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PANZERKAMPFWAGEN I & II





Pz Kpfw I Ausführung (model) A distinguished from Ausf. B by the four suspension wheels and three return rollers.
 (Photo: Imperial War Museum)

Panzerkampfwagen I and II

by Major-General N. W. Duncan

UNDER the Treaty of Versailles, signed after the First World War, Germany was restricted to an army of 100,000 men and was forbidden to have or to build any tanks. General von Seeckt, who was commander-in-chief of this force until 1926, was a firm believer in the value of flexibility and mobility, and in addition to publishing a book on the subject he lost no opportunity of driving these two virtues home to his command. Although he was not a great believer in the tank he appreciated the part that it could play in attaining his ideal and its potentialities were continually under review. Von Seeckt used the post-war German army as a gigantic training cadre to turn out a succession of junior leaders who would be required when the force was increased in size. He also instituted a series of war games and theoretical exercises to examine the conduct of operations and to determine the equipment needed to bring them to a successful conclusion.

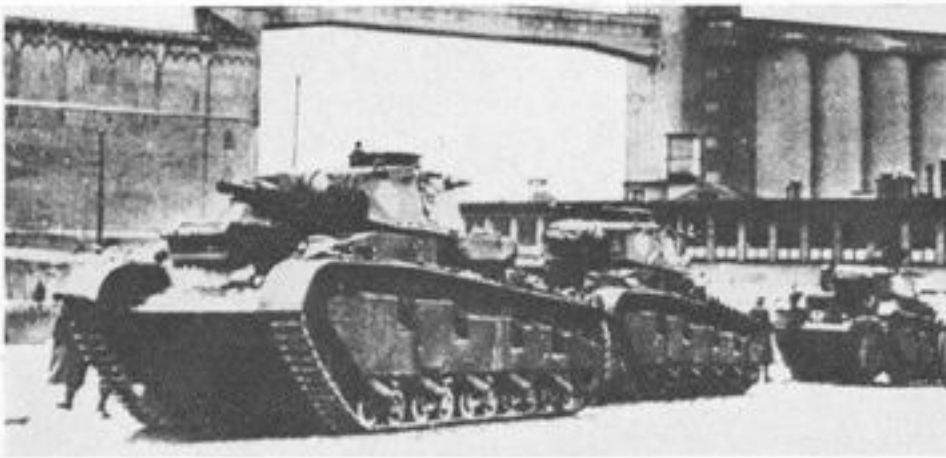
For some years the official ban on tanks was reinforced in practice by the dislocation following the war. Reparations, requirements for civilian construction, and the ban on the manufacture of military equipment imposed by the Versailles Treaty, all meant that there was virtually no German heavy industry available or ready to undertake tank construction. However, in 1926 Rheinmetall built a tank in mild steel disguised under the description of a *Grosstraktor*. This so-called tractor had a turret-mounted 75-mm. gun, weighed about 20 tons, and resembled the Vickers Medium Mark II. In 1928 a light "tractor" was built mounting a 37-mm. gun. Then in the early '30s came the multi-turreted *Neubaufahrzeug* (new model vehicle) A which weighed 35 tons with a 75-mm. and coaxial 37-mm. in the main turret and machine-guns in each of two sub-

sidiary turrets fore and aft of the main turret. It had 70 mm. of armour and looked similar to the Vickers Medium Mark III or the Russian T-28, all three being influenced by the Independent A1E1. NbFz. Type B had a 105-mm. gun in place of the 75-mm.

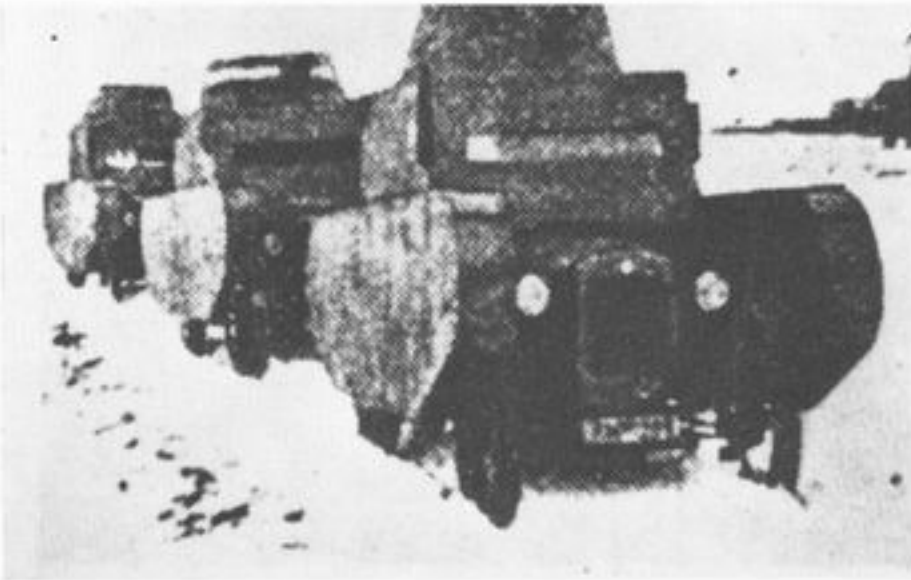
Forbidden to have tanks by the Versailles Treaty, the German army began its armoured training with canvas dummies pushed about by men on foot. In 1929 Guderian, who was tactical instructor at the Motor Transport Instructional Staff, Berlin, introduced motorized dummies of sheet metal.

(Photo: R.A.C. Tank Museum)





Despite the Versailles Treaty prohibition, Germany built some experimental tanks including these Neubaufahrzeuge.
(Photo: R.A.C. Tank Museum)



Guderian's dummy tanks. (Photo: R.A.C. Tank Museum)

Both types had a 500-h.p. engine and a speed of about 15 m.p.h. Excluding the Neubaufahrzeug, ten tanks in all were built—two each of two types of medium, and two each of three types of light. The light tanks all had 37-mm. guns and were the first gun-armed light tanks to be built; other nations were still making the machine-gun the main armament. These forbidden machines were tried out with Russian connivance at a tank testing centre established in 1926 at Kazan in the Eastern Baltic States.

Meanwhile a champion of armoured warfare had arisen in Lieut.-Col. Heinz Guderian who, in 1931, became Chief of Staff to General Lutz, Inspector of Motorized Troops. Lutz and Guderian were convinced that the future development of German armoured troops must be the formation of Panzer Divisions. As far as tanks were concerned they saw the requirement for two types: the first, a medium

tank in the 20-ton class, armed with a 75-mm. gun in the turret and two machine-guns, and capable of taking its place in the tank battle; and the second, a lighter machine intended primarily for reconnaissance, and armed with a 50-mm. armour-piercing gun and two machine-guns. These conclusions were accepted, except for the gun on the light tank which was to be 37-mm. because this was the size of gun with which the German infantry were already being equipped for the anti-tank rôle. The Chief of the Ordnance Office and the Inspector of Artillery favoured the 37-mm. gun and the desirability of production simplicity enhanced their argument. The change was reluctantly accepted by the armoured representatives.

None of the experimental models which had been built were considered adequate to fill the rôle required of these two types in the proposed Panzer Divisions. New models were necessary, and these eventually emerged in real life as the Pz Kpfw III and IV, but until they were ready, which would be several years, a training tank was needed. In the interests of speedy production and for the education of industry a light tank was the obvious answer. Light tanks were cheaper, they could be built easily—especially with the Carden-Loyd Mark VI chassis which had been bought in England ostensibly as a carrier for a 20-mm. anti-aircraft gun to serve as a design guide—and their potential would create no undue alarm in other countries.

In pursuance of this policy, the German Army Weapons Branch (Heereswaffenamt), on behalf of the General Staff, issued a requirement for a tank of approximately 5 tons weight with two machine-guns mounted in a turret with all-round traverse and protected by armour immune to attack by small arms fire. Five firms, an indication of the rapid recovery made by German heavy industry, were selected—Rheinmetall Borsig, Daimler-Benz, MAN, Henschel, and Krupp—and they were invited to submit their proposals for a machine to meet the requirement. Germany was lucky to have as many firms as this with the necessary engineering experience, design staff, and capacity to undertake work of this nature. Germany was more fortunate than other countries which on occasion have found civilian industry

Panzer I Ausf. As drawn up for inspection on peace-time manoeuvres.

(Photo: Imperial War Museum)





Panzer I Ausf. As moving through a battered street in Granadella during the Nationalist offensive in Catalonia towards the end of the Spanish Civil War.
(Photo: Imperial War Museum)

reluctant to branch out into unknown fields, and it says a good deal for the resilience of German industry that it should have been able to undertake this task so relatively soon after the country's defeat.

LANDWIRTSCHAFTLICHER SCHLEPPER (La S)

After close and detailed examinations LKA1, a design submitted by Krupps and based on the Carden-Loyd Mk. VI chassis, was selected and Krupps were made responsible for the development of the chassis, while Daimler-Benz were to construct the turret and the hull. To ensure secrecy and to hide the project from the outside world, the machine was given the

code name of "Landwirtschaftlicher Schlepper (La S)" or agricultural tractor. As the drawings and design reached completion in December 1933 Henschel were given orders to construct three prototypes. The first of these ran in February 1934, an extremely short time for constructional work of this nature even allowing for the fact that the tank was a very simple one.

Full-scale production began in 1934 with an order for 150 machines given to Henschel under the description IA La S Krupp and this was followed by another version known as IB La S May. About 1,800 in all were built and of these roughly 1,500 were the B model, longer and with a more powerful engine.

Panzer I Ausf. A showing twin MGs in turret.

(Photo: Imperial War Museum)





Panzer I Ausf. Bs entering Warsaw after it had been forced to capitulate on September 27, 1939. Note five suspension wheels and four return rollers.
(Photo: Imperial War Museum)

The La S designation was retained until 1938 when a standard code for tank designation was substituted. Experimental machines were given an identifying serial number—700 or 2000 or 3003, for example. The first number or pair of numbers indicated the weight class of the vehicle, e.g. 7 ton or 20 ton or 30 ton. The last two numbers were used to indicate the number of the prototype. A prefix VK indicated that the vehicle was fully tracked and where a multiple order had been given, the firms' initial letters followed in a bracket after the serial number, e.g. VK 2001 (H) and VK 2002 (DB) would have indicated tanks in the 20-ton class under experimental con-

struction by Henschel and Daimler-Benz respectively.

When a tank had been accepted for service it became known by its class name followed by the model number. Panzerkampfwagen abbreviated into Pz Kpfw or PzKw was used, e.g. Pz Kpfw I C indicating Model C of the first tank. On acceptance into the service a tank also received an Ordnance vocabulary number, e.g. Sonderkraftfahrzeug 101 abbreviated to SdKfz 101.

PZ KPFW I A (SD KFZ 101)

This tank was a straightforward machine with no unexpected characteristics or technical devices. It

Panzer I Ausf. A in Norway, April 1940, attacking a Norwegian position while German infantry take cover.
(Photo: Imperial War Museum)



was 13 ft. long and weighed 5.4 tons, with a crew of two men. It had welded turret mounting two coaxial 7.92-mm. MGs in an external mantlet and no special provision was made for observation by the commander who was performed by the gunner as well.

A 3.5 litre air-cooled Krupp M 305 four-cylinder engine was used which developed 57 h.p. at 2,500 r.p.m. and was housed in the engine compartment at the back of the tank together with a large oil cooler. The drive was taken forward to a five-speed sliding pinion gearbox and thence through cross shafts, carrying on each side a clutch and brake steering system, to the front driving sprockets. Several machines were fitted with the Krupp M 601 CI engine which developed 45 h.p. at 2,200 r.p.m., but the experiment proved unsuccessful and the Krupp petrol engine was used in all production models of the Pz Kpfw IA.

Krupps original prototype had four suspension wheels with a rear idler touching the ground: movement of the wheels was controlled by coil springs and three return rollers were mounted on the hull. The layout was changed in the production models which had an external girder covering the two rear suspension wheels. The ends of this girder were connected to the axle of the second suspension wheel and to the rear idler wheel axle by forked links carrying $\frac{1}{4}$ elliptic springs whose tips rested on the axles of the third and fourth suspension wheels. Movement of the leading suspension wheel was controlled by coil springs and three return rollers were mounted on the hull. The suspension was reasonably satisfactory at low speeds but pitched badly when the tank was moving faster, probably accentuated by the rear idler wheel which was in contact with the ground. The outside girder

appears in almost all original light tank designs whatever the country of origin. While it simplifies design to some extent it offers much additional drag in soft going and is vulnerable to hostile gun-fire. In practically every instance it disappears after the first batch of tanks, but in this instance it was used in the IA and IB and is included in the first two versions of Pz Kpfw II. Pz Kpfw I in all models used a single-pin skeletal track, having two guiding horns on each plate between which ran the suspension wheels: track plates were 10 in. wide.

PZ KPFW I B (SD KFZ 101)

This tank was evolved from Model A and appeared in 1935. Superficially the external appearance is the same but there are considerable differences in detail. A more powerful engine, a water-cooled Maybach NL 38 TR was installed and this required a longer and higher engine compartment. The tank was lengthened to provide the extra room and the sides of the superstructure were raised. The engine developed 100 h.p. at 3,000 r.p.m. and the extra power raised the speed of the tank from 23 to 25 m.p.h.

The armament remained the same as in the IA and despite the many disadvantages the two-man crew was retained. Armour thickness remained at 13 mm. and the turret showed no change except that an internal mantlet was used, a design feature that appeared on all German tanks until the introduction of the 50-mm. gun on the Pz Kpfw IIIs. A redesigned transmission incorporating a five-speed gearbox and a better final drive reduction gear was substituted for the IA pattern. The nose plate of the tank was redesigned to provide the necessary room for the final reduction gear which resulted in a complicated design pattern for casting.

Panzer Ausf. A in Norway. Soldier marching beside it gives good indication of its height.

