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Tigers on the Loose:

Assessing the Effectiveness of the Panzer VI “Tiger”, 1935-1945

by

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Introduction

In September 1942, a new German *Panzerkampfwagen* (Armoured Fighting Vehicle) the Panzer VI, better known as the Tiger I, entered combat outside Leningrad. By the time the war ended, the Tiger I and its successor the Tiger II (also known as the King Tiger) had gained a formidable reputation. Their thick armour and high-velocity 8.8cm guns allowed them to penetrate the armour of any Allied tanks they encountered at over a kilometer.¹ As Generalmajor (Major General) Friedrich von Mellenthin, wrote in his post war memoir *Panzer Battles*, “with this powerful gun and very strong armour the Tiger was the most successful and effective tank in the world until the end of the war”.² This reputation for battlefield capability contrasts sharply with the vehicle’s other reputation as ones that were overly complex and mechanically unreliable.³

With the exception of works by a few notable authors who have considered both aspects of the tank’s history, the majority of the historiography is split into works that deal with either the vehicle’s mechanical complexity or its combat performance. Further, none of these works are set within the context of the Germans’ wider use of tanks or Germany’s wartime economy. Without the ability to combine the technical, operational, doctrinal and economic aspects of the Tiger’s story, creating a comprehensive account of the vehicle’s history and assessing its value to the Heer (Army) has been extremely difficult.

¹ Oberkommando des Heers. Pz Offz B Chef GenStdH Anlage 7. 5.7.1944. Betr. Panzer Waffen Verrichtung. NARA, T-78, Roll 620 frame 000053,000071,000079.

² Ferdinand Maria von Mellenthin, *Panzer Battles: A Study of the Employment of Armor in the Second World War*, translated by H. Betzler, edited by L.C.F Turner, (Norman: University of Oklahoma Press, 1956), 212.

³ F.M von Senger and Etterlin, *German Tanks of World War II: The Complete Illustrated History of German Armoured Fighting Vehicles 1926-1945*. Translated by J. Lucas, ed. Peter Camberlain and Chris Ellis, (Munich: Lionel Leventhal ltd, 1969), 68-74.

Technical works on the Tiger tank are aimed primarily at armour enthusiasts. When it comes to books designed to cater to this group, there are many large “coffee table” books on offer, but two names stand above the rest, especially when it comes to the Tiger, Thomas Jentz and Hilary Doyle.⁴ Their works on the Tiger, *Germany’s Tiger Tanks: D.W. to Tiger I: Design, Production & Modifications* (2000) and *Germany’s Tiger Tanks: VK45.02 to Tiger II: Design, Production & Modifications* (1997) stand as great achievements.⁵ Every prototype is examined and every major decision that led to the creation of these vehicles is chronicled in detail, as are the vehicles production statistics and the numerous changes made to the vehicles over the course of their production. The inside the hatch view provided by Jentz and Doyle provides an incredibly detailed look at the mechanical complexity of the vehicles, which can leave the reader to draw their own conclusions about them. Tigers can either be lauded as tremendous technical achievements, as their designers created powerful vehicles of immense weight, armour and firepower (the mechanical reliability of the vehicles in the field is left unaddressed), or as machines whose complexity and small numbers would leave them vulnerable to smaller but more numerous Allied vehicles. There is also little discussion of the reasoning behind the inclusion of many of the key elements of the

⁴ Robert Jackson, *Tanks and Armoured Fighting Vehicles Visual Encyclopedia*, (London: Amber Books, 2009). *The Encyclopedia of Weapons of World War II: The Comprehensive Guide to over 1500 Weapons Systems, including Tanks, Small Arms, Warplanes, Artillery, Ships and Submarines*, ed. Chris Bishop, (London: Amber Books, 1998).

⁵ Thomas Jentz and Hilary Doyle, *Germany’s Tiger Tanks: D.W. to Tiger I: Design, Production & Modifications*, (Atglen: Schiffer Military History, 2000). Thomas Jentz, and Hilary Doyle, *Germany’s Tiger Tanks: VK45.02 to Tiger II: Design, Production & Modifications*, (Atglen: Schiffer Military History, 1997).

vehicles, and especially little or no discussion of the doctrinal niche the Tigers were meant to fill and why they had the powerful guns and heavy armour that have made them so famous. These ideas and any conclusions about the vehicle's value are left entirely up to the reader, as Jentz and Doyle sought only to create a comprehensive record of the physical development of the vehicles themselves. Any implications of the designs for their combat performance are not addressed in these works, nor is the effect that production of the Tiger or other vehicles had on the broader German economy.⁶

Discussion of the combat performance of the Tiger appears in a number of memoirs and unit histories as well as a noteworthy secondary source. Turning first to the memoirs, the most famous is Otto Carius's *Tigers in the Mud. The Combat Career of German Panzer Commander Otto Carius*.⁷ In this memoir the Tiger is treated as a fairly reliable vehicle⁸. Any mechanical foibles that the vehicle had were treated less as damning indictments of the vehicle's design but rather as a natural part of operations with vehicles of such complexity, suggesting a vehicle with fewer flaws than readers of the Jentz and Doyle books might conclude.

If there is one thing that memoirs such as this lack, it is a connection to the wider context of the war. This is understandable, as a company commander, was not expected

⁶ Jentz and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 167. Jentz and Doyle, *Germany's Tiger Tanks: VK45.02 to Tiger II*, 143. Walter J. Spielberger, Hilary L. Doyle and Thomas L. Jentz, *Heavy Jagdpanzer: Development, Production, Operations*, (Atglen: Schiffer Publishing, 2007). Walter J. Spielberger and Hilary L. Doyle, *Tigers I and II and their Variants*, (Atglen: Schiffer Publishing, 2007).

⁷ Otto Carius, *Tigers in the Mud. The Combat Career of German Panzer Commander Otto Carius*, translated by Robert J. Edwards, (Mechanicsburg: Stackpole Books, 1992). Richard Freiherr von Rosen, *Panzer Ace: The Memoirs of an Iron Cross Panzer Commander From Barbarossa to Normandy*, translated by Geoffrey Brooks, (South Yorkshire: Greenhill Books, 2018), ebook.

⁸ Carius, *Tigers in the Mud*, 21.

to, or able in the normal course of their duties to keep up with the wider progress of the war. Nevertheless, this lack of wider context does have an impact, creating a sense that the victories that are discussed had a greater impact than was actually the case.

The themes present in the memoirs are carried over into the unit histories available for the Tigers, the Ferdinand and the Jagdtiger, of which the most prominent is *The Combat History of the German Tiger Tank Battalion 503 in World War Two*, written by Franz-Wilhelm Lochmann, Alfred Rubbel and Richard Freiherr von Rosen, all veterans of the unit.⁹ These also present a nuanced view of the vehicles but lack broader context which means that “like many German veterans’ accounts, the emphasis is placed more on damage inflicted on the enemy, rather than the fact that the Wehrmacht was being steadily pushed back towards the Reich”, as Robert Forczyk stated in his introduction to *Tiger Battalion 507*.¹⁰

A noteworthy addition to the secondary source analysis of the Tiger’s combat performance is Christopher Wilbeck’s *Sledgehammers: Strengths and Flaws of Tiger Tank Battalions in World War II*.¹¹ Wilbeck’s book is the most comprehensive examination of the Tigers’ performance during the war, examining every major combat

⁹ Franz-Wilhelm Lochmann, Alfred Rubbel and Richard Freiherr von Rosen. *The Combat History of the German Tiger Tank Battalion 503 in World War Two*, (Mechanicsburg: Stackpole Books, 2008), ebook. *Tiger Battalion 507*, ed. Helmut Schneider, translated by Geoffrey Brooks, (Newport: Greenhill Books, 2020). *The Combat History of Schwere Panzer Abteilung 508: In Action in Italy with the Tiger I*, ed. Kurt Hirlinger, translated by David Johnston, (Winnipeg: J.J. Fedorowicz Publishing Inc., 2001). *The Combat History of Schwere Panzer Abteilung 508: In Action in Italy with the Tiger I*, ed. Kurt Hirlinger, translated by David Johnston, (Winnipeg: J.J. Fedorowicz Publishing Inc., 2001). Karlheinz Münch, *The Combat History of German Heavy Anti-Tank Unit 653 in World War II*, (Mechanicsburg: Stackpole Books, 2005).

¹⁰ *Tiger Battalion 507*, ed. Helmut Schneider, 13.

¹¹ Christopher W. Wilbeck, *Sledgehammers: Strengths and Flaws of Tiger Tank Battalions in World War II*, (Bedford: The Aberjona Press, 2004).

action that the vehicle undertook, from 1942-1945. It also contains an excellent examination of the doctrine used by the *schwere Panzer Abteilung* (heavy tank battalion) during the war. Unlike the memoirs and unit histories Wilbeck places the Tigers' engagements into a broader context, describing their impact on battles and campaigns rather than leaving them in unconnected engagements presented without wider context. While this addition describes the role of the Tigers in detail, it still does not place these operations into the context of the wider war, making it difficult to assess the Tigers' broader impact on the outcome of both individual operations and the war.¹²

The discussion of the German economy in the Second World War looms large over the Tigers, though such tanks are rarely discussed within them. Among the most prominent works in this regard are the memoirs of Albert Speer, the Minister of Armaments from 1942-1945 and Adam Tooze's *The Wages of Destruction: The Making and Breaking of the Nazi Economy*.¹³ These accounts of the German war economy often touch on the production of Armoured Fighting Vehicles (AFVs, this term encompasses both tanks and other armoured vehicles such as tank destroyers) and even the Tiger itself. They do not however, provide an in-depth examination of their production and their position within the greater economy. This thesis will add to the literature surrounding the

¹² Wilbeck, *Sledgehammers*, 173-175.

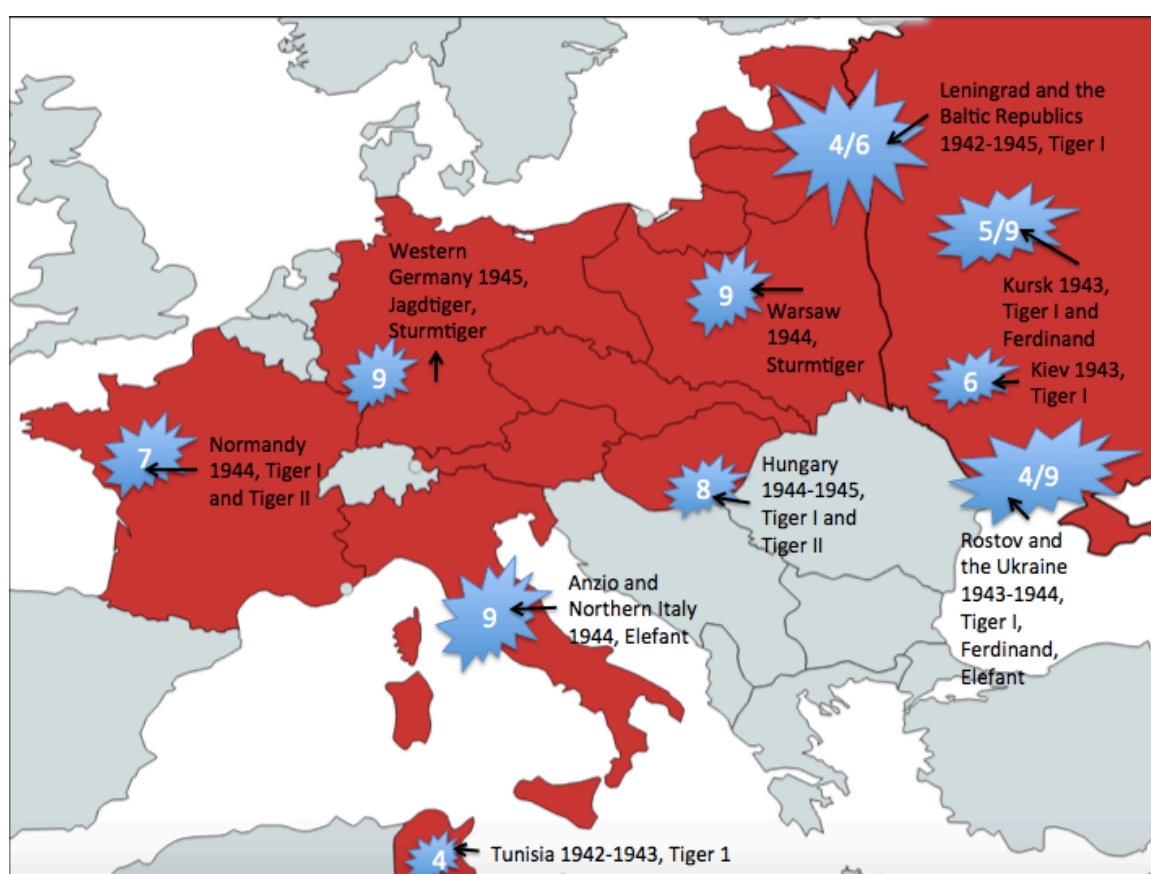
¹³ Albert Speer, *Inside the Third Reich*, translated by Richard and Clara Winston, (Toronto: The Macmillan Company, 1970), 234, 241. Adam Tooze, *The Wages of Destruction: The Making and Breaking of the Nazi Economy*, (New York: Penguin Group, 2006). Bernhard R. Kroener, Rolf- Dieter Müller, Hans Umbreit, *Germany and the Second World War, Volume V/I Organization and Mobilization of the German Sphere of Power: Wartime Administration, Economy, and Manpower Resources 1939-1941*, translated by John Brownjohn et.al, (Oxford: Clarendon Press, 2000). Bernhard R. Kroener, Rolf- Dieter Müller, Hans Umbreit, *Germany and the Second World War, Volume V/II Organization and Mobilization of the German Sphere of Power: Wartime Administration, Economy, and Manpower Resources 1942-1944/5*, translated by Derry Cook- Radmore et-al, (Oxford: Clarendon Press, 2003).

Tiger by placing its development and use within the context of Armoured Fighting Vehicle (AFV) production and the wider wartime economy. These broader contextual connections, paired with the development and operational history of the Tigers will show that the tanks and their derivatives were developed and fielded even though they lacked a firm doctrinal rationale and their combat performance could never help redress the enormous economic imbalance under which the Germans fought the war, which points to poor economic, political and military decision making, effecting not only the Tigers but also the greater German war effort.

As the above brief survey of the historiography suggests, there is still a need to provide a comprehensive examination of the Tigers that considers not only combat performance or mechanical issues but both together as well as the previously neglected economic elements of the vehicle's story to create a full account of its history and fully assess the value of the Tigers for the German war effort. The full assessment provided by this thesis demonstrates that although there is certainly truth to the Tigers much vaunted combat performance, this performance was overshadowed by their mechanical unreliability and limited numbers as well as the fact that they were designed not to fill a pressing doctrinal need but instead to satisfy Adolf Hitler. Consequently, the Tigers were in no way capable of fulfilling the roles they were given in practice when they were used in the second half of the war, at a time when the Heer did not have the resources to employ them as designed. This study will cover the entire Tiger "Family", which includes not only the Tiger I and II, but also the specialized vehicles based on their chassis, including the Ferdinand and Jagdtiger tank destroyers as well as the Sturmtyger, an urban assault gun. It will do so both for the sake of completeness and because these

vehicles provide a number of parallels to the story of the tanks upon which they were based even though their roles differed considerably.

In combat the Tigers were organized into *schwere Panzer Abteilungen* (heavy tank battalions) rather than being added to the Panzer divisions (armoured divisions). This decision was made both as a concession to low production numbers but also so that the units could be shuffled around as needed to provide additional combat power to key sectors.¹⁴



The deployments of the Tiger “Family”, indicating the chapters and vehicles involved in each area. Red Areas indicate not only areas where the Tigers fought but also the wartime extent of the German state, encompassing both Austria and Czechoslovakia. Map by author, using Historical Map Chart. <https://historicalmapchart.net/world-1938.html>

¹⁴ Wilbeck, *Sledgehammers*, 19, 30.

During their combat service from September 1942 to May 1945, a number of long-term trends with regards to the Tigers effectiveness emerged, the decline of the Heer and the growing effectiveness of Allied anti-tank weapons and tactics. It also showed their effectiveness and limitations in not only their intended role as breakthrough tanks but also as defensive weapons as the Germans were forced onto the defensive across all fronts from 1943 onwards.

The initial deployments of the Tigers in the Soviet Union in the fall 1942 and the winter of 1943, as well as in North Africa in 1943, lead to the creation of the Tiger's legendary reputation with its armour and armament proving to be more than a match for any Allied vehicle. However, these initial employments also demonstrated the vehicles weaknesses, especially with regards to its lack of mechanical reliability and poor mobility. In both North Africa and the Soviet Union, the Allies would capture Tigers, paving the way for improved weapons and tactics to counter them in the battles to come, leaving the Tigers with an all too brief moment of battlefield superiority.

Operation *Zitadelle* (Citadel), also known as the Battle of Kursk in July 1943, was in theory at least, the Tiger's greatest moment. The Tigers were to be employed as intended in the breakthrough role, with all the supporting weapons the Germans could muster. Unfortunately, extensive Soviet defences and a growing Soviet understanding of the Tiger's strengths and weaknesses, combined with more powerful anti-tank weapons like the SU-152 "beast killer" self-propelled guns, allowed them to counter the Tigers' far

more effectively than they had at the beginning of year.¹⁵ The depth of the Soviet positions also robbed the formations supporting the Tigers of the strength to exploit whatever breakthroughs the Tigers were able to achieve.

Subsequent operations on the Eastern Front in 1943 and 1944, would see German forces largely on the defensive. During this period the Tigers were not only used in counter attacks, which was the intended defensive role for all Panzers, but also as ‘*Korsettstange*’ (Corset Stays). In this role the Tigers would occupy positions in the Germans front line to support infantry divisions, which had neither the number nor morale to hold their positions alone. While the Tigers would achieve some successes in this period, with small numbers of well-handled Tigers defeating larger Soviet units, it was generally a period that placed even more strain on the unreliable vehicle, than previous offensive operations had, which ensured that their effectiveness was limited, especially in the face of the overwhelming superiority of the Red Army.

The Normandy Campaign in the summer of 1944 would see the Tigers facing many of the same problems they had faced in the Soviet Union, with the vehicles’ poor mechanical reliability and the Allies’ material superiority limiting their effectiveness. It would also see the introduction of the Tiger II and the Western Allies significantly improved anti-tank capabilities, most famously with the Sherman Firefly, provided with the high-velocity 17 Pounder anti-tank gun.¹⁶

¹⁵ Alexander Hill, *The Red Army and the Second World War*, (Cambridge: Cambridge University Press, 2019), 440. Artem Drabkim, *Panzer Killers: Anti-Tank Warfare on the Eastern Front*, translated by Stuart Britton, (Barnsely: Pen & Sword Books, 2013), ebook, 352-353.

¹⁶ Stephen A. Hart, *Sherman Firefly vs Tiger: Normandy, 1944*, (London: Osprey Publishing, 1997), 14-15, 24

The operations of the Tiger II in Hungary from October 1944 to March 1945, provided the vehicle with a much more effective showcase for its abilities, with its improved armour and armament further contributing to the Tiger's reputation as a formidable opponent. That said, the vehicle did not improve upon the Tiger I's poor mobility and lack of reliability. Operations in Hungary also provided the Tigers with their last victories, demonstrating that in the right circumstances, the Tigers could still be used with great effectiveness, though Germany's weakness and Soviet strength ensured that those victories were few and very fleeting.

The combat experiences of the Tiger variants, the Ferdinand, Sturmtiger and Jagdtiger bear many similarities to their better-known relations. Like the Tigers, they suffered from poor mobility and reliability but it is in their combat performance where there were some differences. The Ferdinands (renamed the *Elefant* or Elephant in 1944) were the most successful but only when employed as long range tank destroyers. Attempts to use them outside of this role, most famously in their first use which saw them employed as assault guns during Operation *Zitadelle* proved that the vehicles were too specialized to be employed in any way other than designed, a stark contrast to the relative flexibility of the Tigers. The Sturmtiger and Jagdtiger also suffered significantly from being overly specialized and their even greater weight (65 tons and 75 tons respectively) severely limited their ability to be used as intended or otherwise which meant that they enjoyed very little success and were easily the worst vehicles in the entire Tiger "family".

Putting the different elements of the Tiger's story together it is clear that the vehicles were technically impressive and that their combat performance did sometimes live up to their post-war reputation but overall the story is one of failure. The members

of the Tiger “family” proved too complex to produce in large numbers and their mechanical unreliability made a vehicle that already lacked a clear doctrinal role to fill even less valuable when their high production costs and limited numbers are considered. In the end whatever successes they did have were overshadowed by their weaknesses and the weaknesses of the Heer as a whole as the war turned into one in which Germany’s defeat was inevitable.

Chapter 1: To Build or not to Build: The Development of the Tiger Tank

The Tiger I and II were remarkable creations, but what is more remarkable is that they were ever built at all. Their development, and the development of other vehicles based on their chassis, was a long and torturous one because of a vehicle selection system that was extremely inefficient. It was marred by the lack of a clear role for a heavy tank, and political interference in the designs and the development of vehicles that reflected the personal whims of Adolf Hitler and a desire to have the biggest vehicles possible, even if those vehicles had little operational value. These themes were present throughout the development of the five vehicles that made up the Tiger “family” and each will be dealt with separately, in chronological order. The creation of the Tiger I would see an indecisive Heer spend seven years on numerous prototypes without result. Only with Hitler’s intervention in 1941, was a clear design opted for. Hitler’s intervention proved more curse than blessing, as his interference would continually lead to modification of designs from the leading heavy tank designers, *Henschel und Sohn* and *Dr. Ing.h.c Porsche KG*. Once Henschel won the production contract for the Tiger I, Porsche’s design became the basis for the Ferdinand tank destroyer to fill the Heer’s insatiable need for armoured vehicles. The final vehicle based on the Tiger I, the Sturmtiger, featured an awe-inspiring 38cm rocket launcher but such a heavy vehicle was not really necessary for urban combat, particularly when the Heer was on the defensive. Even before the Tiger I entered service Hitler wanted a Tiger II with more armour and a more powerful gun, despite the fact that there was no indication that the Tiger I would face any foe that it could not destroy. The Jagdtiger, based on the Tiger II’s chassis was, like the Sturmtiger a testament to the trend Hitler had established to create vehicles that were bigger and

better than any conceivable rival even though the vehicle had little to offer a resource strapped army.

Plotting the “family tree” of the Tiger means starting with the first German tanks produced after World War One. In 1925, the *Reichswaffenamt* (Army Weapons Office), of the Reichswehr, the Weimar era German army, commissioned *Daimler Benz AG*, *Rheinmetall AG* and *Fredrich Krupp Grusonwerk AG* to each design the first German tanks built since 1918. These vehicles were referred to as the *Grosstraktor* (heavy tractor), in an effort to convince Allied inspectors looking at company records that the Germans were not defying the Treaty of Versailles by building tanks. Any inspector that saw these tractors for themselves would have had no illusions as to their actual purpose, as tractors usually did not weigh 16 tons and most certainly did not have 14mm of armour and a turret sporting a 7.5cm gun. The *Grosstraktor* was intended to act as infantry support tanks while the *Leichtetraktor* (light tractor), which was commissioned in 1928, were to be tank killers.¹⁷ In 1929, as the vehicles were being developed, the *Reichswaffenamt* called for a heavier infantry support tank sporting multiple turrets, imitating the British Vickers A1E1 Independent of 1926 to support them. Rheinmetall would complete two prototypes in 1934, with a further three production vehicles finished in 1935. Since it was being produced at a time when the Nazis were still pretending to abide by the Treaty of Versailles it was christened *Neubaufahrzeug* (New Construction Vehicle). The 23-ton vehicle retained the 14mm of armour found on the *Grosstraktor*, but featured three turrets. In the central turret a 7.5cm gun was fitted along with a coaxial

¹⁷ James S. Corum, *The Roots of Blitzkrieg: Hans von Seeckt and German Military Reform*, (Lawrence: University of Kansas Press, 1992), 112-114.

3.7cm gun. Two other turrets, one in front of and the other behind the central one, were fitted with machine guns. Once these vehicles were completed, interest in the venture quickly waned as the Germans discovered the same faults with multi-turreted tanks that other powers either had or would discover. Vehicles of this type proved to be impossible for commanders to coordinate effectively as managing the fire of multiple turrets proved impossible. As a result the *Neubaufahrzeug* was relegated to propaganda duties, with one exception. In April 1940, the three production vehicles were assigned to *Panzer Abteilung zbV 40 (zur besonderen Verwendung, for special purpose)* for operations in Norway. In their one and only combat use one of the vehicles was destroyed. After this use they were scrapped.¹⁸

Despite the inauspicious life of the *Neubaufahrzeug*, interest in a heavy tank, both in infantry support and anti-tank roles, continued. In 1935, as the *Neubaufahrzeug* left Rheinmetall, the life of the Tiger was beginning. On October 30th, General Liese, head of the *Heers Waffenamt* (Army Weapons Office, renamed to reflect the change in name instituted by the Nazis) authored a report on *Offensive Abwehr von Panzerwagen* (Offensive defence of tanks). This report called for a 30-ton tank mounting a high velocity 7.5cm gun, with over 20mm of armour to counter heavy French tanks of the period. This included the Char 2C, a 76-ton tank with 45mm of armour and a 75mm gun, developed by the French in 1917 and the heaviest tank in world at the time.¹⁹

¹⁸ Peter Chamberlin, and Hilary L. Doyle, *Encyclopedia of German Tanks of World War Two: A Complete Illustrated Directory of German Battle Tanks, Armored Cars, Self-Propelled Guns and Semi- Tracked Vehicles, 1933-1945*, (London: Arms and Armour Press, 1993), 147. von Senger and Etterlin, *German Tanks of World War II: The Complete Illustrated History of German Armoured Fighting Vehicles 1926-1945*, 108.

¹⁹ Jentz and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 9.

This hypothetical heavy tank posed some engineering problems from the start. It would have been considerably heavier than any other tank the Germans had produced up to that point. Their heaviest tank in production in 1935, the Panzer II, was a light tank of just 8.9 tons and the heavier Panzer III and Panzer IV's, weighing 16 and 17 tons respectively were still in development and would not be ready for testing for another year.²⁰ Given this much greater weight there were concerns over the sort of engine needed to move this vehicle. In October and December, representatives of the *Waffenamt* met with Dr. Maybach of *Maybach Motorenbau GmbH* (Maybach Engine Construction Company). Maybach was already providing the rest of the German tanks with their engines and the *Waffenamt* wanted a 700-horsepower V12 engine for this proposed heavy tank. Such an engine was deemed by the company's engineers to be impossible, but a longer sixteen-cylinder engine was deemed feasible, although this engine would add an additional half-meter to the tanks length. This additional length would also increase the weight, thus removing any horsepower advantage from the engine. While Maybach would eventually supply 700-horsepower engines for the Tigers, producing such an engine was beyond the firm's capabilities at the time.²¹

Without an engine, the *Waffenamt* abandoned the idea of a heavy tank but not for long. In January of 1937, *Wa Prüf* (Armaments Department) 6, the agency responsible for the design of tanks for the *Waffenamt* approached *Henschel und Sohn* (Henschel and Son) to develop a 30-ton tank. They had previously been one of the manufacturers of the Panzer I, and were also prominent manufactures of locomotives. This prior experience

²⁰ Bryan Perrett, *Panzerkampfwagen IV Medium Tank 1936-45*, (London: Osprey Publishing, 2001), 4-5.

²¹ Jentz, and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 9.

with both tanks and heavy steel locomotives made them ideal as the designers of a heavy tank. As in the 1935 proposal, this tank was to mount a 7.5cm gun in a turret to be provided by the famed German gun manufacturer *Fredrich Krupp Grusonwerk AG*. Since this vehicle was formally tendered to a company for construction, it was graced with a name, the *Begleitwagen (verstärk)* (Escort Vehicle, strengthened). *Begleitwagen* was the same designation given to the Panzer IV when that tank had been in development, implying a similar role of infantry support but *verstärkt* denoted a more heavily armoured vehicle. This name would not be used for long, as on March 12th, 1937, it was renamed to the *Durchbruchswagen* (Breakthrough Vehicle) or DW, reflecting its new role. With this third tank, the Panzer divisions would have the two faster tanks, the Panzer III and IV, optimized for the destruction of enemy tanks and infantry support respectively, while the DW would facilitate the breakthrough, taking full advantage of its heavier armour in the process, allowing the other two to surge through the hole blasted in the enemy's defences.²²

To perform this role, the DW was to mount the Krupp made 7.5cm KwK L/24 (KwK or *Kampfwagenkanone*, Fighting Vehicle Gun was the designation for a tank gun, while the L represented the length of the barrel), the same gun mounted on the Panzer IV. This was a sensible decision as the tanks support roles made the short-barreled, lower velocity gun more useful than the higher velocity 3.7cm gun on the Panzer III. It would also have 50mm of hull armour, a significant improvement over the 15mm of hull armour on the Panzer III and IV.²³

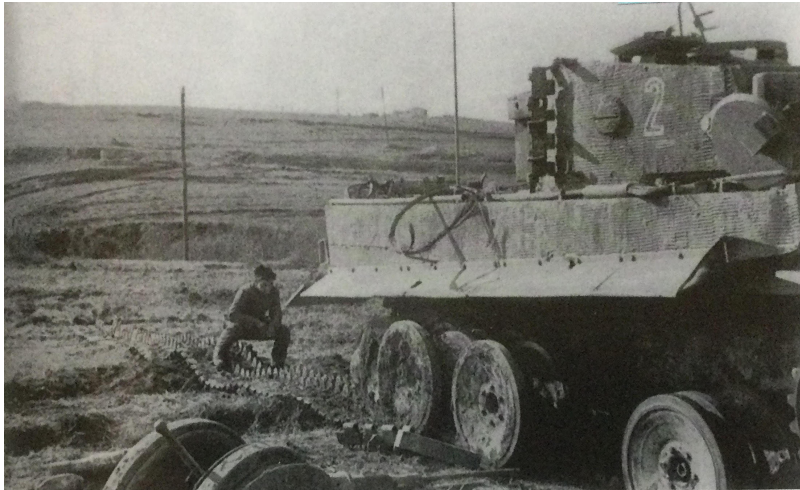
²² Jentz, and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 10.

²³ Ibid, 10-11.

Once the DW design had been finalized, in 1938, Henschel had the design approved by the *Waffenamt* which gave it the designation VK 30.01 (VK, *Versuchs Kraftfahrzeug*, Experimental vehicle). The first pair of numbers referred to the intended weight, while the second two designated different prototypes). VK 30.01 would come to weigh 32 tons but otherwise had the same attributes as the DW, with only one other substantial difference. VK 30.01 would be the first Henschel tank designed with interleaved road wheels, rather than the five separated road wheels used on the DW. This style of road wheels would become standard not only for the Tigers but also the majority of mid-to-late war German armoured vehicles. This style of road wheels was used as it better distributed the weight of the vehicle across the length of the tracks, which made it easier for the tracks and the suspension to bear the vehicles weight. It also had the effect of making the vehicle less likely to bog down as the larger surface area of the wheels spread the weight out more (though the fact that the Tigers would eventually weigh over fifty tons negated this advantage).²⁴ The problem with this system was that changing interleaved road wheels was incredibly time consuming. On the Tiger I it would require between twelve and twenty four hours to effect repairs depending on the severity of the damage.²⁵

²⁴ Jentz, and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 10-11.

²⁵ Lochmann et.al, *The Combat History of the German Tiger Tank Battalion 503 in World War Two*, ebook, 120.



A Tiger of schwere Panzer Abteilung 508 undergoes track repair in Italy, showcasing the burden of repairing the Tigers running gear (Bundesarchiv Bild 101I-310-0899-15)

Beginning in June of 1939, the *Waffenamt* asked Krupp to design a turret to take a 10.5cm gun and in mid 1940, Henschel was ordered to build a tank to mount this turret. Since VK 30.01 was too small for this task, a larger vehicle, christened VK 36.01 was created. This new tank was to feature 80mm of armour on its front plate, with 50mm on the sides and rear. The decision to abandon VK 30.01 in favor of VK 36.01 was based in part on experience gained in Poland and France, which indicated that the 7.5cm guns available would not be adequate for the breakthrough role. The 10.5cm gun could certainly be used to great effect against enemy tanks, but as a comparatively low velocity gun, the inclusion of this artillery piece as the tanks main armament suggested that destruction of fortifications was the main role of VK 36.01.²⁶

As the first hulls for VK 30.01 were being built and the *Waffenamt* was calling for a 10.5cm gun to smash enemy fortifications, another company was working on a heavy tank designed for a very different role. Dr. Ferdinand Porsche of *Dr.Ing.h.c*

²⁶ Jentz, and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 17-18.

Porsche KG had a reputation as a carmaker. This unpromising resume obscured Porsche's earlier tank experience. While working at Daimler he was the chief designer and project supervisor for that company's *Grosstraktor*, making Porsche a man with significant knowledge of tank design. He was convinced that he could not only build a heavy tank but a vastly superior one. It was the power plant -a pair of gas engines- which would each power an electrical generator to propel the tank, which would make it superior to the single gas engine used on the Henschel vehicle.²⁷ This 30 ton tank, known internally as the Type 100, was soon under development. Owing to its dual engine design -which occupied a considerable amount of space in the rear of the vehicle -it had an unconventional layout with the turret located not in the center of the vehicle as was the norm for German tanks but much further forward, giving the Porsche design a distinctive look. By April of 1941, Krupp would be awarded a contract to provide a turret for Type 100 sporting the 8.8cm KwK L/56, a tank gun based on the company's 8.8cm Flak 36 anti aircraft gun of the same caliber.²⁸

While no turrets and only one hull for the Type 100 were ever completed, it never the less marks the introduction of the "damned 88's", as the Allies called them, to the Tiger's story.²⁹ While the weapons fearsome reputation was largely made later in the war, by April of 1941, it was already a well-established tank killer. During the conquest of France the previous year, the Flak gun had proven itself during the Battle of Arras on the

²⁷ Doyle, *The Complete Guide to German Armored Vehicles*, ebook, 341.

²⁸ Jentz, and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 23-24.

²⁹ Hans von Luck, *Panzer Commander: The Memoirs of Colonel Hans von Luck*, (New York: Praeger Publishing, 1989), 197.

21st of May when even the 60mm of frontal armour on the Matilda I and 78mm of frontal armour on the Matilda II could not withstand the Flak guns fire.³⁰

The conflicting designs from Henschel and Porsche in this period speaks to an army that had no clear intended role for a heavy tank. Henschel's designs were intended for infantry support, with either the 7.5cm KwK L/24 of VK 30.01 or the 10.5cm gun of VK36.01. By contrast, the high velocity 8.8 cm KwK L/56 gun to be mounted to Porsche's Type 100 -a gun that was best suited to an anti-armour role (though it did have an excellent high explosive round -which gave the gun a great deal of flexibility in terms of use), suggested a vehicle designed more explicitly as a tank killer.

Clarity about the main role of Germany's heavy tank was not obtained until May 26th, 1941. On this date Hitler would outline his requirements for a heavy tank, finally committing the *Waffenamt* to a single set of design priorities.³¹ After reviewing the vehicles then in development Hitler ordered that any new heavy tank would be used in a spearhead role and must have a gun with greater penetration capability and heavier armour than previous tanks.³² These design parameters would allow the new heavy tank to deal not only with the British Matildas encountered in France but also Soviet heavy tanks and the T-34, which had been identified and described in detail by German intelligence in December 1940.³³ The 8.8cm KwK L56 to be mounted on the Type 100

³⁰ von Luck, *Panzer Commander*, 41. Lloyd Clark, *Blitzkrieg: Myth, Reality, and Hitler's Lighting War- France, 1940*, (New York: Atlantic Monthly Press, 2016), 264. Peter McCarthy and Mike Syron, *Panzerkrieg: The Rise and Fall of Hitler's Tank Divisions*, (London: Constable, 2002), 85.

³¹ Thomas Jentz and Hilary Doyle, *Kingtiger Heavy Tank 1942-45*, (London: Osprey Publishing, 2002), 4.

³² Spielberger, and Doyle, *Tigers I and II and their Variants*, 27.

³³ Steven Zaloga, *Armored Champion: The Top Tanks of World War II*, (Mechanicsburg: Stackpole Books, 2015), ebook, 206.

was considered acceptable, but Hitler also wanted to explore the possibility of fitting a version of the Flak 41, a higher velocity 8.8cm gun designed by Rheinmetall-Borsig (Rheinmetall acquired *August Borsig GmbH* in 1933 and changed its name to *Rheinmetall-Borsig AG* in 1936). Henschel's VK 36.01 was to be redesigned to mount the *Waffe 0725*, a tapered bore gun. This gun was similar to the Pak 41, a gun with a 75mm breech that narrowed to 55mm at the muzzle. By squeezing the projectile down the barrel it would gain greater velocity and thus penetration while requiring lighter projectiles. There was one major problem, as this ammunition required Tungsten and all of Germany's supplies of this rare metal came from neutral Spain and Sweden. Consequently, Hitler ordered that the gun only be used if sufficient Tungsten was available for mass production.³⁴ Hitler also decreed that both tanks should have 100mm of frontal armour and be ready for testing by the spring of 1942.³⁵ At this point the parameters for Germany's heavy tanks had been finalized at last, creating a fusion of the breakthrough oriented VK 36.01 and Porsche's tank killing Type 100.

Fulfilling Hitler's requirements meant that both companies had to modify their designs to accommodate the armour and weapons required and quickly, as the final date for submission of the new designs was April 20th, 1942, Hitler's Birthday, less than a year away. Porsche's new design, which the *Waffenamt* dubbed VK 45.01 (P) and which the company christened the Type 101 received the 100mm of frontal armour called for by

³⁴ Dennis Showalter, *Hitler's Panzers: The Lightning Attacks that Revolutionized Warfare*, (Toronto: Penguin Group, 2007), 230.

³⁵ Spielberger, and Doyle, *Tigers I and II and their Variants*, 27. Jentz, and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 18.

Hitler.³⁶ Visually the tank was identical to the Type 100, even inheriting the earlier tanks turret, as Porsche and Krupp concluded by September of 1941 that the turret ring was too small to allow the Flak 41 to be mounted. This fact saved Krupp from the embarrassment of having to mount Rheinmetall-Borsig's gun in their turret, allowing the company to retain its virtual monopoly on tank guns.³⁷

Henschel's entry, VK 45.01 (H) underwent a similar process, with the new vehicle retaining the final drives, suspension, steering gear and the interleaved road wheels of VK36.01- a valuable addition given the tight time frame the company was working under. As with the Porsche tank, the weight of the vehicle increased significantly to 56 tons in order to accommodate the increased armour. The most substantial change would come in September of 1941, as Henschel, like Porsche was forced to reconsider their armament. Fritz Todt, *Reichminister für Bewaffnung und Munition* (Minister for Armaments and Munitions) had concluded in July of 1941 that, out of a stockpile of 700 tons of Tungsten available, only 260 tons could be allocated for weapons, with the rest required for tool steel. As each 0725 shell required a kilogram of Tungsten, the *Waffe 0725* was not feasible. Henschel and the Waffenamt remained wedded to the *Waffe 0725*, nevertheless. Hitler had to intervene personally, so that they would accept that the weapon was impossible to use, refuting the common trope that "Hitler was solely responsible for the technical dead ends that plagued the armoured forces during the war's second half".³⁸ With their desired turret unavailable and time

³⁶ Thomas Jentz and Hilary Doyle. *Tiger I: Heavy Tank 1942-1945*, (London: Osprey Publishing, 1993), 5.

³⁷ Jentz, and Doyle, *Tiger I: Heavy Tank*, 5.

³⁸ Showalter, *Hitler's Panzers*, 231.

running short, Henschel modified VK 45.01 (H) to accept the same Krupp turret, with the 8.8 cm KwK 36 L/56 gun as the Porsche tank.³⁹

With only eleven months to complete the vehicles, it is a testament to the skill of Porsche and Henschel's engineers that they were able to redesign their vehicles to accommodate Hitler's wishes. In their initial tests before the Führer on April 20th, 1942, no clear winner could be determined and both vehicles showed the strain of their rushed production. They both broke down repeatedly and during a speed test in which the Porsche tank reached fifty kilometers an hour and the Henschel forty-five, the latter vehicle's engine temperature was so high that the company's engineers feared it would burst into flames. Thankfully it did not and the vehicle went on to prove its superior maneuverability.⁴⁰ Despite the inconclusive results of the initial testing both companies would hand over their vehicles to the *Waffenamt* for further testing in July. In these tests the Henschel vehicle proved to be superior, especially as the Porsche tank frequently bogged down and broke down.⁴¹

Henschel may have emerged victorious but Hitler continued to have an interest in the Porsche vehicle. His interest, combined with the fact that the company had already contracted for 100 of the vehicles to be produced, led to a desire to find a role for them. As the Porsche vehicles were air-cooled, Hitler decided in the summer of 1942 that they should be sent to North Africa, though events overtook this plan and none were ever

³⁹ Jentz, and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 31. Spielberger, and Doyle, *Tigers I and II and their Variants*, 39.

⁴⁰ Spielberger, and Doyle, *Tigers I and II and their Variants*, 76.

Bruce Culver, *Tiger in Action* (Carrollton: Squadron/Signal Productions, 1989), 5.

Spielberger, and Doyle, *Tigers I and II and their Variants*, 76. Culver, *Tiger in Action*, 5.

⁴¹ Spielberger, and Doyle, *Tigers I and II and their Variants*, 94.

dispatched.⁴² As the negative reports about the Porsche Tiger piled up, Hitler's confidence in the vehicle began to wane. Since 100 vehicles were already being manufactured, and with Hitler's regard for Porsche, a cost and face saving measure was required. On the 2nd of September 1942 Hitler declared that the Porsche tanks were to be converted into tank destroyers. At this point Henschel had, for all intents and purposes won, but a formal decision was still considered necessary, to placate Porsche. So, in October of 1942, *Reichminister für Bewaffnung und Munition* Albert Speer (who replaced Todt after his death in February 1942), would create a Tiger Commission. After meeting from the 26th to the 31st the commission became the second and final organization to endorse the Henschel vehicle, as the Tiger. The next month production, of the Porsche Tiger was halted, as it was at this point that the hulls had been completed and were ready for conversion.⁴³

Thus ended the basic development of the Tiger I. The numerous proposed vehicles and prototypes that preceded it were a testament to an army that struggled to define a clear role and attributes for a heavy tank. Only Hitler's authority could end this uncertainty but as Hitler giveth, Hitler taketh away and he injected more uncertainty into the proceedings as Henschel and Porsche vied for the Tiger contract. His clear preference for the Porsche vehicle meant that the final decision was delayed for months. Only the many failings of the Porsche vehicle and the early availability of the Henschel vehicle prevented the process from being dragged out further.

⁴² Spielberger, and Doyle, *Tigers I and II and their Variants*, 94. Heinz Guderian, *Panzer Leader*, translated by Constantine Fitzgibbon, (London: Michael Joseph Ltd, 1952), 218.

⁴³ Spielberger, and Doyle, *Tigers I and II and their Variants*, 98, 104.

At the September 2nd 1942 meeting where the Porsche Tank was ordered to be converted into a tank destroyer, Hitler called for some changes to the vehicle. He wanted 200mm of frontal armour, and the mounting of Rheinmetall-Borsig's Flak 41, the gun Hitler had wanted to be fitted to the Tiger I. Krupp would provide this in the form of the 8.8 cm Pak (*Panzerabwehrkanone*, Anti-tank gun) 43 L/71 in March 1943 (the tank gun version of this weapon would be fitted to the Tiger II).⁴⁴ This gun had a higher velocity than the 8.8cm KwK L/56, allowing it to penetrate the frontal armour on a T-34 from over three and half kilometers, rather than the one and half kilometers possible with the earlier gun.⁴⁵ Fulfilling Hitler's orders would require the work of three firms, *Alkett*, *Nibelungenwerk* and *Eisenwerk Oberdonau*. Design of the vehicle would go to *Alkett* (*Altmärkische Kettenwerk GmbH*) of Berlin. This firm had extensive experience with tank destroyers and assault guns, having been the primary manufacturer of the StuG III since 1940.⁴⁶ To accommodate the much larger gun the vehicle was designed as a casemate tank destroyer, with the gun mounted in a non-rotating fighting compartment. While this design decision limited the vehicle flexibility, as the entire vehicle would need to turn to traverse the gun outside of a limited degree of rotation allowed by its mounting, this decision allowed the vehicle to be produced more quickly and mounting a larger gun unencumbered by the additional machinery needed for a turret. For balance, the fighting compartment was placed over the rear of the vehicle, with the gun extending out over the front of the hull. *Nibelungenwerk* in St. Valentin Austria, had been awarded the original

⁴⁴ Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 59.

