



The Mk V Spitfire was a superb fighter but not good in the role of dive-bomber. (Photo by John Dibbs/planepicture.com)

SPITFIRE

BY DONALD NIJBOER

DIVE-BOMBER

GREAT FIGHTER, LOUSY BOMBER



The Supermarine Spitfire is regarded by many as the finest single-seat fighter of World War II. Immortalized during the Battle of Britain and well known for its defense of Malta during 1942, the Spitfire would see action on every British front during the war. Originally designed as a short-range interceptor, the Spitfire was one of the best, but as the war situation began to change, more demands were made of this elegant airframe.

The Mk III MC 500-pound bomb was the principal air-to-ground weapon carried by the Spitfire of the RAF 2nd Tactical Air Force in 1943–45. (Photo via Donald Nijboer)

In February 1941, the Spitfire Mk V appeared. Powered by the Merlin 45 engine, it offered significantly improved performance over the earlier Mk II. It was also the first version of the Spitfire equipped to carry bombs. (Photo courtesy of Donald Nijboer)



THE SPITFIRE'S GROUND-ATTACK CAPABILITIES WERE LIMITED BY ITS LIGHT GUN ARMAMENT. THIS WAS RECOGNIZED BY THE AUTHORITIES, AND BEFORE THE INVASION, THERE WAS A BIG PUSH TO UPGRADE THE SPITFIRE'S ARMAMENT.

A Great Multitasker...Usually

As a fighter, the Spitfire was well known for its speed and maneuverability. Its greatest attribute, however, had nothing to do with its exceptional performance. Reflected in R. J. Mitchell's brilliant design was the capacity for continued development. What set the Spitfire apart from the Hawker Hurricane and the muscle-bound Typhoon was its ability to take on more horsepower without degrading its performance. Indeed, every new Spitfire mark was essentially a simple increase in horsepower. The Spitfire Mk V was essentially a Mk I with the more-powerful Merlin 45 engine, and the Mk IX was a Mk V with the new Merlin 61 engine. Fortunately for the British, the Spitfire's ability to accommodate the more-powerful engines meant they had a fighter capable of taking on the *Luftwaffe's* latest Bf 109s and FW 190s. One can only imagine what might have happened if the Spitfire's development ended with the Mk I or Mk V.

Like many combat aircraft of WW II, the Spitfire was soon modified to perform a number of roles for which it was never intended. Starting out as an interceptor, the Spitfire was soon modified into a long-range escort fighter (60 Mk IIA long-range fighters were built with a 40-gallon fixed tank under the port wing), photo-reconnaissance aircraft, air superiority fighter, and carrier-borne fighter. It was even modified with floats and tested as a floatplane fighter. That was a lot to ask of one airframe, and in the end, there were two roles in which the Spitfire performed rather poorly. The first was as a carrier-borne fighter. Never intended for carrier operations, it suffered from poor range and a high accident rate. Ironically, once free of the carrier deck, the Seafire was considered to be one of the best low- to medium-altitude naval fighters of the war. The second was as a dive-bomber. R. J. Mitchell never envisioned the Spitfire as a fighter-bomber. So when the Royal Air Force (RAF) considered the Spitfire as a dive-bomber, it couldn't have picked a worse aircraft.

A Bad Idea Begins

The evolution of the Spitfire into a dive-bomber began shortly after the fall of France in 1940. Although still convinced that strategic bombing would win the war, the RAF quickly realized that air support for the army had to be improved. Developments in North Africa would also contribute to the air support question. After the two failed attempts to relieve the port of Tobruk in May and June of 1941, Air Vice-Marshal Arthur Tedder and Gen. Sir Claude Auchinleck moved ahead with a



series of exercises designed to solve the problem of air support for ground forces. This led directly to the formation of the Desert Air Force—the Allies' first Tactical Air Force (TAF) and the first time Spitfires would carry bombs.

By early 1943, planning for the D-Day invasion was well advanced. Both the RAF and the British Army were finally singing from the same songbook and fully endorsed the formation of the RAF's Allied Expeditionary Force in May 1943. By November, it was renamed the "2nd Tactical Air Force" and included No. 2 Group (transferred from Bomber Command) and No. 83, 84, and 85 groups. The vast majority of aircraft found in the

The cockpit of a Mk Vc Spitfire. Note how the stick pivots in the middle, rather than the bottom, of the stick. (Photo by John Dibbs/planepicture.com)



