Allied-Axis

THE PHOTO JOURNAL OF THE SECOND WORLD WAR

LVTs at the front

German 10.5cm leFH 18 howitzer (part 2)

Marine Corps Shermans of WW2

Kursk: Porsche's heavyweight in action

Issue 8

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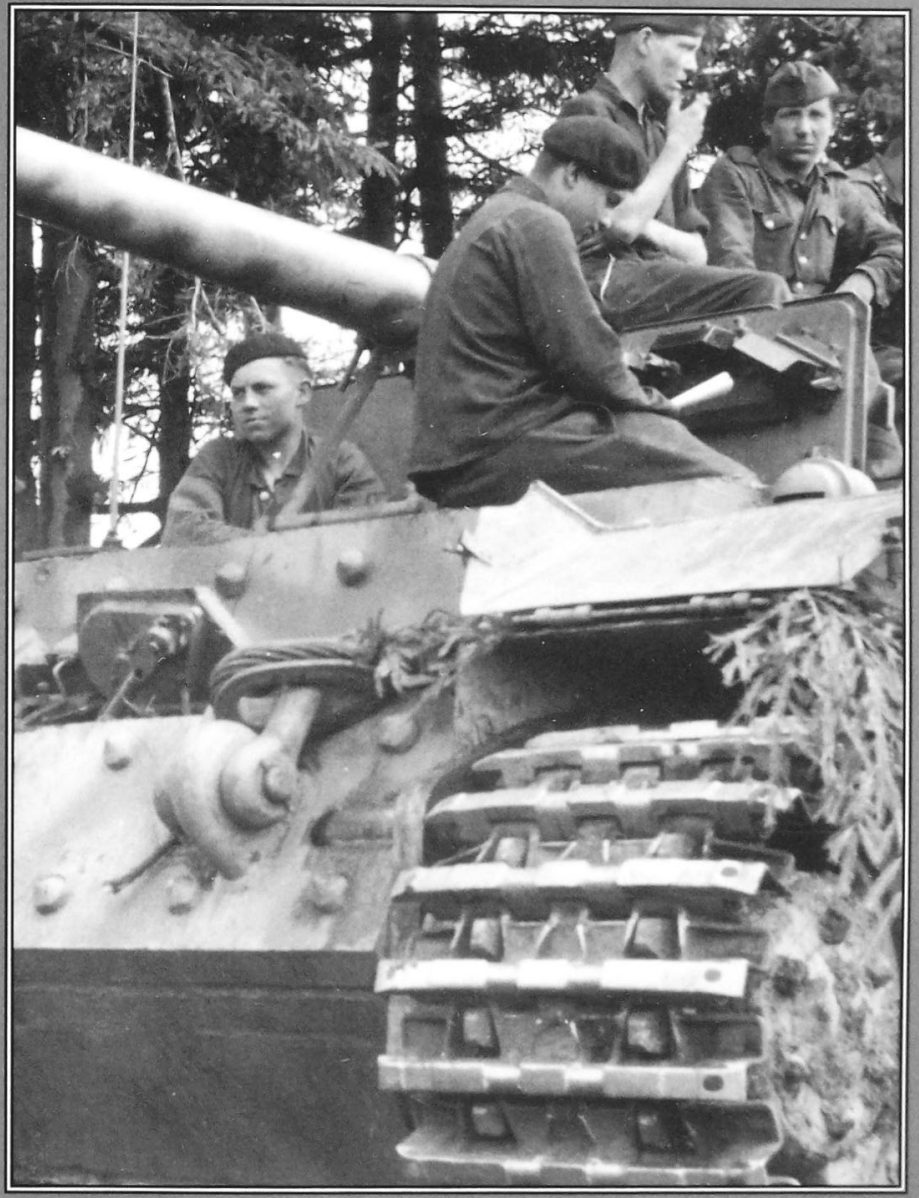

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German 10.5cm leFH 18 howitzer (part 2)

Ammunition for the 10.5cm gun was prepared for transport by placing the rounds and charge cartridges in a steel container that was, in turn, encased in a wooden crate. These crates were stored in the large rear lockers of the SdKfz. 11 half track. This crew has just begun their fire mission and the crewman to the left can be seen pulling a charge cartridge from the bottom of a storage tube. (BA)

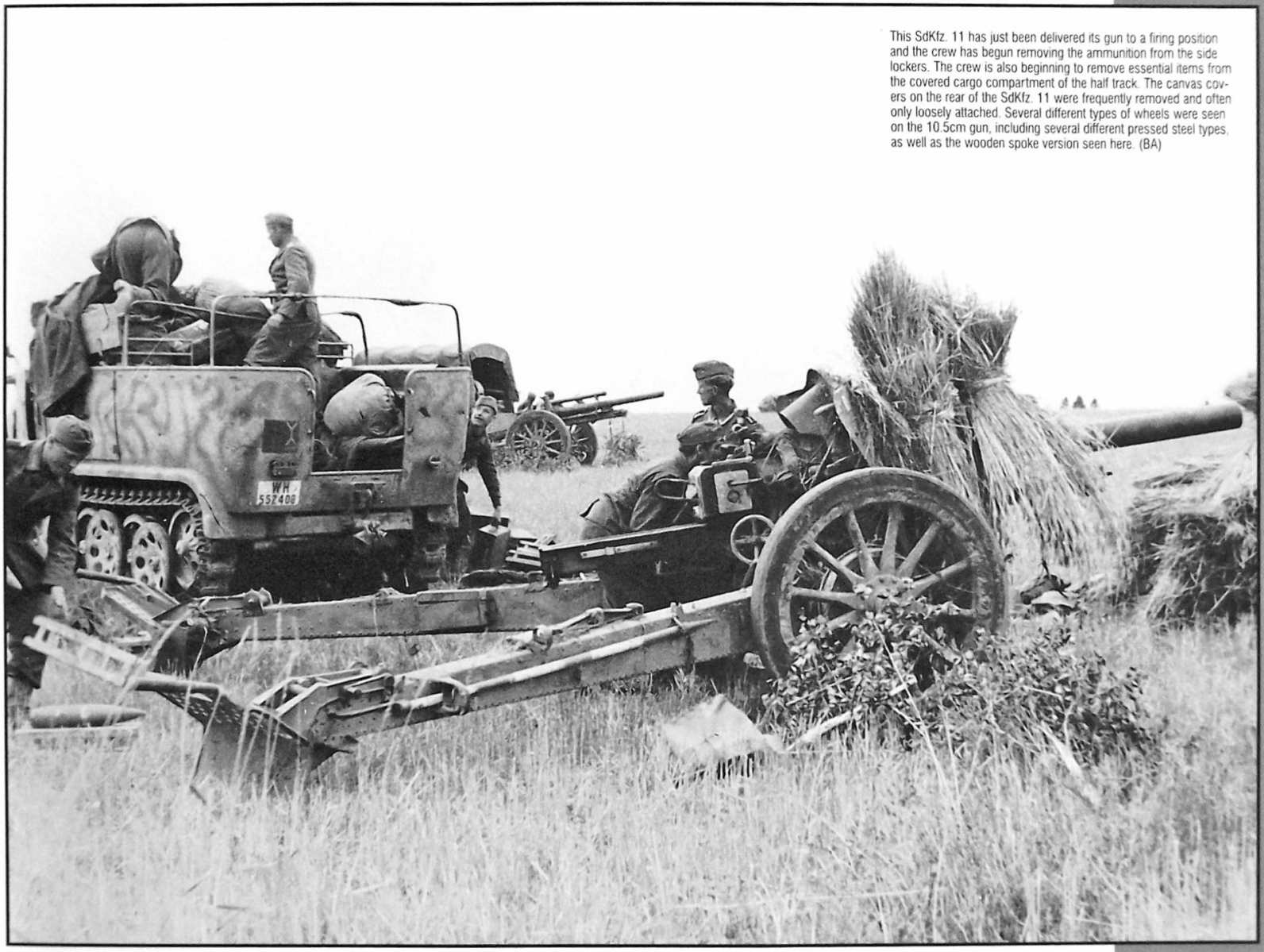
Another gun of the same battery seen on the previous page. This shot provides a clearer view of the powder charges seen here in the foreground. These bags were numbered to indicate the amount of powder contained within. The charges were placed into the cartridge and then attached to the round. (BA)

This close-up shot of a 10.5cm clearly shows the lettering stenciled on the barrel slide and the recuperator housing. The word "Braun" indicated that a brown type of buffer fluid was being used for the recoil mechanism. This was a lower viscosity fluid used in warmer weather. (BA)

The 10.5cm gun was often used in the direct support role. Here, two guns of a unit attached to the 13. Pz. Div. are assisting in clearing the town of Jitomir in the Ukraine on July 9th, 1941. (BA)

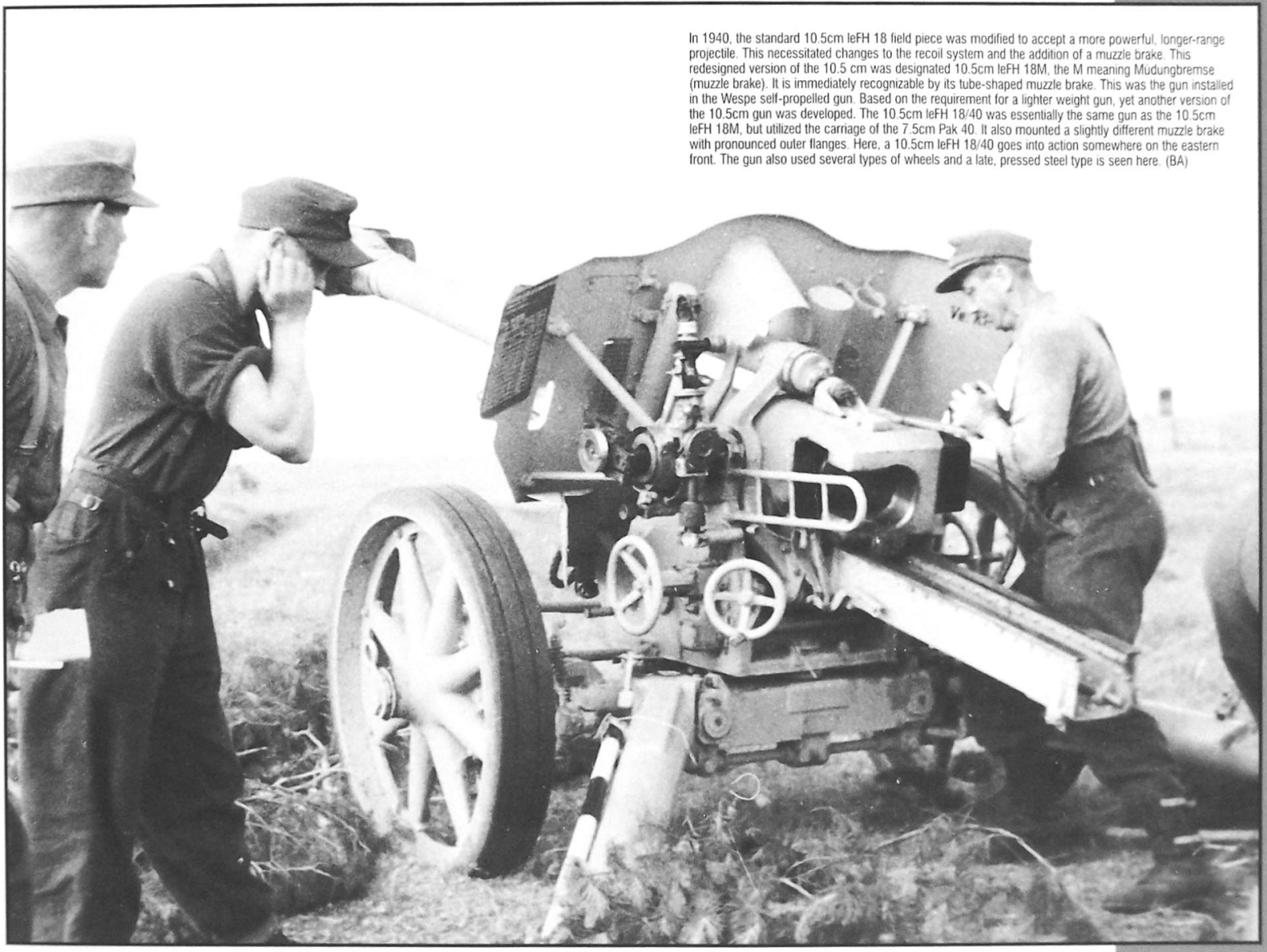
Here, a crew of a 10.5cm gun handles the gun into position. The crew has chosen the edge of the small wood to conceal itself and the gun has been placed quite close to the foliage for better concealment. Note the rope attached to the shield and the gun cover installed on the recuperator housing. (BA)

The same gun as the previous page begins its fire mission. The gun has been traversed to the left for the start of this mission. The gun could be traversed 56° from the centerline. Note the location of the breech block handle, which indicates that the breech is in the open position. (BA)

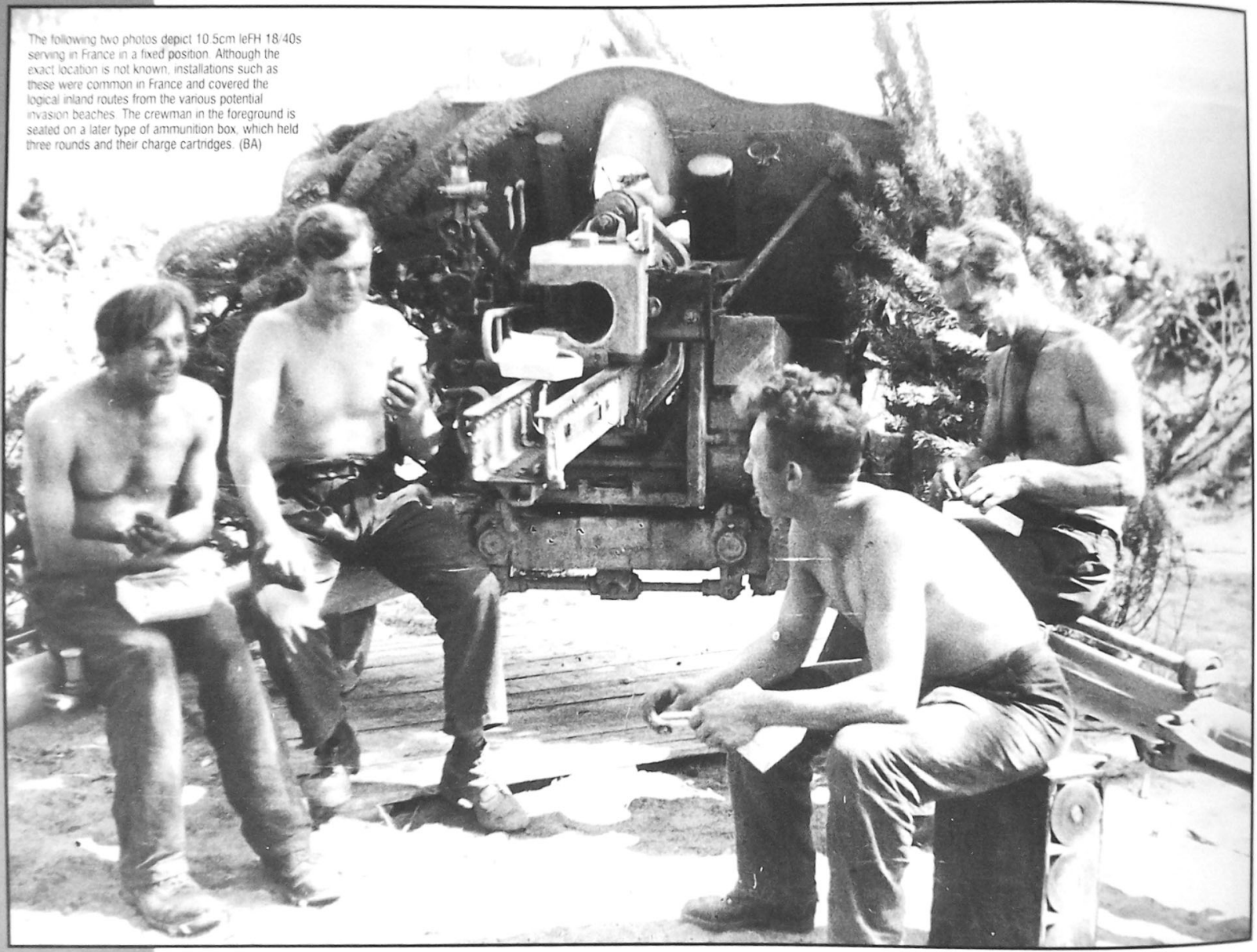


This SdKfz. 11 has just been delivered its gun to a firing position and the crew has begun removing the ammunition from the side lockers. The crew is also beginning to remove essential items from the covered cargo compartment of the half track. The canvas covers on the rear of the SdKfz. 11 were frequently removed and often only loosely attached. Several different types of wheels were seen on the 10.5cm gun, including several different pressed steel types, as well as the wooden spoke version seen here. (BA)

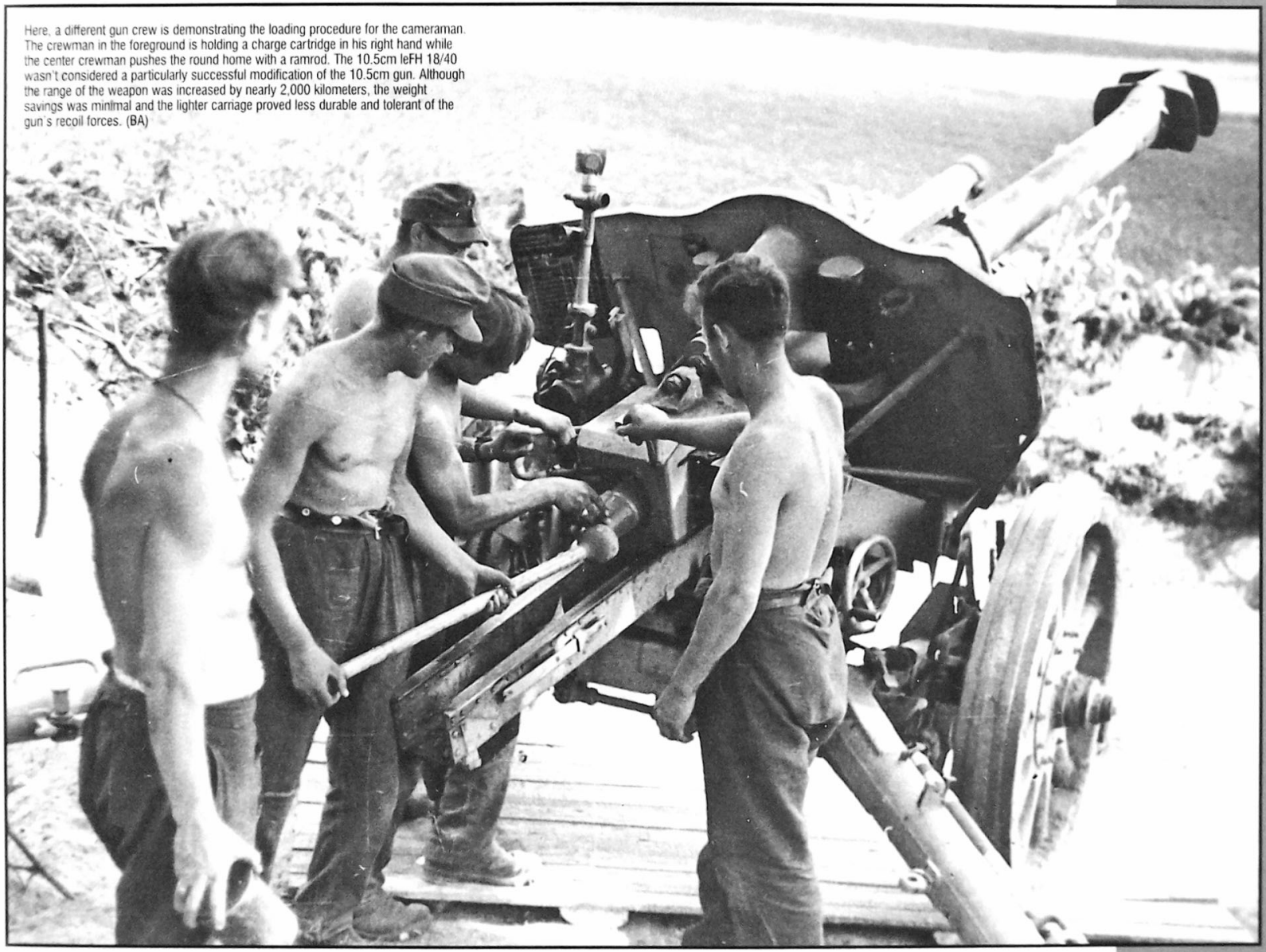
This gun is at the absolute limit of its recoil and it is surprising to see just how far back it goes. Note the bright steel areas of the gun slide and recoil guide tube. The crew is in the middle of a sustained fire mission as evidenced by the large amount of shells and crates in the foreground. (BA)



In 1940, the standard 10.5cm leFH 18 field piece was modified to accept a more powerful, longer-range projectile. This necessitated changes to the recoil system and the addition of a muzzle brake. This redesigned version of the 10.5 cm was designated 10.5cm leFH 18M, the M meaning Mündungbremse (muzzle brake). It is immediately recognizable by its tube-shaped muzzle brake. This was the gun installed in the Wespe self-propelled gun. Based on the requirement for a lighter weight gun, yet another version of the 10.5cm gun was developed. The 10.5cm leFH 18/40 was essentially the same gun as the 10.5cm leFH 18M, but utilized the carriage of the 7.5cm Pak 40. It also mounted a slightly different muzzle brake with pronounced outer flanges. Here, a 10.5cm leFH 18/40 goes into action somewhere on the eastern front. The gun also used several types of wheels and a late, pressed steel type is seen here. (BA)

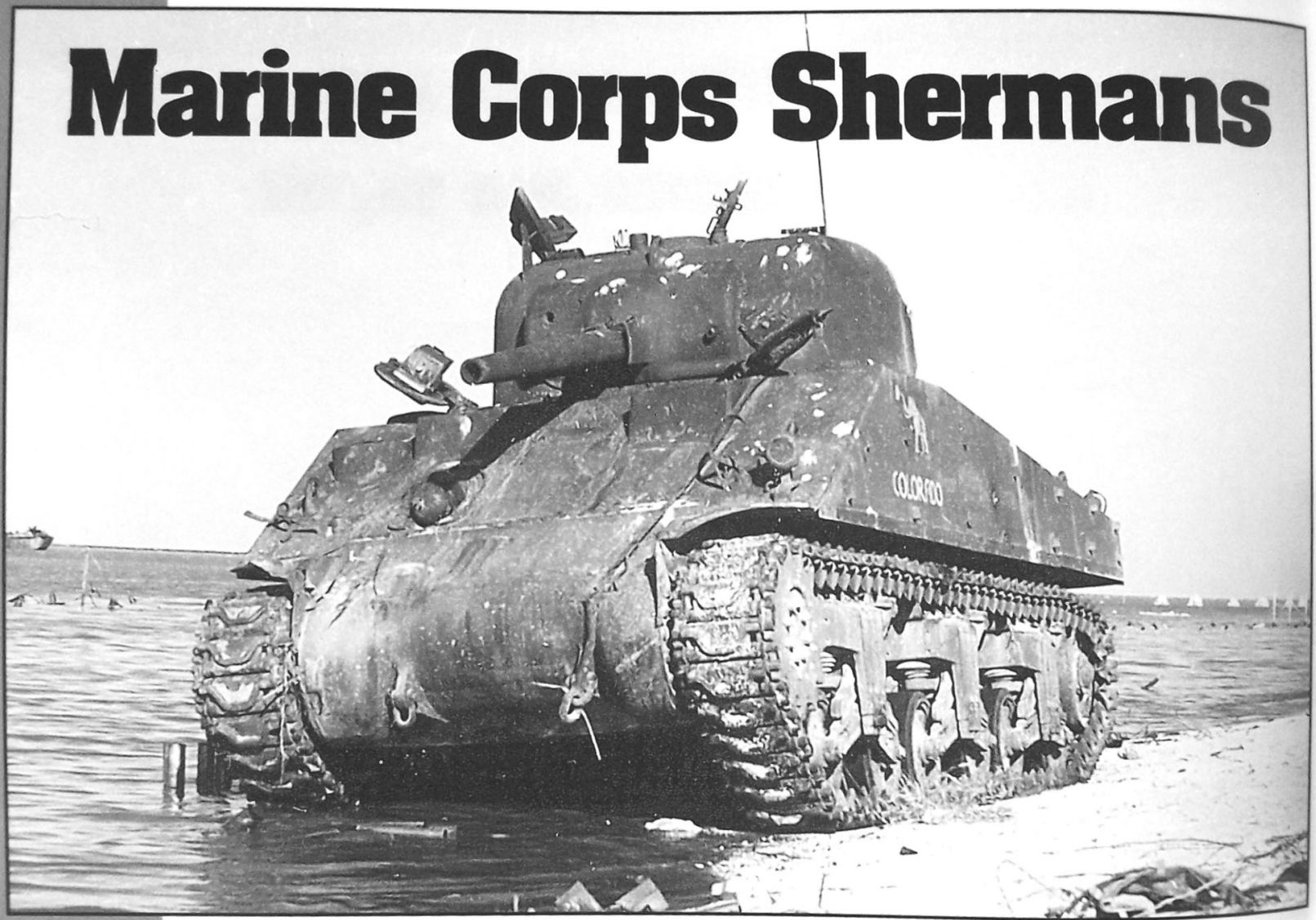


The following two photos depict 10.5cm leFH 18/40s serving in France in a fixed position. Although the exact location is not known, installations such as these were common in France and covered the logical inland routes from the various potential invasion beaches. The crewman in the foreground is seated on a later type of ammunition box, which held three rounds and their charge cartridges. (BA)



Here, a different gun crew is demonstrating the loading procedure for the cameraman. The crewman in the foreground is holding a charge cartridge in his right hand while the center crewman pushes the round home with a ramrod. The 10.5cm leFH 18/40 wasn't considered a particularly successful modification of the 10.5cm gun. Although the range of the weapon was increased by nearly 2,000 kilometers, the weight savings was minimal and the lighter carriage proved less durable and tolerant of the gun's recoil forces. (BA)

Marine Corps Shermans



The assault on the tiny island of Betio, Tarawa Atoll in November 1943 marked the combat debut of the medium tank in Marine Corps service. Fourteen M4A2s of 1st LT Ed Bale's Company C, 1st Marine Amphibious Corps Medium Tank Battalion were divided among the three assault beaches to augment the light tanks of the 2nd Tank Battalion. Nine medium tanks made it ashore, but their numbers were soon reduced to two by the deadly Japanese defenses. The most famous was COLORADO; taken over by 2nd LT Lou Largey after his tank was knocked out. COLORADO spearheaded the final breakout from the east end of the tiny beachhead on the second day of the battle. (NARA)

The unsung heroine of the battle was CHINA GAL, shown being resupplied with ammunition. Bale's command tank, CECILIA, was disabled by a Japanese 37mm round that went down the gun tube. Bale took over CHINA GAL, but the loss of CECILIA, with its critical command net radio, crippled Bale's ability to control and coordinate his remaining tanks. On the second day of battle Bale and MAJ Mike Ryan of the 3rd Battalion, 2nd Marines organized an attack that took the enemy defenses along GREEN Beach from behind. This allowed the Marines to bring ashore organized fighting units that turned the tide of the battle. Through much of the battle Bale fired 75mm howitzer ammunition not designed for use in the tank's main gun. (NARA)

Some infantry commanders, not realizing the limitations of the tanks, ordered them to attack unsupported. COMMANDO penetrated about 250 meters and wrecked several Japanese pillboxes and gun positions before it was destroyed by enemy fire. The crew escaped and hid out until rescued the next day. At virtually point blank range, both the Japanese Type 01 47mm Anti-tank Gun and the Type 88 75mm Anti-aircraft Gun (often referred to as the "Japanese 88") were deadly. The M4A2s (the Marines never used the British-originated term "Sherman") used at Tarawa were early production types, with welded driver's hoods, dry stowage with no applique plates, and a single turret hatch. The rack for extra fuel cans was a common modification. (NARA)

