

= Tiger II =

Tiger II is the common name of a German heavy tank of the Second World War . The final official German designation was Panzerkampfwagen Tiger Ausf . B , often shortened to Tiger B. The ordnance inventory designation was Sd.Kfz. 182 . It is also known under the informal name Königstiger ( the German name for the Bengal tiger ) , often translated literally as Royal Tiger , or somewhat incorrectly as King Tiger by Allied soldiers , especially by American forces .

The Tiger II was the successor to the Tiger I , combining the latter 's thick armour with the armour sloping used on the Panther medium tank . The tank weighed almost 70 tonnes , and was protected by 100 to 185 mm ( 3 @. @ 9 to 7 @. @ 3 in ) of armour to the front . It was armed with the long barrelled 8 @. @ 8 cm KwK 43 L / 71 anti @-@ tank cannon . The chassis was also the basis for the Jagdtiger turretless tank destroyer .

The Tiger II was issued to heavy tank battalions of the Army and the Waffen @-@ SS . It was first used in combat with 503rd Heavy Panzer Battalion during the Allied Invasion of Normandy on 11 July 1944 ; on the Eastern Front , the first unit to be outfitted with Tiger IIs was the 501st Heavy Panzer Battalion , which by 1 September 1944 listed 25 Tiger IIs operational .

= = Development = =

Development of a heavy tank design had been initiated in 1937 ; the initial design contract was awarded to Henschel . Another design contract followed in 1939 , and was given to Porsche . Both prototype series used the same turret design from Krupp ; the main differences were in the hull , transmission , suspension and automotive features .

The Henschel version used a conventional hull design with sloped armour resembling the layout of the Panther tank . It had a rear mounted engine and used nine steel @-@ tired , eighty centimeter diameter overlapping road wheels per side with internal springing , mounted on transverse torsion bars , in a similar manner to the original Henschel @-@ designed Tiger I. To simplify maintenance , however , as when the same steel @-@ tired road wheels were used on later Tiger I hulls , the wheels were only overlapping without being interleaved ? the full Schachtellaufwerk rubber @-@ rimmed roadwheel system that had been in use on nearly all German half @-@ tracks used the interleaved design , later inherited by the early production versions of the Tiger I and Panther .

The Porsche hull designs included a rear @-@ mounted turret and a mid @-@ mounted engine . The suspension was the same as on the Elefant tank destroyer . This had six road wheels per side mounted in paired bogies sprung with short longitudinal torsion bars that were integral to the wheel pair ; this saved internal space and facilitated repairs . One Porsche version had a gasoline @-@ electric drive ( fundamentally identical to a Diesel @-@ electric transmission , only using a gasoline @-@ fueled engine as the prime mover ) , similar to a gasoline @-@ electric hybrid but without a storage battery ; two separate drive trains in parallel , one per side of the tank , each consisting of a hybrid drive train ; gasoline engine ? electric generator ? electric motor ? drive sprocket . This method of propulsion had been attempted before on the Tiger ( P ) ( later Elefant prototypes ) and in some US designs , but had never been put into production . The Porsche suspension were later used on a few of the later Jagdtiger tank destroyers . Another proposal was to use hydraulic drives . Dr. Porsche 's unorthodox designs gathered little favour .

= = Design = =

Henschel won the design contract , and all Tiger IIs were produced by the firm . Two turret designs were used in production vehicles . The initial design is often misleadingly called the " Porsche " turret due to the belief that it was designed by Porsche for their prototype ; in fact it was the initial Krupp design for both prototypes . This turret had a rounded front and steeply sloped sides , with a difficult @-@ to @-@ manufacture curved bulge on the turret 's left side to accommodate the commander 's cupola . Fifty early turrets were mounted to Henschel 's hull and used in action . The more common " production " turret , sometimes called the " Henschel " turret , was simplified with a

significantly thicker flat face , no shot trap ( created by the curved face of the earlier turret ) , and less steeply sloped sides , which prevented the need for a bulge for the commander 's cupola , and added additional room for ammunition storage .

