14-cylinder BMW 139 radial engine that the Ministry of Aviation's interest was aroused. As this design used a radial engine, it would not compete with the inline-powered Bf 109 for engines, when there were already too few Daimler-Benz DB 601s to go around. This was not the case for competing advanced designs like the Heinkel He 100 or Focke-Wulf Fw 187, where production would compete with the 109 or Messerschmitt Bf 110 for engine supplies. After the war, Tank denied a rumor that he had to "fight a battle" with the Ministry to convince them of the radial engine's merits.

Design concepts

At the time, the use of radial engines in land-based fighters was relatively rare in Europe, as it was believed that their large frontal area would cause too much drag on something as small as a fighter. Tank was not convinced of this, having witnessed the successful use of radial engines by the U.S. Navy, and felt a properly streamlined installation would eliminate this problem.

The hottest points on any air-cooled engine are the cylinder heads, located along the outside diameter of a radial engine. In order to provide sufficient air to cool the engine, airflow had to be maximized at this outer edge, which was normally accomplished by leaving



FW 190A-0, WNr0015, KB+PQ, during landing gear testing (Heinz Nowarra)

FW 190A-3 in final stage of assembly (Heinz Nowarra)

the majority of the front face of the engine open to the air. During the late 1920s, NACA led development of a dramatic improvement by placing an airfoil-shaped ring around the outside of the cylinder heads (the NACA cowling). The shaping accelerated the air as it entered the front of the cowl, increasing the total airflow, and allowing the opening in front of the engine to be made smaller.

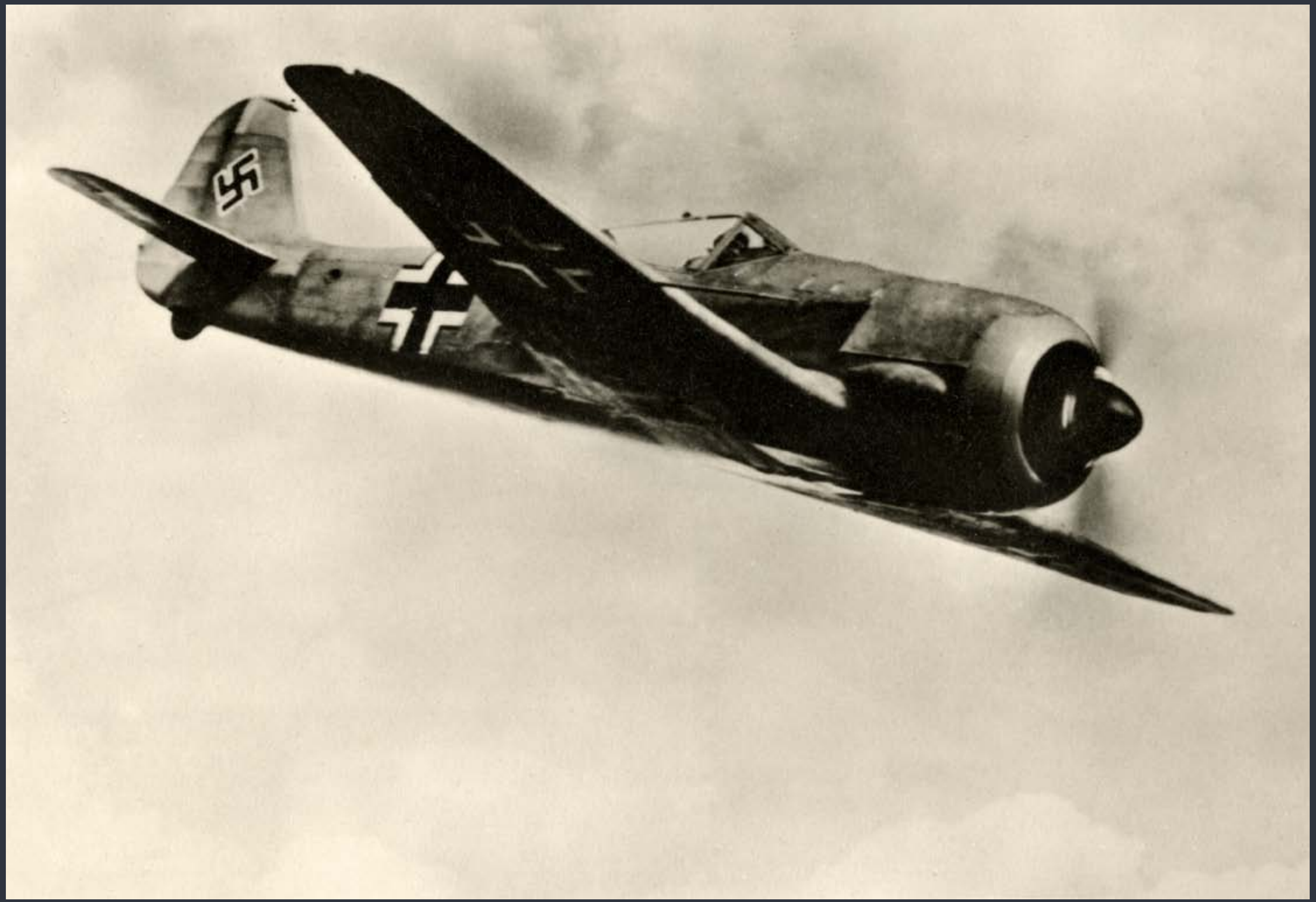
Tank introduced a further refinement to this basic concept. He suggested placing most of the airflow components on the propeller, in the form of a oversized propeller spinner whose outside diameter was the same as the engine. The cowl around the engine proper was greatly simplified, essentially a basic cylinder. Air entered through a small hole at the centre of the propeller, and was directed through ductwork in the spinner so it was blowing rearward along the cylinder heads. To provide enough airflow, a cone was placed in the centre of the hole, over the propeller hub, which was intended to compress the airflow and allow a smaller opening to be used. In theory, the tight-fitting cowling also provided some thrust due to the compression and heating of air as it flowed through the cowling.

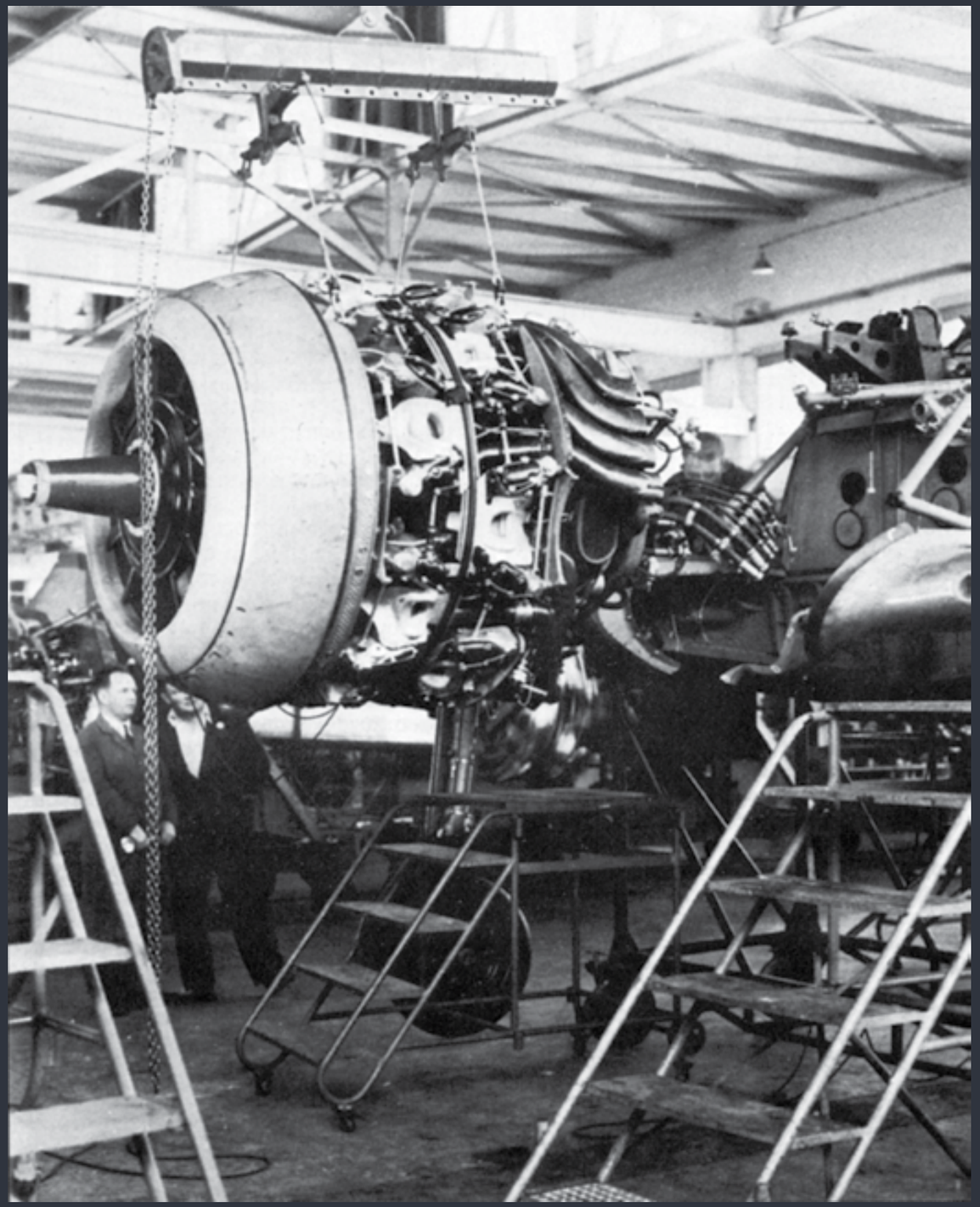
As to the rest of the design philosophy, Tank wanted something more than an aircraft built only for speed. Tank outlined the reasoning:

The Messerschmitt 109 and the British Spitfire, the two fastest fighters in world at the time we began work on the Fw 190, could both be summed up as a very large engine on the front of the smallest possible airframe; in each case armament had been added almost as an afterthought. These designs, both of which admittedly proved successful, could be likened to racehorses: given the right amount of pampering and easy course, they could outrun anything. But the moment the going became tough they were liable to falter. During World War I, I served in the cavalry and in the infantry. I had seen the harsh conditions under which military equipment had to work in wartime. I felt sure that a quite different breed of fighter would also have a place in any future conflict: one that could operate from ill-prepared front-line airfields; one that could be flown and maintained by men who had received only short training; and one that could absorb a reasonable amount of battle damage and still get back. This was the background thinking behind the Focke-Wulf 190; it was not to be a racehorse but a Dienstpferd, a cavalry horse.

One of the main features of the Fw 190 was its wide-tracked, inwards-retracting landing gear, designed to withstand a sink rate of 4.5 meters per second , double the strength factor usually required. Hydraulic wheel brakes were used. The wide-track landing gear produced better ground handling characteristics, and the Fw 190 suffered fewer ground accidents than the Bf 109 with its narrow-track, outwards-retracting landing gear hinged on its wing root structure. The retractable tail gear used a cable, which was guided over a set of pulleys located in the vertical fin, to pull the oleo strut upwards into the lower fuselage. On some versions of the Fw 190 an extended oleo strut could be fitted for larger-sized loads (such as bombs or even a torpedo) beneath the fuselage.

Most aircraft of the era used cables and pulleys to operate their controls. The cables tended to stretch, resulting in the sensations





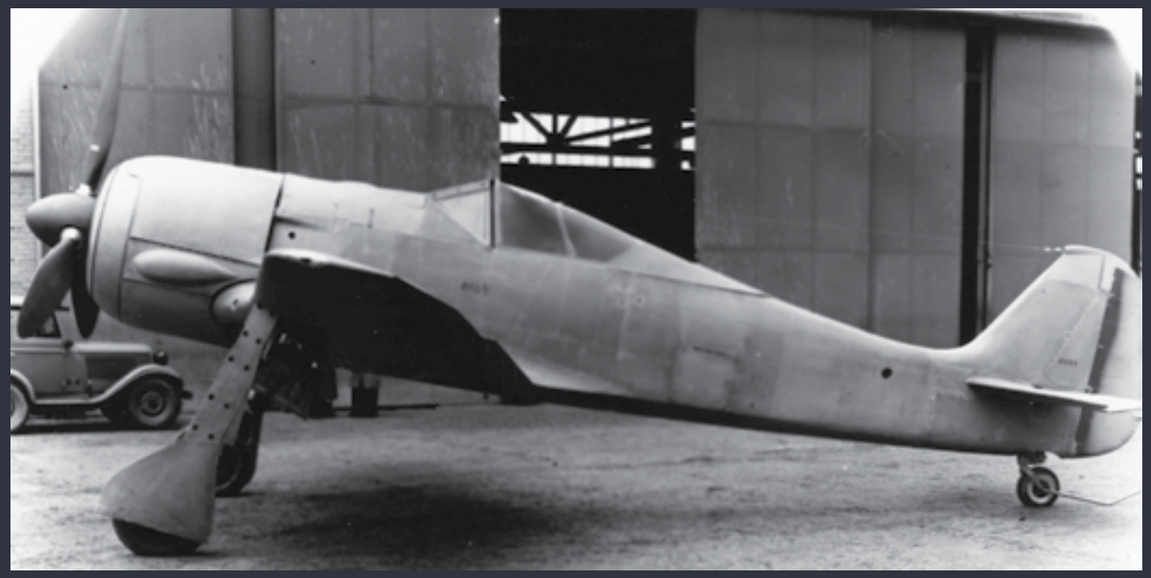
of "give" and "play" that made the controls less crisp and responsive, and required constant maintenance to correct. For the new design, the team replaced the cables with rigid pushrods and bearings to eliminate this problem. Another innovation was making the controls as light as possible. The maximum resistance of the ailerons was limited to 3.6 kg as the average man's wrist could not exert a greater force. The empennage (tail assembly) featured relatively small and well-balanced horizontal and vertical surfaces.

The design team also attempted to minimize changes in the aircraft's trim at varying speeds, thus reducing the pilot's workload. They were so successful in this regard that they found in-flight-adjustable aileron and rudder trim tabs were not necessary. Small, fixed tabs were fitted to control surfaces and adjusted for proper balance during initial test flights. Only the elevator trim needed to be adjusted in flight (a feature common to all aircraft). This was accomplished by tilting the entire horizontal tailplane with an electric motor, with an angle of incidence ranging from -3° to +5°.

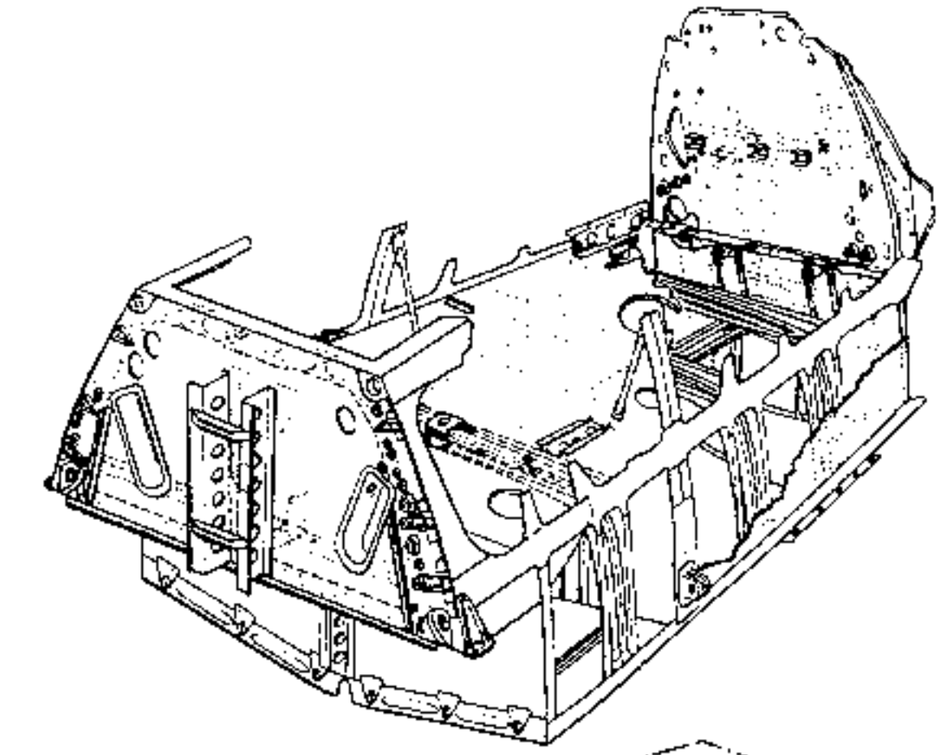
Another aspect of the new design was the extensive use of electrically powered equipment instead of the hydraulic systems used by most aircraft manufacturers of the time. On the first two prototypes, the main landing gear was hydraulic. Starting with the third prototype, the undercarriage was operated by push buttons controlling electric motors in the wings, and was kept in position by electric up and down-locks. The armament was also loaded and fired electrically. Tank believed that service use would prove that electrically powered systems were more reliable and more rugged than hydraulics, electric lines being much less prone to damage from enemy fire.

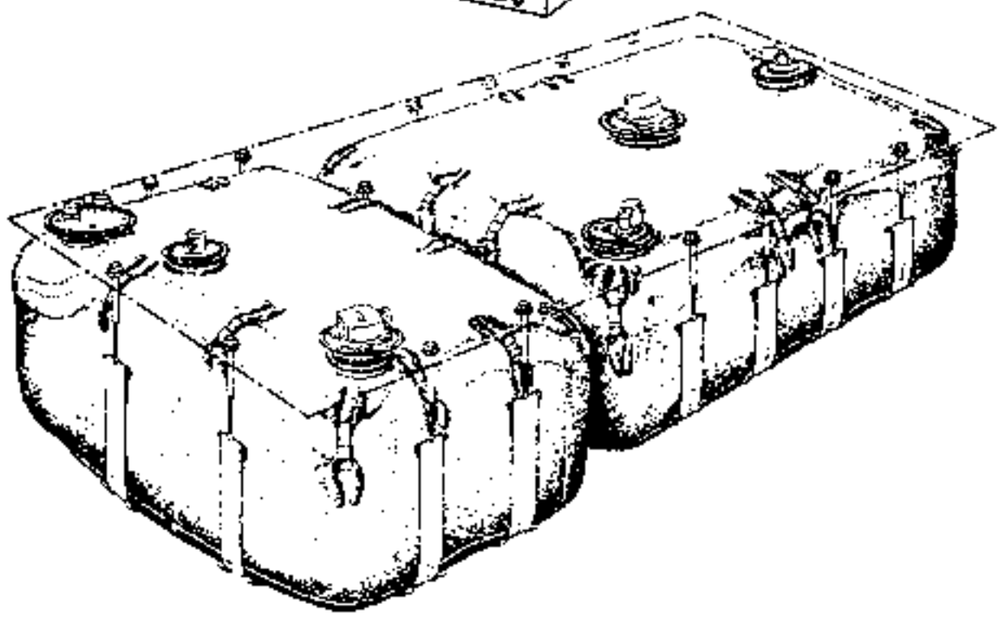
As was the case for the 109, the 190 featured a fairly small wing planform with relatively high wing loading. This presents a trade-off in performance; an aircraft with a smaller wing suffers less drag in most flight and therefore flies faster and may have better range. However, it also means the wing cannot generate extra lift as easily, which is needed for maneuvering or flight at high altitudes. The wings spanned 9.5 m and had an area of 15 m² . The wing was designed using the NACA 23015.3 airfoil at the root and the NACA 23009 airfoil at the tip.

Earlier designs generally featured canopies consisting of small plates of perspex in a metal framework, and the fuselage running horizontally back from the top of the canopy frame. This design considerably limited visibility, especially to the rear. The introduction of vacuum forming led to the creation of the "bubble canopy" which was largely self-supporting, and could be mounted over the cockpit, offering greatly improved all-round views. Tank's new design included a canopy that used only a single perimeter frame — with only a single short centerline seam frame forward of the radio antenna fitting atop the canopy's highest point — where the three-panel windscreen and forward edge of the canopy met, just in front of the pilot.

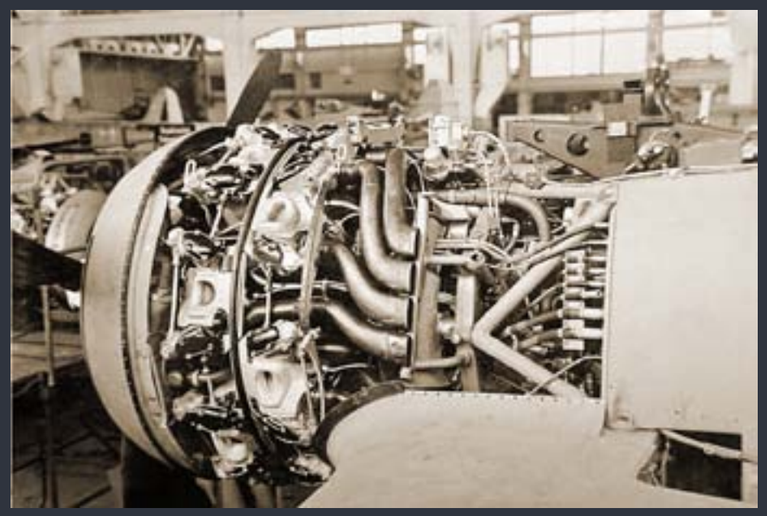


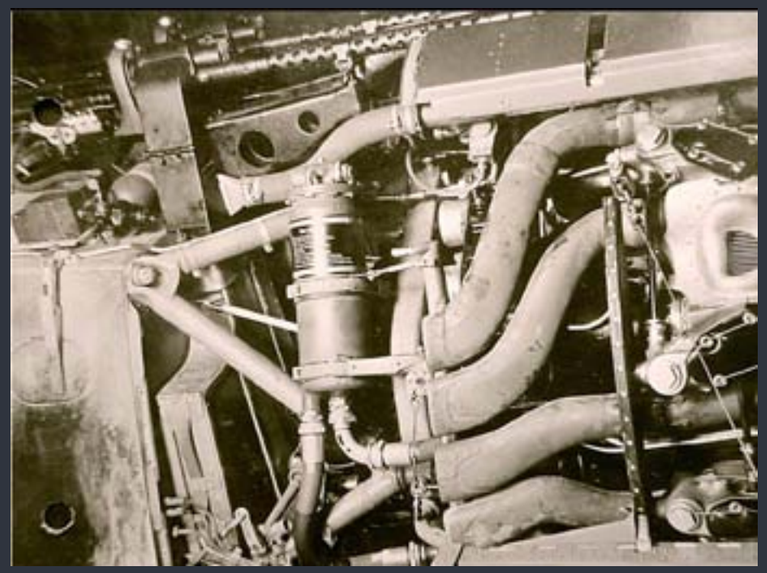
Variants





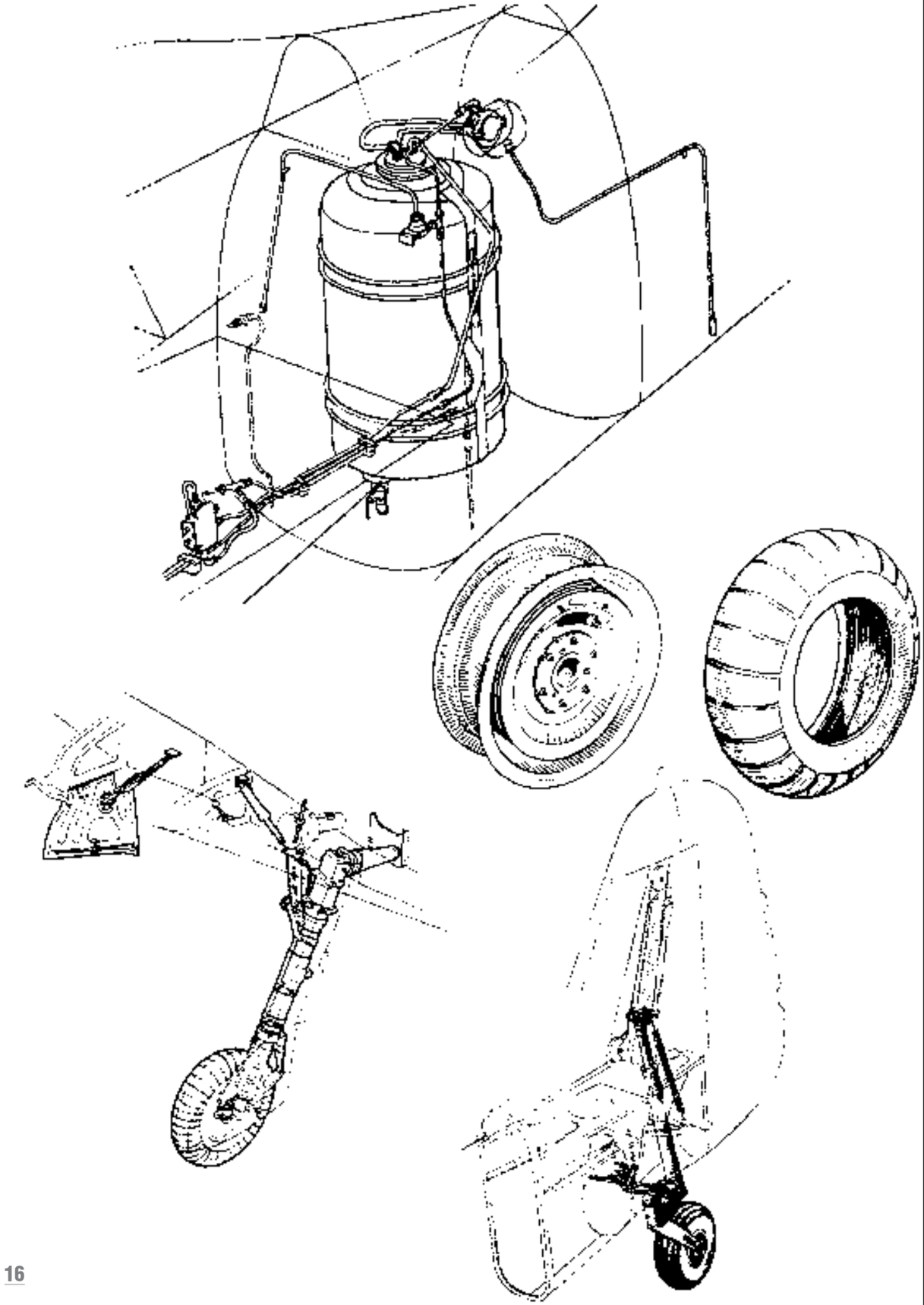
First prototypes





The first prototype, the Fw 190 V1 (civil registration D-OPZE), powered by a 1,529 hp, BMW 139 14-cylinder two-row radial engine, first flew on 1 June 1939. It soon showed exceptional qualities for such a comparatively small aircraft, with excellent handling, good visibility and speed (initially around 610 km/h . The roll rate was 162° per second at 410 km/h, but the aircraft had a high stall speed of 205 km/h . The cockpit, located directly behind the engine, quickly became uncomfortably hot. During the first flight, the temperature reached 55 °C, after which Focke Wulf's chief test pilot, Hans Sander commented, "It was like sitting with both feet in the fireplace." Flight tests soon showed that the expected benefits of Tank's cooling design did not materialize, so after the first few flights, this arrangement was replaced by a smaller, more conventional spinner that covered only the hub of the three-blade VDM propeller. In an attempt to increase airflow over the tightly cowled engine, a 10-blade fan was fitted at the front opening of the redesigned cowling and was geared to be driven at 3.12 times faster than the propeller shaft's speed. This quickly became standard on the Fw 190 and nearly all other German aircraft powered by the BMW 801.[3] In this form the V1 first flew on 1 December 1939, having been repainted with the Luftwaffe's Balkenkreuz and with the Stammkennzeichen (factory code) RM+CA.

The Fw 190 V2, designated with the Stammkennzeichen alphabetic ID code of FL+OZ (later RM+CB) first flew on 31 October 1939 and was equipped from the outset with the new spinner and cooling fan. It was armed with one Rheinmetall-Borsig 7.92 mm MG 17 machine gun and one 13 mm synchronized MG 131 machine gun in each wing



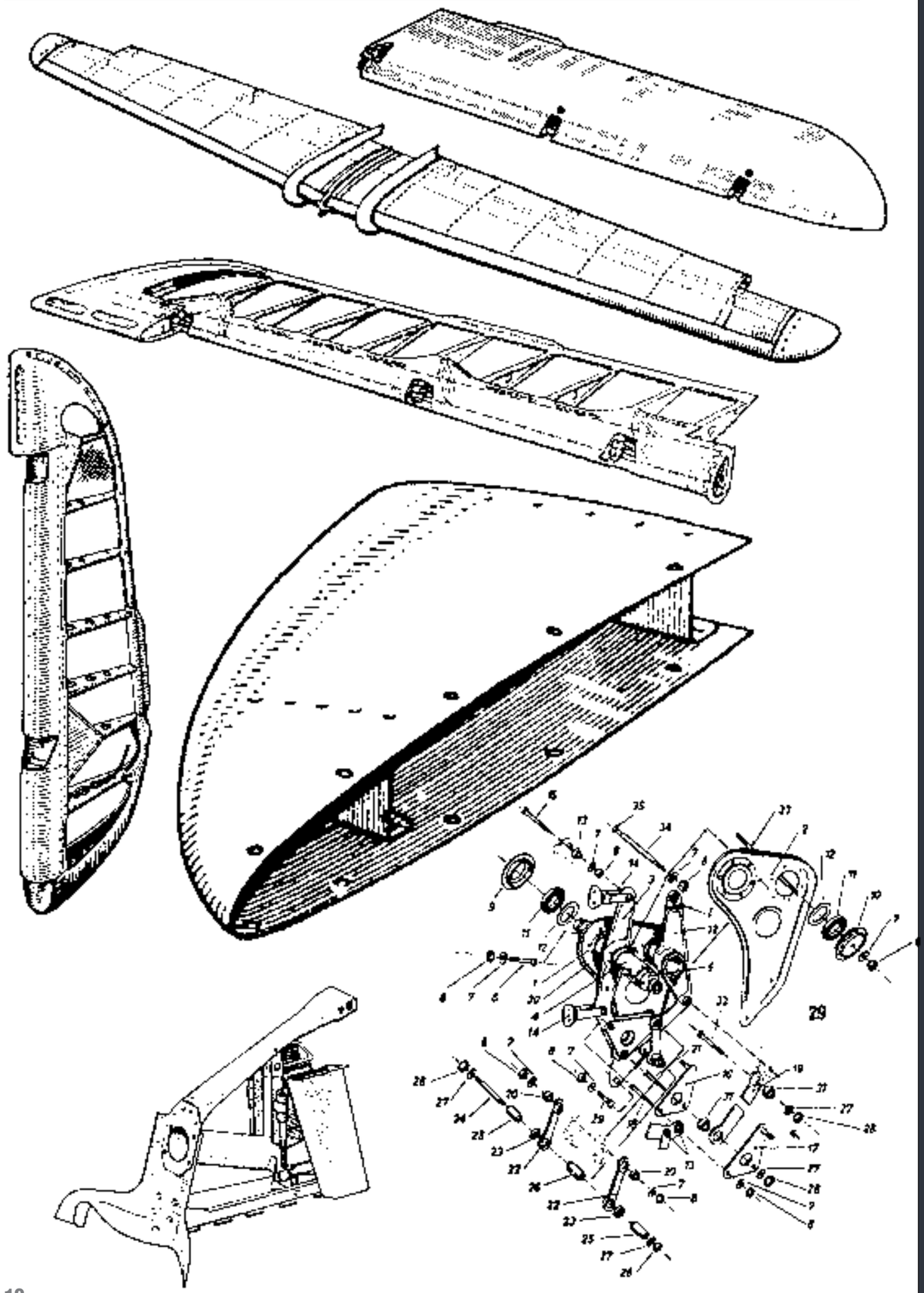
root.

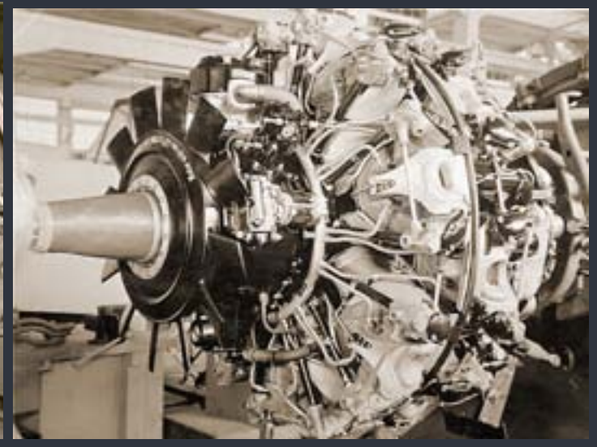
Later prototypes, BMW 801

Even before the first flight of the Fw 190 V1, BMW was bench testing a larger, more powerful 14-cylinder two-row radial engine, the BMW 801. This engine introduced a pioneering example of an engine management system called the Kommandogerät (command-device): in effect, an electro-mechanical computer which set mixture, propeller pitch (for the constant speed propeller), boost, and magneto timing. This reduced the pilot's work load to moving the throttle control only, with the rest of the associated inputs handled by the Kommandogerät. The drawback was slight and minor surges that made the Fw 190 harder to fly in close formations. Tank asserted the device did not work well.

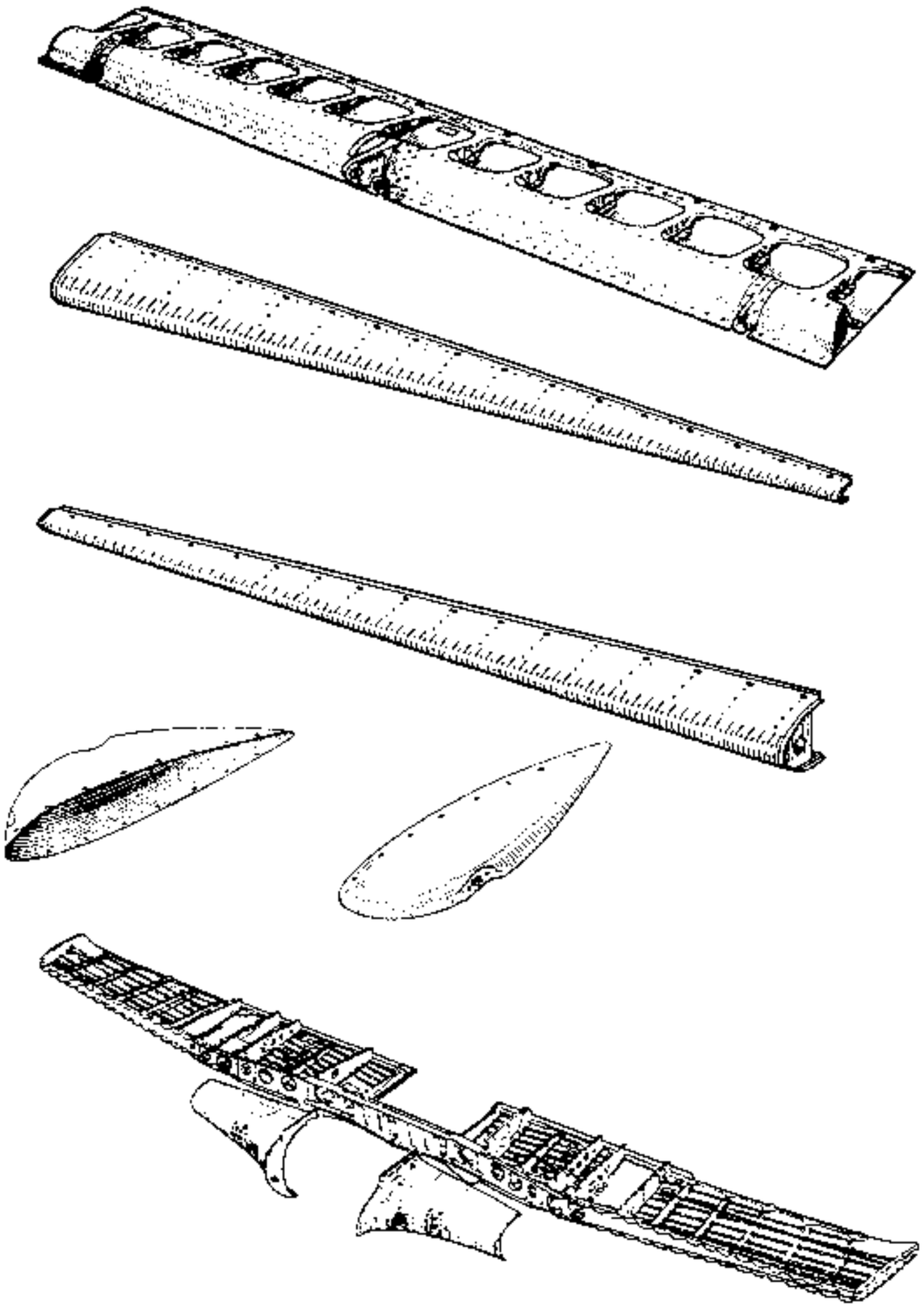
Another problem was the violent switching in of the high gear of the supercharger as the aircraft climbed. During a test flight, Tank carried out a loop at medium altitude. Just as he was nearing the top of the loop, at 2,650 m, the supercharger's high gear kicked in with a jerk. The Fw 190 was on its back, with little airspeed. The sudden change in torque hurled the aircraft into a spin. Tank's artificial horizon toppled (the cause is not explained). Although Tank did not know whether he was in an upright or inverted spin, he managed to recover after a loss of altitude. The rough transition was smoothed out and the supercharger's gear-change could engage without incident.