(Photo: Imperial War Museum)





Panzer I Ausf. B passing through a destroyed town during the campaign in the west, May 1940. The numbers 322 on the turret side are tactical markings. 3 indicates company in regiment, first 2 is Zug (platoon) in company, second 2 is vehicle in Zug.
(Photo: Imperial War Museum)

To allow for the extra room needed by the bigger engine the suspension was modified and an extra wheel, making five in all, was inserted: the rear idler wheel was raised clear of the ground which materially improved the ride, and the additional suspension wheel meant that the same amount of track as before was in contact with the ground. Four return rollers were used on the hull in place of the three of the earlier model.

The turret was set over on the right-hand side of the superstructure; the driver sat on the left-hand side of the hull in contrast to the general run of two-man tanks whose turret with the commander/gunner was usually directly behind the driver. There is no obvious reason for the German practice: it gives a wider hull with the tracks a little further apart and therefore the tank possesses a little more lateral stability and it may simplify mechanical layout; against these points must be put the extra size of the hull and the consequent weight increase.

KLEINER PANZER BEFEHLSWAGEN (SD KFZ 265)

This imposing title (abbreviated to Kl.Pz.Bef.Wg) was given to a command tank. The superstructure was considerably modified and the sides built up to form a rectangular non-rotating turret which carried a 7.92-mm MG in a ball mounting in the front plate for defensive purposes. An additional 17 mm. of armour plate was added to the turret face and the nose plate was also reinforced by an additional 10 mm.

Two hundred of the I B chassis were modified and three types were produced, 1K1B, 2K1B and 3K1B. Differences between them were slight, but one of them incorporated a rotating turret which was abandoned because the interior was too cramped. The crew of these tanks was increased to three men. Provision was made for a small table and for the display of maps, and two wireless sets, an FU2 and an FU6, were fitted. Additional dynamo capacity to keep the wireless batteries fully charged was also provided.

Great importance was attached to these tanks since they enabled a commander to be up with his leading

troops and also provided him with the means of controlling a battle and issuing the necessary orders. They were first used in the Polish campaign and 96 of them were available for use in the operations in the West in 1940.

PZ KPFW I C (VK 601)

In September 1939 a requirement was issued for a variation of the normal Pz Kpfw I to make it suitable for use as a fast reconnaissance vehicle, which could also be used for airborne operations. The project was given an experimental number VK 601, and two firms, Krauss Maffei and Daimler-Benz, were selected to build it. The order was for 40 machines which were to be completed by July 1942: it seems curious that so long a time should have been allowed for this contract when the speed of completion of other Mark Is is taken into consideration. Only one prototype is however believed to have been delivered and this is reinforced by the fact that this model never received an Ordnance vocabulary number.

Model C was to weigh about 8 tons and was to carry up to 30 mm. of armour. A 20-mm. gun and a 7.92-mm. MG were to be mounted coaxially in the turret which was to be angular in shape with an external mantlet and a form of cupola for the commander/gunner: the hull superstructure was lower than in the standard Mark Is. A six-cylinder Maybach HL 45 engine which developed 150 h.p. gave the tank a top speed of 40 m.p.h. despite the increased weight. No return rollers were fitted on the hull and the top run of the track was taken on the tops of two lines of overlapping suspension wheels, three on the inside and two on the outside. The track plates had a central guide and in contrast to earlier patterns were fitted with projecting grouser bars.

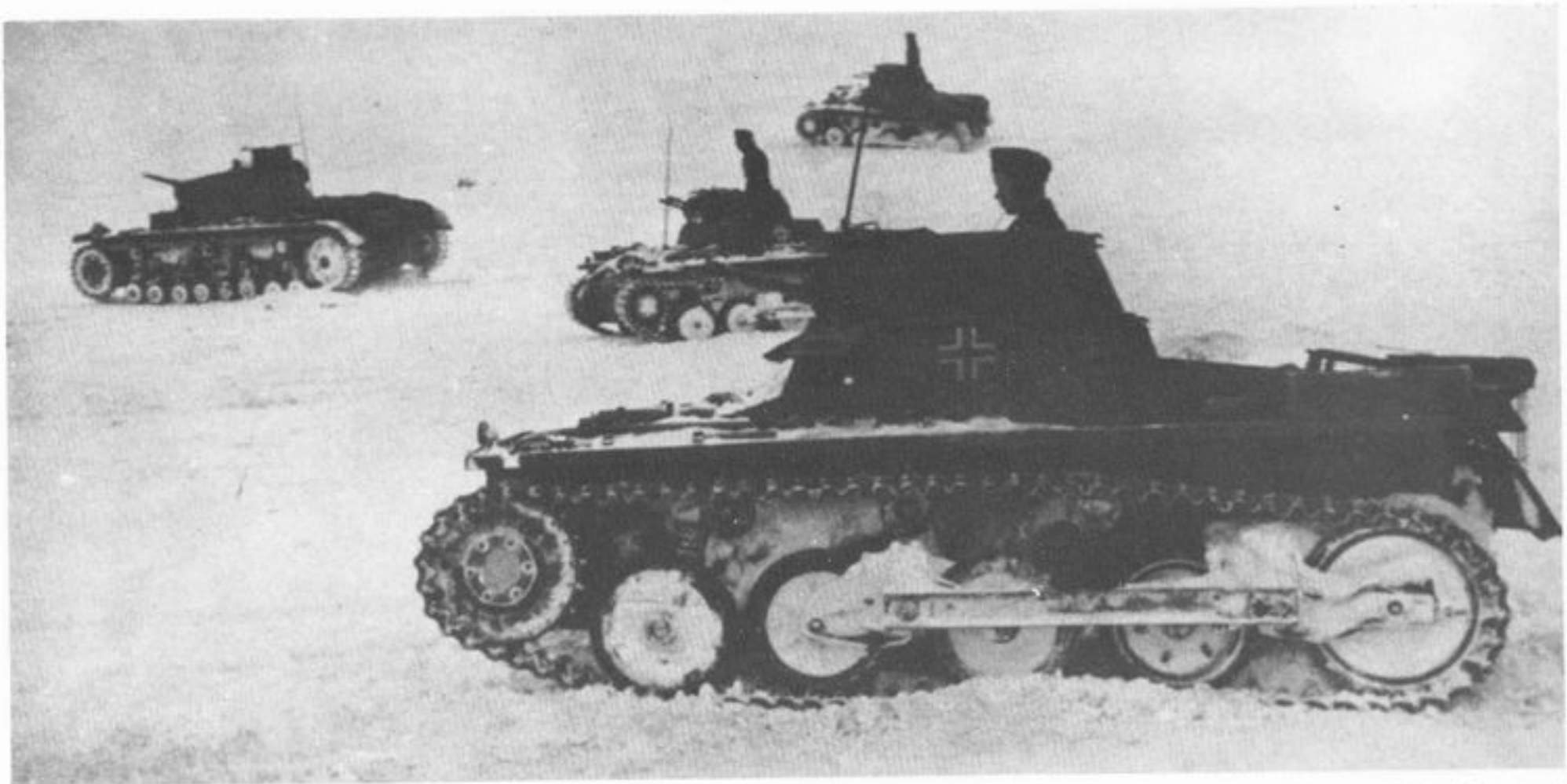
VK 1801 (PZ KPFW I D)

This heavily armoured version of Pz Kpfw I is most interesting because it represents a complete change of thought on the part of the General Staff. The aberration was short-lived and this tank was only produced in prototype form. It was intended for close co-operation with the infantry to provide them with

Panzer Is advancing through a burning village in Russia, 1942. Leading vehicle is an Ausf. B.

(Photo: Imperial War Museum)





Three Panzer I Ausf. As in Russia following an early model Panzer III (Ausf. B or C).

(Photo: H. J. Nowarra)

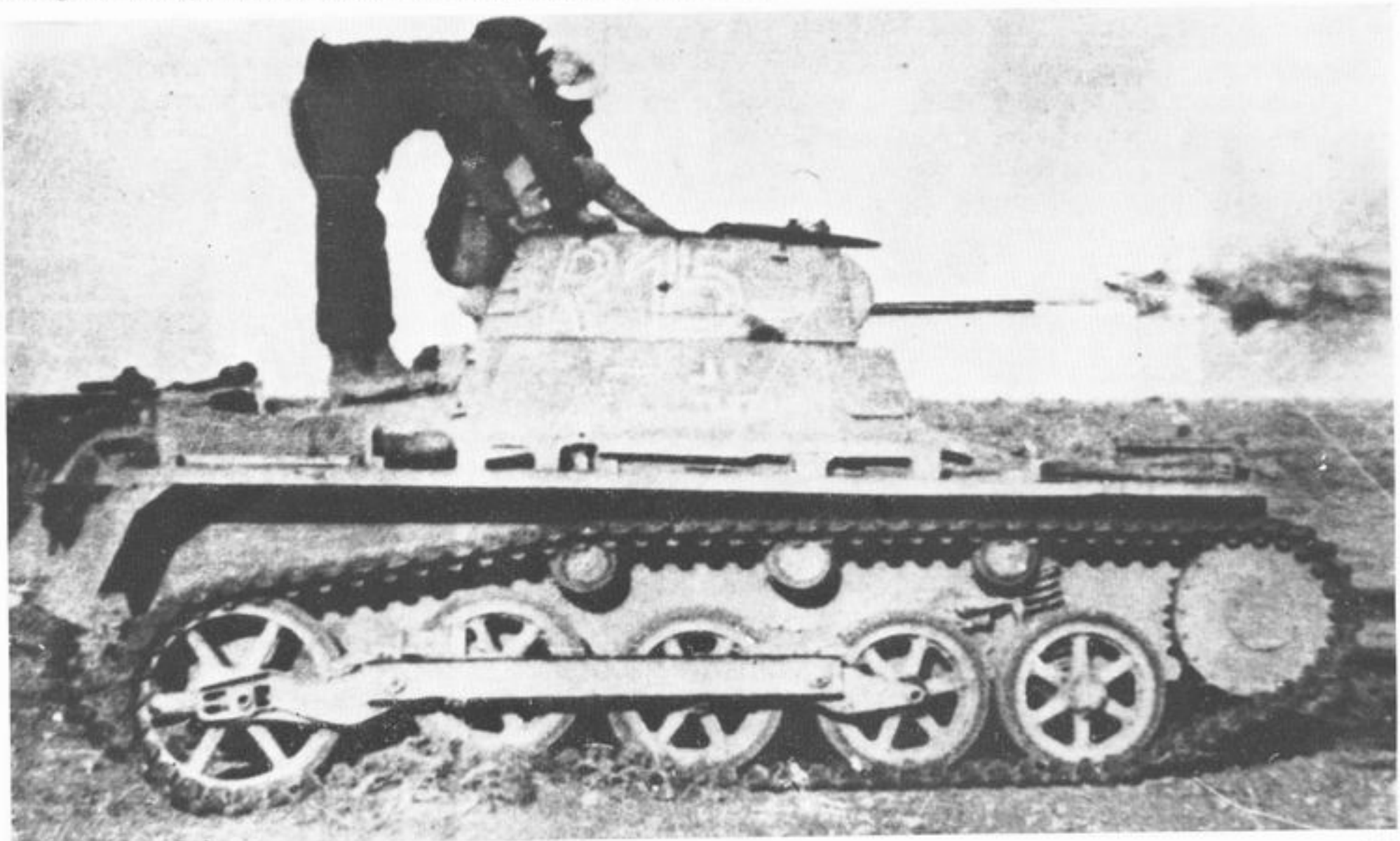
immediate MG fire; this was in contrast to the normal practice of concentrating all armour in armoured divisions which were trained to exploit the mobility of the tank.

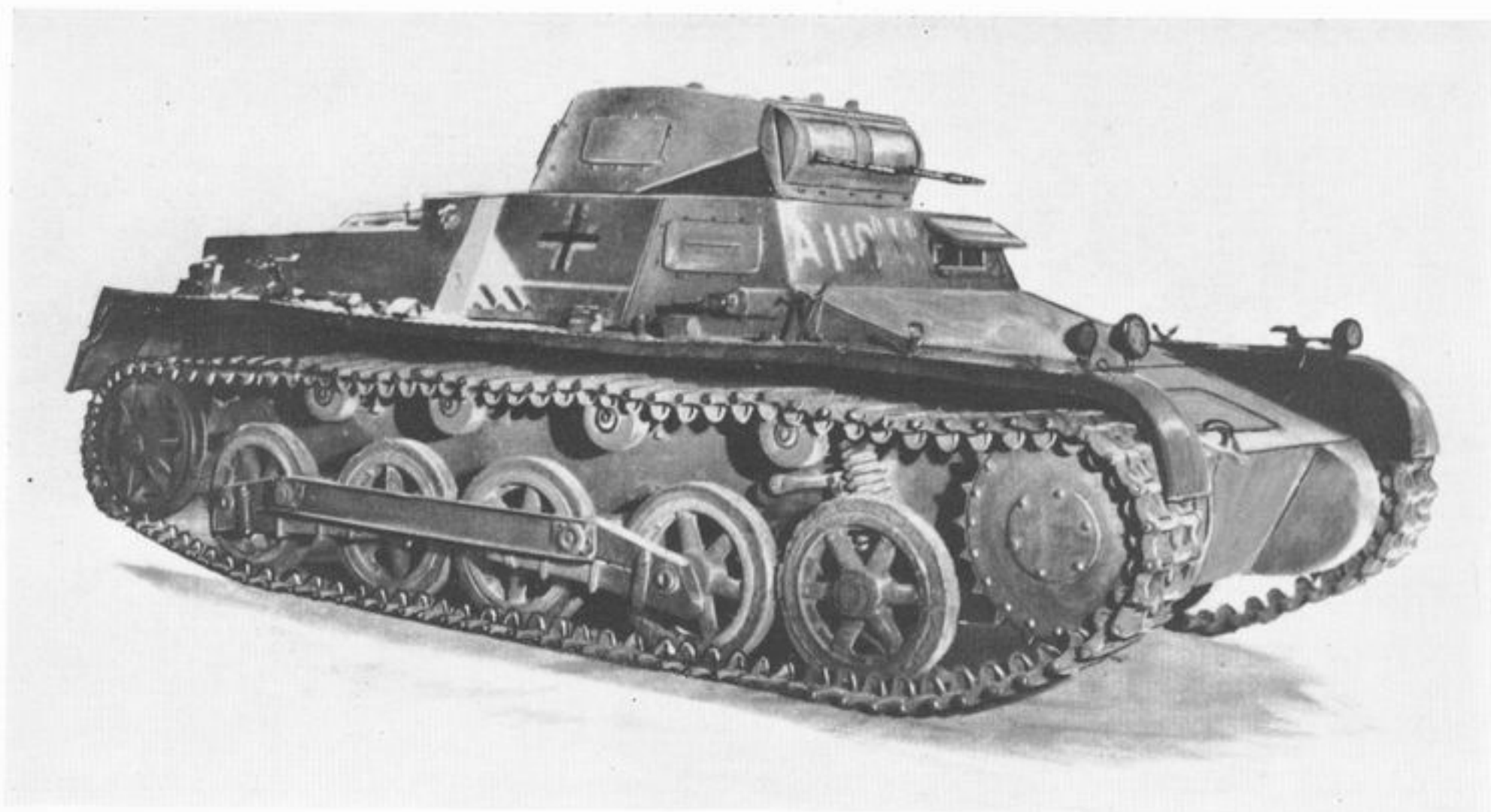
The requirement, issued in December 1939, called for a tank of between 18 and 19 tons weight: it was to carry 80 mm. of armour and was to have been armed with two 7.92-mm. MGs mounted in a heavily armoured external mantlet. The same type of suspension as in VK 601 but on much more robust lines was to have been used, but the track reverted to

the earlier skeletal type with no projecting grousers. The Maybach HL 45 six-cylinder engine was again used and would have given a top speed of 15 m.p.h. The first machine ran in June 1940 but the project was then abandoned.