⁴⁵ Jentz and Doyle, *Kingtiger Heavy Tank*, 35. Jentz and Doyle, *Tiger I*, 20.

⁴⁶ Hilary Doyle, & Tom Jentz, *StuG III Assault Gun 1940-1942*, (Oxford: Osprey Publishing, 1996), 15.

Porsche contract and had completed the vehicles hulls and running gear, which were to be retained in the new vehicle. These hulls would need to be reconfigured before being used as the original vehicle had the engines and electrical generators mounted in the rear of the vehicle. To make room for the new fighting compartment, the engine compartment was moved forward into the middle of the vehicle.

This work was completed by *Eisenwerk Oberdonau*, a steel works in Linz, near the *Nibelungenwerk*. Once the hulls had been modified, they were initially to be sent to *Alkett* for final assembly but Speer ordered them to be returned to *Nibelungenwerk* in February 1943 to simplify production. The 200mm armour thickness was achieved by adding another 100mm armour plate onto the hull's original 100mm thick front plate. This addition, along with the new gun and the new fighting compartment gave the vehicle a weight of 68.5 tons.⁴⁷ On February 6th, 1943, during a Führer conference the name Ferdinand was chosen for the vehicle, to acknowledge Dr. Porsche's contributions.⁴⁸

The development of the Ferdinand certainly reflected a desire on the part of Hitler to compensate Porsche for the loss of the Tiger contract but there were other factors involved in making their conversion an attractive prospect. Normally when a vehicle was not accepted, any completed prototypes, even if they were only finished chassis were retained, either by the company for testing or by the Heer for training purposes. Porsche kept the sole Type 100 chassis for testing purposes, especially for insights into air-cooled

⁴⁷ Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 58, 63-64.

David Doyle, *The Complete Guide to German Armored Vehicles: Panzers, Jagdpanzers, Assault Guns, Antiaircraft. Self-Propelled Artillery, Armored Wheeled and Semi-Tracked Vehicles, and More*, (New York: Skyhorse Publishing, 2019, ebook), 518, 530.

⁴⁸ Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 63-64, 76.

tank engines.⁴⁹ Henschel's VK 36.01 prototype had a similar fate, being given to Maybach for engine trials.⁵⁰ With the very limited production of these failed prototypes, retaining them as training or test vehicles made sense, to avoid wasting material and with the possibility of gleaning valuable insights for future production vehicles. When more vehicles were finished before production was halted, however their fates became more varied. Henschel's VK 30.01 had eight hulls finished by July 1940, before production was halted in favor of the heavier VK 36.01.⁵¹ One of the hulls remained at Henschel as a test vehicle, while another five were used as training vehicles. Two were handed over to Rheinmetall-Borsig, which lengthened the chassis and fitted them with a 12.8cm L/61 gun. These vehicles, named the *Sturer Emil*, were test beds for the mounting of 12.8cm guns and would go on to see service on the Eastern Front. One was destroyed in 1942 and the other was captured.⁵² The two VK 30.01 hulls converted into the *Sturer Emil* would be the only of the Tiger's predecessors from Henschel to see combat service.

These precedents were of little use in the case of the VK 45.01 (P), as Porsche had produced a hundred vehicles and since the Porsche's dual engine, electrical generator powertrain was unique amongst German tanks it was of dubious value as a training vehicle, so another role needed to be found. Their conversion into tank destroyers was best available option because, by time development started in September of 1942, it was clear that the war would last for at least one more year, if not more and that Germany was being out produced by her many enemies. That year Germany would produce 6,094 AFVs, while Great Britain, the United States and the Soviet Union produced a combined

⁴⁹ Jentz and Doyle. *Germany's Tiger Tanks: D.W. to Tiger I*, 23, 25.

⁵⁰ Ibid, 20.

⁵¹ Spielberger, and Doyle, *Tigers I and II and their Variants*, 10-14.

⁵² Ibid, 18, 22-23.

60,364 AFVs.⁵³ Thus the potential for 90 new tank destroyers (the other ten were finished to the original VK.45.01 (P) specifications and were used mostly for testing and training purposes) was not something that could be passed up. As Generaloberst (Colonel General) Heinz Guderian put it after inspecting the finished vehicles in May 1943, before their first use during Operation *Zitadelle* in July, “I also had to use it, even though from a technical standpoint, I could not share Hitler’s enthusiasm over the creations of his favorite Porsche”.⁵⁴

After the development of the Ferdinand there would be a final vehicle connected to the Tiger I, the *38cm Sturmmörserwagen* (Assault Mortar vehicle), better known as the *Sturmtiger*. This vehicle emerged from an August 5th, 1943 meeting where Hitler agreed to create a “Tiger Mortar”. It would be a heavy assault gun, with the armour and armament to support infantry in urban environments.⁵⁵ Two previous vehicles had already been built along the same lines. *Sturminfantriegeschütze 33B* (Infantry Assault Gun) developed in the fall of 1942, which a modification of the StuG III, mounting the 15cm sIG 33 howitzer. Mounting such a weapon was intended to give the StuG greater firepower when fighting in urban environments. This focus was the result of the ongoing battle of Stalingrad, where the majority of these vehicles were used and lost.⁵⁶ A second vehicle, the *Sturmpanzer* (Assault Tank) was developed in the same period, using the Panzer IV’s hull and sported a short-barreled 15cm StuH 43 L/12 gun in a ball mount, a weapon using the same shell as the 15cm sIG 33.⁵⁷

⁵³ Zaloga, *Armored Champion: The Top Tanks of World War II*, ebook, 597-604.

⁵⁴ Guderian, *Panzer Leader*, 238.

⁵⁵ Spielberger, and Doyle, *Tigers I and II and their Variants*, 169.

⁵⁶ Doyle, *The Complete Guide to German Armored Vehicles*, 442-445.

⁵⁷ *Ibid*, 451-454.

While both of these vehicles had served fairly well, the Sturmtiger was born out of a belief that these previous vehicles were not sufficiently armoured for close-range engagements in urban environments and that the gun should be capable of toppling buildings with a single round. Given that by this time the Germans were increasingly on the defensive, the wisdom of constructing such a vehicle was in doubt. The fact that production was pursued, despite Germany's reversal of fortune reflects a sense of desperate optimism that Hitler insisted upon until the war's end.

To actually create this vehicle *Alkett* was given eighteen Tiger I hulls in 1944. These were recycled hulls, remnants of tanks that were so badly damaged that they had been returned to Germany for repair or scrapping. This decision was not an effort at recycling per se, but was done at the behest of the army, which was extremely reluctant to give up any of the Tiger's production for the project. *Alkett* built a superstructure atop them, with a 150mm thick front plate, creating a 65-ton vehicle. The gun was the 38cm *Raketenwerfer* (Rocket Launcher) 61 L/5.4. This weapon, originally designed for the German Navy as a depth charge launcher was more than powerful enough to level virtually any building it hit. The rounds though, were so large that only twelve rounds could be carried and the vehicle had to have a crane attached to the engine deck to facilitate its resupply. This was not considered a serious drawback given the nature of the vehicle's task, as it was unlikely to venture far from its supply base unlike a conventional tank.⁵⁸ The Sturmtiger was the most exotic of the Tiger variants, although far from the most useful.

⁵⁸ Doyle, *The Complete Guide to German Armored Vehicles*, 454-456. Spielberger and Doyle, *Tigers I and II and their Variants*, 169, 172.

Turning now to the development of the Tiger II, it is necessary to return to the summer of 1941. As discussed previously, the May 26th 1941 meeting between Hitler and senior officials in the armaments industry had seen Hitler's requirements for a heavy tank outlined, requirements that led to the production of the Tiger I. The invasion of the Soviet Union, less than a month after this meeting would help to spur the development of another heavy tank, which would become the Tiger II.

On June 22nd, 1941 Germany invaded the Soviet Union in Operation Barbarossa. Soon after, the Germans began to encounter two new Soviet tanks, the T-34 medium and the KV-1 heavy tank. These vehicles were superior in armour and armament to the tanks the Germans possessed. Oberkommando des Heers (OKH, Army High Command) had been aware of the T-34 since the previous December but had no knowledge of the KV-1 prior to the invasion. Even the knowledge of the T-34 had not filtered down to the ordinary *Landser* (A nickname for German infantrymen) or *Panzermann* (Panzer soldier) prior to the invasion.⁵⁹

Encounters with the KV-1 and the T-34 demonstrated the shortcomings of German tank weapons in dramatic fashion. The 6th Panzer Division would encounter KV-1s during its defence of Raseinai on the 24th of June. A lone KV-1 broke through the division's lines and sat astride the road that was the division's sole supply line. The 3rd Battery of *Panzerjäger* (Anti tank) Battalion 41 arrived with the new 5cm Pak 38 guns. After scoring eight hits at 600 meters, the KV-1 responded, destroying two of the guns and badly damaging two others. As one of division's officers, Erhard Raus recalled,

⁵⁹ Robert Kirchubel, *Hitler's Panzer Armies on the Eastern Front*, (Barnsley: Pen and Sword Military, 2009), 134. Oberkommando des Heers. Merkblatt des OKH den 1.6.41. Betr. Die wichtigsten Panzerkampfwagen der UdSSR. TsAMO f.500. o.12451. d. 452.

“Deeply depressed, Lieutenant Wegenroth returned to the bridgehead with his soldiers. His newly introduced weapon, in which he had felt absolute confidence, had proven completely inadequate against the monster tank”.⁶⁰

An effort to destroy the Soviet tank using a nighttime attack by engineers with satchel charges failed and the next day an 8.8cm Flak was brought in, with cover provided by the fire of the 35(t)s. Even this heavy weapon proved insufficient and the crew was finally dispatched by a grenade lobbed through the hatch. Once the crew had been removed from the vehicle and buried with full honours befitting their dogged defiance of an entire division their battered tank was inspected. Only two penetrating hits were found, unsurprisingly both were from the 8.8cm Flak. What was surprising was that five of the rounds had failed to penetrate, leaving deep gouges in the armour. Eight “blue spots” marked the impacts of the 5cm Pak rounds. The engineer’s charges had damaged one of the tracks and had left a “slight dent in the gun barrel”. Most frightening of all was the fact that no trace of any of the 3.7cm rounds fired by the 35(t)s could be found.⁶¹

Encounters like these eroded the confidence that many German tankers had in their tanks and more specifically their guns. *Gefreiter* (Corporal) Robert Pönsen of the 9th Panzer Division, a loader in a Panzer III with the 5cm KwK 38 L/42, the best tank gun available for most of 1941, said that this tank was “popularly and properly known as the army doorknocker”.⁶² Comments like these would spur the development of longer barreled and higher velocity guns for the Panzer III and Panzer IV. In December of 1941

⁶⁰ Erhard Raus, *Panzer Operations: The Eastern Front Memoir of General Raus, 1941-1945*, compiled and translated by Steven H. Newton, (Da Capo Press: Cambridge, 2003), ebook, 72-76.

⁶¹ Raus, *Panzer Operations*, 76-88.

⁶² Hans Schäufli, *Panzer Warfare on the Eastern Front*, (Mechanicsburg: Stackpole Books, 2012), 52.

the first of these, the Panzer III ausf J with the 5cm KwK 39 L/60 came into service.⁶³ In early 1942, the Panzer IV ausf F2 would follow, equipped with a 7.5cm KwK 40 L/43 gun.⁶⁴

These improvements would do much to restore the confidence of the average *Landser* and *Panzermann*. They would also impact the nascent Tiger. Experience reports coming back from the front lines reinforced the wisdom of developing a heavy tank to deal with the KV-1, something that VK45.01 (P) and VK45.01 (H) could do thanks to the armour and armament outlined in May. Even though Hitler's requirements for the Tiger had provided a vehicle that could take on the new Soviet tanks, he was not entirely satisfied and would begin to call for a higher performance weapon by September 1941. The change in Hitler's views resulted from consideration of a number of different factors. One was that while the Flak 37 had performed very well against the new Soviet tanks, there were exceptions, including the decidedly mixed performance of the gun noted by Raus. It was however Hitler's personal philosophy of tank design that would prove to be a decisive factor. After the appearance of the T-34, the initial plan proposed was to either copy the T-34 wholesale or produce a vehicle that could outmaneuver the Soviet tank. Neither solution satisfied Hitler, who had determined that it was not speed and maneuverability that were decisive, but rather armour and armament. In his memoir, Albert Speer recalled that Hitler's favorite way to describe this philosophy was to use the analogy of warships:

In a naval battle the side having the greater range can open fire at the greater distance. Even if it is only half a mile. If along with this he has stronger armour...

⁶³ Doyle, *The Complete Guide to German Armored Vehicles*, 127.

⁶⁴ Ibid, 206-207. Perrett, *Panzerkampfwagen IV Medium Tank*, 8.

He must necessarily be superior. What are you after? The faster ship has only one advantage: to utilize its greater speed for retreating. Do you mean to say a ship can possibly overcome heavier armour and superior artillery by greater speed? It's exactly the same for tanks. Your faster tank has to avoid meeting the heavier tank.⁶⁵

With such a philosophy Hitler was dissatisfied with the attributes of the Tiger I and would call for a more heavily armed and armoured version in keeping with his beliefs. As discussed previously, by September of 1941, Porsche and Krupp had already informed the *Waffenamt* that there was no way to fit the Flak 41 into the Tiger I turret. The Flak 41 not only required a larger gun mount, but the engineers also needed to find ways to balance this larger, longer weapon, protect the recoil cylinders, traverse the gun and find space in the turret to handle the larger projectiles. These problems proved to be insurmountable given the space available in the VK 45.01 vehicles.⁶⁶ Hitler, being Hitler was not satisfied with this answer and pressured Fritz Todt to get the Flak 41 into the Tiger. The letter that Todt sent to General Emil Leeb, the head of the *Waffenamt*, on September 23rd, 1941 is an excellent example of the pressure Hitler was exerting to achieve this dream:

I must inform you that every time I see Hitler, he repeatedly asks if in reality the highly effective Flak 41 will be installed...Hitler does not feel confident that another 88 mm gun design can be used instead of the Flak 41. Hitler wants the Flak 41 installed in the new heavy panzer without any degrading modifications. I bring to your attention today that we will have to expect the strongest objections

⁶⁵ Speer, *Inside the Third Reich*, 233.

⁶⁶ Jentz, and Doyle, *Kingtiger Heavy Tank*, 5.

from Hitler if one day during the first demonstration, the Panzer has a gun other than the Flak 41.⁶⁷

With this, less than subtle encouragement, the *Waffenamt* would turn to Porsche and Henschel to begin to develop a tank that would mount a tank gun based on the Flak 41. Porsche was the first to respond in January of 1942. Their vehicle, known internally as the Type 180 and as VK.45.02 (P) by the *Waffenamt*, was effectively an enlarged VK 45.01 (P). It would retain the engine and suspension of the earlier vehicle, with the only major changes being the new turret, which was to be another Krupp design, featuring a rounded front plate and a modification to the armour. Instead of the 100mm vertical plate of frontal armour found on VK 45.01 (P). VK 45.02 (P) would feature a 55 degree angled plate of 80mm. This change in the armour layout was inspired by Porsche's knowledge of the designs being submitted for VK 30.01, which would become the Panther because he was the head of the *Panzerkommission*, that was overseeing the design of German tanks at the time.⁶⁸

While Porsche was developing VK 45.02 (P), Henschel lagged behind, only starting work on their VK 45.02 (H) in April of 1942. This delay was owed to the continued work on VK 36.01, which was halted only in March of 1942 with one hull finished for testing purposes and the work on VK 45.01 (H). These delays would affect VK 45.02 (H), which never progressed past a few drawings, and the company abandoned the project quickly. In November work on VK 45.03 began, a more serious effort by Henschel to develop a new heavy tank. The new tank was to retain the suspension and drive train of VK 45.01 (H). Like the Porsche vehicle, VK 45.03 would feature a new

⁶⁷ Jentz and Doyle, *Germany's Tiger Tanks: VK45.02 to Tiger II*, 10-11.

⁶⁸ Ibid, 8-10.

turret from Krupp, this time a unique design featuring a flat front plate. Henschel would also follow Porsche's lead and slope the front armour on the tanks hull to 50 degrees while retaining the 100mm thick plates found on their previous vehicle.⁶⁹

As Henschel began to work on their second attempt to create a new heavy tank Porsche was well on its way to exiting the competition, as it lacked a viable engine. To power the 65-ton vehicle, Porsche designed a power plant similar to that seen on VK 45.01 (P) with two Porsche Type 101/3 10 cylinder engines connected to a pair of electrical generators, which would in turn power two electrical motors, each connected to a drive sprocket. These engines proved to be insufficiently powerful to propel the tank and so in October of 1942, Porsche would begin design work on five different engines in an effort to extract as much horsepower as possible. Just one month later Porsche was forced to concede that none of his company's engines would be sufficiently powerful to propel the tank and contracts placed with Krupp to provide turrets and armour plate were cancelled, as were contracts with *Nibelungenwerk*. Ferdinand Porsche's efforts to build a heavy tank had ended unceremoniously and the only company left who could fulfill Hitler's wishes was Henschel.⁷⁰

Before Henschel could provide Hitler with a new heavy tank, he once again changed its specifications. During a conference with Speer on January 3rd, 1943 Hitler decided that while he was satisfied with the longer 8.8cm gun being developed by Krupp, he was dissatisfied with the 100mm front plate that Henschel was proposing for VK 45.03 and instead wanted a 150mm front plate. In keeping with Hitler's wishes the plans for VK 45.03 were duly modified to accommodate a 150mm thick front plate, sloped at

⁶⁹ Jentz and Doyle, *Germany's Tiger Tanks: VK45.02 to Tiger II*, 16-18.

⁷⁰ Ibid, 10, 15.

50 degrees. This change would add 1760 kilograms to the tanks weight, helping to turn what was to be a 45 ton vehicle into a 68 ton vehicle.⁷¹

It is a testament to Hitler's fixation on a replacement for the Tiger I that this discussion was taking place just six months after the Tiger's operational debut. At this point only 111 Tiger Is had been built and just two units, *schwere Panzer Abteilung 502* and *503* had been using them in the field. The limited experience of these units had been sufficient to demonstrate the vehicles strengths, especially in the areas of armour and armament. Erhard Raus would recall that after the Tigers were introduced German troops would remark, "the T-34 tips it's hat whenever it meets the Tiger", a reference to the ability of the 8.8cm KwK 36 L56 guns to blow the turrets off of T-34s, something that could be done at ranges of over a kilometer.⁷² The armour too had been well proven at this point. Richard von Rosen, described the Tiger's armour as "almost a life assurance".⁷³ This was a far cry from the way Otto Carius would describe the armour on his first tank, a Panzer 38(t), "[it] would only serve as moral support. If necessary, it would stop small arms fire".⁷⁴ Despite these endorsements, Hitler remained fixated on the purely hypothetical Tiger II. Guderian would recall that Hitler would nominally concede to the experts, including himself, that armour was a secondary consideration, with armament and speed being the first and second considerations in tank design, "but he was a paradoxical man, and he continued to insist that heavy armour was also a primary requirement".⁷⁵ This fixation on armour would not stop with the Tiger II but would last

⁷¹ Jentz and Doyle, *Germany's Tiger Tanks: VK45.02 to Tiger II*, 18.

⁷² Jentz, and Doyle, *Tiger I: Heavy Tank 1942-1945*, 20. Raus, *Panzer Operations*, 191.

⁷³ von Rosen, *Panzer Ace*, ebook, 378.

⁷⁴ Carius, *Tigers in the Mud*, 3.

⁷⁵ Guderian, *Panzer Leader*, 217.

until the end of the war, becoming in Guderian's words, "[a] fantasy [which] led him into the realms of the gigantic", culminating in the Panzer VII, known as the Maus (Mouse, the name was deliberately ironic), which sported a 12.8cm gun and 200mm of frontal armour. At 188 tons there was not a single bridge in Europe it could cross and remains the heaviest tank ever built. Only two prototypes were finished before the end of the war, making it the largest monument to Hitler's obsession with heavy tanks.⁷⁶ The Tiger II, at a mere 68 tons, was at least a more practical vehicle, though hardly less of a reminder of Hitler's technical folly.

In February 1943 Krupp would receive the contract to build the long 8.8cm gun Hitler had so long desired. The 8.8 KwK 43 L/71 shared the performance of Rheinmetall-Borsig's Flak 41, with both guns being capable of penetrating 148mm of armour at 1500m but nothing else. Krupp's gun was shorter, at 62.98cm than Rheinmetall-Borsig's 65.48cm gun. The two guns were further differentiated by Krupp's inclusion of a muzzle brake to assist with recoil.⁷⁷ With a gun finally ready to be fitted, it was now down to Henschel to finish designing the tank. VK45.03, was approved by the Heer in January 1944. The new tank was then christened the Tiger II. Hitler finally had the heavily armoured heavy tank with a long 8.8cm gun that he had wanted since 1941.⁷⁸

One final Tiger variant, based on the chassis of the Tiger II remains to be examined, the Jagdtiger (Hunting Tiger). This tank destroyer, unlike the other members of the Tiger family was not created to satisfy the wishes of Adolf Hitler but came from soldiers serving in the East. They wanted a "heavy assault gun with 12.8cm cannon" to

⁷⁶ Ibid, 217, 247. Showalter, *Hitler's Panzers*, 238.

⁷⁷ Jentz, and Doyle, *Kingtiger Heavy Tank*, 7-8.

⁷⁸ Ibid, 11.

be able to support infantry and engage both unarmored and armoured targets at up to 3000 meters.⁷⁹ This view was supported by OKH, which put in an official request to Krupp to fit a 12.8cm gun to the Tiger II chassis. This decision was made despite the fact that at this point, in early in 1943, there was no enemy tank in service that would require a gun of this size to destroy it, nor would there ever be an Allied tank that would have required a gun of that size to destroy. Its development was thus based less on countering a current or anticipated threat but was instead built to preserve German technical superiority regardless of practical need. Thus, on February 5th, 1943, development began, despite the fact that there was no compelling operational reason to do so. It would be based on the chassis of VK 45.03, which would be lengthened by 26cm to accommodate Krupp's 12.8cm KwK L/55 gun. Due to the size and weight of the gun, the Jagdtiger, like the Ferdinand was designed as a casemate tank destroyer, which was the only way to transport the gun. The vehicle would also feature a 250mm front armour plate, angled at 75 degrees. These features would make the Jagdtiger the best protected and most powerfully armed armoured vehicle fielded by the Germans during the war, as well as being the heaviest, at 75 tons.⁸⁰

As with most of the members of the Tiger family the Jagdtiger's development was marred by political interference. In January 1944, Ferdinand Porsche made his final foray into tank design, convincing Hitler to accept his plan for the suspension of the new tank destroyer. Rather than keeping the interleaved road wheels and transverse torsion bar suspension from the Tiger II, Porsche's suspension featured pairs of road wheels in wheel trucks, suspended from longitudinal torsion bars, a system similar to that found on

⁷⁹ Spielberger, Doyle and Jentz. *Heavy Jagdpanzer*, 126.

⁸⁰ Ibid, 126-127. Spielberger, and Doyle, *Tigers I and II and their Variants*, 153.

Porsche's earlier designs. Porsche's name and influence were far from the only things that made this new system attractive. His suspension would also cut 1200kg from the vehicles weight, 450 work hours, add 800mm of ground clearance and best of all, had a cost savings of 404,000 Reichmarks.⁸¹ Unfortunately, Porsche's bad luck with tanks would continue. His running gear had many advantages but when two prototypes, one with the Porsche running gear and the other with the Henschel, were tested in May 1944, things did not go well for the carmaker. The Jagdtiger fitted with the Porsche running gear caused an "almost unbearable" shaking in the suspension and so the traditional Henschel running gear won out.⁸² In spite of this failure, the Porsche suspension was still fitted to the first nine production vehicles to use up the supply of parts and ensure timely delivery of vehicles. With the first Jagdtigers coming off the production line at *Nibelungenwerk* in July of 1944 the story of the Tiger Family's development was finally at an end.⁸³

The development of the Tiger Family from 1935 to 1944 exposed a number of problems. Not only was the development of these vehicles complex and subject to delays as necessary technologies proved ineffective in their intended roles (as seen with the engines on Porsche's VK45.02 and the Jagdtiger's running gear), but it was also heavily influenced by not only traditional motivating factors like organizational needs, but also individual whims, most of them Hitler's. The indecision of the Heer and the *Waffenamt* over the role of a heavy tank led to seven years without a design being selected, despite numerous prototypes being developed and discarded. Only Hitler's personal intervention

⁸¹ Spielberger, Doyle and Jentz. *Heavy Jagdpanzer*, 141.

⁸² Ibid, 149.

⁸³ Ibid, 149, 168.

finally created a concrete set of design parameters. Unfortunately, Hitler's continued interference in the design process led to the great weight of the Tiger I and would create the Tiger II, even though there was no evidence that the Tiger I's performance was poor enough to warrant a new vehicle. A perception that German vehicles needed to be bigger and incontrovertibly superior to all possible Allied foes, would lead to the development of the Sturmtiger and the Jagdtiger, despite the fact that neither vehicle allowed the Heer to fulfill some pressing operational need. Only the Ferdinand could be said to be filling an urgent need as the Heer had a desperate need for any kind of armoured vehicle that German industry could supply in 1943, and tank destroyers would prove to be highly effective in the defensive war the Heer was fighting from that point onward (whether the Ferdinand would be truly effective in this role was another matter, discussed fully in Chapter 9). This long process paints a picture of a vehicle selection and development system that was deeply dysfunctional, one lacking clear vision, wasting resources on projects of dubious value and was highly susceptible to political interference. It is a testament to the designers of these vehicles that, despite of the dysfunction that surrounded them, they were nevertheless able to create functional vehicles. The question of how these new vehicles would be used operationally was another matter entirely.

Chapter 2: Room for One More?:

Panzer Doctrine and the Tiger's Place within it.

By the time the design parameters for what would become the Tiger I were finalized by Hitler on May 26th, 1941, finally creating a clear vision for Germany's heavy tanks -the *Panzerwaffe* (Armoured Force) had a well-established and battle-tested doctrine (the principles and ideas which inform a military's standard practices) which had no real need for a heavy tank like the Tiger due to an emphasis on speed and maneuver. Thus the Tigers incorporation into the Heer did not reflect the filling of a necessary doctrinal niche but instead a sort of "covering of the bases", to counter enemy heavy tanks and fulfill a breakthrough role, which the doctrine's emphasis on maneuver made largely redundant in the circumstances of the time. In the early years of the war neither side was constructing anti-armour defences in sufficient depth to make a breakthrough tank a necessity. By 1943, when defences were arranged in sufficient depth to give heavy tanks more of a role, Germany was firmly on the defensive.

Panzer doctrine, like the doctrine of the Heer itself was the result of a fusion of centuries old Prussian doctrine and modern technology created by the post- Great War Reichswehr. The emphasis on speed, maneuver and surprise was reflected in the Panzers of the interwar period, especially the Panzer III and IV which were to become the mainstays of the *Panzerwaffe*. These vehicles and their associated doctrine would be vindicated in spectacular fashion during the French Campaign of 1940. Here the Germans were able to outflank the main Allied armies and the vaunted Maginot Line with a surprise attack through the Ardennes Forest. Then the speed of the Panzers -their ability to outmaneuver and surprise their foes -allowed them to smash through Allied positions,

driving to the English Channel and winning one of the greatest German victories of the Second World War.⁸⁴ Many of the battles of the campaign could have been made easier with the addition of the Tiger, as its heavy armour and weapons would have provided a welcome edge to the Germans (though an Allied counter to it would have likely been present as well in that scenario), especially when facing Allied heavy tanks, one of the key roles of the Panzers.⁸⁵ That being said, the heavy enemy fortifications that the Tigers had been designed to smash through had simply been bypassed on the way to a decisive victory. So, by 1941 Germany was ready to begin building a heavy tank that was incompatible with their doctrine and which previous experience had demonstrated no compelling need for.

Prussian doctrine, upon which German doctrine was based, was summed up well by one of its later practitioners from the Second World War, General der Panzertruppen Hermann Balck, who described it this way:

The German ideas about war were derived from the geographical position of Prussia and Germany, which faced superior enemies all around and unsecured borders. In order to survive they had to be faster than their enemies, stay ahead of them, and hit them decisively at a vulnerable point with locally superior forces.⁸⁶

⁸⁴ Niklas Zetterling, *Blitzkrieg: From the Ground Up*, (Philadelphia: Casemate Publishers, 2017), 140-141. Erich von Manstein, *Lost Victories: The Memoirs of Hitler's Most Brilliant General*, translated and edited by Antony G. Powell. (St. Paul: Zenith Press, 2004), 97, 99-100, 104.

⁸⁵ Thomas Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force: 1933-1942*, (Atglen: Schiffer Military History, 1996), 43.

⁸⁶ Hermann Balck, *Order in Chaos: The Memoirs of General of Panzer Troops Hermann Balck*, edited and translated by Major General (ret) David T. Zabecki and Lieutenant Colonel Dieter J. Biedekarken, (Lexington: University of Kentucky Press, 2017), 445.

Wars of this kind were called *Bewegungskrieg* (War of movement), utilizing operational maneuver to strike at the enemy's most vulnerable point. They also embraced *Auftragstaktik* (Mission Tactics). This Prussian concept expected junior officers to exercise a great deal of initiative and aggression to complete their objectives, without detailed instructions from higher headquarters.⁸⁷

These concepts had served the Prussians well and continued to serve their German successors until 1914, when the Great War would force them to adapt them to suit the new realities of twentieth century warfare. The descent of the Western Front into a *Stellungskrieg* (position, or static war) would demand new solutions to overcome the devastating effects of machine guns and modern artillery. One solution adopted by the Germans was the *Stoßtruppen* (Storm troopers), elite soldiers that would lead the breakthrough of Allied positions combining hand grenades and sub machine guns with the aggression, speed and initiative of the traditional German system.⁸⁸ Another solution, embraced by both sides was the tank. The British were the first to adopt them and deployed tanks for the first time on September 15, 1916, at Flers, France during the Battle of the Somme.⁸⁹ The first German tank, the A7V would follow in May of 1917.⁹⁰ Their performance was generally poor, marred by vulnerability to artillery and frequent breakdowns.⁹¹ Thus the army's Chief of Staff, Erich Ludendorff found little to encourage greater production at the expense of other, more proven weapons. Despite Ludendorff's

⁸⁷ Robert M. Citino, *The German Way of War: From the Thirty Years War to the Third Reich*, (Lawrence: University Press of Kansas, 2005), XIV. Clark, *Blitzkrieg*, 32.

⁸⁸ Zetterling, *Blitzkrieg: From the Ground Up*, 17-18.

⁸⁹ G. W. L. Nicolson, *Canadian Expeditionary Force, 1914-1919: Official History of the Canadian Army in the First World War*, (Montreal & Kingston: McGill- Queen's University Press, 2015), 168-169.

⁹⁰ Showalter, *Hitler's Panzers*, 7.

⁹¹ *Ibid*, 7-8.

skepticism, there were those within the German Army that believed that the tank had potential. Generalleutnant (Lieutenant General) D.W von Balck, who commanded the 51st Division, would describe the tank as being “at first a grossly underestimated weapon” that became “an extremely potent attack weapon”.⁹²

The Eastern Front saw no clashes of armour during the Great War but did offer a very different kind of fighting. Since operations were conducted in the great open spaces of Russia there were numerous opportunities for a traditional war of maneuver. One of the best examples of this mobile war was in November 1916. After Romania entered the war on the side of the Allies, the Germans launched an invasion of Romania. After pushing through the Transylvanian Mountains, the Germans ran into a strong Romanian position in the Iron Gate region. To overcome this position, General der Infanterie (General of Infantry) von Falkenhayn assembled a combined arms battle group under Hauptmann (Captain) Picht. Picht’s battle group had very simple instructions, “Open the Iron Gate”.⁹³ Picht brought his forces up to the Romanian positions at night, drove through a weak sector and positioned himself in the their rear. After fending off a number of counter attacks and with German reinforcements arriving, the Romanians were forced to withdraw.⁹⁴ Hauptmann Picht’s penetration of the Romanian lines suggested that with lower level initiative there was scope for infiltration and exploitation even when faced with seemingly significant defences.

After the war, the new German Army, rechristened the Reichswehr and its first Chief of Staff, Generaloberst Hans von Seeckt would have to find a way to create a new

⁹² Corum, *The Roots of Blitzkrieg*, 22.

⁹³ Ibid, 8.

⁹⁴ Ibid.

doctrine out of the experiences of Eastern Front veterans and those of the Western Front. Von Seeckt was an Eastern Front veteran and firmly believed that the traditional system could still be successful in a mechanized world. From von Seeckt's perspective, the mass armies of the Great War were too large and vulnerable to the enormous destructive power of artillery and machine guns. Thus the Reichswehr needed only to be large enough to survive a surprise attack. Then its superior ability to maneuver would allow it to destroy any attacker. He wrote that "mass becomes immobile, it cannot maneuver and therefore cannot win victories, it can only crush through sheer weight".⁹⁵

The Reichswehr quickly adopted von Seeckt's beliefs, not just out of conviction but also because the Treaty of Versailles limited the Reichswehr to 100,000 men, leaving few other alternatives than innovation as a means to overcome quantitative inferiority. Thus the Reichswehr's leadership became firmly committed to maneuver and combined arms as the keys to victory. The tank was quickly added to this traditional doctrine as the 1924 maneuvers showed. These maneuvers featured no actual tanks, merely wooden mockups on bicycles but their presence was still important. For this maneuver a Blue infantry division and cavalry division were tasked with countering a Red force that was crossing the Oder River. The Blues were ordered to envelop the Reds left (southern) wing as it crossed the Oder. Meanwhile the Reds would envelop the right (northern) wing of the Blue force as they crossed the river. As both forces worked to envelop the others flank a Blue cavalry regiment was able to charge at the flank of two Red artillery batteries. Before they could complete this potentially devastating maneuver, a new Red force, including a number of tanks, flanked the Blue cavalry. The Blues position was only

⁹⁵ Corum, *The Roots of Blitzkrieg*, 30.

salvaged by a renewed cavalry thrust that outflanked the Red's advance guard and penetrated into the enemy's rear.⁹⁶ This exercise demonstrated the value of tanks in a supporting role while also demonstrating the premium that the Reichswehr placed on maneuver.

The 1928 maneuvers represented the Reichswehr's nascent armored corps in transition. In these maneuvers, the tanks were divided into three waves. The first two broke through the enemy line, driving into the rear to strike at enemy artillery. Meanwhile the third wave remained with the infantry. Once the exercise was over, the Chief of Motorized Troops, who led the exercise, Otto von Stülpnagel, drew an important conclusion. The infantry must be kept with the first wave of tanks so that their weapons could support the tanks and to prevent enemy infantry from simply waiting for the tanks to pass them before engaging the oncoming infantry. The necessity of close co-operation between infantry and tanks had been confirmed but working towards full independent armored units with organic infantry components was not yet something the Reichswehr was ready for.⁹⁷

In 1929, the Reichswehr gained access to a tremendous new resource, the Kazan Tank School. Here, deep in the Soviet Union and far from the prying eyes of Allied inspectors, the Germans could begin to test actual tanks. The school was the result of negotiations between the two governments, trading German technical expertise for Soviet space to develop technologies made illegal under the Treaty of Versailles. Only at Kazan,

⁹⁶ Robert M. Citino, *The Path to Blitzkrieg: Doctrine and Training in the German Army, 1920-1939*, (London: Lynne Rienner Publishers, 1999), 120-121.

⁹⁷ Mary R. Habeck, *Storm of Steel: The Development of Armor Doctrine in Germany and the Soviet Union, 1919-1939*, (New York: Cornell University, 2003), 85.

could the secretly built tanks, referred to as “tractors” to fool Allied inspectors be tested.⁹⁸ Von Stülpnagel wrote glowingly about Kazan and its potential:

[Kazan] is at the present time the only place where really positive work on the area of tanks can be achieved. Clear insight into the true worth of the tank, the effect of its weapons, the possibilities of its employment, the tactics to follow etc., can only be acquired there, with the actual material. The most detailed study of foreign literature, the best theoretical reflections, and well prepared experimental exercises with tank mock-up units, can only yield an approximate value.⁹⁹

Von Stülpnagel was quite correct. The writings of British theorists like J.F.C Fuller and B.H. Liddell Hart were important but remained theoretical. Various tank mock-ups, which had been serving the Reichswehr for a decade were likewise of great use in visualizing this forbidden technology, however their speed, size and capabilities were always wildly different from those of actual tanks.¹⁰⁰

It was here that the *Grosstraktor* and *Leichtetraktor*, discussed in the previous chapter, were tested. The 16-ton *Grosstraktor* with a 7.5cm gun was designed as an infantry support tank while the *Leichtetraktor* (light tractor), weighing 8.9 tons and mounting a 3.7cm guns was intended to be tank killer.¹⁰¹ This division in roles was in line with conventional thinking in the late 1920's, as tanks were still viewed as being primarily for infantry support with the heavy tanks acting in the same way as their Great

⁹⁸ Habeck, *Storm of Steel*, 97.

⁹⁹ Ibid, 136.

¹⁰⁰ Ibid, 138.

¹⁰¹ Corum, *The Roots of Blitzkrieg*, 112-114.

War counterparts, breaking through enemy defences. Then the light tanks would support and exploit the breakthrough.¹⁰²

The practical birth of the Panzer division as a concept came in a series of exercises overseen by Generalmajor (Major General) Oswald Lutz, the Inspector of Motor Transport Troops in 1931 and 1932. In these exercises, a full battalion of tanks was created, alongside supporting motorized infantry. During these exercises an emphasis was placed on the importance of massing tanks for the greatest effect. The result was some novel conclusions. Lutz and his chief of staff, Heinz Guderian concluded that not only speed but also surprise and constant movement were needed to facilitate and sustain breakthroughs. They also stressed the importance of ensuring that the infantry was moving at the speed of the tank to maintain the momentum of the attack and allow for full exploitation of the breakthrough. Based on these maneuvers Lutz and Guderian developed the *modus operandi* of the Panzer division in 1932, embracing the traditional German emphasis on aggression and combined-arms operations, combined with fully mechanized and motorized units to create an extraordinarily powerful tool for *Bewegungskrieg*.¹⁰³ The Panzers new doctrine was summarized in Guderian's oft repeated mantra, "*Klotzen, nicht Kleckern* (Boot'em, don't splatter'em)".¹⁰⁴

On January 30th, 1933, Adolf Hitler became Chancellor. Soon after, Guderian would have an opportunity to showcase a platoon of Panzer I's, then in the prototype stage. Guderian recorded, "Hitler was much impressed by the speed and precision of movement of our units and said repeatedly: 'That's what I need! That's what I want to

¹⁰² Corum, *The Roots of Blitzkrieg*, 125, 135.

¹⁰³ Citino, *The Path to Blitzkrieg*, 202.

¹⁰⁴ McCarthy and Syron, *Panzerkrieg*, 83. Thomas Jentz, *Panzer Truppen Vol. I*, 76-77.

have!’”¹⁰⁵ Hitler’s endorsement was certainly a boost to the development of Panzers and in 1935, the 1st, 2nd and 3rd Panzer Divisions were created. These new Panzer divisions were exceptionally well equipped. They contained two Panzer regiments, with each containing two *Panzer Abteilungen* (Tank battalions). Each Abteilung would be divided into four *Panzer Kompanien* (Tank companies), three *leichte Panzer Kompanien*, (light tank companies) with tanks designed to combat enemy tanks and a *mittlere Panzer Kompanie* (medium tank company), tasked with providing infantry support.¹⁰⁶ Each division would have a staggering 561 tanks. They also contained a motorized infantry regiment, also of two battalions, a motorized artillery regiment, a motorcycle battalion, a motorized reconnaissance battalion, a motorized pioneer battalion and a motorized anti-tank battalion. In the words of Richard Ogorkiewicz, a Panzer division was a “self-contained combined arms team in which tanks were backed by other arms brought up, as far as possible, to the tanks standard of mobility”.¹⁰⁷

To outfit the Panzer divisions properly, three new Panzers were in development throughout the 1930’s, in addition to a training tank, the 5.4-ton Panzer I.¹⁰⁸ The Panzer II, a 7.6-ton vehicle with a 2 cm cannon would act as reconnaissance vehicle for the divisions.¹⁰⁹ The 15.4-ton Panzer III would fill the light companies, using its 3.7cm gun to combat enemy tanks while the 17-ton Panzer IV would be assigned to the medium company, employing its 7.5cm gun in an infantry support role.¹¹⁰ In combat the *leichte Panzer Kompanien* would be employed first, striking the enemy line with the motorized

¹⁰⁵ Guderian, *Panzer Leader*, 19.

¹⁰⁶ Ibid, 28, 90.

¹⁰⁷ Citino, *The Path to Blitzkrieg*, 231.

¹⁰⁸ David Doyle, *The Complete Guide to German Armored Vehicles*, ebook, 26-29.

¹⁰⁹ Ibid, 56-59.

¹¹⁰ Ibid, 91,98,154-155, 164.

infantry, engaging any enemy tanks then striking into “the heart of the enemy battle zone”.¹¹¹ The *mittlere Panzer Kompanie* would follow, using its firepower to reduce enemy strongpoints and to facilitate the advance of the *leichte Panzer Kompanie* and the infantry, while also protecting the flanks of the advancing units.¹¹² As conceived in the mid 1930s, the *Panzer Abteilung* was a powerful force, with a good mixture of vehicles to perform the offensive role that the Panzers were expected to fulfill, with a capacity to both engage enemy tanks and facilitate an infantry breakthrough. While the anti-tank battalion was certainly part of the former category, the prominence of the *leichte Panzer Kompanien* indicates that a high premium was placed on the ability of the tanks to combat other tanks, rather than relying on anti-tank guns, which were to be used in a purely defensive role.¹¹³

This system was not one that had an explicit need for anything heavier than a Panzer IV. That being said, the concept of a heavy tank had not been neglected. As described in the previous chapter, the *Neubaufahrzeug* had been in development since 1929, to offer the Germans a heavy breakthrough tank and while the project was canceled in 1934 as impractical, it nevertheless demonstrated that the idea of a heavy tank was something that had been under consideration for some time, though not without a considerable amount of confusion over the specifics of its role.¹¹⁴ The *Waffenamt*’s initial

¹¹¹ Jentz, *Panzer Truppen Vol. I*, 77.

¹¹² Ibid, 83.

¹¹³ Heinz Guderian, *Achtung- Panzer!: The Development of Armoured Forces, their Tactics and Operational Potential*, translated by Christopher Duffy, (London: Brockhampton Press: 1999), 155-157.

¹¹⁴ Chamberlin, and Doyle, *Encyclopedia of German Tanks of World War Two: A Complete Illustrated Directory of German Battle Tanks, Armored Cars, Self-Propelled Guns and Semi- Tracked Vehicles, 1933-1945*, 147.

proposal from 1935 envisioned a heavy tank specifically designed to counter the French Char 2C, changing the emphasis of vehicle to being a heavy tank killer, a role not completely out of line with German doctrine.¹¹⁵ VK 30.01, following in 1937 would return to the breakthrough role as the tank's primary purpose.¹¹⁶ This shift in priority was not absolute, as VK 30.01 could still act as a counter to enemy heavy tanks but it does indicate that Waffenamt was embracing the conventional view of heavy tanks in the period. Both the British and the French saw their heavy tanks of the late 1930's, the Matilda and the Char B1, as breakthrough vehicles to aid of the infantry and lighter tanks.¹¹⁷ Consequently, by the late 1930's the Waffenamt had a vision of a heavy tank (though as seen previously this vision would be revised several more times after the war began) but it was unclear whether or not their doctrine, dependent as it was on speed and maneuver, needed a heavy breakthrough tank at all.

During the Invasion of Poland in September 1939, the Panzer divisions performed well, breaking through Polish lines and doing a great deal to aid in the German victory. Despite their central role, the fact remained that the Poles had been forced to defend a great deal of territory with comparatively few forces, making it easier to create breakthroughs in their lines. It was not clear in 1939, whether the Panzers would perform as well as against the British and French which possessed much larger armies arranged in greater depth across a smaller area (relatively speaking). They also had larger and much better equipped armoured forces. It would be against these more formidable foes that the

von Senger and Etterlin, *German Tanks of World War II: The Complete Illustrated History of German Armoured Fighting Vehicles 1926-1945*, 108.

¹¹⁵ Jentz, and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 9.