Following the campaign for Guadalcanal, the 1st Marine Division was temporarily assigned to GEN Douglas MacArthur's Southwest Pacific Operations Area. The Cape Gloucester and Talasea Peninsula campaigns were designed to isolate the Japanese base at Rabaul. The 1st Tank Battalion received 14 M4A1 tanks from Army stocks to equip Company A, the only Marine Corps unit to use the M4A1. The Marines quickly developed a very refined tank-infantry doctrine and adapted the concepts of tank warfare to the thick jungle. Rifle squads were assigned to work with specific tanks, resulting in smooth teamwork in which the tank could bring to bear its armor and firepower, while the infantry protected the blind tank from suicidal attackers armed with satchel charges and gasoline bombs. (NARA)

LT John E. Heath and his crew during the fighting for the airfield at Cape Gloucester. Heath later became a company commander, and was killed by a sniper on Peleliu. Marine tankers usually wore the same uniform as the infantry, except for the belt suspender straps, and many wore the shirt and trousers without underwear. The tanks initially carried no markings. Later a series of sequential numbers was assigned, painted on the four-quarter faces of the turret, and on the rear engine doors. Marine tanks tended to be uncluttered by personal gear, since units quickly established base areas for maintenance and supply. This company later supported landings by the Army on New Guinea, the only Marine unit to serve there. (NARA)

The 4th Marine Division attacked Roi and Namur in late January and early February 1944. Only CAPT Bob Neiman's Company C was equipped with M4A2s. Neiman's company introduced oak planks attached to the sides of the hull and fording trunks to allow the tanks to traverse water deeper than four feet. The 4th Tank Battalion was the first to paint a name and radio call sign on the sides of the hull. The platoons in Company C used the letters I, J, K and L. KILLER belonged to Platoon Sergeant Joe Bruno. Bruno was severely wounded, and the rest of his crew killed, by a mine on Iwo Jima. The small Japanese tank has been loaded onto the deck for transport back to Hawaii. (NARA)

Saipan and Tinian saw the appearance of modern versions of the M4A2, and the first use of important specialist vehicles like the dozer tank. This mid-production M4A2 has the steep hull front and additional hatch for the loader, but dry ammunition stowage. This vehicle also has three appliqué armor plates on the hull side. The 2nd Tank Battalion was the first to use the "speed-number" system that later became a Marine Corps standard. The C-42 indicates the number two tank of C Company, Headquarters Platoon. The dozer tank became an important part of the tank-infantry team, building roads and trails under fire, clearing mines, pushing wreckage and debris off of roads, and building ramps so that tanks could fire as artillery. (NARA)

The contributions of Bale's tanks on Tarawa led the 2nd Marine Division to develop the finest tank-infantry teamwork of World War II. Tanks trained intensively with infantry units, often rehearsing the assault several times. Here an M4A2 of CWO William "Gunner Mac" McMillian's 2nd Platoon, Company C fires at one Japanese machine gun and interposes its bulk to block the fire of another while covering the rescue of a wounded Marine. When enemy fire was extremely heavy the tanks would pull up above a wounded man, and drag him to safety through the escape hatch. The capture of Saipan and Tinian were two of the most strategically important events of World War II, but were overshadowed by the simultaneous Normandy campaigns. (NARA)

Tank-infantry coordination was vastly improved by an improvised system of two field telephones, one in the turret, the other in a box or bag on the rear of the hull, connected by a cable through the small grouser box vent on the rear corner of the engine deck. Tank infantry phones later became a factory feature on American tanks. Here an infantry squad communicates with LT G. M. "Max" English inside his command tank, KING KONG, Company C, 4th Tank Battalion, on Saipan. English was the only tank commander who camouflaged his vehicle with the random patches of tan paint, a practice he started on Roi-Namur. The water tank for the infantry is a fuel tank from a light tank. (NARA)

The 2nd and 4th Marine Divisions assaulted Tinian immediately after capturing Saipan, becoming the only divisions to fight two major campaigns back-to-back without a period of recuperation. Bob Neiman encouraged improvisation by his tank crews and maintenance men, and his company introduced many of the special features associated with Marine tanks. Here Neiman's command tank, ILL WIND, crashes through a cane field on Tinian. The Japanese singled out command tanks, identified by the additional antennae, for special attack. ILL WIND has not only the usual plank armor, but also a thick layer of concrete over the slope plate. An armored cylinder over the commander's hatch periscope is visible on top of the turret; this feature rotated with the periscope assembly. (NARA)

The 3rd Marine Division, the 1st Provisional Marine Brigade, and the Army's 77th Division (a much respected unit often called the "77th Marines" by the Marines) liberated Guam, a U. S. Territory captured by the Japanese in 1941. The Brigade consisted of the 4th and 22nd Marines, each of which had its own tank company. There was actually considerable variation in the design of fording trunks, since they were constructed by unit personnel. The type shown here on vehicles of Tank Company 22nd Marines was used by all Marine Corps units on Guam, and by the 6th Tank Battalion after it absorbed both regimental tank companies. These vehicles are fighting their way up the narrow road toward the pre-war Marine Barracks on the Orote Peninsula. (NARA)

The charging rhinoceros was the very distinctive symbol for Tank Company 4th Marines, shown here in a privately taken photo. The 4th Marines legacy had great emotional significance. Overwhelmed on Corregidor, the reborn regiment was a very tough unit, manned largely by members of the disbanded Raider Battalions. Many Marine tank units used a complex color-symbol-number system in their first campaign, but found it cumbersome and changed to a simpler system after their first campaign. The symbol on the turret of this M4A2 indicates the Platoon Sergeant's (2) tank of the 2nd (diamond) Platoon. A body weight of 150 pounds (68kg) was considered heavy by the standards of the time, and the men tended to be emaciated after weeks in combat.

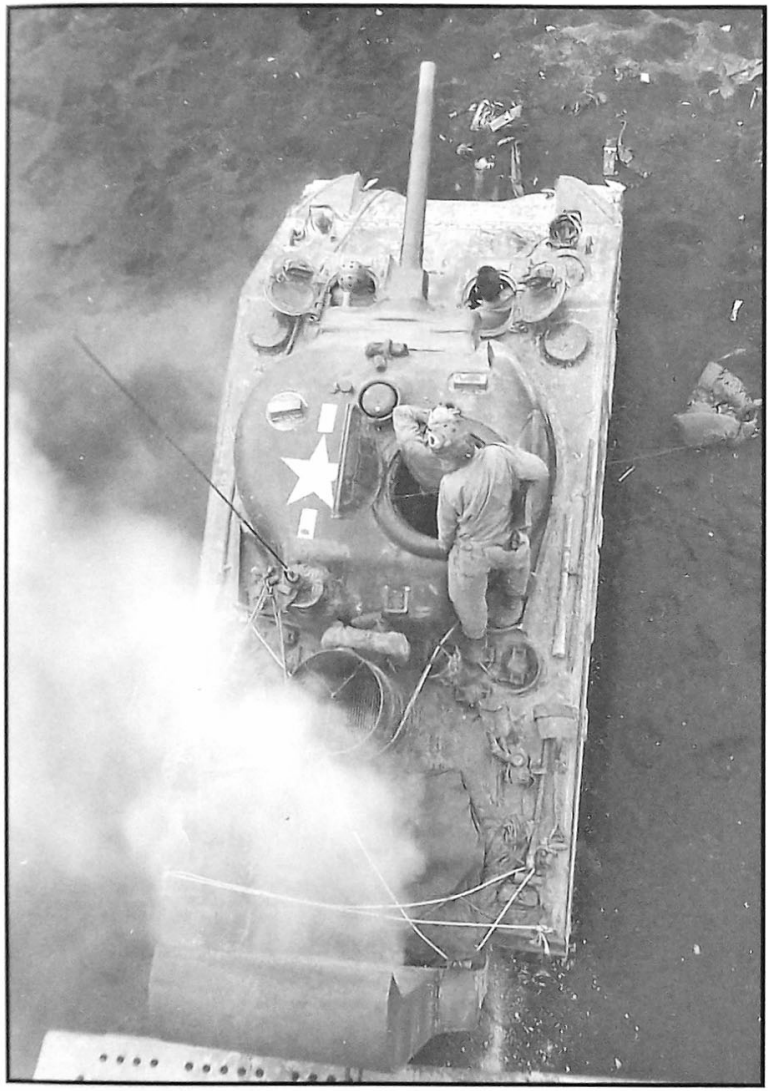
In late 1944 the 1st Marine Division attacked Peleliu, in the Palau Islands, site of several Japanese airfields. The Japanese defended Peleliu to the bitter end from a tangled maze of jagged hills and caves. Temperatures soared over 110 degrees F (44.3 C), there was little drinkable water, and heat casualties among both the infantry and the tankers closed up inside their steel boxes were enormous. In this photo, an M4A2 of Company A, 1st Tank Battalion fights its way through the trees at the base of the Umurbrogol hill complex. Tank commanders often fought with their head out the hatch, risking their own safety for that of their tank and crew. Seventy percent of tank commanders on Peleliu were killed or wounded. (NARA)

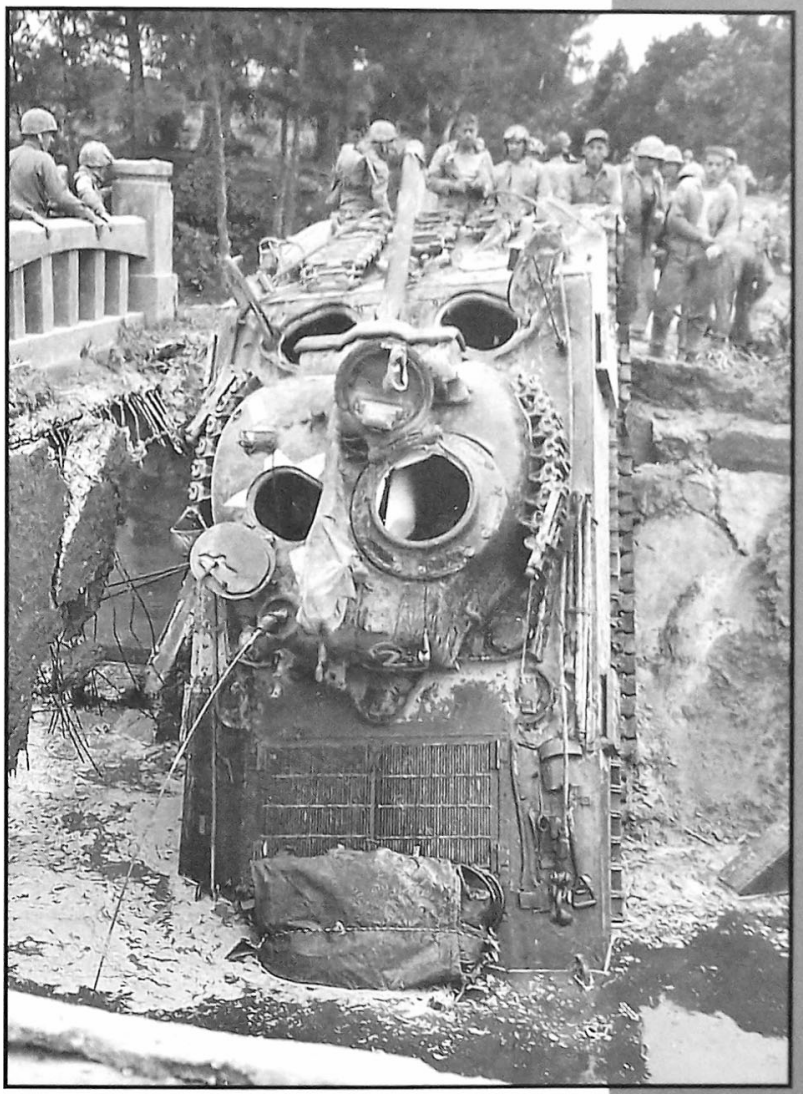
The tank crewmen often stood outside the tank to observe the fall of shot, as with this dozer tank as it blasts away at enemy positions hidden in the thick forest. The 1st Tank Battalion used mid-production M4A2s with appliqué armor, and the old style split commander's hatch, and commonly used extra track welded to the slope plate and turret sides. The Philippines invasion consumed much of the Navy's shipping, so the 1st Division landed only two-thirds of its full complement of tanks. Many tanks carried loose ammunition stacked on the turret deck, as well as the full ammunition load of 97 rounds. A typical tank might fire up to eight such loads in a single day. (NARA)

In early 1945 the M4A3 became the preferred tank for the Marine Corps. On Iwo Jima, the 4th and 5th Tank Battalions were equipped with the M4A3, while the 3rd Tank Battalion had mid-production M4A2s. Both 4th and 5th Battalion tanks used the wooden side armor, but most tank photos taken on Iwo were of Bob Neiman's Company C, 4th Tank. 41 CAIRO illustrates the distinctive steel bar cages over the hatches, track blocks welded to the turret sides and slope plate, and wooden side armor made up of narrow planks with a layer of concrete between it and the hull side. The track extensions for better traction were common on Marine tanks from the Marianas campaigns onward. (NARA)

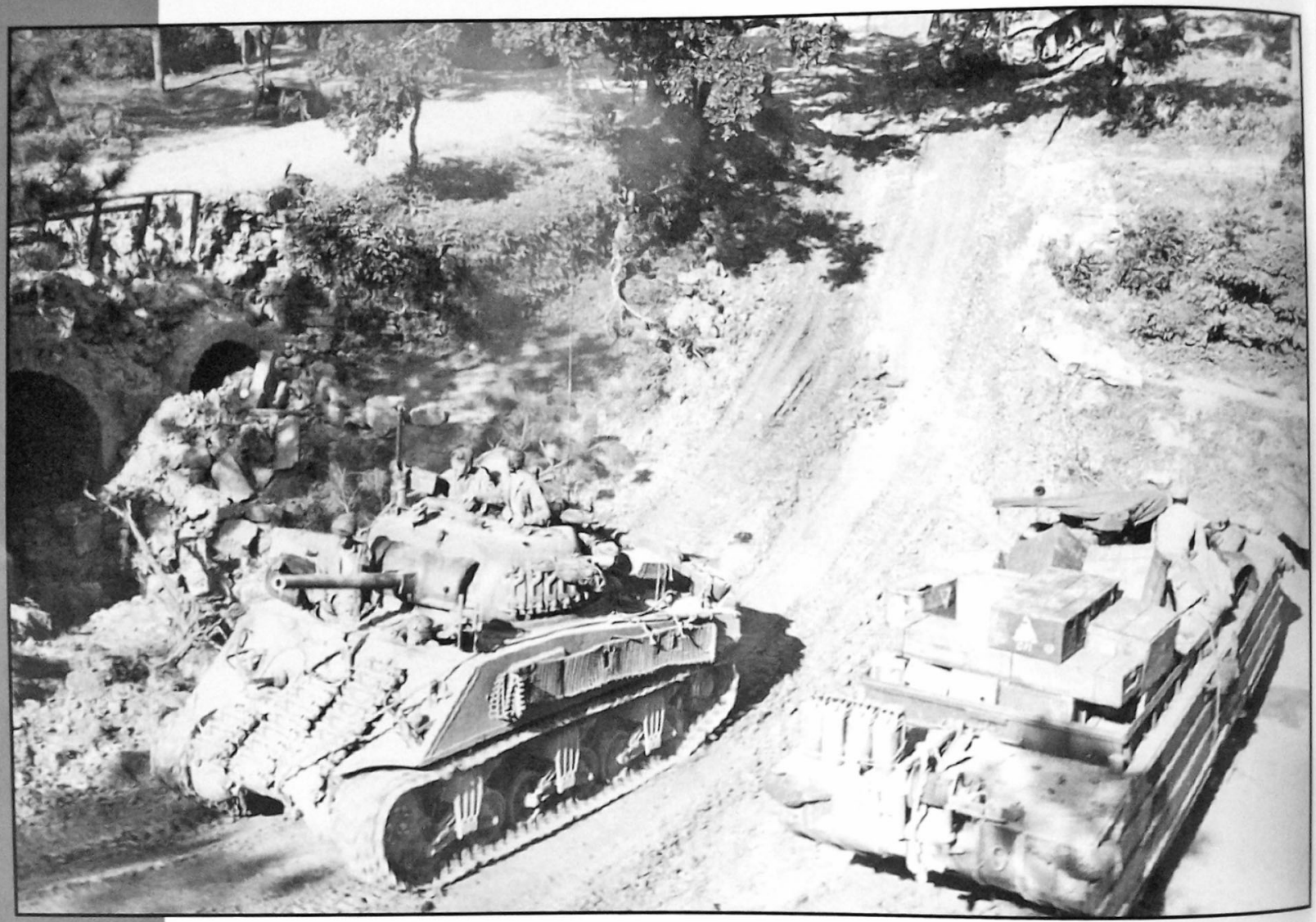
Two M4A2s serve as a temporary church while a Navy chaplain conducts religious services for men of the 3rd Tank Battalion on Iwo Jima. After late 1942 the Marines no longer mixed tank types within battalions. These vehicles exhibit the diagnostic features of the M4A2s on Iwo: welded driver's hoods, applique armor, including the turret face plate, split commander's hatch, and no track extensions. The vehicle on the right is a command tank, marked by an additional antenna on the slope plate. The markings are typical for this battalion and include a tactical number on the turret side, the name ANN on the lower front of the side armor and personal inscriptions on the driver's hood faces. (NARA)

On Iwo Jima, the daily attrition of tanks destroyed or disabled by mines, artillery, anti-tank guns, and the rugged terrain sometimes reached sixty per cent. Recovery and repair crews performed heroic feats, working all night in field shops built in bomb craters covered by tarps to conceal lights and the glow of welding torches. Company shops performed repairs that in Europe were done only in rear-echelon depots, sometimes assembling tanks from scavenged parts. Recovery crews often moved into enemy-held ground to recover repairable tanks. Here "Dude," the M32B2 of Company C, 3rd Tank Battalion, works to extract an M4A2 from a shell hole. The fighting is still going on nearby, as indicated by the flame-thrower man near the rear corner of the retriever. (NARA)





Left: Replacement tanks of the 3rd Tank Battalion roll out of an LST onto the beaches of Iwo Jima. The photographer was standing on the bow of the LST when this shot was taken. Note the combined use of the 55-gallon drum and the square-shaped wading trunks. (NARA) **Right:** Enemy action was not the only hazard. This M4A3 of the 6th Tank Battalion has broken through one of the flimsy bridges on northern Okinawa. The marking on the rear of the turret, a yellow number two inside a yellow shamrock, indicates the Executive Officer's tank in Headquarters Platoon of Company C. This marking was also carried on the forward one of the two peculiar panels on the sides of the hull, but the function of the plates is unknown. The white winged star on the turret roof is also unusual, seen on a few vehicles of both the 3rd and 6th Tank Battalions. The extra track blocks were added prior to the assault landings. (NARA)

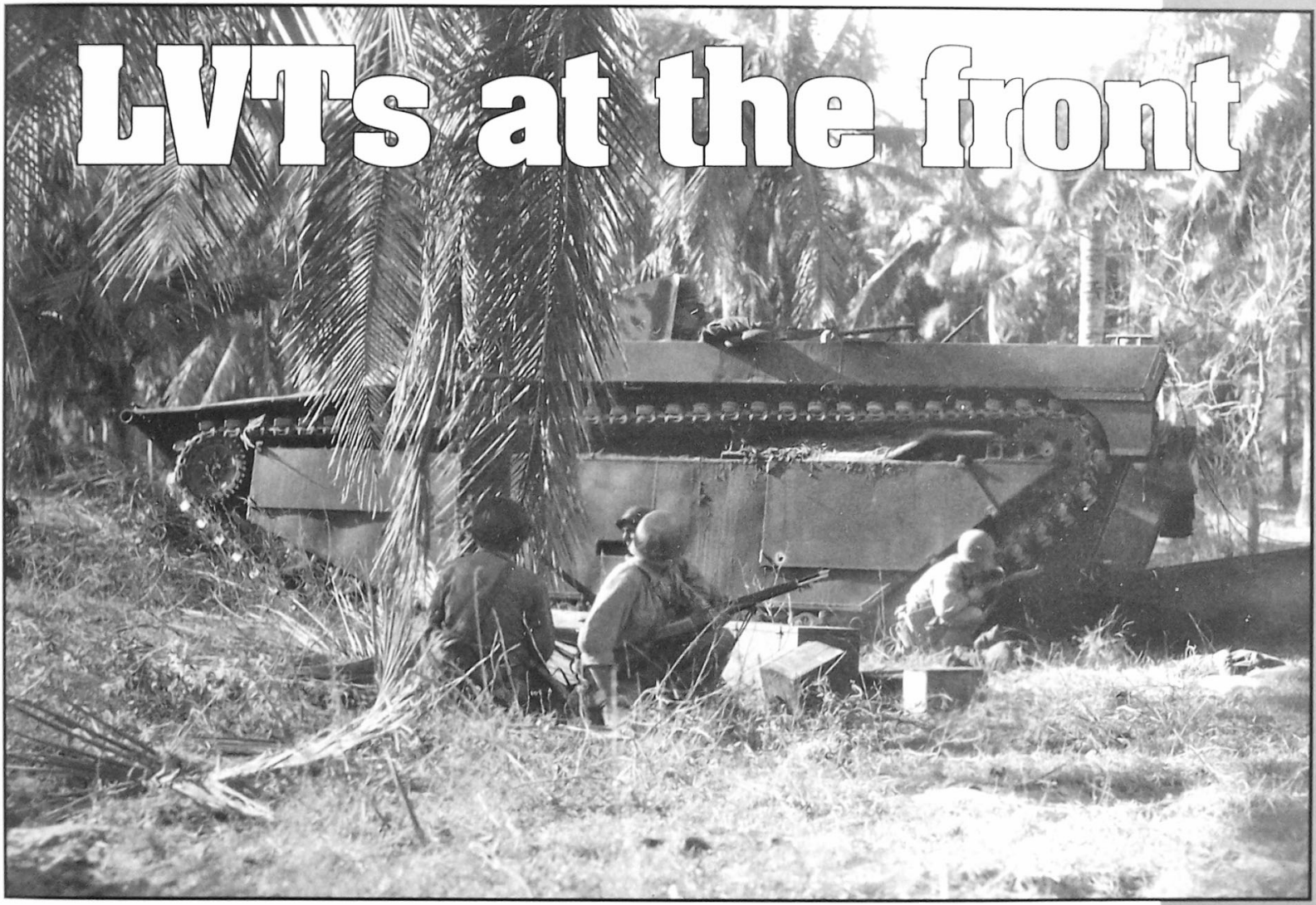


The M4A2 was to be phased out of USMC service by early 1945, but LTCOL Arthur J. "Jeb" Stuart obtained special permission for the 1st Tank Battalion to use it on Okinawa. The Army had refused the diesel-engined tank, but the Marines who fought in the M4A2 loved it. This is a typical vehicle, with extra track welded to the slope plate and turret sides, track extensions, and the machine gun mount moved forward of the tank commander's cupola. The use of the ship's deck matting hung from the sides as extra armor was limited to Able Company. First Tank used the usual speed numbers as tactical markings in this campaign. The vehicle at right is a heavily loaded DUKW. (NARA)

On both Iwo Jima and Okinawa the greatest threat to the tanks was the augmented mine, a buried aircraft bomb or torpedo warhead with a normal anti-tank mine as a detonator. Depending upon circumstance, the explosion might just blow off the front of the tank, or worse, detonate ammunition stored in the floor of the hull, the fate of this late-model M4A3 of 6th Tank Battalion destroyed near Itoman, on Okinawa. Crewmen who had their hatches open might be blown out, badly wounded but alive. The track blocks welded to the hull sides were added late in the campaign, after the Marine tank units moved south to participate in the assault on the main Japanese defenses of the Shun Line. (NARA)

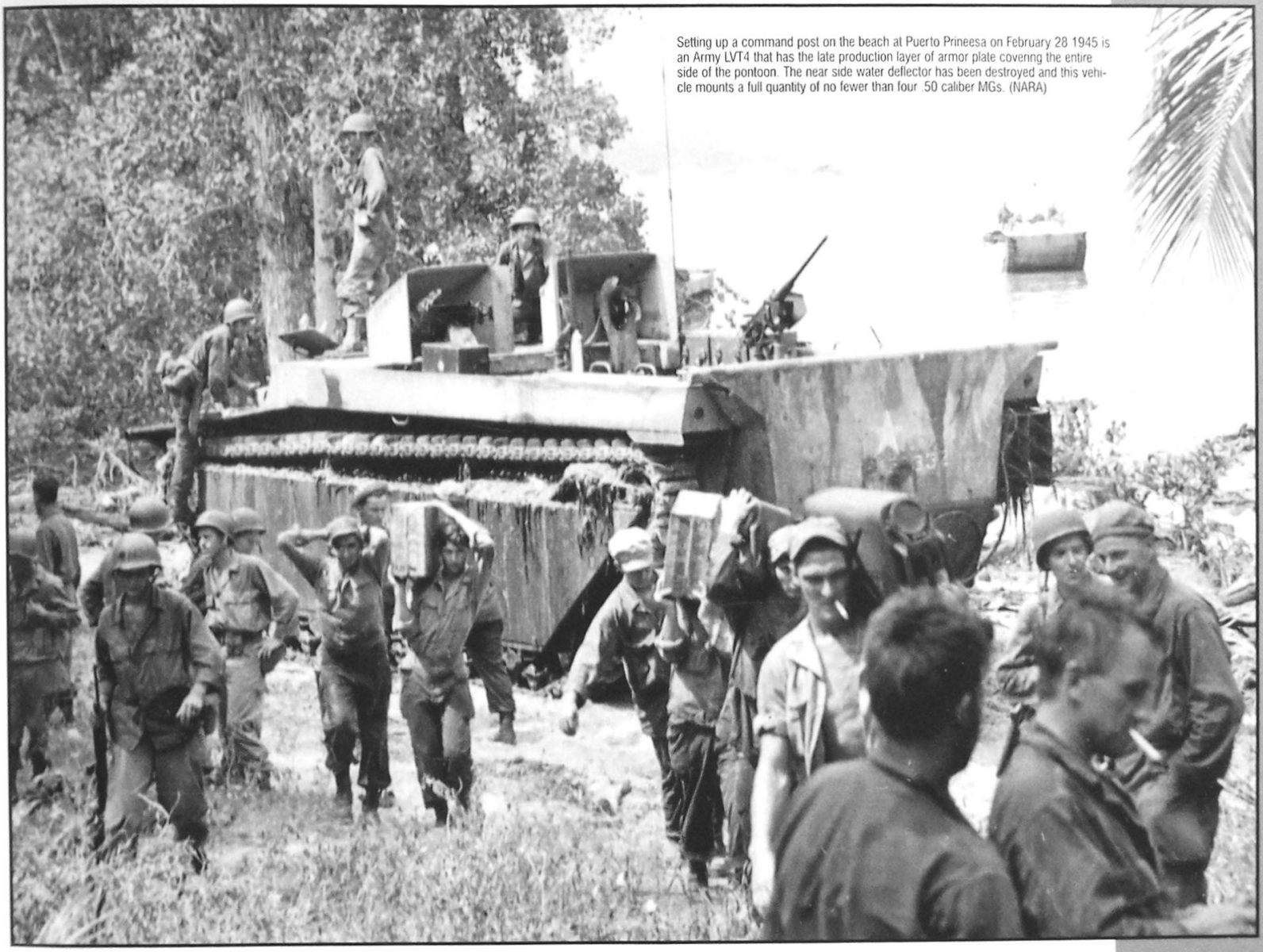
A late M4A3 moves forward to assault Oroku Village on 7 June 1945. This is a tank of 2nd Platoon, B Company, 6th Tank battalion. This unit was part of the landing on 4 June at the Oroku Peninsula. This tank is a fine example of the late M4A3 with its commander's cupola, (apparently) solid road wheels and drive sprocket, and enlarged forward hatches. The hull of the tank is liberally covered with spare track links as supplemental armor. Both the steel cleat and steel chevron types are used. It also has a full set of extended "duck bill" end connectors. Both these features were common to Shermans of this unit. This tank also has a base mount for a command antenna on the right side, but not the antenna itself. (NARA)

