Allied-Axis

THE PHOTO JOURNAL OF THE SECOND WORLD WAR

M18 Hellcat Tank Destroyer

Schwere Panzerspähwagen 8-Rad Armored Cars

M32B1 Sherman Recovery Vehicle
Sherman Armored Recovery Vehicle (ARV) Mk I and Mk II
Panzerselbstfahrlafette V "Sturer Emil"
Panzerbefehlswagen IV
7.5 cm Gebrigsjäger 36 and 10cm Leichtgeschütz 40, 40/2

Issue 4

Contents

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ALLIED-AXIS is published by Ampersand Publishing Company, Inc.
235 N.E. 6th Avenue, Delray Beach, Florida 33483. Tel: (561) 266-9686
Fax: (561) 266-9786. E-mail: mmir35701@aol.com.

Agent in Hong Kong and the Far East: Falcon Supplies Co., Unit 203, Chit Lee Commercial Building, 30 Shaukiwan Road, Hong Kong Tel: 8862290 Fax: 8863001.

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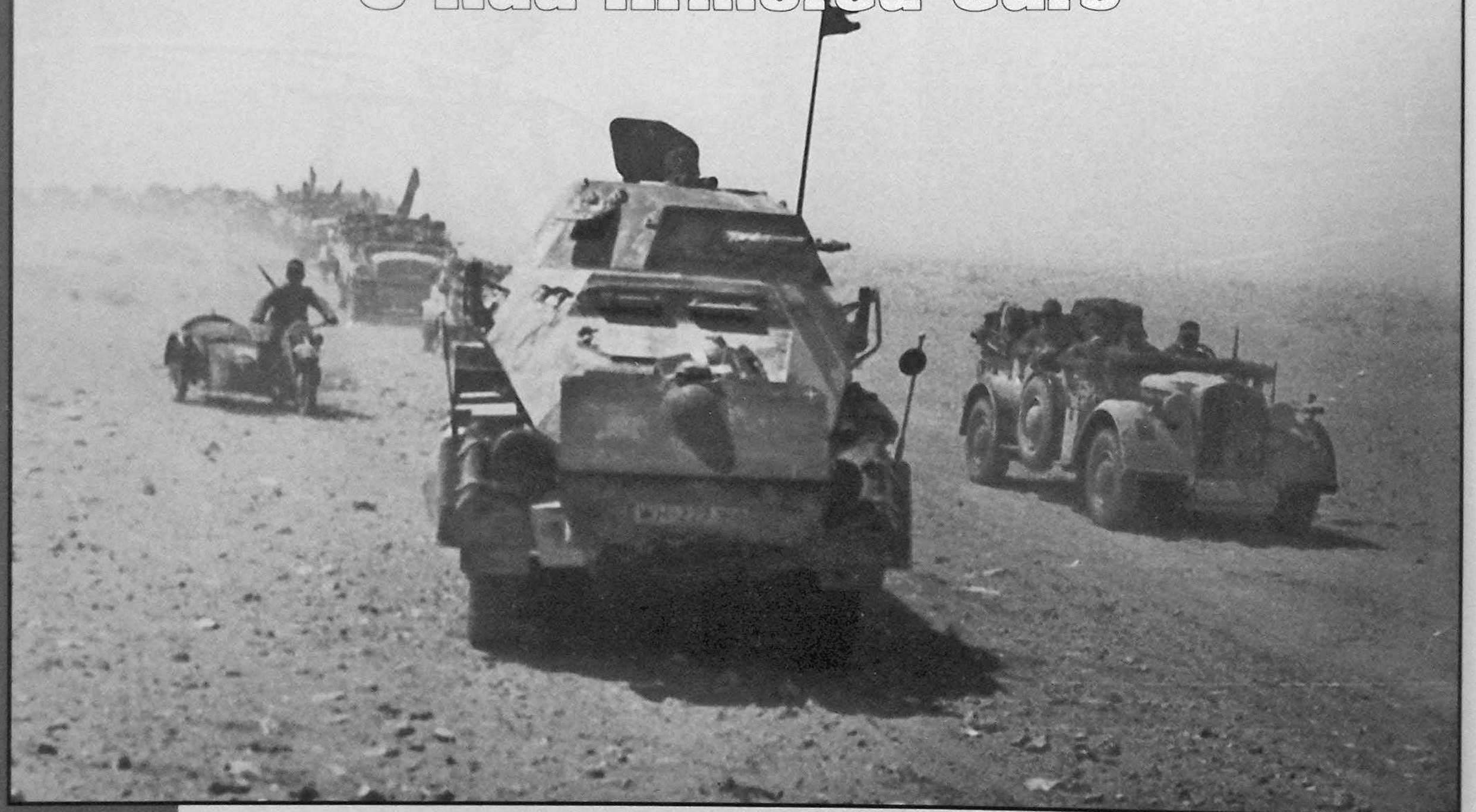
Schwere Panzerspähwagen
8-Rad Armored Cars



The heavy 8-wheeled Panzerspahwagen entered development in 1934, fully five years prior to the invasion of Poland. Two experimental vehicles were initially designated Versuchskraftfahrzeug 623 and 624. In 1937 the designations changed to Sd.Kfz. 233 and 234 and changed again in 1939 to Sd.Kfz. 231 and 232. A total of 607 of the 231 and 232 vehicles were produced between 1936 and 1943; the 231 ceased production in mid 1942 and the 232 ceased production in September 1943, making way for the new and improved Sd.Kfz. 234 family. The primary difference in the two vehicles was the massive frame antenna mounted on the 232. The 231 and 232 saw service on every front throughout World War 2. The 231 seen here is leading a convoy in North Africa. (BA)

The 231 series had a crew of four, a top speed of 85 km/hr and unique matching controls at both front and rear, so it could be driven at full speed (in either forward or reverse) from either end. The fully traversing turret featured a 7.92mm MG34 alongside a 2cm gun. Initially the KwK30 was installed, replaced by the KwK38 in July 1942. This increased the cyclic rate of fire from 280 rounds per minute to 450. Either could be used against ground troops at up to 1200 meters and against armored targets at 600-1000 meters. Clad in tropical garb, these five Germans take a peek inside one of the side engine access panels. The 231 shows the effects of dust and mud caked onto the gray paint scheme. The fighting compartment doors on the right are blocked by a footlocker lashed inside the break in the fender. (BA)

Until February 1943 the Panzerspähwagens were issued with bulletproof, self-sealing inner tubes for the eight tires. Each wheel had its own axle with leaf spring and rubber bump stop suspension and helped bear the weight of the 8.3 metric tons above. The 231 was designed to resist penetration at 30 meters by under 8mm caliber weapons and the sides and engine rear were protected by 10mm armor. The remaining forward, side and rear plates were 8mm thick, with 5.5mm armor used for the roofs and rear deck. A late production vehicle is seen here; the turn signals have been moved to the fenders and the guard rails eliminated. The 231 sports smoke dischargers added as of early 1942. Note the additional mesh guards over the covered headlights. The more heavily armed 233 follows along. (BA)

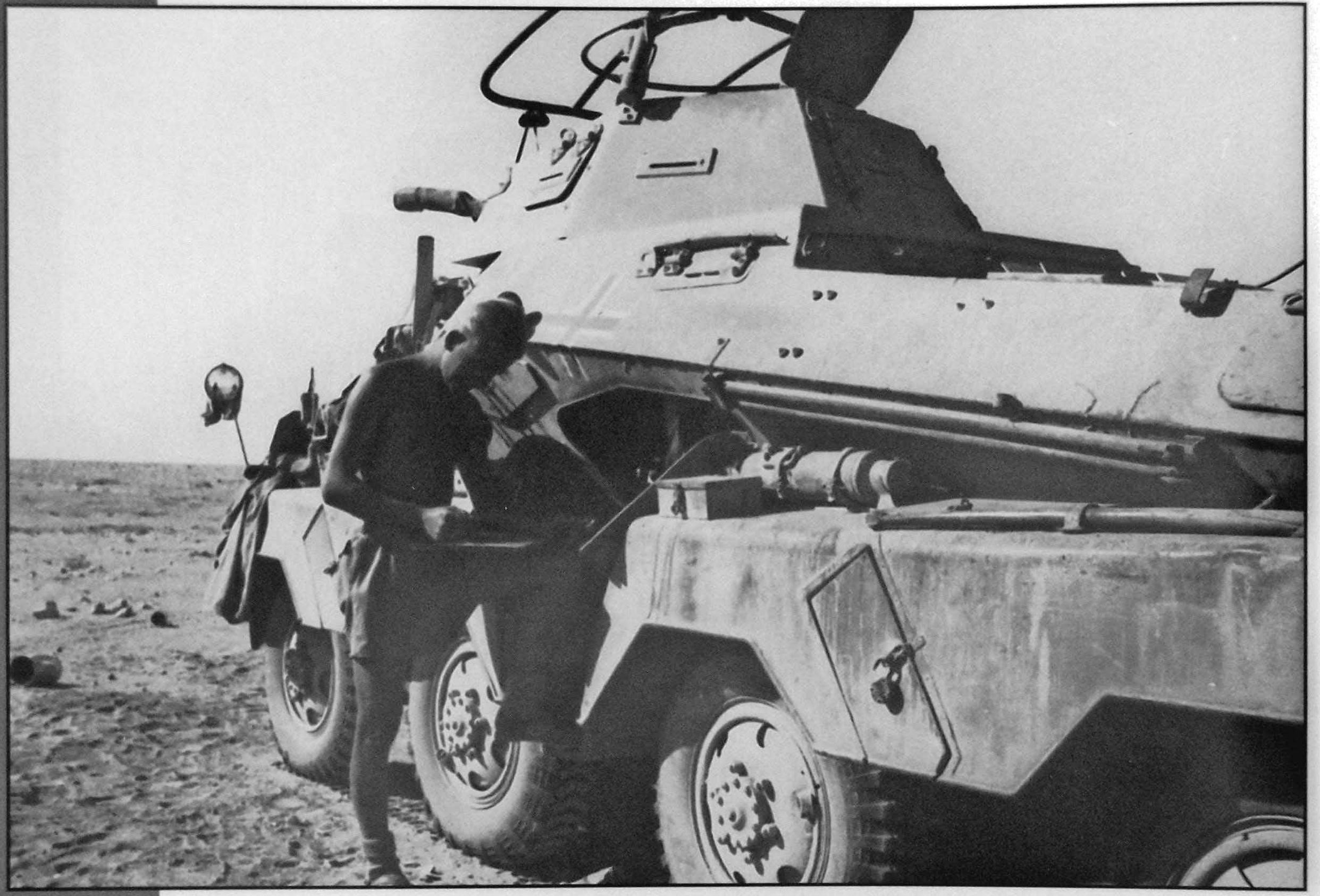
Another late production characteristic is the lack of bullet splash guards over the visors. These guards may have disappeared as early as 1939, when simpler visors were developed. The pipe bumper on the front was introduced in July 1942. This vehicle also lacks the protective side rails for the now relocated turn signals, another 1942 modification. On the left side of the turret is seen the antenna mount (minus the antenna) for the turret radio installed as of 1941. This was added strictly for interunit communications, as the radio only had an operational distance of one kilometer when the vehicle was underway. As evidenced by the insignia on the crewman's Schirmütze, this is a Wehrmacht vehicle. It also presents a fine study in stowage for this vehicle. Note the gear lashed over the left smoke discharger. (BA)

Here's an interesting mix of uniforms found on a 231 in North Africa. The uppermost soldier wears the distinctive tropical panzer uniform, with twin death's head insignia on the lapels. The other crewman with his foot on the fender wears his cap backwards and is quite possibly the driver of the vehicle. The seated man wears a Fallschirmjäger helmet, while his companions have the standard steel pattern helmet. Note the pith helmet hanging on the side of the vehicle and the two helmets on the turret, which still bear markings on the sides. Evident in this photo is the turn signal indicator mounted on the fender just rearward of the rolled tarps. Also note the two bullet holes below which fully penetrated the thin metal of the fender. (BA)

Those bullet holes and helmets tell us this is the same vehicle. Clearer here is the thin material tied over the 2cm and MG barrels to block dust. Like many tropical vehicles, the additional armored nose shield is missing here. This Zusatzfrontplatte was designed in July 1940 and provided an additional 10mm of armor to the front of the vehicle. However, crews often found that it overtaxed the forward suspension, particularly in the tropical heat. Therefore not all vehicles were thus retrofitted. The Zusatzfrontplatte was eliminated from new vehicles in May 1942 when the front armor increased to 30mm. Note the difference in the headlight covers here, with the right light missing the protective plate. This photo provides excellent reference for the plate joints on the front of the vehicle, all of which are cleanly welded. (BA)

Our third look at this vehicle reveals that the riders are all Fallschirmjäger; note the Luftwaffe eagle on the right breast. Visible here is the protective armored cowl over the rear engine louvers, another feature not seen on all tropical vehicles. The short tailpipe visible on the right muffler identifies this vehicle as mid 1942 manufacture. These pipes were extended later that year, curving upward to near the top of the muffler itself. The 231 carried 180 rounds of 2cm ammunition, in ten-round magazines. The MG34 was initially outfitted with 1125 rounds in 75-round magazines, increased to 2100 rounds, but these were switched to 150-round sacks of belt-fed ammo in 1939. In July 1942 the armor on the turret sides was increased to 10mm. Note the pattern of the heat shields over the mufflers. (BA)

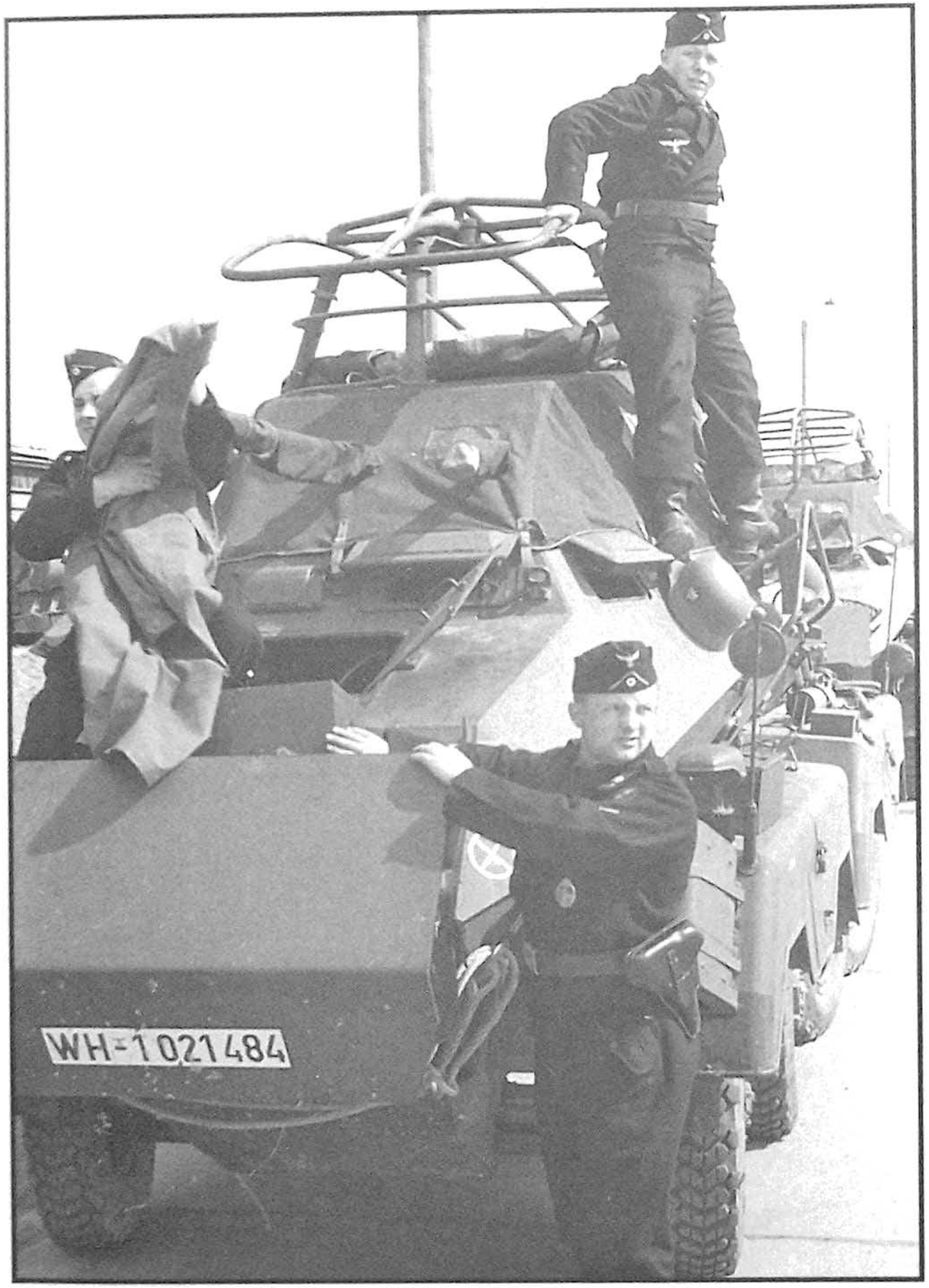
In its role as a heavy cross-country armored car, the 231 was rarely deployed alongside similar vehicles. Instead, its role was to support and protect smaller four-wheeled armored cars and halftracks. The license plate of this 231 puts it a mere four slots away from the vehicle shown in the previous photos, indicating they arrived together in North Africa. Here is another instance of infantry clambering aboard for a ride. The sharp looking vehicle commander wears the Iron Cross 1st Class and tank engagement badge on his tunic. And what appears to be a 231 is actually a 232 radio car. In July 1942 the large frame antenna was eliminated and a Sternantenne (star aerial, or crow's foot) was mounted in an armored box on the right side. (BA)



Our first look at the Sd.Kfz. 232 reveals the distinctive frame antenna. Three posts on the turret formed a tripod beneath the front of the antenna, allowing the turret to turn beneath. The two large support posts in the rear are just out of view in this photo. The 232s with the frame antennae were equipped with Fu 11 SE 100 radios. The additional space required for radios and receivers inside reduced the MG34 load to 1050, as opposed to 2,100 rounds in the 231. This vehicle still sports the bullet splash guards over the visors as well as turn signals and guard rails on the sides of the hull. Note the rag hanging from the rear view mirror, a practical measure in the desert. (BA)

Followed by a Sd.Kfz. 222 four-wheeled armored car, this 232 exhibits early characteristics. The driver's hatch is the earlier two-door variety, compared to the previously seen vehicles, most of which sport the single door introduced in 1942. Bullet splash guards are all in place and the more heavily hinged visors are evident. Twin visors appear on the front, later reduced to one larger visor in front of the driver. This perspective offers an excellent look at the Zusatzfrontplatte; the crew has used the space behind for additional stowage. The bracketed cans on the front fenders were replaced with the smoke dischargers in late 1941/early 1942. The heavier barrel indicates that the 2cm in the turret is the earlier KwK30 type. (BA)

These early 232s appear to be factory fresh as they are deployed by railcar. With no chocks or tie downs in place, they have either just arrived or are just leaving. They bear the distinctive markings of Panzer Division Grossdeutschland along with tactical signs attaching them to motorcycle units. The low angle provides insight as to the lower mounts for the auxiliary armored Zusatzfrontplatte (also known as Zusatzpanzer or Pakschütz). The headlights and weapons all wear canvas covers. The 231 series vehicles featured two stowage bins on each side, built into the fenders between the wheels. All of these stowage doors opened forward. Note how the wheels of the front vehicle are turned and the visual effect of the multi-layered hubs. (BA)



Left: "WH 1021484" is one digit away from the 232 on the preceding page. These well-fed Grossdeutschland tankers wear the inverted "V" soutache braiding on their Feldmütze; this particular adornment was discontinued in mid-1942, so this photo was probably taken earlier that year. (BA)

Right: Another Grossdeutschland 232 appears with the divisional insignia outlined in black. This later vehicle has no bullet splash guards. Note the wire leading up to the frame antenna and the distinct pattern of the heat shield over the left muffler. Of particular interest is the armored cowl over the engine louvers. (BA)

As the war progressed, armored reconnaissance units requested an upgunned version of the heavy armored car. The Sd.Kfz. 233 was created from a 231 chassis, armed with the 7.5cm StuK37 L/24 and manned by a crew of three. The 231 design was altered to include removal of the turret, opening the superstructure roof and cutting away the right side of the superstructure front to accommodate the weapon. A total of 109 units were produced between October 1942 and October 1943, serving on all fronts until the war's end. This photograph demonstrates the distinctive silhouette of the 233, showing a later version with raised sides around the fighting compartment. Although the Zusatzfrontplatte and side guardrails were eliminated in 1942–before 233 production began –this vehicle still bears those features. (BA)

Like its predecessors, these vehicles were manufactured by Schichau and were powered by a Bussing-Nag L8V engine. Between 32 and 55 HE rounds were carried for the main gun, along with an MG34 or 42 and 1,500 rounds of ammunition. Preparing for deployment, this crew of a 233 spends time cleaning the vehicle's MG34 and MP40. Both vehicles display the guard rails. Interesting features of the rear 233 include the unusual license plate, full foul weather tarp over the fighting compartment and shielded headlights reinforced with mesh. Also note that the nose of the 233 bears the split driver's hatch with no splash guard. Though the forward vehicle might be mistaken for a 231, it is identifiable as a 233 by the bow arcing over the fighting compartment, to support the tarp. (BA)

Moving through Russian mud, this battered 233 bears the tactical marking of an armored car company, a marking which changed the following year; thus this photograph presents one of the first production vehicles. The casual posture of the crew indicates movement through a secured area, though enemy fire or an accident has already claimed the left headlight. The pickaxe is missing from the nose and the axe has been erroneously placed in the upper brackets. Like most 233s in this photo series, it does not bear the raised sides around the fighting compartment. The MG34 is in position for antiaircraft defense. Of general interest is the size of the license plate compared to its frame. (BA)

This vehicle also sports its MG in the antiaircraft posture, though this 233 is armed with the heavier MG42. The Panzerspähwagen is festooned with branches to break up its unusual profile. Note the cap over the barrel of the 7.5cm StuK37. The foul weather tarp for the fighting compartment is bunched over the right superstructure wall. The distance indicator pole mounted on the right fender is considerably taller than those found on other armored cars, halftracks and trucks; the driver had to be able to see it across the nose of the vehicle. The 233 is painted overall in dark yellow and the determined-looking crew appears ready for combat. (BA)

Or do they? Does this photo look familiar? Look at the three helmets on the side and the distinctive wear marks on the water can. Note the position of the tarp. The license plate is not distinguishable, but these guys certainly look familiar. Do they seem a bit posed? The fellow with the pipe looks awfully serious compared to his compatriots. Note the trellis on the building in the background, covered with ivy. "Okay boys, change hats; this one's for the cover of 'Signal'!" A photographer had fun with this crew and evidently two of the gang couldn't keep from grinning. (BA)

Another Wehrmacht 233 heads into the fray. This angle demonstrates the position of the gunner's sight on the left side of the 7.5cm. This vehicle also sports a dust cap on the main gun. There are two unusual brackets affixed to the nose of the vehicle, perhaps for securing stowage or for carrying small logs in the event the vehicle became bogged down. In this photo the peculiar hatches are seen above the fender break, common to all vehicles in this family. A small lamp and polished plate could be pushed through this hatch and used for both illumination and signaling. Note once again the helmets on the left side, still bearing the national insignia decals. Also of interest is the missing smoke canister on the front left fender, although the head of the unit remains in place. (BA)

The fourth and final vehicle in the 231 family was the Sd.Kfz. 263. Developed alongside the 231 and 232, a total of 240 of these vehicles were produced from April 1938 to April 1943. The 263 strongly resembled the 232, except that in place of the turret the superstructure walls were extended upward to form an upward extension of the crew compartment. The 263 was armed only with a single MG34 and 1,050 rounds of ammunition and was not intended for use in a combat capacity. Rather, it was a mobile communications station, relaying messages from the forward units to the rear echelons. Additionally, a mast antenna supplemented the frame antenna, cranking skyward a full nine meters. This antenna was mounted on the deck behind the elevated superstructure and later versions substituted a star aerial. (BA)

The Sd.Kfz. 263 was equipped with a powerful 1 Satz Funkgerat für (m) Pz Funktrupp b radio capable of powerful transmissions. The frame antenna was identical to that found on the 232, but the three forward supports were replaced with only two. The soldier sitting on the front edge of the antenna demonstrates the strength of this device. This vehicle exhibits several "standard" Afrika Korps traits: aerial identification flag on the antenna, dust and mud covering the dark gray paint and water cans lashed to the engine deck. The DAK logo is just visible over the head of the fellow with his arms crossed. These Afrika Korps troops seem bemused by the appearance of a pair of Italian Bersaglieri dispatch riders. (BA)

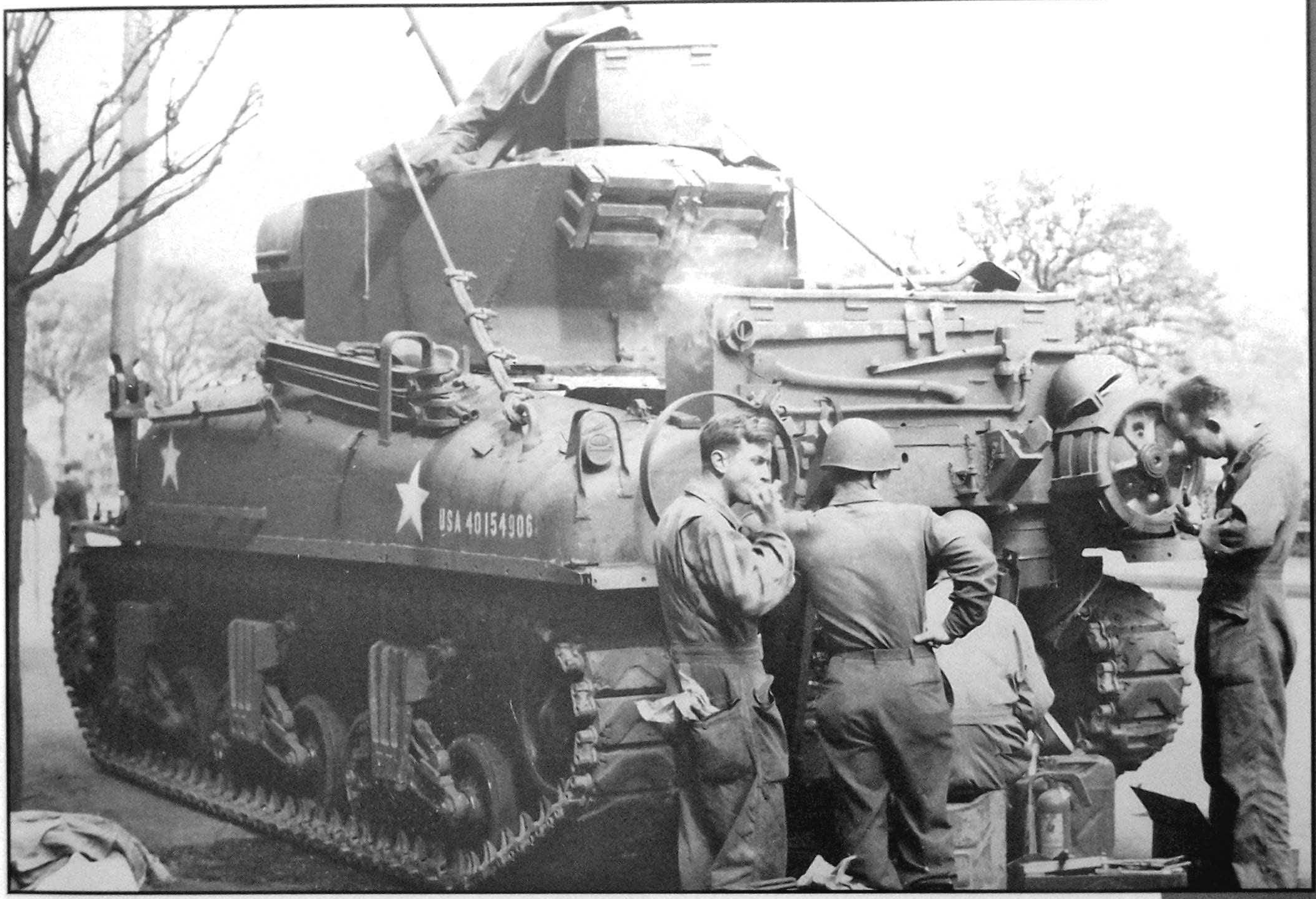
The 263 weighed slightly less than its brethren and was capable of 100 km/hr with a range of 300 km. This 263 is doubtlessly assigned to someone important, as it has been equipped with yet another antenna on its right side. The telescoping antenna is seen here in its retracted position with a canvas cover over the top. This might well be the edge of a field headquarters in North Afrika, with a dispatch team standing by. Note the water cans on the 263, particularly the unusual rack on the right front fender. This vehicle carries three spare tires and a British helmet can be seen hanging from the right rear distance indicator pole. With the extra communications equipment added, the 263 boasted a crew of five, more than the 231, 232, or 233. (BA)

M32B1 Recovery Vehicle

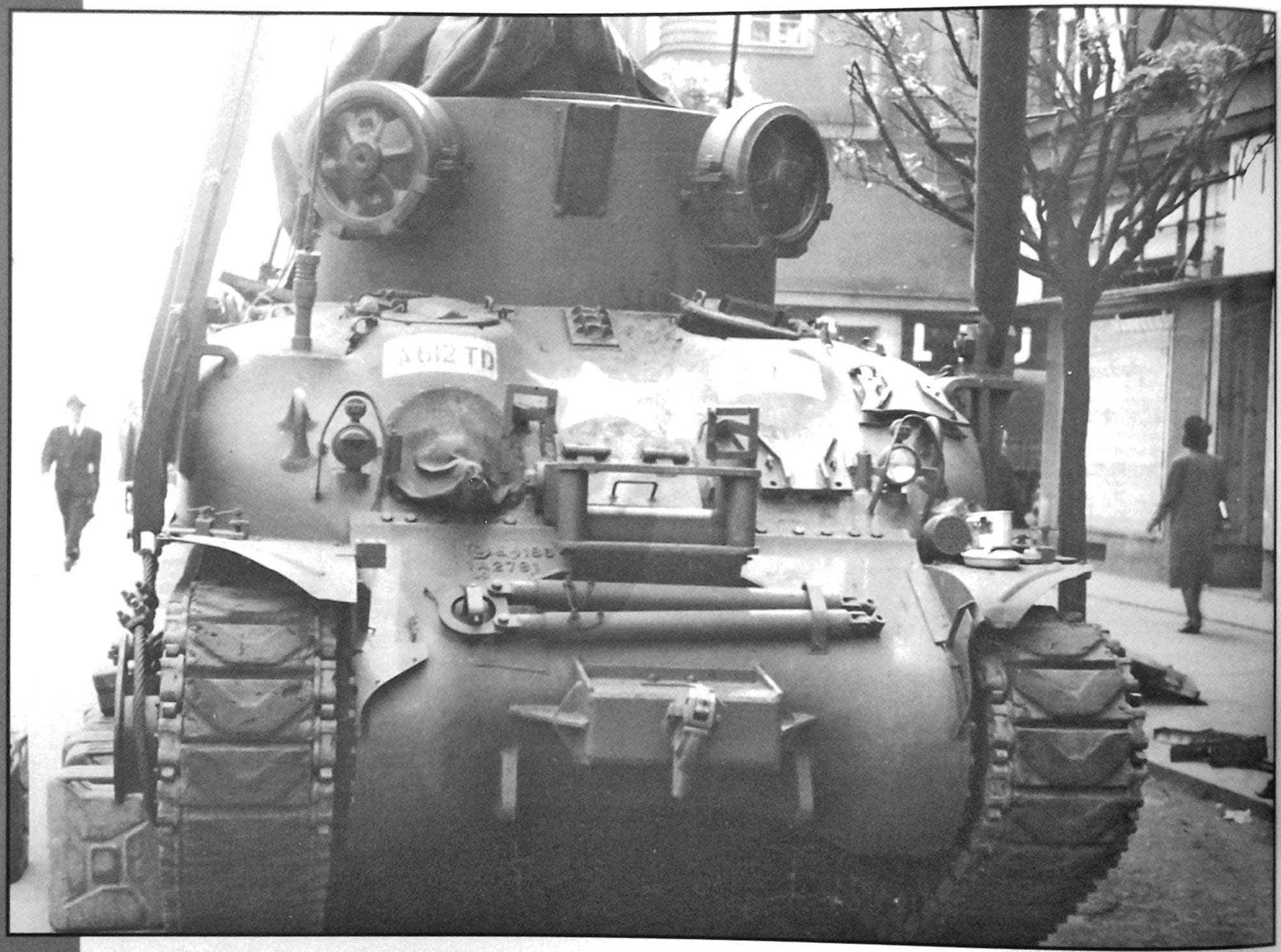
The following photos were taken in early May of 1945. The primary M32B1 shown here is assigned to Co. A, 612th Tank Destroyer Battalion, in support of the 1st and 4th Armored Divisions, 3rd Army, 5th Corps, as it advanced through Czechoslovakia. These shots were taken on the streets of Dobrany on or about VE Day. It is relevant to note that following the Communist coup in 1948, possession of Allied forces photos was considered treason. As a result, many Czechs suffered severe punishment under the Communist regime. These photos only recently came to light and all are from the Czech National Archive.

The M32B1 was the most widely produced variant of the M32 family, with 1,055 units manufactured between December 1943 and May 1945. An "A" frame boom crane capable of lifting 30,000 pounds was used for heavy recovery operations and a 60,000-pound Gar Wood winch was mounted below the floor plates directly beneath the fixed turret. The M32 had three outlets for the winch cable: through a small portal in the turret rear, directly through a drag line hatch in the nose, or through a port at the front of the turret. It was through these first and third positions that the winch and crane were used together. With the crane secured rearward, the M32 functioned as a wrecker. The fixed turret sported an open ring mount for a .50 cal and an 81mm mortar for firing smoke could be mounted on the front of the vehicle.

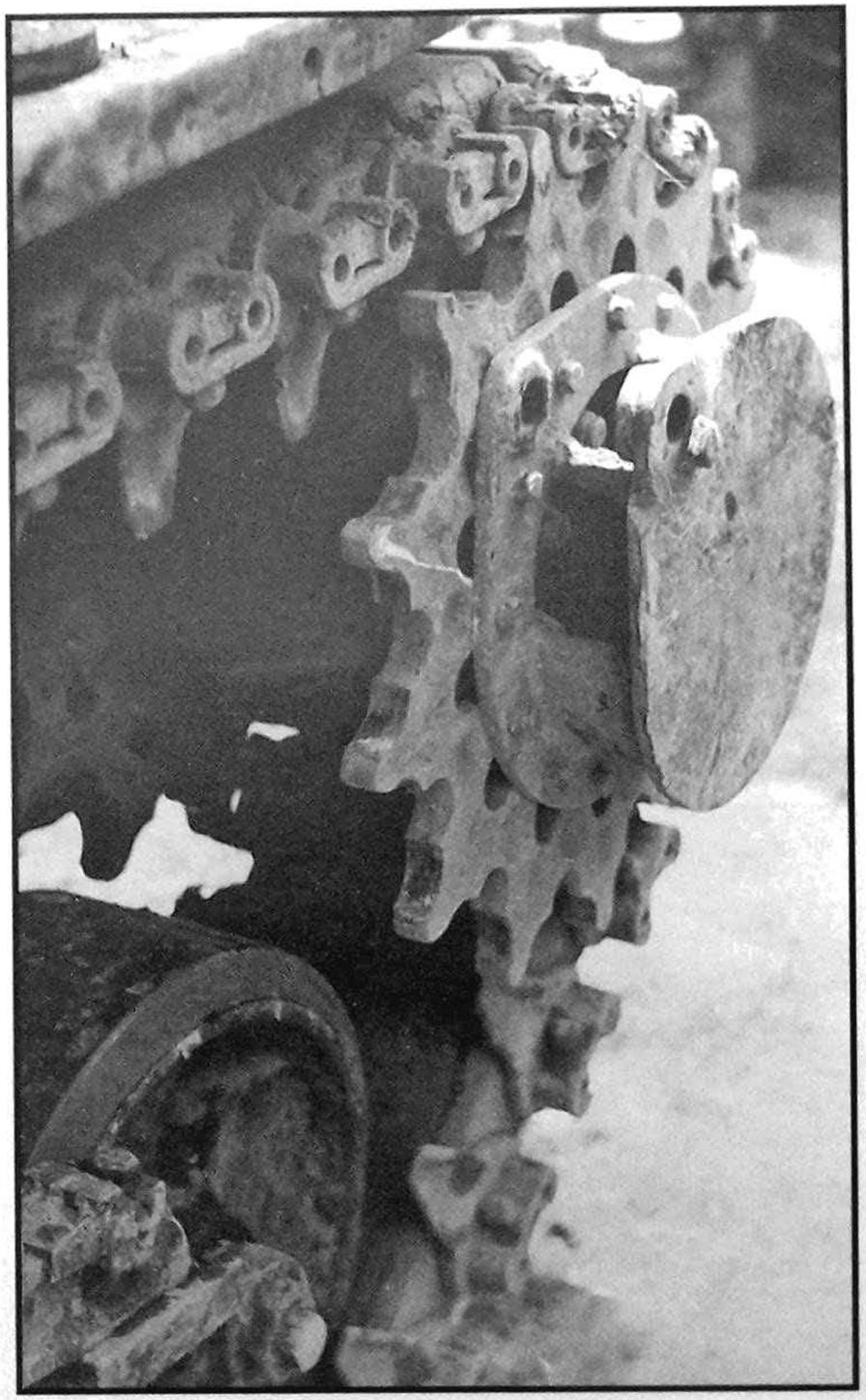
Although the crane is in the fully raised position, the lifting cable assembly on the front right drive sprocket is not attached to the crane. Note that the counterbalance assembly actually brakes against the right crane mount. The lower edge of the counterbalance sports three cable positions, and the rearmost has a U-bolt through it-this is where the lifting cable was attached from the drive sprocket. The center connection was used on level ground, while the top and bottom connections were used for upward and downward slopes. The large bent arm mounted on the right upper hull was used as a winch cable guide when the winch cable was fed out through the turret. The visible cables are guide wires to stabilize the crane itself and remain fixed even when the crane is lowered to the rear.



The array of pioneer tools on the rear stowage bin shows a broken handle on the sledgehammer, and the small chain securing the pin through the head of the wrench. The left taillight guard has been re-welded. Note the spare track racks on the rear of the fixed turret. Beneath the racks is the small port for feeding the winch cable to the rear of the vehicle. The rear sports a pair of spare bogie racks and in between are twin mounts for the crane brace; this large triangular brace is now suspended in the sky, hanging from the tip of the crane. This M32 has the less common round air filters and no rear fenders, but the drilled runners for mounting them are in evidence, welded to the hull.



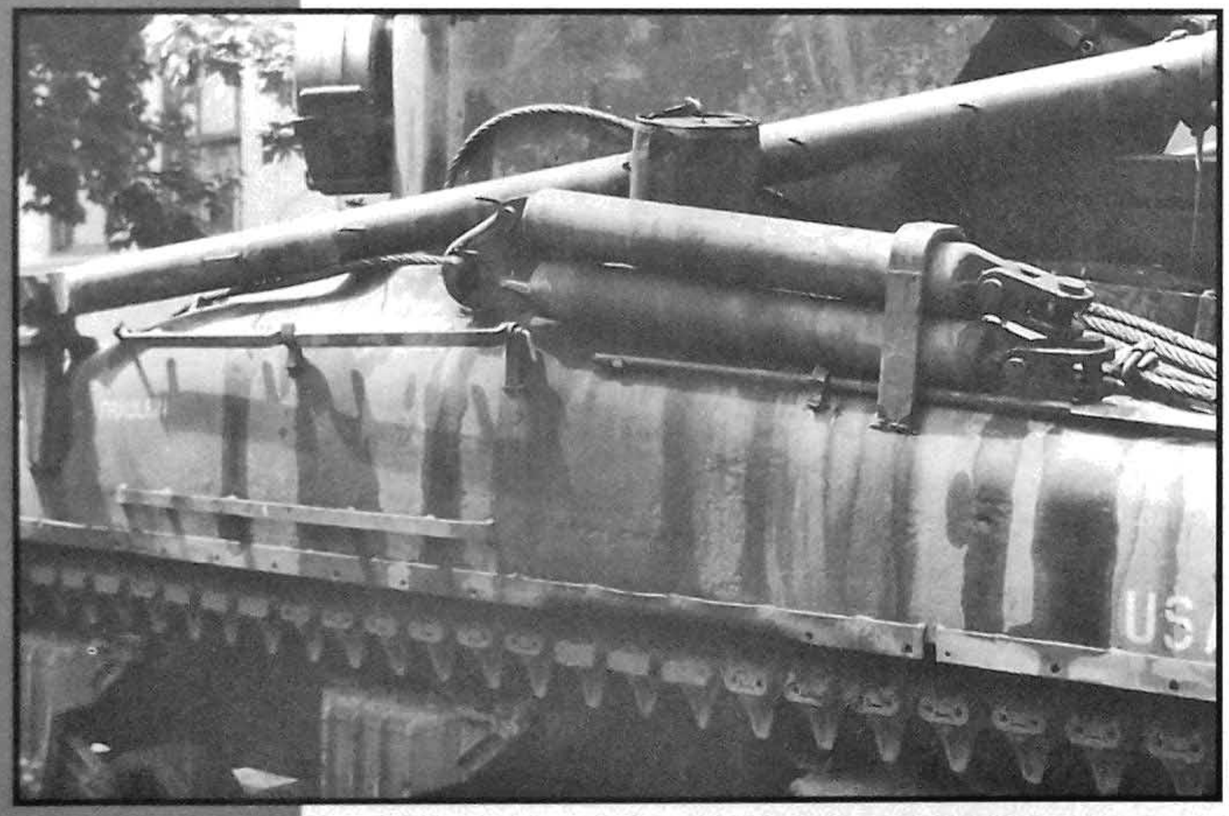
Two spare bogies are mounted on the front of the fixed turret and between them is a cable port for the winch cable. The two forward facing hatches have no periscope guards, and tow cable brackets and latches can be seen next to the hatches. The base plate for the 81mm mortar is welded above the large star. Mounted on the vehicle's left are stabilizer plates installed on the front and rear bogies to lock out the spring action when lifting loads over 10,000 pounds. Centered on the upper nose is the small drag line hatch and roller assembly for feeding the winch cable directly through the front. Beneath is mounted a large bipod brace used in recovery operations, and lower still is the front towing hook on its large extruded mount.