¹¹⁶ Ibid, 10-11.

¹¹⁷ Wilbeck, *Sledgehammers*, 202-204.

Panzers would have their greatest test and it would be in France that the need for a heavy tank could be more accurately assessed¹¹⁸.

There were a number of battles during the French Campaign where the presence of a German heavy tank would have been useful as a means to counter Allied heavy tanks. The French counterattacks against the German bridgeheads over the Meuse from the 15th to the 17th of May are a very good example of the potential use of a heavy tank as a counter to enemy heavy tanks. During this time, the fighting was concentrated on the village of Stonne which changed hands seventeen times as the 10th Panzer Division and Infanterie Regiment Großdeutschland (Infantry Regiment Greater Germany) battled the French for control of the vital bridgeheads. The principal French unit was the 3rd Armoured Division, which possessed four battalions of tanks. Two were equipped with the Hotchkiss H39, an 11-ton tank with a 3.7cm gun roughly comparable to the 10th Panzer's Panzer III and IVs. The other two battalions were equipped with the vastly superior Char B1. This French heavy tank had 60mm of frontal armour (twice the frontal armour of the Panzer III) and sported a higher velocity 4.7cm gun in its turret, as well as a 7.5cm howitzer in the front of the hull.¹¹⁹

¹¹⁸ Habeck, *Storm of Steel*, 288. Jürgen E. Förster, "The Dynamics of Volksgemeinschaft: The Effectiveness of the German Military Establishment in the Second World War", *Military Effectiveness. Volume III: The Second World War*, edited by Allan R. Millett and Williamson Murray, 204, (Winchester: Allen & Unwin Inc., 1988). Zetterling, *Blitzkrieg: From the Ground Up*, 139-140.

¹¹⁹ Showalter, *Hitler's Panzers*, 109.



A Panzer III of the 1st Panzer Division in France. The Panzer III was the principle tank of the Panzerwaffe in 1940 and while it was inferior to Allied heavy tanks, its mobility, radio and the training of its crews proved to be decisive advantages (Bundesarchiv).

General Jean-Adolphe Flavigny, the French divisional commander and his inexperienced staff found it impossible to deploy the division as a cohesive whole, instead deploying it piecemeal. Nevertheless the Char B1 proved to be a formidable vehicle. One Char B1 took 140 hits, none of which penetrated and was able to destroy twelve German tanks. Another caught a column of German infantry in the open and literally ran them down.¹²⁰

The only way to halt this assault was for the Pak 36 crews to wait for the tanks to close in before striking their more thinly armoured sides and rear. This was a “near ultimate exercise in nerve and discipline” for the Germans but in this way they were able

¹²⁰ Showalter, *Hitler's Panzers*, 109.

to destroy or at least discourage enough of the Char B1s to allow the tide to turn in the Germans favor.¹²¹ By the end of the day on the 17th, the Germans retained the village and their bridgeheads. The cost had been high with over fifty tanks, both French and German, filling Stonne.¹²²

At Stonne, and Arras, the latter mentioned briefly in the previous chapter, the inadequacy of current German panzers in the face of Allied heavy tanks was amply demonstrated.¹²³ This inferiority suggested that the Germans required a heavy tank of their own if tanks involved in a breakthrough were to survive such encounters. That being said, the Char B1 and the Matilda's represented a minority of Allied tanks. The majority, like the H39 and the British A13 Cruiser were roughly comparable to their German counterparts.¹²⁴ Consequently when German and Allied tanks met in combat, German victory owed less to the vehicle themselves and more to their superior handling. The Germans fought as part of a combined arms team, using infantry, Panzers, anti-tank guns and aircraft in close cooperation, all unified by the radio, which every tank, aircraft and platoon carried. By contrast the French rarely coordinated their operations between units and even individual tanks often failed to support each other in the heat of battle. They also lacked radios, with one company commander reduced to running between his tanks while under fire in an effort to coordinate their movement.¹²⁵ In these circumstances, training and organization were key advantages that demonstrated the superiority of the German Panzer division concept as a means to win battles. Tanks like the Char B1 could

¹²¹ Showalter, *Hitler's Panzers*, 110.

¹²² Ibid, 109-110.

¹²³ von Luck, *Panzer Commander*, 41. Clark, *Blitzkrieg: Myth, Reality, and Hitler's Lighting War- France, 1940*, 264. McCarthy and Syron, *Panzerkrieg*, 85.

¹²⁴ McCarthy and Syron, *Panzerkrieg*, 71-72.

¹²⁵ Showalter, *Hitler's Panzers*, 119.

certainly increase the cost the Germans would pay for victory, but without strong doctrine, emphasizing a combined arms approach to their use and effective command and control, they could not prevent German victories. In such battles having a heavy tank was not necessary as the maneuverability, coordination and co-operation of the Germans was more than enough to compensate for any qualitative inferiority their tanks may have suffered.

In the end then, the battle for France was a resounding German victory and one that did not seem to call for a heavy tank. The Panzer division concept had been proven in astonishing fashion, proving to be a key element in defeating one of the dominant military powers in Europe in just six weeks. Since the campaign had been decided by rapid maneuver, which specifically avoided the sort of defences that the heavy tank was designed to overcome, there seemed to be little need for them. That said, the presence of the Char B1 and the Matilda loomed over the men of the *Waffenamt*, especially since those tanks had put German infantrymen to rout. Avoiding such embarrassments in the future was vitally important.

The simplest solution was to improve German weapons and that was pursued quickly after the end of the campaign. New 5cm anti-tank guns were in production, and the Panzer III was also outfitted with a new 5cm gun of its own, though the Panzer IV, due to its status as an infantry support tank, did not receive a new gun at this point in the war.¹²⁶ Upgrading the German arsenal was not only a straightforward solution but also preserved the doctrine that proven so successful in France. Integrating a heavy tank into this doctrine as a way to counter enemy heavy tanks would not have completely upended

¹²⁶ Doyle, *The Complete Guide to German Armored Vehicles*, 132-133.

Panzer doctrine but would have added a slow vehicle, the use of which demanded methodical planning. Its needs would have been hard to reconcile with a system that was at its best when it was fast and unpredictable. Nevertheless the desire to have a heavy tank to counter to any similar Allied vehicle and serve as a breakthrough vehicle, against stronger defences, overrode that consideration, especially given Hitler's desire for a heavy tank. So, after the end of the Battle of France the *Waffenamt* asked Henschel to mount a 10.5cm gun on their heavy tank, creating VK 36.01 and Porsche also put the 8.8cm gun on their Type 100.¹²⁷ With the *Waffenamt* and Hitler on board Germany would get a heavy tank, regardless of its need for one. The only question that remained to be answered as the Tiger entered service in September 1942, was how best to use them and integrate them with their faster brethren.

¹²⁷ Jentz and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 17-18, 23-24.

Chapter 3: Product of a Dysfunctional Family:

The Tiger Tanks and the German Wartime Economy

Between 1942 and 1945, 2,021 vehicles in the Tiger “family” were constructed. The Tiger I and II were constructed by Henschel in Kassel, the Ferdinands and Jagdtigers were built at *Nibelungenwerk* in St. Valentin, Austria and the Sturm Tigers by *Alkett* in Berlin. Production of these vehicles embodied many of the strengths and weaknesses of the German wartime economy. They were technically complex and expensive vehicles and strategic bombing by the Allied air forces, imposed additional delays in production and resulted in the loss of a number of vehicles. Despite this damage, the Tigers were still produced in quantities that the Heer requested for much of their production run. Relative success with the Tiger “family” was not however, indicative of wider economic success, and undoubtedly detracted from it. While the German economy was successful in production of individual vehicles and weapons, the economy at large was very inefficient. Throughout the war the economy remained badly managed by Western standards as a vast array of ministries, offices and organizations, many with overlapping economic mandates all competed for Germany’s resources, which while substantial, were nevertheless dwarfed by those available to her enemies. Efforts by Fritz Todt and Albert Speer as *Reichminister für Bewaffnung und Munition* (Minister for Armaments and Munitions) to centralize and streamline the economy failed to transform it. Full centralization proved impossible and the ministry itself, especially under Speer grew to be a vast byzantine organization, unequal to the task of effectively harnessing the German economy for the war. This effort was further complicated by the same Allied bombs that disrupted the Tiger’s production.

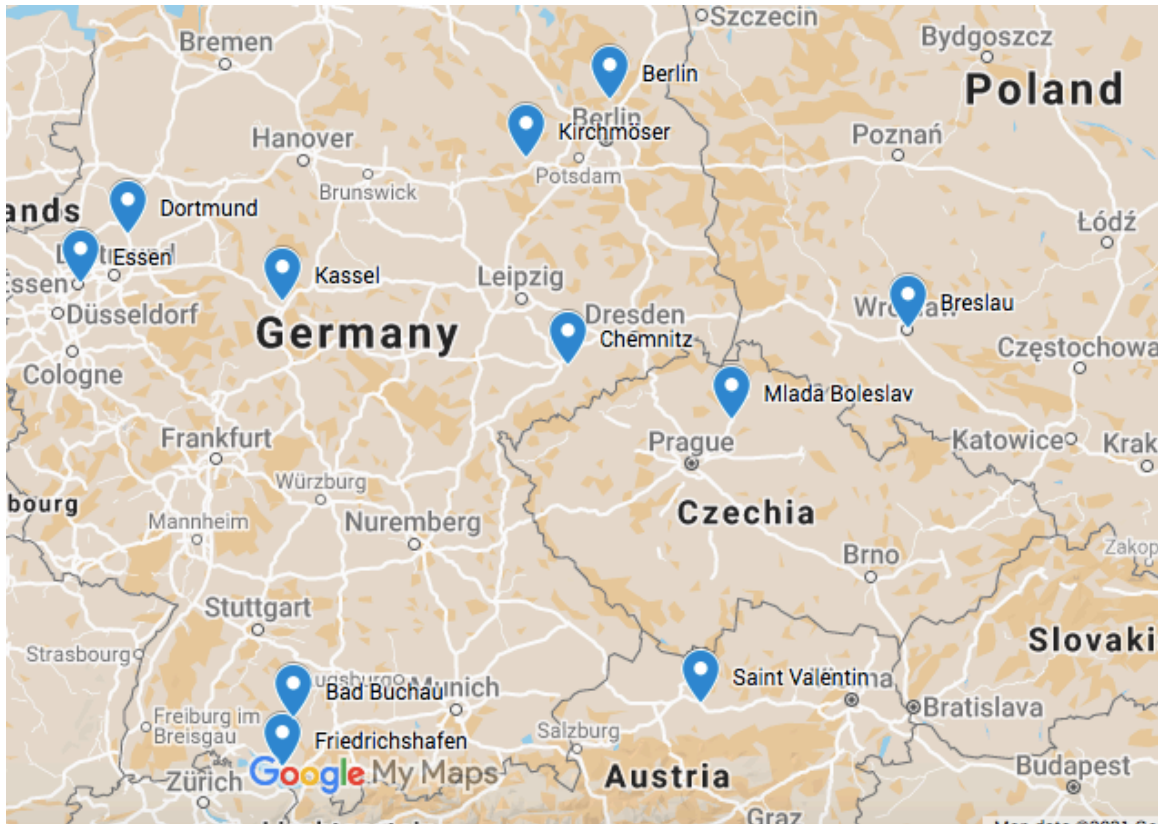
Not only were the Tigers a heavy burden on German industry but the decision to produce the Tigers in an effort to overcome the Allies quantitative advantage with superior quality vehicles was a decision with dire consequences for the Heer that would increasingly field far fewer tanks than their opponents even when superior German command-and-control created local concentrations of German armour. Even in these circumstances, reliance on the qualitative superiority of the Tigers was a questionable tactic given their poor mechanical reliability, which ensured that the Germans were never able to field them in numbers intended and certainly not in quantities that might have helped to turn the tide of the war in their favor.

Production of the Tiger Family

Production of the Tiger I was slated to begin in June 1942 but did not start until August. This two-month delay was the result of ongoing problems with the transmission, steering gear and brakes. The delay was sufficient to rectify the issues in the steering gear and brakes and while the transmission would be brought up to satisfactory production standard, it nevertheless remained a point of weakness owing to the great strain that moving the 56-ton vehicle placed upon it.¹²⁸ With these delays only eight vehicles were finished in August 1942¹²⁹.

¹²⁸ Jentz and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 68.

¹²⁹ Ibid.



It is in these cities, located across the Reich that the Tiger “Family” and their components were produced (Map by author using Google My Maps. <https://www.google.com/maps/d/viewer?hl=en&mid=15P2IGmcVeGxrOgZUXkRh8MxmX1CxlILd&ll=49.05524016070433%2C18.6977791060541&z=5>).

As inauspicious as this start was, the Tiger’s production then became much smoother. By October 1942, Henschel was able to exceed its monthly production goals, finishing twenty-five tanks, not the eighteen that was proscribed. By September 1943, the goal was seventy-five tanks for that month and Henschel produced eighty-five.¹³⁰ This relatively smooth production was a testament not only to the engineers and workers at Henschel but also the success of the many firms that contributed parts to the Tigers.

¹³⁰ Jentz and Doyle, *Germany’s Tiger Tanks: D.W. to Tiger I*, 68.

Henschel was the principle manufacturer, producing most of the vehicle's parts, including the steering system, but they were just one of many firms building key components. Krupp supplied the guns and also the armour plate, though due to Krupp's commitments elsewhere, many of these components were not manufactured at the company's famed *Gusstahlfabrik* (Cast Steel Factory) but instead by other companies. *Dortmund Hoerder Hutten Verein* (DHHV) was the most prominent, producing a significant quantity of armour plate and being one of two companies responsible for the production of the 8.8cm KwK 36 L/56 gun, along with *Wolf Buchau*, located in Buchau (renamed Bad Buchau, or Spa Buchau in 1963). As noted earlier the Tiger's engines were developed by Maybach and were produced at their factory in Friedrichshafen.¹³¹ These parts, manufactured across the Ruhr Valley, the industrial heart of Germany, were then shipped to Henschel for final assembly. This system allowed specialty manufacturers to contribute high quality products to the vehicle, utilizing Germany's vast rail network to ship parts in order to build a high quality machine. In December 1943 and throughout 1944, the vulnerabilities of this system were exposed as many of the factories and the rail network that connected them were targeted by the Combined Bomber Offensive.

RAF's Bomber Command began bombing Germany on September 4th, 1939, the day after Britain declared war.¹³² Their goal, as summarized by Tami Davis Biddle was to "create a general level of destruction which ...[would] overwhelm the enemy's war

¹³¹ Jentz and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 69-70.

¹³² Donald Caldwell, and Richard Muller, *The Luftwaffe over Germany: Defence of the Reich*, (London: Greenhill Books, 2007), 31-33. Robin Neillands, *The Bomber War: The Allied Air Offensive Against Nazi Germany*, (Woodstock: The Overlook Press, 2001), 36.

economy and especially his will to fight”.¹³³ This effort initially met with little success as a lack of navigational aids made it extremely difficult to find blacked out cities at night, to say nothing of bombing them. In this first act of the Bomber offensive, which lasted until March 1942, the factories that were to be integral parts of the Tiger’s production were largely safe. Essen was the first city involved in the Tigers production to be targeted on the night of March 8th-9th, 1942, although this early raid and others in the same period caused little damage.¹³⁴

This massive RAF bombing campaign was supported by another carried out by the USSAF’s 8th and 15th Air Forces during the day. The operations of the two air forces, bombing Germany day and night had a decidedly mixed effect. The cities where the key Tiger factories were located all suffered under Allied bombing, with Essen and Kassel being targeted regularly as they sat in the Ruhr Valley, Germany’s industrial heartland. By the wars end, each city suffered over twenty raids. While Essen itself was devastated by Allied bombing, the Krupp works remained functional for most of the war and in 1943 only lost 7.6 percent of its planned output despite repeated attacks designed specifically to destroy the famous arms makers’ factory.¹³⁵ Consequently Krupp was able to complete the armour plates for 597 hulls and turrets by June 1944 without lasting interruptions. Dortmund’s DHHV completed an additional 758 hulls and turrets. Thus 1,295 hulls were completed by June 1944, and both companies also refurbished a further 54 hulls to

¹³³ Tammi Davis Biddle, “British and American Approaches to Strategic Bombing: Their Origins and Implementation in the World War Two Combined Bomber Offensive”, *Airpower: Theory and Practice*, edited by John Gooch, (London: Frank Cass & CO Ltd., 1995), 91.

¹³⁴ Richard Overy, *The Bombers and the Bombed: Allied Air War over Europe, 1940-1945*, (New York: Penguin Press, 2013), 93.

¹³⁵ Overy, *The Bombers and the Bombed*, 281. William Manchester, *The Arms of Krupp 1587-1968*, (Toronto: Little, Brown and Company, 1968), 449.

complete the Tiger I production run of 1,346 vehicles. DHHV also produced the 8.8 cm Kwk 36 L56 gun along with *Wolf Buchau* at their plant in Buchau. Between them 1,514 guns were produced by July 1944, with minimal disruptions.¹³⁶

The Henschel factory in Kassel was not as fortunate as Krupp's *Gusstahlfabrik*. On the night of the 22nd-23rd of October 1943, the city suffered a fire storm. An estimated 6,000 people were killed and fifty-nine percent of the city was destroyed. The Henschel works were badly damaged and seventy-nine Tigers were lost as a result. This loss was the equivalent of almost two full *schwere Panzer Abteilungen*. As devastating as this short-term loss was, the factory was quickly rebuilt and in January, just three months later the factory was once again meeting its production targets, with ninety-three tanks completed. This recovery was mirrored by the rest of the city, as by January the city's industrial output had reached ninety percent of its pre-raid level.¹³⁷

The rapid recovery of Kassel after the devastating bombings of 1943 was the result of two factors. As numerous photographs of shattered German cities attest, the bombing was exceptionally good at destroying buildings. That being said the heavy machinery often survived the bombing. Thus the roof and many of the walls of Germany's vital factories were often blasted apart but the machinery that was at their hearts was more often than not largely intact.¹³⁸ For Henschel, it would take three months for production to fully recover, but by the third week of November they were able to finish twenty two tanks, indicating that much of the essential production equipment had

¹³⁶ Jentz and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 69-70.

¹³⁷ Jentz and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 68. Overy, *The Bombers and the Bombed*, 153.

¹³⁸ Phillips Payson O'Brien, *How the War was Won: Air-Sea Power and Allied Victory in World War Two*, (New York: Cambridge University Press, 2015), 287.

either survived the RAF's bombs completely intact or at the very least suffered only minor damage.¹³⁹

The second factor that enabled the rapid restoration of German industry was a vast and ruthless mobilization of labour to restore key industries. Like all other wartime powers, the Germans were forced to try to balance the needs of industry with the insatiable demands of the Wehrmacht. In May 1939, the German workforce consisted of 39.5 million people, 24.5 million men and 14.6 million women, with an additional 300,000 foreigners. In 1940, the workforce demographics had already changed significantly. There were now 20.5 million men and 14.4 million women. The gap created by the expansion of the Wehrmacht was filled not by women, as the majority were already working on farms and therefore there was no pool of surplus female labour to draw upon. Instead the lost men were replaced by 350,000 Prisoners of War (POW) and 800,000 foreigners.¹⁴⁰ The use of foreign slave labour and concentration camp inmates who joined the work force in 1942, as well as POW's increased as the war went on until by 1944 they represented one in every three workers in the Reich.¹⁴¹ It was this labour force, which worked to not only keep the factories running but also restored them after they had been visited by Allied bombers. Without this army of slave labour the German economy would not have proven so resilient.

Returning to Tiger production, the Maybach factory in Friedrichshafen was also badly affected by Allied bombing, though not until 1944. While only 153 engines were completed in 1942, 4,346 were finished in 1943. From January to April 1944, an

¹³⁹ Jentz and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 68.

¹⁴⁰ Tooze, *The Wages of Destruction*, 358-359, 513.

¹⁴¹ Ibid, 640.

estimated 1,785 engines were produced before a raid on the city in late April so devastated the plant that it could not be returned to service until October. To fill this gap in production, *Autounion's Siegmars-Werk* in Chemnitz was commissioned to take over production. From April 1944 to April 1945, the company produced a further 4,366 engines.¹⁴² The use of the *Siegmars-Werk* was an example of the Germans use of alternate producers and dispersion of vulnerable production deeper into the Reich, out of the reach of Allied bombers. Substitution and relocation provided the economy with much greater flexibility in the face of Allied bombing than had been anticipated prior to war. Thus production could be maintained even in the face of increasingly heavy strategic bombing.¹⁴³

The next member of the Tiger family to enter production was the Ferdinand. Converting the Porsche Tiger into the Ferdinand tank destroyer required the work of four firms. Design of the vehicle was undertaken by *Alkett (Altmärkische Kettenwerk GmbH)* of Berlin. This firm had extensive experience with tank destroyers and assault guns, having been the primary manufacturer of the StuG III since 1940.¹⁴⁴ While the vehicles were being designed at *Alkett* in Berlin, the *Nibelungenwerk* in St. Valentin continued to fulfill part of the original Porsche contract, completing the vehicles hulls and running gear. The finished hulls were then sent to *Eisenwerk Oberdonau*, a steel works in Linz, near the *Nibelungenwerk*. *Eisenwerk Oberdonau* was responsible for reconfiguring the hulls, moving the fighting compartment from the front to the rear of the vehicle and

¹⁴² Jentz and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 70.

¹⁴³ Lieutenant Mancur Olson, "The Economics of Target Selection for the Combined Bomber Offensive," *Royal United Services Institution Journal* 107, No. 218 (1962), 311, doi 10.1080/03071846209428669.

¹⁴⁴ Doyle, & Jentz, *StuG III Assault Gun 1940-1942*, 15.

moving the engines from the rear to the middle. Once the hulls had been modified they were initially to be sent to *Alkett* for final assembly but Speer ordered them to be returned to *Nibelungenwerk* in February of 1943, to simplify production and limit the time the hulls would spend travelling from Austria to Berlin.¹⁴⁵

As St. Valentin was outside the range of Allied bombers in 1943, *Nibelungenwerk* was able to complete its work fairly quickly, though not without delay. Production began in November 1942, but a shortage of running gear, which had earlier afflicted production of the Porsche Tiger, continued to impede the Ferdinand's production.¹⁴⁶ Consequently, the first hulls were not finished until February and Krupp began to deliver the armoured fighting compartments designed by *Alkett* in March. Given that the Ferdinands were to be completed in time for the upcoming summer offensive these delays were problematic. Nevertheless, the first thirty vehicles were delivered in April, with the last sixty finished in May, allowing the complete production run to be used in Operation *Zitadelle* in July.¹⁴⁷ Production of the Ferdinand may have had some initial delays, but their rapid production did display the speed and efficiency of German industry unaffected by Allied bombers.

The Sturmtiger was the only member of the Tiger family that had straightforward production. In April 1944, Hitler ordered production of the vehicle to begin. *Alkett*, in Berlin was given eighteen Tiger I hulls from Henschel for the project. These were recycled hulls, remnants of tanks that were so badly damaged that they had be returned to Germany for repair or scrapping. This decision was not an effort at recycling per se, but

¹⁴⁵ Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 58, 63-64.

Doyle, *The Complete Guide to German Armored Vehicles*, 518, 530.

¹⁴⁶ Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 76. Jentz and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 28.

¹⁴⁷ Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 76-77, 81.

was done at the behest of the army, which was extremely reluctant to give up any of the Tiger's production for the project. Alkett designed a superstructure atop them. This structure was built by the *Brandenburgische Eisenwerke* in Kirchmöser, just west of Brandenburg. *Alkett* then finished assembly. All eighteen hulls were converted into Sturm Tigers by the end of September 1944. With their limited production and even more limited use - seeing service first in the Warsaw Uprising and then in the defence of Germany in 1945 - no modifications were made to the vehicle. While production of the Sturm Tiger lacked the many delays and changes that would complicate the production of other vehicles in the "Tiger family", it nevertheless remains a good example of resources sunk into a vehicle of dubious value. In the defensive war the Germans found themselves waging in 1944, there was little need for assault vehicles like the Sturm Tiger, and while another eighteen Tigers would not have shifted the balance of the war, they certainly would have had far more battlefield utility in their original form.¹⁴⁸

The Tiger II's production history followed many of the themes established by the production of the Tiger I, though strategic bombing would have a greater effect upon its production. In Kassel, Henschel produced the steering and suspension themselves and handled final assembly. Krupp's *Gusstahlfabrik* in Essen manufactured the majority of the armoured plate, with plates for 444 hulls and 385 turrets finished by the end of February 1945. Dortmund's DHHV produced comparatively little, with plates for only 157 hulls and turrets completed by war's end. The Skoda works, in Mlada Boleslav, Czechoslovakia also produced armour plate for the Tiger IIs, but only enough for 35 vehicles. As with the Tiger I, engines were produced by Maybach in Friedrichshafen and

¹⁴⁸ Doyle, *The Complete Guide to German Armored Vehicles*, 454-456. Spielberger and Doyle, *Tigers I and II and their Variants*, 169, 172.

Autounion's Siegmar-Werk in Chemnitz. The 8.8cm KwK 43 L/71 gun was designed by Krupp but all 802 of them were built by DHHV. Final assembly of the guns was dispersed, with 55 percent finished by firms in Frankfurt and 45 percent in DHHV's home city of Dortmund.¹⁴⁹

Tiger II production began in October 1943, with just one vehicle produced that month. Production remained slow until May 1944. By that point only thirty-eight tanks had been completed, a far cry from the anticipated 191. The slow start to production was blamed on start up problems for the new production line. Over the summer of 1944, production finally began to meet and exceed production targets, with ninety-four finished in August, fourteen more than the production goal.¹⁵⁰

September and October would see a number of heavy bomber raids on Kassel, with the express purpose of destroying the Henschel works. The raids began on the 22nd of September 1944, with subsequent raids on the 27th and 28th of September and 2nd and 7th of October. Over the course of these five raids, 2,906 tons of high explosive and 1,792 tons of incendiaries were dropped. This quantity of ordnance, guided by the many navigational and targeting aids available in 1944, was able to destroy 95 percent of the Henschel plant. Subsequent raids on the city on the night of the 27th of October, another raid on the Henschel works on the 15th of December and additional raids on the city on December 30th and January 1st, caused more damage and imposed even more delays on the plant's recovery. From September 1944 to January 1945, 211 Tiger II's were completed. In that same period, planned production was 380 vehicles.¹⁵¹

¹⁴⁹ Jentz, and Doyle, *Germany's Tiger Tanks: VK45.02 to Tiger II*, 60-62.

¹⁵⁰ Ibid, 59, 62.

¹⁵¹ Ibid, 59-62.

The bombing of the Henschel works in the fall of 1944, was part of an intensification of Allied bombing that had begun in September of that year. Only then when Bomber Command and the USAAF possessed over a thousand bombers each, developed a reliable and accurate set of navigational aids, as well as having obtaining effective air superiority over Germany, would the bomber war reach its height. From September 1944 to the war's end, three quarters of all the bombs used against Germany were dropped. In that same period, an estimated half of all German bombing-related fatalities occurred.¹⁵² The devastation wrought upon the Henschel works was part of this intense period of bombardment.

In addition to the heavy damage inflicted upon the Henschel works in Kassel, *Autounion's Siegmar Werk* in Chemnitz was also heavily damaged in a raid on September 11th, reducing the factory's output from 800 engines a month to just 198. Since Maybach was still restoring their own factory, after the raids in April 1944, an effort which was not completed until October, there was a shortage of engines. Though this shortage was mitigated by the bombing of the Henschel Works later in the month, which prevented the installation of any available engines, it nevertheless demonstrated that the effectiveness of dispersal was coming to an end. At this stage in the war, the four engine bombers that made up the majority of each bomber force, the B-17 and B-24 bombers for the Americans and the British Lancaster and Halifax, had the range to hit targets anywhere in Germany. Even Chemnitz, far from the Ruhr, was no longer immune.¹⁵³

¹⁵² Overy, *The Bombers and the Bombed*, 184, 189. Speer, *Inside the Third Reich*, 194, 284.

¹⁵³ Jentz and Doyle, *Germany's Tiger Tanks: VK45.02 to Tiger II*, 61.

A report to Speer's ministry from the *Hauptausschuss Panzerkampfwagen* (Main Committee for Armoured Fighting Vehicles), which oversaw the production of Panzers, written in January 1945 by Dr. Blaicher, a senior member of the committee, summarized the issues faced by Panzer producers. "While during 1943 the influence of hostile air attacks was not yet very noticeable in the tank industry...in 1944 there was no single tank producing plant which did not suffer directly and above all indirectly to a considerable extent".¹⁵⁴

One major indirect source of damage was the increased disruption of transportation networks. Part of this disruption was the inevitable result of damage to German cities but in the final period of the war, increased emphasis was placed on destroying the Ruhr's transportation links. Key losses included the draining of the Dortmund-Ems Canal by Bomber Command at the end of September 1944, and the destruction of the Koln (Cologne)-Mulheim bridge on October 14th.¹⁵⁵ These large-scale attacks and numerous smaller ones served to isolate the Ruhr. The loss of rail infrastructure further negated the advantage of dispersion, as even undamaged factories found it difficult to transport their products to their customers for lack of intact rail lines. This created additional friction for German industries, already badly battered by the direct effects of strategic bombing. It was this combination of direct and indirect damage that led to low production of the Tiger IIs even after the Henschel works were repaired in early 1945, including the finishing of just thirty tanks in March 1945, meaning the company could not meet its revised goal of forty-five tanks in that month, to say nothing

¹⁵⁴ Jentz and Doyle, *Germany's Tiger Tanks: VK45.02 to Tiger II*, 59.

¹⁵⁵ Tooze, *The Wages of Destruction*, 650.

of the 150 originally planned for production prior to the intensification of Allied bombing.¹⁵⁶

Damage to Germany's rail system was problematic not only in terms of finished products lost but also in terms of lost coal. Ninety percent of Germany's industries were powered by Ruhr coal. 19,900 railcars full of it left the Ruhr every day in August 1944, to fuel German industry. By October only 7,000 cars were leaving the Ruhr daily. With that little coal leaving the Ruhr, Speer reported to Hitler on October 5th that German industry could only be fueled for another eight to twelve weeks.¹⁵⁷ To resolve this crisis would require a vast army of labourers. Thankfully for the Germans, the past several years had made them masters of mobilizing labour. Unfortunately, the traditional solution of relying on slave labour was no longer effective. The occupied territories the Germans had so ruthlessly pillaged, had largely been liberated and with the collapse of the Reich in sight, the remaining foreign labourers were no longer considered politically reliable enough for many tasks, especially for the restoration of Germany's vital infrastructure. So two million German workers were pulled from their factories to repair the shattered rail lines. Another 350,000 were sent to repair damage to the oil industry and a further 300,000 were drawn to repair the chemical industry. These new manpower demands, added to previous losses of skilled German labourers to the Wehrmacht, made it increasingly difficult for firms to produce even the simplest items, to say nothing of complex weapons like Tigers.¹⁵⁸ Faced with all of this direct and indirect damage the

¹⁵⁶ Jentz and Doyle, *Germany's Tiger Tanks: VK45.02 to Tiger II*, 60-61.

¹⁵⁷ Tooze, *The Wages of Destruction*, 342. O'Brien, *How the War was Won*, 351, 353.

¹⁵⁸ O'Brien, *How the War was Won*, 354-355.

Hauptausschuss Panzerkampfwagen report concluded, “At this moment one can no longer speak of planned production at all”.¹⁵⁹

The report also described the last ditch effort of German industry in the war’s final months. “The extraordinary extent of the stoppages throughout the whole of the armaments industry caused all external assistance in overcoming these difficulties to diminish more and more, and firms were largely dependent on helping themselves”.¹⁶⁰ Despite this pessimistic appraisal of the situation, it was still believed in January 1945 that Henschel could draw upon sufficient resources to return to the production of 125 Tiger II’s a month by August 1945. This was hopelessly optimistic and in February, the *Panzer Notprogramm* (Emergency Tank Production Program) was issued by Speer’s ministry. This program aimed to wind down the production of advanced vehicles like the Tiger II in favor of simpler models like the StuGs (Sturmgeschütz, Assault Guns) and other casemate tank destroyers. These lighter and simpler vehicles were better suited to not only the production situation at the end of the war but also the nature of the defensive fighting that the Germans were undertaking in the final defence of the Reich¹⁶¹. This plan envisioned sharing production between the Henschel plant in Kassel and the *Nibelungenwerk* (which was already producing the Jagdtiger). Production of Tiger II between the two plants would be halted once 350 vehicles had been completed, a milestone that was expected to be reached in October 1945. Then both plants would be converted to production of other, simpler vehicles. This plan proved useless, as *Nibelungenwerk* never produced a single Tiger II and Kassel fell to the Allies at the end

¹⁵⁹ Jentz and Doyle, *Germany’s Tiger Tanks: VK45.02 to Tiger II*, 59.

¹⁶⁰ Ibid, 59.

¹⁶¹ Tooze, *Wages of Destruction*, 652-653.



Tiger II turrets, ready for assembly at the Henschel factory in Kassel after its capture in March 1945. These turrets represent the literal last vestiges of the Tiger II's production (NARA).

of March. By that point 492 Tiger II's had left Henschel but Allied bombing had prevented the construction of a further 657 from 1943-1945.¹⁶²

The consequences of this lost production were keenly felt. Of the fourteen *schwere Panzer Abteilungen* created between 1942 and 1944, only nine received a full complement of Tiger II's, the rest continued to use the Tiger I until the wars end. 2.508 was particularly short charged*. The company left Italy in September 1944, moving to the training grounds at Paderborn to be trained on the Tiger II. With the heavy damage to the Henschel works in that month they were left without vehicles to train on and so they waited, for five months. Finally on March 30th, 1945, they were given new orders.

¹⁶² Jentz and Doyle, *Germany's Tiger Tanks: VK45.02 to Tiger II*, 60.

* In the German military of the period 2.508 referred to the 2nd *Kompanie*, *schwere Panzer Abteilung* 508. Each *Abteilung* would have three *Kompanien*, the others numbered as 1.508 and 3.508.

The veteran Tiger crews of 2.508 were to be used as infantry to counter the approaching American army.¹⁶³ It was a strange way for Panzer veterans to end the war but it does illustrate the dire straits in which Germany found itself as its production lines and front lines collapsed in the war's waning months.

The Jagdtiger was subject to the same late war production pressures that had such an impact on the Tiger II. Henschel designed the Jagdtiger but they lacked the capacity to build them so *Nibelungenwerk* was given the contract instead. As with the Ferdinands, the nearby *Eisenwerke Oberdonau* handled the production of the hulls while the 12.8 cm Pak 44 L55 gun was provided by Krupp's *Bertha Werk* in Breslau.¹⁶⁴

The first Jagdtiger was to be finished in December 1943, but *Nibelungenwerk* was ramping up its production of Panzer IV's to 300 vehicles a month and the first vehicles were not ready until February 1944. These initial vehicles were used for testing, and production did not begin in earnest until July with three Jagdtigers completed. By September, *Nibelungenwerk* was turning out eight per month with production expected to continue to increase.¹⁶⁵

Unfortunately, increases were delayed significantly by a bombing raid on the factory on October 16th, 1944. The vulnerability of plants deep inside Austria at this stage in the war reflected not only the long range of Allied bombers based in England but also the growing number of bombers based in Italy, which between them ensured that no corner of the Reich was immune. Vulnerable though *Nibelungenwerk* was, the raid caused little lasting damage. While only nine Jagdtigers were completed in October, by

¹⁶³ *The Combat History of Schwere Panzer Abteilung 508*, 37.

¹⁶⁴ Spielberger and Doyle, *Tigers I and II and their Variants*, 154. Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 149, 153.

¹⁶⁵ Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 168.

December the plant was producing twenty, which would be the monthly production record for the vehicle.¹⁶⁶

Just a few days before the bombing raid on *Nibelungenwerk*, on October 12th, the decision was made to produce only 150 Jagdtigers and then convert the production line to the Panther. On January 3rd, Hitler overrode this decision, ordering that under no circumstances was production of the Jagdtiger to be halted. Instead production was to be increased, with 100 vehicles to be finished by April 1945. Then, without delay *Nibelungenwerk* was to convert its assembly lines to producing Tiger II's, with twenty five to be finished in May. Jagdtiger production would be transferred to the Jung firm in Jungenthal which was expected to begin production without delay. How Jung was to achieve this when they had not built a single armoured vehicle was of no concern to Hitler.¹⁶⁷

Luckily for the plants involved, Hitler's plan never came to fruition. Instead the February *Panzer Notprogramm* superseded it, calling for an end to production in April 1945, with 150 vehicles finished. This plan was more rational but was, like the programs plans for the Tiger II, overtaken by events. *Nibelungenwerk* was bombed again on March 23rd, 1945, ensuring that the plant could finish only three vehicles that month. Despite these setbacks the *Nibelungenwerk* was still committed to manufacturing Jagdtigers when it was occupied by the Red Army on May 9th. Through the chaos and confusion of late war production, only seventy-nine Jagdtigers were completed representing a considerable expenditure of effort for very few vehicles.¹⁶⁸ The production of the Jagdtiger provides

¹⁶⁶ Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 168.

¹⁶⁷ Ibid, 169-170.

¹⁶⁸ Ibid.

further evidence of the effect of Allied bombing on production, though the capacity to the plant to recover and continue manufacturing until the last days of the war is a testament to the restorative capabilities of German industry even at the very end of the war.

The production of the Tiger Family from 1942 to 1945 illustrates several key aspects of the German economy during the war. First and foremost, production was reasonably effective, as vehicles were still produced in quantity despite Allied bombing. While the dispersed nature of production did create additional hurdles late in the war as the Allies increasingly targeted Germany's transportation network, it nevertheless proved to be a system that could, until the fall of 1944, generally provide the Heer with the number of tanks it requested. It also shows the limited effectiveness of strategic bombing until late in the war quite clearly. The bombing had little impact on Tiger production until late 1944, when the Combined Bomber Offensive reached its height. Even then, when the Allies could send vast fleets of heavy bombers over Germany day and night, the damage they could inflict was never enough to halt production. As the *Nibelungenwerk* proved, the Germans were still able to marshal the resources and labour necessary to repair damaged factories right up to the end of the war. Thus strategic bombing was unable to prevent the production of the Tiger "family" only hamper it.

The Burden of Tiger Production for the German Economy and the Question of Alternatives

Impressive as the German production of the "Tiger "family" was, the question remains whether this productive effort was worthwhile. One way to answer this question to examine what might have been produced instead. The production of the "Tiger family" represented an effort to overcome Germany's quantitative weakness through superior

quality. This effort was compromised by the inherent inefficiency of the German economy, which prevented even the greatly expanded wartime economy from closing the quantitative gap between Germany and her foes. It was further compromised by the nature of the Tigers themselves. While they did embody Germany's pursuit of quality over quantity, their unreliability and lack of replacement vehicles owing to their expense did not allow the Germans to field enough of them to even begin to overcome the Allies quantitative advantage. Had the Germans focused on producing a few types of less complex vehicles, more vehicles could have been produced until the effects of strategic bombing and Germany's territorial losses began to curtail large scale production in the summer and fall of 1944. The efforts by Speer to create a more efficient production program like this including *Panzer Notprogramm* of February 1945 came too late to have any real impact.

After six years of war, German industry furnished the Wehrmacht with 44,688 AFVs. Of those 2,021 were Tigers, or variants of. These numbers were quite impressive, given that in 1939 only 787 AFVs had been manufactured.¹⁶⁹ Impressive as German production figures were, they paled in comparison to that of the Allies. While the Germans exceeded the 33,356 AFVs produced by the British and the Commonwealth, the Soviets, produced 107,359 AFVs and the Americans another 99,035, dwarfing the Germans production.¹⁷⁰

The vast gulf between German and Allied AFV production, which was emblematic of the gap that existed across the economies themselves, was the result of several factors. Unlike the Allies, the Germans were unable to maintain a long-term, high

¹⁶⁹ Zaloga, *Armored Champion*, 600.

¹⁷⁰ Ibid, 597-604.

volume bombing campaign against the Allies, as they lacked long range heavy bombers to strike the British Midlands (their Ruhr) and the Soviet factories relocated beyond the Urals, to say nothing of the United States, which was all but immune to air attack with the technology of the time.¹⁷¹ The Allies also possessed a much greater pool of resources to draw upon. To use steel as an example, by 1944, the Allies produced between them 110 million tons. By contrast the Germans produced only 28.1 million tons.¹⁷² Allied economies also benefited from better management, especially in terms of efficient centralization. While centralization took different forms in different countries, they arrived at similar results. The Americans initially found that production was hindered by multiple, competing agencies but by May 1943 they had consolidated much of their economy under the Office of War Mobilization. While this office had a considerable bureaucratic footprint, it nevertheless lacked the overwhelming array of committees and sub committees that turned Speer's Ministry into a bureaucratic hell.¹⁷³ Thus the Americans were able to reduce infighting, allowing for more effective prioritization overall. They were then able to produce more than twice the number of AFVs produced by the Germans.¹⁷⁴ Richard Overly summed things up well, noting that the "huge disparity

¹⁷¹ Williamson Murray, *The Luftwaffe 1933-45: Strategy for Defeat*, (Washington: Brassey's, 1983), 54. Alexander Hill, *The Great Patriotic War of the Soviet Union, 1941-45: A documentary Reader*, (New York: Routledge, 2009), 56-57.

¹⁷² Kroener, Müller, Umbreit, *Germany and the Second World War, Volume V/II Organization and Mobilization of the German Sphere of Power: Wartime Administration, Economy, and Manpower Resources 1942-1944/5*, 455.

¹⁷³ Martin Kitchen, *Speer: Hitler's Architect*, (Yale: Yale University Press, 2015), 109, 132, 210, 242.

¹⁷⁴ Mark Harrison, "Resource Mobilization for World War Two: The U.S.A, U.K, U.S.S.R and Germany, 1938-1945", *Economic History Review*, 41:2, 1988, 183-184.

in weapons was due not only to American rearmament and Soviet revival, but also to the inability of their enemies to make the most of the resources they had”.¹⁷⁵

Allied production also benefited from a radically different overall design philosophy. Recognizing their superior resources and manufacturing capability, the Allies focused on weapons to win a war of long duration, including the vast bomber forces that inflicted great damage upon the German economy. By contrast the Germans focused on a “maximization of specific kinds of short term military power”, be it fighters and bombers in the summer of 1940 or Panzers in the winter and spring of 1943, during the *Adolf Hitler Panzer Programme*.¹⁷⁶ This German philosophy suited a military used to fighting short wars but robbed the economy of stable long term prioritization that proved so effective to the Allies.¹⁷⁷

These philosophies were also present in tanks. The Panzer III and Panzer IV were vehicles comparable in quality to their Allied counterparts (at least until 1941) and were designed for mass production, where as late war German tanks were not. The Panther and the Tigers were designed to be qualitatively superior to their Allied counterparts. As seen with the Tigers, this element of their design was partly a reflection of Hitler’s personal views on Panzer design, as well as a quest to create the “best” tanks available. It also reflected a realistic appraisal of Germany’s industrial position. Despite the best efforts of Todt and Speer, the Allies, with their focus on building a large number of simpler, though

¹⁷⁵ Richard Overy, *Why the Allies Won*, (London: Random House Books, 2006), ebook, 27.

¹⁷⁶ Oberkommando des Heers. Abt. Hauptausschuß Panzerwagen und Zugmaschinen Nr. 18 den März 1943. Betr. Adolf Hitler Panzerprogramm. NARA T-78, Roll 619, frame 000081, 000085-000087. Tooze, *The Wages of Destruction*, 594. Harrison, *Resource Mobilization for World War Two*, 177.

¹⁷⁷ Ibid.

by no means less effective tanks, were out producing them. So prioritization of quality in the hopes of mitigating the Allies quantitative advantage seemed to make sense- after all quality had trumped quantity in France and in the Soviet Union early in the war. There were however a number of problems with this idea.¹⁷⁸

While the Germans aimed to prioritize fighting efficiency over numbers, it instead created an emphasis on “technical virtuosity for its own sake”.¹⁷⁹ Rather than producing the Panzer IV ausf. G, at a unit cost of 125,000 Reichmarks (RM)*, the emphasis was placed on the costlier 176,000 RM Panther and 321,000 RM Tiger II.¹⁸⁰ For the cost of one Tiger II, 2.6 Panzer IV ausf. Gs could be built. Thus 1,279 Panzer IV ausf. Gs could have been built for the cost of the 492 Tiger II’s completed. A 1944 Panzer division with one Panzer Regiment, contained two *Panzer Abteilungen*, one with 79 Panthers and the other with 81 Panzer IVs. 15.8 Panzer IV- equipped *Panzer Abteilungen* could have been created for the cost of the Tiger II’s total production.¹⁸¹ Thus the Germans were left with a few tanks of dubious superiority, rather than a greater number of tanks that had rough parity with their foes.