The RLM convinced Focke-Wulf and BMW to abandon the 139 engine in favour of the new engine. The BMW 801 engine was similar in diameter to the 139, although it was heavier and longer by a considerable margin. This required Tank to redesign the Fw 190, and





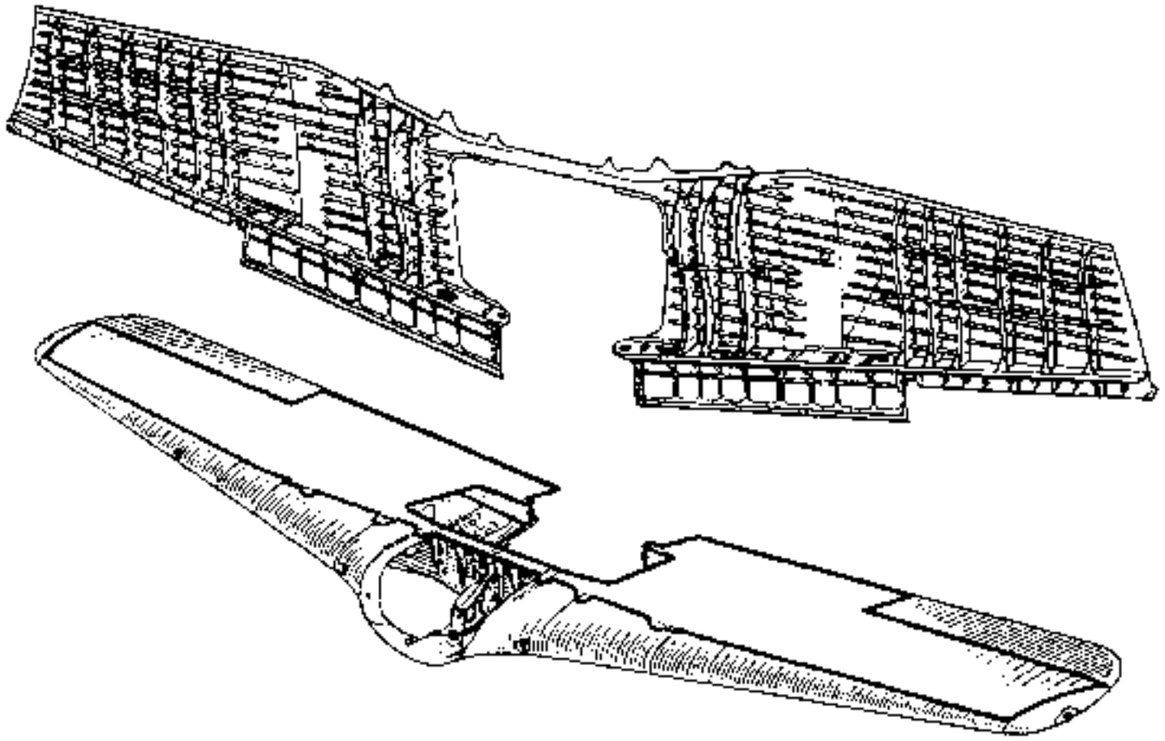
resulted in the abandonment of the V3 and V4. The V5 became the first prototype with the new engine, being fitted with the 1,539 hp, BMW 801 C-0. Much of the airframe was strengthened and in order to balance the heavier engine, the cockpit was moved back in the fuselage and the engine mounted on longer struts. This had the side-effect of reducing the troubles with high temperatures and for the first time provided space for nose armament. It also reduced visibility in nose-high attitudes, notably when taxiing on the ground. A 12-blade cooling fan replaced the earlier 10-blade unit, and was likewise installed in front of the engine's reduction gear housing, still running with the original 3.12:1 reduction ratio, which was standardised for BMW-powered Fw 190s. The propeller shaft passed through the fan's central plate, which was made of cast magnesium. The fan provided cooling air not only for the engine cylinders' fins, but also for the BMW-designed annular oil cooler, which was located in the forward part of the cowling, likewise designed by the engine firm and used on all BMW 801-powered aircraft as part of the later "unitized" Kraftei engine mounting concept. The oil cooler was protected by an armoured ring which made up the front face of the cowling. A small hole in the centre of the spinner also directed airflow to ancillary components. Even with the new engine and the cooling fan, the 801

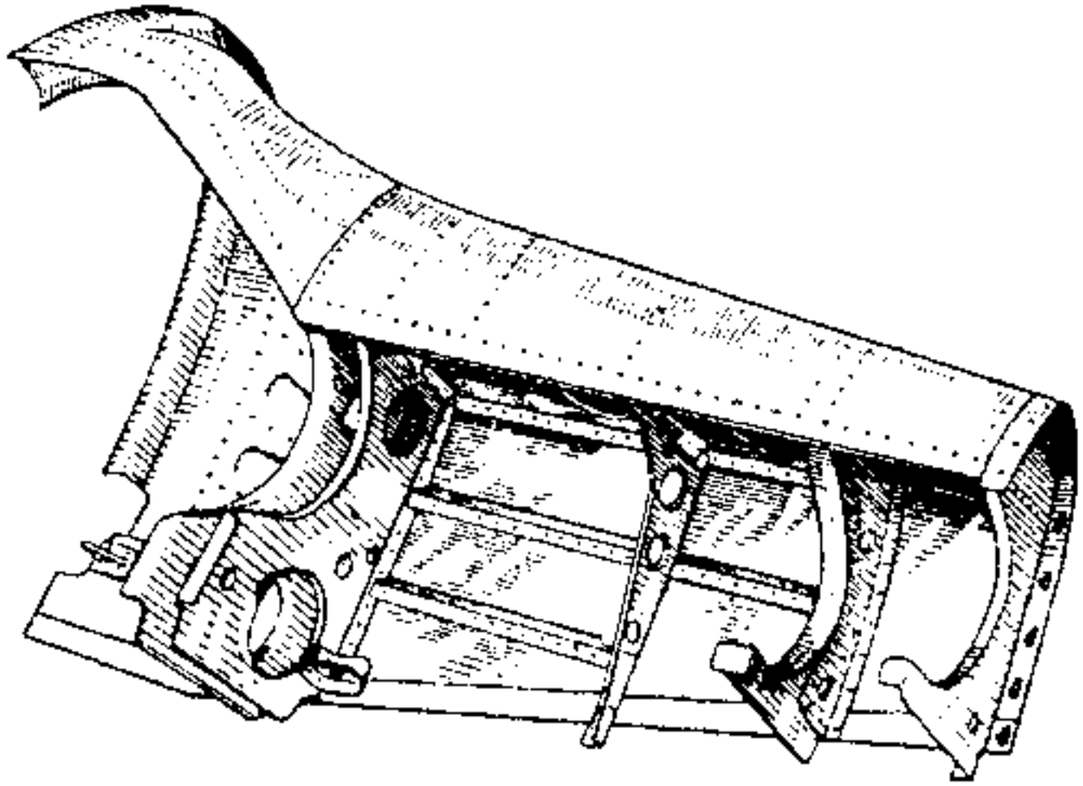


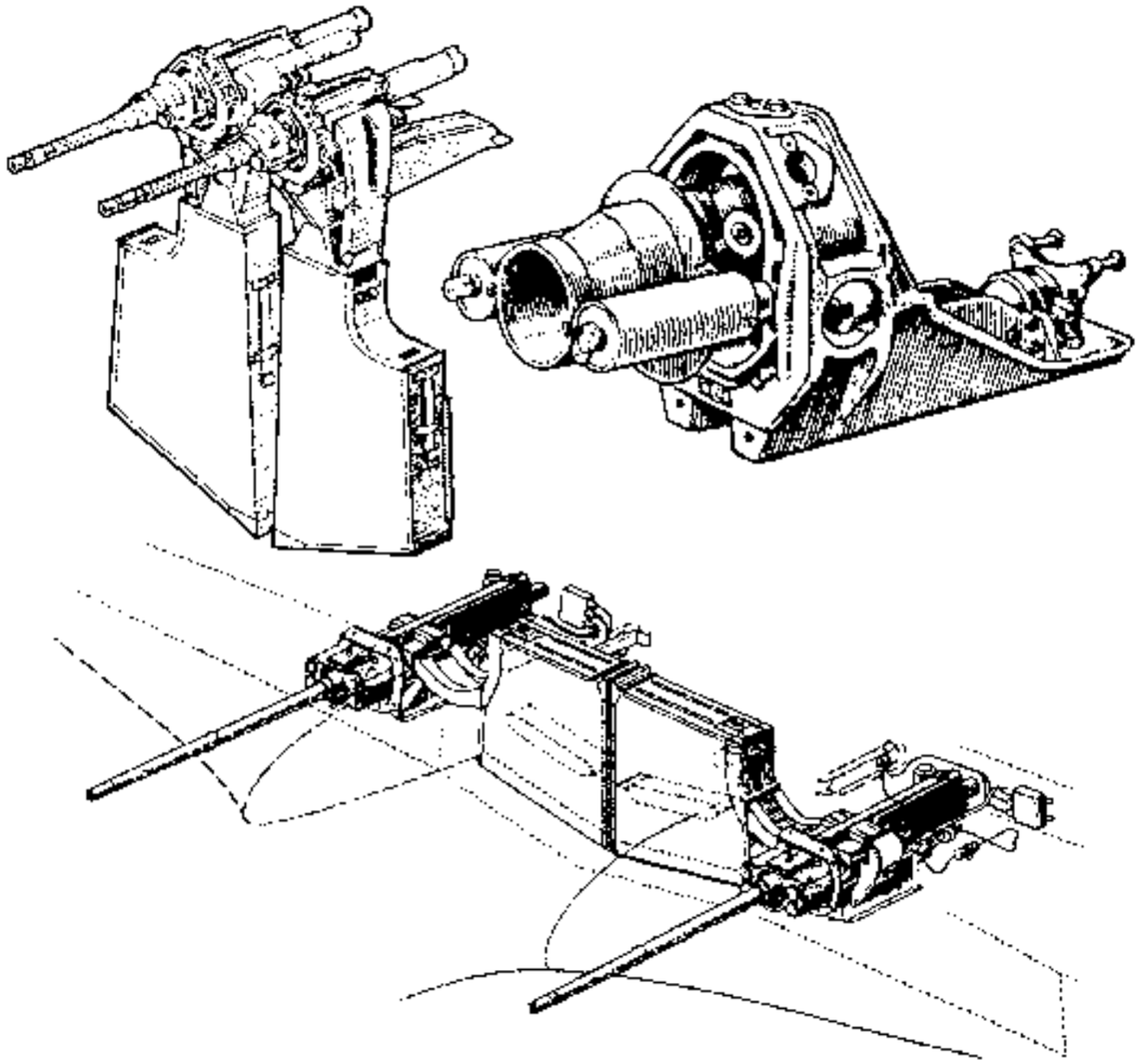
suffered from high rear-row cylinder head temperatures, which in at least one case resulted in the detonation of the fuselage-mounted MG 17 ammunition.

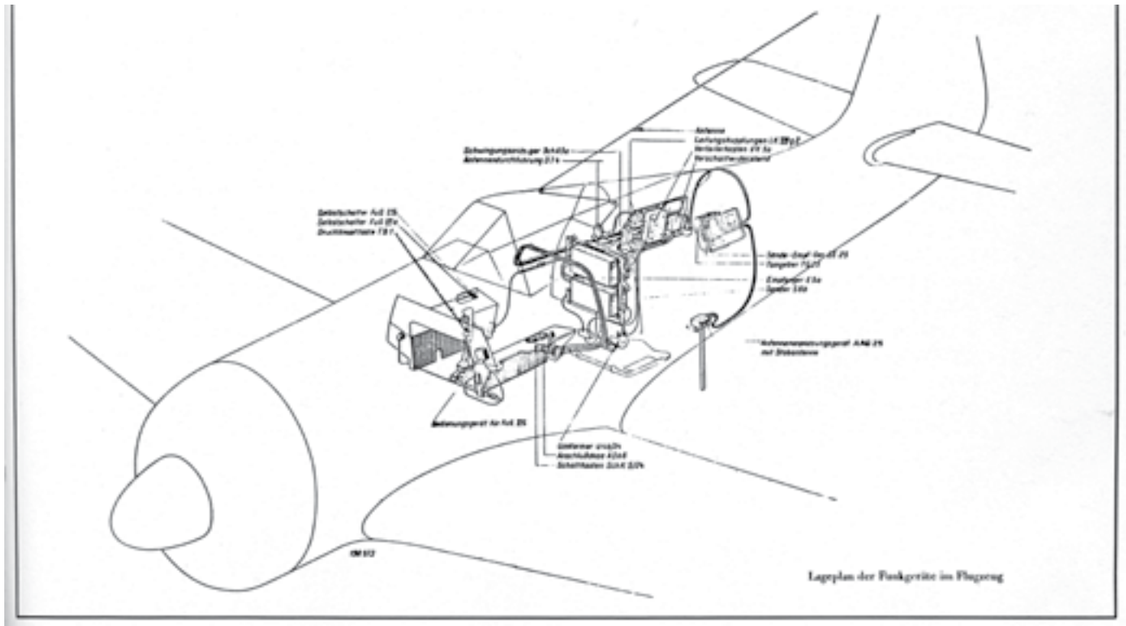
The vertical tail shape was also changed and the rudder tab was replaced by a metal trim strip adjustable only on the ground. New, stiffer undercarriage struts were introduced, along with larger diameter wheels. The retraction mechanism was changed from hydraulic to electrically powered, which became a hallmark of later Focke-Wulf aircraft system designs, and new strut door fairings of a simplified design were fitted to the legs. Another minor change was that the rearmost sections of the sliding canopy were redesigned by replacing the plexiglas glazing with duralumin panels. As this section was behind the pilot's seat, there was little visibility lost.

At first, the V5 used the same wings as the first two prototypes, but to allow for the larger tires, the wheelwells were enlarged by moving forward part of the leading edge of the wing root; the wing area became 15.0 m² . The V5 first flew in the early spring of 1940. The weight increase with all of the modifications was substantial, about 635 kg, leading to higher wing loading and a deterioration in





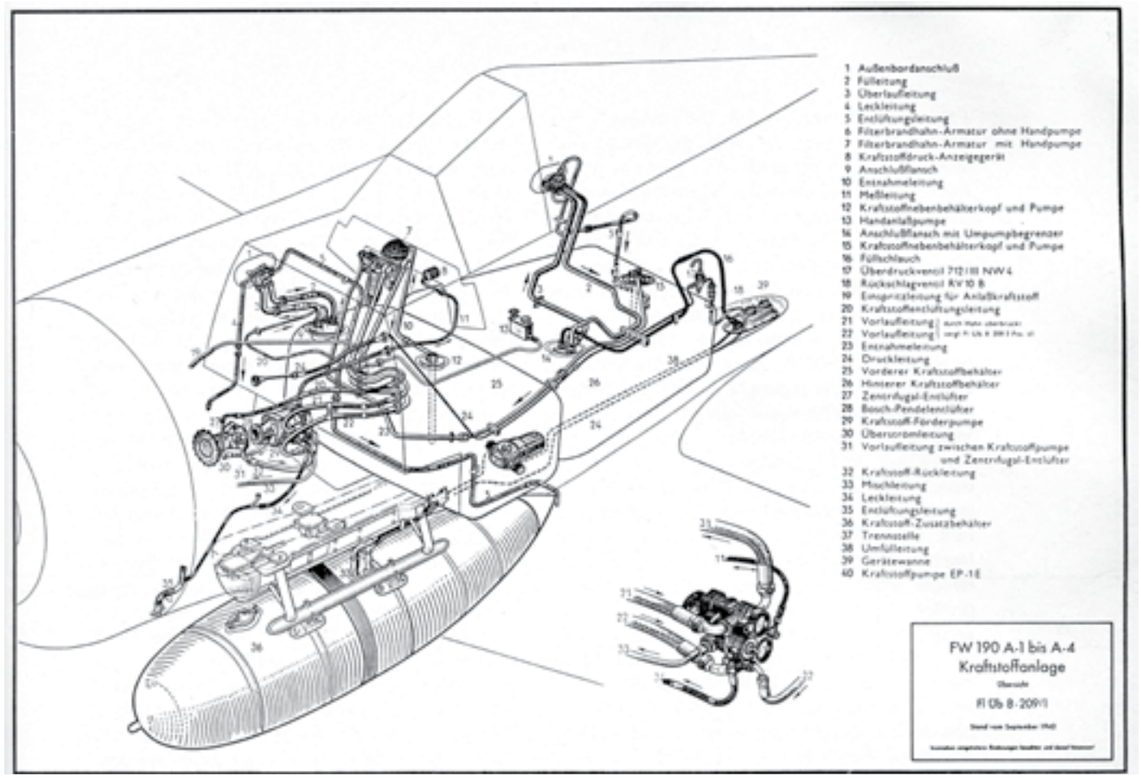


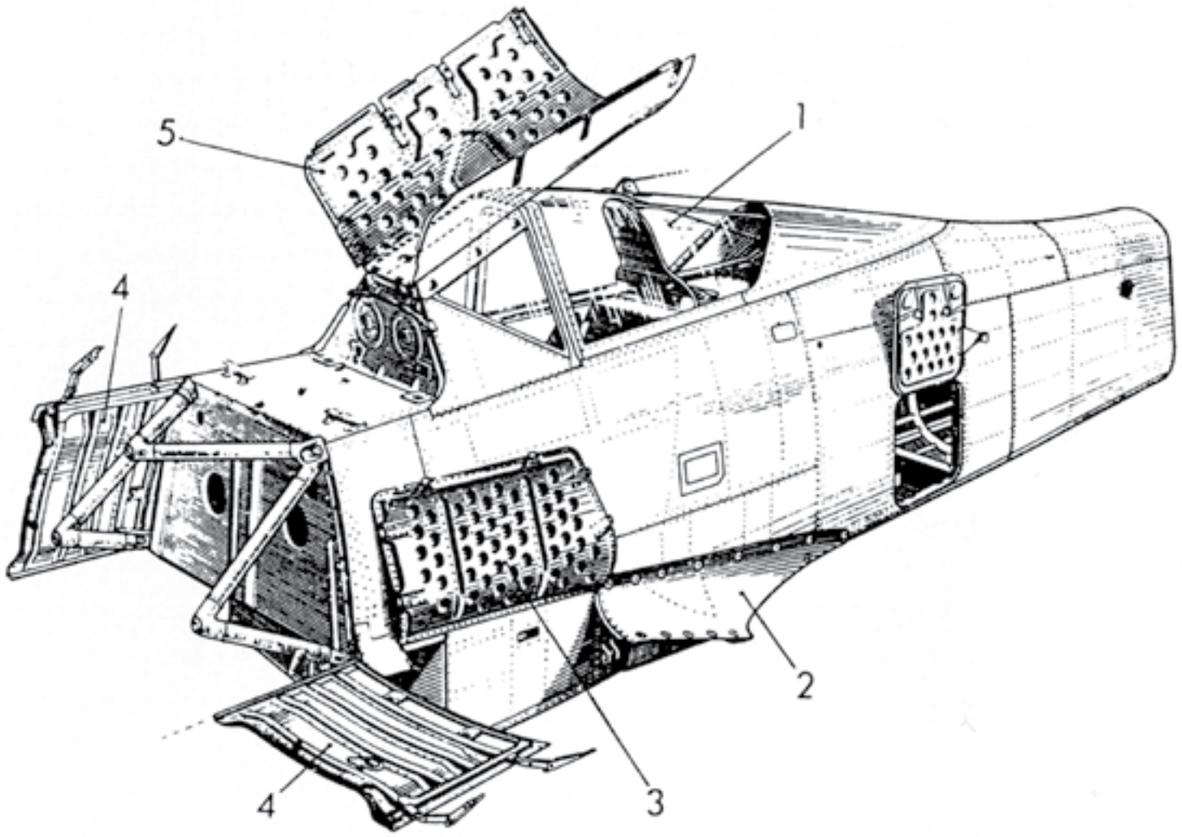


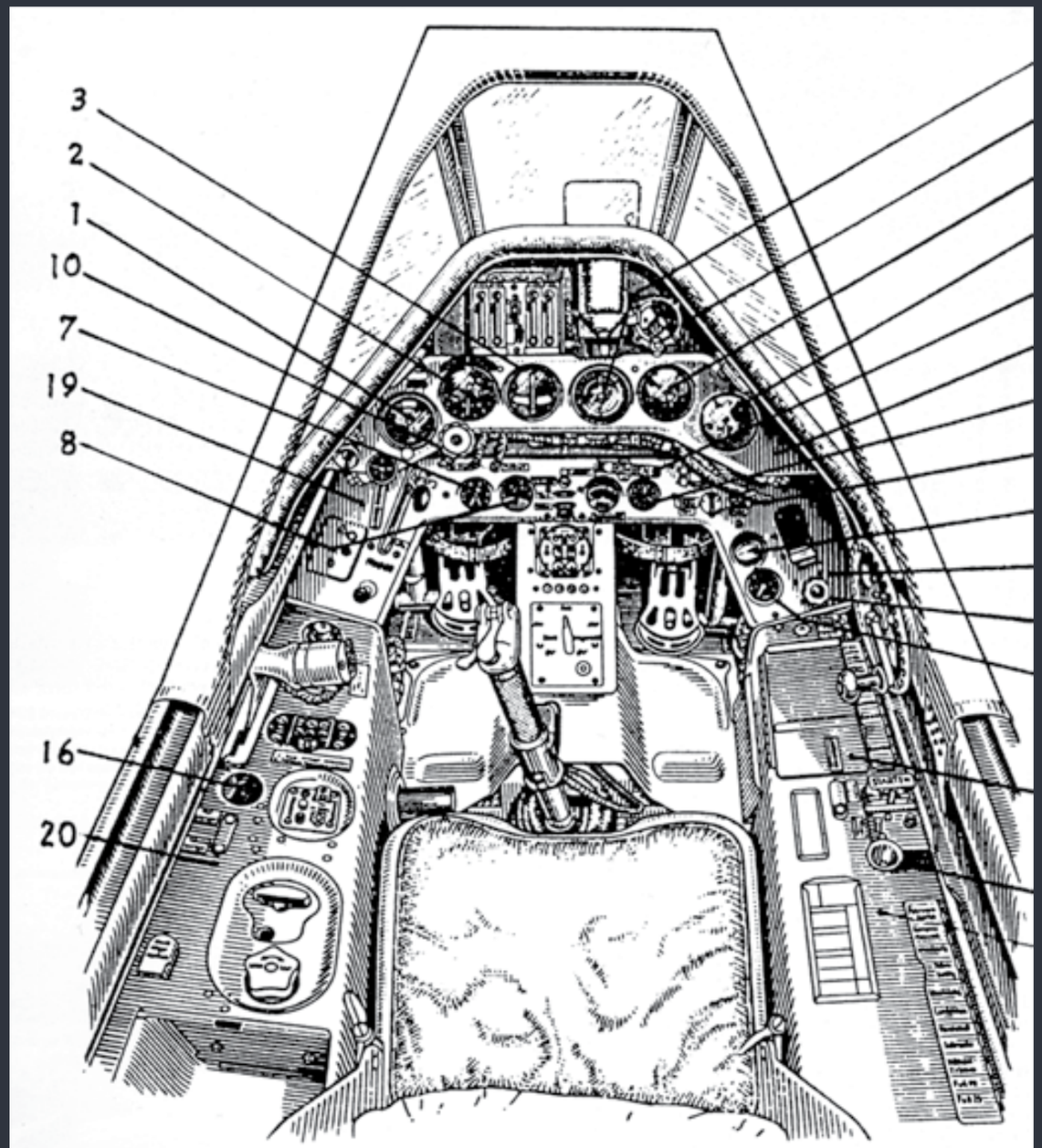
handling. Plans were made to create a new wing with more area to address these issues. In its original form, this prototype was called the V5k for kleine Fläche (small surface). In August 1940 a collision with a ground vehicle damaged the V5 and it was sent back to the factory for major repairs. This was an opportune time to rebuild it with a new wing which was less tapered in plan than the original design, extending the leading and trailing edges outward to increase the area. The new wing had an area of 18.30 m², and now spanned 10.506 m. After conversion, the aircraft was called the V5g for große Fläche (large surface). Although it was 10 km/h (6 mph) slower than when fitted with the small wing, V5g was much more manoeuvrable and had a faster climb rate. This new wing platform was to be used for all major production versions of the Fw 190.

Pre-production, Fw 190 A-0

The pre-production Fw 190 A-0 series was ordered in November 1940, a total of 28 being completed. Because they were built before the new wing design was fully tested and approved, the first nine A-0s were fitted with the orig-

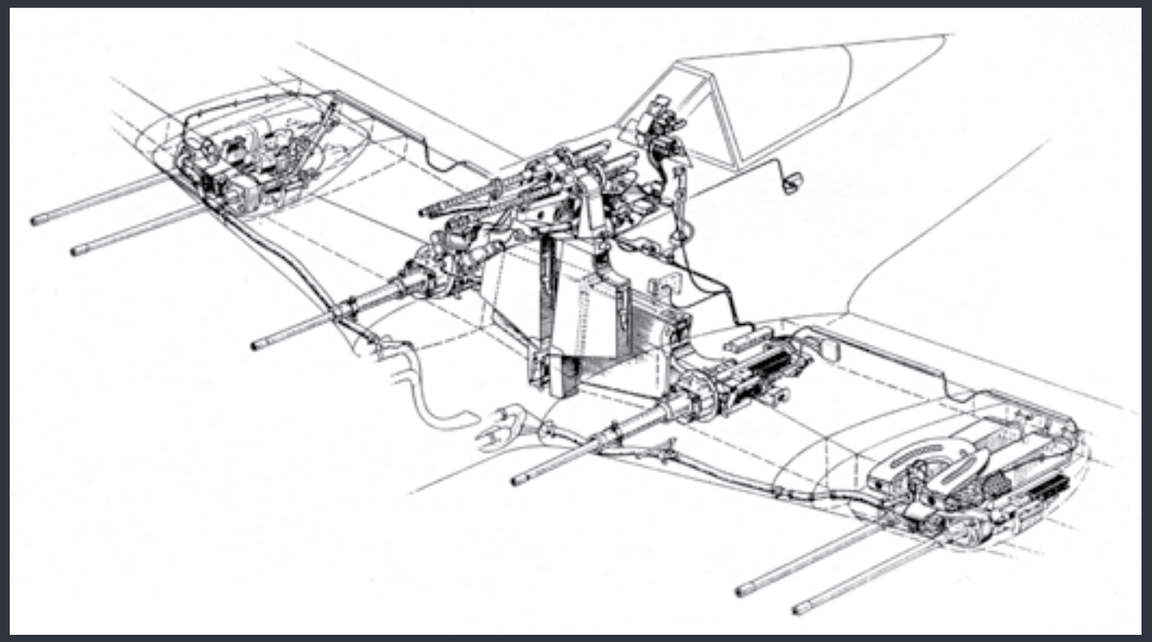


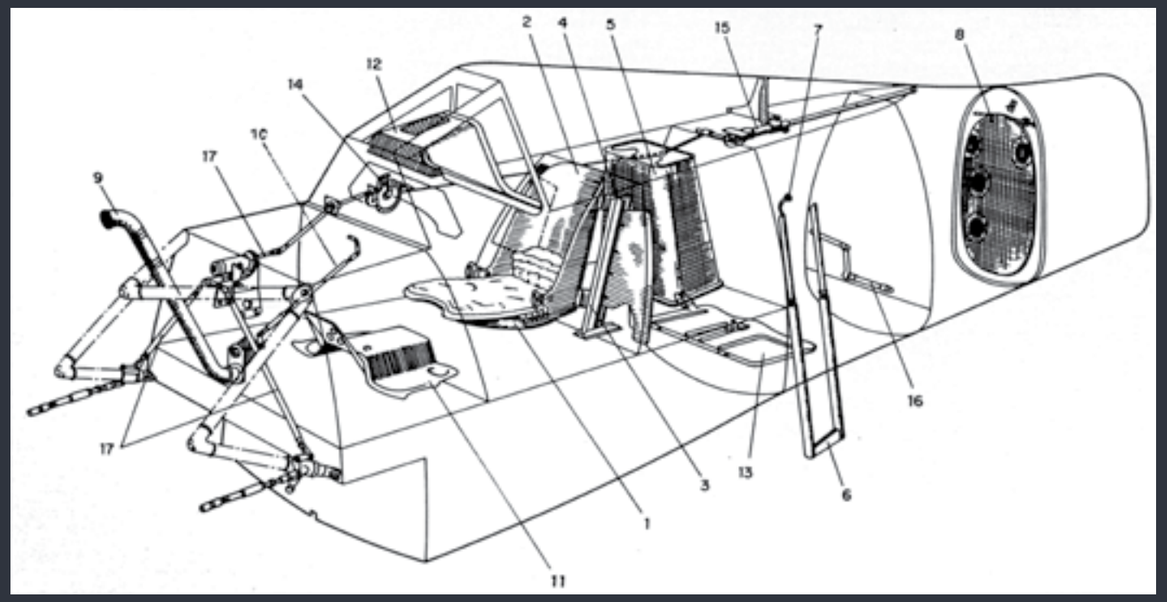




Focke-Wulf Fw 190 A-1

1. Fein- und Grobhöhenmesser
2. Fahrtmesser
3. Elektrischer Wendezeiger
4. Führertochterkompass
5. Ladedruckmesser
6. Drehzahlmesser
7. Kraftstoff-Schmierstoff-Druckmesser
8. Schmierstofftemperaturmesser
9. Bombennotzug
10. Merkleuchte für Reststandswarnung
11. Umschalter für Kraftstoffvorrat
12. Mechanischer Stellungsanzeiger
13. O_2-Wächter
14. Sauerstoffdruckmesser
15. Flaschenfernventil
16. Höhenflossentrimmanzeiger
17. Borduhr
18. Hauptgerätebrett
19. Hilfsgerätebrett
20. Gerätebank links
21. Gerätebank rechts
22. Halterung für Leuchtpistole
23. Leuchtpatronenkasten

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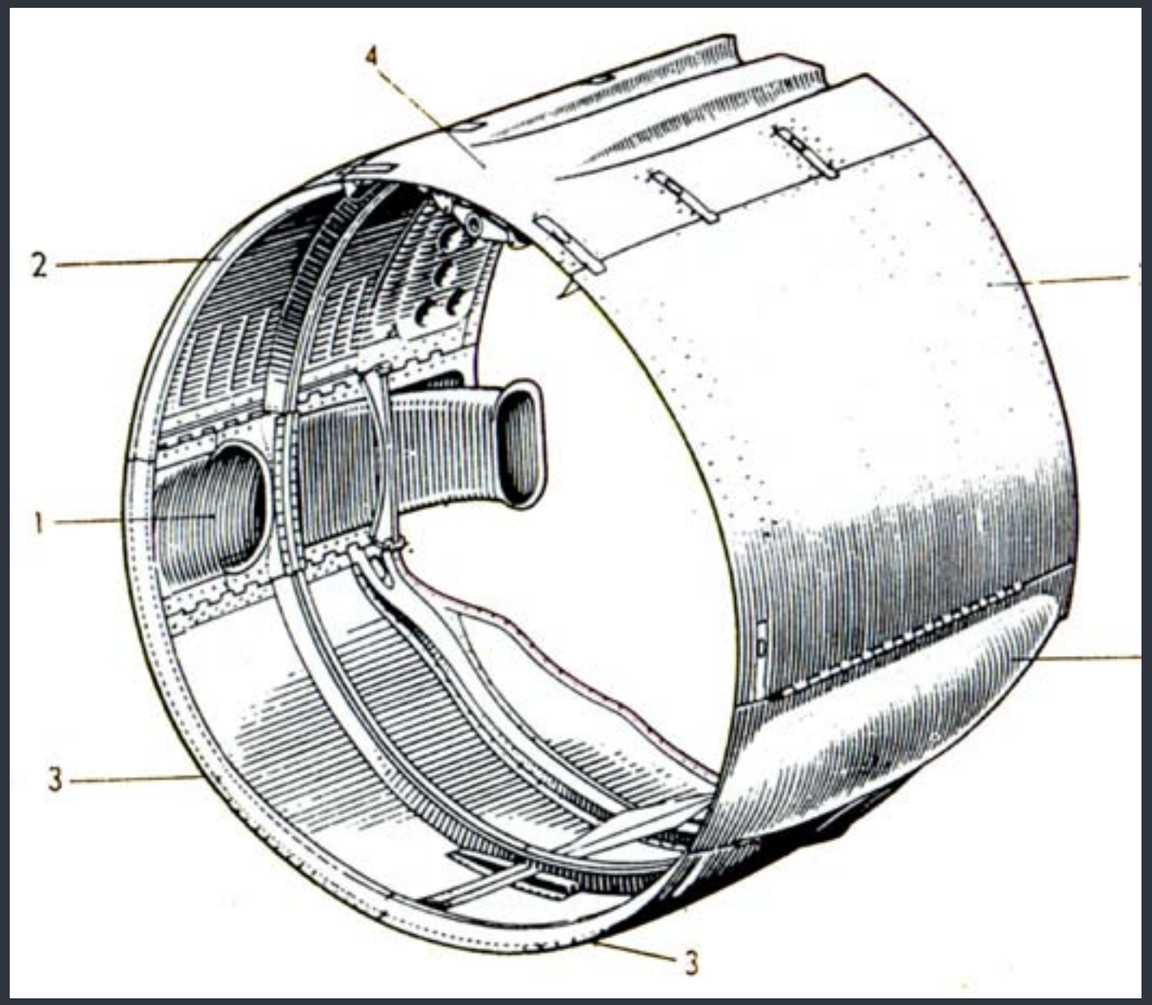
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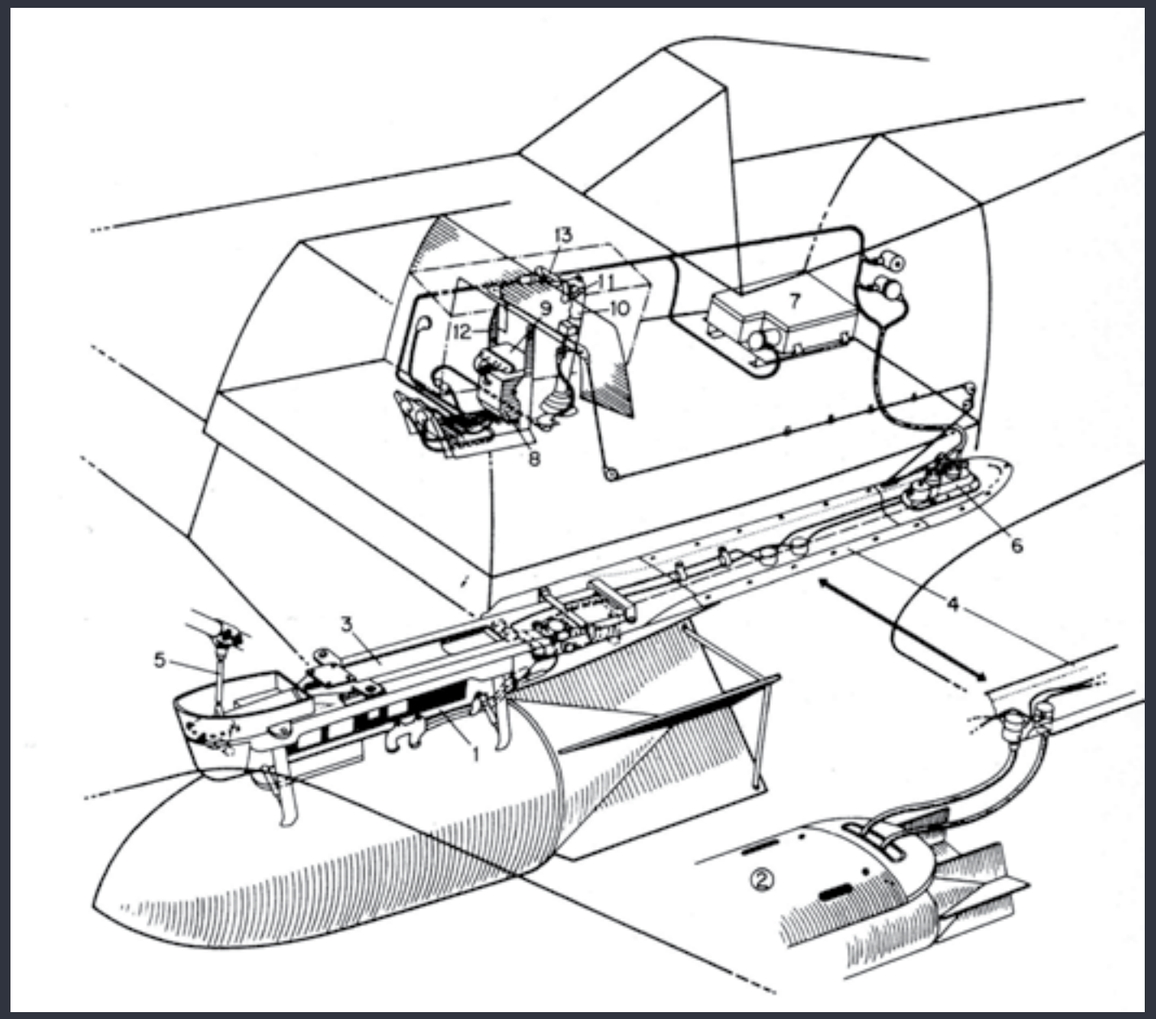
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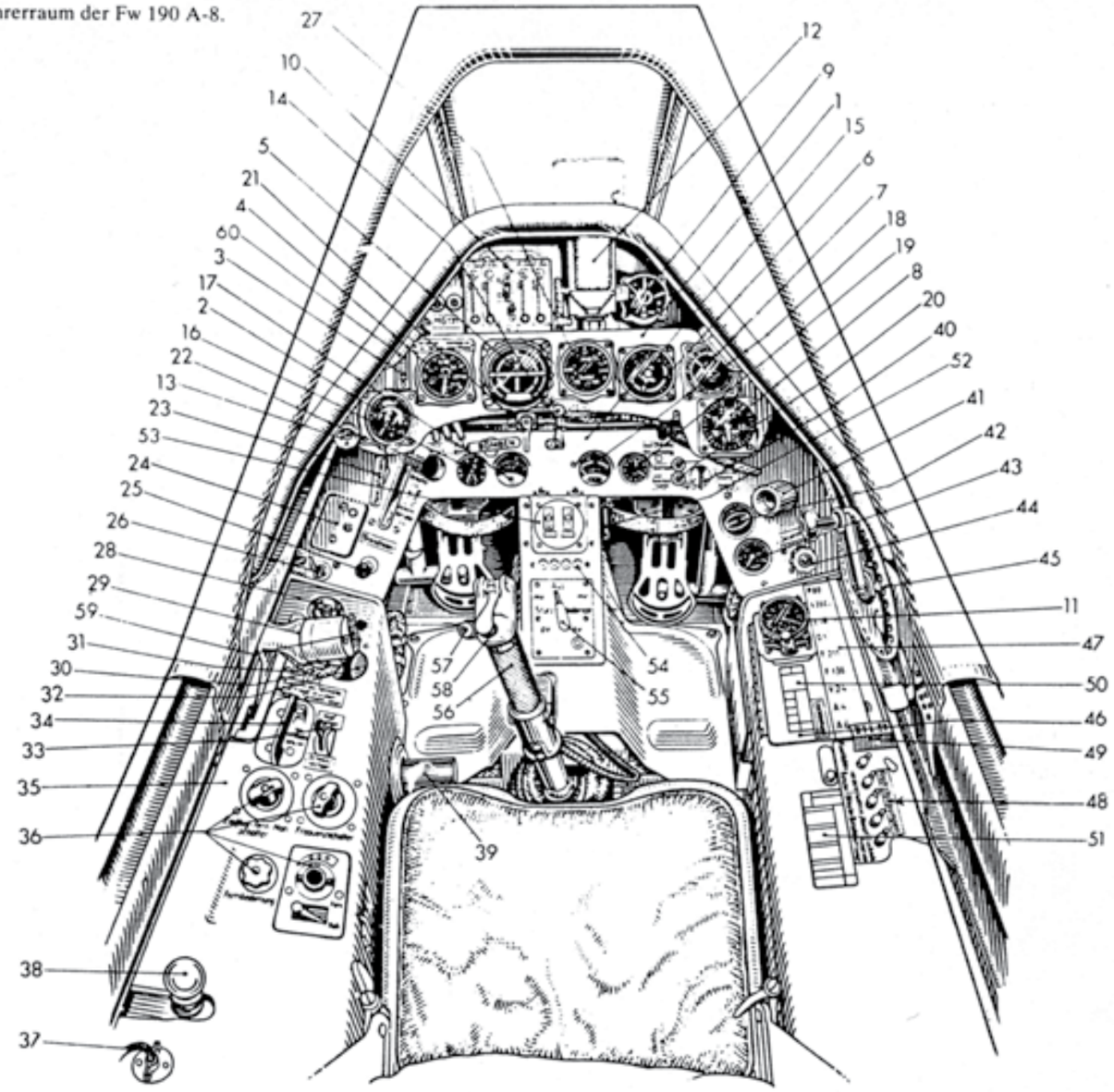
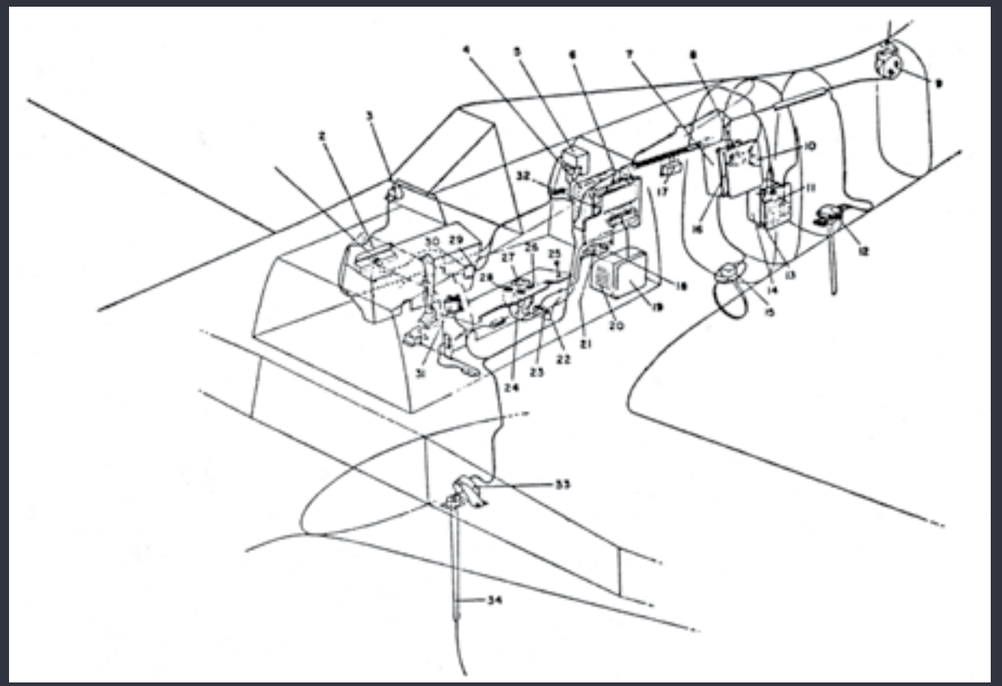
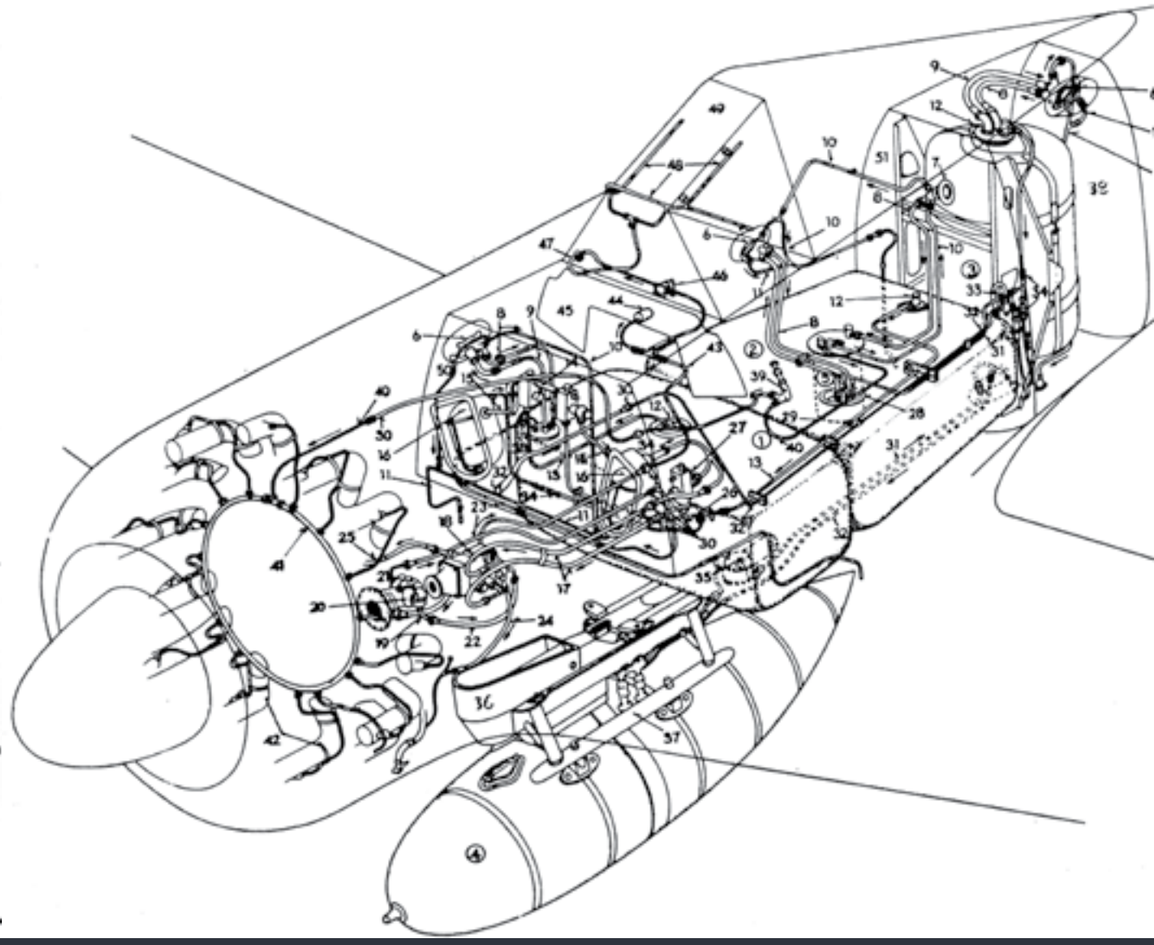
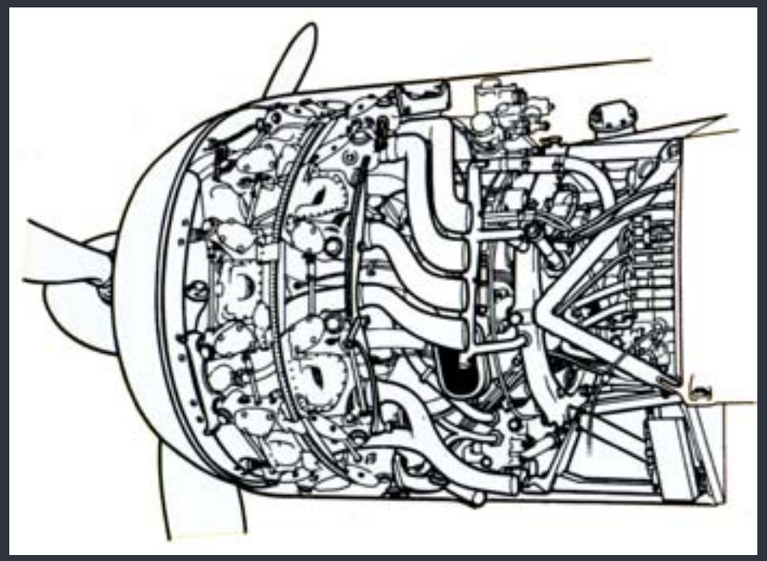
Führerraum der Fw 190 A-8.