An interesting comparison can be drawn between this machine and the Infantry Tank Mark I which the British had in 1940. Armour thicknesses were approximately the same, the German had one more MG and if it had ever been used would have achieved the same results: immunity to current anti-tank guns and

Panzer I Ausf. A in the rôle of a flame-thrower. Vehicle was modified by the Afrika Korps for use against Tobruk fortifications. Right-hand MG was replaced by flame-gun. Fuel containers were carried in turret. The R on the turret side indicates that the vehicle belongs to Regimental H.Q., 15 being the identifying number of the tank at R.H.Q. (Photo: R.A.C. Tank Museum)





Pz Kpfw I Ausf. B showing the five suspension wheels, four return rollers, and raised idler wheel. (Photo: R.A.C. Tank Museum)

insufficient gun power to achieve decisive results. The German machine had one great advantage—it was capable of nearly three times the speed the British tank could achieve.

PZ KPFW II—THE FIRST MODELS

For one reason and another, production of Pz Kpfw III and IV proceeded more slowly than forecast. To cover the delay in getting these tanks into the hands of troops it was decided to build a tank in the 10 ton class as a successor to Pz Kpfw I. The new tank was only to be a training machine stop-gap; paradoxically it fought in two wars, the Spanish Civil War and in the opening stages of World War II, and without it the early German successes could not have been achieved.

A specification for the new tank was issued in July 1934. Three prototypes were submitted, one of them being Krupp's LKA II which closely resembled their prototype LKA I for Pz Kpfw I. Machines

Three-quarter front view of Panzer I Ausf. B on a transporter showing driver's visor and entry hatch open.

(Photo: R.A.C. Tank Museum)

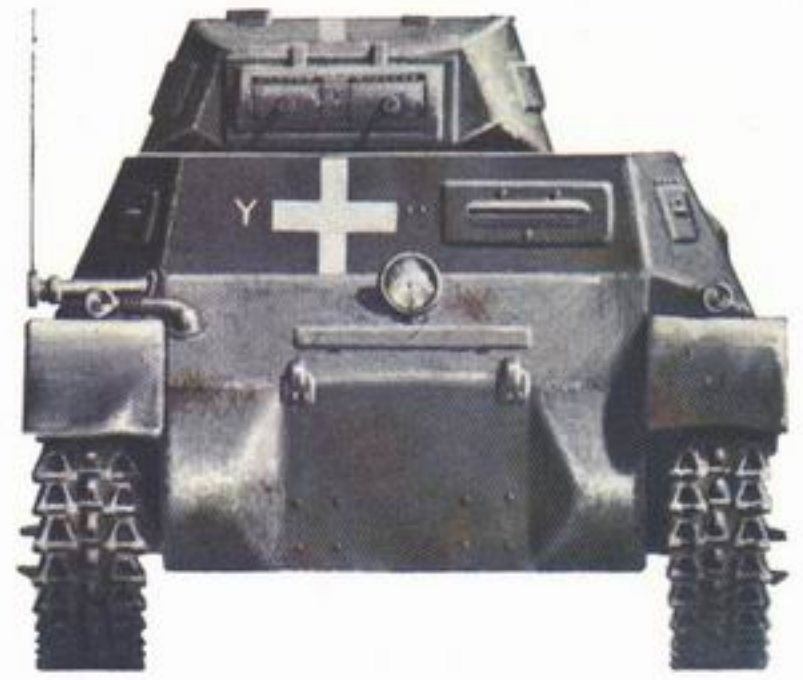


were also built by Henschel and MAN, both resembling the Krupp design except for radical differences in the suspension. Under the pseudonym La S 100 the MAN vehicle was selected for production.

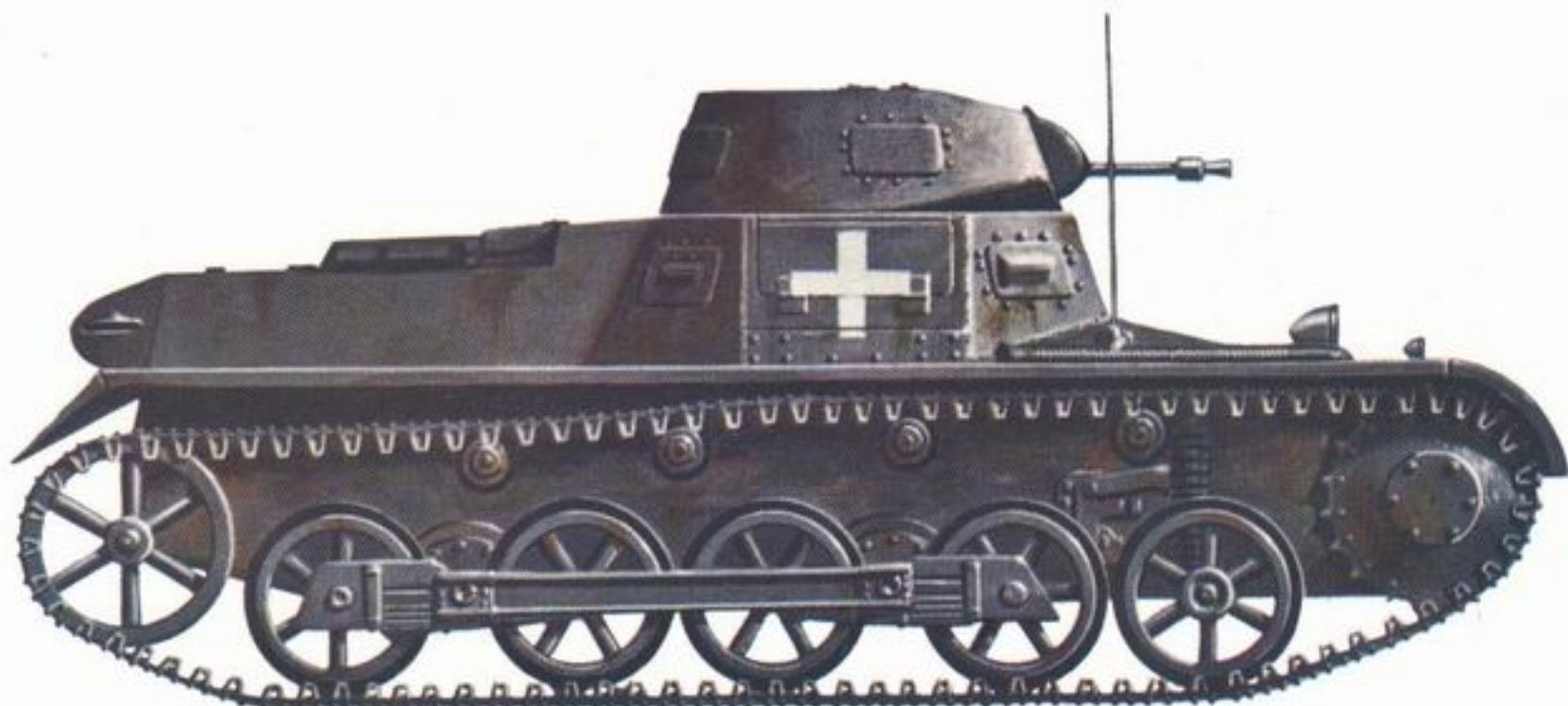
Twenty-five tanks were issued during 1935 as 1/La S 100 and taken into service as Pz Kpfw II a1 (SdKfz 121). They weighed 7.2 tons and had a crew of three. They were armed with a 20 mm. KwK 30 gun and a 7.92-mm. MG, mounted coaxially in a turret with all-round traverse. They were powered by a Maybach HL 57 six-cylinder petrol engine developing 130 h.p. at 2,100 r.p.m. A plate clutch and a six-speed sliding pinion gearbox took the power to a cross shaft: this carried at either end the usual clutch and brake steering mechanism for each track and a driving sprocket. The suspension consisted of six small suspension wheels grouped in pairs in bogies which were sprung by leaf springs. An outside girder connected the outer ends of the bogie pivot pins, the inboard ends being housed in the hull which also carried three return rollers. The adjustable rear idler wheel was clear of the ground. The nose plate was a rounded casting, a distinct change from previous German tanks, and an internal mantlet was used in the turret.

These first 25 machines were followed, also in 1935, by a second batch of 25—Pz Kpfw II a2. Externally they were exactly the same as the a1s but had a better cooling system and more room had been found in the engine compartment. A further batch of 50 machines appeared in 1936—Pz Kpfw II a3. Further improvements had been effected in the cooling system and the tracks and suspension had been altered for the better in comparison with the earlier machines.

2/La S 100, or Pz Kpfw II b, appeared in 1936. One hundred machines were built with frontal armour increased to 30 mm. and an all-up weight of 7.9 tons. The armament remained unchanged, but a Maybach HL 62 petrol engine was fitted which



PzKpfw I Ausf. B of 1st Panzer Division at the time of the Polish campaign in September 1939. Plain white cross was national insignia for this campaign. Divisional signs of the first panzer divisions were changed in late 1940.





Panzer School training machine—Pz Kpfw I Ausf. B.
(Photo: Imperial War Museum)

developed 140 h.p. Externally there was little change. These tanks had a new reduction gear in the cross drive and a new type of driving sprocket which incorporated a geared final drive. These sprockets, together with new pattern track plates that appeared with the machine, were adopted as standard fittings for all subsequent Pz Kpfw IIs.

In 1937 the third version, 3/La S 100 or Pz Kpfw IIc, appeared; slight alterations were made to the turret which still housed the same armament and the driver's front plate extended right across the tank: in

other versions the superstructure sides tapered a little towards the front which meant that the driver's plate was narrower than the width of the hull. A radical change had been effected in the suspension. The outside girder and the small bogies disappeared and were replaced by five medium-sized suspension wheels each individually controlled by $\frac{1}{4}$ elliptic springs. Four return rollers were used on the hull. This suspension was used for all subsequent models of Pz Kpfw II.

PZ KPFW II A, B AND C

The early versions of Pz Kpfw II, together with Pz Kpfw Is, were tried out under operational conditions in the Spanish Civil War—an opportunity rarely given to tank builders during peace-time. The behaviour of the machines showed that though they were only intended as training machines they were soundly constructed and capable of playing their part in an armoured rôle provided that the opposition was not too strong, but even with the primitive anti-tank resources available in Spain the Pz Kpfw Is were virtually outclassed. It would appear that the vulnerability of the tanks under the conditions of war in Spain was misinterpreted by the German General Staff who at least acquiesced in the continued large-scale production of the Pz Kpfw II which by 1938-39 was on the way to becoming obsolescent. Even though its armour was increased it was barely proof against the current anti-tank guns in Europe. While the armament was adequate for taking on its own kind, the Panzer II was too undergunned to deal with heavier hostile tanks and had no HE capacity at all. However, despite these disadvantages which were well known to all armoured officers, production continued till 1942.

Panzer I Ausf. A and B chassis being used for training by the NSKK (National-Socialist Mechanized Corps)
(Photo: Imperial War Museum)





Panzer I on the Leningrad front.
(Photo: Imperial War Museum)



150-mm. infantry support gun (Infanteriegeschütz 33) on a Panzer I Ausf. B chassis. (Photo: Imperial War Museum)

Pz Kpfw II A, B and C appeared between 1937 and 1940. There is little difference between these models. The 1937 tanks which mark the real start of mass production show little change from Pz Kpfw II c. To improve protection the nose plate is changed and becomes angular and of welded construction instead of being round in shape and cast in construction. Gun mantlets are very slightly changed with flanges at the top and bottom of the internal moving shield, presumably to avoid lead splash. Otherwise the turret was unchanged except that provision was now made for the commander's observation—a periscope in model A and a cupola in B and in subsequent models.