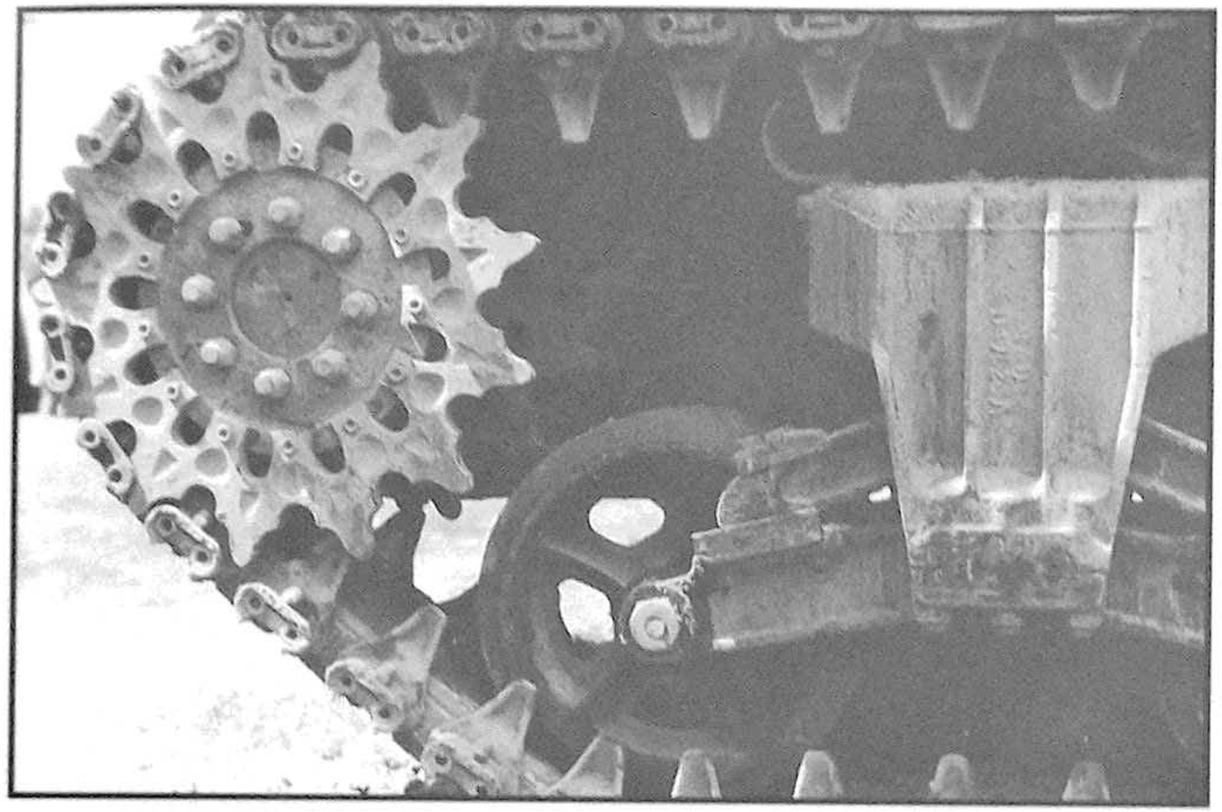
Above: Close-up of the lifting cable assembly on FRAULEIN, another M32 of the 1st Armored Division parked nearby. The short cable for elevating the crane is not in position here.

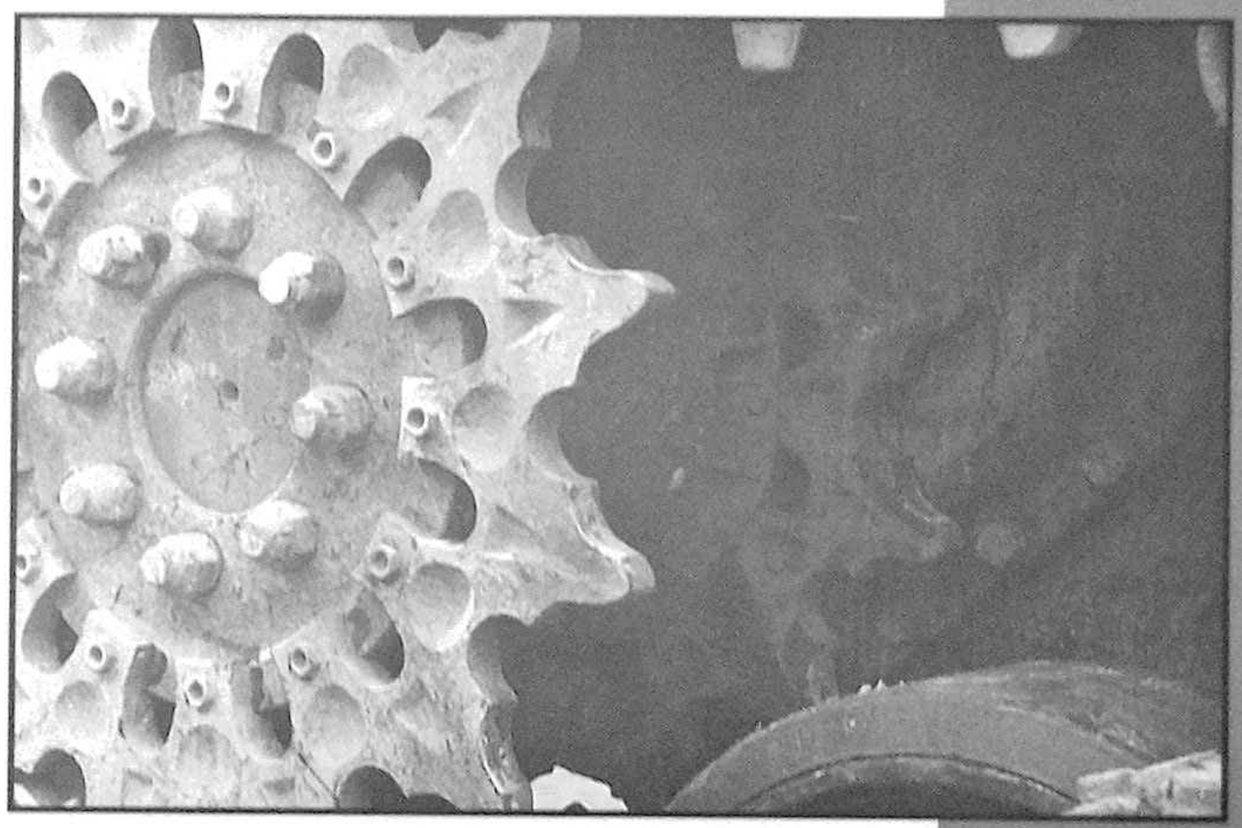
Left: Seen here is the manner in which the guide cable loops through the crane and returns to the rear of the vehicle. The long racks welded to each side of the hull are for carrying spare drive sprockets. In addition to the large star on the nose, this M32B1 has two stars sprayed on each side from a non-regulation stencil. Fresh markings were applied to vehicles of advance units as they anticipated their first encounters with Soviet forces.

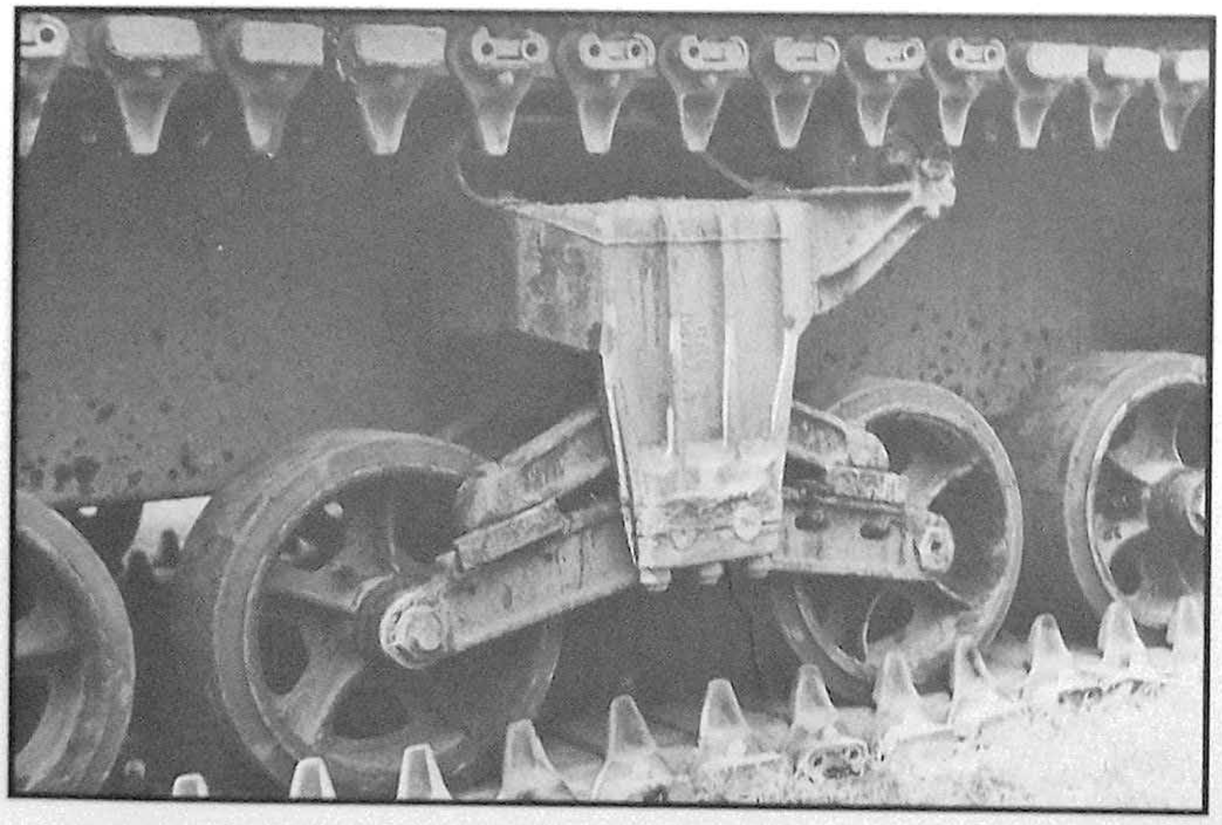
Inset: This WC51 Dodge of the 612 Tank Destroyer Battalion sports stenciled markings on its bumper similar to those found on the M32.

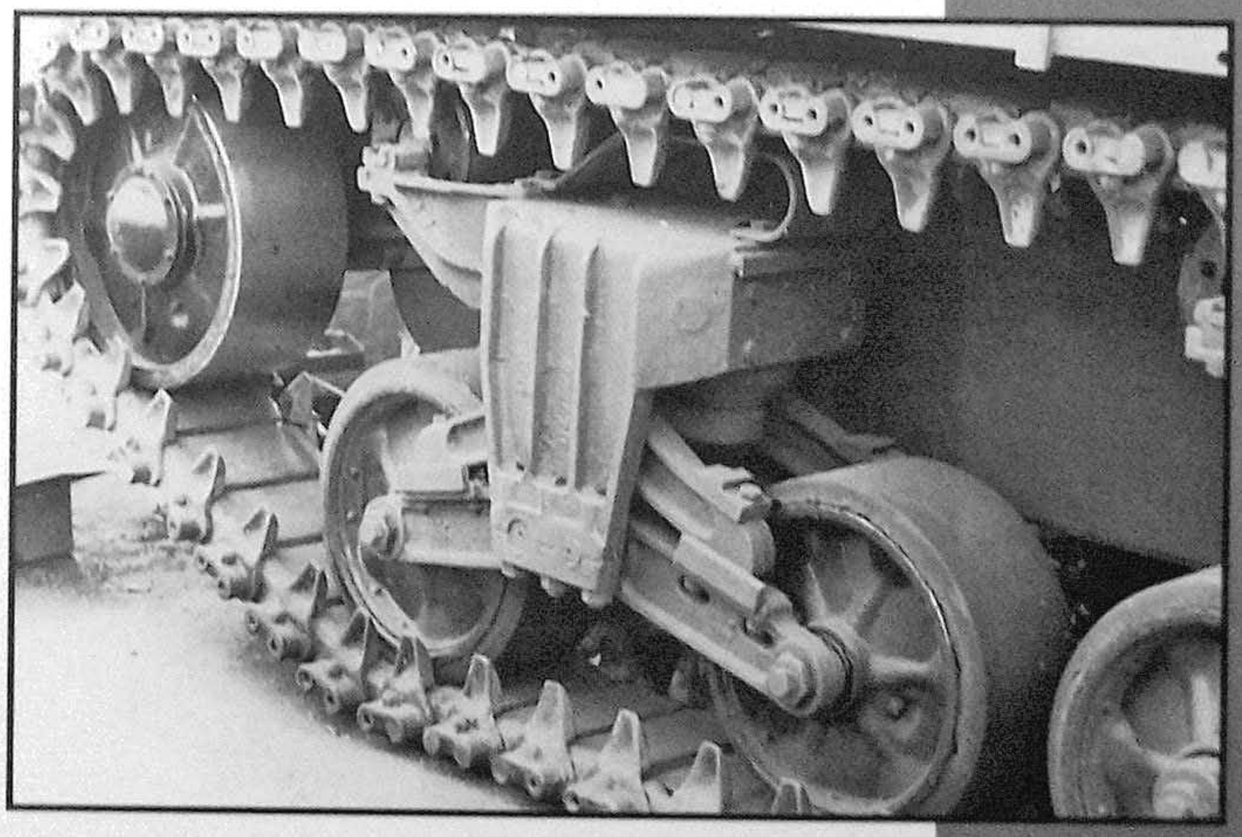


Top left: The right crane mount is visible here. Note once more the details of the spare drive sprocket bracket. The front towing pintle and its extended mount are also seen to good effect. This photo reveals the faintest outlines of a large star on the turret which has been painted over. **Top right:** A last look at the crew tweaking the engine of the M32B1. Three bolts securing the engine doors have been removed, and the round air filter is clearly visible. Note the curved fender flange behind the right rear idler. **Above:** Two further views of FRAULEIN. The large bipod-style assembly mounted on the left side of the hull is a towing brace. In these photos the boom is folded to the rear. FRAULEIN's boom is secured to the twin brackets on the rear of the hull. In this configuration, the M32 could function as a wrecker.

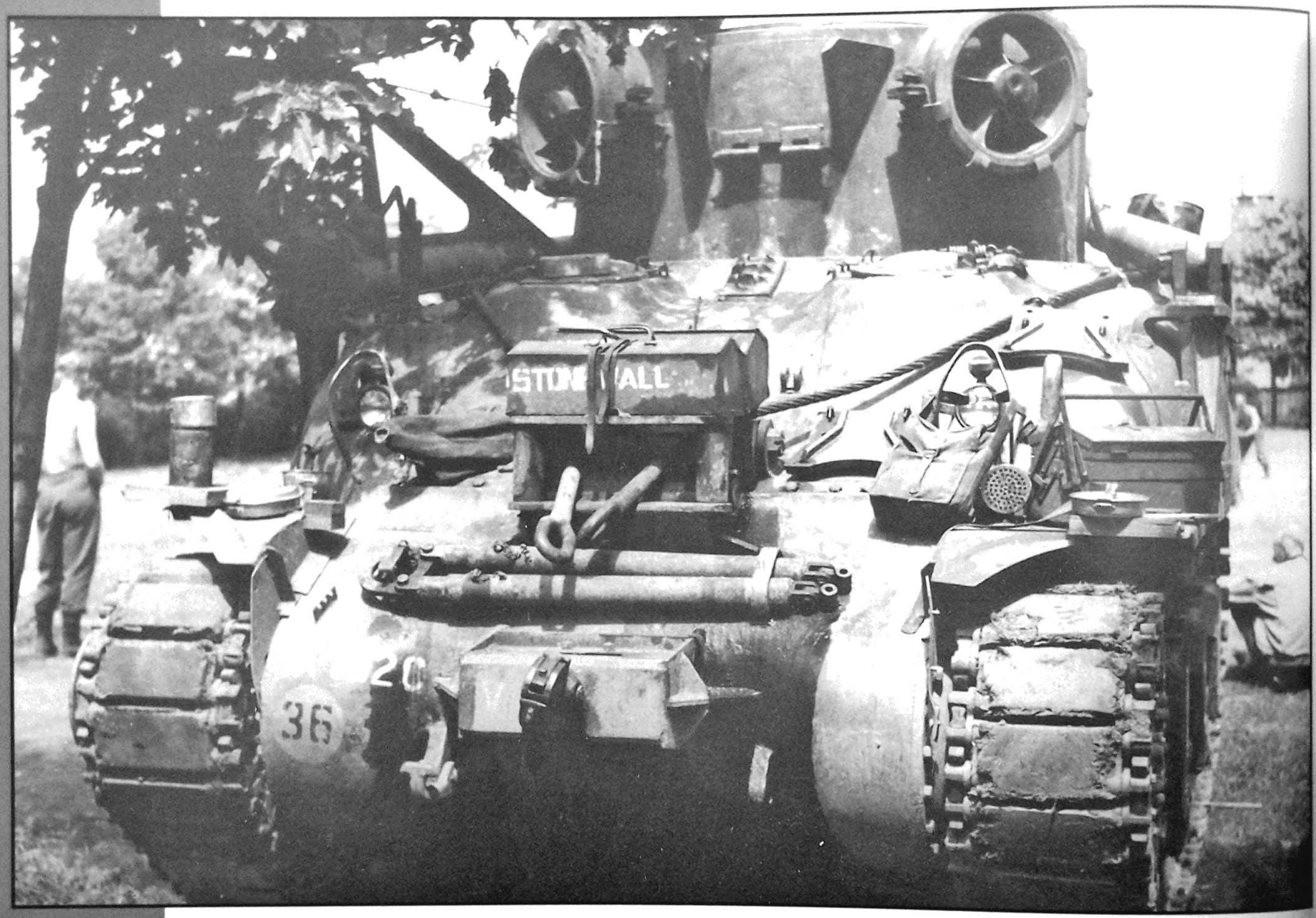








Top left and right, and above left: Unlike the unnamed M32B1, FRAULEIN sports the earlier open spoke bogies and the so-called "fancy" style drive sprocket. The complex milling pattern of this sprocket is clearly seen in these photos. In the top right photo the details of the backside of the sprocket can be seen. The purpose of the caps on the end connectors is not known, but they are welded in place and would have to be removed in order to service the track pins. **Above right:** The unnamed M32 has the solid-type bogie wheels and bogie trucks of a different type. The two above photos provides an excellent contrast between the two types. Note the bolt holes on the forward face of the bogie units. The trailing arm could be attached to either face, depending on which side the unit was installed.



A look at the nose of FRAULEIN. Note the tool boxes on top of the cable roller marked with the name STONEWALL. For easier access, the two tow cables are not attached to their brackets, but are stuck through the lifting cable roller assembly on the front of the vehicle. This M32 has an entirely different cable port on the front of the turret; note the flat hatch with two large welded guards to the sides.

Headlight guards are in place, but periscope guards have been removed from the two forward hatches. A bipod brace for recovery operations is lashed above the extruded towing pintle. This angle reveals the left mount for the mortar bipod, behind the toolboxes lashed above the drag line hatch. Much of the external gear has been recently lubricated, leaving numerous oil stains.

An intriguing study of wheeled vehicles belonging to the 612 Tank Destroyer Battalion and the 1st Armored Division. **Top left.** Note the bizarrely decorated mud flaps on the Willys Jeep in addition to its painted bumpers. The 2.5-ton truck in front of it also has the white bumpers and also has the rarely seen "W" prefix on its registration number. **Left:** These three vehicles all display different stars on the hood. The center Dodge is from the same section as the previous photo. The different canvas top configurations of the two vehicles is interesting. The Jeep contains a non-standard lettering on its windshield indicating that it belongs to the unit chaplain. **Above:** among the many oddities in the street that day was this highly unusual Dodge 3/4-ton truck. A welded jib has been added to the vehicle's front bumper. This convenient modification would allow the vehicle's winch to be used as a lifting device and was no doubt handy for lifting engine blocks and other heavy objects.

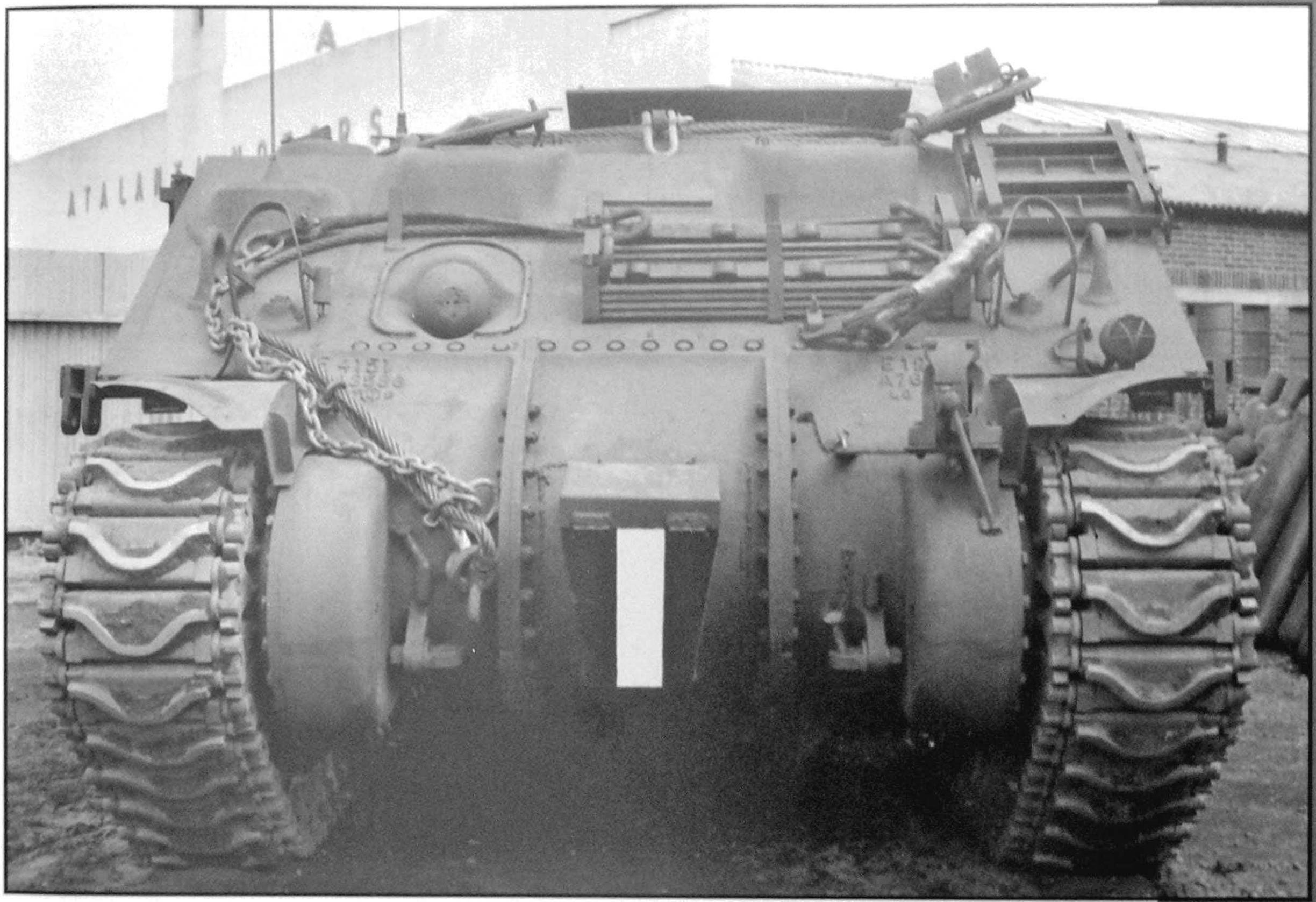
Sherman Armoured Recovery Vehicle (ARV) Mk I

The Sherman Armoured Recovery Vehicle (ARV) Mk I was a modified Sherman III or Sherman V that was used to recover or tow disabled vehicles. Its crew could carry out minor repairs in the field while being protected by the tank's armour and it possessed the good cross-country capabilities of a tracked vehicle. The ARV Mk I was essentially an armoured tug. Vehicles were converted by REME Arborfeld in Berkshire. The turrets were removed and the opening plated over, cables, stowage, blocks, jibs, gun planks, drawbars and other recovery equipment were added to the exterior. Internal stowage included cutting and welding rigs, jacks, drawbar adapters, track equipment, spares, radio and so on. Crew protection came from personal weapons, a bow mounted 30 Cal. MG and a Bren mounted on a special stand near the battery box. Some vehicles had 50 Cal. MG mounted near or in the crew access doors on the plated over turret ring.

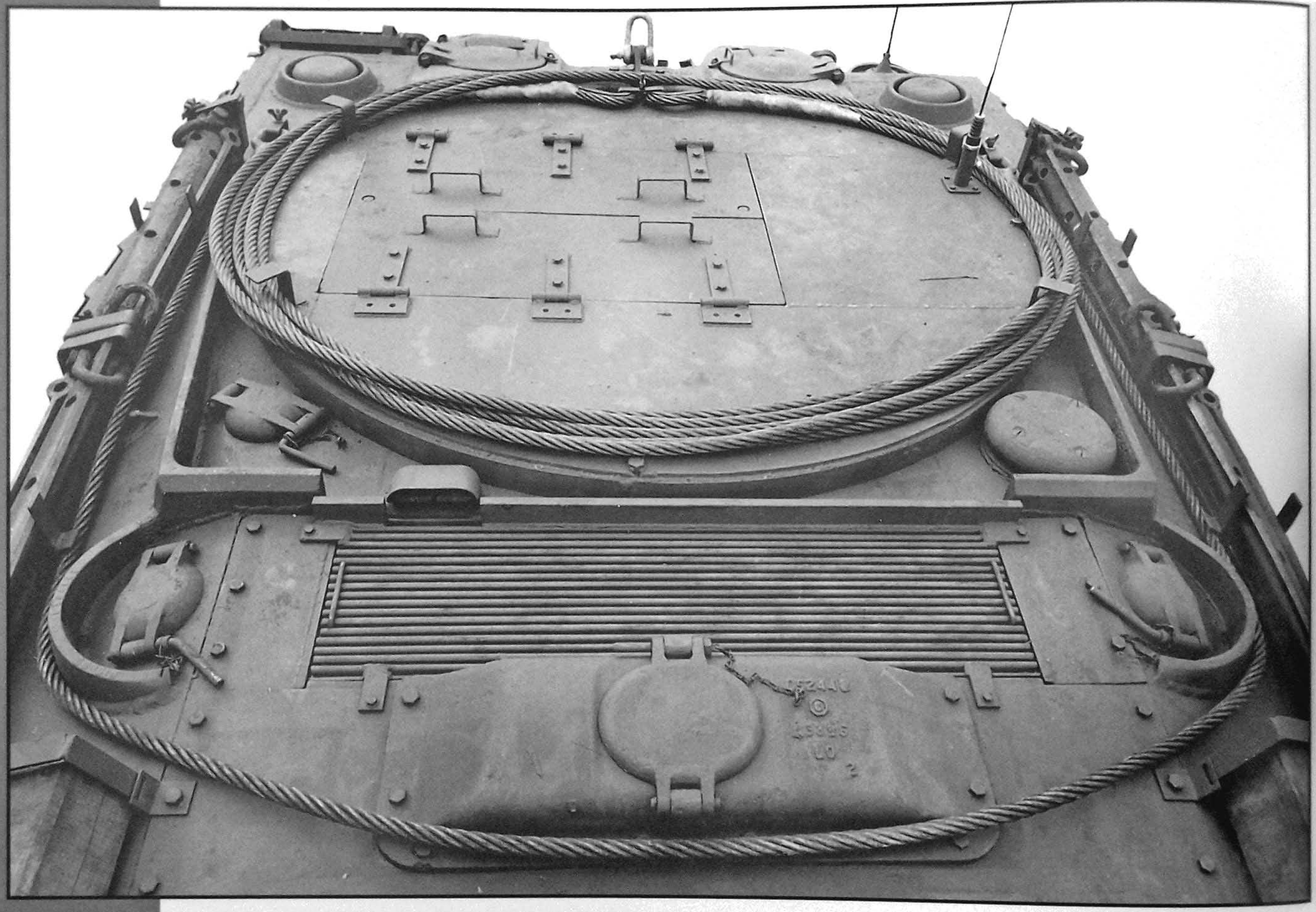
ARV Mk I towing a kaput Panzer IV. Note partial front mud guard, bin for hoist, properly stored snatch block, earth anchors and spikes, spare track and "A" and "B" radio aerials. The long Hollebone drawbar is in use, while the short one is hanging on precariously to the onside sponson. One part or leg of the jib boom can be seen below the drawbar. Fancy drive sprocket and Type T56E1 steel tracks are in use on this vehicle.

Sherman ARV Mk I festooned with equipment. Note duckbills or extended end connectors on tracks, two 15-ton snatch blocks, stored grousers on front three-piece housing and side sponson, spare road wheel and front vise. The stowage box on the front housed the chain block and cable used for recovering engines or transmissions. Spare shackles are located on the light guards. A Churchill AVRE with a covered Petard mortar can be seen trundling along the road to the right.

Rear view showing unusual stowage of the snatch block. Two fire extinguishers were stored on the rear hull plate. The side box stowing tools, brackets for two shovels, spare track links and frames for the grousers are all missing from the off side sponson. There is a small winch seen near the crew opening and a vertical support. This support was used to secure the deep wading trunks at the rear and the wide square trunking over the crew doors. The tow cable is attached to the swiveling draught bar for speedy recovery.



Front view showing towing eyes with attachment points and pins for front jib or boom. The 4.5-inch vise was able to swivel on its base. The tips of the front boom can be seen in their roller brackets. A bracket and pin with nut secured the ends together and the three-ton Felco Hoist was hung off the bracket. The front jib cable secured the top of the jib to the shackle seen above and between the hood castings. Earth anchors and pins are visible but the spare track brackets are missing. A siren is visible over the left side track and there are no periscope wire guards. No markings are visible apart from the RAC red and white flash on the pulley box.



View of plated over turret ring. Note 100-ft cable and brackets around the crew access doors. On this plate, a camouflage net, tarpaulin and track spanner were secured. The hold fast and eight earth spikes or pins can be seen in their brackets. The vehicle's tow cable is secured by front clamps and stretches around the radiator cover and fuel filler cap splash protectors. The brackets for the gun planks are just visible. Wing nuts and clamps secured the other ends of the gun planks. The earth anchors were attached to cables and the spikes were hammered in at different angles into holes on the anchor. Some crews striped their anchors with paint to aid visibility and reduce loss.

Right. Left to right, we see an aerial variometer Mk II, the No. 19 Wireless set with wiring running up to the "B" Aerial and to other points and then downwards to the batteries. The vertical support or bulkhead has a Control Unit #1 Mk II secured to it. This unit had an "A" (squad/regimental net) switch, "B" (troop net) switch and an intercom control "IC"switch. Drop leads allowed the crew to hook up headphones to the snatch plugs. Below and to the right of the control unit were boxes for wireless spares or radio tubes. Below the wireless set on the pannier, the handbook and code books were stored in a case for quick reference.

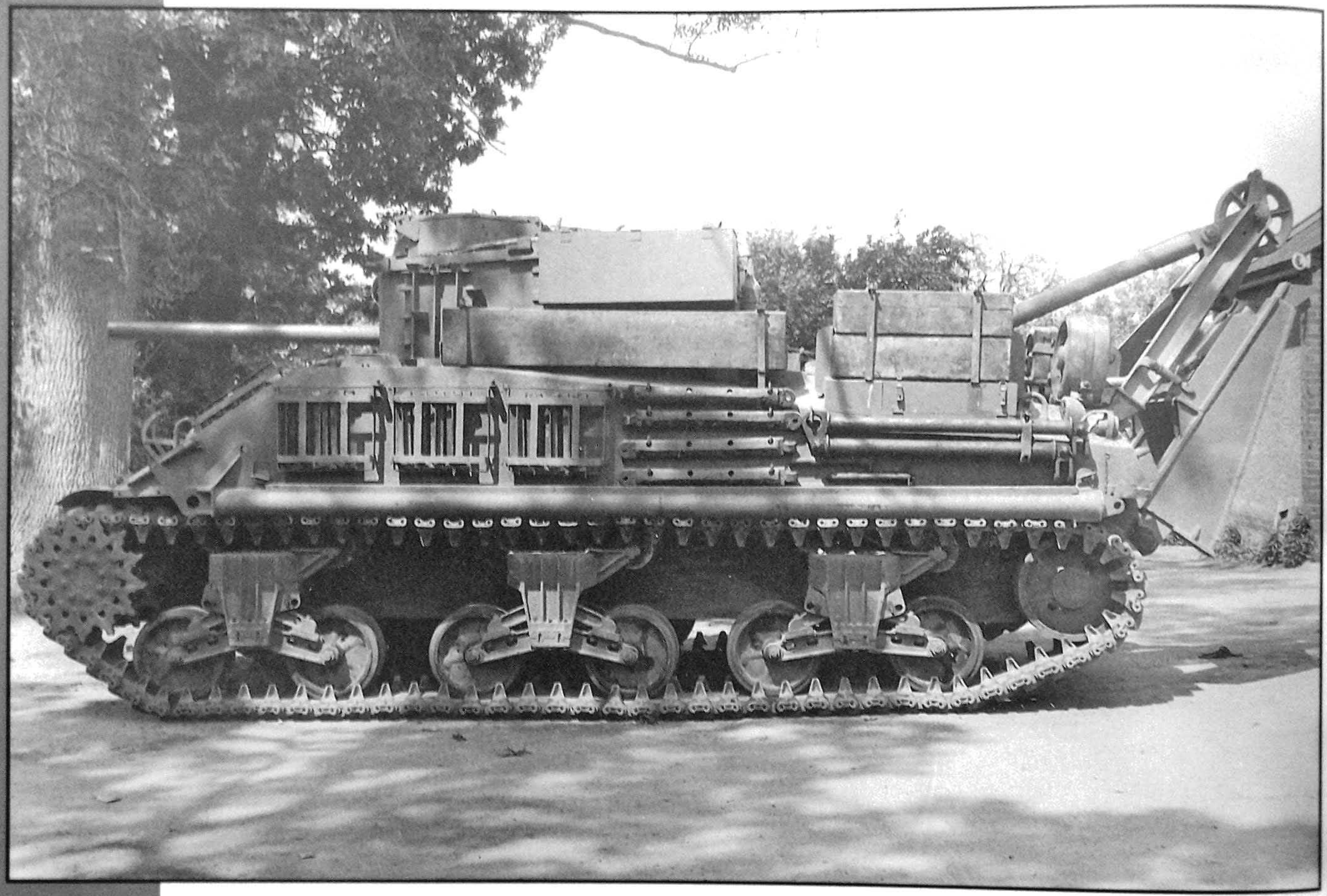
ARV recovering a knocked out PzKpfw IV. The crew appears to be pulling and attaching the tow cable to the swiveling draught bar. All four crew members wear the tanker's helmets and some carry dust goggles. The rear stowage bin can be seen just below the four stowed gun planks. The long Hollebone drawbar was designed for UK vehicles and was stowed on the gun planks or below the stowage bin. The small box on the right stored intercom headphones, while that on the left was a first aid kit. Two extra towing eyes were welded to the engine access door area.

Sherman Armoured Recovery Vehicle (ARV) Mk II

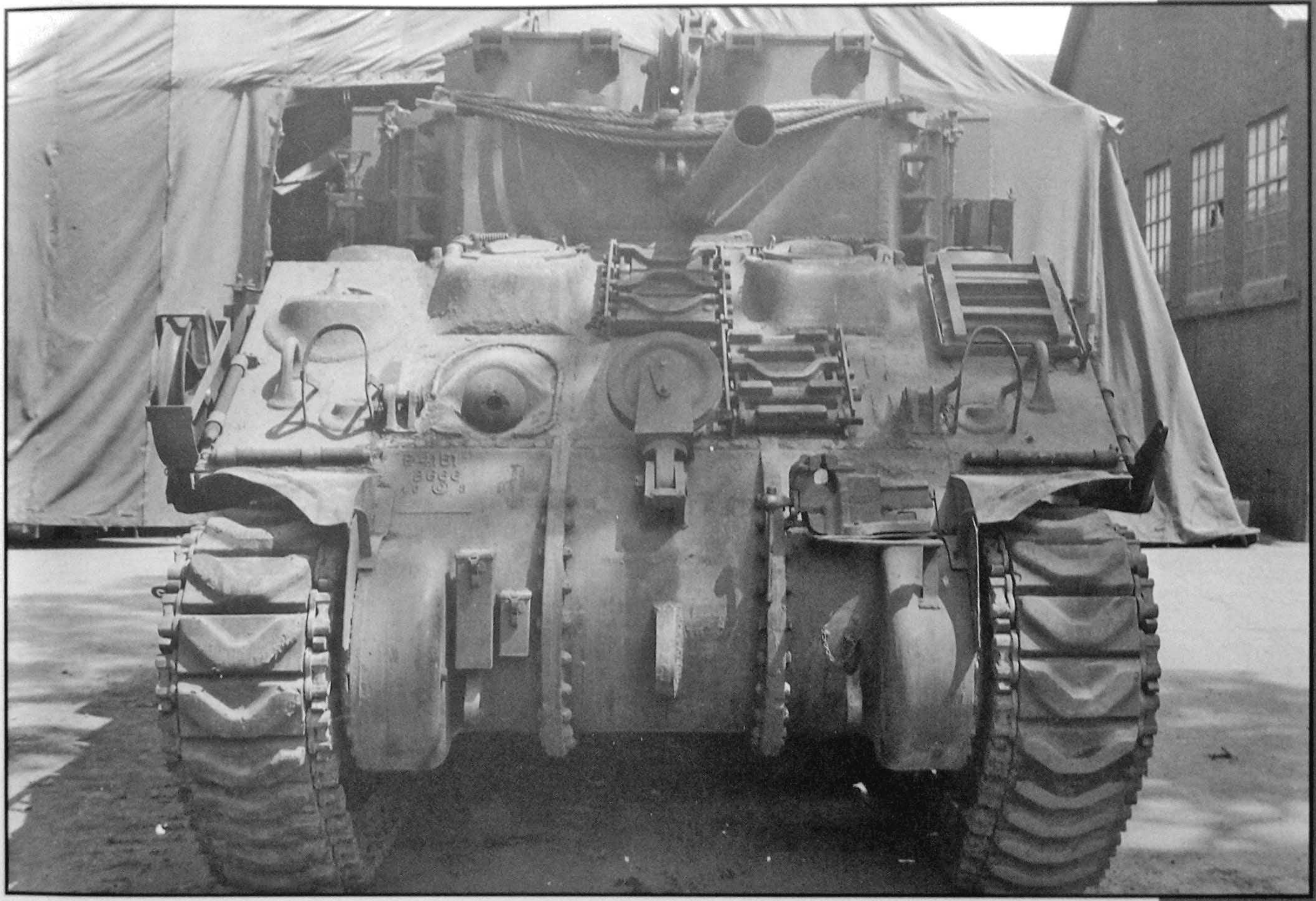
The Sherman Armoured Recovery Vehicle (ARV) Mk II was based on the M4A4 or Mk V Sherman and was a more sophisticated and elaborate recovery vehicle. It carried a two speed 25-Ton winch protected by a steel superstructure. All vehicles had three openings in the superstructure, two for the crew and one at the rear for the cable exit. Some vehicles may have had an extra double door opening near the roof ventilators. A fixed A-Frame jib was attached to the back and an earth spade was hinged at the rear. Two types of earth spades were seen. The Mk II ARV carried similar equipment to the Mk I, such as the dismountable front jib, welding/cutting equipment and vehicle spares. The spade and winch allowed for speedier recovery of heavier vehicles.