LVTs at the front



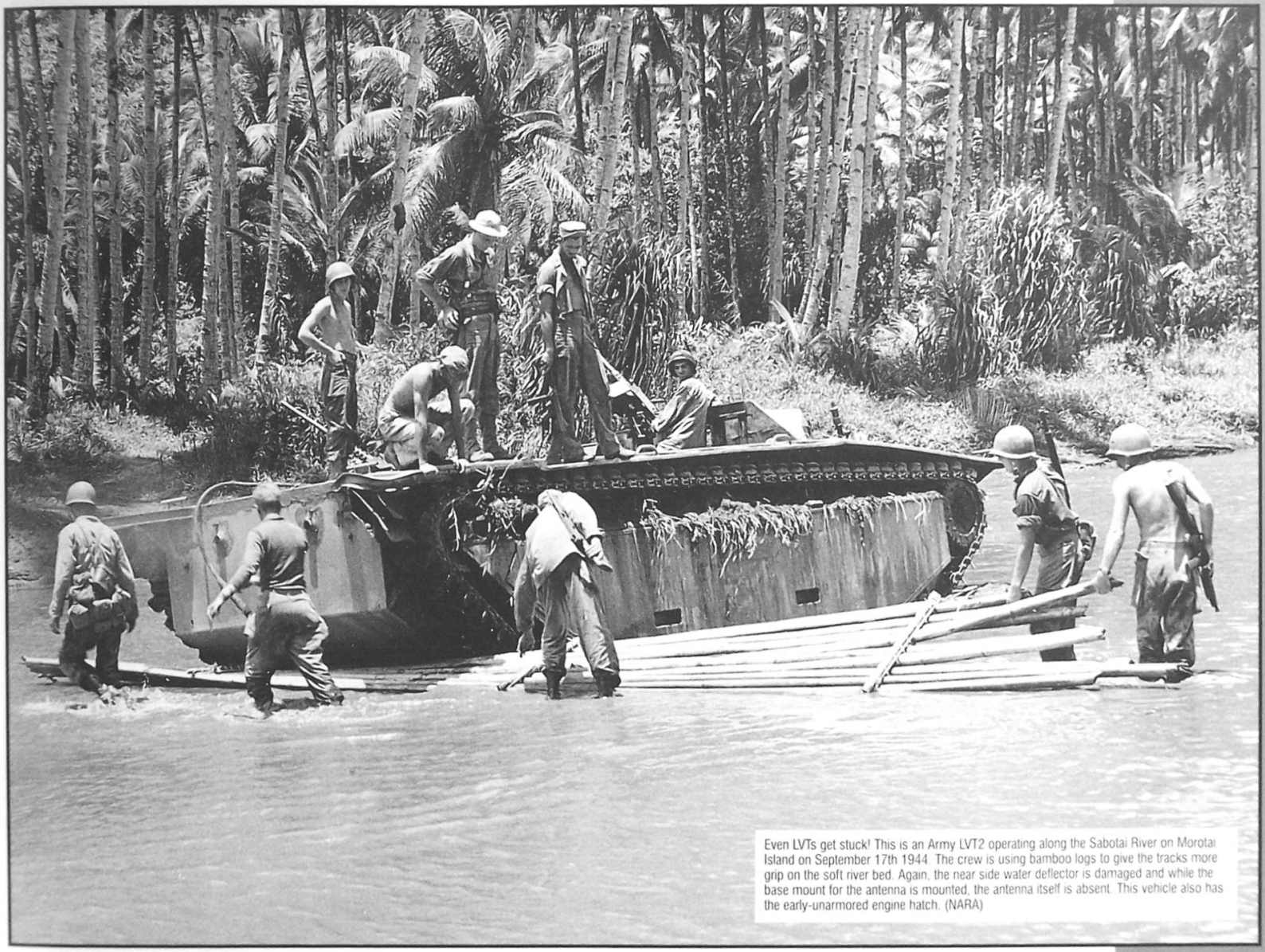
This photo shows an LVT4 attached to the 43rd Infantry Division. The 43rd came ashore on White Beach #3 on the Lingayen Gulf, Luzon Island in the Philippines on January 9th 1945. Evident in this photo are the additional armor packs mounted on the sponson sides. The plate in the front part of the pontoon was added to give better protection to the crew cab. The plate on the rear part of the side pontoon was added to protect the fuel tanks. Upon closer examination of this picture it appears that the nearest gunner's position gun shield has some type of camouflage applied. (NARA)

A bird's eye view of the beach at Aitape, Dutch New Guinea showing a wealth of LVTA4's and LVT4's. These vehicles are in the process of being loaded aboard LSTs for future operations. A tent city appears in the background, men are skinny-dipping in the surf. Noticeable on several of the LVT's in this photo is the use of the big white star on the sides of the vehicles; a practice not used by USMC LVT's. (NARA)



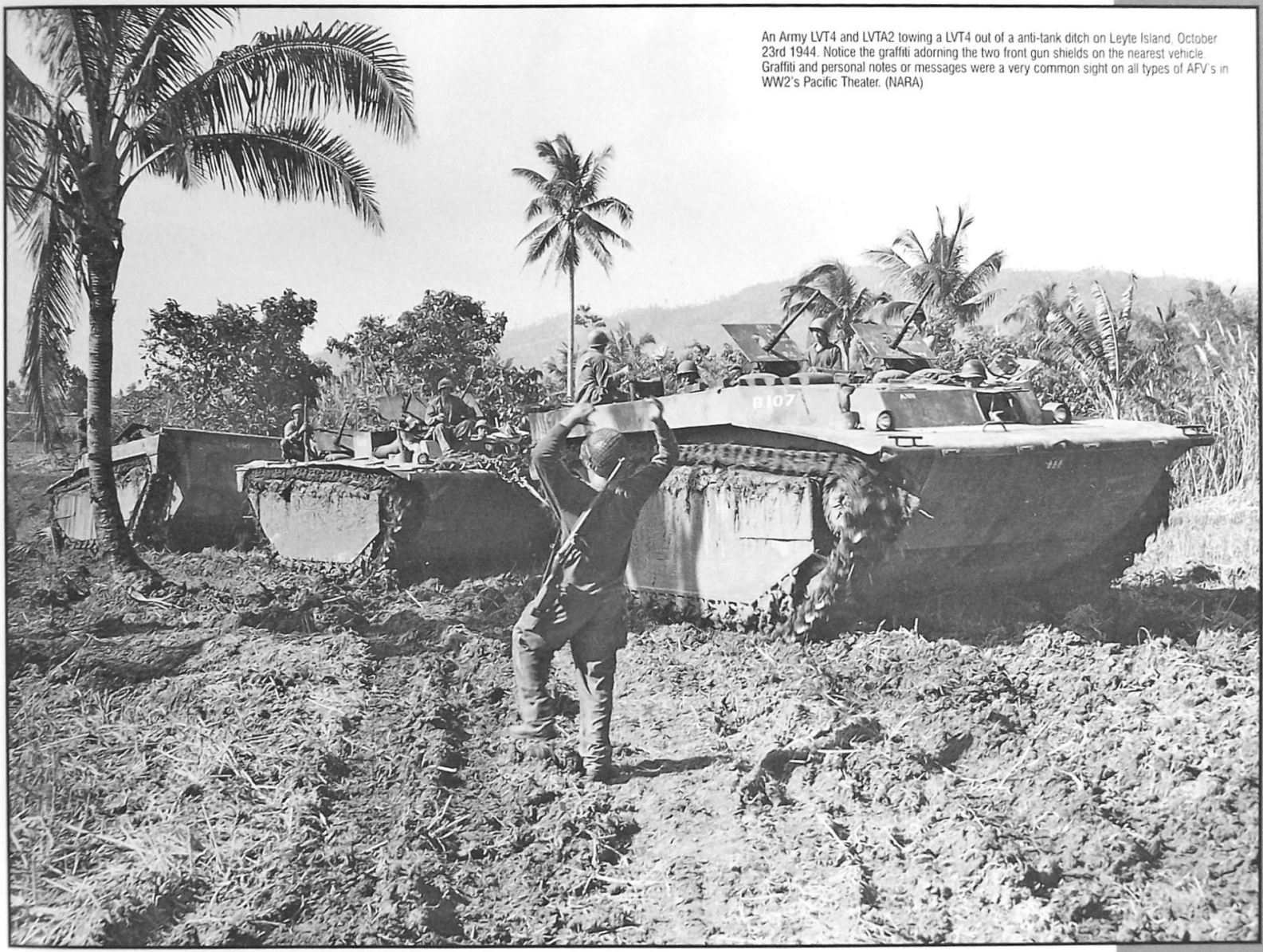
Setting up a command post on the beach at Puerto Prineesa on February 28 1945 is an Army LVT4 that has the late production layer of armor plate covering the entire side of the pontoon. The near side water deflector has been destroyed and this vehicle mounts a full quantity of no fewer than four .50 caliber MGs. (NARA)

An Army LVT2 in support of the 124th Regimental Headquarters is seen moving through a native village on Morotai Island on September 17th 1944. An interesting feature on some WWII LVT2's and A2's is shown in this photo, the crew appears to be using a replacement radio mounted in the right front of the cargo compartment. You can see the antenna protruding above the vehicle in this position. Early LVT's had a real problem with leaking in the driver's compartment and waterproofing of the electrical system was insufficient. This may explain the reason for the replacement radio and its relocation to the cargo compartment. (NARA)

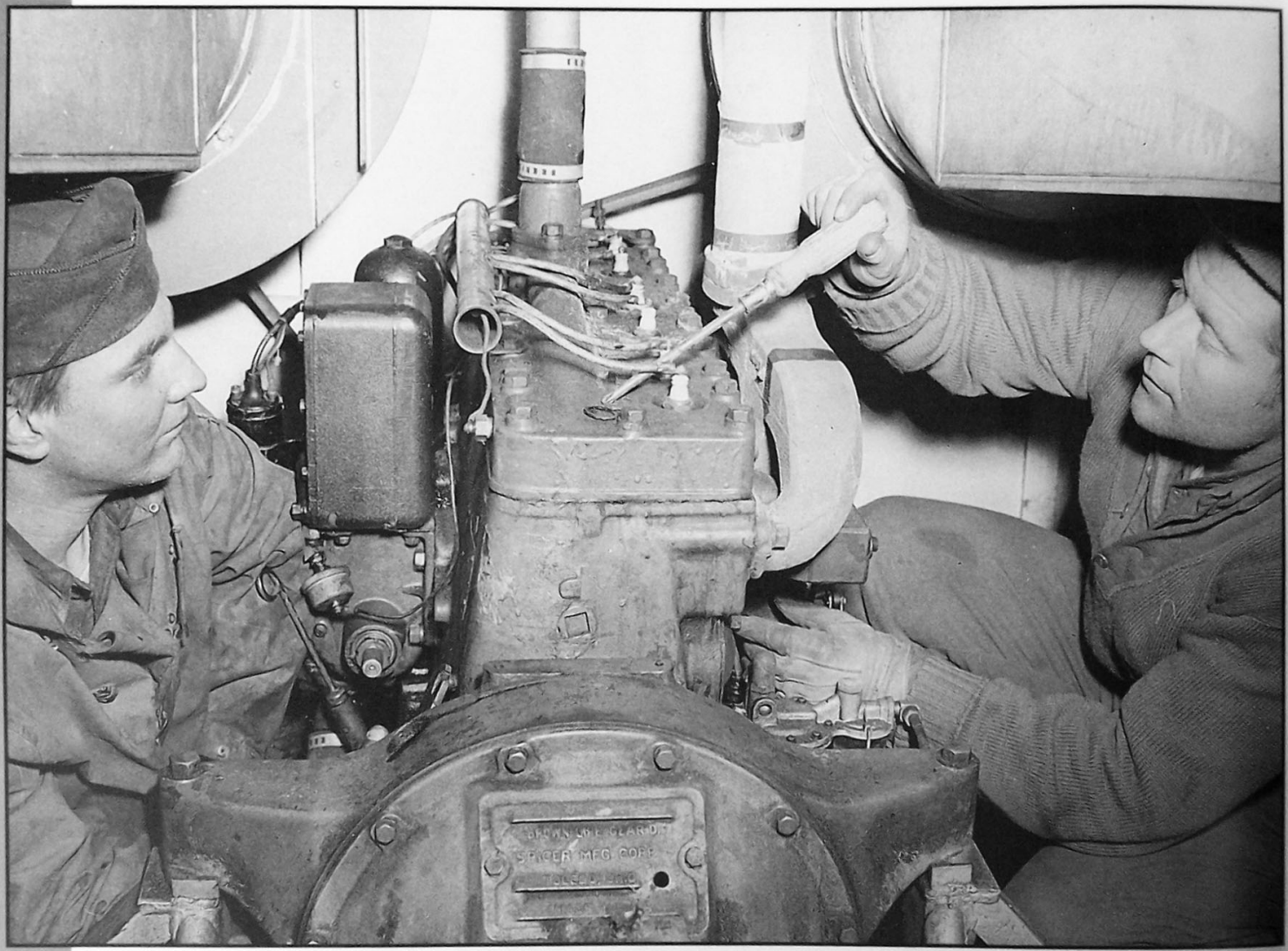


Even LVTs get stuck! This is an Army LVT2 operating along the Sabotai River on Morotai Island on September 17th 1944. The crew is using bamboo logs to give the tracks more grip on the soft river bed. Again, the near side water deflector is damaged and while the base mount for the antenna is mounted, the antenna itself is absent. This vehicle also has the early-unarmored engine hatch. (NARA)

Somewhere off the bloody beaches near Aberdeen Proving Grounds, this late production LVTA4 and its crew, including "Splash" the wonder dog, head out to sea to test the 4.5-inch rocket launcher mounts. These rocket systems did make it into service during WWII and were mounted on a variety of platforms. The LVT mounted rockets were not used after it was learned that the firing circuits were often ruined by the sea water pouring over them and the mounts themselves were so fragile that their own weight caused them to collapse in even mild conditions. (NARA)

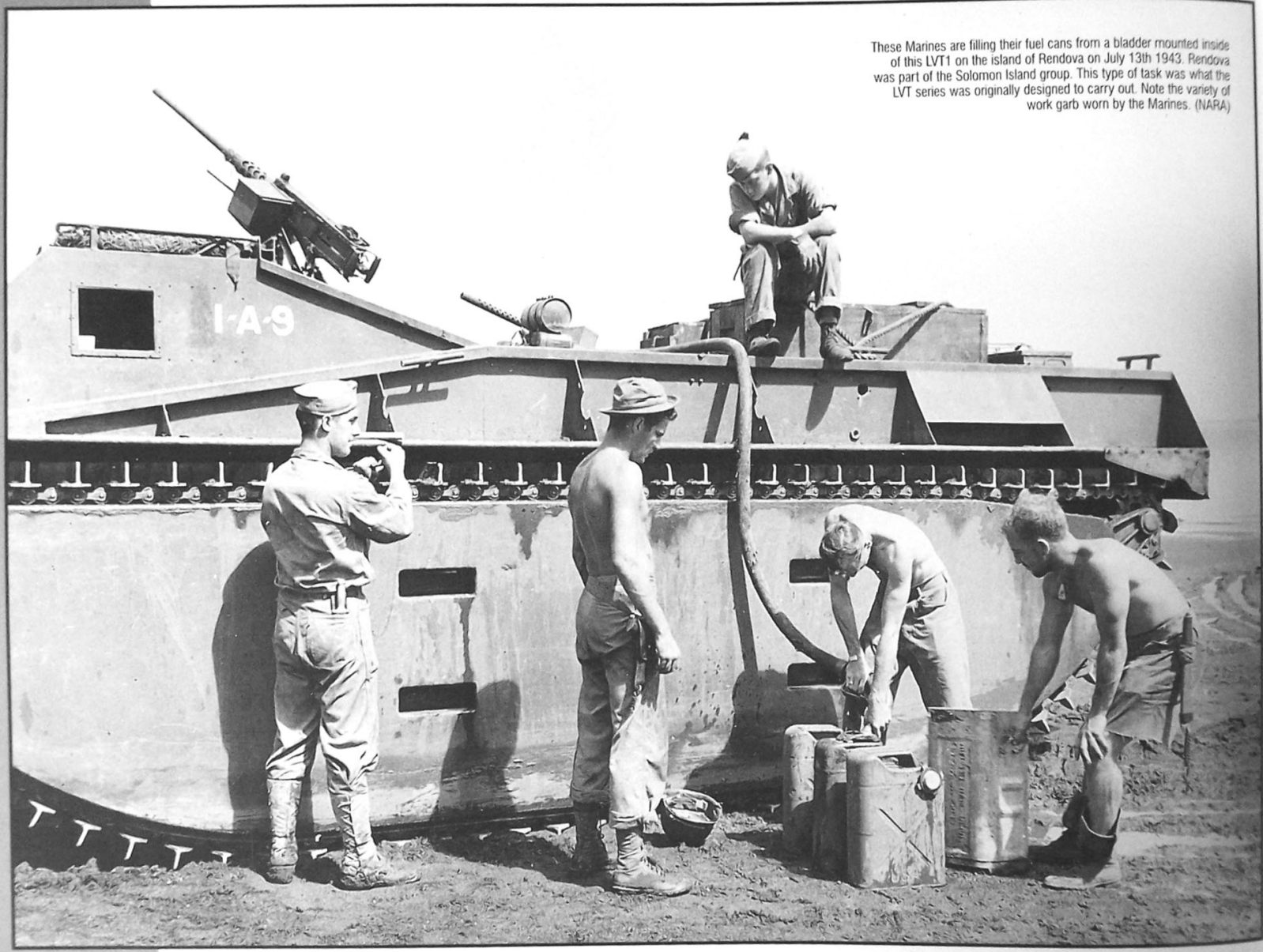


An Army LVT4 and LVTA2 towing a LVT4 out of a anti-tank ditch on Leyte Island, October 23rd 1944. Notice the graffiti adorning the two front gun shields on the nearest vehicle. Graffiti and personal notes or messages were a very common sight on all types of AFV's in WW2's Pacific Theater. (NARA)



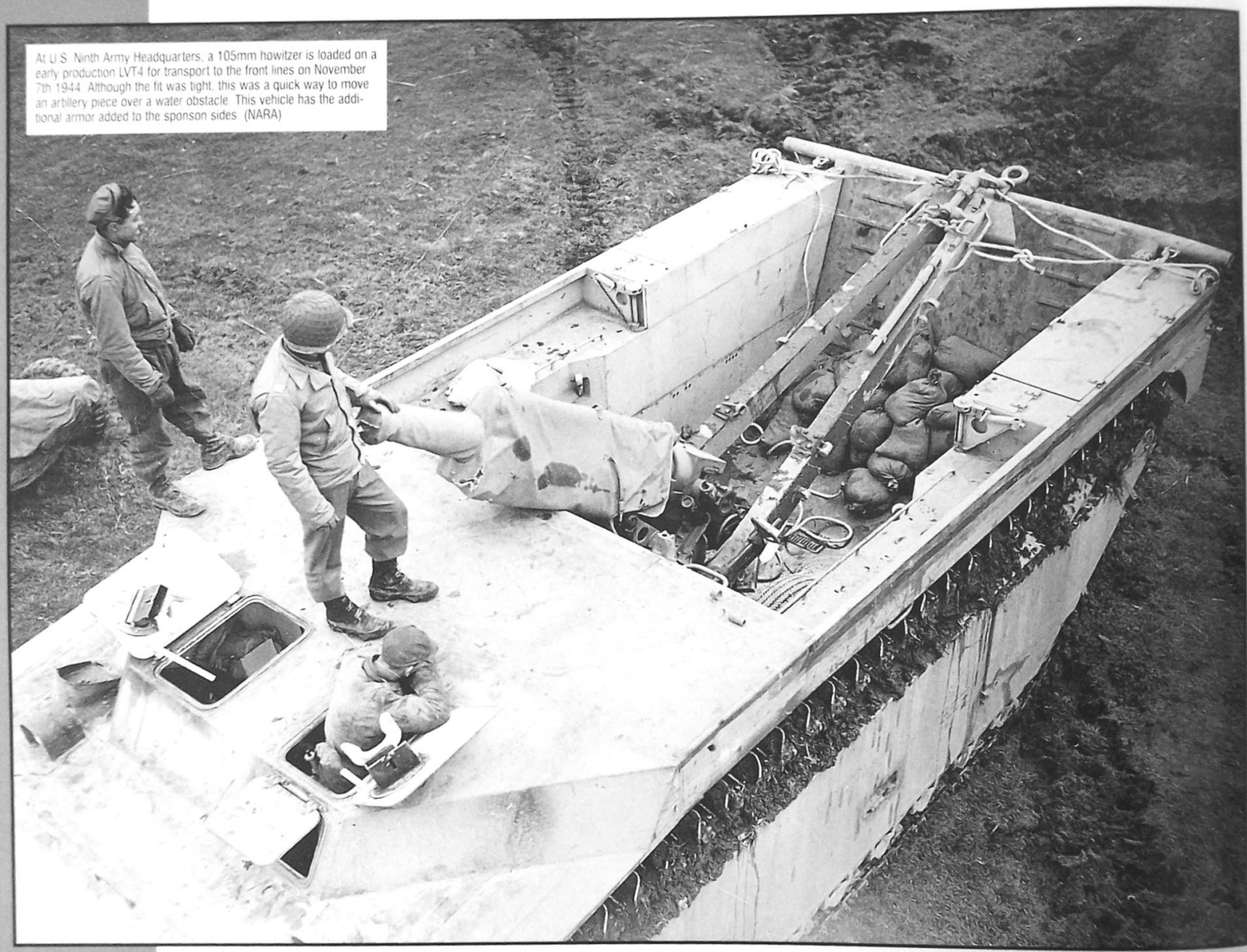
Two mechanics are seen here with the 150 HP Hercules engine that powered the original series of LVT1 vehicles. All other LVT's from the LVTA1 through the LVTA5 were powered by a Continental air-cooled seven cylinder 200 HP radial engine. This is the same engine found in the M3 Stuart tanks. This photo was taken on the island of Kiska, Alaska October 6th 1944. (NARA)

Another picture from the Aleutians showing 17 LVT1's sitting on the beach of Trout Lagoon in the Northern part of Kiska Harbor on September 23rd 1943. These LVT's really showed their worth when it came to moving men and material in the harsh climate of this theater. (NARA)

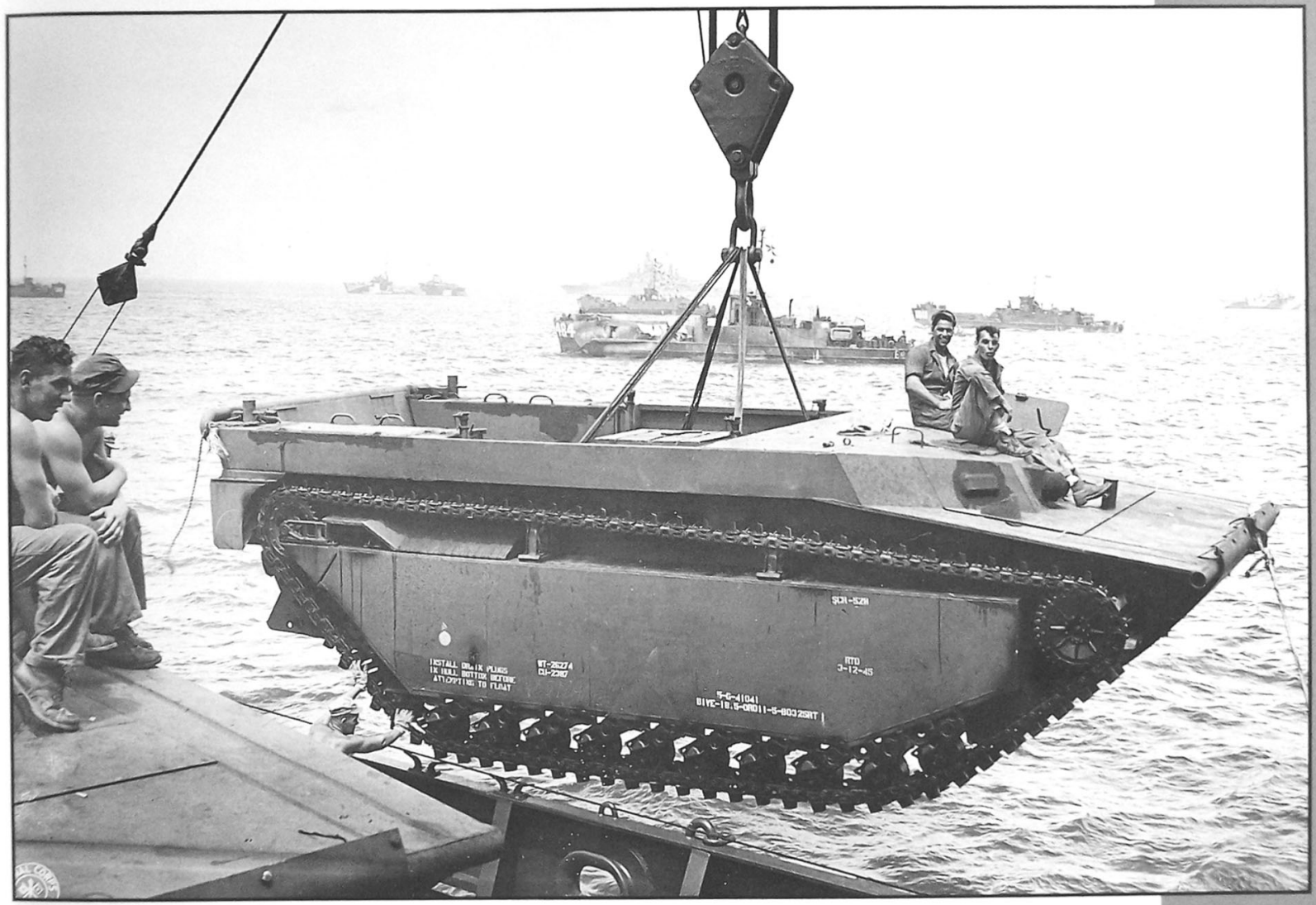


These Marines are filling their fuel cans from a bladder mounted inside of this LVT1 on the island of Rendova on July 13th 1943. Rendova was part of the Solomon Island group. This type of task was what the LVT series was originally designed to carry out. Note the variety of work garb worn by the Marines. (NARA)

Men of the 7th Infantry Division move from an LCVP to an LVTA2 for the final ride into the beach during the Kwajalein landings, on February 1 1944. The wooden hulls of the LCVPs were vulnerable to damage by the coral reefs surrounding Kwajalein Island. This LVTA2 bears the name "Mildred" painted on the left pontoon. Many times LVT's would carry several different names painted on different parts of the same vehicle. The bilge pump outlet is clearly shown in this photo expelling water. (NARA)