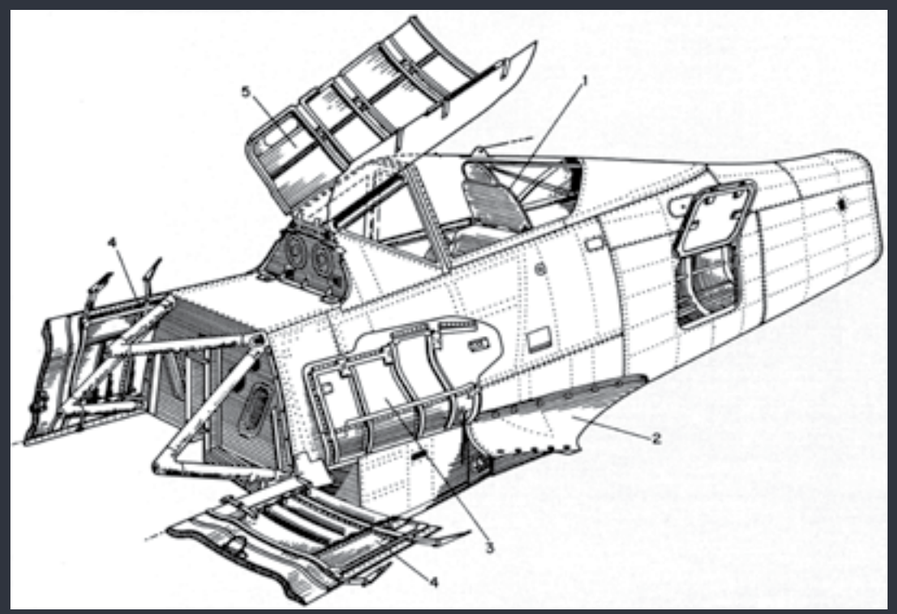


1 Hauptgerätebrett
2 Fein- und Grobhöhenmesser
3 Gitterschauzeichen für Staurohrheizung
4 Fahrtmesser
5 Wendehorizont
6 Führertochterkompaß
7 Ladedruckmesser
8 Nah-Drehzahlmesser
9 Anzeigegerät für Funknavigation
10 Schalt-, Zähler- und Kontrollkasten
11 Borduhr
12 Reflexvisier
13 Drehknopf für Führerraumbelüftung
14 Handkurbel zur Betätigung der Lüfterklappen (Motorkühluftregulierung)
15 Hilfsgerätebrett
16 Doppeldruckmesser (Kraft- und Schmierstoff)
17 Elt. Schmierstofftemperaturmesser
18 Elt. Kraftstoffvorratsmesser
19 Mechanischer Luftschraubenstellungsanzeiger
20 Merkleuchten für Reststandswarnung
21 Absperrhahn für Scheibenspülung
22 Brandhahnhebel
23 Fahrwerksnotzug
24 Bediengerät für FuG 25a
25 Betätigungsknopf für Bürstenabhebung
26 Bedienhebel für Absperrventil
27 Variometer
28 Verdunkler für Gerätebrettbeleuchtung
29 Gashebel
30 Zündschalter (von Gashebel verdeckt)
31 Schauzeichensatz für Fahrwerk- und Landeklappenüberwachung
32 Stellungsanzeiger für Höhenflossentrimmung
33 Schalter für Höhenflossentrimmung
34 Schalter für Fahrwerk- und Landeklappenbetätigung
35 Linke Gerätebank
36 Bediengeräte für FuG 16 ZY
37 Anschlußschnur für Fliegerkopfhaube
38 SUM-Anlaßpumpe AP 20
39 Handgriff zur Feststellung des Gashebels
40 Meßstellenumschalter für Kraftstoffvorratsmessung
41 Halterung für Leuchtpistole
42 02-Wächter
43 Sauerstoffdruckmesser
44 Durchgangsventil mit Schnellablaß für Sauerstoffanlage
45 Antrieb für Schiebehaube
46 Leuchtpatronenkasten
47 Klappe über den Selbstschaltern
48 Selbstschalter für Kraftstoffbehälterpumpen
49 Anlaßschalter
50 Betriebsdatentafel
51 Deviationstafel
52 Betätigung für Kabinenbelüftung
53 Schaltkasten für 21-cm-Gerät
54 Anzeigegerät für Abwurfwaffe
55 Zünderschaltkasten ZSK
56 Knüppelgriff
57 Bombenauslöseknopf
58 Auslöseknopf für Außenflügelwaffen
59 Daumenschalter für Luftschraubenverstellung
60 Gerätebrettleuchten





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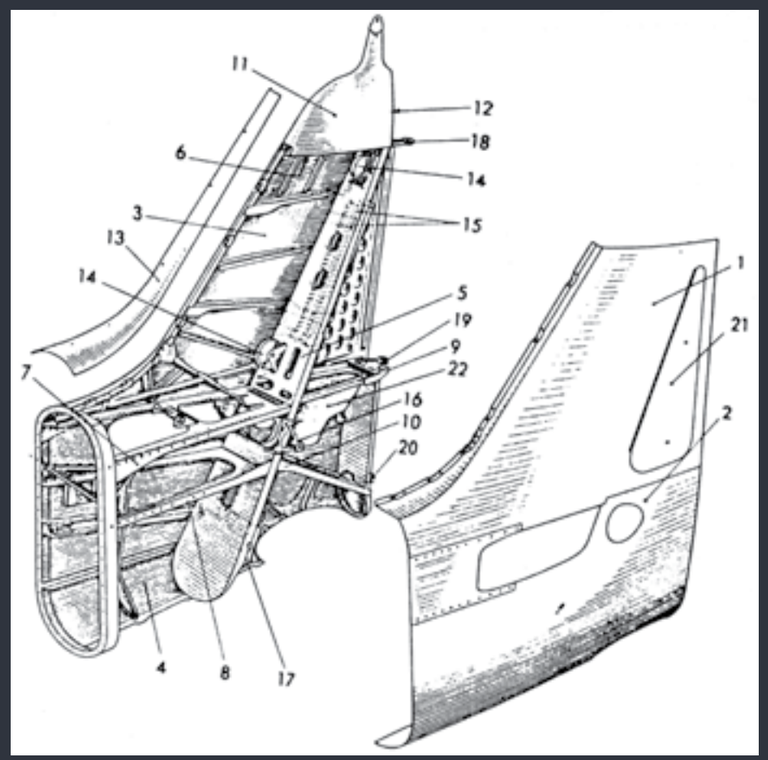
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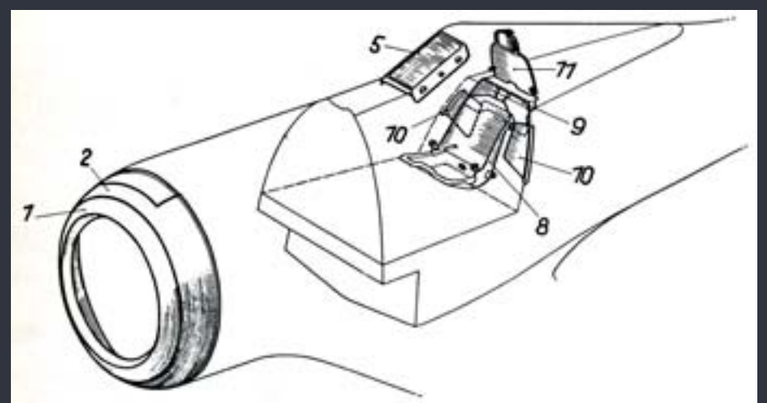
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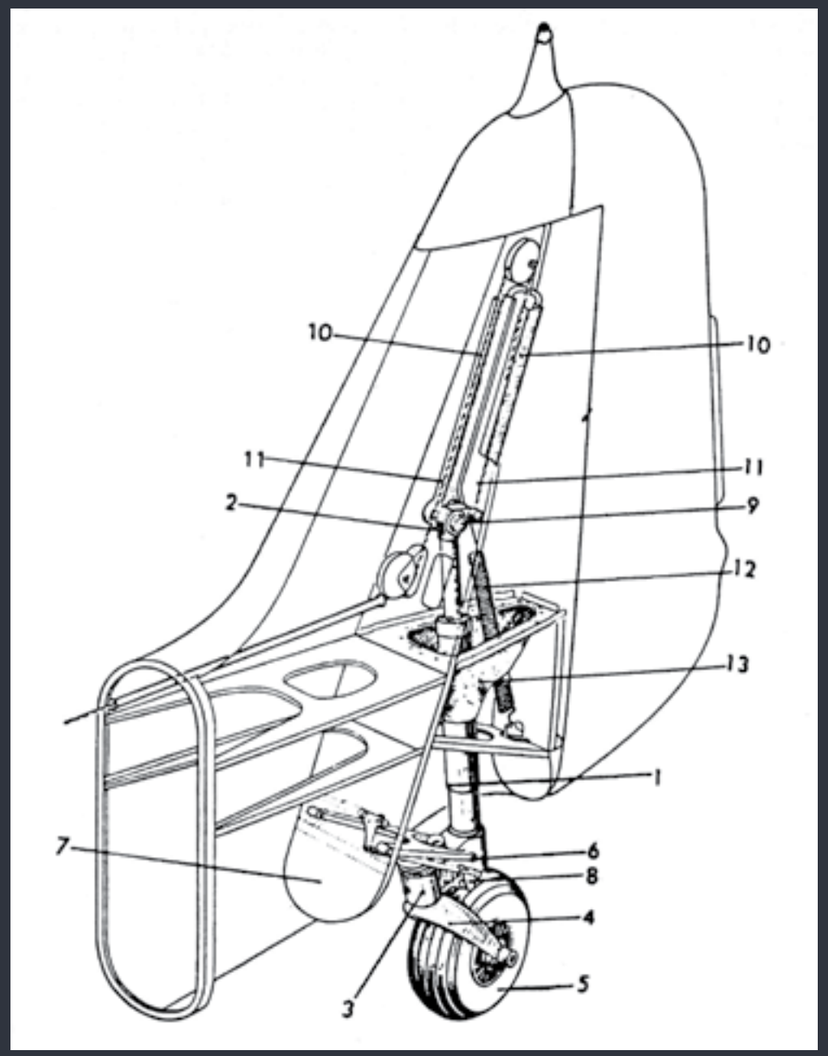
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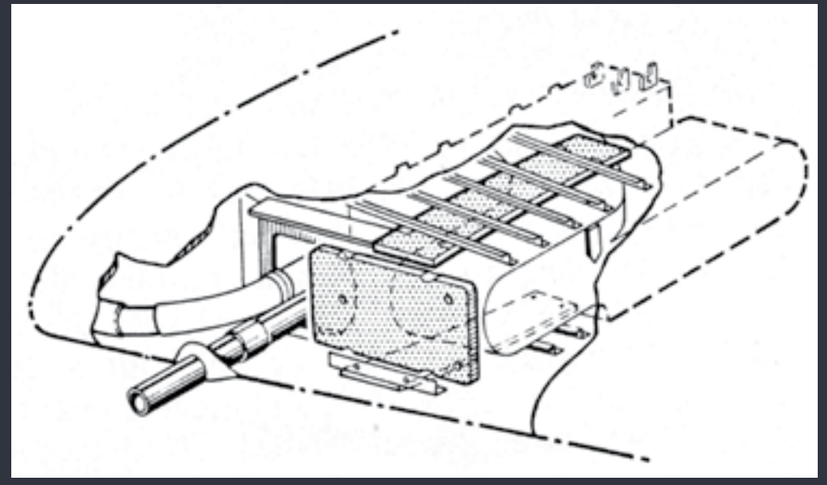

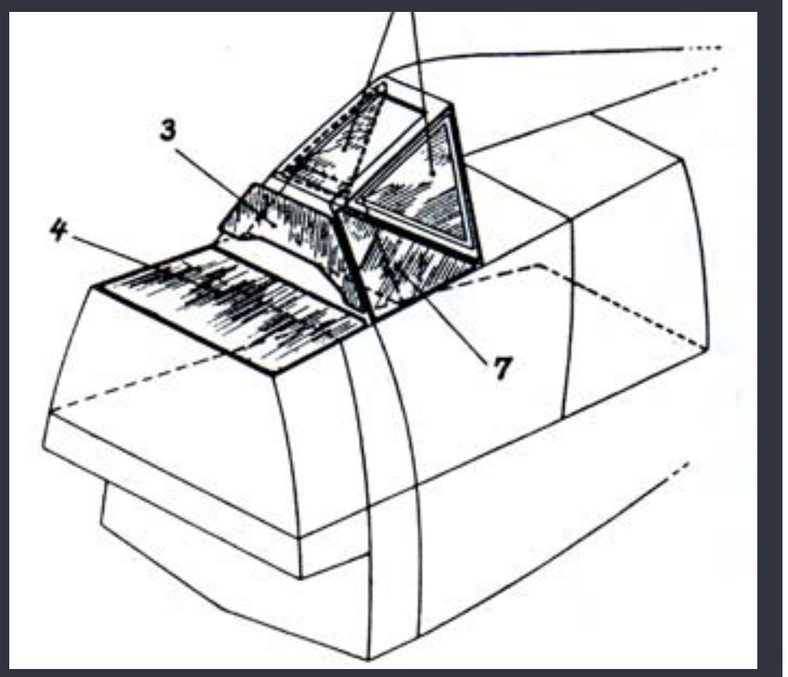
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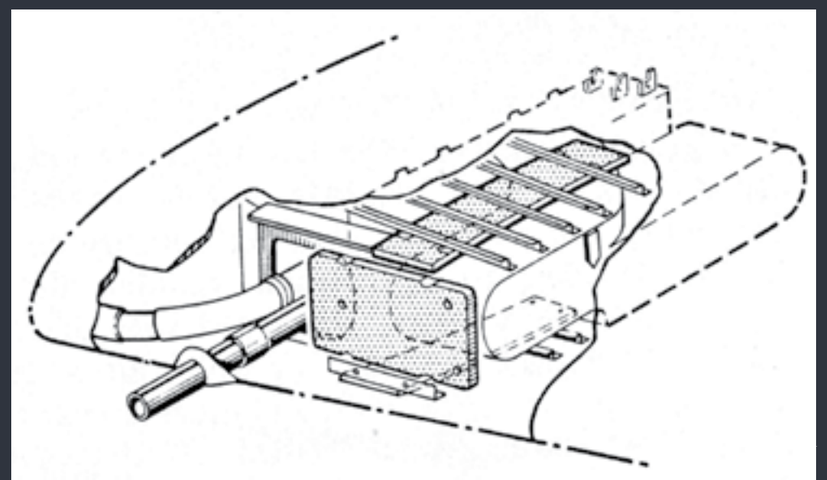
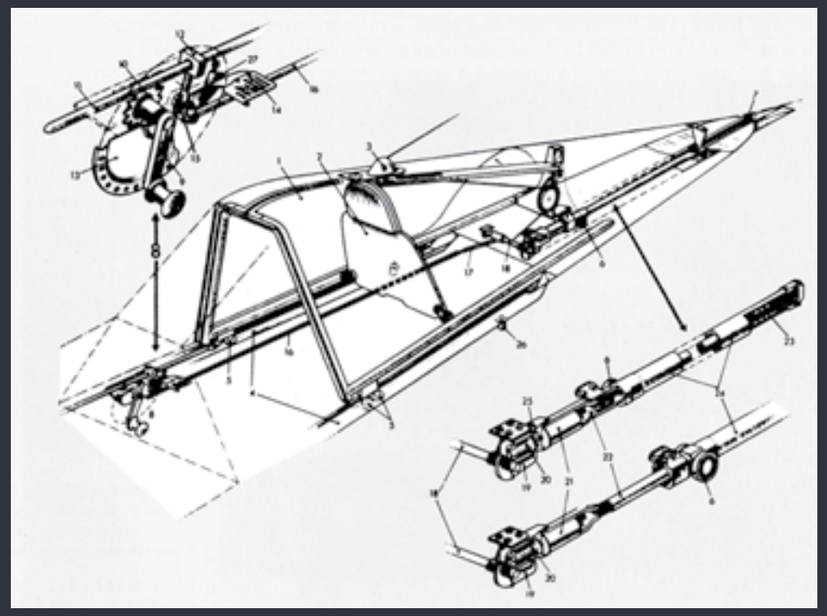
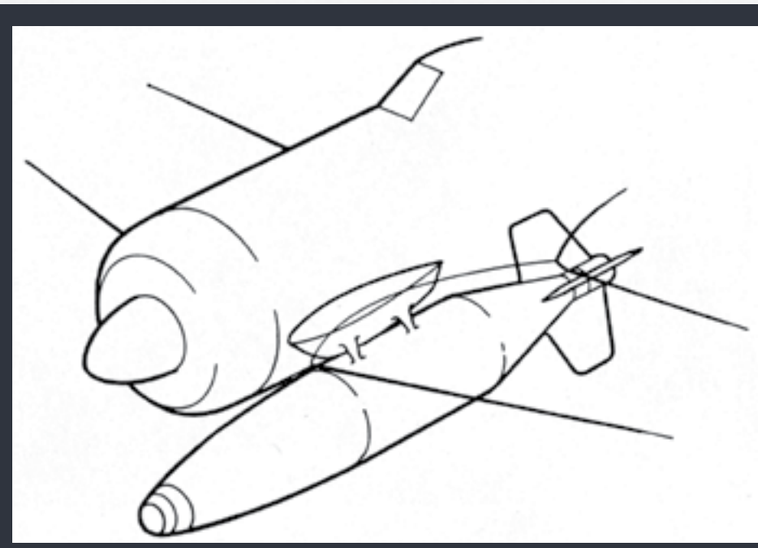






inal small wings. All were armed with six 7.92 mm MG 17 machine guns — four synchronised weapons, two in the forward fuselage and one in each wing root, supplemented by a free-firing MG 17 in each wing, outboard of the propeller disc. They differed from later A-series Fw 190s in that they had shorter spinners, the armoured cowling ring was a different shape, with a scalloped hinge on the upper, forward edge of the upper engine cowling, and the bulges covering the interior air intakes on the engine cowlings were symmetrical "teardrops". The panels aft of the exhaust pipes had no cooling slots. Several of these aircraft were later modified for testing engines and special equipment.

The first unit to be equipped with the A-0 was Erprobungsstaffel 190, formed in March 1941 to help iron out any technical problems and approve the new fighter before it would be accepted for full operational service in mainstream Luftwaffe Jagdgeschwader.

At first, this unit, commanded by Oblt. Otto Behrens, was based at the Luftwaffe's central Erprobungsstelle facility at Rechlin, but it was soon moved to Le Bourget. Engine problems plagued the 190 for much of its early development, and the entire project was threatened several times with a complete shutdown. Had it not been for the input of Behrens and Karl Borris, both of whom had originally enlisted in the Luftwaffe as mechanics, the Fw 190 program might have died before reaching the front lines. Both men indicated that the Fw 190's outstanding qualities outweighed its deficiencies during several Ministry of Aviation commissions that considered terminating the program. Some 50 modifications were required before the Ministry of Aviation approved the Fw 190 for deployment to Luftwaffe units.

Fw 190 A

A-1

The Fw 190 A-1 rolled off the assembly lines in June 1941. The first few models were shipped to the Erprobungsstaffel (formerly from II./JG 26 Schlageter) for further testing. Following this testing, the Fw 190 A-1 entered service with II./JG 26, stationed near Paris, France. The A-1 was equipped with the BMW 801 C-1 engine, rated at 1,539 hp, for take-off. Armament consisted of two fuselage-mounted 7.92 mm MG 17s, two wing root-mounted 7.92 mm MG 17s - with all four MG 17s synchronized to fire through the propeller arc - and two outboard wing-mounted 20 mm MG FF/Ms. The new longer propeller spinner and the cowling bulges, which became asymmetrical "teardrops" in shape, remained the same for the rest of the A-series. The panel immediately behind the exhaust outlets was unslotted, although some A-1s were retrofitted with cooling slots. A new hood jettisoning system, operated by an MG FF cartridge, was introduced. The pilot's head armour changed in shape and was supported by two thin metal struts in a "V" shape attached to the canopy sides. The standard radio fitted was the FuG 7, although some A-1s were also equipped with FuG 25 "Erstling" IFF (identification friend or foe) equipment. The A-1 models still suffered from the overheating that prototype Fw 190s had experienced during test-

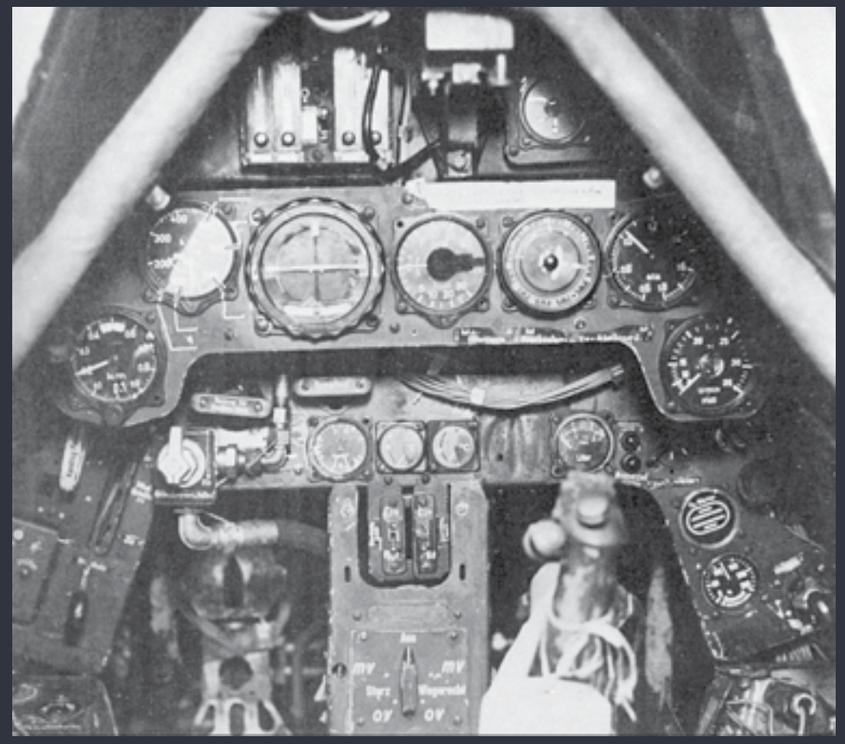
ing. After only 30–40 hours of use (sometimes less), many of these earl engines had to be replaced. Focke Wulf completed 102 A-1s at the Bremen and Marienburg factories between June and October 1941. Also in October, a further order of 315 A-1s, subcontracted to AGO Flugzeugwerke at its Oschersleben factory, began to be built as A-2s.

A-2

The introduction of the BMW 801 C-2 resulted in the Fw 190 A-2 model, first introduced in October 1941. As part of this upgrade, a modification to the exhaust system devised by III./JG 26's Technical Officer ("T.O.") Rolf Schrödeter was added. There were 13 exhausts for the 14 cylinders; eight of these were grouped to exit, four on each side, along the forward fuselage, just above the leading edge of the wing; under the forward centre section, between the undercarriage bays were five exhaust stacks, with cylinders 9 and 10 sharing a common pipe. To quickly implement the fix, it was found that the fire Mk V, to the Germans. German production records make no real distinction between A-2s and A-3s, which were very similar aircraft: the total combined production was 910 airframes between October 1941 and August 1942. In addition to Focke-Wulf and AGO, a new subcontractor, Arado, built A-2s and A-3s at Warnemünde.

A-3

The Fw 190 A-3 was equipped with the BMW 801 D-2 engine, which increased power to 1,700 PS (1,677 hp, 1,250 kW) at take-off by improving the supercharger and raising the compression ratio. Because of these changes, the A-3 model required a higher octane fuel—100 (C3) versus 87 (B4). The A-3 retained the same weaponry as the A-2. The A-3 also introduced the Umrüst-Bausätze factory conversion sets. The Fw 190 A-3/U1 and U2 were single experimental Fw 190s: U1 (W.Nr 130270) was the first 190 to have the engine mount extended by 15 cm (6 in), which would be standardized on the later production A-5 model.



The U2 (W.Nr 130386) had RZ 65 73 mm rocket launcher racks under the wings with three rockets per wing. There were also a small number of U7 aircraft tested as high-altitude fighters armed with only two 20 mm MG 151 cannon, but with reduced overall weight.
The Fw 190 A-3/U3 was the first of the Jabo (Jagdbomber), using an ETC-501 centre-line bomb rack able to carry up to 500 kg of bombs or, with horizontal stabilising bars, one 300 L drop tank. The U3 retained the fuselage-mounted 7.92 mm MG 17s and the wing mounted 20 mm MG 151 cannon, with the outer MG FF being removed.
The Fw 190 A-3/U4 was a reconnaissance version with two RB 12.5 cameras in the rear fuselage and an EK 16 gun camera or a Robot II miniature camera in the leading edge of the port wing root. Armament was similar to the U3, however, and the ETC 501 was usually fitted with a 300 L drop tank.
In autumn 1942, a political decision diverted 72 new aircraft to Turkey in an effort to keep that country friendly to the Axis powers. These were designated Fw 190 A-3a (a=ausländisch (foreign), designation for export models) and delivered between October 1942 and March 1943. The Turkish aircraft had the same armament as the A-1: four 7.92 mm synchronized MG 17 machine guns and two 20 mm MG FF cannon. There was no FuG 25 IFF device in the radio equipment.

A-4

Introduced in July 1942, the Fw 190 A-4 was equipped with the same engine and basic armament as the A-3. Updated radio gear, the FuG 16Z, was installed replacing the earlier FuG VIIa. A new, short "stub" vertical aerial mount was fitted to the top of the tailfin, a configuration which was kept through the rest of the production Fw 190s. In some instances, pilot-controllable engine cooling vents were fitted to the fuselage sides in place of the plain slots. Some A-4s were outfitted with a special Rüstsatz field conversion kit, comprising the fitting of a pair of under-wing Werfer-Granate 21 (BR 21) rocket mortars, and were designated Fw 190 A-4/R6. The most important innovation introduced by the A-4 was, however, the fitting of various Umrüst-Bausätze factory-refit packages.
The A-4/U1 was outfitted with an ETC 501 rack under the fuselage. All armament except for the MG 151 cannon was removed. The U3 was very similar to the U1, and later served as the prototype for the Fw 190 F-1 assault fighter. Some

U3s used for night operations had a landing light mounted in the leading edge of the left wing-root. The U4 was a reconnaissance fighter, with two Rb 12.4 cameras in the rear fuselage and an EK 16 or Robot II gun camera. The U4 was equipped with fuselage-mounted 7.92 mm MG 17s and 20 mm MG 151 cannon. The U7 was a high-altitude fighter, easily identified by the compressor air intakes on either side of the cowling. Adolf Galland flew a U7 in the spring of 1943.

The A-4/U8 was the Jabo-Rei (Jagdbomber Reichweite, long-range fighter-bomber), adding a 300 L drop tank under each wing, on VTr-Ju 87 racks with duralumin fairings produced by Weserflug, and a centreline bomb rack. The outer wing-mounted 20 mm MG FF/M cannon and the cowling-mounted 7.92 mm MG 17 were removed to save weight. The A-4/U8 served as the model for the Fw 190 G-1.

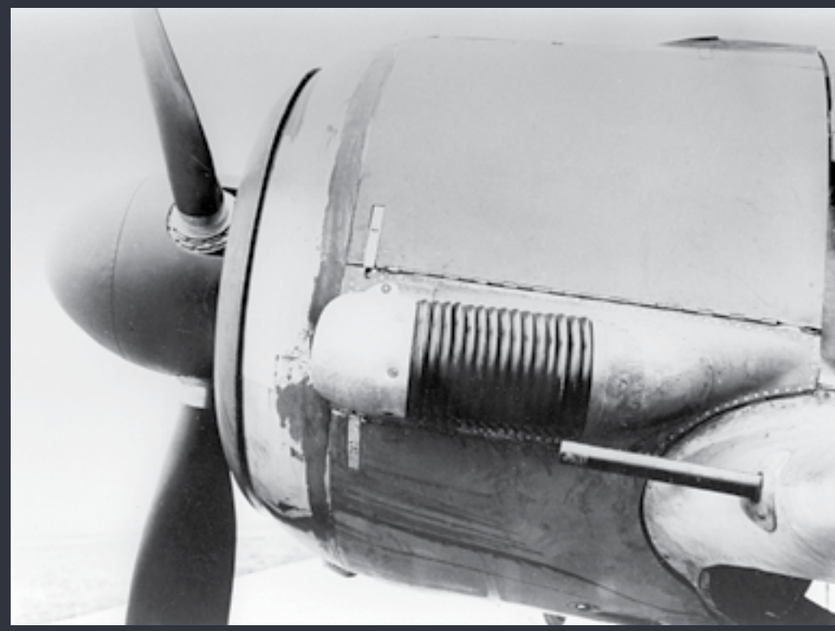
A new series of easier-to-install Rüstsatz field kits began to be produced in 1943. The first of these, the A-4/R1, was fitted with a FuG 16ZY radio set with a Morane "whip" aerial fitted under the port wing. These aircraft, called Leitjäger or Fighter Formation Leaders, could be tracked and directed from the ground via special R/T equipment called Y-Verfahren. More frequent use of this equipment was made from the A-5 onwards. The Fw 190A-4 could achieve 1,700 hp (2,100 with MW-50 boost). Its maximum speed was 670 km/h at 6,250 m. Operational

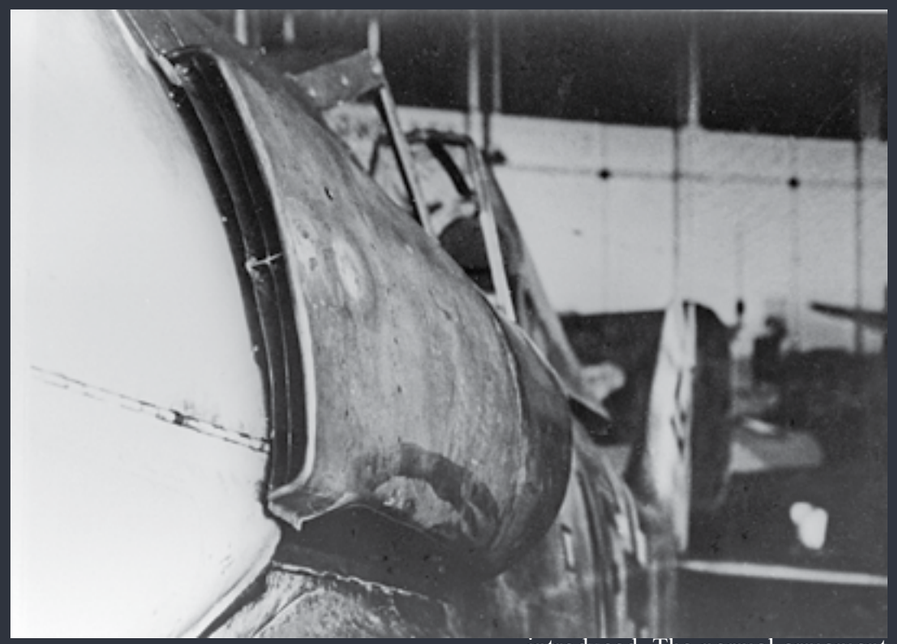
ceiling was 11,400 m. Normal range was 800 km. Normal take-off weight was 3,800 kg. A total of 976 A-4s were built between June 1942 and March 1943.