Three quarter rear view of an ARV Mk II. Visible are the spade, fixed rear jib, spare road wheels, gun planks and stowage bins. On the offside we see one 16 foot boom arm which is reinforced by a channel welded longitudinally to the topside. The long Hollebone drawbar and 15 ton snatch block. This vehicle carries two added brackets on the front and rear bogie assemblies and two of their locking pins can be seen below the drawbar. Frames for the grousers and the sheave or boom pulley can be seen toward the front of the vehicle.

Three quarter front view showing circular hatches on superstructure, cable stowage, dummy gun, grousers and spare tracks. The hold fasts or earth anchors are stored on the side, along with the larger front jib. Gun planks and rear boom or A -frame can be seen at the back. Note the two added brackets with holes that hide the springs on the rear bogie assembly. Front mud fenders, vise and pulleys on front and superstructure for raising the boom and recovery.

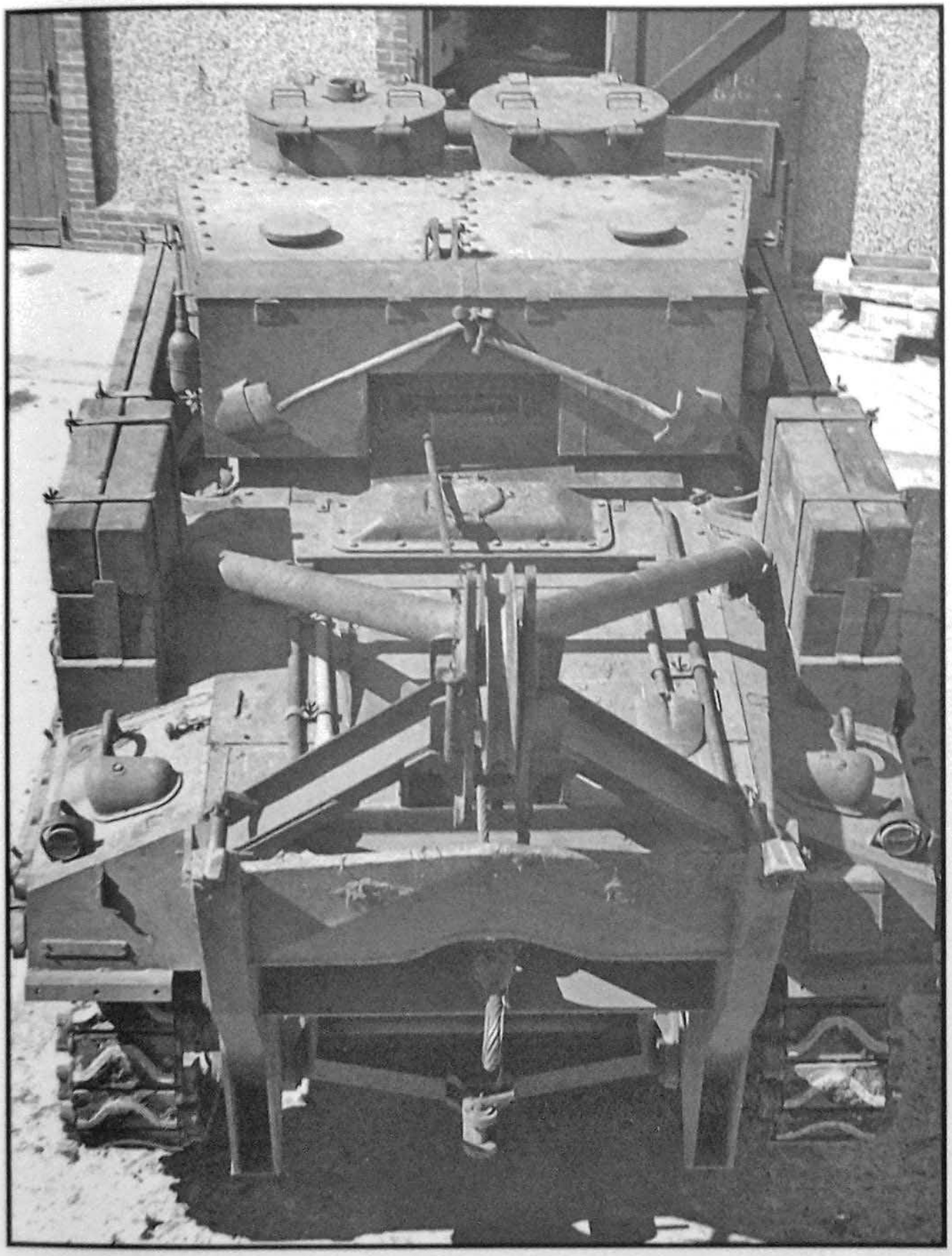


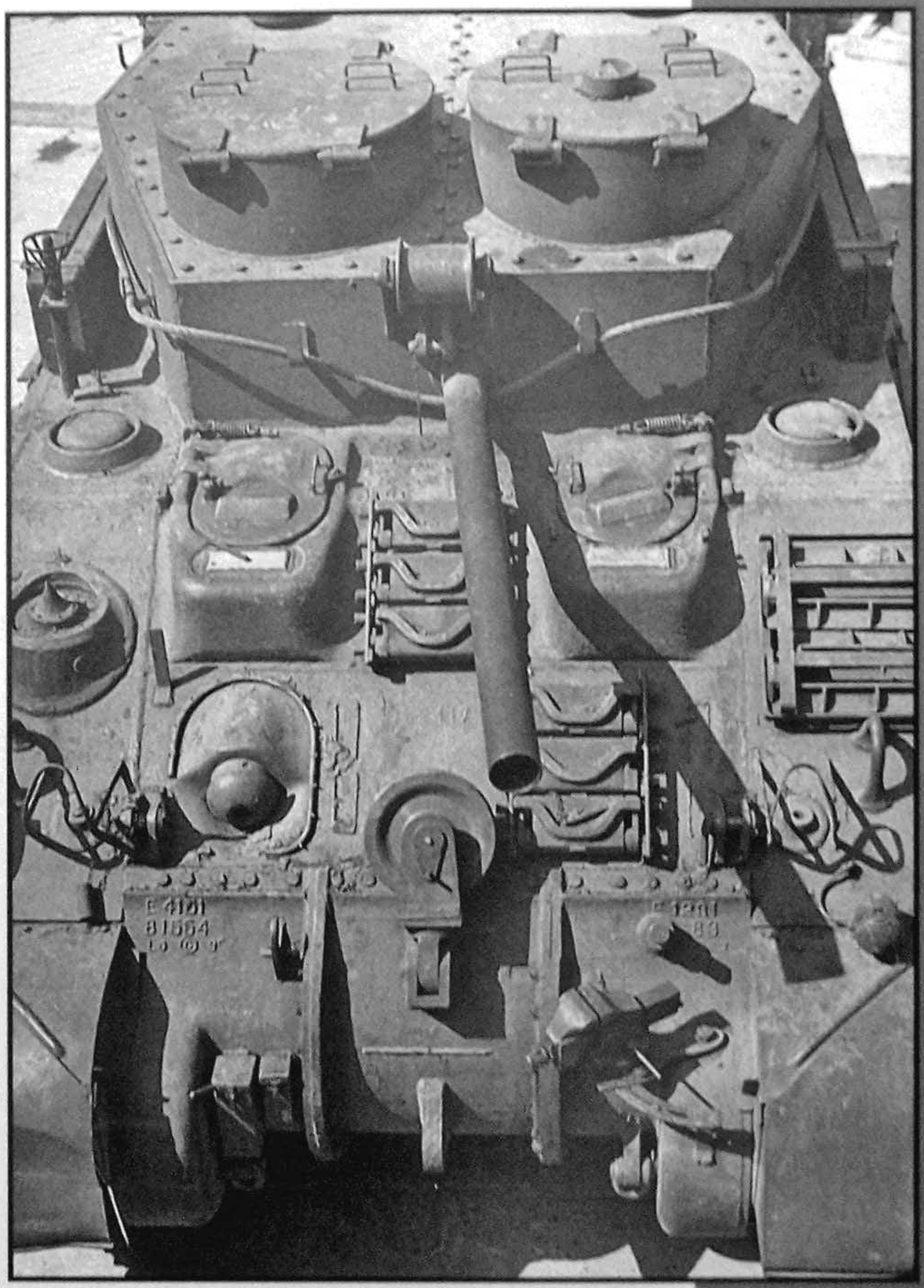
Onside view of an ARV Mk II with hexagonal crew cupolas. Just below these cupolas, on the superstructure, we can see a track locking clamp stored horizontally and a spud plate or track anchor below it. Two stowage bins and gun planks are fixed to the upper deck and superstructure. Grousers in the frames, four holdfasts and the short Hollebone drawbar for US vehicles can also be seen. The locking pins for the bogie assemblies are located above the rear bogie and near the front.



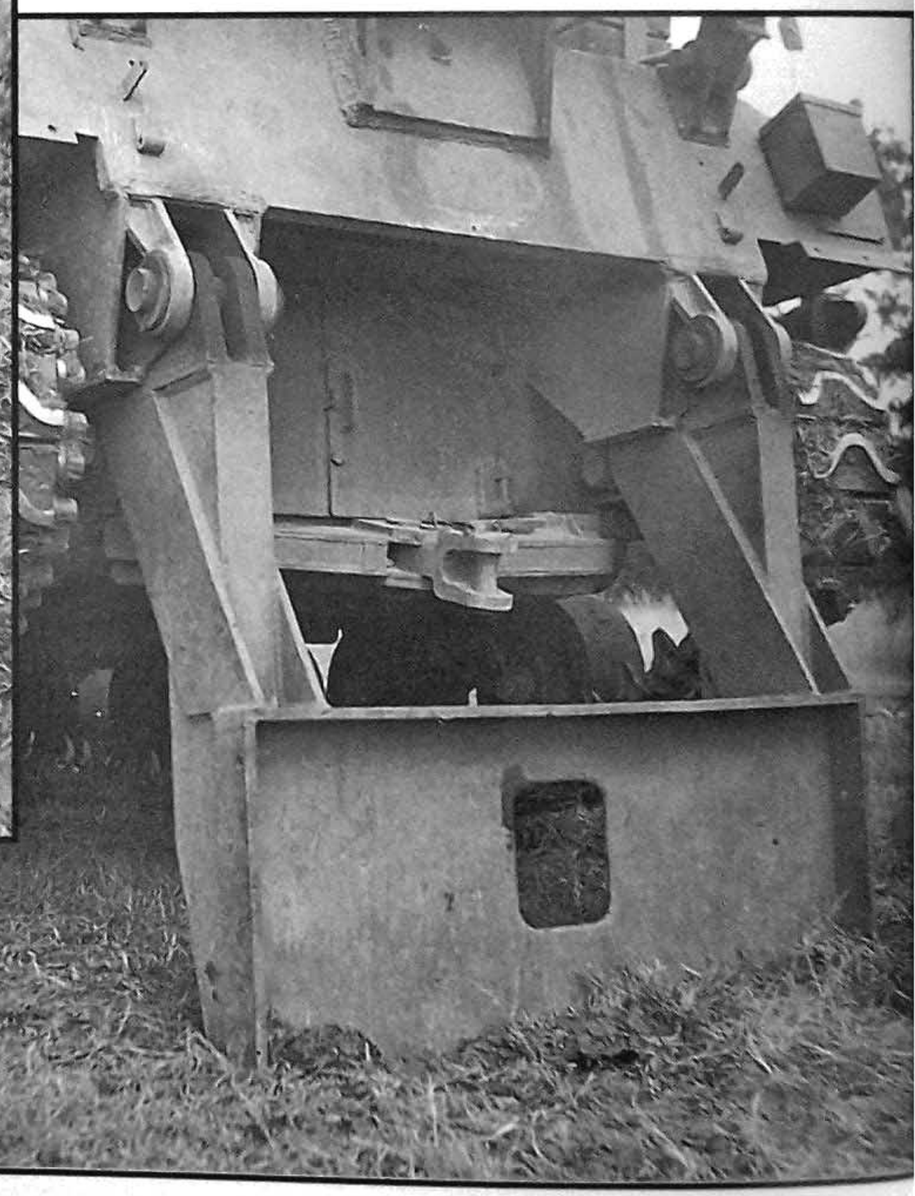
Hexagonal cupolas, superstructure pulley and B aerial are visible. Note that the dummy gun was offset to the port side to prevent interference with the pulley system. Four bogie pins are seen in this view and when inserted into the brackets on the bogies, prevented the vehicle from dipping when weight was applied to the front or rear booms. The pins, therefore, stopped the springs from functioning and furnished an unsprung platform. Brackets for the front jib can be seen near the light guards. The spud anchors on the superstructure were used on hard ground or roads when the rear spade could not dig in. Note the different types of spare track and large towing eye on the center transmission plate below the pulley.

Rear spade is engaged and the winch cable extends over the rear boom. Note that the spade is different from previous views. Below the boom we can see the fairlead, which was similar to the one used on Bergepanthers. The sturdy rear jib had a 15-ton capacity and was reinforced with angle plates and tubing. The winch cable could extend through the fairleads, over the rear boom pulley, over the superstructure pulley and under the front pulley for front pulls or self-recovery. A similar layout was used for raising the jib booms and lifting from the front boom.





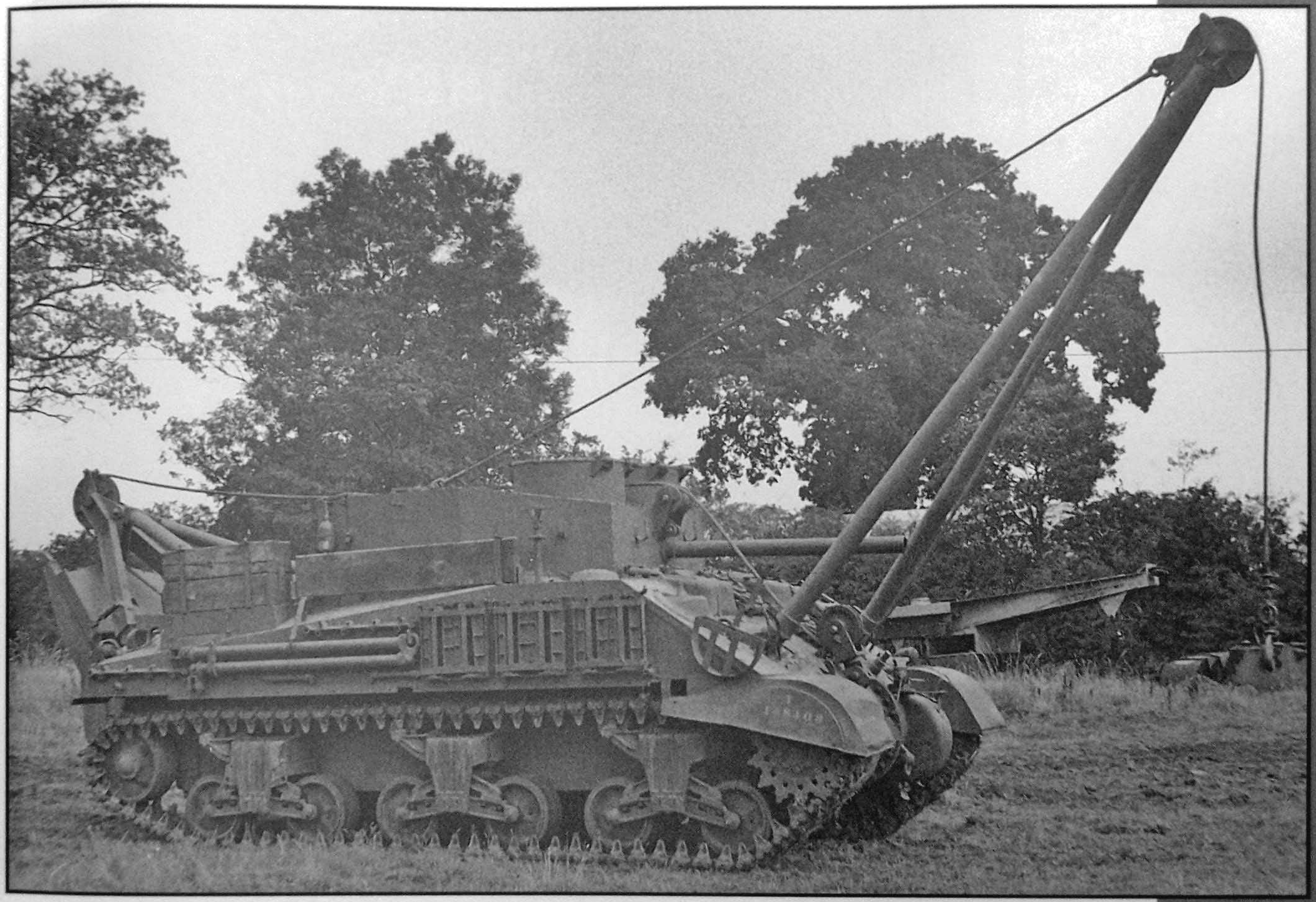
Circular cupolas with commander's periscope, ventilators and bolted on superstructure roof for access to the 25-ton Croft winch. Bins at the rear of the superstructure have fire extinguishers and spades attached to them. The superstructure roof had 14mm armor plate and 40mm on the sides. The winch cable extended out from the opening below the bins, through the fairleads, through the spade cut out and was secured to a hook on the underside of the rear spade. The spade could then be lowered and raised when required. Two turnbuckles secured the rear spade when upright for traveling. Hand tools were stored on the rear deck plate.



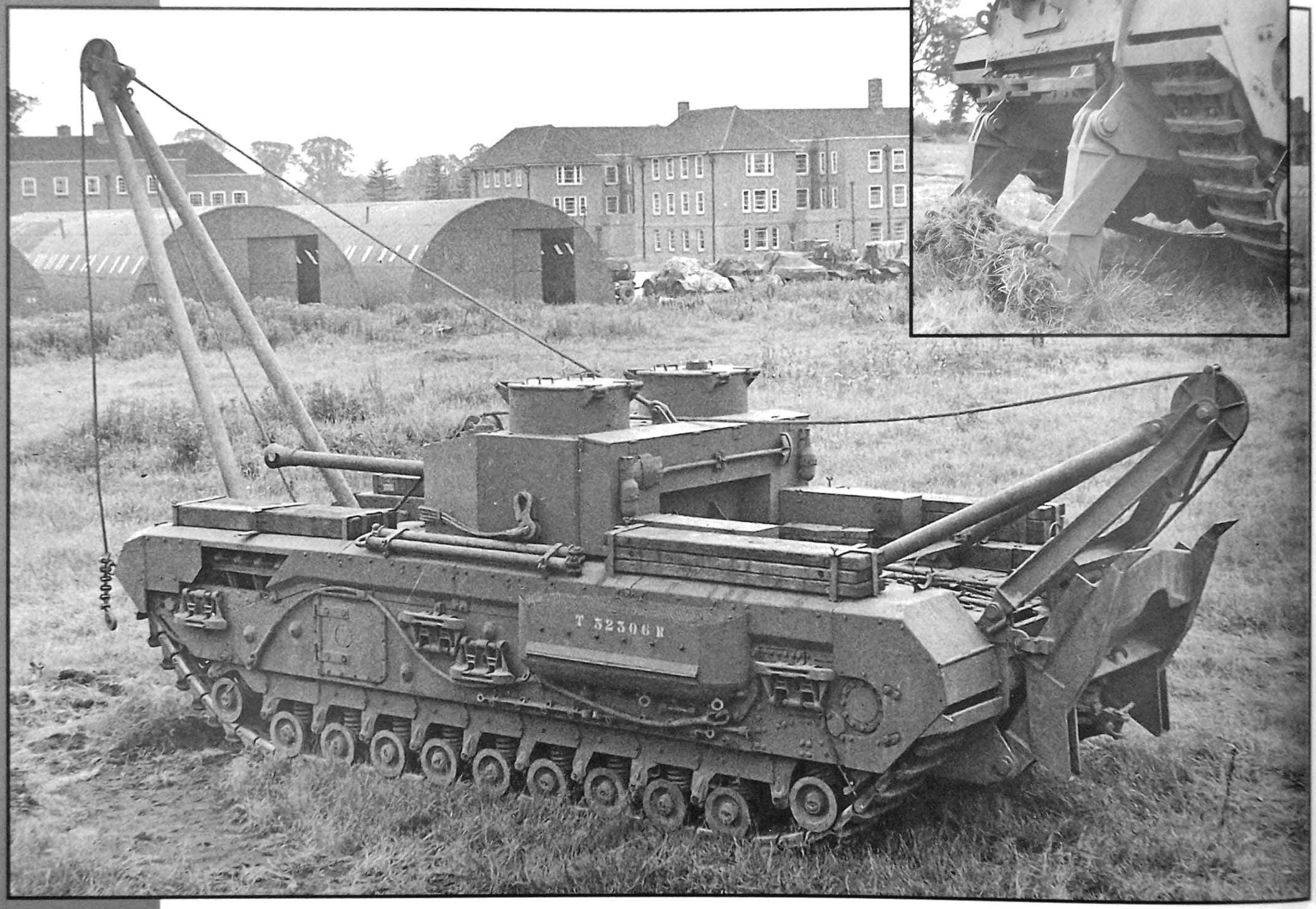
The mild steel spade was reinforced with angles and welded gussets making it very sturdy. The claws or prongs were hardened for easy soil penetration in hard terrain. When the winch is engaged the spade begins to dig in as the brakes are released. A maximum load of 75 tons was capable when the spade was engaged. The two speed Croft winch was driven by the vehicle's main engine. The two track locking clamps worked in conjunction with the front sprockets and bogies and immobilized the tracks thus relieving the parking brake from extra duty.

Two crew members remove each leg of the front boom and place them in front of the vehicle. The legs are then attached to the fittings on the front hull plate. The pulley is attached and the head assembly is completed. The winch cable is unwound, threaded over the rear jib, over the superstructure pulley, under the glacis pulley and over the head assembly. The tie cable is then hooked up to the head assembly. The winch cable is then attached to the center-towing lug on the transmission and the winch is engaged. The boom rises and the end of the tie cable is secured to the bracket below the superstructure pulley. The boom is now lowered and the tie cable allowed to take up the slack. The winch cable can now be removed from the center-towing lug and used for lifting.

The main boom is being raised by the winch so that the standing crewman can attach the boom cable to the roof bracket. This bracket is off set to the left and therefore does not interfere with the boom cable running over the roof. The main cable can now be unhooked from the bracket above the dummy gun and used for lifting. The empty brackets for the boom securing cable can be seen on the superstructure. The crewman in the hatch is operating the winch controls.



The boom has been erected and the securing cable attached to the bracket at the rear end of the roof plate. The lifting cable has been threaded from the winch in the superstructure over the rear boom, over the roof, over the roof pulley , under the glacis plate pulley and up and over the main boom. Lifting can now commerce using the winch.



A Churchill ARV Mk II with its boom erected and ready to lift. All the recovery equipment was essentially the same as that used on the Sherman ARV MK II. This Churchill sports the early rounded air intakes and circular superstructure cupola. The fenders over the tracks and drive sprocket are very different from the other marks of Churchills. They are flat and without the support ribs. The front fender and mud chute is also different. The vehicle weighs 40-tons and was based on the Churchill Mk V. **Inset:** The earth anchor is engaged after the winch pulls exceeds the tractive resistance of the recovery vehicle. The spade-type earth anchors is at almost 90° an the vehicle is lifting off its bogies due to the heavy weight being recovered.

M18 "Hellcat" Tank Destroyer

During World War Two the American Army had a strict doctrine concerning the use of tanks. They were seen as an exploitation weapon, similar to the old horse cavalry and, as such, were not designed to fight enemy tanks. These were to be engaged by conventional anti-tank guns and specialized Tank Destroyers. **Above**: This M18 is serving with the 704th Tank battalion, which at the time was attached to the 89th Infantry division. The photo was taken at the very end of the Second World War, on May 5th, 1945. The location is the Lossnitz Forest in Southern Germany. This photo gives a good impression of the M18's front profile. The inside face of the T69 track can be seen clearly here on the spares stowed across the hull.

The Tank Destroyers were generally lightly armored and were to depend on speed and mobility to protect them. As the war progressed, the Army realized that the best way to combat an enemy tank is, in fact, with another tank and the Tank Destroyer Command was absorbed into the Armoured Force. In 1941 the U.S. Army called for a new tank destroyer armed with a 37mm gun, but by April 1942 the requirement called for a 57mm gun. **Above:** the M18 saw extensive service in the Pacific in spite of the fact that its open topped turret made it vulnerable to infantry attack. The powerful punch of the main gun was put to good use, especially in this shot. Here, an M18 fires into fortified enemy positions along the Shuri Line on Okinawa, May 11, 1945. (NA)

Buick Motor Car Division of General Motors Corporation built two pilot vehicles under the designation T49. The specification changed again and now the M3 75mm gun was called for. The T49 was modified to take the new weapon and was redesignated the T67. However, by November 1942 the requirement changed again and a version of the new 76mm M1 gun was specified. The first pilot of the T70 was completed by April 1943. It was standardized as the Gun Motor Carriage M18 in March 1944 and 2,507 were constructed by the time production ceased in October 1944. **Above:** The cramped interior of the M18 meant that much of the crew's gear had to be stowed on the outside of the vehicle. A variety of packs and bedrolls festoon this M18 attached to the 6th Armored Division. (NA)

640 of the production run of the M18 were converted to M39 Armoured Utility Vehicles. The M18 first saw service in Italy in the spring of 1944, under the control of the Tank Destroyer Force. It was used in Northwest Europe and also in the Far East campaign. Layout of the M18 was fairly conventional. The rear mounted Continental R-975-C1 Radial engine (-C4 on later vehicles) drove a front mounted gear-box and final drive assembly, situated between the driver's and assistant driver's positions. **Above**: This crew of the 2nd Armored Division loads ammunition during a live fire exercise the week before D-Day. This shot provides an excellent impression of the M42A1 High Explosive Shell. The shell was not small, measuring 32.25 inches and weighing 27 pounds (NA).

In the center of the vehicle was an open topped turret with 25 mm of frontal armor. The rest of the turret was only 13mm, the same as the hull. The 76mm M1A1C (or M1A2) gun was set 2 inches to the right of the centerline of the turret to allow more room for the gunner. A power traverse mechanism was used to give fast gun aiming. **Above:** This M18 sits within the destroyed city of Brest, France on September 9, 1944. This M18 has a girl figure painted on the front hull side and the words: "I Don't Want a," further back. Perhaps the most interesting feature of the vehicle is the Cullin Hedgerow cuter mounted on the front hull. These devices were used to pierce the thick hedgerows found in Normandy. It is rare to see it installed on an M18. (NA)

The only secondary armament of the Hell Cat was a .50 caliber machine gun operated by the vehicle commander, who was positioned to the left rear of the turret, behind the gunner. The loader was seated to the right of the main gun, which was set at 45 degrees. The M1A1 fired the APC-T M62 armor piercing round at 2,600 feet per second, the HVAP-T M93 shot at 3,400 feet per second. The M1A1C was fitted with a muzzle brake; the M1A2 had slightly tighter twist to the rifling of the tube. **Above:** "Powder River" of the 6th Armored Division bombs up outside of Brest on August 12, 1944. The right side of the hull is entirely covered with well-wishes written in white chalk by French civilians. The tank also has an obscuring pattern painted on the gun barrel, a practice also seen on the Sherman Firefly. (NA)

An SCR 610 radio was fitted in the turret bustle of the M18 and storage racks were fitted on the turret exterior. The suspension was by torsion bars, which gave a good cross-country ride. There were five double road wheels each side of the vehicle. **Above:** An M18 of the 602nd tank Destroyer Battalion fires across the Rhine outside of St. Goar, Germany in support of the 89th Infantry Division on March 26, 1945. This M18 has picked up an extraordinary amount of external stowage. In addition to the usual array of GI issue bedrolls and backpacks; there are four GI-issue shovels, two civilian suitcases and a lantern! The gun has just fired, causing the vehicle to appear slightly blurry in the image. (NA)

Above: Another M18 is bought up in St. Goar to help silence a strong point within the city. Note how another M18 provides cover as it advances. Several interesting features can be seen in this photo, such as the gun cleaning rods and the forward hull markings. Large unobstructed surfaces were scarce on the M18 and as a result many of its markings were quite small. This photo also provides a good view of the drive sprocket. (NA)

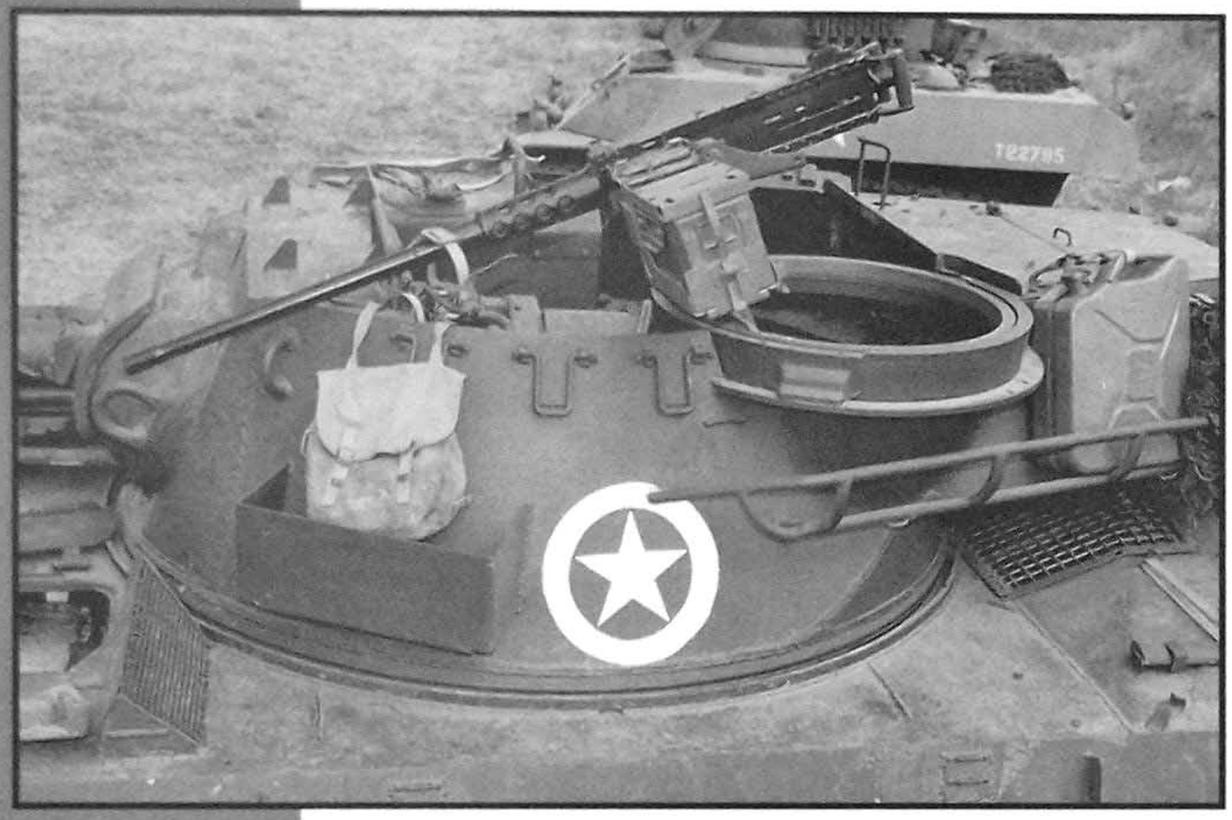
Above: An M18 of the 805th Tank Destroyer battalion rolls through Fontebuona, Italy on September 11, 1944. At this time the 805th was attached to the 91st Infantry Division, which was part of the 5th Army. The Luftwaffe was much more of an operational presence in Italy and Allied vehicles were much more careful about concealment from the air. To this end, the crew of this M18 has liberally covered their vehicle with branches. Interestingly, the entire crew of this M18 wear the tanker's "football" style helmet, rather than the more common steel pot helmets. The turret crew is watching a 240mm-howitzer battery that is parked alongside the road. The 240 was transported in two loads and the carriage can be seen just behind the barrel of the M18. (NA)

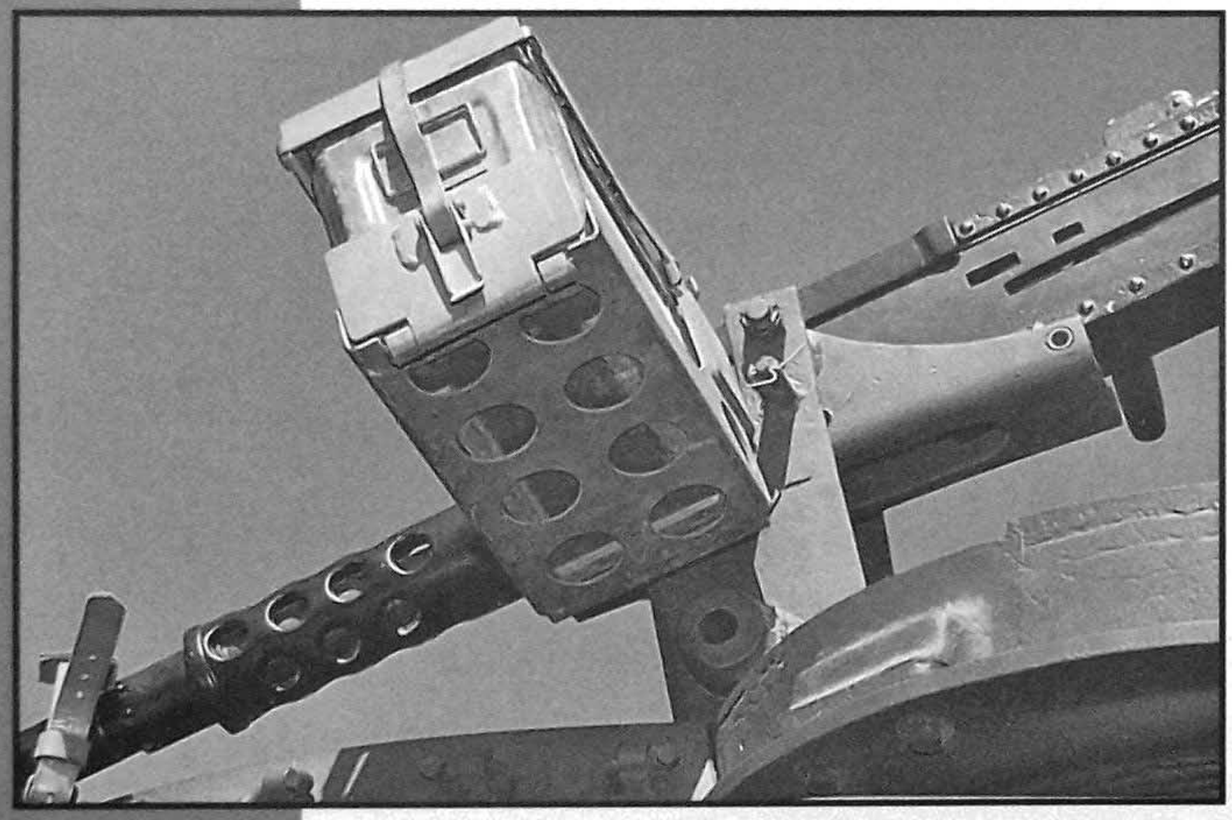
Above: An M18 is stopped in the town of Immendorf, Germany on December 11, 1944 during the initial penetrations into Germany. This side view provides a good impression of the side fender panels so often damaged or discarded by the crew. The shipping stencils can clearly be seen along the right side of the hull, as well as "radio OK" written in chalk. (NA).

Above: M18s and Shermans of the 6th Armored Division paused prior to entering Kopsheild, Germany on February 28th, 1945. The Shermans are all marked with extremely large tactical markings. A knocked out Tiger II sits in the tree line. Close examination of the original photo shows that the Tiger has a penetration in the front glacis plate, a somewhat rare sight on this vehicle. An internal explosion has displaced the turret, as well. At least one of the tank crewmen present is climbing on the vehicle. (NA)

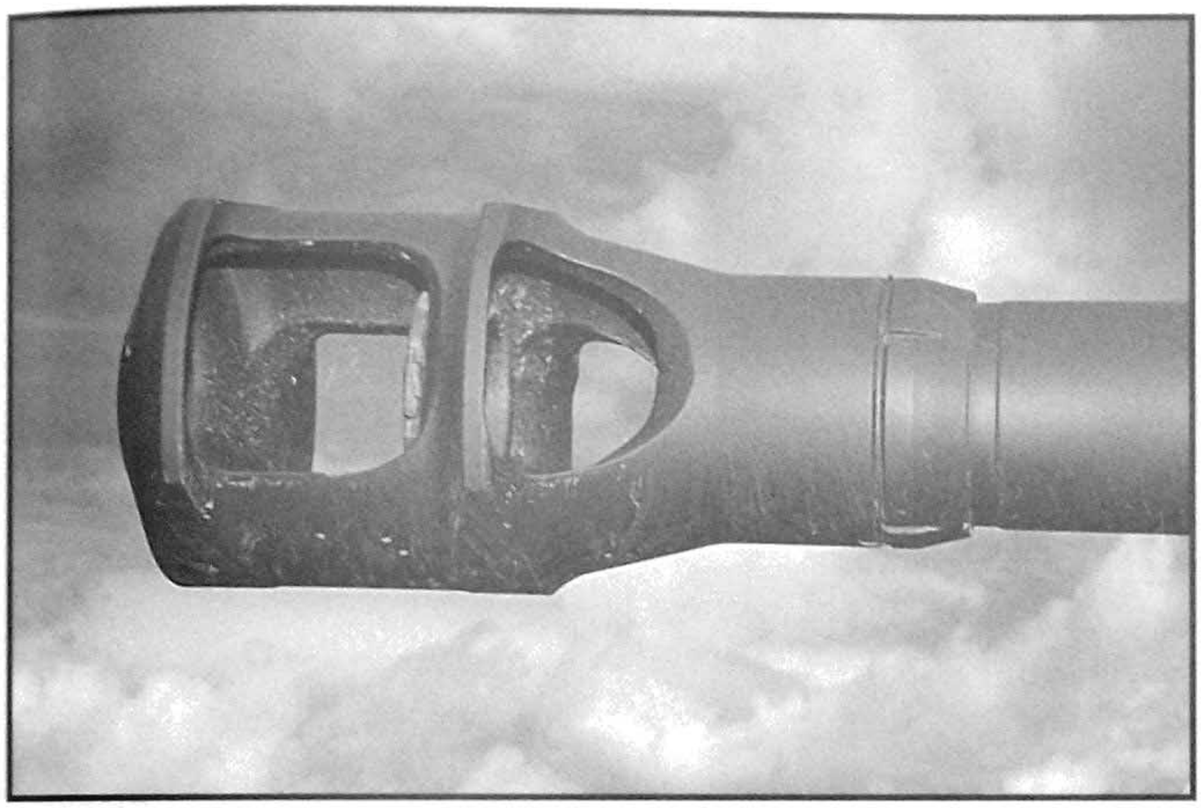
This and the following photos are of a fully restored M18 owned and operated in England. As is evident in this shot, the M18 was fairly small and had a low silhouette for such a well-armed vehicle. This one is fully stowed and crewed and has markings for 702 Tank Destroyer Battalion, 2nd Armored Division.

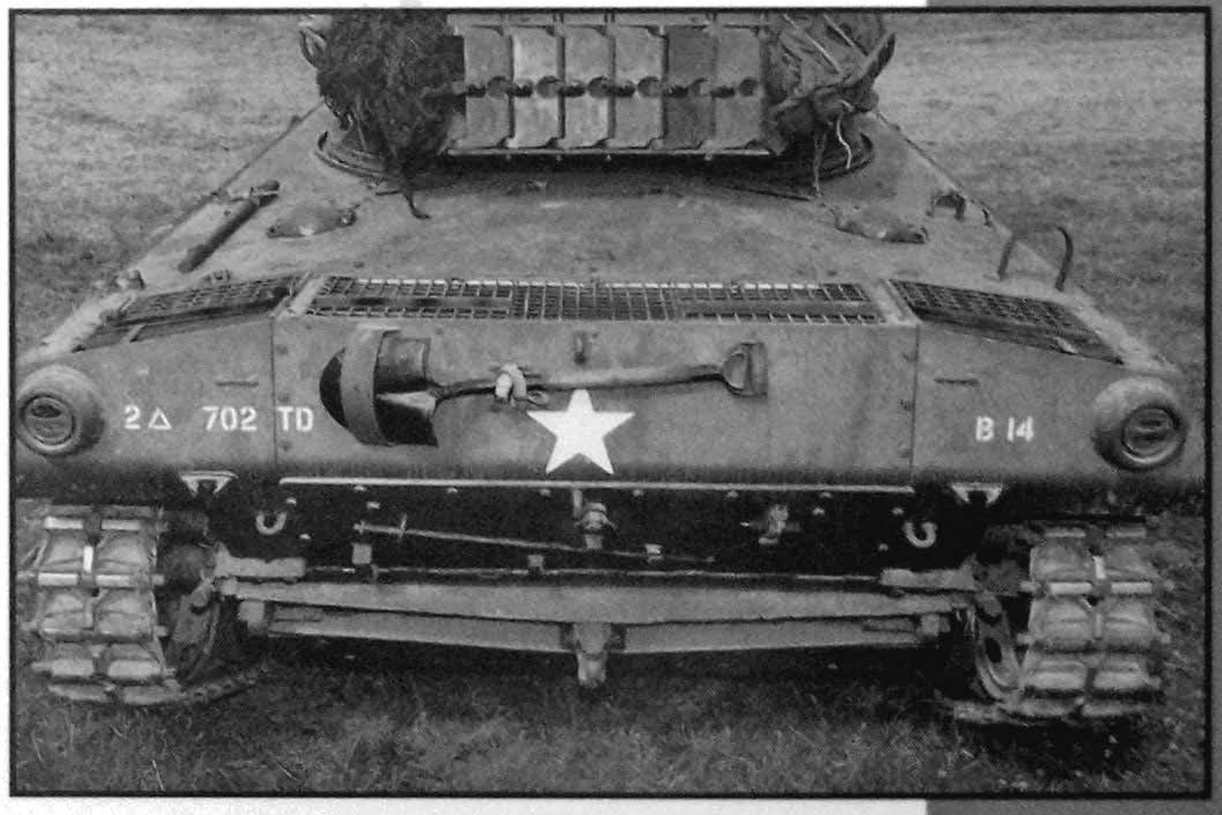
The torsion bar suspension was good and gave the M18 excellent mobility, which was a very good thing, as the armor was thin and the turret had an open top. The M18 was capable of extraordinary speed for an armored vehicle, up to 50 mph on a level paved surface.