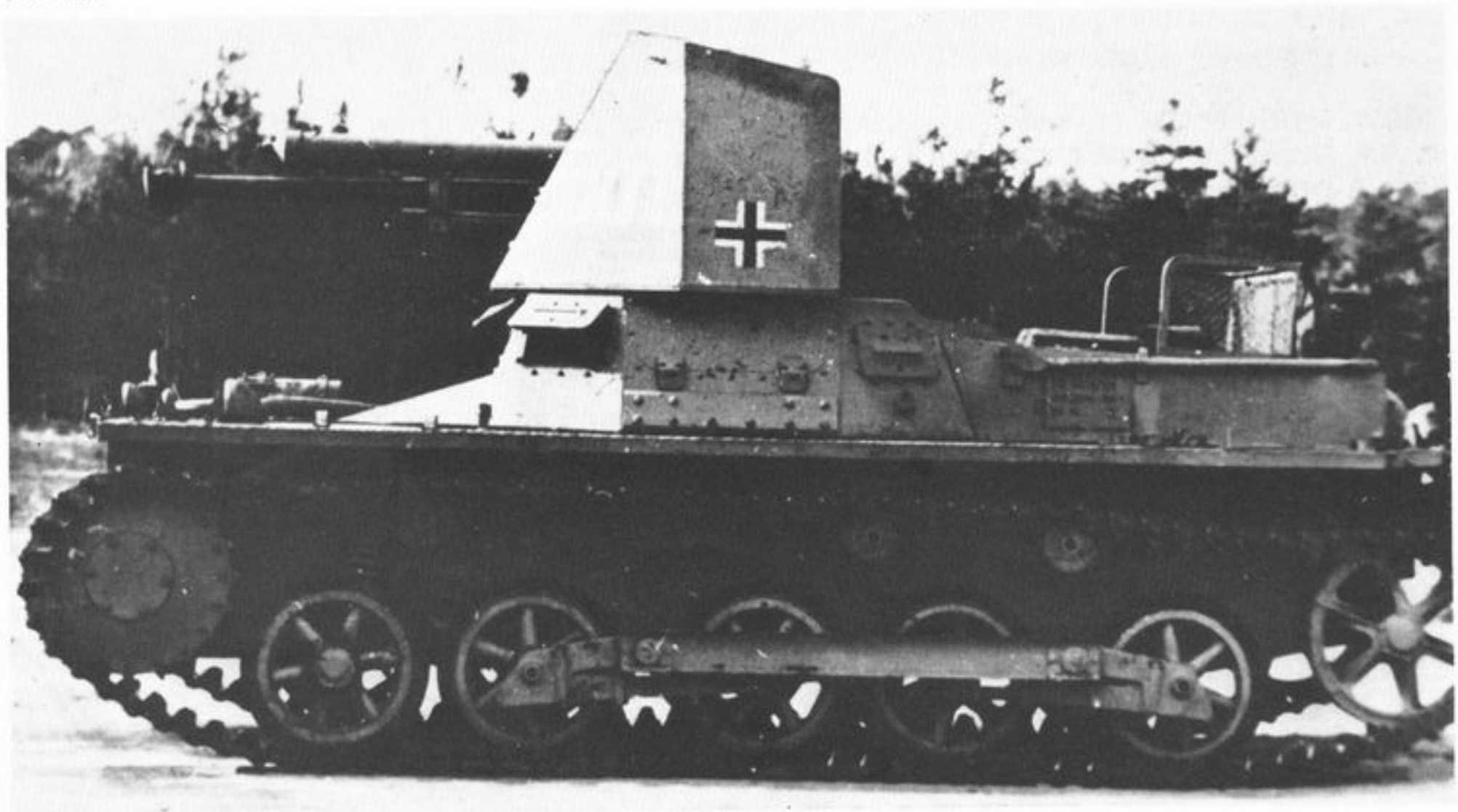
The German Army had 955 Pz Kpfw IIs for the attack on France in May 1940, and 1,067 when the Russian campaign began in 1941. By the following April this figure had been reduced to 866 despite

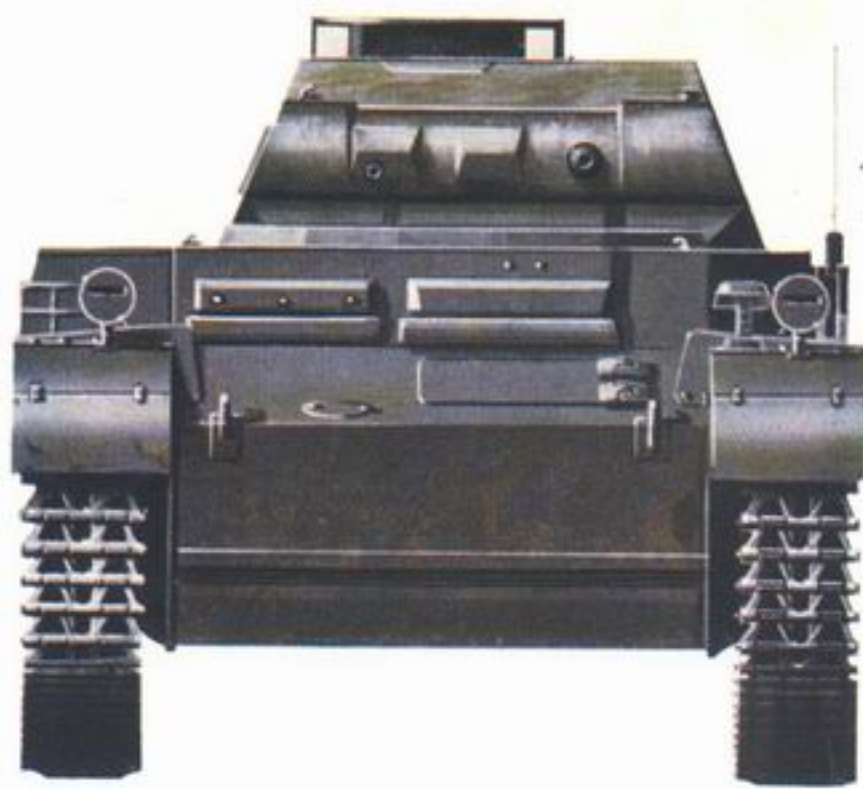
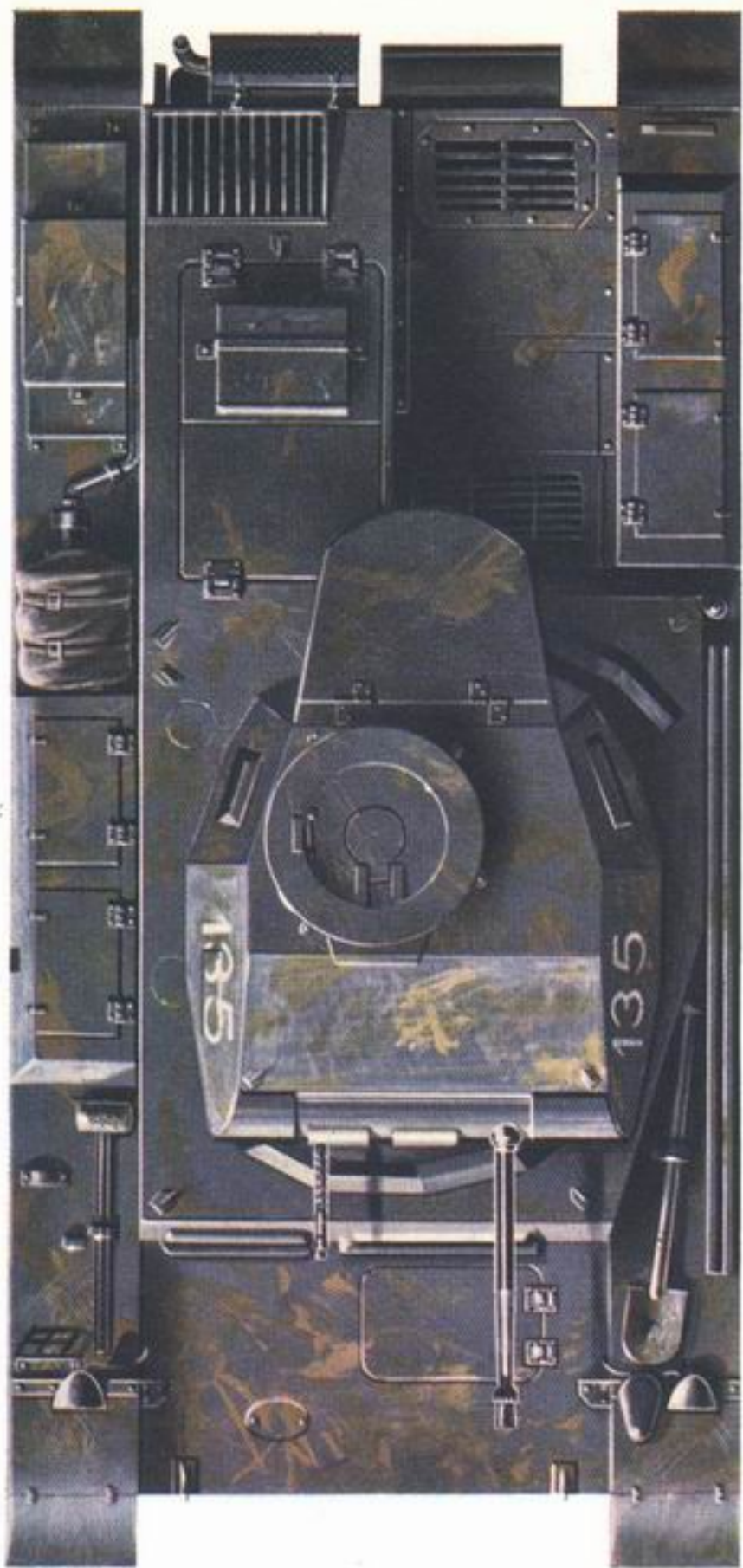
continued production, an indication of the casualties inflicted by the Soviet forces, and a further example of the folly of using undergunned and under-armoured tanks against an opponent with material superiority in armour.

PZ KPFW II D AND E

These machines, built by Daimler-Benz, were intended to be a faster version of the standard tanks. As far as the turret, superstructure, engine and transmission were concerned they showed no difference from the other Panzer IIs. However, the suspension was completely changed and used four large suspension wheels in Christie tank fashion but with their movement controlled by torsion bars. These tanks could reach 35 m.p.h. but their performance across country was considerably slower than the standard Pz Kpfw II.

Panzer Jäger I. Czech 4.7-cm. PAK (t) on Panzer I Ausf. B chassis. PAK=PanzerabwehrKanone=anti-tank gun; (t)=(tscheche)=(Czech). (Photo: Imperial War Museum)

