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PanzerKampfwagen IV

by Walter Spielberger



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Panzer IV in action.

Panzerkampfwagen IV

by Walter Spielberger

MOST postwar publications on German armour of the Second World War tend to over-emphasise the importance of the well-known Tiger and Panther. These vehicles, while undoubtedly making quite an impression on their opponents during their somewhat limited appearance on the battlefield, should be considered above all as derivatives of the Panzerkampfwagen III and IV. It was these two tanks which established the reputation of the German armoured forces, and demonstrated the most advanced technical and tactical features of their time.

While the PzKpfw III was intended to equip three out of four German tank companies, the PzKpfw IV was originally given a limited rôle as a support vehicle equipping the fourth company of a standard tank battalion. This vehicle, conceived in 1934 but neglected through the years by inadequate production schedules, eventually became the only German tank which remained in production and troop service until the end of the war. This is an indication of its sound basic design, supplemented by remarkable foresight in the specification. Most of the other armoured vehicles originally designed during the same period

progressively disappeared under the stress of war from 1939 onward.

One man most instrumental in the design of the Panzer IV was the creator of the German *Panzertruppe*, Colonel-General Heinz Guderian, who had laid down the basic prerequisites for armoured fighting vehicles as early as 1933–34. These were mobility, fire-power, armour protection and communication, specified in that order. A five-man crew was also considered essential. The latter allowed for a distinct allocation of duties between the crew, an advantage both in training and in battle, which gave German tanks their marked tactical superiority over their Allied counterparts despite other shortcomings. Guderian's insistence on supplying the crews with communication systems, usable not only between tanks but also on intercom., was another key factor enabling these vehicles to be used as practical and effective units of the newly-created armoured force, trained in the disciplined and co-ordinated art of armoured warfare. However, despite these major advantages, most German tanks of the development period could not be considered superior in Guderian's



Panzer IV Ausf. A of 1st Panzer Division, only 35 of this model were built. Ausf. A had stepped front plate with driver's position protruding at left, round bow machine-gun mount at right. Driver had single centre vision slit and rectangular side view opening in front plate.

first three requirements of mobility, fire-power and armour protection. In fact many of the French tanks opposing the German attack of 1940 had heavier armour, while the British cruisers were superior in manoeuvrability. What the Allied armour lacked most was the administrative backing of supply and maintenance required by modern mechanised forces, and the fighting efficiency afforded by well-designed crew compartments.

German armour had a further weakness which became apparent during the Russian campaign in 1941. The German General Staff had foreseen the future deployment of armoured fighting vehicles primarily in Western Europe. The capacity of European bridges and railroad profiles, and the existence of a dense road network determined to a large degree the specifications for ground pressure and power/weight ratio, thus limiting basic dimensions and cross-country performance. These factors became obvious handicaps among the vast plains, swamps and forests of Russia. The challenge set by the T-34—tailor-made for its environment with its wide tracks, high speed, effective armour and powerful gun—could only be met fully by completely new designs with their inevitably lengthy development time. But immediate solutions were found which up-dated especially the Panzer IV to such an extent that it was still a usable weapon when the war ended. Its modification was continuous, if often makeshift. Much was left to the tactical ability and determination of Panzer crews to make up for deficiencies in their vehicles. Tanks returned for overhaul were, in principle, brought up to the latest standards, considerably complicating the recognition of later marks.

The outstanding basic vehicle of this wartime development period, created to restore the balance of power in favour of German armour, was PzKpfw IV Ausf. F2.

DEVELOPMENT HISTORY

The story of Panzer IV began at a policy meeting called at the Army Ordnance Department on January 11, 1934. The agenda was to settle some final problems concerning a proper balance of armoured fighting vehicle equipment for a 63-division German Army. As a result of this discussion, final specifications for a "medium tractor" were agreed and orders for



Another recognition feature of Ausf. A was the drum-shaped commander's cupola protruding through rear plate of turret. Engine was Maybach HL 108. Weight 17.3 tons.

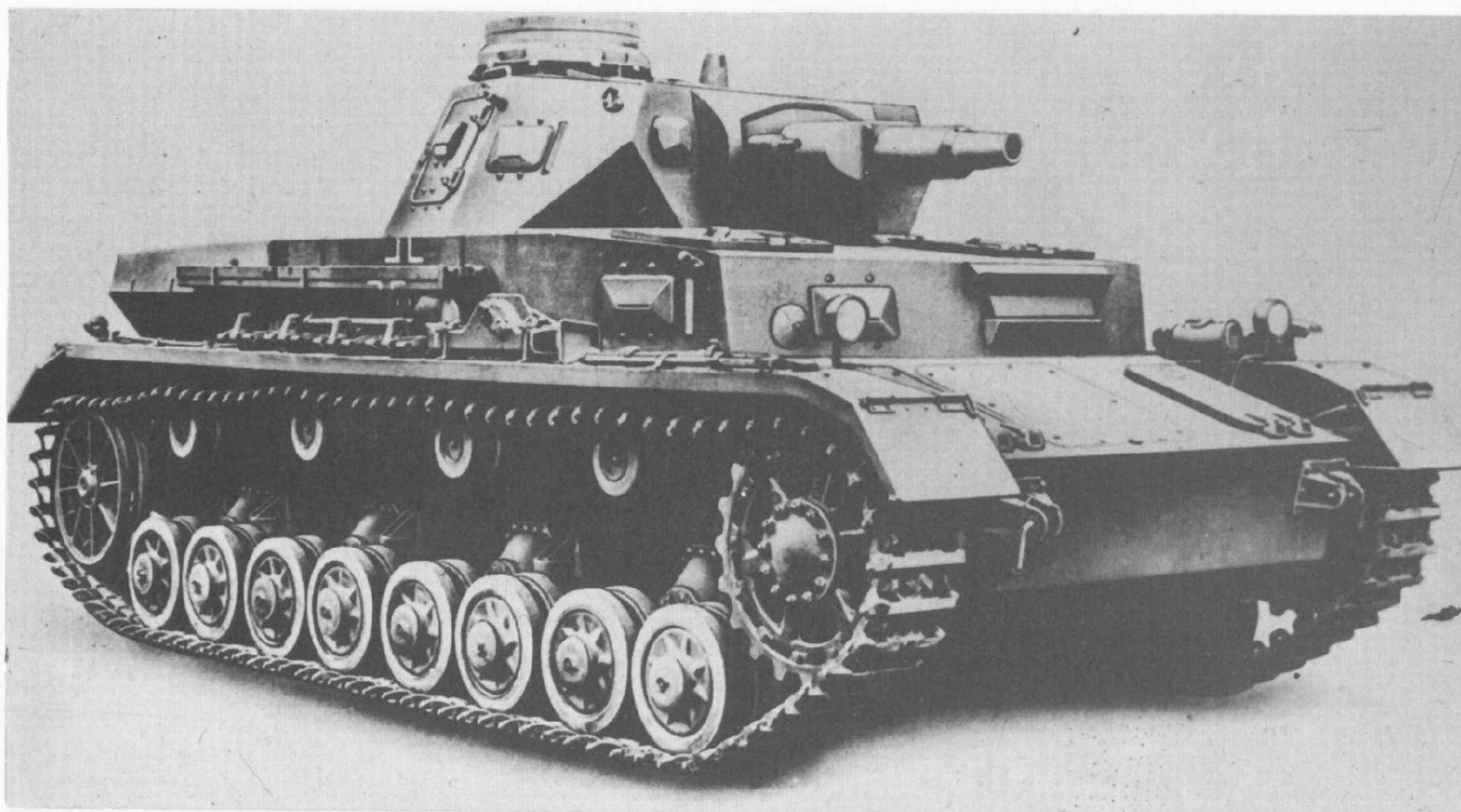
prototypes were issued to industry. The armament required was a short 7.5 cm. assault gun; this was thought necessary to support the new Panzer army's standard vehicle, PzKpfw III which was to be equipped with a 3.7 cm. gun. The limit for its battle weight, imposed by the capacity of standard bridges, was 24 tons. Rheinmetall-Borsig AG. immediately started their design and completed a wooden mock-up by the end of the year. Their first prototype, called "VK 2001", went to Kummersdorf for trials in 1935. Both M.A.N. of Augsburg and Friedr. Krupp AG. of Essen submitted their proposals to the *Waffenamt* (War Office) during 1935. Intensive trials of all prototypes resulted in the acceptance of the Krupp design in 1936.

In order to disguise these vehicles the code name "*Bataillonsführerwagen*" or "BW" was established, a designation which served for identification throughout the entire model run. While development and construction of prototypes took place at Krupp's Essen factory, the production line was established at Krupp-Grusonwerke AG. at Magdeburg. Now called "*Versuchskraftfahrzeug 622*" (VsKfz 622), a few examples of the first version, or Ausführung A, came off the production line in 1936. The second, Ausf. B, appeared in 1937, again in very limited numbers. Ausf. C was produced in 1938, as was Ausf. D.

The campaign against Poland in September 1939 saw only 211 Panzer IV in action, since production had been curtailed after all existing units had received their allotted number of vehicles. Encouraged by the results of this first battle, Panzer IV was accepted as standard issue on September 27, 1939, and now received the Ordnance Number *Sonderkraftfahrzeug 161* (SdKfz. 161). In December 1939 production began of Ausf. E, bringing the total of Panzer IV available for the impending campaign against France up to 278. In fact only 280 Panzer IV were built during 1940. It was not until a "*Führerbefehl*"—Hitler's order—of August 20, 1940 finally put more urgency into tank production that both Panzer III and IV were placed in production class "SS", a high priority classification.

AUSFUHRUNG F APPEARS

The Panzer IV model profiting most from the accumulated experience of the Polish campaign was the "6/BW" or Ausf. F. Altogether 393 PzKpfw IV



Ausf. B and C were very similar to each other in appearance. Both had a straight frontal plate with double driver's visor and pistol port and peep slot instead of bow machine-gun. Commander's cupola was no longer drum-shaped. Ausf. C had its turret machine-gun partially protected by an armoured sleeve. Engine in Ausf. B and first C vehicles was Maybach HL 120 TR; in later C vehicles and subsequent models Maybach HL 120 TRM engine was installed. Thickness of turret armour was increased in Ausf. C. Only 42 Ausf. B were built. Note also cone-shaped signal port flap on turret roof, which appeared on Ausf. B, C, and D.

Ausf. F were built in 1940 and 1941, with the first batch of 20 leaving the factory in February 1940. Compared to previous models, the basic armour was increased from 30 to 50 mm. The front of the superstructure was now in the form of a single plate extending straight across the tank. The front revolver port was omitted altogether and a "Kugelblende 50" for the radio-operator/hull gunner, together with a "Fahrersehklappe 50" for the driver were now provided. Modifications to the two hinged maintenance hatches in the glacis plate included the incorporation of air intake apertures on each door. These were protected by a cast cowl welded to the cover. Another change affected the access doors to the turret; the single door previously fitted was superseded by double doors similar to those fitted on Panzer III. The forward door on each side incorporated a vision port, while revolver ports were provided in each rear door. The additional armour increased the weight from 21 to a total of 22.3 metric tons and required a modification of the chassis. Track width was increased from 380 to 400 mm. (Track type Kgs. 61/400/120) to lower ground pressure. These new tracks also had the sole and outer webs of each shoe slotted to fit ice sprags.

The front driving sprocket of Panzer IV Ausf. F, while similar to previous models, had its spokes bent outwards from the hub, giving the outside a dished appearance. The rear idler wheel was completely changed. Constructed of 2½ in. welded tube, both outside and inside sections were secured together by flat plates welded to their respective spokes. Thus modified the vehicle was ready to accept the final major modification, which again made it an even match for the Russian T-34.

THE NEW 7.5 cm. GUN

The surprise created by the Soviet's T-34 when it was encountered for the first time at the end of July 1941 could have been avoided. Guderian indicates in his book "Erinnerungen eines Soldaten" that a group of Russian officers received Hitler's personal permission to inspect German tank factories as late as the spring of 1941. The Russians, confronted with the Panzer IV, would not believe that this was supposedly the heaviest German tank. They protested so strongly that they should be shown everything as promised by Hitler that it was deduced that they must have something much better. They actually had. In the event, no German weapon other than the 8.8 cm. gun, available only in limited numbers, was able to defeat the new Russian tanks in an open encounter. To compensate for this, the Ordnance Department issued Order No. 917/41 gKdos Wa. Pruef. 4 of November 18, 1941 to Friedrich Krupp AG. of Essen to design in co-operation with Rheinmetall-Borsig AG. a replacement for the short-barrelled 7.5 cm. Panzer IV tank gun. Originally called *Kampfwagenkanone 44* (later KwK 40), the weapon was to have a barrel length of 3,218 mm. (L/43). Muzzle velocity was to be increased from 450 to 990 m./sec. and range from 6,500 m. to 8,100 m. Mass production was ordered in March 1942. Installed for the first time in the F version of the Panzer IV, it received the official nomenclature F2, while vehicles with the short-barrelled weapon were re-named Ausf. F1. Serial numbers of Ausf. F1 run from 82001 to 82393; those for F2 from 82394 to 83700. The fighting weight of the F2 version increased to 23.6 metric tons; 87 rounds of ammunition were carried. The price per unit (without weapons) amount-



This three-quarter rear view of Ausf. B or C in France shows the single hatch door on the turret sides. Double doors were not substituted until Ausf. F. Exhaust configuration and track tensioning device are typical of all Panzer IV vehicles. Weight of Ausf. B was 17.7 tons, of Ausf. C 20 tons.

ed to RM 103,462. These vehicles remained in production until 1942 when they were succeeded by the Ausf. G.

PRODUCTION

Panzer IV production was originally intended to be on a limited scale. Only one prime contractor, Krupp-Gruson AG., was engaged, while Panzer III production was divided among eight major companies. This limited production and the effects of losses left the following numbers of Panzer IV on Army strength during the first three years of the war: end of 1939: 174; end of 1940: 386; end of 1941: 769. In fact, the total Panzer IV production during 1941 amounted to only 480 units, despite an order dated July 18, 1941 which requested production of 2,160 to equip the planned 36 armoured divisions. A monthly production goal of 40 units per month was set for 1941. In January 1942 a monthly output of 57 units was anticipated. In the event this target was exceeded and a total of 964 urgently needed Panzer IV were produced during 1942. Originally the main assembly was by Krupp-Gruson, with hulls and turrets supplied by Krupp of Essen and Eisen-und-Huettenwerke of Bochum. This picture changed considerably during 1942 under the influence of Allied air raids. The relocation of key war industry to areas not readily accessible to the bombers was begun in 1940 and established several new tank factories. One of these was "Nibelungenwerke" at St. Valentin (Lower Austria), managed by Steyr-Daimler-Puch AG. Initially intended for the production of a replacement vehicle for Panzer IV—the Porsche "Leopard" (Porsche Type 100)—it became operational just in time to take on the expanded Panzer IV production. From 1943, Panzer IV was assembled almost exclusively at this factory and remained in production there until the end of the war. Its proximity to the Hermann Goering steel mills at Linz established a new source for hulls and turrets including Gebr. Koehler & Co of Kapfenberg and Eisenwerke Oberdonau of Linz. The raw material consumption of one Panzer

IV (without weapons, optical instruments or radio equipment) was as follows: Steel (Fe), 39,000.00 kg.; Tin (Sn), 1.20 kg.; Copper (Cu), 195.10 kg.; Aluminium (Al), 238.00 kg.; Lead (Pb), 63.30 kg.; Zinc (Zn), 66.40 kg.; Magnesium (Mg), 0.15 kg.; Rubber, 116.30 kg. These totals illustrate the profound strain on the blockaded and stretched German industry of tank production and go far to explain its limitation even in the early days of the war and by comparison with the achievements of Allied industry in this field.

Concluding Panzer IV production were Ausf. H and J, both mounting the final version of the 7.5 cm. gun with a length of L/48. A total of approximately 9,000 Panzer IV was produced.

PANZER IV F2 DESCRIBED

The hull was a comparatively simple design, incorporating various sizes of steel plates. All joints were austenitic steel welds and the plates were high-quality chromium-molybdenum steel made by the electric furnace process. Two bulkheads separated the hull into three compartments—driving, fighting and engine. The front driving compartment housed the transmission and final drive assemblies in addition to seats for both driver and radio operator/hull gunner. Three petrol tanks with a capacity of approximately 105 gallons were located beneath the floor of the centre fighting compartment. A most noticeable and characteristic feature of Panzer IV was the superstructure, of welded construction, bolted to the top flange of the hull. To accommodate the rather large turret race, it projected well beyond each side wall of the hull. One bolted and two hinged maintenance hatches were provided in the front glacis plate; access hatches for driver and radio operator were provided in the roof plate.

THE TURRET

The welded turret provided seats for three crew members—commander, gunner and loader. The sides were sloped so that the overall width was appreciably greater than the internal diameter of the turret ring. The 7.5 cm. gun was mounted on a trunnion axis. The forward end of the recoil mechanism projected through the mantlet to afford additional protection. The commander's cupola, set well back on the turret roof, had five observation ports equally spaced around its circumference with the front port pointing

Panzer IV in action in Russia supporting infantry: Ausf. B, C, or D. Note fuel cans on side.