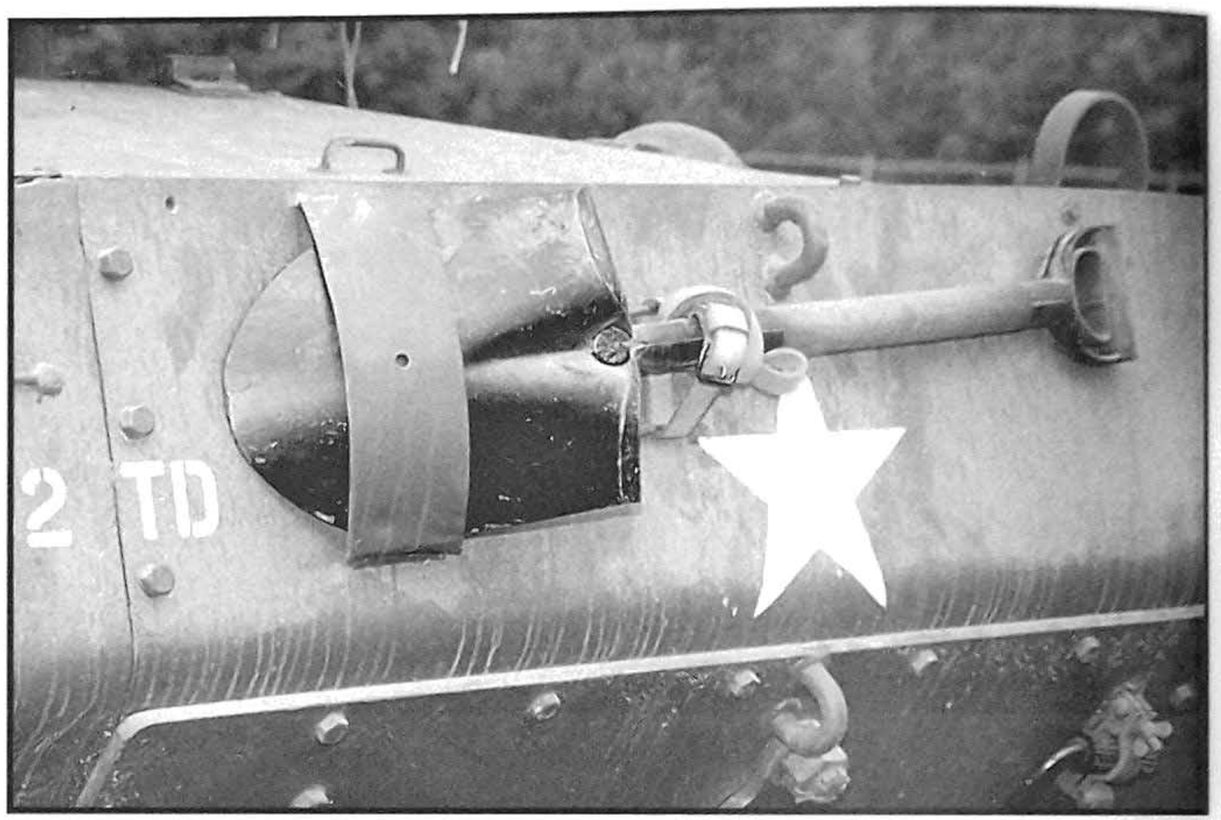


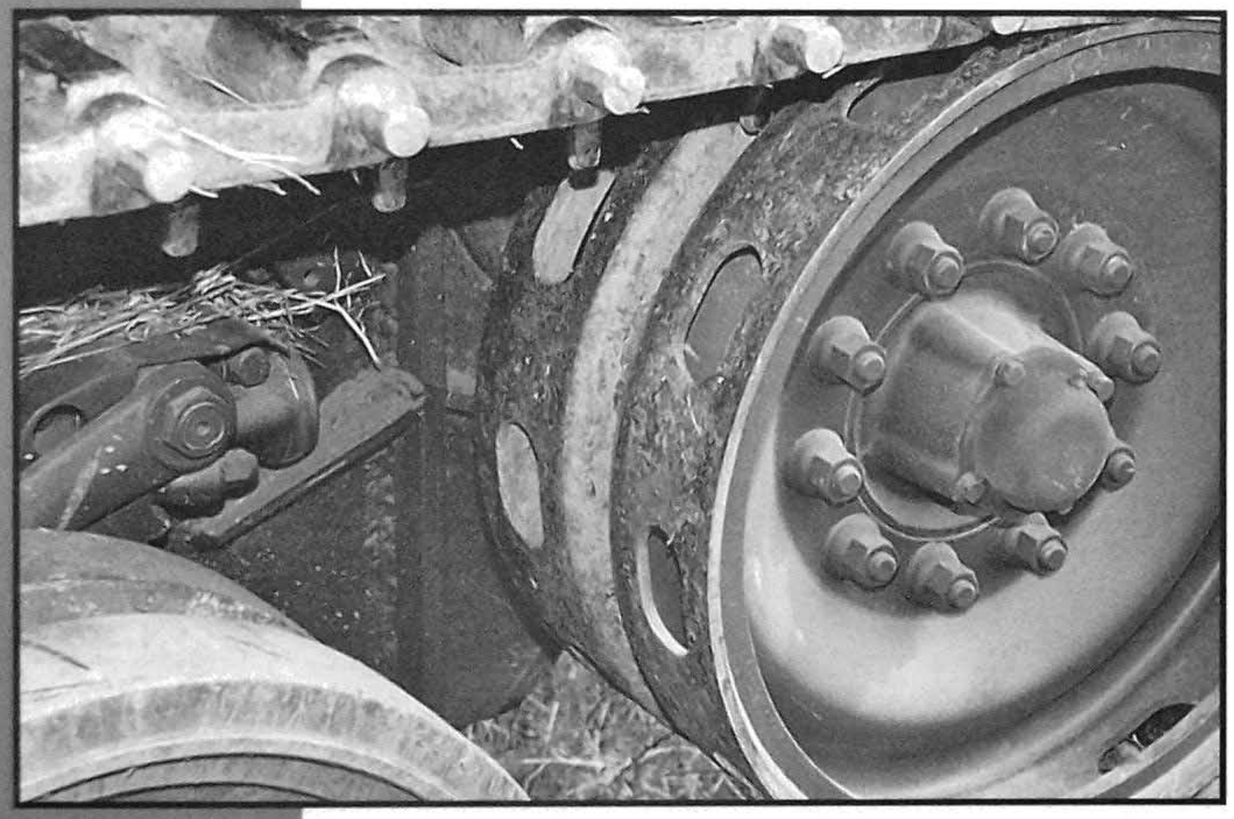
Top left: The box at the front of the turret was used to store the driver's hood and visor. The commander fired the ring mounted .50 cal machine gun. The tie down loops visible on the hull side were for storing the gun cleaning rods. **Top right:** The turret interior and all fittings were painted the same color as the vehicle exterior. The left side of the turret was formed with a bulge to allow access to the ring mounted machine gun. **Above left:** Ammunition boxes for the .50 cal machine gun were clipped into a perforated sheet metal tray. **Above right:** To operate the .50 cal M2 Browning machine gun the commander had to expose much of his upper body. This made him very vulnerable to enemy fire.

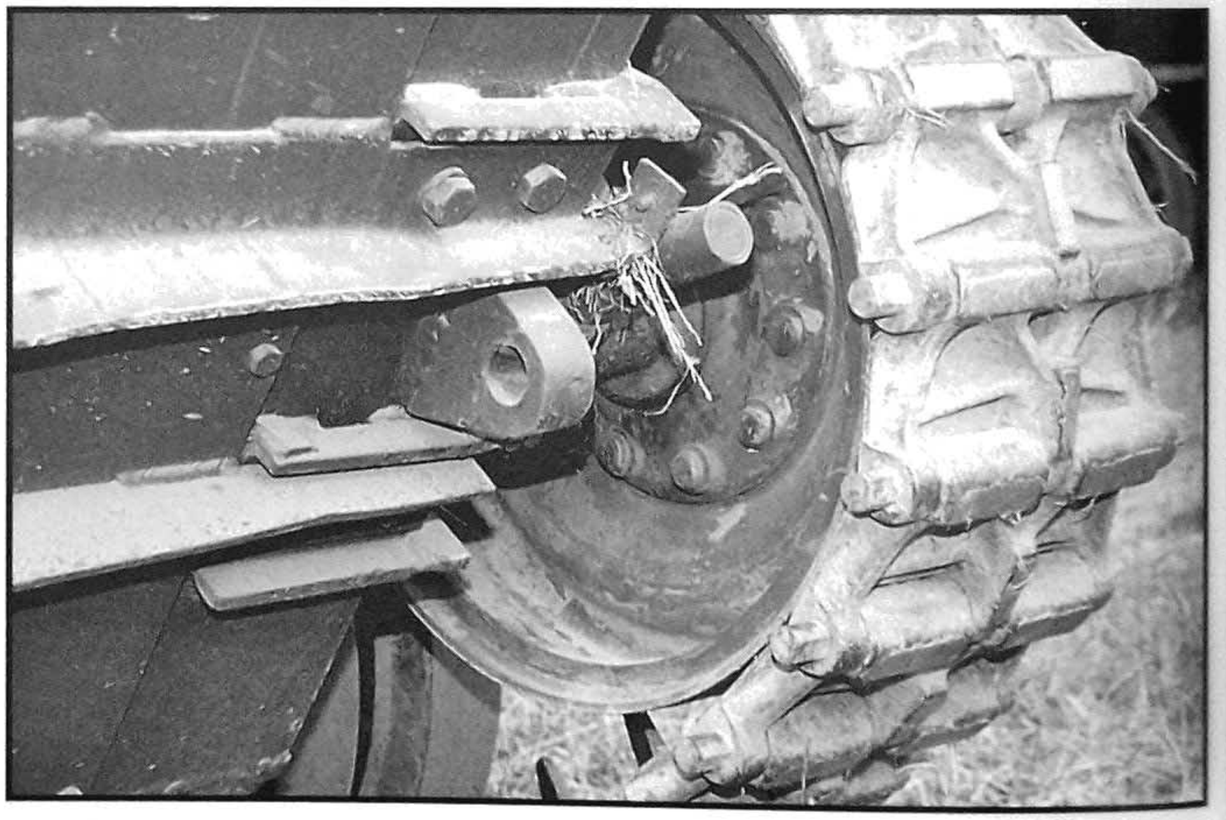




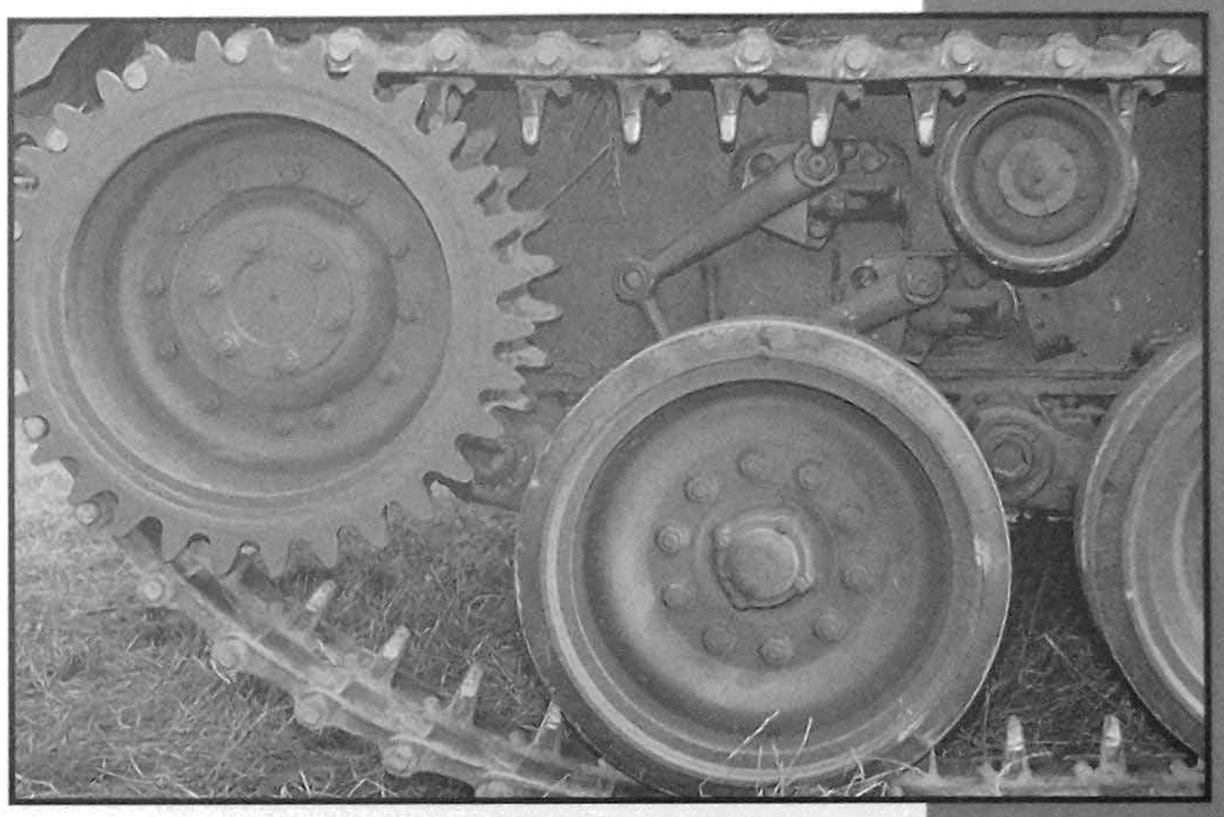
Top left: The 76mm M1A1C was fitted with a double baffle muzzle brake, which reduced the gun recoil forces. **Top right**: Access to the engine was easy owing to this bolt on panel. The panel incorporated a standard towing hook. **Above left**: Close up view of the tow hook. **Above right**: At the rear of the turret was a storage box, which had a rack for spare track links welded to it. The engine cooling air and exhausts were directed through the grills on the rear upper hull.

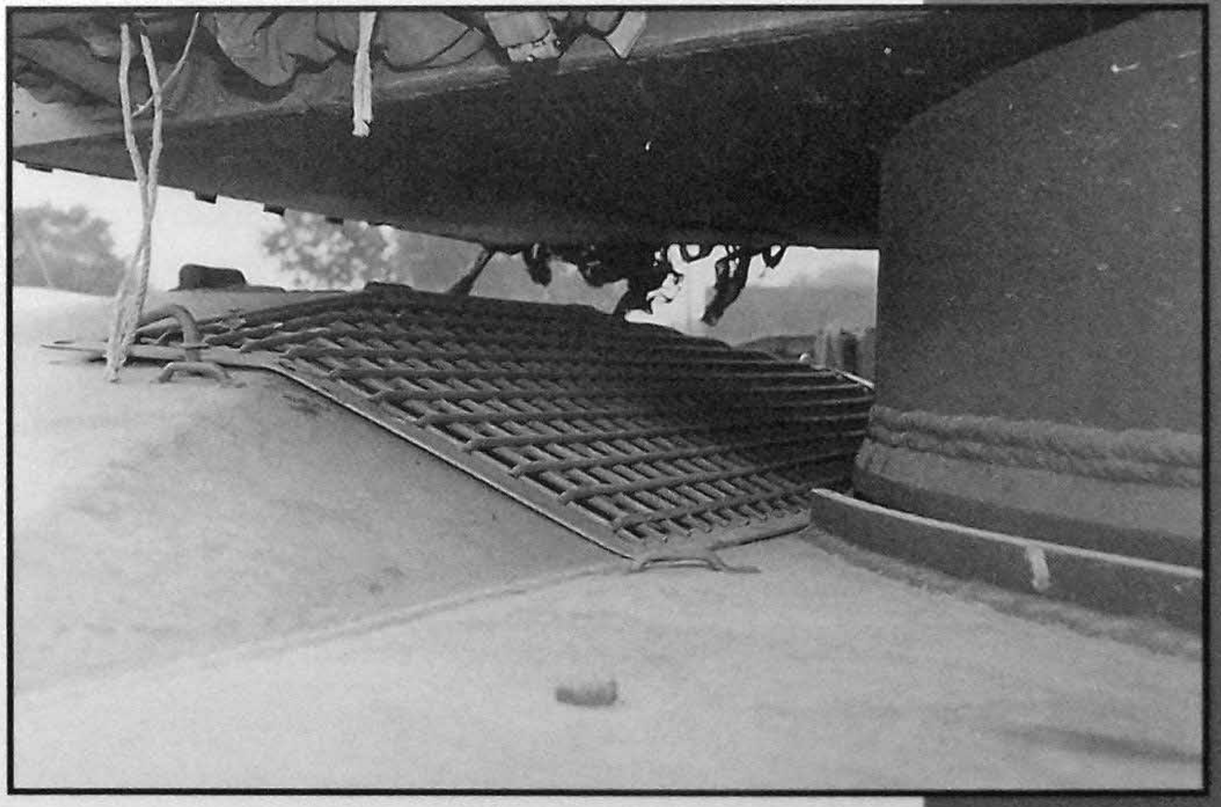




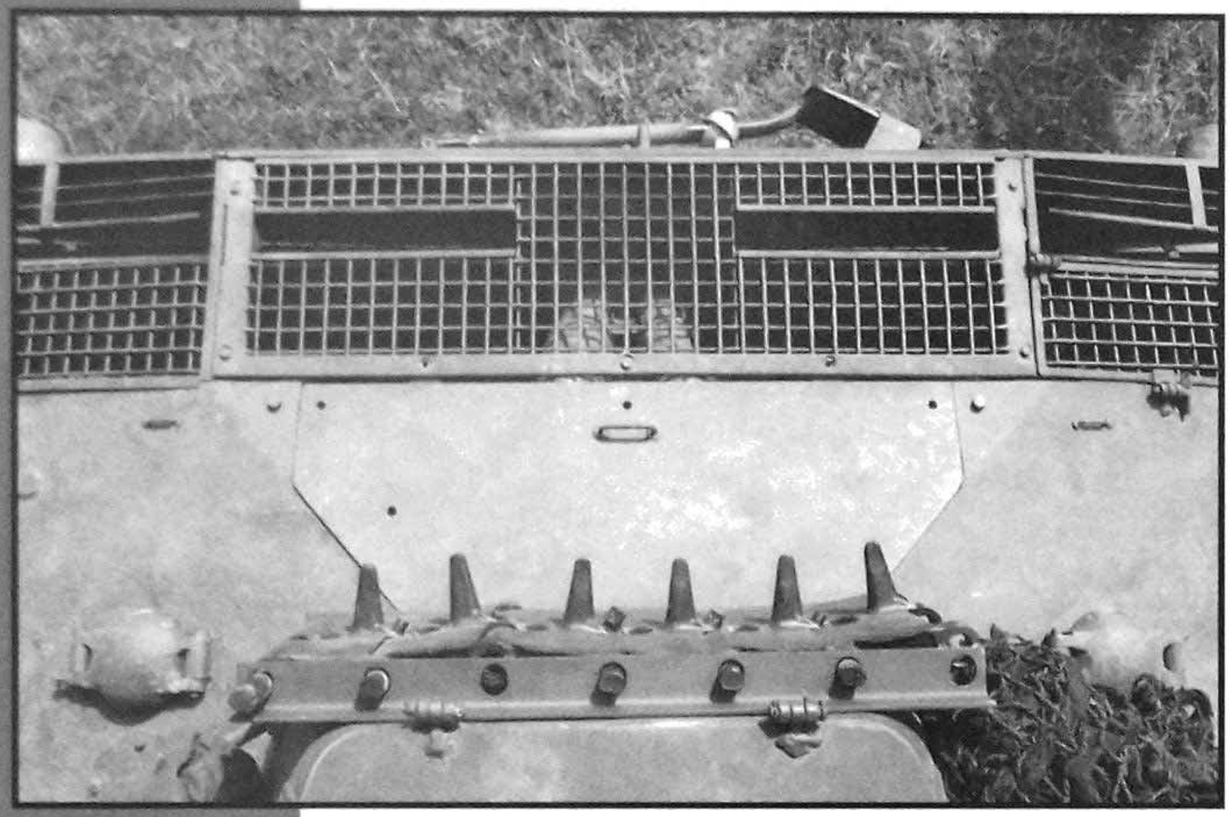


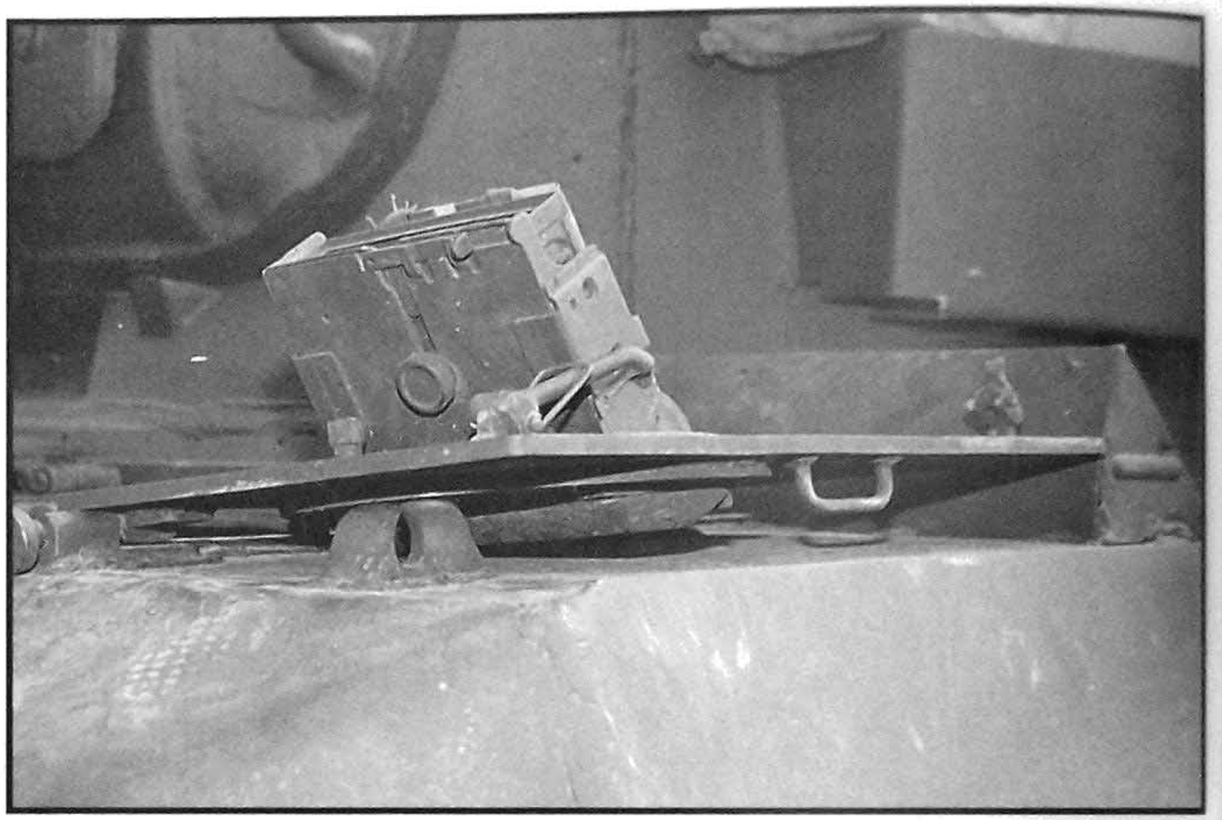
Top left: The idler wheels were made from steel pressings and had lightening holes in the rim. **Top right:** The spade was fitted to clips that were standardized on most U.S. Army vehicles. The starter crank handle was used if the electric starter system failed. However, starting a 400HP engine by hand could not have been easy! **Above left:** Shock absorbers were fitted to all road wheel stations, except the middle one. **Above right:** The T69 track was 12 inches wide and had a pitch of 5.09 inches. There were 83 links per side.

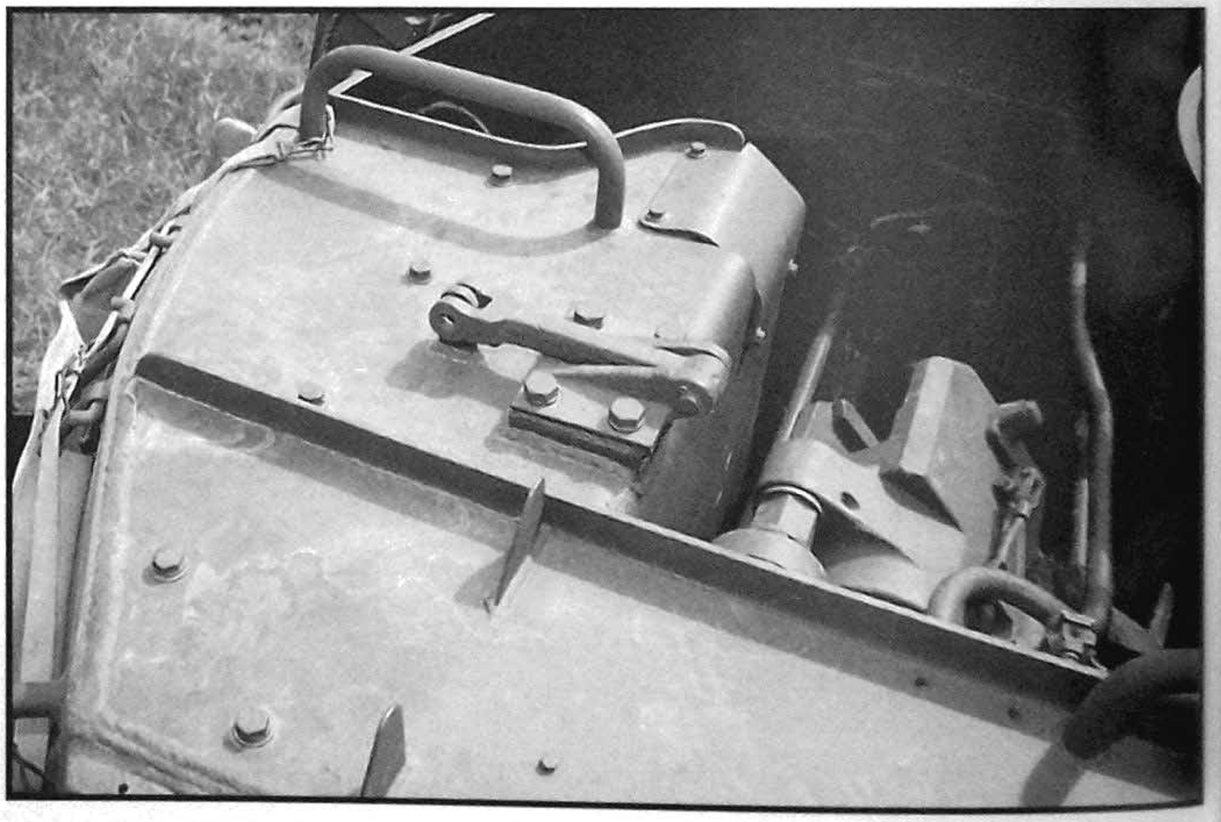




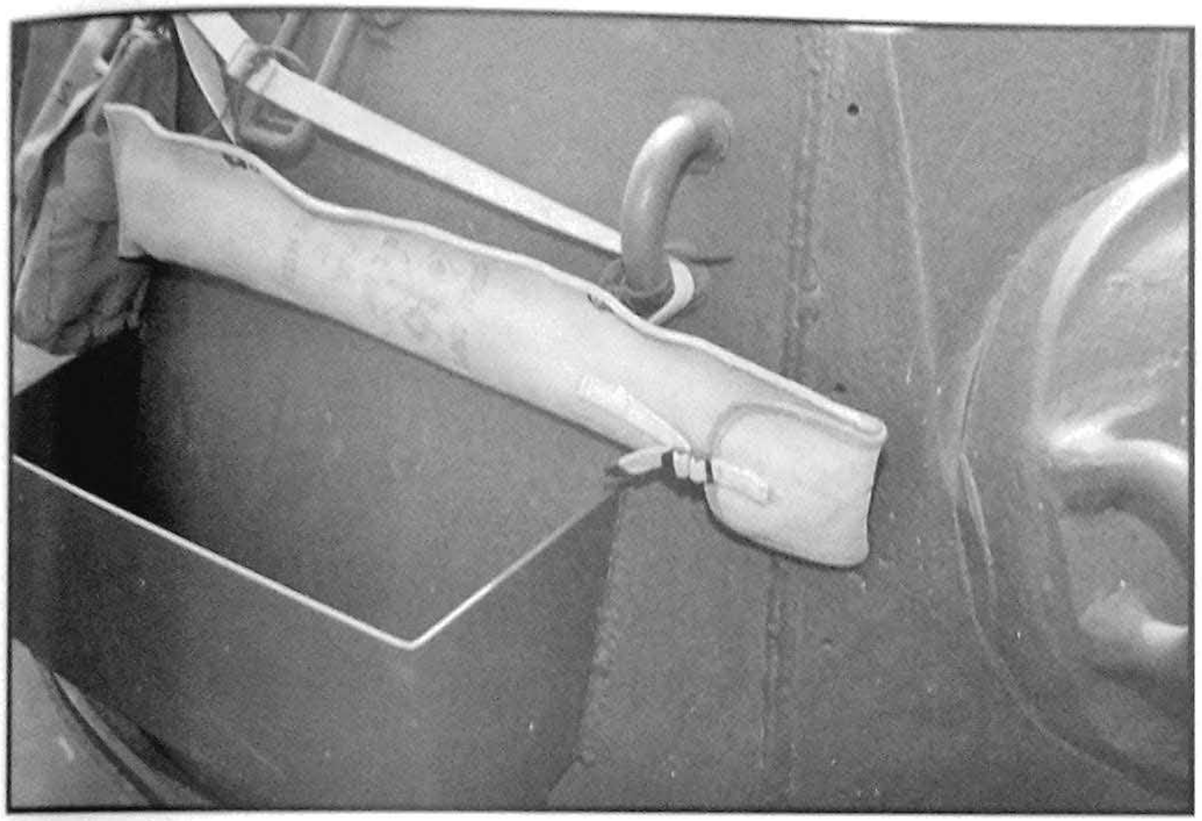
Top left: The tracks were rubber bushed and the drive was transmitted from the sprockets by the track pin ends. **Top right:** In tests on the pilot model, the commercial shock absorber fitted to the front road wheel failed in operation. As a result, two were fitted instead, one mounted above the other. **Above left:** Tools were located in steel clips, secured by leather straps. **Above right:** A stout metal grille protected the engine air intake. Overhead protection was offered by the turret bustle.

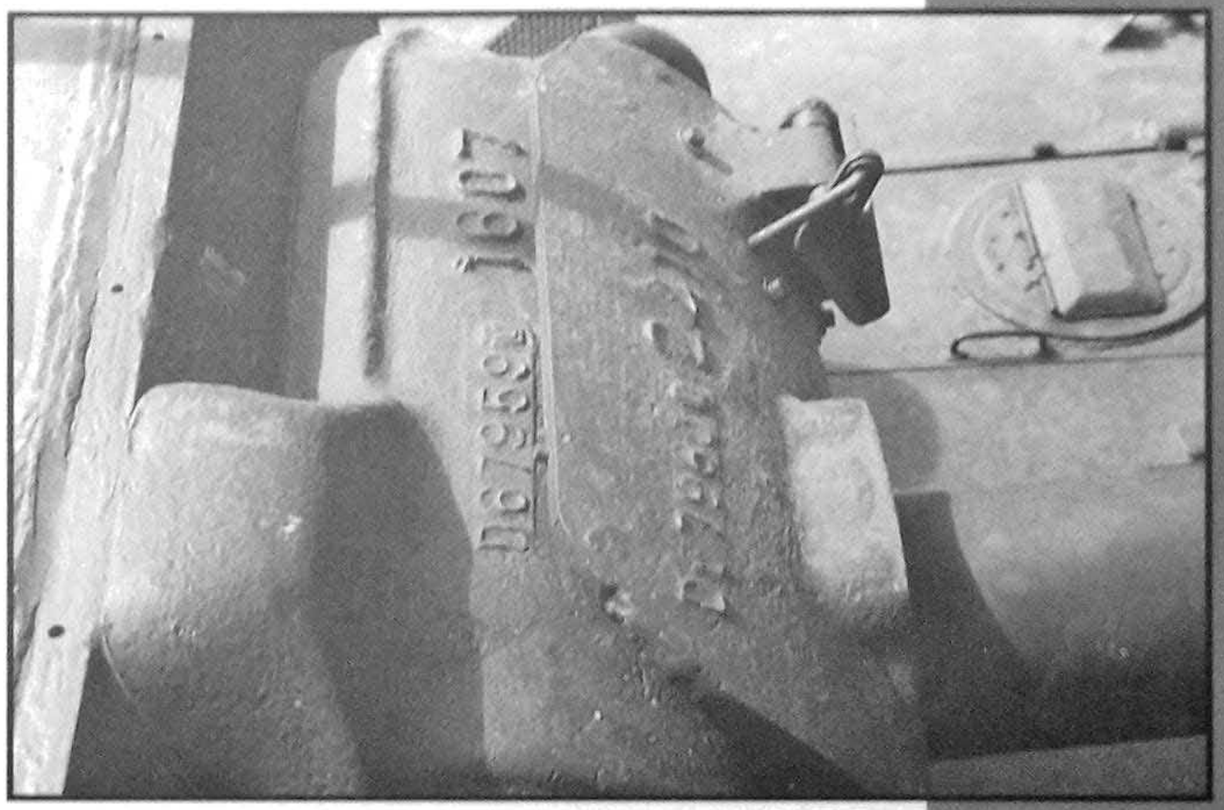


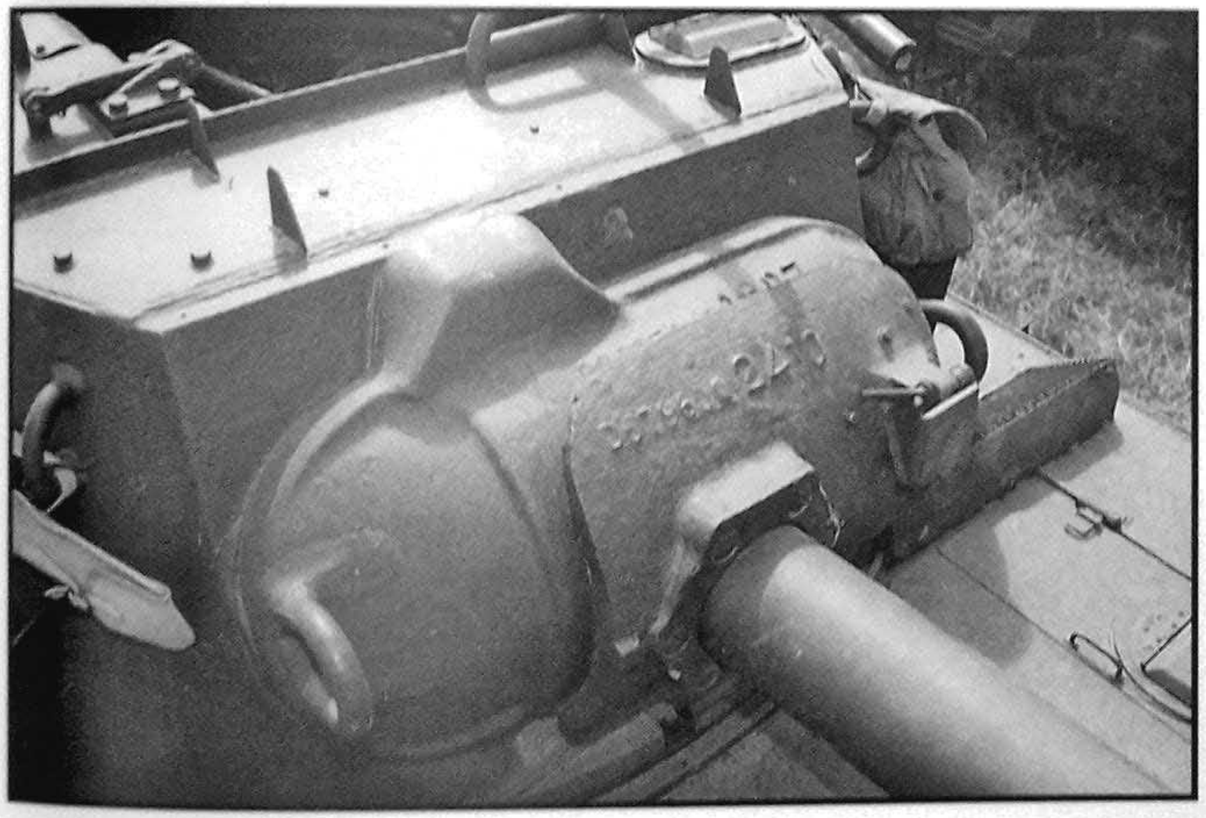


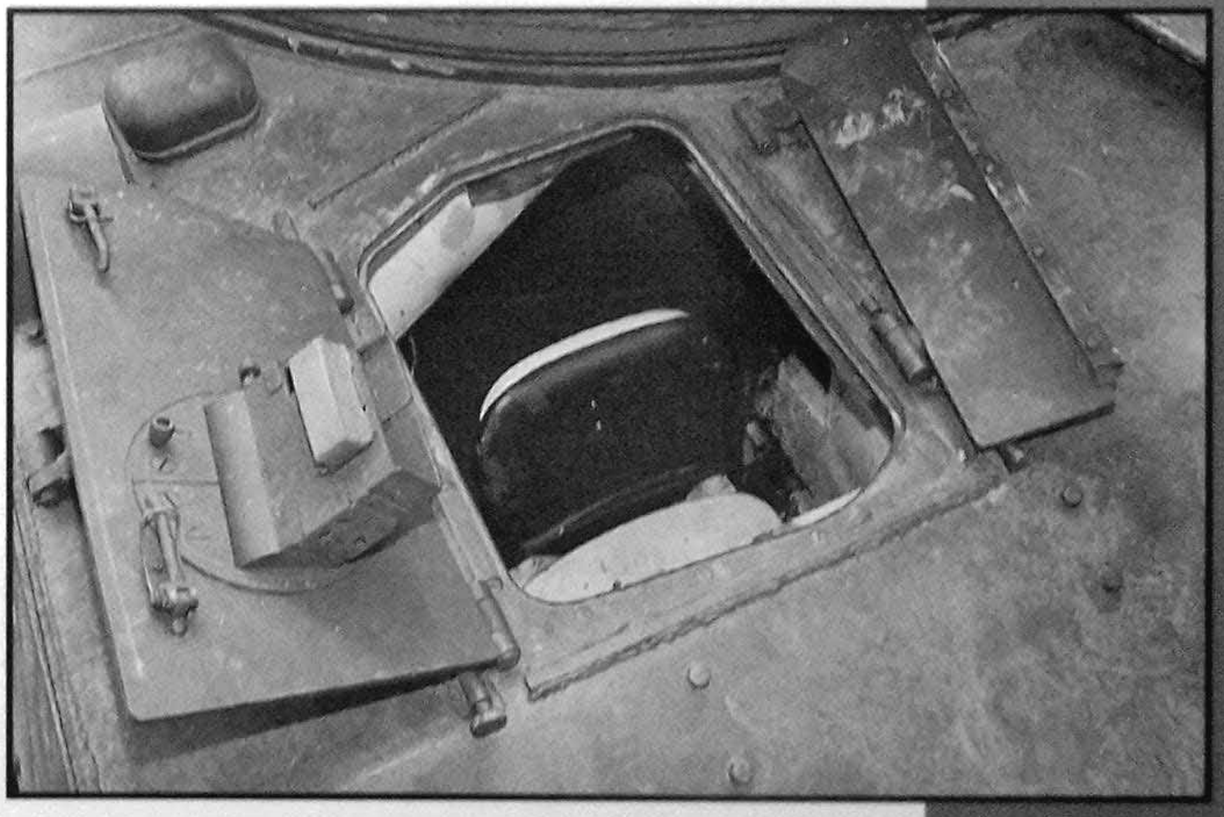


Top left: Metal grills covered the exhaust outlets on the upper hull. **Top right:** Split hatches were fitted above each driver's station. A periscope was mounted in the outer half. **Above left:** The turret cast front armor was 25mm thick. The gun shield was 19mm thick. Normally a canvas cover hid the gun shield area. **Above right:** To the left is the ammunition ready round box. Note the gun breech is turned 45 degrees clockwise, to allow easier loading in the cramped turret.