The great cost of producing the Tigers ensured that their losses would be much more difficult to replace than the Allies. One example comes from Operation Goodwood,

¹⁷⁸ Harrison, *Resource Mobilization for World War Two*, 177. Zaloga, *Armored Champion*, 597-604.

¹⁷⁹ Showalter, *Hitler’s Panzers*, 230.

* Prices listed here reflect the price the Heer paid for each vehicle and is an average only, but is the best available for comparison. They ignore the fact that the prices provided reflects only the cost of the hull, as many parts, including power trains and guns were provided to firms as government equipment. It also ignores variations in price from different factories, reflecting different state tax schemes and machine tool investments.

¹⁸⁰ Zaloga, *Armored Champion*, 92-93.

¹⁸¹ Zaloga, *Armored Champion*, 97. Thomas Jentz, *Panzer Truppen: The Complete Guide to the Creation & Combat Employment of Germany’s Tank Force: 1943-1945*, (Atglen: Schiffer Military History, 1996), 164.

on July 18th, 1944. Goodwood was one of the many efforts by the British 21st Army Group to breakout of the Normandy bridgehead. In this instance, three British armoured divisions, the 7th, 11th and Guards Armoured, ran afoul of the Germans defences, among them being the Tiger's of *schwere Panzer Abteilung 503*. After three days the Tigers and the rest of the German defenders had destroyed over 400 British tanks (at this stage in the war these losses represented the entire inventory of two and a half Panzer divisions).¹⁸² As devastating as these losses were, the British quickly made them good. The Guards Armoured Division and the 7th were both back at full strength and ready for Operation Spring on the 25th, less than a week after the debacle of Goodwood. By contrast *schwere Panzer Abteilung 503* lost thirteen Tigers, (effectively an entire company) and these losses were not made good until the end of the Normandy Campaign when the *Abteilung* returned to Germany.¹⁸³

Indeed, the Normandy Campaign on the whole, demonstrated the dangers of the Tigers expense, which prevented easy replacement of losses. Three *schwere Panzer Abteilungen* served in Normandy, *schwere Panzer Abteilung 503*, as well as *schwere SS Panzer Abteilungen 101* and *102*. A total of 135 Tiger Is and 45 Tiger II's saw service in Normandy. Only three tanks would survive the campaign. Reinforcements were few, with only the twenty-eight Tiger II's of 1.SS 101 and 3.503 arriving after the *Abteilung* began to fight. Both *Kompanien* had been reduced to a handful of operational vehicles before returning to Germany to retrain on the new tank, but no replacements came for their

¹⁸² John Buckley, *British Armour in the Normandy Campaign*, (New York: Frank Crass, 2004), 36. Jentz, *Panzer Truppen Vol 2*, 164.

¹⁸³ Buckley, *British Armour in the Normandy Campaign*, 36. Wolfgang Schneider, *Tigers in Combat I*, (Mechanicsburg: Stackpole Books, 2000), 133.

equally decimated comrades.¹⁸⁴ Thus the majority of the 175 Tigers that participated in the campaign were there at the start and were lost before the end, not to be replaced until the remnants of the units returned to Germany. The expense of the vehicle led to their low production numbers, and this had very real effects on Abteilungen operational effectiveness, especially as campaigns dragged on.

Another issue that impacted operational effectiveness was the supply of spare parts, which was an issue throughout the war. Part of the issue was logistical, as the Germans far flung military operations put enormous strain on their supply lines. For example, in September 1943, *schwere Panzer Abteilung 503* lamented that urgently needed spare parts took six weeks to reach them, an eternity for units engaged in near constant combat.¹⁸⁵ The other issue, and by far the larger one had to do with their production. Production of spare parts was at best, conducted at a ratio of one to one. Thus for each finished tank, one engine, one transmission, etc. would also be produced as spares. This ratio was woefully inadequate, especially for items like engines and transmissions which needed to be replaced more frequently. Todt and Speer recognized that production of spare parts was important and by 1943, their rationalization efforts ensured that between twenty five to thirty percent of components produced were reserved for spare parts.¹⁸⁶

¹⁸⁴ Schneider, *Tigers in Combat I*, 2000, 133-135, 188. Wolfgang Schneider, *Tigers in Combat II*, (Mechanicsburg: Stackpole Books, 2005), ebook. 415, 425-429, 500, 513-531.

¹⁸⁵ Oberkommando des Heers Abt. Gef.Std. s. Panzer-Abteilung 503 den 10.10.1943. Betr. Aufstellungen für die Zeit vom 5.7.43-21.9.43. NARA T-78, Roll 620, frame 000802.

¹⁸⁶ "German Tank Maintenance in World War II" in *World War II German Military Studies: A Collection of 213 Special Reports on the Second World War Prepared by Former Officers of the Wehrmacht for the United States Army, Volume 23, Part X*.

This was a definite improvement, but production of spare parts remained inadequate. As with many other things in the Third Reich, some of the blame must fall upon Adolf Hitler. Guderian impressed upon Speer the importance of spare parts as a means to cheaply maintain large Panzer forces, at a fraction of the cost required to complete finished vehicles. Hitler was not convinced and remained fixated on production of finished vehicles, especially since the increase in spare parts production that Guderian wanted could be obtained only with a twenty percent cut in new AFV production.¹⁸⁷ Since Hitler's will had been clearly expressed in favor of finished production there was little room to increase production of spare parts.

This preference for production of finished vehicles made the spare part situation worse as Allied bombing intensified. Shortages were worsened not only by damage to factories where much needed components were manufactured but because shortfalls in production were made up by cutting into the supply of spare parts. In the summer of 1944, Maybach had cut its allotment of spare engines to fifteen percent and by autumn it was down to just eight percent.¹⁸⁸

The effect of the shortage of spare parts on *schwere Panzer Abteilung* was significant even before Allied bombing began to seriously impact production in 1944. From July 5th to September 21st 1943, *schwere Panzer Abteilung 503* recorded 240 Tigers going to the *Panzerwerkstatt Kompanie* (Tank Repair Company) for repairs (given that the unit had an allotted strength of forty five Tigers, each Tiger was sent back for repairs

Special Topics, edited by Charles B. Burdick, Donald S. Detwiler and Jürgen Rohwer, (New York: Garland Publishing Inc., 1979), 21-23. Zaloga, *Armored Champion*, ebook, 535.

¹⁸⁷ Speer, *Inside the Third Reich*, 234.

¹⁸⁸ Zaloga, *Armored Champion*, ebook, 535.

at least five times). During this period, 275, 919 kilograms of spare parts were used by the *Abteilung*, most of which were not readily available to the unit. This included twenty five replacement engines and thirty new gearboxes which had to be shipped to the unit. What was worse was that the unit was still awaiting delivery of another twenty-eight engines and thirty-eight gearboxes when the report was filed on October 10th, 1943. At this point the unit was still waiting on parts to refurbish thirty-nine Tigers, the majority of the unit. Given these shortages it is hardly surprising that the unit found that its average daily strength was just ten Tigers.¹⁸⁹

The shortage of spare parts was further exacerbated by the other major problem that the Tiger's complexity created, the vehicles poor mechanical reliability. Many of these problems could be traced to the drive train, as the engine and transmission were not adequate to support these vehicles, be it the 56-ton Tiger I or the 75-ton Jagdtiger. Alfred Rubbel, a Tiger commander from *schwere Panzer Abteilung 503* wrote that:

The engine did not take well to overloading. It's longevity in service was limited.

Assuring availability for operations demanded a great deal of technical understanding and hard work from our drivers. The maintenance sections and the workshop were constantly in demand. I remember how I always kept one ear free to listen to the engine when road marching as a tank commander.¹⁹⁰

Failure to carefully manage these engines would result in disaster. One of the best examples of the calamities that could befall any Tiger unit that failed to keep the

¹⁸⁹ Oberkommando des Heers Abt. Gef.Std. s. Panzer-Abteilung 503 den 10.10.1943. Betr. Aufstellungen für die Zeit vom 5.7.43-21.9.43. NARA T-78, Roll 620, frame 000789-000794,000802.

¹⁹⁰ Lochmann, Rubbel and von Rosen, *The Combat History of the German Tiger Tank Battalion 503 in World War Two*, ebook, 55.

weaknesses of their engines and transmissions in mind comes from the Italian Front. On May 23rd 1944, 3.508 was ordered to deploy around the town of Cisterna south of Rome to halt the Allied drive on the city which had begun the day before. The Kompanie had sixteen Tigers, two more than its allotted strength. Over the next three days they would lose all but one of their vehicles. All were lost to mechanical failures, often while trying to tow previously disabled Tigers, in an action that captured members of Kompanie considered “penny wise and pound foolish”.¹⁹¹ The loss of an entire company was compounded by the Tigers scarcity in the Italian theatre as the 508 was the sole *schwere Panzer Abteilung* available (*schwere Panzer Abteilung 504* would not arrive until June 1944), so the losses represented one third of the Tigers in the Italian theatre, all lost in just three days.¹⁹²

Consequently, the Tiger I and the Tiger II which shared its predecessors strengths and weaknesses, were individually more than a match for the American M4 Sherman and the Soviet T-34, but the Tiger’s high costs, low production numbers and unreliability ensured that the *schwere Panzer Abteilungen* would rarely have sufficient tanks to fill their *Kompanien*. Even if the units could have been maintained at a high rate of operational readiness, as Operation Goodwood showed, the Allies ability to replace their losses far outstripped the Germans ability to inflict them. In total 48,900 Shermans and

¹⁹¹ *Tiger! The Tiger Tank: A British View*, edited by David Fletcher, (London: Her Majesty’s Stationary Office, 1987), 220-221.

¹⁹² Schneider, *Tigers in Combat I*, 197, 323. Thomas Jentz, *Germany’s Tiger Tanks: Tiger I & II: Combat Tactics*, (Atglen: Schiffer Military History, 1997), 97-98. Wilbeck, *Sledgehammers*, 92-94.

55,660 T-34's were produced before the war's end. The Tiger's superiority was not sufficient to overcome such a numerical disadvantage.¹⁹³

The warring powers may have only devoted an average of seven percent of their industrial might to AFV's, but Germany's seven percent allowed her to produce only 44,688 of them, while the Allies produced 239,750 with theirs.¹⁹⁴ Given this massive disparity it is clear that Todt and Speer had failed utterly in the task of producing the means to defeat the Allies. While the production of the various members of the Tiger family was reasonably effective, it was hampered both internally and externally. Allied bombing ensured that many Tigers would never be built as the tanks themselves and the resources needed to build them, were destroyed. In broader economic terms, Todt and Speer's efforts at rationalization, consolidation and centralization enhanced, rather than diminished the infighting that had hampered the German economy before the war and the lack of clear and consistent priorities created even more problems as production lines were constantly reorganized to meet new demands. In many respects, the increases in production that the Germans were able to achieve were not the result of any kind of managerial brilliance from Todt or Speer but were instead the result of greater production of raw materials and ruthless exploitation of a vast army of forced labour.¹⁹⁵ In the end though, the question of whether the resources poured into these expensive, labour and

¹⁹³ Harrison, *Resource Mobilization for World War Two*, 177. Zaloga, *Armored Champion*, 597-604

¹⁹⁴ Zaloga, *Armored Champion*, 597-604. O'Brien, *How the War was Won*, 2-3.

¹⁹⁵ Karl- Heinz Frieser, Klaus Schmider, Klaus Schönherr et al., *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, translated by Barry Smerin and Barbara Wilson, (Oxford: Clarendon Press, 2017), 30.

resource intensive vehicles were worthwhile could only be answered on the field of battle.

Chapter 4: In Mud, Sand and Snow: Early Deployments of the Tiger I in the Soviet Union and North Africa, September 1942-May 1943.

In September 1942, *schwere Panzer Abteilung 502* of Army Group North would be the first unit to use the Tiger in combat. In January 1943, *schwere Panzer Abteilung 503* would see its first combat with Army Group Don as the Army Group retreated towards the Donets to escape oncoming Soviet forces eager to deal further blows to the Germans after the encirclement of the Sixth Army at Stalingrad. Meanwhile, in North Africa *schwere Panzer Abteilung 501* would see its first combat against the western Allies in December 1942. The actions of these *Abteilungen* seemingly vindicated the Tiger's design, especially to the converted. In reality however, their operations demonstrated the Tiger's weaknesses far better than its strengths. Individually, the Tiger's armour and 8.8cm KwK 36 L/56 gun more than proved themselves against the Allies weapons, but their overall deployments were far less successful. The 502 would deploy its Tigers in marshy terrain where a number of Tigers were lost, including one captured intact by the Soviets. With a Tiger of their own, the surprise and shock value of the Tiger against the Soviets had, to some extent been lost, with little to show for it. In January, the 503's operations with Army Group Don were tactical successes but unreliable vehicles and doctrinal weaknesses undermined these. In just two weeks of operations the 503 would find itself able to only field a handful of vehicles, an early sign of the toll that repeated combat, a lack of regular maintenance and the vehicle's unreliability would have on the unit's fighting strength. Their successes were overshadowed by the older, more mobile Panzer IIIs and IVs of Herman Balck's 11th Panzer Division, which ultimately saved Army Group Don from being cut off and

destroyed. Balck's success demonstrated that for all of the Tiger's vaunted combat power, it was the traditional Panzer's emphasis on speed, surprise and aggression that was truly decisive. In North Africa, the Tigers of the 501 and the 504 were similarly affected by the vehicles poor reliability and proved incapable of turning the tide in favor of the Germans.

In Mud and Snow: The Tigers Initial Operations in the Soviet Union

As the first Tigers came off the assembly line at Henschel in the summer of 1942 they had to be organized for combat. During the May 26, 1941 meeting, which had outlined Hitler's requirements for Germany's heavy tanks, he described the intended deployment of these vehicles. He envisioned each Panzer division having twenty of these new tanks to act in a spearhead role.¹⁹⁶ The first two *schwere Panzer Kompanien* (heavy tank companies), formed in February 1942, would be designed to fulfill Hitler's wishes but by the spring of 1942 the plan had changed dramatically.¹⁹⁷ It became clear that with production of the Tiger being delayed until the end of the summer, there was no way to make Hitler's request a reality. Equipping the twenty Panzer divisions that the Heer had in 1941 with a *schwere Panzer Kompanie*, would have required 400 Tigers, which given the Tigers actual production would have meant that every division could only be fully equipped in July 1943 when 405 Tigers had been built.¹⁹⁸ This number left no room for training tanks or the replacement of losses, to say nothing of further expansion of the *Panzerwaffe*.

¹⁹⁶ Jentz and Doyle, *Kingtiger Heavy Tank 1942-45*, 4.

¹⁹⁷ Wilbeck, *Sledgehammers*, 19.

¹⁹⁸ Jentz and Doyle, *Germany's Tiger Tanks: D.W. to Tiger I*, 68. Jentz, *Panzer Truppen Vol 1*, 143.

The revised plan was to form the Tigers into *schwere Panzer Abteilungen* to make the best use of these scarce vehicles. The *Abteilungen* would be assigned by OKH to whichever army or corps required them the most. As a result, the limited number of Tigers could be deployed at crucial points to either fulfill their original breakthrough role or reinforce the defence of a particularly embattled area. The Tigers would thus shift rapidly from being a general force multiplier that any Panzer division could call upon to instead be a more elite unit, employed only in the most crucial of circumstances.¹⁹⁹

As the first *schwere Panzer Abteilungen* were being created in the summer of 1942, Hitler became increasingly anxious to employ Germany's new heavy tanks and demonstrate the correctness of his design philosophy. Albert Speer recalled: "He regaled us with vivid descriptions of how the Soviet 7.7 [7.62] centimeter antitank guns which penetrated our Panzer IV front armour even at sizable distances, would fire shot after shot in vain, and how finally the Tiger would roll over the antitank gun nests".²⁰⁰ When 1.502 was ready, it was sent to Army Group North to support planned operations around Leningrad along with the *Abteilung* headquarters and the *Panzerwerkstatt Kompanie* in September 1942. This plan was subject to a great deal of criticism by many generals, especially Heinz Guderian. Much of their criticism stemmed from the marshy terrain in which operations were to be conducted. In such conditions, the heavy Tiger's would be confined to roads to avoid becoming bogged down. Confined to roads, the Tigers would be easy targets for Soviet antitank guns and Guderian did not share Hitler's belief in the Tiger's invulnerability. Guderian also criticized the limited deployment of these new machines. "A lesson learned from the First World War had taught us that it is necessary

¹⁹⁹ Wilbeck, *Sledgehammers*, 19-20.

²⁰⁰ Speer, *Inside the Third Reich*, 241.

to be patient about committing new weapons and that they must be held back until they are being produced in such quantities as to allow their employment in mass”.²⁰¹

Despite Guderian’s well-known and vocal criticisms of the early deployment of the Tiger’s, Hitler ordered it anyway. The first combat deployment on September 16th 1942 with four Tigers (All that had arrived up to that point) was a success. The Tigers were able to defeat dug in infantry and artillery, with the 8.8cm KwK 36 L/56 gun performing well and the armour was not penetrated by any Soviet fire. So a larger attack was ordered for the 22nd. This attack, supported by a *Zug* (Platoon) of Panzer IIIs and the men of the 170th Infantry Division was not a success. One Panzer III was lost, three of the four Tigers suffered damage to their gun barrels and the leading Tiger burned out and was abandoned (efforts to recover it failed and it was destroyed on November 25th).²⁰²

Worse was to come. On January 18th, 1943, while breaking out of Schlüsselberg, to avoid being encircled by Soviet forces conducting Operation Iskra (Spark), one Tiger was fired on and the inexperienced driver attempted to turn around to get away. Unfortunately, his efforts sent the Tiger off the road and into a swamp. The crew was then killed trying to escape the bogged down vehicle. Afterwards the Soviets were able to recover the Tiger and by May, the Soviets had completed their analysis of the Tiger. Their analysis identified the Tiger’s weakest points, a “shell trap“ between the turret and the hull, the gun itself and hits on the drive train at a thirty-degree angle, which would

²⁰¹ Guderian, *Panzer Leader*, 219. Schneider, *Tigers in Combat I*, 73.

²⁰² Jentz, *Germany’s Tiger Tanks: Tiger I & II: Combat Tactics*, 38-39. Schneider, *Tigers in Combat I*, 173-175.

destroy the brakes and multiple road wheels.²⁰³ Analysis identified the 85mm anti-aircraft gun, as well as the 122mm and 152mm howitzers as the three weapons capable of penetrating the new German tank and plans were made to fit these weapons in AFVs. These efforts would not bear fruit until February 1943 with the introduction of the SU-152, followed by the SU-122 and SU-76 (The SUs were a series of casemate tank destroyers and assault guns mounting a variety of weapons, with the number after the name referring to the caliber of weapon) and the T-34/85.²⁰⁴ Even before more powerful weapons were available, information on the Tiger was rapidly circulated within the Red Army. While it would take the Soviets several months to fully uncover the Tiger's secrets, Guderian was vindicated. "The results were not only heavy, unnecessary casualties, but also the loss of secrecy and of the element of surprise for future operations".²⁰⁵

The Tigers deployed to Army Group Don were part of an effort to protect the remnants of the German southern wing after the encirclement of the 6th Army at Stalingrad. They had to protect the vital transportation hub at Rostov long enough for Army Group A to withdraw from the Caucasus, shoring up the German position.²⁰⁶ By the time *schwere Panzer Abteilung 503* arrived in the Rostov area in January 1943 the situation was very fluid, with the Germans occupying only a series of strongpoints and

²⁰³ Oberkommando des Heers. Generalinspekteur der Panzertruppen. Nachrichtenblatt der Panzertruppen, Nr.4 *Oktober, 1943*. Betr.: Russische Anweisung zur Bekämpfung des "Tiger". NARA, T-78, Roll 623, frame 000587.

²⁰⁴ Michael Green, *Tiger Tanks*, (Osceola: Motorbooks International, 1995), 69. Hill, *The Red Army and the Second World War*, 440. Robert A. Forczyk, *Tank Warfare on the Eastern Front 1943-1945: Red Steamroller*, (Barnsley: Pen & Sword Books Ltd., 2016), 67. Schneider, *Tigers in Combat I*, 75.

²⁰⁵ Guderian, *Panzer Leader*, 219.

²⁰⁶ von Manstein, *Lost Victories*, 368-370. Robert M. Citino, *The Wehrmacht Retreats: Fighting a Lost War, 1943*, (Lawrence: University of Kansas Press, 2012), 58-61.

blocking points in an effort to stall the Soviet advance. In this situation the *Abteilung* was employed primarily as a counterattacking force. While this was not the offensive breakthrough role the Tiger was intended for, the Tiger's heavy armour and powerful gun, made them useful additions, destroying key defensive positions and enemy tanks.²⁰⁷

The most important operation by the *Abteilung* came on January 9th. The *Abteilung* assisted II (2nd *Abteilung* or Battalion). Panzergrenadier Regiment 128, in its attack on the village of Vessely, but only eleven Tigers were available, a far cry from the seventeen that had been available just three days earlier.²⁰⁸ The absent vehicles had not been destroyed but were simply down for maintenance, and while this fact was of some comfort for the unit in the future, it did little for the immediate situation and spoke to the underlying mechanical unreliability of the Tiger. Vessely's defenders were determined and well supported, throwing back three German assaults and while the 503 destroyed eight T-34s this was poor compensation for their own losses. Two Tigers were lost and only one of the surviving Tigers was still operational at the end of the day. Two of them were so badly damaged that they were returned to Germany, after they each suffered over two hundred hits.²⁰⁹ This heavy damage reflected a Soviet tendency to fire all available weapons at a Tiger. It was a tendency borne not out of desperation but an understanding that while many light weapons, including the 45mm M1937 anti-tank gun could not penetrate the Tigers armour, these weapons could still damage sensitive components

²⁰⁷ Wilbeck, *Sledgehammers*, 35. Carius, *Tigers in the Mud*, 22.

²⁰⁸ Wilbeck, *Sledgehammers*, 59-60. Schneider, *Tigers in Combat I*, 121.

²⁰⁹ Schneider, *Tigers in Combat I*, 122. Wilbeck, *Sledgehammers*, 60.

including vision blocks and running gear, ideally disabling the vehicle and making it easier to destroy with heavier weapons.²¹⁰

The Soviets gave the Tigers armour a thorough testing and it's survivability would be trumpeted in the Tiger's manual, the *Tigerfibel*. It would declare "[The Tiger] Will withstand anything!"²¹¹ Thus the legend of the Tiger's invincibility was born. This statement ignored the fact that Soviet fire had been sufficient to halt the attack that the Tigers had participated in.²¹² So while it's armour was vindicated, it was also clear that the Soviets had found ways to negate the effectiveness of the few Tigers available, even if their ability to reliably dispatch them was still limited at this juncture.

On the 17th of January the Tigers were beginning to withdraw towards Rostov as the Soviets advance made the positions they had fought for earlier in the month untenable. As *schwere Panzer Abteilung 503* made its way back towards the Don the Soviets were ready to try and destroy the still retreating Army Group A and deal a severe blow to Army Group Don. Their plan was to create a bridgehead on the western bank of the Manych River, at Manychskaya, near the Manych junction with the Don River. From there it was just forty kilometers to the main bridgehead over the Don at Bataisk, Army Group A's main escape route. On the 22nd, the Soviets gained their desired bridgehead. At this point the Tigers of the 503, representing the most powerful tanks in the world, could do absolutely nothing. Two weeks of hard fighting and constant movement, had prevented much of the necessary routine maintenance the Tigers required, and only two

²¹⁰ Oberkommando des Heers. Gen.St.d.H/ Ausb.Abt. (II). Zusammendruck der Ausbildungshinweise Nr.10-23.g.5.5.44. TsAMO f.500.o.12451.d.133.

²¹¹ Bob Carruthers, *Hitler's War Machine: Tiger I Official Wartime Crew Manual (The Tigerfibel)*, translated by Bob Carruthers, (Havertown: Pen and Sword, 2014), 21-22.

²¹² Schneider, *Tigers in Combat I*, 123.

were still operational out of twenty-four. Even if every vehicle had been ready for action, Rostov was too far for the slow, heavy tanks to be sent roaring across the steppe to the rescue.²¹³

So the task of saving Army Group A would fall not to the new wonder weapons, but to the old workhorses, the Panzer IIIs and IVs of Generalleutnant (Lieutenant General) Herman Balck's 11th Panzer Division. Balck and his division were accustomed to this role as they had spent the previous month holding a line along the Chir River against the forces of the 5th Tank Army- acting as a "fire brigade" for the XLVIII Panzer Corps in what Denis Showalter described as "an example of staff work, willpower, and tactical skill still legitimately cited as among the greatest divisional battles ever fought".²¹⁴ In these battles, Balck came "tearing down on the enemy with the whole weight of his armour in accordance with the old maxim, Nicht kleckern, sondern klotzen ['Don't slap them, punch them', a variation on 'boot'em don't splatter them']".²¹⁵

Balck would apply the same principles to the Soviet bridgehead at Manychkaya, even though by this point his division could only muster thirty tanks at best. On the 23rd, Balck pushed back the leading elements of 3rd Guards Tank Brigade to Manychkaya itself. Three attacks launched by the Germans were repulsed and for the next day Balck had a new plan to defeat the Soviets. As before, the Germans began by bombarding the northeastern part of the town, then assaulting it with armoured cars and halftracks. Once the Soviet brigade's tanks had left their positions in the south of town to counter the German feint, the artillery switched to the south of Manychkaya, Balck's true target. The

²¹³ Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 53. Schneider, *Tigers in Combat I*, 122.

²¹⁴ Showalter, *Hitler's Panzers*, 215. von Mellenthin, *Panzer Battles*, 183.

²¹⁵ von Mellenthin, *Panzer Battles*, 183.

Panzer roared in, striking the Soviets in the rear. Outmaneuvered and badly battered in the bargain, 3rd Guards Tank Brigade withdrew back over the Manych. Twenty Soviet tanks were lost and the brigade suffered between 500-600 casualties. 11th Panzer by contrast suffered only one man killed and fourteen wounded. Balck's excellent attack pushed the Soviets off balance, convincing them that a full strength Panzer division lay before them, not Balck's badly depleted force. With the Soviets reverting to the defensive, Army Group A was able to complete its withdrawal on the 31st as the last units of First Panzer Army reached safety.²¹⁶

Balck's victory at Manychskaya was a triumph that further cemented his reputation as a "born leader of armour", but in a larger sense it was also a further vindication of the traditional German Panzer doctrine.²¹⁷ Even when badly outnumbered, speed, surprise and aggression could win the day, provided the Panzers were well led. By contrast, while the Tigers of the 503 had performed well, destroying at least thirty-nine Soviet tanks, with only two Tiger's lost outright, their overall impact had been limited and fleeting.²¹⁸ The Tiger's were a powerful force multiplier for counterattacks but lacked the speed and reliability that allowed the Panzer IIIs and IVs to have a decisive impact on the campaign.²¹⁹

In the Sand: The Tigers in North Africa

The operations of the Tigers in North Africa lacked the dramatic contrast between the operations of the new heavy tank and the old mediums provided by the operations

²¹⁶ Balck, *Order in Chaos*, 280. von Mellenthin, *Panzer Battles*, 204-205. Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 53.

²¹⁷ von Mellenthin, *Panzer Battles*, 183.

²¹⁸ Schneider, *Tigers in Combat I*, 74, 121-122.

²¹⁹ Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 53.

with Army Group Don. Nevertheless, the Tigers performance in Tunisia from December 1942 to May 1943 reflected the same strengths and weaknesses that had been encountered in the Soviet Union. *Schwere Panzer Abteilung 501* was the first of two *Abteilungen* sent to reinforce the *Deutsch-Italienische Panzerarmee* (German- Italian Armoured Army) in November 1943. When the unit arrived the situation was particularly perilous. In November the Axis had suffered two devastating blows in quick succession. In the east, on November 4th, they had lost the 2nd Battle of El Alamein to Lieutenant General Bernard Montgomery's 8th Army and in the west, on the 8th, Operation Torch, the first major successful Allied amphibious landing of the war saw a combined British and American army invade Algeria and Morocco.²²⁰ The Tigers of the 501 would be part of an effort to restore the situation in North Africa, halting the Allies two-pronged convergence on Tunisia.

The first elements of the 501 arrived in Tunis on November 23rd, 1942 and the *Abteilung* would see piecemeal deployments until the new year. This was the result of both the strained logistical situation faced by the Axis, especially as Allied aircraft and submarines took a heavy toll on the ships needed to sustain the Panzerarmee and the precarious position of the entire army. The unit's first action came on December 1st, with just three Tigers of 1.501. This initial action was part of General der Panzertruppen Walter Nehring's efforts to protect the vital port of Tunis by attacking Allied forces in the Tebourba area just thirty two kilometers from the city. Nehring's plan was to employ four Kampfgruppen attacking from three directions. While Kampfgruppe Koch fixed the

²²⁰ Horst Boog, Werner Rahn, Reinhard Stumpf et al, *Germany and the Second World War: Volume VI: The Global War: Widening of the Conflict into a World War and the Shift of the Initiative 1941-1943*, translated by Ewald Osers, John Brownjohn et al, (Oxford: Clarendon Press, 2001), 1100.

Allies attention from the south, Kampfgruppen Lüder and Hudel would strike from the north. The fourth Kampfgruppe, Djedeida was to launch attacks from the east. The three Tigers of 1.501 were split between Kampfgruppe Lüder and Djedeida for the initial attack, with Lüder receiving one Tiger and Djedeida the remaining two. The initial attack met with a great deal of success. Kampfgruppen Lüder and Hudel successfully attacked from the north driving back the American units in front of them. They also repulsed a counterattack by two British armoured battalions, the 17th and 21st Lancers, with five Crusader tanks destroyed, though it is unclear if the Tigers accounted for any of these vehicles.²²¹

Much more can be said about the Tigers attached to Kampfgruppe Djedeida. According to the units after action report the attack was carried out under heavy artillery fire. Then the Tigers engaged a group of General Lee tanks (American tanks also supplied to the British with a 75mm gun in a hull sponson and a 37mm gun in the turret) at 100 meters. At this range the British tanks could not penetrate the Tigers side armour, but the Germans had no trouble penetrating the Allied tanks. Once two of the General Lees were destroyed, the rest withdrew.²²²

This initial attack in North Africa was far more auspicious than the Tigers first action in the Soviet Union back in September, though one Tiger was taken out of the fight by engine failure. Nevertheless, the tank's armour and gun had more than proven themselves against the western Allies. That said, the overall German effort was less successful. The attack by Kampfgruppen Lüder and Hudel had stalled between the Tebourba Gap and Teboubra and while the Tigers had bested the General Lees of the 2nd

²²¹ Wilbeck, *Sledgehammers*, 40. Schneider, *Tigers in Combat I*, 42.

²²² Jentz, *Germany's Tiger Tanks: Tiger I & II: Combat Tactics*, 42.

Battalion of the Hampshire Regiment, the British still held their line, though not for long. By December 3rd, Tebourba had fallen and while the Tigers were deployed only in small numbers, they were nevertheless welcome force multipliers for the German attacks.²²³

After a number of other small-scale operations in December, January would see the first major deployment of the 501 in Operation *Eilbote* I (Messenger). *Eilbote* was designed to protect the lines of communication between Tunis and Rommel's Afrika Korps (Africa Corps), still operating on the eastern flank of the Panzerarmee by attacking Allied forces between Enfidaville and Sousse. While this operation would be the first major deployment of the unit, as the first vehicles of 2.501 finally arrived, it did not represent a deployment of Tigers en masse. Only nine were available for the operation out of nineteen Tigers in the entire theatre. The rest were either awaiting repairs or were still being unloaded at Tunis. Vehicles in the former category would prove to be especially problematic for the *Abteilung* however as the *Panzerwerkstatt Kompanie* had not yet arrived, leaving repairs in the hands of the smaller and less well equipped *Panzerwerkstatt Zug* (Tank Repair Platoon) that were attached to each *Kompanie*. Repairs were also hampered by an especially acute shortage of spare parts caused by the Allied interdiction of Axis supplies.²²⁴ Four Tigers of 2.501 were assigned to Kampfgruppe Weber, which would handle the initial breakthrough of the Allied line, allowing Kampfgruppe Lüder, with five Tigers of 1.501 to exploit the initial breakthrough.²²⁵

²²³ Wilbeck, *Sledgehammers*, 42-43.

²²⁴ Oberkommando des Heers. Abt.Ia/Brb.Nr.157/43 Geh- Panzer Abteilung 501 den 18.3.1943. Betr.: Tiger- Erfahrungen in Tunesien. NARA, T-78, Roll 620, frame 001239.

²²⁵ Wilbeck, *Sledgehammers*, 45.

The initial attacks by Kampfgruppe Weber were successful but while previous attacks had struck Allied positions that were often poorly equipped to repulse tank attacks, especially by the new Tigers, the Allies had ample time to prepare their ground and had seeded the area with large quantities of landmines. While the attack was a success, with the attached *Pionier Zug* (Pioneer Platoon) clearing over 100 mines, the mines still exacted a high price on the understrength unit. One Tiger suffered transmission damage and another Tiger, as well as three Panzer IIIs were disabled by mines.²²⁶

With the success of the initial attack, Kampfgruppe Lüder continued their attack, the next day capturing their objective, the crossroads outside El Glib. Unfortunately for the *Abteilung*, Allied mines continued to take their toll, with two more Tigers disabled.²²⁷ Kampfgruppe Lüder may have been fairly successful, but two Tigers from 2.501, protecting the right flank of the Kampfgruppe were not. A subsequent British report described the action where two Tigers, and six Panzer IIIs, were engaged from the left side of the Robaa Road. The German tanks were engaged by multiple 6 pounder (57mm) anti tank guns at ranges varying between 900 to 576 meters. At these ranges the British guns made short work of the Panzer IIIs and were also successful in knocking out the Tigers.²²⁸

German reports corroborate much of this account, describing both Tigers as having burst into flames after being hit, though they record the loss of only four Panzer IIIs, suggesting that several may have been fired upon and claimed by multiple British

²²⁶ Jentz, *Germany's Tiger Tanks: Tiger I & II: Combat Tactics*, 48. Schneider, Wolfgang. *Tigers in Combat I*, 43. Wilbeck, *Sledgehammers*, 45.

²²⁷ Wilbeck, *Sledgehammers*, 47.

²²⁸ *Tiger! The Tiger Tank: A British View*, 17.

guns.²²⁹ The Germans were subsequently able to recover the second Tiger after nightfall but the first tank, Tiger 231 remained in place until destroyed by British engineers who feared its recapture. While the vehicle was destroyed before a thorough examination could be completed, examining the wreck and especially the hull armour, which was intact, did allow the British to develop a good assessment of the effectiveness of their anti-tank weapons against the new German tank. They concluded that the 6-pounder could not penetrate the Tiger from the front. Firing two rounds at the front plate at 300 yards (274 meters) failed to penetrate the 100mm frontal armour. Thus the Tigers had to be engaged, as they were in this instance, from the flanks. This conclusion was proven by the Germans, as analysis of the second Tiger, which they had recovered showed twenty-four hits by 6-pounder rounds. Of those, only five penetrated the Tigers armour and all were fired at the sides of the vehicle. None of the rounds, which struck the front of the tank penetrated.²³⁰ It was this series of tests, and examination of another Tiger, captured in March 1943, that would spur the British to develop the 17 pounder (76.2mm) anti-tank gun, which would be capable of penetrating the Tiger from the front.²³¹

While the British had gotten the better of the engagement on the 20th, both in terms of vehicles destroyed and knowledge gained, the overall German attack by Kampfgruppe Lüder had been successful and the Tigers would remain in the area until the 25th, to hold their gains. Nevertheless, the 501 found, as had the 503 before them and every *schwere Panzer Abteilung* would find subsequently, that repeated use had a rapid

²²⁹ Jentz, *Germany's Tiger Tanks: Tiger I & II: Combat Tactics*, 48. Schneider, Wolfgang. *Tigers in Combat I*, 49.

²³⁰ *Tiger! The Tiger Tank: A British View*, 17-20. Jentz, *Germany's Tiger Tanks: Tiger I & II: Combat Tactics*, 51-53.

²³¹ Wilbeck, *Sledgehammers*, 111.

and disastrous effect on the number of operational vehicles. The unit's after action report records an average of just three Tigers operational per day during this operation and by the 25th, "The fact that only one Tiger out of nine was still fully operational and two or three others were conditionally operational at the end of the operation should not be disregarded".²³² After five months in combat, the Tiger had established its reputation as one whose lack of mechanical reliability had a serious impact on their operational readiness.

These operations also demonstrated that the Allies were beginning to develop effective counters to the Tigers. The heavy Allied use of minefields was the most prominent example, and while the 501 did prove that a sufficient number of Tigers could simply "bull through" a minefield, simply accepting casualties, their ability to wear down Tiger formations would continue to make them useful throughout the war. It is also worth noting here that unlike the Allies, who invested heavily in mine clearance tanks, utilizing either rollers or flail drums, the Germans continued to rely either on highly vulnerable Pioneer units or simply charging through them until the war's end, especially as efforts to clear mines with remote controlled explosive carriers at Kursk were not particularly successful or feasible on a large scale.²³³ It was also clear that Allied anti-tank guns like the 6 pounder may not have had sufficient power to overcome the Tiger's formidable front armour, but tactical preference for flanking shots allowed these guns to be used effectively against the vehicles' thinner side armour. Consequently, like the

²³² Jentz, *Germany's Tiger Tanks: Tiger I & II: Combat Tactics*, 49.

²³³ Wilbeck, *Sledgehammers*, 48. Oberkommando des Heers. Pz.Offz.b.Chef. Gen St d H Bb.Nr.945/43. Geh Kdr. Pz.Abt. (FKL) 301 den 23.7.43. Betr. Denkschrift über die weitere Verwendung der FKL-Waffe unter Auswertung der Erfahrungen des Einsatzes vom 5.-8.7.43 bei Unternehmen "Zitadelle". NARA, T-78, Roll 620.

Soviets, whatever initial shock value the Tigers appearance had quickly dissipated and even though the Allies lacked a definite “Tiger Killer” at this juncture, they had nevertheless rapidly adapted available weapons to defeat the new German heavy tank.

The story of the 501 in North Africa would come to an end in March, as the eleven remaining Tigers were transferred to the newly arrived *schwere Panzer Abteilung 504* on March 17th, 1943.²³⁴ *Schwere Panzer Abteilung 504* would have even less success in Tunisia than the 501 had, participating in a number of small scale actions as the Axis forces retreated towards Tunis, with the final elements of the Abteilung surrendering on May 12th along with the rest of the Axis forces in North Africa. One incident is worth discussing however, the capture of Tiger 131. On April 19th, two Tigers were attached to III. Fallschirmjäger (Paratroop) Regiment 5 for an attack on Djebel Djaffa, codenamed Operation *Fliederblüte* (Lilac Bloom). The attack met with little success and the Tigers found themselves in combat with the Churchill Tanks of the 48th Royal Tank Regiment (RTR).

These British heavy tanks actually had more frontal armour than the Tiger, with 152mm thick vertical front plates, but the 6 pounder gun mounted to the Churchill Mk. IV in use by the 48th RTR were certainly not particularly effective against the Tigers, especially when compared to the Tiger’s 8.8cm KwK 36 L/56 gun. Nevertheless the Churchill’s of B Squadron, advancing in support of the defending battalion from the East Surry Regiment were surprised to find the 504’s two Tigers behind a ridge. A close quarters battle, fought at just 183 meters ensued. Two Churchill’s were quickly knocked out, one of them providing ample evidence of the superiority of the Germans 8.8 cm gun

²³⁴Schneider, Wolfgang. *Tigers in Combat I*, 44.

as a round entered the hull machine gun position and ended up embedded in the engine, which was hardly a glowing endorsement of the Churchill's armour. Nevertheless the British attack clearly caught the Germans by surprise, causing the crews of two Panzer IIIs, one Panzer IV and Tiger 131 to abandon their vehicles, despite none taking serious damage.²³⁵ Like the Tiger of the 502 the Soviets recovered from the swamps around Leningrad in January, Tiger 131 would provide the western Allies with invaluable insights into the new German tank and was instrumental in understanding the vehicles vulnerabilities. This knowledge and the 17 pounder gun would prove essential in Allied successes against the Tiger, especially in Normandy in the summer of 1944.²³⁶

The early operations of the Tiger from September 1942 to May 1943 had been generally poor in operational terms and with infrequent tactical successes. The 502 had been unable to positively impact the Germans position around Leningrad and neither the 501 nor the 504 could tip the balance back in favor of the Axis in North Africa. Their failures operationally were due partly to the shortage of Tigers, with none of three units being able to field a full *Abteilung* during this period owing to low production numbers and poor transport capability, though even full strength units would have been unlikely to fare any better, especially in North Africa where the tide had turned decisively against the Axis by the time the first Tigers of the 501 arrived. Tactically, the Tigers performed much better, with their early engagements establishing the legendary reputation of both its gun and armour. That said, these engagements also established the Tigers reputation for unreliability just as well. This period did a great deal to create and dispel much of the

²³⁵ David Fletcher, *Mr. Churchill's Tank: The British Infantry Tank Mark IV*, (Atglen: Schiffer Publishing Ltd., 1999), 112-113. Schneider, Wolfgang. *Tigers in Combat I*, 194.

²³⁶ *Tiger! The Tiger Tank: A British View*, 54.

Tigers mystique, as both the Soviets and British rapidly adapted their tactics to counter the new German heavy tank, and more importantly, in the longer term, captured Tigers spurred the development of more powerful weapons to combat these tanks.

Indeed the only thing that had not been sufficiently tested, with regards to the Tiger, was its ability to carry out its intended breakthrough role, as even in its offensive uses in North Africa, the *schwere Panzer Abteilungen* were considerably understrength and were not operating at their full potential. The true test of the Tiger in its intended role would come in July of 1943 at the famed Battle of Kursk, where the Tigers would finally be tested on the offensive, with the full might of the Wehrmacht (Armed Forces) to support them.

Chapter 5: Operation *Zitadelle*: The Tiger's Greatest Test

The initial operations of the Tigers, both in the Soviet Union and in North Africa, demonstrated the value of the vehicle in both the counter attack role, and in offensive actions with limited scope. That said, German forces were overall too weak and the Tigers too few to allow for their use in their intended breakthrough role. The Tiger would get the opportunity to perform in this role on July 5th, 1943 with the launching of Operation *Zitadelle* (Citadel) (also known as the Battle of Kursk).

Operation *Zitadelle* was designed to be the answer to the German strategic dilemma in the East in 1943. After two years of heavy fighting the Wehrmacht no longer had the strength to launch an offensive on the scale of the previous years Operation Blue, to say nothing of another Barbarossa. Nevertheless the Germans still needed to stage some kind of offensive in the East during 1943, to convince their wavering allies of the continued supremacy of German arms, and partly to buy time. Destroying the Kursk Salient would, if all went according to plan cause enough damage to the Red Army that their inevitable summer offensives would have to be delayed.²³⁷

This operation would be the only opportunity to use the Tigers en masse in their intended role. The results were decidedly mixed. While the Tigers were able to facilitate some German breaches in Soviet lines, especially when units were operating at close to full strength, the rapid accumulation of losses meant that their overall effectiveness declined rapidly. In a broader sense the Tigers were also hampered by the Germans' numerical weakness and the Soviets numerical superiority, along with the depth of their defences, which made it difficult to exploit whatever successes the Tigers were able to

²³⁷ Citino, *The Wehrmacht Retreats*, 114.

create. Not only had the Allies been able to learn how to deal with the Tiger, they had also learned how to deal with German armoured tactics more broadly, which doubly hampered the Tigers performance during the operation. Ultimately, the rapidly diminishing strength of Tiger units and general German weakness in the summer of 1943 limited the Tigers effectiveness during *Zitadelle*.