Ausf. D again had a stepped front plate like Ausf. A, but the bow machine-gun for the radio operator was now in a square shaped mount with internal ball. The driver had a side opening for a sub-machine-gun. The mantlet for the main armament was external, as opposed to the internal mantlet on all earlier models.

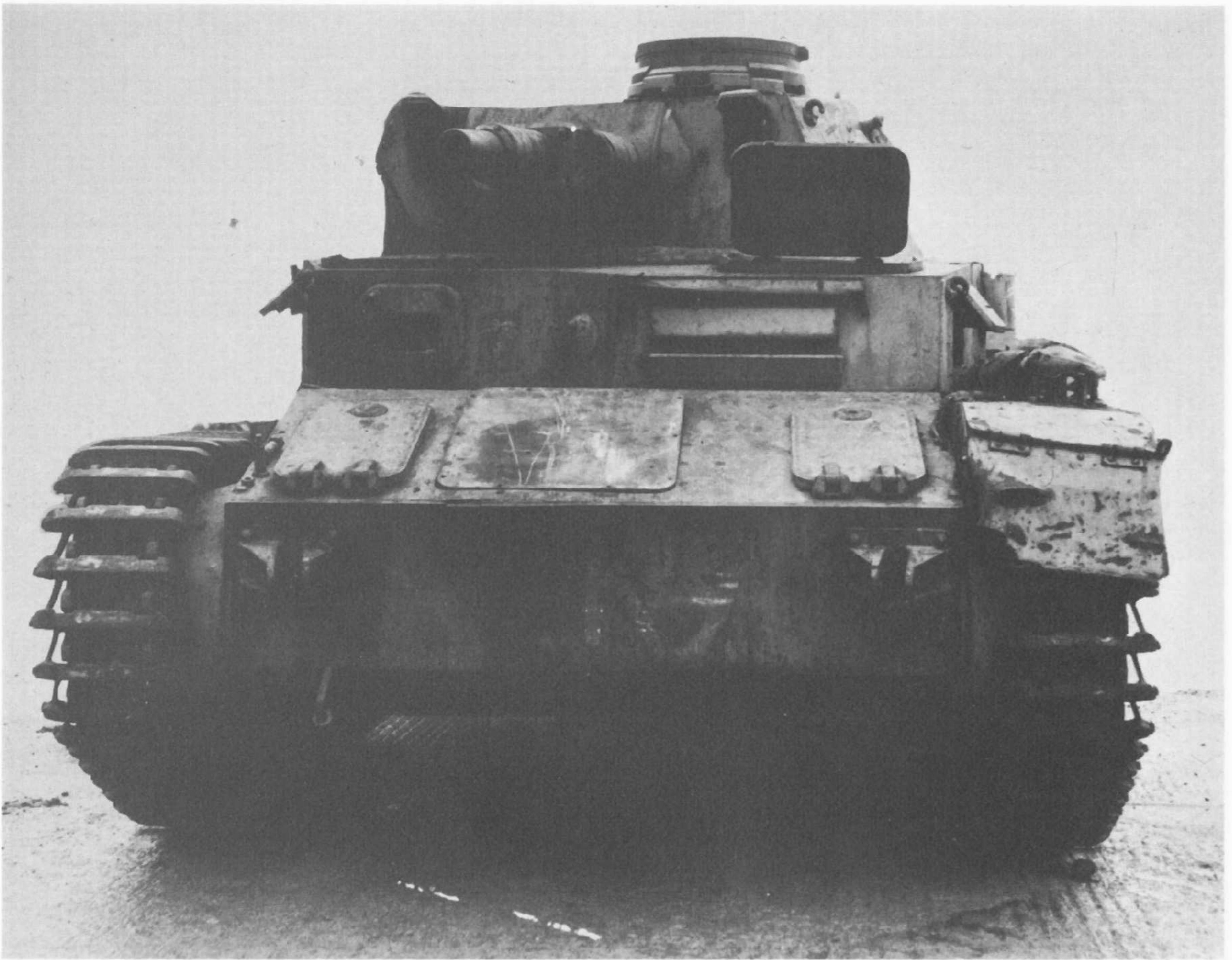
directly forward in line with the gun. It was closed by a pair of semi-circular hatch covers. An observation port was provided in each side wall of the turret, in front of the side access hatches. Additional observation ports appeared on Panzer IV turrets at either side of the gun mantlet, although official documents indicated that the right side port should be omitted on the F2 version. Not all turrets were so modified, since even the later Ausf. G sometimes carried both ports. Only one signal port appeared on the turret roof, similar to the ones mounted on both driving compartment crew access hatches. There were also two revolver and carbine ports at the rear of the turret. The fighting compartment was ventilated by a roof-mounted extractor fan.

The new gun KwK 40, of Panzer IV Ausf. F2 was easily distinguishable by its increased barrel length and muzzle brake. While the first production model was fitted with a single-baffle globular muzzle brake, later vehicles had a double brake. The gun itself was capable of penetrating homogeneous armour of 77 mm. thickness at 2,000 yards using PzGr.39 at normal impact. It could fire at least six different kinds of ammunition: *Panzergranate* 40 (A.P.C.R.), PzGr. 39 (A.P.C.B.C.), *Sprenggranate* 38A and B (H.E.A.T.), *Sprenggranate* 34 (H.E.) and *Nebelgranate* (Smoke shell). A total of 87 rounds were carried, plus 2,250

rounds of 7.92 mm. ammunition for both MG 34 machine-guns, one of which was mounted co-axially on the right side of the gun. The second machine-gun was mounted on the right side of the front vertical plate and operated by the radio operator. It had a ball mounting with a hemispherical fixed external mantlet, the ball being inserted from the outside. Turret traverse was effected by both hand and electric power gears supplied from a generator, driven by a DKW two-cylinder two-cycle 10 h.p. 500 c.c. petrol engine.

POWER AND TRANSMISSION

The main power plant was the standard medium tank engine of World War II, the Maybach "HL 120 TRM", a 12-cylinder, 11,867 c.c. liquid-cooled petrol engine built under licence by Norddeutsche Motorenbau GmbH. of Berlin-Niederschöneweide. Normally developing an output of 300 b.h.p. at 3,000 r.p.m., the engine was in most instances restricted to 2,600 r.p.m. giving a rating of 265 b.h.p. The engine used only 74 octane petrol. Cooling air entered through louvres on the left hand side of the engine compartment, was drawn through two radiators and over the engine by two ten-bladed fans. An exceptionally large filter provided clean air for the power plant. Engine output was transmitted by a propeller shaft and a three-plate



Front and side views of an Ausf. D of the Afrika Korps. Bow machine-gun has been removed. Note that although this Panzer IV can be identified as Ausf. D from its stepped front plate and the shape of the driver's visor and the bow machine-gun mount it does not have the cone-shaped signal port flap on the turret roof. This was removed from Ausf. D vehicles when they were uparmoured.





Three-quarter rear view of Ausf. D shows clearly the shape of the commander's cupola compared with that on Ausf. A. The four return rollers identify all Panzer IV vehicles.



Four of the five-man crew of a Panzer IV can be seen in this picture of an Ausf. D cruising along. 250 of this model were built, their chassis numbers running from 80501 to 80750.

Top view of Ausf. D. Note round pistol ports at rear of turret; in Ausf. A these were square. To the right of the cone-shaped signal port flap the rectangular ventilator flap can be seen slightly open. In later models the flap was replaced by a fan ventilator.

dry clutch to the Zahnradfabrik Friedrichshafen AG. synchro-mesh six-speed gearbox. Small multi-disc synchronising clutches were used for 2nd, 3rd, 4th, 5th and 6th gears. A Krupp-Wilson "Clutch-Brake" final drive and steering mechanism was used. In this, the input gear drove the annulus of an epicyclic train. The sunwheel was coupled to a steering brake drum, which was held stationary by an external band and compression spring while the vehicle was in motion. The drive from the epicyclic annulus was transmitted through the planet carrier to the spur reduction gears, which drove the track sprockets. The six-speed gearbox and the final drive units had one common oil circulation system.

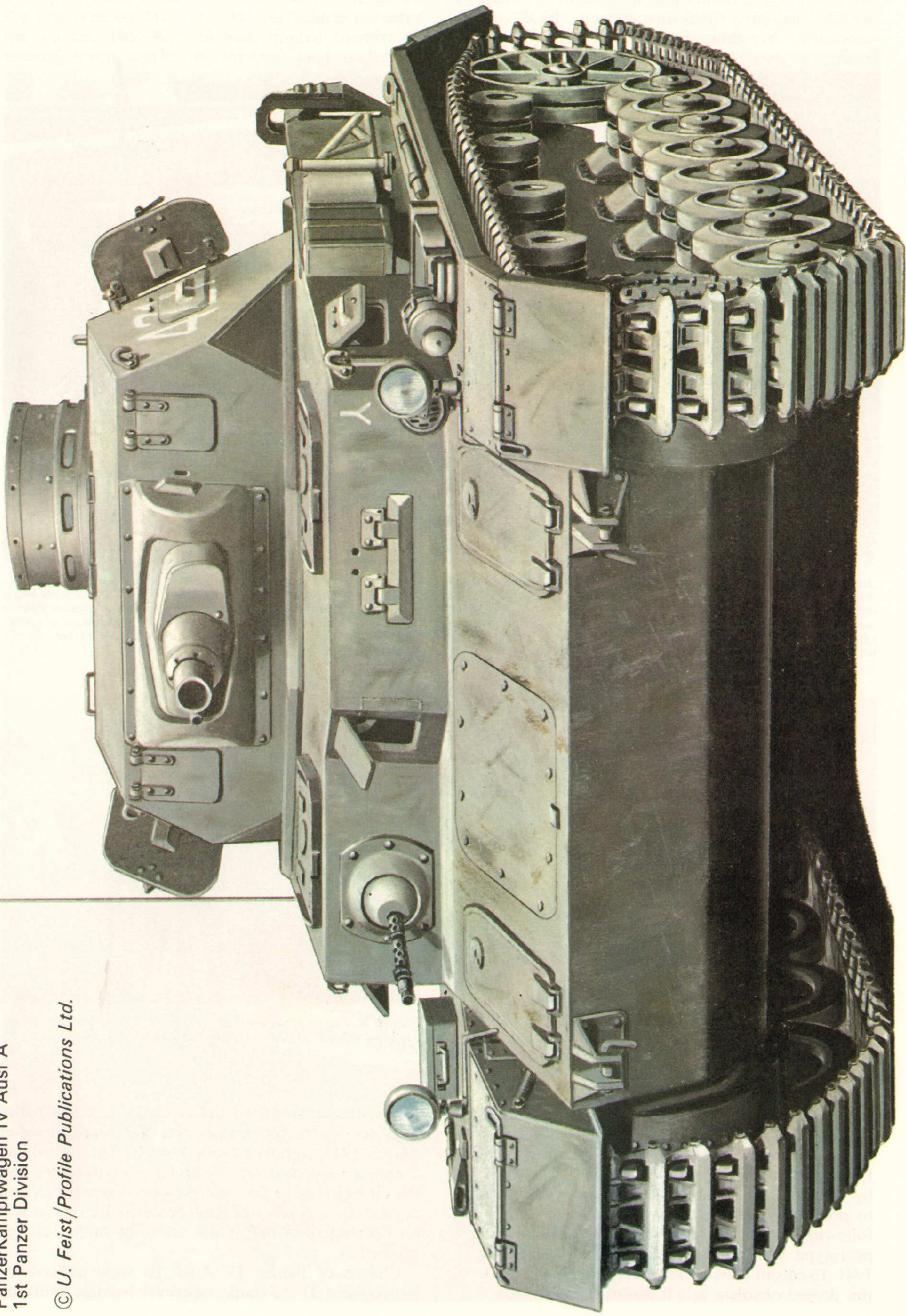
Each track consisted of 98 links, each one 400 mm. wide with 120 mm. pitch. Manganese steel was used for this "skeleton" type of track which weighed approximately 1,400 lb. Track tension was adjusted by means of a large diameter idler wheel mounted on an eccentric axle at the rear of the vehicle. The suspension system consisted of four bogie units per side, each one of which was fitted with two 18½ in. diameter rubber-tyred wheels. Quarter elliptic springs were mounted on the underside of the leading axle arm of each bogie. The other end of the spring rested on a shackle pin and roller, carried on an extension of the trailing axle arm. Four support rollers per side completed the suspension.

Ausf. D crossing a trench during training in 1939. Guide teeth on Ausf. D and E tracks were higher than on tracks for earlier models.



PanzerKampfwagen IV Ausf A
1st Panzer Division

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Ausf. E of 13th Panzer Division early in the Russian campaign, 1941. This model still had the stepped front plate, although with modifications to the driver's visor and the bow machine-gun mount. Other changes included: modified commander's cupola installed further forward so that it no longer protruded from the back plate of the turret which was now unbroken; increased armour on nose plate, bolted on armour for hull to improve fighting compartment protection (see picture), spaced armour in front of bow machine-gun and sometimes in front of driver's position; replacement of rectangular ventilator flap on turret roof by fan ventilator, and removal of cone-shaped single port flap which was replaced by a flat lid (see picture: the new ventilator is half-way along the turret roof in front of the cupola).



Close up of front plate of Ausf. E showing the new driver's visor with single hinged flap and the modified bow machine-gun mount.



Ausf. E moving up for action in North Africa. Chassis numbers of this model were 80801 to 82000. Weight was 21 tons.

VARIANTS

Before deciding to install the long-barrelled 7.5 cm. gun on the Ausf. F, Krupp carried out extensive research into utilising the 5 cm. Pak 38 for the Panzer IV. Krupp maintained that if a decision was reached by August 1941, "Nibelungenwerke" would be able to produce 80 Panzer IV with the 5 cm. Pak by the following spring. An order was issued resulting in one prototype, which was demonstrated on November 15, 1941. Events in Russia, however, had already rendered this project obsolete, and it was dropped.

Vehicles returning to the factories or home maintenance depots for major overhaul received, after March 1943, standard armour skirts. This additional 5 mm. armour was loosely attached to the sides and the turret of the vehicle and provided extra protection against the very efficient Russian anti-tank rifle; it was also intended to defeat the effect of hollow-charge projectiles.

Chassis of Panzer IV Ausf. Fs were utilised for Panzerjäger IV, a tank destroyer vehicle built by

Vomag of Plauen. Shown as a wooden mock-up for the first time on May 14, 1943 the vehicle mounted the 7.5 cm. Pak 39 L/48 with limited traverse. It entered troop service in January 1944 under the designation *Jagdpanzer IV Ausf. F* (SdKfz.162). Battle weight was 24 metric tons, with 79 rounds of ammunition and a crew of four. Early versions of the 15 cm. *Sturmpanzer IV Brummbär* (SdKfz.166) were also based on PzKpfw IV Ausf. F.