A-5

The Fw 190 A-5 was developed after it was determined that the Fw 190 could easily carry more ordnance. The D-2 engine was moved forward another 15 cm as had been tried out earlier on the service test A-3/U1 aircraft, moving the centre of gravity forward to allow more weight to be carried aft. Some A-5s were tested with the MW 50 installation: this was a mix of 50% methyl alcohol and 50% water, which could be injected into the engine to produce a short-term power boost to 1,973 hp, but this system was not adopted for serial production. New radio gear, including FuG 25a Erstling IFF, and an electric artificial horizon found their way into the A-5. The A-5 retained the same basic armament as the A-4.

The A-5 too, saw several Umrüst-Bausätze kits. The U2 was designed as a night Jabo-Rei and featured anti-reflective fittings and exhaust flame dampeners. A centre-line ETC 501 rack typically held a 250 kg bomb, and wing-mounted racks mounted 300 L drop tanks. An EK16 gun camera, as well as landing lights, were fitted to the wing leading edge. The U2 was armed with only two 20 mm MG 151 cannon. The U3 was a Jabo fighter fitted with ETC 501s for drop tanks and bombs; it too featured only two MG 151s for armament. The U4 was a "recon" fighter with two RB 12.5 cameras and all armament of the basic A-5 with the exception of the MG FF cannon. The A-5/U8 was another Jabo-Rei outfitted with SC-250 centreline-mounted bombs, under-wing 300-litre drop tanks and only two MG 151s; it later became the Fw 190 G-2. A special U12 was created for bomber attack, outfitted with the standard 7.92 mm MG 17 and 20 mm MG 151 but replacing the outer wing 20 mm MG-FF cannon with two underwing gun pods containing two 20 mm MG 151/20 each, for a total of two machine guns and six cannon. The A-5/U12 was the prototype installation of what was known as the R1 package from the A-6 onwards. The A-5/R11 was a night fighter conversion fitted with FuG 217 Neptun (Neptune) radar equipment with arrays of three dipole antenna elements vertically mounted fore and aft of the cockpit and above and below the wings. Flame-dampening boxes were fitted over the exhaust exits. 1,752 A-5s were built from November 1942 to June 1943.



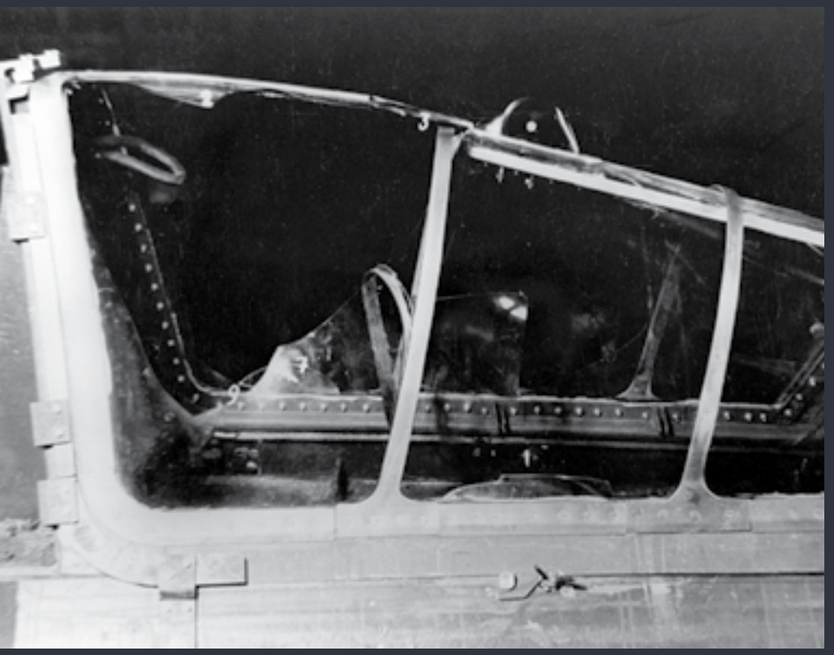


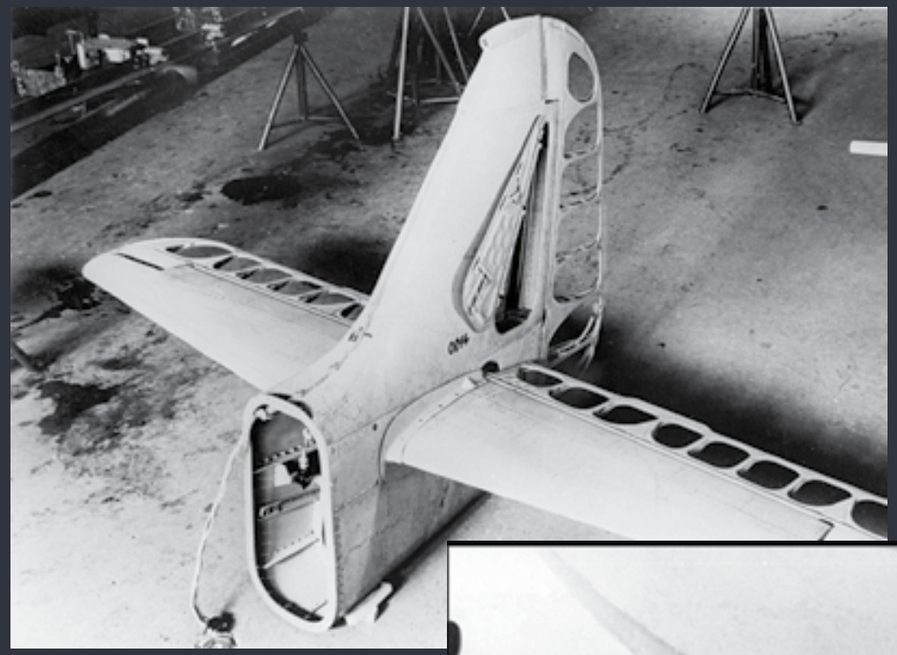
A-6

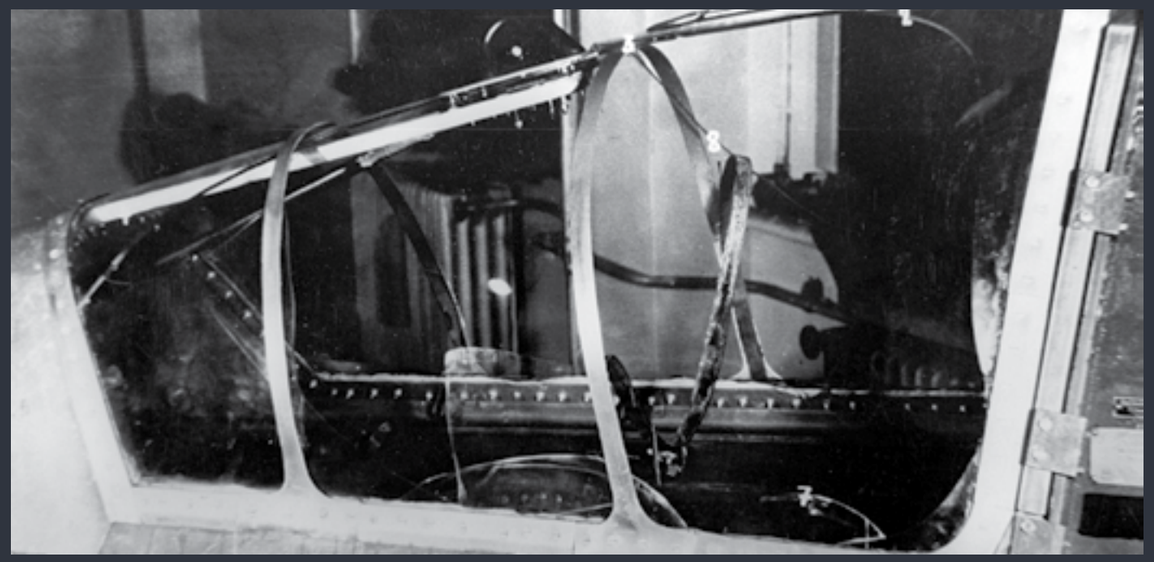
The Fw 190 A-6 was developed to address shortcomings found in previous "A" models when attacking U.S. heavy bombers. Modifications of the type to date had caused the weight of the aircraft to creep up. To combat this and to allow better weapons to be installed in the wings, a structurally redesigned and lighter wing was introduced. The normal armament was increased to two MG 17 fuselage machine guns and four 20 mm MG 151/20E wing root and outer wing cannon with larger ammunition boxes. New electrical sockets and reinforced weapon mounts were fitted internally in the wings to allow the installation of either 20 mm or 30 mm ammunition boxes and for underwing armament. Because the outer wing MG 151s were mounted lower than the MG/FFs new larger hatches, incorporating bulges and cartridge discharge chutes, were incorporated into the wing lower surfaces. It is believed the MG 17s were kept because their tracer rounds served as a targeting aid for the pilots. A new FuG 16 ZE radio navigation system was fitted in conjunction with a FuG 10 ZY. A loop aerial for radio navigation, mounted on a small "teardrop" base was fitted under the rear fuselage, offset slightly to port, with an additional short "whip" aerial aft of this. These aerials were fitted on all later Fw 190 variants. The A-6 was outfitted in numerous ways with various sets, Rüstsätze (field modification kits); more flexible than the factory upgrade kits for previous versions, these field upgrade kits allowed the A-6 to be refitted in the field as missions demanded. At least 963 A-6s were built from July 1943 ending in April 1944, according to Ministry of Aviation acceptance reports and Focke Wulf production books. In late 1943, the Erla Antwerp factory designed a simpler rack/drop-tank fitting, which was more streamlined than the bulky ETC 501 and could be quickly fitted or removed. Several A-6s, A-7s and A-8s of JG 26 were fitted with these racks (one such aircraft was A-8 W.Nr.170346 Black 13 flown by Obstlt. Josef Priller during the Normandy invasion on 6 June 1944.)

A-7

The Fw 190 A-7 was based on the Fw 190 A-5/U9 prototype, and entered production in November 1943. The A-7 was equipped with the BMW 801 D-2 engine, again producing 1,677 hp. Designed to combat the USAAF's heavy bombers the basic armament was upgraded to include two fuselage-mounted 13 mm MG 131s, replacing the MG 17s. Because the larger-breeched MG 131s had to be mounted further apart, the upper gun cowling, just in front of the cockpit, was modified with faired bulges and a new upper engine cowling was manufactured. This left insufficient room for the three cowling toggle latches, which were moved to the side panels. The rest of the armament fit stayed the same as earlier versions; two wing root-mounted 20 mm MG





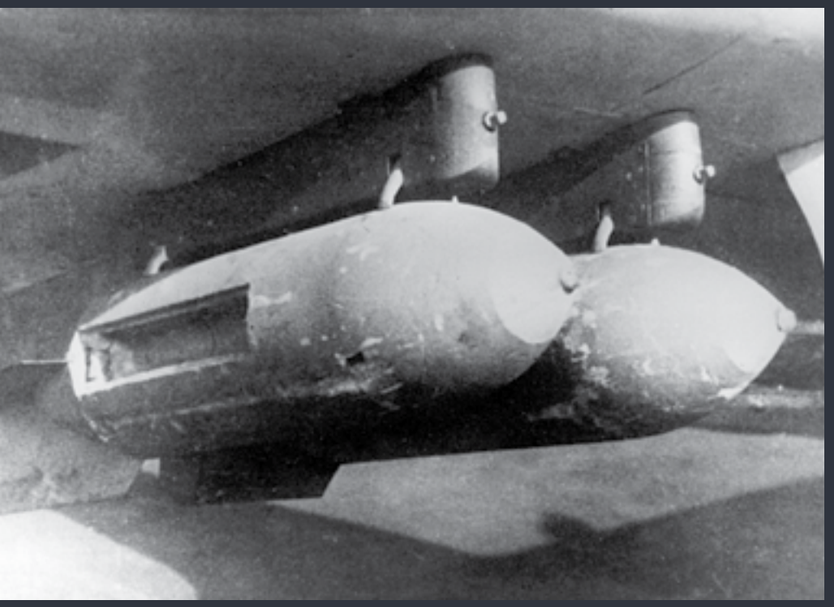


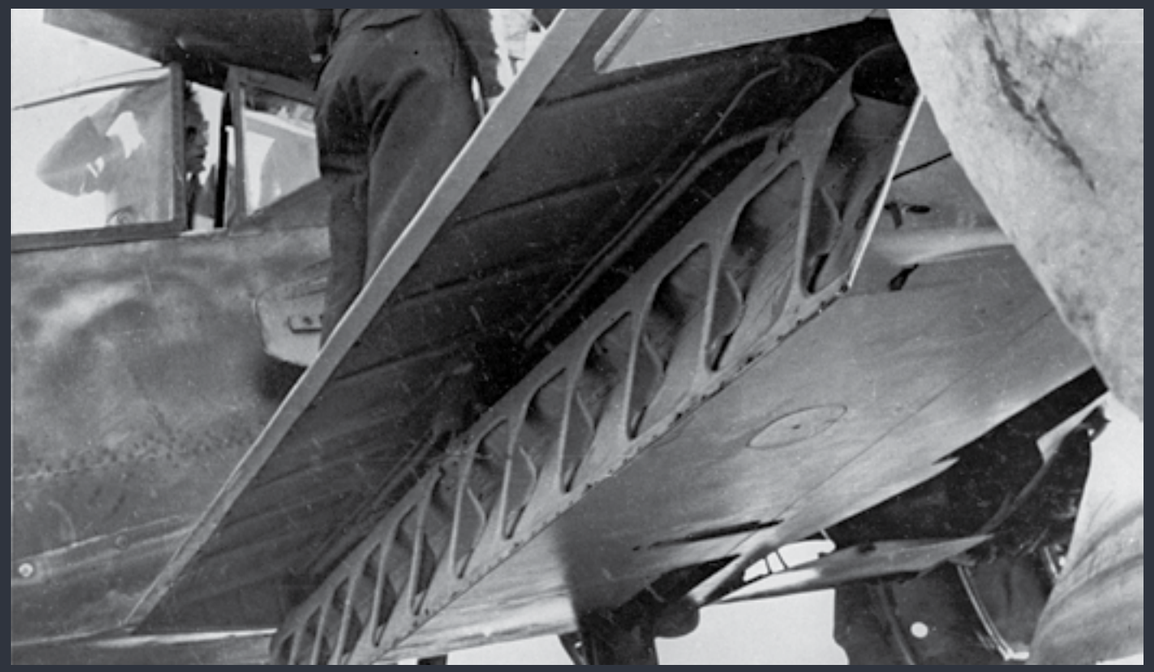
151s and two outer wing-mounted 20 mm MG 151s. The Revi gunsight was updated to the new 16B model. The additional weight of the new weapon systems required strengthening of the wheels, adding a reinforced rim to better deal with typical combat airfield conditions. The A-7 was usually outfitted with the centreline-mounted ETC 501 rack. There were several major Rüstsätze for the A-7, many including Werfer-Granate 21 WGr 21 rockets. A total of 701 A-7s were produced from November 1943 to April 1944, according to Ministry of Aviation acceptance reports and Focke-Wulf production books.

A-8

The Fw 190 A-8 entered production in February 1944, powered either by the standard BMW 801 D-2 or the 801Q (also known as 801TU). The 801Q/TU, with the "T" signifying a Triebwerksanlage unitized powerplant installation, was a standard 801D with improved, thicker armour on the front annular cowling, which also incorporated the oil tank, upgraded from 6 mm on earlier models to 10 mm. Changes introduced in the Fw 190 A-8 also included the C3-injection Erhöhte Notleistung emergency boost system to the fighter variant of the Fw 190 A (a similar system with less power had been fitted to some earlier Jabo variants of the 190 A), raising power to 1,953 hp, for a short time. The Erhöhte Notleistung system operated by spraying additional fuel into the fuel/air mix, cooling it and allowing higher boost pressures to be run, but at the cost of much higher fuel consumption. From the A-8 on, Fw 190s could be fitted with a new paddle-bladed wooden propeller, easily identified by its wide blades with curved tips. A new outwardly bulged main canopy glazing format, more in the manner of a Malcolm hood rather than a bubble canopy, with greatly improved vision sideways and forward, had been developed for the F-2 ground attack model, but was often seen fitted at random on A-8s, F-8s and G-8s. The new canopy included a larger piece of head armour which was supported by reinforced bracing and a large fairing. A new internal fuel tank with a capacity of 115 L was fitted behind the cockpit, which meant that the radio equipment had to be moved forward to just behind the pilot.

Externally, a large round hatch was incorporated into the lower fuselage to enable the new tank to be installed, and the pilot's oxygen bottles were moved aft and positioned around this hatch. A fuel filler was added to the port side, below the rear canopy and a rectangular radio access hatch was added to starboard. Other changes included an ETC 501 under fuselage rack which was mounted on a lengthened carrier and moved 200 mm further forward to help restore the centre of gravity of the aircraft. This fuselage would form the basis for all later variants of the Fw 190 and the Ta 152 series. The Morane





"whip" aerial for the Y-Verfahren was fitted as standard under the port wing, just aft of the wheel-well. Nearly a dozen Rüstsätze kits were made available for the A-8, including the famous A-8/R2 and A-8/R8 Sturmbock models. The A-8/R2 replaced the outer wing 20 mm cannon with a 30 mm MK 108 cannon. The A-8/R8 was similar, but fitted with heavy armour including 30 mm canopy and windscreen armour and 5 mm cockpit armour. The A-8 was the most numerous of the Fw 190 As, with over 6,655 A-8 airframes produced from March 1944 to May 1945. A-8s were produced by at least eight factories during its lifetime.

A-9

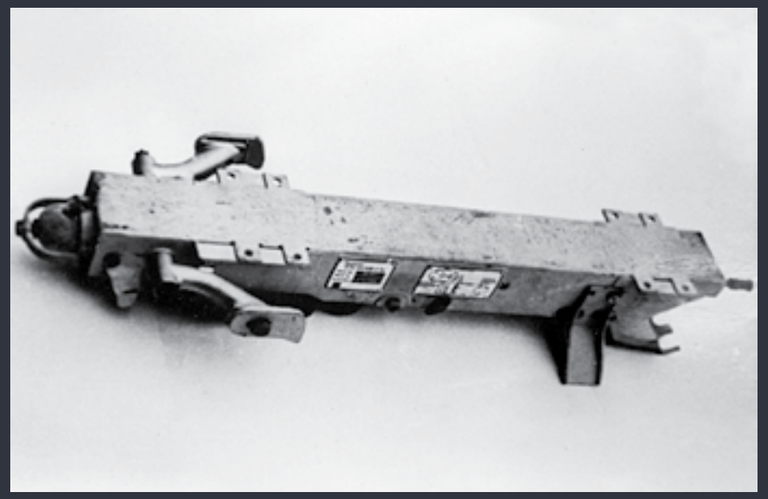
The Fw 190 A-9 was the last A-model produced, and was first built in September 1944. The A-9 was fitted with the new BMW 801S, called the 801 TS or 801 TH when shipped as a more complete Triebwerksanlage version of the modular Kraftei or "power egg" concept, unitized engine installation (an aircraft engine installation format embraced by the Luftwaffe for a number of engine types on operational aircraft, in part for easy field replacement) rated at 1,973 hp, the more powerful 2,367 hp, BMW 801F-1 was still under development, and not yet available. The armour on the front annular cowling, which also incorporated the oil tank, was upgraded from the 6 mm on earlier models to 10 mm. The 12-blade cooling fan was initially changed to a 14-blade fan, but it consumed more power to operate and did not really improve cooling; thus BMW reverted to the 12-blade fan. The A-9 cowling was slightly longer than that of the A-8 due to a larger annular radiator within the forward cowl for the oil system. The bubble canopy design with the larger head armour was fitted as standard. Three types of propeller were authorised for use on the A-9: the VDM 9-112176A wooden propeller, 3.5 m in diameter, was the preferred option, however, many A-9s were fitted with the standard VDM 9-12067A metal propeller and some had a VDM 9-12153A metal propeller with external, bolt on balance weights. The A-9 was also designed originally as an assault aircraft, so the wing leading edges were to have been armoured; however, this did not make it past the design stage

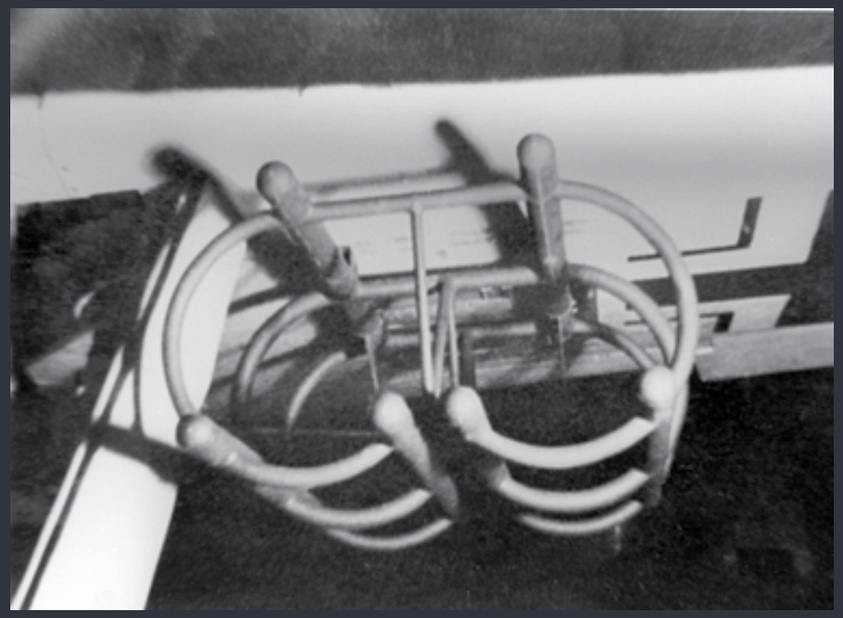
in order to save weight. The A-9 was very similar to the A-8 in regards to the armament and Rüstsätze kits. A total of 910 A-9s were built between April 1944 and May 1945, mostly in Focke Wulf's Cottbus factory.

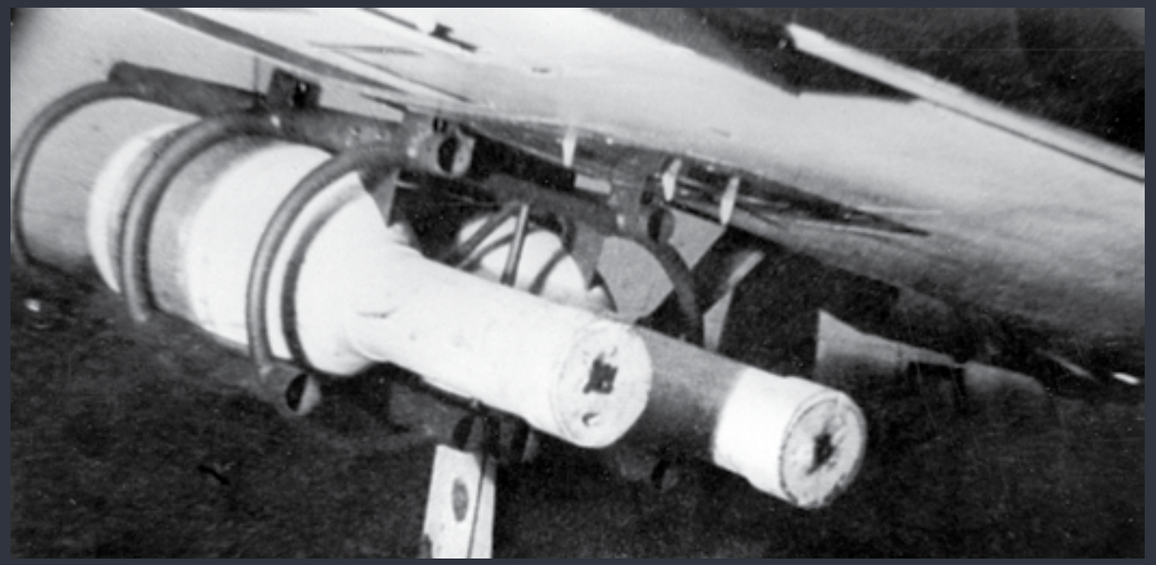
A late-war attempt was made with the Fw 190 A-10, which was to have begun arriving in pilots' hands by March 1945 and was to be fitted with larger wings for better maneuverability at higher altitudes, which, due to internal space, could have allowed additional 30 mm calibre, long-barreled MK 103 cannon to be fitted. The A-10 was to be powered by the 801 F engine. However, due to the priority given to the Dora variant of the Fw 190 and the new Ta 152, the A-10 never made it past the prototype stage.

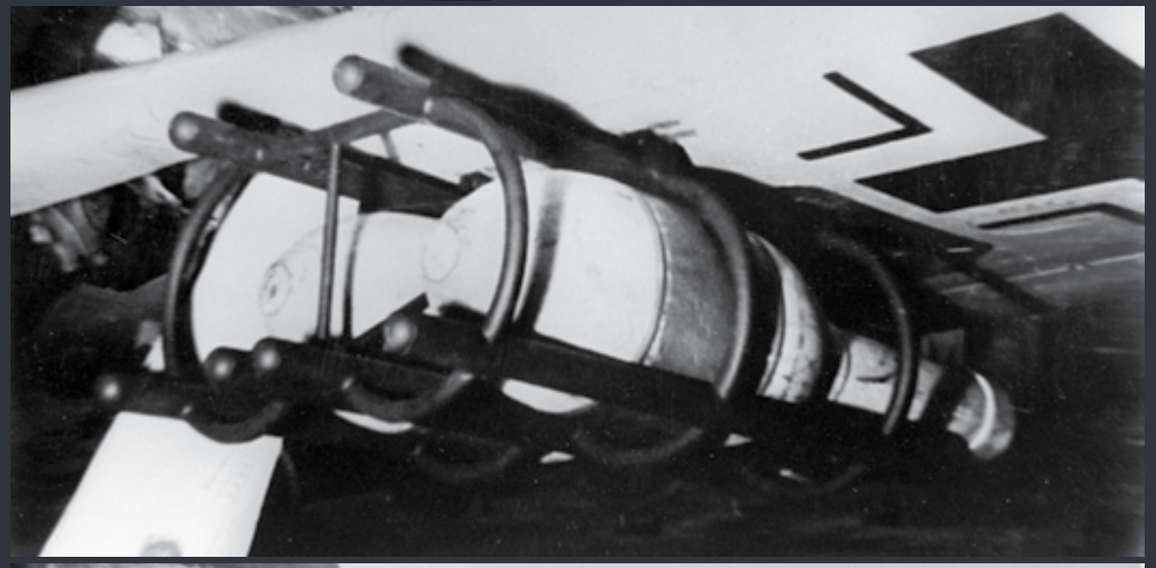
Total A-series Production

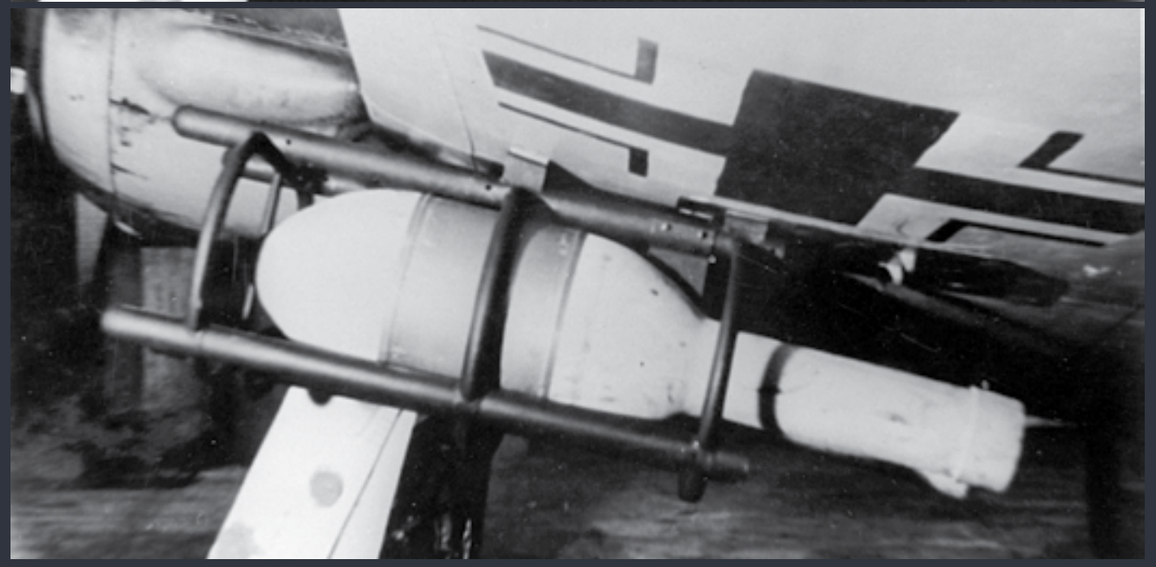
Across all variants, 13,291 Fw 190 A-model aircraft were produced. This total may, however, include rebuilt or modified airframes from earlier airframes. The Luftwaffe frequently changed between models on the production line, and it would not have been uncommon for an A5 variant to be converted into an A7 or A8 aircraft. This was especially true for older, battle-damaged aircraft that were upgraded to whatever current version the factory was manufacturing at the time of repair. The other complicating factor, sometimes making detailed compilation impossible is that many aircraft were assembled in field workshops where airframes and engines from aircraft withdrawn from service units were recycled.