The Tigers would play an important role in the offensive, with five units of them taking part. Starting in the north, *schwere Panzer Abteilung 505* had only been activated in February and *Zitadelle* was their first major combat operation. The unit was attached to XLVII Panzer Corps, which was to spearhead Generaloberst Walter Model's attack in the north. Unlike the rest of the Tiger units, the 505 started the operation understrength, as 3.505 was still being equipped and would not arrive until July 8th.²³⁸ Turning south, Generaloberst Herman Hoth's Fourth Panzer Army would contain the largest number of Tigers across four *schwere Panzer Kompanien*. The first of these was 13.Panzer Regiment Großdeutschland (hereafter 13.Großdeutschland), attached to the Großdeutschland Panzergrenadier Division, which was assigned to XLVIII Panzer Corps. The other three were attached to the three divisions of II SS Panzer Corps. The 13.SS Panzer Regiment 1 (hereafter 13.LSSAH or 13.Leibstandarte) of the 1st SS Panzergrenadier Division, the Leibstandarte SS Adolf Hitler (Lifeguard SS Adolf Hitler), 8.SS Panzer Regiment 2 (hereafter 8.Das Reich) of the 2nd SS Panzergrenadier Division Das Reich (The Empire) and 9.SS Panzer Regiment 3 (hereafter 9.Totenkopf) of the 3rd SS Panzergrenadier Division Totenkopf (Deaths Head).²³⁹

²³⁸ Schneider, *Tigers in Combat I*, 224.

²³⁹ Schneider, *Tigers in Combat II*, ebook, 71, 183, 244, 314.

The independent companies attached to these elite divisions reflected partly their status within the Wehrmacht but also the last vestiges of Hitler's initial conception for the use of the vehicles. As discussed in the previous chapter, Hitler intended each panzer division to have a *schwere Panzer Kompanie* and while production realities made this plan unworkable these elite divisions of the Heer and the Waffen SS were still permitted to test the theory.²⁴⁰ All of these *Kompanien* had been activated at the beginning of the year and had been active in the recapture of Kharkov in March 1943, the culmination of Generalfeldmarschall (Field Marshall) Erich von Manstein's "backhand blow".²⁴¹

While the *schwere Panzer Kompanien* operating with Fourth Panzer Army had some experience, none had as much as the final unit to see combat during Zitadelle, *schwere Panzer Abteilung 503*. Unlike the other Tiger units, the 503 was not assigned to one of the principal assaulting corps. It was instead attached to III Panzer Corps in Armee-Abteilung Kempf (Army Detachment, an ad hoc formation that was larger than a corps but smaller than an army). Armee Abteilung Kempf was tasked with keeping pace with II SS Panzer Corps on its left to protect the right flank of the SS divisions as they advanced. It is this important role that would see the veterans of the 503 attached to what was otherwise the periphery of the upcoming operation.²⁴²

²⁴⁰ Lochmann, Rubbel and von Rosen, *The Combat History of the German Tiger Tank Battalion 503 in World War Two*, ebook, 20. Jentz and Doyle, *Kingtiger Heavy Tank 1942-45*, 4. Oberkommando des Heers. Oberstleutnant m.d.Führ..d.Abt.beauftr. Geh-Panzer Abteilung 503 den 12.4.43. Betr. Erfahrungsbericht für die Zeit vom 2.2-2.22 1943.NARA, T-78 Roll 620, frame 001155. Oberkommando des Heers. 114/43 Geh. 13. Kompanie (Tiger Kp.) Pz. Rgt. Großdeutschland den 27.3.43. Betr. Erfahrungsbericht über den Panzer VI (Tiger). NARA, T-78 Roll 620, frame 000992.

²⁴¹ Schneider, *Tigers in Combat II*, 67, 178, 238, 308.

²⁴² Schneider, *Tigers in Combat I*, 125.

July 5th, 1943, the opening day of Operation *Zitadelle* was a day of mixed results for the Tigers. *Schwere Panzer Abteilung 505*, attached to XLVII Panzer Corps, led Model's attack. The Abteilung acted as the spearhead for the 6th Infantry Division. The 6th Infantry breeched the Soviet line and sent the Tigers forward. During the initial advance to the Oka River they encountered the Soviet first line of defence. Among its defenders was Lieutenant Vasiliy Krysov's battery of SU-122 assault guns. His unit, the 1454th Self Propelled Artillery Regiment was part of the Red Army's growing arsenal of anti-tank weapons capable of taking on the Tiger. As discussed in the previous chapter, the 122mm M1938 (M-30) Howitzer had been identified as one of the few weapons in the Soviet arsenal capable of effectively engaging the Tiger. To improve its mobility, it was mounted on to a T-34 chassis to create an effective assault gun.²⁴³ These vehicles would disable two Tigers and while both were recovered, the action was a testament to the effectiveness of new Soviet anti-tank weapons and the dissemination of information regarding the Tiger's weaknesses across the Red Army.²⁴⁴

While the Soviets may have been better prepared to face the Tigers in 1943, *schwere Panzer Abteilung 505* continued to demonstrate their effectiveness. Once they had driven off Krysov's SU-122s with artillery and crossed the Oka River the division was attacked by waves of T-34s. Here the Tigers proved their worth, as the waves of

²⁴³ Niklas Zetterling, and Anders Frankson, *Kursk 1943: A Statistical Analysis*, (New York: Frank Cass, 2000), 69. Hill, *The Red Army and the Second World War*, 440.

²⁴⁴ Vasiliy Krysov, *Panzer Destroyer: Memoirs of a Red Army Tank Commander*, translated by Vladimir Kroupnik, edited by Stuart Britton, (Barnsley: Pen & Sword Books Ltd., 2010), ebook, 75-81. Upravlenie Komanduiushchego bronetankovimi... Krasnoi armii. Naibolee uizazvime i porazhaemie mesta nemetskogo Tanka T-VI I sposobi bor'bi s nim (Moscow: Voenizdat NKO SSSR, 1943?). TsAMO f.500.o.12480.d.145. Thanks to Dr. Alexander Hill for these Soviet materials and their translation.

T-34s were broken up by highly accurate 8.8cm rounds. Forty-two T-34s were lost and the division's subsequent advance would cause the collapse of the Soviet 15th Rifle Division. With the collapse of this division, a hole was opened on the right flank of the 70th Army. Unfortunately for the Germans, the 2nd Panzer Division was not slated to begin its attack until the next day and was not ready to exploit this opportunity.²⁴⁵ Nevertheless *schwere Panzer Abteilung 505* had been very successful. The Soviets front had been breached, forty-two Soviet tanks had been destroyed and no Tigers were lost.²⁴⁶

On the 6th, the Tigers were instrumental in defeating a Soviet counterattack, with the 107th Tank Brigade having the extreme misfortune of driving right into the them, losing forty-six of their sixty-three tanks in less than fifteen minutes.²⁴⁷ With the Soviet counterattack destroyed, the Panzers moved towards the key terrain feature in the northern part of the Kursk Salient, the Olkhovatka Heights. Once this high ground passed into German hands, the Panzers would break out onto the open plains on the way to Kursk. The initial German assault on the heights was unsuccessful and eighteen Tigers were damaged in the effort.²⁴⁸ Repeated efforts to seize the heights over the coming days would not only fail but would also exact a heavy toll on the Tigers of the 505. By the 8th, only three Tigers remained operational, leading to their withdrawal into XLVII Panzer Corps reserve until the 10th.²⁴⁹ This two-day reprieve allowed twelve tanks to rejoin the

²⁴⁵ Steven H. Newton, *Kursk: The German View: Firsthand Accounts of the German Commanders who Planned and Executed the Largest Tank Battle In History*, translated and edited by Steven H. Newton, (Cambridge: Da Capo Books, 2002), ebook., 224. Dennis Showalter, *Armor and Blood: The Battle of Kursk: The Turning Point of World War Two*, (New York: Random House, 2013), 81.

²⁴⁶ Schneider, *Tigers in Combat I*, 224.

²⁴⁷ Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 113.

²⁴⁸ Showalter, *Armor and Blood*, 91.

²⁴⁹ Showalter, *Armor and Blood*, 91-92. Schneider, *Tigers in Combat I*, 224.

unit, a testament to the skills of the *Panzerwerkstatt Kompanie*. They were also joined by the newly arrived tanks of 3.505. With these new tanks the 505 was ready to fight when Model renewed his advance on the 10th.²⁵⁰ Despite this boost in the units fighting power, the attack was not a success as the 505 lost fifteen tanks. While all of them were recovered and could be repaired, the unit was reduced to eleven vehicles, not even enough to fill out a company.²⁵¹

Model would try one more time on the 11th, but had no more success than he had the day before. To make matters worse, the Soviets had launched Operation Kutuzov, a counteroffensive thrust towards the city of Orel, north of the salient. If Orel fell, then the Ninth Army would be cut off and likely destroyed. So the northern attack of *Zitadelle* came to an end. As Model withdrew his battered Panzer divisions to meet this new Soviet threat the Tigers of the 505 remained on the defensive until 18th as they were too slow to go fend off the new Soviet offensive and were needed to hold the Germans gains, such as they were.²⁵²

The discussion of Army Group South's *schwere Panzer Kompanien* will focus on the 13.LSSAH, with mentions of the performance of the other two *schwere SS Panzer Kompanien*. This focus reflects the fact that the 13.LSSAH's performance is indicative of the successes and limitations of these units, which had experiences that broadly mirrored each other throughout the battle.

On July 5th, the three SS divisions, with their *schwere Panzer Kompanien* in the lead made good progress, though two Leibstandarte Tigers were disabled by mines. One

²⁵⁰ Schneider, *Tigers in Combat I*, 224. Showalter, *Armor and Blood*, 138.

²⁵¹ Showalter, *Armor and Blood*, 140. Schneider, *Tigers in Combat I*, 224.

²⁵² Schneider, *Tigers in Combat I*, 225. Citino, *The Wehrmacht Retreats*, 202.

of them belonged to SS Untersturmführer (Junior Assault Leader, equivalent to a Leutnant or 2nd Lieutenant) Michael Wittmann. Wittmann was an experienced tankerman, having commanded a StuG since 1941, but his actions at Kursk, and later in Normandy would turn him into a legendary Panzer commander, closely associated with the Tiger.²⁵³ Prior to the disabling of his Tiger, Wittmann and his crew had destroyed eight T-34s and had run over several anti-tank guns (This may seem like bravado but Tiger crews were encouraged to save ammunition by simply crushing anti-tank guns, rather than destroying them with high explosive ammunition).²⁵⁴ 13.LSSAH had one other Tiger disabled, which was struck in the lighter rear armour by an anti-tank gun. Das Reich had two of its Tigers disabled by mines as well, and Totenkopf suffered the most, losing five.²⁵⁵

By the 8th, the SS divisions had made good progress northwards, and then began to pivot northwest towards the railway junction at Prokhorovka, which would allow the Germans to seize the rail junction and to avoid crossing the Psel River, instead breaking out on to the open plain for the link up with Model's Ninth Army.²⁵⁶ As the SS divisions advanced, one remarkable story came out of 13.LSSAH. While the rest of the unit advanced, Tiger 1322, commanded by SS Unterscharführer (Junior Squad Leader, equivalent to an Unteroffizier or Corporal) Staudegger was moving his damaged vehicle back to the divisions rear when he encountered fifty to sixty Soviet tanks. Seventeen Soviet tanks were destroyed in the initial engagement and Staudegger accounted for five

²⁵³ Franz Kurowski, *Panzer Aces: German Tank Commanders of WWII*, translated by David Johnston, (Mechanicsburg: Stackpole Books, 2004), 662.

²⁵⁴ Lloyd Clark, *Kursk: The Greatest Battle, Eastern Front 1943*, (London: Headline Review, 2011), 241. Carruthers, *Hitler's War Machine: Tiger I Official Wartime Crew Manual (The Tigerfibel)*, ebook, 265.

²⁵⁵ Schneider, *Tigers in Combat II*, 183-184, 244, 314.

²⁵⁶ Newton, *Kursk: The German View*, 158-161.

more when they regrouped and attacked again. After being thoroughly mauled by the lone German tank, the surviving Soviets beat a hasty retreat.²⁵⁷ He would subsequently be awarded the Knights Cross for this action.²⁵⁸

On the eve of the 12th, the LSSAH had arrived at Prokhorovka, but it and its fellow Panzergrenadier divisions were badly worn out, with most of their *schwere Panzer Kompanien* being in particularly poor shape. Totenkopf, holding the Corps left flank over the Psel River was in the best condition, with eleven Tigers still operational, which reflected a particularly efficient *Panzerwerkstatt Zug* given that on the 9th, only one Tiger had been operational.²⁵⁹ In the centre, the Leibstandarte had only four Tigers left operational.²⁶⁰ On the right, Das Reich had no Tigers operational at all, having had one tank destroyed the previous day and the rest being disabled by mines and enemy fire.²⁶¹ On the 12th, the Soviets launched a massive counterattack, which struck the SS Panzer Corps dead centre, in the frontline of the Leibstandarte, outside Prokhorovka.²⁶²

The battle that followed the Soviet counterattack, spearheaded by Lieutenant General Pavel Rotmistrov's 5th Guards Tank Army, has gone down in history as one of the greatest tank battles of all time with Soviet and German tanks meeting in a close quarters death match. At the end of this dramatic battle the price to the Soviets had been high with over two hundred tanks lost, but the Germans had suffered a serious defeat,

²⁵⁷ Schneider, *Tigers in Combat II*, 185.

²⁵⁸ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 116-117.

²⁵⁹ Schneider, *Tigers in Combat II*, 315.

²⁶⁰ Ibid, 186.

²⁶¹ Ibid, 245.

²⁶² Valeriy Zamulin, *The Battle of Kursk: Controversial & Neglected Aspects*, translated and edited by Stuart Britton, (West Midlands: Helion & Company Limited, 2017), 294.

with 400 German tanks destroyed, including seventy Tigers, at least according to Rotmistrov.²⁶³ Rotmistrov's account, which would become the definitive Soviet narrative of the battle was almost entirely incorrect. As stated earlier the Leibstandarte had only four operational Tigers and it must be said that there were only fifty-six Tigers in the Fourth Panzer Army's divisions when the operation began. The entire story was a cover up, a very effective one to hide Rotmistrov's failures.²⁶⁴

Rather than an epic clash of armour on the steppe, Prokhorovka instead resembled a twentieth-century Charge of the Light Brigade. The counterattack had been hastily planned and the emphasis that the Soviets had placed on secrecy meant that Rotmistrov and his staff lacked accurate maps of the area. Consequently, the majority of his tanks were left to drive across an open plain towards a massive anti-tank ditch, over which there was just one bridge.²⁶⁵ On the other side sat most of the anti-tank guns of the Leibstandarte. Leutnant Rudolf von Ribbentrop, a Panzer IV commander witnessed the 5th Guards Tank Army's advance: "Burning T-34's ran into and over each other. It was a total inferno of fire and smoke, and impacting shells and explosions. T-34s blazed, while the wounded tried to crawl away to the side. The entire slope was soon littered with burning enemy tanks".²⁶⁶

While the bulk of Rotmistrov's forces were being destroyed by the anti-tank guns of the Leibstandarte, the Tigers were employed on the divisions left flank. The four Tigers, commanded by Wittmann, covered the October State Farm. Arrayed against them

²⁶³ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 131.

²⁶⁴ Hill, *The Red Army and the Second World War*, 452-453.

²⁶⁵ Showalter, *Armor and Blood*, 200-203.

²⁶⁶ Kurowski, *Panzer Aces*, 365.

were 100 Soviet tanks. At long range the 8.8cm rounds made short work of the Soviets, but they pressed on regardless and the fight became a close range melee.²⁶⁷ Wittmann's tank was struck twice but suffered no lasting damage.²⁶⁸

The 13. LSSAH's defence of the October State Farm would become a key component of Wittmann's legacy as a great tank ace. He and his Tigers accounted for many of the estimated 340 Soviet tanks destroyed on the 12th of July, while only losing one Tiger.²⁶⁹ The losses for the rest of the division were similarly low, with only seven vehicles lost.²⁷⁰ While the battle had been a crushing defeat for the Soviets, the intense fighting had still taken a toll on the Leibstandarte, and the loss of both men and material were worsened by the fact that they came after eleven days of constant combat. So while Generalfeldmarschall Erich von Manstein, who as Army Group South's commander oversaw Fourth Panzer Army rejoiced, believing that the Soviets were nearly broken, Hoth was more cautious, recognizing that the divisions which had been at the sharp end of the offensive were nearly spent and with the ending of Model's attack in the north to counter Operation Kutuzov there was little point in continuing the advance, especially with exhausted divisions.²⁷¹

The experiences of the independent *schwere Panzer Kompanien* of Großdeutschland and the three Waffen SS divisions did not provide the concept of divisional heavy tank companies with any vindication. With only fourteen Tigers, each

²⁶⁷ Showalter, *Armor and Blood*, 210-211.

²⁶⁸ Kurowski, *Panzer Aces I*, 618.

²⁶⁹ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 131.

²⁷⁰ Hill, *The Red Army and the Second World War*, 452-453. Zamulin, *The Battle of Kursk: Controversial & Neglected Aspects*, 278, 294.

²⁷¹ Showalter, *Armor and Blood* 219-220. Newton, *Kursk: The German View*, ebook, 182

company could ill afford losses, even if they were only temporary, as they had serious effects on their fighting power. It was this rapid accumulation of losses, combined with the logistical difficulties inherent in supplying the unique needs of the Tigers and with the rest of the Panzers in a normal Panzer Regiment that led to the disbanding of the SS and Großdeutschland *schwere Panzer Kompanien* in the months following Kursk.²⁷² They would become the nucleus of several new *schwere Panzer Abteilungen*.

13.Großdeutschland became the *III.Abteilung Panzer Regiment Großdeutschland* in August 1943.²⁷³ 13.LSSAH and 8.Das Reich became part of *schwere SS Panzer Abteilung 101* and *schwere SS Panzer Abteilung 102* respectively. While many of the men from these *Kompanien* helped to form these units, in the summer of 1943 the *Kompanien* themselves remained at the front until April 1944, at the end of the Soviet offensives which began after Kursk.²⁷⁴ The only exception was 9.Totenkopf, which retained its Tigers until the end of the war, though whether this was because of Henrich Himmler's particular fondness for the division, or as a final attempt to try the *schwere Panzer Kompanie* concept remains unclear.²⁷⁵

The final group of Tigers to see combat during Zitadelle were those of *schwere Panzer Abteilung 503*, attached to *Armee Abteilung Kempf*. While *schwere Panzer Abteilung 505* was deployed as a complete battalion, the 503 was broken up, with each *Kompanie* being assigned to one of the three Panzer Divisions of III Panzer Corps. 1.503 was assigned to the 6th Panzer Division, 2.503 to the 19th Panzer Division and 3.503 to

²⁷² Wilbeck, *Sledgehammers*, 23-24. Oberkommando des Heers. Der Generalinspekteur der Panzertruppen Ia Org. Nr.1000/43 geh. den 14.5.43. Betr. Einsatz von "Tiger"-Einheiten. NARA, T-78 Roll 620, frame 001005.

²⁷³ Schneider, *Tigers in Combat II*, 77.

²⁷⁴ Ibid, 207, 261, 404, 510.

²⁷⁵ Ibid, 15.

the 7th Panzer Division.²⁷⁶ General der Panzertruppen Werner Kempf, who lent his name to the *Armee Abteilung*, ordered this dispersion of the *Abteilung*. This decision ensured that each of III Panzer Corps leading Panzer divisions had their own force of Tigers to help them breakthrough the Soviet lines. His decision was not popular with Hauptmann Clemens Graf Kageneck, the commander of *schwere Panzer Abteilung 503* however. He felt that this deployment of his unit violated “Guderian’s maxim of klotzen, nicht kleckern [Boot’em, don’t splatter’em]”, which called for the massing of armour, not its dispersion.²⁷⁷ His immediate superior, General der Panzertruppen Hermann Breith, commanding III Panzer Corps agreed but it would be several days before the *Abteilung* was reunified, so the *Kompanien* began the offensive independently.²⁷⁸

The initial employment of the 503 did not go well and was fraught with problems, which were compounded by the fact that III Panzer Corps would have to cross the Donets River before they could even begin their offensive in earnest. Destroyed bridges and unmarked German minefields would cost the *Abteilung* nine vehicles before they could even begin to assist the divisions of III Panzer Corps.²⁷⁹

From the 6th to the 11th, when the *Kompanien* of the *Abteilung* were finally reunited, III Panzer Corps continued to advance, though their advance proved to be much slower than that of II SS Panzer Corps, which was problematic since the task of the

²⁷⁶ Schneider, *Tigers in Combat I*, 125.

²⁷⁷ Lochmann, Rubbel and von Rosen, *The Combat History of the German Tiger Tank Battalion 503 in World War Two*, 283.

²⁷⁸ Oberkommando des Heers. Ia Nr. 1549/43 geh. Der Kommandierende General des III. Panzerkorps den 21.7.43. Betr. Auf Grund der Erfahrungen bei der letzten Kämpfen gebe ich folgende Hinweise für die Zusammenarbeit der Tiger mit anderen Waffen. NARA, T-78 Roll 620, frame 000919. Lochmann, Rubbel and von Rosen, *The Combat History of the German Tiger Tank Battalion 503 in World War Two*, 283.

²⁷⁹ Lochmann, Rubbel and von Rosen, *The Combat History of the German Tiger Tank Battalion 503 in World War Two*, 243.

Armee Abteilung was to protect the corps right flank. During this time 1.503 and 3.503, serving with the 6th and 7th Panzer Divisions respectively, were able to effectively aid these divisions, despite their own losses, including the reduction of 1.503 to just four operational Tigers on the 8th. It is important to note however that the 19th Panzer Division which lacked the support of the 2.503 after its heavy losses on the 5th, did not perform markedly worse than its Tiger supported comrades. Part of this fairly even performance - regardless of the presence of Tigers - was due to the extensive Soviet defences, which made any kind of rapid progress difficult to achieve. It also reflects the limitations of Tiger support, especially when the vehicles were available in such small numbers, which made it difficult for them to have a decisive impact.²⁸⁰

On the 11th, the 503 could call upon twenty-two Tigers, which was fortunate, because III Panzer Corps desperately needed them. III Panzer Corps was still expected to link up with II SS Panzer Corps, now approaching Prokhorovka, to either continue the offensive, or, as seemed more likely, to at least encircle and destroy a number of Soviet formations between the two corps. For the attack, the Tigers would be in the lead, assisting the forty remaining Panzers of the 6th Panzer Division. Sixty-two tanks was not much, especially in an operation like *Zitadelle* but the opposing 69th Army had no remaining tanks of their own, which helped to even the odds. While the 6th Panzer took the lead in the centre, the 19th and 7th Panzer would support on the left and right flanks respectively.²⁸¹

Here the 503 demonstrated what concentrated Tigers could do. They smashed through the Soviets front line and pressed on. The opposing 35th Guards Rifle Corps

²⁸⁰ Schneider, *Tigers in Combat I*, 125. Showalter, *Armor and Blood*, 124, 134, 147.

²⁸¹ Showalter, *Armor and Blood*, 185. Schneider, *Tigers in Combat I*, 125..

cracked, allowing the 7th Panzer Division and their eleven tanks to press on as well. With the Soviets yielding for a change, the Tigers reached the village of Olkhovatka (no relation to the Olkhovatka heights encountered by the Ninth Army further north), with only minimal resistance. By nightfall, the Soviets resistance had once again stiffened, but the 6th Panzer Division and the accompanying Tigers had reached the village of Kazache, the centre of 69th Army's second line of defence. The eleven kilometer advance was the corps best in the whole operation and demonstrated once again that Guderian was right, "*Klotzen, nicht Kleckern*" was the best way to employ tanks. With the success of their operations on the 11th, III Panzer Corps was, for the first time since *Zitadelle* began, poised to link up with II SS Panzer Corps and encircle the Sixty Ninth Army.²⁸² While a daring night time advance by Major Franz Bäke, would secure a bridgehead over the Donets, the Tigers were unable to cross and III Panzer Corps was unable to link up with the SS Panzer Corps on the 12th.²⁸³

July 12th would for all intents and purposes be the end of *Zitadelle*. Model had just ended his attack to counter Operation Kutuzov and Hoth's Fourth Panzer Army lacked the strength to renew the offensive. To make matters worse the Allies would launch Operation Husky, the invasion of Sicily on the 13th, necessitating the withdrawal of units from the east to counter this new Allied front.²⁸⁴ So *Zitadelle* ended in defeat. Eleven days of grinding combat under the hot July sun had left the Germans with little to show for their efforts. The Kursk Salient was still present and the Soviets 177, 847 casualties, while significant, were by no means sufficient to delay the coming Soviet

²⁸² Showalter, *Armor and Blood*, 186.

²⁸³ Kurowski, *Panzer Aces*, 118-121. Showalter, *Armor and Blood*, 188-192.

²⁸⁴ Citino, *The Wehrmacht Retreats*, 138.

offensives, despite the commitment of substantial reserves as the launching of Operation Kutuzov on the 12th showed.²⁸⁵ For the Tigers, the results were more mixed. Once again the armour and armament had demonstrated their superiority, with even Staudegger's lone damaged Tiger proving to be more than a match for sixty Soviet tanks. It had also been a triumph for the vehicles survivability, with only ten of the 146 Tigers employed being lost.²⁸⁶ Praise must also given to the units mechanics for the rapid return of damaged vehicles, though the rapid depletion of operational vehicles spoke to both the Tigers underlying unreliability and the immense concentration of firepower employed by the Soviets.

In broader terms, *Zitadelle* did allow the Tigers to perform in their intended role but they found little success in it. This lack of success can be traced back, at least in part to the failure of the *Zitadelle* plan itself. The Germans did not have the numbers to breakthrough the Soviet's stout defences and instead engaged in a battle of attrition they simply could not win.²⁸⁷ That said the Tigers themselves did not perform well in their intended role either. The poor operational readiness of the Tiger, resulting in units routinely operating at less than half strength denied them the numbers to be able to affect any kind of break through. Even when they had sufficient numbers, as the 505 did on the 5th and the 503 did on the 11th, the units that were to exploit the Tiger's break in were either not yet ready or lacked the strength to conduct the rapid breakouts of years past. As

²⁸⁵ Karl- Heinz Frieser, Klaus Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 153. Hill, *The Red Army and the Second World War*, 454.

²⁸⁶ Schneider, *Tigers in Combat I*, 187,263. Schneider, *Tigers in Combat II*, ebook, 71-74, 223, 302, 395.

²⁸⁷ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 85.

a report from the 16th Panzergrenadier Division stated, “As a result of propaganda, the Tiger was presented as an invincible battering ram. Sadly, that is not correct”.²⁸⁸ The Tigers were not only not as powerful as they had been advertised but also the Allies anti-tank capabilities were ever improving, giving further lie to the Tigers invincibility. While there had been few weapons available in the fall of 1942 that could reliably penetrate the Tiger’s armour, especially from the front, by 1943 the Allies had identified a number of weapons that could destroy Tigers and were adding ever more to their inventories. Also the greater depth of Allied defences, taken to an extreme at Kursk, provided ample opportunities to exploit the known weaknesses of the Tiger, such as flank attacks against its weaker side armour, further increasing casualties and reducing their overall effectiveness. The rapid decline in a Tiger unit’s fighting power, combined with German weaknesses generally, in the context of the Allies’ growing anti-tank capability, and their material and numerical superiority ensured that the Tiger could never be truly successful in its intended role. Instead they became part of a new operational reality where “there was no position the Germans could defend, no line they could maintain, if the Red Army was willing to pay the price of taking it or breaking it”.²⁸⁹ In this new reality, the Tigers could only increase the price the Allies would pay for victory, but that price would never be high enough to tip the balance back in the Germans favor.

²⁸⁸Oberkommando des Heers. Ia Nr.783/43 Geh. Kommandeur 16th Panzergrenadier Division den 4.10.43. Betr. Zusammenarbeit mi Tiger-Panzern. T-78, Roll 620, frame 000836.

²⁸⁹ Showalter, *Armor and Blood*, 271.

Chapter 6: The Corset Stays:

The Tigers on the Defensive in the East 1943-1944.

After the failure of Operation *Zitadelle*, the Germans were forced on the defensive as the Soviets pushed them back towards the Reich itself. In this period of defensive fighting, the Panzer divisions deployed in the East saw heavy use, both in their intended offensive role, counter attacking against Soviet penetrations, but also in defensive roles for which they were ill suited. The *schwere Panzer Abteilungen* likewise found themselves torn between their traditional defensive role as force multipliers for counterattacks and a new role as ‘*Korsettstange*’ (Corset Stays). ‘*Korsettstange*’ referred to the fact, that in many areas where German defenders were stretched perilously thin, only the Tigers held the line together. However, the Tigers did have some successes against long odds but these were eclipsed by the fact that these operations stretched the already mechanically unreliable vehicles to their limits, meaning that the limited number of Tigers were overstretched and as such proved to be unable to overcome the Soviets numerical superiority.

To best analyze this tumultuous period, the initial focus will be on a series of large-scale operations involving *schwere Panzer Abteilungen*, the defense of Kiev in November and December 1943, which involved *schwere Panzer Abteilung 509* as well two *schwere SS Panzer Kompanien*, the 13.Leibstandarte and 8.Das Reich. These operations would see an interesting mixture of good and bad employment of both Panzers in general and the Tigers in particular, providing a valuable look at some of the pressures the Germans were operating under. These large scale operations will be examined in conjunction with small-scale operations by *schwere Abteilung 502*, with additional

insight provided by events described by Leutnant Otto Carius, who served with 2.502 from July 1943 to July 1944. His memoir, *Tigers in the Mud: The Combat Career of German Panzer Commander Otto Carius*, provides a useful look at the successes and failures that Tigers encountered at a local level. Examining the 502 in detail will expose some of their successes in their defensive role and well as well as providing an excellent look at their weaknesses both tactically and operationally.

Following the failure of *Zitadelle*, in July 1943, the Soviets launched a series of offensives across the length of the Eastern Front. Germany's capacity to withstand this succession of blows was already poor owing to the heavy losses incurred over the previous two years, but the concentration of mobile formations for *Zitadelle* had further weakened the Germans ability to turn back Soviet advances by concentrating those forces in the Kursk Salient, rather than positioning them across the front to parry Soviet attacks. While the Soviets would spare no Army Group from their attentions in this period, they concentrated initially on the destruction of the Army Group South, and the liberation of the resources of the Ukraine. The Soviets attacked with overwhelming force and by September, the Army Group was retreating to the Dnieper.²⁹⁰

In the midst of this chaotic period the Germans would fight a series of battles in an attempt to hold on to Kiev. Their efforts, and the efforts of the Tigers sent to aid in the city's defense would demonstrate that the demands of defensive fighting at this stage of the war would often lead to poor employment of armour. By the end of September 1943, Army Group South had stabilized their line on the western bank of the Dnieper, though

²⁹⁰ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 343.

the Soviets had a number of bridgeheads over the river, which negated its effectiveness as a defensive barrier. One of these bridgeheads, the Lyutezh Bridgehead, north of Kiev would become crucial in the battle for the city once the Soviets launched their offensive on the 1st of November. The strength of the two opposing armies offered a good look at their overall status after the events of the summer. The Soviets 1st Ukrainian Front could call upon 671,000 men, supported by 650 tanks. By contrast the Germans had four understrength infantry divisions and the 8th Panzer Division, which had a grand total of fourteen tanks. Despite their weakness, the Germans were able to keep the Soviets from taking the city until the 6th.²⁹¹

Hitler was most displeased at the loss of the Ukrainian capital and ordered General der Panzertruppen Erhard Raus, newly installed commander of the Fourth Panzer Army, to retake the city. Initially the odds seemed to be tipping back in the Germans favor. The newly refitted 1st Panzer Division and the Leibstandarte (including the full strength *13.Kompaine*) were rushed in. Joining them was the newly raised 25th Panzer Division and *schwere Panzer Abteilung 509*, which had only finished its final inspection on October 17th.²⁹² This was a potent force with 588 tanks, including 172 Panthers and 72 Tigers.²⁹³

The plan was for another “backhand blow”, striking the open western flank of the 1st Ukrainian Front, enveloping their rear north of Zhitomir, ending the Soviets offensive

²⁹¹ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 362-366. Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 188-189.

²⁹² Schneider, *Tigers in Combat I*, 345.

²⁹³ Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 189-190.

efforts and allowing for the recapture of Kiev.²⁹⁴ Unfortunately for the Germans, the plan was undermined by Clausewitzian friction before it could begin. The transport of the new Panzer divisions was hampered by Soviet partisans which left them arriving piecemeal, and often arriving at different railway stations, making it difficult to construct any coherent attacking forces. Also the Soviets had not yet halted their operations and continued to attack throughout the first weeks of November, threatening Zhitomir (which would fall on the 13th), and threatening to overrun the Germans assembly area.²⁹⁵

To prevent this, Raus employed Das Reich (Unlike the Leibstandarte it had not been refitted and mustered just 33 tanks, including five Tigers), Kampfgruppe von Wechmar of the 25th Panzer Division and elements of *schwere Panzer Abteilung 509* to attack the Soviets spearheads south of Fastov on the 9th. The deployment of the 509 is emblematic of the chaotic transport situation created by Soviet partisans with only the 2.509 and 3.509 arriving in time for operations, but lacking logistical support. The *Kompanien* were also split between the two attacking divisions, with the 2.509 attached to Kampfgruppe von Wechmar and the 3.509 attached to Das Reich.²⁹⁶ The entire effort, a hastily planned attack using whatever was available, was not a recipe for success.

By the time the attack finished on the 13th, the Germans had little to show for their efforts. They claimed to have destroyed over thirty Soviet tanks but they had done little to blunt the Soviets offensive. Things were particularly bad for the Tigers of the 509. Their attacks on the 10th, which were poorly supported by infantry, especially by Kampfgruppe von Wechmar, resulted in the destruction of six Tigers, two destroyed by their crews as

²⁹⁴ von Manstein, *Lost Victories*, 488. Raus, *Panzer Operations*, ebook, 531-532.

²⁹⁵ Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 190.

²⁹⁶ Schneider, *Tigers in Combat I*, 345-346.

being unrecoverable but the rest were lost to Soviet fire, a grim introduction for the unit to the effectiveness of Soviet anti-tank weapons at the end of 1943.²⁹⁷ The Tigers of Das Reich's 8.*Kompanie* fared better, losing only one vehicle, but since it had been in combat almost constantly since *Zitadelle* in July, it was only able to field an average of five Tigers a day, giving the *Kompanie* little with which to aid the division.²⁹⁸ Wolfgang Schneider summed up the effort well, stating "This dispersed and overly hasty action brings the penetration to Fastov to a halt, ultimately achieving nothing!"²⁹⁹

The Germans were already off to a poor start and then things got worse. A Soviet thrust from the west captured the vital rail junction at Zhitomir on the 13th. In response, the counterattack was revised. It would no longer be a "backhand blow" to deliver a serious defeat to the 1st Ukrainian Front but instead was to be a more modest effort to retake Zhitomir and Fastov, launched on November 15th. The Leibstandarte would thrust north towards Brusilov to cover the advance of the 1st and 7th Panzer Divisions, which would retake Zhitomir. In the mean time the 19th Panzer Division would encircle Soviet forces in Brusilov while the 25th Panzer and Das Reich covered the German's right flank. By the time the operation was completed on the 26th, the Germans had obtained a modest victory. Zhitomir had been recaptured and a modest encirclement had been completed at Brusilov. The Germans would claim to have killed 3,000 Soviets and destroyed 153 tanks in the pocket but the bulk of the Soviet forces in the area were able to escape, meaning

²⁹⁷ Schneider, *Tigers in Combat I*, 346.

²⁹⁸ Schneider, *Tigers in Combat II*, ebook, 249-250. Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 370.

²⁹⁹ Schneider, *Tigers in Combat I*, 346.

that the Germans had achieved relatively little, especially given the enormous effort expended.³⁰⁰

The performance of the Tiger units in this operation mirrored that of the larger Panzer divisions. The 509 had been attached to the 25th Panzer Division, guarding the Germans right flank. Flank support was a odd role to give to breakthrough tanks. With the Tigers being better suited to attachment to one of the attacking divisions, but their role in this operation did not only reflect poor use of the vehicles, it also reflected the need to support the inexperienced, and already badly mauled 25th Panzer Division. In this role the Tigers were fairly successful, supporting the capture of several villages to help stabilize the divisions front from the 21st-24th. These successes were overshadowed by the heavy casualties suffered by the *Abteilung*. On the 21st the 509 could call upon seventeen Tigers, but by the 24th, only seven were still operational. While none of these vehicles were total losses, it was nevertheless another example of operations where the gains in no way justified the effort expended.³⁰¹

The *schwere SS Panzer Kompanien* fared better than their Heer counterpart but not by much. 8.Das Reich, which like the 509 was deployed to the right flank of the operation had no noteworthy successes but did see three tanks destroyed, a serious blow to the small and already understrength *Kompanie*.³⁰² The 13.L Leibstandarte, being deployed alongside its parent division in the offensive role for which the Tigers were designed, fared better. Over the course of the operation, the Tigers remained at the forefront of the divisions operations and were very successful, claiming the destruction of

³⁰⁰ Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 191-192.

³⁰¹ Schneider, *Tigers in Combat I*, 346.

³⁰² Schneider, *Tigers in Combat II*, ebook, 252.

over fifty T-34s and a similar number of anti-tank guns with no losses of their own.

While their claims are difficult to verify, it is clear that the *Kompanie* performed well in the thick of the fighting, a stark contrast to the units fighting on the periphery of the German effort, which indicates that the Tiger's specialized nature did not lend itself well to actions outside of its intended roles.³⁰³

There would be two more modest encirclements in December, at Radomyschyl and Meleni, but like Brusilov before it, these victories were minor and could do little to disguise the fact that the Germans had utterly failed to recapture Kiev. A renewed Soviet offensive, launched on Christmas Eve put an end to any further efforts to recapture the city as the Germans were forced to abandon everything they had fought to regain by the end of the year.³⁰⁴ These operations had demonstrated that while the Germans still had many tactical advantages, which enabled them to outmaneuver and encircle their foes several times, they lacked the strength to achieve their overall objectives.³⁰⁵

The operations around Kiev also demonstrated many of the ways in which Panzer doctrine had been compromised in this defensive fighting. These deviations were outlined well by Heinz Guderian, in his role as the *Generalinspekteur der Panzertruppen* (General Inspector of Armoured Troops) in the first issue of the *Nachrichtenblatt der Panzertruppen* (Panzer Troop's News Bulletin), published on July 15th, 1943. While this issue was published just after the failure of *Zitadelle*, its commentary would remain applicable to German operations in the East throughout the next year. In his view the fundamental principles that had governed the use of the Panzer were still completely

³⁰³ Schneider, *Tigers in Combat II*, ebook, 193-194.

³⁰⁴ Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 193-194.

³⁰⁵ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 371.

sound. Concentrated use of Panzers, well supported by other arms would continue to produce victory. The main issue at the tactical level was not so much German material weakness, though he would admit that it was a problem. Instead the main issue on the ground was that the Panzers had been often poorly used, being used without adequate support from other arms and in small numbers, including use as “bunkers in the front line”. They had also been employed without time provided in between operations for proper maintenance.³⁰⁶

Guderian’s views were generally correct. Well-supported Panzer divisions could still deliver victory and would do so at the tactical level until the end of the war as subsequent chapters will show. It was also true that poor cooperation and a lack of planning were present, especially in the Germans initial operations around Fastov in November, with both factors playing important roles in that operation’s failure. He did however, underrate the importance of Germany’s material weakness, which rendered any victories fleeting in the face of the Soviets material superiority. It also must be said that Guderian’s complaints were not entirely applicable to the fighting around Kiev. The use of tanks in small numbers and as bunkers in the front line were not present in the battles around Kiev, as most of the units (Tigers and others) were at full strength and were not being deployed in defensive roles, instead being used in highly mobile operations, with the Germans often launching powerful counterattacks with full divisions. In the more traditional defensive operations of *schwere Panzer Abteilung 502* and Otto Carius, where only small numbers of Panzers could be mobilized at any given time, that Guderian’s

³⁰⁶ Oberkommando des Heers. Nachrichtenblatt der Panzertruppen Nr.1 g.15.7.43. TsAMO f.500.o.12473.d.197.

complaints about the Panzers defensive deployments and the limitations of the Panzers and the Tigers in particular would become clearer.

By the summer of 1943, Army Group North was a badly depleted force, especially since *Zitadelle* had stripped away virtually all of their mobile formations, leading to an army group that resembled an army of 1917 more than 1943, with its horse drawn transport and foot sore infantry. Only *schwere Panzer Abteilung 502* remained to provide the Germans with the mobile firepower that was supposed to be the hallmark of the Heer. In the previous year the 502 had done a great deal to help hold the line, though they could not prevent the Soviets from securing a land route into the besieged city of Leningrad in January.³⁰⁷ Regardless of its performance, the forty-five Tigers of the *Abteilung* were pitifully few, given that the Germans had a 750 kilometer front to man.³⁰⁸

During the summer and fall of 1943, the Tigers of the 502 were repeatedly employed in small numbers to beat back Soviet incursions across the Army Group's frontage. In this effort the Tigers were successful, repeatedly repealing the Soviets and restoring the Germans front line. This success did come at a high mechanical cost as the dispersed nature of the unit made routine maintenance difficult. On August 10th, in the midst of the 3rd Battle of Lake Lagoda, thirteen Tigers were ready for combat. Ten days later only six could be called upon. In that month of fighting the *Abteilung* had performed well. Only three Tigers had been destroyed, a far cry from the over one hundred Soviet tanks the unit claimed to have destroyed. Nevertheless, the mechanical cost had been

³⁰⁷ Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 69-70.

³⁰⁸ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 275.

high and by the time the Soviets attacked again on October 6th, the Abteilung was a little over half strength, with only twenty-six operational Tigers.³⁰⁹

The scattered deployment of the Tigers of the 502 during the summer and fall of 1943 amidst further Soviet offensives reflected the weakness of Army Group North extremely well. While the Tigers had been successful in their defensive efforts, the manner in which they had been deployed was something against which the *Abteilung* vigorously protested. In one report from *schwere Panzer Abteilung 502, Points for Panzer Employment* from 1943, they repeated Guderian's mantra, "Klotzen, nicht Kleckern", stating, "Only the massed use of tanks brings success".³¹⁰

This report was also critical of the decision to employ the Tigers directly on the front line, rather than retaining them in the rear for use in counterattacks or to halt enemy penetrations. While the Tigers could and did perform this task fairly well, it also exposed them to the full weight of enemy fire. This had the effect of endangering the supporting infantry, who inevitably suffered for being near the fire- drawing tanks. It also contributed to the high maintenance losses, both as a result of enemy fire but also because these deployments made it more difficult to withdraw them to complete regular maintenance tasks.³¹¹ *Schwere Panzer Abteilung 506*, serving with Army Group South, lamented in a similar vein that "the Grenadiers [infantry] were too weak, completely worn out".³¹² Like the 502, the 506 chafed under its new role, declaring "It is

³⁰⁹ Schneider, *Tigers in Combat I*, 77.

³¹⁰ Oberkommando des Heers.s.Pz.Abt.502. *Merkmale für den Panzereinsatz*. NARA. T-78, Roll 203, frame 147056.

³¹¹ Ibid.