The introduction of super-heavy artillery units in 1941 necessitated the conversion of several Panzer

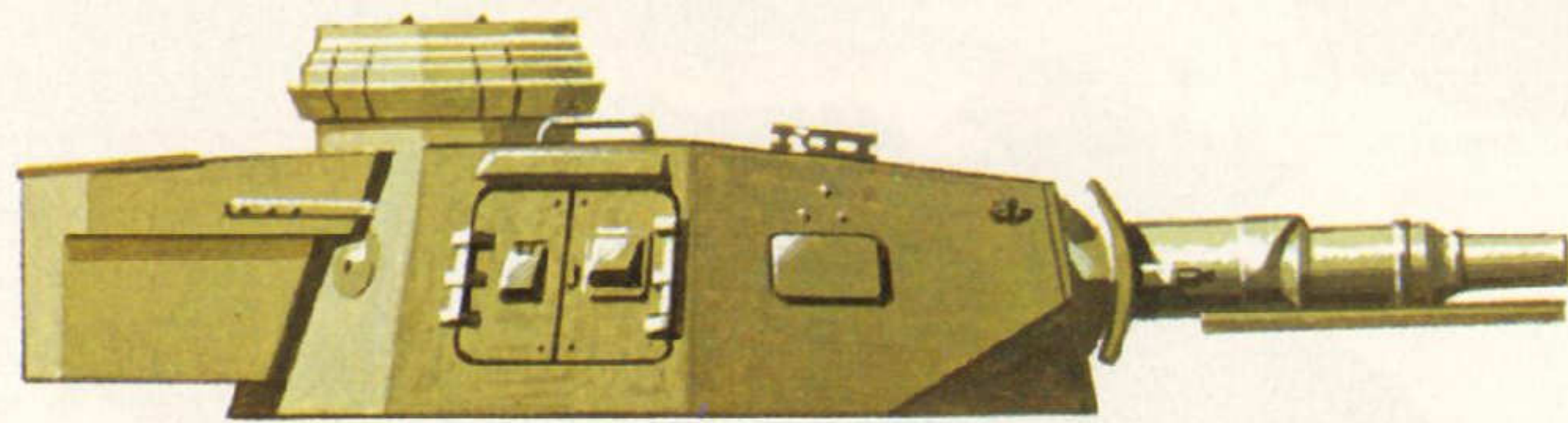
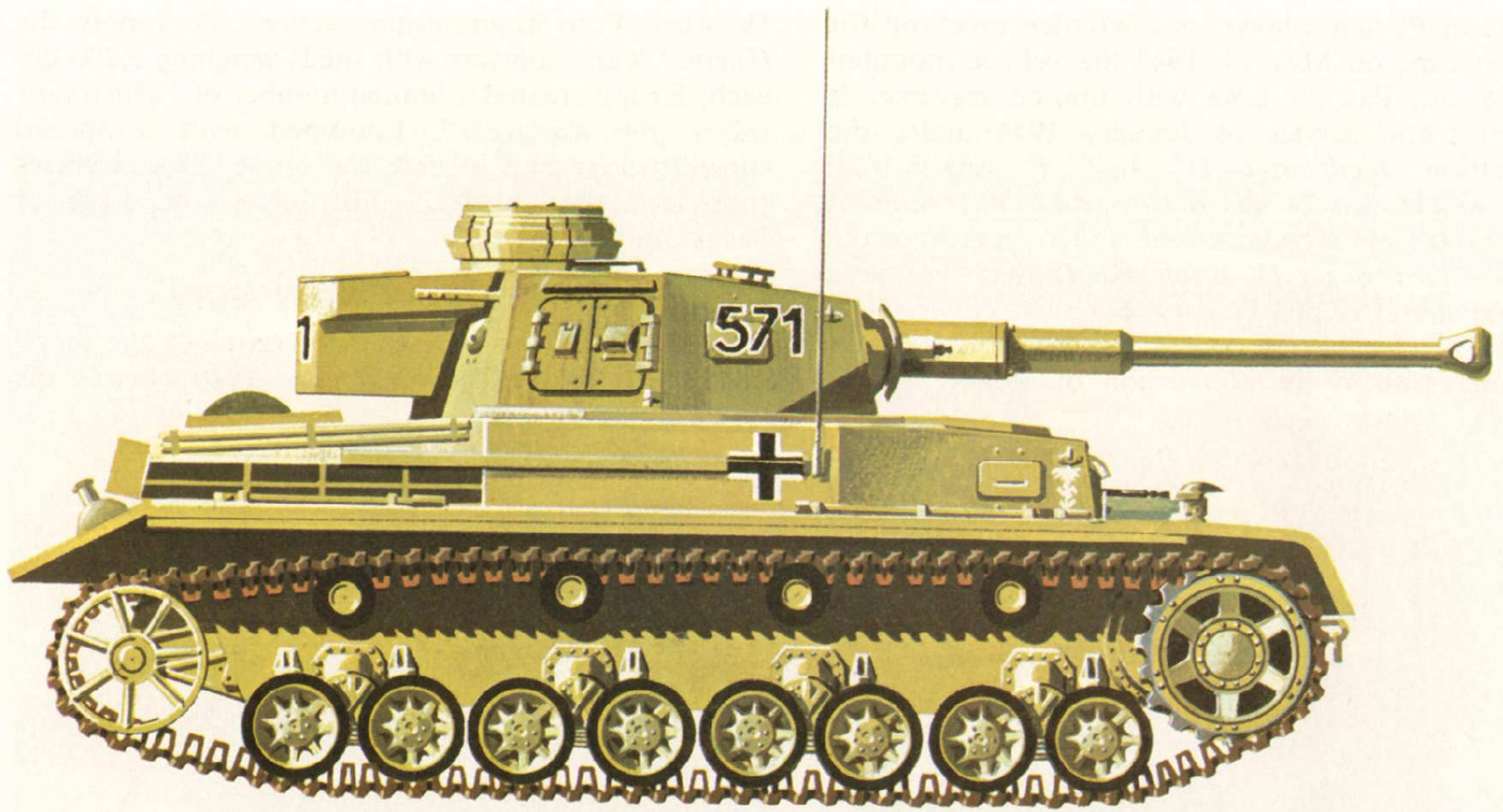
IV Ausf. F to ammunition carriers. To supply the 60 cm. "Karl" mortars with shells weighing 2,200 kg. each, Krupp created a limited number of "*Munitionsträger für Karlgerät*". Equipped with a special superstructure and a three ton crane, these vehicles supported the gigantic guns during the siege of Sevastopol.

GESCHÜTZWAGEN III/IV

One of the most useful and numerous of the many makeshift chassis developed after 1940-41 was the

In the foreground a Panzer IV Ausf. E with turret pointing almost at nine o'clock among other German tanks knocked out in Russia.

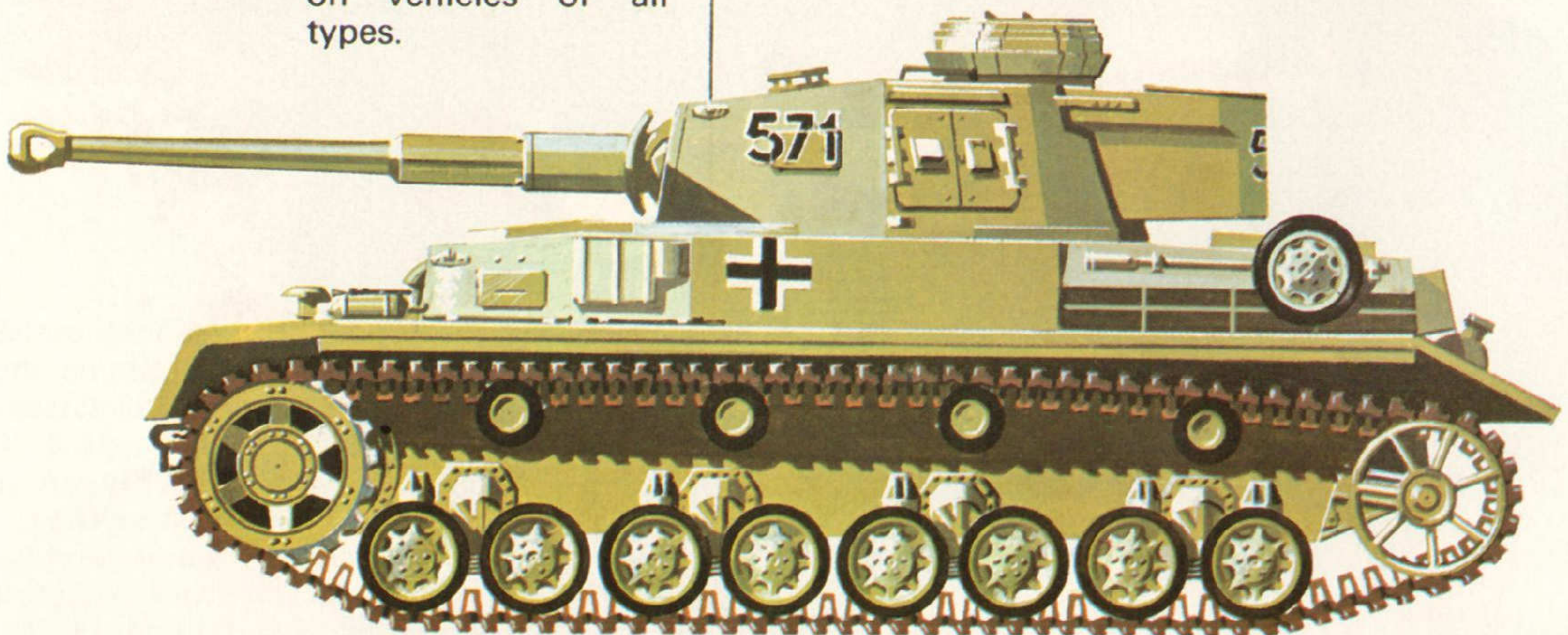


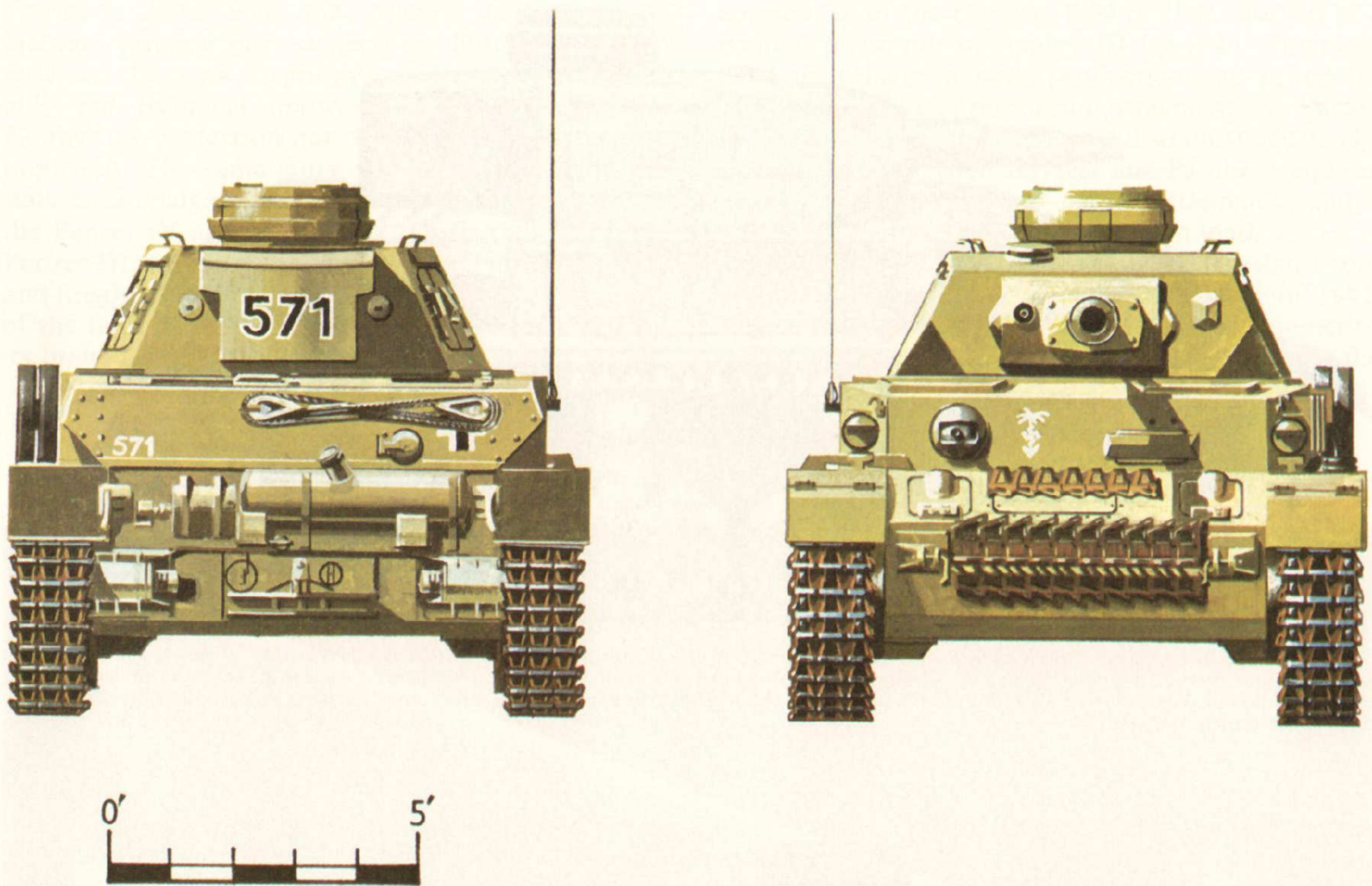


The turret, mounting the short 7.5 cm. gun of PzKpfw IV Ausf. FI.



The insignia of the Afrika Korps; varying in detail, the basic palm - and - swastika motif was widely used on vehicles of all types.