2nd TAF were single-seat Spitfire IXs and Typhoon IBs. While the Spitfire Mk IX was a great fighter, in many respects, it was ill suited for the ground-attack role. At this stage of the war, the ineffectiveness of the 0.303-inch machine gun was well known. While the 20mm cannon was an effective weapon against both aircraft and most ground targets the Spitfire's ground-attack capabilities were limited by its light gun armament. This was recognized by the authorities, and before the invasion, there was a big push to upgrade the Spitfire's armament to two 20mm cannons and two .50-caliber machine guns. A portion of a report titled "Loose Minute," describes the urgency at the time:

March 29, 1944

.5 IN. BROWNING GUNS IN SPITFIRE AIRCRAFT

1. At the Commanders meeting this morning the A.C.-in-C. directed that every possible effort was to be made to get into service in the shortest possible time the maximum number of aircraft with the above armament. He also described that Second TAF were to ensure that adequate stocks of ammunition of the right type were provisioned. The A.C.-in-C. said that this retrospective conversion was to be given high priority; it will mainly involve the S.Tech.S.O. as soon as the appropriate technical leaflet has been published.

A wing rider guides a No. 412 Squadron Mk IX out with a full load: 1,000 pounds of bombs (one 500- and two 250-pound bombs). The wing-mounted 250-pound bombs were of questionable tactical value due to their low explosive weight. (Photo courtesy of Donald Nijboer)



Another "Loose Minute," reveals figures related to the number of Spitfires already converted and ones coming off the production lines:

March 12, 1944
 SPITFIRE WITH .5" GUNS

1. Air Commodore Battle, Chief Overseer, M.A.P., rang to say that anticipated deliveries of .5" Spitfire installations are:

For retrospective fitting-80 sets April, 80 sets May

Off production already March 60, fitted in aircraft- April 80, May 280

In many respects, the Spitfire IX was lightly armed when compared to the Typhoon (four 20mm cannon), P-47D Thunderbolt (eight 0.50-inch machine guns), P-38J Lightning (one 20mm cannon and four 0.50-inch machine guns), and P-51D Mustang (six 0.50-inch machine guns), all of which were employed as dive-bombers and fighter-bombers. All would be equipped with bombs, and here again, the Spitfire was found wanting. All of the above fighters were capable of delivering 2,000 pounds of bombs, whereas the Spitfire was only cleared to carry a 1,000-pound load in September 1944. This was really beyond its capability, with 60 percent of all accidents when carrying a full load were caused by burst tires due to excessive weight. Range was also an issue. With a single 500-pound bomb, the Spitfire IX had a combat radius of just 95 miles (even shorter with a full 1,000-pound load), whereas the Typhoon had

a combat radius of 250 miles with a 2,000-pound bomb load. This restricted the Spitfires of the 2nd TAF to targets that were in the immediate battle area, often forcing them to attack targets within range rather than by priority.

One of the Spitfire Wings heavily involved in both the air superiority role and as a dive-bomber was those of No. 126 Wing Royal Canadian Air Force (RCAF) (No. 401, 411, and 412 Sq. RCAF). From D-Day to V-E Day, it was the most successful fighter wing on the continent, with a total of 333 enemy aircraft shot down. While its air-to-air record was spectacular, its dive-bombing activities were less so. For the pilots of No. 126 Wing, their dive-bombing activities started before the D-Day landings. In April, the Spitfires of No. 126 Wing began their dive-bombing attacks on the V-1 "Noball" sites in France. Flight Lt. Bill McRae of 401 Sq. takes up the story:

"In April of 1944, after a short dive-bombing course at Fairwood Common in Wales, where we used only small smoke bombs, 401 moved from RAF Biggin Hill to RAF Tangmere and began dive-bombing as part of our regular duties. The Spitfire had been used as a dive-bomber in the Mediterranean theatre, but there I believe only two wing-mounted 250 lb bombs were used. In Normandy 401 Squadron carried only the belly-mounted 500-pounder. The targets assigned to us, mainly V-1 launching sites and occasionally small railway bridges, required pinpoint accuracy, something almost impossible to achieve with the technique recommended for releasing belly-mounted bombs from a Spitfire, i.e. to start the pull out before releasing. Only once in my log do I mention the squadron having achieved a significant number of hits."

Operational Research studies prior to D-Day

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Note the lack of hardpoints for mounting bombs on the Mk 1 Spitfire. (Photo by John Dibbs/planepicture.com)

clearly showed that bombs dropped from fighters in a dive were found to hit a viaduct 500 yards long and 8 yards wide just once in 82 attempts (the report doesn't mention which type of fighter was used). And near misses did little damage.