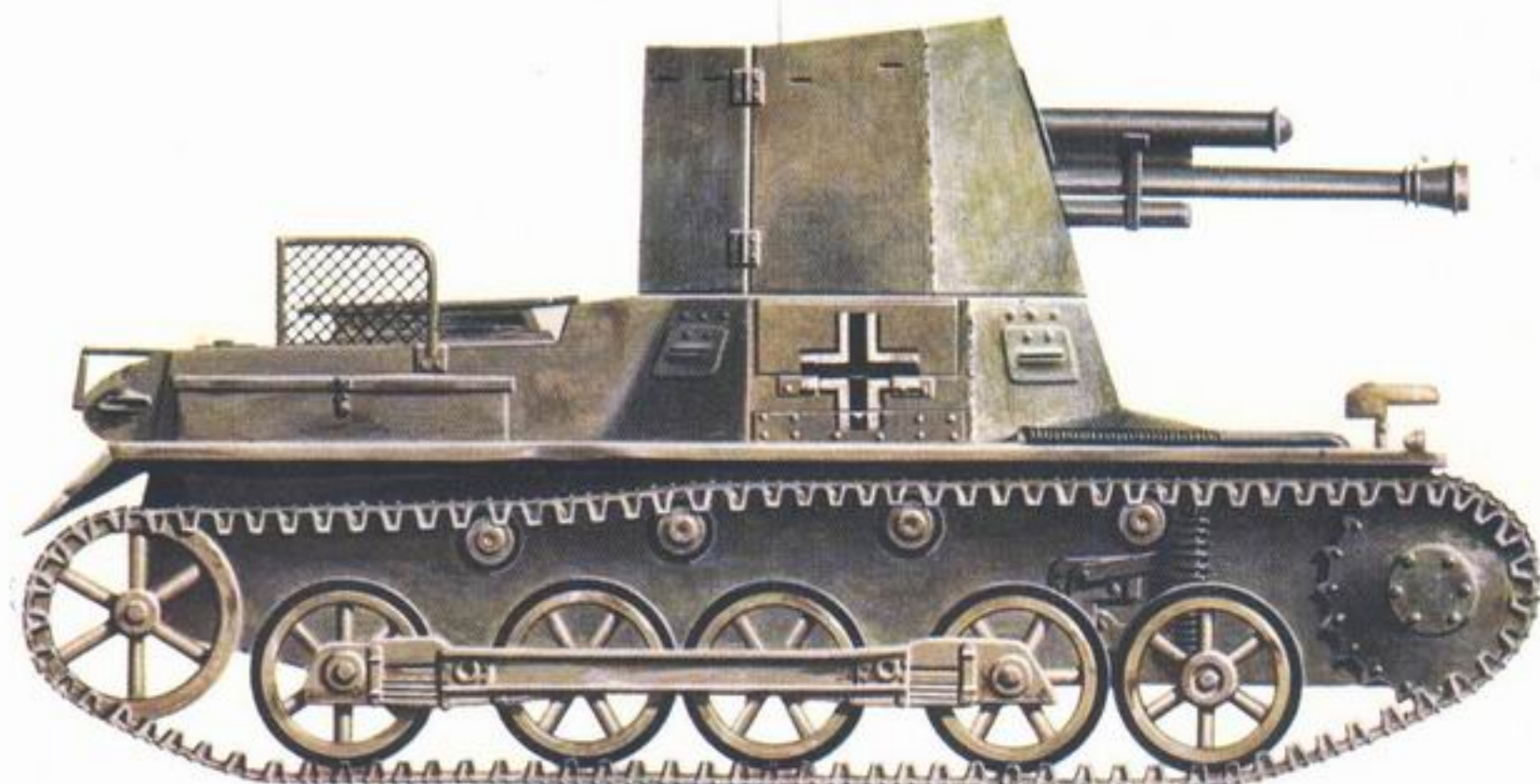




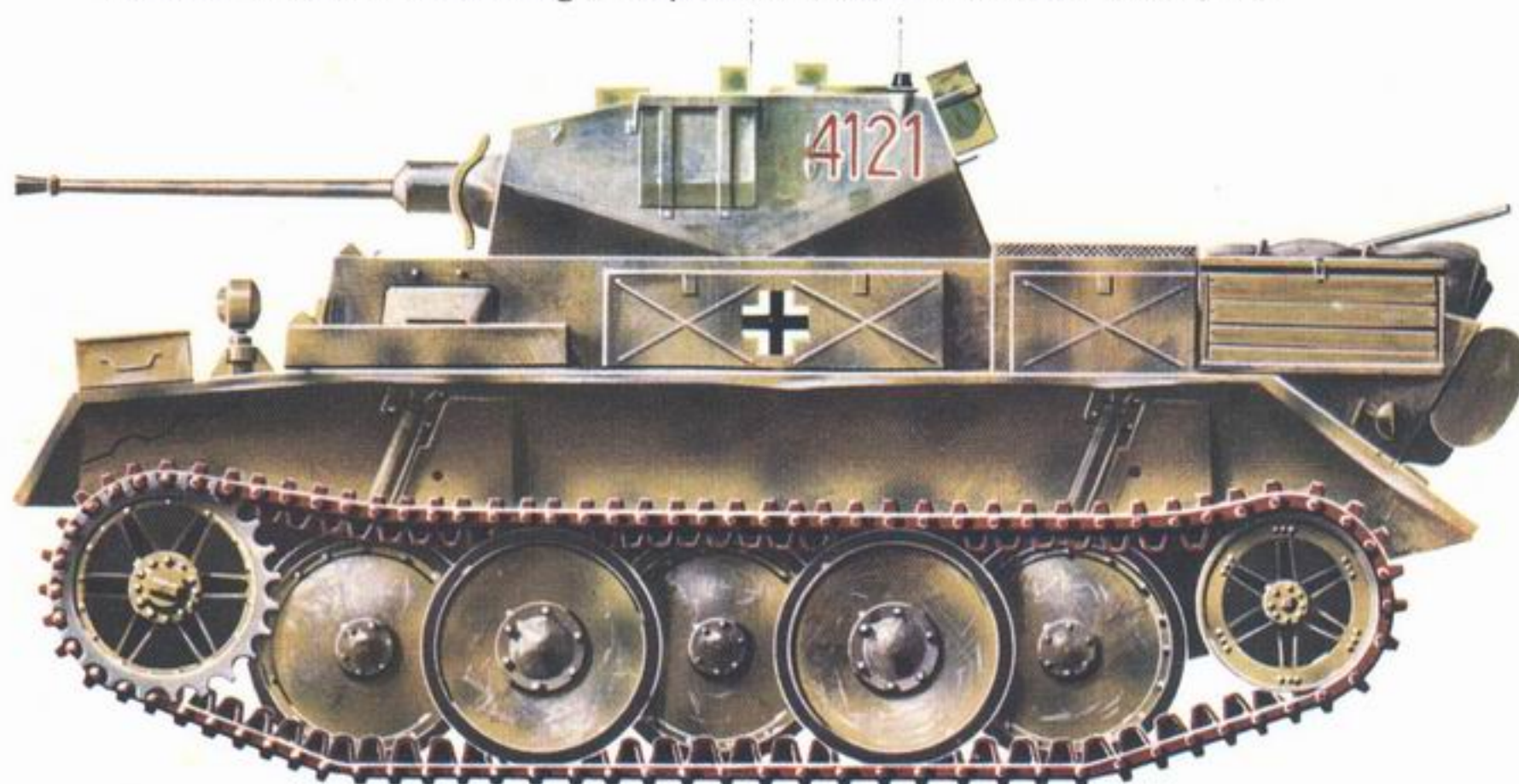
PzKpfw II Ausf. F of 6th Panzer Division. The national insignia was changed to a black cross after the Polish campaign and vehicles that had been in Poland had their white crosses modified as shown here.

Bottom right Wespe (the Wasp)—10.5 cm Pz FH 18/2 auf PzKpfw II (Sf), Sd Kfz 124. An AA MG34 is shown mounted above the superstructure. Three "kill" rings on the Wasp's gun barrel are tally of vehicles destroyed. Munition carriers were structurally similar except for a curved plate across the gun aperture.

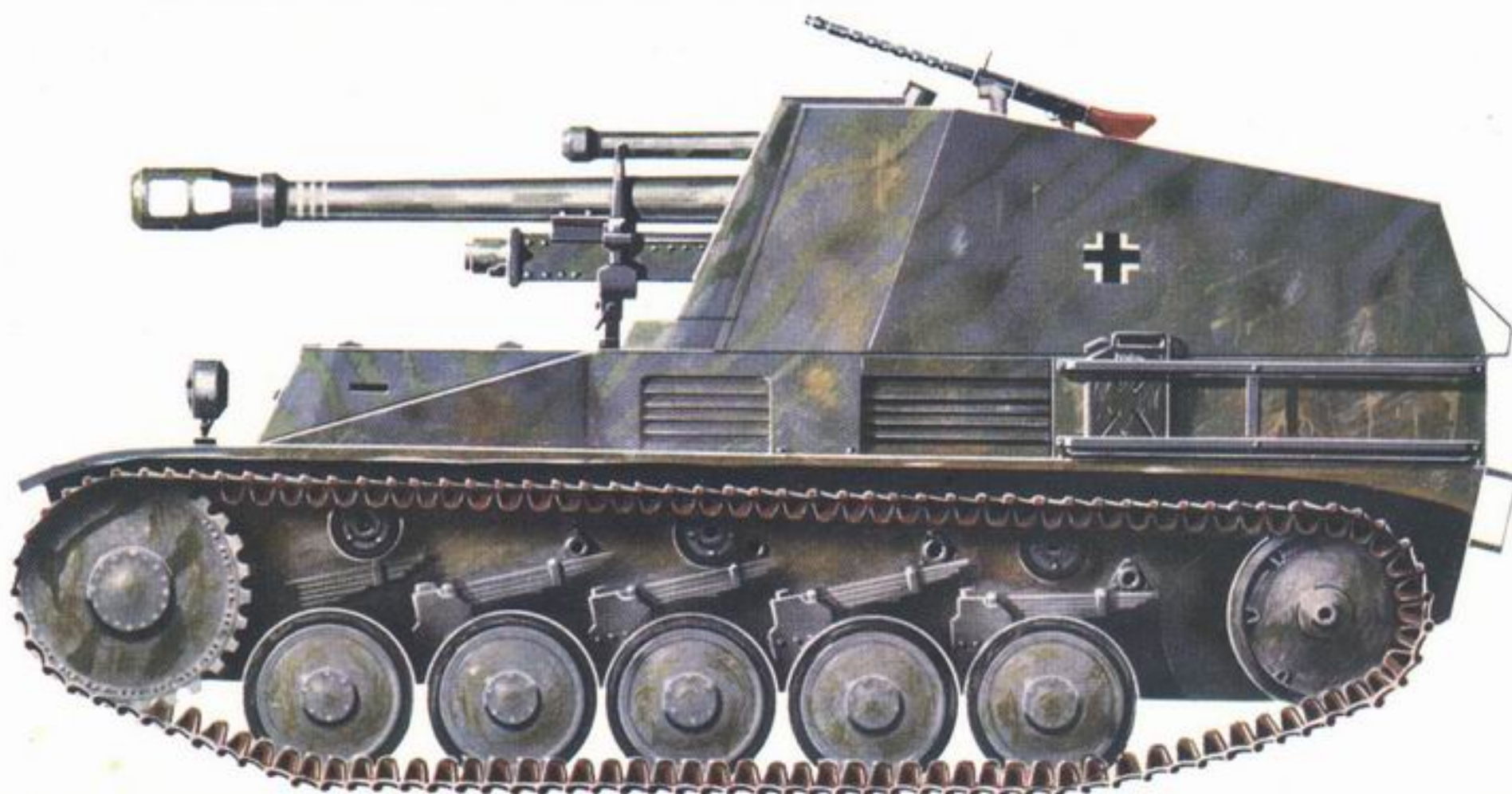


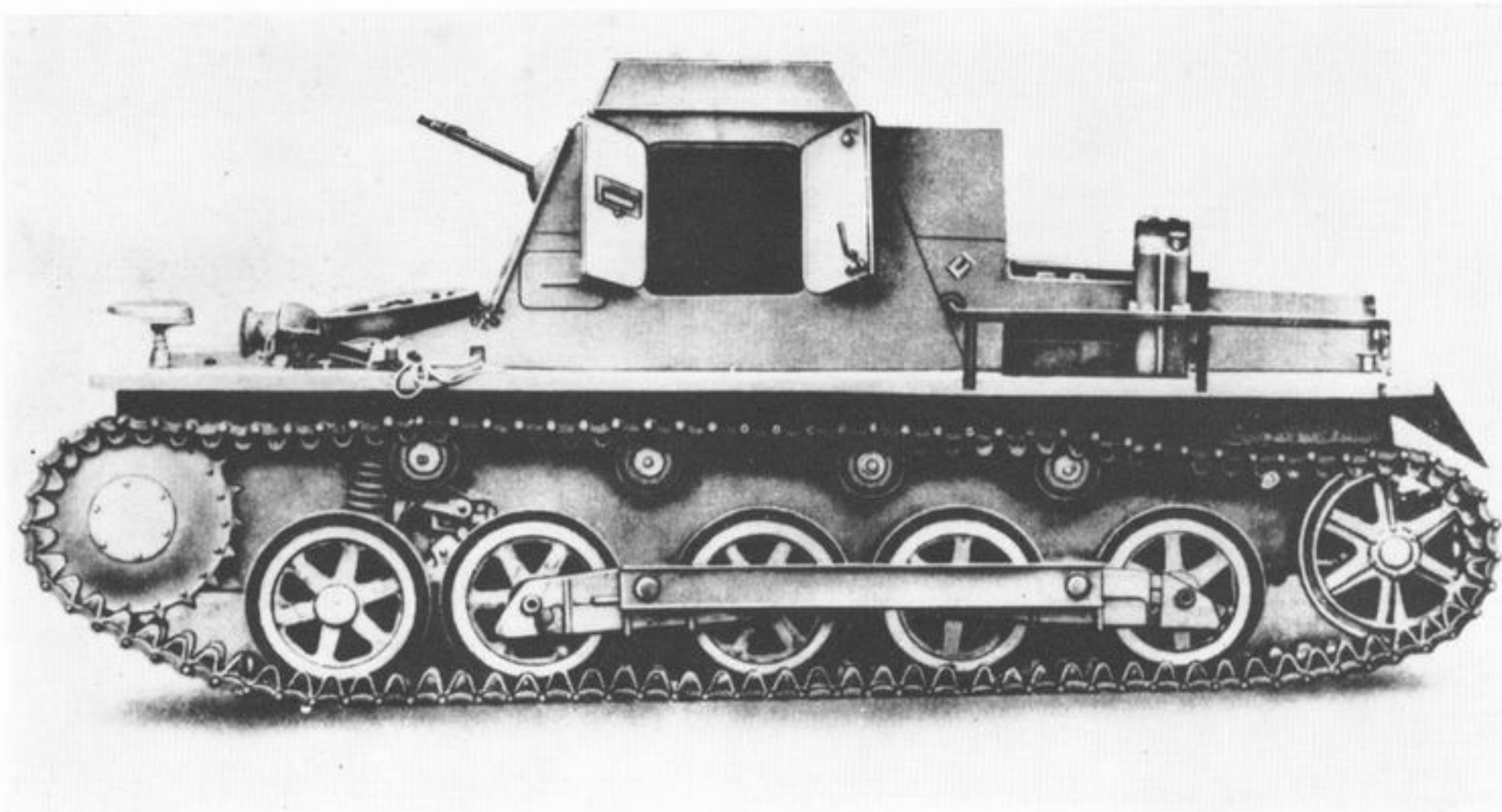


Panzerjäger I. Germany's first self-propelled gun, converted from a Panzer I B and mounting a captured Czech 4.7 cm PAK L/43.



Luchs (the Lynx)—Panzerspähwagen II (2 cm KwK 38), Sd Kfz 123.
Hadler/Brittain/Lee © Profile Publications Ltd.





Left side view of Kleiner Panzer Befehlswagen on Panzer I Ausf. B chassis.

(Photo: R.A.C. Tank Museum)

FLAMMPANZER II (SDKFZ 122)

Because the performance of Models D and E did not come up to expectation they were taken out of service and 95 were converted to a flame-throwing rôle. They were fitted with two flame-throwers each covering 180 degrees of arc with a flame range of about 40 yards, which is about the maximum that can be obtained with a pump-fed gun. To obtain greater range it is necessary to use a gas pressurized system which introduces problems over stowage. Sufficient fuel was stowed in internal tanks for about 80 shots each of 2-3 seconds duration.

PZ KPFW II F

The hollow charge anti-tank missile had by now become a menace to be reckoned with. After reference to Hitler and with his personal agreement, it was decided that all future AFVs were to be up-armoured by the addition of spaced plates to reduce the effect of the new missiles.

In pursuance of this decision the last of the Pz Kpfw II series appeared in late 1940. This was

Right side view of Kleiner Panzer Befehlswagen. Panzer I Command Tank with non-rotating turret and single MG.
(Photo: Imperial War Museum)



7/La S 100—Pz Kpfw II F. It weighed 9½ tons with 35 mm. of armour on the front and 20 mm. on the sides. Otherwise it was exactly the same as Model C in appearance with engine, transmission, armament and suspension remaining unchanged. The top speed was considerably reduced but this was a penalty that had been foreseen when the order authorizing additional armour was issued. Crew losses had been heavy, heavy enough to justify the reduction in performance in the hope of saving lives. Production of Model F was to have been at the rate of 45 per month but rarely reached this target.