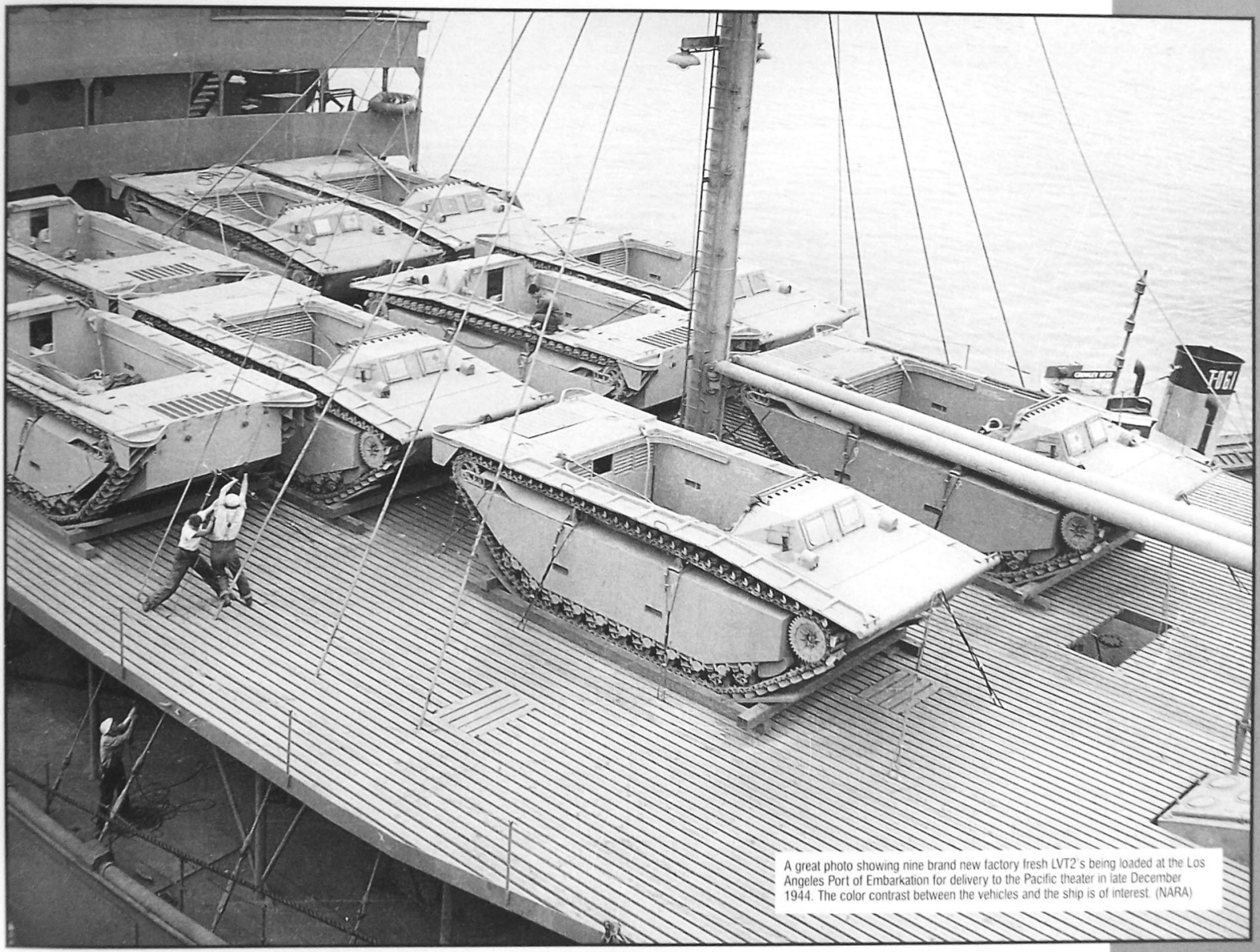


At U.S. Ninth Army Headquarters, a 105mm howitzer is loaded on a early production LVT4 for transport to the front lines on November 7th 1944. Although the fit was tight, this was a quick way to move an artillery piece over a water obstacle. This vehicle has the additional armor added to the sponson sides. (NARA)

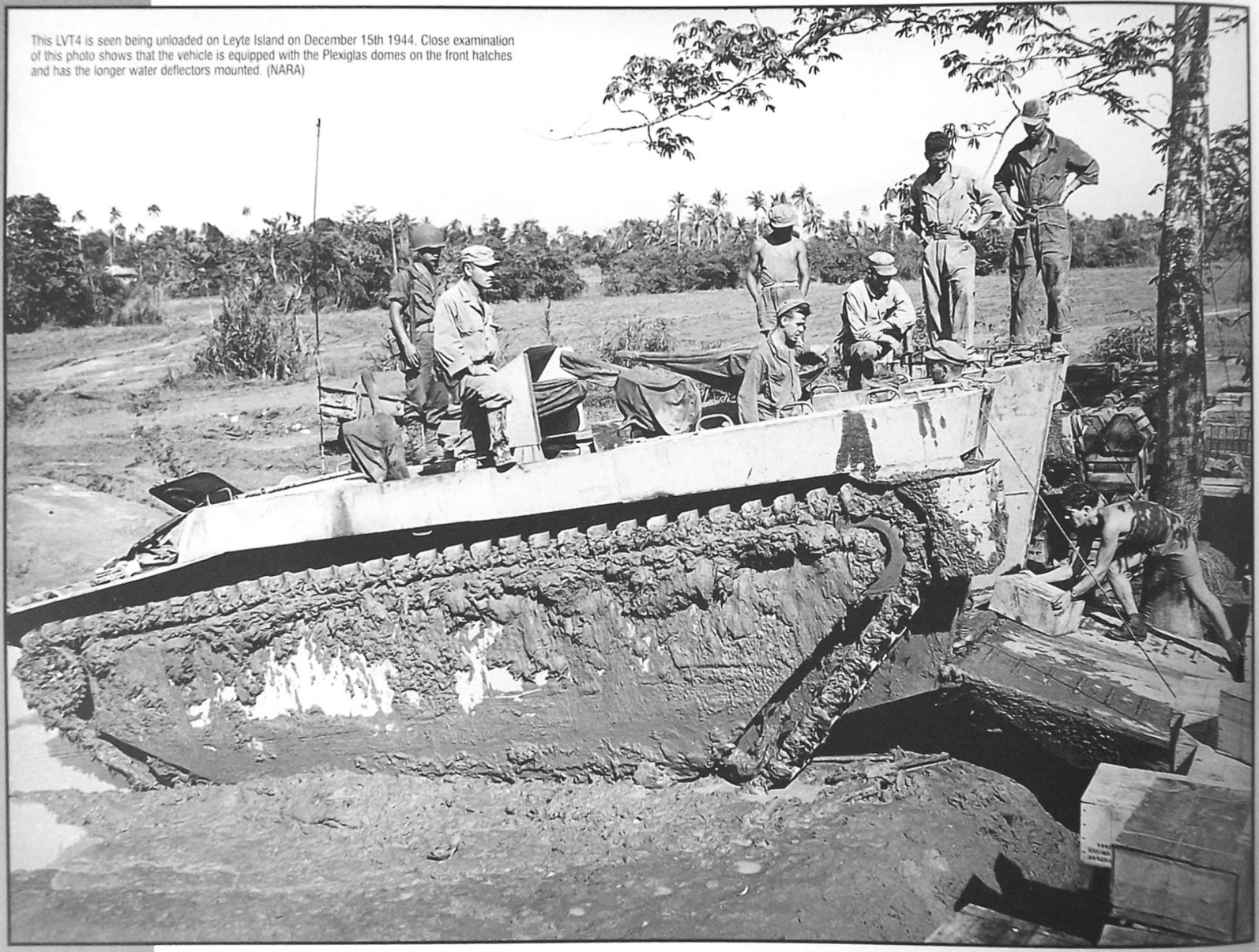


A great photo of an early production LVT4 that has been returned to a maintenance facility and rebuilt with some of the late production modifications, like the added vision ports in the cab front and sides and added armor plate in the cab sides. Note the three vision ports located on the front of the cab, the post-type chock cleat and large plates on the pontoon sides. The lack of any headlights is a curious mystery. The stenciling on the side of the vehicle gives the radio type, the vehicle weight and the "Returned to Depot" date. This photo was taken on June 12th 1945 at an Okinawa port. The ship is the S.S. Grinell. (NARA)

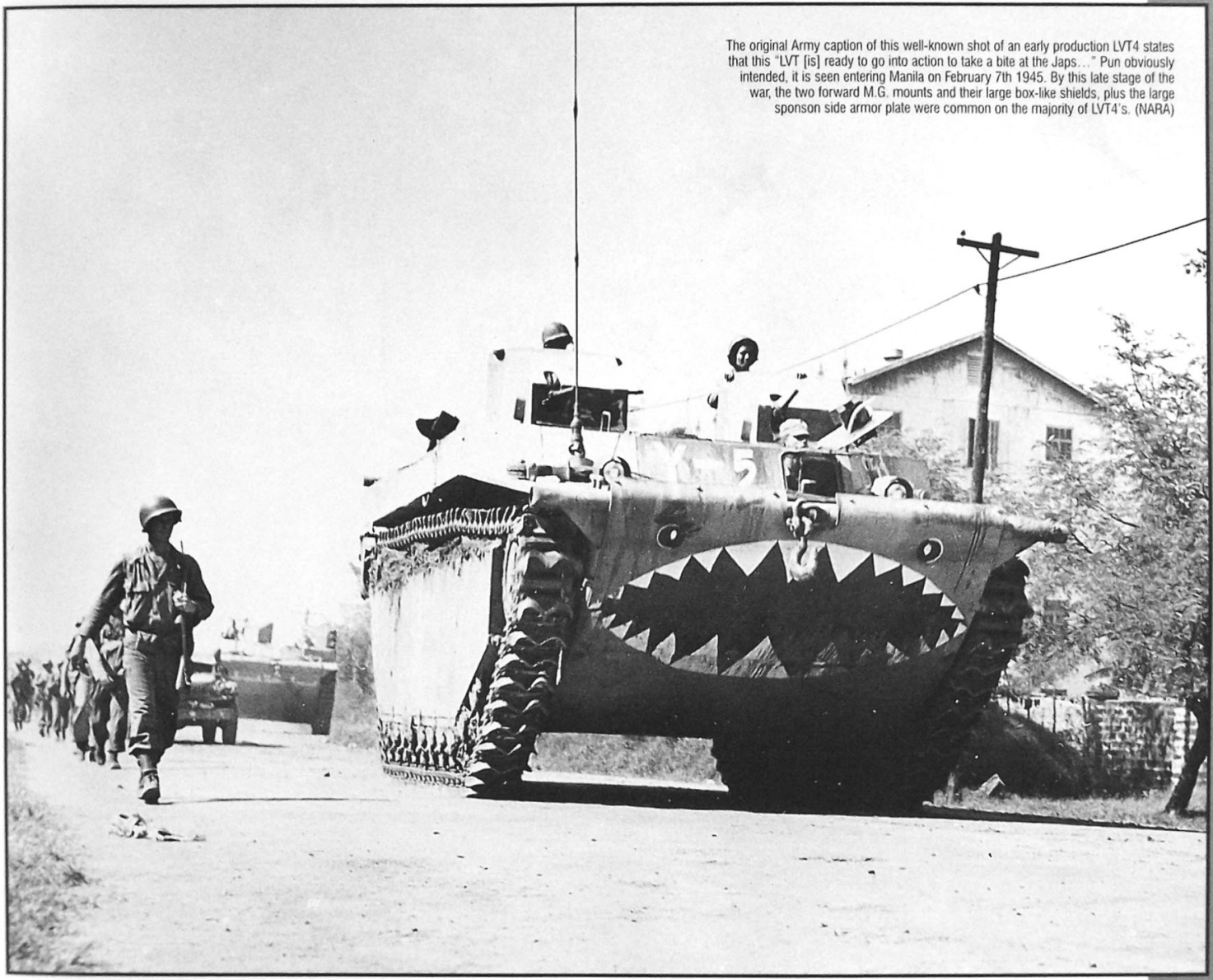
This LVT4 was photographed somewhere in Europe on December 2nd 1944. The location is most likely western Germany. This vehicle appears to be an early production model that has seen its share of use. One of the headlights is missing, as well as one of the chock cleats. Also note the bright white of the hatch interiors against the dirty OD exterior. (NARA)



A great photo showing nine brand new factory fresh LVT2's being loaded at the Los Angeles Port of Embarkation for delivery to the Pacific theater in late December 1944. The color contrast between the vehicles and the ship is of interest. (NARA)



This LVT4 is seen being unloaded on Leyte Island on December 15th 1944. Close examination of this photo shows that the vehicle is equipped with the Plexiglas domes on the front hatches and has the longer water deflectors mounted. (NARA)

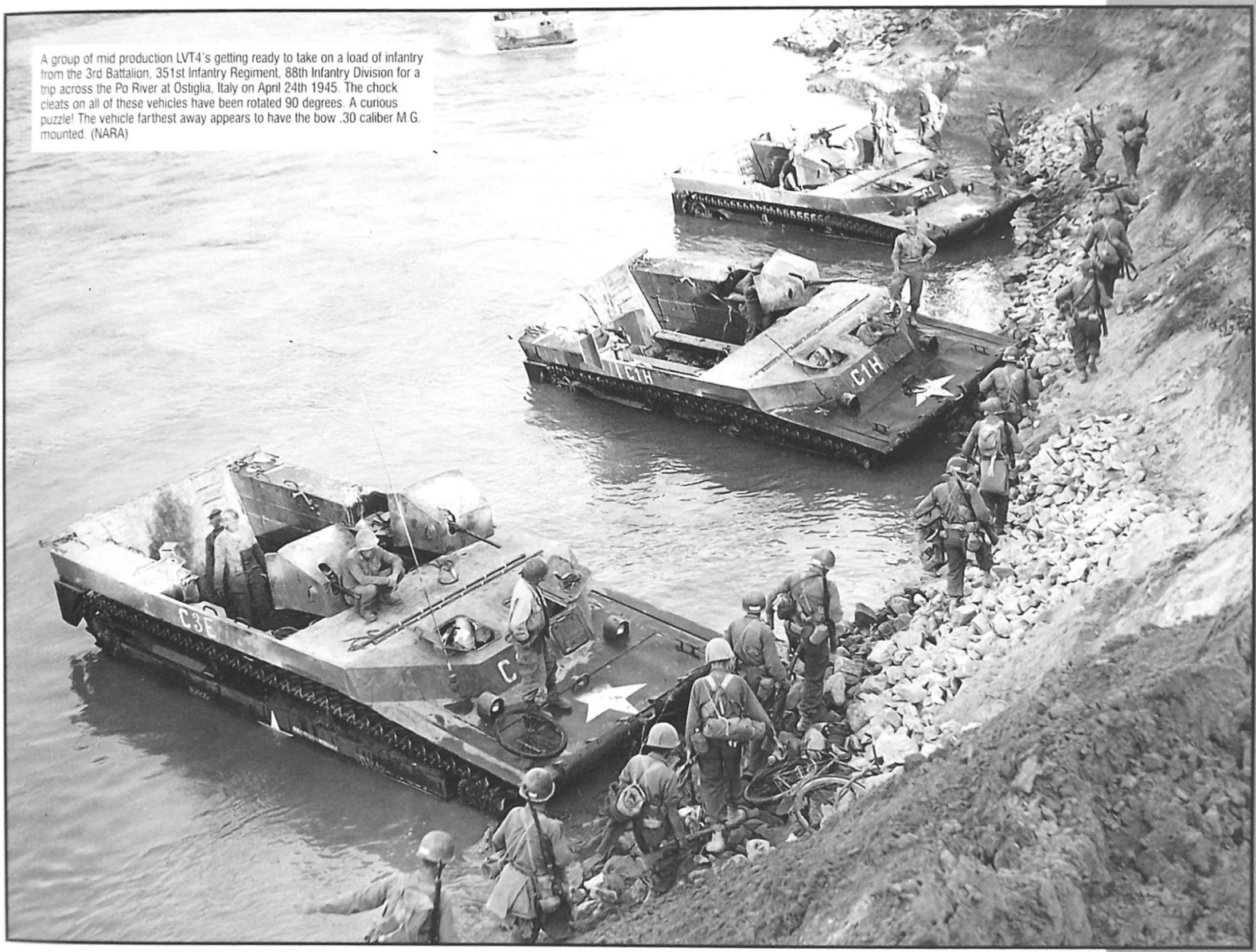


The original Army caption of this well-known shot of an early production LVT4 states that this "LVT [is] ready to go into action to take a bite at the Japs..." Pun obviously intended, it is seen entering Manila on February 7th 1945. By this late stage of the war, the two forward M.G. mounts and their large box-like shields, plus the large sponson side armor plate were common on the majority of LVT4's. (NARA)

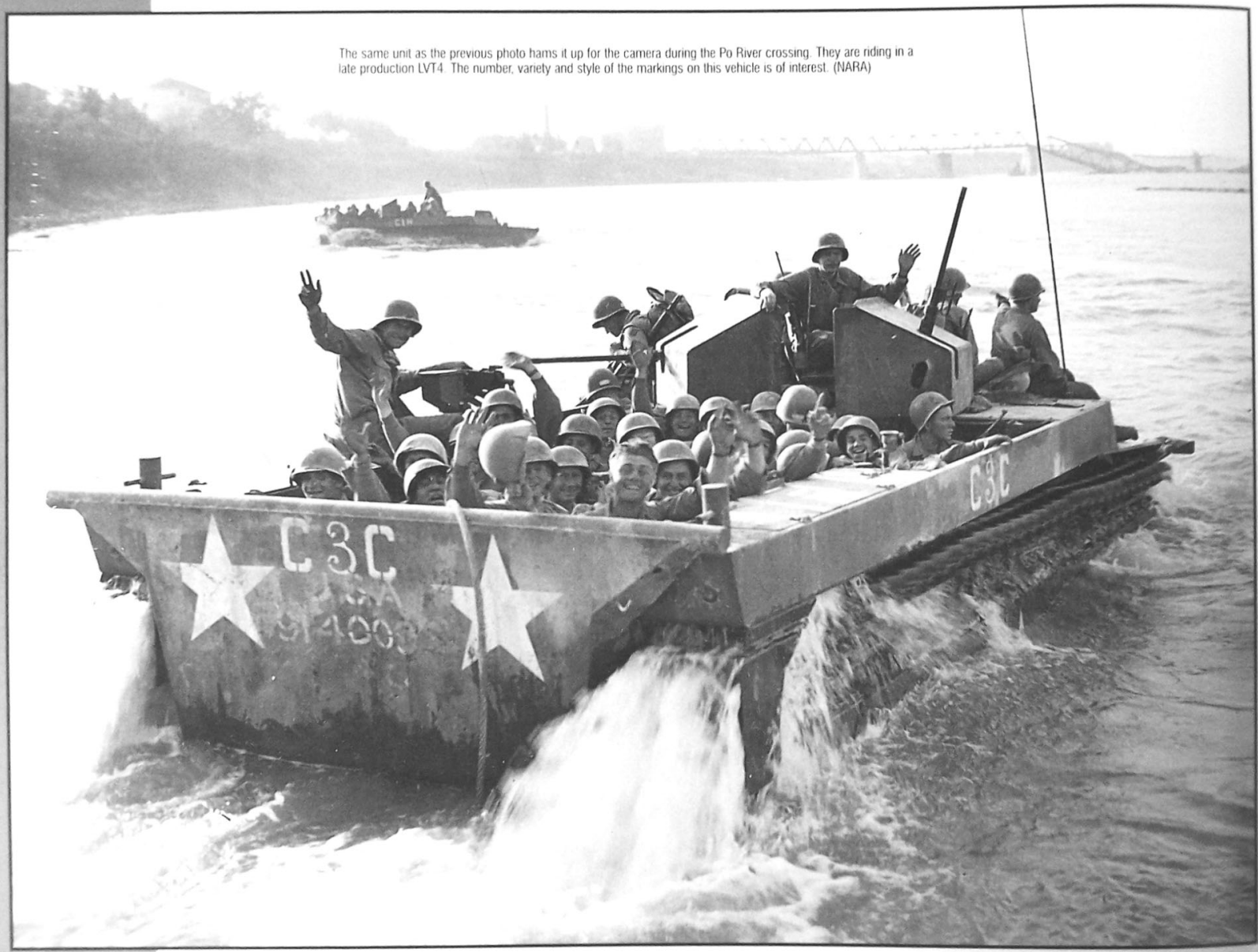
A pair of LVT4's parked on Malingong Street in Binmeley Village in Luzon on January 9th 1945. Just visible between the two Amtracks is the wheel of something that the first vehicle appears to be towing. It is possibly a small artillery piece or a trailer. (NARA)

LVTA1's attached to the 96th Division approach the Chatan village on Okinawa. April 1st 1945. These vehicles appear to have the 3/4-height side sponson armor plate added, as well as a late production relocated antenna mount on the vehicle in the right background. Both have additional armor installed to protect the gunners in their ring mounts. (NARA)

"Dream Girl," a late production LVTA1 attached to the 77th Infantry Division makes its way through the brush on Okinawa on March 31st 1945. This vehicle has the front bow .30 caliber M.G. mounted and has the additional front vision slits. The "Dream Girl" artwork might very well be a temporary addition rendered in chalk, a detail that was common on vehicles in the pacific. (NARA)



A group of mid production LVT4's getting ready to take on a load of infantry from the 3rd Battalion, 351st Infantry Regiment, 88th Infantry Division for a trip across the Po River at Ostiglia, Italy on April 24th 1945. The chock cleats on all of these vehicles have been rotated 90 degrees. A curious puzzle! The vehicle farthest away appears to have the bow .30 caliber M.G. mounted. (NARA)



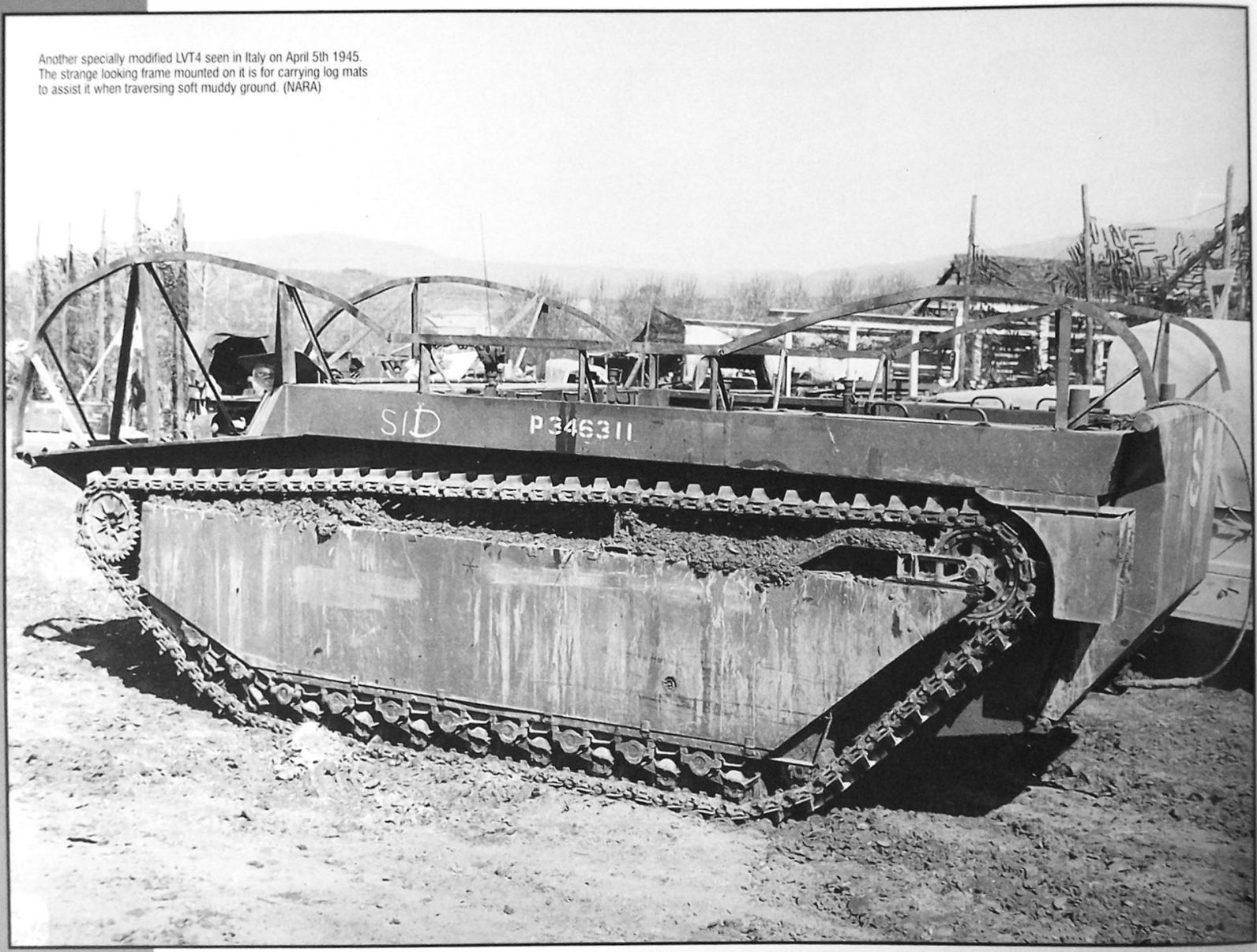
The same unit as the previous photo hams it up for the camera during the Po River crossing. They are riding in a late production LVT4. The number, variety and style of the markings on this vehicle is of interest. (NARA)

Another picture in the Po River series shows an LVT4 being used to carry troops and a 57mm anti-tank gun across the river. (Harper)

A late model LVT4 in British hands near the city of Perugia, Italy on March 23rd 1945. It is not known if the smoke screen present in the background is the result of a bombardment or a deliberate action. Smoke screens were common in combat situations to help obscure your movements from the enemy observers. The casual appearance and stance of the men in the LVT however show this to be some type of training exercise. Note the three vision ports located on the front of the cab, the larger headlights and guards and the post-type chock cleat, all late production LVT4 modifications. (NARA)

Several LVT4s were specially modified for the landings on Tinian with the addition of a timber ramp. Referred to as "Doodlebugs," 12 of these LVT's were successfully used to breach high sea walls by beaching themselves against the wall thus allowing following vehicles to crawl right up their backs and over the sea wall. This particular vehicle has been similarly modified and is being tested near Perugia, Italy on March 23rd 1945. (NARA)

Another specially modified LVT4 seen in Italy on April 5th 1945. The strange looking frame mounted on it is for carrying log mats to assist it when traversing soft muddy ground. (NARA)



A late production LVTA1 of the 708th Amphibian Tank Battalion is seen here posing for the camera. This picture later appeared on the cover of Life Magazine during WWII. The photo was taken "somewhere in the Pacific area" on January 11th 1945. (NARA)

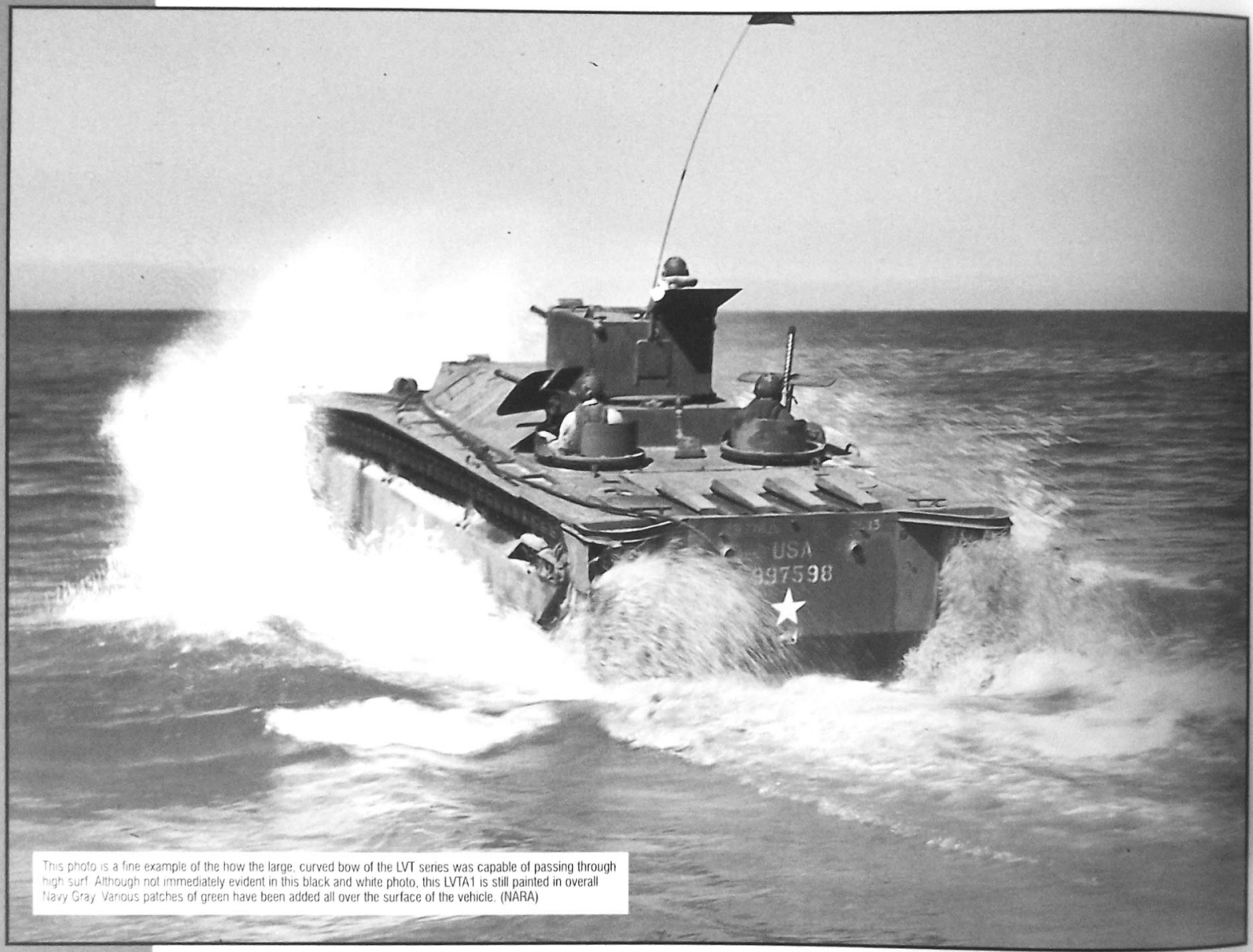
A mid production LVTA4 plows through the shallows on the beach at Iwo Jima. In the background you can see a mix of mid and late production LVT4's and one LVTA4. These vehicles all carry the three color camouflage scheme so common on many different types of vehicles on Iwo. Note that even the water trailer on the near left carries the camo. (Harper)

The following is a series of famous photos of LVTs giving the FMC photographers a demonstration of their use and capabilities along the California coast. This is a very interesting shot of a Mid-Production LVTA1 vehicle with a M8 style LVTA4 turret fitted. Note that the Schanf style MG positions are still present behind the turret on the back deck. This is quite probably the test vehicle for the LVTA4 project.