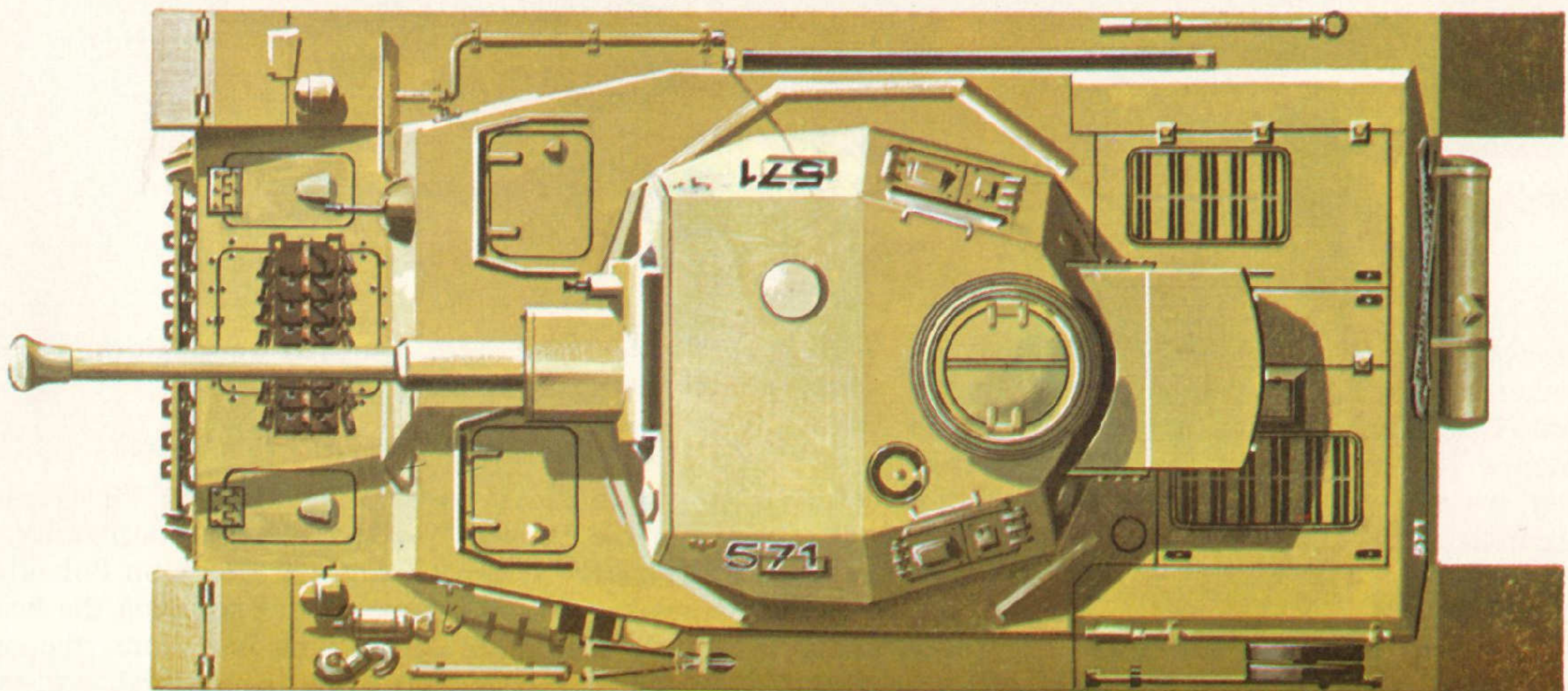


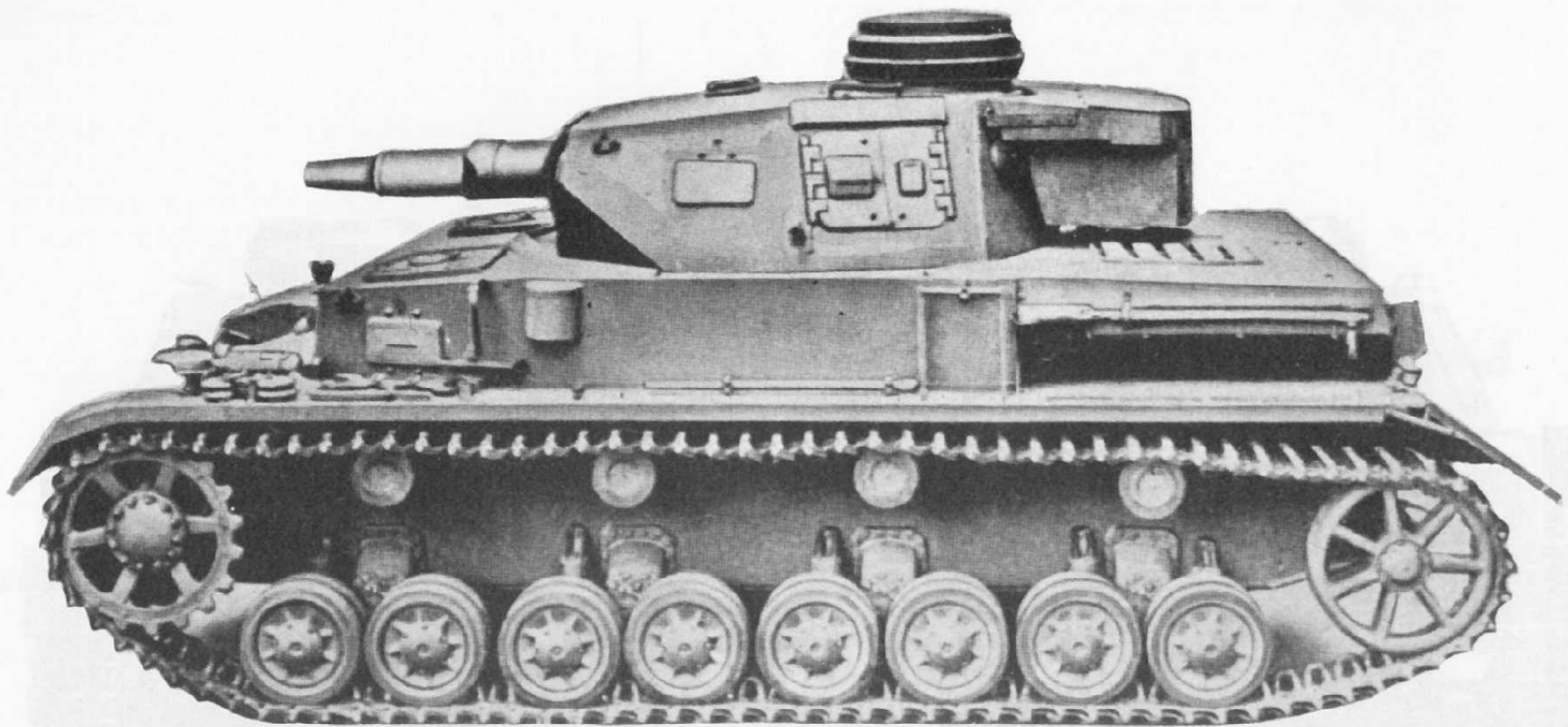


PANZERKAMPFWAGEN IV Ausführung F2

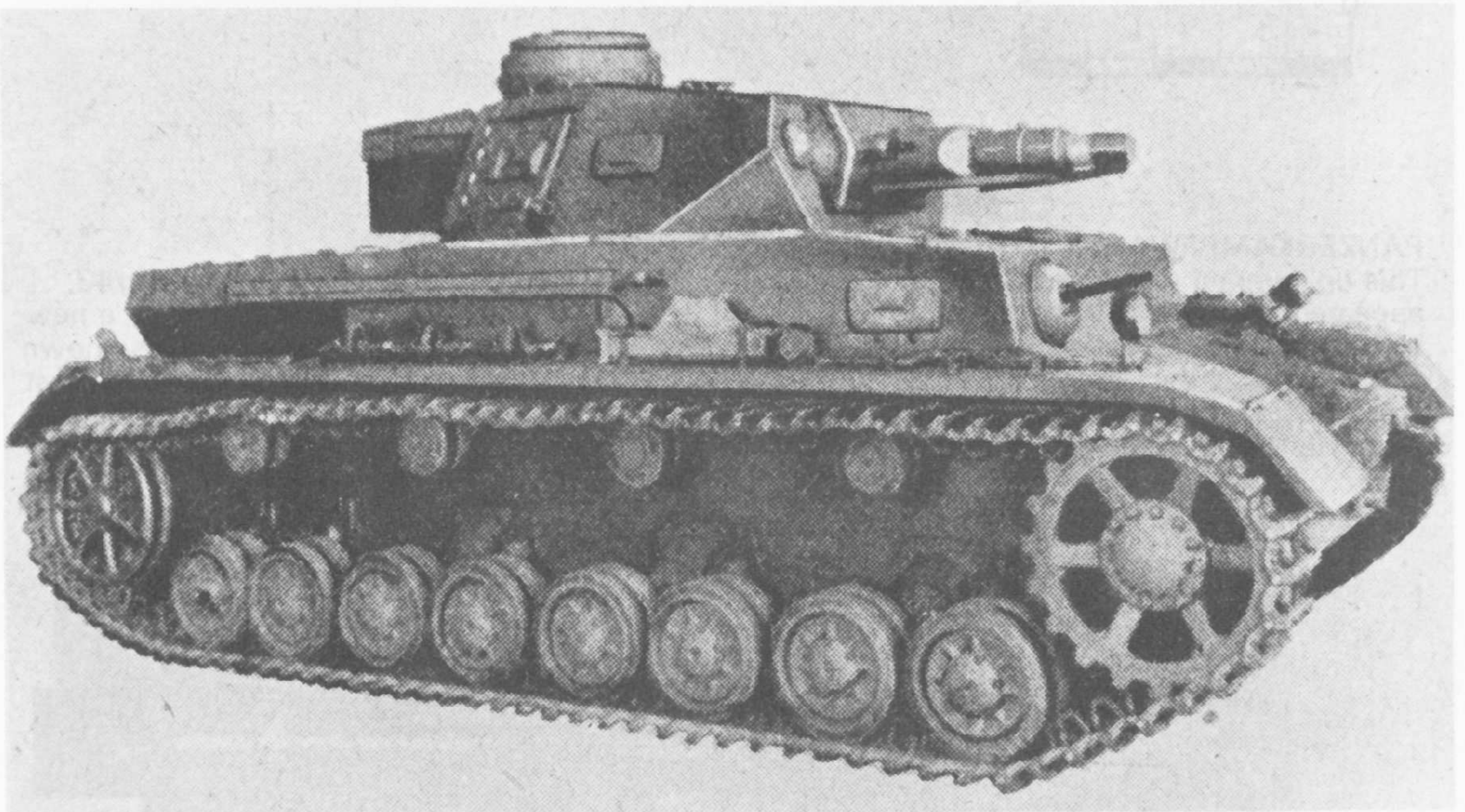
This up-gunned version of Germany's famed Panzer IV, armed with the long 7.5 cm. K L/43, appeared from March 1942 as a hurried answer to the Soviet T-34. It gave the Panzer IV a new lease of life which, with the L/48, saw it through to the end of the war; this version was known to the Allies as the "Mark IV Special". Some of these tanks were operated by the 15th and 21st Panzer Divisions in North Africa, and they played an important part in the German operations at Alam Halfa and El Alamein in September and October 1942.

M. Roffe © Profile Publications Ltd.





Ausf. F had a straight front plate. Basic armour was increased from 30 mm. to 50 mm. and the track width was increased by 20 mm. to 400 mm. Turret hatch doors were changed from single to double. The first 393 vehicles of this model still had the short-barrelled 7.5 cm. gun as their main armament. Later vehicles had the new long-barrelled KwK 40 L/43. Those with the short-barrelled gun were re-designated Ausf. F1, those with the long-barrelled 7.5 cm. gun were designated Ausf. F2.



Ausf. F1. As well as reverting to the straight front plate Ausf. F had the driver's visor and bow machine-gun mount modified yet again.

Geschützwagen III/IV based on components of both Panzer III and IV by Altmaerkische Ketten-Fabrik GmbH. (ALKETT) of Berlin. The vehicle used PzKpfw IV Ausf. F bogie units, return rollers and idler wheels with PzKpfw III Ausf. J final drive assemblies, tracks and transmission components. Principal types built on this chassis were the 8.8 cm. Pak "Nashorn" (SdKfz.164) of which 473 were produced by Deutsche Eisenwerke, Teplitz-Schoenau works; and the 15 cm. heavy field howitzer 18/1 "Hummel" (SdKfz.165) of which 666 were built in

1943-44. There were also 150 ammunition carriers constructed on the chassis.

TACTICAL EMPLOYMENT

Painted in the usual dark blue-grey of the German Army, the Panzer IV backed up the occupation of Czechoslovakia in 1939 and the attack on Poland on September 1 of the same year. Equipping the heavy support companies of the tank battalions, the only opposition encountered came from Polish anti-tank guns. Losses were light here and in the invasion of

France in 1940. Here the superior deployment of German armour proved decisive. Battle experience modified the tactical application of armour considerably but technical improvements were negligible. Neither the protection nor the fire power was greatly improved. The same story was repeated during the Balkan campaign of 1941 and the first appearance of the Panzer IV in North Africa. During all this time, Panzer III had replaced the obsolete Panzer I and II and fought, already up-gunned with a 5 cm. gun, most of the tank battles. The Panzer IV, still restricted by its limited availability, acted only as a back-up unit.

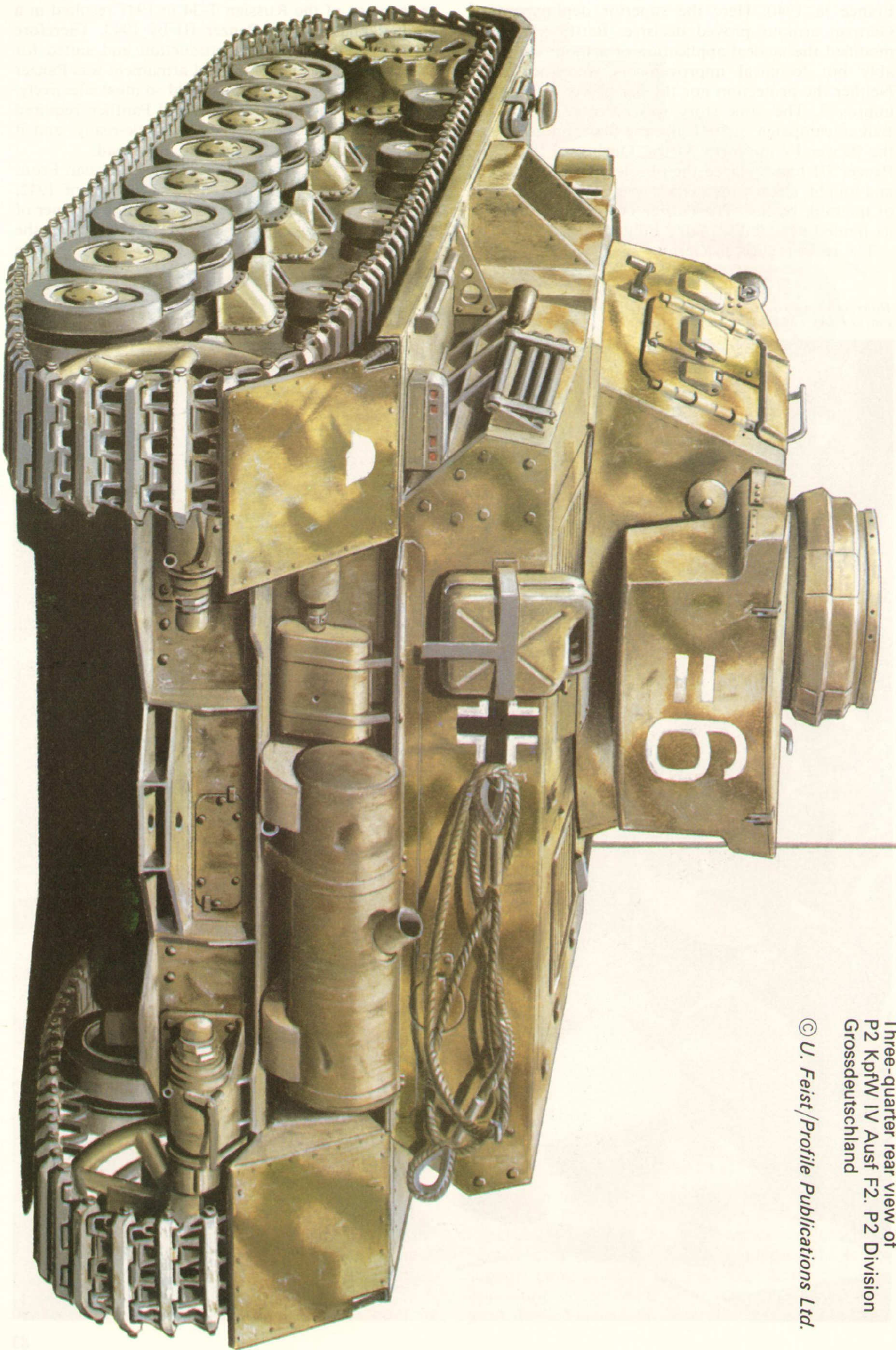
The reorientation in German tank design after the

appearance of the Russian T-34 in 1941 resulted in a gradual phase-out of Panzer III by 1943. Therefore the only vehicle in mass production and suited for carrying improved armour and armament was Panzer IV. It had to close the gap and did so most effectively. The new designs, such as Tiger and Panther, required time to be developed and made battle-ready, and it was left to Panzer IV to carry the main load.

Panzer IV F2s were delivered to the Russian Front in small numbers for the spring campaign of 1942. They also appeared in North Africa in the summer of that year. They were identified by the British as the "Mark IV Special" and accounted the most formidable

Hitler, surrounded by a ring of SS men with a single Army officer in attendance, inspects the first prototype PzKpfw IV F2, with the long-barrelled 7.5 cm. gun, at Krupp's Magdeburg factory early in 1942: note the ball-shaped, single-baffle muzzle brake of the early version.