Fighters Need Speed, Dive-Bombers Do Not

One of the Spitfire's greatest assets was its speed, but when in a dive, this was also a problem. None of the Allied fighters that were used as dive-bombers were modified to carry dive-brakes. Dive-brakes allowed a dive-bomber to maintain a set speed during a dive, thus increasing bombing accuracy. When a Spitfire went into a dive, it gained speed rapidly with no way to slow it down. It also revealed a new and strange phenomenon. McRae describes what was called "aileron up-float":

"The first indication of problems came when our crews began painting a white and a yellow line on the inboard chord of the ailerons. This, we were told, was to enable us to watch for and take action in the event of 'aileron up-float.' This phenomenon had been known to the brass for at least a year, but it was news to us. Apparently at high speeds both ailerons would rise, or float, and if allowed to continue could theoretically reach the point where they would break off. When first discovered on the Mk V, a suggested solution was to droop both ailerons 5/8" at rest, so they could rise to neutral at high speed! In our case we were told to monitor the ailerons as the speed increased; if the white line appeared you were approaching the critical point, if the yellow line showed you were to slow down! At the same time we were supposed to keep the airspeed below the Vne [velocity—never exceed]. Obviously we were far too busy trying to keep the target in sight, with red and white balls (AAA) [antiaircraft artillery] going past us in the opposite direction, to be checking the ailerons and the airspeed while in the dive, so both of these limiting factors were simply ignored. Reaching an indicated AS [air speed] of 500 mph was not uncommon."

No. 401 Squadron Spitfires armed with 500-pound bombs. Unfortunately, the 500-pound British bomb's fuses and tail assemblies were designed to be dropped horizontally, and the bomb was never intended to be delivered in a near-vertical dive. So the pilot began the pullout before releasing the bomb to ensure clearing the propeller, thus ruining bombing accuracy. (Photo courtesy of Donald Nijboer)

Operationally Unfit: Pilots and Plane

While the RAF had fully embraced the dive-bombing technique, it did nothing to modify or equip both the Spitfire and Typhoon for the role. No proper dive-bombing sight was used, the bomb racks fitted to the aircraft were designed for level-bombing, and the bombs themselves were designed to be dropped from a lumbering Lancaster flying horizontally! And when the Spitfire used the centerline-mounted 500-pound bomb, the pilot was forced to pull up through the target before releasing his bomb, thus degrading his accuracy. If he didn't, the bomb wouldn't clear the propeller arch. When a Spitfire was in a dive, it gained speed rapidly and often exceeded 450mph. This meant the release point was above 4,000 feet. McRae describes the physically taxing pull-up maneuver and how it sometimes proved deadly:

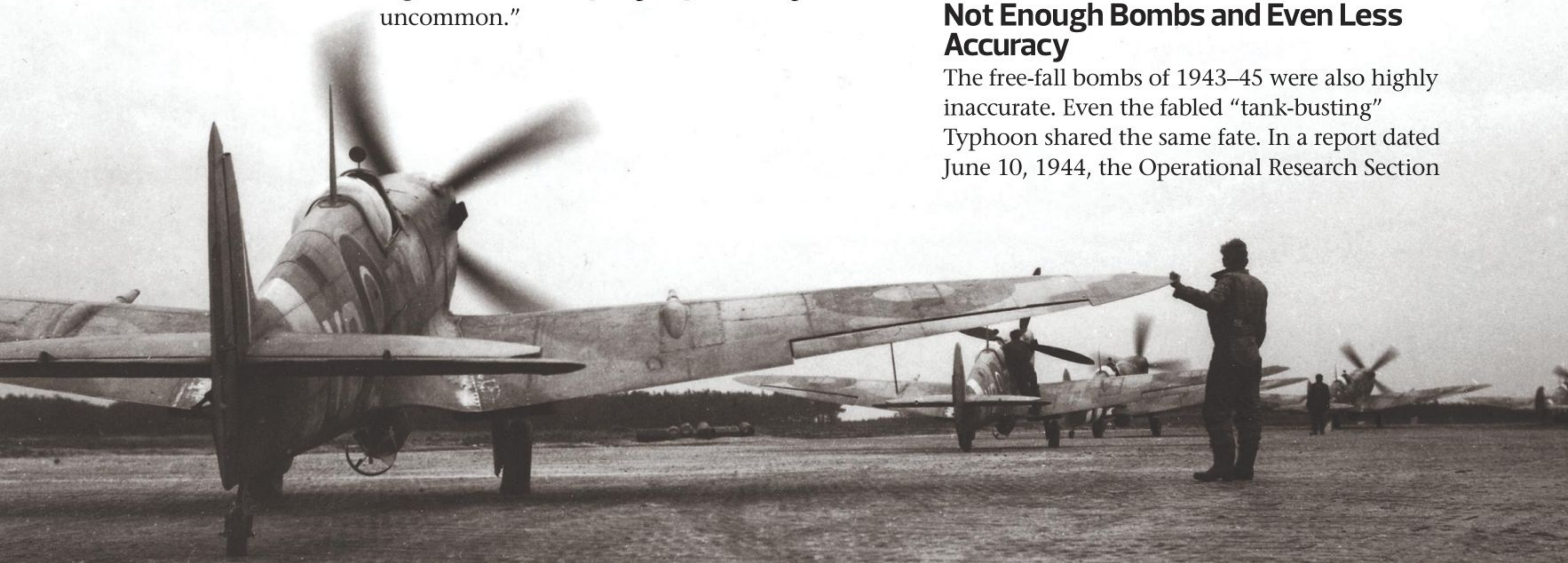
"On my first dive-bombing show I went through the procedure, pulled out with great difficulty, blacked out, to recover back up about where I started.