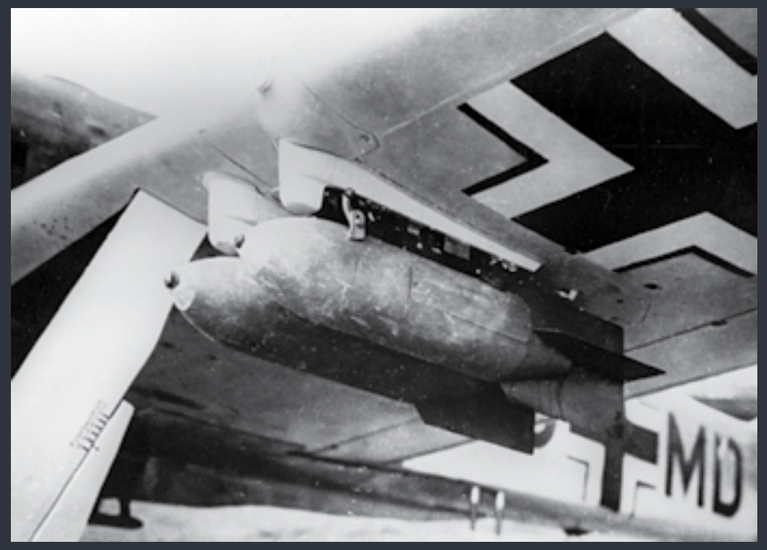


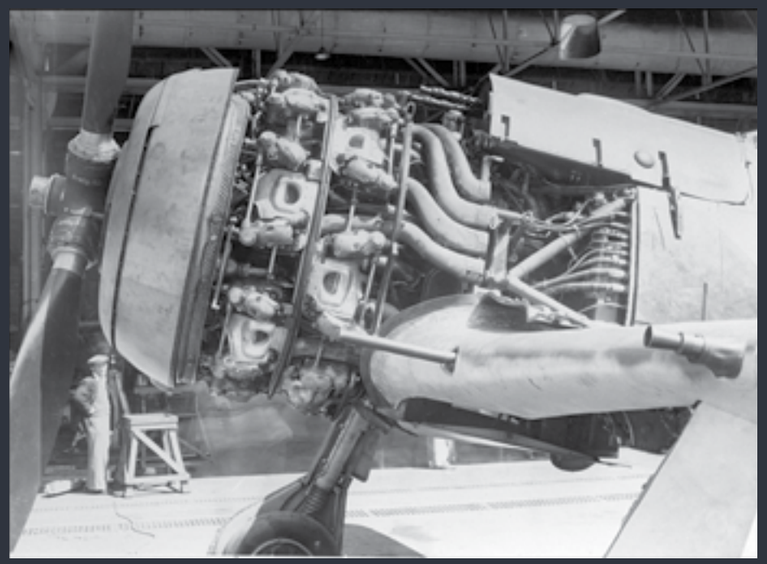


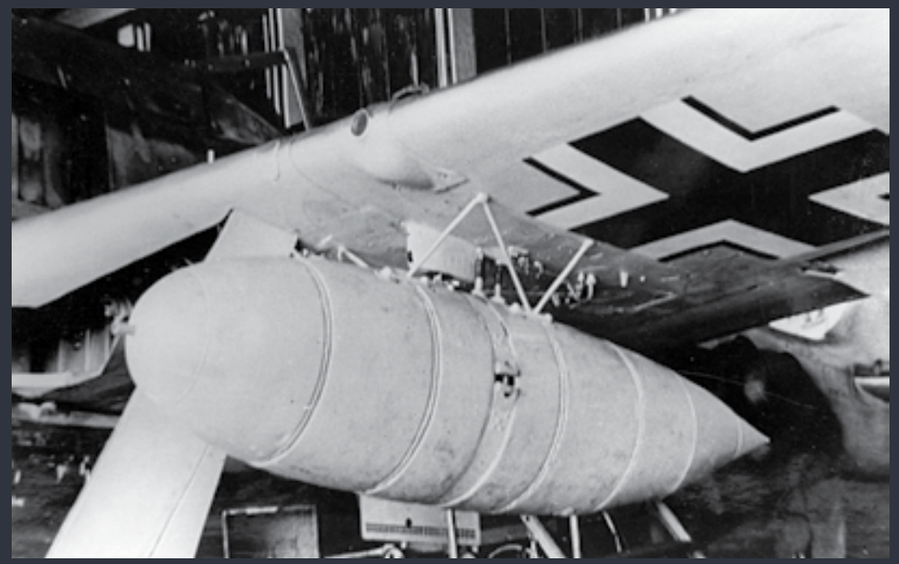


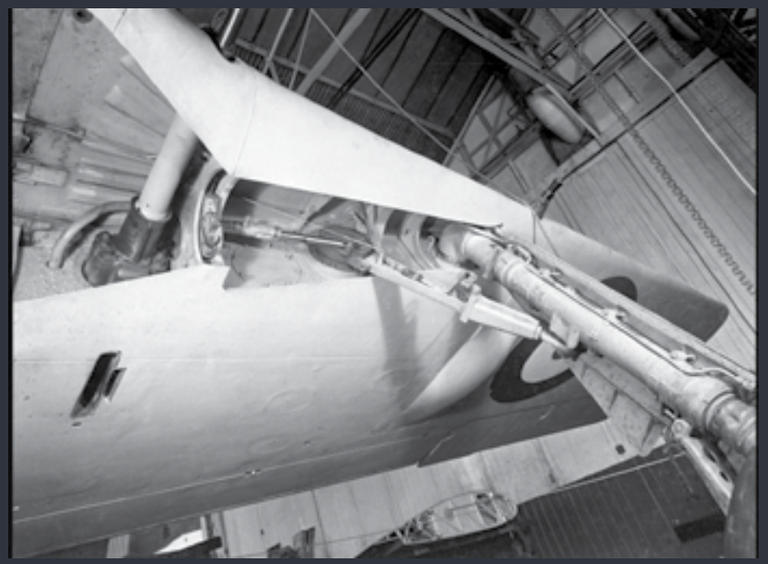


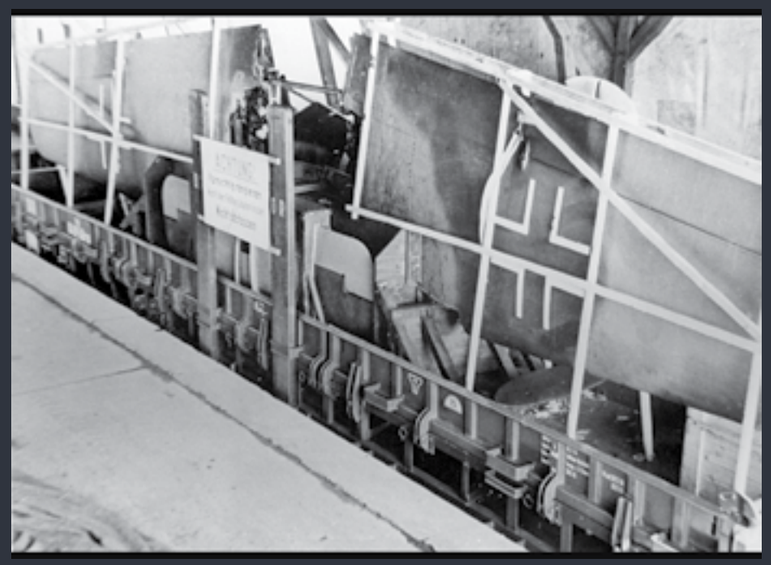


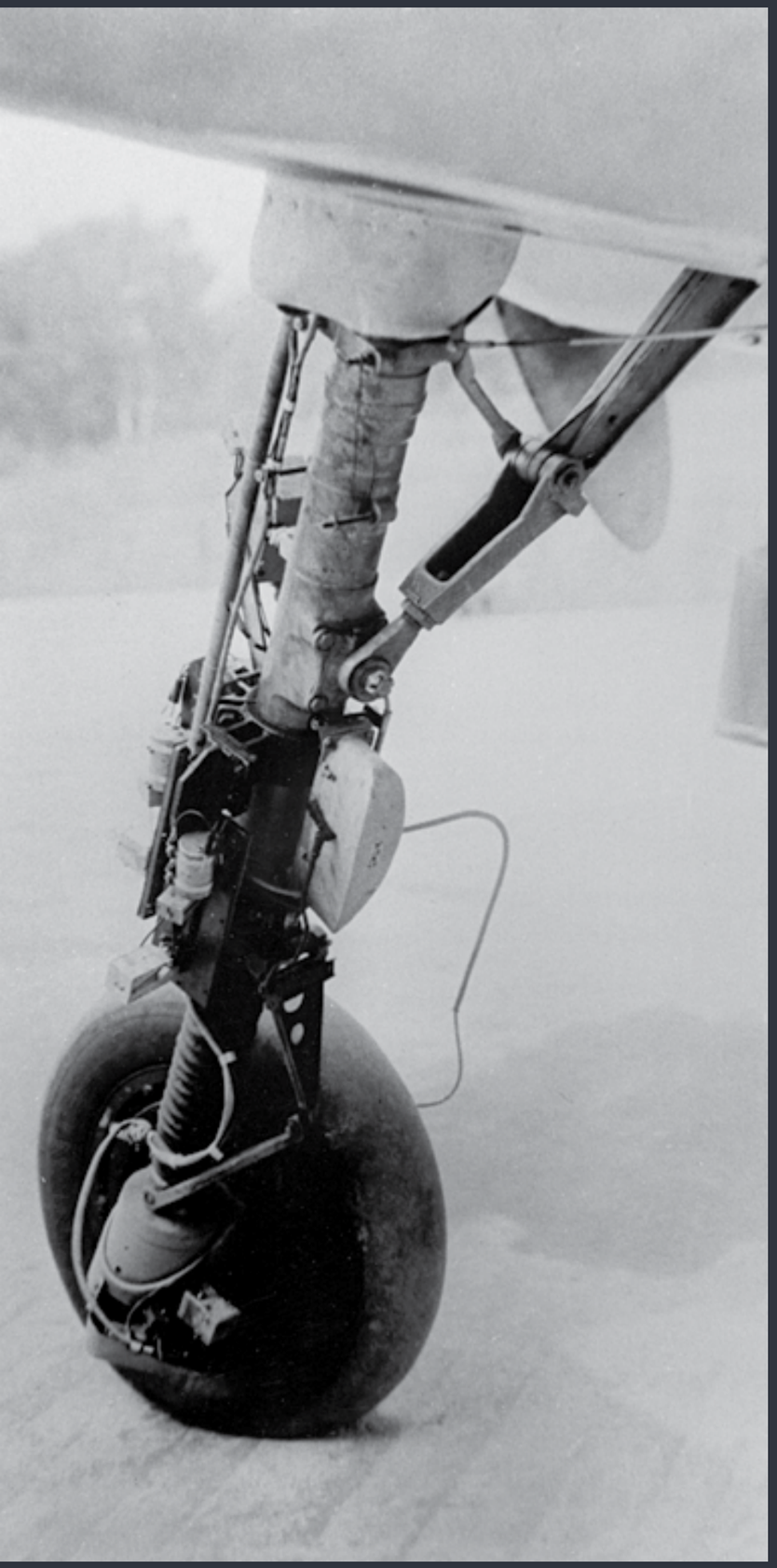


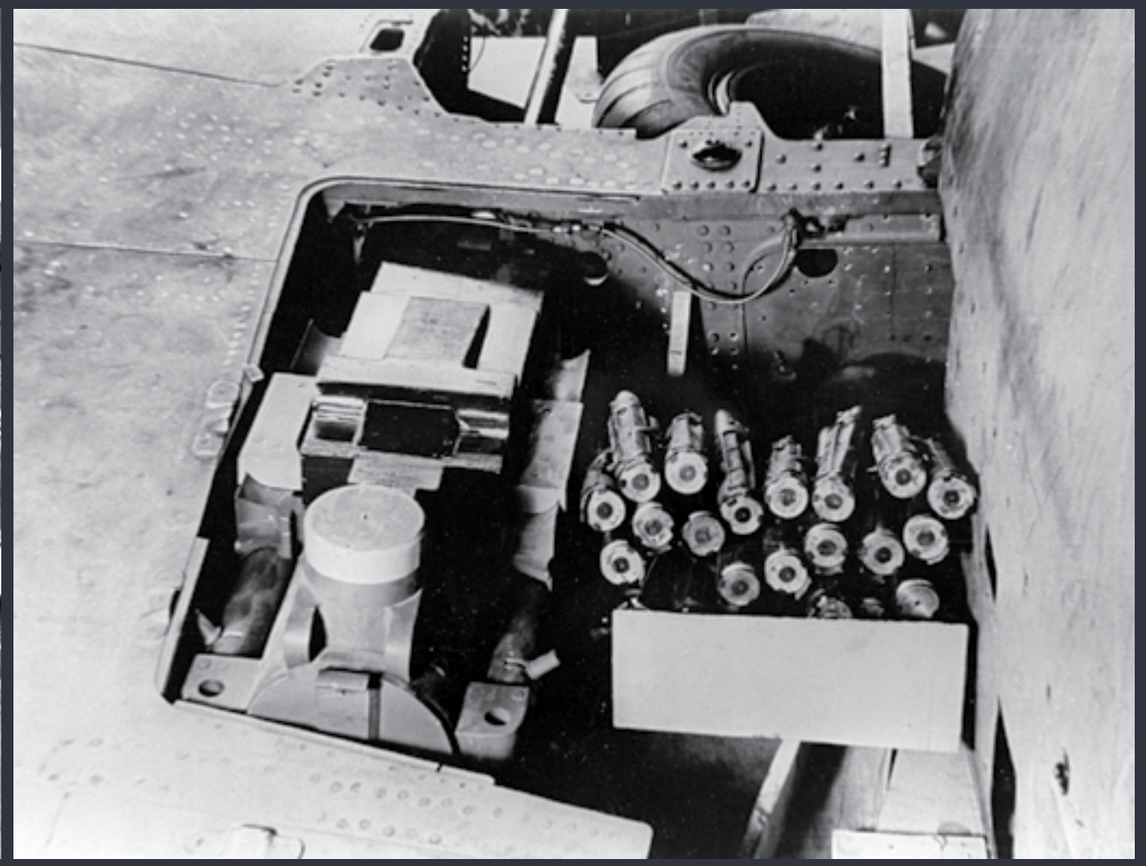


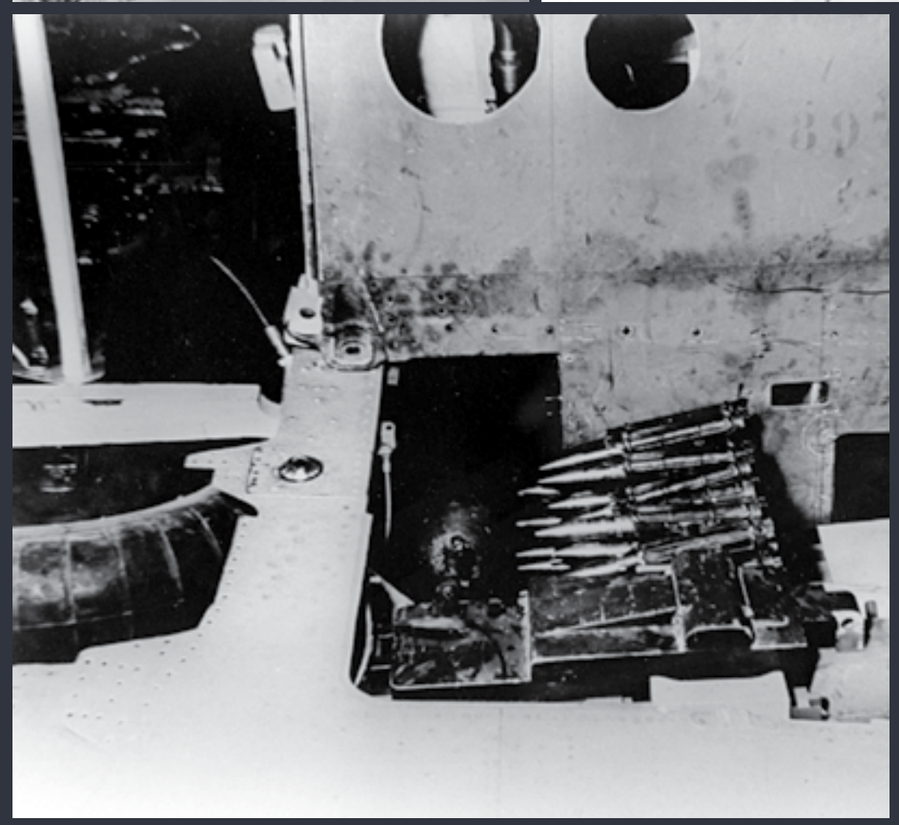


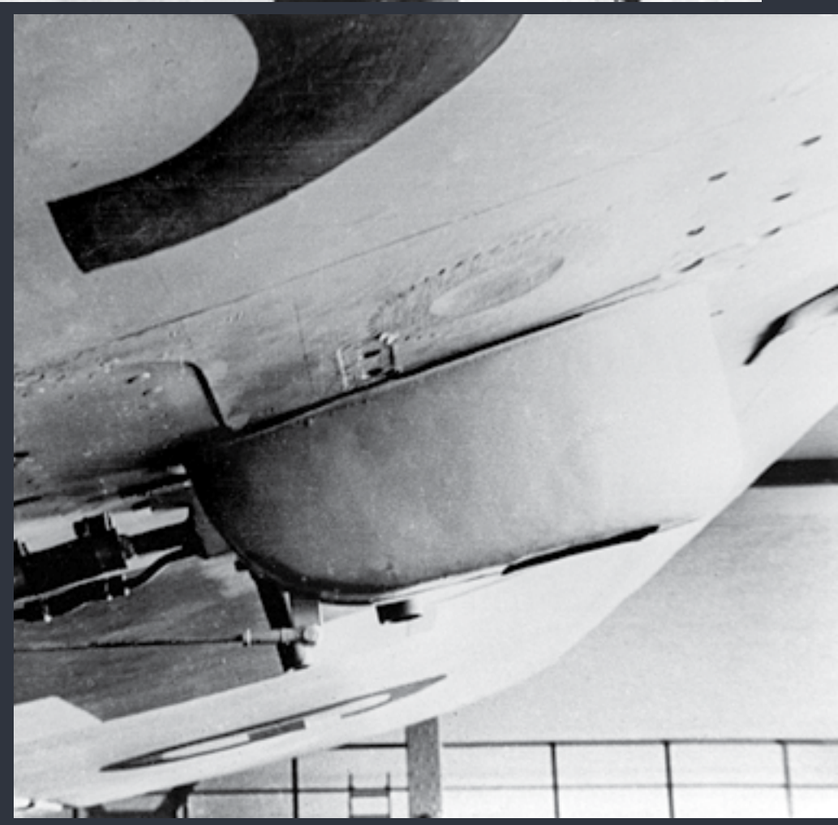


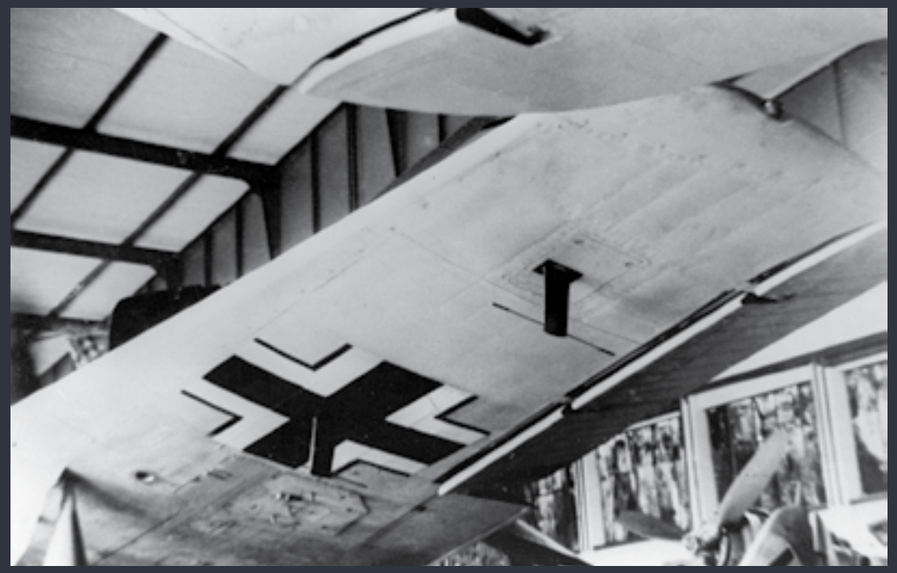


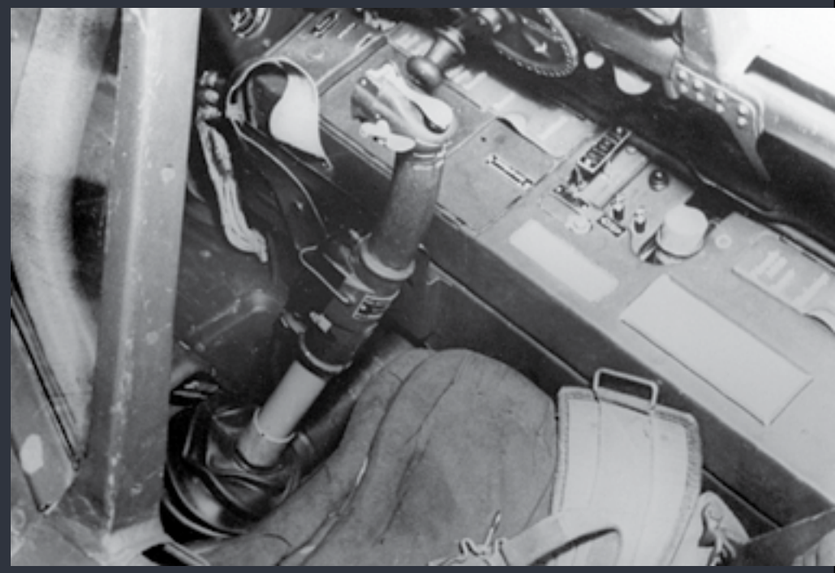


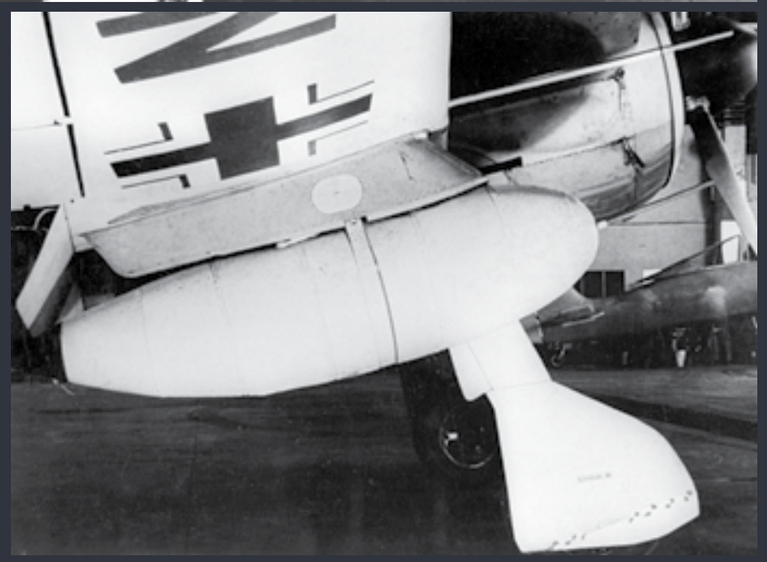


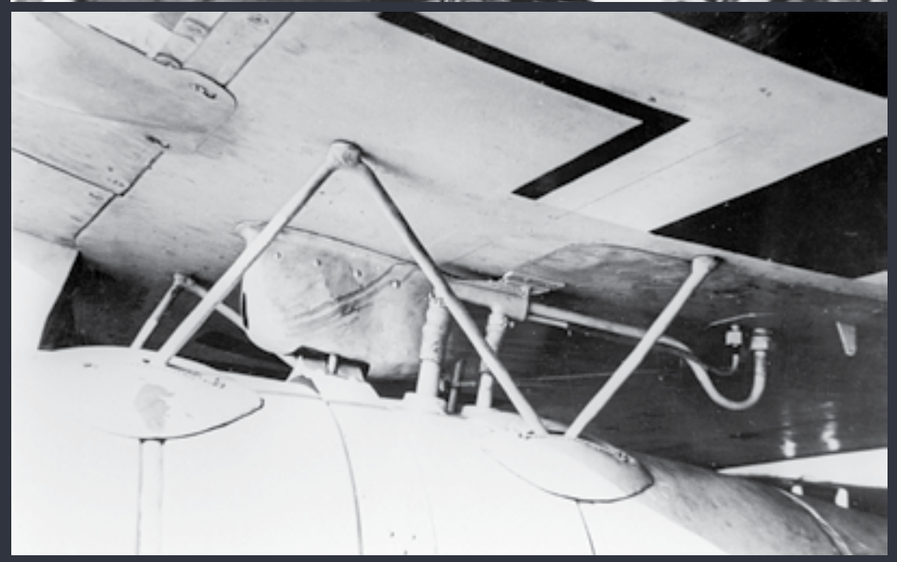


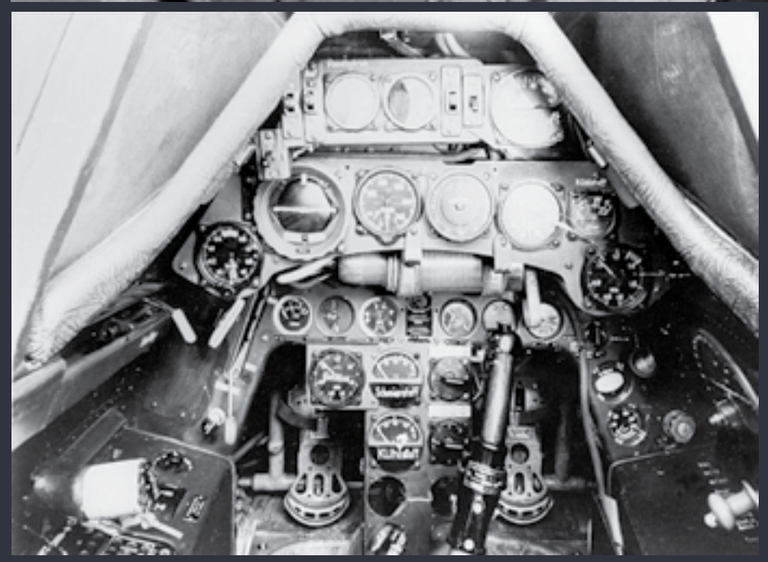


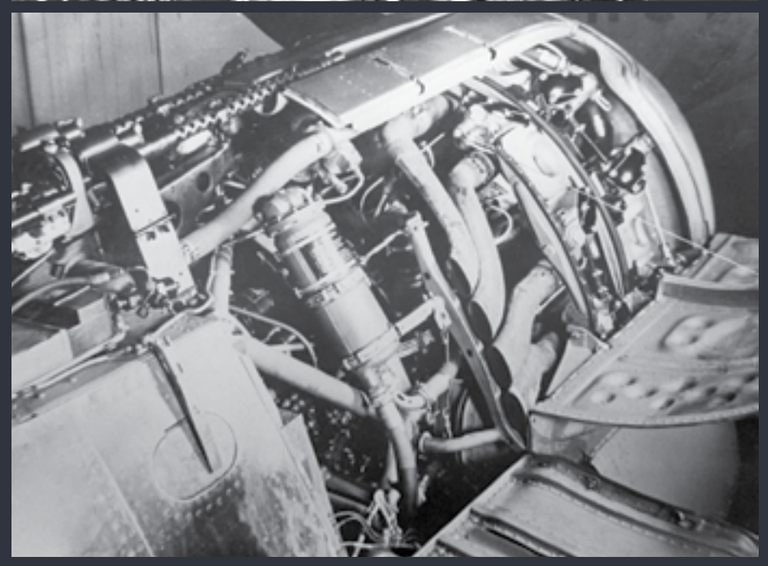


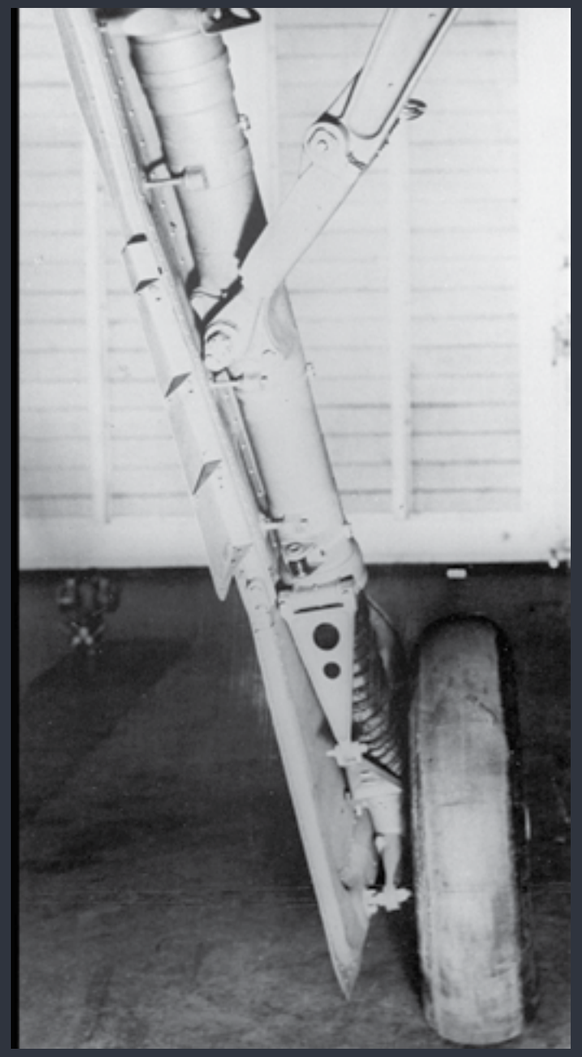


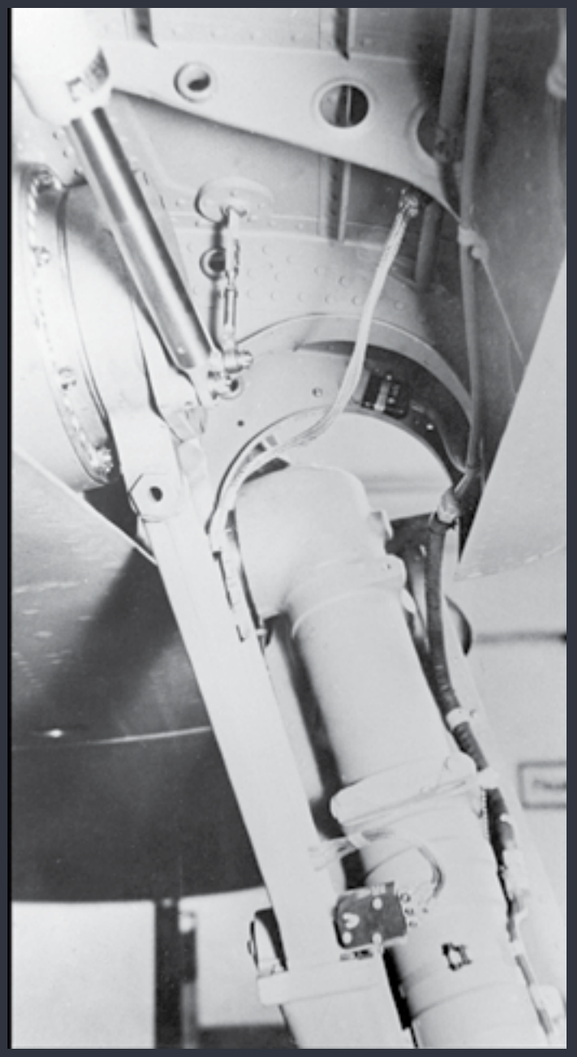


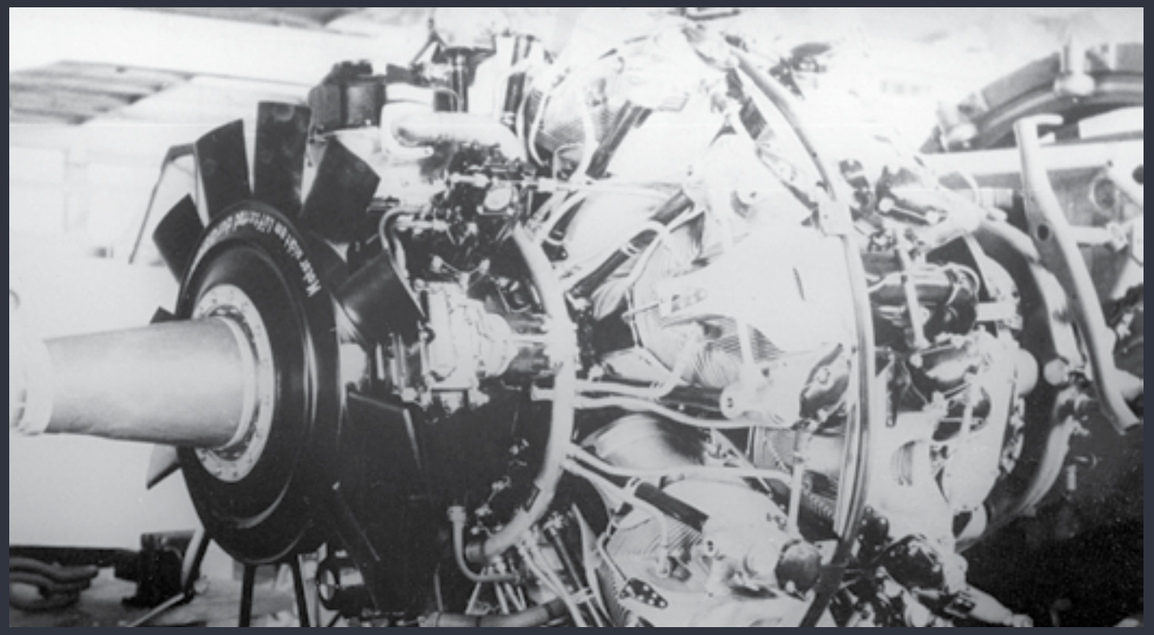


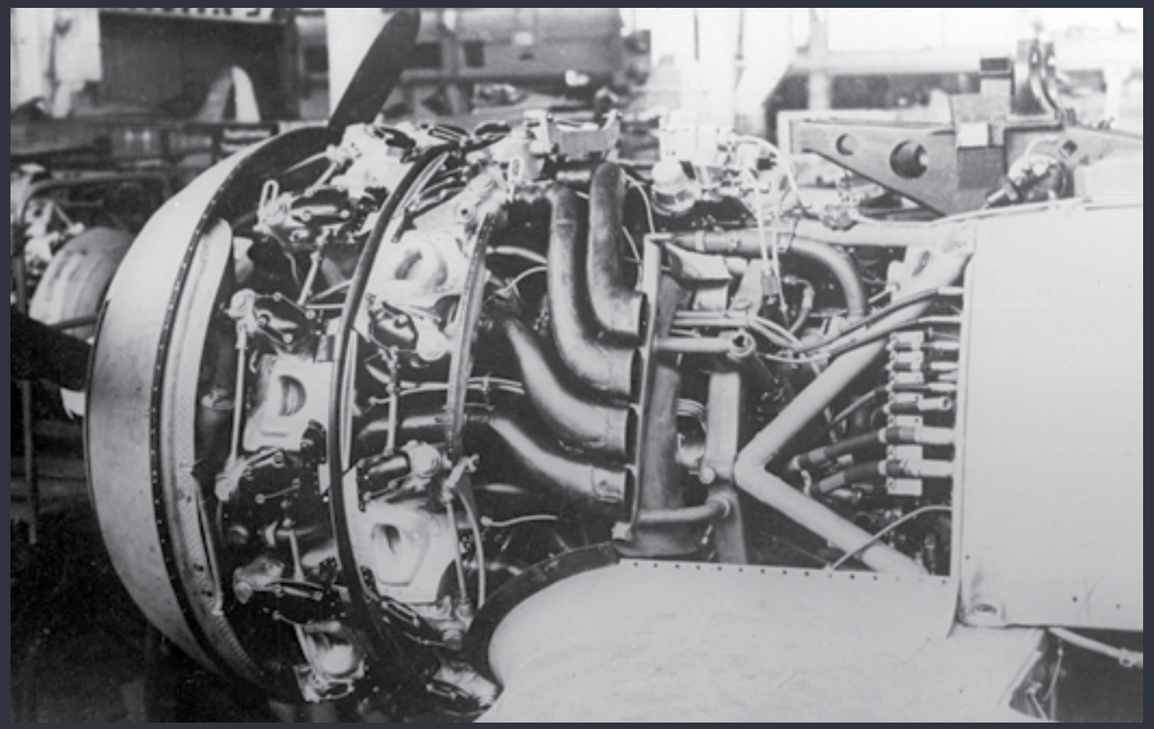


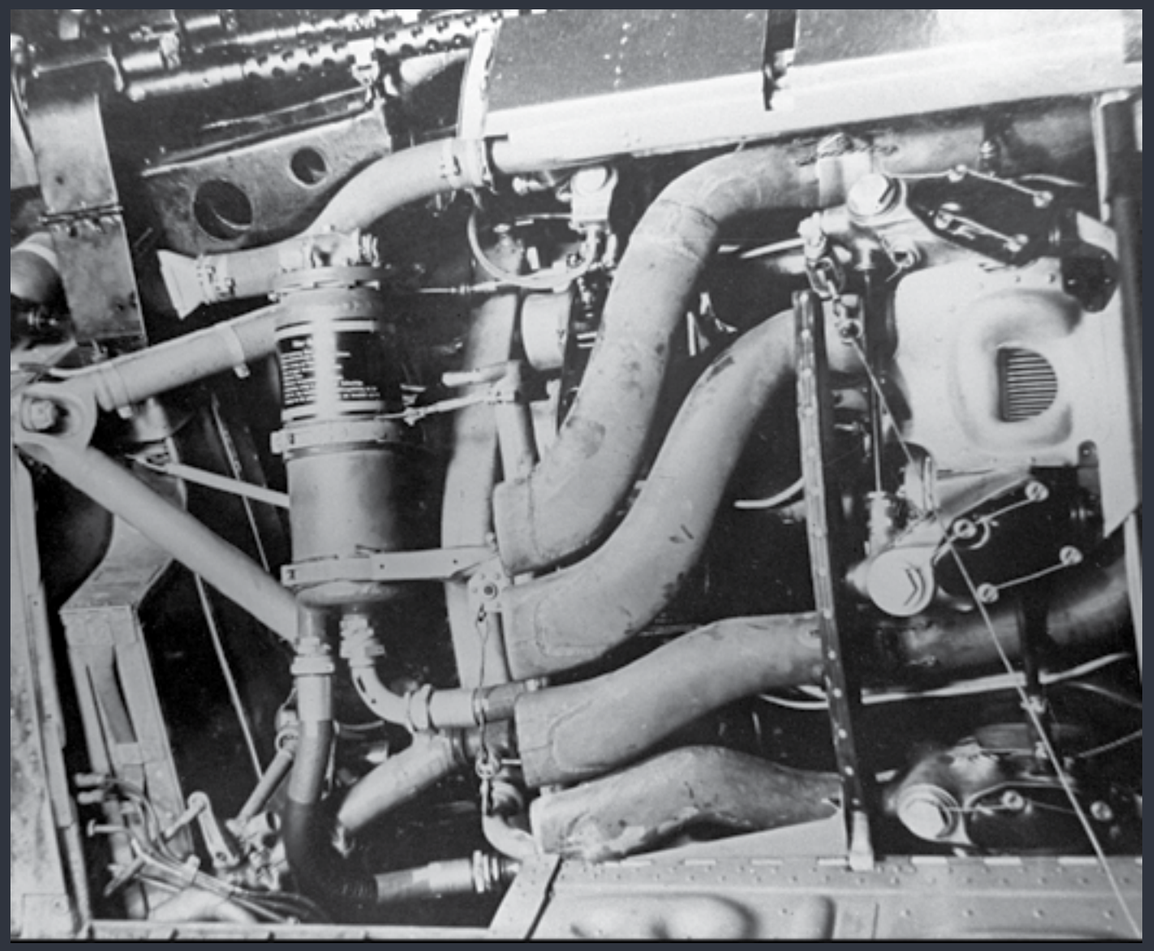


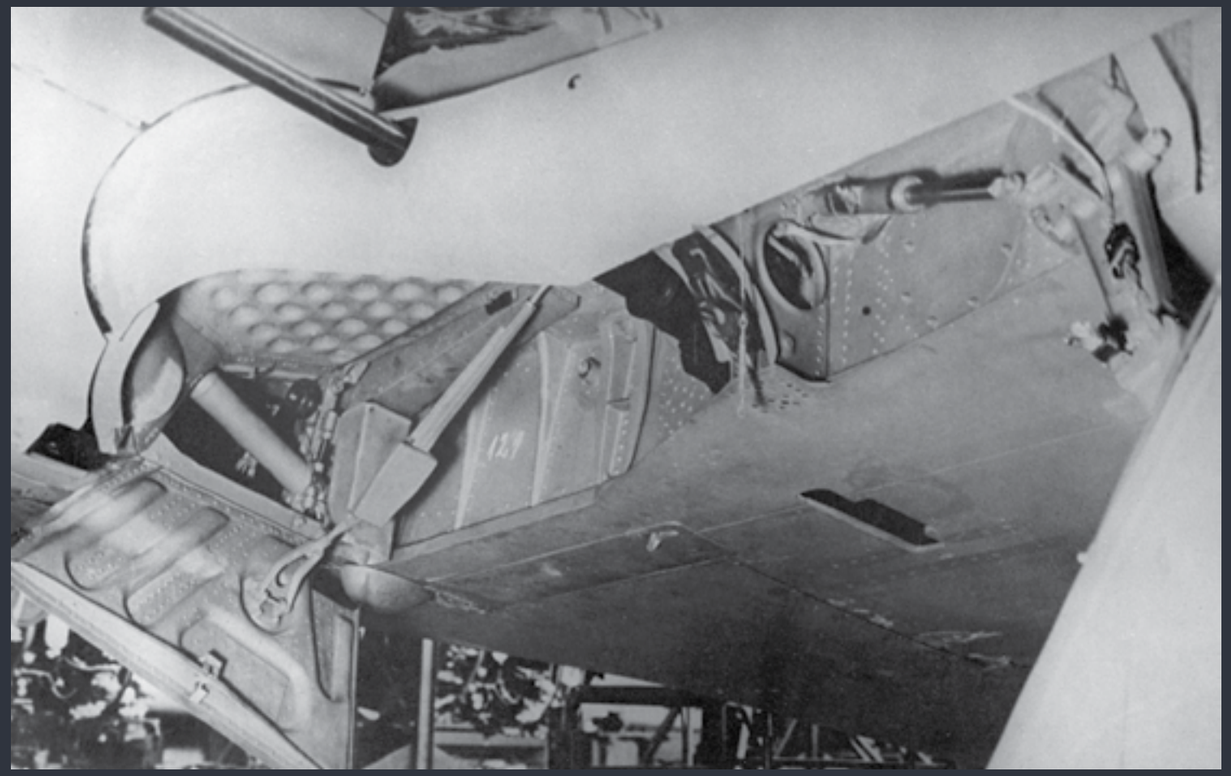


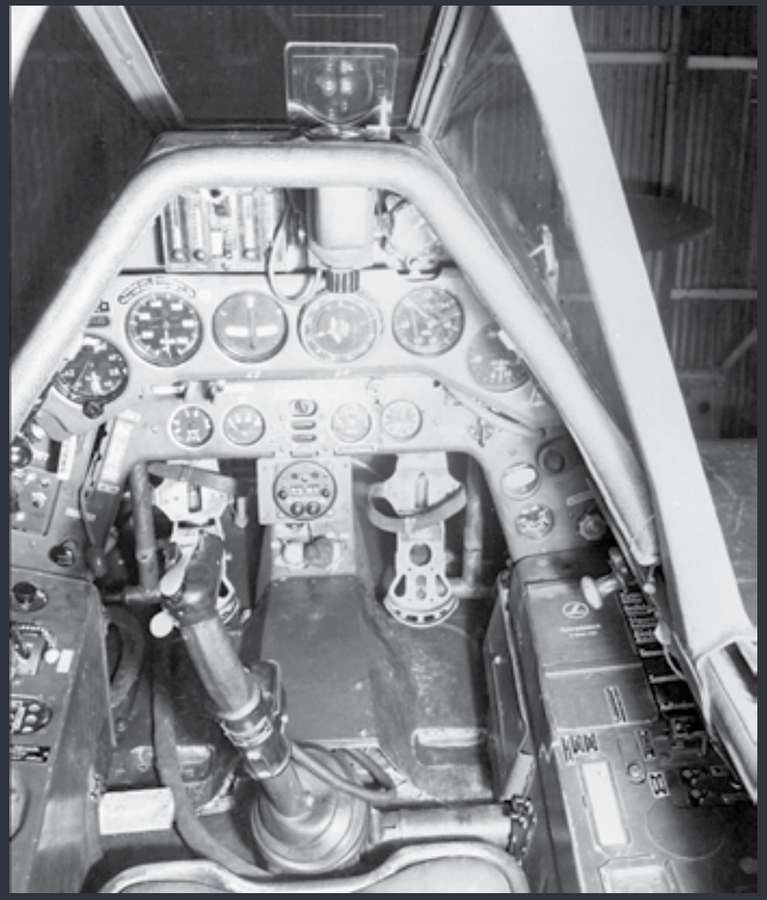


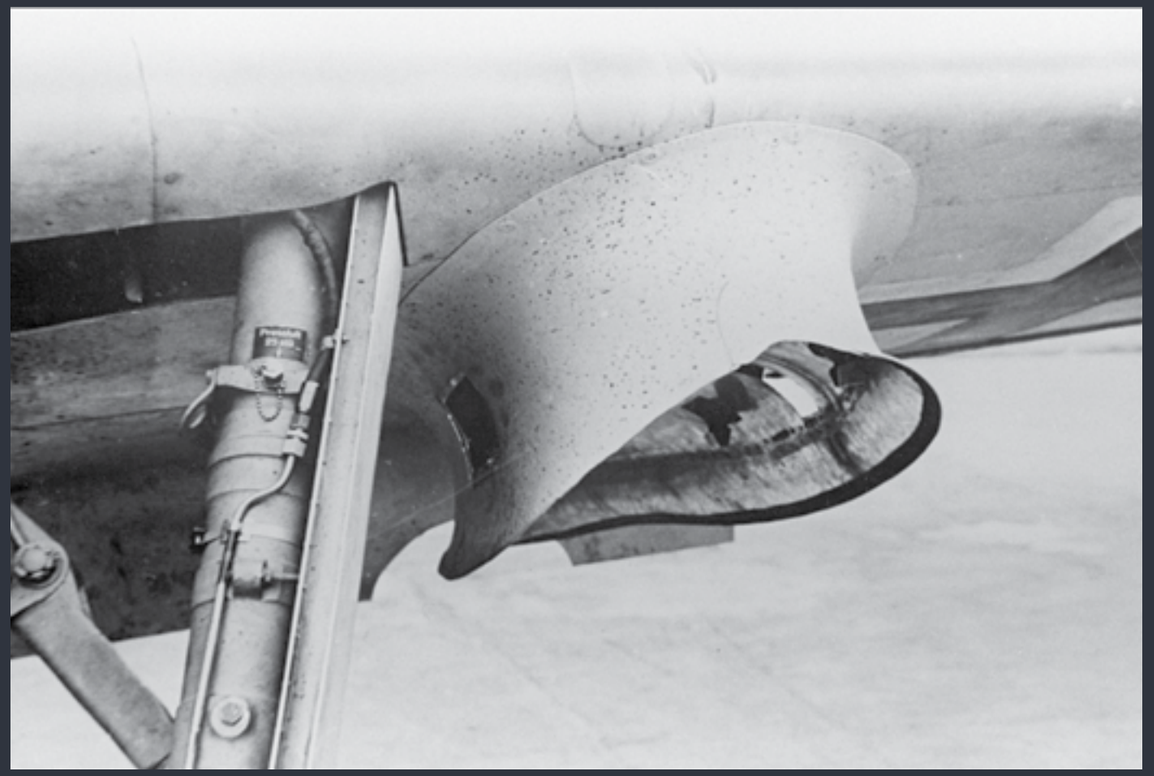


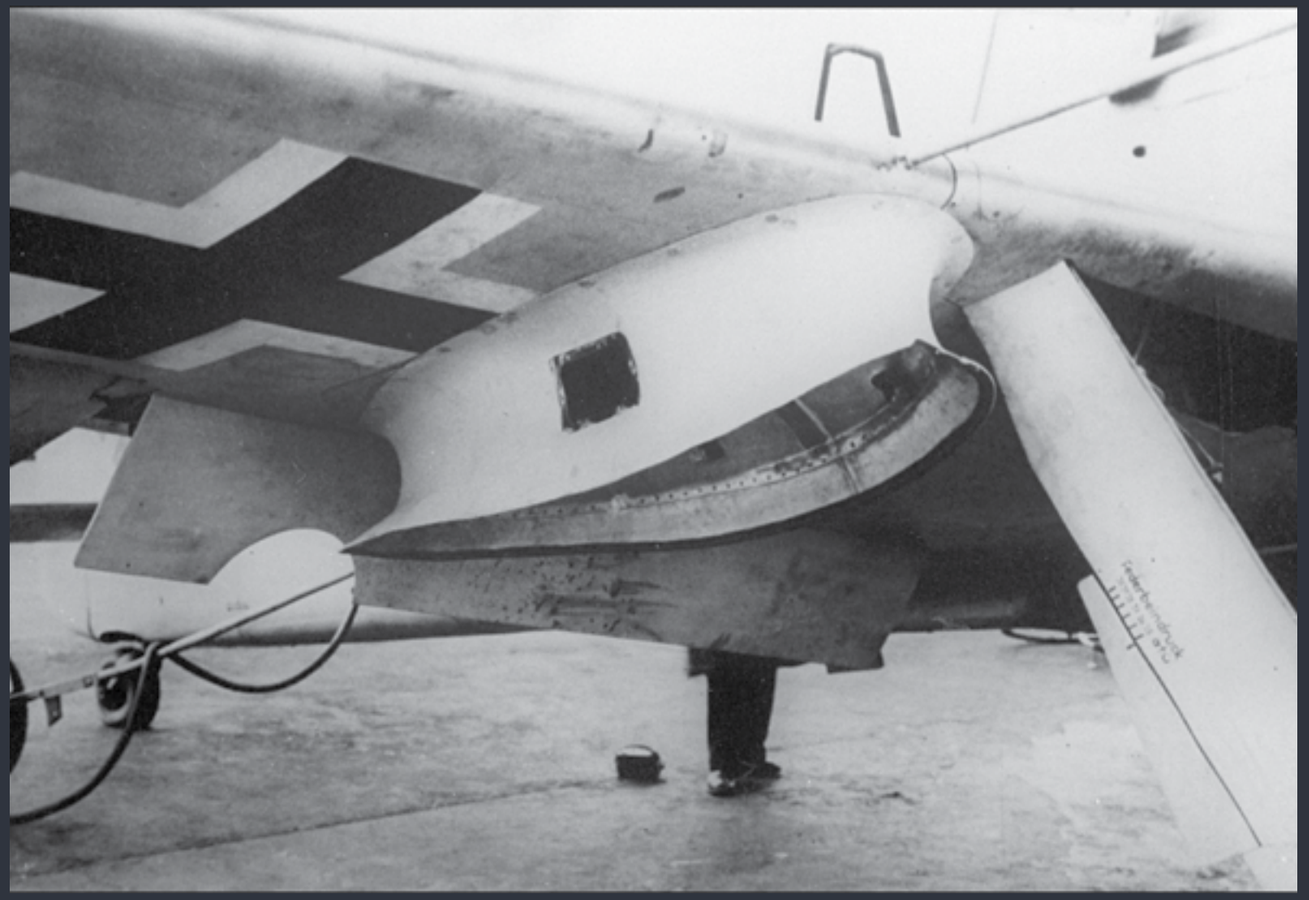












OPERATIONS

Focke-Wulf Fw 190 operational history

The Focke-Wulf Fw 190 Würger was used by the Luftwaffe during the Second World War in a variety of roles. Like the Messerschmitt Bf 109, the Fw 190 was employed as a "workhorse", and proved suitable for a wide variety of roles, including air superiority fighter, strike fighter, ground-attack aircraft, escort fighter, and operated with less success as a night fighter. It served on all the German fronts: Eastern Front, Western Front, North African Campaign and the Defence of the Reich.

When it was first introduced in August 1941, it quickly proved to be superior in all but turn radius to the Royal Air Force (RAF) front-line fighter, the Spitfire Mk. V variant. The 190 wrested air superiority away from the RAF until the introduction of tvhe vastly improved Spitfire Mk. IX in July 1942 restored qualitative parity. The Fw 190 made its air combat debut on the Eastern Front much later, in November/December 1942. The Fw 190 made a significant impact seeing service as a fighter and fighter-bomber. The fighter and its pilots proved just as capable as the Bf 109 in aerial combat, and in the opinion of German pilots who had flown both fighters, the Fw 190 presented increased firepower and manoeuvrability at low to medium altitude. The Fw 190 became the backbone of Jagdwaffe (Fighter Force) along with the Bf 109. On the Eastern Front, owing to its versatility, the Fw 190 was used in Schlachtgeschwader (Attack Wings) which were specialised ground attack units. The units achieved much success against Soviet ground forces.

As an interceptor, the Fw 190 underwent improvements to make it effective at high altitude, allowing the 190 to maintain relative parity with its Allied counterparts. The Fw 190A series' performance decreased at high altitudes (usually 6,000 m and above), which reduced its usefulness as a high-altitude fighter, but these complications were mostly rectified in later models, notably the Focke-Wulf Fw 190D variant, which was introduced in September 1944. In spite of its successes, it never entirely replaced the Bf 109. The Fw 190 was well liked by its pilots. Some of the Luftwaffe's most successful fighter aces flew the Fw 190, including Otto Kittel with 267 victories, Walter Nowotny with 258, and Erich Rudorffer with 222 claimed. A great many of their kills were claimed while flying the Fw 190.

Western Front

Early months

The Fw 190 was introduced on the Western Front in August 1941. For the first few months of its combat career, the Allies, entirely unaware of the new fighter, attributed pilots' reports of a new "radial-engine fighter" to Curtiss P-36 Mohawks which the Germans had captured from the French. The new fighter outperformed the Spitfire Mk. V, the then top-of-the-line RAF fighter, in all aspects except turning radius. The Fw 190 was considerably better in firepower, rate of roll, and straight-line speed at low altitude. As Allied fighter losses rose and local air superiority over the Channel front passed to the Luftwaffe, Allied plans were tentatively made to launch a commando raid on a Luftwaffe airfield to steal an Fw 190 for evaluation. However, the British acquired an intact Fw 190 A-3 in late June 1942, when a Jagdgeschwader 2 pilot, Oberleutnant Armin Faber, landed on a British airfield by mistake.

As tests confirmed the performance characteristics, British rushed development of the Spitfire Mk. IX with the new two-stage supercharged Merlin 61 engine. The RAF was also quick to study the aircraft for any novel design elements. In particular, the cooling system and installation of Fw 190's radial engine was a direct influence on Hawker Siddeley's Tempest II. On the whole, Allied pilots who flew the Fw 190 found

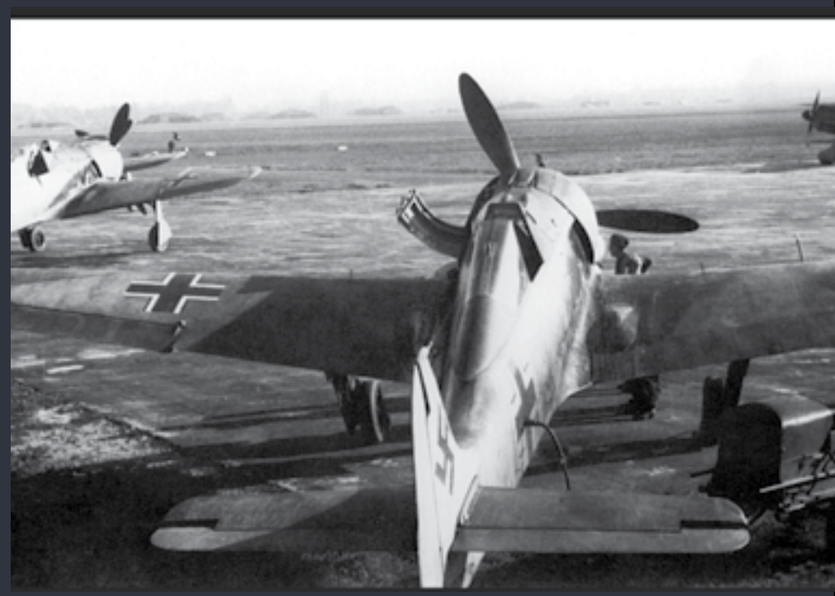
it pleasant to fly, very responsive, and, while the cockpit was small compared to most Allied fighters, it was well laid out. Most pilots found the Fw 190's Kommandogerät system (which automatically controlled the RPM, fuel mixture, ignition timing, supercharger switchover, and boost pressure) to be

powerful, variable incidence tailplane trim mechanism in the "nose heavy" position, meaning that their aircraft could not recover from the dive in time.

Cerberus and Jubilee

The first significant operation in which Fw 190s played an important role was Operation Cerberus, the "Channel dash" break-out through the English Channel and Dover Strait by the Kriegsmarine's small battleships Scharnhorst and Gneisenau and the heavy cruiser Prinz Eugen on 12 February 1942. Adolf Galland, the General der Jagdflieger (General of the Fighter Arm), insisted that the operation take place during daylight hours and accepted responsibility for devising a plan to provide continuous daylight fighter cover against the heavy attacks expected by the RAF. By the end of the day, JG 26 had been credited with seven aerial victories and six probables for the loss of four Fw 190s and their pilots. Adolf Galland was to later call the success of this operation the "greatest hour" of his career.

The Fw 190s first significant mass engagement took place on 19 August 1942, during Operation Jubilee, the Allied raid on Dieppe. Jagdgeschwaders JG 2 and JG 26 had recently converted from the Bf 109, fielding 115 fighter aircraft during the day's fighting, including a small number of high-altitude Bf 109G-1 models (although there is doubt as to whether G-1 variants existed as operational types). The RAF committed over 300 fighter aircraft, consisting mostly of Spitfire VB models, with just six squadrons of Spitfire Mk. IXBs, and also some of the new Hawker Typhoons. In addition, several squadrons of Hawker Hurricanes



and RAF Allison-engined Mustangs performed fighter-bomber and reconnaissance duties. During the action, the two Jagdgeschwader lost 25 Fw 190s to all causes, including crashes, but, in return, they claimed 61 of the 106 Allied aircraft lost that day (JG 26 and JG 2 claiming 40 and 21 respectively. Fighting over occupied territory, the RAF lost 81 pilots and aircrew killed or taken prisoner, against Luftwaffe fighter losses of 20 pilots killed (14 from JG 26 and six from JG 2).

Fighter-bomber raids

From the end of June 1942, the Fw 190 A-3/U3 Jabo (Jagdbomber, fighter-bomber) equipped 10.(Jabo)/JG 2 and 10.(Jabo)/JG 26, which operated with considerable success attacking shipping and port towns around the south-eastern coasts of England. These high-speed, low-altitude attacks were almost impossible to defend against, as the Fw 190s came in below effective radar coverage and were often gone before RAF fighters could intercept them. The most successful of these fighter-bomber operations was carried out on 31 October 1942 on Canterbury in retaliation for RAF bombing raids over Germany. In the largest daylight raid mounted by the Luftwaffe since the Battle of Britain, about 70 Fw 190s unloaded 30 bombs on the city, killing 32 people and injuring 116, as well as causing a lot of damage to residential properties and shops. Only one Fw 190 was lost over England. The most successful RAF fighters used to intercept these attacks were the Hawker Typhoons and the Griffon-engine Spitfire Mk XIIs, which were both fast enough to catch the Fw 190, especially at low altitudes.

In April 1943, the two Jabo units were amalgamated into Schnellkampfgeschwader 10 (SKG 10) which switched to night operations over southern England, a role in which the Fw 190 proved unsuccessful, taking heavy casualties from the de Havilland Mosquito night fighters. On the night of 16/17 April, on this unit's first operation, four Fw 190s which were attempting to attack London, got lost over Kent. Three of them tried to land at RAF West Malling: Yellow H of 7./SKG 10, flown by Feldwebel Otto Bechtold landed and was captured, his Fw 190 later being evaluated by the RAE at Farnborough; another Fw 190 of 5./SKG 10, flown by Leutnant Fritz Sezter landed several minutes later. When Setzer realised he had landed on an enemy airfield and attempted to take off, his aircraft was destroyed by an armoured car. Setzer surrendered to Wing Commander Peter Townsend. A third Fw 190 undershot the runway and was also destroyed, the pilot escaping with a concussion. The fourth Fw 190 crashed at Staplehurst, killing the pilot.

Normandy to Salzburg

The Fw 190 also saw heavy action in the 1944 Normandy Campaign. German fighters flew 760 sorties on 6 June 1944 against an Allied total of 14,000. By 10 June, the dearth of specialised ground attack aircraft forces meant the Oberkommando der Luftwaffe (High Command of the Air Force) ordered the Fw 190 Gruppen to install bomb racks for these types of operations. Just 24 hours later, the Fw 190 units were asked to revert to air superiority roles again. With conflicting orders and harried by Allied air forces, losses were heavy. In the space of three weeks, 200 Fw 190s and 100 pilots were lost to enemy action. Total losses by the end of June 1944 totalled 230 pilots killed and 88 wounded. Among the casualties was the 173-victory Fw 190

ace Emil Lang. 551 German fighters were shot down, with another 65 destroyed on the ground. A further 290 were damaged. In return, German pilots claimed 526 Allied aircraft destroyed.The Fw 190 also formed, along with the Bf 109, the core of the German fighter force that participated in Operation Bodenplatte. A total of 35 Fw 190 A-8s, 27 A-8/R2s, 5 F-8s and 50 D-9s were destroyed or lost over Allied lines on 1 January 1945.

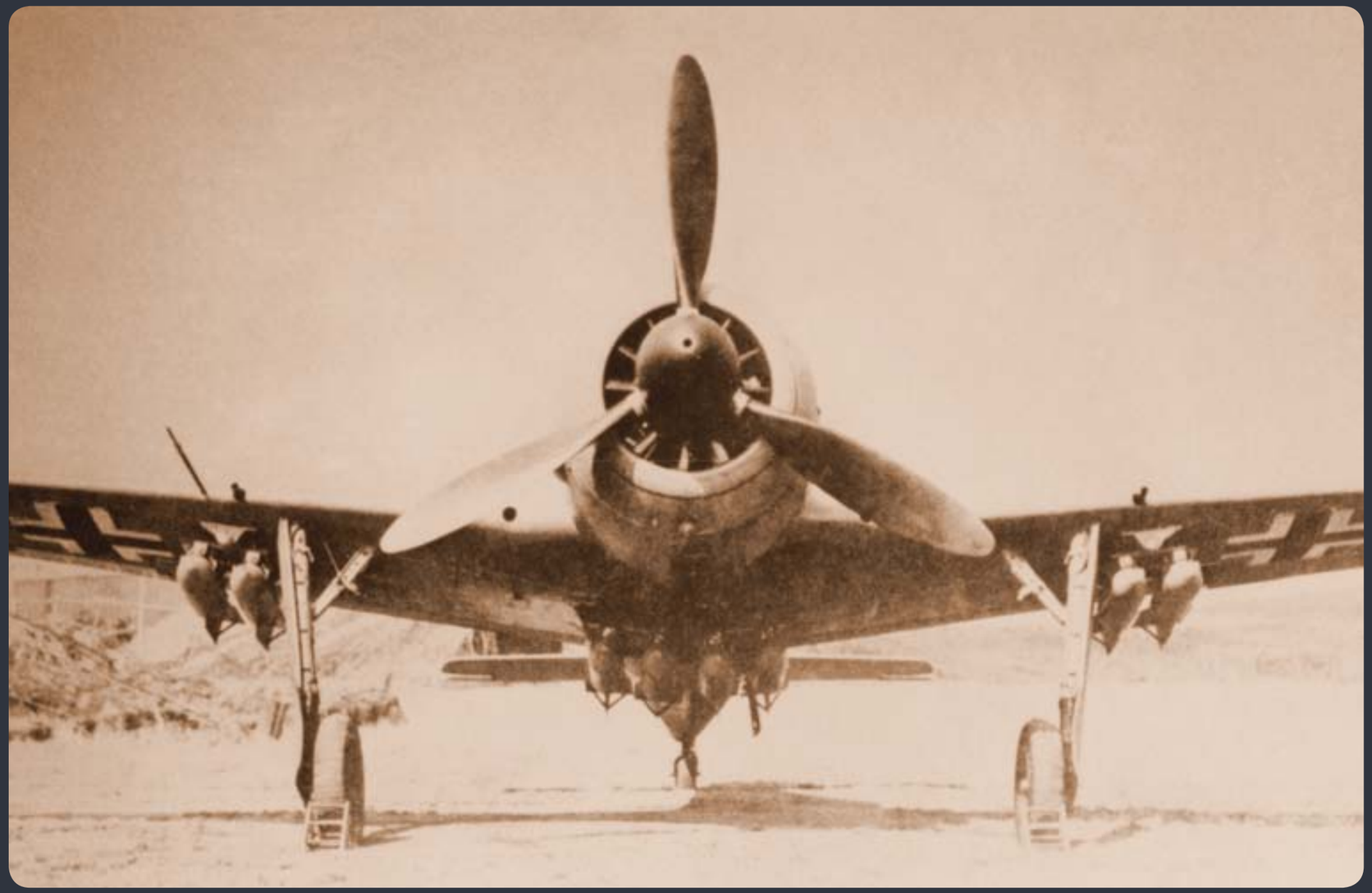
Over Germany

Wilde Sau

From mid-1943, Fw 190s were also used as night fighters against the growing RAF Bomber Command offensive. In mid-1943, one of the earliest participants in the single-engine, ground controlled, night-fighting experiments was the Nachtjagdkommando Fw 190 (Night Fighter Command Fw 190), operated by IV. Gruppe (4 Group), Jagdgeschwader 3, (Fighter Wing 3, or JG 3). The main Nachtgeschwader (Night Fighter Wings) were keen to adopt a new fighter type as their twin-engine fighters were too slow for combat against increasing numbers of de Havilland Mosquito night fighters and bombers. Nachtjagdgeschwader 1 (NJG 1) and NJG 3 kept a pair of Fw 190s on standby to supplement the Messerschmitt Bf 110 and Junkers Ju 88. The considerable performance advantage of the Fw 190 over the other two types was more than offset by the difficulties of operating at night. Few, if any, aerial successes can be attributed to these operational tests.

One of the first purpose built units to use Fw 190s in this role was Stab/Versuchskommando Herrmann, a unit specifically set up in April 1943 by Major Hajo Herrmann. Herrmann's unit used standard A-4s and A-5s borrowed from day fighter units to intercept bomb-

ers over or near the targeted city, using searchlights and other visual aids to help them find their quarry. The first use of "Window" by the RAF during the Battle of Hamburg in July 1943, rendered the standard nightfighter Himmelbett procedures useless and brought urgency to the development of Herrmann's Wilde Sau (Wild Boar) technique, pending the development of new nightfighting strategies.[20] Instead of restricting the Fw 190s to



ground control interception protocols, the Fw 190s were given a free hand to over-fly bombed areas to see if they could locate bombers using the ground fires below. These tactics became an integral part of the nightfighter operations until May 1944.