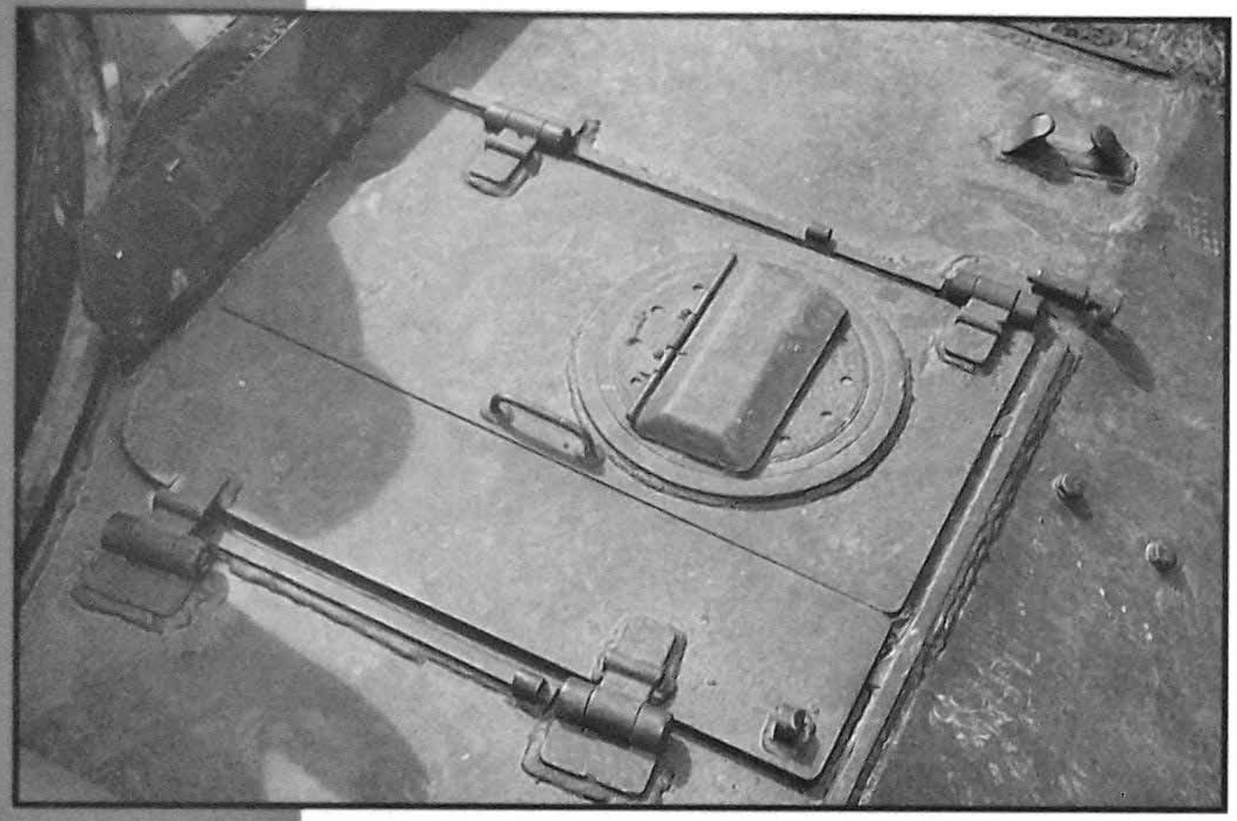


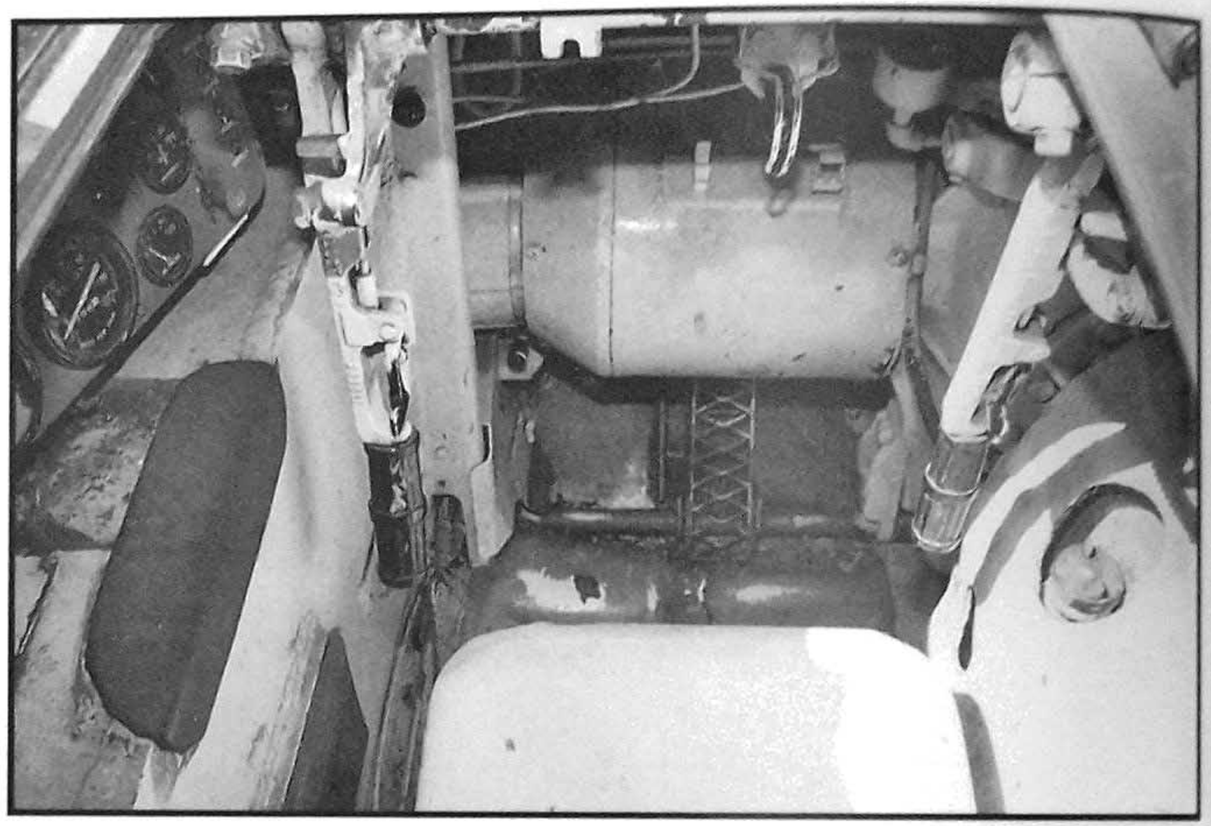


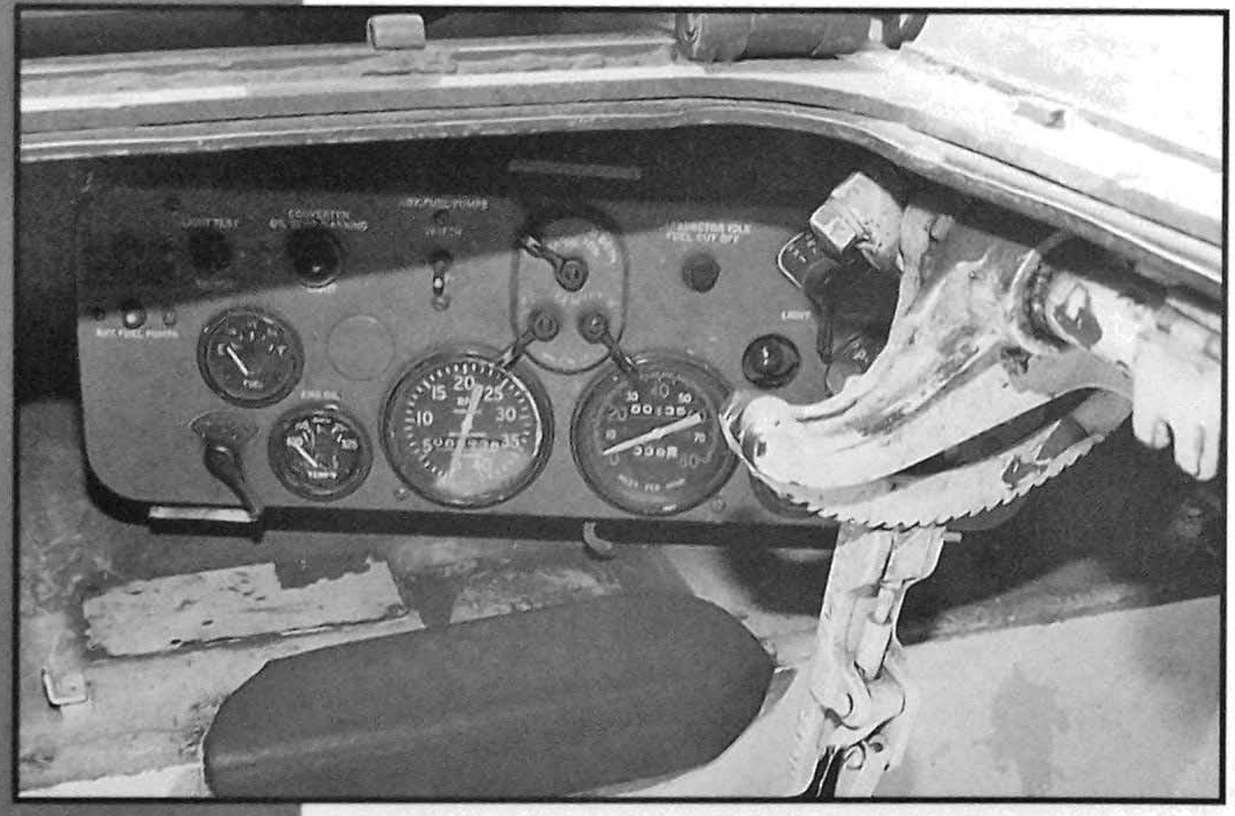


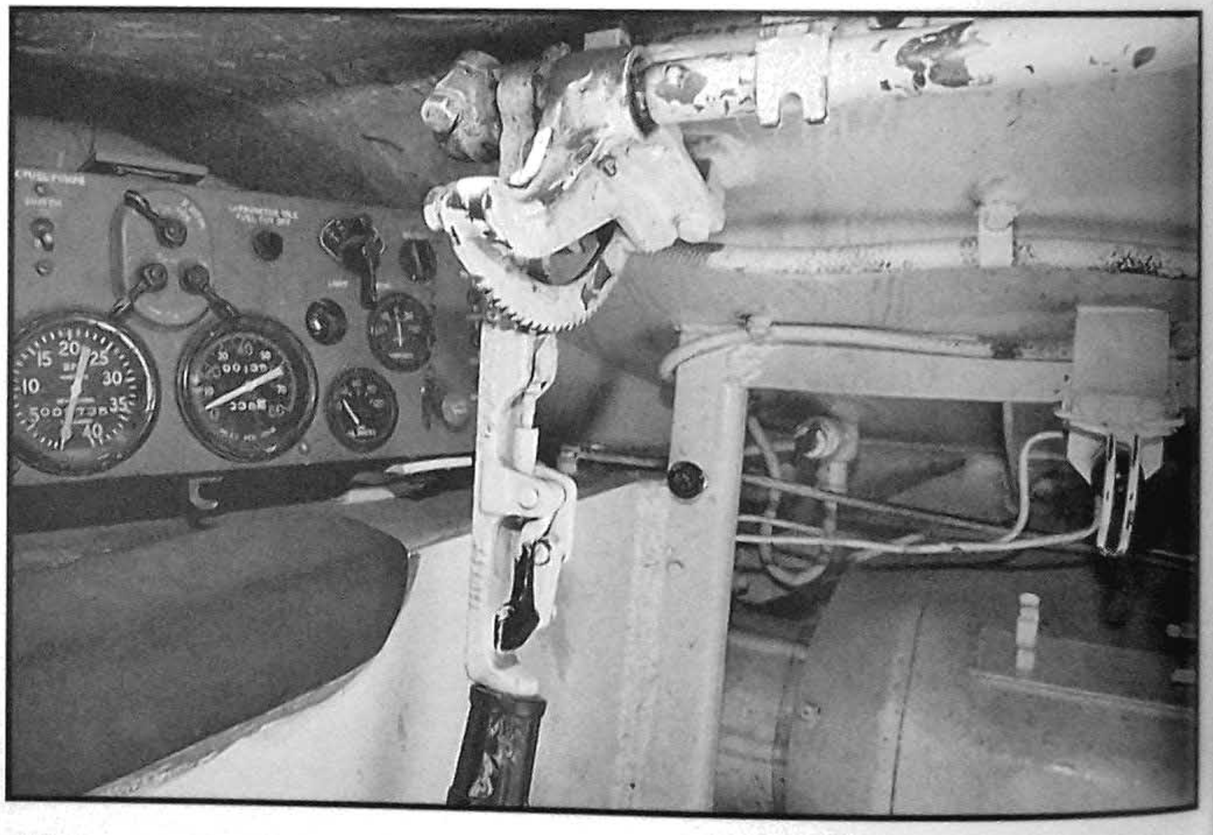


Top left: The open topped box on the turret side was the storage for the assistant driver's hood. **Top right:** The cast sections of the turret armor had part numbers set into them. The numbers were for part number, heat treatment and manufacturer. **Above left:** The gunner was provided with the M72C or M76 direct sight telescope. It was fitted with a small armored cover on the gun mantlet. The gunner was also provided with the M4A1 periscope sight, fitted to the turret roof. **Above right:** The assistant driver's hatch was split into two sections to allow it to open when the turret was in any position. A standard periscope was fitted to the outer section.

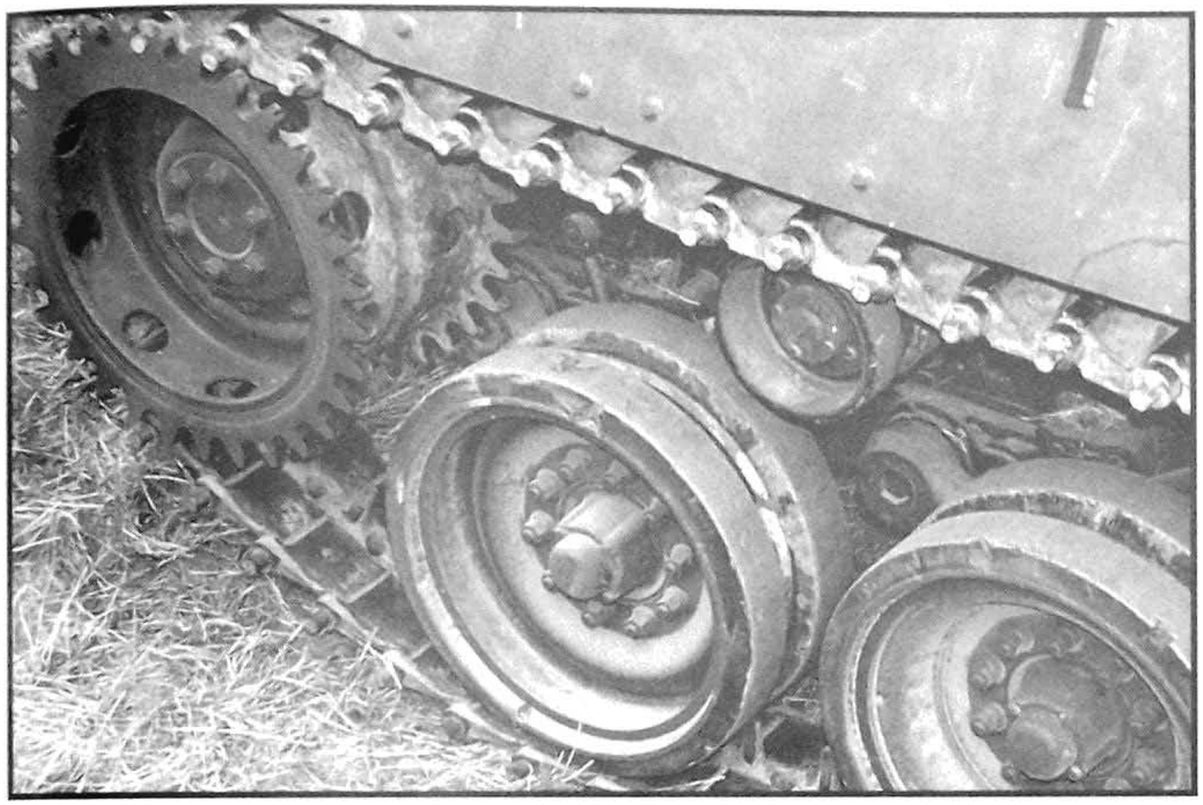


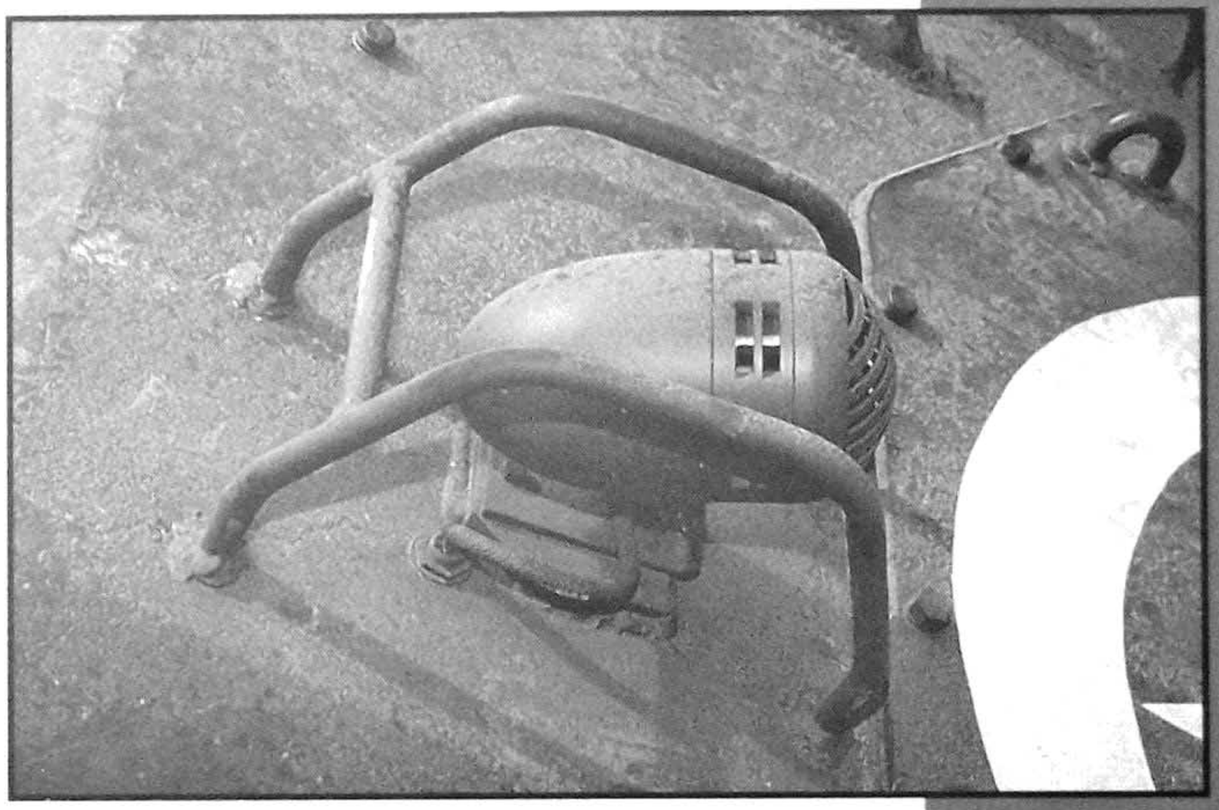


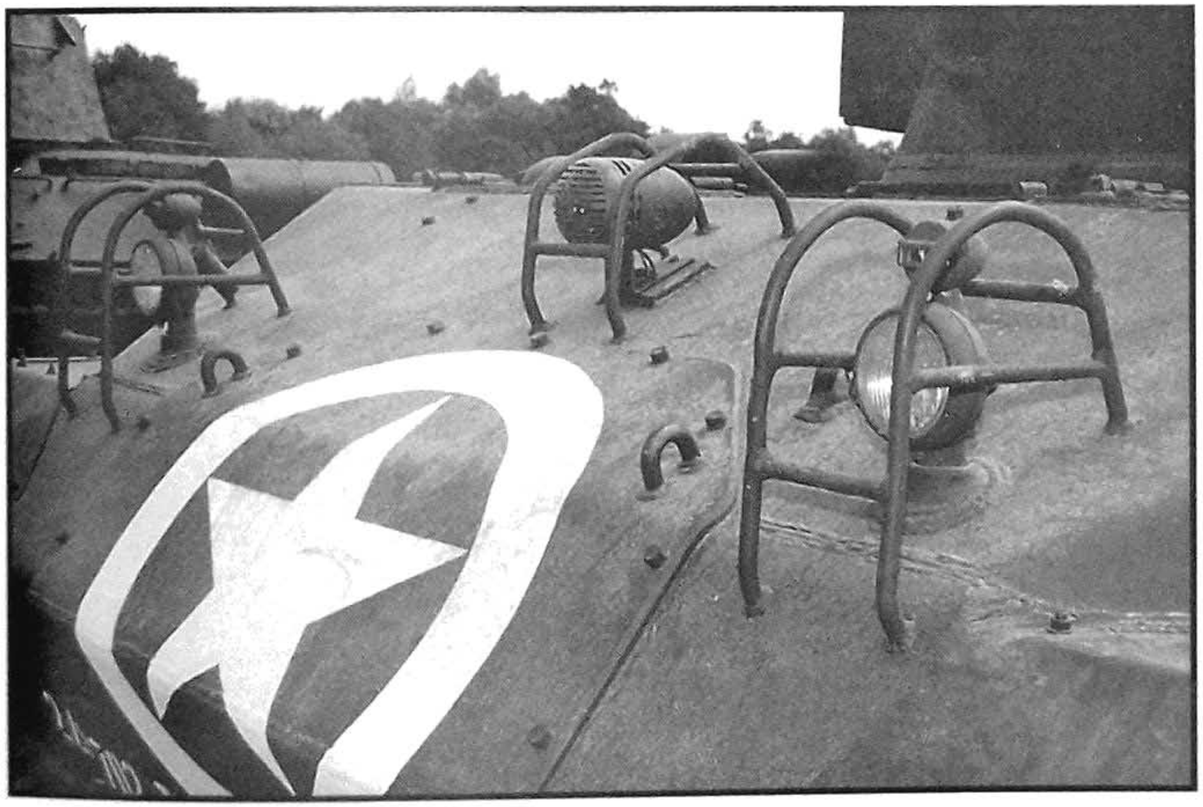




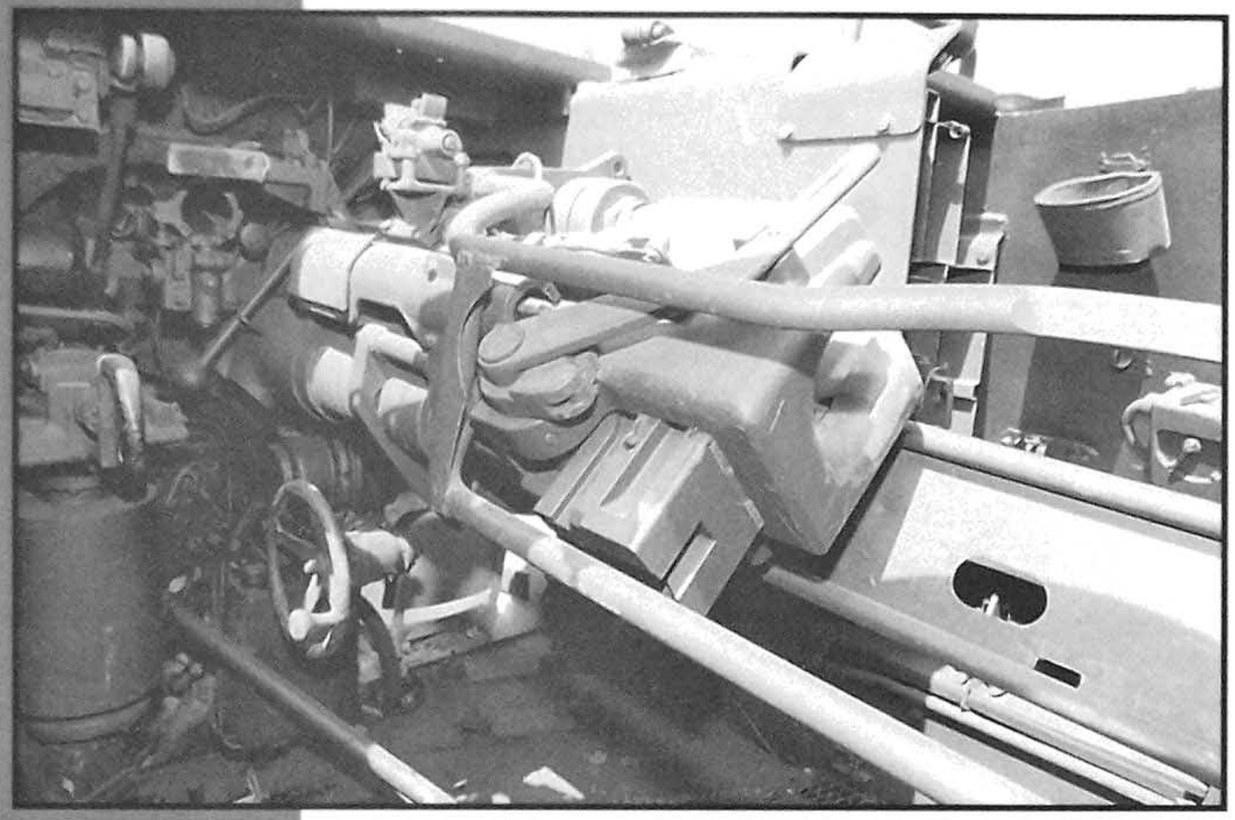
Top left: The driver's hatch is seen here fully closed. **Top right:** The hull interior was painted white, although the instrument panel was Olive Drab. The steering levers were suspended from the top of the glacis plate and were identical at both drivers' positions. **Above left:** The instrument panel gave the driver information, such as vehicle speed, engine speed, fuel contents, etc. **Above right:** There is a metal support for the glacis plate in front of the driver's position.

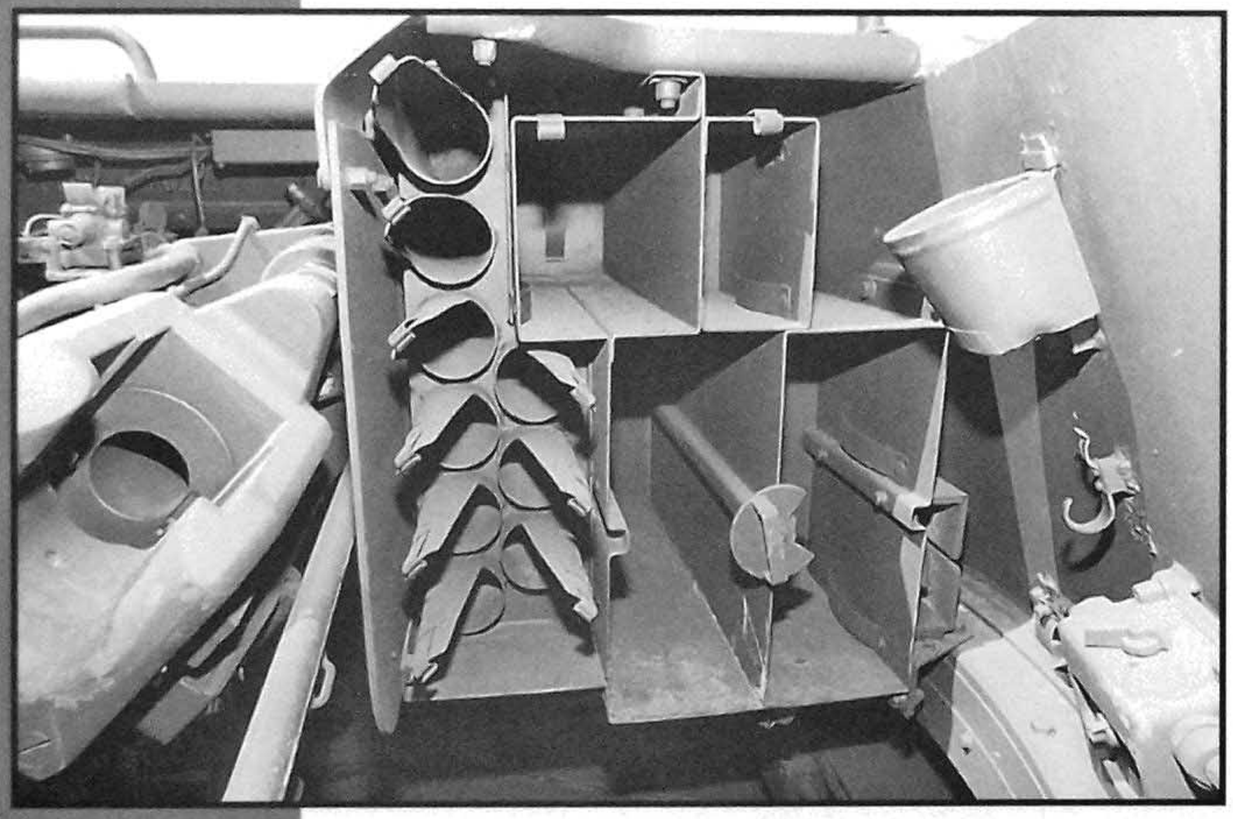




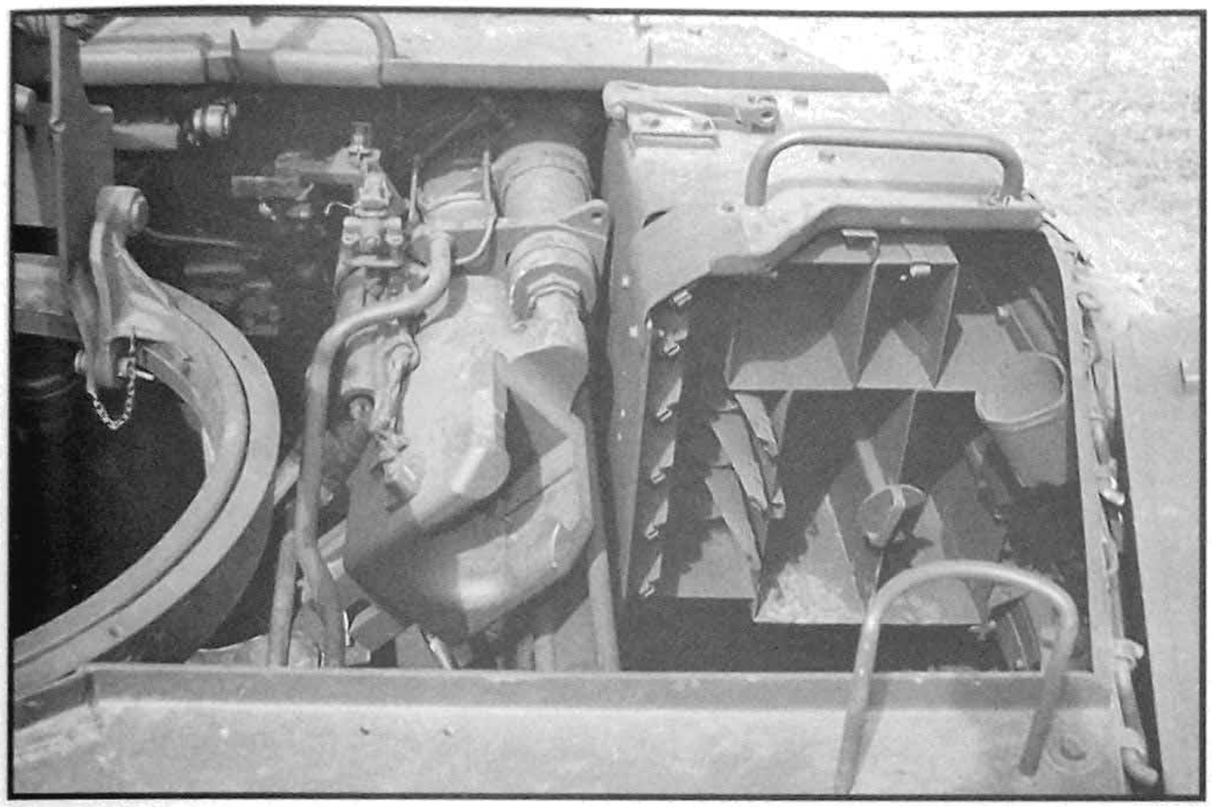


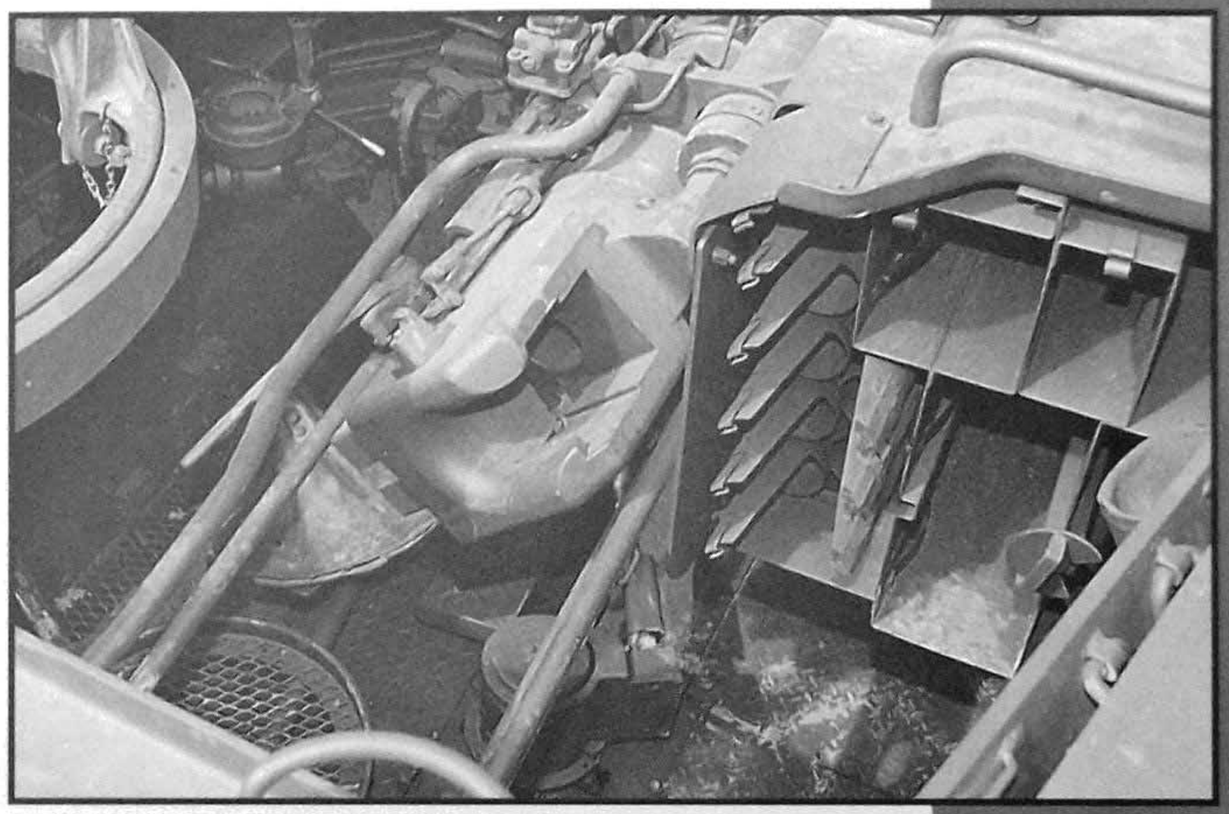
Top left: The drive sprockets had 37 teeth. They engaged with the track pins, which were 14 3/8 inches wide, with a track nominal width of 12 inches. **Top right:** The siren was fitted centrally on the upper glacis plate. It was protected by a guard made from steel rod. Earlier American vehicle guards were made from flat strip. **Above left:** This large bolt-on plate gave access to the gearbox and steering system. There are small blackout lamps fitted above the main driving lamps. **Above right:** Towing eyes were welded to the front of the glacis. Note the gearbox access plate is made from two sections welded together.

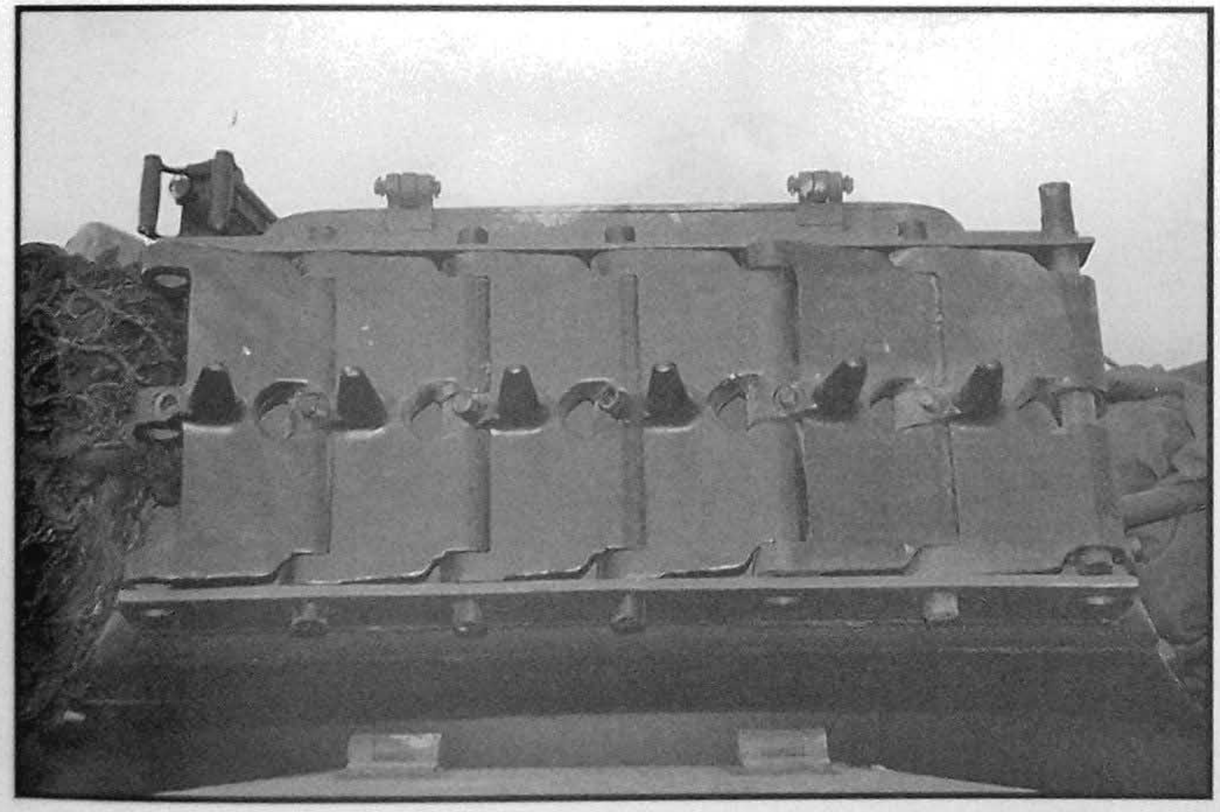


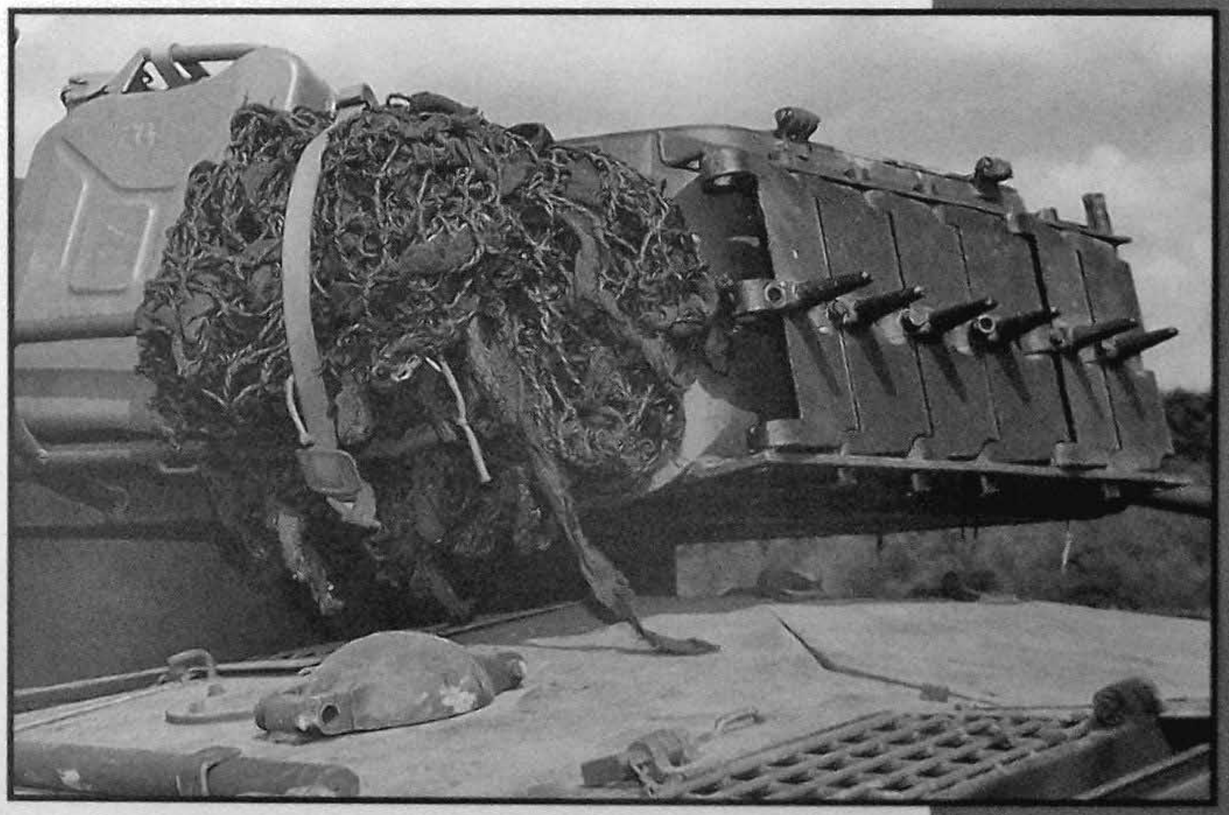


Top left: The M1A1 gun was tilted by 45 degrees towards the loader. Here the breech block is open. The gunner's controls can be seen clearly. **Top right**: Right at the back of the turret is the shock-absorbing mount for the SCR 610 radio set. **Above left:** The ammunition ready rack was fitted next to the main gun, in front of the loader. A total of 45 rounds of 76mm ammunition was carried, with 9 rounds in the turret ready rack and 18 in each hull sponson. **Above right:** The M1A1 gun was fitted with a guard to prevent crew injury when the weapon recoiled. Note the commander's seat was formed from expanded metal mesh. This was because he needed to stand on it to operate the .50 cal machine gun.