³¹² Oberkommando des Heers. s.Panzer. Abteilung 506 Abt.Gef.St. den 15.1.44. Betr. Erfahrungsbericht der Tiger Abteilung 506. T-78, Roll 620, 000235.

unacceptable that the Tigers have to stand constantly behind the front lines as moral support”.³¹³

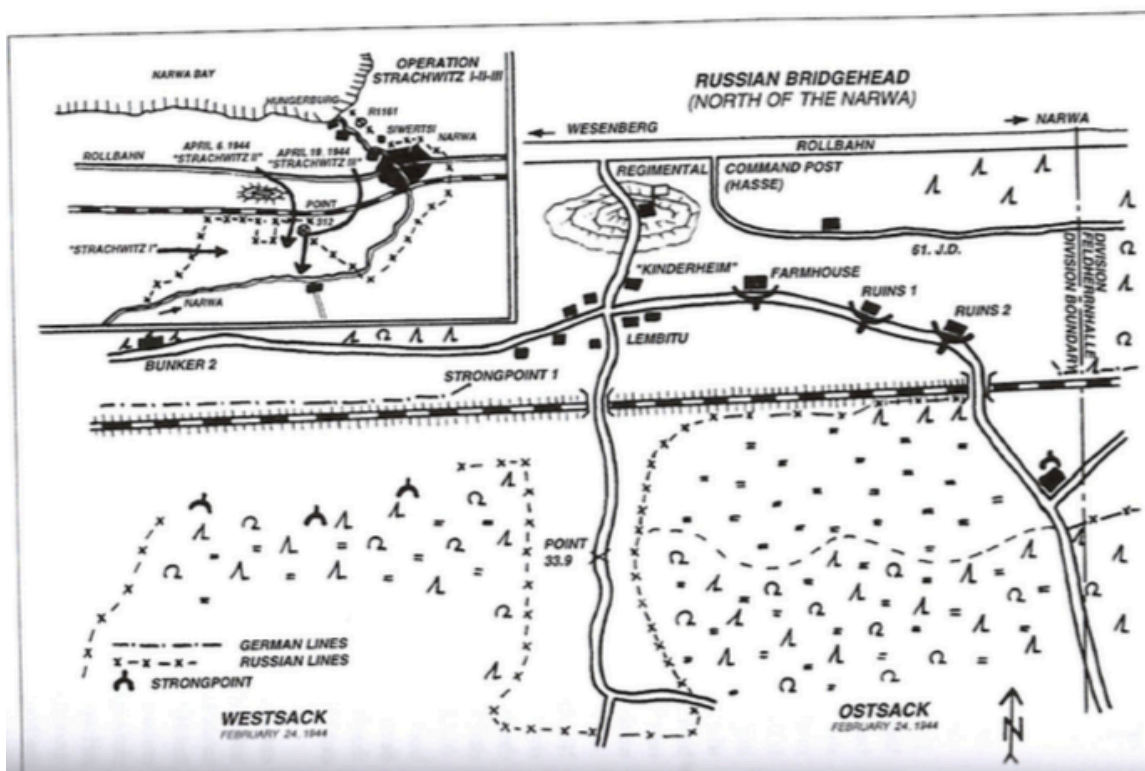
While the *schwere Panzer Abteilungen* despised their new role, both for being contrary to doctrine and an exceptional drain on their vehicles, other Panzer units demonstrated a better understanding of the overall situation. The *Use of Tanks in the Main Line of Resistance to Support the Infantry* from the 25th Panzer Division, makes the same points as the documents from the *schwere Panzer Abteilungen*, with one noteworthy exception. While they implied that the poor employment of their Tigers reflected general ignorance of their intended use, the 25th Panzer Division was willing to acknowledge that while the current employment of Panzers was very poor and prevented them from being used to the best of their ability, this was not the result of ignorant infantrymen, but rather a sign of the times. It freely acknowledges that the infantry had, and were continuing to bear the brunt of the defensive fighting in the East, leaving units badly understrength. Consequently, the Panzers had to be employed to fill the gaps left by infantry units that lacked the strength to fully defend their positions, regardless of their preferences.³¹⁴

In 1944, the Army Group continued its retreat, with its frontline centered around the two towns of Luga and Narva in January 1944. On February 1st, the Soviets gained several bridgeheads over the Luga River, and by the 13th, despite determined German resistance, the town of Luga fell. While this was a disaster, so long as Narva remained in German hands, the Army Group could hold on. As benefited its reputation as the Army

³¹³ Oberkommando des Heers. s.Panzer. Abteilung 506 Abt.Gef.St. den 15.1.44. Betr. Erfahrungsbericht der Tiger Abteilung 506. T-78, Roll 620, 000236.

³¹⁴ Oberkommando des Heers. Major, 25.Pz.Div. Einsatz von Panzern in dem HKL zur Unterstützung der Infanterie. NARA, T-78, Roll 203, frame 147052.

Group's main defensive stalwart, the 502 was transferred to Narva.³¹⁵ The fighting around Narva in March and April 1944 took place during a period of relative quiet for Army Group North as a whole, as the Soviets were preparing to renew their offensive in July.³¹⁶ The local fighting that occurred in this time of "quiet" provided sometimes dramatic examples of the successes that small numbers of well-handled Tigers could achieve, when adequately supported. It was here the limitations of the Tiger, and the Heer in the East were most starkly revealed, even before the Germans were struck again in July 1944.



Map of the Narva [Narva] "Sacks" (Otto Carius, *Tigers in the Mud*, 62).

³¹⁵ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944*, 201.

³¹⁶ Ibid, 292.

The area where Carius and 2.502 fought was one where the Soviet's 59th Army had obtained a bridgehead over the Narva near the village of Lembitu. While the Germans held the *Rollbahn* (The main supply road) that led to Narva itself, and the major north-south trail that linked to it, the Soviets dominated the areas to the east and the west of this trail. This created what became known both officially and unofficially as the west and east “sacks”, on either side of the trail. These Soviet positions provided bases from which to encircle and destroy the local German defenders and drive on to Narva. It would fall to the Tigers to play a major role in both defeating Soviet thrusts from the two “sacks” and reducing them in turn in March 1944.³¹⁷

The nature of the Narva Sacks forced the Tigers back into the role of ‘*Korsettstange*’. As corset stays, they were once again the main force holding the German front line in the area. Their first time back in this role came on March 17th, 1944 when the Soviets launched their first major attack from the “east sack”. The Soviet preliminary barrage had a devastating effect on the German defenders and the infantry were routed even before the barrage had stopped, a clear indicator of their poor morale. After the barrage lifted, Carius and two other Tigers alone manned the front line. While they claimed to have destroyed sixteen T-34s, the Soviets were still able to occupy the two eastern strong points had anchored the German line.³¹⁸

Since the captured strongpoints allowed the Soviets to dominate the far side of the railway embankment and offering a good jumping off point for an attack on the *Rollbahn*, they had to be retaken. The counterattack was to be a pre-dawn assault, but with force of three Tigers and just sixteen infantry, it was an operation with little room for error, and

³¹⁷ Carius, *Tigers in the Mud*, 63.

³¹⁸ Schneider, *Tigers in Combat I*, 80. Carius, *Tigers in the Mud*, 84-88.

one that could not be said to be well supported by any metric. The western ruin was quickly retaken and occupied by eight men but the eastern ruin proved to be a more formidable position, as it had been reinforced with a number of anti-tank guns and artillery pieces. After a gunnery duel, which lasted several hours the Soviet position remained secure and the eight man German infantry force had lost two dead, and two wounded. Since the four survivors were nowhere near enough to take it, the Germans were forced to withdraw, leaving the task of retaking their front line positions unfinished.³¹⁹ In the days that followed the eastern strongpoint would change hands several times, until it was finally recaptured on the 21st.³²⁰

Efforts to reduce the “sacks” themselves with Strachwitz I-III were only partially successful³²¹. While Strachwitz I would successfully destroy the “west sack” in March 1944, and the “east sack” was successfully reduced by Strachwitz II in April, Strachwitz III was unable to destroy the 59th Army’s bridgehead over the Narva.³²² *Schwere Panzer Abteilung 502* lost three hard to replace Tigers during these operations and to add insult to injury had failed to inflict serious damage on the Soviets with retrospective reports noting that “the enemy managed only to cut off two small bridgeheads of our positions in the region”, making it clear that the Soviets ability to threaten Narva had not been substantially weakened by the Strachwitz counterattacks.³²³ Once again the Tigers could still act as a potent force multiplier but could only be truly successful when well

³¹⁹ Carius, *Tigers in the Mud*, 89-90. Schneider, *Tigers in Combat I*, 80. Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 201.

³²⁰ Carius, *Tigers in the Mud*, 95.

³²¹ Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 201.

³²² Carius, *Tigers in the Mud*, 100-101. Schneider, *Tigers in Combat I*, 80.

³²³ Boevoi put’ 59 armii 15 noiabria 1944 g. 18.11.44. TsAMO RF f.416.010437.d.12.1.45. Thanks to Dr. Alexander Hill for these Soviet materials and their translation.

supported. As the October 1943 *Guidelines for Employment of Panzers in Cooperation with an Infantry Division*, stated, “It is crucial for success that the infantry hold on to the tank attack and use its paralyzing effect on the enemy”.³²⁴ This was an ideal that the increasingly depleted Heer could not achieve, as there were few infantrymen to exploit the tanks success.

Whatever limited positive effects the Strachwitz counterattacks had on the Germans position were erased by a subsequent Soviet offensive. On June 22nd, 1944, the third anniversary of Operation Barbarossa, the Soviets launched Operation Bagration against Army Group Centre. This operation was an enormous success, virtually annihilating the depleted German units in front of it and eventually driving the Germans back to the gates of Warsaw by the time the offensive petered out at the beginning of August.³²⁵ This offensive would not only destroy Army Group Centre, but also unseated Army Group North. The initial collapse of Army Group Centre created a new front, the “Baltic Hole”. From there the Soviets could either strike for Vilnius with the aim of reaching the East Prussian city of Königsberg or launch a more limited operation towards Riga. Either way Army Group North was threatened with imminent encirclement.³²⁶

On July 2nd, *schwere Panzer Abteilung 502* was dispatched to Dünaburg (now Daugavpils, Latvia), which was situated in the midst of the “Baltic Hole”, and was the target of the Soviet 6th Guards Army. Their first operation in this area was launched on the 8th. To reach the area of operations the *Abteilung* was required to conduct a rapid 50-

³²⁴ Oberkommando des Heers. GenStdH/Ausb.Abt./Gen.Insp.d.Pz.Tr. Richtlinien für den Einsatz von Panzerkampfwagen im Rahmen einer Infanterie Division.g.1.10.43. TsAMO f.500.o.12480.d.145.

³²⁵ Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 226-230.

³²⁶ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944*, 627.

kilometer road march. The unit protested this decision, owing to the unreliability of the Tiger's engine but was overruled. When the march began there were twenty-two operational Tigers, by the time it ended only eight were still ready to fight.³²⁷ On the 10th, 3.502 supported the attack by a battalion from the 205th Infantry Division, southwest of Garniai to relieve encircled German forces. The attack would fail and two Tigers were lost. Another five vehicles were lost to mechanical breakdowns, which were recovered with great difficulty on the 11th.³²⁸

From the 11th to the 21st of July, the Tigers of the 502 participated in a number of small-scale engagements, usually with an average of five tanks along the southern bank of the Dūna. On the 21st, the Soviets broke through German lines north of the Dūna River, forcing the Abteilung to shift northwards in three march columns to counter these new Soviet attacks. As part of this shift, Carius took the 2.502 back to Dünaburg to cover the main road to the north of the city.³²⁹ On the 22nd, in the small town of Malinava, Carius and his men would have their first major engagement with a new Soviet heavy tank, the Iosef Stalin 2 or IS-2, as it was more commonly known (This tank can also be referred to as the JS-2 if using the English spelling of Stalin's name).

The IS-2 was the result of Soviet disaffection with the KV-1's performance by the summer of 1942. The KV-1 lacked the mobility and reliability of the T-34, which made the two vehicles difficult to employ together. It was also outclassed in armour and armament by late 1942. In 1941 its 75mm armour and 76.2mm gun had been among the best in the world, which allowed single tanks to stall local German advances for

³²⁷ Wilbeck, *Sledgehammers*, 105.

³²⁸ Schneider, *Tigers in Combat I*, 83. Wilbeck, *Sledgehammers*, 107-108.

³²⁹ Wilbeck, *Sledgehammers*, 108.

significant periods, as Erhard Raus experienced in 1941 during the defence of Raseinai on June 24th.³³⁰ During the summer of 1942 however, the longer and higher velocity 5cm and 7.5cm guns being mounted on German Panzers were allowing them to meet the KV-1 on more equal footing, and that was to say nothing of the vast performance gap between the KV-1 and the Tigers, once they appeared in September 1942. The new Soviet heavy tank was to be faster, more reliable and have armour and armament that could match the Tiger and could fulfill the same breakthrough role as both the KV-1 and the Tiger.³³¹

Soviet tests in the summer and fall of 1943 showed that the 85mm M1939 anti-aircraft gun, slated to be fitted to the new version of the T-34 would not consistently penetrate the Tiger's armour. The A-19 122mm howitzer proved to have superior penetrative capabilities, with later German tests showing that the gun could penetrate the 100mm front plate of the Tiger I at 1,500 meters.³³² It was this gun that would give the IS-2 its offensive punch, though its use of a separate charge and projectile meant that it had much slower reload than the Tigers unified ammunition, a reminder of its intended role as a breakthrough tank, rather than as a tank hunter. In armour it surpassed the Tiger, with a maximum of 120mm of frontal armour. The effectiveness of the armour was greatly enhanced by the extensive use of sloped armour, similar to that seen on the Tiger II and by the vehicles comparatively low profile, a definite asset on the open steppes. It was also equipped with a reliable V-12 engine, something that the Tigers certainly could

³³⁰ Raus, *Panzer Operations*, ebook, 72-88. Zaloga, *KV-1 & 2 Heavy Tanks 1939-45*, 28

³³¹ Zaloga, *KV-1 & 2 Heavy Tanks 1939-45*, 28. Steven Zaloga, *IS-2 Heavy Tank 1944-1973*, (London: Osprey Publishing, 1994), 3, 8.

³³² Oberkommando des Heers. Pz Offz B Chef GenStdH Anlage 7. 5.7.1944. Betr. Tiger 2. NARA, T-78, Roll 620 frame 000079.

not boast.³³³ On paper then the Soviets had developed an almost ideal tank to counter the Tiger. It's frontal armour could only be penetrated by the Tiger's 8.8cm KwK 36 L/56 gun from a distance of 300 meters, where as the A-19 122mm gun could do the same to the Tiger at 1,500 meters.³³⁴ Unfortunately for the crews of the IS-2 their battles with the Tiger did not take place on paper, but in the much more unforgiving real world.

Returning to Carius, the 2.502, and Malinava, Carius observed that the town was only held by a company of tanks, an estimated thirty IS-2s and T-34s. In keeping with the aggressive initiative that was a hallmark of the German way of war, Carius, with six Tigers, decided to destroy the exposed Soviet company. Their attack came as a complete surprise to the Soviets and in less than twenty-five minutes it was all over. Seventeen IS-2s and five T-34s were claimed by the Germans. Another twenty eight tanks were later ambushed by the *Kompanie* as they approached the village, unaware of the their comrades fate. This effort derailed the initial Soviet assault on Dünaburg.³³⁵

Subsequent engagements, until July 26th, including one on the 25th, where Leutnant Eichhorn of 3.502, led an attack by five Tigers against a Soviet armoured unit planning to attack down the Dünaburg road, claiming to destroy sixteen IS-2's within ten minutes while suffering no losses of his own.³³⁶ These actions were a testament to the capabilities of the Tiger, especially striking unprepared Soviet units. Their claimed "kills" should still be approached with a degree of skepticism and their broader effect must also be examined. While these operations in late July did allow the Germans to

³³³ Zaloga, *IS-2 Heavy Tank 1944-1973*, 7, Photo Insert D.

³³⁴ Oberkommando des Heers. Pz Offz B Chef GenStdH Anlage 7. 5.7.1944. Betr. Tiger 2. NARA, T-78, Roll 620 frame 000079.

³³⁵ Schneider, *Tigers in Combat I*, 84-85. Carius, *Tigers in the Mud*, 167. Wilbeck, *Sledgehammers*, 109-110.

³³⁶ Wilbeck, *Sledgehammers*, 110. Schneider, *Tigers in Combat I*, 85.

retain Dünaburg, this advantage did not last long.³³⁷ Even as *schwere Panzer Abteilung* 502 fought to defend Dünaburg, the position of Army Group North was collapsing. On July 10th, the Soviet's 2nd and 3rd Baltic Fronts launched new attacks against the embattled Army Group, reaching Vilnius on the 13th and by the months end forced the Germans out of Lithuania and into Latvia.³³⁸ So once again, the actions of the Tigers were impressive on their own but proved to have little lasting effect, as the Soviets losses around Dünaburg did nothing to stall their broader offensive.

This period also provided some interesting insights into the IS-2. The new Soviet heavy tank was a formidable opponent, though few of its engagements with the Tigers of the 502 in July showcased the vehicle at its best, as surprise engagements at close range favored the faster firing Tigers rather than the larger gun of the IS-2. Nevertheless, by the time the war ended the IS-2 would develop a reputation as a formidable vehicle and one that was very much a "Tiger Killer", even if that was not its intended role. In one instance, the driver of Tiger 214 of *schwere Panzer Abteilung* 509 was killed by a 122mm shell that penetrated the vehicles 100mm frontal plate, something that no other tank then in service could achieve.³³⁹ Events like that led Tiger veteran, Karl Bormann to recall, "The Iosef Stalin was without a doubt our best opponent".³⁴⁰

That said, the IS-2 superiority was only really present against the Tiger I and its flat armour. With the end of Tiger I production in August 1944 and the appearance of the

³³⁷ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944*, 627.

³³⁸ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944*, 629-630. Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 231.

³³⁹ Schneider, *Tigers in Combat I*, 364.

³⁴⁰ Michael Green, *Tiger Tanks*, 75.

first Tiger IIs on the Eastern Front in that same month, the IS-2's moment of superiority proved fleeting. The Tiger II was substantially better armoured, with 150mm of sloped frontal armour and was also better armed, with a higher velocity 8.8cm KwK 43 L/71 gun. These features allowed the Tiger II to defeat the IS-2 at a range of 2600 meters while the IS-2 would have to close to 1,500 meters to penetrate the armour of the Tiger II.³⁴¹ One combat report from an unspecified *schwere Panzer Abteilung* (likely *schwere Panzer Abteilung 501*), which appeared in the September 1944 issue of *Nachrichtenblatt der Panzertruppen* detailed the imbalance between the two vehicles. The *schwere Panzer Kompanie* was advancing through thick woods, accompanied by an infantry battalion. With the thick trees the Tigers were forced to move single file. The lead Tiger then saw an IS-2 in front of him. In a short, sharp engagement fought at just thirty five- meters a pair of Tigers would engage two IS-2s. While the second Tiger would be hit, the round failed to penetrate the vehicles 150mm front plate. The faster firing Tigers however, were able to destroy the two Soviet tanks.³⁴² Again the Tigers substantial advantage in rate of fire proved decisive, especially in an engagement like this in which both combatants were at close range where penetrating hits were likely.

The IS-2 was not the only Allied heavy tank designed, at least in part to counter the Tiger. The Americans would field the M26 Pershing heavy tank. This tank, armed with a 90mm gun was designed as a breakthrough tank, like its German and Soviet contemporaries. Only twenty of them had arrived by the end of the war and saw little service, owing to an American focus on infantry creating breakthroughs with medium

³⁴¹ Oberkommando des Heers. Pz Offz B Chef GenStdH Anlage 7. 5.7.1944. Betr. Tiger 2. NARA, T-78, Roll 620 frame 000079.

³⁴² Oberkommando des Heers. *Nachrichtenblatt der Panzertruppen* Nr.15 den 9.44. Betr. Kampf zwischen "Tiger" und "Josef Stalin". NARA, T-78, Roll 623, frame 000720.

tank support, while tank destroyers engaged enemy tanks, a doctrine which left little room for a heavy tank until a desire to match the Tiger in role and firepower became attractive towards the end of the war.³⁴³ Thus the IS-2 was left as the only Allied tank roughly comparable to the Tiger in armour, armament and role to see substantial wartime service.³⁴⁴ Nevertheless, both tanks demonstrated that the Allies invested considerable resources into creating tanks to compete with the Tiger, an outgrowth of their efforts to enhance their anti-tank capabilities. Although their general improvements were highly effective, neither country managed to create a tank that was truly equal to the Tiger, especially the Tiger II. In fairness though, they did not need to. Their material superiority meant that qualitative failings in their vehicles were more than compensated for by the sheer number produced.

The summer of 1943 to the summer of 1944 was a dreadful one for the Germans as they were forced onto the defensive and began their retreat back to Germany. This move onto the defensive stretched Panzer divisions and the *schwere Panzer Abteilungen* to their breaking point, as tanks were employed as ‘*Korsettstange*’, to compensate for a lack of infantry. As the efforts of *schwere Panzer Abteilung 502* demonstrated, these efforts seriously diluted and diminished their fighting strength by parceling their vehicles in small numbers to reinforce threatened sectors, rather than massing them for operations and by denying the already mechanically unreliable vehicles opportunities for repair. That said, while operations as ‘*Korsettstange*’ was far from ideal the Tigers were able to achieve some impressive successes against long odds, and in spite of the great losses

³⁴³ Wilbeck, *Sledgehammers*, 205-208. Victor Failmezger, *American Knights: The Untold Story of the Men of the Legendary 601st Tank Destroyer Battalion*, (New York: Osprey Publishing, 2015), ebook, 31,37.

³⁴⁴ Green, *Tiger Tanks*, 80-81.

suffered by the Heer in the East, the fundamental principles governing the use of the Panzers remained sound, as was seen in the battles around Kiev in November and December 1943 (Though here too, there were plenty of examples of poor employment of Panzers, particularly, Tigers). These victories were however, all rendered fleeting by the Soviets numerical and material superiority, which allowed them to weather any number of local defeats on their way to achieving their overall goals. In addition, the Soviets ever expanding arsenal of anti-tank weapons and the introduction of both the IS-2 heavy tank and the large number of assault guns and tank destroyers made it easier for the Soviets to inflict losses upon the Tigers and eroded their position of technical superiority. So while the Tigers could still turn the tide in local engagements, their ability to affect the wider war had largely vanished, overcome by the Soviets great numbers as well as their ever improving weapons and tactics.

Chapter 7: Tiger Terror or Terrible Tigers:

The Tiger I and II in Normandy June-August 1944

On June 6th 1944, the Allied landings in Normandy opened up the long-awaited second front. After the great initial success of the D-Day landings, the Allies and the Germans found themselves engaged in a grinding battle of attrition until the end of July across Normandy. Among the German units employed in this campaign were three *schwere Panzer Abteilungen*: *schwere SS Panzer Abteilungen 101* and *102*, as well as *schwere Panzer Abteilung 503*. The operations of these units did not alter the by now familiar refrain of Tiger operations, where success was fleeting and operational failure was all but inevitable but in some ways Normandy was unique. It was in Normandy that the Tiger's reputation was in many ways firmly established in the Anglo-Saxon literature of the war, with many Allied accounts discussing its vast superiority over their own vehicles. While there was some factual evidence to support this view, it also represented an exaggeration because Allied vehicles and tactics were often better than was frequently supposed. Operations in Normandy which involved both the Tiger I and the first combat uses of the Tiger II also demonstrated that while the vehicles could still inspire a degree of fear amongst their foes, Allied tactics and weapons had improved to the point that the Tigers operational effectiveness was severely diminished.

To best demonstrate these ideas, several key operations involving Tigers in Normandy will be covered in this chapter. First, the counterattack by *schwere SS Panzer Abteilung 101* at Villers Bocage on June 13th, 1944, in which Tiger commander Michael Wittmann would have a starring role in a highly overrated counterattack which proved far more costly to the Germans despite spectacular British losses. Second, Operation

Goodwood, July 18-20th, where *schwere Panzer Abteilung 503* would prove to be decisive in the repulse of a major British offensive despite heavy losses to Allied bombers. Third, Operation Totalize, August 8th, where Michael Wittmann was killed leading a poorly planned counterattack but the mere presence of Tigers still derailed key components of the Canadian offensive, the last time that the Tigers presence could do so in Normandy.

For the Normandy campaign, the British would substantially upgrade their tanks to face the Tigers, something that was a necessity- especially since none of the tanks fielded in North Africa or Italy had proven to have neither the fire power or armour to compete with the Tiger. Only the Churchill, with its 152mm thick front plate could compare to the Tiger's armour, though the 8.8 KwK 36 L/56 gun could still penetrate the Churchill's armour at a range of 2.5km.³⁴⁵ In terms of guns, both the Churchill and the lighter Cromwell (which had 76mm of armour) were both armed with the 75mm MV Gun which could only penetrate 76mm of armour at 450 meters. This was sufficient to penetrate the side armour of a Tiger but could not penetrate the front plate.³⁴⁶ While these two British tanks would see considerable service in Normandy, many armoured units were outfitted with the American M4, known as the Sherman. Like its British counterparts, the Sherman compared poorly to the Tiger in terms of armour and armament. Its frontal armour was only 51mm thick, and could be reliably penetrated by the Tigers 8.8cm KwK 36 L/56 gun at a range of three kilometers, although the Sherman's armour did have one advantage over its British counterparts as the frontal

³⁴⁵Oberkommando des Heers. Pz Offz B Chef GenStdH Anlage 7. 5.7.1944. Betr. Tiger 1. NARA, T-78, Roll 620 frame 000053. Fletcher, *Mr. Churchill's Tank*, 113.

³⁴⁶David Fletcher, & Richard C. Harley, *Cromwell Cruiser Tank 1942-50*, (New York: Osprey Publishing, 1996), 13. Fletcher, *Mr. Churchill's Tank*, 120.

armour was sloped which offered better protection than the flat armour found on British tanks, though this was not much of an advantage when facing Tigers.³⁴⁷ The M3 75mm gun on the Sherman could only penetrate 68mm of armour at 500 meters, giving it similar performance to the standard British guns of the period.³⁴⁸ The inferiority of all Allied tanks to the Tiger, as well as the Panther would become a great concern to their crews during the Normandy campaign, but British tank designers ensured that they would not go into battle without any kind of response to the Tiger.

In 1942, in recognition of the inadequacy of the 6 Pounder (57mm) tank guns being fitted to British tanks in North Africa, development began on a gun capable of penetrating any German tank at a distance of 1,300 meters. What came out of that program was the 17 Pounder (76.2mm) gun. Initial versions were towed anti-tank guns but efforts were quickly started to mount the gun in a tank. Initial efforts to convert the new Cromwell and the Churchill did result in viable vehicles but neither were ready in time for D-Day.³⁴⁹ Efforts to create tank destroyers with the 17 Pounder were similarly delayed. Neither the Achilles, an American made M10 tank destroyer with a 17 Pounder or the Archer, which mounted the gun on a Valentine tank chassis were available in quantity until the end of the Normandy campaign.³⁵⁰ Owing to these delays, emphasis was placed on a conversion of the Sherman, starting in October 1943. While the 17

³⁴⁷ Steven Zaloga, *Sherman Medium Tank 1942-1945*, (New York: Osprey Publishing, 2004), 14. Oberkommando des Heers. Pz Offz B Chef GenStdH Anlage 7. 5.7.1944. Betr. Tiger 1. NARA, T-78, Roll 620 frame 000053.

³⁴⁸ Zaloga, *Sherman Medium Tank 1942-1945*, 10.

³⁴⁹ Fletcher, & Harley, *Cromwell Cruiser Tank 1942-50*, 36-38. Fletcher, *Mr. Churchill's Tank*, 200, 202, 208.

³⁵⁰ Buckley, *British Armour in the Normandy Campaign*, 115-116. Ian Hogg, *Tank Killing: Anti-Tank Warfare by Men and Machines*, (London: Sidgwick & Jackson, 1996), 114.

Pounder did have to be modified so it could safely recoil in the confines of the Sherman's turret, the effort was a success when the vehicle was trialed in January 1944. With the invasion of Normandy six months away, a rapid production program was ordered for the Sherman Firefly as it was known. By May 31st, 342 Fireflies had been completed, a testament both to the relatively straightforward conversion process and the capabilities of British industry. This quantity of Fireflies was sufficient to give every troop (equivalent to a platoon or German *Zug*) one of the vehicles, with the other three tanks being either Sherman's armed with 75mm guns or Cromwell's for the invasion.³⁵¹

The Sherman Firefly had the same armour as its unmodified counterparts, with all the advantages and disadvantages that that entailed, but its gun was markedly superior. The standard armour-piercing round could penetrate the 100mm frontal armour of a Tiger at a kilometer, but it was the APDS (Armour Piercing Discarding Sabot) that gave the Firefly its reputation. This ammunition featured a sub caliber shot, the sabot, inside the round. When fired, the external case would fall away and the sabot would be propelled forward with all the velocity of the larger round, but without the friction associated with the larger projectile. This increase in muzzle velocity allowed the round to strike the target with much more force, in this case allowing the round to penetrate 172mm of armour at 1000 meters, which was enough to penetrate any armour on the Tiger I and would allow it to penetrate most of the armour on the Tiger II (though in practice the front plate proved impervious to fire under combat conditions).³⁵² One British sergeant

³⁵¹ Hart, *Sherman Firefly vs Tiger*, 14-15, 24.

³⁵² Hart, *Sherman Firefly vs Tiger*, 14. Wilbeck, *Sledgehammers*, 112. Buckley, *British Armour in the Normandy Campaign*, 130-131.

summed up Allied responses to the Firefly well when he commented, “At last a gun which one could trust to get its teeth really deep into any German tank it met”.³⁵³

The first *schwere Panzer Abteilung* to arrive in Normandy was *schwere SS Panzer Abteilung 101*. The Abteilung had been training in France since the beginning of the year and in March had been supplemented with the men of the 13. Leibstandarte including Obersturmführer (Senior Storm Leader, equivalent to an Oberleutnant, a senior Lieutenant) Michael Wittmann who took command of the 2. SS 101. In April, this mix of Eastern Front veterans and newly trained crews were stationed in the Pas de Calais area in anticipation of the Allied invasion.³⁵⁴ Since the Allies instead invaded in Normandy, the Tigers of the Abteilung were forced to rush to the invasion front. The Abteilung began its journey on June 7th, but extensive damage to the rail network of northern France forced them to detrain at Versailles and conduct road marches. Allied air superiority forced them to move only at night, starting on the 9th. By that point the unit had already taken some casualties and lost many support vehicles. As a result the leading elements of the unit did not arrive until the 12th. The road march into Normandy and the constant Allied air attacks took their toll on the unit, with the 1. and 2. Kompanie both arriving on the 12th, understrength, with eight and six Tigers respectively (3. SS 101 would not arrive until the 15th). While these losses were not insignificant, it must be emphasized that despite the loss of many of its supporting vehicles *schwere SS Panzer Abteilung 101* was not badly hindered by these losses. Like their comrades in the east, who were not suffering under the same kind of heavy interdiction, the unit was able to field an average of fifteen to twenty Tigers. This indicates that while Allied airpower was an additional

³⁵³ Buckley, *British Armour in the Normandy Campaign*, 130.

³⁵⁴ Schneider, *Tigers in Combat II*, ebook, 406-407.

source of friction, sufficient vehicles remained to keep the unit in reasonably good shape, aided by the *Panzerwerkstatt Kompanie*.³⁵⁵

The arrival of the *schwere SS Panzer Kompanien* came in the midst of Operation Perch. Perch called for an attack on the western flank of the German line by the 7th Armoured Division's 22nd Armoured Brigade and elements of the division's infantry brigade, the 131st Queen's Brigade. This attack would exploit a gap that had opened up between the Panzer Lehr Division and its neighbor, the 352nd Infantry Division by taking the town of Villers Bocage. Once the town was secured the Panzer Lehr Division could be effectively outflanked.³⁵⁶

By 8am on the 13th, the 4th County of London Yeomanry (4th CLY) had arrived at Villers Bocage and advanced east to Point 213.³⁵⁷ This proved to be a fateful mistake as the six Tigers of Wittmann's 2.SS 101 were concealed in a defile between the town and Point 213. Watching the vast column of British vehicles which ran from Point 213 through Villers Bocage, Wittmann assumed that the British would continue on to Caen without pause, so he elected to attack. Unfortunately for him the defile was only wide enough for a single Tiger and he felt that there was no time to organize his five functioning tanks for a counter attack. Instead he would attack alone.³⁵⁸ In his one tank attack, he drove into the 4th CLY column, destroying a number of vehicles before driving

³⁵⁵ Schneider, *Tigers in Combat II*, ebook, 406-407. Ben. H. Shepherd, *Hitler's Soldiers: The German Army in the Third Reich*, (New Haven and London: Yale University Press, 2016), 443.

³⁵⁶ Buckley, *British Armour in the Normandy Campaign*, 23-24.

³⁵⁷ Ibid, 24.

³⁵⁸ Wilbeck, *Sledgehammers*, 116-117.

into the town of Villers where a 17 Pounder anti-tank gun managed to blow off one of his tracks.³⁵⁹

Wittmann and his crew then abandoned his tank and returned to German lines. In the course of his one tank-attack he destroyed a total of twelve tanks, thirteen halftracks and Bren Carriers as well as two anti-tank guns.³⁶⁰ This action would earn Wittmann the Knights Cross from his own government and decades of adulation since.³⁶¹ It is here that many accounts of the battle end, with Carlo D'Este saying of Wittmann, "Almost single-handedly, this one audacious and brilliant German tank commander had crushed the British advance around Villers Bocage and forced the 7th Armoured on to the defensive".³⁶²

The truth of the matter is rather more complicated and involved several more attacks on the embattled 4th CLY. After Wittmann launched his attack, the other Tigers of 2.SS 101, reduced to three functional vehicles by mechanical failures launched their own attack towards Point 213, destroying an additional five tanks and capturing 230 prisoners. In spite of this impressive result, the unsupported Tigers were unable to make any impression on the British defenders of Point 213.³⁶³

In the afternoon, 1.SS 101 stationed to the north of the 2.SS 101, under the command of SS Hauptsturmführer (Head Storm Leader, equivalent to a Heer Hauptmann

³⁵⁹ Wilbeck, *Sledgehammers*, 117. Wolfgang Schneider, *Tigers in Normandy*, translated by Battle Born Books and Consulting, (Mechanicsburg: Stackpole Books, 2011), ebook, 61.

³⁶⁰ Wilbeck, *Sledgehammers*, 117.

³⁶¹ Showalter, *Hitler's Panzers*, 325.

³⁶² Carlo D'Este, *Decision in Normandy: The Unwritten Story of Montgomery and the Allied Campaign*, (Toronto: Penguin Books, 2001), 183.

³⁶³ Schneider, *Tigers in Normandy*, 62. Buckley, *British Armour in the Normandy Campaign*, 25.

or Captain) Möbius launched their own counterattack on Point 213, with support from some Panzer IVs from the Panzer Lehr Division. They were able to defeat the elements of the 4th CLY holding the point, which had been isolated by Wittmann's earlier attack. This force then turned its attention to Villers Bocage. While the Germans had been retaking Point 213, the British, namely B and C Squadrons of the 4th CLY and the infantry of the 1st and 7th Battalions Queens Royal Regiment had reoccupied the town and prepared an ambush. Driving through the town, two of the Tigers and one Panzer IV were destroyed by a Sherman Firefly, penetrating their thinner rear armour. Three other Tigers would run afoul of British anti-tank guns in the town.³⁶⁴ Despite this victory, the British withdrew to their starting positions, after the losses they had suffered, which were all the more galling given the elite reputation that the Desert Rats had earned in the North African campaign.³⁶⁵

In this, more complete telling of the fighting in and around Villers Bocage on June 13th, 1944, it is clear that it was not just a tale of Michael Wittmann's skill and courage. Instead it was more a story of British blunders and German luck. In the first place Operation Perch had been delayed for several days as XXX Corps and 2nd British Army exhausted other alternatives and while starting the operation on June 10th or 11th would not have guaranteed its success, attacking before the Tigers of *schwere SS Panzer Abteilung 101* arrived would have certainly been beneficial to the 7th Armoured Division. It also undeniable that an attack by a reduced armoured brigade, with limited infantry support was not a good idea either, especially since the plan involved an ambitious end run around stout German defences. Consequently the chances of success for Perch were

³⁶⁴ Schneider, *Tigers in Normandy*, 62-63. Wilbeck, *Sledgehammers*, 118.

³⁶⁵ Buckley, *British Armour in the Normandy Campaign*, 25.

slim from the outset even without the intervention of the Tigers. Their involvement only compounded the failure and ensured that it would loom large in the legacy of the campaign.³⁶⁶

While Operation Perch was certainly not the Desert Rat's finest hour, it is difficult to argue that it was the finest hour for Wittmann and the 1. and 2. SS 101 either. In his book, *Tigers in Normandy*, Wolfgang Schneider, himself a former German tank commander in the post war West German Bundeswehr gave Wittmann credit for his courage but little else. His one tank assault violated many key tenets of armoured warfare, including the need for tanks to be positioned in an assembly area with unrestricted movement and that the enemy must not be able to approach unnoticed and tanks must be concentrated for action in line with Guderian's "*Klotzen nicht Kleckern*" maxim.³⁶⁷ Had Wittmann positioned his vehicles better and been willing to wait it is likely that they would have achieved greater results with more firepower and mutual support. As it was Wittmann was fortunate that the British were so unprepared for his attack as the close range at which he engaged the British meant that even the 75mm guns on the Cromwell's would have been able to penetrate the Tiger's armour.³⁶⁸ His final mistake, which could have been fatal, ending his attack inside Villers Bocage itself was similarly ill advised, sacrificing his mobility and creating ideal circumstances for an ambush. Wittmann's after action report did not provide any reasoning for this decision, and neither did the unit report submitted subsequently as a recommendation for his

³⁶⁶ Buckley, *British Armour in the Normandy Campaign*, 25.

³⁶⁷ Schneider, *Tigers in Normandy*, 68.

³⁶⁸ Ibid, 68-69.

Knights Cross.³⁶⁹ It remains unknown if this decision was the result of simple hubris or if Wittmann had some other complex plan to perform his own end run through the British column to return to the *Kompanie* assembly area. The subsequent counterattack by 1.SS 101 and Panzer Lehr also cannot be considered a particularly good use of armour. They made the same mistake as Wittmann and advanced into a built up area without infantry support, resulting in substantial losses.³⁷⁰

Despite the many German tactical failings, the balance sheet still favored them. Seven Tigers had been lost but the 7th Armoured Division had been repulsed and had lost over forty vehicles over the course of the day. This assessment was true in the short term but not in the long term. By June 16th, the 4th CLY had totally replaced its losses. *Schwere SS Panzer Abteilung 101* was not so lucky, as it received no replacements for its lost vehicles during the campaign, meaning that the unit had lost half of a *Kompanie*, with little to show for it, save Wittmann's Knight's Cross.³⁷¹

Villers Bocage was far from a good example of Tiger deployment, but the appearance of the Tigers there and the damage that Wittmann was able to inflict had serious psychological effects on Allied servicemen in Normandy. While the Sherman Firefly was a great boost to the firepower of the armoured units of 21st Army Group, it by no means provided much solace to the men crewing other tanks which lacked the 17 Pounder's ability to destroy Tigers, especially after Villers Bocage which convinced Allied tankers of their inferiority. Steve and Tom Dyson of the 34th Tank Brigade, noted

³⁶⁹ Jentz, *Germany's Tiger Tanks: Tiger I & II: Combat Tactics*, 104,107, 110. Wilbeck, *Sledgehammers*, 117.

³⁷⁰ Schneider, *Tigers in Normandy*, 70.

³⁷¹ Wilbeck, *Sledgehammers*, 118-119. Buckley, *British Armour in the Normandy Campaign*, 26.

that, “We also learned to our dismay, of the devastating effects of the German 88mm...anti-tank guns, and Tiger tanks. The shells apparently went through our Shermans like a knife through butter”.³⁷² This quality of Allied armour plate was shared by the Cromwell and the Churchill but it was the Sherman in particular that came to dominate these conversations due to its prominent role in the campaign. One report submitted by Brigadier Harold Pyman to Major General Robert Erskine, General Officer Commanding 7th Armoured Division, described the problem, “the result is that when 75mm shot has been failing to penetrate the front face of Tigers and Panthers at ranges down to 30 yards, they can knock Shermans and Cromwells out at ranges up to 1500 yards with ease”.³⁷³ Pyman was not wrong, the Sherman and the Cromwell could not penetrate the frontal armour of the Tiger but they were not completely impotent either. The Sherman’s maligned M3 75mm gun was more than capable of penetrating the side armour of a Tiger at 900 meters.³⁷⁴ Defeating a Tiger was difficult, but courage and good tactics did offer a reasonable chance of success. One of the best examples of this comes not from Normandy, but from the Eastern Front. Dmitry Loza, who commanded a Sherman in the Soviet 223rd Tank Brigade stated that the best way of dealing with a Tiger in the open was to assign each Tiger to two Shermans. The first would open fire at 400-500 meters, the best range to knock the tracks off. Once the Tiger was immobilized the other Sherman could either drive around, or wait for the undamaged track to turn the Tiger ninety degrees, exposing its more vulnerable rear. This maneuver was extremely risky, especially given the close range that the Shermans had to fire from to achieve the

³⁷² Buckley, *British Armour in the Normandy Campaign*, 125.

³⁷³ Ibid, 107.

³⁷⁴ Jentz, *Germany’s Tiger Tanks: Tiger I & II: Combat Tactics*, 13.

best results, but it is a testament to how tactical skill, coordination and a good helping of courage could compensate for the Sherman's weaknesses.³⁷⁵ Good tactics did allow for success against Tigers, but they did nothing to dispel the aura of invincibility that surrounded not only the Tiger, but also the Panther, which as Pyman's report indicated, was a similarly formidable vehicle. It was felt that every tree and hedge in Normandy concealed a Tiger.³⁷⁶ This Tiger Phobia was discussed in many post war memoirs, including George Blackburn's *Guns of Normandy* where the Sherman was described as "grossly inferior" to the Tiger.³⁷⁷ Nonetheless, despite this prominence in the memoir literature, in many encounters between the Tigers and Allied units, the actions were marked not by panic and fear but instead cool heads and good tactics. This trend was already evident at Villers Bocage, where B and C Squadrons of the 4th CLY and the infantry of the 1st and 7th Battalions Queens Royal Regiment had overcome their initial shock and effectively dispatched the counterattack which followed Wittmann's foolhardy attack, to say nothing of the anti-tank gun crew that had disabled his tank in the first place. Consequently, it is clear that Tiger Phobia was present, but mostly had the effect of overinflating the number of Tigers reported in Normandy, rather than affecting the Allies ability to destroy them.³⁷⁸

After Villers Bocage, the Tigers would return to prominence during Operation Goodwood on July 18th. After little over a month in Normandy the Allies had yet to achieve a decisive breakthrough but Operation Goodwood was intended to be the

³⁷⁵ Dmitriy Loza, *Commanding the Red Army's Sherman Tanks*, edited and translated by James F. Gebhardt, (Lincoln: University of Nebraska, 1996), 22.

³⁷⁶ Buckley, *British Armour in the Normandy Campaign*, 92.

³⁷⁷ George G. Blackburn, *The Guns of Normandy: A Soldier's Eye View, France 1944*, (Toronto: McClelland & Stewart Inc., 1997), 212-213.

³⁷⁸ Buckley, *British Armour in the Normandy Campaign*, 92.

breakthrough they had been looking for. Facing them were the Tigers of *schwere Panzer Abteilung 503*.³⁷⁹

Schwere Panzer Abteilung 503 had been the last of the three *schwere Panzer Abteilungen* to be deployed to Normandy. It had left the Eastern Front on May 25th, 1944 after two years of hard fighting. During its reconstruction in June 1944, the unit was issued with twelve Tiger IIs, some of the first issued. All would be employed by 1.503. Once the unit was fully equipped it was transported by rail to the Paris area between June 29th and July 5th. From there, like *schwere SS Panzer Abteilung 101* the unit conducted road marches into Normandy. Unlike the SS, the 503 moving at night was able to avoid losses to Allied aircraft. It was not, however, carried out without incident. On July 6th, while crossing a bridge near the village of Canon, Tiger 323, commanded by Feldwebel Seidel crashed through it. Seidel and his crew were injured but did survive the event, but their Tiger did not.³⁸⁰ After this less than auspicious start the 503 were involved in a number of small engagements on the eastern flank of the invasion front but Goodwood was to be their first large scale engagement of the campaign.

The *Kompanien* of the 503 were dispersed behind the German front line. 3.503 had their assembly area outside Manneville. This proved to be an unfortunate placement as this was one the areas targeted by the RAF. Leutnant Richard von Rosen, the acting company commander experienced the bombing first hand, feeling as “helpless as a

³⁷⁹ Buckley, *British Armour in the Normandy Campaign*, 33. D’Este, *Decision in Normandy*, 356, 358, 360. Colonel C.P. Stacey, *Official History of the Canadian Army In The Second World War: Volume III: The Victory Campaign: The Operations in North-West Europe 1944-1945*, (Ottawa: Queen’s Printer and Controller of Stationery, 1966), 166-168.

³⁸⁰ Schneider, *Tigers in Combat I*, 132-133. Schneider, *Tigers in Normandy*, 266.

drowning man tossed into raging seas”.³⁸¹ When the bombardment finally ended “of the once so beautiful parkland nothing remained but shredded trees, churned meadows and giant bomb craters so numerous that they overlapped-a gray, repulsive moonscape”.³⁸² In this midst of this moonscape sat the remnants of his company. The 500 and 1,000 pound bombs had decimated the Tigers. One tank took a direct hit and “looked like a giant opened sardine tin”.³⁸³ Another lay on its turret, the force of the blasts overturning the 56-ton vehicle. Even the surviving tanks were not in fine fighting trim, having been covered in dirt up to their turrets, covered in fallen trees and with many having broken tracks.³⁸⁴ Moving on foot, von Rosen was able to establish contact with the Abteilung and was ordered to ready as many tanks as he could and proceed to occupy positions between Maneville and Cagny, on what was suspected, correctly, to be the left flank of the British attack.³⁸⁵

Of the thirteen Tigers the *Kompanie* had at the beginning of the day, only six were still roadworthy, but two of them were forced to travel slowly on account of engine fires. There was one additional problem as the blasts had de-calibrated their guns, meaning that they needed three shots to hit targets they could normally hit with one.³⁸⁶ Nevertheless, they were able to reach their position between Maneville and Cagny. At this point two tanks were destroyed by rounds that penetrated their front armour. This came as something of a shock to the men of the 3.503 who had not previously encountered a British weapon that could penetrate the Tigers frontal armour, a belief that suggests they

³⁸¹ von Rosen, *Panzer Ace*, ebook, 643.