St/V Herrmann was expanded to become Jagdgeschwader 300 (JG 300, or Fighter Wing 300), JG 301 and JG 302. All three units initially continued borrowing their aircraft from day fighter units. The day fighter units began to protest at the numbers of their aircraft which were being written off because of the hazards of night operations; the numbers soared with the onset of winter, with pilots often being forced to bail-out through being unable to find an airfield at which to land safely. Crash landings were also frequent. Eventually all three Wilde Sau units received their own aircraft, which were often modified with exhaust dampers and blind-flying radio equipment. Another unit was Nachtjagd Gruppe 10 (N/JGr 10), which used Fw 190 A-4/R11s through to A-8/R11s; Fw 190s modified to carry FuG (Funkgerät) 217 or FuG 218 radar mid-VHF band equipment.

The Sturmböcke

The appearance of United States Army Air Forces heavy bombers caused a problem for the German fighter force. The B-17 Flying Fortress in particular could absorb heavy punishment. The armament of the Bf 109 and then current Fw 190 were not adequate for bomber-destroyer operations, with the B-17's eventual deployment in the combat box formations providing their defensive armament with formidable massed firepower from as many as one hundred Browning AN/M2 .50 caliber machine guns or more between all the bombers in such a formation, from almost any conceivable direction. The Fw 190, designed as a rugged interceptor capable of withstanding considerable combat damage and delivering a potent 'punch' from its stable gun platform, was considered ideal for anti-bomber operations. Focke-Wulf redesigned parts of the wing structure to accommodate larger armament. The Fw 190A-6 was the first sub-variant to undergo this change. Its standard armament was increased from four MG 151/20s to two of them with four

more in two underwing cannon pods. The aircraft was designated A-6/R1 (Rüstsatz; or field conversion model). The first aircraft were delivered on 20 November 1943. Brief trials saw the twin cannon replaced by the MK 108 30mm autocannon in the outer wing, which then became the A-6/R2. The cannons were blowback-operated, had electric ignition, and were belt fed. The 30mm MK 108 was simple to make and its construction was economical; the majority of its components consisted of just pressed sheet metal stampings. In the A-6/R4, the GM-1 (nitrous oxide) Boost was added for the BMW 801 engine to increase performance at high altitude. For protection, 30 millimetres of armoured glass was added to the canopy. The A-6/R6 was fitted with twin heavy calibre Werfer-Granate 21 (BR 21) unguided, air-to-air rockets, fired from single underwing tubular launchers (one per wing panel). The increased modifications, in particular heavy firepower, made the Fw 190 a potent bomber-killer. The A-7 evolved in November 1943. Two synchronized 13mm MG 131 machine guns replaced the twin cowl-mount synchronized 7.92mm MG 17 machine guns. The A-7/R variants could carry two 30mm MK 108s as well as BR 21 rockets. This increased its potency as a Pulk-Zerstörer (Bomber Formation Destroyer). The A-8/R2 was the most numerous Sturmbock aircraft, some 900 were built by Fiesler at Kassel with 30mm MK 108s installed in their outer wing panel mounts. While formidable bomber-killers, the armour and substantial up-gunning with heavier calibre firepower meant the Fw 190 was now cumbersome to manuever. Vulnerable to Allied fighters, they had to be escorted by Bf 109s.

Two of the former Wilde Sau single-engined night fighter wings were reconstituted for their use, such as Jagdgeschwader 300 (JG 300, or Fighter Wing 300) and JG 301. These units consisted of Sturmböcke. However, JG 3 also had a special gruppe (group) of Sturmböcke. Willy Unger of 11.(Sturm)/JG 3 (11 Staffel (Squadron) of Sturmgruppe (Storm group) JG 3) made the following comments:

Advantages; wide undercarriage, large twin-row radial engine which protected the pilot from the front, electric starter motor and electric trim system.

Disadvantages; there was a danger of turning over when braking hard on soft or sandy ground. In combat against enemy fighters, more awkward because of the heavy armour plating. Strong at low altitude, inferior to the Bf 109 at higher altitude. In my opinion the Fw 190, in this version, was the best aircraft used in the formation against the Viermots. Richard Franz commented:

When we made our attack, we approached from slightly above, then dived, opening fire with 13mm and 20mm guns to knock out the rear gunner and then, at about 150 metres, we tried to engage with the MK 108 30mm cannon, which was a formidable weapon. It could cut the wing off a B-17. Actually, it was still easier to kill a B-24, which was somewhat weaker in respect of fuselage strength and armament. I think we generally had the better armament and ammunition, whereas they had the better aircraft.

Eastern Front

Against the Red Air Force German aces were able to shoot down large numbers of aircraft. Erich Rudorffer, a 222 victory ace, and Otto Kittel, a 267 victory ace, and Walter Nowotny, a 258 victory ace were the highest scoring Fw 190 aces in the Luftwaffe. Nowotny claimed most of his successes in the Fw 190. Rudorffer destroyed 138 aircraft flying the Fw 190; 13 in 17 minutes on 11 October 1943. Rudorffer scored 136 of his 222 victories in the Fw 190, while Kittel scored all but 40 of his kills in the type.[29] No more than a few hundred Fw 190s were ever in service on the Eastern Front at any one time.

Blau to Third Kharkov

The first appearance of the Fw 190 on the Eastern Front occurred in September 1942. During this time, the Battle of Stalingrad was taking place, which would eventually lead to the destruction of the German Sixth Army. The first German unit to receive the fighter in the east, was Jagdgeschwader 51 (JG 51). However, its I. Gruppe was assigned to the north sector, and undertook operations against the Soviets during the Siege of Leningrad in order to allow the Fw 190 to acclimatise. The unit flew free fighter sweeps (Freie Jagd). This lasted only days, and I./JG 51 moved southward to Lake Ilmen to provide air cover for the vulnerable Demyansk pocket survivors. In October, 1942 the unit moved south again, this time the Rzhev-Vyazma salient. It was at this location the Fw 190 started to make an impact.

On 10 December the first loss was taken; Hauptmann (Captain) Horst Riemann, was killed in action. Others were also shot down owing to AAA fire whilst escorting German bomber and transport aircraft dropping in supplies. Pilots that had not ‘shone’ while flying the Bf 109 now increased their scores with the Fw 190. Günther Schack would score a large percentage of his 174 victories on the Fw 190; including 88 Ilyushin Il-2 Sturmoviks. Josef

Jennewein scored 86 victories. His tally increased markedly only after he converted on to the Fw 190. In December 1942, Jagdgeschwader 54 (JG 54) also began converting on to the Fw 190. I./JG 54 would produce the fourth and fifth highest scoring aces of the war. Otto Kittel had scored just 39 victories since the start of Operation Barbarossa, in June 1941. The other, was Walter Nowotny. Although he had claimed more than 50 kills on the Bf 109, his success in the Fw 190 would see his score rise to 258. Kittel would also go on to achieve 267 victories, all but 39 in the Fw 190.

The Fw 190 would also prove to be a more reliable aircraft, in some respects, to the Bf 109. It handled well on the ground, its wide undercarriage made it more suited to primitive conditions on the Eastern Front. It could also sustain heavier damage than the Bf 109 and survive owing to its radial engines. On one mission in mid-1943, a Fw 190 returned to base with two cylinder heads shot off. During the first phase of the Fw 190s service on the Eastern Front, it served with two other Geschwader (Wings). Jagdgeschwader 26's I. Gruppe was deployed briefly to the front, and Jagdgeschwader 5 (JG 5) served in northern Norway with the Fw 190. The Third Battle of Kharkov prevented a collapse of the Germans' southern front. The fighting left a salient in the front line near Orel-Belgorod-Kursk.

Citadel to the Dnieper

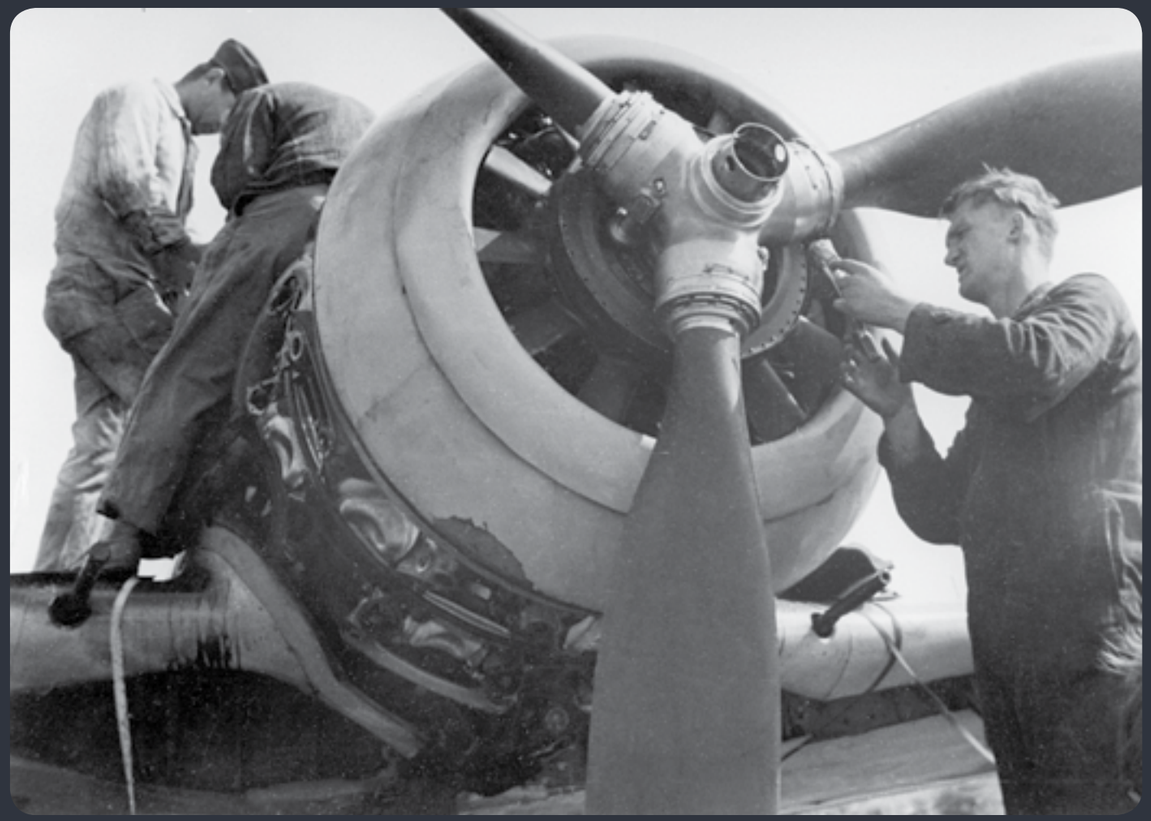
The Oberkommando der Wehrmacht (OKW or German High Command) chose to eliminate the bulge. Unternehmen Zitadelle (Operation Citadel), planned for the summer, 1943, would be the Fw 190s first major battle in number. By June 1943 the Fw 190 was to reach peak strength. II./JG 54,

the main operator, operated 196 fighters before Zitadelle. However, some of this total included Bf 109s still on strength. I./54, I., III., and IV./ Jagdgeschwader 51 (JG 51) mustered 186 Fw 190s (most of the fighter force in this region operated the Fw 190)] 88 of them serviceable. The Fw 190 force was assigned to the northern sector near Orel, supporting the German Ninth Army.

In the early morning of 5 July 1943, the opening day of the offensive, the Fw 190s won air superiority over the northern sector. Soviet aviation was held in reserve and its units fed in piecemeal, whereas 1 Fliegerdivision had made an all out effort. The Soviet 16th Air Army (16VA) was permitted to engage only one-third of its fighter force. The German numerical superiority managed to deliver a severe defeat on Soviet aviation on this date. The Fw 190s had the upper hand and shot down scores of Soviet fighter aircraft allowing the German strike aircraft to attack Red Army positions at will. Within a space of a few hours, 50 Soviet aircraft had been shot down. For just 29 casualties, 18 of them destroyed and seven Fw 190s shot down in combat, 1st Fliegerdivision filed claims for 165 victories. The division had over claimed, but Soviet losses were around 100. The Fw 190s performance as a low level air superiority was evident and it reflected the German superiority in the air on that date.

On 6 July the Fw 190 again proved its worth at low altitude. Soviet fighters providing close escort for slow bombers enabled the Fw 190s of JG 51 and JG 54 to attack Soviet formations at will. Fw 190s claimed a ratio in favour of 60:1 on this date; losing two fighters shot down and two damaged while claiming 121 enemy aircraft destroyed. The situation called for a change in Soviet air tactics. Soviet fighters on airfields were placed on alert should larger German formations appear and fighters were now permitted to conduct fighter sweeps in small formations of four to six aircraft. These changes had limited influence of the air battle and not the significant results claimed by Soviet histories. Soviet aviation would still sustain heavy losses. JG 51 and 54 had inflicted heavy damage, the three regiments of 1 DIAD (1st Guards Fighter Division) could field only 26 fighters between them. The 6th IAK (Air Corps) could muster just 48 fighters.

Two main reasons resulted in these



loss rates; Soviet pilots were still limited to close escort duty and were not allowed to pursue aircraft into airspace guarded by other Soviet units which restricted their freedom, and when the experience of the German pilots is added, the result was damaging. On 7 July the 16th Air Army lost 30 aircraft for three Fw 190s destroyed and three crash-landed in German-held territory. On 8 July, the Fw 190 units claimed 74 of the 81 Soviet aircraft claimed destroyed on that date. Actual Soviet losses were 43.

With the German armies now exhausted, the Fw 190 units were asked to perform Jabo, or fighter-bomber missions. JG 54 flew missions in this capacity. Now performing dual purposes, the Fw 190 achieved significant recognition as a rugged aircraft. On 12 July 1943, the 16VA was almost driven from the skies by Fw 190 Geschwader. The air battle had been decisively won by the 1st Fliegerdivision, thanks largely to the Fw 190. However, the ground battle was lost. On 13 July the Soviets launched Operation Kutuzov. The offensive threatened to cut off the entire German Ninth and Second Panzer Army. Luftwaffe resistance was vital to slowing down Soviet advances. On several days, the Luftwaffe achieved numerical superiority (Soviet aviation was concentrated in the south). The 15th Air Army could not prevent the Fw 190 units gaining air superiority which allowed Ju 87 units to help the Army to restrict the Red Army's break through to the first German defence line on the first day. But the overall situation could not be sustained, as the Soviet ground forces had made several advances further north. Between 1 and 31 July 1943 JG 51 claimed 800 victories against 77 Fw 190s (50 destroyed). JG 54 claimed 450 for the same period for 34 Fw 190s

(24 destroyed). Even though it is probable that between 25 to 33 percent of these claims were exaggerations, the statistics confirm the qualitative superiority of tactical air units in combat. More accurate data suggests JG 51s losses were 55 Fw 190s destroyed and 31 damaged. The introduction of the Fw 190 to the front had proven wise. The armament of the Fw 190 was something that was needed by German fighter units. The IL-2 Shturmoviks were becoming available in increasing numbers, and the Fw 190 was an ideal counter to the Soviet aircraft.