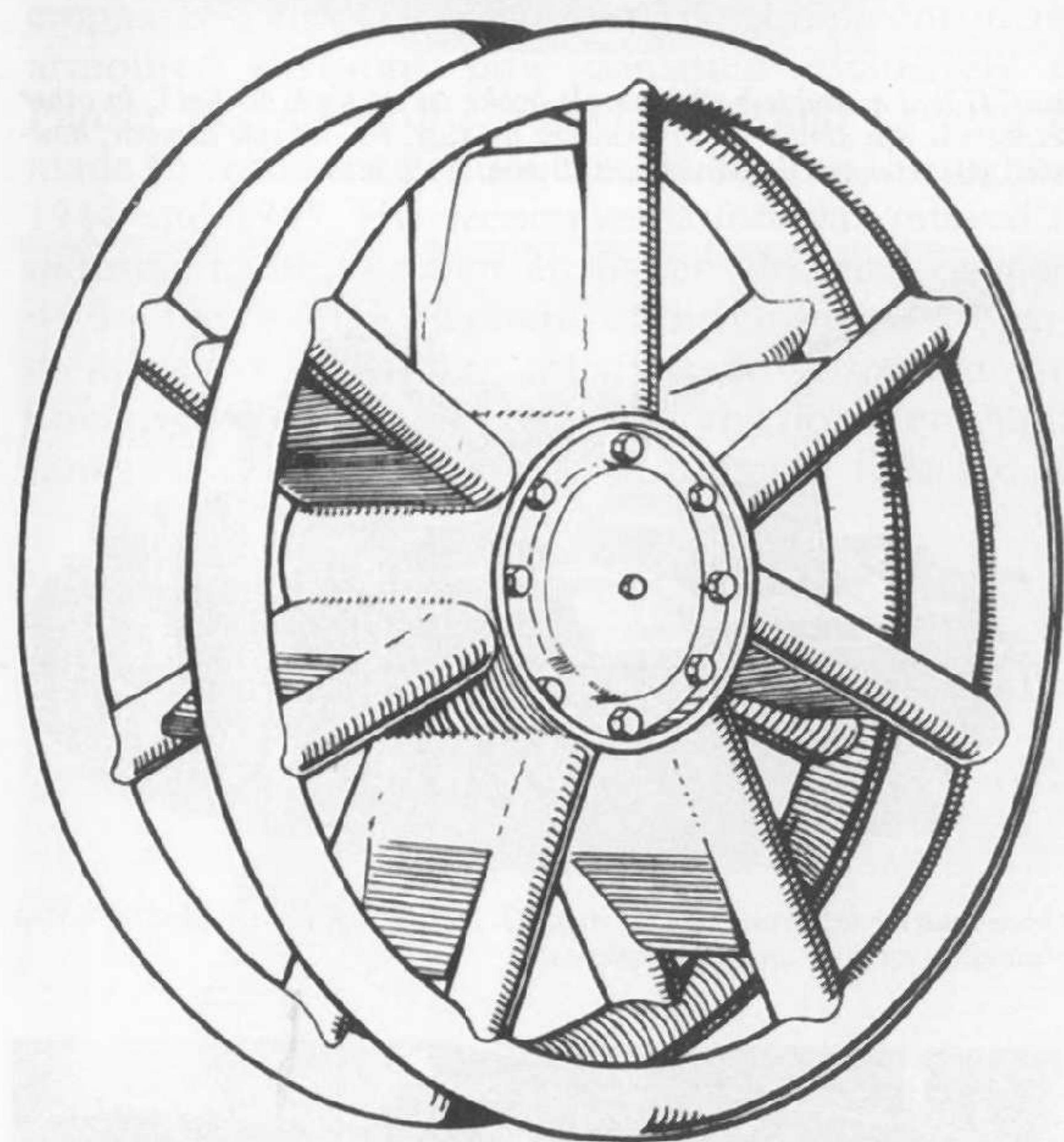


Three-quarter rear view of
P2 KpFW IV Ausf F2. P2 Division
Grossdeutschland

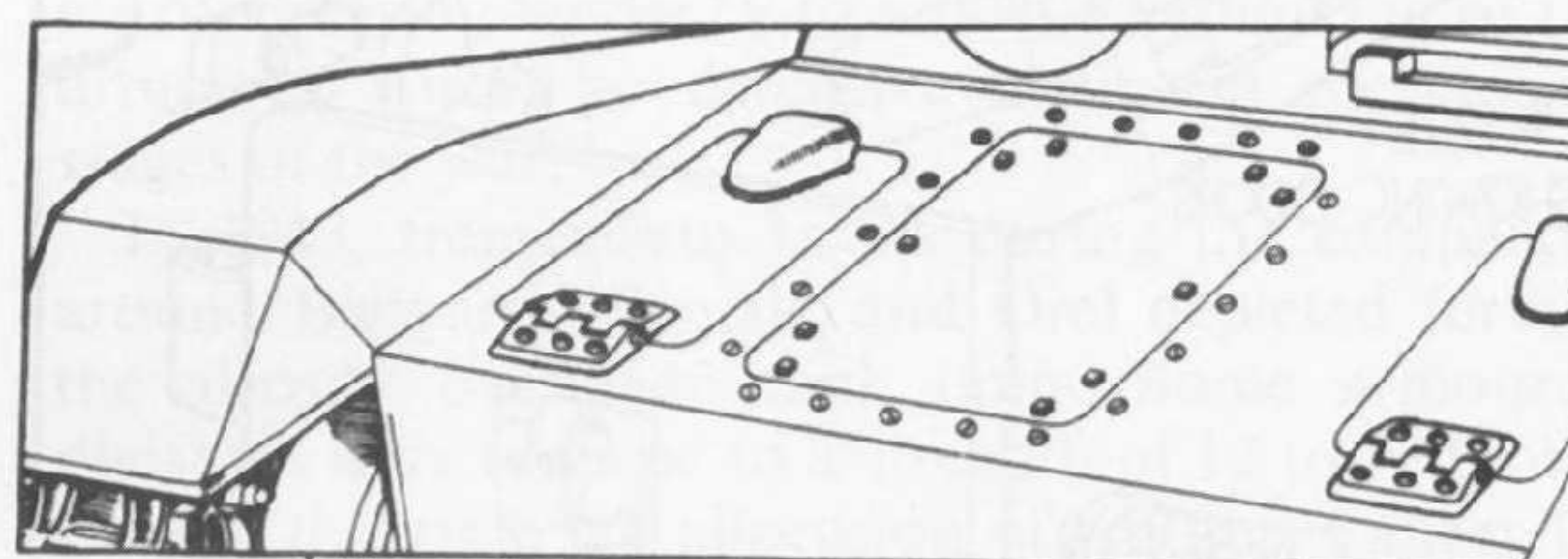
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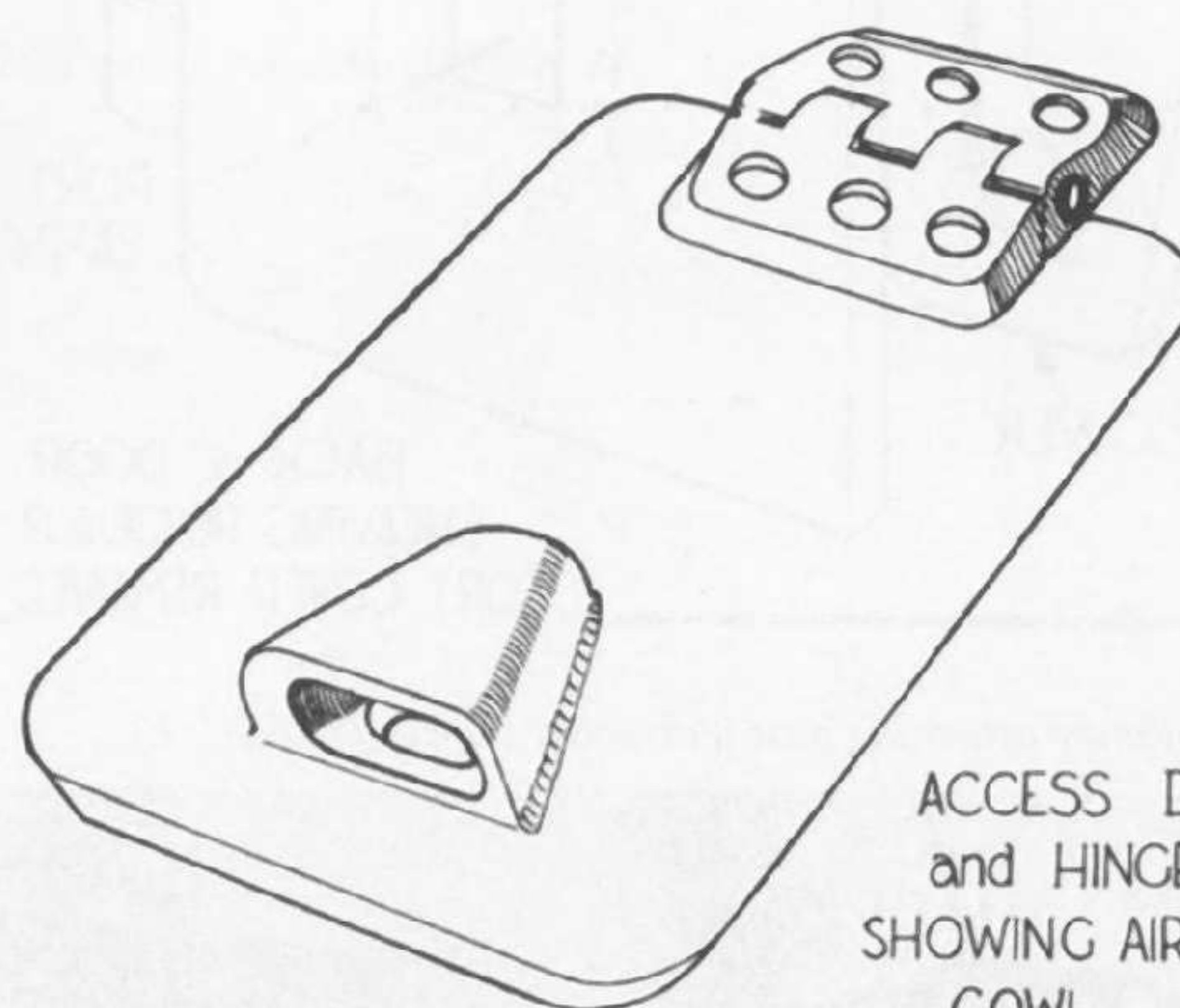
Ausf. F2 destroyed by its own crew in the Libyan desert; numbers of tanks had to be abandoned as fuel and spare parts shortages increased under British blockade. Note the raised glacis plate access doors; these were changed from earlier models, each door having an air intake cowl.



The increased track width of 400 mm. demanded new idler wheels, which were constructed of metal tube by a unique welding process.



View of Glacis Plate showing Access Doors



**ACCESS DOOR
and HINGE
SHOWING AIR INTAKE
COWL**

Glacis plate access door of Ausf. F and later Panzer IV models.

tank they had yet met. F2s led Rommel's push for Alexandria in August 1942, until they were halted by British 6-pdrs. at El Alamein. Their effect on the 8th Army far outweighed their numbers. British Intelligence was astonished to discover later from captured Deutsches Afrika Korps records that on June 11, 1942 the total number of Panzer IV on strength was only 14 of which six were "specials" and by August 30, on the

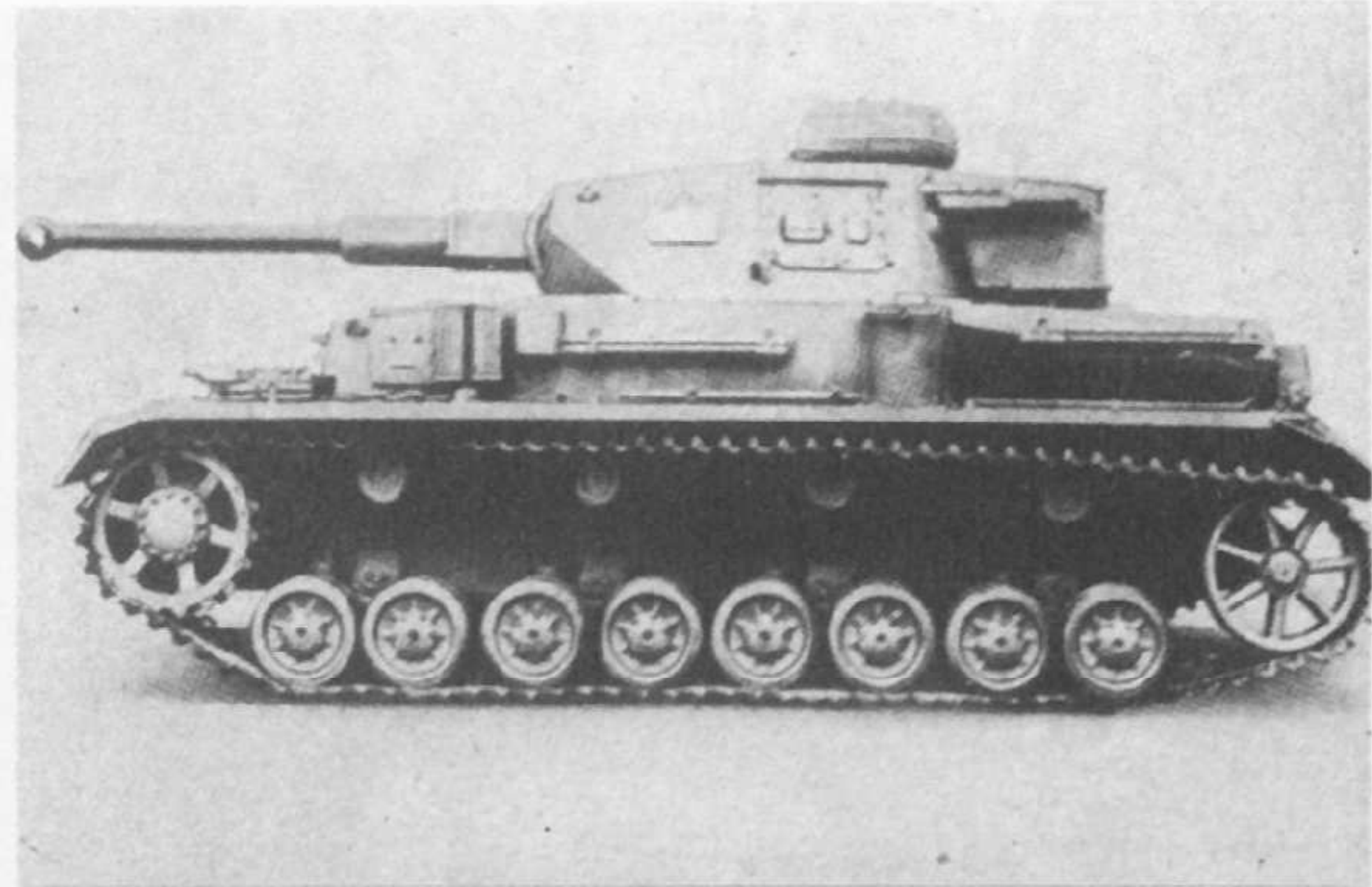
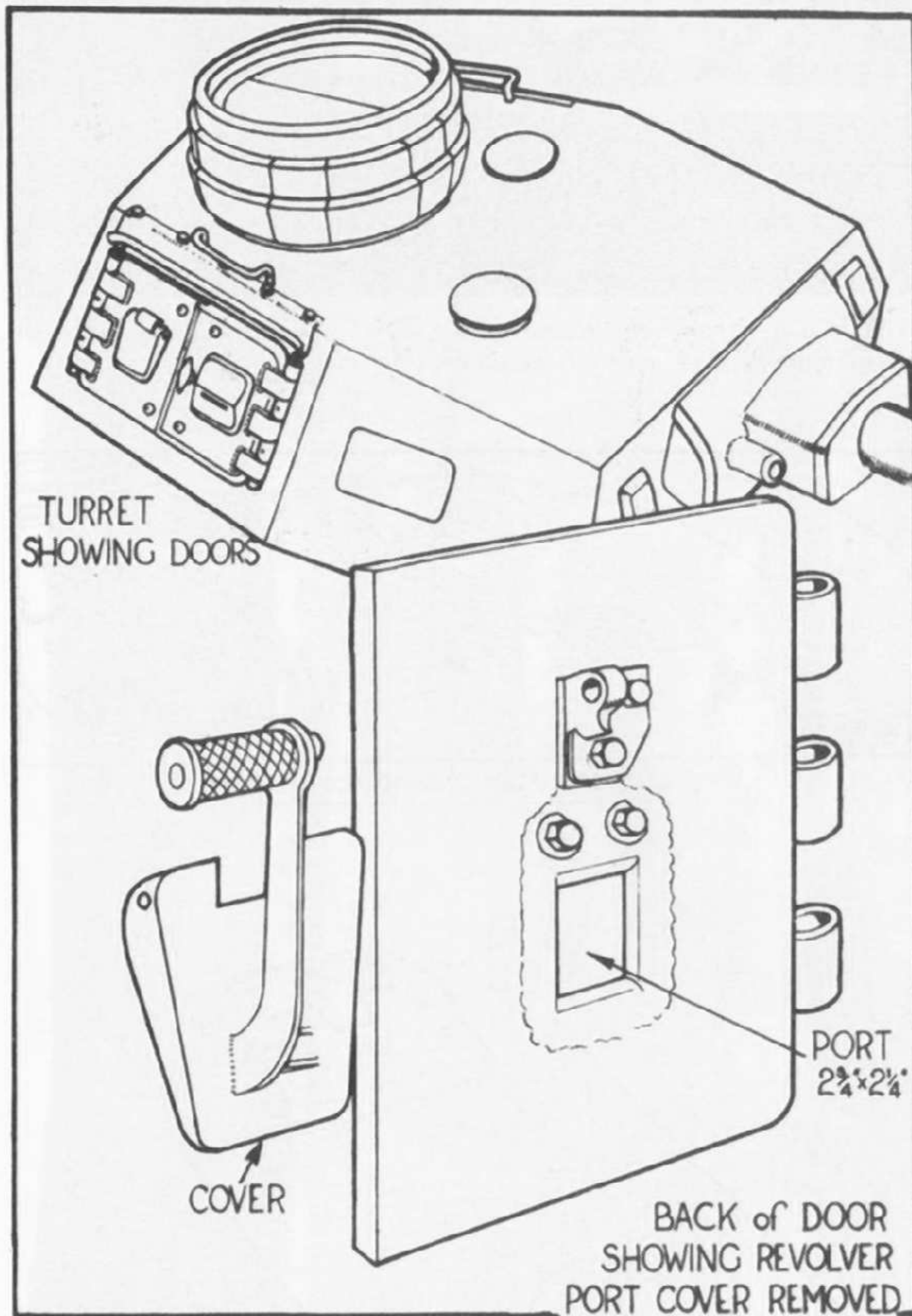
eve of the Battle of Alam Halfa, the strengths were 37 and 27 respectively.

On March 9, 1943 General Guderian read an important paper at Hitler's HQ presenting his ideas about the future of the German armoured forces. He



A snow-camouflaged Panzer IV F2 in Russia during the winter of 1942-43. This was the only tank then available to the Wehrmacht capable of defeating the Russian T-34.

The turret on Ausf. F and later Panzer IV models was equipped with double doors similar to those of Panzer III. Note the flat lid of the signal port beside the cupola and the turret ventilator in front of it; these first appeared in Ausf. E.



Side view of Ausf. F2 with ball-shaped muzzle brake on the KwK 40 L/43.