In 1941 a new specification was issued which called for a ten-ton vehicle with increased armour over that of Model F and a higher speed. To meet this requirement MAN delivered a chassis in September which had a Maybach HL-P engine developing 200 h.p. and was capable of a top speed of 40 m.p.h. The tank was to have had 30 mm. of armour, a three-man crew, and was to have been armed with a 20 mm. type 38 gun of higher velocity than that used in the other models, together with a 7.92-mm. MG. Production was scheduled for July 1942 but by then the Pz Kpfw II was so obviously obsolete in its tank rôle that the order was cancelled.

PZ KPFW II L (SDKFZ 123) "LUCXS" (LYNX)

The final prototype Lynx (VK 1303) appeared in mild steel in 1942 but its development story goes back to 1938 when Daimler-Benz were given instructions to produce a new version of Pz Kpfw II "with principal emphasis on increased speed" under the development number VK 901.

A Maybach HL 45 six-cylinder petrol engine was used which gave 145 h.p. and a top speed for the tank of 32 m.p.h. The specified speed was 37½ m.p.h. but

that was unattainable because no engine of the necessary power (200 h.p.) was available at the time. VK 901 had 30 mm. of front armour and weighed 9.2 tons. It was armed with a 20 mm. type 38 tank gun and a 7.92 MG which was mounted coaxially: both guns were installed in a stabilized mounting. The manufacture of 75 pre-production machines began in 1940. The third prototype VK 903 had a turret from VK 1303 which became the Lynx and which had been equipped with a range finder and locating instruments. This substitution of turrets gives some idea of the complexity of the German tank programme for at that time the Lynx chassis had been built by MAN: the interplay of one model on another is difficult to disentangle, but it is quite clear that development was on a most extensive scale which makes the continued retention of Pz Kpfw II difficult to understand.

To complicate matters even further, Daimler-Benz and MAN together received another contract in December 1939 for a very different type of machine. VK 1601 was to carry "the thickest possible armour" with a crew of three men. The Maybach HL 45 engine of 200 h.p. was used for the project giving a top speed of 20 m.p.h. with an all-up weight of 16½ tons. Frontal armour was 80 mm. thick and the side armour was 50 mm. Armament was the 20-mm. KwK 38 gun and an MG in a stabilized mount.

Both VK 901 and VK 1601 used a new type of suspension with five large overlapping suspension wheels with no return rollers. Torsion bar springing was used. This type of suspension, which had already been tried out on VK 601 (the Pz Kpfw I prototype of the 6-ton tank), ultimately led to the Panther and Tiger suspension where overlapping became interleaving—a necessary step to reduce ground pressure but one which brought many problems concerned with track jamming in its wake.



Early model Panzer II in action in Poland, September 1939. Probably Ausf. b, but possibly a1, a2 or a3. (Photo: R.A.C. Tank Museum)

Out of these two models VK 1301, "Luchs," was born. VK 901 was considered too light for its proposed rôle and VK 1601 was much too heavy. The prototype VK 1301 in mild steel ran in April 1942, looking very like VK 901. Various alterations were made to this first prototype and VK 1303, the third prototype, was accepted for production at a weight of 11.8 tons, a reduction of a little over a ton on the first prototype VK 1301.

Intended primarily for reconnaissance the Lynx was also given the designation Panzerspähwagen II (2 cm. KwK 38) "Luchs," with the same Ordnance vocabulary number, Sd kfz 123. It weighed 11.8 tons and had a crew of four men: it was fitted with a Maybach HL 66P six-cylinder engine which developed 180 h.p. The drive was taken to the front driving sprocket through a Synchron SSG 46 six-speed gearbox and controlled differential steering on the cross shafts. The maximum speed was 38 m.p.h. Luchs used

Pz Kpfw II Ausf. c in November 1939. Note cast rounded nose plate and medium-sized suspension wheels which identify it. Compare angular welded nose plate of subsequent Ausf. A. (Photo: Imperial War Museum)



Panzer divisional signs from late 1940. After their victory in France in 1940 the Germans doubled the number of their panzer divisions for the next campaign. Signs of the old divisions were changed and the new signs shown here were introduced. Panzer divisions from 21 onwards were formed after 1940. The Gross Deutschland was officially a panzer grenadier regiment but with its full tank regiment and armoured reconnaissance unit under command it was actually a panzer division.



1st Panzer



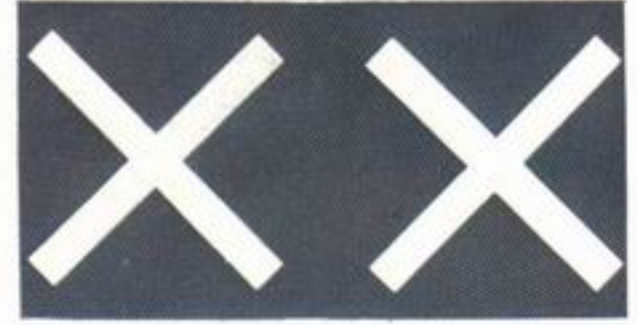
2nd Panzer



3rd Panzer



4th Panzer



6th Panzer



5th Panzer



7th Panzer



8th Panzer



9th Panzer



10th Panzer



11th Panzer



12th Panzer



Gross Deutschland



13th Panzer



14th Panzer



15th Panzer



16th Panzer



17th Panzer



18th Panzer



19th Panzer



20th Panzer



21st Panzer



22nd Panzer



23rd Panzer



24th Panzer



25th Panzer



Afrika Korps



116th Panzer



Afrika Korps
(variation)



1st Panzer
(variation)



4th Panzer (1943)



7th Panzer
(1943-44)



19th Panzer
(1943-44)



23rd Panzer
(variation)



Panzer II Ausf. c in the attack on Warsaw, September 1939.

(Photo: Imperial War Museum)

the same five overlapping suspension wheel suspension that had been developed on VK 901 and VK 1601 with torsion bar springing. Frontal armour was 30 mm. and the side plates 20 mm. MAN at Nürnberg built the chassis, Daimler-Benz at Berlin-Marienefelde the hulls and turrets.

One hundred of these tanks were fitted with 20-mm. guns and a further 31 were fitted with 50-mm. KwK 39 L/60 guns. Admittedly the Lynx turret had been redesigned, but if it was possible to get a 50-mm. piece on the last L chassis it is curious that no effort was made to upgun earlier models, especially after the 20-mm. had proved inadequate during the campaign in France in 1940.

LEOPARD (VK 1602)

In 1941 the army Weapons Branch called for a vehicle capable of undertaking battle reconnaissance in contrast to the Lynx which was intended—and used—for general reconnaissance and was not intended to take part in the main battle. The new contract given to MAN and Daimler-Benz was for VK 1602 inspired by VK 1601 which has already been discussed as one of the forerunners of Lynx.

The new tank, Leopard—a favourite cognomen for German tanks—was to have 80 mm. of armour on the turret and the front and 60 mm. on the sides. It was to have a 550 h.p. engine to give it a top speed of 37 m.p.h. and it was to be armed with a 50 mm. type 39 L/60 gun and an MG coaxially mounted. It was to have a crew of four men, but their disposition in the tank is not known. There was no bow machine-gun so that the fourth man was not needed there: he could have been employed as wireless operator next to the driver, a common German practice; alternatively he might have been used in the turret as a loader and this is probably the more likely course. While it is interesting, the problem is actually only of academic interest because the tank never went into production although the turrets were used for the eight-wheeled armoured car Puma, Sd kfz 234/2.

PZ KPFW II—AMPHIBIOUS

In preparation for the invasion of England—Operation Sealion—a regiment's worth of Pz Kpfw IIs were converted to amphibious tanks. Extra flotation gear, pontoons of some sort, were attached to the return rollers on either side of the tank to provide the necessary buoyancy to make it float. As a further precaution the inside of the tank was divided into three watertight compartments. When afloat the tank was driven by a propeller off an extension shaft from the gearbox. It was said to float at track guard level and to be very seaworthy in seas Force 3-4; also to be capable of a speed of 5 knots in the water. In theory the guns could be fired from the turret when the tank was waterborne: in practice the tank was never used operationally and from experience with other amphibious tanks it is very unlikely that the quoted figure could have been reached.

Panzer II Ausf. A. Note horn-type periscope on turret top (centrally behind guns) which distinguishes Ausf. A from subsequent models; also absence of cupola. Background suggests tank is passing through Flemish square.

(Photo: Imperial War Museum)





Panzer II Ausf. B (note cupola and absence of horn-type periscope) knocked out in the Western Desert fighting.
 (Photo: Imperial War Museum)



Panzer II Ausf. Bs in Russia.
 (Photo: Imperial War Museum)



Panzer IIs Ausf. B or C on a desert road in North Africa spanned by one of the triumphal arches erected under Mussolini's rule.
 (Photo: Imperial War Museum)



Flammpanzer II—Ausf. D or E modified as flame-thrower, showing location of flame-gun and rod of fuel which has apparently not ignited. Vehicle is in Russian hands having been captured on Leningrad front.
 (Photo: R.A.C. Tank Museum)

Panzer II Ausf. Bs fording the River Dnieper in Russia, 1941. Note crew's kit stowed on rear decking and "kill" rings on gun barrel.
 (Photo: Imperial War Museum)



Panzer II Ausf. D and E being loaded on to transporters. Note large Christie-type suspension wheels.
 (Photo: R.A.C. Tank Museum)



PZ KPFW I AND II IN OTHER ROLES

When the Pz Kpfw Is were no longer required as tanks they were converted for other duties. Some were used for the carriage of ammunition while many of the IBs ended their days as tractors. Three hundred and fifty-eight IBs were converted into Pz Jäger I self-propelled guns armed with the Czech 4.7 cm. PAK L/43. They were used in the Western Desert and on the Russian front in later 1941 for a short period. Others mounted a 150-mm. gun for the close support of infantry in the attack: these guns were also used to give high angle covering fire for armoured attacks.

The Pz Kpfw II chassis was also used for various tasks. Models D and E, as mentioned previously, were early converted to flame-throwers following their lack of success as a fast version of the ordinary gun tanks. After the appearance of the Russian T-34 other Panzer II chassis, together with chassis of Pz Kpfw 38(t), were rapidly converted to anti-tank SP weapons using captured Russian 76.2 mm. anti-tank guns or field guns of the same calibre. Subsequently chassis were converted to anti-tank weapons using a 75-mm. PAK 40/2. In all, nearly 1,000 Panzer II chassis were converted either to the anti-tank rôle or else to an SP artillery weapon mounting a 105-mm. light field howitzer.

WESPE

In the latter rôle the vehicle was designated "Wespe" (Wasp): 10.5 cm. Pz FH 18/2 auf Pz Kpfw II (Sf)—Wespe Sd Kfz 124. Wespe had the Panzer II F

chassis and the first vehicles were coming off the production line at the Famo assembly plant in Poland in December 1942. In February 1943 Hitler ordered that all Pz Kpfw II production capacity should be concentrated on Wespe, the anti-tank SP rôle being taken by the Pz Kpfw 38 (t) chassis. Wespe production continued until mid-1944 by which time 682 had been built and a further 158 completed as ammunition carriers without the gun.

Wespe was popular with the troops, being generally used in the divisional artillery of panzer and panzer grenadier divisions organized in batteries of six with up to five batteries in an abteilung (battalion).

THE PANZER DIVISIONS

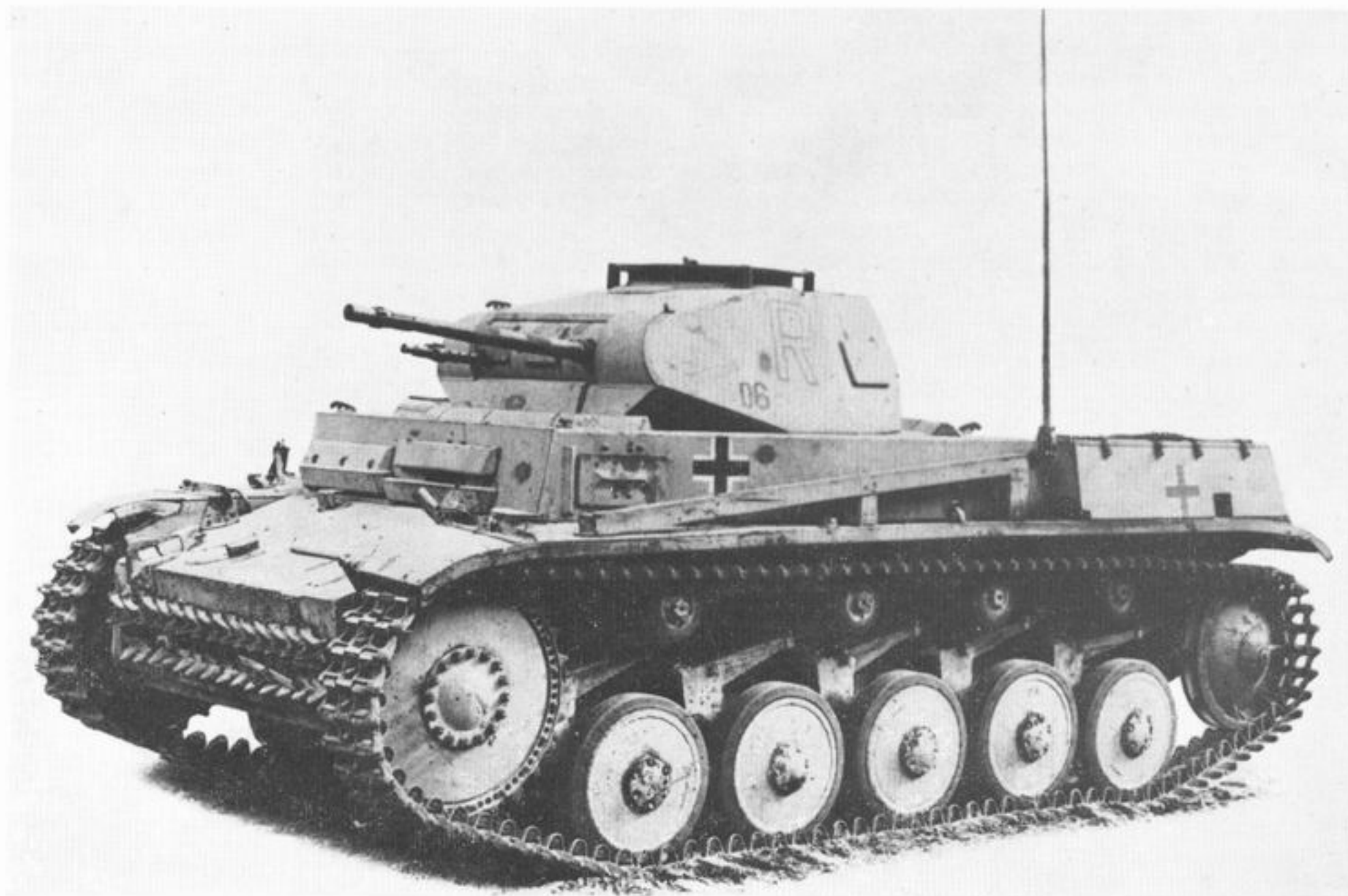
by

DUNCAN CROW

Germany's first three panzer, or armoured, divisions ("panzer" is the German for "armour") were formed on October 15, 1935. The 1st Panzer Division, commanded by General Freiherr von Weichs, was at Weimar, the 2nd, under Colonel Guderian, was at Würzburg, and the 3rd, under General Fessman, was in Berlin. The main tank was the Panzer I.