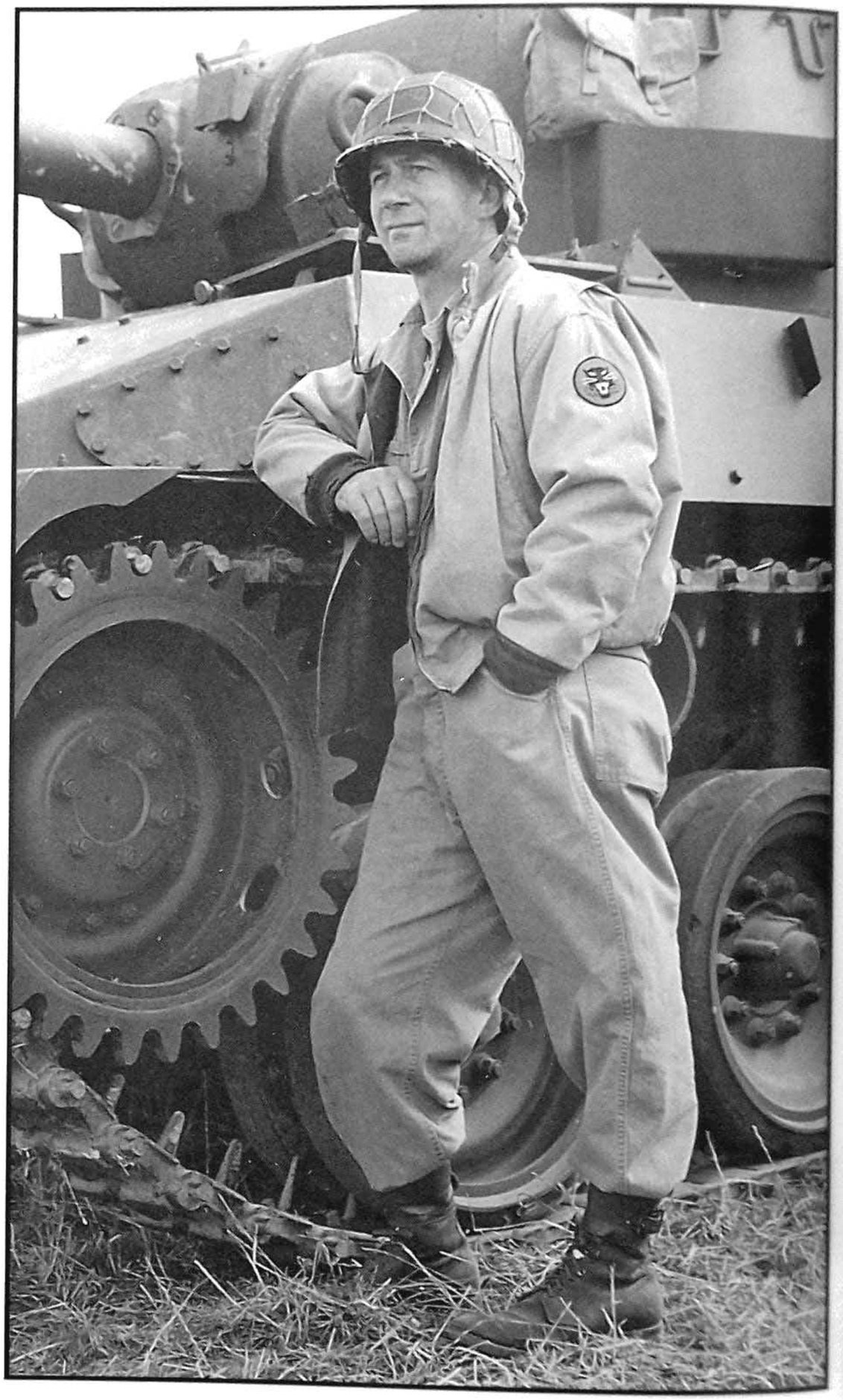








Top left: The turret was very cramped. There was only just enough room for the gun and the crew; so most personal equipment was stowed outside the vehicle. Note the minimal clearance between the gun and the ready rack. **Top right:** The turret had only a partial floor, what can be seen here are the main hull floor plates, which cover the suspension, batteries and drive shaft. The turret electrical slip ring assembly can be seen immediately below the gun breech block. **Above left:** Six track links were stored on a rack at the rear of the turret. Each track pin was held in place by the pinch bolt located behind the center guide tooth. **Above right:** The side racks could hold nets, fuel cans, ration boxes, etc. There was little spare room inside the vehicle.



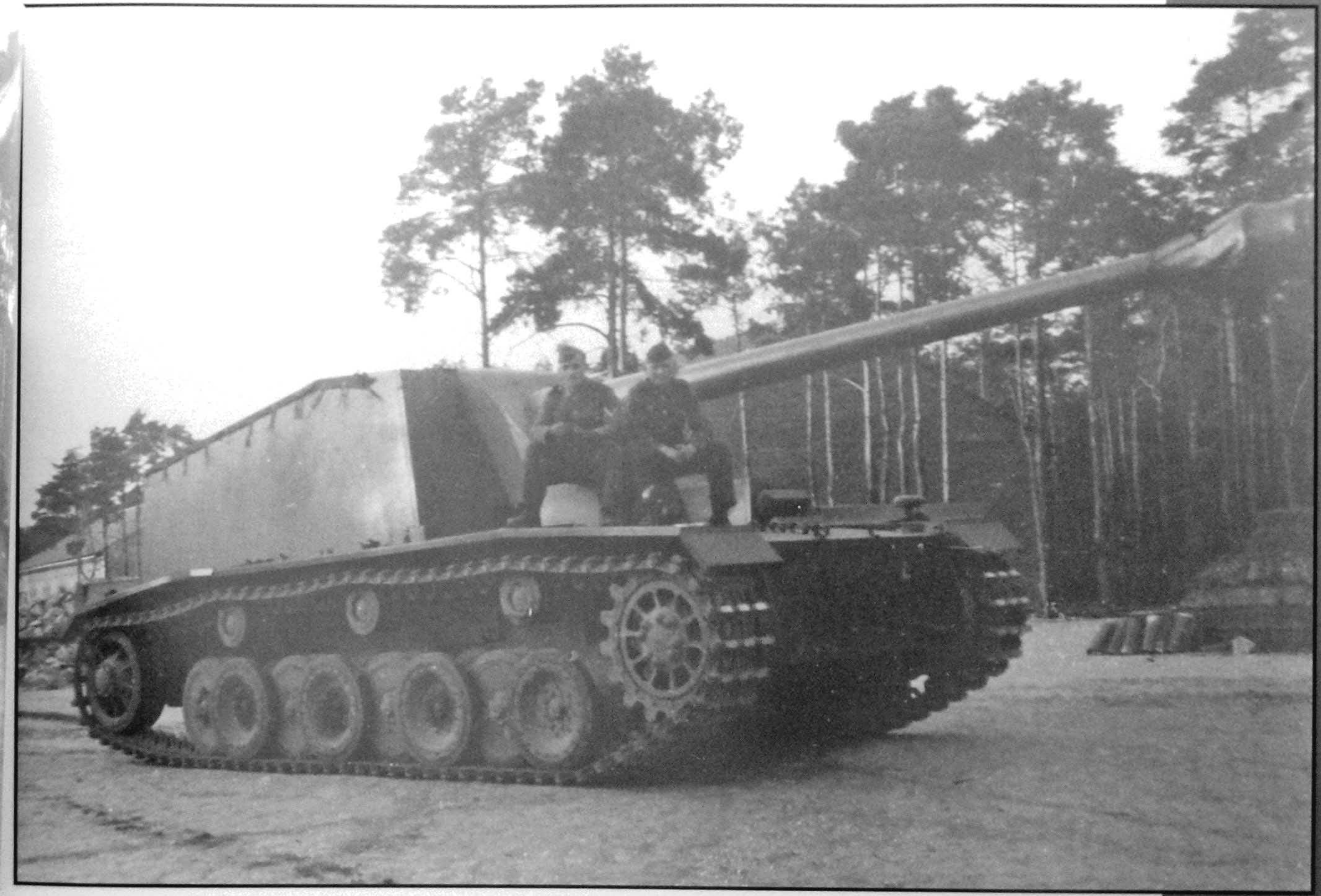
Above: Welded on loops were provided near the racks, so items could be secured with straps. Note how thin the metal is on most sections of the M18. Most of it was vulnerable to machine gun fire! **Right:** Typical attire for a Tank Destroyer crewman in Europe 1944/45. Warm clothing was an essential in an open topped combat vehicle, such as the M18. Although the crew was issued the standard tanker's "football" style helmets, the steel helmet was much more common. This was, no doubt, due to the increased level of protection provided by the steel helmet. Note the tank destroyer logo displayed on the patch on the trooper's left shoulder.

Panzerselbstfahrlafette V "Sturer Emil"

In 1941 the situation seemed to be favorable for Germany. Western Europe was defeated and largely conquered. After "Operation Seelöwe" had to be dropped, Hitler turned towards new aims. In late 1940 the German general staff evaluated its own inventory of armored vehicles. Since "super heavy" British and American tanks were expected to appear on the battlefield in the near future, this evaluation brought only poor results. Neither the Panzer III nor the Panzer IV seemed equal to the task. Ironically, the army intelligence (Fremde Heere Ost) was unaware of the most modern Soviet tanks like the KV and T-34 at this time. However after confronting them, the German "medium" tanks were obsolete over night. Stop gap solutions had to be developed in emergency programs. Only the high degree of training and a generally superior tactical leadership prevented the total collapse of the eastern front in the winter of 1941/42. The development of the Pz.Sfl. V (Panzerselbstfahrlafette V) has to be viewed under these premises—a stop gap solution using interesting existing components.

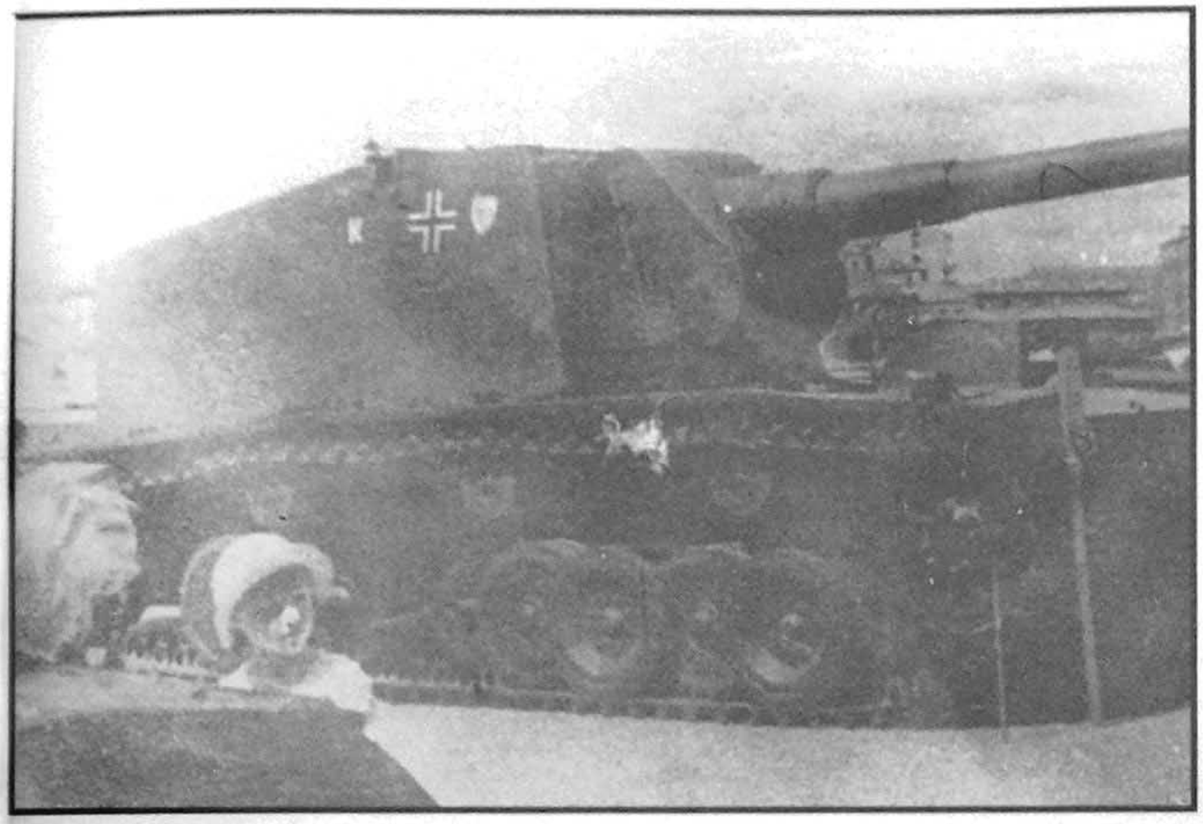
German technicians chose the largest gun available for the Pz.Sfl. V, the massive 12.8cm gun with its outstanding capabilities. Two prototypes of the VK 3001, artifacts from the evolution of the famous Tiger tank, served as the basis for this self propelled gun. This amalgamation resulted in an extremely powerful design, of which a mere two vehicles were actually built. Ballistic data was tremendous. In some confirmed battle situations T-34 tanks were destroyed at ranges in excess of 4,500 meters! Brought into action favorably, this weapon system could surely have made great use of its advantages. It was nicknamed "Sturer Emil" by the troops. **Above:** Pz.Sfl. V, Wagon 1 in its home garrison of Wünstorf, probably autumn 1941. The early style head lamps are evident. (K. Voigt)

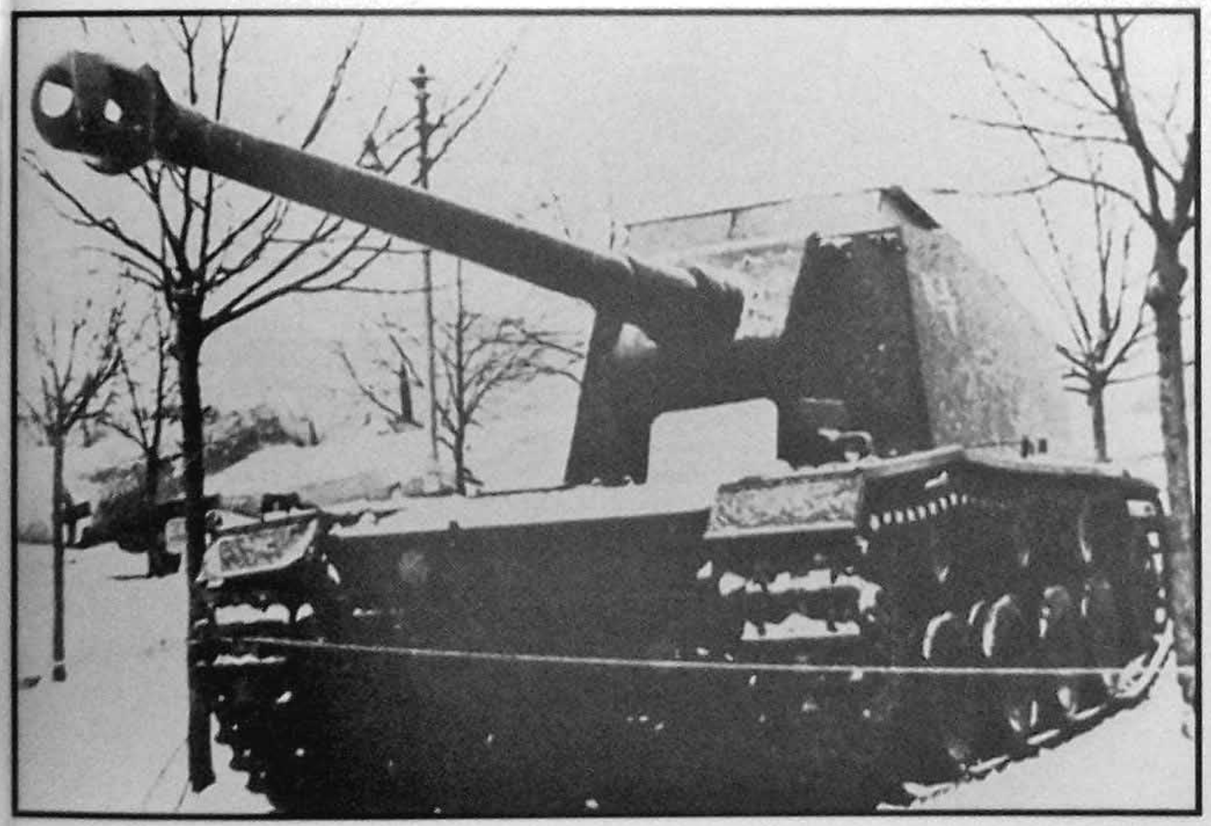
The Pz.Sfl. V had many shortcomings. The vehicle, elongated by adding one running wheel per side, turned out to be a little too long and showed an unfavorable center of gravity. To avoid staggering and shifting after firing, both frontal and aft torsion bars were reinforced. This reduced riding comfort significantly. Due to the long ground contact of tracks, the final drives were over stressed. This problem was worsened by the fact that self-propelled guns had to follow moving targets by moving the entire vehicle. **Above:** The same vehicle as the previous page photographed some time later. Now a letter "L", possibly for "Lehr" (training), seems to have been added. The weird shaped parts on the hull's roof plate have not been identified. (H. Fleischer)

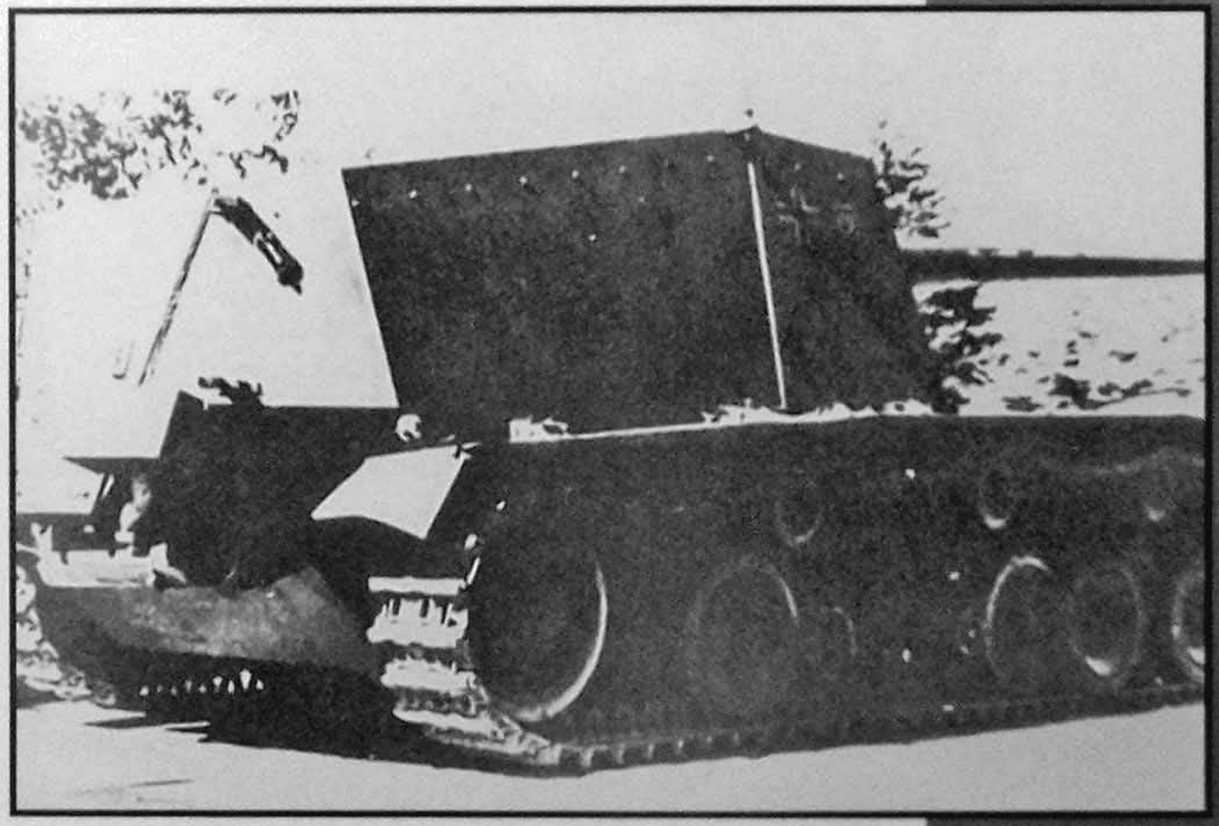


To lay the gun, any rough side traverse had to be made by the vehicle itself. Ambush positions were revealed easily, because the engine had to run in order to match every move of the target vehicle. The engine, with its performance of 300 HP, proved to be too weak. Its maximum speed of 20 km/h was too slow. All steering maneuvers inflicted steady wear on the engine as well, especially in muddy terrain. Since the engine was situated in the center of the fighting compartment, normal crew communication was almost impossible under combat conditions. An intercom was not provided. The excessive heat inside the vehicle undoubtedly affected the crew adversely. **Above:** Although strictly forbidden, these vehicles were photographed quite often. (H. Fleischer)

The rate of fire of the Pz.Sfl. V's gun was comparatively slow. To bring the breech in line, the barrel had to be lowered to load after every round fired. The ammunition was of two piece type and rendered loading even more difficult. Since neither hull nor gun came from large-scale production, the supply of spare parts caused severe problems for the supply units. Every small part, road wheel and gasket, not to mention the special two-part ammunition, had to be sent on a 2,000 km journey to the eastern front. **Above:** Only one year after the previous photos, Wagon 2 moves slowly through the southern Russian steppes. Extra tracks were added, foliage was used to conceal the vehicle without success. Wagon 2 was fitted with two fuel cans. (K. Münch)

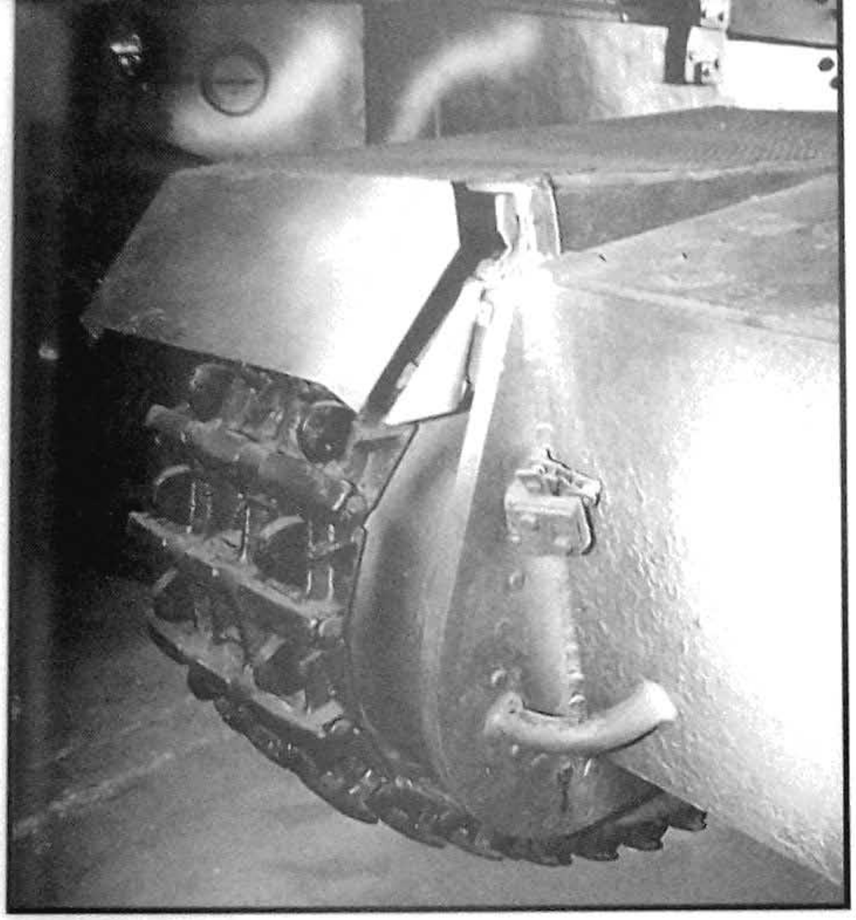


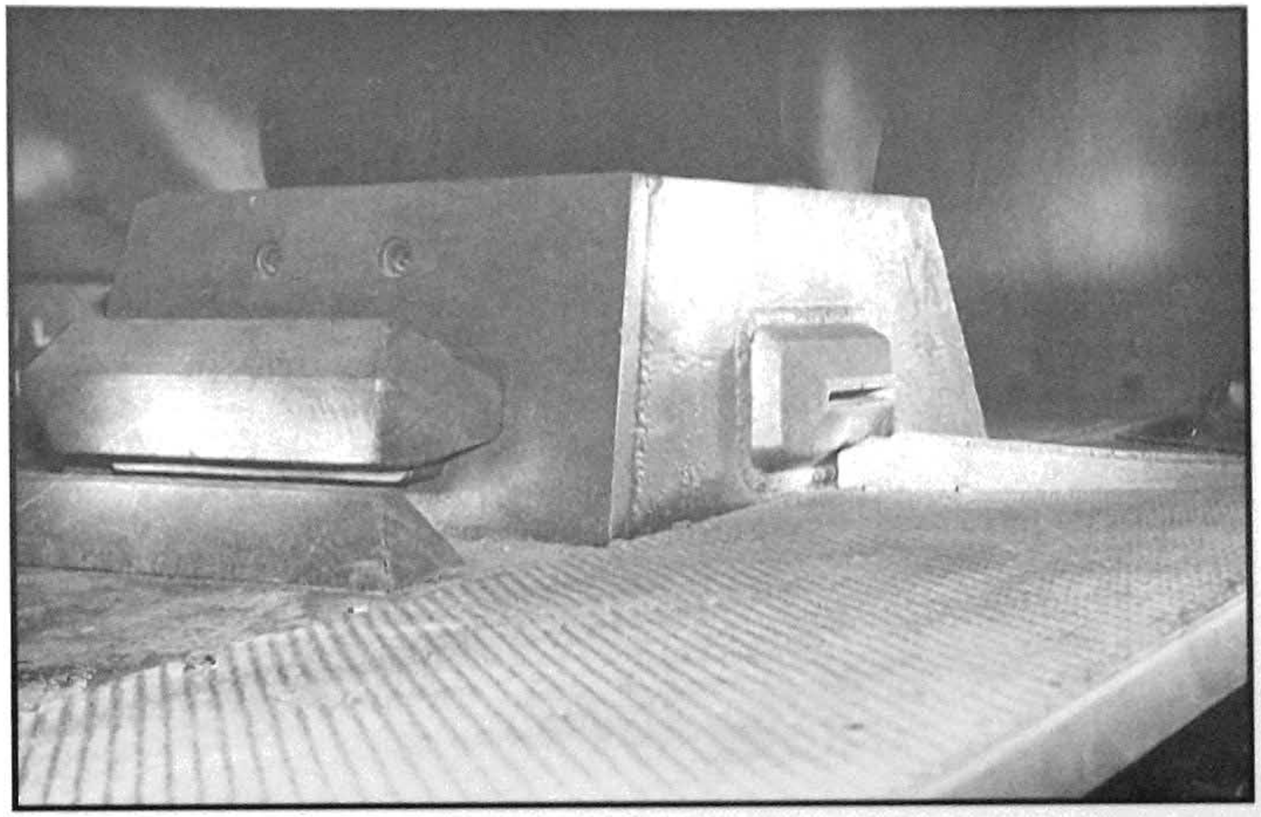


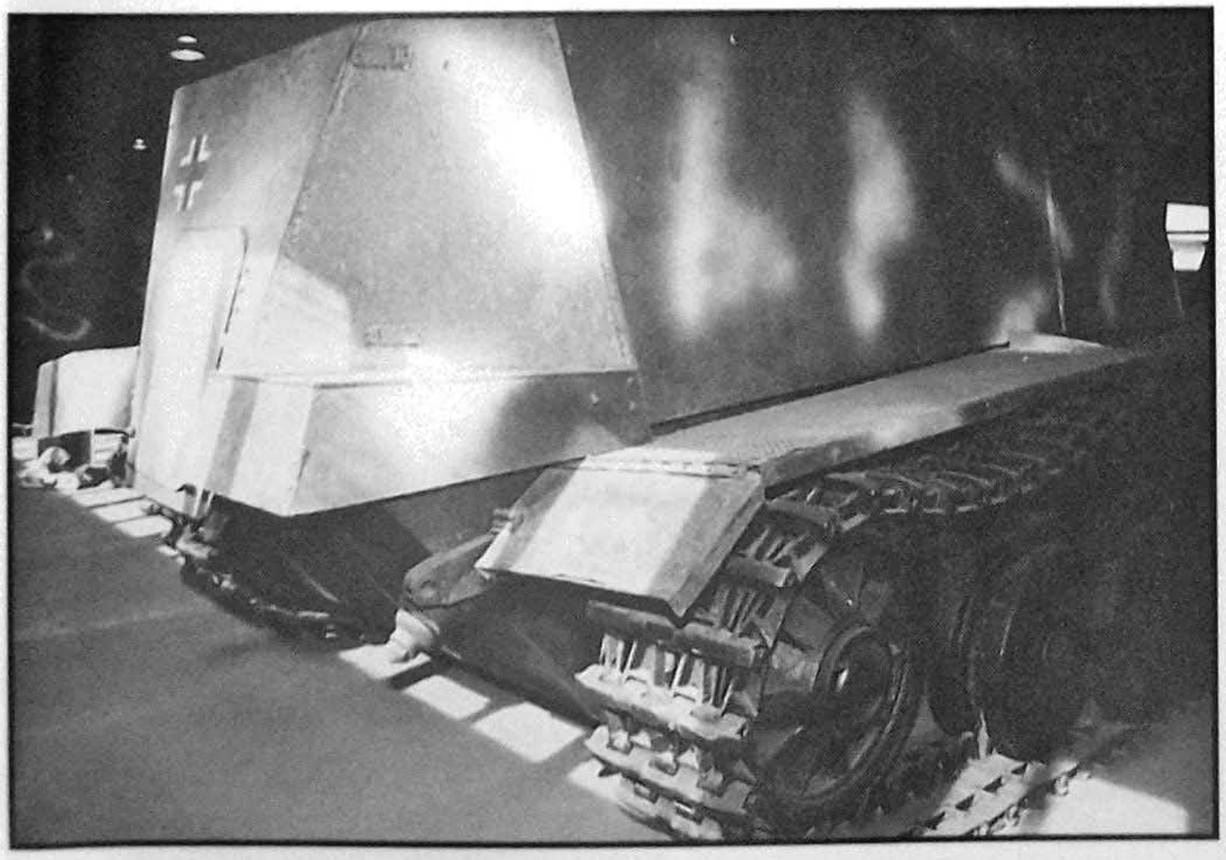


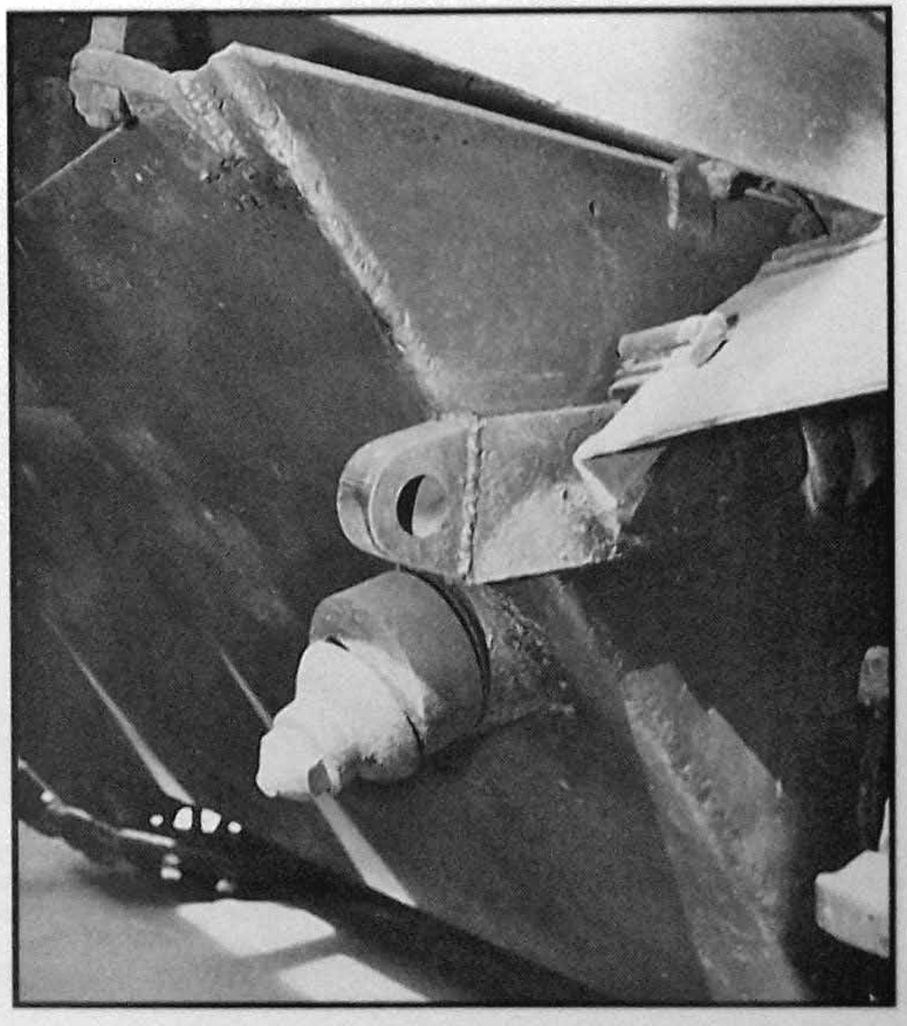
Little is known of combat experiences of these heavy SP guns. Most probably they were not issued earlier than spring 1942. The Panzerjäger-Abteilung 521 (tank destroyer battalion) received both guns. At this time, the battalion's main strength consisted of towed 5 cm Pak 38 and Panzerjäger I (4.7 cm) tank destroyers. **Top left:** Wagon 2 during a victory parade probably held during summer 1943. The markings are clearly visible. Note the missing running wheel. The battalion badge is evident as is the letter "K." Also note the position of the antenna. (S. Netrebenko). **Top right:** The markings are also visible here. (S. Netrebenko). **Above left:** Wagon 2 shows a rain cover, probably a Soviet modification. (Photo S. Netrebenko). **Above right:** The markings on the rear plate are barely visible. (Photo S. Netrebenko).

Later in 1942, two further companies equipped with Panzerjäger II (7.62 cm) Marder II were sent to reinforce the weakened Abteilung. With this equipment, it fought its way south to Stalingrad, where it would perish in January 1943. At that time, at least one vehicle was still operational, as the Soviets managed to capture an example in good condition. This booty was presented to the Russian public during several subsequent celebrations. It was stored for years under the open sky, until it found a final resting place in the tank museum at Kubinka, were it still can be viewed today (above). Although all the vehicles at Kubinka have been repainted, obscuring their original color schemes, this has probably helped preserve them. Perhaps restoration will take place at a later date (?).