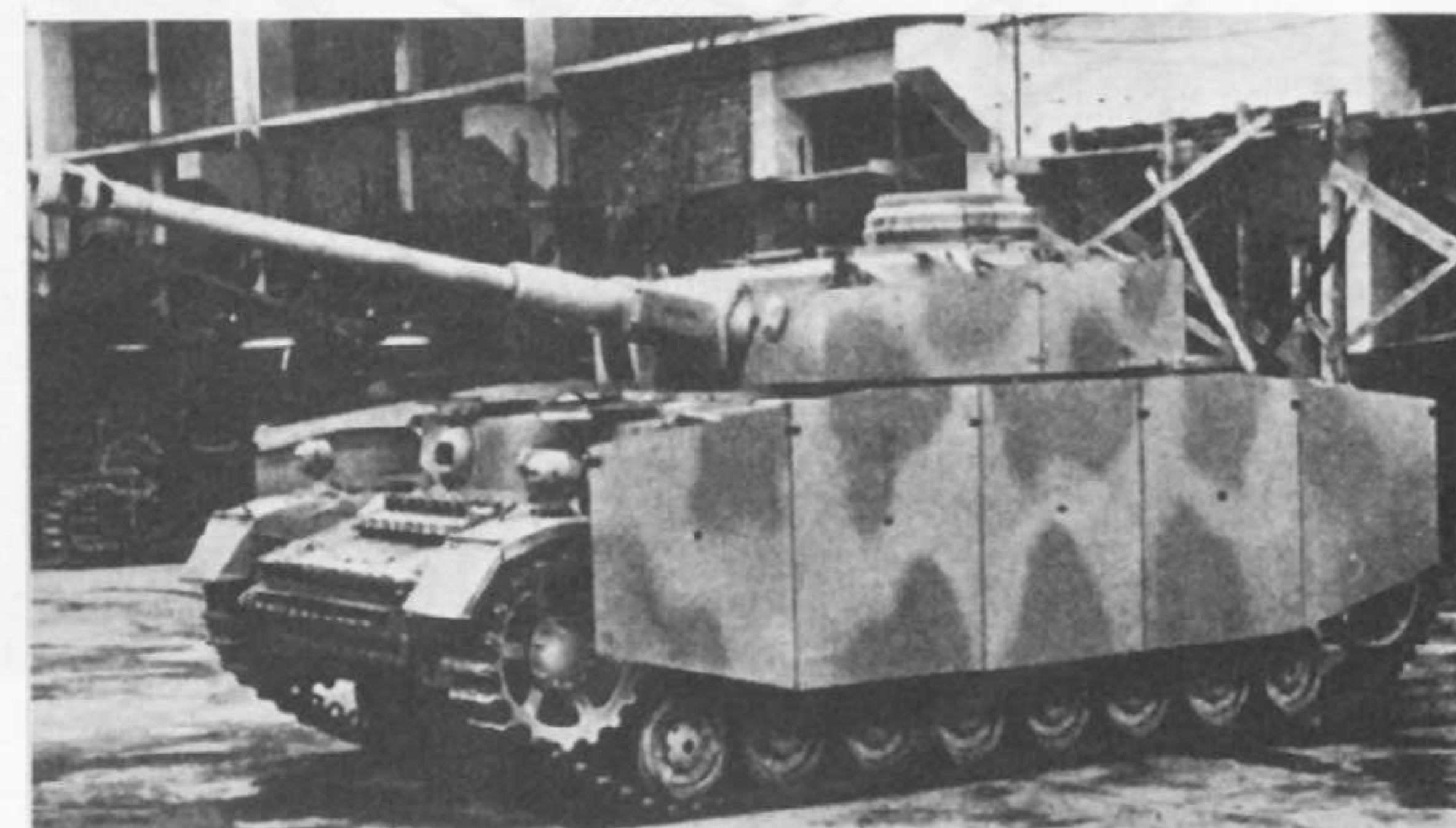


Ausf. G had a double-baffle muzzle brake on its KwK 40 L/43. In other respects it was similar in appearance to Ausf. F2. Its side armour, however, was 30 mm. compared with 20 mm. + 20 mm.

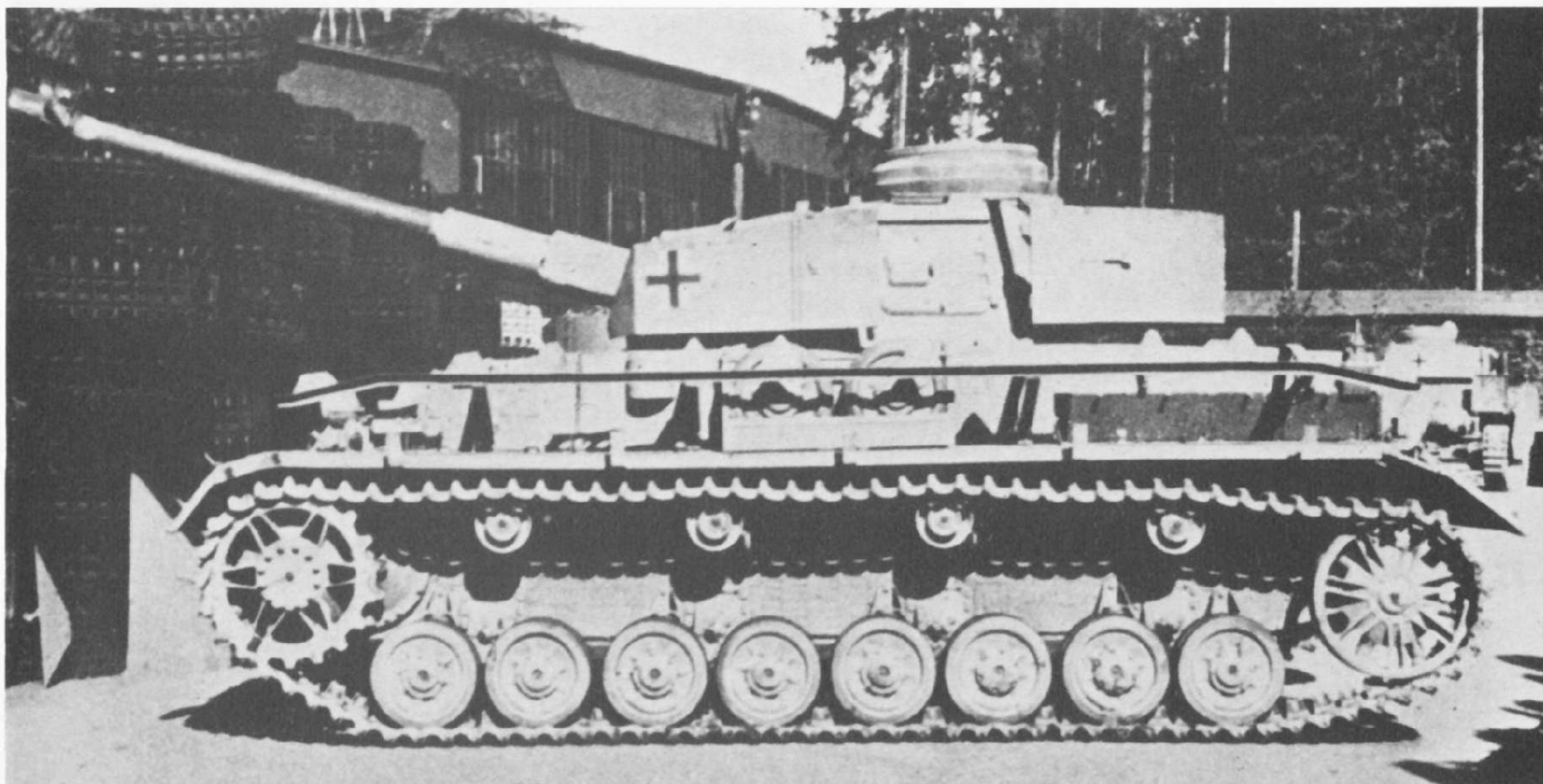


Three-quarter left front view of Ausf. G. Note track links added for extra protection on nose and glacis plates.

Red Army infantry attacking past a disabled Panzer IV Ausf. F1.



To give protection against Russian anti-tank rifles and hollow-charge projectiles side armour plates called Schürzen were attached to German AFVs. Those on the hull sides were removable, being hung loosely from rails, and were often lost in the turmoil of battle; those round the turret were a permanent fixture.



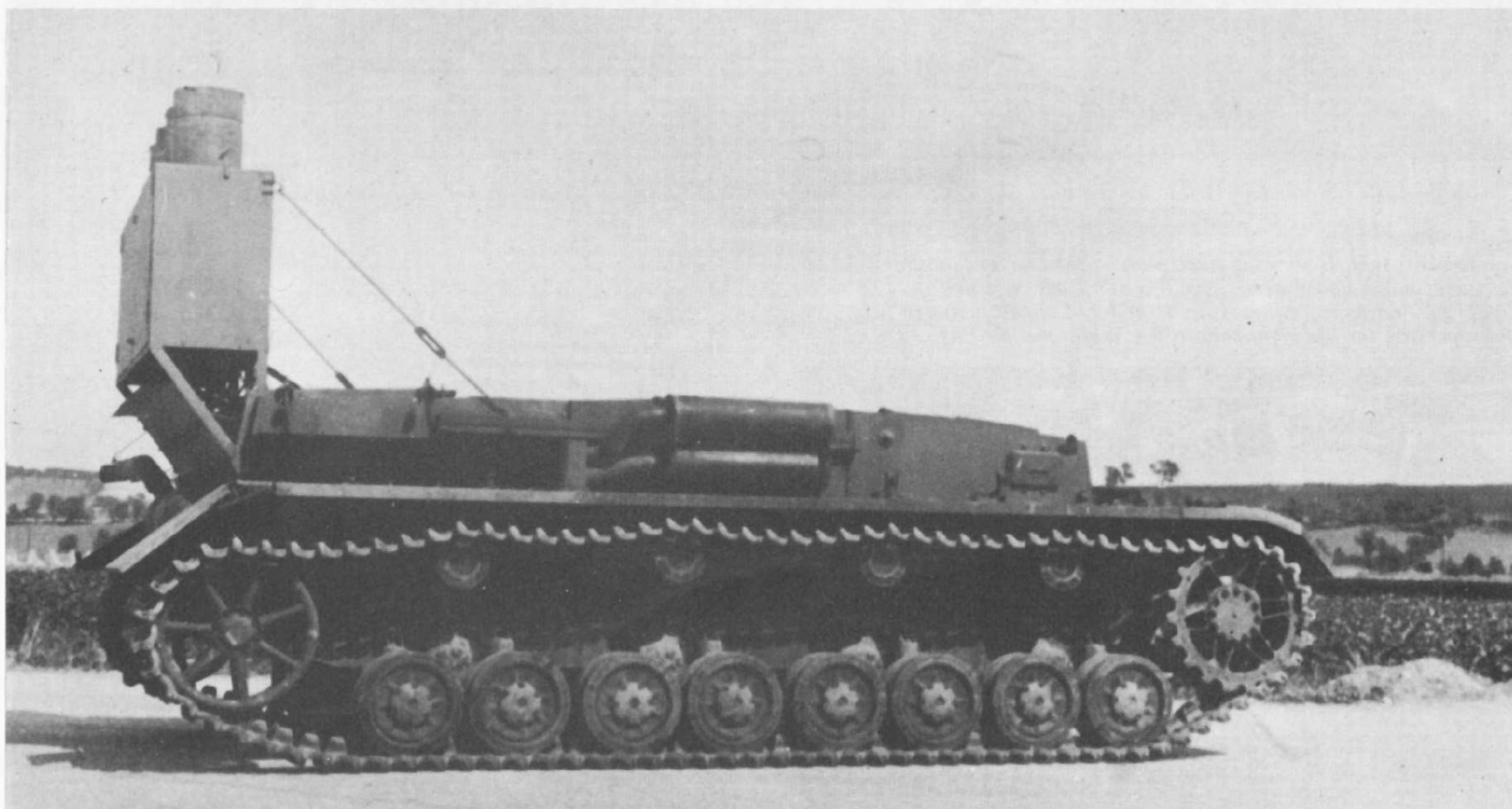
Ausf. H, the penultimate Panzer IV model, had the L/48 7.5 cm. gun as its main armament, as did Ausf. J, the last model. The cupola lid which had been divided in two in earlier models now became a circular one piece lid. Driving sprocket and idler wheel were changed. Front armour was increased to 80 mm. In Ausf. J the power traverse was replaced by a two-speed hand gear to provide room for increased fuel capacity. A new gearbox in later Ausf. H vehicles and in Ausf. J gave improved cross country performance. Mesh Schürzen instead of plates were sometimes used on Ausf. J vehicles. Weight of Ausf. J was 25 tons, slightly less than Ausf. H. These two models together accounted for about two-thirds of the total number of Panzer IVs produced. In appearance they were very similar. Note rail on side from which Schürzen were suspended.

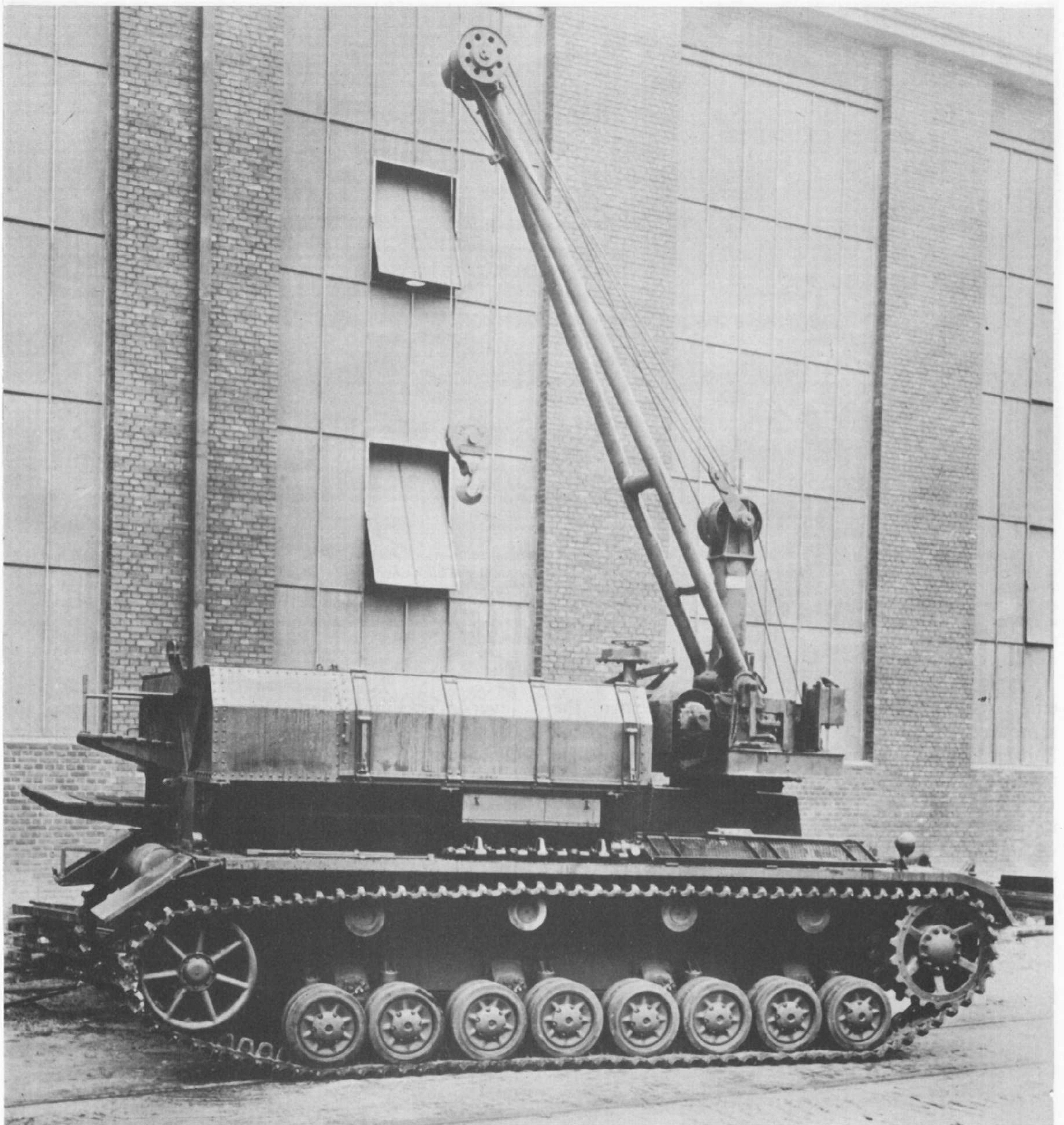
emphasised the fact that the basic equipment of the armoured divisions now consisted exclusively of Panzer IV. All efforts, therefore, would have to be made to ensure its continuous production throughout 1944 and 1945. His recommendation was relayed to industry in the form of an Order. Personal quarrels within the ranking hierarchy of the Ordnance Department led to constant attempts to disregard this directive and divert Panzer IV production from battle tanks to assault guns. These attempts reflected an

ever-increasing tendency to adjust the thinking of the armoured forces to defensive tactics in the closing stages of the war.