From the findings of this test vehicle, it was discovered that the larger turret ring of the M8 style turret required that the upper hull piece be modified, while the two .30 caliber gunner's positions located on the rear deck were eliminated. A single .50 caliber was mounted on the turret top, so that the vehicle would still have some defensive capability. (NARA)

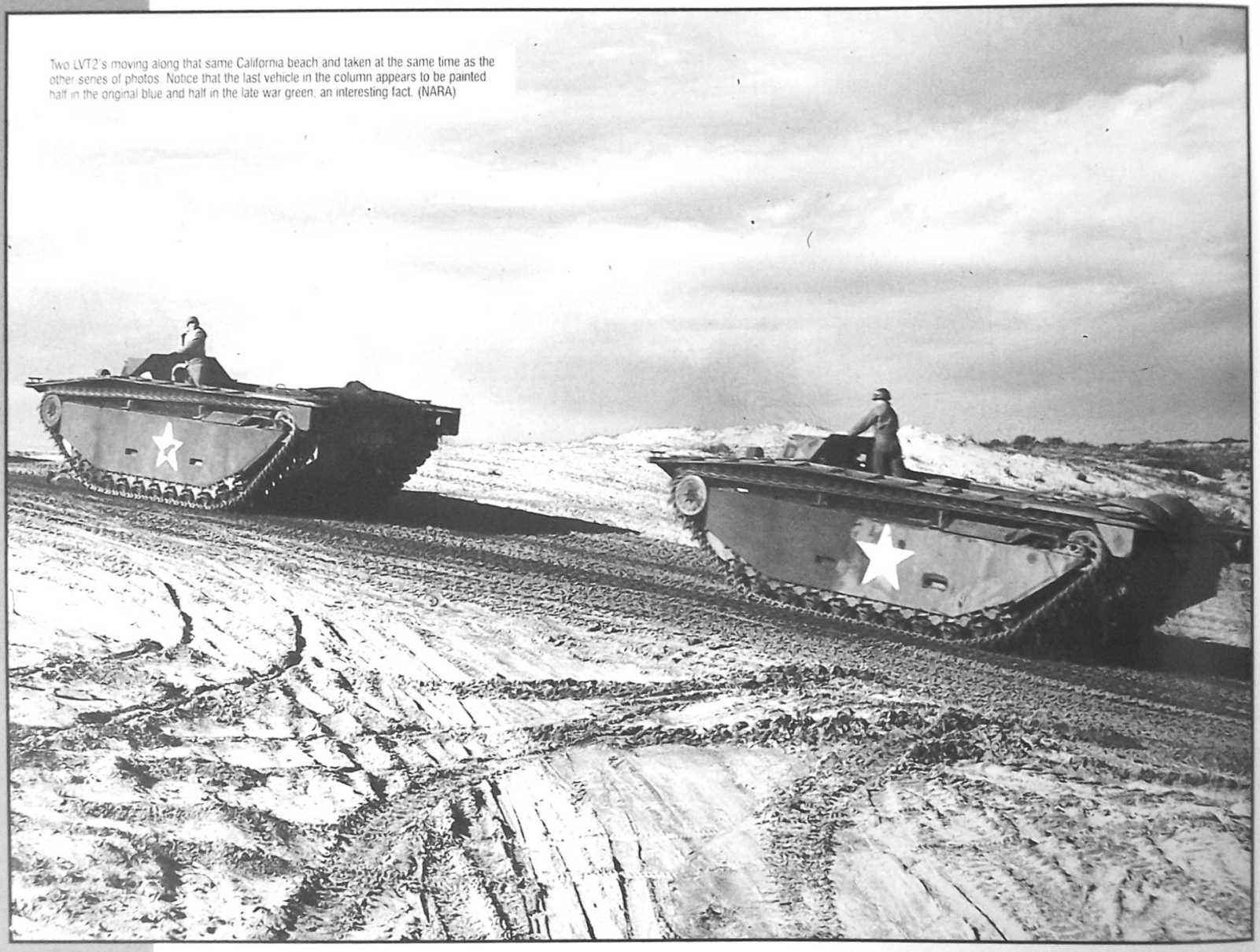
This LVTA1 is moving at speed through the ocean near San Jose, California. Unique in this series of photos is that the original blue is still visible in several spots even though this vehicle has been repainted in the late war overall green color. Up until mid 1944 all LVTA1's were painted in the Navy Gray color. In 1944 orders were issued that all LVT's were to be painted in a solid green color and the blue vehicles were to be repainted as they came in for maintenance or repairs. (NARA)

Another LVTA1 frolics in the California surf. On later production vehicles, and as a field modification to almost all LVTA4/5 vehicles, more MGs (both .30 & .50 cal) were mounted on both turret sides and sometimes even the front of the turret. (NARA)



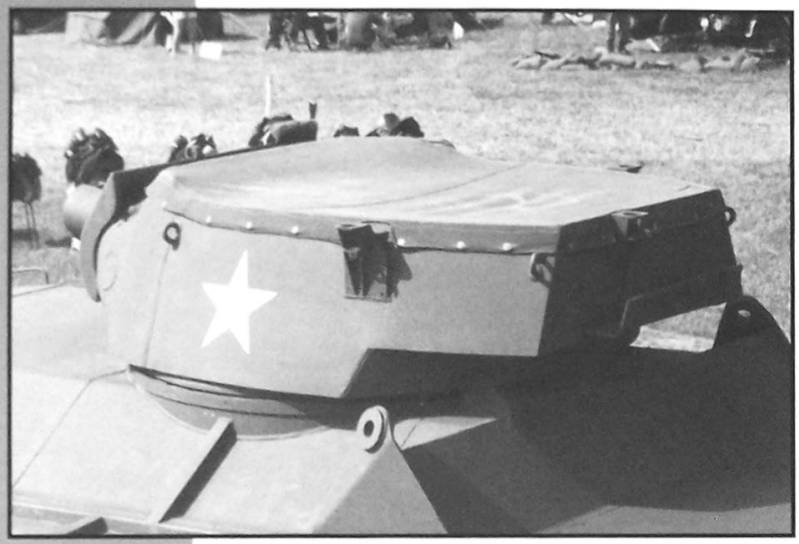
This photo is a fine example of the how the large, curved bow of the LVT series was capable of passing through high surf. Although not immediately evident in this black and white photo, this LVTA1 is still painted in overall Navy Gray. Various patches of green have been added all over the surface of the vehicle. (NARA)

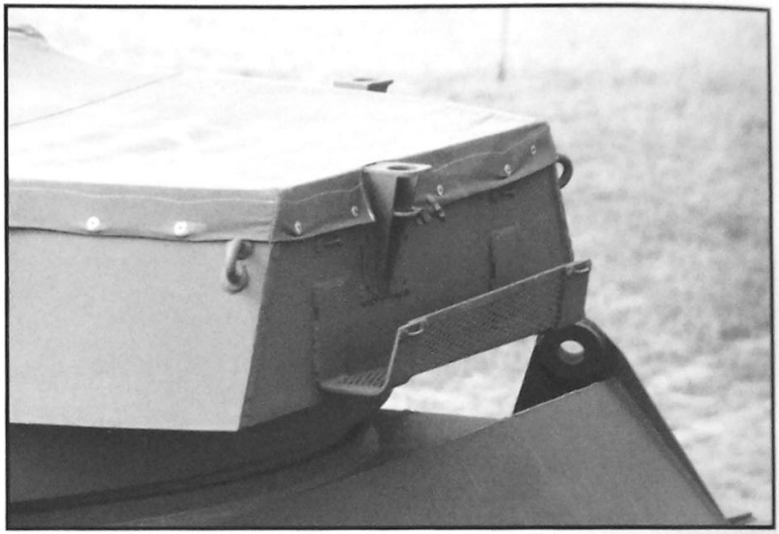
This photo shows an LVT4 also in the late war green color. No LVT4's were probably ever painted in the blue color as they were a later war version of the LVT and still being produced when the decision to paint LVT's in the green finish was made. A curious detail on this particular vehicle is that a piece of the cargo compartment topside wall is missing. The production version of this vehicle has a solid piece of plate running from the backside of the cab bulkhead back to the upper storage bin visible here. This may be a modification made to this particular vehicle for either evaluation or training purposes. (NARA)

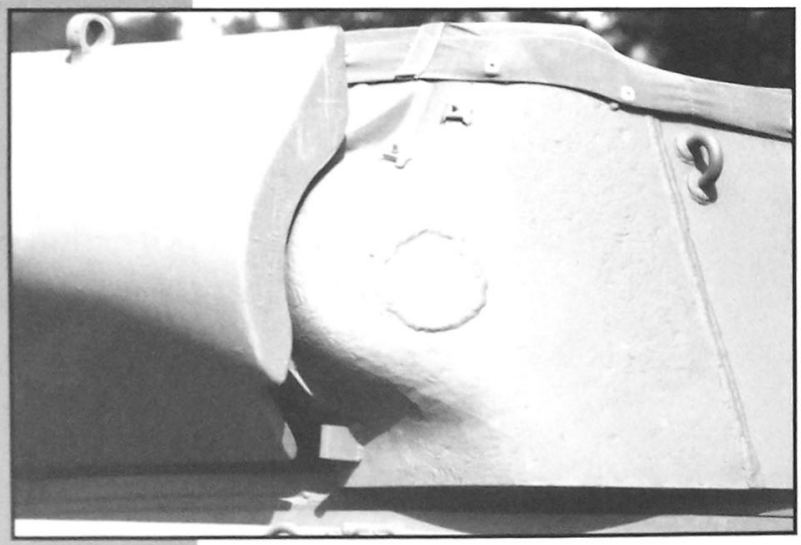


Two LVT2's moving along that same California beach and taken at the same time as the other series of photos. Notice that the last vehicle in the column appears to be painted half in the original blue and half in the late war green, an interesting fact. (NARA)

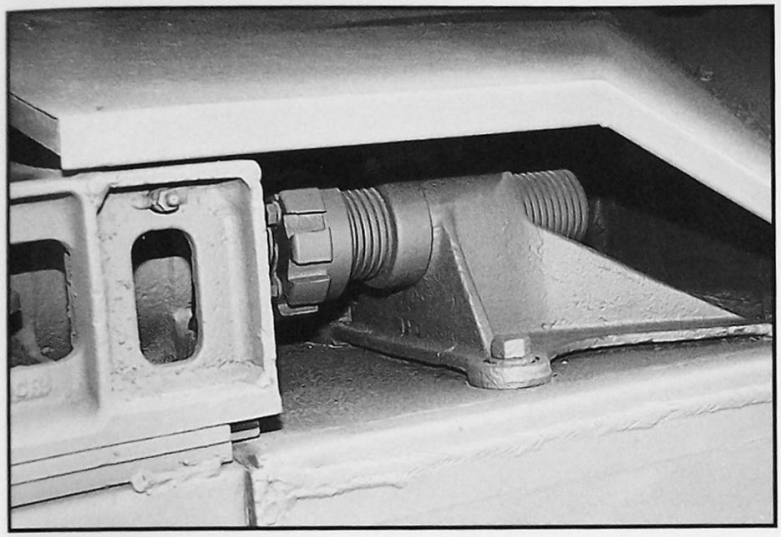
Here we have an overall 3/4 view of the LVTA4, a very nice looking fully restored standard mid production vehicle. This vehicle does not appear to have the drivers emergency escape hatch located on the left-hand pontoon face. No additional armor plates are mounted on the pontoons and the two pocket foot positions are a standard feature.

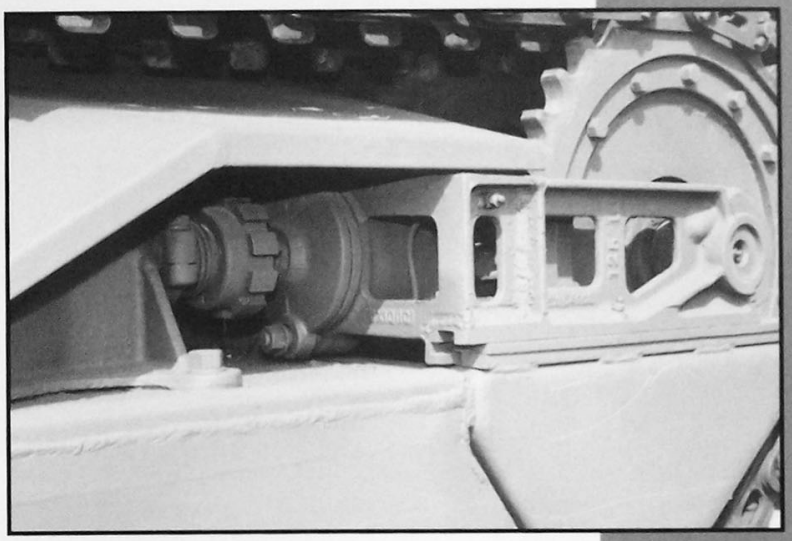


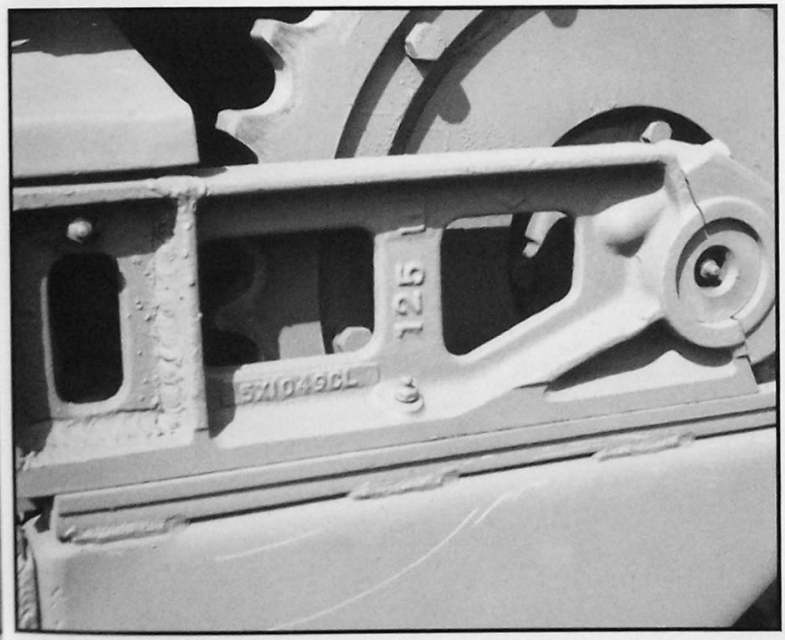


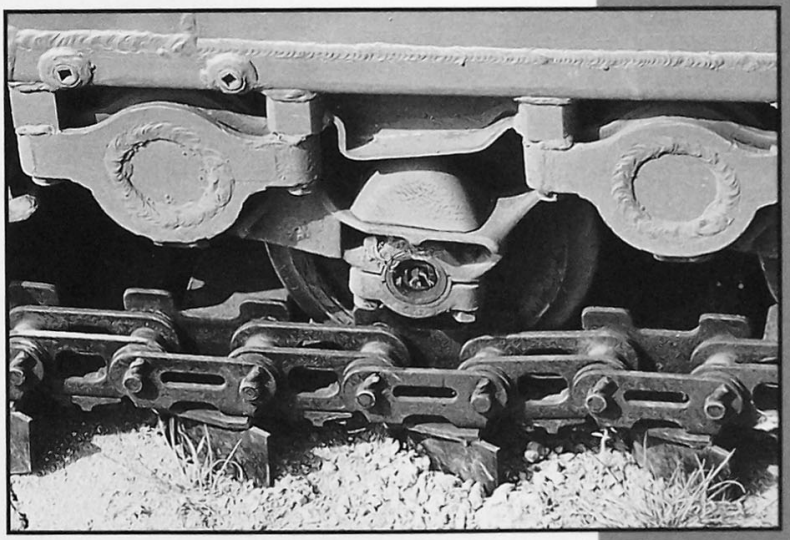


This vehicle appears to have a later production style turret. Even with the canvas cover attached, you can see that this turret does not have the ring mounted .50 caliber M.G. position in the turret top rear. It does have the mounts on the turret sides for the .30 caliber MGs. Also note the small circular weld detail on the turret cheek for the main gun mount.

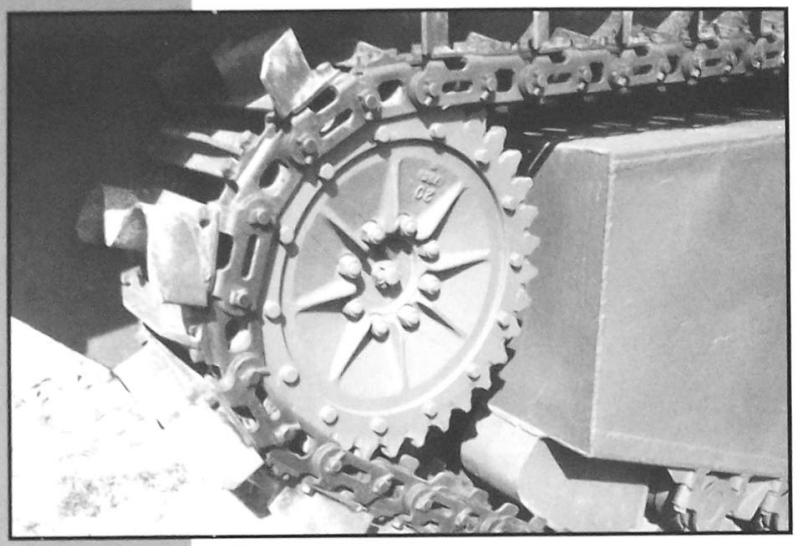


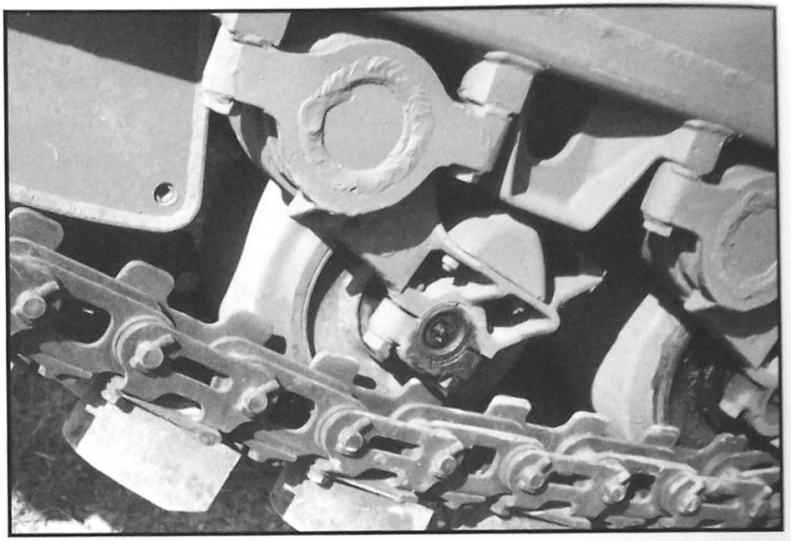


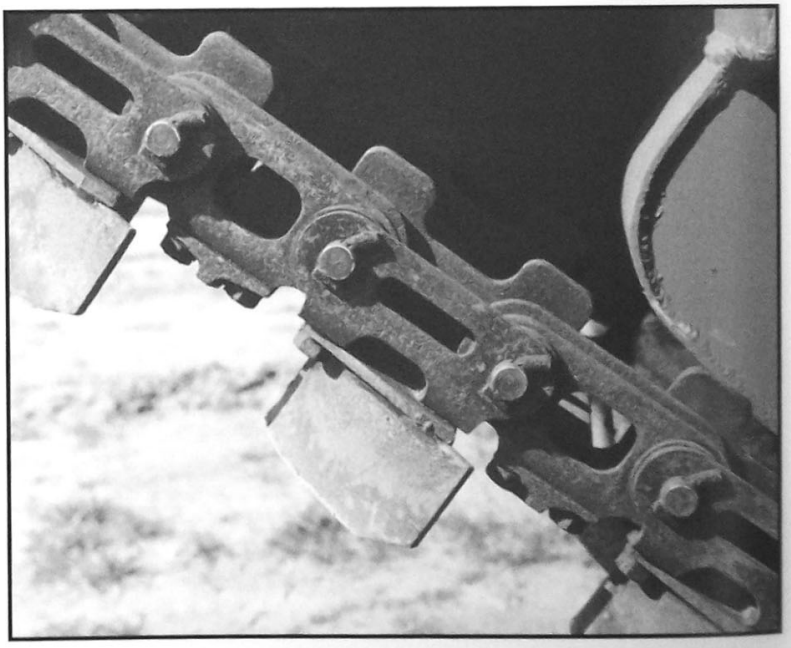




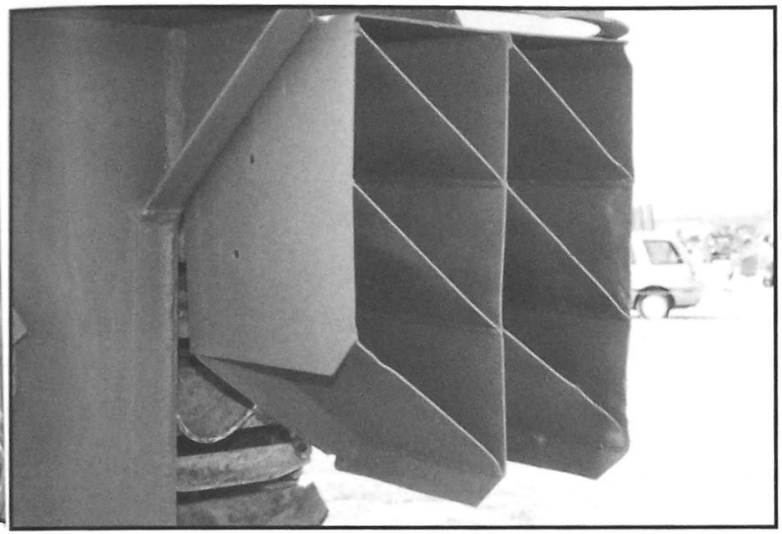
There were at least two different styles of rear idler sprockets on LVT's in WW2. This vehicle has the solid disc style, the other style was a six spoke dished version. Both are seen in use on early and late vehicles. It is thought that this has more to do with the factory that produced the vehicle than when it was produced.

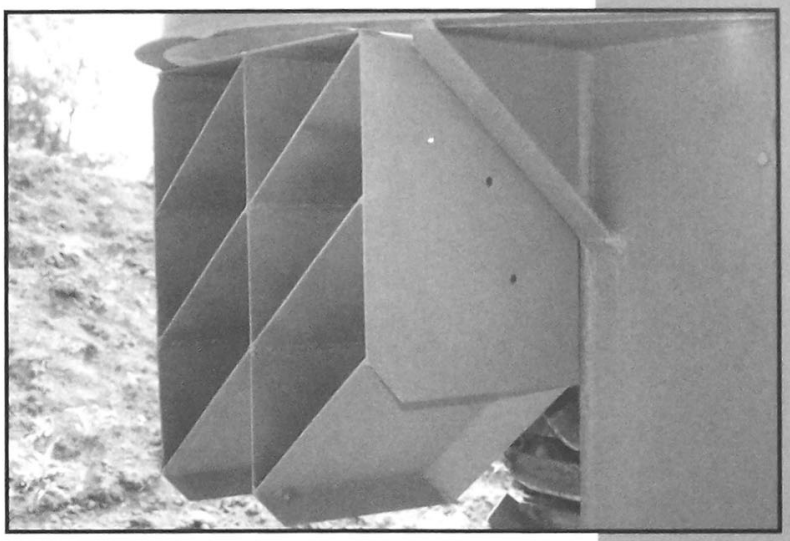


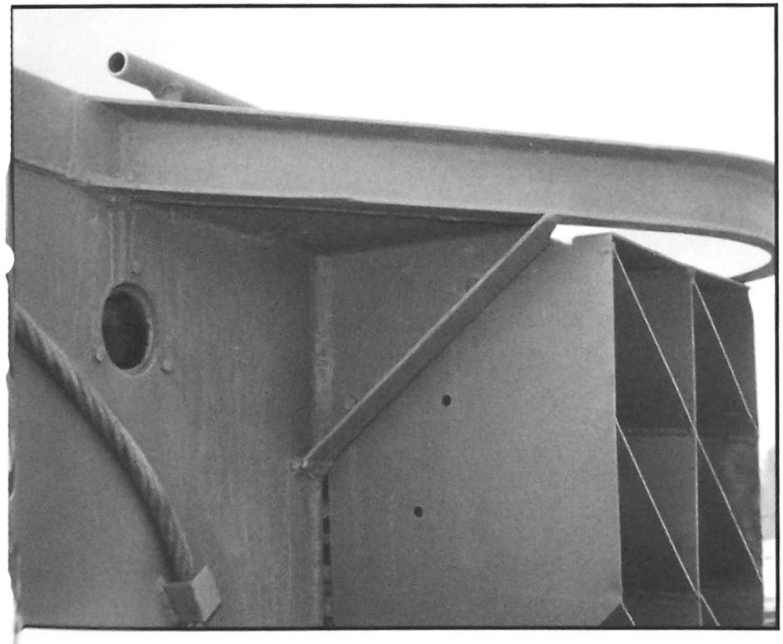


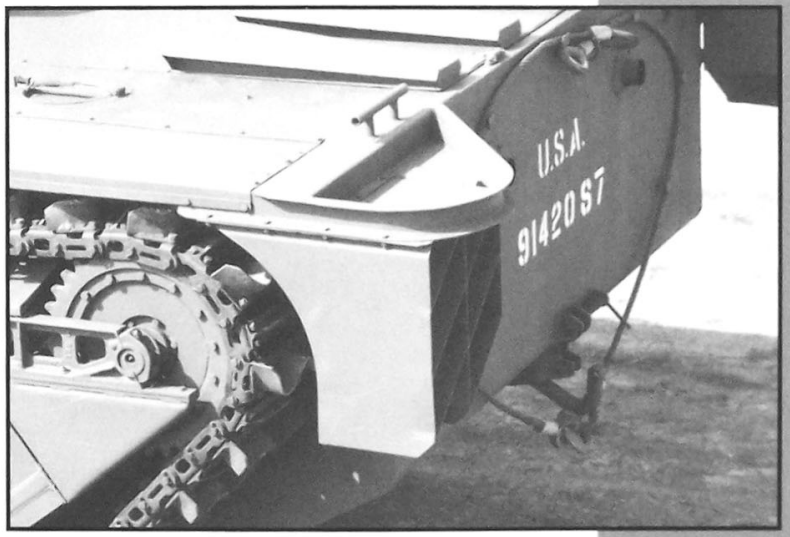


There was only one style front sprocket used on all WWII LVT's and we see it here. The tracks and running gear of the LVT was unique to this vehicle. Here you can see the two different pads required to this track system, along with how it is mounted to the chains. Also very apparent is the part of the suspension referred to as the "Monkey Skulls."