The turrets were designed to mount the 8 cm KwK 43 L / 71 gun . Combined with the Turmzielfernrohr 9d ( German " turret telescopic sight " ) monocular sight by Leitz , which all but a few early Tiger IIs used , it was a very accurate and deadly weapon . During practice , the estimated probability of a first round hit on a 2 m ( 6 ft 7 in ) high , 5 m ( 8 ft 2 in ) wide target only dropped below 100 percent at ranges beyond 1 000 m ( 0 62 mi ) , to 95 ? 97 percent at 1 500 metres ( 0 93 mi ) and 85 ? 87 percent at 2 000 m ( 1 2 mi ) , depending on ammunition type . Recorded combat performance was lower , but still over 80 percent at 1 000 m , in the 60s at 1 500 m and the 40s at 2 000 m . Penetration of armoured plate inclined at 30 degrees was 202 and 132 mm ( 8 0 and 5 2 in ) at 100 m ( 110 yd ) and 2 000 m ( 1 2 mi ) respectively for the Panzergranate 39 / 43 projectile ( PzGr ? armour - piercing shell ) , and 238 and 153 mm ( 9 4 and 6 0 in ) for the PzGr . 40 / 43 projectile between the same ranges . The Sprenggranate 43 ( SpGr ) high - explosive round was available for soft targets , or the Hohlgranate or Hohlgeschoss 39 ( HIGr ? HEAT or High - explosive anti - tank warhead ) round , which had 90 mm ( 3 5 in ) penetration at any range , could be used as a dual - purpose munition against soft or armoured targets .

Powered turret traverse was provided by the variable speed Boehringer - Sturm L4S hydraulic motor , which was driven from the main engine by a secondary drive shaft . A high and a low speed setting was available to the gunner via a lever on his right . The turret could be rotated 360 degrees in 60 seconds in low gear independent of engine rpm , in 19 seconds with the high speed setting and engine at 2000 rpm , and within 10 seconds at the maximum allowable engine speed of 3000 rpm . The direction and speed of traverse were controlled by the gunner through pedals , or a control lever near his left arm . If power was lost , such as when the tank ran out of fuel , the turret could be slowly traversed by hand , assisted by the loader who had an additional wheel . Two full turns of the wheel were necessary for a one degree turn of the turret , with a total of 720 turns for a full circle . The hydraulic system was not precise and gunners preferred to use the manual system to aim .

Like all German tanks , it had a petrol engine ; in this case the same 700 PS ( 690 hp , 515 kW ) V - 12 Maybach HL 230 P30 which powered the much lighter Panther and Tiger I tanks . The Tiger II was under - powered , like many other heavy tanks of World War II , and consumed a lot of fuel , which was in short supply for the Germans . The transmission was the Maybach OLVAR EG 40 12 16 Model B , giving eight forward gears and four reverse , which drove the steering gear . This was the Henschel L 801 , a double radius design which proved susceptible to failure . Transverse torsion bar suspension supported the hull on nine axles per side . Overlapped 800 mm ( 31 in ) diameter road wheels with rubber cushions and steel tyres rode inside the tracks .

Like the Tiger I , each tank was issued with two sets of tracks : a normal " battle track " and a narrower " transport " version used during rail movement . The transport tracks reduced the overall width of the load and could be used to drive the tank short distances on firm ground . The crew were expected to change to normal battle tracks as soon as the tank was unloaded . Ground pressure was 0 76 kg / cm<sup>2</sup> ( 10 8 psi ) .

== Command variant ==

The command variant of the Tiger II was designated Panzerbefehlswagen Tiger Ausf . B. It had two versions , Sd.Kfz. 267 and Sd.Kfz. 268 . These carried only 63 rounds of 8 cm ammunition to provide room to accommodate the extra radios and equipment , and had additional armour on the engine compartment . The Sd.Kfz. 267 was to have used FuG 8 and FuG 5 radio sets , with the most notable external changes being a two metre long rod antenna mounted on the turret roof and a Sternantenne D ( " Star antenna D " ) , mounted on an insulated base ( the 105mm Antennenfuß Nr. 1 ) , which was protected by a large armoured cylinder . This equipment was located on the rear

decking in a position originally used for deep @-@ wading equipment . The Sd.Kfz. 268 used FuG 7 and FuG 5 radios with a two @-@ metre rod antenna mounted on the turret roof and a 1 @.@ 4 metre rod antenna mounted on the rear deck .