³⁸² Ibid, 645.

³⁸³ Ibid, 646.

³⁸⁴ Ibid, 646-647.

³⁸⁵ Ibid.

³⁸⁶ Ibid, 651-652.

had not been informed of, or had forgotten in the heat of the moment about the Firefly and its 17 Pounder. Regardless, it was not a British tank that had destroyed the two Tigers, but a battery of 8.8cm Flak 36/37 guns defending the Cagny airfield which Oberst Hans von Luck of the 21st Panzer Division had ordered into action to hold the flank. In the confusion the Luftwaffe gunners had mistaken the lead Tigers for Allied tanks.³⁸⁷ Despite this set back the Flak guns and von Rosen's four Tigers were ideally situated to attack the 11th Armoured Divisions leading brigade, the 29th Armoured. Its leading regiment, the 3rd Royal Tank Regiment was able to avoid the worst of the German's fire, but the following unit, the 2nd Fife and Forfar Yeomanry, which was to have masked Cagny took the full brunt of the German crossfire. With the Yeomanry being battered by the Germans, the following units from both the 11th Armoured and the Guards Armoured Divisions were delayed and taken under fire.³⁸⁸

After the battle, von Luck observed an estimated forty British tanks destroyed in the fields between the Flak battery at Cagny and von Rosen's four Tigers. This victory was a deadly testament to the long-range firepower of the "damned 88's", but it was not the only operation conducted by *schwere Panzer Abteilung 503* on July 18th.³⁸⁹ The 1.503 had also been hit by the Allied bombing but four of its Tiger II's were still fully functional, though Tiger 100 slipped into a bomb crater and could not be recovered. These Tiger IIs alongside the Tiger Is of 2.503 which had escaped the bombing were key components in a pair of counterattacks in the afternoon.

³⁸⁷ von Rosen, *Panzer Ace*, ebook, 653. D'Este, *Decision in Normandy*, 375. von Luck, *Panzer Commander*, 196.

³⁸⁸ von Luck, *Panzer Commander*, 197.

³⁸⁹ *Ibid*, 197.

That afternoon, 1.503s Tiger IIs, alongside eight Panzer IVs of the 21st Panzer Division attacked Demouville. The attack was repulsed with heavy losses. Two of the Tiger IIs were destroyed outright by Allied fire, giving them the dubious distinction being the first Tiger IIs destroyed by direct enemy fire.³⁹⁰ While details are limited, it is clear that the dug in British defenders of Demouville and the Sherman's of the Irish Guards were more than a match for the small German counterattacking force, especially since the Germans lacked the infantry support that might have helped to neutralize the towns defenders. Given that not even the 17 Pounder could penetrate the 150mm frontal armour of the Tiger II, it is likely that the tanks were either destroyed by well concealed anti-tank guns, striking the thinner side and rear armour or by outflanking Sherman's targeting the same weaknesses.³⁹¹ In this first engagement of the Tiger IIs, they had proven to be no match for the well prepared British defenders, which demonstrated not only that Tiger Phobia was by no means ubiquitous but also that the western Allies, like the Soviets by 1944, had developed a number of weapons and tactics to destroy the Tigers and not even the much improved protection of the Tiger II was proof against them.

While the 1.503 was giving its Tiger IIs a bloody baptism of fire, the Tiger Is of 2.503 were engaged in their own counterattack. The *Kompanie*, alongside the training battalion of the 16th Luftwaffe Field Division, (which had already been decimated by the bombing) and Anti-tank Battalion von Obstfelder of the 346th Infantry Division, attacked northwest of Toran. This effort proved much more successful than the attack of 1.503,

³⁹⁰ Wilbeck, *Sledgehammers*, 123. Lochmann, Rubbel and von Rosen, *The Combat History of the German Tiger Tank Battalion 503 in World War Two*, ebook, 709.

³⁹¹ Jentz, *Tiger I & II: Combat Tactics*, 14.

protecting the open hole left by the badly mauled 16th Luftwaffe on the German right flank.³⁹²

By evening the survivors of the *Abteilung* including 3.503 which had been reduced to only one operational tank - the others succumbing to the damage inflicted by the RAF earlier in the day - were withdrawn to the Frenouville area to defend the Cagny-Vimont road. Here they stopped a further attack to the southeast from Cagny, which had fallen earlier that afternoon.³⁹³ During this action a Tiger II, Tiger 112, was destroyed in a highly unconventional manner. In the midst of engaging Shermans from the Irish Guards in front of it the inexperienced commander of the Tiger ordered it to reverse straight through a hedge where it promptly ran into a British Sherman.³⁹⁴

This encounter left both crews with “the war story of a lifetime”, led to the loss of the Tiger and brought the 503’s day to an end, but there was still more for the Tigers to do.³⁹⁵ *Schwere SS Panzer Abteilung 101*, along with the Panthers of the LSSAH were part of I SS Panzer Corps reserve. These forces, assisted by one of the Leibstandarte Panzergrenadier battalions launched a counterattack of their own in the afternoon towards Bourgebus to protect Bourgebus Ridge. The *Abteilung* committed nineteen Tiger’s of its 2.and 3.*Kompanien* (1.SS 101 had returned to Germany on July 2nd to be retrained on Tiger II’s after sustaining heavy losses³⁹⁶) and they, alongside the tanks and infantry of

³⁹² Lochmann, Rubbel and Richard von Rosen, *The Combat History of the German Tiger Tank Battalion 503*, 709. Wilbeck, *Sledgehammers*, 123.

³⁹³ Lochmann, Rubbel and Richard von Rosen, *The Combat History of the German Tiger Tank Battalion 503*, 709.

³⁹⁴ Schneider, *Tigers in Normandy*, 344.

³⁹⁵ Showalter, *Hitler’s Panzers*, 325.

³⁹⁶ Schneider, *Tigers in Combat II*, 415.

the LSSAH halted the final attacks of the 7th Armoured Division. During the day the SS 101 lost one Tiger to a Sherman Firefly.³⁹⁷

Operation Goodwood would last until July 20th, but the debacle on the first day had taken its toll on the attacking divisions and little additional progress was made. Bourgebus Ridge remained in German hands and the breakout that had been promised was still illusive. Losses had also been heavy with over four hundred tanks lost.³⁹⁸ While much of the responsibility for the defeat must be laid at the feet of British officers, it was also undeniable that VII Corps had encountered a “topclass German defence” and that the Tigers of the 503 and SS 101 had been important parts of that defence.³⁹⁹

The Tigers were important to the defence against Goodwood but their performance was decidedly mixed. It is easy to praise the actions of SS 101 and 2.503 in their well-executed counterattacks which saved the German right flank and denied the British Bourgebus Ridge while continuing to show the Tiger’s adept performance in it’s intended role. 3.503 also has to be commended for their quick recovery after the devastating bombardment which allowed them to play a key role in the defence of the Cagny area throughout much of the day. There was however, also much to condemn, especially in the attack of 1.503, where the advantages conveyed by the armour and armament of the Tiger II’s were squandered in a poorly supported attack against a well prepared enemy. Thus, like the Tiger I’s first inauspicious employment by the 502 back in September 1942, the initial use of the Tiger II demonstrated the vehicles weaknesses

³⁹⁷ Wilbeck, *Sledgehammers*, 123. Hubert Meyer, *The History of the 12.SS- Panzer Divisions Hitlerjugend*, translated by H. Harri Henschler, (Winnipeg: J.J. Fedorowicz Publishing Inc., 1994), 158.

³⁹⁸ Buckley, *British Armour in the Normandy Campaign*, 36.

³⁹⁹ D’Este, *Decision in Normandy*, 376.

far more than its strengths. It also showcased how much better prepared the Allies were for the appearance of German heavy tanks, be they Tiger Is or Tiger IIs than they had been in 1942. Despite the fact that even their most powerful weapons bounced off the new Tigers frontal armour, the defenders of Demouville learned that the Tiger II shared its predecessors vulnerabilities and were able to defeat the counterattack. Consequently, while the Tiger II was a superior vehicle in many respects over its predecessor, the strides that the Allies had made in weapons and tactics meant that the Tiger II would not enjoy the success that the Tiger I had in 1942-1943.

It also has to be said that while the Tiger's overall performance had been quite good, just as at Villers Bocage, the Allies numerical advantage wiped out their gains. The four hundred tanks that the British had lost during Goodwood were quickly replaced and the Desert Rats, who had been handed another bloody defeat, were nevertheless fully operational and ready for Operation Spring, launched on July 25th.⁴⁰⁰ In contrast the heavy losses sustained by *schwere Panzer Abteilung 503*, were not made good. The unit lost thirteen Tigers on the 18th, most of them to the preliminary bombing, none of which were replaced.⁴⁰¹

Operation Totalize was to breakthrough to Falaise. Like Operation Goodwood it would feature preliminary attacks by the RAF, but they were employed differently. Not only would there be a preliminary bombardment, but also a second phase bombardment. This second phase would follow the initial break in by the 2nd and 3rd Canadian Infantry Divisions and was designed to destroy the German second line and impede the arrival of German reserves, both of which had remained intact during Goodwood. Once the second

⁴⁰⁰ Buckley, *British Armour in the Normandy Campaign*, 36.

⁴⁰¹ Schneider, *Tigers in Combat I*, 133-134.

phase bombardment had cleared the way, Simonds armoured divisions, 4th Canadian and 1st Polish would breakthrough.⁴⁰²

Totalize began just after 11pm on August 7th, as 1020 bombers and 720 guns struck the 89th Infantry Division. The first phase was far from a flawless operation, with a number of units becoming lost. Nevertheless, by noon on the 8th, they had achieved almost all of their phase one objectives. This success opened a six-kilometer wide hole in the German line and unlike during Goodwood there was no second German line to hold the Canadians back. Only a rapid response by the German's reserves could save the situation.⁴⁰³

A rapid response is just what they got. Soon after the bombers began to drop their payloads on the 89th Infantry Division holding the German frontline, SS Oberführer (A senior colonel with no direct equivalent in the Heer) Kurt Meyer, commanding the 12th SS Panzer Division *Hitlerjugend* (Hitler Youth) recognized that a Canadian breakthrough in this section could easily reach the Route Nationale 158 which connected Caen to Falaise and moved quickly to mobilize the available portions of his division, which was effectively the only German reserve for a series of counterattacks on the 8th.⁴⁰⁴ Meyer assembled two Kampfgruppen for the defence of the area. Kampfgruppe Waldmüller, consisting of *II. Abteilung SS Panzer Regiment 12* (Equipped with Panzer IVs), *I. SS Panzergrenadier Regiment 25*, *1. SS Panzerjäger Abteilung 12* (equipped with Jagdpanzer IVs, a casemate tank destroyer with a 7.5cm gun on the Panzer IV chassis) and *3. SS 101*,

⁴⁰² Stacey, *The Victory Campaign*, 211-215.

⁴⁰³ Stacey, *The Victory Campaign*, 218-220. Hubert Meyer, *The History of the 12. SS-Panzer Division Hitlerjugend*, 171.

⁴⁰⁴ Brian A. Reid, *No Holding Back: Operation Totalize, Normandy, August 1944*, (Toronto: Robin Bass Studio, 2005), ebook, 529-533.

equipped with Tigers, were ordered to recapture the hills south of St. Aignan.

Kampfgruppe Wünsche, with three *Panzer Kompanien*, one each of Panzer IVs, Panthers and the Tigers of 2.SS 101, along with the I and III. Panzergrenadier Regiment 26 was to disengage from the fighting at the Grimbosq bridgehead to the south and occupy the hills to the west and northwest of Potigny.⁴⁰⁵ Once these two Kampfgruppen were in place, the Hitlerjugend would control the two best routes into Falaise, but only temporarily. While the two Kampfgruppen looked formidable, all of the units employed were understrength and could not be expected to hold against the Canadian attack for long, but the hope was that they could hold long enough for the 85th Infantry Division to arrive on the 9th, which would add some much needed depth to the German position.⁴⁰⁶

Meyer had reacted with great speed to the Canadian attack in the finest German tradition but his delaying actions were inadvertently helped by the actions of the Canadians. While it was only at noon that the majority of the Canadians objectives had been secured, many had been secured hours earlier and there was an opportunity to press on, especially since the two exploiting armoured divisions, 4th Canadian and 1st Polish were ready to go. However, the bombers could not be called off on short notice and so the second phase had to begin on schedule at 1:55 in the afternoon. It was this interlude that allowed Meyer's Kampfgruppen to advance and would allow them to play a significant role in Totalize's second phase.⁴⁰⁷

⁴⁰⁵ Reid, *No Holding Back*, ebook, 533. Meyer, *The History of the 12.SS- Panzer Division Hitlerjugend*, 172.

⁴⁰⁶ Reid, *No Holding Back*, 541-545.

⁴⁰⁷ Kurt Meyer, *Grenadiers: The Story of Waffen SS General Kurt "Panzer" Meyer*, translated by Michael Mende and Robert J. Edwards, (Mechanicsburg: Stackpole Books, 2005), ebook, 279-280. Stacey, *The Victory Campaign*, 222. Wilbeck, *Sledgehammers*, 126.

During this interlude Michael Wittmann, in temporary command of *schwere SS Panzer Abteilung 101*, would lead eight Tigers forward as part of Kampfgruppe Waldmüller, at 12:30. The counterattack of Kampfgruppe Waldmüller was in keeping with the long standing German traditions of aggression and seizing of the initiative but the time when those hallmarks would have carried the day were long gone. While the Germans had been assembling their forces, 2nd Canadian Infantry Division and the British 51st Highland Division (attached to II Canadian Corps for the operation), had been preparing for a counterattack. Since the Canadians expected to find the Hitlerjugend in the German second line they had planned for an attack by that division and the remnants of the 89th Infantry Division hours earlier. So rather than attacking exhausted men who had just finished wresting their objectives from the enemy, the weak German Kampfgruppe, which consisted of an understrength infantry battalion supported by three depleted companies of AFVs were attacking two infantry and two armoured brigades with ample time to prepare. The defenders also enjoyed a five to one superiority in artillery.⁴⁰⁸

To make matters worse, the elements of Kampfgruppe Waldmüller did not strike the British and Canadian positions all at once, but instead the attack broke down into three separate ones, which were incapable of supporting each other. The Panzer IVs of II Abteilung Panzer Regiment 12 attacked Cremesnil, Waldmüller's Panzergrenadiers attacked St. Aignan, while Wittmann's Tigers and the Jagdpanzer IVs drove down Route Nationale 158 towards Gaumesnil.⁴⁰⁹ While all three attacks would fail, it was Wittmann's Tigers that would prove the limitations of the Tiger's in 1944. Wittmann

⁴⁰⁸ Reid, *No Holding Back*, 591-592.

⁴⁰⁹ Wilbeck, *Sledgehammers*, 127.

advanced down the Route Nationale, ignoring the woods to his right where Allied tanks were waiting in ambush.⁴¹⁰ Allied accounts confirm Wittmann's poor decision making as they came under fire from three armoured regiments. In the orchards to the east (on the right) of the Route Nationale were the Shermans of A Squadron, Northamptonshire Yeomanry.⁴¹¹ On the other side of the Route Nationale A Squadron, Sherbrooke Fusiliers, also fired on the Germans.⁴¹² Further to the north, B Squadron of the 144 Regiment, Royal Armoured Corps (144 RAC) also took the AFV's of Kampfgruppe Waldmüller under fire.⁴¹³ Between the two British and one Canadian Regiments (The Sherbrooke Fusiliers) eight Tigers had been claimed but only five had actually been destroyed, based on examination of the wrecked vehicles afterwards.⁴¹⁴ Regardless of the number of losses it was clear that the attack had been launched in haste and Wittmann had led his Tigers down the Route Nationale into what amounted to an ambush launched from three sides. In the process Wittmann lost his own life, as well as that of his crew. He also cost *schwere SS Panzer Abteilung 101* five Tigers, which the depleted unit could ill afford.⁴¹⁵

After the collapse of Kampfgruppe Waldmüller's attack along Route Nationale 158 and the launching of Totalize's 2nd phase, the exploitation by the 4th Canadian and 1st Polish Armoured Divisions would come the Tiger's last action of the day. As part of his response to the operation, Meyer had dispatched elements of Kampfgruppe Wünsche to occupy positions in the woods between Robertmesnil and St. Sylvain, including the

⁴¹⁰ Reid, *No Holding Back*, 1006-1007.

⁴¹¹ Ibid, 597-599.

⁴¹² Ibid, 599-600.

⁴¹³ Ibid, 600.

⁴¹⁴ Ibid, 1037.

⁴¹⁵ Ibid, 603.

Tigers of 2.SS 101.⁴¹⁶ From these woods, the Tigers, Jagdpanzer IVs and Panzer IVs could disrupt the advance of the 1st Polish Armoured Division. At 2:25, just half an hour after the advance had begun the 2nd Armoured Regiment came under fire from these woods, reporting that twenty Tigers were firing at them. In reality 2.SS 101 had only three Tigers available, so the majority were likely Jagdpanzer IVs and Panzer IVs.⁴¹⁷ The exact composition of the German force aside, their fire brought the Polish advance to a standstill. Attempts to blast the Germans out of the woods proved fruitless and while the 10th Mounted Rifle Regiment, the divisions reconnaissance unit and its Cromwell's were able to blunt an attempt by the Kampfgruppe to outflank the stalled Poles, the offensive proved impossible to restart. By the end of the day the division's armoured brigade, the 10th Armoured Cavalry had lost 57 tanks, almost a third of its strength.⁴¹⁸ While the Poles had taken heavy losses, the Tigers did not come out of the fight without losing a tank of their own, though that was small consolation to the Poles.⁴¹⁹

The operations of 2.SS 101 and the rest of Kampfgruppe Wünsche did successfully hold up an entire armoured division for a day, a strong performance, especially given the small number of vehicles involved, and a good example of the Tiger Phobia found in Normandy. However, claims of success for the 2.SS 101 and the rest of Kampfgruppe Wünsche should come with some caveats. The 1st Polish Armoured Division had only just arrived in Normandy and watching much of their lead unit being destroyed in the open by hidden German tanks would be enough to make even hardened veterans hesitant. Also the German position had not been struck by the Phase Two

⁴¹⁶ Reid, *No Holding Back*, 698.

⁴¹⁷ Ibid, 699. Schneider, *Tigers in Combat II*, 420.

⁴¹⁸ Reid, *No Holding Back*, 702.

⁴¹⁹ Schneider, *Tigers in Combat II*, 420.

bombardment and subsequent efforts to neutralize the position with the divisions own artillery also failed.⁴²⁰ Consequently, while the Kampfgruppe and its Tigers had done very well, they were aided considerably by the failure of the Poles supporting arms and their inexperience. Regardless of how the credit is allocated, by the end of the day the Polish advance, upon which half of Simonds plan depended had failed and the 4th Canadian Armoured Division had not fared much better, though it was primarily poor staff work that caused their operations to fail, not German guns.⁴²¹

Despite the poor showing of the Canadian and Polish Armoured Divisions, August 8th was the beginning of the end for the German's eastern flank. Totalize was followed by Operation Tractable, launched on the 14th, which put II Canadian Corps over the Laion River and culminated in a drive to Falaise with units of II Canadian Corps and US V Corps.⁴²² This effort created the Falaise pocket on August 19th. This pocket contained over 100,000 German soldiers from eleven infantry and ten Panzer divisions. A major Allied victory was in the offing but determined German counterattacks managed to keep a narrow escape route open, through which between 35,000 and 40,000 men managed to escape before the Allies sealed off the pocket for good on the 21st.⁴²³ Amongst the escapees from the pocket were the men of the three schwere Panzer

⁴²⁰ Reid, *No Holding Back*, 703-704.

⁴²¹ Reid, *No Holding Back*, 703. John A. English, *Failure in High Command: The Canadian Army and the Normandy Campaign*, (Ottawa: The Golden Dog Press, 1995), 278-279. Mark Zuehlke, *Breakout from Juno: First Canadian Army and the Normandy Campaign, July 4- August 21, 1944*, (Vancouver and Toronto; Douglas & McIntyre, 2011), 292.

⁴²² Stacey, *The Victory Campaign*, 252.

⁴²³ Horst Boog, Gerhard Krebs and Detlef Vogel, *Germany and the Second World War: Volume VII; The Strategic Air War in Europe and the War in the West and East Asia 1943-1944/45*, translated by Derry Cook- Radmore, Francisca Garvie, Ewald Osers, Barry Smerin, Barbara Wilson (Oxford: Clarendon Press, 2006), 612.

Abteilungen that had been fighting in Normandy, though only three of their tanks would survive the retreat and return to Germany with their crews.⁴²⁴

The campaign in Normandy was not only a dismal failure for the Germans in general but also for the Tigers. Their victories at Villers Bocage as well as during Operation Goodwood and Totalize were overshadowed not only by the overall failure of the German defence in all three instances but also the fact that even when the Germans were able to cause significant losses, the Allies were able to quickly make them good - something which the Germans could not do. Also, while Wittmann helped to spread Tiger Phobia across the beachhead after his attack at Villers Bocage, time and time again the Allies performance against these vehicles was not characterized by fear but rather careful application of superior tactics. This was true in both engagements with the familiar Tiger I but also the brand new Tiger II, whose appearance did not appear to unduly alarm the Allied units facing them. Indeed the Allies had no trouble applying the tactics they had prepared for the Tiger I against its successor. So while Normandy is often considered to be the place where the Tigers were most feared, it is instead where the fear of the Tiger finally disappeared for good.

⁴²⁴ Schneider, *Tigers in Combat I*, 134. Schneider, *Tigers in Combat II*, ebook, 424-425, 531.

Chapter 8: The Final Battles: The Tiger II in Hungary

October 1944 to March 1945

The Normandy Campaign had been an inauspicious one for the Tigers and for the new Tiger II in particular. It was not until a number of *schwere Panzer Abteilungen* equipped with these tanks were deployed to Hungary, in October 1944, that the Tiger II would fully demonstrate its capabilities. The operations of the Tiger II in Hungary included a series of counterattacks by *schwere Panzer Abteilung 503* in October and later operations by both Heer and Waffen SS *Abteilungen* from January to March 1945, including the major offensives of Konrad I to III as well as *Frühlingserwachen* (Spring Awakening). These operations demonstrated that even with Germany's final defeat looming, large-scale deployments of Tiger IIs with ample support could be tactically successful. That said, the Allies numerical and material superiority, which had been working against the Tigers since 1943, was still very much in evidence and ensured that any German victories were especially short lived. Also working against the Tigers was the decline of the German army more generally, which often denied the *schwere Panzer Abteilungen* the support required to achieve even temporary success. Consequently, operations in Hungary would better illustrate the strengths of the Tiger II but even when these tanks were performing well, there was no way they could hope to compensate for the broader problems afflicting the Heer.

Hungary had been a member of the Axis since 1940 and by the fall of 1944, it was one of Germany's last and most vital allies. With the defection of the Romanians on August 23rd, 1944, the Germans had lost the support of their military along its vulnerable southern flank and more importantly access to Romanian oil. Determined to keep

Hungary in the war, to keep the Soviets out of Austria and to maintain control of Hungary's oilfields, Hitler invested considerable resources into Hungary's defence. By March 1945 half of the armoured formations on the Eastern Front were employed in Hungary. In total fifteen Panzer, four Panzergrenadier, four infantry and four cavalry divisions were sent to Hungary before the wars end.⁴²⁵

By October 1944, before the bulk of the German reinforcements arrived, the Axis forces defending Hungary had been pushed deep into the interior, following a succession of Soviet attacks over the summer and were within seventy kilometers of Budapest.⁴²⁶ At this point *schwere Panzer Abteilung 503*, which had been completely reequipped with the Tiger II after their losses in Normandy was dispatched to Budapest on October 9th.⁴²⁷

After helping to stage a coup to keep Hungary in the war, the *Abteilung* was transferred to the front.⁴²⁸ On the 18th, the *Abteilung* was attached to the 24th Panzer Division for IV Panzer Corps' counterattack out of the Szolnok Bridgehead towards Debrecen. Owing to a lack of rail transport only the Tigers of 1.503 and ten Tigers of 3.503 were available.⁴²⁹ What followed was an operation that echoed the exploits of the Panzer divisions that had swept across France in 1940. The German attack struck the First Romanian Army and caused its defences to collapse almost immediately. The chaos was so complete that a train carrying a Soviet Guards cavalry division drove into the area

⁴²⁵ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 855-856, 862-863.

⁴²⁶ Ibid, 872.

⁴²⁷ Wilbeck, *Sledgehammers*, 164.

⁴²⁸ Ibid.

⁴²⁹ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 873. Schneider, *Tigers in Combat I*, 135.

unawares and was shot up by the Tigers.⁴³⁰ By the days end the Germans had advanced forty kilometers. In the early years of the war, an opening attack like this would be the prelude to a great victory as the Panzers surged forward, deep into the enemy's rear. Unfortunately for the Germans, much had changed since those halcyon days and while the Romanians were as ill prepared as any Allied army had been early in the war, their new Soviet allies had extensive fighting the Germans and would not provide them with any easy victories the next day.

For operations on the 20th, 3.503 was to lead the assault towards the city of Turkeve. Unfortunately, the only available route was down a narrow causeway over a dam, flanked by marshland, which was an impenetrable obstacle for the seventy-ton Tigers. The Tigers thick frontal armour allowed them to survive the advance down the causeway and they were able to take Turkeve, though seven of the ten tanks were disabled in the advance on the town⁴³¹. Without more tanks the German advance halted outside Kisujszalls.⁴³² Despite being unable to take Kisujszalls, the attack had been a tremendous success with *schwere Panzer Abteilung 503* advancing seventy kilometers in two days, the deepest penetration achieved by any *schwere Panzer Abteilung* during the war.⁴³³ Unfortunately this great success was followed by a rapid withdrawal as Soviet forces captured Mezötur, a town in the German's rear. With the specter of encirclement

⁴³⁰ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts* 781-782. Wilbeck, *Sledgehammers*, 155.

⁴³¹ Lochmann, Rubbel and von Rosen, *The Combat History of the German Tiger Tank Battalion 503 in World War Two*, ebook, 818.

⁴³² Ibid, 820. Wilbeck, *Sledgehammers*, 155.

⁴³³ Hill, *The Red Army and the Second World War*, 527-528. Wilbeck, *Sledgehammers*, 155.

looming, the Germans turned around and began a fighting retreat back to the Theiss River, where they would remain for most of the next month.⁴³⁴

The 503's operations in October demonstrated that, even in 1944, the *schwere Panzer Abteilung* could still find great success in their intended role but in many respects these operations were the exception, not the rule. The *Abteilung* was fresh and could employ the majority of its vehicles in the attack and they were well supported by the 24th Panzer Division. They also had the advantage on the 19th of attacking the 1st Romanian Army, whose principal anti-tank gun was still a 47mm gun of French design that had been purchased before the war. The Germans had done little to provide their erstwhile ally with better anti-tank guns and the Soviets had not had time to upgrade their new ally's arsenal, leaving them vulnerable to attack by virtually any late war tank, but especially the Tiger II.⁴³⁵ That said, the better equipped Soviets fared only slightly better, as even their well constructed defensive lines were penetrated by the Germans. So fresh *schwere Panzer Abteilungen* could still perform their assigned tasks even late in the war, but the circumstances that would allow for this performance, fresh tanks, good support and weak enemy forces were very rare. It is also important to emphasize, that whatever the weakness of the Soviet defences of Turkeve were, the Soviets still had sufficient strength to outmaneuver the Germans and force them to respond to their attack, rather than pressing forwards. So even at their most successful, at this stage in the war the Soviet's material and numerical advantage was still decisive and could erase German gains with ease.

⁴³⁴ Schneider, *Tigers in Combat I*, 136.

⁴³⁵ Wilbeck, *Sledgehammers*, 155-156.

On December 24th, the Axis position in Hungary became even worse as the Red Army encircled Budapest.⁴³⁶ With the capital threatened the emphasis shifted towards its relief. There would be three operations launched to relieve Budapest in January, named Konrad I-III. *Schwere Panzer Abteilung 503* and *509* would play important roles in these operations, as would the Tiger Is of SS Panzer Division Totenkopf (The Division was designated as a Panzer Division in December 1943). Konrad I would see an attack from the north using the 96th Infantry Division to cross to the Danube's southern bank, opening the way for IV SS Panzer Corps to thrust east along the riverbank then turning south towards the city.⁴³⁷ The initial attacks by the 96th Infantry and IV SS Panzer Corps on January 1st, were a success, but by January 6th, the offensive had stalled after the capture of Bicske owing to Soviet numerical superiority and the mountainous terrain in the area.⁴³⁸ One of the attacking divisions was the 3rd SS Panzer Division Totenkopf, the only unit to retain its *schwere Panzer Kompanie*. The *9.Kompanie* SS Panzer Regiment 3, which was still equipped with Tiger Is, would be an important part of the division's offensive firepower, but its older Tigers were more vulnerable to Soviet fire, than the new Tiger IIs, especially given that the growing number of 152mm guns fielded to counter the latest German tanks had no problem penetrating the Tiger Is armour.⁴³⁹ When the offensive began on January 1st, the *Kompanie* had eleven of its seventeen tanks operational. By the 6th, only four tanks were operational and that day would see three

⁴³⁶ Frieser, Schmider, Schönherr et al. *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 895.

⁴³⁷ Ibid, 905. Balck, *Order in Chaos*, 409-410.

⁴³⁸ Frieser, Schmider, Schönherr et al. *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 906.

⁴³⁹ Oberkommando des Heers. Pz Offz B Chef GenStdH Anlage 7. 5.7.1944. Betr. Tiger 1. NARA, T-78, Roll 620 frame 000071.

Tigers disabled by Soviet anti-tank guns. Their crews subsequently destroyed these vehicles as they could not be recovered. In addition to the three Tigers lost on the 6th, a further four vehicles had been destroyed by Soviet fire in the preceding days. These losses would keep the *Kompanie* out of Konrad II while damaged vehicles were repaired, denying Totenkopf an important force multiplier for the next offensive. The loss of seven tanks in less than week was a spectacular series of losses, especially given that during Operation *Zitadelle* Totenkopf had only lost one Tiger in the course of that two week operation.⁴⁴⁰ These heavy losses were a testament to not only the strength of the Soviets defences but also to the greater abundance of weapons capable of killing Tigers. These included not only a greater numbers of ZiS-3 anti-tank guns but also the aforementioned IS-2, the T-34/85 as well as the ISU 122 and 152. These were casemate tank destroyers with 122mm and 152mm guns on the IS-2 chassis, which provided them with more protection than had been afforded to the earlier SU 122 and 152s.⁴⁴¹ While these new vehicles would struggle to penetrate the heavier armour of the Tiger II, they had much less trouble penetrating the flat 100mm armour plate on the front of the Tiger I.⁴⁴² Consequently by 1945, it was clear that the Tiger I was well and truly obsolete as a breakthrough tank, given the improvements in the Soviet arsenal that had been undertaken the previous year.

⁴⁴⁰ Schneider, *Tigers in Combat II*, ebook, 343, 395-396.

⁴⁴¹ Hill, *The Red Army and the Second World War*, 491.

⁴⁴² Oberkommando des Heers. En Pruf (BuM) den 23.6.44. Betr. Gegenüberatellung deutscher Pz.Kfw. gegen die neuen russischen Pz.Kfw. T-34 85 und IS 122. NARA, T-78, Roll 620, frame 000043-000044. Oberkommando des Heers. Pz Offz B Chef GenStdH Anlage 7. 5.7.1944. Betr. Tiger I. NARA, T-78, Roll 620, frame 000071.

Acting in support of IV SS Panzer Corps was III Panzer Corps, on the SS corps right flank. Among their units was *schwere Panzer Abteilung 503*. After three months fighting in Hungary the *Abteilung* had only twenty-six tanks and of those only ten were operational when the operation began on January 1st. The initial attack struck especially strong Soviet positions, with some key areas requiring twelve attacks to overcome. Given this heavy fighting it is not surprising that the attack took a heavy toll on the depleted Tiger unit as the next day only two Tigers were left in operation. This loss was heavier in terms of numbers than that suffered by the 9. Totenkopf but crucially the improved armour of the Tiger II meant that none of the 503's Tigers were lost and by the 4th, the unit was able to field thirteen tanks. While the 503's Tigers had fared better than those of Totenkopf, III Panzer Corps progress was no better than that of IV SS Panzer Corps, requiring a second operation.⁴⁴³

Konrad II would shift the emphasis to III Panzer Corps, to not only gain ground but also to relieve pressure on IV SS Panzer Corps. *Schwere Panzer Abteilung 503* was once again in the vanguard of III Panzer Corps. 1.503 was attached to the 4th Cavalry Division while the rest of the *Abteilung* would fight alongside the 23rd Panzer Division. On the 9th, 1.503's attack went fairly well and resulted in the destruction of seven enemy tanks. On the 23rd Panzer's front a Tiger ran afoul of an SU-152 and was destroyed. That was however, far from the only problem that 2. and 3.503 encountered. When the Tigers encountered a strong Soviet trench line the battalion commander, Hauptmann von Diest-

⁴⁴³ Frieser, Schmider, Schönherr et al. *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 907. Schneider, *Tigers in Combat I*, 138. Wilbeck, *Sledgehammers*, 164.

Koerber attempted to personally motivate the supporting infantry.⁴⁴⁴ In a dramatic display he left his tank and attempted to rally them on foot, but they refused to follow.⁴⁴⁵

With the aid of several corporals von Diest-Koerber was able to rally the reluctant infantry and they secured the Soviet trench.⁴⁴⁶ The need to rally the infantry to continue to advance with the tanks was a sign of the weakness of the German infantry by 1945. Their unwillingness to support the attack of the tanks violated the principles of combined arms attacks laid out in the 1943 *Guidelines for Employment of Panzers in Cooperation with an Infantry Division*. The manual emphasized that the close support of the infantry was absolutely vital to the success of any combined effort. The tanks would reduce strong points and suppress enemy infantry. In return the infantry would eliminate enemy anti-tank guns and warn of other obstacles. This effort placed great demands on the infantry, which the manual acknowledges, “You must then give up your last strength to take advantage of the paralysis of enemy weapons by the tanks and follow them quickly. Better to shed sweat than blood!”⁴⁴⁷

After six long years of war not only was there a shortage of infantry, but the infantry that were available were tired, worn out and unwilling to act in the aggressive manner that had been the hallmark of the German military earlier in the war. It also demonstrated that the Tigers were only a part of a larger combined arms system and even though the Tigers themselves could perform well, they were incapable of achieving their

⁴⁴⁴ Lochmann, Rubbel and von Rosen, *The Combat History of the German Tiger Tank Battalion 503 in World War Two*, ebook, 882.

⁴⁴⁵ Ibid.

⁴⁴⁶ Wilbeck, *Sledgehammers*, 166.

⁴⁴⁷ Oberkommando des Heers. GenStdH/Ausb.Abt./Gen.Insp.d.Pz.Tr. Richtlinien für den Einsatz von Panzerkampfwagen im Rahmen einer Infanterie Division.g.1.10.43. TsAMO f.500.o.12480.d.145.

objectives alone. As Herman Balck said in his memoirs, in a criticism of this late war tendency that could just as easily act as a assessment of this attack:

Tactics is the coordinated effect of all arms in space and time onto one objective, with the emphasis being on *all* arms and *one* objective. The armoured units on their own could not handle the Russian infantry. One type of arm by itself is doomed to failure, and this iron-clad principle had been violated.⁴⁴⁸

The highlight of Konrad II for the 503 was the attack on Zamoly on January 11th. The *Abteilung* deployed thirteen Tigers for the operation and while it was a success, it was a costly one as von Rosen recalled:

The Russians had very skillfully positioned some SU-152 [or ISU-152s which would have been more common at this time, though distinguishing between the two at range in combat ranges would have been difficult⁴⁴⁹] self-propelled assault guns in the vineyard... We had not even spotted them when suddenly a 1 Company panzer went up in flames... Half an hour later the same thing happened to a second panzer. We withdrew a little. Apparently the crews of these guns observed us from hiding. When they saw a panzer they came into the open, aimed and fired one round, and withdrew into cover immediately. This deprived us of the opportunity to return fire and knock them out... After another half- hour a third panzer, standing to my left, was hit, killing the crew. We were at a loss how to deal with these assault guns since we had no idea where they were.⁴⁵⁰

⁴⁴⁸ Balck, *Order in Chaos*, 406.

⁴⁴⁹ Hill, *The Red Army and the Second World War*, 491.

⁴⁵⁰ von Rosen, *Panzer Ace*, 896-898.

Von Rosen's Tiger would be the next to fall victim. His encounter with the ISU-152s outside Zamoly was an excellent example of how the Soviets had learned to effectively counter the Tiger II. The assault guns not only had the firepower to overcome the Tigers formidable armour but also had the tactics necessary to avoid retaliation. By this stage in the war, the Allies in both the east and the west had become quite adept at countering Tigers. That said, the Soviets did not have it all their way. They did lose the town, and according to German records, would lose twenty-one tanks and twenty anti-tank guns but as was the norm by this point in the war, these material losses were ones that the Soviets could easily replace. By contrast the three Tigers lost by the *Abteilung*, with a further seven, including von Rosen's badly damaged one were not so easily replaced. Indeed, the attack at Zamoly was the 503s last operation in Konrad II as the depleted unit, which only had twenty three tanks, of which only three were operational was withdrawn to repair its badly damaged vehicles. So even when the Soviets lost the battle, their ability to inflict losses on the *Abteilung* was a greater victory, as a key German supporting element was removed from operations for some time, weakening the German offensive.⁴⁵¹

The loss of the Tigers was a blow but the great success of the operation was obtained not by the Tiger supported III Panzer Corps, which made very limited progress but instead by IV SS Panzer Corps. The 711th Infantry Division managed to break into the Soviets lines to the southeast, allowing the 5th SS Panzer Division, Wiking (Viking) to breakthrough. This attack met with great success, catching the Soviets off guard and allowing the division to continue on until it was just seventeen kilometers from Budapest,

⁴⁵¹ Wilbeck, *Sledgehammers*, 167.

before being withdrawn on the 12th for fear that the limited German penetration would be cut off and destroyed. Even in the last months of the war, the Tigers were proving to be nice additions to the Heer, but the fundamental principles of armoured warfare that the Germans had developed in the interwar period were still more than capable of delivering victory without the Tigers, even if two divisions could only deliver a fleeting victory far short of the decisive operation success that the Germans required to relieve Budapest⁴⁵²

Konrad II had been another failure, but Wiking's success placed the Germans tantalizingly close to Budapest so Konrad III was authorized. For this operation, IV SS Panzer Corps was once again going to lead the offensive, but rather than launching another attack in the north along the Danube the new plan was to strike further south between Lake Balaton and Lake Velence, driving straight on to Budapest. The Soviets had noticed the movement of IV SS Panzer Corps but believed that the Corps was going north, to Prague, rather than spearheading another attack on Budapest. Consequently the Germans achieved total surprise when the attack was launched on January 18th⁴⁵³. This day was particularly auspicious for *schwere Panzer Abteilung 509*. The 509 had been all but wiped out fighting on the Vistula River in September 1944 and had been rebuilt and reequipped with the Tiger II. It arrived in Hungary on January 15th, just in time for Konrad III.⁴⁵⁴ The 509 would be spearheading the IV SS Panzer Corps attack, specifically that of the Totenkopf. 9. Totenkopf had nine Tiger Is ready, but after their poor showing in Konrad I, these vehicles were employed in a supporting role. Leading

⁴⁵² Frieser, Schmider, Schönherr et al. *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 909-910.

⁴⁵³ Ibid, 912-913. Balck, *Order in Chaos*, 411-412.

⁴⁵⁴ Wilbeck, *Sledgehammers*, 167. Schneider, *Tigers in Combat I*, 345.

the attack would be the new Tiger IIs of the 509.⁴⁵⁵ The first day of Konrad III offered a rare opportunity to see a *schwere Panzer Abteilung* performing exactly as envisioned, at full strength, rather than attacking piecemeal and at reduced strength as was the norm throughout the war.⁴⁵⁶

The initial attack was a success for the *Abteilung*, but extensive minefields and the usual Soviets defence in depth took a heavy toll with only eighteen Tigers still operational by the end of the morning.⁴⁵⁷ At 2pm the attack on the town of Szabadbattyan began. The town was captured but the Soviets destroyed the town's bridge over the Sarviz Canal when the lead Tigers were just fifty meters away. Nevertheless, the *Abteilung* penetrated the Soviets lines to a distance of nineteen kilometers, an excellent demonstration of their offensive capabilities at full strength. As impressive as the achievement was, a number of other factors must be considered which make their success one that comes with significant caveats. The *Abteilung* suffered heavy losses in the attack. Seven Tigers were destroyed by Soviet fire and a further sixteen were disabled.⁴⁵⁸ Losing half of the *Abteilung* in a day, even if most of the vehicles could be recovered and restored was a serious loss, especially since the offensive was far from over. These losses were also a reflection of the fact that the Tiger II was unable to escape the problems that had hobbled the Tiger I in previous offensives, most notably Kursk. As in that great 1943 battle, the combination of strong Soviet defenses and the Tiger's poor mechanical reliability led to rapid and significant losses in fighting power, which meant that it was

⁴⁵⁵ Schneider, *Tigers in Combat II*, ebook, 344.

⁴⁵⁶ Wilbeck, *Sledgehammers*, 169.

⁴⁵⁷ Ibid, 169.

⁴⁵⁸ Oberkommando des Heers. Armeegruppe Balack den 17.1.45. Betr. Fernschreiben An Heersgruppe Sud. TsAMO.f.500.o.12472.d.410. Wilbeck, *Sledgehammers*, 169-170.

very difficult to sustain the momentum of an advance once the initial break in had been achieved and create the breakthroughs that the Tigers were designed to force.

The other two Tiger units in Konrad III, 9.Totenkopf and the 503 started the operation badly depleted. *Schwere Panzer Abteilung 503*, once again employed in support of III Panzer Corps began the operation with just eight Tigers which was the greatest number they would field during the operation, with the average being just five tanks.⁴⁵⁹ Totenkopf's Tigers would support the division throughout the operation but the *Kompanie* never had more than five operational Tigers. By the time it was called off on the 26th, the *Kompanie* had just one operational Tiger, which was par for the course for the whole of SS Panzer Regiment 3. In addition to its lone Tiger, also had one operational Panzer IV and one operational Panther, a far cry from the 176 tanks the regiment should have had.⁴⁶⁰

The poor state of Totenkopf's Panzer Regiment on January 26th was a problem across the divisions participating in the operation and Balck ended the operation on that day for lack of offensive power. When the offensive was called off, the Germans were just twenty kilometers from Budapest but as the strength of the Tiger units indicates quite starkly, actually reaching the city was far outside the capabilities of the forces employed.⁴⁶¹ With the failure of the relief effort, Budapest's fate was sealed, though the city would not fall until an abortive and ill-advised breakout attempt by the city's

⁴⁵⁹ Schneider, *Tigers in Combat I*, 138-139. Oberkommando des Heers. Armeegruppe Balack Ia den 18.1.45. Betr. Anruf von IV SS Pz.Kps. TsAMO.f.500.o.12472.d.410.

⁴⁶⁰ Schneider, *Tigers in Combat II*, ebook, 345-346.

⁴⁶¹ Balck, *Order in Chaos*, 412. Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 914-915.

defenders failed on February 11th.⁴⁶² The efforts to relieve Budapest with Konrad I-III were failures that demonstrated that while even at the end of the war the Wehrmacht in general and the Tigers in particular could still enjoy an occasional victory, their wider ability to capitalize on those victories had been severely diminished.