In 1943, tremendous losses during the campaigns around Bjelgorod, Kursk, and Orel depleted further the already overtaxed tank units. Some armoured divisions were reduced to a strength of 12 to 18 tanks. During this time, an allocation of ten new Panzer IV to a division was considered an outstanding event. In 1942, a tank battalion still consisted of light and

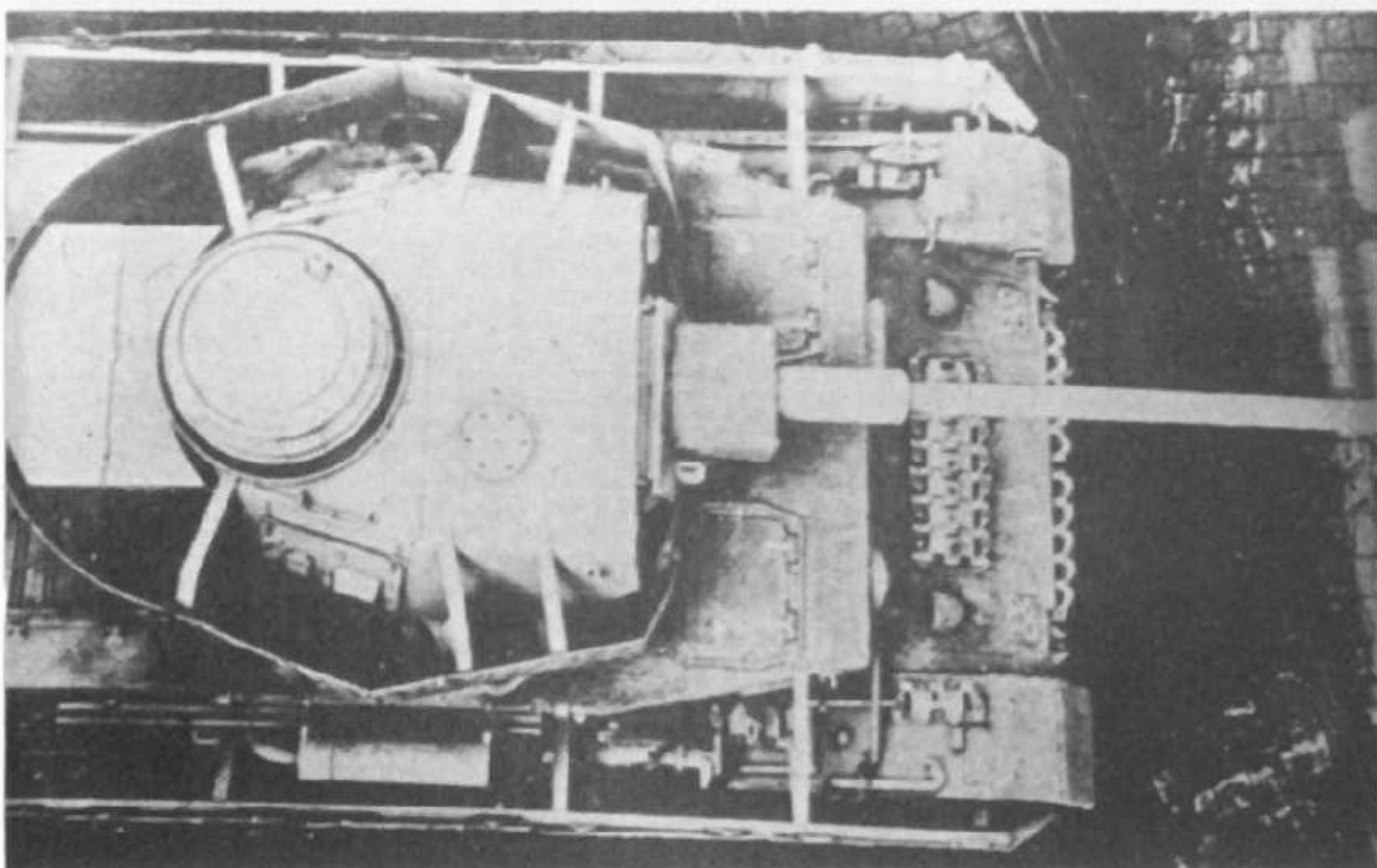
Fuel shortage in Germany made it necessary for tanks to be test-driven on bottled gas: a turretless Panzer IV.





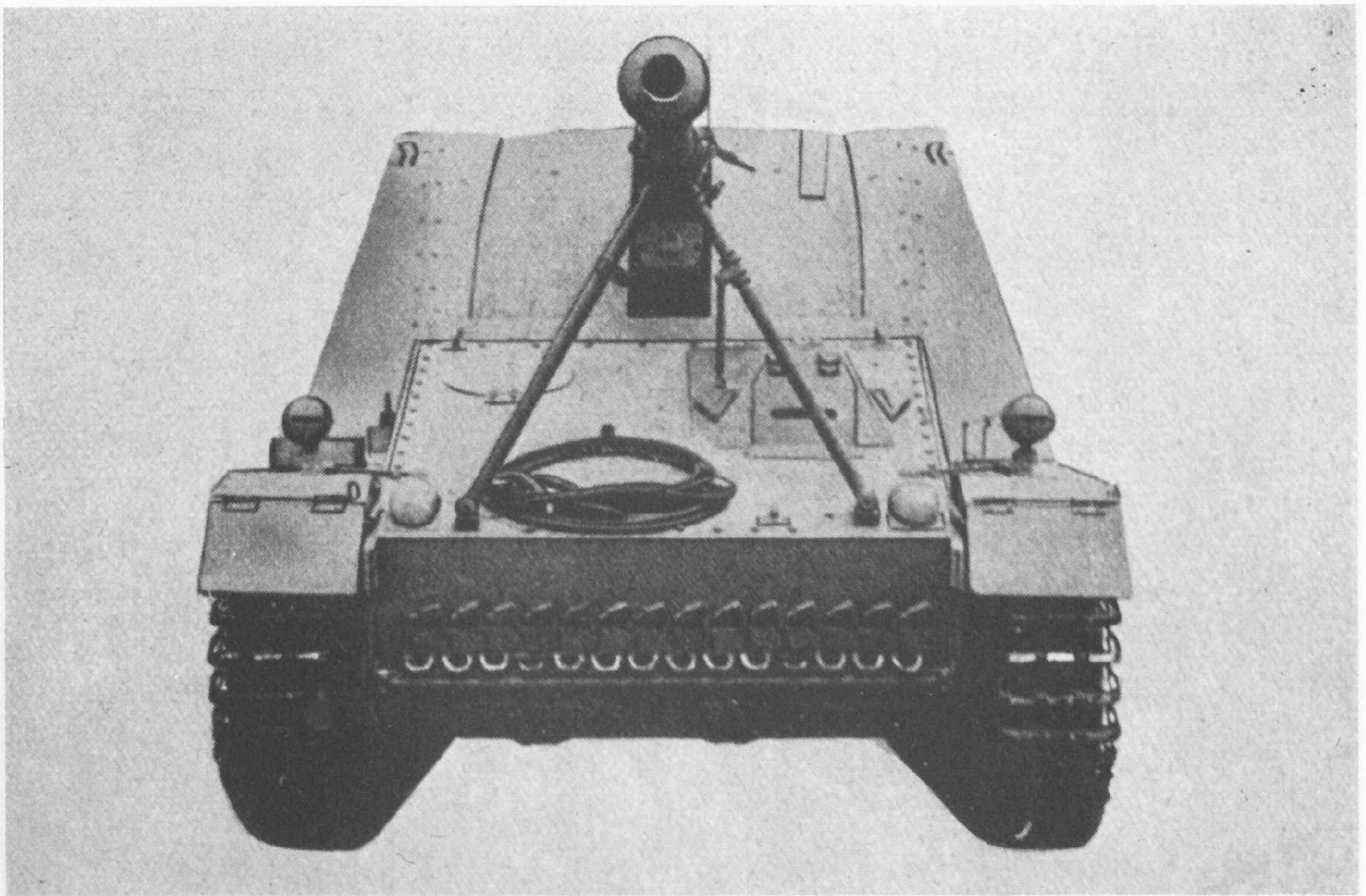
Chassis of Ausf. F were converted to ammunition carriers for super-heavy artillery; the crane had a load capacity of 3 tons.

Top view of Ausf. H showing fixed plates round turret (those protecting the turret hatch doors were hinged to allow access), and the one piece cupola lid that appeared on Ausf. H and J. Cylinder between Schürzen and superstructure on right hand side is additional air filter.

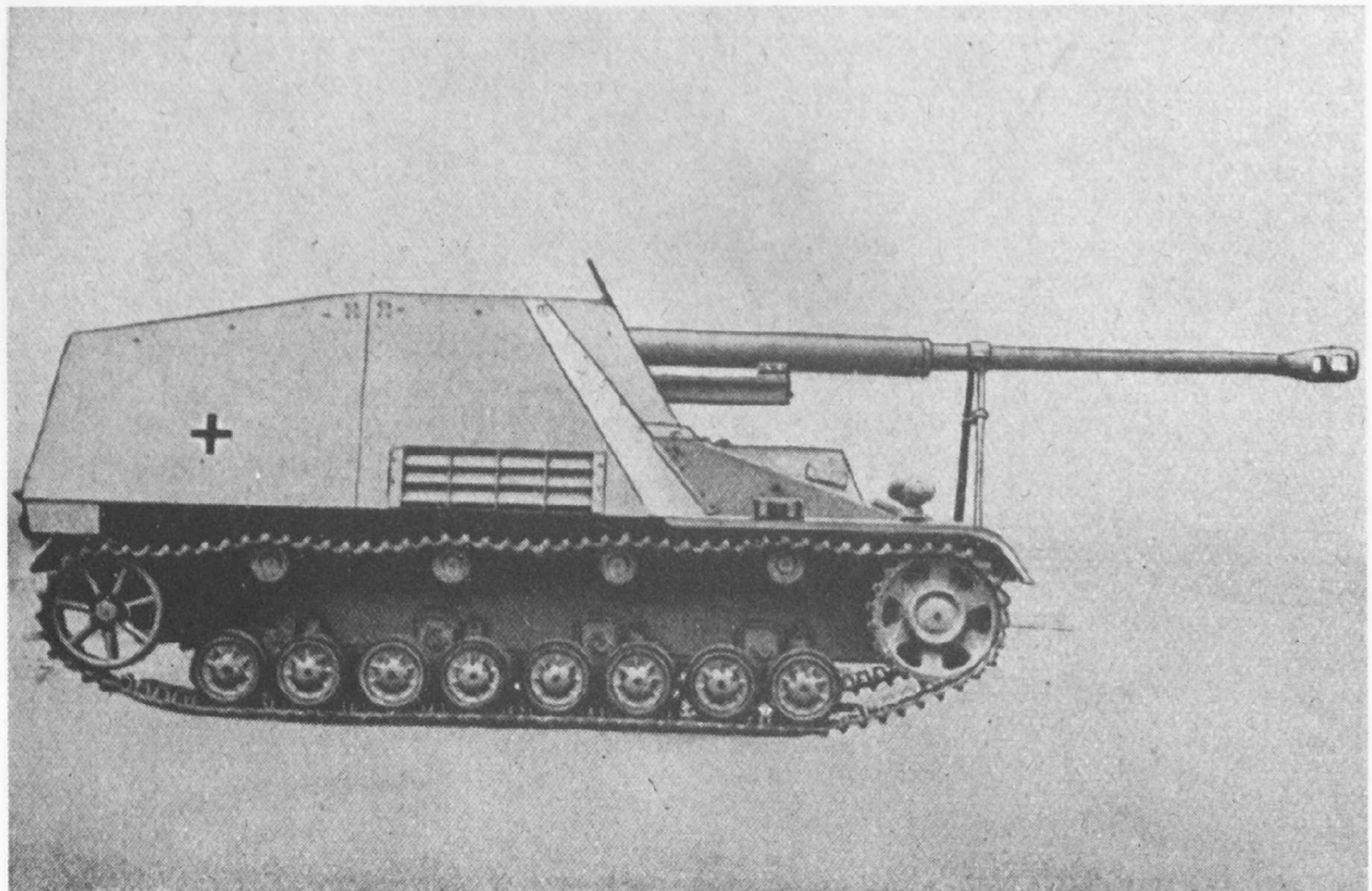


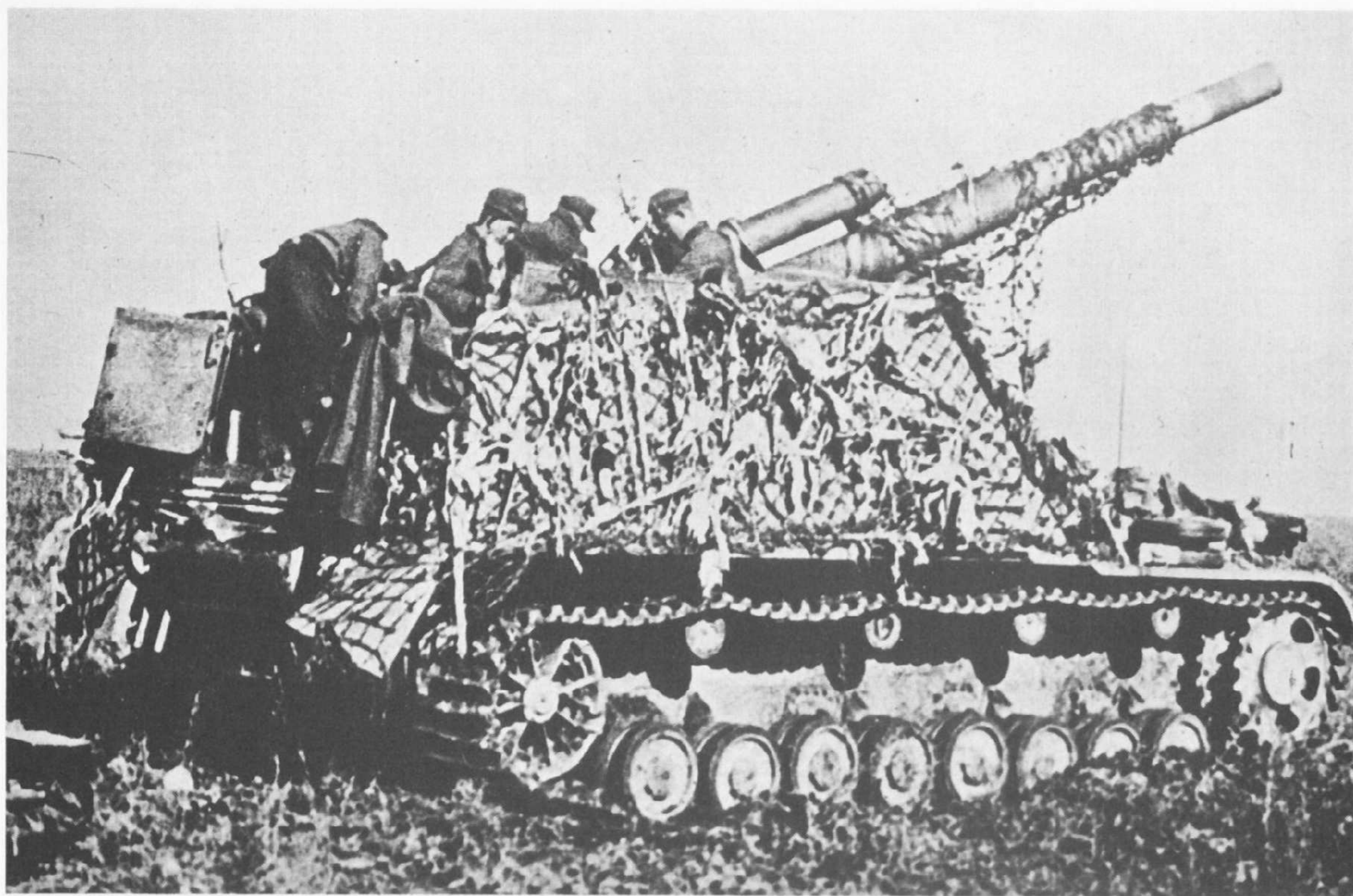
Nashorn in action, with nine "kill rings" on its 8.8 cm. gun barrel showing the number of tanks destroyed. Another name for it was Hornisse (Hornet).





To improve the mobility of the famous 8.8 cm. gun, chassis components of Panzer IV Ausf. F were used for the Nashorn (Rhinceros) tank destroyer, of which 473 were built.

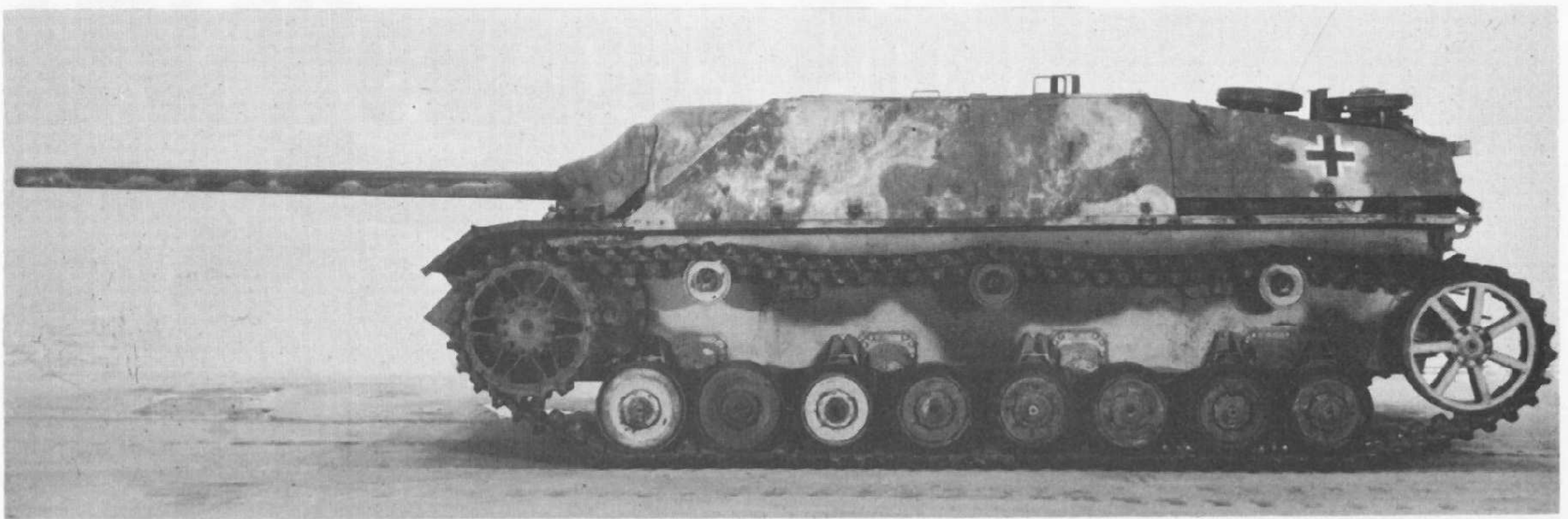




Firing a 95-7lb. shell to a maximum range of 14,550 yds. the 15 cm. s.FH 18/1 on the Hummel was in service until the end of the war. This Hummel is shown under camouflage in Russia.