= = Production = =

The Tiger II was developed late in the war and built in relatively small numbers . Orders were placed for 1 @,@ 500 Tiger IIs ? slightly more than the 1 @,@ 347 Tiger I tanks produced ? but Tiger II production was severely disrupted by Allied bombing . Among others , five raids between 22 September and 7 October 1944 destroyed 95 percent of the floor area of the Henschel plant . It is estimated that this caused the loss in production of some 657 Tiger IIs . Only 492 units were produced : one in 1943 , 379 in 1944 , and 112 in 1945 . Full production ran from mid @-@ 1944 to the end of the war .

The Tiger II served as the basis for one production variant , the Jagdtiger casemated tank destroyer , and a proposed Grille 17 / 21 / 30 / 42 self @-@ propelled mount for heavy guns that never reached production .

= = Proposed upgrades = =

The HL234 , an engine born from the developments initiated by attempting to convert the Maybach HL230 to fuel injection , would have increased the power to about 800 to 900 PS ( hp ) . The Entwicklungskommission Panzer unanimously decided that HL234 be immediately included in the engine design and procurement program . The AK @-@ 7 @-@ 200 was also explored as an alternative to the Olvar @-@ B drive train , but Waffenamt research and development department Wa Prüf 6 found that it offered inferior driving characteristics and so the Olvar @-@ B was retained . Krupp proposed mounting a new main weapon , the 10 @.@ 5 cm KwK L / 68 . Wa Prüf 6 was not supportive of this as the Heer had not accepted the cannon itself . Other suggested improvements included stabilised sights , a stabilised main gun , an automatic ammunition feed , a Zeiss stereoscopic range finder , heated crew compartment , stowage for an additional 12 rounds , and an overpressure and air filtration system to protect against poison gas , but these also never got beyond the proposal stage or did not enter production before the war ended .

= = Specifications = =

Gearbox : Maybach OLVAR EG 40 12 16 B ( eight forward and four reverse )

Radio : FuG 5 , Befehlswagen ( command tank ) version : FuG 8 ( Sd.Kfz. 267 ) , FuG 7 ( Sd.Kfz. 268 )

Ammunition :

8 @.@ 8 cm ? 80 rounds ( Porsche turret ) , 86 rounds ( Henschel turret ) , usually 50 % PzGr 39 / 43 and 50 % SprGr 43 , sometimes with a limited number of PzGr 40 / 43 , or with the SprGr replaced by HIGrPzGr 39 / 43 ( Armour @-@ piercing , tungsten core ) ( longer range , lower penetration , explosive filler )

PzGr 40 / 43 ( Armour @-@ piercing , tungsten core ) ( shorter range , higher penetration , inert )

SprGr 43 ( High Explosive )

HIGr 39 ( Hollow charge )

7.92mm ? up to 5 @,@ 850 rounds

Gun Sight : Turmzielfernrohr 9b / 1 ( TZF 9b / 1 ) binocular to May 1944 , then the 9d ( TZF 9d ) monocular .

= = Operational history = =

= = Organisation = =

Apart from research , training , and a five @-@ tank attachment to the Panzer Lehr , the Tiger II was only issued to heavy tank battalions ( schwere Panzer Abteilung ) of the German Army ( Heer ) , or Waffen @-@ SS .