The fall of Budapest was not the end of the fighting in Hungary, but it did represent the last glimmers of German operational success in the theatre, as the final German offensive, *Frühlingserwachen* - launched in March 1945 met with little success and merely kept the last German armoured reserves far from Berlin, proving far more advantageous to the Soviets than the Germans. In this final offensive the depleted 509 and *schwere SS Panzer Abteilung 501* (Previously *schwere SS Panzer Abteilung 101*) had met with little success and were forced to abandon the majority of their vehicles in the final retreat into Austria.⁴⁶³

Tactically, the *schwere Panzer Abteilungen* that fought in Hungary from October 1944 to March 1945 did not entirely share Germany's strategic weakness. When an adequate number of the Tigers with good support attacked the Soviets they could still succeed but the demands placed upon them, their lack of mechanical reliability and the poor state of the Heer made it difficult to create favorable conditions. The success of the initial operations of the 509 in Konrad III and the 503's attack on the First Romanian Army were outnumbered by failures. *Frühlingserwachen* was perhaps the most dramatic but it was the failed rallying of the infantry by Hauptmann von Diest-Koerber and the

⁴⁶² Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 919-920.

⁴⁶³ Michael Reynolds, *Sons of the Reich: II SS Panzer Corps*, (Staplehurst: Spellmount, 2002), 258, 264-272. Wilbeck, *Sledgehammers*, 175. Schneider, *Tigers in Combat II*, 443. Schneider, *Tigers in Combat I*, 355.

depletion of the 509 after their initial success in Konrad III that were emblematic of not only the decline in the Heers strength and will but also the Tiger II's unreliability, which led to the rapid decline in the fighting power of the *schwere Panzer Abteilung* as operations progressed. Hungary provided a better showcase of the Tiger IIs capabilities than Normandy, but it could not duplicate the fairly consistent ability of its predecessor to salvage the local situation, as the army it supported became weaker and its enemies became stronger.

From Ponyri to the Rhine:

The Tiger Variants 1943-1945

While the Tiger I and II are the most famous members of the Tiger “family”, the variants built upon their chassis demonstrated the effectiveness and limitations of the specialized AFVs fielded by the Heer in the second half of the war. The vehicles bore a number of similarities. All three were heavy vehicles, ranging from 65 tons to 75 tons, which severely limited their mobility. The Ferdinand proved to be best of the three when it was used as a long range tank destroyer, the role for which it had been designed, though the fluid nature of the war in this period and the Germans shortage of AFVs meant that they were often lost in retreat and used as assault guns, a role for which they were ill suited. The Sturmtiger, as an urban assault gun proved to be of limited utility even in its intended role as demonstrated in the Warsaw Uprising. The Jagdtiger likewise proved to be of limited use as its extreme weight and the burden this put on the drivetrain meant that the vehicles were often out of commission, awaiting spare parts leaving them with few opportunities to employ their formidable 12.8cm guns. The Ferdinand would prove to be the best of the Tiger variants but this was a dubious distinction as all three vehicles had proven to be overspecialized, or ill-conceived and ill-suited to the conflict in which they were engaged.

After losing the Tiger contract to Henschel in July 1942, ninety of the one hundred Porsche Tiger hulls that had been completed by *Nibelungenwerk* were converted into tank destroyers.⁴⁶⁴ The new Ferdinands, which had been manufactured by May 1943, shared only the hull and running gear with the original Porsche Tiger VK 45.01 (P). The

⁴⁶⁴ Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 59, 76-77, 81.

Ferdinand sported an additional 100mm of frontal armour, for a total of 200mm (while this armour thickness was 50mm greater than that of the Tiger II it should be noted that the Ferdinands armour was completely flat and thus did not offer the same degree of ballistic protection as the sloped armour of the Tiger II), as well as sporting the 8.8 cm Pak (*Panzerabwehrkanone*, Anti-Tank gun) 43 L/71 gun.⁴⁶⁵

This new 68.5 ton vehicle was even more radically differentiated from its origin by its look and role. Rather than being fitted with a turret, the Ferdinand's 8.8cm Pak 43 L/71 gun was mounted in an armoured casemate placed on the rear of the hull. While this arrangement made it easier to fit the larger gun, it did mean that the gun could fire only in an arc in front of the vehicle, denying it the combat flexibility of a turreted tank. The lack of a turret was not a serious problem when the vehicle was being used in its intended role. The Ferdinand was a tank destroyer, meant to engage enemy tanks at long range, up to 2.8 kilometers when firing at a T-34.⁴⁶⁶ Engagements at these ranges made a turret redundant, all the Ferdinand needed was a good firing position and enemy tanks could be comfortably dispatched long before they could outmaneuver it. That said, if enemy tanks or infantry could approach the vehicle from its flanks, the entire vehicle would have to be moved to engage them, a serious weakness in close quarters combat.⁴⁶⁷

For Operation *Zitadelle* the ninety Ferdinands were divided between two *Abteilungen*, *schwere Panzerjäger Abteilung* (Heavy Tank Destroyer Battalion) 653 and

⁴⁶⁵ Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 59.

⁴⁶⁶ Ibid, 122.

⁴⁶⁷ Oberkommando des Heers. Abteilungsführerschule der Panzertruppen Paris den 16.8.43. Betr. Kurzmerkblatt über Führung und Kampf der Sturmgeschütze zur Orientierung für andere Waffengattungen. TsAMO.f.500.o.12473.d.137. Showalter, *Hitler's Panzers*, 238. Bruno Friesen, *Panzer Gunner: A Canadian in the German 7th Panzer Division, 1944-45*, (Mechanicsburg: Stackpole Books, 2009), 149-151.

654. These two *Abteilungen* were part of *schwere Panzerjäger Regiment 656*.^{*468} Rather than employing the Regiment as a whole, its *Abteilungen* were assigned to separate corps in Generaloberst Model's 9th Army. XLI Panzer Corps got the 653 while XXIII Panzer Corps was given the 654 for the operation.

The 653's objective on July 5th was Hill 257.7, nicknamed "Panzer Hill". The hill was cleared by close assault, which Denis Showalter describes as "a polite euphemism for a series of vicious fights in which bayonets were civilized weapons".⁴⁶⁹ This kind of close quarters combat, where the bayonet was frequently employed was no place for a vehicle like the Ferdinand, but it was employed in the assault guns traditional role, to supplement available StuG *Abteilungen*. It proved a poor supplement, as its great size and lack of a turret were not its only weaknesses, it also lacked any close in defence weapon, like the hull mounted and coaxial machine guns mounted to the Tigers, making it even more vulnerable to enemy infantry. That said, while the Ferdinands lack of a machine gun was a cited as a major fault, both by the 653 and by subsequent historians, the real problem was less a lack of defensive weapons and more that cooperation between the tank destroyers and the infantry had broken down.⁴⁷⁰ As a result, while the Germans took Panzer Hill, the losses to *schwere Panzerjäger Abteilung 653* were exceptionally high.

The *Abteilung* started the day at full strength with forty-five vehicles; by the end of the

* While operating under *schwere Regiment 656*, the 653 and 654 were designated *I. Abteilung schwere Panzerjäger Regiment 656* and *II. Abteilung schwere Panzerjäger Regiment 656* but for clarity's sake the original designations will be the ones used in the text.

⁴⁶⁸ Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 45.

⁴⁶⁹ Showalter, *Armor and Blood*, 80.

⁴⁷⁰ Culver, *Tiger in Action*, 14. Showalter, *Armor and Blood*, 80. Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 65-66.

day only twelve were still operational.⁴⁷¹ By the 7th, the *Abteilung* had no operational vehicles, following two days of heavy fighting around the fiercely contested town of Ponyri where the vehicles were once again employed in close support roles for which they were ill suited. After this the unit was withdrawn to rebuild its strength.⁴⁷²

Schwere Panzerjäger Abteilung 654 did not fare much better during *Zitadelle*, Their Ferdinands proved just as vulnerable to attack by Soviet infantry as their comrades in the 653 as they advanced towards Ponyri⁴⁷³. By July 7th, the 654 was reduced to twenty-five vehicles, having lost almost half its strength in just three days⁴⁷⁴. On July 9th, as the entire *schwere Panzerjäger Regiment 656* (including the rebuilding 653) could only call upon ten operational vehicles and on the 10th, the 654 would lose another four Ferdinands inside Ponyri itself. After these losses, the 654 was also withdrawn to be rebuilt.⁴⁷⁵

Lieutenant Aleksei Voloshin, commanding a battery of 76mm ZiS-3 guns in the 271st Rifle Brigade, 181st “Stalingrad” Rifle Division, provided a good example of an engagement with an Elephant during 1944, but even though his combat was with the improved version of the vehicle, the fundamental elements of the engagement could have very easily taken place at Kursk or any where else the vehicles were employed in the East. His testimony demonstrated very starkly the vulnerabilities of the vehicle, as well as the effectiveness of Soviet anti-tank weapons in the latter half of the war. The Elephant was in a camouflaged position, allowing it to destroy several machine gun nests and a

⁴⁷¹ Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 50.

⁴⁷² Ibid.

⁴⁷³ Showalter, *Armor and Blood*, 82.

⁴⁷⁴ Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 86.

⁴⁷⁵ Forczyk, *Tank Warfare on the Eastern Front 1943-1945*, 116. Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 86.

45mm anti-tank gun at a range of two kilometers. It also destroyed a battalion of Valentine tanks (The Valentine was a British Infantry Tank provided to the Soviet Union). Voloshin recalled how his guns were then sent into the fray:

That evening I set out with one gun platoon to go around this hill, before deploying the guns about 300 meters from the self-propelled guns presumed location...we opened fire at its tracks and undercarriage. We fired five or six rounds. It attempted to move, but lost its tracks. Now immobilized, combat engineers crept up to it, set an anti tank mine beneath it, and blew it up.⁴⁷⁶

The specifics of Voloshin's account might have been particular to this engagement but nevertheless, it does showcase a number of things. It shows the vulnerability of the Elephant to being outflanked, especially when it was employed without infantry support, a recurring problem for the 656. Voloshin's actions also demonstrate the enhanced effectiveness of late war Soviet anti-tank weapons and their tactics in particular. He was careful to avoid an almost certainly fatal head on engagement and instead strike it from the more vulnerable flanks, taking care to immobilize the vehicle so that, even if his guns could not destroy it, the combat engineers could. The weapons and tactics that the Soviets had developed to counter the Tigers proved to be just as effective against tank destroyers with similar armour and armament.

Returning to Kursk, *Zitadelle* was called off on the 12th of July. At that time, *schwere Panzerjäger Regiment 656* reported the loss of nineteen Ferdinands across its two *Abteilungen*. These losses were relatively small, especially given the ninety vehicles that the regiment started the offensive with, but were significantly higher than that of the

⁴⁷⁶ Drabkim, *Panzer Killers*, ebook, 365-366.

Tiger I with only ten Tigers being lost during Operation *Zitadelle* out of 146 deployed. The Ferdinands higher losses were the result of their poor employment, being thrust into the role of assault guns, and while their armour and armament were up to the task, their poor mobility and the poor cooperation with the infantry left them exceptionally vulnerable, leading to a very costly operation for the new tank destroyer. The Tigers by contrast, had been deployed in accordance with their design, leading to lower casualties and a more successful operation for the heavy tank.⁴⁷⁷

The rapid diminishing of the fighting power of both *Abteilungen* reflected a malady that the Ferdinands shared with the Tiger, that is their mechanical unreliability, which was never overcome despite the best efforts of their crews. A number of problems were encountered with its engines, including bent or torn valves from shattered piston heads, broken piston rods and cracked cylinder heads. These were all the result of the engine overheating, not surprising given the 68.5 ton weight of the vehicle.⁴⁷⁸

While Operation *Zitadelle* had been a disappointing start for the Ferdinands as they took heavy losses in poor deployments, their next employment would allow them to be used as intended. On July 12th, the Soviets launched Operation Kutuzov with the aim of cutting off the Orel Salient. Among the forces that would be trapped by this Soviet encirclement was Model's Ninth Army and *schwere Panzerjäger Regiment 656*.⁴⁷⁹ Since the regiment had been in reserve when the Soviets attacked, it was quickly dispatched to

⁴⁷⁷ Shepherd, *Hitler's Soldiers*, 330.

⁴⁷⁸ Oberkommando des Heers. Kommandeur Panzer-Jäger Abteilung 656 den 2.11.43. Lagebericht über das schw. Panzer-Jäger-Regiment 656. NARA, T-78, Roll 620, frame 000775. Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 56, 66-70.

⁴⁷⁹ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944: The War in the East and the Neighboring Fronts*, 173.

help defend against the new Soviet offensive. The regiment's vehicles would remain in the Orel area until the end of July. In this defensive fighting, the regiment's vehicles were dispersed amongst German defenders, with their operations alongside the 36th Infantry Division on July 14th being typical. On this day, fourteen Ferdinands, mostly from the 653 were attached to the division, being dispersed around the division's frontage at *Zug* strength. Most of these vehicles were acting as part of the divisions static defence, but one *Zug* was employed, alongside a number of StuGs from *Sturmgeschütz Abteilung 185* and the divisions Pioneer battalion, in an attack on a group of dug in enemy tanks in Shelyabug. This attack, carried out with sufficient infantry was successful and resulted in no losses to the Ferdinands, a far cry from the fighting at Kursk. The four Ferdinands and the 3.*Sturmgeschütz Abteilung 185* that made up the divisional reserve were also engaged in a serious fight, fending off a Soviet attack that broke through the grenadiers and threatened to overrun the headquarters of Grenadier Regiment 118.⁴⁸⁰

As this action demonstrated, the Ferdinand proved to be potent tank destroyer when it was employed correctly. Engaging Soviet tanks at range maximized the advantages provided by the 8.8cm gun and the vehicles heavy armour, while avoiding the many disadvantages that afflicted the vehicle in close combat. Overall the fighting on the 14th was a success for the regiment and over the course of the fighting during both *Zitadelle* and the Orel Salient they would claim to have destroyed 502 tanks, more than 200 anti-tank guns and 100 field guns. While these numbers are certainly exaggerated, seriously so in the case of the number of tanks destroyed, it is nevertheless clear that the Ferdinands could be very successful when used as designed. That said, things did not

⁴⁸⁰ Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 51.

always go their way and by the end of July, when the unit was withdrawn from the Orel Salient, they had lost another twenty vehicles, most of which were destroyed by their crews to prevent their capture. The fact that most were destroyed by their crews is a testament to the difficulties in recovering the 68.5 ton vehicle, especially amid the fluid situation in the Salient where the Germans were repeatedly forced back, with Model ultimately abandoning the area on August 16th.⁴⁸¹ By then the badly depleted regiment was recovering in Briansk where *schwere Panzerjäger Abteilung 654* would hand their last remaining Ferdinands over to the 653, before returning to Germany to be reequipped with the Jagdpanther (a Casemate tank destroyer on the Panthers chassis, mounting the same 8.8cm Pak 43 L/71 gun as the Ferdinand) - the first unit to be equipped with this vehicle.⁴⁸²

Thanks to the transfer from the 654, the 653 was once again at full strength. Its Ferdinands would next see service in September 1943, in the Zaporozhe Bridgehead. The bridgehead was one of the last German positions on the eastern bank of the Dnieper left after Generalfeldmarschall Manstein had finally secured Hitler's permission to withdraw behind the mighty river on September 16th in the face of continued Soviet attacks against Army Group South.⁴⁸³ When the 653 arrived on October 1st, it was an *Abteilung* in name only. It was over strength upon arrival with fifty Ferdinands but the fighting in July and the necessity of conducting most of the unit's movement by road marches owing to shortage of rail transport had taken a serious mechanical toll, with only ten initially

⁴⁸¹ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944*, 274. Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 86.

⁴⁸² Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 42. Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 61.

⁴⁸³ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944*, 356-358.

available for operations. During the unit's deployment which lasted until October 16th, the unit's average strength remained around ten vehicles and only on October 7th, would it be able to field twenty vehicles.⁴⁸⁴

The shortage of operational vehicles aside, the operations of the 653 in the Zaporozhe Bridgehead were generally successful, particularly in the defence of the town of Novo-Alexandrovka on October 10th, with nine Ferdinands accounting for forty eight Soviet tanks with no losses to themselves.⁴⁸⁵ The 16th Panzergrenadier Division was supported by the 653's Ferdinands throughout their operations in the bridgehead. Their assessment of the Ferdinands strengths helps to explain their success in this encounter. Their heavy armour made them all but impervious to enemy tank fire (Even with the 85mm guns that would become the norm in 1944, a T-34 could only penetrate the Ferdinands armour at a range of 100 meters).⁴⁸⁶ It also possesses "a gun with unbelievable shooting performance. It's shots leave every T-34 and KV-1 in ruins, even at the longest possible range [Three kilometers⁴⁸⁷]"⁴⁸⁸

The 16th Panzergrenadier Divisions report was not all glowing praise however, as it also highlighted the same problems that the Ferdinands use at Kursk had shown. It emphasized once again the vehicle's lack of close defence weapons, concluding that "it is

⁴⁸⁴Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 71.

⁴⁸⁵ Ibid, 71.

⁴⁸⁶ Spielberg, Doyle and Jentz. *Heavy Jagdpanzer*, 122.

⁴⁸⁷ Ibid.

⁴⁸⁸ Oberkommando des Heers. Kommandeur 16.Panzer-Grenadier-Division den 7.10.43. Betr. Zusammenarbeit mit Panzern "Ferdinand" und Sturmpanzern. NARA, T-78, Roll 620, frame 000827.

therefore completely unsuitable for driving into the enemy[‘s positions] alone”.⁴⁸⁹ This warning was one that was worth repeating, but it was hardly a revolutionary insight. More interesting was the reports discussion of the Ferdinands use as an “Infantry Escort Tank”, which indicates that they employed the vehicle in a direct support role, when attacking the enemy front line, though the task of exploitation was still to be handled by the Panzer III and IVs.⁴⁹⁰ Their use in this role was in violation of the rules that both the division and the members of the 653 knew.⁴⁹¹ That they did it anyway is less a reflection of poor decision making and instead reflects the chronic shortage of AFVs on the Eastern Front, which necessitated using the Ferdinands more like a tank or assault gun, rather than as a tank destroyer. It also must be said, that while this employment of the Ferdinands did go against their intended role, the results were nowhere near as disastrous as they were at Kursk, with the 653 noting only two losses. One Ferdinand was so badly damaged that it was returned to the *Nibelungenwerk* and one vehicle was destroyed by its crew as it could not be recovered. These small losses, made all the more remarkable given the tenuous situation of the Zaporozhe Bridgehead suggests that the majority of the Ferdinands combat engagements were consistent with its intended use and that even when it was used contrary to its intended use, the supporting divisions were careful to keep the vehicles far away from enemy infantry, which indicates much better cooperation between the two arms than the 656 had at Kursk, though in fairness the more open nature of the Zaporozhe Bridgehead made it easier to maintain close contact than was possible

⁴⁸⁹Oberkommando des Heers. Kommandeur 16.Panzer-Grenadier-Division den 7.10.43. Betr. Zusammenarbeit mit Panzern “Ferdinand” und Sturmpanzern. NARA, T-78, Roll 620, frame 000826.

⁴⁹⁰ Ibid.

⁴⁹¹ Ibid.

amidst the layered Soviet defences of Kursk.⁴⁹² Despite the successes and minimal losses that the 653 had in the fighting in the Zaporozhe Bridgehead, it was not enough to salvage the situation. On October 10th, when the 653 successfully defended Novo-Alexandrovka, elsewhere in the bridgehead, the larger offensive by Southwest Fronts, 3rd and 8th Guards Armies as well as the 12th Armies was successful and on the 13th, the 653 was evacuated, a sign that regardless of Hitler's wishes the bridgehead could not be held. By the 14th, Zaporozhe itself was liberated. On the 15th, the last German units leaving the eastern bank of the Dnieper destroyed the dam and the bridges.⁴⁹³ Like the Tigers, the excellent performance of the Ferdinands, which in the words of the regiment's commander, Oberstleutnant Ernst von Jungenfeld, "made it a household name for both friend and foe" were not sufficient to compensate for the Germans overall weakness and counter the Soviets great strength.⁴⁹⁴

In December 1943, the Abteilung was dispatched to another Dnieper Bridgehead, this one at Nikopol. The fighting there mirrored the Ferdinands earlier performance, with the vehicles proving highly effective in their intended role. Their armour also proved

⁴⁹² Oberkommando des Heers. Kommandeur 16.Panzer-Grenadier-Division den 7.10.43. Betr. Zusammenarbeit mit Panzern "Ferdinand" und Sturmpanzern. NARA, T-78, Roll 620, frame 000826. Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 74.

⁴⁹³ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944*, 375.

⁴⁹⁴ Oberkommando des Heers. Kommandeur Panzer-Jäger Abteilung 656 den 2.11.43. Lagebericht über das schw. Panzer-Jäger-Regiment 656. NARA, T-78, Roll 620, frame 000777.

highly effective, with the unit losing only four vehicles.⁴⁹⁵ That said, with an average of just ten operational vehicles, they were once again able to only delay the inevitable, with the bridgehead falling on February 8th, 1944.⁴⁹⁶

By that point the Ferdinands had been withdrawn, returning to the Nibelungenwerk for much needed overhaul.⁴⁹⁷ The vehicles were modified, with a hull mounted machine gun, as well as other requests, including a commander's cupola, instead of the periscopes provided previously.⁴⁹⁸ They also underwent a name change. On February 1st, 1944, the Ferdinand was renamed, the *Elefant* (Elephant), a reflection of Porsche's fall from favor the previous year.⁴⁹⁹

The operations of the new *Elefant* in 1944, were very poor, marked by heavy losses and few successes. The 653 was split to deal with multiple new crises that had developed. 1.653 was sent to the Anzio Beachhead in February 1944, and the rest of the unit was dispatched to Army Group North Ukraine in March to assist in the relief of Tarnopol. Anzio would prove to be poor tank country, with the reclaimed swamps offering few opportunities to escape from heavy Allied artillery and anti-tank fire. While only three vehicles were lost in the fighting at Anzio, the *Kompanie* was all but wiped out in its retreat through northern Italy from May to August 1944 after the Allied breakout.⁵⁰⁰

⁴⁹⁵ Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 73-74.

⁴⁹⁶ Frieser, Schmider, Schönherr et al, *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944*, 467.

⁴⁹⁷ Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 174.

⁴⁹⁸ Ibid, 171-173. Spielberger, Doyle and Jentz. *Heavy Jagdpanzer*, 110-116.

⁴⁹⁹ Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 64-65.

Spielberger, Doyle and Jentz. *Heavy Jagdpanzer*, 110-116.

⁵⁰⁰ Steven Zaloga, *Anzio 1944: The Beleaguered Beachhead*, (New York: Osprey Publishing, 2005), 21,36. Failmezger, *American Knights*, ebook, 359, 365-368. Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 177-178, 185.

In the Ukraine, the *Elefanten* had a similarly limited impact on events. While their initial effort, supporting the attack of the 9th SS Panzer Division Hohenstaufen saw them reach the Strypa River as planned, they were unable to reach Tarnopol, which fell to the Soviets on April 14th.⁵⁰¹ While losses were light, with only four *Elefanten* destroyed, they had once again had little impact on events. In another parallel with Italy, the failure of the 653 in front of Tarnopol was followed by another devastating retreat in June which cost the unit twenty-two vehicles.⁵⁰²

The fighting in Italy and the units actions in the Ukraine in 1944 demonstrated that while the *Elefant* still had a gun and armour that was formidable, its lack of mechanical reliability was a devastating weakness, especially in the retreats that became more and more common as the war dragged on. Like the Tiger, when deployed in favorable conditions, it could be highly effective, but those circumstances were becoming ever rarer and the vehicles weaknesses increasingly came to the fore.

The surviving veterans of the 653 would finish the war in another tank destroyer variant of the Tiger, the Jagdtiger (Hunting Tiger). It mounted Krupp's 12.8cm KwK L/55 gun, which was so large that, like the Ferdinand before it, the Jagdtiger would be designed as a casemate tank destroyer, the only way to transport the gun. The vehicle would also feature a 250mm front armour plate, angled at 75 degrees. As a consequence, the Jagdtiger was the heaviest AFV fielded during the war with a weight of 75 tons.⁵⁰³ As a consequence of these features the Jagdtiger was both one of the most formidable AFVs

⁵⁰¹ Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 203.

⁵⁰² Ibid, 215. Frieser, Schmider, Schönherr et al. *Germany and the Second World War Volume VIII: The Eastern Front 1943-1944*, 684.

⁵⁰³ Spielberger, Doyle and Jentz. *Heavy Jagdpanzer*, 126-127. Spielberger, and Doyle, *Tigers I and II and their Variants*, 153.

of the Second World War and one of the weakest. Its armour and firepower, unsurprisingly fall into the former category. With 250mm of well sloped frontal armour, none of the common Allied tanks of the late war period, including the Sherman with the M3 75mm gun, the T-34 85 and the IS-2 could penetrate the Jagdtigers armour at anything more than 100 meters. Conversely the Jagdtigers 12.8cm KwK 44 L/55 gun could penetrate an IS-2 at a range of 2.5km, and penetrate the armor of every other Allied tank at a range of 4 kilometers.⁵⁰⁴ Otto Carius, who would command a Jagdtiger right at the war's end, provided a practical example of "the monstrous penetrating capability of our cannon".⁵⁰⁵ On one of the few opportunities he had to fire it, a Sherman drove behind a building to escape from their fire. Carius had his gunner put one round through the house, demolishing a portion of it and the second round destroyed the rest of the house and the Sherman.⁵⁰⁶

The strengths and weaknesses of the Jagdtiger as a vehicle were amply demonstrated in their combat performance in the final months of the war. Only two *schwere Panzerjäger Abteilungen* would use the Jagdtiger, the 653 as previously mentioned and the 512, though it is the old veterans of the 653 that will be discussed in detail, as the 512 only fought in the Ruhr Pocket in April 1945 and its experiences largely mirrored that of the more experienced unit.⁵⁰⁷

The 653's experience with the Jagdtiger was defined largely by its poor mechanical reliability, which accounted for far more losses than Allied arms. By January

⁵⁰⁴ Oberkommando des Heers. Pz Offz B Chef GenStdH Anlage 7. 5.7.1944. Betr. Jagdtiger. NARA, T-78, Roll 620 frame 000081.

⁵⁰⁵ Carius, *Tigers in the Mud*, 214.

⁵⁰⁶ Ibid.

⁵⁰⁷ Spielberger, Doyle and Jentz, *Heavy Jagdpanzer*, 183-185.

1945, after just two months of service in which the unit had spent most of its time driving around western Germany in an abortive effort to join Operation *Wacht am Rhein* (Watch on the Rhine, better known as the Battle of the Bulge). This placed a great toll on the vehicles, which were forced to conduct long road marches for lack of rail transport. The result was a steady drain on the units operational vehicles. By the end of January only four Jagdtigers had been destroyed but nineteen needed repairs and by the end of March, the unit had been reduced to twenty-eight vehicles after two months of steady retreat through the Rhineland of which only eight were operational.⁵⁰⁸

The Jagdtigers combat performance proved to be little better than its mechanical reliability. As with the Tigers, the Jagdtigers were often employed in small numbers to shore up German defences. There were instances where the Jagdtigers succeeded in having a tactical impact, including a successful rearguard action by the seven Jagdtigers of 1.653 on March 16th, but this effort in which well-coordinated Kampfgruppen prevented an American crossing of the Sauer River was an exception.⁵⁰⁹ It was far more common for the vehicles to be involved in poorly supported counterattacks for which they were ill suited, leading to the loss of a number of vehicles.⁵¹⁰ Ultimately the Jagdtiger proved too unreliable for mass deployment and was too specialized to be useful in the fluid defensive fighting the Germans were engaged in at the end of the war.

The Sturmtyger likewise proved ill suited to the circumstances in which it was employed. The Sturmtyger, or to give its official name, the 38cm *Sturmmörserwagen* (Assault Mortar vehicle), represented the final iteration of an assault gun specifically

⁵⁰⁸ Münch, *The Combat History of German Heavy Anti-Tank Unit 653*, 280,282-283.

⁵⁰⁹ Ibid, 287-288.

⁵¹⁰ Ibid, 278.

designed for urban combat. When the citizens of Warsaw rose up against their German occupiers in August 1944, the situation seemed to be tailor made for the Sturmtiger, with the formidable armour of the Tiger I and 38cm *Raketenwerfer* (Rocket Launcher) 61 L/5.4. Unfortunately for the Germans, production had only just begun in August of 1944, so only two vehicles were ready for service.⁵¹¹ Nevertheless their arrival in the city did cause a stir. One Sturmtiger was filmed on August 19th, operating around the Kierbedz Bridge. The camera showed an “entire building crumble to dust”, under the weight of the 38cm rockets.⁵¹² It was a dramatic showcase of the vehicles firepower but the Sturmtiger would actually have a very small role in the Germans suppression of the uprising. This was owed partly to the extremely small number employed but also to the nature of the fighting itself. The Sturmtiger could certainly level buildings but that was never enough in Warsaw. While the Germans had an unquestionable firepower advantage, reducing the city’s buildings to rubble turned them into even more formidable strongpoints, which the Poles held tenaciously. “In this way practically every building and crater had to be fought over time and time again before the Germans could secure a disputed sector”.⁵¹³

In this Rattenkreig (War of the Rats), the Sturmtiger was more liability than asset.⁵¹⁴ Its armour was formidable, but the tightly packed and rubble chocked streets of Warsaw made the vehicle difficult to maneuver, and if should become stuck, the sixty-five ton Sturmtiger would be difficult to recover. They were also exceptionally

⁵¹¹ Doyle, *The Complete Guide to German Armored Vehicles*, 454-456. Spielberg and Doyle, *Tigers I and II and their Variants*, 169, 172.

⁵¹² Oberkommando des Heers. 76 g 31 a WaIRU...Wa Chefgruppe den 4.1.1944. Betr. Tiger Mörser. United States National Archives (NARA), T-78, Roll 619, frame 001047. Alexandra Richie, *Warsaw 1944: The Fateful Uprising*, (London: William Collins, 2013), 416-417.

⁵¹³ Norman Davis, *Rising 44: The Battle for Warsaw*, (London: Pan Books, 2018), 254.

⁵¹⁴ Davis, *Rising 44*, 259.

vulnerable to infantry anti-tank weapons, including captured German Panzerfausts (Tank Fist, a short range rocket launcher) to Molotov Cocktails. Finally, as Davies indicated, the leveling of buildings looked impressive, but did little to overcome the Pole's determined resistance- they simply turned the ruins into even more formidable defensive positions. So the Sturmtyger saw little use, in what was, ostensibly the very environment they were designed for. Indeed, in the long term, the citizens of Warsaw did not remember the massive German assault tank, but did remember the Germans heavy use of the Nebelwerfer (rocket launcher). Thousands were launched into the city and were nicknamed Krowa (Bellowing Cow), after the sound they made.⁵¹⁵

After their disappointing initial employment, the vehicles saw little use and references to them are few and far between, a testament to the absence of circumstances in which these highly specialized vehicles could be successfully employed. Oberst Helmut Ritgen, of the Panzer Lehr Division recalled that his Kampfgruppe had one attached to them at the Vouziers Bridgehead, just north of Falaise at the end of August 1944. The vehicle had been sent for use in Paris, but had been diverted after the collapse of the German front in Normandy and the declaration of Paris as an open city by its German commandant. Its only noteworthy contribution to the German defence came on August 31st, when it was used to demolish a windmill on a hill outside Vouziers that was being used by American artillery observers. Ritgen did not mention its fate, but given the demise of the other Tigers retreating from France and the decimated state of the Panzer Lehr Division generally, it is very likely that the vehicle was destroyed by its crew in the

⁵¹⁵ Davis, *Rising 44*, 259.

subsequent German retreat back into the Reich, either due to mechanical failure or a lack of fuel.⁵¹⁶

The last recorded deployment of the Sturmtiger comes from April 1945, where four Sturmtigers were attached to the 116th Panzer Division, fighting in the Ruhr Pocket. In addition to the Sturmtigers, the division could only field another fourteen Panthers, another testament to the poor state of the Heer at the end of the war.⁵¹⁷ While their armour and armament made them theoretically formidable, their twelve round ammunition capacity, poor mobility and the great clouds of dust and smoke that accompanied their firing made them poorly suited for defensive fighting and they added little to the division's fighting strength at the end of the war. Consequently, the Sturmtiger would prove to have the worst combat career of any member of the Tiger "family", being too heavy even for its intended role and too specialized to be effective in any other role.

Overall the tale of the Tiger variants is one of failure. All three vehicles proved to be too specialized to adapt to the mobile defensive war the Germans were waging from 1943 to 1945. The Ferdinand would enjoy more success than the others in 1943 when employed in more static defensive positions in the Orel Salient as well as the Zaporozhe and Nikopol Bridgeheads but those successes were overshadowed by failures in 1944 and in its first deployment during *Zitadelle* – the latter of which demonstrated that while it could be used successfully, opportunities to do so were fairly rare and it proved unable to adapt to changing circumstances in the same way that the Tigers themselves could. Thus

⁵¹⁶ Helmut Ritgen, *The Western Front 1944: Memoirs of a Panzer Lehr Officer*, translated by Joseph Welsh, (Winnipeg: J.J Fedorowicz Publishing Inc., 1995), 204.

⁵¹⁷ Jorge Rosado and Chris Bishop, *Wehrmacht Panzer Divisions 1939-45*, (London: Amber Books, 2010), 184.

it proved to be like the Sturmtyger and Jagdtyger, technically impressive vehicles with heavy armour and awe-inspiring guns, that lacked the flexibility required to be truly successful.

Conclusion

With the end of the war in Europe on May 9th, 1945 the story of the Tiger “family” came to an end. The *schwere Panzer Abteilungen* were disbanded and their vehicles were largely sent to the scrap heap. All that remained was their complex legacy as both examples of German technological superiority and as testament to the folly of the engineers who created such unreliable behemoths. There is also the remaining question about how effective they truly were for the German war effort. As has been demonstrated time and time again, the Tigers really did earn much of their legendary reputation. There were plenty of instances between 1942 and 1945 where the Tigers shrugged off enemy fire and destroyed everything in their path. Nevertheless the overriding conclusion of the Tiger story is one of failure.

Even from the start, the members of the Tiger “family” were not created to fill any pressing doctrinal need. While the *Heers Waffenamt* had been planning for a heavy tank since 1935, no firm plan for a heavy tank existed until Hitler established his own parameters in May 1941. The Tiger I that resulted set the precedent for the rest of the Tiger “family” to follow. Rather than continuing to embrace the emphasis on mobility and firepower that had guided previous Panzer designs like the Panzer III and IV - which allowed the vehicles to operate well within the doctrine of *Bewegungskreis* - Hitler placed his emphasis on armour and firepower. Thus a new trend in German armoured fighting vehicle design was created, with ever heavier vehicles and increasingly large guns entering service, culminating in the 75-ton Jagdtiger which possessed 250mm of armour

and a 12.8cm gun.⁵¹⁸ These massive vehicles were technically impressive but they created substantial economic burdens even before they fired a shot in anger.

Production of the Tiger “family” was in some respects quite successful. German industry was able to produce the vehicles in the quantities set by the Heer for most of the war, continuing production even in the midst of a concerted Allied bombing campaign. Only in the fall of 1944, when the Allied bombing offensive had reached its zenith and the Germans had begun to run out of both manpower and raw materials was production finally subject to serious delays and eventual collapse. That said, the success of production was overshadowed by larger problems. The great complexity of the Tigers led to a limit on the number that could be produced and prevented the Germans from producing larger numbers of cheaper, but less powerful vehicles. This compromise was considered acceptable as a means to counter the Allies quantitative superiority with the qualitative superiority of heavier German tanks. Unfortunately for the Germans, no tank had the necessary qualitative superiority to overcome the Allies overwhelming numerical superiority, given that Germany produced 44,688 AFVs to the Allies 239,750.⁵¹⁹ German efforts to compensate for the Allies material superiority were further undermined by poor economic management. A lack of consistent prioritization and the constant conflicts between different economic agencies ensured that for the duration of the war the term “German efficiency” remained a contradiction in terms. Consequently, while the production of the Tiger “family” was relatively efficient, it took place against a backdrop

⁵¹⁸ Spielberger, Doyle and Jentz. *Heavy Jagdpanzer*, 126-127. Spielberger, Doyle, *Tigers I and II and their Variants*, 153.

⁵¹⁹ Zaloga, *Armored Champion: The Top Tanks of World War II*, ebook, 597-604.

of chronic inefficiency and a wider quantitative gap between the two sides that no vehicle, regardless of its quality could bridge.

The true test of the Tiger “family” came not in their development or production, but upon the many battlefields over which they fought. The Tiger I’s initial operations in the Soviet Union and North Africa in 1942 and 1943 would create the Tiger’s legendary reputation, with its thick armour and powerful gun leaving a lasting impression on friend and foe alike. It was also at this time that the Tiger’s faults first became apparent. In these operations it began to earn its other reputation as a mechanically unreliable vehicle, which often left units with too few vehicles to be truly effective. Their lack of mobility was also demonstrated well, especially in the operations of *schwere Panzer Abteilung* 503 with Army Group Don in January 1943. In that instance, with the army group threatened with encirclement the Tigers lacked the numbers or the mobility to save the day. Instead it was Herman Balack’s 11th Panzer Division, with the Panzer III and IV, which saved Army Group Don, demonstrating that the traditional emphasis of Panzer design on mobility and firepower that was so compatible with the traditions of *Bewegungskreis* was still a potent and decisive combination. These early operations also gave the Allies ample opportunities to examine the new German heavy tank, especially since both the British and the Soviets would quickly secure their own captured examples to analyze. With captured examples of the Tiger in hand, the British and the Soviets could begin to create new tactics and weapons to meet the new threat, ensuring that the Tigers superiority would be short-lived.

Operation *Zitadelle* seemed tailor made for the Tigers and their breakthrough role. Strong Soviet defences needed to be smashed to allow the Panzer divisions to surge

through the gaps and deliver victory. Unfortunately for the Tigers, the Soviets had planned their defence well and were ready to combat the Tigers. While Tiger losses were low -with only ten of the 146 Tigers deployed being lost -the rapid depletion of their units to combat or mechanical damage meant that the Tigers often lacked the strength to secure the breakthroughs for which they had been designed.⁵²⁰

On the defensive, from the summer of 1943 to the summer of 1944 the Tigers again had decidedly mixed results. Their use as '*Korsettstange*' (Corset Stays) was one that stretched the already mechanically unreliable tanks to their limits as they worked to reinforce depleted and demoralized infantry formations. Even in this period however, the Tigers would have a number of successes against long odds. While these successes were impressive, they could not disguise the fact that the Germans were steadily retreating and no success against the odds in local combat between the Tigers and the Red Army could change that. Additionally, this period saw a slew of new Soviet AFVs entering the fight, from the IS-2 tank to numerous tank destroyers including the SU-100 and ISU-152, all of which were capable of combating the Tiger I and II on a relatively equal footing- especially as they tended to be deployed in larger numbers than the Tigers.

Normandy would see the Tiger I cement its legendary reputation, especially with Michael Wittmann's actions at Villers Bocage on June 7th, 1944. Wittmann did his fair share to ensure the lasting nature of the Tiger legend, but their overall performance in Normandy was fairly poor. In Normandy the Tigers were not only unable to help maintain the Germans position in the region in the face of the Allies material superiority but they were also increasingly vulnerable to Allied weapons in the form of both Allied

⁵²⁰ Schneider, *Tigers in Combat I*, 187,263. Schneider, *Tigers in Combat II*, ebook, 71-74, 223, 302, 395.

air power and powerful new anti-tank weapons, especially the British 17 pounder, which turned the Sherman into a tank capable of defeating the Tiger.

Normandy would also see the first, inauspicious deployment of the Tiger II. While the new tank would have little success in France, its operations in Hungary from October 1944 to March 1945 would demonstrate that it was a worthy successor to the Tiger I in every way. Its armour and armament were even more formidable but it would also prove to be just as unreliable as its predecessor. In Hungary the Tiger II would have a number of successes, including the attack of *schwere Panzer Abteilung 503* against the Romanian 1st Army in October 1944. These operations demonstrated that even with the war coming to an end, the underlying principles of Panzer doctrine -the massed use of tanks, well supported by other weapons -could still lead to tactical and even operational success. These victories were however, few and far between as the Germans were generally unable to muster sufficient Tigers and adequate support for their operations. So while the Tiger IIs did have their share of victories in Hungary, they were totally insufficient to tip the balance in a war that the Germans had already lost.

The Tiger variants - the Ferdinand, the Sturmtiger and the Jagdtiger - shared many similarities with the Tiger I and II. They were all heavily armoured and armed to their detriment, as it robbed them of the mobility so prized by German doctrine. They were also mechanically unreliable. That said, there were plenty of distinguishing features in their stories. The Ferdinand was the most successful of the variants, but only when used as intended. When it operated as intended -as a long-range tank destroyer in the Orel Salient as well as the Zaporozhe and Nikopol Bridgeheads in 1943 -the Ferdinand was highly successful. When employed outside of that role, especially when pressed into

service as an assault gun during its debut during Zitadelle and in the fighting in the Anzio beachhead in February 1944, it performed very poorly, with its lack of mobility and close range defensive weapons proving to be major handicaps.

By contrast the Sturmtiger and Jagdtiger lacked the Ferdinand's periods of successful employment. The Sturmtiger's 38cm rocket launcher was an awe-inspiring weapon but the vehicle proved too heavy to be used effectively. Thus it saw only limited use in the Warsaw Uprising, which should have been the vehicles finest hour as the uprising was defined by the kind of urban warfare the vehicle was designed for but that was not the case. The Jagdtiger too had an impressive 12.8cm gun but its unreliability and lack of mobility meant that it contributed very little to the final defence of western Germany in the final months of the war.

Taken all together the Tiger "family" represented an enormous technical achievement. The development and production of a succession of ever-heavier vehicles in the midst of one of the greatest conflicts of all time and under the shadow of Allied strategic bombing is an achievement worth noting. Unfortunately, the performance of these vehicles is worthy of less celebration. While they did have their share of successes, especially the Tiger I and II - which are among the most famous tanks of the Second World War - their achievements are overshadowed by their failures. They did not fit into German doctrine and were never capable of fulfilling their intended role owing to their poor mobility and lack of mechanical reliability. So for as impressive as the members of the Tiger "family" were, it is clear that they never quite lived up to the expectations placed upon them and were ultimately ineffective weapons when placed in the context of the wider war.

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- Oberkommando des Heers. Gen.St.d.H/ Ausb.Abt. (II). Zusammendruck der Ausbildungshinweise Nr.10-23.g.5.5.44. TsAMO f.500.o.12451.d.133.
- Oberkommando des Heers. Generalinspekteur der Panzertruppen. Nachrichtenblatt der Panzertruppen, Nr.4 *Oktober, 1943*. Betr.: Russische Anweisung zur Bekämpfung des "Tiger". NARA, T-78, Roll 623.
- Oberkommando des Heers. Generalinspekteur der Panzertruppen Ia Org. Nr.1000/43 geh. den 14.5.43. Betr. Einsatz von "Tiger"- Einheiten. NARA, T-78 Roll 620.
- Oberkommando des Heers. Kommandeur 16.Panzer-Grenadier-Division den 7.10.43. Betr. Zusammenarbeit mit Panzern "Ferdinand" und Sturmpanzern. NARA, T-78, Roll 620.

- Oberkommando des Heers. Kommandeur Panzer-Jäger Abteilung 656 den 2.11.43.
Lagebreicht über das schw. Panzer-Jäger-Regiment 656. NARA, T-78, Roll 620.
- Oberkommando des Heers. Major, 25.Pz.Div. Einsatz von Panzern in dem HKL zur Unterstützung der Infanterie. NARA, T-78, Roll 203.
- Oberkommando des Heers. Merkblatt des OKH den 1.6.41. Betr. Die wichtigsten Panzerkampfwagen der UdSSR. TsAMO f.500. o.12451. d. 452.
- Oberkommando des Heers. Nachrichtenblatt der Panzertruppen Nr.1 g.15.7.43. TsAMO f.500.o.12473.d.197.
- Oberkommando des Heers. *Nachrichtenblatt der Panzertruppen* Nr.15 den 9.4.44. Betr. Kampf zwischen "Tiger" und "Josef Stalin". NARA, T-78, Roll 623.
- Oberkommando des Heers. Oberstleutnant m.d.Führ..d.Abt.beauftr. Geh-Panzer Abteilung 503 den 12.4.43. Betr. Erfahrungsbericht für die Zeit vom 2.2-2.22 1943. NARA, T-78 Roll 620.
- Oberkommando des Heers. Pz Offz B Chef GenStdH Anlage 7. 5.7.1944. Betr. Panzer Waffen Verrichtung. NARA, T-78, Roll 620.
- Oberkommando des Heers. Pz Offz B Chef GenStdH Anlage 7. 5.7.1944. Betr. Panzer IV. NARA, T-78, Roll 620.
- Oberkommando des Heers. Pz Offz B Chef GenStdH Anlage 7. 5.7.1944. Betr. Panther. NARA, T-78, Roll 620.
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