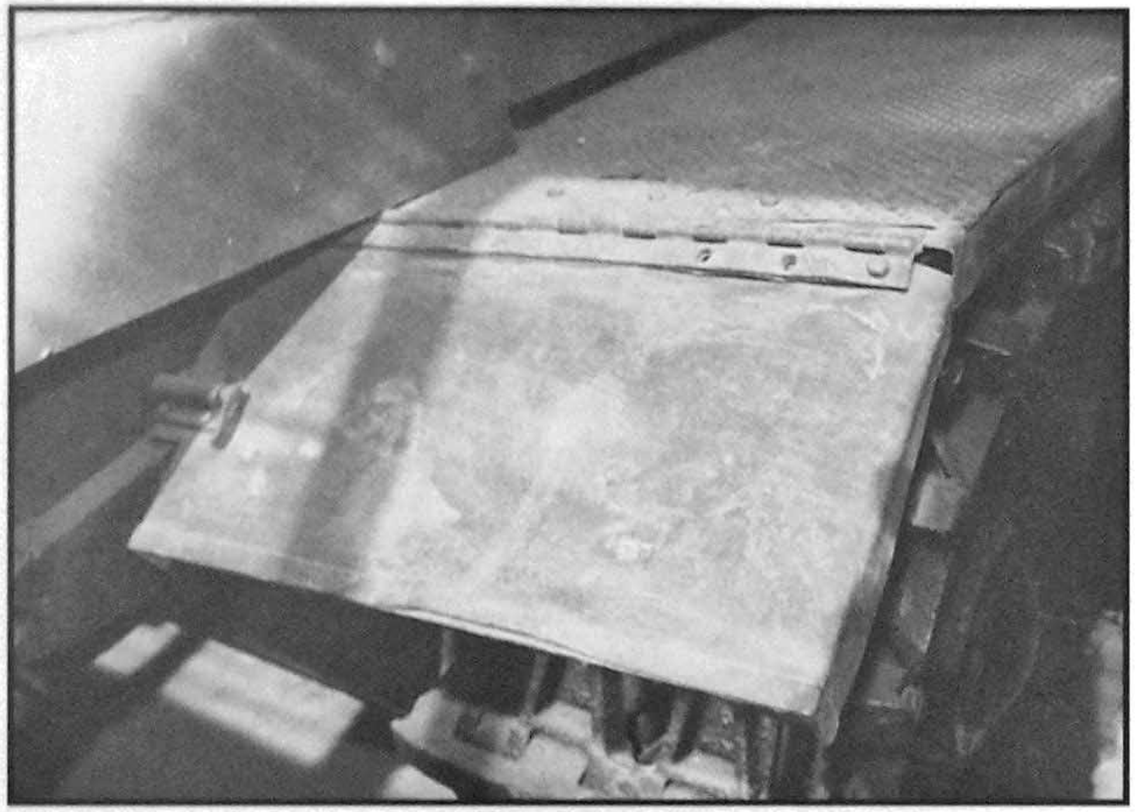


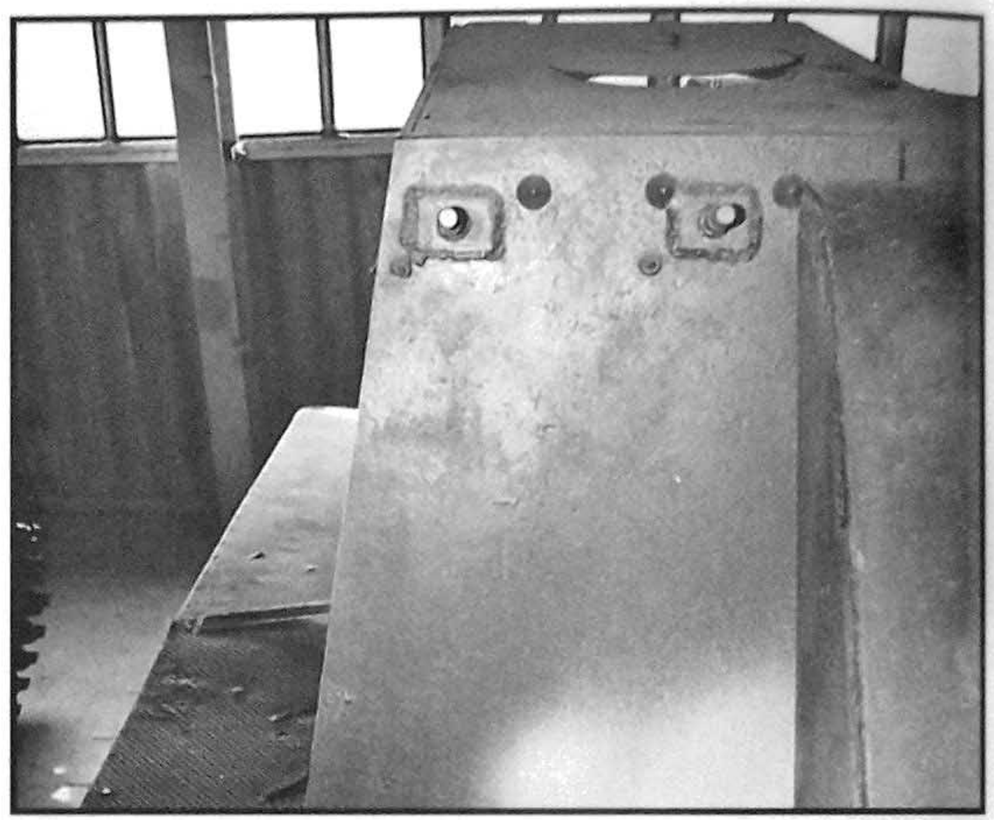


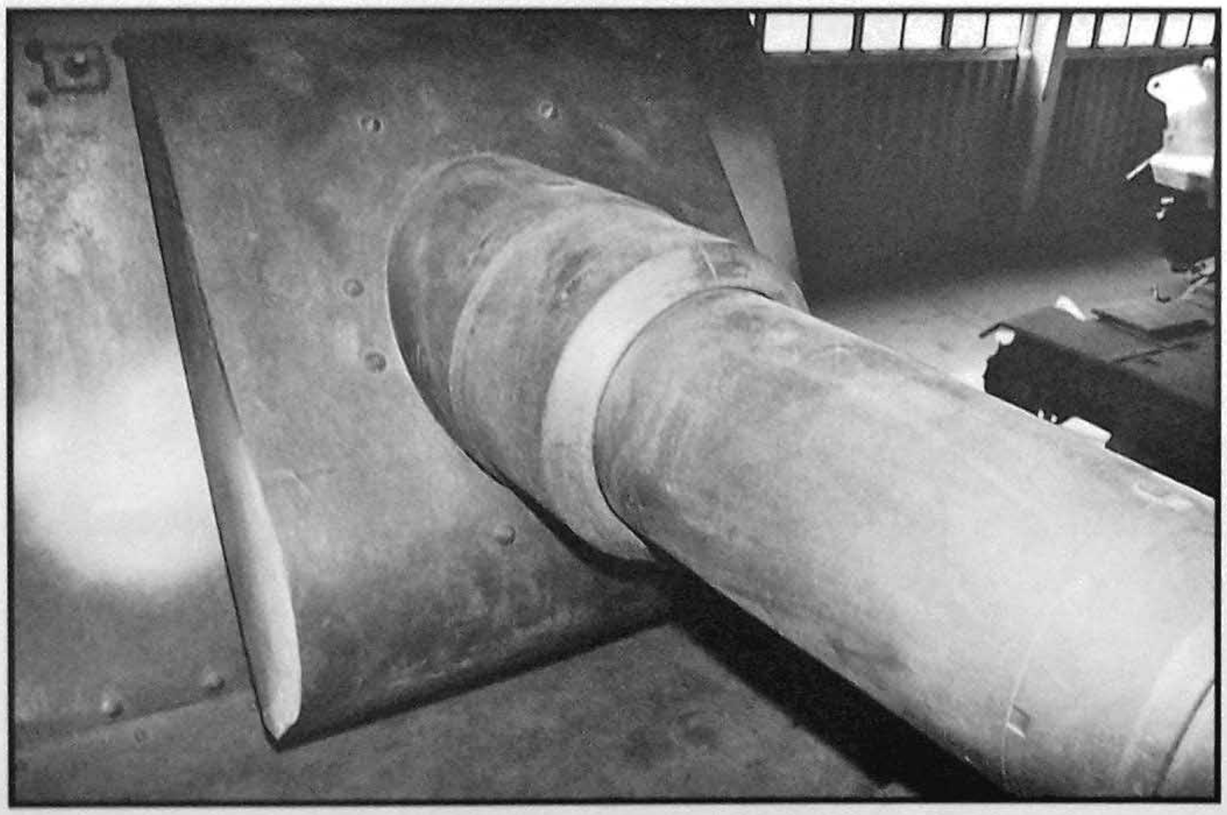


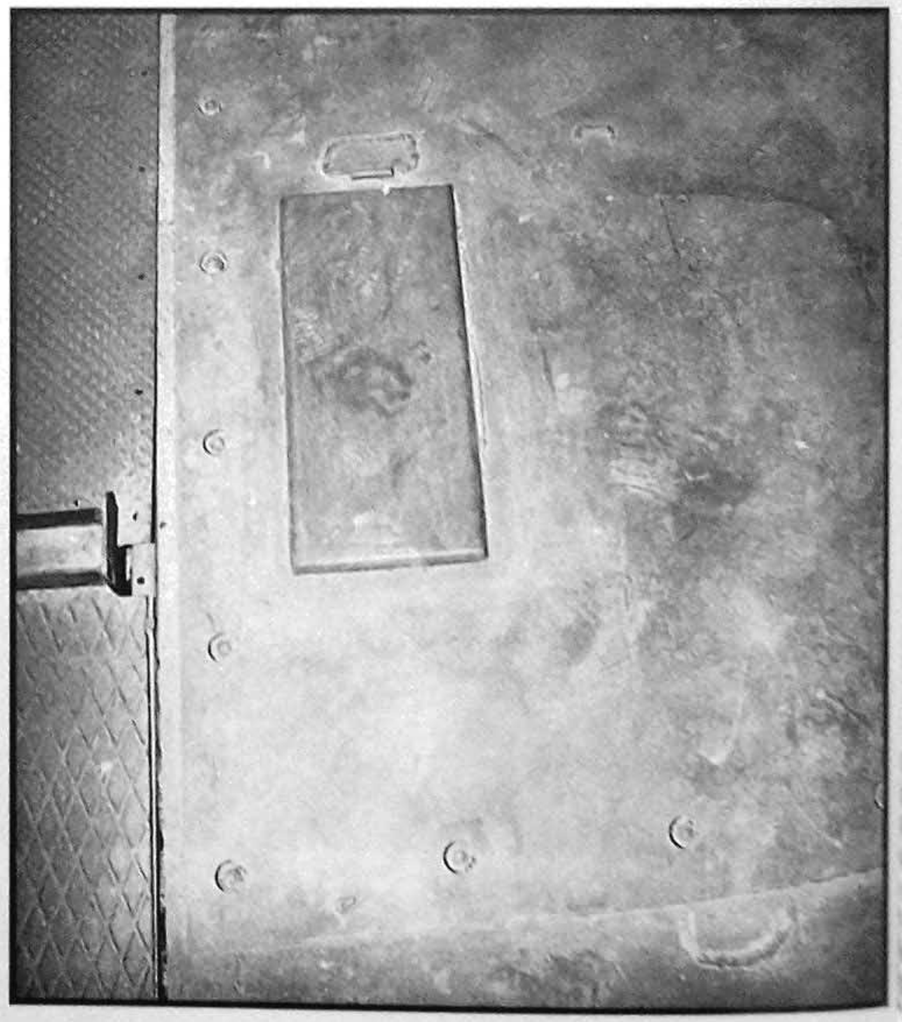


Top left: Details of the frontal armor plate. **Top right**: The driver's bay. **Above left**: The rear view still shows remnants of the ominous clamps fitted here. **Right**: A view below the rear overhang, which provided the engine with air. Track adjustment device and towing loop are visible here.

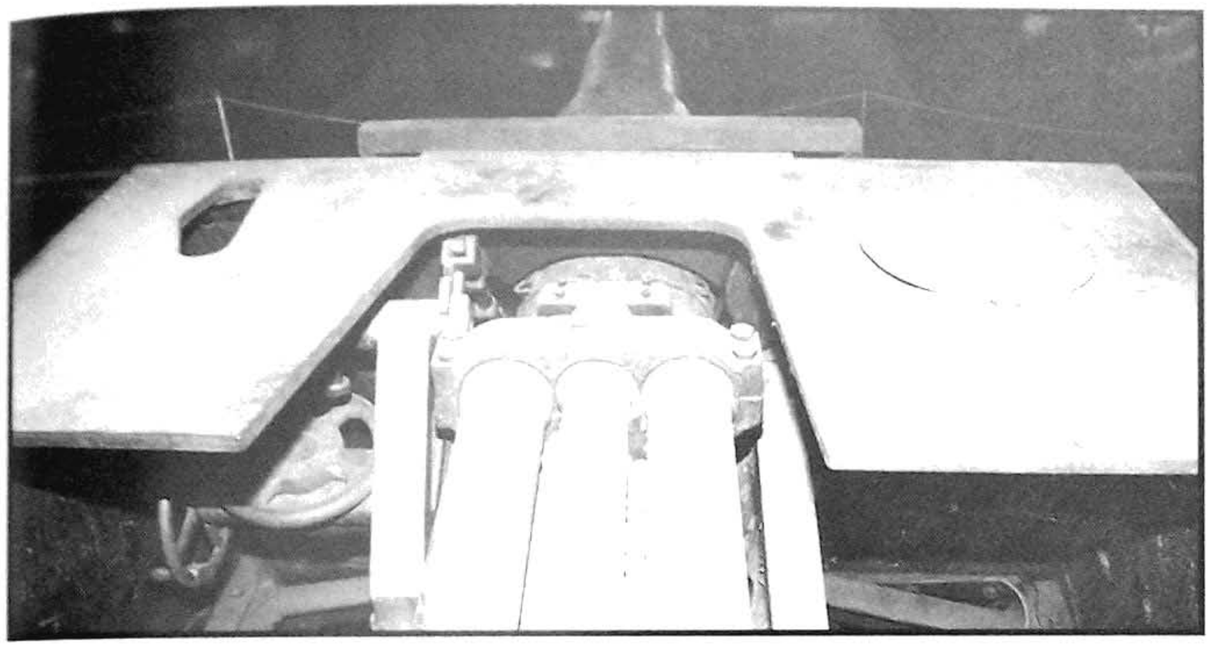


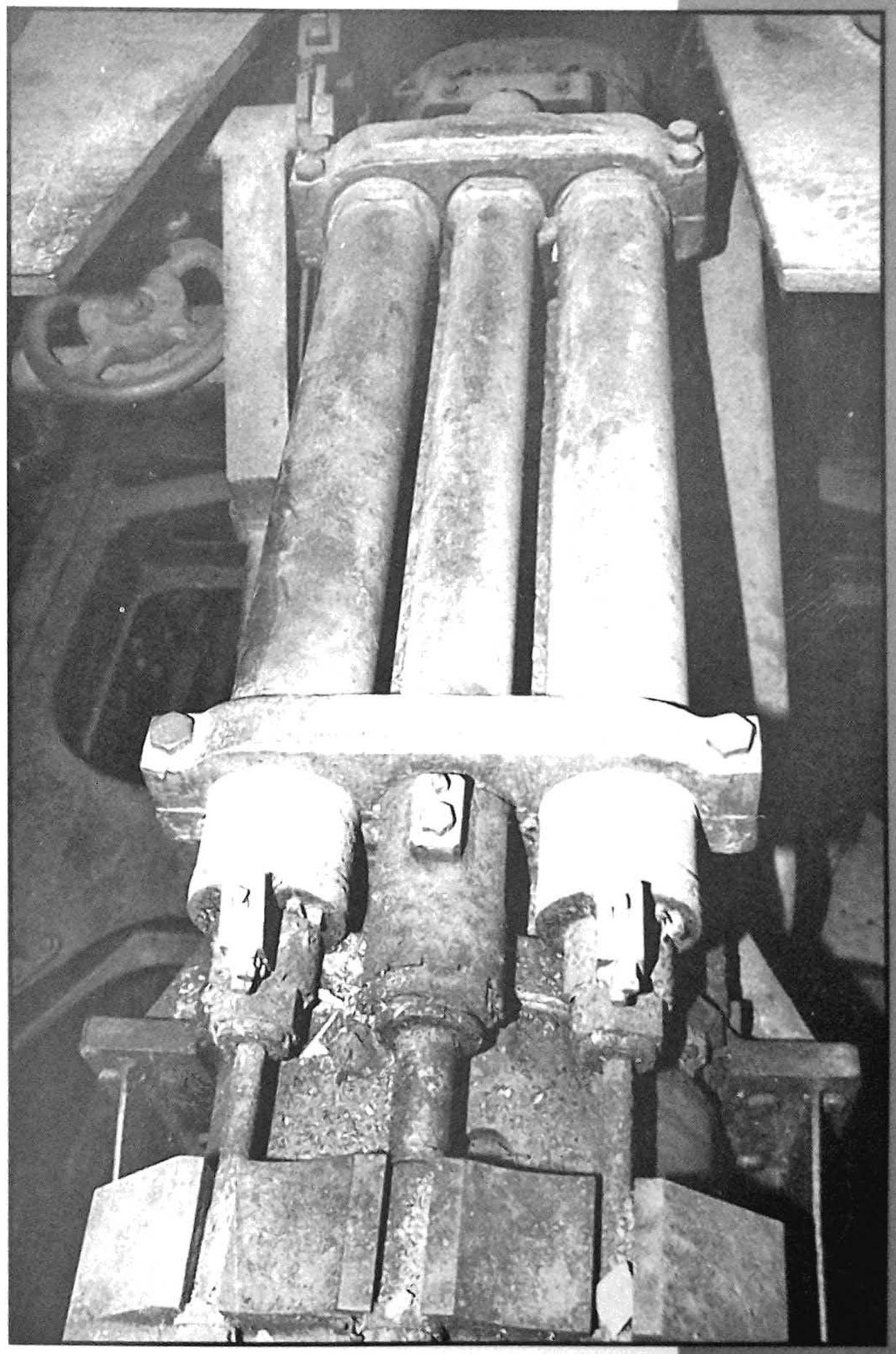






Top left: The rear mud flap. **Top right:** Spare track racks were mounted on both sides of the gun. **Above left:** The massive gun housing and mantlet. **Above right:** Under this flap the fuel cap was hidden. In viewing photos of both vehicles, some small differences can be noticed. Initially, at least one vehicle had two bays mounted in front of the superstructure. On the left side, the driver was accommodated, a dummy bay at the right served as a storage box and covered the fuel cap at the same time. Here, we have referred to this vehicle as "Wagon 1," and the photos show some shots of it





taken at Wünstorf garrison. The other vehicle, "Wagon 2," was possibly not provided with this dummy bay. The only photos known were made in the southern part of the Eastern front in summer 1942. This is the vehicle found now in Kubinka. There are no hints, like welding marks visible, proving that there actually was a second bay. Another interesting difference is the use of unique armored head lamps. It is however possible that this alteration was added to both vehicles. Both Pz.Sfl. V were delivered in standard dark gray, at that time obligatory. Since the battalion

continued on next page

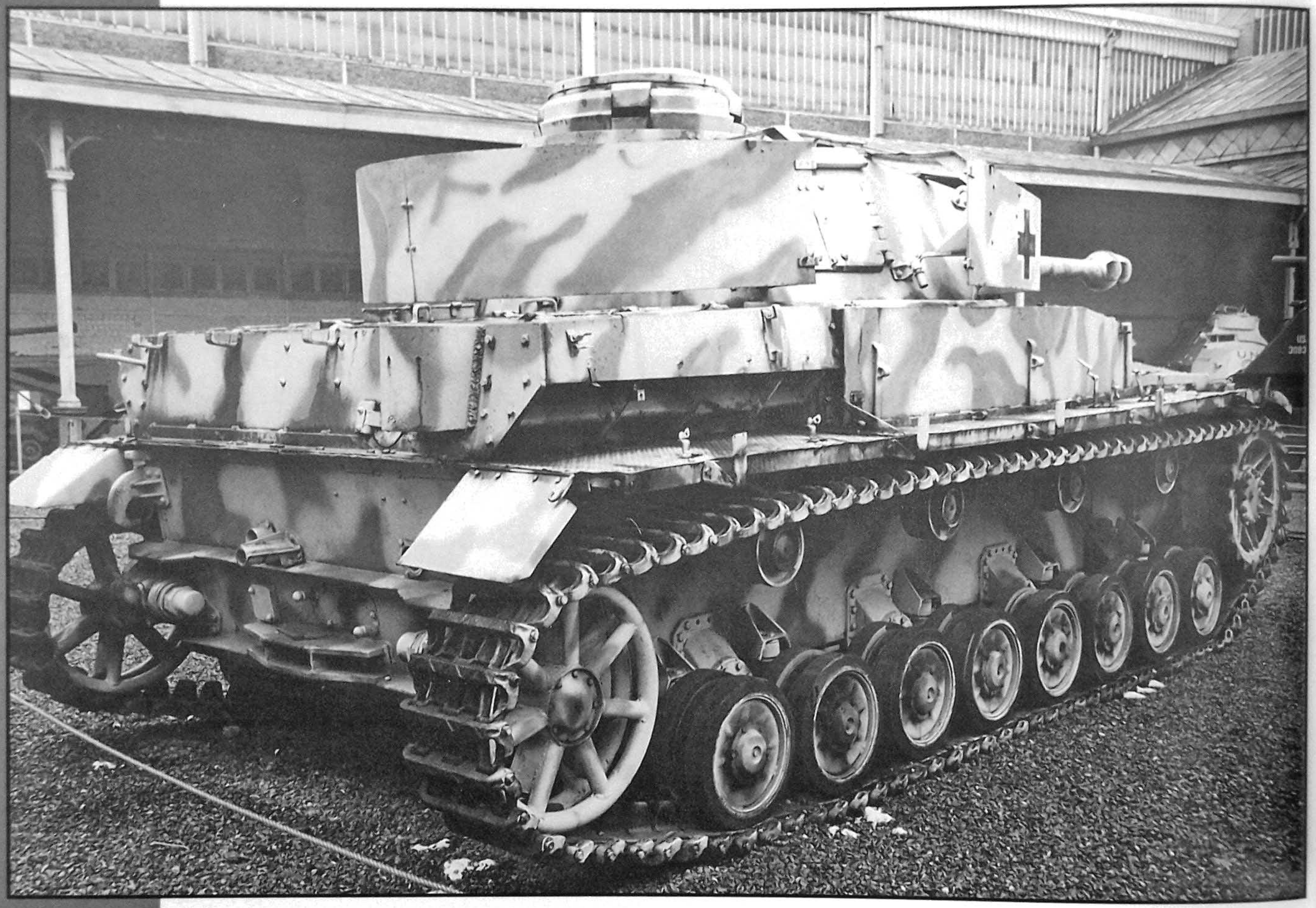
Top left: The top of the superstructure. The apertures of both gunner's periscope and commanders stereoscopic periscope (both missing) are evident here. **Right**: The gunner's position. Side traverse and elevation gear handles are still in place. **Far right**: A view of the recuperator housing from above.

perished in early 1943, three-color camouflage schemes were not used. A winter wash, however, is surely possible. The markings of Wagon 2 can be reconstructed almost entirely. In summer 1942 this vehicle showed standard German crosses on both sides, flanked by the letter "K" (army group von Kleist) and the battalion's badge. Pz.J.Abt. 521 carried a red cross in a slightly pointed white badge (in 1940 the battalion carried stag's antlers below the badge). This arrangement was repeated at the rear. **Left:** The equiliberator of the heavy gun was incorporated in the gun mount. **Right:** The commander's place, barely visible are welding marks on the front plate—perhaps a hint of the radio set possibly being fitted here?

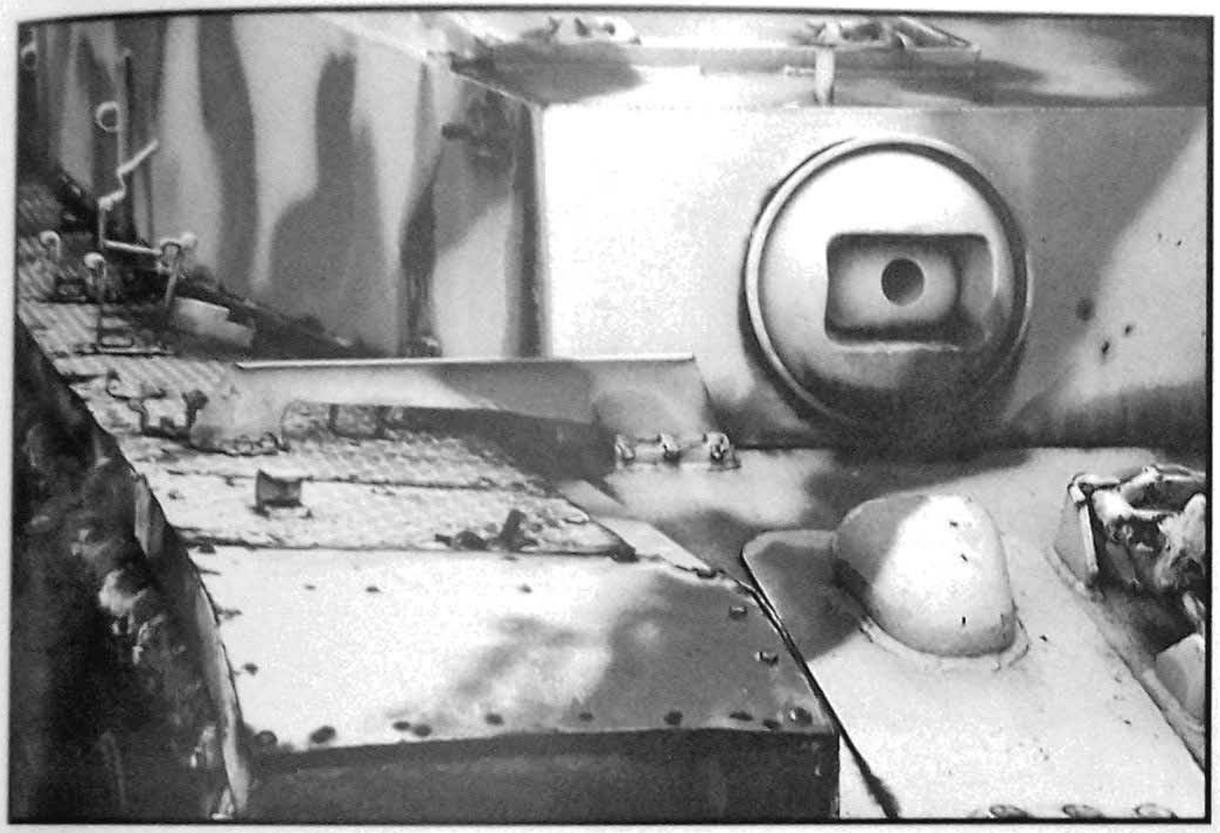
Panzerbefehlswagen IV

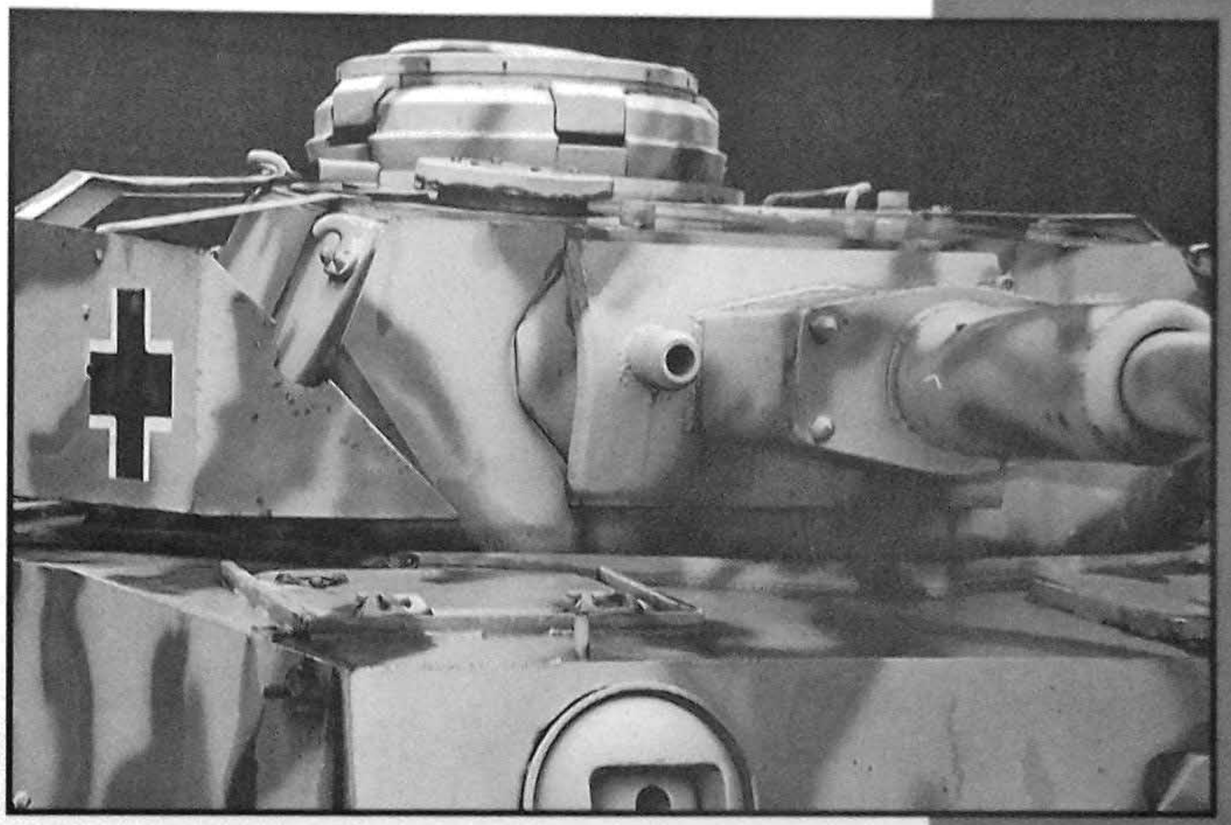
The Panzerbefehlswagen IV was a standard Panzer IV tank that was converted to a command tank with the addition of an extra radio set. 97 vehicles were converted at the Nibelungenwerke between March and September 1944. Previously, the Panzer III was the Wehrmacht's main tank and command variants had been built on that chassis. In the Panzer IV ammunition stowage was reduced and a radio rack was mounted in the turret. Either a FuG 7 or FuG 8 could be fitted, operated by the loader. The normal tank aerial for the FuG 5 was moved from the left rear hull to the right side of the turret roof adjacent to the ventilator. The star antenna for the command radio was fitted to the right hand rear hull in an armored pot. A TSFl periscope could be fitted in a rotating mount ahead and to the left of the standard commander's cupola. The chassis used for the conversion was the Ausf. J, which was the current production type. It was similar in layout to its predecessors, but many simplified parts were used. The driver and co-driver's side vision ports were deleted.

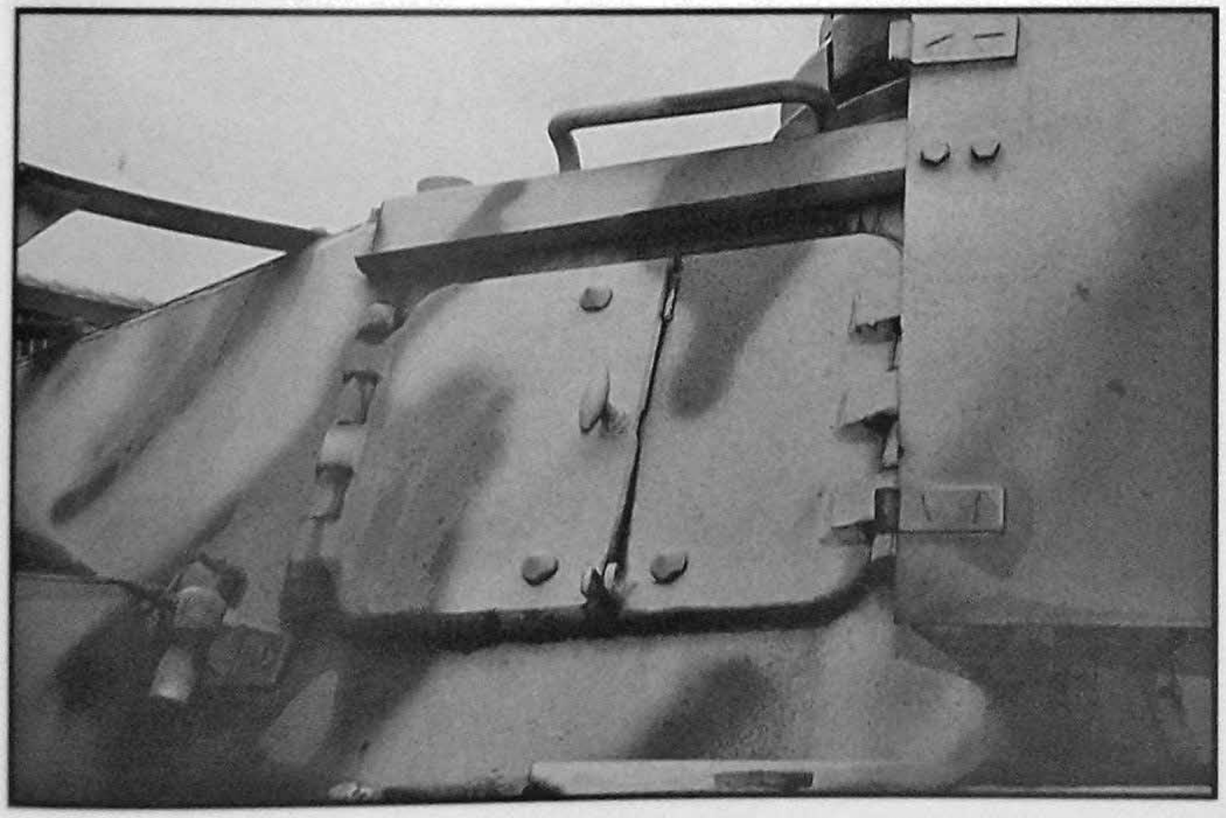
The hatches for their positions were simplified; the hinges were welded to the hatches rather than bolted and the hatch edges were rounded. New turret side hatches were used which had a simpler hinge design and the previous vision ports were deleted completely. The turret roof was up armored from I 5mm to 26mm and three Pilzen were added which could mount a light crane. Our photographs show the Panzerbefehlswagen IV displayed at the Tank Museum, Brussels, Belgium. **Above:** Most Ausf. J vehicles were fitted with 5mm Schürzen for the hull and turret, but on this vehicle the hull Schürzen are not fitted. Although an Ausf J, it is an early production vehicle and retains the tow attachments of the earlier Ausf. H. Armed with the 7.5 cm KwK 40 L/48, it was still an effective fighting vehicle right to the end of the war.

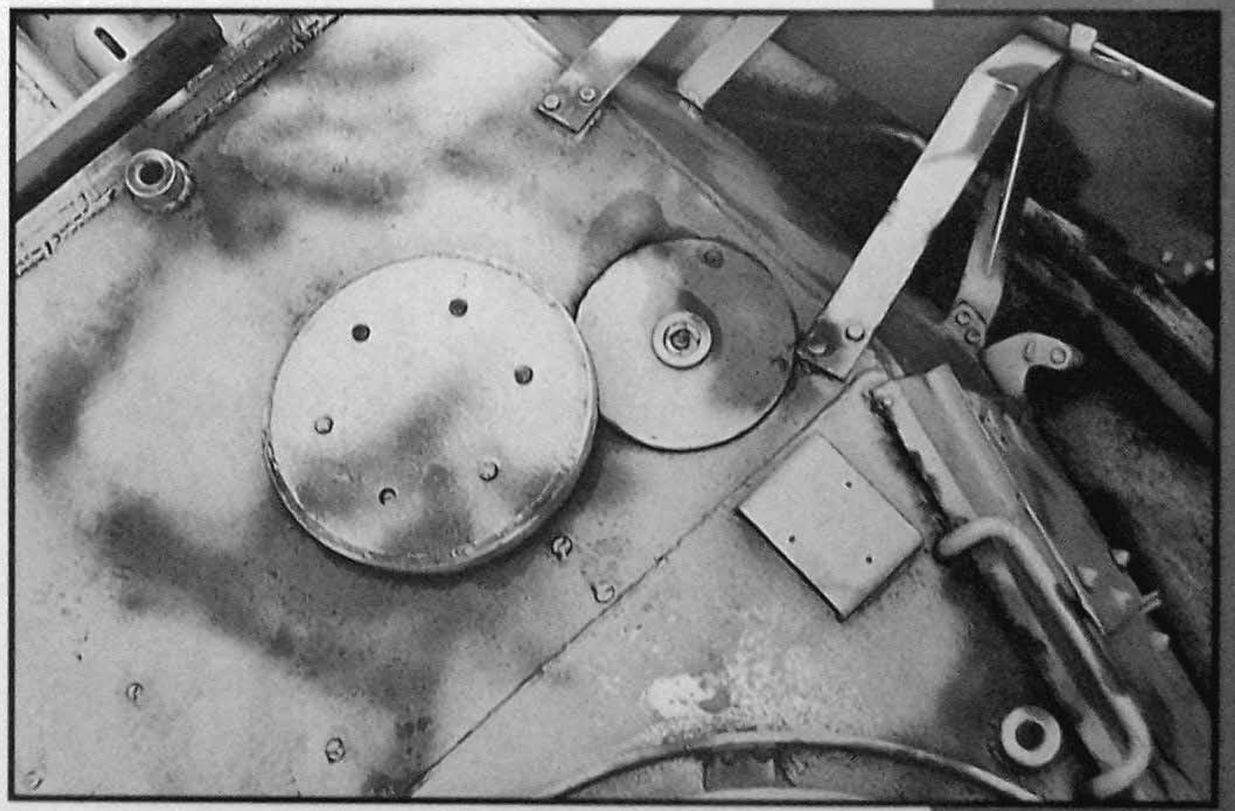


This rear view shows the armored pot for the base of the command aerial. The late rear plate is made of one piece of metal - earlier vehicles were made in two pieces. Brackets for the hull Schürzen are fitted to the edge of the mudguard but not the larger brackets, which were fitted to the main upper hull armor. The rear mounted idler wheel is the Ausf H style.