A standard battalion ( Abteilung ) comprised 45 tanks :

Units that used the Tiger II were as follows :

Heer : ( s.H.Pz.Abt ) 501 , 502 , 503 , 504 , 505 , 506 , 507 , 508 , 509 , 510 , 511

SS : ( s.SS.Pz.Abt ) 501 , 502 , 503

== = Reliability and mobility == =

Early Tiger IIs proved unreliable , owing principally to leaking seals and gaskets , and an overburdened drive train originally intended for a lighter vehicle . The double radius steering gear was initially particularly prone to failure . Lack of crew training could amplify this problem ; drivers originally given only limited training on other tanks were often sent directly to operational units already on their way to the front .

The Schwere Heeres Panzer Abteilung 501 ( s.H.Pz.Abt. 501 ) arrived on the Eastern Front with only eight out of 45 tanks operational ; these faults were mostly due to drive @-@ train failures . The first five Tiger IIs delivered to the Panzer Lehr Division broke down before they could be used in combat , and were destroyed to prevent capture .

The introduction of modified seals , gaskets and drive train components , as well as improved driver training and sufficient maintenance improved the tank 's mechanical reliability . Statistics from 15 March 1945 show reliability rates of 59 percent for the Tiger , almost equal to the 62 percent of the Panzer IV and better than the 48 percent of the Panther were operational by this period .

Notwithstanding its initial reliability problems , the Tiger II was remarkably agile for such a heavy vehicle . Contemporary German records and testing results indicate that its tactical mobility was as good as or better than most German or Allied tanks .

== = Combat history == =

The first combat use of the Tiger II was by the 1st Company of the 503rd Heavy Panzer Battalion ( s.H.Pz.Abt. 503 ) during the Battle of Normandy , opposing Operation Atlantic between Troarn and Demouville on 18 July 1944 . Losses were : two from combat , plus the company commander 's tank , which became irrecoverably trapped after falling into a bomb crater created during Operation Goodwood .

On the Eastern Front , it was first used on 12 August 1944 by the 501st Heavy Panzer Battalion ( s.H.Pz.Abt. 501 ) resisting the Lvov ? Sandomierz Offensive . It attacked the Soviet bridgehead over the Vistula River near Baranów Sandomierski . On the road to Oglódów , three Tiger IIs were destroyed in an ambush by a few T @-@ 34 @-@ 85s . Because these German tanks suffered ammunition explosions , which caused many crew fatalities , main gun rounds were no longer allowed to be stowed within the turret , reducing capacity to 68 . Up to fourteen Tiger IIs of the 501st were lost in the area between 12 and 13 August to ambushes and flank attacks by Soviet T @-@ 34 @-@ 85 and IS @-@ 2 tanks , and ISU @-@ 122 assault guns in inconvenient sandy terrain .

On 15 October 1944 , Tiger IIs of 503rd Heavy Panzer Battalion played a crucial role during Operation Panzerfaust , supporting Otto Skorzeny 's troops in taking the Hungarian capital of Budapest , which ensured that the country remained with the Axis until the end of the war . The 503rd then took part in the Battle of Debrecen . The 503rd remained in the Hungarian theater of operations for 166 days , during which it accounted for at least 121 Soviet tanks , 244 anti @-@ tank guns and artillery pieces , five aircraft and a train . This was set against the loss of 25 Tiger IIs ; ten were knocked out by Soviet troops and burned out , two were sent back to Vienna for a factory overhaul , while thirteen were blown up by their crews for various reasons , usually to prevent them from falling into enemy hands . Kurt Knispel , the highest scoring tank ace of all time ( 162 enemy AFVs destroyed ) , also served with the 503rd , and was killed in action on 29 April 1945 in his Tiger

II .

The Tiger II was also present in the four heavy panzer battalions during the Ardennes Offensive of December 1944 , the Soviet Vistula ? Oder and East Prussian Offensives in January 1945 , the German Lake Balaton Offensive in Hungary in March 1945 , the Battle of the Seelow Heights in April 1945 , and the Battle of Berlin at the end of the war .