Each panzer division had: one panzer brigade consisting of two panzer regiments, each with two tank battalions, each of four light tank companies; one motorized rifle brigade of three battalions, two of

Panzer II Ausf. F of a regimental H.Q. (indicated by R on turret side). Figures 06 identify the vehicle as part of reconnaissance Zug. Track on nose plate is for extra protection. Vehicle was captured in North Africa and is now in the Royal Armoured Corps Tank Museum at Bovington, England. Chassis number is 28434, Ausf. F having been allocated chassis number block from 28000 to 29400. (Photo: R.A.C. Tank Museum)





Panzer II Ausf. F which was up-armoured on turret and nose. The visor beside the driver's true visor (under the 20-mm. gun) was a dummy, presumably to confuse enemy anti-tank gunners. To complete the illusion there was also a vision slit on the off-side superstructure to match the one seen here on the near-side. Conical idler wheel was also a feature of Ausf. F.

(Photo: R.A.C. Tank Museum)

them in a rifle regiment, the other a motor-cycle battalion (each rifle battalion had one motor-cycle company, two motorized rifle companies, one heavy machine-gun company, and one mixed company of engineer, anti-tank, and infantry gun platoons, while the motor-cycle battalion had three motor-cycle companies and one mixed company similarly organized); an armoured reconnaissance battalion consisting of two armoured car companies, one motor-cycle company, and one mixed company; an anti-tank battalion of three anti-tank companies; an artillery regiment of two battalions, each of three batteries of light field howitzers; a signals battalion of two companies, one equipped with telephones, the other with wireless; and a light engineer company.

The first public appearance of a German panzer division, which was in fact an improved copy of the British Experimental Armoured Force of 1927-28, was in 1937 at the autumn manoeuvres in Mecklenburg, when the show-piece was an attack by 800 tanks and 400 aircraft. For years the German General Staff—and especially Guderian, who was himself, as he admitted, a disciple of the type of warfare propounded by Liddell Hart, Fuller and Martel—had been considering three principles of tank fighting: the use of tanks in close co-operation with infantry; the independent use of tanks to break through and penetrate into the enemy's defensive position; and the best use of air co-operation. In order to decide on the type of tank to be built and the type of formation in which tanks should be organized it was necessary to choose between one or other of the first two principles: one sacrificed speed, the other armour protection.

Guderian had no doubt which principle should be chosen. In 1929 he had become convinced that "tanks working on their own or in conjunction with infantry could never achieve decisive importance. My historical studies," he wrote in his memoirs, "the exercises carried out in England and our own experiences with mock-ups had persuaded me that tanks would never be able to produce their full effect until the other weapons on whose support they must inevitably rely were brought up to their standard of speed and of cross-country performance. In such a formation of all arms, the tanks must play the primary rôle, the other weapons being subordinated to the requirements of the armour. It would be wrong to include tanks in infantry divisions: what was needed were armoured divisions which would include all the supporting arms needed to allow the tanks to fight with full effect."*

Guderian's view prevailed. The final decision favoured speed. The second principle was chosen; and to it was added the third—close support bombing would be used to give maximum striking power.

A number of Panzers I and II served with the Franco forces in the Spanish Civil War and gave valuable experience to the German army. Spain provided the dress rehearsal of blitzkrieg when, towards the end of the war, motorized columns pushed forward 25 miles a day in the Aragon battle and even faster during the drive through Catalonia; the enormous influence of air superiority was clear to all who saw it.

More experience was gained from the moves into

*General Heinz Guderian, *Panzer Leader*, Michael Joseph (London) 1952.

Austria and Czechoslovakia. Defects that were revealed in March 1938 were remedied before the occupation of the Sudetenland later in the year. The occupation of Czechoslovakia, carried out on March 15 and 16, 1939, in hard weather conditions, showed that panzer divisions could operate on frozen roads and in difficult country. For example, one panzer division on the first day of the march to Prague covered nearly one hundred miles over bad roads in a snowstorm without a single vehicle being disabled.

By September 1, 1939, when the Polish campaign began, there were six panzer divisions (1st, 2nd, 3rd, 4th, 5th and 10th), plus the Panzer Lehr Battalion, the Ordnance Department's own unit for tank testing and demonstrations, and the Reconnaissance Demonstration Battalion. All took part in the campaign, the two demonstration battalions as part of Guderian's XIX Army Corps. In addition there were four light divisions which also fought in Poland.* These light divisions were the cavalry's counterwork to the panzer divisions. Just as the cavalry in Britain strongly resisted any loss of identity or surrender of ground to the Royal Tank Corps, so the cavalry in Germany tried to remain independent of the panzers. They

*In Appendix III to *Panzer Leader* Guderian states that three light divisions took part in the Polish campaign. This appendix is a copy of a report he wrote as Inspector General of Armoured Forces in November 1944, five years after the campaign in which he was a corps commander. But the battle map earlier in the book (p.77) shows four light divisions engaged (just as it shows six panzer divisions) and the text on p.89 confirms this by implication. This error in Guderian's 1944 report has been repeated by most Wehrmacht historians, and even appears in the *AFV Profile* of the Panzer III, where it is incorrectly stated that there were only "three existing 'Light Divisions' ". It is also incorrectly stated there that there were only five armoured divisions engaged in the Polish campaign and that the 10th Panzer Division was newly formed afterwards. It was, in fact, engaged in occupation duties in Prague from March to September 1939, when it became part of Guderian's XIX Army Corps in Poland where it took part in the advance south to Brest-Litovsk.

formed light divisions, each of which had two motorized rifle regiments of two battalions each, a reconnaissance regiment, an artillery regiment, and a lorry-borne light tank battalion, as well as supporting units. Early in 1940, before the campaign in the west, the light divisions were converted to panzer divisions (6th, 7th, 8th and 9th).

By May 10, 1940, when the attack on the Low Countries and France began, the organization of a panzer division excluding its supply services was:

HQ

Armoured Recce Bn, consisting of:

two armoured car companies, each of ten armoured cars, *motor-cycle company*, *mixed company* of anti-tank, close support gun, mortar and engineer platoons.

Panzer Brigade, consisting of:

two panzer regiments, each of *two mixed tank battalions*, each of *two light and one medium companies*.

Motorized Rifle Brigade, consisting of:

one rifle regiment of *three battalions*, two of them each with *a motor-cycle company*, *two infantry companies*, *a machine-gun company*, and *a mixed company*, the third with *three infantry companies*, *a machine-gun company*, and *a mixed company*, *motorcycle battalion* of *two motor-cycle companies*, *a machine-gun company*, and *a mixed company*, *heavy infantry gun company* with six guns.

Anti-tank Bn, consisting of:

three companies each with 12 light anti-tank guns, *one company* with six heavy anti-tank guns.

Anti-aircraft Bn, consisting of:

one battery with nine heavy AA machine-cannons, *two batteries* each with 12 light AA guns.

Artillery Regiment, consisting of:

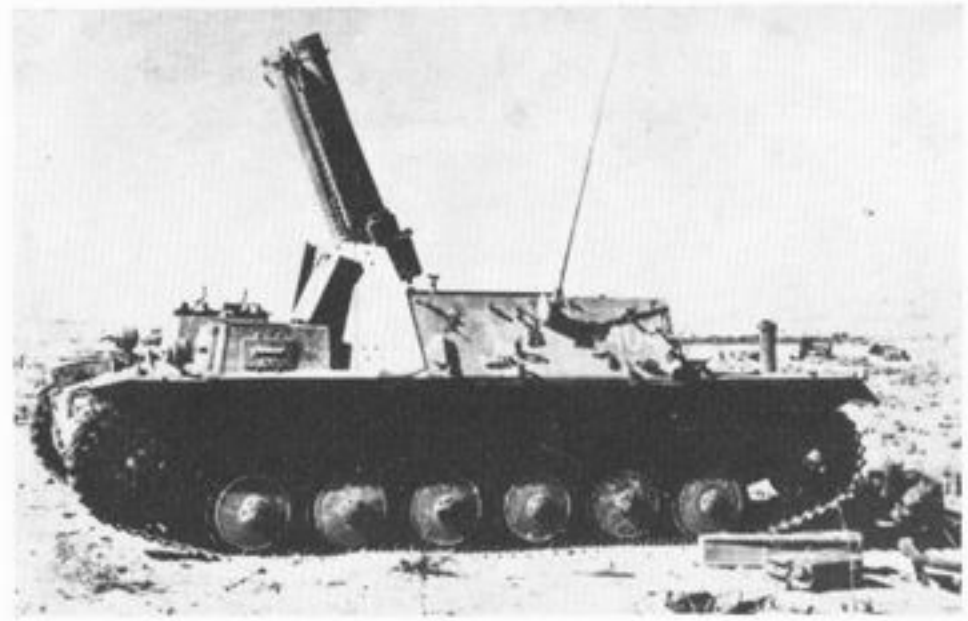
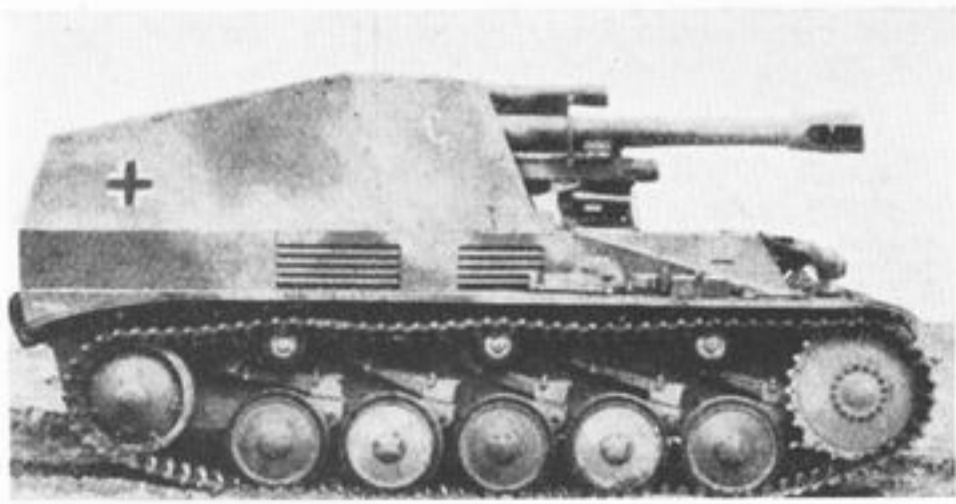
two battalions, each of *three batteries*, each of four field guns, signals etc., *one battalion* of *three batteries*, each of four howitzers, signals, etc.

Air Reconnaissance Squadron, consisting of:

nine recce aircraft.

Panzers I and II being prepared for embarkation. Apparatus for discharging smoke is fitted at tail. Note divisional sign on right-hand mudguard of right-hand tank and on tool chest of left-hand tank. (Photo: Imperial War Museum)





Above: 150-mm. heavy infantry support gun (*Infanteriegeschütz 33*) on a lengthened *Panzer II* chassis.
(Photo: Imperial War Museum)

Top left: *Wespe*—10.5-cm. *Panzerfeldhaubitze 18* on a *Panzer II* chassis.
(Photo: Imperial War Museum)

Bottom left: *Panzer II Ausf. F* in the desert. This particular vehicle appears to have been fitted with a heavier gun than the 20-mm. weapon usual in this model.
(Photo: Imperial War Museum)

Signals Bn, consisting of:
one wireless company, one telephone company.

Engineer Bn, consisting of:
two motorized engineer companies, one armoured engineer company, two bridging columns, light engineer column.

Bugle Platoon.

Supply Bn.

Administrative services.

This was the organization of the 1st-5th and 10th Panzer Divisions which were equipped entirely with German tanks. The 6th, 7th and 8th were equipped with captured Czech tanks and had only one panzer regiment of three battalions. The 9th, equipped with German tanks, had only one panzer regiment of two battalions.

At the opening of the Polish campaign the vast majority of the tanks in the six panzer divisions were Pz Kpfw I and II, most of the Pz Kpfw III and IV being allotted to the Panzer-Lehr. By May 10, 1940, the 35 tank battalions launched against the west had 523 Pz Kpfw I, 955 Pz Kpfw II, 349 Pz Kpfw III, 278 Pz Kpfw IV, 106 Pz Kpfw 35(t) (Czech), 228 Pz Kpfw 38(t) (Czech), 96 Kleine Panzer Befehlswagen (on Panzer IB chassis), and 39 Panzer Befehlswagen III (on Panzer III chassis)—a total of 2,574 tanks.