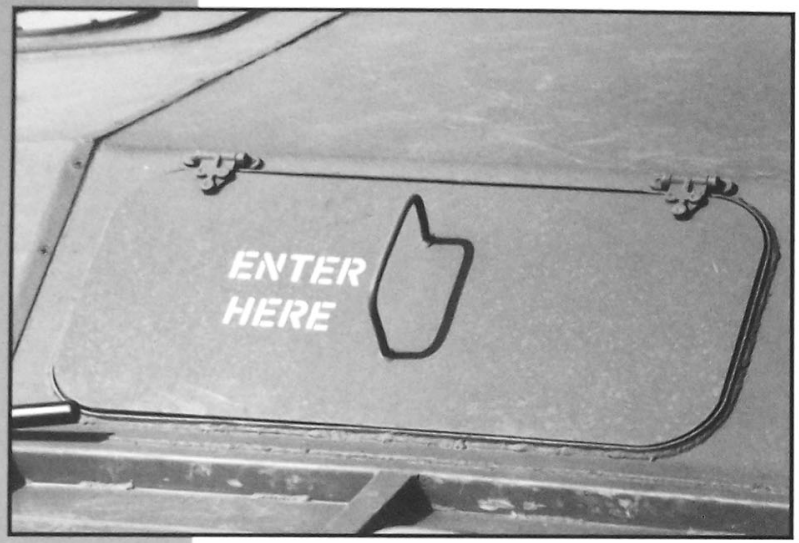


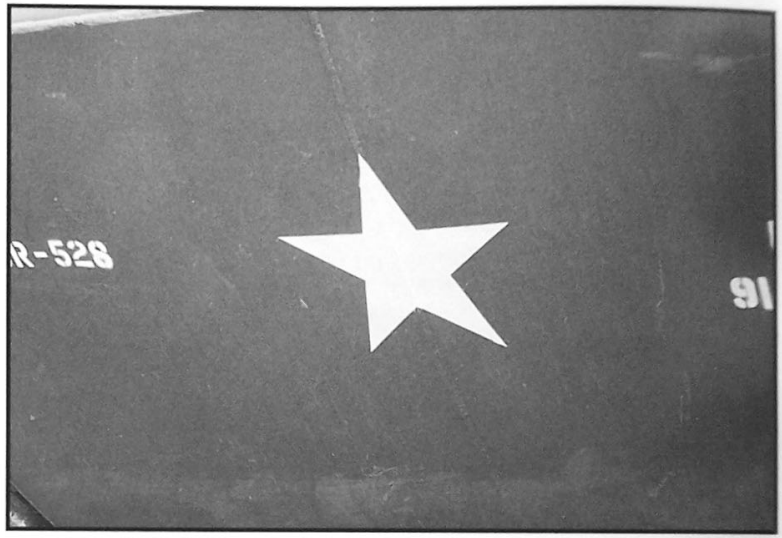


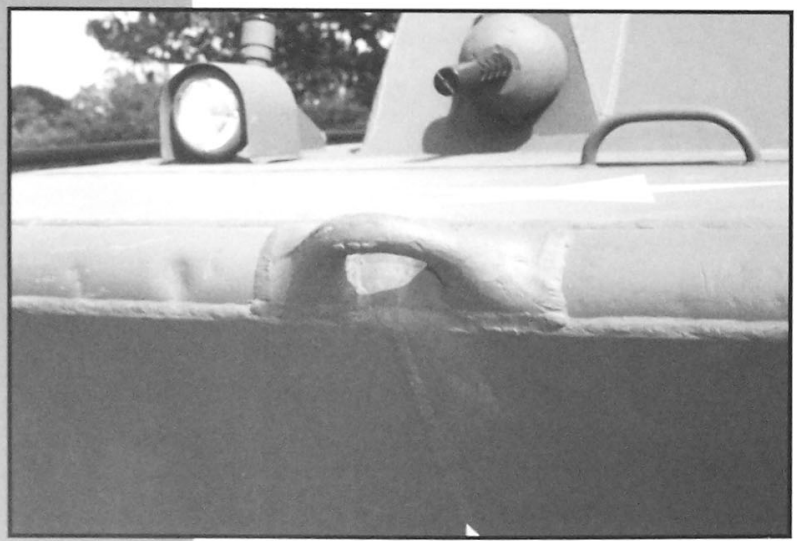




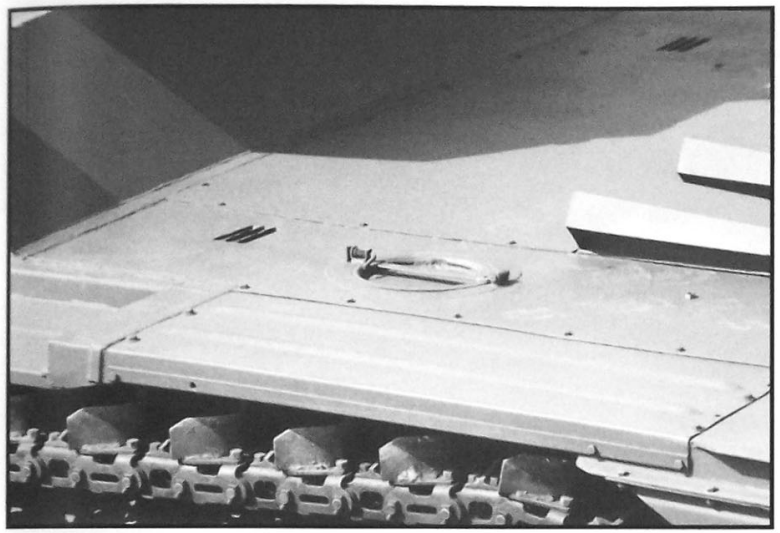
The larger later production splash deflectors are shown here. This style of deflector was common on LVT4's and LVTA4's. These can be seen on earlier production LVT's. They were often used as replacement parts on reworked vehicles.

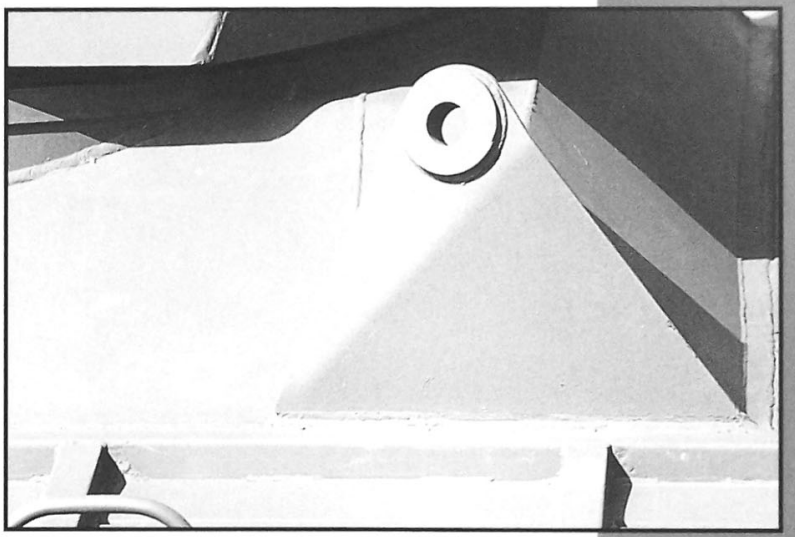




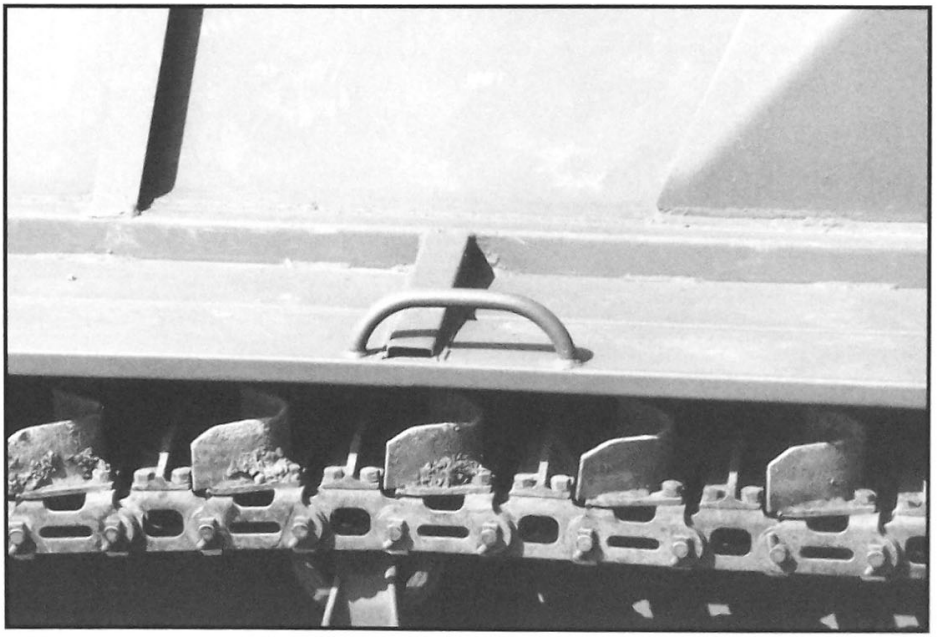


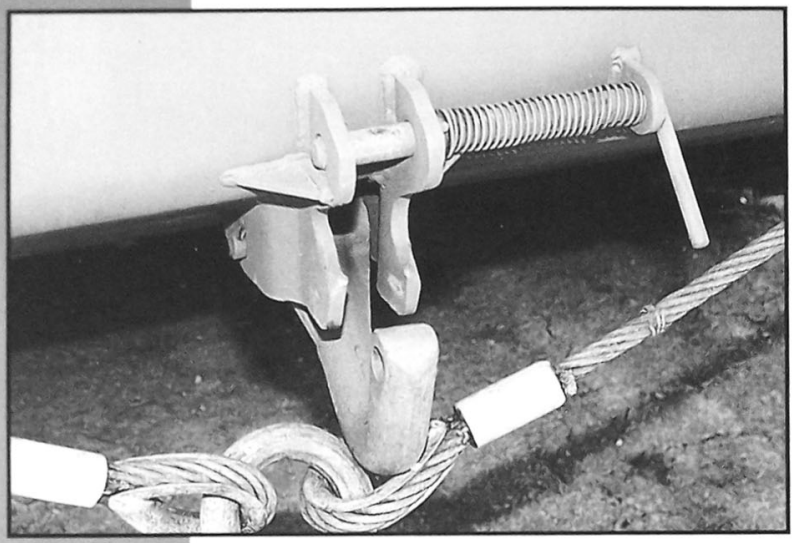
Some of the front hull (or bow) details including the pull staple and the lower bow plate with the center weld detail. The larger crew hatches (interestingly referred to as escape hatches!) are apparent here along with the driver and co-drivers hatches and the metal rod stop/grab handles.

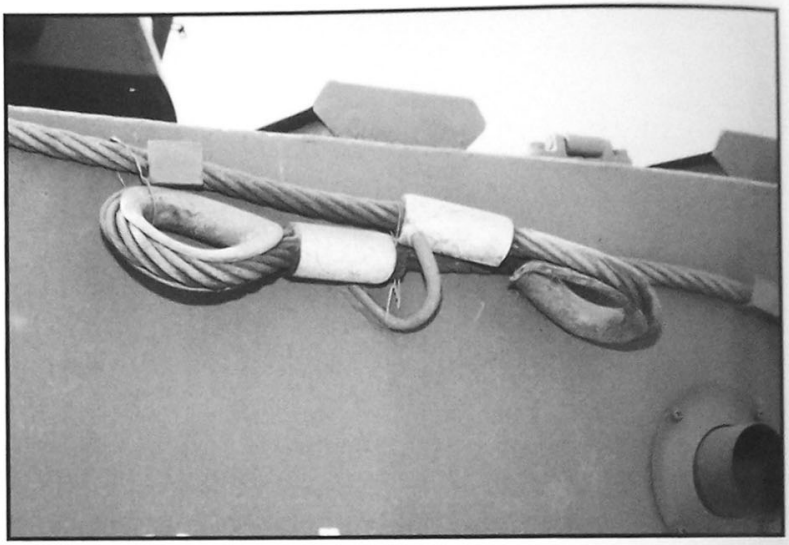




Some of the hulls side details including fender reinforcement points, grab handles and upper hull lifting points. On the engine deck you can see one of the fuel filling points and part of several of the armored engine vent protectors.

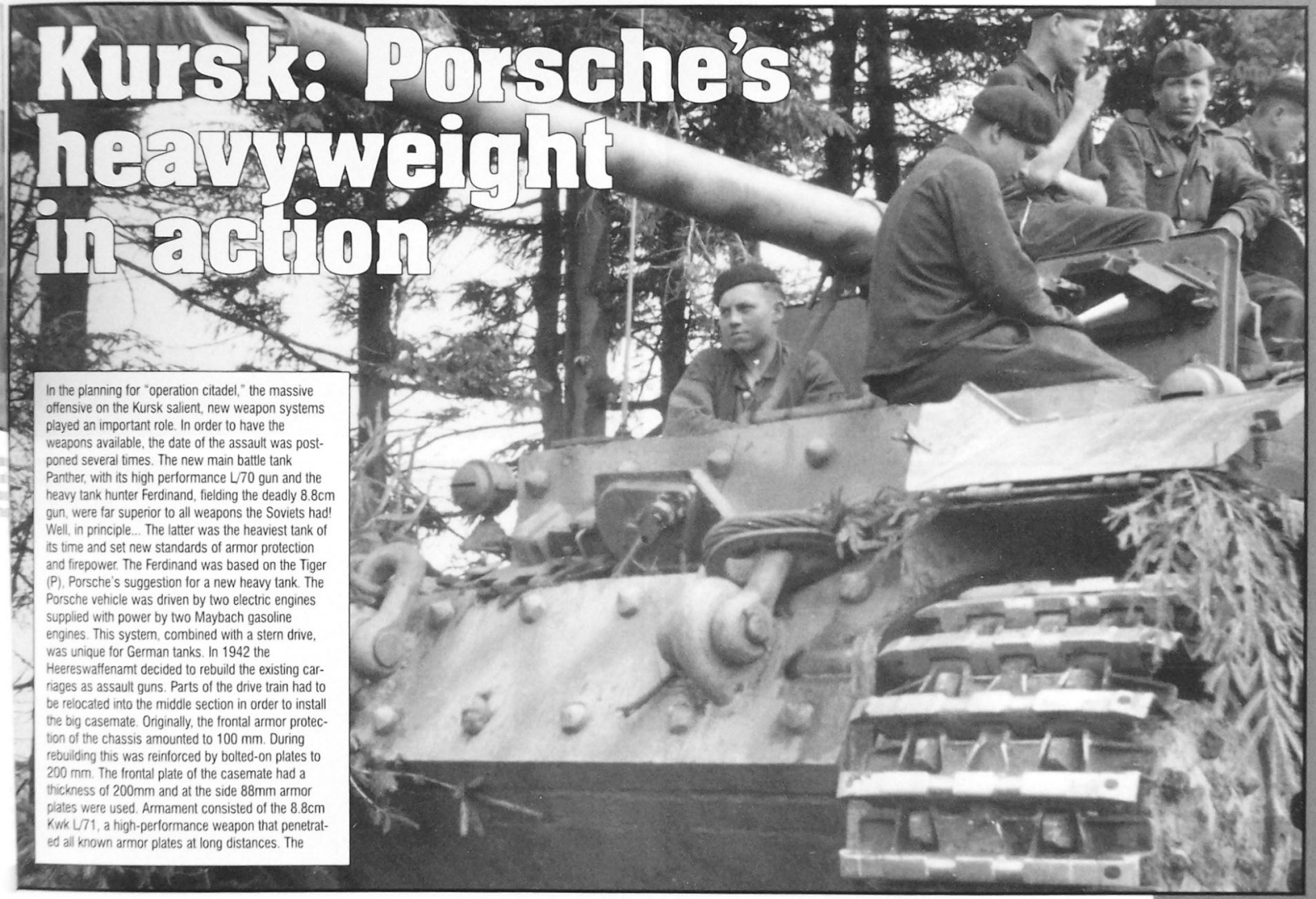






The rear hull (or stern) details visible here are the tail lights, engine exhaust ports, tow cable and it's mounting brackets and towing hitch. On the top deck you can see the armored covers for the engine vent and the early to mid production chock cleats.

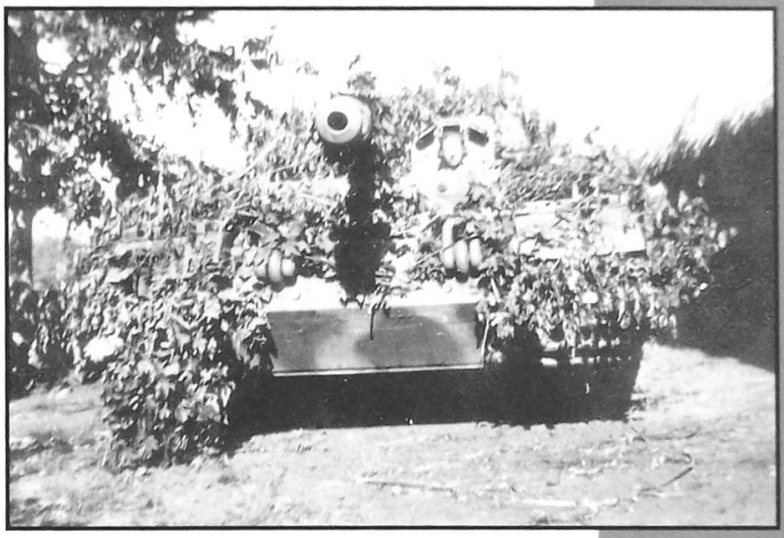
Kursk: Porsche's heavyweight in action



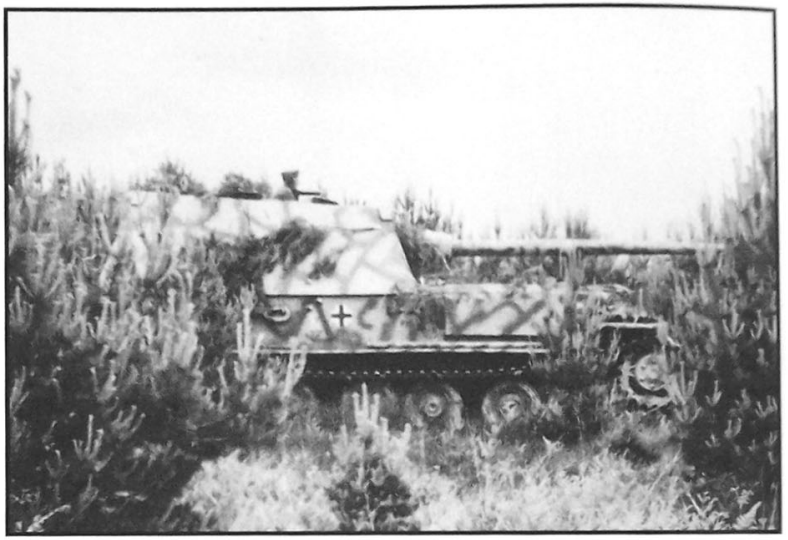
In the planning for "operation citadel," the massive offensive on the Kursk salient, new weapon systems played an important role. In order to have the weapons available, the date of the assault was postponed several times. The new main battle tank Panther, with its high performance L/70 gun and the heavy tank hunter Ferdinand, fielding the deadly 8.8cm gun, were far superior to all weapons the Soviets had! Well, in principle... The latter was the heaviest tank of its time and set new standards of armor protection and firepower. The Ferdinand was based on the Tiger (P), Porsche's suggestion for a new heavy tank. The Porsche vehicle was driven by two electric engines supplied with power by two Maybach gasoline engines. This system, combined with a stern drive, was unique for German tanks. In 1942 the Heereswaffenamt decided to rebuild the existing carriages as assault guns. Parts of the drive train had to be relocated into the middle section in order to install the big casemate. Originally, the frontal armor protection of the chassis amounted to 100 mm. During rebuilding this was reinforced by bolted-on plates to 200 mm. The frontal plate of the casemate had a thickness of 200mm and at the side 88mm armor plates were used. Armament consisted of the 8.8cm Kwk L/71, a high-performance weapon that penetrated all known armor plates at long distances. The

in's accuracy was extraordinary. It is difficult to evaluate the Ferdinand "weapon system." The tank nter suffered from the "German disease," simply expressed it was too heavy, too expensive and too mplicated. Very much like the Tiger, the Ferdinand was too much tank (70 tons) for the weapon (8.8 n) carried. A comparison with the Russian JS II is interesting; this tank had a 122mm gun and weighed 45-tons. Despite this, the 8.8 cm KwK 43 was among the best anti tank guns developed during WW II. **Above:** This Ferdinand's young driver looks at his hatch periscopes. His sight was restricted, with considerable dead corners to the front. But whoever would want to be in a Ferdinand's way... (Photo ECPA via K. Münch)

Top left: A brand-new Ferdinand after the transfer to the Pz.Jg.Abt.654 in Rouen, France. Here, the first training took place with the vehicles. The car is finished in dark-yellow and doesn't show any camouflage. (Photo W. Schneider) **Top right:** A Ferdinand of the Abt. 653 shortly after arrival in Russia. The vehicle shows the green camouflage blotches on dark yellow background typical for the battalion. The vehicle number 121 is barely recognizable since the 653 numbers were painted only in black outlines. (Photo private) **Above left:** Three other tanks of the Abt. 653. Shortly before "Zitadelle" was launched, the crews were hastily trained to handle the vehicles. (Photo private) **Above right:** This Ferdinand of the Abt. 653 shows a generous provision of spare tracks, note also the camouflage scheme. (Photo private)



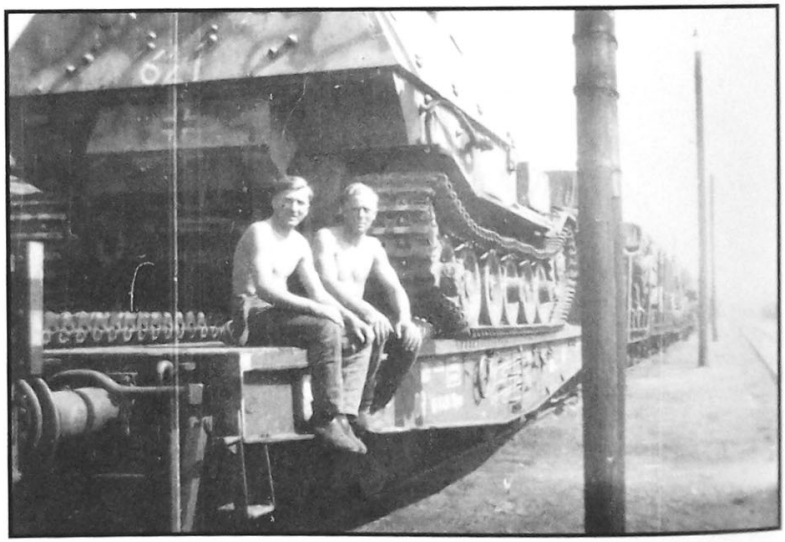
Top left: Another photo of Ferdinand 121. The Abt. 653 used a complex system of geometrical patterns painted to the stern of the casemate to distinguish the vehicles at far distances. This system was not continued after amalgamation of the Abt. 653 and 654. The lateral tool crate was already transferred to the back. (Photo private) **Top right:** Photographed during practice in Davidowa before the attack on Kursk, the tank hunters still are undamaged. This Ferdinand belongs to the Abt. 653. (Photo W. Schneider) **Above left:** Exhausted and dirty, these men gather for a group photo. (Photo W. Schneider) **Above right:** The crew of this Ferdinand of Abt. 653 picks up ammunition. The heavy projectiles had to be carried to the back where they had to be passed through the stern hatch. (Photo W. Schneider)



Top left: This photo shows tank 714 before action. The crew seems to be resting while the cooling water is checked. (Photo ECPA via K. Münch) **Top right:** A perfectly camouflaged Ferdinand of Abt. 654 in a young forest. The commander watches the situation from his hatch expecting further orders. The net camouflage pattern of the Abt. 654 is clearly evident. (Photo K. Münch) **Above left:** Ferdinand 612 of Abt. 654. With its net camouflage pattern and the white numbering system, this battalion differed from its sister battalion 653. (Photo S. de Meyer) **Above right:** Before action. The crew of this Ferdinand of Abt. 653 is getting orders from a regimental staff officer. (Photo Tams)

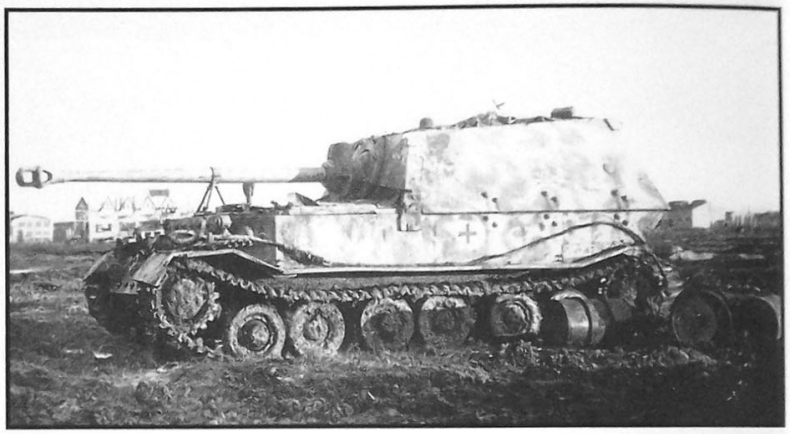
Top left: In the vast steppes of Russia, a Ferdinand of Abt. 653 meets an 8.8-cm Flak 36 gun team. These AA teams were often engaged in ground combat. The Ferdinand's number is not recognizable, but the tactical sign on the back of the casemate is. This probably is a tank of 1./Pz.Jg.Abt. 653. (Photo private) **Above left:** Ferdinand 513 of Pz.Jg.Abt. 654. The crew gathers for a photo. The tool crate still is in its place; the 654 typical camouflage and numbering system is visible. (Photo L. Konetzny) **Right:** A front view of Ferdinand 513. The photo is good, showing the enormous size of the tank. (Photo L. Konetzny)

Left: A third view of number 513. The past days took their toll; the frontal track cover got lost during an attack. (Photo L. Konetzny) **Below:** The end. After a mine damaged the left track, this Ferdinand of the Abt. 654 was destroyed by its crew with an explosive charge as ordered. The entire structure was torn to pieces by the force of the detonation. (Photo S. Netrebenko) **Facing page, above:** This Ferdinand of 654 also became a victim of Soviet defense lines. Besides the destroyed suspension, the loose engine covers attract attention. Either the engines were blown up by the crew, or Russian artillery finally found the range on the immobile giant. (Photo S. Netrebenko) **Facing page below:** A mine destroyed the suspension of this Ferdinand, too. Tank 624 fell hardly damaged into Russian hands. The badge to left of the German cross could not be identified. (Photo S. Netrebenko)