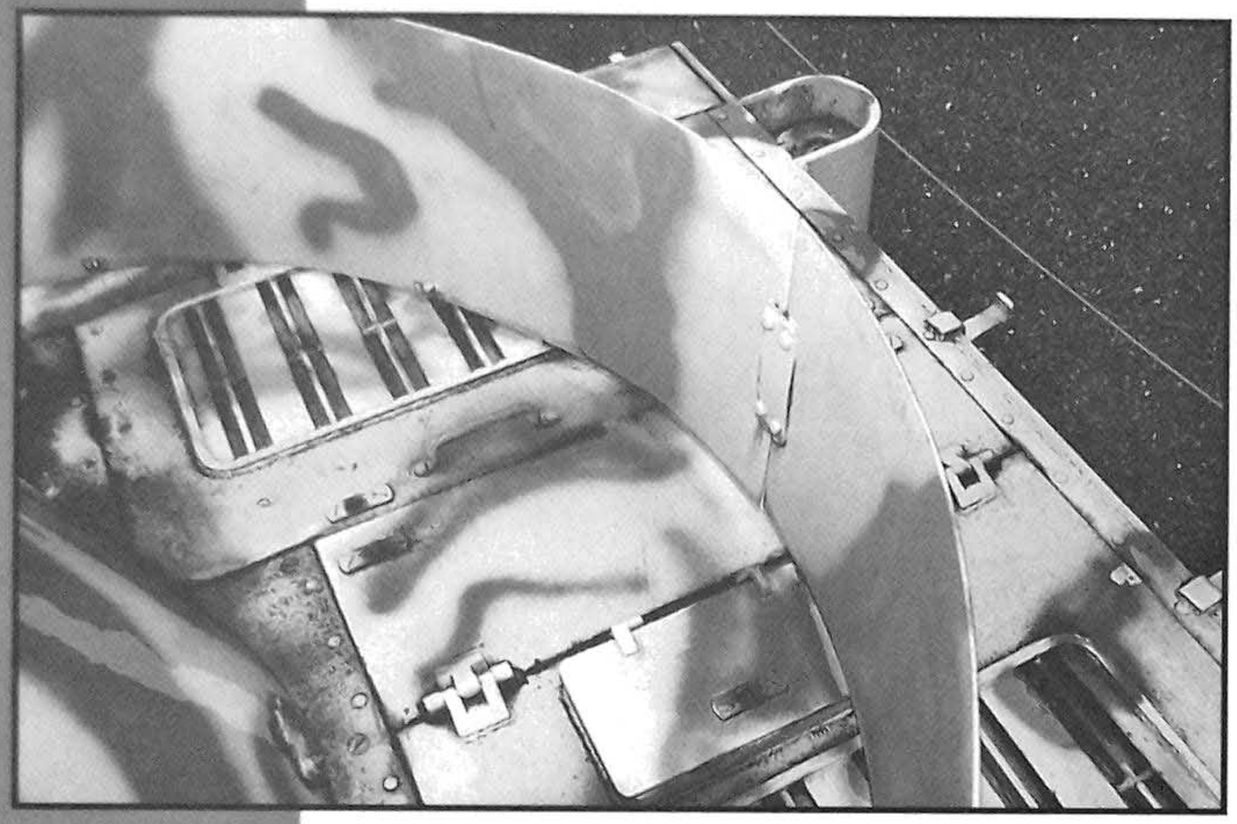


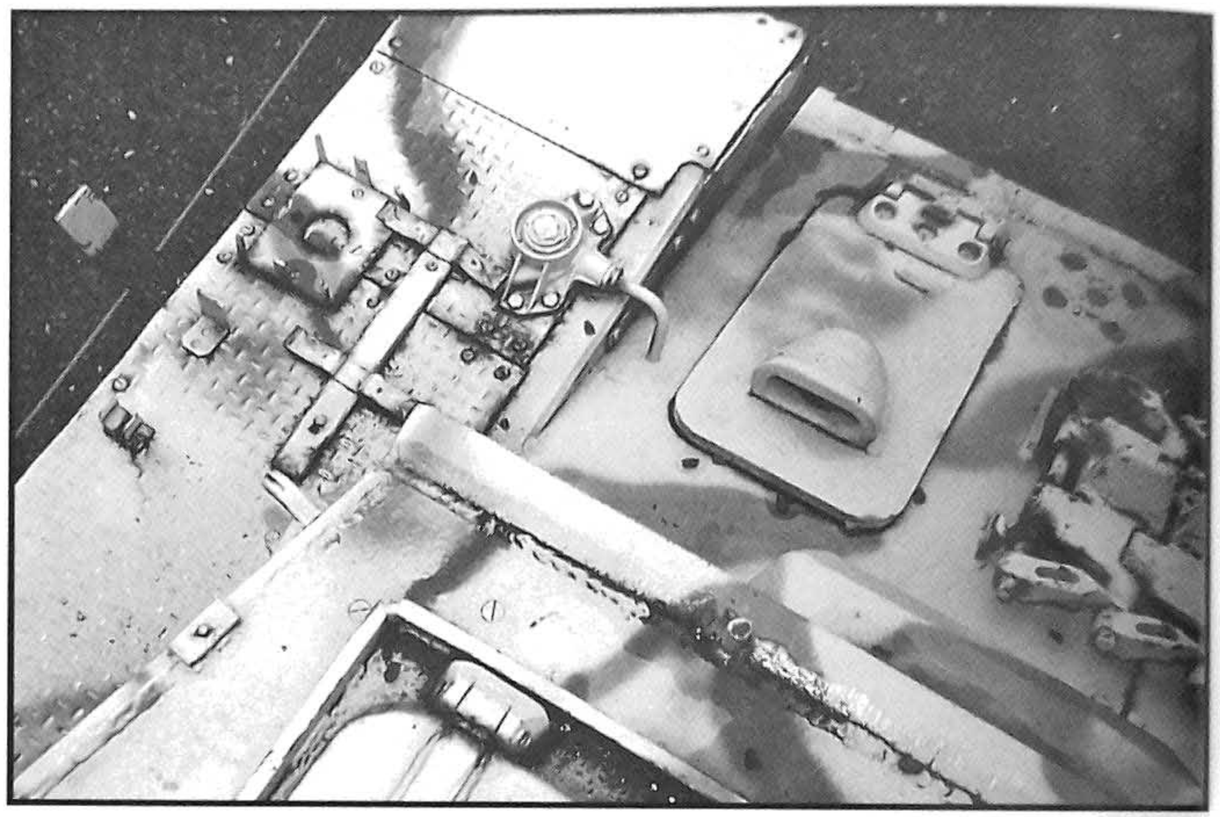


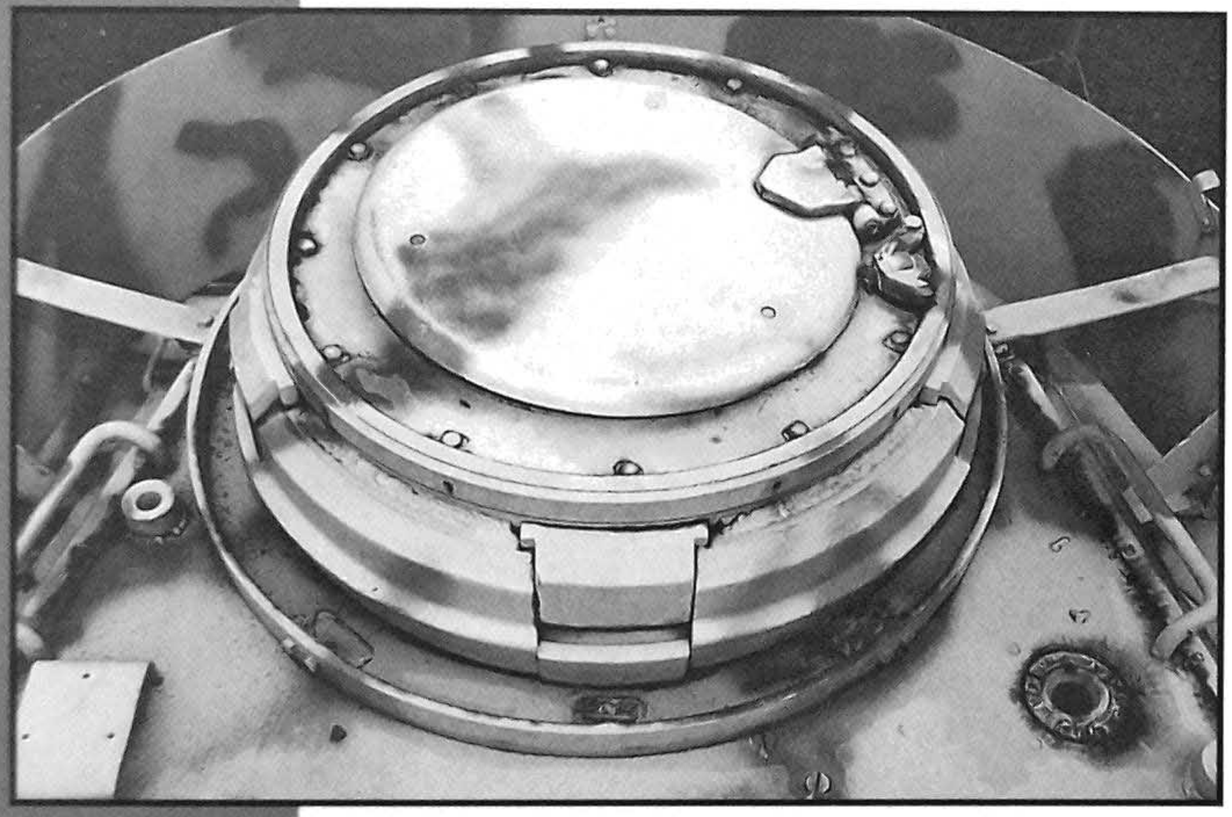


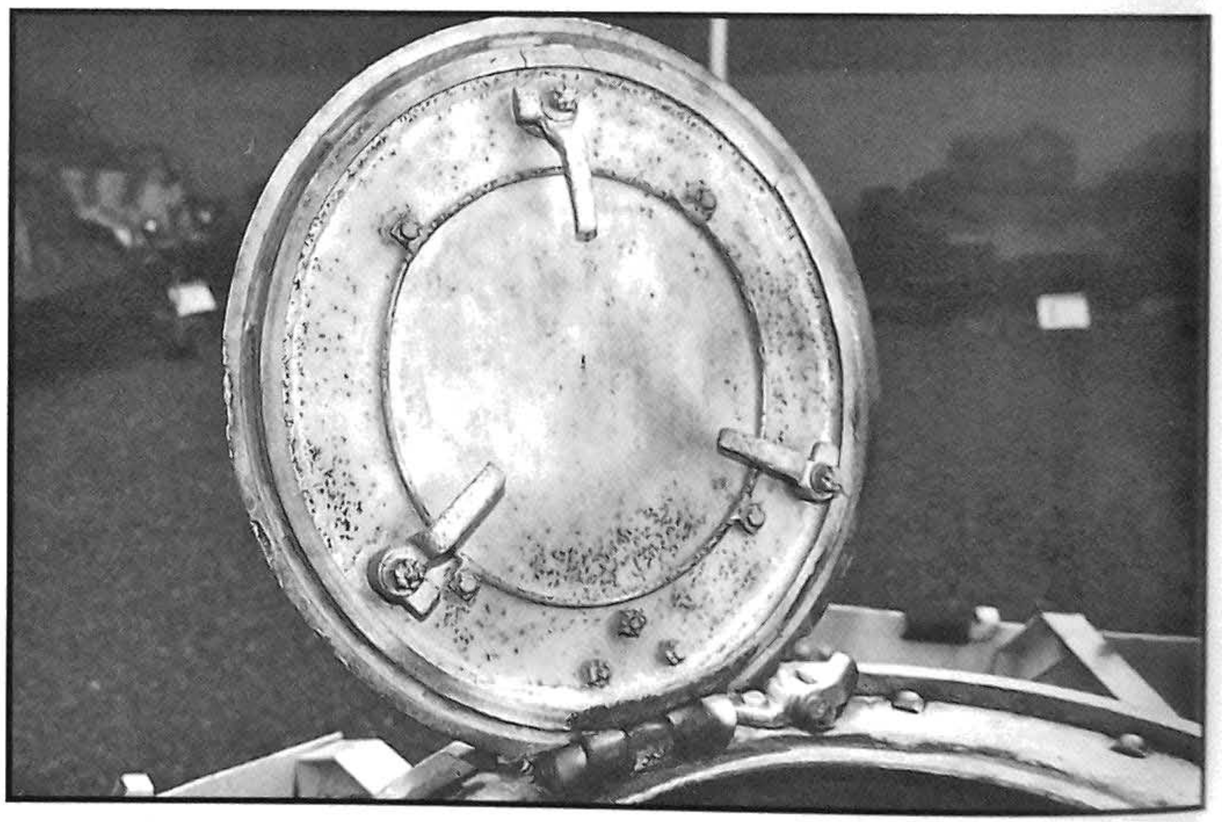


Top left: The co-driver's side vision port has been deleted. This saved time on the production lines. The mudguards are assembled with many bolts rather than welding. Note the small vertical pipe in front of the hatch; this was used as a stopper. **Top right:** The armored splash plate in front of the turret was simplified. Earlier versions were made from two layers of metal. Above the right hand side of the gun mount and in front of the turret ventilator can be seen one of the Pilze mounts. The front plate of the turret Schürzen has been damaged. **Above left:** The turret access door is of the late pattern simplified type. The earlier vision ports are deleted and the hinges are simpler. The vertical reinforcements of the rain gutter above the doors were deleted on the Ausf. J. The 2 hinged Schürzen plates that allow access to the turret doors are missing. **Above right:** The tank's normal radio aerial base was relocated to the turret roof and it can be seen here next to the turret ventilator cover.

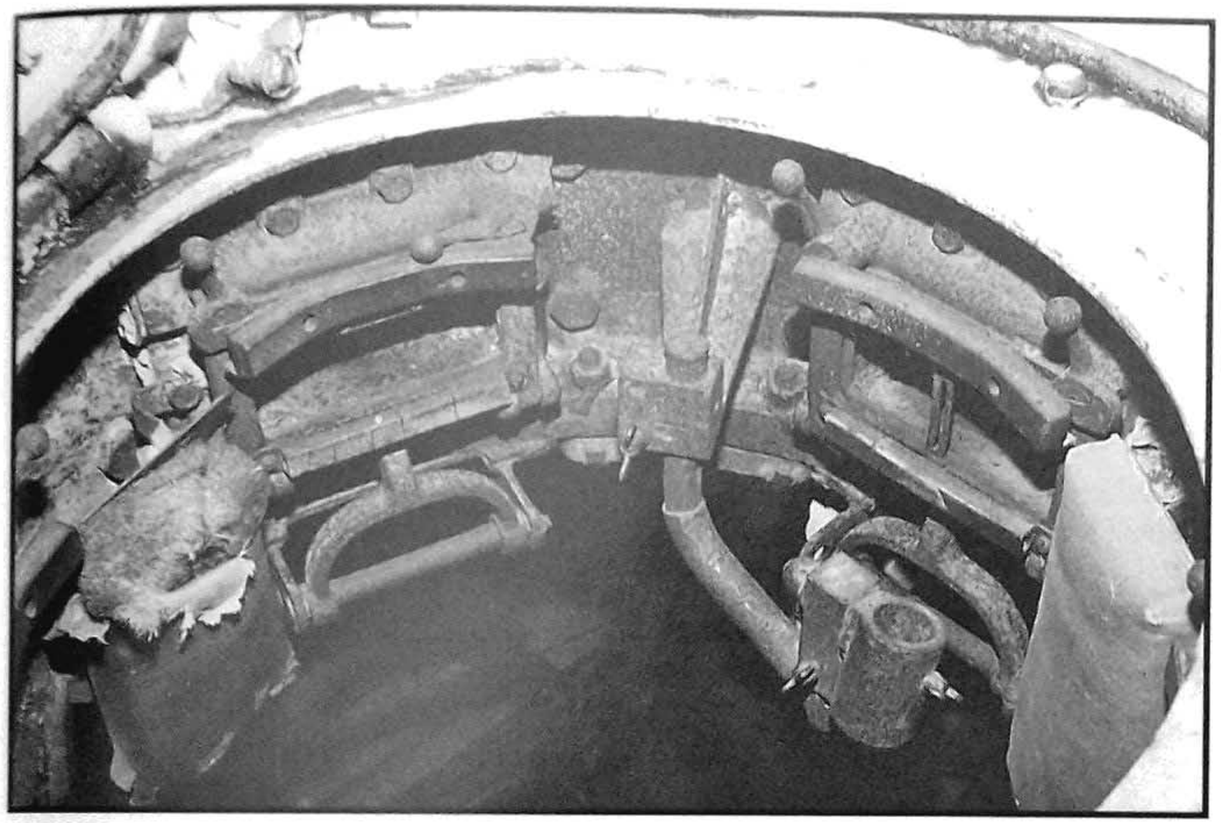


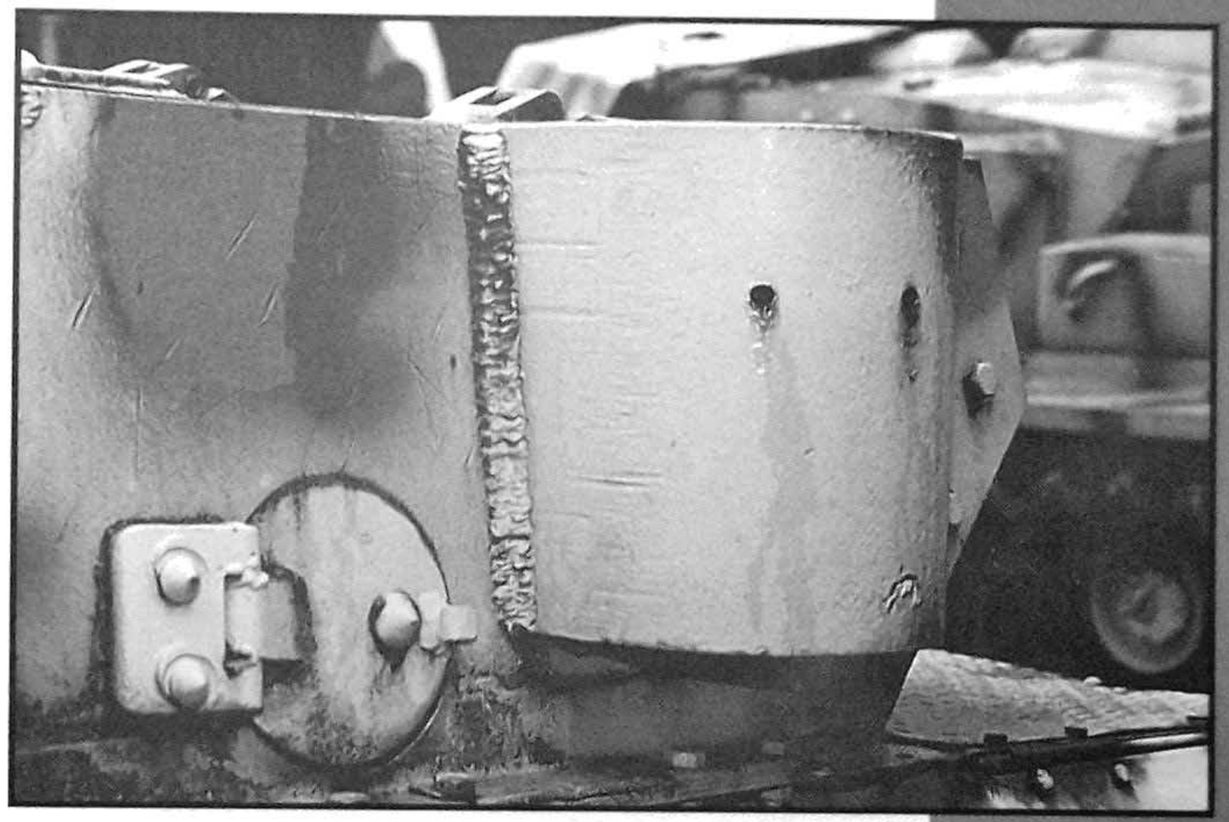


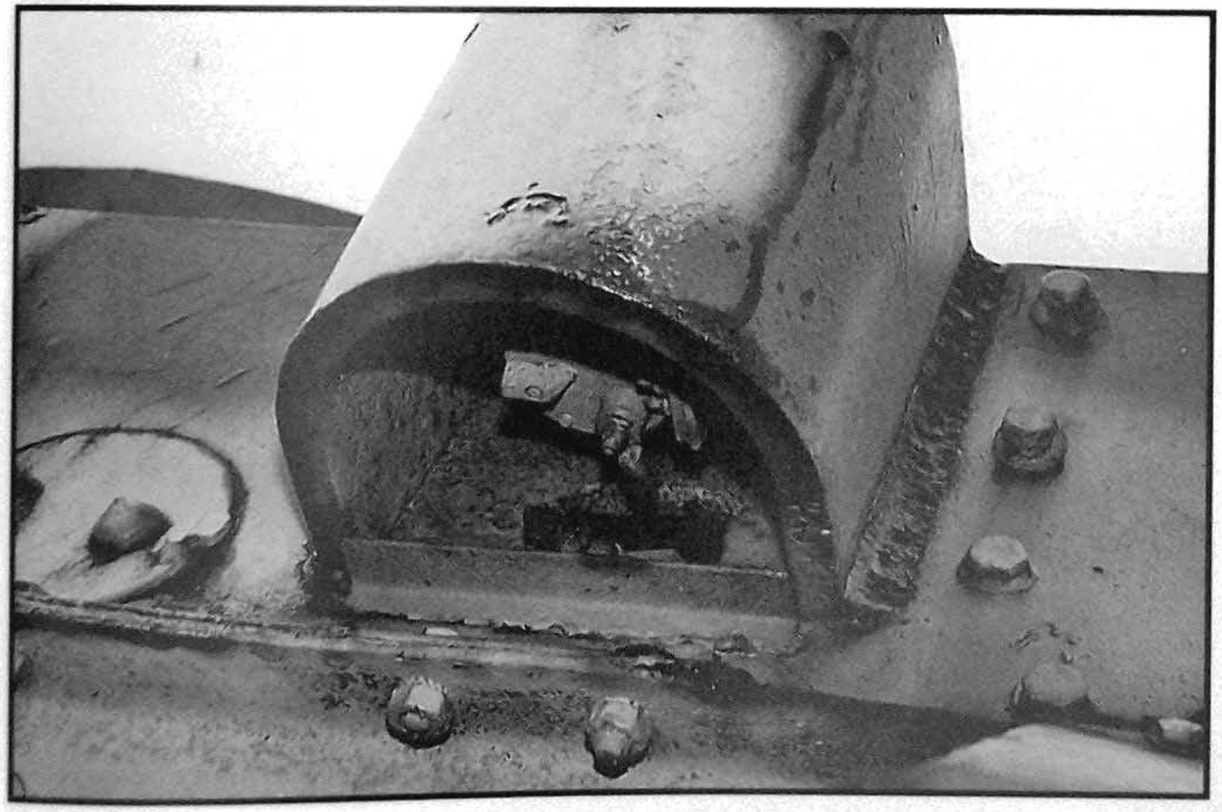


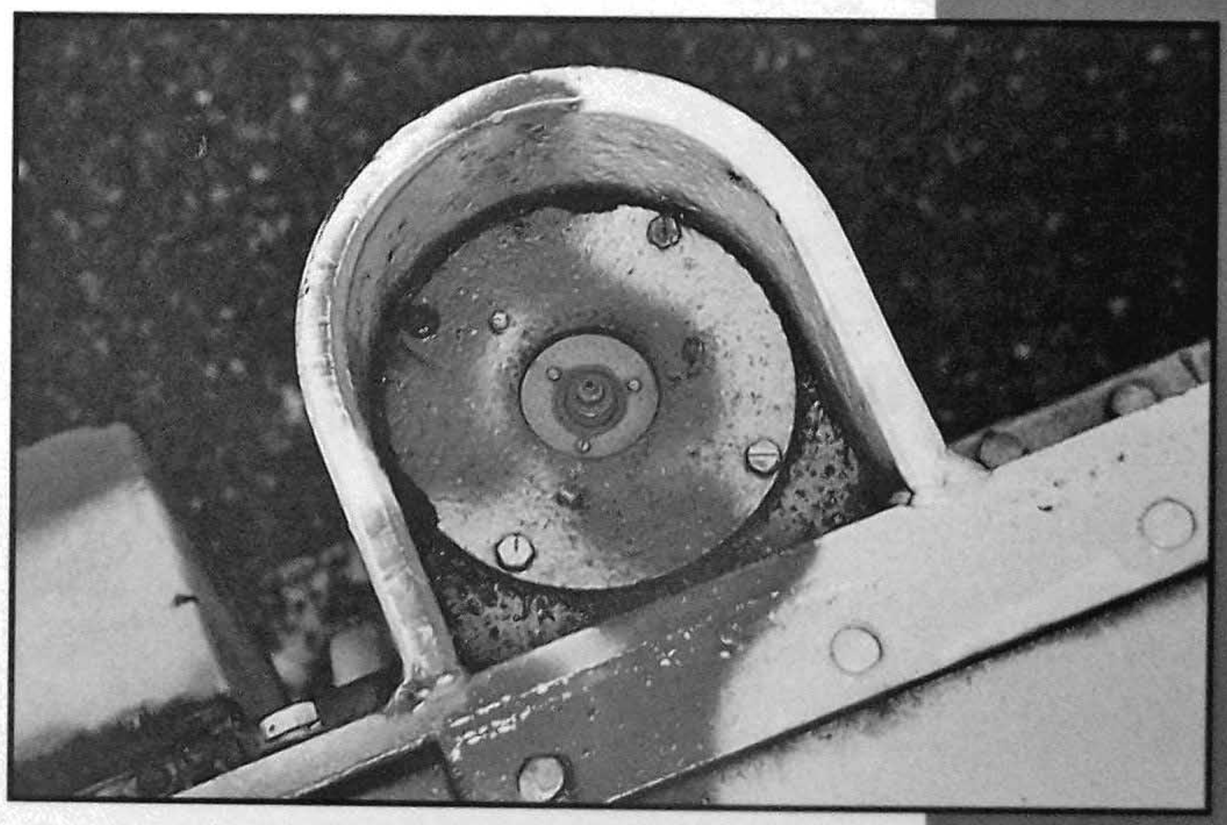


Top left: The rear turret Schürzen was made from two plates bolted together. The normal sheet metal turret bin is missing, which allows a view of the armored coolant filler cover. This style was fitted to Ausf. H and J tanks. **Top right:** On the front of the mudguard is the base for the standard Bosch driving light. The electrical cable goes into the hull via a steel conduit. Next to it are tool clips made from mild steel. At the bottom of the photograph is the welded hinge for the driver's hatch. **Above left:** The standard Panzer IV cupola was fitted. To the left is the mount for the TSF1 periscope. The third Pilze mount can also be seen to the left of the cupola. **Above right:** The inside of the commander's hatch has three locking levers. There would normally be a padded headrest in the center of the hatch.

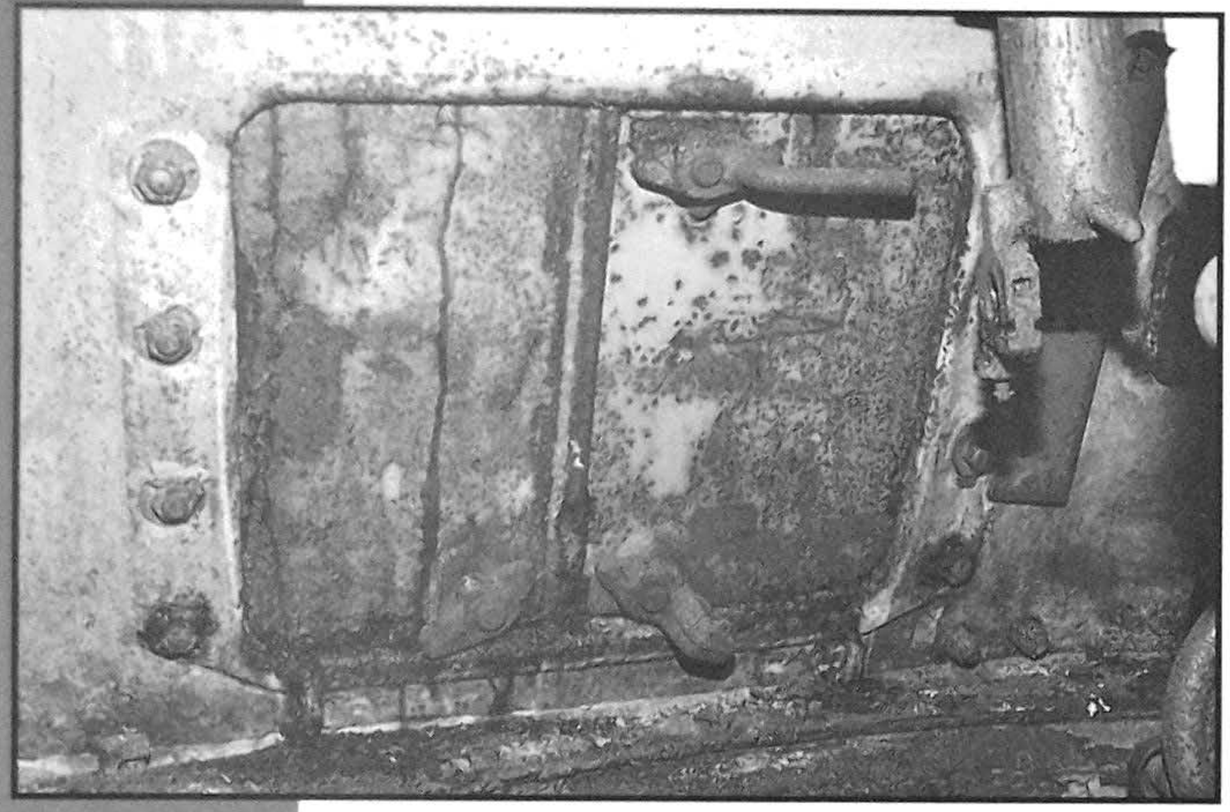


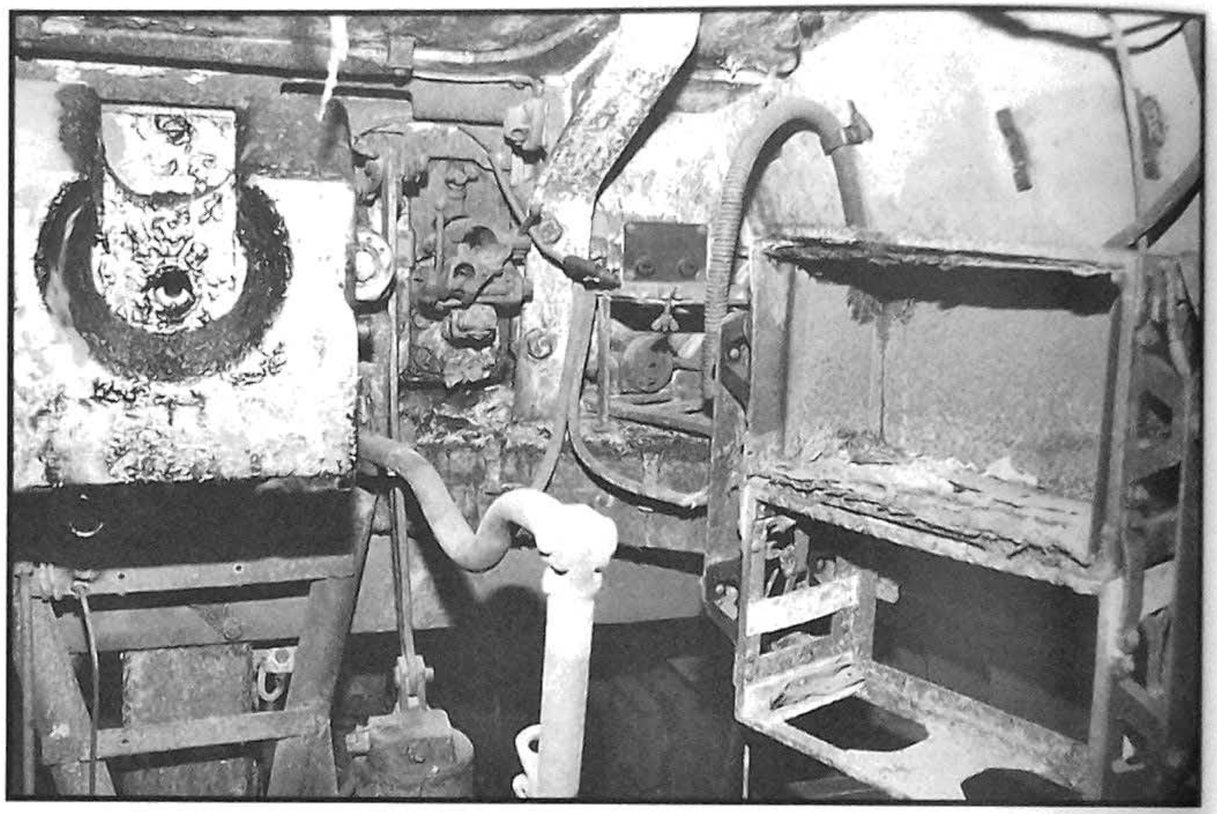


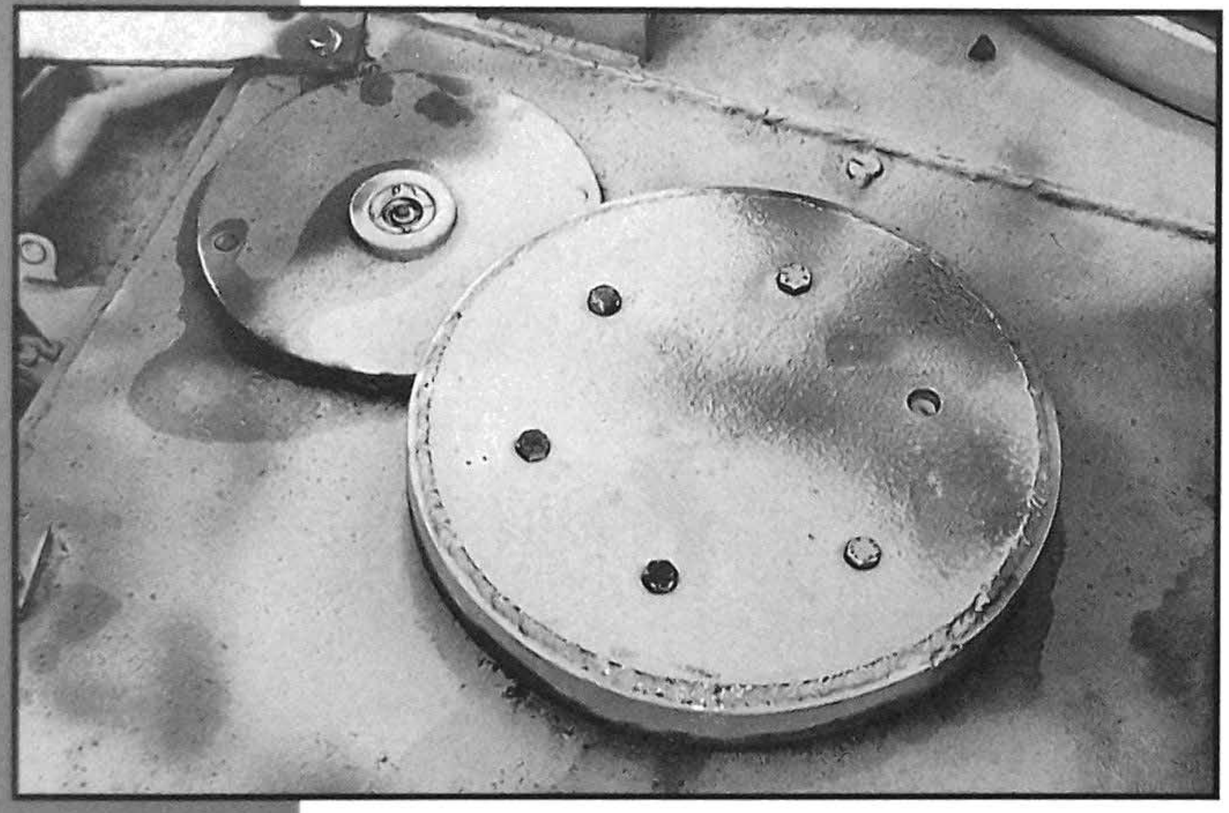


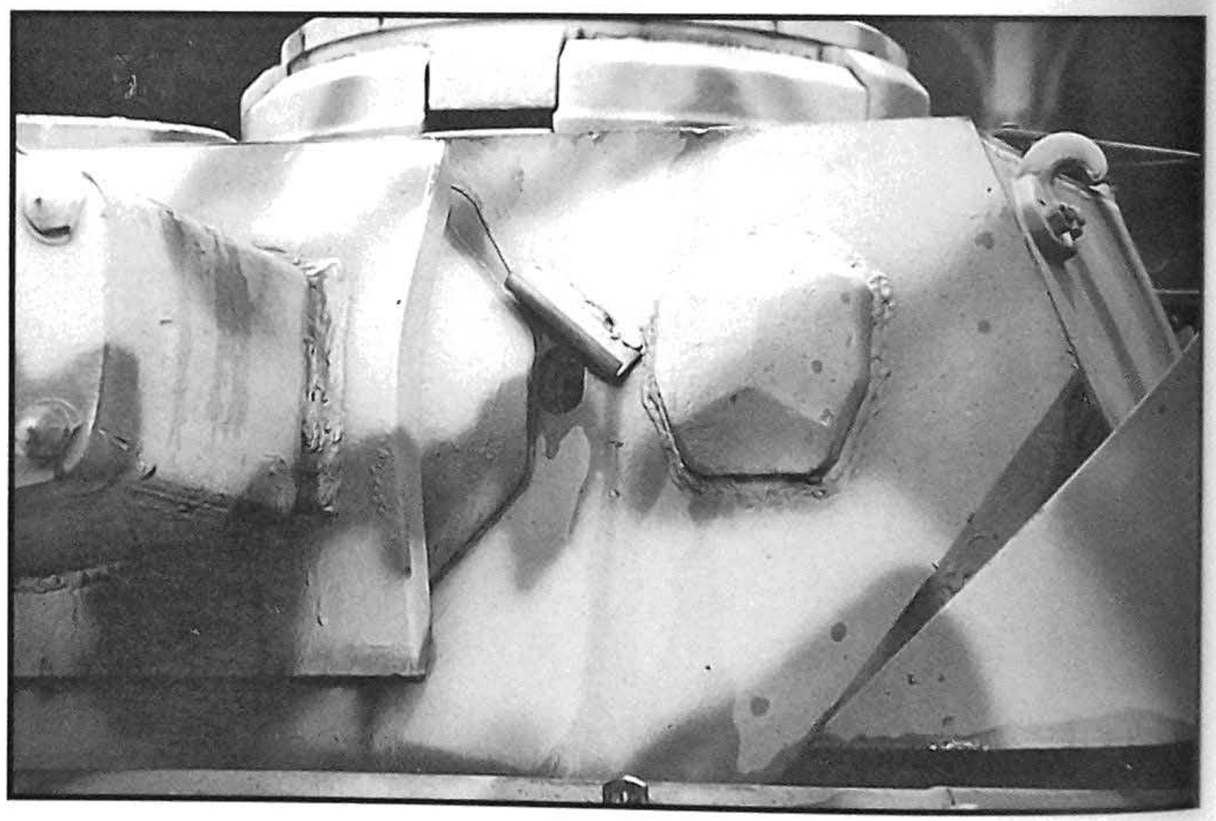


Top left: Although heavily corroded, the mechanisms of the commander's vision ports can be seen clearly. The handle at the bottom opens and closes the external armored covers. The vision ports were fitted with thick armored glass. Above each port is a rubber-padded headrest. To the right can be seen the fixed base unit for an artillery style scissors periscope. **Top right:** The armored cover for the external radio antenna was welded to the rear hull plate. The welding was fairly crude by the usual German standards. **Above left:** The bottom of the armored pot was open. A small hole can be seen in the rear hull plate. The wiring to the aerial base would enter the hull through this hole. **Above right:** The top of the armored pot was flush with the engine deck. The aerial base was recessed.









Top left: The left-hand turret access doors from inside the vehicle, showing the locking levers and attachment bolts for the hinges. **Top right:** The command radio rack was mounted adjacent to the loader's position. Above it can be seen the turret aerial hole and the ventilator hole. To the left is the breechblock of the KwK 40. **Above left:** External close up of the turret ventilator and aerial base. The standard Ausf. J was fitted with the Nähverteidigungswaffe (close defense weapon) here, instead of the aerial base. **Above right:** This front view of the Pz IV shows one of the main problems with production of the vehicle. It is made up of many pieces that took a long time and a lot of energy to produce. There are a lot of shot traps and most of the armor is vertical. Tanks such as the Panther used sloping armor that offered greater protection and could be made from fewer pieces.

Combat photos of the the Panzerbefehlswagen IV are decidedly rare. This Panzer IV Ausf. J of the 111/ Panzer Brigade, 2111 Panzer Abteilung was photographed in September of 1944 in the Lorraine region of France. It is interesting in that it is being used in the role of a command tank, but was not manufactured as a Panzerbefehlswagen. Note the location of the standard radio antenna on the left rear fender, instead of on the turret roof. The large star antenna has been installed on the right rear fender, certainly an impractical place given the fragile nature of the sheet metal fenders in the combat environment. Other photos on the series indicate the installation of the additional radio sets in the turret. The Zimmerit pattern is also of interest with its horizontal, rather than vertical pattern. (ECPA)

7.5cm Gebirgsgeschütz 36

Every European country with a mountainous border eventually formed Mountain Troops. Mountain Troops would be specialists in fighting in this harsh terrain, with additional skill in rock climbing, skiing and mountain rescue. This role also required specialized weapons systems and equipment, such as light rifles or carbines and artillery pieces with special features and functions.

Features required of a mountain field piece are portability, extreme elevation and depression, and a very rugged design capable of sustained operation in difficult weather conditions. The Germans fielded eight Mountain divisions, numbered one though eight and they were known as Gebirgsjäger troops. Each of these divisions contained an artillery regiment. Among the weapons that served these units was the 7.5cm Gebirgsgeschütz 36. **Above:** these troops are preparing the weapon for firing in very cold conditions. This view provides a good look at the barrel and breech of the Gebirgsgeschütz 36. The unique multi-baffle design of the weapon's muzzle brake can also be clearly seen here. Several different types of wheels were utilized and the pressed steel type is seen here. (BA)

The Gebirgsgeschütz 36 had been in development since 1935 and full-blown production began in 1938. The weapon was designed by the firm of Rheinmetall-Borsig AG of Düsseldorf, but was also built by R. Wolf of Magdeburg-Buckau. The gun was also known as 7.5cm GebG 36. The caliber of the weapon was 75mm and the length of the piece was 1,450 mm (L19.5). The barrel was rifled for a length of 972mm. The Gebirgsgeschütz 36 had a muzzle velocity of 475 meters per second. The shell weight was either 5.74 or 5.83 kg. depending on the type selected. **Above:** preparing the gun for travel, these 3 Gebirgsjägers secure the barrel slide. Note the two robust posts used to lift and maneuver the component into position. Additional parts are stored in the boxes at the rear. (BA)

The rate of fire of the Gebirgsgeschutz 36 was generally 6 rounds per minute and it could throw a shell to a maximum range of 9,250 meters. At this sustained rate, the barrel life would be between 6,000 to 8,000 rounds. True to its role, the Gebirgsgeschutz 36 could be depressed to –2° and elevated to 70°. **Above**: the small size of the weapon meant that it could be emplaced with only minor difficulty. This was a huge plus in terrain where the ground was frequently frozen. The gun has been carefully white-washed to aid in its concealment. The soldiers depicted all wear the popular Gebirgsjäger cap, called a Bergmütze. This was similar to the M43 cap, but with a shorter brim. They also all wear the "Windjacke," an equally popular five-button garment made from heavy cotton twill. (BA)

The Gebirgsgeschütz 36 could either be towed by horse or small vehicles, but perhaps one of its best features was its ability to be broken done into eight roughly equal sized loads. The total transport weight was 715 kg. The weapon could also be outfitted with skis for transport over snow. **Above:** The small size of the gun also meant that could be contained within an enclosure. These Gebirgsjäger have constructed an enclosure from logs. An ammunition trailer can be seen at the left. The light weight of the 7.5cm round (5.83 kg.) is indicated by the way that the soldier on the left casually holds it in one hand. In his right hand, he holds a small ram used to place the round in the breech of the gun. This Gebirgsjäger also wears one of the several variants of the heavy-duty felt over boots. (BA)

In order to design a very lightweight anti-tank weapon for airborne use, the Germans began experimenting with a variety of concepts. The most successful of these was the so-called "recoilless" gun. The concept was simple. The carriage of the gun could be radically reduced in size and weight if the recoil mechanism could eliminated. In the German design this was accomplished by directing the exhaust gases of the exploding round through a rear-mounted nozzle. The concept became known as a "Düsenkanone" or nozzle gun. Work began on this concept in the early 1930s' and culminated in the Krupp 7.5cm LG 1. This weapon entered service with Fallschirmjäger units in the invasion of Crete in 1940. The lightweight concept was taken too far in this design and the resulting field service of the gun was not successful.

10.5cm Leichtgeschütz 40, 40/2

The weight of the carriage had been too greatly reduced and this made the gun too delicate for sustained field use. Many of the successful features of the LG 1 were incorporated into a Rheinmetall design known as the 7.5 cm Leichtgeschütz 40. This was a much more robust weapon mounted on a steel-wheeled carriage. The LG 40 was developed into two sub-types, the LG 40 and LG 40/2, but they differed only in carriage details. Both weapons were of 105mm caliber and had a barrel length of 1,380 mm (L/13). The length of the barrel including the rear nozzle was 1,902 mm. **Above:** the 7.5 cm LG40/2 in service with a Fallschirmjäger unit in Italy. The crew has dug a small pit behind the gun to help contain the back blast of the weapon. (BA)

The weight of the gun was 476 kg. in travel mode and 431 kg. During firing, the 7.5 cm LG 40 had an initial velocity of 380 meters per second and a sustained rate of fire of 7 rounds per minute. The maximum range of the weapon was 8,000 meters. One of the more unique features of the gun was that it was towed by a pintle attached to the barrel, the carriage being too short to reach a towing vehicle.

Above: an excellent close-up of the back-end of the gun. The exhaust nozzle can clearly be seen at the bottom of the photo. The sight can be seen, as well as the elevation and traverse wheels. The gun could be elevated from -15° to +42°. The crewman is undoubtedly posing for the camera, as he would normally put a fair amount of distance between himself and the gun. Note the length of the firing cord. (BA)

The extreme back blast of the weapon was always a problem in service. This not only presented a hazard to the crew, but also immediately revealed the position of the gun. This was made worse in darkness, when a bright flash accompanied the discharge. A fair amount of space was also necessary to ensure the gases did not completely engulf the crew. The problem of back blast was eventually reduced with changes in the ammunition. **Above and inset:** the 7.5 cm LG 40 in service with another Fallschirmjäger unit. The differences in the two guns were minor and involved the design of the small carriage. Note the different wheel pattern. (BA)