After their victory in the west the Germans doubled the number of their panzer divisions. But there were as yet insufficient tanks to equip all the divisions to the original scale, so that the doubling was only nominal. Each tank brigade was reduced to one regiment. Six divisions each had a three-battalion regiment, but the remainder had only two battalions. The battalions, however, were more powerful. Each had two light companies equipped with up-gunned Panzer IIIs and one medium company with 75-mm. Panzer IVs. The infantry brigade now had two two-battalion motorized rifle regiments and one motor-cycle battalion. Anti-aircraft artillery became a regiment equipped with 88-mm. guns.

Both the 5th (Light)—later re-designated the 21st

Panzer—and the 15th Panzer Divisions which arrived in the Western Desert in 1941 were on the reduced establishment of two tank battalions and three motorized rifle battalions; and this was basically the establishment of the panzer divisions which took part in the attack on Russia in June 1941. About 3,200 tanks were available at the start of the campaign in the east.

Three years later, on the eve of the battle of Normandy, the standard panzer division had two tank battalions (one generally equipped with Pz Kpfw IV, the other with Panthers). Only one of the three artillery battalions had SP guns, and only one out of the four infantry battalions had armoured personnel carriers. Tank battalions were now not mixed—each, in theory, had four companies of 22 tanks each. In practice it was usually three companies of 17 tanks each: by the end of the war it was 14. Some panzer divisions—especially the SS—were favoured and had three tank battalions; some even more—the Gross Deutschland, for example, had four battalions (one of Tigers) and six infantry battalions. Special Panzer-Lehr establishment when it became a division late in 1943 was two tank battalions, each of four companies, with a divisional HQ company of Tigers; its infantry battalions had half-tracks, and artillery units had SP guns.

In 1944 there were 25 army panzer divisions and eight SS panzer divisions, formed originally from panzer grenadiers. There was also the Hermann Goering Panzer Parachute Corps of two divisions formed of Luftwaffe personnel.

The army panzer divisions were numbered 1 to 27 inclusive, all formed before the end of 1942, plus 116 formed in spring 1944 and Panzer-Lehr. Of these the 10th, 18th, 22nd and 27th were destroyed or disbanded (the 18th) in 1943 and not re-formed. The 14th, 15th, 21st and 24th were destroyed in 1943 but all were re-formed.

AFV Series Editor: DUNCAN CROW

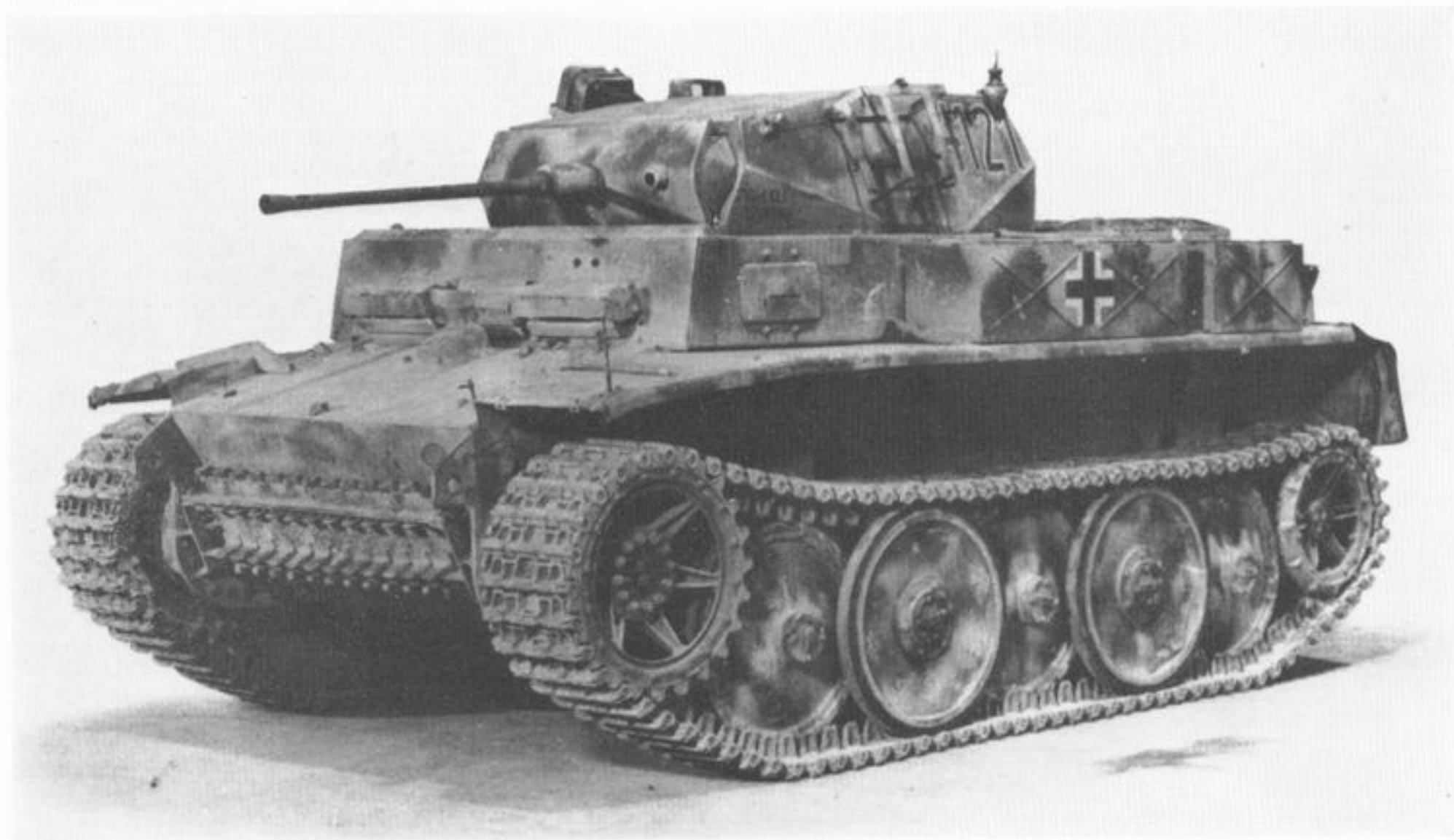
TABLE OF TANK DETAILS—Pz Kpfw I and II

Type & Model Date	Weight tons	Crew	Length	Width	Height	Speed m.p.h.	Radius of action	Armament/Amn		Armour max/min mm.	Engine BHP/r.p.m. BHP/ton	Trans- mission	Remarks
								Main	Mgs				
Pz Kpfw 1A Sd Kfz 101 1934	5.4	2	13'2"	6'10"	5'8"	25	90	—	2/ 3125	13/7	Krupp M.105 4-cyl. air cooled 60/2500 11.1 per ton	5 F I R clutch and brake steering	Four suspension wheels. External girder. Rear idler on ground. Three return rollers. External mantlet
Pz Kpfw 1B Sd Kfz 101 1935	5.8	2	14'7"	6'10"	5'8"	25	90	—	2/ 3125	13/7	Maybach NL 38 TR 6-cyl. water cooled 100/3000 17.2 per ton	5 F I R clutch and brake steering	Five suspension wheels. External girder. Rear idler wheel raised. Four return rollers. Internal gun mantlet. Skeletal track
Kleine Panzer Befehlswagen (Kl. Pz. Bef. Wg.) Sd Kfz 265 1938	5.8	3	14'7"	6'10"	5'8"	25	90	—	1/ 900	30/23/ 7	Maybach NL 38 TR 6-cyl. water cooled 100/3000 17.2 per ton	5 F I R clutch and brake steering	Command tank. Two wireless sets
Pz Kpfw 1C VK 601 1939	8.0	2	14'6"	6'10"	5'8"	40	90	1 × 20mm./ —	1/—	30/10	Maybach HL 45 6-cyl. 150/3000 18.8 per ton	5 F I R clutch and brake steering	Prototype only. Five overlapping suspension wheels of large diameter—no return rollers. Steel track with grouser bars. Commander's observation cupola
Pz Kpfw 1D VK 1801 1939	18.5	2	14'4"	8'7"	6'9"	15	60	—	2/	82/20	Maybach HL 45 6-cyl. 150/3000 7 per ton	5 F I R clutch and brake steering	Prototype only. Intended for close co-operation with infantry. Five overlapping large diameter suspension wheels. No return rollers. External grouser bars on track Commander's observation periscope
Pz Kpfw II a1, a2, a3. (1, 2, 3 La S100) Sd Kfz 121 1934	7.2	3	15'10"	7'1"	6'8"	25	110	20mm. KwK 30/ 180	1/ 1425	14.5	Maybach HL 57 TR 6-cyl. 130/3000	6 F I R Synchro- mesh gearbox clutch and brake steering	Rounded nose plates. Minor variations between a1, a2, a3. Three pairs small suspension wheels each side. External girder. Raised rear idler. Three return rollers. Internal gun mantlet
Pz Kpfw IIb or 2 La S100b Sd Kfz 121 1934	7.9	3	15'10"	7'1"	6'8"	25	100	20mm./ 180	1/ 1425	14.5/ —	Maybach HL TR 6-cyl. 140/2600 17.7 per ton	6 F I R Synchro- mesh. Epicyclic steering	Similar to IIa but more powerful engine. Wider track
Pz Kpfw IIc or 3 La S100c 1934	8.8	3	15'10"	7'1"	6'8"	25	100	20mm./ 180	1/ 1425	30/10	Maybach HL TR 6-cyl. 140/2600 15.9 per ton	6 F I R Synchro- mesh. Epicyclic steering	Suspension—five large diameter suspension wheels each held on an arm with hull pivots. Movement controlled by ¼ elliptic springs. Four return rollers. Petrol tanks uparmoured to 10mm.
Pz Kpfw IIA Sd Kfz 121 1937	9.5	3	16'0"	7'7"	6'9"	25	100	20mm./ 180	1/ 1425	30/10	Maybach HL TR 6-cyl. 140/2600 14.7 per ton	6 F I R Synchro- mesh. Epicyclic steering	Angled nose plate replaced rounded pattern of earlier models. Suspension as for IIc. 15mm. extra fitted to nose plate and 20mm. on turret after 1941
Pz Kpfw IIB and C Sd Kfz 121 1938	9.5	3	16'0"	7'7"	6'9"	25	100	20mm./ 180	1/ 1425	30/10	Maybach HL TR 6-cyl. 140/2600 14.7 per ton	6 F I R Synchro- mesh. Epicyclic steering	
Pz Kpfw IID and E Sd Kfz 121 later	10.0	3	15'5"	7'5"	6'9"	35	125	20mm./ 180	1/ 1425	30/14	Maybach HL TR 6-cyl. 140/2600 14.0 per ton	6 F I R Synchro- mesh. SS 948 gearbox clutch, brake steering	Four large suspension wheels. No return rollers. Torsion bar springing. Converted to flame thrower 1940

TABLE OF TANK DETAILS—Pz Kpfw I and II

Type & Model Date	Weight tons	Crew	Length	Width	Height	Speed m.p.h.	Radius of action	Armament/Anm		Armour max/min mm.	Engine BHP/r.p.m. BHP/ton	Trans- mission	Remarks
								Main	Mgs				
Flammpanzer II Sd Kfz 122	10.0	2	15'5"	7'5"	6'9"	35	125	Two Flame guns	1/ 2000	30/14	Maybach HL TR 6-cyl. 140/2600 14.0 per ton	6 F I R Synchro- mesh. SS 948 gearbox clutch, brake steering	Internal flame fuel tanks 225 gallon capacity. Flame range 40 yards
Pz Kpfw IIF, (G, J) Sd Kfz 121	9.5	3	16'0"	7'8"	6'9"	25	125	20mm./ 180	1/ 2550	35/20	Maybach HL TR 6-cyl. 140/2600 14.7 per ton	6 F I R Synchro- mesh. SS 948 gearbox Epicyclic steering	35mm. on nose. 30 on glacis plate and 20 on hull sides. Redesigned hull. (Baggage box on turret back, Models G and J)
VK 901 1938	9.2	3	—	—	—	32	100	20mm. KwK 38/ 180	1/ 1425	30/10	Maybach HL 45 145/2800 15.7 per ton	—	75 pre-production machines begun in 1940. Guns in stabilized mounting. Five large overlapping suspension wheels: no return rollers
VK 1601 1939	16.5	3	—	—	—	20	100	20mm. KwK 38/ 180	1/ 1425	80/50/ 20	Maybach HL 45 200/3000	—	Prototype only. Guns in stabilized mount
VK 1301 1942	12.8	4	—	—	—	—	—	—	—	—	Maybach HL 66P 180/3200	—	First prototype for Luchs. Pz Kpfw II L. VK 1303 at 11.8 tons was accepted for production
"Luchs" Pz Kpfw II L, or Panzerspäh- wagen II (2cm. KwK 38) Sd Kfz 123 1942	11.8	4	15'5"	8'3"	7'1"	37½	155	20mm. KwK 38/ 180	1/ 1425	30/10	Maybach HL 66 P 180/3200 15.2 per ton	6 F I R Synchro- mesh. SS 948 gearbox con- trolled differ- ential steering	Suspension as for VK 901. Torsion bar springing. Fixed cupola. 100 of these tanks built with 20mm. guns: next 35 mounted 50mm. L/60 guns

Three-quarter front view of Panzerspähwagen II (or Pz Kpfw II L)—Luchs (Lynx) showing interleaved suspension wheels. Full side view of this vehicle, now in the R.A.C. Tank Museum, appears in colour on another page. (Photo: R.A.C. Tank Museum)



AFV Profiles

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| 7 Medium Tanks Marks A to D | 17 Russian KV and IS | 28 French R35, H35 and S35 |
| 8 Crusader—Cruiser Mark VI | 18 Chieftain | 29 Russian BT |
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| 10 PanzerKampfwagen V Panther | 20 Churchill and Sherman Specials | |
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