The increasing numbers of Soviet armour led to a rethink in how to combat the threat. In the summer, 1943, Ju 87s crews had suffered heavy losses. The Henschel Hs 129 had suffered 495 losses from a total production of 664. It was decided to replace them with the Fw 190. On 18 October, Sturzkampfgeschwader 1, Sturzkampfgeschwader 3 and Sturzkampfgeschwader 5 were renamed Schlachtgeschwader 1, 3 and 5. Sturzkampfgeschwader

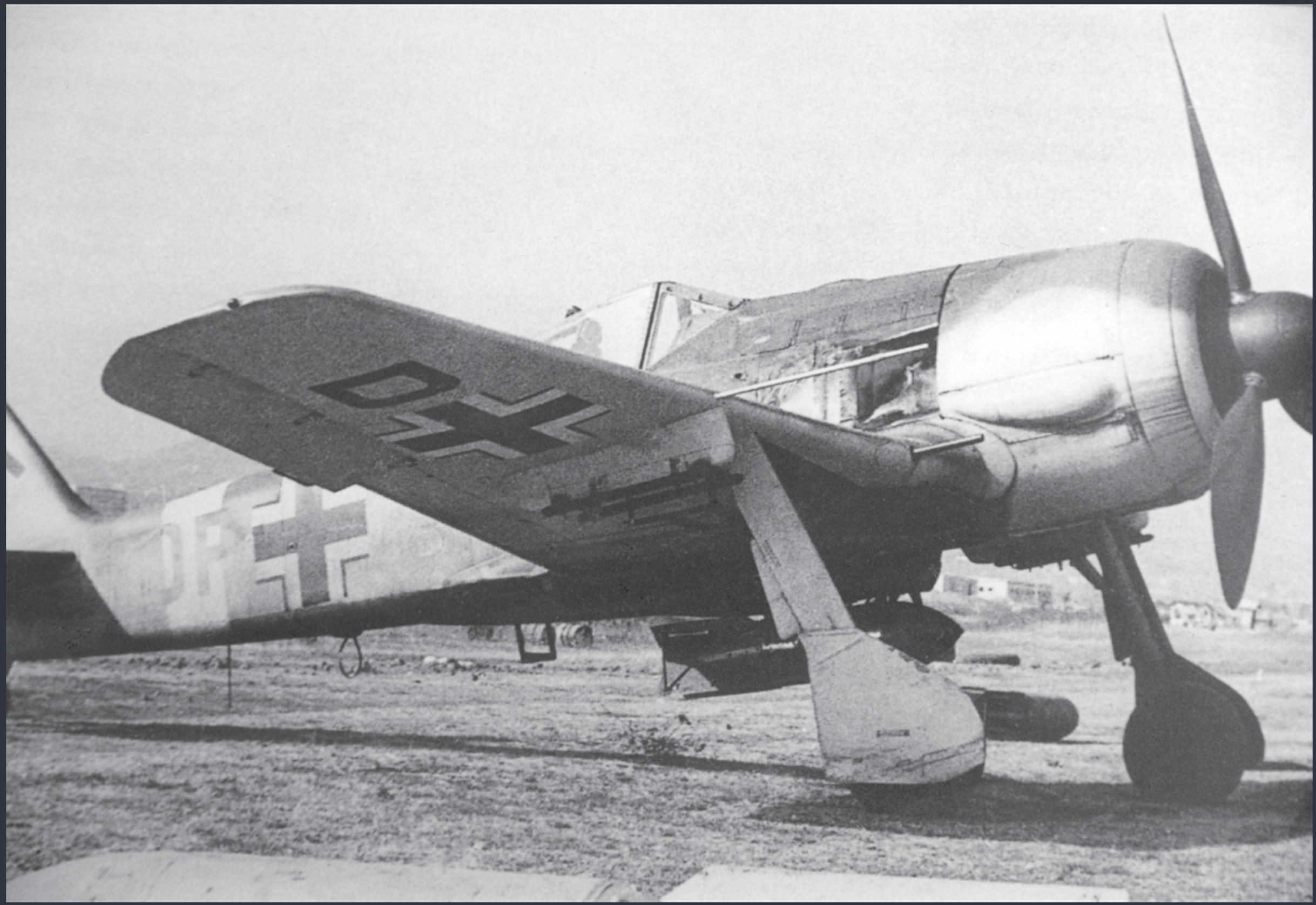
2 and Sturzkampfgeschwader 77 were reformed as mixed fighter and dive bomber units. Two Geschwader, Schlachtgeschwader 9 and Schlachtgeschwader 10 were formed to deal with the threat. It was not until March 1944 that the Geschwader's were able to exchange their Ju 87s for the Fw 190. Some units, such as Hans-Ulrich Rudel, continued to fly the Ju 87 (and Fw 190) until the end of the war. In the meant time, the Fw 190 units fought an increasing number of defensive battles. The Lower Dnieper Offensive and Second Battle of Kiev witnessed large scale air battles. During these actions, Walter Nowotny claimed his 256th and final victory on the front, and was nearly shot down himself on 11 November 1943. JG 54, operating the Focke-Wulf, claimed 71 victories in December 1943, for the loss of 14 Fw 190s. This represented a decreasing victory-to-loss ratio.

However, the Soviets were gaining in number and quality. The Red Army was pushing back both Army Group South, and soon Army Group North. Only Army Group Centre remained in strong defensive positions. By the spring, 1944,

the German fighter units victory to loss ratio had shrunk from 4:1 at the Battle of Kursk to 1.5:1. Soviet fighter aircraft were now equal to the Luftwaffe's best. Schlachtgeschwader losses amounted to 175, which included a number of Fw 190s

Bagration to Budapest

By the summer, 1944 the Germans had lost the Crimean campaign and the Soviets were able to pursue operations that would break into Eastern Europe. German fighter units continued to take a heavy toll of Soviet aviation. However, the entry of types, such as Lavochkin La-7 and Yak-3, presented a problem for German fighters. With wings only 9.8 metres long, it was one of the lightest and smallest fighters of the war. The Yak-3 was faster and more manoeuvrable than the Bf 109 and the Fw 190. According to Soviet tests with cap-



tured German fighters, the Yak-9U also out performed the Fw 190.

Further, the liberation of the Donbass region improved metal supplies. The IL-2's weakness was its wing and tail structure, which was now made from metals. This contributed to a reduction in losses.

The Luftwaffe had a small number of Fw 190s on the Eastern Front by this time. SG 3 and SG 5 was equipped with Fw 190s in June 1944. II./SG 2 was fully equipped with Fw 190s, while III./SG 2 was a mixed unit of Ju 87s and Fw 190s. By June 1944, the German fighter order of battle contained mostly the Bf 109. 1. Fliegerdivision, Luftflotte 6, contained SG 1 and 10 totalling 76 Fw 190s. JG 54, attached to Jagdabschnittfuhrer Ostland (Fighter Area East) of Luftflotte 1 had on strength 32 Fw 190s. 3 Fliegerdivision contained mixed units, including the Fw 190, which were 64 aircraft strong, although the number of Fw 190s is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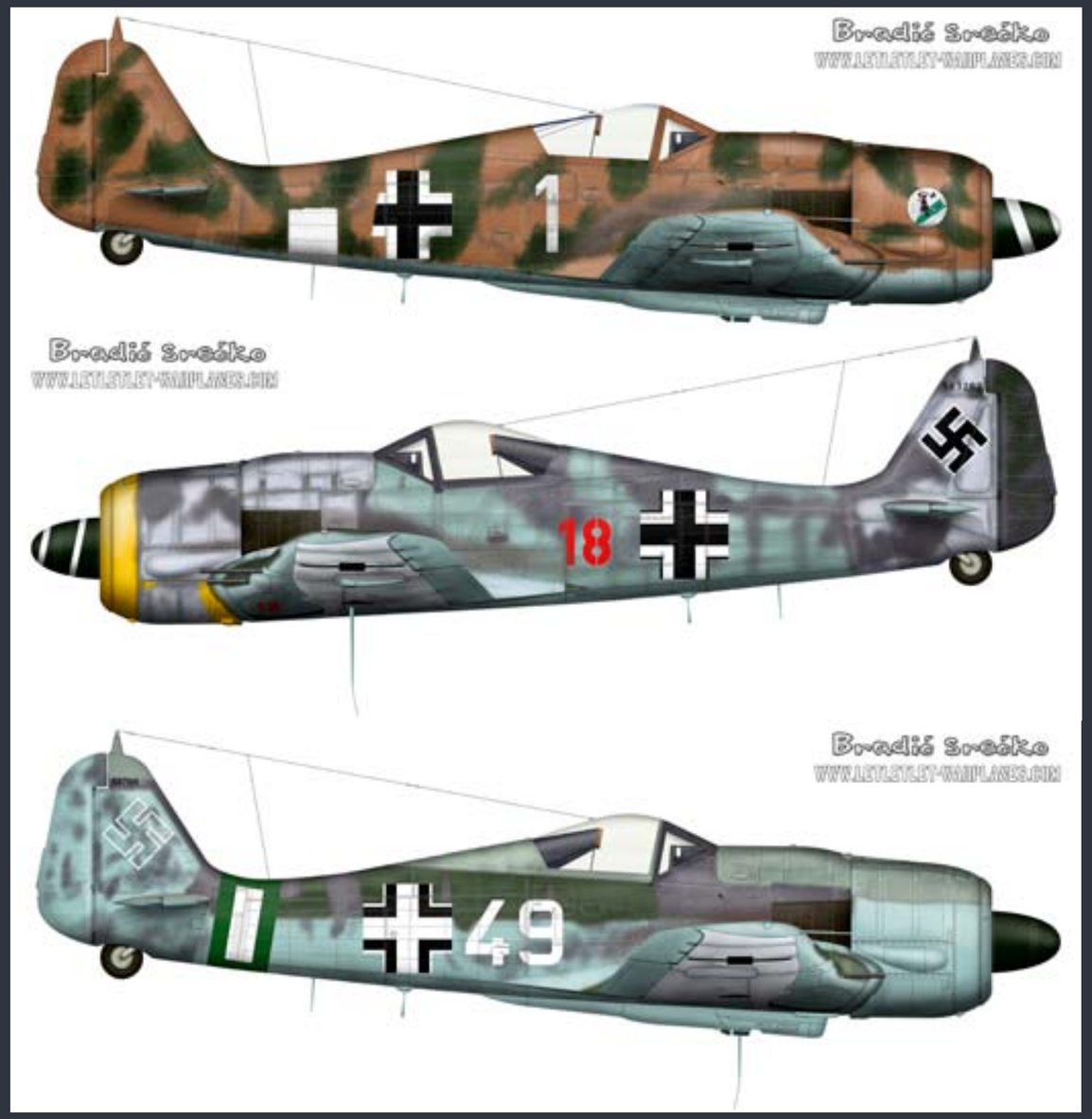
30


60

unknown. Luftflotte 4, I. Fliegerkorps contained units from SG 2, 10 and 77 numbering 27, 29 and 33 respectively.

On 22 June 1944, the Red Army launched Operation Bagration. The Schlachtgeschwader were a vital part of German defences. The fluid situation on the ground meant units retreated rapidly westward. Fw 190 units that employed the aircraft as jabo, became the first line of defence as German ground defences broke down. The Fw 190 Gruppen sent a few aircraft out over pre-assigned areas each morning. They were able to identify any movements made by the enemy. The Fw 190s were sent out after enemy armour spearheads that were roaming in the German rear. Usually 250 or 500 kg bombs were used along with SD-2, 4 and 10 bombs and 13 and 20 mm armaments for soft targets. If the Soviet tanks were operating without resistance, then the targets were the soft skin supporting vehicles. Eliminating them would deny fuel and ammunition to the armour, cutting short the Soviets' advance. If the tanks were engaged with German armour, the tanks themselves would be the target to support the defence. The usual approach was made at 1,600 m, above the reach of light enemy AAA fire. The Fw 190s would then drop to 4 to 10 m, dropping their loads just as the target disappeared under the nose of the fighter. The delay charge gave the German pilots about one second to get clear. At 485 k/ph this was usually enough. In the battles that followed, it was not uncommon for German Schlachtgeschwader pilots to fly seven or eight sorties a day. Towards the end of August fuel shortages kept the German fighters units on the ground. To save fuel, animals, such as oxen were used to carry fighters from dispersal to the take off point. Pilots were ordered to shut down the engine immediately on landing. The Oberkommando



der Luftwaffe (OKL – German Air Force High Command) managed to scrape fuel together while the battles lasted, allowing some units to fly five sorties per day.

The Schlacht Fw 190s were hard hit. Among those operating the Fw 190 were SG 10, which lost 59 Fw 190s in July 1944. The fighter units fared better. IV./JG 54 claimed 80 aerial kills for 31 losses, 21 to enemy action. However, it seems from loss records that even experience German units had lost more aircraft than they actually shot down in this period. The jabos maintained intense activity and succeeded in inflicting heavy damage to Soviet forces. On 11 July 1944 200 Soviet vehicles were claimed by Fw 190 units. In Estonia, SG 3 and 4 claimed 400 Soviet vehicles destroyed on 28 July. The German air units helped slow down the advance into the Baltic states. In Poland the Lvov–Sandomierz Offensive had captured bridgeheads over the Vistula river. The German air units tried to eliminate the foothold. On 28 August the Fw 190s of the Schlachtgeschwader along with Ju 87s claimed to have sunk 28 bridging ferries. The assaults failed to prevent the Soviets from continuing westward. Still, the Fw 190s SG 2 and 77 took advantage of brief moments of air superiority to inflict heavy losses of Soviet infantry, as at times the Red Army's advance was so fast that they outran their air support, allowing the Germans a free hand.

In East Prussia the Luftwaffe sent an 800-strong force under 4. Fliegerdivision. JG 54, operating the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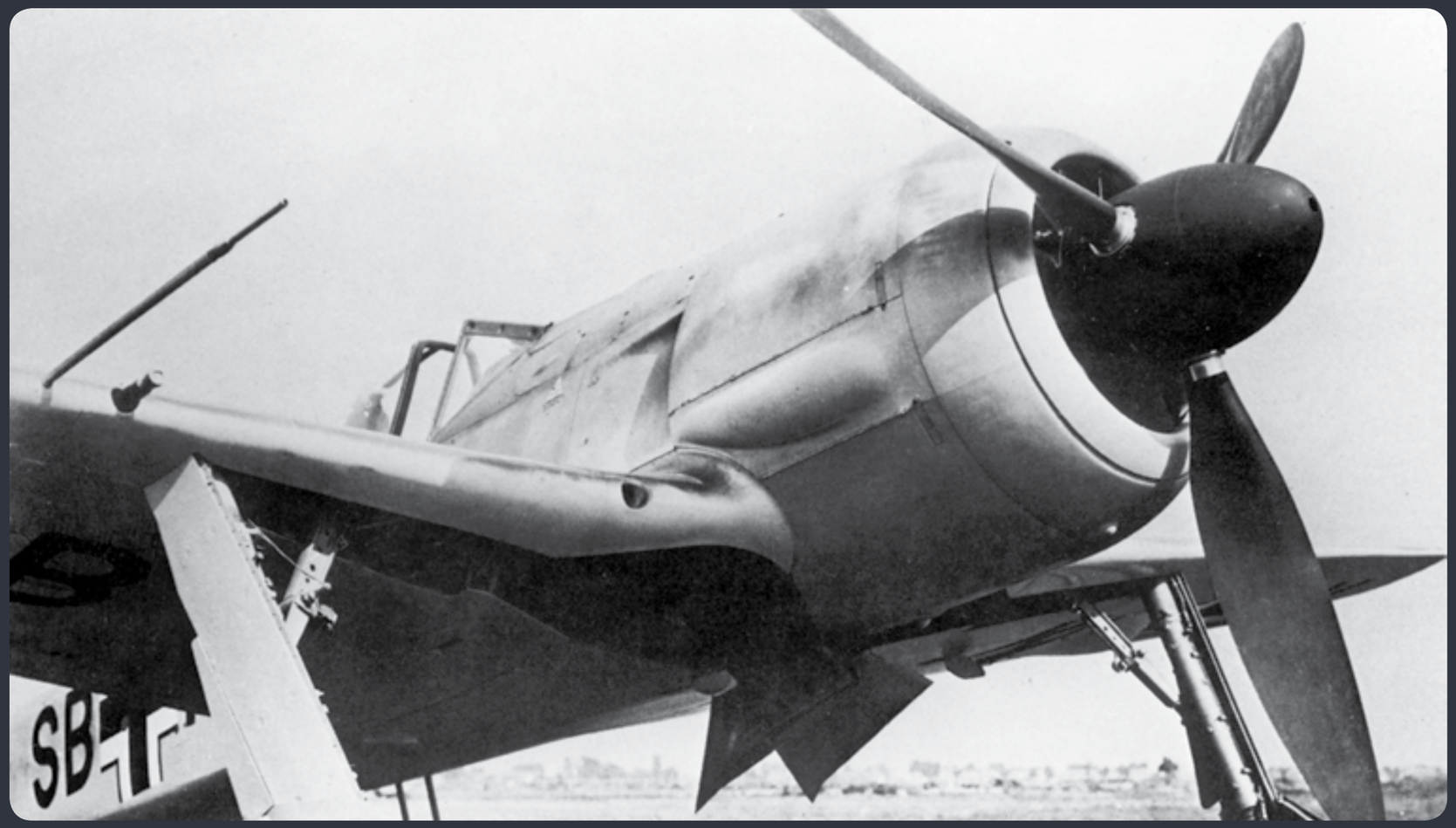


Fw 190 fighter versions along with SG 4 supported the German Fourth Army and enabled them to halt the Soviet attempt to crush the Courland pocket. On one day, 27 October, the Fw 190 fighter unit JG 54 claimed 57 aircraft shot down. SG 4 lost 17 Fw 190F ground attack machines. On 28 October, Erich Rudorffer claimed 11 to reach 209 victories. Fw 190s of JG 54 claimed 600 victories between 14 September and 24 November. Soviet units reported a total loss of 779 aircraft. The crisis on the Eastern Front now required all available units to return to the theatre. The Battle of the Bulge in the Western theatre was still ongoing, but with the Siege of Budapest and the Soviet winter offensive about to strike across the Polish plain, Luftflotte 6 was rushed from the Ardennes sector to Poland to meet the Soviet threat. It brought with it some 100 Fw 190s.

Hungary Fw 190 operations (November 1944–1945)

On 8 November 1944, Germany delivered sixteen Fw 190 F-8 fighters (G5+01 and G5+02) to the Hungarian Royal Air Force for training. They were initially based in Börgönd, near Lake Balaton, under the command of Lfl. Kdo 4, Fliegerführer 102 Hungarn/VIII Fliegerkorps (HQ in Debrecen). A number of recruits from the Önálló Zuhanóbombazó Osztály (independent dive bomber wing) based at same airfield were sent to Flugzeugführerschule B2 in Neuruppin for ground attack and air combat training in the Fw 190. At the same time, Hungary established the 101. Csatarepülő Osztály as a specialized Fw 190 operational training unit. The Hungarian 190s were originally intended for use on the Eastern front in offensive actions against Soviet armored units along with other Hungarian dive bomber and anti-tank units. In the end, they were used only over Hungarian soil in defensive operations against

USAAF and Soviet Air force units. In addition, a small numbers of Fw 190G fighter-bombers were used in air-to-ground operations.

Originally, these aircraft served with the 102. Vadászbombázó. This unit entered combat on 16 November 1944 under the command of Captain Lévay Győző. It would successfully operate Fw 190s until the final days of the war. The fighters were also intended to collaborate with Luftflotte 4 under the designation Ung.JSt.102/1 and /2 along with Hungarian Me 210Cas and Fw 190Gs operating from airfields in Poland during June 1944, but the course of operations changed the plans to defensive actions.

Fw 190s were flown by Section Leader Horváth Sándor (aircraft ID W-521) and Sergeant F. Timler, (aircraft IDs W-510 and W-520), who were awarded the Iron Cross 2nd Class with Oak Leaves for downing an A-20 Boston over the Esztergom on 26 January 1945. Another Fw 190, W-524, was based in Siedmiogrod, during the winter of 1944. On 7 March 1945, an order from Fliegerkorps IV directed tha Hungarian aircraft be painted with a 50 cm wide yellow band on the nose and fuselage and a yellow rudder to aid in identification by other Axis units.

In 1945, during the final months of the war, Fw 190s of the 102. Csatarepülő Osztály together with the 102/1.Zuhanóbombázó század, 102/2 Zuhanóbombázó Osztály "Coconut" (dive-bomber units equipped with Junkers Ju-87Ds), 102.Gyorsbombázó, 102/2.Szazad "Tigris" (a dive bomber and anti tank unit operating Messerschmitt Me 210Ca-1s and Henschel Hs 129Bs), and 101/1 század "Puma" (fighter squadron flying Bf 109Ds) defended Hungary against fleets of Soviet and American heavy bombers and fighters.Hungarian Royal Air Force equipped with the Fw 190F/G:

101 Csatarepülő osztály (as Fw

190 wing)
102/1 Vadászbombazó század
102/2 Vadászbombázó század (later 102 Csatarepülő osztály)

Silesia to Berlin

In January 1945 the Soviets began a series of offensives in its drive to Berlin. The Lower Silesian Offensive and Upper Silesian Offensives and the vital Vistula-Oder Offensive was designed to bring the Red Army to the eastern border of Germany. The Soviets began their offensive early, to take the pressure off the Western Allies in the Ardennes. For the Fw 190s units, the initial stages were to prove tactically successful. The Soviets were forced to start offensive action under severe weather conditions. Airfields were reduced to mud-baths owing to heavy rains, and open country became impassable owing after use by large numbers of vehicles. The Red Air Force suffered more losses to accidents than combat. The Soviet armour was forced to use the few hard-surface roads to continue their advance. These routes were easily detected by German Schlachtgeschwader. The Germans, by contrast, had hard surface runways in German territory and large hangars for aircraft. On 26 January 800 vehicles, 14 tanks and 40 artillery pieces were claimed among the crammed highways. After two weeks, the offensive slowed. Fw 190 units in particular exacted a heavy toll of Soviet infantry; attacking in waves of seven to nine, unchallenged. Overall, the Germans claimed 2,000 vehicles and 51 tanks in the first three days of February. However, this came at a cost of 107 aircraft in nearly 3,000 attacks. The largest concentration of German air forces since 1940 was amassed against the Soviets, which saw the Germans gain air supremacy briefly, contributing to saving Berlin from capture sooner. The rapid construction of concrete runways

allowed the Soviets to win back "aerial superiority". On 14 or 16 February 1945 Otto Kittel became the most successful Luftwaffe ace to be killed in action; Kittel had achieved 267 victories on the Eastern Front, all but 39 in the Fw 190. By March and April the situation was serious for German forces. The Soviets had reached the Oder and were encroaching upon Berlin. Fw 190s were now used in unusual ways to destroy the Soviet bridgeheads across the Oder. Focke-Wulfs were attached the upper fuselage of a Junkers Ju 88 "host" by struts which also contained control cables to allow the Fw 190 pilot to fly the combination using his flight controls. The operational versions of the Mistel replaced the cockpit section of the Ju 88 with a shaped, hollow charge warhead weighing, in total, some 3400 kg – the weight of the explosives was 3,800 lbs. The Fw 190 pilot would approach to within a few miles of the target, aim the Ju 88 at the bridges, then release his Fw 190 and escape while the Ju 88 flew into the target. These weapons, which, in some versions, used a Bf 109F-4 instead of an Fw 190,

combat, losing three out of four Fw 190s over Berlin. On this date the Soviet 16th Air Army claimed seven Fw 190s, its last victories of the war.

North Africa and the Mediterranean

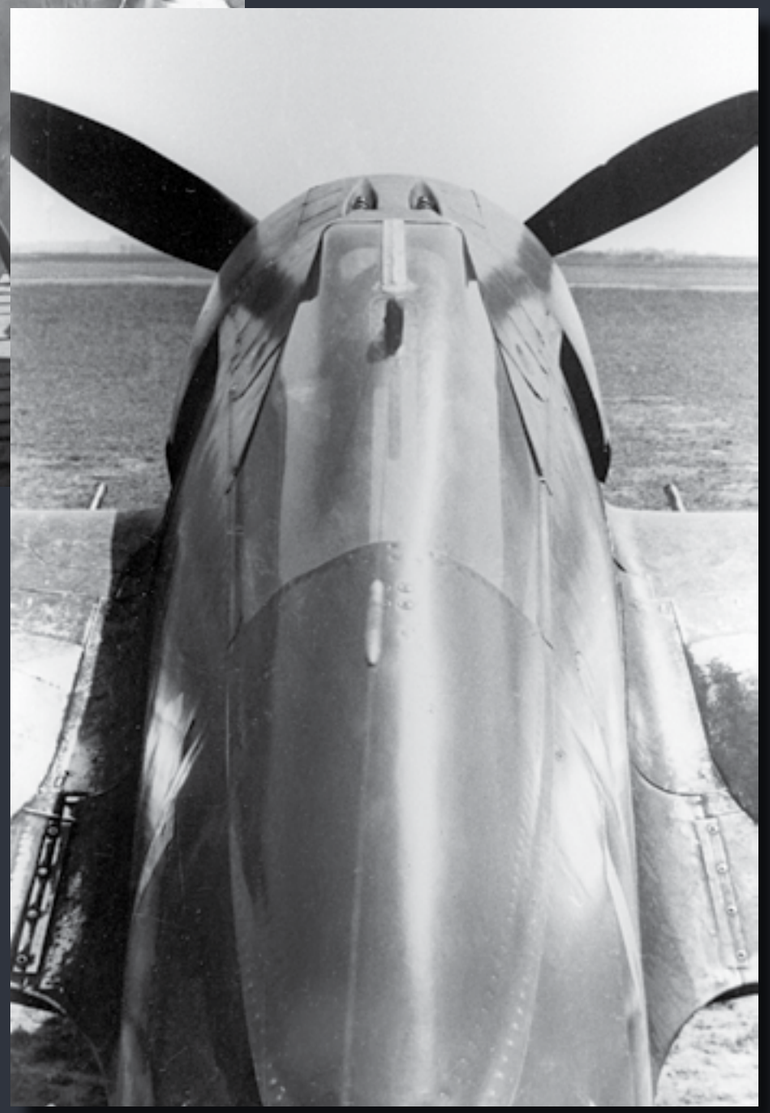
The Fw 190 was also deployed to North Africa in the period from November 1942 to May 1943. After the end of the North African campaign, it continued to see action from bases in Sicily.The fighter was a late arrival in North Africa, making its combat debut on 16 November 1942 with Fw A-4/Trop. and A-5/Trop of EprobungsKomando 19 (EKdo 19) departed from Benghazi, Libya at the time of the El Alamein campaign. Over the next six months, the FW 190 was flown by the units III.Gruppe/Zerstörergeschwader 2 (III./ZG 2), later changed to III.Gruppe/Schnellkampfgeschwader 10 (III./SKG 10) (9./SKG 10/SKG 10 and 11/SKG 10 units based in la Fauconnerie and Sidi Ahmed,Tunisia) and, II.Gruppe/Jagdgeschwader 2 during that period.

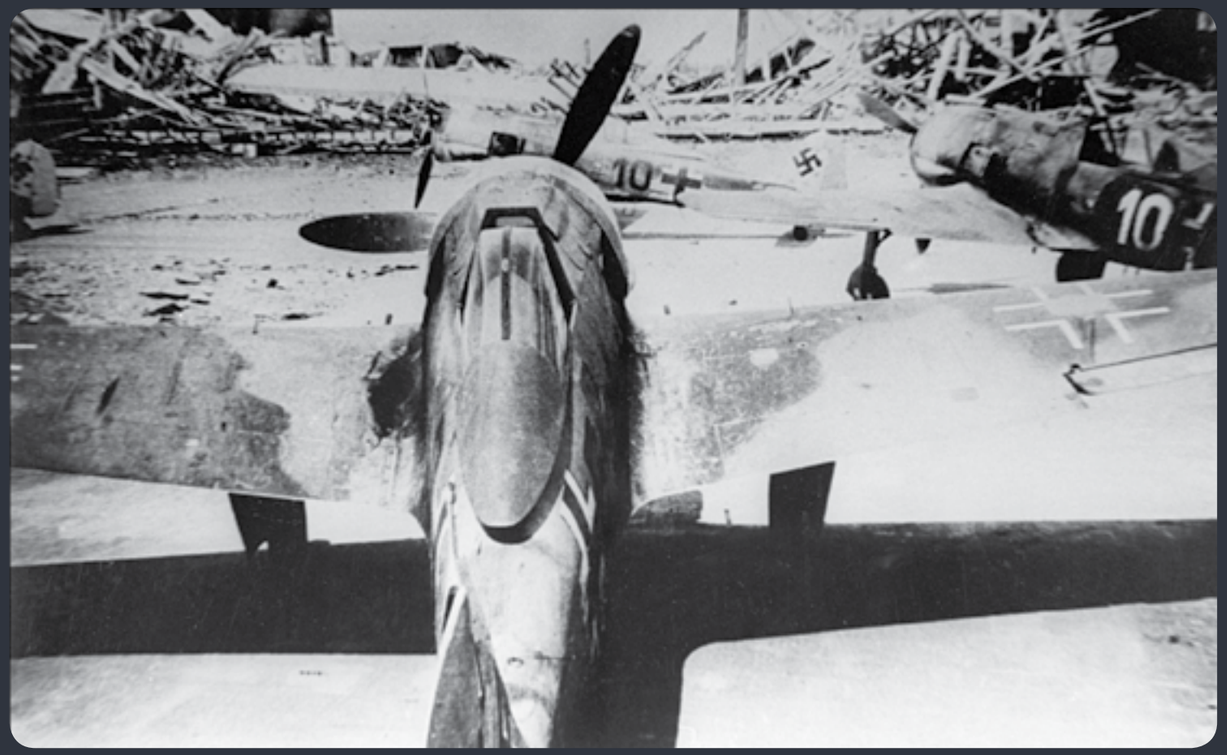
Many aerial victories were achieved and the Fw 190 fighter-bomber pilots demonstrated how effective the Fw 190 could be against ground targets, and III. Gruppe/ZG 2 (renamed III./SKG 10 in December 1942), was particularly successful. This unit operated throughout the Tunisian campaign, and attacked a variety of Allied targets including airfields, harbours, tanks, vehicles, troop concentrations, anti-aircraft positions, and on one occasion, a British submarine. The fighter pilots of II./JG 2 downed scores of British, American and French aircraft, especially during the first three months of 1943, and Kurt Bühligen and Erich Rudorffer became two of the top scorers in the Tunisian campaign.

A list of II./JG 2 aerial victories in African campaign:

Kurt Bühligen – (44)
Erich Rudorffer – (26)
Kurt Goltzsch – (13)
Lothar Werner – (8)
Fritz Karch – (4)
Adolf Dickfeld – (3)

GALLERY



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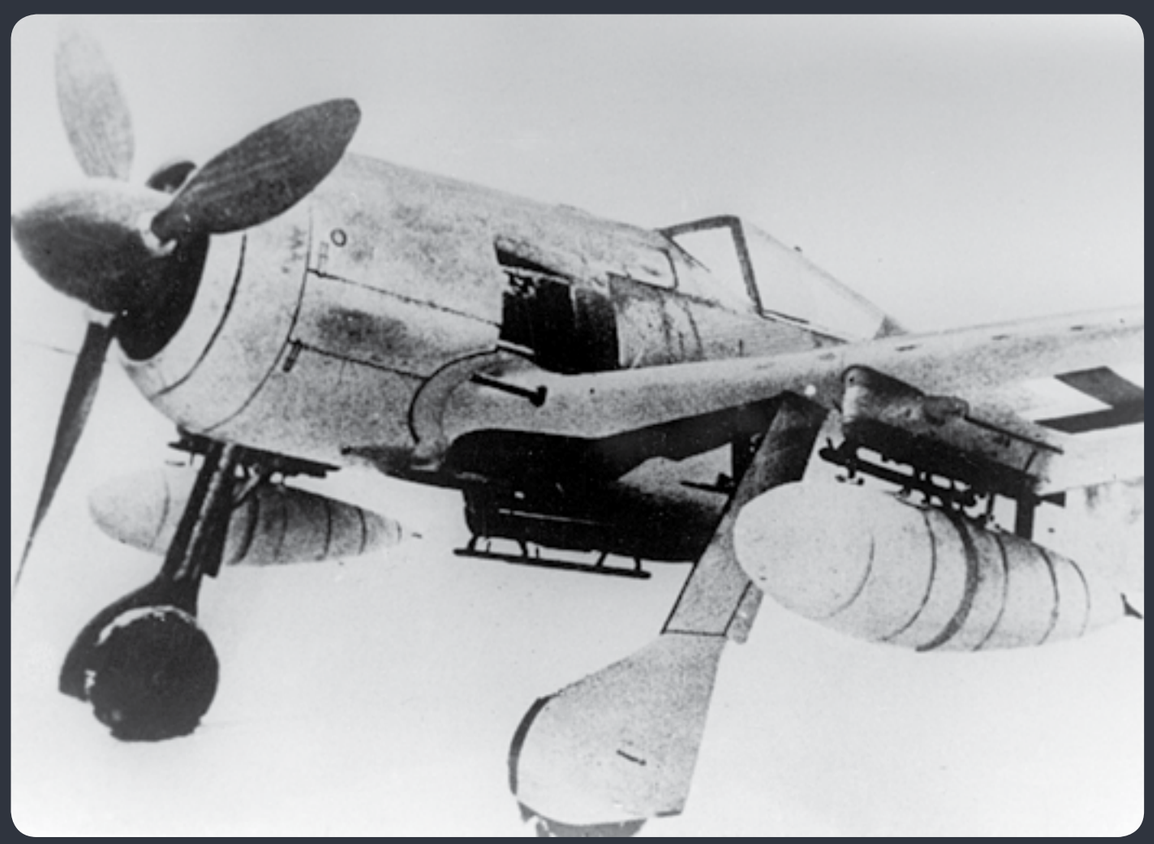

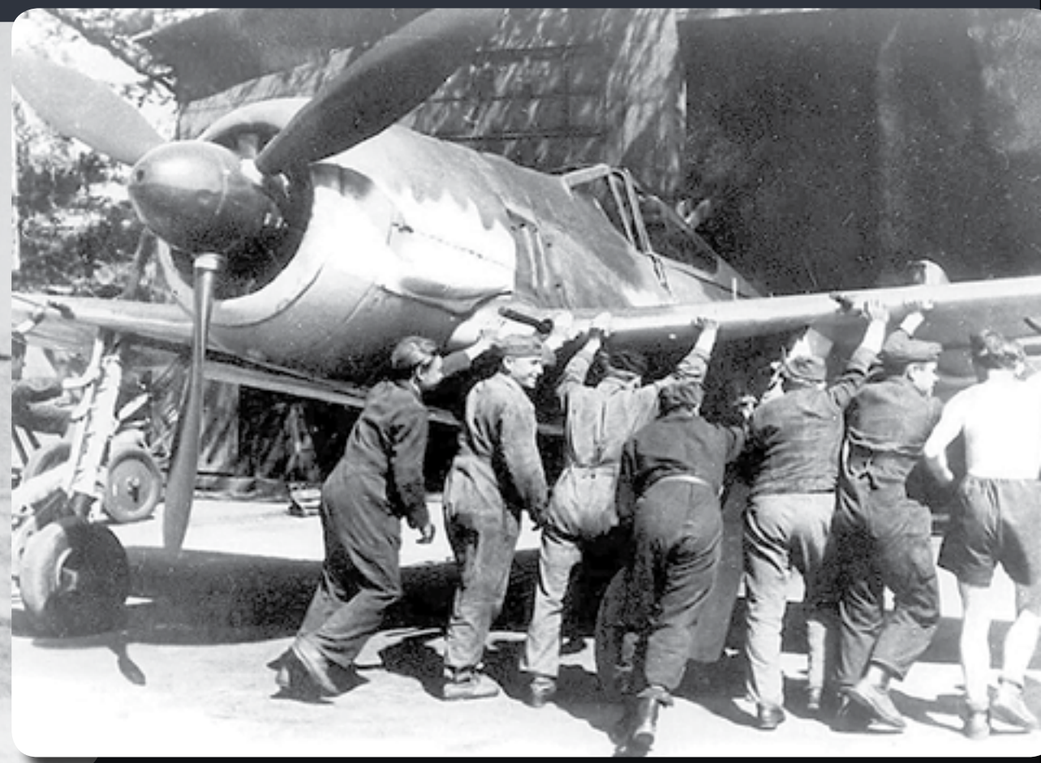

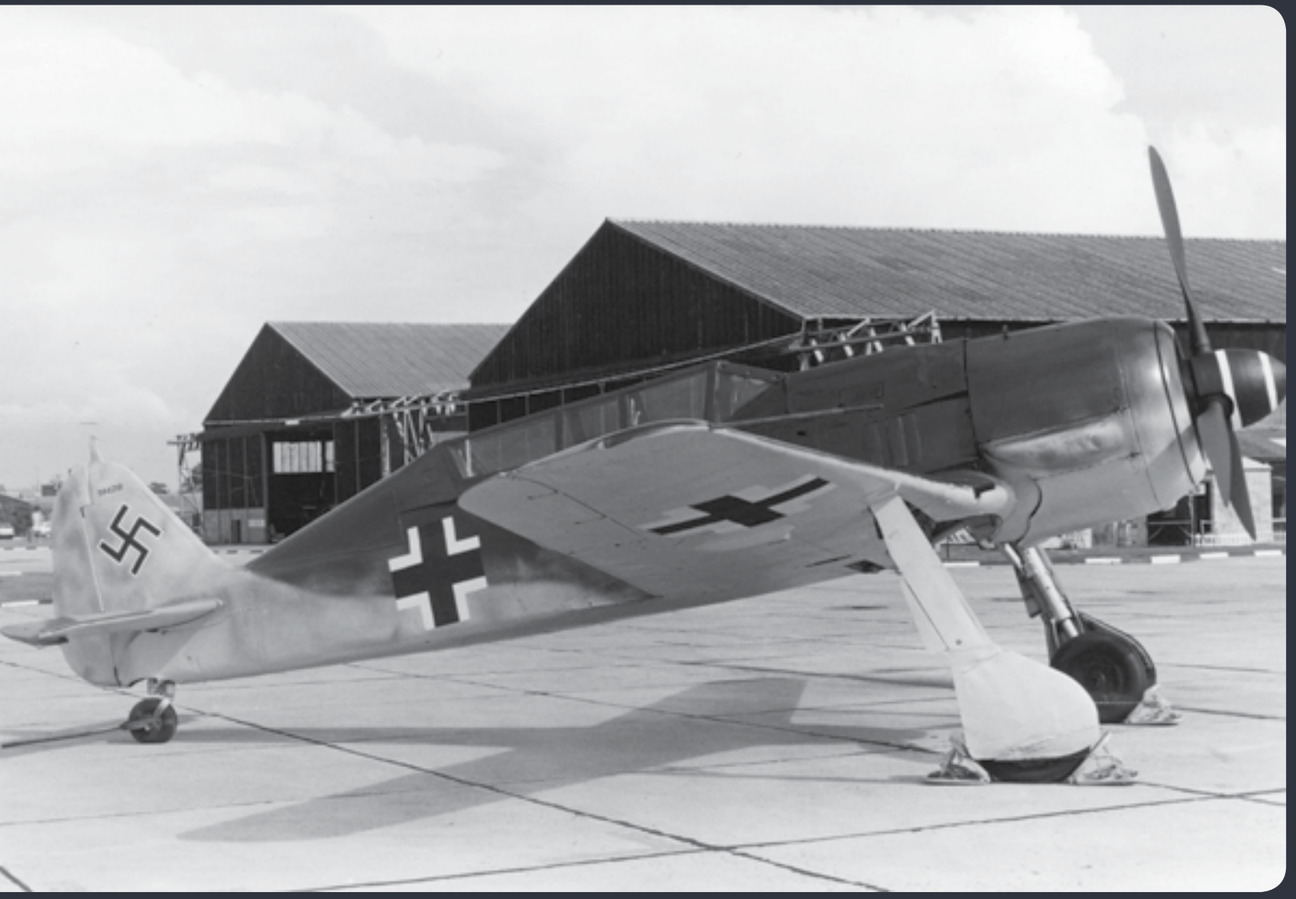

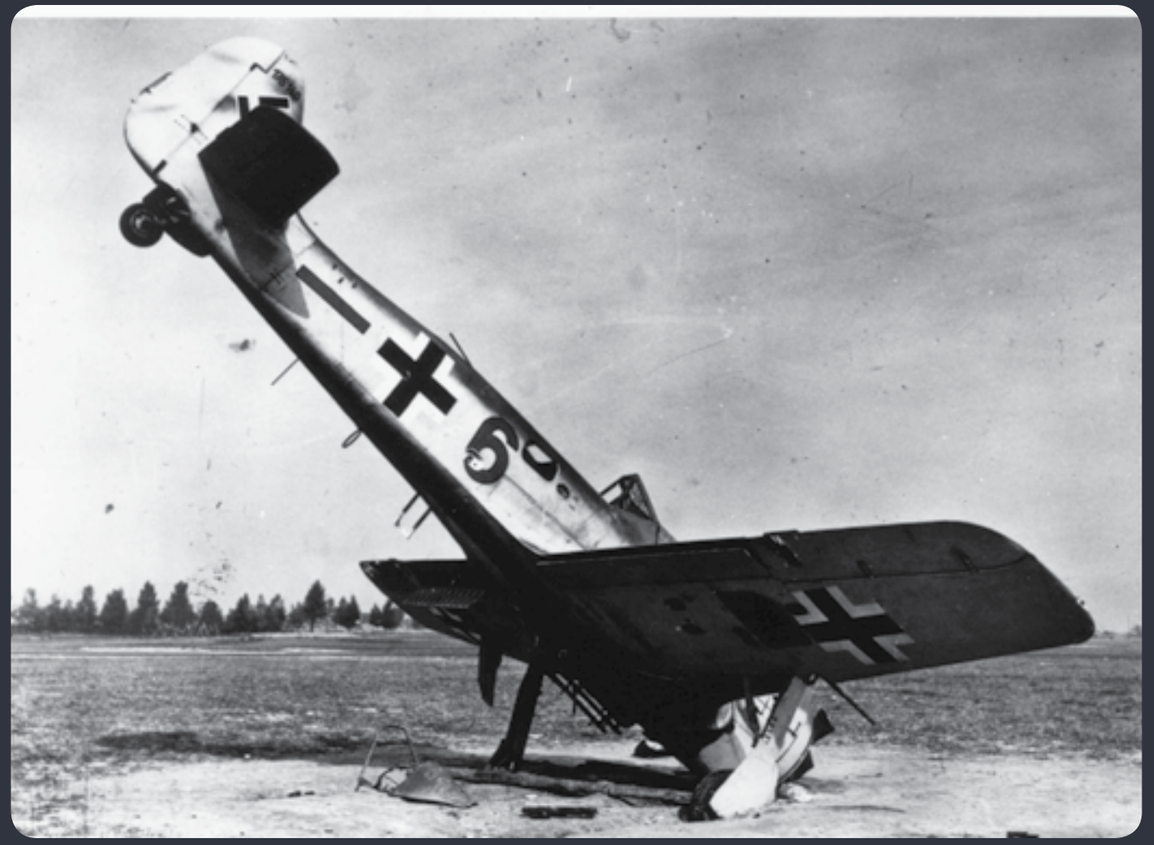


SB KH
TK MJ


VB PR


Bradić Srećko
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Evaluation

German view

Many pilots flew both the Focke-Wulf Fw 190 and Messerschmitt Bf 109. Leutnant Fritz Seyffardt, a 30 victory ace, flew both fighters. Later, he flew in Schlachtgeschwader 2 (Destroyer Wing 2) and commented:

In 1942, I flew my first Fw 190; I was thrilled with this machine. During the war I flew the Fw 190A, F and G models, and also the Messerschmitt Bf 109. The difference between the Fw 190 and the Bf 109 was that there was more room in the Focke-Wulf's cockpit and the controls were simpler — for example, landing flaps and trim were electric. Another pronounced difference was the stability of the Fw 190. Thanks to its through-wing spars and wide landing gear the machine was substantially more stable in flight, especially landing on rough fields. At great height, engine performance was inadequate. Firepower was very good.