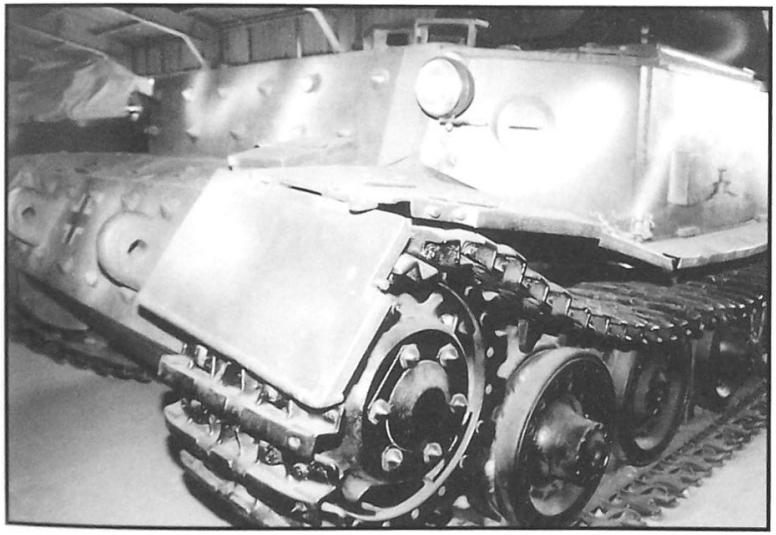


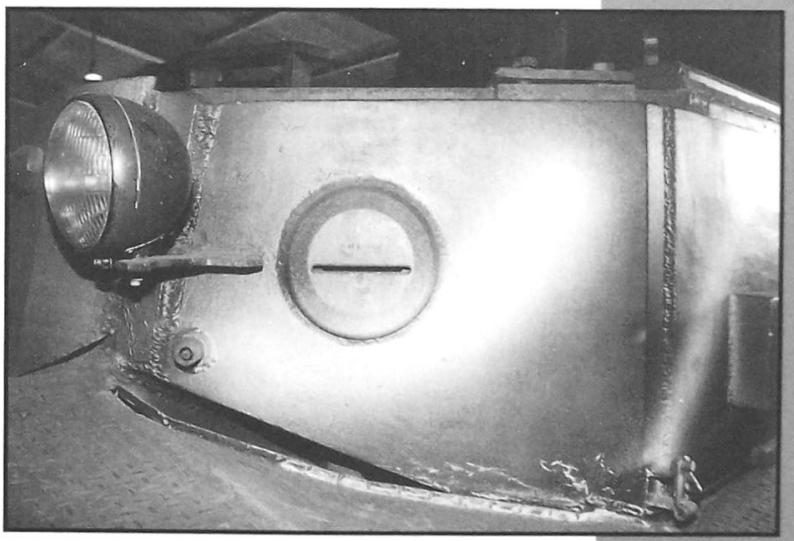
Top left: Two further victims of the mine fields. Both vehicles belong to Abt. 654; the rear one has the tactical number 723. With pride, Russian soldiers gather around the booty. (Photo S. Netrebenko) **Top right:** The Kubinka Ferdinand, tank 501 of Pz.Jg.Abt. 654, also fell the victim to the mines. The force of the ordered self-destruction blew the large rear hatch away. (Photo S. Netrebenko) **Above left:** Ferdinand 501 was transported to the Soviet school of tank warfare in Kubinka where it is still on display. (Photo S. Netrebenko) **Above right:** During amalgamation Ferdinand 621 was also brought to Briansk. Under the tank, another set of tracks is stored. (Photo Tams)

As far as possible, Ferdinand 501 was repaired after the obligatory examinations. The missing rear escape however, although still existing, was not installed. (Photo S. Netrebenko)

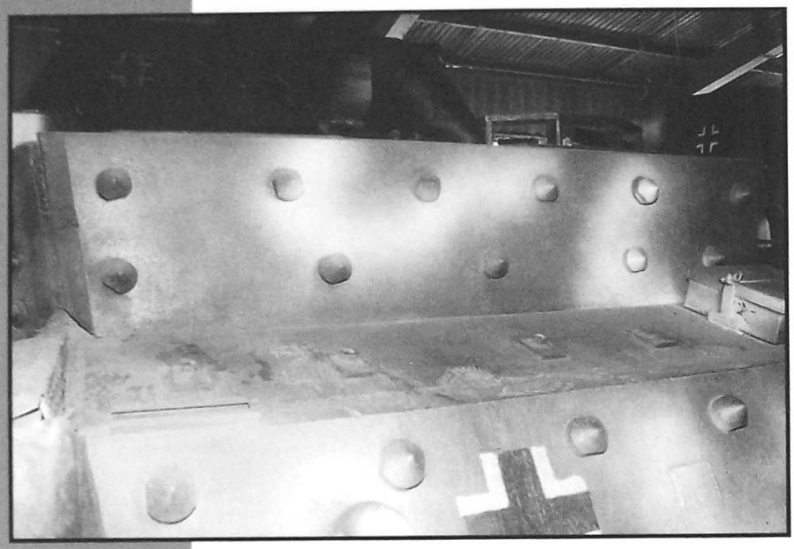


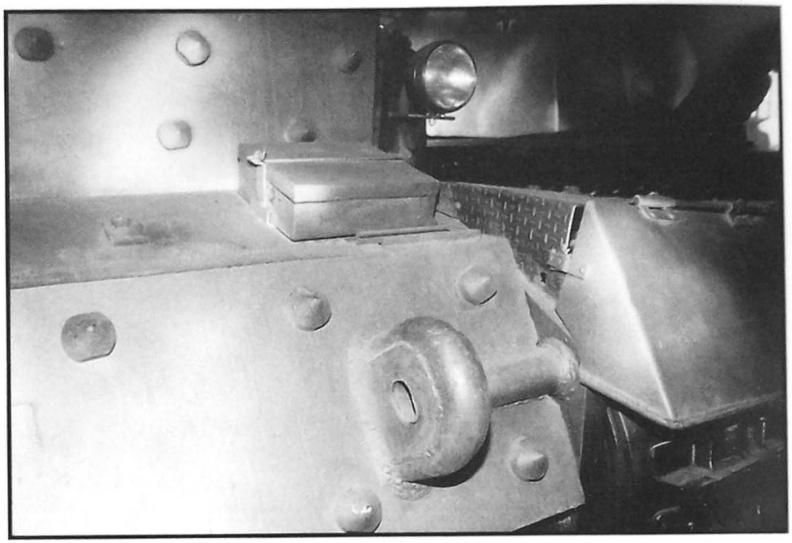
Top left: This Ferdinand of the 3./653 waits for the rail transport. Only the heavy six axle Ssyms freight cars were able to carry the heavy vehicles. (Photo K. Münch) **Top right:** Here again we see Ferdinand 121. This photo was taken in Nikopol, shortly before rail transport to Vienna. The tank hunter is being supplied with fuel. The winter camouflage is already worn. (Photo W. Schneider) **Above left:** During the regiment's embarkation, the Soviets started an attack. A combat group of Ferdinand tank hunters was sent for relief. This remarkable photo shows a ferry transport over the Dnjepr. (Photo W. Schneider) **Above right:** This photo shows the difficulties of a recovery. Another Ferdinand supports one of the two Berge-Ferdinand. This Ferdinand of Abt. 653 shows the prominent tactical symbol at the right rear, as well as another smaller one to the left. The tank is presumably of the 2nd company. (Photo K. Münch)

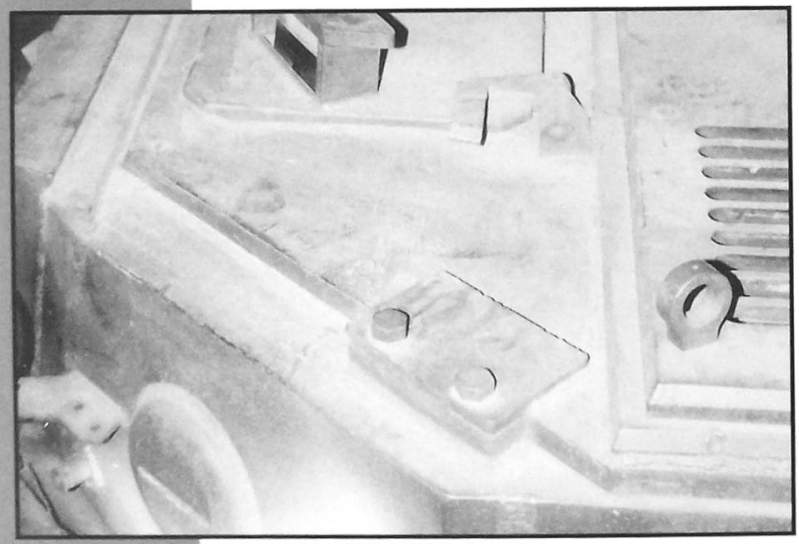




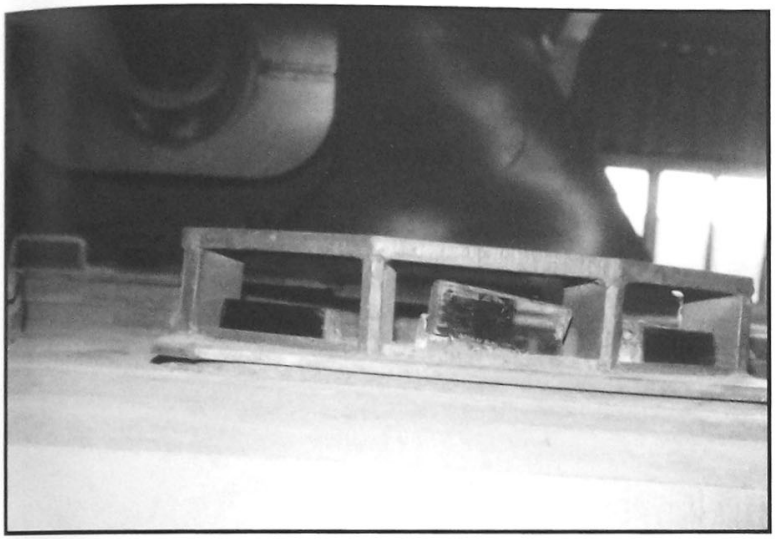
Among the vehicles of the Pz.Jg.Rgt. 654, which were lost in the vast mine fields during the first days of operation Zitadelle, some were still in good condition. Their crews could not blow up all the vehicles. Some fell into the hands of the advancing Soviets. Ferdinand 501 of the Pz.Jg.Abt. 654 was transported to the school of the tank troops in Kubinka as a trophy and quite naturally, for testing purposes. Here the heavy tank hunter can still be seen. The damaged tracks were repaired, only the missing rear escape hatch was not put into place again. **Top left:** Ferdinand 501 in full splendor. The vehicle was repainted in dark-green after the end of war; the white camouflage stripes make photographing very difficult. **Top right:** This view shows the pure size of the tank hunter. The Soviets cut out parts of the armor plates for testing purposes, later the holes were welded again. **Above left:** This photo shows the good condition of the vehicle. The track cover still is original. The undercarriage is completely varnished in black, as with most exhibits in Kubinka. **Above right:** A close-up of the driver's lateral view slit. The headlight is of Russian origin. Below it, the hole for the electric line is visible.

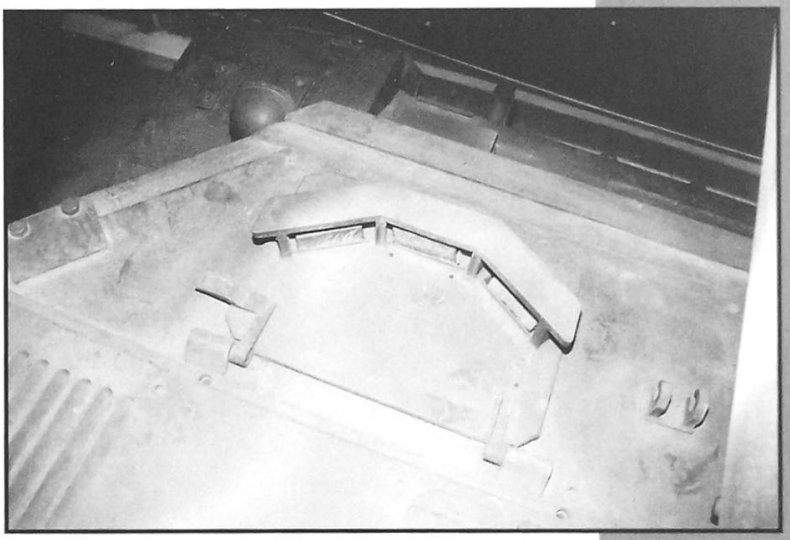


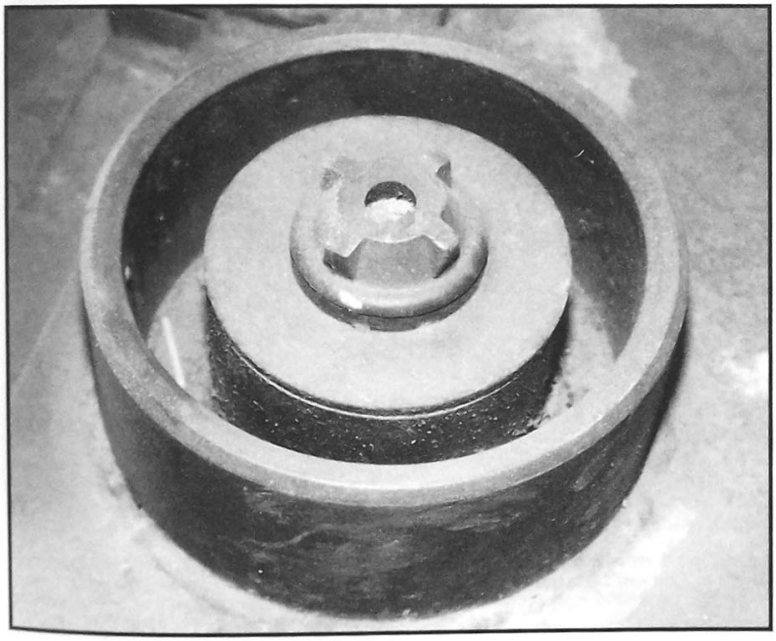




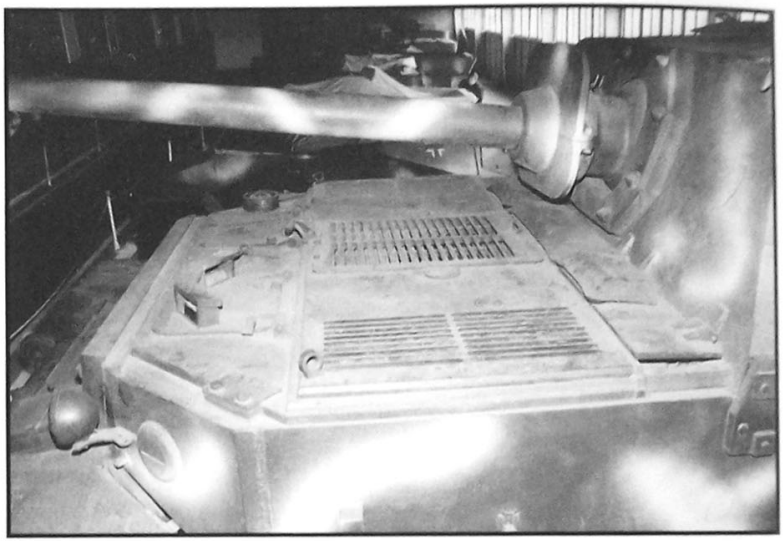
Top left: This photo reveals the heavy bolted-on additional armor plate. This 200-mm strong protection could not be merely penetrated by any gun. **Top right:** The towing hooks on the frontal plate were reinforced, since these tended to break off when being towed laterally. Again, many details of the track cover are visible. **Above left:** The missing wood block for the jack was replaced by a sheet metal crate. Unfortunately, the jack itself is missing, the brackets are still recognizable. **Above right:** The driver's escape hatch was equipped with three periscopes. The massive frontal armor plate is evident again.

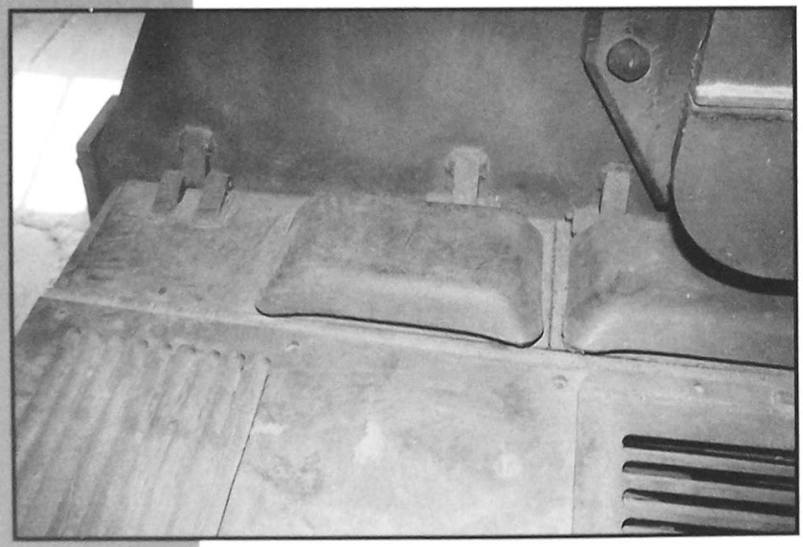


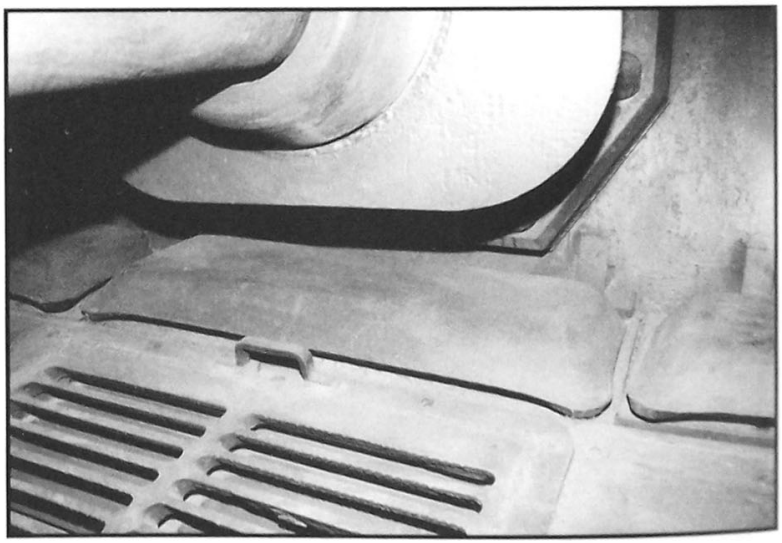




Top left: A frontal view of the periscopes. **Top right:** The hatch seen from above. The gun's travel lock is missing, the hinge still being recognizable. **Left:** A bulletproof "Panzertopf" protected the antenna mount. Here the two-meter rod antenna was installed. Remains of the rubber mount are still evident. **Above right:** The wireless operator's escape hatch didn't have any periscopes. The antenna was installed directly beside it.

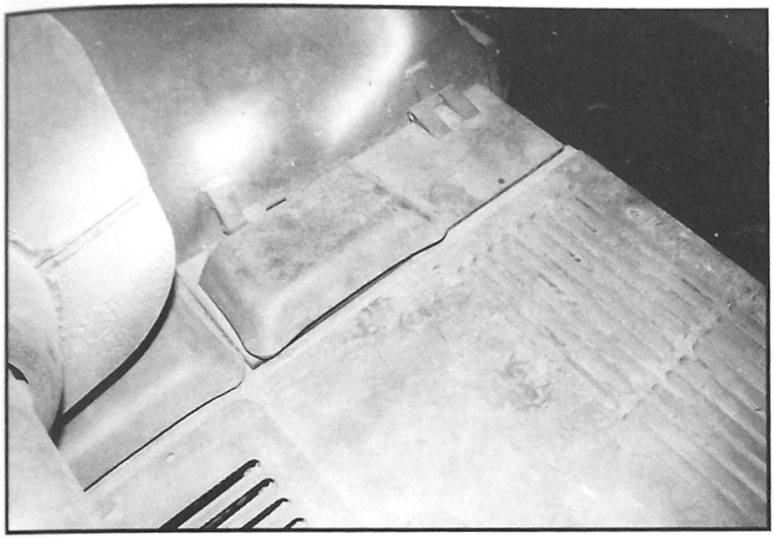


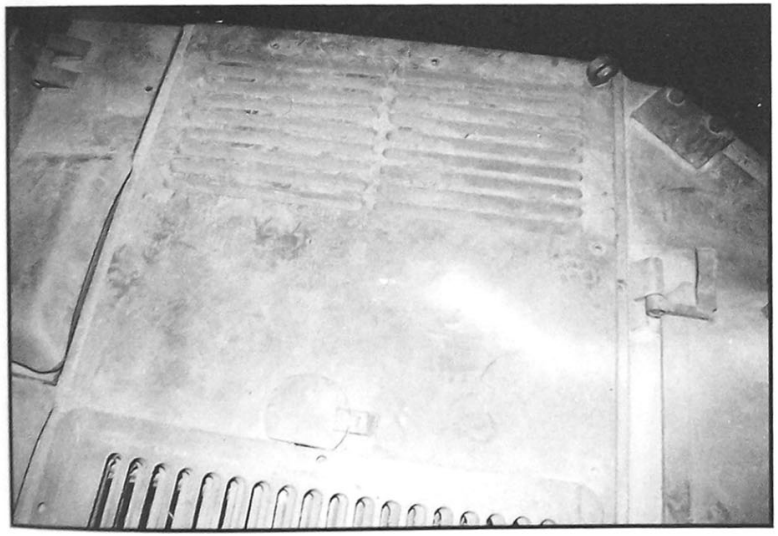


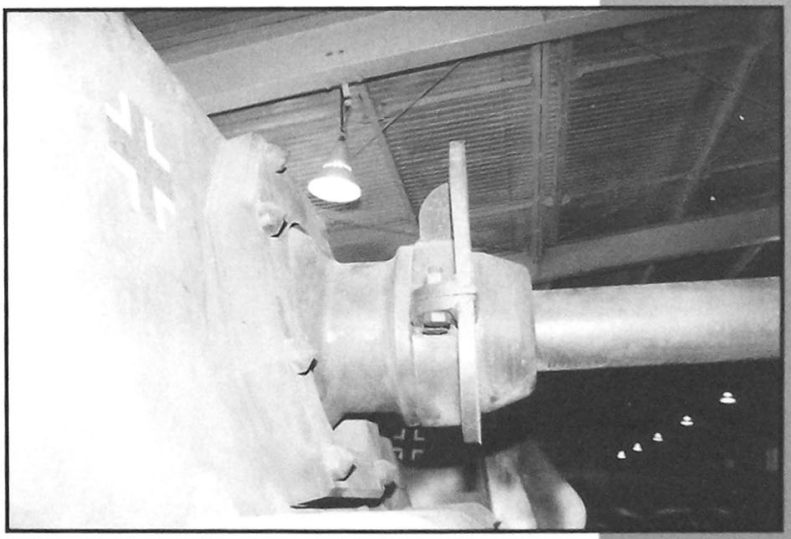


Top left: This photo shows the division of the engine cover. The two engines lay under the gun-barrel, side by side. To the left, the gigantic generator was accommodated and on the right hand side, the cooling system. **Top right**: In this photo the entire engine compartment is visible. A travel lock supported the long gun. This device, however, is missing on the Kubinka Ferdinand.

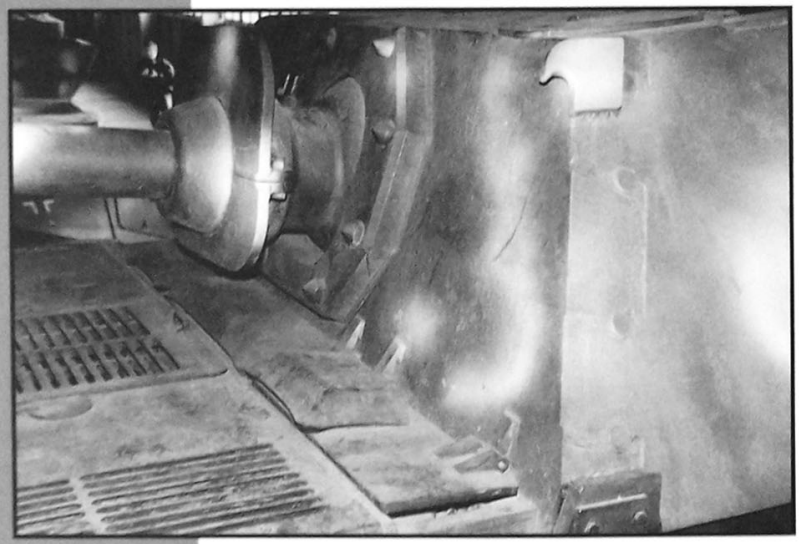
Above left: The right (in driving direction) engine access hood. These two lateral hoods protected the fuel-fillers. **Above right**: The center hood allowed a very restricted access to the engine area. The large covers of the cooling system had to be removed when bigger repairs or maintenance work occurred.

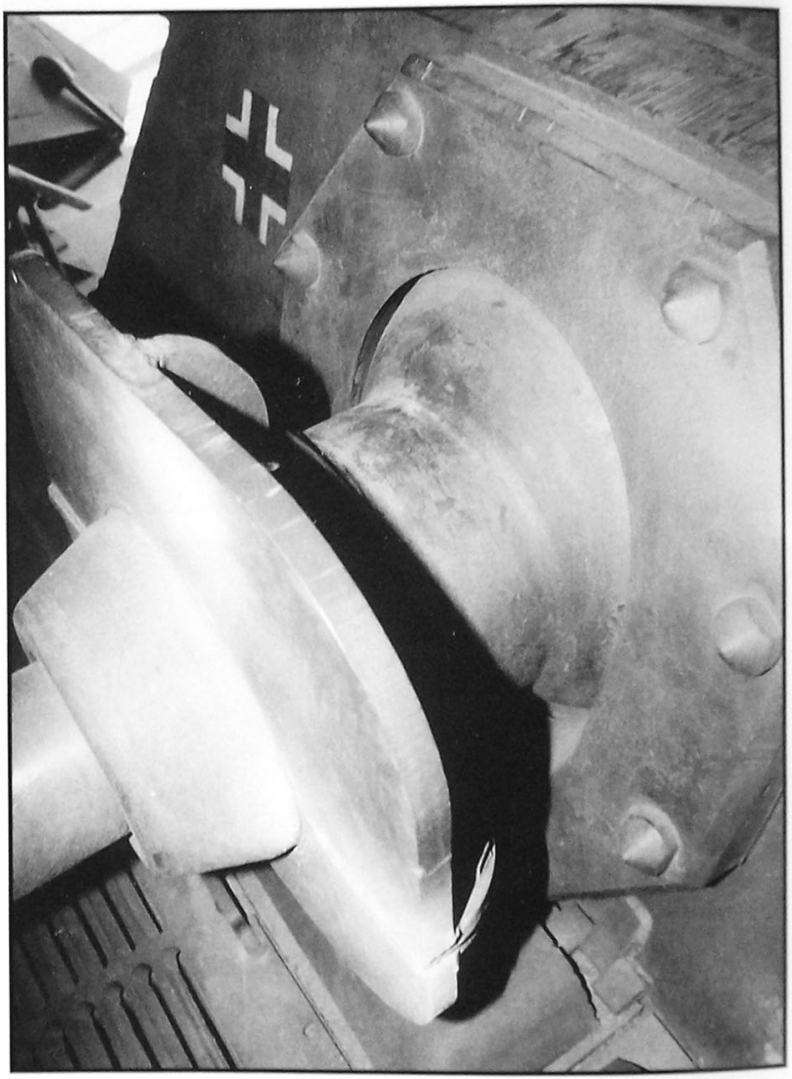




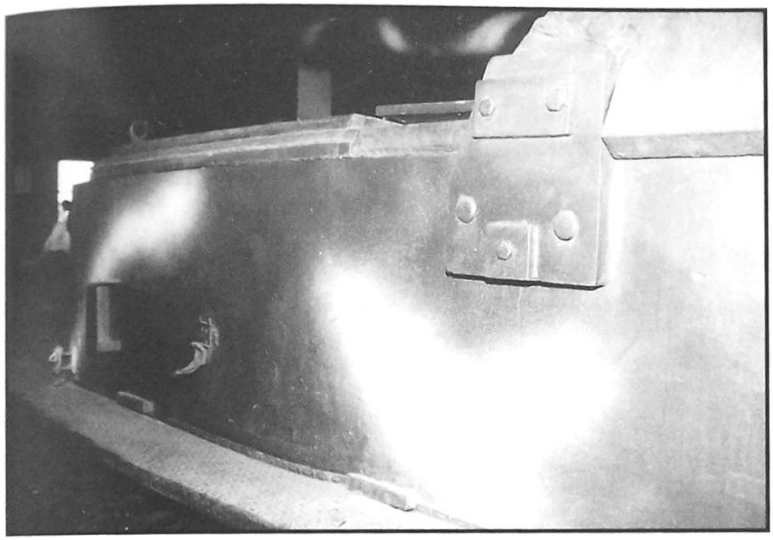


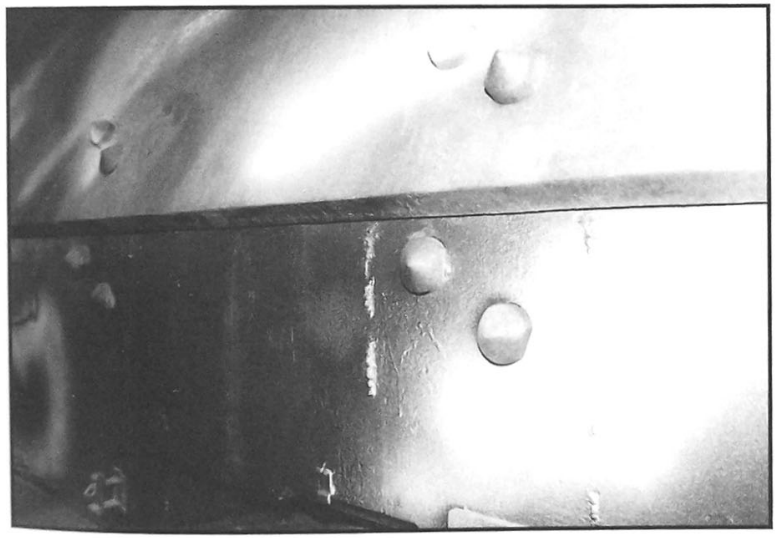
Top left: The left engine access hood. The engine ventilation cover grilles were situated in front of the hoods. **Top right:** A view of the right engine grille. **Above left:** The left engine grille. The lid with the lateral cutout allowed access to the left cooling water filler. **Above right:** Another view of the gigantic gun shield. With the Ferdinand, everything was laid out a little more sturdy!