The 103rd SS Heavy Panzer Battalion ( s.SS Pz.Abt. 503 ) claimed approximately 500 kills in the period from January to April 1945 on the Eastern Front for the loss of 45 Tiger IIs ( most of which were abandoned and destroyed by their own crews after mechanical breakdowns or for lack of fuel )

= = = Gun and armour performance = = =

The heavy armour and powerful long @-@ range gun gave the Tiger II an advantage against all opposing Western Allied and Soviet tanks attempting to engage it from head on . This was especially true on the Western Front where , until the arrival of the few M26 Pershings in 1945 , neither the British nor US forces brought heavy tanks into service . A Wa Prüf 1 report estimated that the Tiger II 's frontal aspect was impervious to the 122 mm D @-@ 25T , the heaviest although not the best penetrating tank gun on the Allied side . On the other hand , an R.A.C 3.d. document of February 1945 estimated that the British QF 17 @-@ pounder ( 76 @.@ 2 mm ) gun , using armour @-@ piercing discarding sabot shot was theoretically capable of penetrating the front of the Tiger II 's turret and nose ( lower front hull ) at 1 @,@ 100 and 1 @,@ 200 yd ( 1 @,@ 000 and 1 @,@ 100 m ) respectively although , given the lack of a stated angle , this is presumably at the ideal 90 degrees angle . As a result of its thick frontal armour , flanking manoeuvres were most often used against the Tiger II to attempt a shot at the thinner side and rear armour , giving a tactical advantage to the Tiger II in most engagements . Moreover , the main armament of the Tiger II was capable of knocking out any Allied tank frontally at ranges exceeding 2 @.@ 5 kilometres ( 1 @.@ 6 mi ) , well beyond the effective range of Allied tank guns .

= = = Soviet wartime testing = = =

During August 1944 , two Tiger Ausf B tanks were captured by the Soviets near Sandomierz , and were soon moved to the testing grounds at Kubinka . During the transfer , the two tanks suffered from various mechanical break downs ; the cooling system was insufficient for the excessively hot climatic conditions , where the engine tended to overheat and cause a consequential failure of the gearbox . The right suspension of one of the tanks had to be completely replaced , and its full functionality could not be re @-@ established . The tank broke down again every 10 ? 15 km . The 8 @.@ 8 cm KwK 43 gave positive results in penetration and accuracy , which were on par with the 122 mm D @-@ 25T . It proved capable of passing completely through its " colleague " , a Tiger Ausf B 's turret at a range of 400 m . The armour of one vehicle was tested by firing at it with shells between 100 and 152 mm calibre . The welding was , despite careful workmanship , significantly worse than on similar designs . As a result , even when shells did not penetrate the armour , there was often a large amount of spalling from the inside of the plates , which damaged the transmission and rendered the tank inoperable . Further testing showed that the armour plate itself exhibited deficiencies in quality compared to earlier German tanks , such as the Tiger I and Panther . Analysis of the Tiger Ausf B armour plate showed an absence of molybdenum ( ascribed to a loss of supply , being replaced by vanadium ) , giving the armour low malleability .

The expanded firing test states that the ?? projectiles from the 100 mm BS @-@ 3 and 122 mm A @-@ 19 gun penetrated a Tiger Ausf B 's turret at ranges of 1000 ? 1500 metres , which suggests a quality factor of 0 @.@ 86 for the Tiger Ausf B 's turret . The firing test against the Tiger B turret front , however , was conducted after removal of the gun and mantlet , and resulted in penetrations close to armour openings , such as vision slits and gun location . The penetrations to the right gun opening were influenced by previous 100 mm projectile penetration hits or armour damage . The tank 's hull and turret side plates were penetrated by ?? shot from domestic 85 mm and American

76 mm guns at ranges of 800 ? 2 @, @ 000 m ( 2 @, @ 600 ? 6 @, @ 600 ft ) . The 100 mm BS @-@ 3 and 122 mm A @-@ 19 could also penetrate the weld joints of the front hull at ranges of 500 ? 600 metres after 3 ? 4 shots .

Despite the wartime testing , there is no reliable evidence that the front armour of the King Tiger had ever been penetrated in combat .