Hauptmann Heinz Lange, an ace with 70 victories said:

I first flew the Fw 190 on 8 November 1942 at Vyazama in the Soviet Union. I was absolutely thrilled. I flew every fighter version of it employed on the Eastern Front. Because of its smaller fuselage, visibility was somewhat better out of the Bf 109. I believe the Fw 190 was more manoeuvrable than the Messerschmitt — although the latter could make a tighter horizontal turn, if you master the Fw 190 you could pull a lot of Gs [g force] and do just about as well. In terms of control and feel, the 109 was heavier on the stick. Structurally, it was distinctly superior to the Messerschmitt, especially in dives. The radial engine of the Fw 190 was more resistant to enemy fire. Firepower, which varied with the particular series, was fairly even in all German fighters. The central cannon of the Messerschmitt was naturally more accurate, but that was really a meaningful advantage only in fighter-to-fighter combat. The 109's 30 mm cannon frequently jammed, especially in hard turns — I lost at least six kills this way.

Lange continued:

Structurally, the Focke was distinctly superior to the Messerschmitt, especially in dives. The radial engine of the Fw 190A was also more resistant to enemy fire. Its small landing gear made the Bf 109 very sensitive to crosswinds and uneven ground on take off and landing. We had unbelievably high aircraft losses and personnel injuries this way. In contrast, the landing gear of the Focke was stable. When taxiing, visibility forward was worse out of the 190 during take off and landing because these were performed in a tail-low attitude, unlike the 109 which was fairly level at these times. A dangerous characteristic of the Focke-Wulf was that in very tight high G-turns it would sometimes, suddenly and with no warning, whip into a turn into the opposite direction. In a dogfight or near the ground, this could have a very

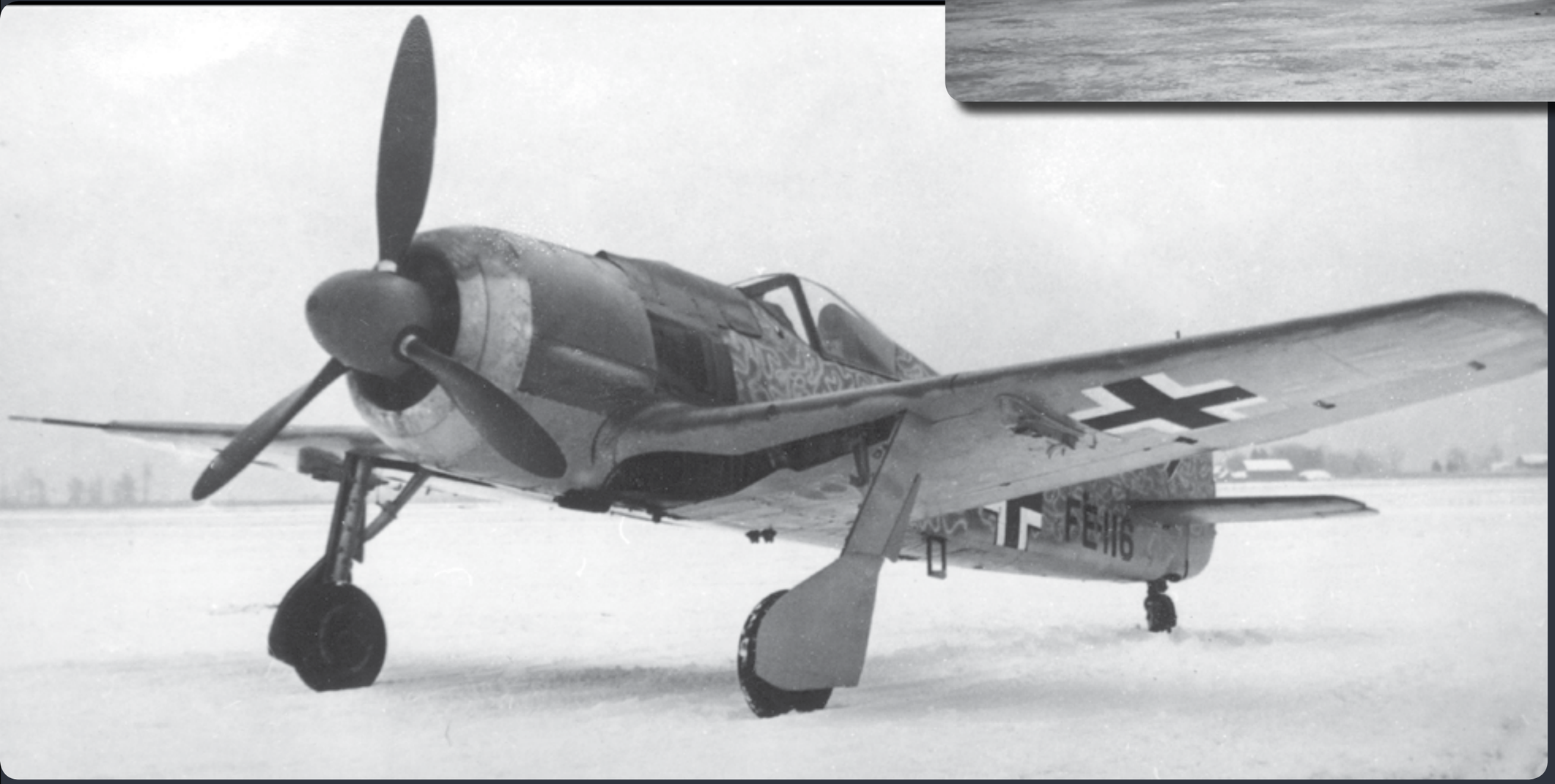
bad result. The Messerschmitt had leading edge slots that hindered this type of stall.

My opinion of the Bf 109G, Fw 190A and Fw 190D-9, all of which I flew willingly, is that they were superb aircraft for their day in terms of performance and reliability. I can say for me my first choice of aircraft was the Fw 190D-9 and my second the [Fw 190] A; the Bf 109 ranks third.

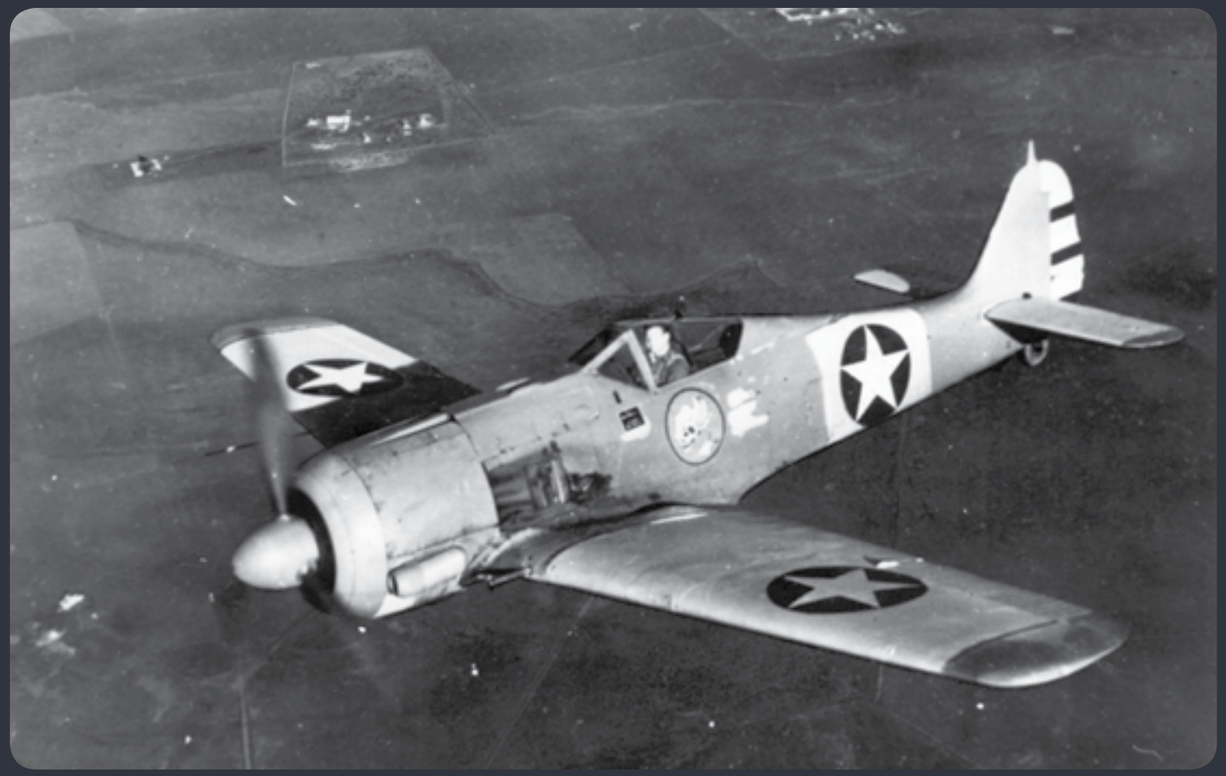
General der Jagdflieger Adolf Galland offered another balanced evaluation:

The pilots liked the Fw 190 very much as far as handling, performance and armament was concerned. Compared with the Bf 109 series of the time, the Fw 190 was superior, but this did not hold true at altitudes above 8,000 metres . Especially against bombers the Fw 190 was by far superior because of its heavy armament, its lower vulnerability, and its better protection for the pilot. All these features were favourable for bomber and schlachtflieger operations.

The evaluation was that the Bf 109 was superior in all around performance "at altitude". The drop in performance was a problem on the Western front during the Defense of the Reich campaign, as most of the fighting took place above 6000 m. On the Eastern Front this was not a problem, as the Soviets, like the Germans, undertook combat at low altitude. In a climbing/diving dogfight (below 6,000 m with the Fw 190 A, at all altitudes with the Fw 190 D), the Fw 190 could easily out perform the Bf 109.[70] There were some problems. If the air speed fell below 127 mph (204 km/h) the Fw 190 would stall, drop its port wing, and suddenly flip onto its back.[70] Pilots converting onto the Fw 190 were warned of these advantages and limitations.



Western Allied view



Eric "Winkle" Brown

Famous British test pilot Eric "Winkle" Brown flew Fw 190A-4/U8 jabo version. Brown commented the view from the cockpit was better than in the Spitfire, P-51 Mustang and the Bf 109 owing to the nose down position of the aircraft in flight. The sloping frontal windscreen provided 50 mm of protection. A further 8 mm armoured seat and 13 mm head and shoulder armour afforded the Fw 190 pilot great protection. Take off was easy; 10° of flap and power to 2,700 rpm and 23.5 lb in. boost made the run very similar to the Spitfire IX. Un-stick was found to be 112 mph and the fighter had a habit of swinging to port. Speed in the climb was set at 161 mph, a rate of 3,000 feet per minute. Brown praised the lack of trimming requirements in flight. However, Brown criticised the lack of trim controls. If a member of the ground crew had moved the tab, or it had been adjusted from another source, it could result in an out-of-trim flight performance at high speeds. Brown praised the high rate of roll. Aileron response was excellent from stall up until 400 mph (644 km/h), when they became heavy. The elevators were heavy at all speeds, particularly above 350 mph (563 km/h) when they became heavy enough to impose tactical restrictions on the fighter as regards to pullout from low-level dives. The heaviness was accentuated because of nose down pitch which occurred at high speeds when trimmed for low-speeds. Brown praised the fighter overall; its control harmony [control surfaces working at once] was superb. The solid gun platform also made it a potent dogfighter. Brown listed some limitations; it was difficult to read and fly on instruments (why is not explained) and it had harsh stall characteristics. Stall speed was a high 127 mph (204 km/h). Stall came without warning. The port wing drops violently that the

190 almost inverts itself. If it was pulled into a G-turn it would spin into the opposite banking turn and an incipient spin was the result, an advantage certain P-47 Thunderbolt pilots could take advantage of by barrel-rolling around the 190's flight path to evade a pursuing one. Landing stall was much more easily dealt with; the intense buffeting resulted in the wing dropping to starboard gently, at roughly 102 mph (164 km/h).

Comparison: Fw 190A and Spitfire V

The British were keen to test captured Fw 190As during the war. The performance of the German fighter series had caused concern to RAF Fighter Command. Against the Spitfire V, the Fw 190 was found to be better in all respects with the exception of turning radius. At 2,000 ft, the Fw 190 was 25 to 30 mph faster; at 3,000 ft it was 30 to 35 mph faster. Its lowest speed advantage was 20 mph faster at 15,000 ft. At all altitudes it

remained the faster fighter. The Fw 190 was also faster in the climb. If a Fw 190 was engaged by a Spitfire V, it could use its superior roll rate to enter a dive in the opposite direction. Its dive speed would enable it to clear the Spitfire. In defensive mode, the Spitfire could only evade an attack if caught at low speed by using its advantage in turning circles. If travelling at maximum speed when engaged, the Spitfire could gain speed in the dive, forcing a longer chase, and the Fw 190 further away from its landing ground.

Air Marshal Sholto Douglas expressed concerns that the Merlin-engine Spitfires were coming to the end of their developmental life, whereas the Fw 190 was only just beginning its career. At the time, he feared the enemy held the technological edge. Douglas determined that the Fw 190 was superior to the Spitfire V and also concluded that the Spitfire IX was also inferior in the climb and acceleration owing to negative G carburation. Douglas' fears would prove overly-pessimistic. The Spitfire IX would prove a clear match for the Fw 190A and the Griffon-engined Spitfire XIV would hold the edge on the type. In 1942 several tests were conducted by RAF pilots at the Royal Aircraft Establishment.

Comparison: Fw 190A and Spitfire IX

The Spitfire IX restored parity in speed; the Spitfire had an 8 mph advantage at 8,000 ft; 5 mph faster at 15,000 ft; and a 5 to 7 mph advantage at 25,000 ft. The Fw 190 retained speed advantages at 2,000 ft and 18,000 ft where it held a lead of 7 to 8 and 3 mph respectively. [75] In the climb, they were equal, the Spitfire being slightly faster. However, once the 22,000 ft mark was reached, the Spitfire climbing rate increased, while the Fw 190s rapidly fell away. The Fw 190 was faster in the dive, particularly in the initial stages. The Spitfire had difficulty in following in the dive owing to the lack of negative G carburettor. The Fw 190 was more manoeuvrable, with the exception of turning circle. The conclusion was the Spitfire IX compared favourably with the Fw 190 provided the Spitfire had the initiative, it had "undoubtedly a good chance of shooting the Fw 190 down".

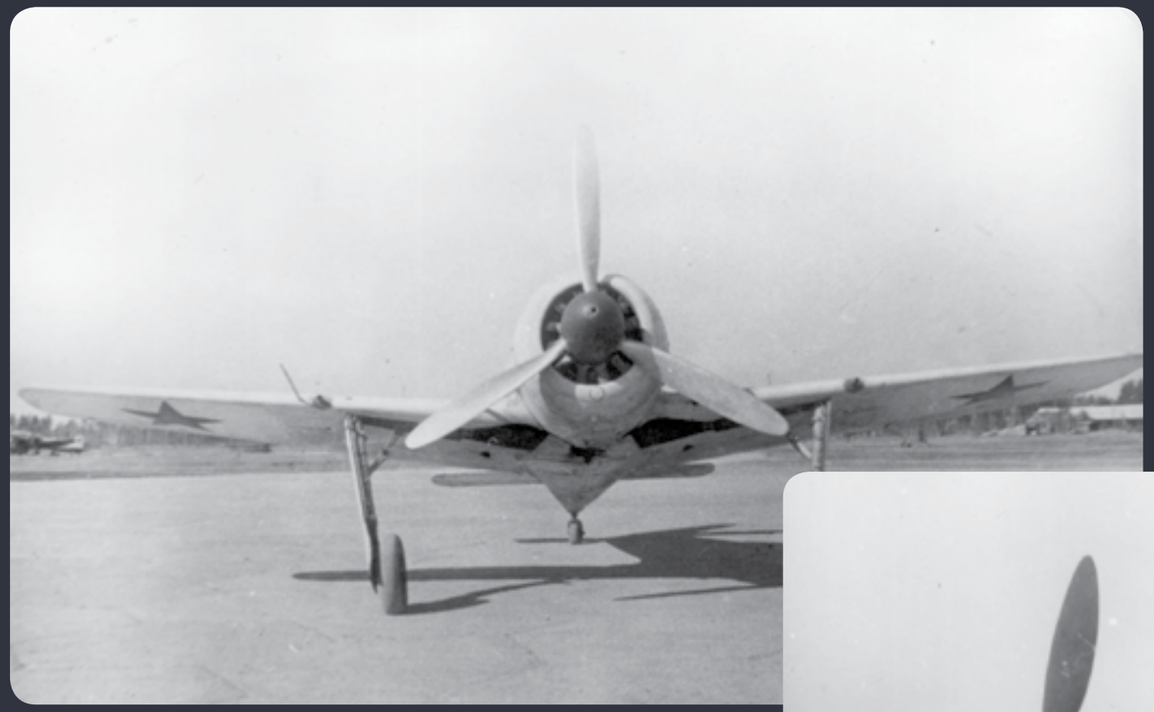
Comparison: Fw 190A and Spitfire XII

A test carried out with the Fw 190A and Spitfire XII, with the Griffon engine, suggested the Spitfire had the "superior" acceleration and its speed was "appreciably" faster after brief flights at 1,000 and 2,000 feet. The other speed altitude tests were not carried through owing to weather conditions. Maneuverability was difficult to discern. The Spitfire could easily outturn the Fw 190, but the pilot of the German fighter was reluctant to stall the aircraft at low altitude. It is possible that the difference could have been less marked had the pilot made the effort to make a tighter turn. The cockpit was judged to be well laid out; controls were well harmonized and light; flying characteristics were rated as excellent and no trimming was required; initial acceleration was good in dive and climbs; and the aileron control enabled a rapid roll from one direction to the other. Limitations were; the rough running of the aircraft is disliked and can cause a lack of confidence in the engine. This is unpleasant when flying over water or hostile areas. The engine required long warmups to allow the oil temperature to reach safe levels. The view from the cockpit made taxiing difficult. It was judged that the aircraft was not suitable for quick takeoffs.

Comparison: Fw 190A and Spitfire XIV

A short report indicated the Spitfire was only 20 mph (32 km/h) faster from 0 to 5,000 ft (0 to 1,525 m) and 15,000 ft to 20,000 ft (4,573 to 6,100 m). At all other heights, the Spitfire had a 60 mph (97 km/h) speed advantage over the Fw 190A. The Spitfire had a considerably faster rate of climb at all altitudes. In the dive the Fw 190A gains slightly in the initial stages. The Spitfire could outturn the Fw 190, though in a right-hand turn this was less pronounced. The Fw 190 was far faster in the roll. It was suggested that if a Spitfire XIV was in the defensive, it should use its fast maximum climb and turning circle to escape. In the offensive the Spitfire could "mix it", but should be aware of the Fw 190As fast roll rate and dive. If the Fw 190 was allowed to do this, the Spitfire probably would not close the range until the Fw 190 pilot has to pull out of the dive.

Soviet view



The Bf 109, called "the lean" (the Soviet nickname for the series) was widely considered by Soviet airmen as a more agile and potent adversary than the Fw 190, which was viewed as "heavy and slow..." especially when climbing. Though it should be remembered that the Fw 190F and G ground attack versions essentially replaced the obsolete Ju 87 on the Eastern front during the latter part of the war. These heavily armoured versions of the Fw 190, piloted by ex-Stuka air crew were indistinguishable in the air from the fighter versions and thus Soviet pilots may have correctly reported an observation, but one that distorts the facts of the true capabilities of the aircraft when deployed in the pure fighter form. Soviet pilot Nikolai G. Golodnikov claimed the Fw 190 to be inferior to the Bf 109; "It did not accelerate as quickly and in this aspect was inferior to most of our aircraft, except for the P-40, perhaps." Goldonikov noted that Germans pilots appreciated the Fw 190 radial engine as a shield, and frequently made head-on attacks in air-to-air combat. "The plane", noted Golodnikov, "had extremely powerful weapons: four 20 mm guns and two machine guns. Soon, however, the Germans started evading frontal attack against our "Cobras". We had a 37 mm gun, so no engine would save you, and one hit was enough to kill you."

The general rule for Soviet airmen in the latter war years was to take advantage of their turning ability, acceleration, and rate of climb to force the adversary into entering a horizontal or vertical manoeuvre. Likewise, La-5FNs freely took up the challenge as an "energy or angles" fighter against all Fw 190As, and as "angles" fighters against the Fw 190D, which was considered by the Soviet pilots as a fighter that "burned as well as other aircraft, and was easier to hit."

Modern productions

Starting in 1997 a small German company, Flug + Werk GmbH, began work on new Fw 190 A-8s; a run of 20 kits were produced. These planes are new reproduction builds from the ground up, using many original dies, plans, and other information from the war. The construction was sub-contracted to Aerostar SA of Bacău, Romania; both companies have been involved in a number of warbird replica projects.Werk numbers continued from where the German war machine left off, with the new Fw 190 A 8s being labeled "Fw 190 A-8/N" (N for Nachbau: "replica"). Some of these new Fw 190s are known to be fitted with the original tail wheel units from the Second World War; a small cache of tail gear having been discovered. In November 2005, the first flights were completed.

Ironically, since the BMW 801 engines are no longer available, a Chinese licensed Soviet-designed engine, the Shvetsov ASh-82FN 14-cylinder twin-row radial engine of similar configuration and slightly smaller displacement (41.2 litres versus 41.8) to the original BMW powerplants, which powered some of the Fw 190s opposition: the La-5 and La-7, powers the new Fw 190 A-8/N.

Flugwerk was also instrumental in the restoration of perhaps the only Fw 190 A-9 in existence. The aircraft is based at the Everett, Washington-based Flying Heritage Collection and is flown at the FHC Open Days.

A Fw 190 A-8/N participated in the Finnish war movie Tali-Ihantala 1944, painted in the same markings as Oberst Erich Rudorffer's aircraft in 1944. The movie was released in December 2007.

In Dijon, France; another Flug Werk-built Fw 190 (F-AZZJ) is based with owner Christophe Jacquard. It was assigned the production number 990013, and first flew on 9 May 2009. It sea-landed and was severely damaged on 9 June 2010 near Hyères after an engine failure; pilot Marc Mathis escaped uninjured.

A Fw 190 A-8/N is in the collection of the Tri-State Warbird Museum in Batavia, Ohio. It was bought by an Indiana doctor, and later donated to the museum. It is currently undergoing repairs to replace the engine and make it airworthy.

For the 2010 Reno Air Races a Flug Werk-built FW 190 A-9 "White 14" entered the unlimited competition in stock configuration, thus

not likely to challenge the highly modified racers. It was constructed by "Flugzeugbau", construction #: 980 574 (painted on tail 980574), its registration number is N190RF and is currently located at the Planes of Fame Air Museum in Chino, CA.

As part of the run of 20 examples, FlugWerk also produced a limited number of 'long nose' Fw 190D examples. Work was recently completed on a Fw 190 D-9, powered by a modified Allison V-1710 V-12, the powerplant of the P-39 Airacobra, another foe of the Fw 190 often flown by Soviet forces (Lend-Lease) in World War II. This aircraft, presented as "Black 12", an Fw 190 D-9 flown by Leutnant Theo Nibel in the 10. / JG 54, and lost due to a bird strike on the morning of 1 Jan 45 during Operation Bodenplatte, is a reproduction Fw 190D-9 Dora (WNr. 210079). It is now located in the Cottbus Hangar of the Military Aviation Museum in Pungo, Virginia, USA.


Vorsicht!

All images here are Fw 190 A8 Hannover new build.
Photo credit- Uwe Jack


170393

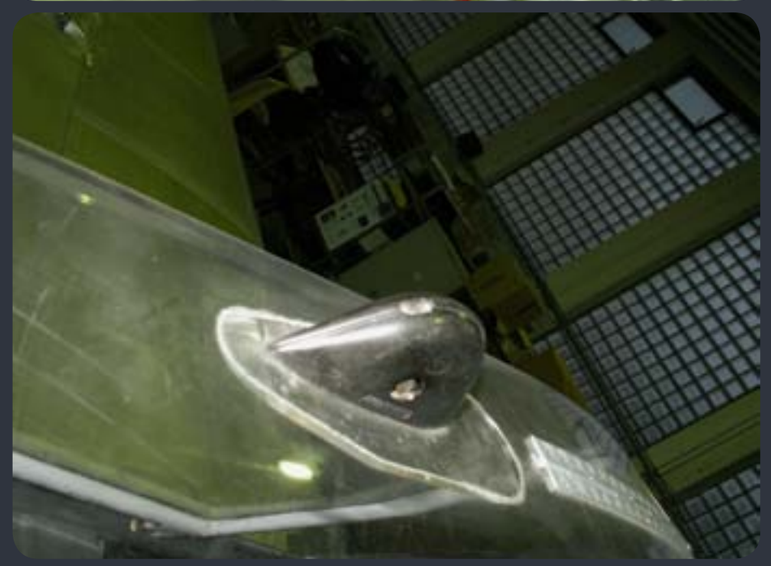
Fw 190 A8 Lt Rolf Lahne Sturm 16JG3 December 17 1944

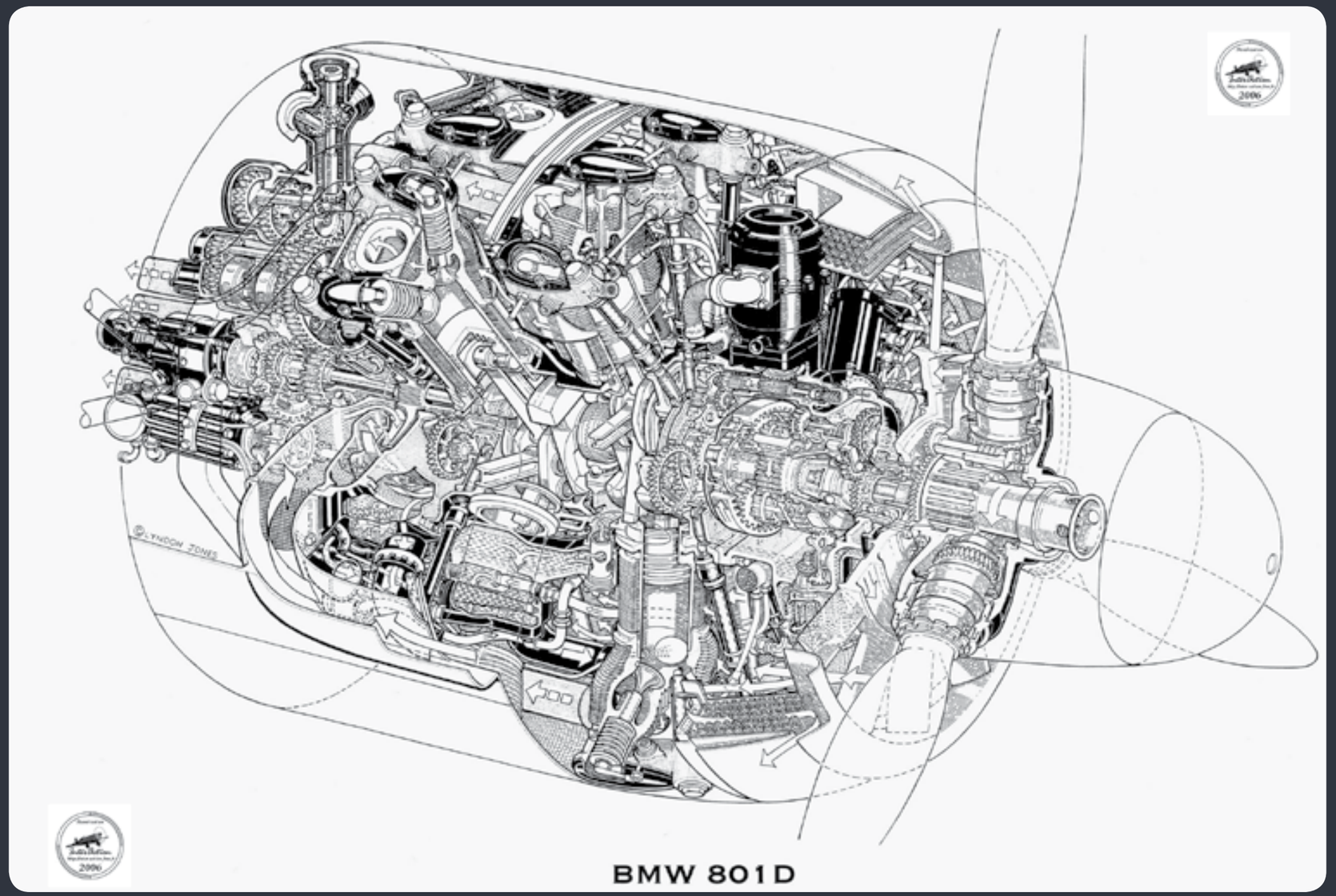
by Uwe Jack

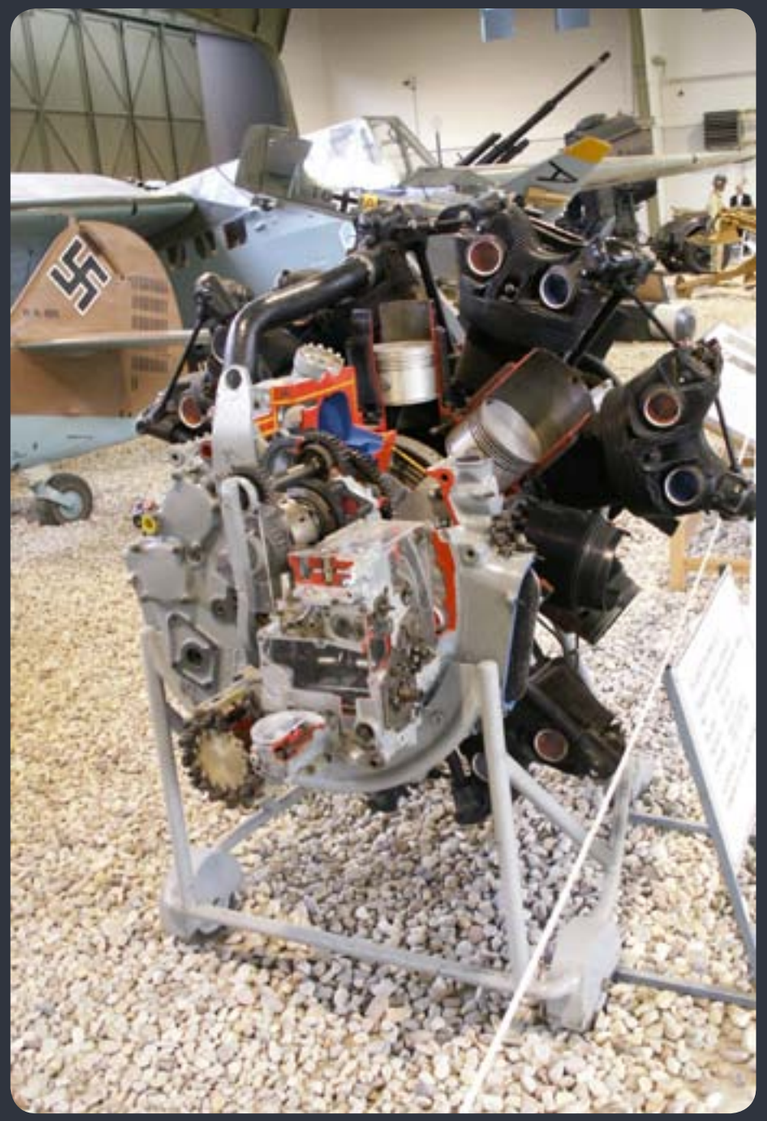
The A-8 “red 5” was piloted by Leutnant Rolf Lahne of 16th “Sturm”-Staffel of JG 3. At December 17th 1944 the Sturm-fighters of JG 3 under the cover of Bf 109 G-14 of JG 11 tried to attack bombers over Bonn. In the dogfight with Thunderbolts, Rolf Lahne was hit several times, his aircraft started to burn. The vertical dive without an ejected cabin-hood and the later found closed belts indicates that the pilot was dead or lost consciousness after being hit. So the “red 5” went burnig directly into the ground and disappeared for long years. During road construction works in 2003 the aircraft was found near Cologne. The complete aircraft fits into two 1m x 1m x 1m-containers plus the engine. All metall was smashed into small pieces with no indentifiable aircraft-parts at the first glance. In the wreck the identification-coin of Rolf Lahne, his leather wallet and a wristwatch was recovered. In the wallet, besides money a letter to his little sister was found, that he was never able to send. A search uncovered that the sister was still living! So a delegation of Luftwaffe-officers handed the private property of her brother over to her, having build a small wooden box to present the items. I was not part of this ceremony but I was told that it was moment of great emotions when the old lady received the last words from her brother. The remains of Rolf Lahme were buried on a soldiers cementery.

You will find some pictures of the smashed BMW 801 engine and

will understand why it was not possible to restore this block of iron to a presentable museum exhibit. So a similar engine was taken from a recovery-action of factory-fresh engines buried in the ground at Frankfurt airport at the wars end. One of the problem we faced was that during Fw 190 production the details of the aircraft seem to have changed from week to week. The engine mounting-ring, connecting fuselage and engine, was manufactured in so many variations that we hat to build a completely new despite being offered some original mounting-rings – no one fits to the fuselage or engine. Because the airframe was only rubble, the complete aircraft was build newly by a hungarian company also working for the Technik Museum Berlin (Junkers Ju 88 and Bf 110). So much on “restored” aircraft in museums! The hungarian company was clever to build every part twice and sold the remaining Fw 190 A-8 to the aircraft museum at Hannover. In Gatow it is labeled an “original” aircraft, in Hannover it is a “replica”.




BMW 801D



Credits

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