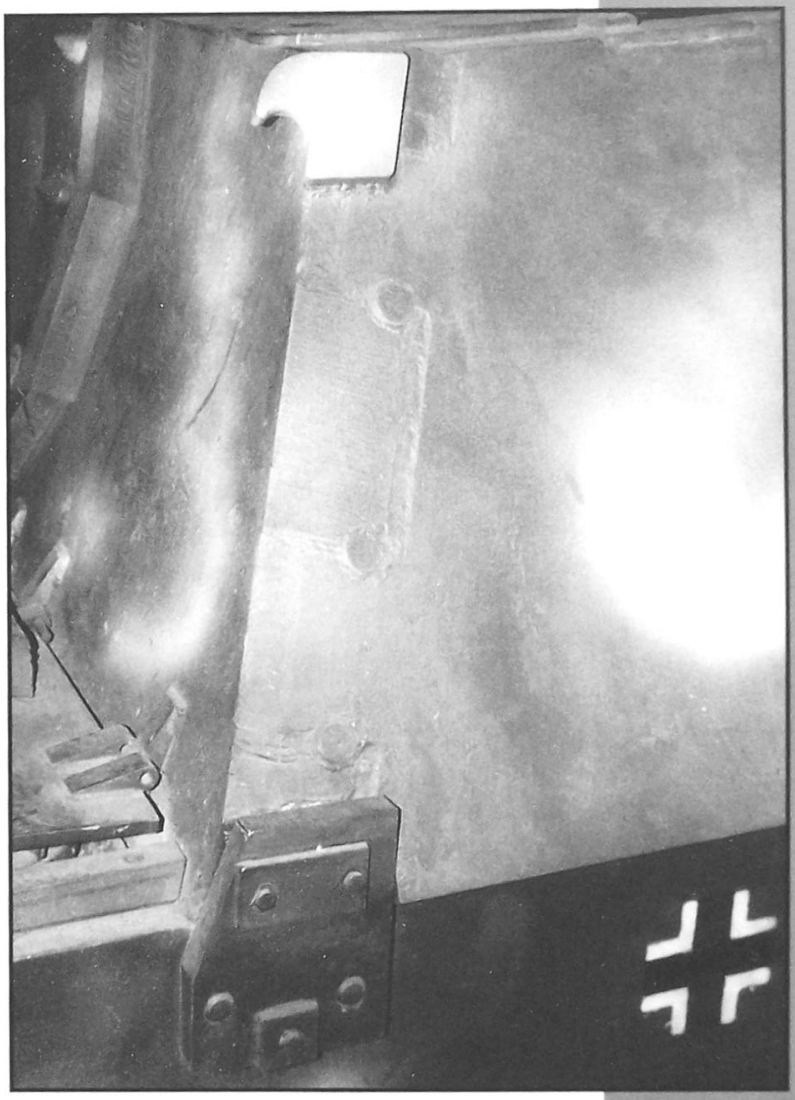




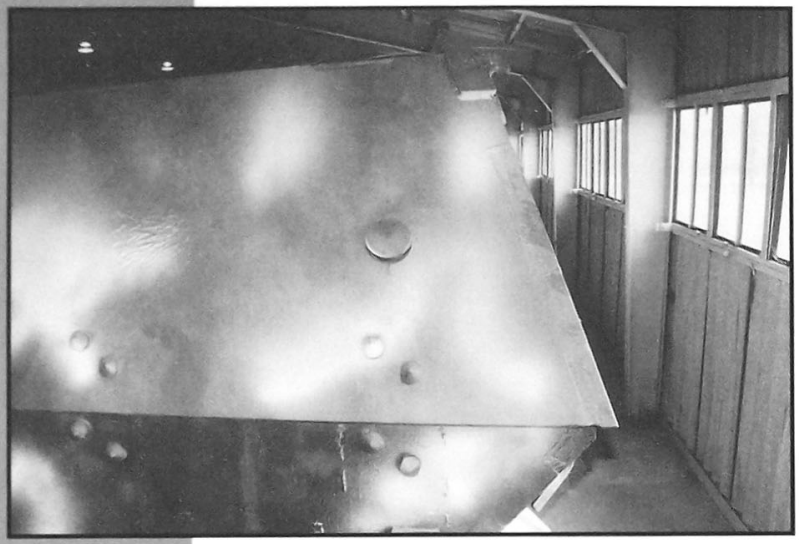
Top left: This interesting view shows the ball mount of the 8.8 cm KwK from above. The protection plate was of screwed construction. **Right**: The ball mount. **Above left**: The casemate had a frontal plate of 200-mm thickness and the side plates were 80 mm. The plates were interleaved, bolted and finally welded. This level of protection was almost impenetrable by 1943 standards.

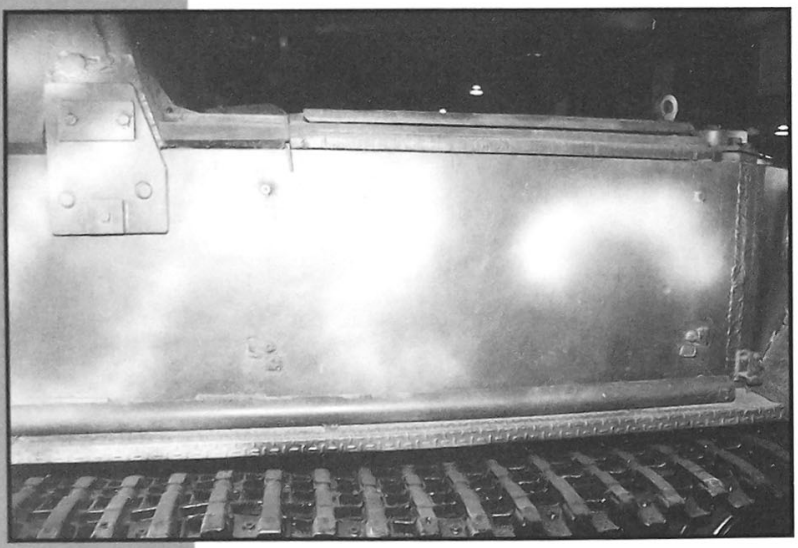


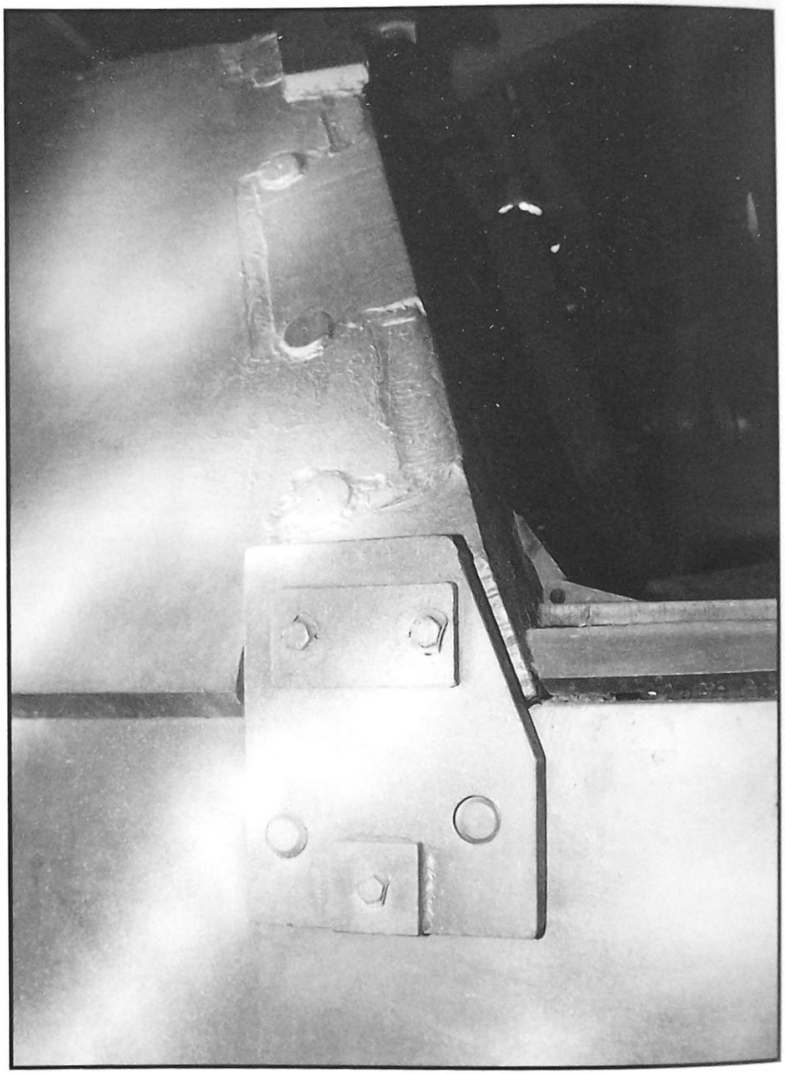




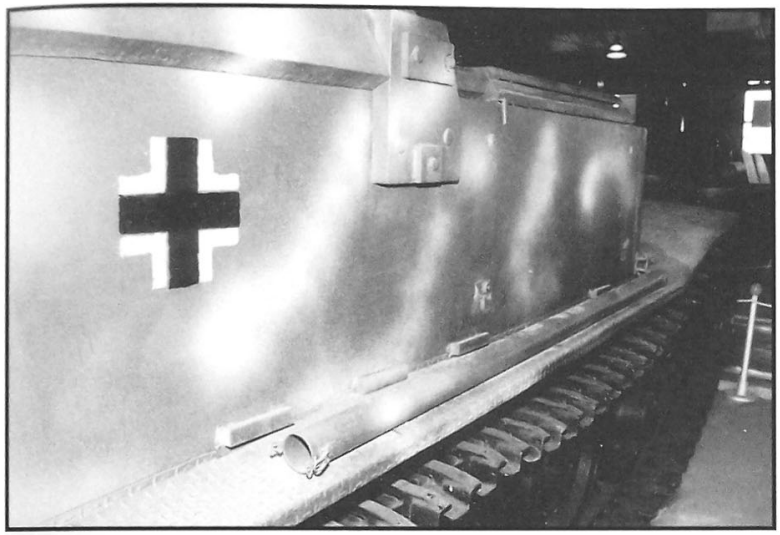
Top left: The casemate could be removed for better access. These plates held the construction together in the front. **Right:** Another view. **Above left:** The casemate was slightly wider than the Ferdinand's hull.

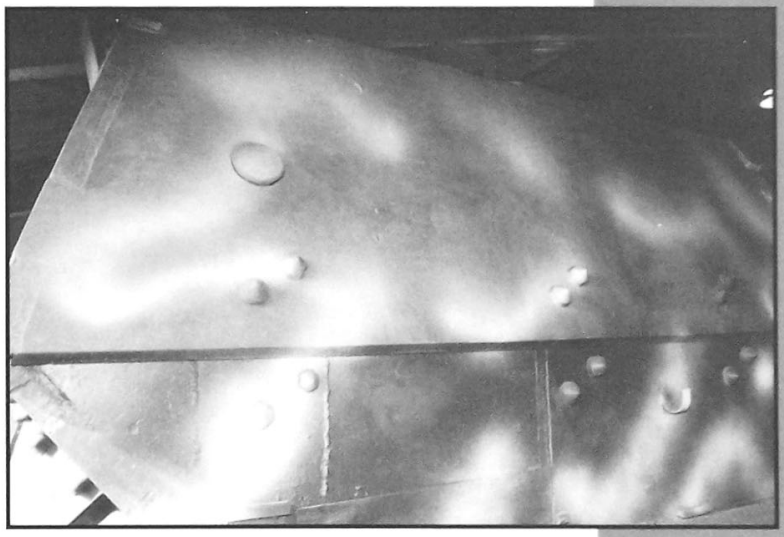


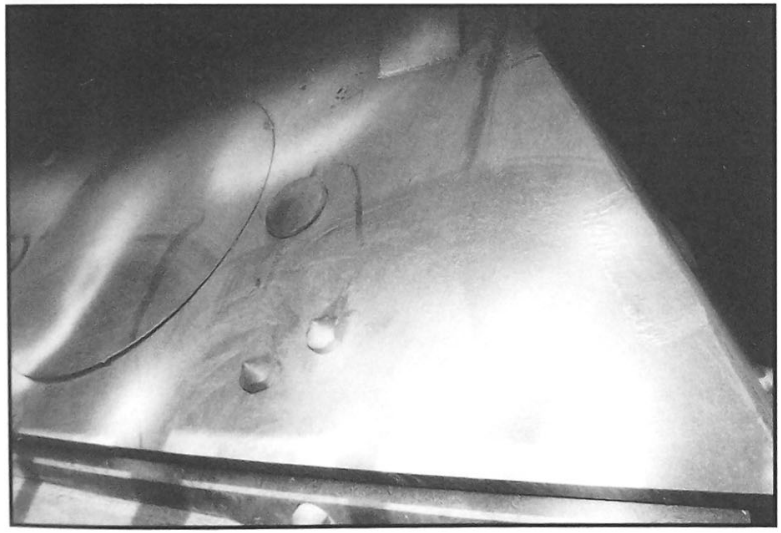




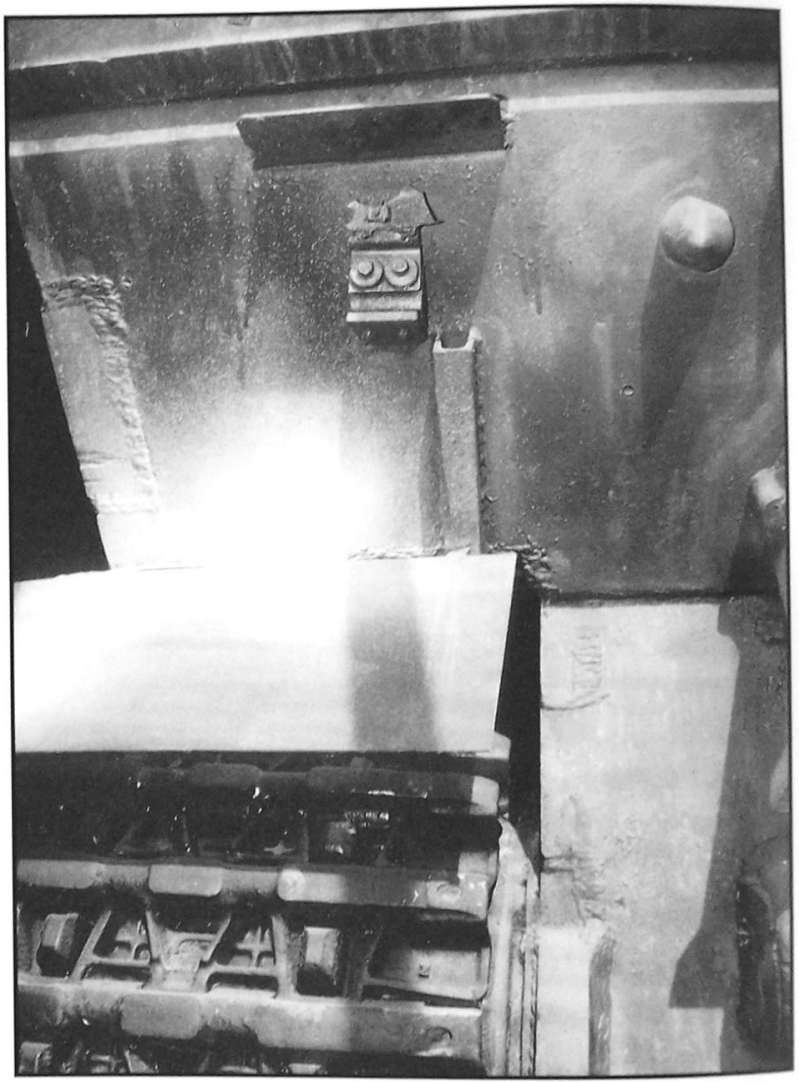
Top left: The casemate's left rear. **Above left:** The big crate fitted to the right side is missing. Under the mounting brackets, the tube for the spare antenna still is in place. **Right:** Another view of the big beam connecting casemate and hull.



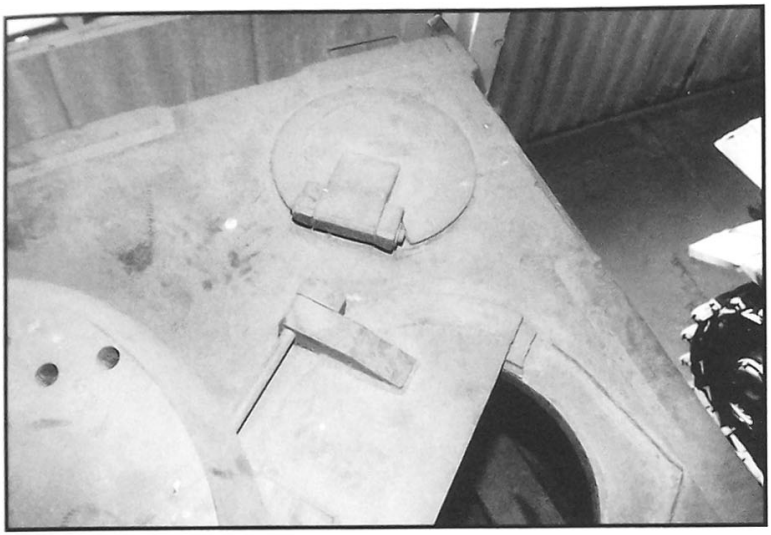


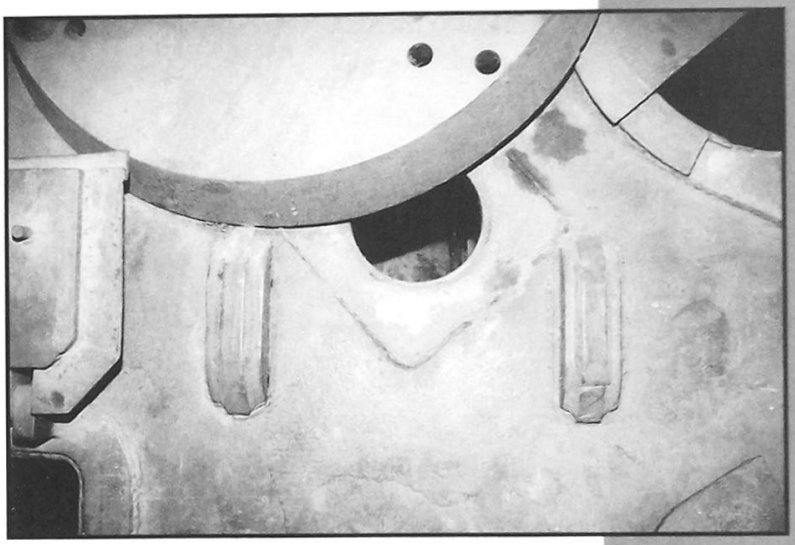


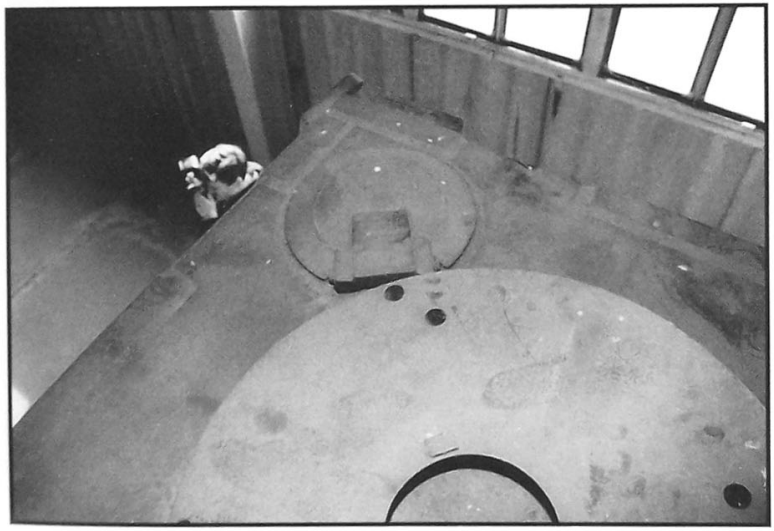
Top left: The spare antenna tube lacks its shutter. Note the strength of the beam.**Top right:** Everywhere, the welding seams caused by the Russian engineers are recognizable on the vehicle. Above in the picture one of the MP ports. **Above left:** The casemate's stern plate. The big rear escape hatch is missing, the aperture, however, was closed by sheet metal. **Above right:** A beautiful view of the massive "Hutze" at the stern. After a few days of use, the tool crate on the side was transferred to the stern. The taillight is mounted to the left of the tool crate.

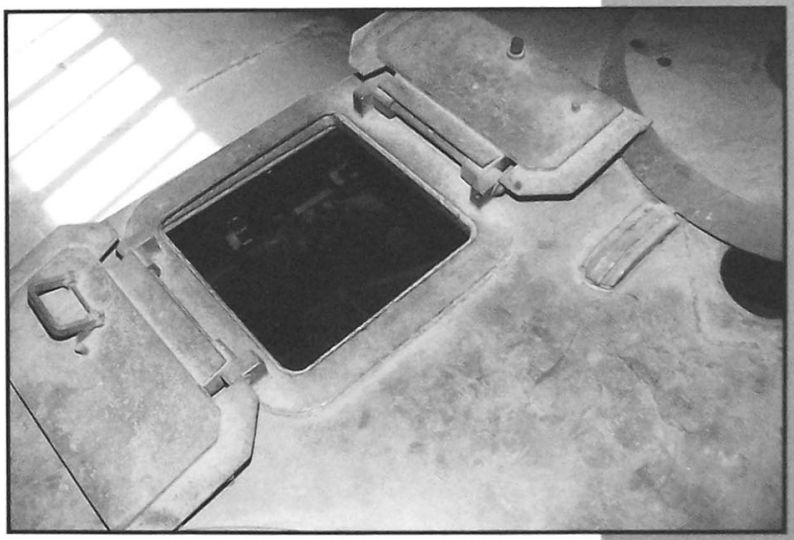


Top left: A look at the rear hood. The aperture was covered by wire mesh. **Above left**: Details of the rear assembly. **Right**: The roof of the casemate. Both hatches are opened, the gigantic escape hatch is stored here.

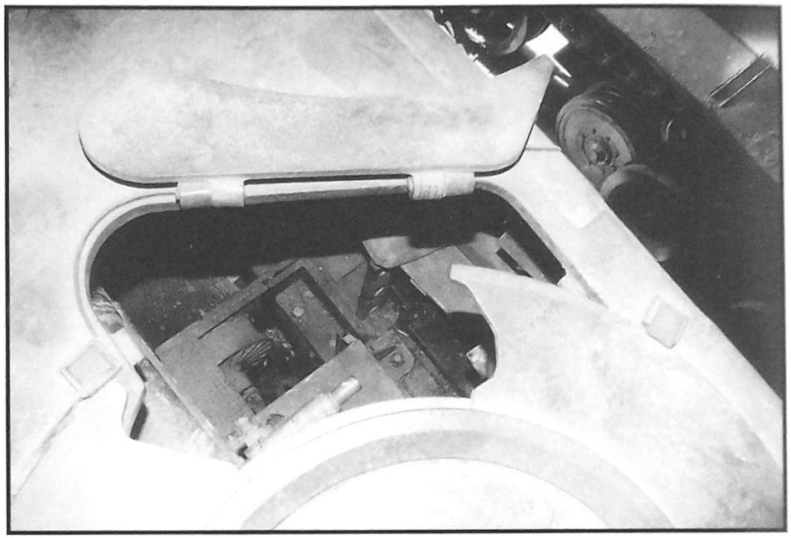


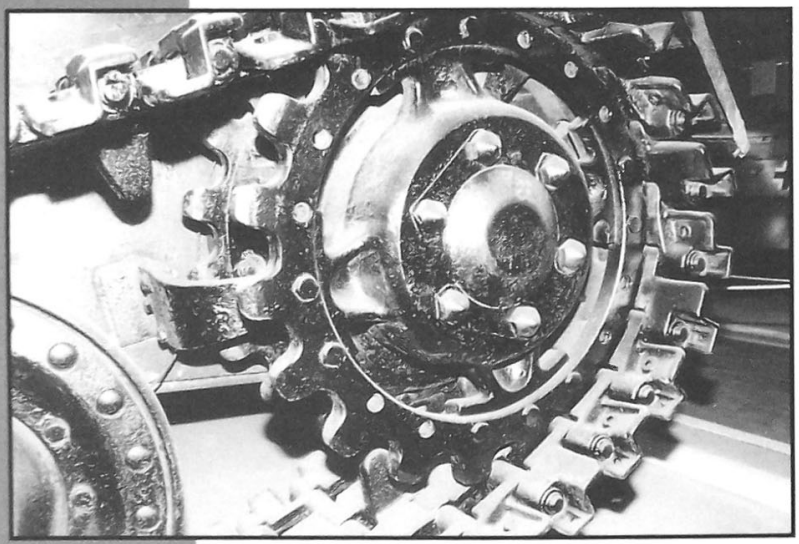


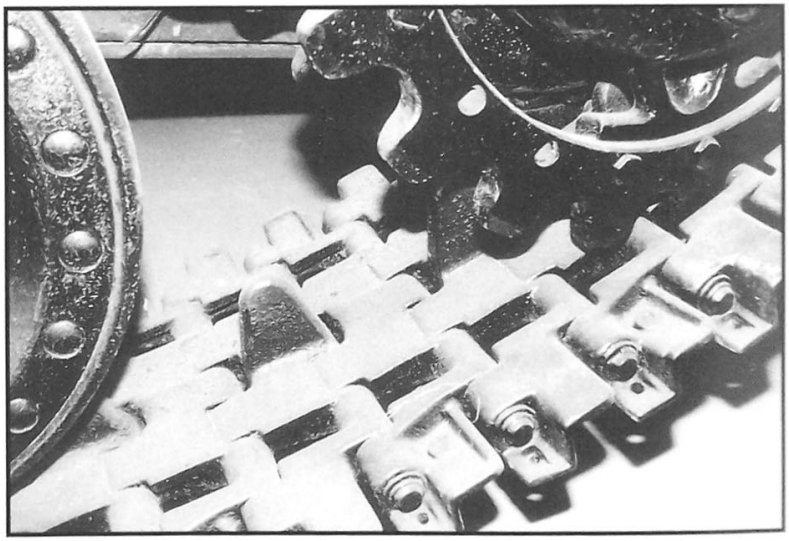




Top left: A view of one of the retractable back periscopes. **Top right:** The ventilator in its armored box is missing, the emergency escape hatch covers half of the opening. **Above left:** The right rear corner. At each side retractable periscopes were fitted, protected by hatches. **Above right:** The commander's hatch was of simple construction. In the course of the rebuilding measures toward the end of 1943 a new cupola identical to those used with the Sturmgeschütze was installed.







Top left: The opening for the TZF 1 telescope. The maintenance hatch is opened. **Top right:** This view shows the massive deflector in front of the TZF 1. **Above left:** The view shows the suspension. Both drive and idler wheels had sprockets. **Above right:** The early type track proved to be prone to breakage. In order to improve protection against mines, a new model was introduced in late 1943.