Panzer IV Ausf. F chassis were used for fully enclosed Jagdpanzer IV tank destroyers which mounted a 7.5 cm. PaK 39 L/48. Late models of SdKfz 162, one of which is shown here with Zimmerit anti-magnetic mine paste, had no port on left hand side of front plate and no muzzle brake.





Jagdpanzer IV was sometimes called Guderian Ente (Guderian Duck). Late versions of SdKfz 162 mounted a 7.5 cm. StuK 42 (L/70) and were given the number SdKfz 162/I. At first these had four return rollers, later three, as shown here. Other modifications included first two bogie wheels steel-tired instead of rubber-tired because of heavy gun weight.

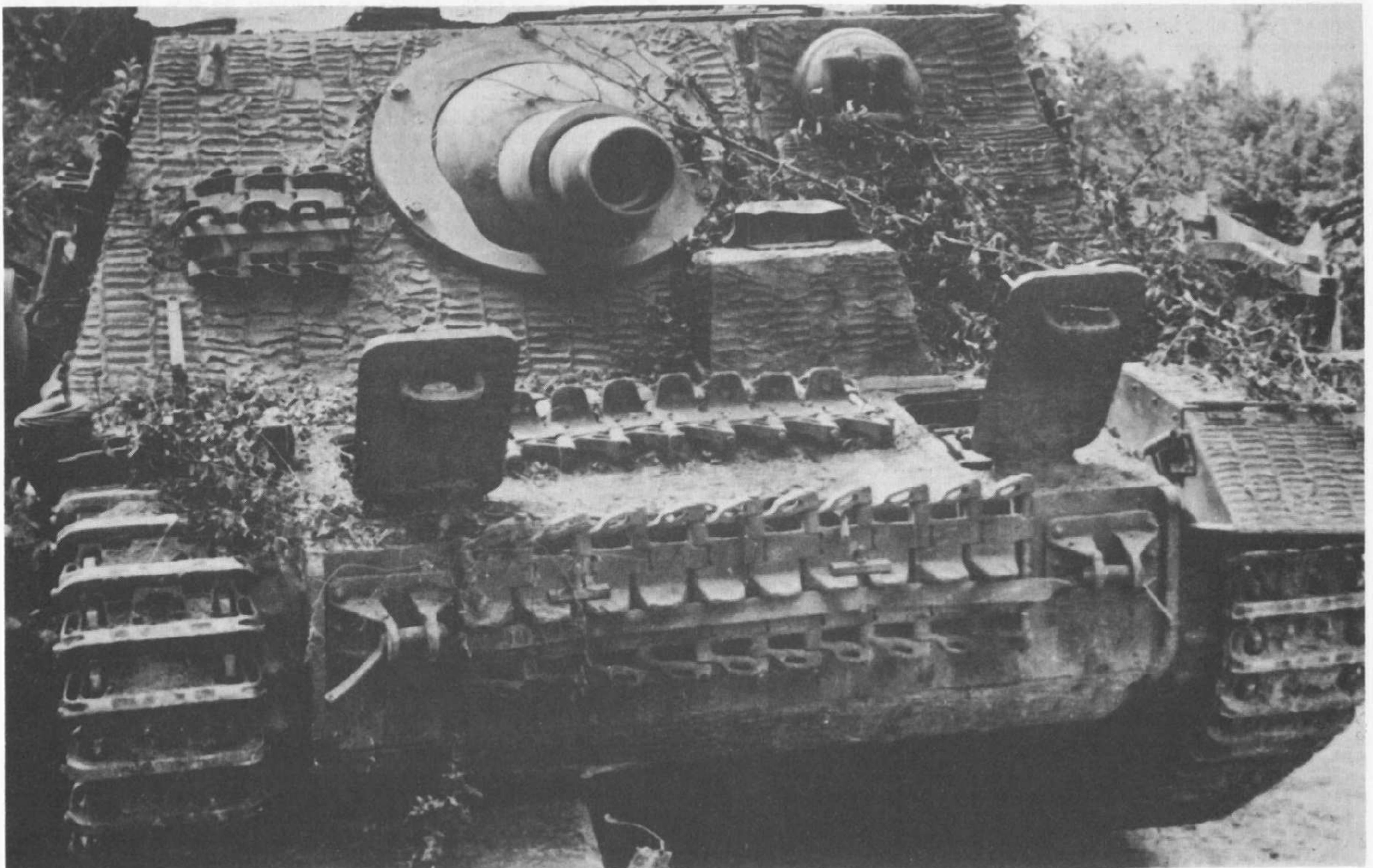
medium tank companies having the 5 cm. Panzer III as standard equipment. 1943 brought more and more of the up-gunned Panzer IV F2s to the forefront and by the end of that year, the Panzer III had almost disappeared. Only command and observation vehicles based on this chassis were retained in service into 1944.

Panzer IV equipped with the long-barrelled 7.5 cm. L/43 and L/48 guns had taken over since the defence against enemy tanks was now their main task. This eliminated the necessity for light and medium tank companies. The equipment of the German tank force thus became for the first time in its history uniform in both organisation and armament.

The climax in the history of Panzer IV came in

1944 when it was continuously thrown into the battle against Allied tank forces. In the East and, after the Normandy landings, also in the West and on impossible terrain in Italy, Panzer IV fought against overwhelming odds. A proposal by the General Staff to cancel its production by the beginning of 1943 and to rely completely upon the Tiger would have had disastrous consequences. An early collapse of the German Army would have been a foregone conclusion. Panzer IV proved to be the most reliable German armoured fighting vehicle. And after the installation of the improved armament in 1942, it was equal to most of its Allied counterparts.

Late production Sturmpanzer IV Brummbär (Grizzly Bear). Brummbärs were built on Panzer IV Ausf. F through J chassis. Early versions had Tiger fahrerblende 80 with visor for the driver, and short collar on gun. Later versions, on Ausf. H and J chassis, had periscopes for driver, longer collar on gun, and different roof layout. Finally, as shown here, a machine-gun in ball mount was added in front for self-defence. Panzer IV chassis were also used for anti-aircraft S.P.s and tanks (Panzer flak and Flakpanzer).





Built on a similar chassis to the Nashorn, the self-propelled 15 cm. howitzer Hummel (Bumble-bee) was a highly successful piece of Panzerartillerie.

(Picture sources for this Profile are Spielberg Collection, Chamberlain Collection, Bundesarchiv, Imperial War Museum, E.C.A., and H. Nowarra).

SPECIFICATION—PANZERKAMPFWAGEN IV AUSF. F2

General

Designation and Ordnance No.: PzKpfw IV (7.5 cm.), Ausführung F2 (Sd. Kfz. 161). Krupp type: 7/BW.
 Crew: 5—commander, gunner, loader, driver and radio operator.
 Battle weight: 23.2 tons.
 Dry weight: 22 tons.
 Power/weight ratio: 13.6 b.h.p./ton.
 Ground Pressure: 2.86 lb./sq. in.
 Bridge classification: A.

Dimensions

Length overall, gun front: 21 ft. 9 in.
 Hull length, overall: 17 ft. 9 in.
 Height: 8 ft. 9½ in.
 Width: 9 ft. 5½ in.
 Track centres: 8 ft. ½ in.
 Track width: 15¾ in.

Armament

Main armament: One 7.5 cm. Tank Gun 40 (KwK 40) L/43, centre turret, 360° traverse, +20° and -1.0° elevation.
 Auxiliary armament: Two 7.92 mm. 34 MG machine-guns, one coaxial right of main armament, one in gun mount in front hull plate for radio operator.

Fire Control

Graduated target position indicator ring inside of cupola for commander. Turret position indicator with two dials for gunner.

Ammunition

87 rounds for 7.5 mm. gun.
 3,192 rounds for 7.92 mm. machine-guns.
 6 hand grenades.
 24 signal cartridges.

Sighting and Vision

Commander: Five observation ports in cupola.
 Gunner: Sighting telescope TZF 5 f vorl. 13 (T).
 Radio operator: *Kugelblende* 50 with sighting periscope KzF 2 1,8 x 18°.
 Driver: *Fahrerblende* 50.

Communication

Two receivers, one transmitter—gunner, driver and commander connected with one intercommunication circuit.

Armour

Chromium-molybdenum homogeneous steel, welded. Brinell No. 10/3000.
 Hull: Front 50 mm. 10° Brinell 460–490; Glacis 25 mm. 73° Brinell 460–490; Sides 20 + 20 mm. 0° Brinell 500–520; Rear 20 mm. 12°; Roof 15 mm. 90°; Floor 10 mm. 90°.
 Turret: Mantlet 50 mm. curved Brinell 490–510; Front 50 mm. 11° Brinell 490–510; Sides 30 mm. 26°, Rear 30 mm. 16°; Roof 10 mm. 90°.

Engine

Main: Maybach "HL 120 TRM" V-12 cyl. petrol. 11,867 cc. 300 b.h.p. at 3,000 r.p.m.
 Auxiliary: DKW/Auto-Union "ZW 500" 2 cyl. inline. 497 cc. 10 b.h.p. at 2,800 r.p.m.
 Fuel capacity: 105 gallons in three tanks underneath fighting compartment.

Transmission

Zahnradfabrik Friedrichshafen "ZF SSG 76 Aphon", Synchronmesh, six forward and one reverse speeds. Krupp-Wilson clutch steering brakes.

Suspension

Running gear per side: One final drive wheel, one idler wheel. Four bogies with eight roadwheels (470/90–359) on quarter-elliptic springs. Four return rollers (250/65–134). Steel "skeleton" track, dry pin, type "Kgs 61/400/120", each one having 98 links. Pitch 4½ in.

Electrical System

Bosch generator, type GQL 12 volt, 300 watt. Four batteries 12 volt 105 Ah.

Performance

Max. road speed: 24.8 m.p.h.
 Gradient: 30°.
 Vertical: 2 ft.
 Trench: 7 ft.
 Wading: 3 ft. 3 in.
 Range: Road—130 miles; cross country—71 miles.

Special Features

Additional 5 mm. armour skirts attached to turret and sides as retrospective modification to all vehicles returning to base maintenance after March 1943.

AFV/Weapons Profiles

Edited by DUNCAN CROW

FORTHCOMING TITLES:

44 Ferret and Fox Scout and Reconnaissance Cars

Ferrets, developed from the Second World War experience with the Daimler scout cars, have become some of the world's most widely used armoured vehicles. Thus, they are in service not only with the British Army, but also with the armed forces of more than twenty different countries. The successful experience with them has, in turn, led to the even more effective Fox armoured car (or Combat Vehicle, Reconnaissance, Wheeled). This has aluminium armour and much more powerful armament but otherwise retains many of the characteristics of the Ferrets: BY R. M. OGORKIEWICZ.

45 Vickers 37-ton Main Battle Tank

Called by the Indian Army "Vijayanta" (Freedom) this Main Battle Tank (the latest in half a century of tank design and tank production) was built by Vickers to meet an Indian request for a tank to replace the Centurion as India's standard battle tank. It incorporates the Chieftain power pack, gearbox, steering unit and brakes, and is now also being built in India: BY R. M. OGORKIEWICZ.

46 Light Tanks M22 (Locust) and M24 (Chaffee)

In appearance rather like a miniature Sherman, the M22, called by the British the Locust, was designed as an airborne tank for the U.S. Army in World War II. But none were used in action by the Americans. The British, however, included some in the Rhine crossing operations of 6th Airborne Division in XVIII U.S. Airborne Corps. The M24 (Chaffee) though classified as a light tank was equivalent to the early British cruisers in weight and superior to them in armament. Though the Chaffee came in at the tail end of WWII, its days of glory were in Korea where it had to withstand the onslaught of North Korea's Russian T34/85s at the beginning of that war. It was still on active service in the Indo-Pakistan war in December 1971: BY COLONEL ROBERT J. ICKS. (M22 is new, M24 is a revised Armour in Profile.)

47 T-34

The development of the Russian T-34 tank and the discomfiture and surprise of the German Army in finding its panzers outclassed by the T-34/76 ("the best tank in any army up to 1943" in Guderian's judgment) are described BY J. M. BRERETON. In the second half of this *Profile* a description of the even more powerful T-34/85 with its increased firepower, and a critique of the T-34 in service, are given BY MAJOR MICHAEL NORMAN, Royal Tank Regiment. (T34/76 is a revised Armour in Profile, T-34/85 is new).

48 PanzerKampfwagen VI - Tiger I and II

49 Japanese Medium Tanks *by Lieut.-General Tomio Hara, Imperial Japanese Army, Retd.*

FUTURE TITLES WILL INCLUDE

Swiss Pz61 & 68 Tanks
The Abbot
M47 Patton
Centurion
Japanese Light Tanks
FV 432
German SPs
French Infantry Tanks Part 1
French Infantry Tanks Part 2
AMX 30

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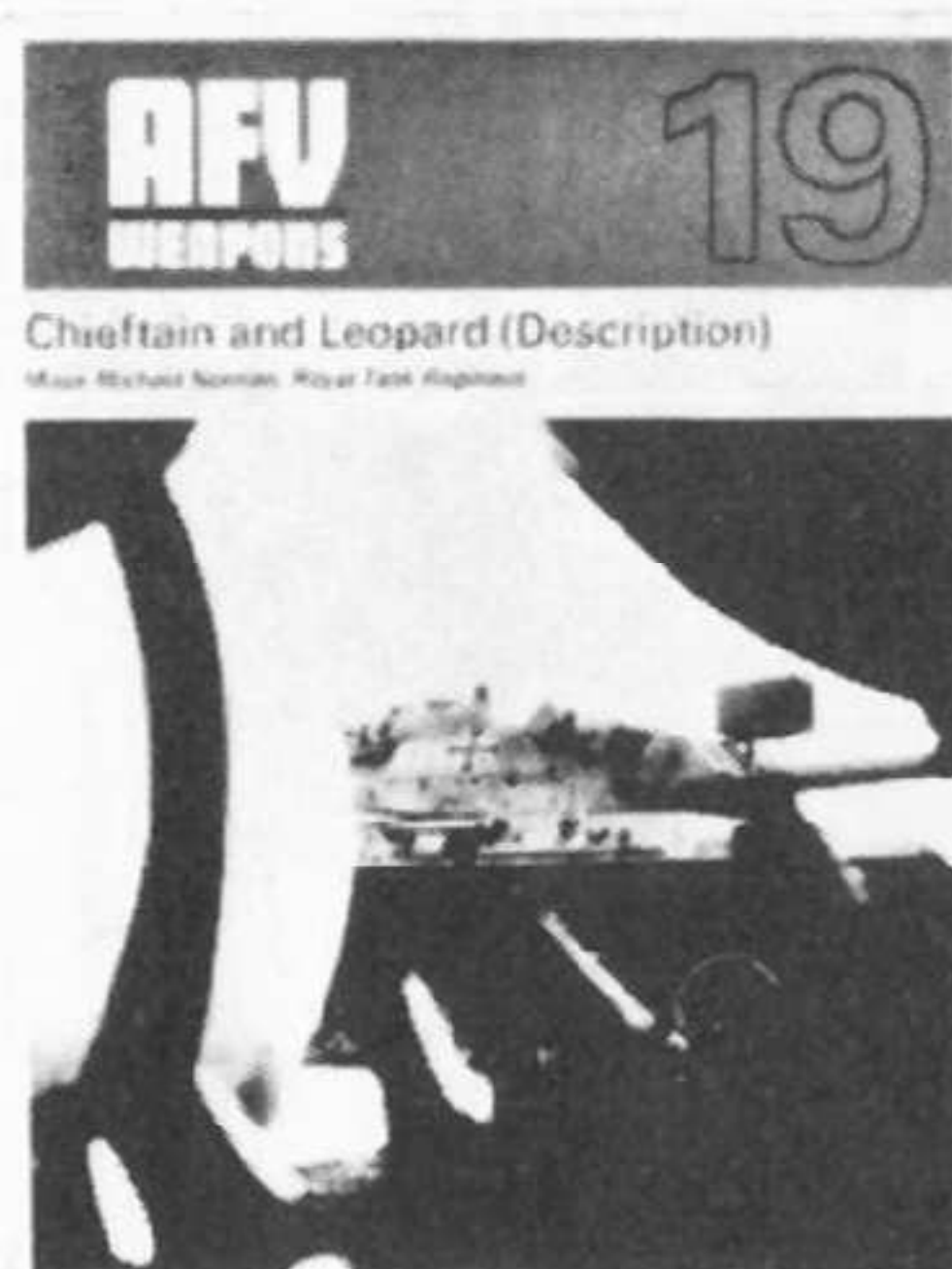
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