= = Surviving vehicles = =

The only working example is displayed at the Musée des Blindés , Saumur , France . It has the production turret and is accessible to the public . Other survivors include :

Bovington Tank Museum , Dorset , UK . Tiger II with early production turret is on display . This vehicle was the second soft steel prototype made and did not see active service . This Tiger II 's engine was removed for use in the restoration of Tiger 131 , the only working example of a Tiger I . A production turret Tiger II is on loan from the Defence Academy , Shrivenham , UK . See below .

Defence Academy of the United Kingdom , Shrivenham , UK . Tiger II ( production turret ) . This vehicle was from s.SS Pz.Abt. 501 , with hull number 280093 , turret number 104 , and has a comprehensive coating of Zimmerit . It was claimed by Sergeant Roberts of A Squadron , 23rd Hussars , 11th Armoured Division in a Sherman tank near Beauvais , although it had already been disabled and abandoned by its crew following damage to its tracks and final drive . There is a photograph showing this vehicle after its final action in a beet field with its turret turned 90 ° . This vehicle is currently on display at Bovington Tank Museum , in Dorset , UK .

The Wheatcroft Collection , Leicestershire , UK . A private collector , Kevin Wheatcroft , is about to start a restoration / rebuild of a complete Tiger II . The project will include parts from many individual Tiger IIs , but many parts will be of new manufacture . Wheatcroft has stated that he has 70 ? 80 % of the original parts needed for a reconstruction and more parts are sourced continuously . Known and shown parts are a complete front glacis plate , 8 @. @ 8 cm KwK 43 main armament , engine deck plates , approx . 1 / 3 hull ( rear ) in one part , a set of tracks , and approx . 2 / 3 of the left @-@ side hull plate in two parts . The aim of the project is a complete Tiger II in running order .

Mantes @-@ la @-@ Jolie , France . A more or less complete , but wrecked , Tiger II ( production turret ) is buried under regional road 913 . Parts of the turret were recovered in a limited exploratory excavation in 2001 . Further excavation is currently halted for financial reasons . There are plans to fully excavate and restore this Tiger II for a Vexin battle memorial .

Kubinka Tank Museum , Russia . Tiger II ( production turret ) with turret number 002 ( 502 ) captured at Ogl?dów by the Red Army . The museum is open to the public .

December 44 Museum , La Gleize , Belgium . A cosmetically restored Tiger II ( production turret ) Hull number 280273 , built in October 1944 . Turret number 213 from s.SS Pz.Abt 501 . Displayed at the entrance to DECEMBER 44 MUSEUM Collections , a museum devoted entirely to the Battle of the Bulge . This tank was abandoned in La Gleize on 24 December 1944 , where the advance of Kampfgruppe Peiper was halted . The front part , about 1 / 3 , of the gun barrel is restored with a Panther gun barrel and muzzle brake . It also has restored mudguards . It is stripped of exterior and internal fittings and most of the torsion bars are broken , but it still has its gearbox and engine in place .

Deutsches Panzermuseum , Munster , Germany . Tiger II ( production turret ) displayed in interior location accessible to public on payment of entrance fee . Hull number 280101 . Turret number 121 from s.SS.Pz.Abt 501 .

Patton Museum of Cavalry and Armor , Fort Knox , United States . Tiger II ( production turret ) . Hull number 280243 , built in September 1944 . Turret number 332 from s.SS Pz.Abt. 501 . Abandoned near Trois @-@ Ponts , it was captured by the US Army on 24 December 1944 . The left side was cut open for educational purposes at the Aberdeen Proving Ground in the late 1940s . This tank left Fort Knox on 14 December 2010 , en route to the proposed US Army armour museum at Fort Benning , United States .

Schweizerisches Militärmuseum Full , Switzerland . This Tiger II ( production turret ) was previously displayed in the Thun Tank Museum , and is now on loan to the Schweizerisches Militärmuseum

Full ( September 2006 ) . It will be completely restored to running condition in a long @-@ term project . This tank was given to Switzerland by France after the war . Hull number 280215 from s.H.Pz.Abt 506 .

= = = Tanks of comparable role , performance and era = = =