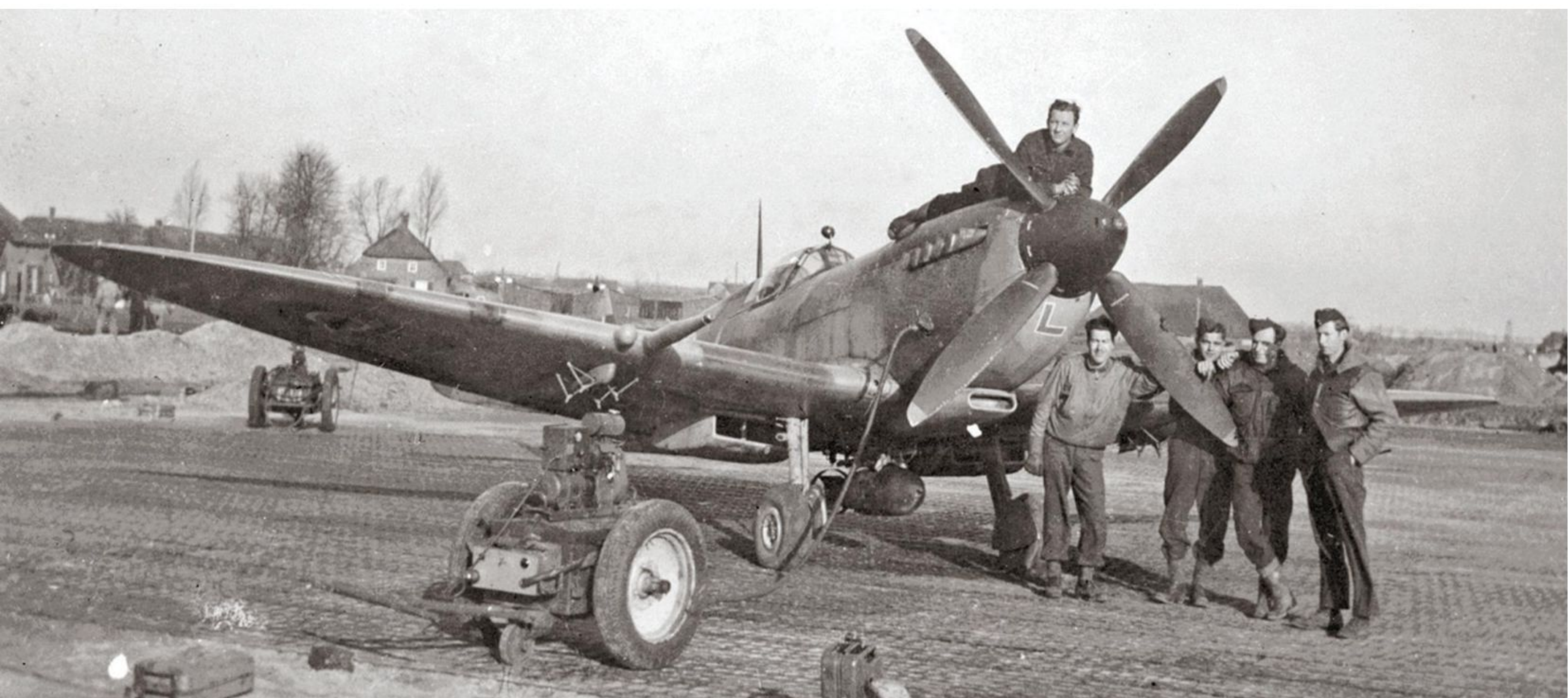
"I believe the training we had with small smoke bombs was inadequate, especially since we were not told what to expect when dealing with the real thing. Consequently we each had our own idea how to go about it. Initially I trimmed out for the dive then tried to trim out while pulling out of the dive. It usually took both hands on the stick, pulling with all my strength to get out of the dive. A day later I watched as another of our pilots appeared to be pulling out, then the dive steepened, past the vertical, and he plowed right into the ground."

Flak and small-arms fire also took a heavy toll. The Spitfire's liquid-cooled engine was extremely vulnerable to light flak. A single bullet in the oil, glycol tank, or radiator would often spell the end, and the numbers speak for themselves. From D-Day to V-E Day, No. 126 Wing RCAF lost 131 Spitfires and 98 pilots killed or captured, all mostly due to flak.

Not Enough Bombs and Even Less Accuracy

The free-fall bombs of 1943–45 were also highly inaccurate. Even the fabled "tank-busting" Typhoon shared the same fate. In a report dated June 10, 1944, the Operational Research Section





of the Allied Expeditionary Force published a study about the effectiveness of fighter-bombers (Spitfires and Typhoons). It became clear that the bomb-toting Typhoons were neither more or less accurate than the Spitfires. The only difference was the Typhoon was capable of carrying two 500-pound bombs to the Spitfire's one, making it twice as powerful (later, Spitfires would carry one 500- and two 250-pound bombs). The results, however, were disappointing. Against such targets as bridges, it was necessary to fly 90 to 180 Spitfire bombing sorties or 45 to 90 with Typhoons before substantial damage was inflicted (the Typhoons' ability to carry two bombs decreased the number of sorties). It was also proven that when targets were defended by flak and small-arms fire, accuracy decreased even more.

To be fair to the Spitfire, all the Allied fighter-bombers suffered from the same difficulties when it came to using dive-bombing techniques. Against fixed positions, fighter aircraft used as dive-bombers were largely ineffective, but when German forces were defeated and in headlong retreat, tactical air power proved devastating. During Falaise and the Rhine crossings, traffic congestion provided a target-rich environment. Air attacks caused considerable damage. Add the panic and confusion caused by the relentless attacks and the results were completely demoralizing for German ground forces. When the numbers are broken down, the 2nd TAF dedicated only one-third of its sorties in direct support of the ground troops. The other two-thirds were dedicated to other missions such as air superiority, cutting French and German rail communications, and attacking other targets in Germany. These interdiction missions were arguably the most effective contributions made by the 2nd TAF during the war in western Europe.

As much as the RAF embraced the concept of

tactical air power and the dive-bombing technique, it never seriously considered acquiring a true dive-bomber. The Spitfire was a failed attempt to make an interceptor into a dive-bomber. It was inaccurate and too delicate for the job. When the 2nd TAF was formed, the obvious source of aircraft came from RAF Fighter Command, which was overwhelmingly equipped with Spitfires. While the Typhoon did gain a reputation as an effective ground-attack aircraft, it was just as inaccurate as the Spitfire. One of the obvious choices for a suitable aircraft would have been the North American A-36 dive-bomber. Proven in Italy, it was overlooked by the RAF and was eventually replaced by the P-47 Thunderbolt in 1944. One can only speculate as to how effective two or three wings of A-36s would have been during the long ground campaign into Germany in 1944–45.

The Final Word

For McRae and the pilots of No. 126 Wing RCAF, it had been long slog. From D-Day to V-E Day, they dropped 4,426 500-pound and 3,883 250-pound bombs. They would go on to claim 4,468 vehicles destroyed or damaged; 493 locomotives blown up or disabled; 1,569 rail trucks in flames or holed; and 426 rail cuts.

Those are impressive numbers. But the last word on the Spitfire as a dive-bomber should go to McRae:

"In my opinion our efforts at dive-bombing were almost a complete failure; we were unable to achieve the precise bombing that our small targets called for. Had we been given area targets, such as marshalling yards or troop concentrations, we could have made a better contribution."

Special thanks to the late Bill McRae and Vintage Wings of Canada for the use of material for this article. †

A No. 442 Squadron Spitfire Mk IX armed with a single 500-pound bomb. The Spitfire's light weight and short range limited its bomb load—the Hawker Typhoon could haul 2,000 pounds of bombs on a consistent basis, while the Spitfire could carry only half that amount. (Photo courtesy of Donald Nijboer)