Allied-Axis

THE PHOTO JOURNAL OF THE SECOND WORLD WAR

German sIG 33/1 Grille SPG

kleines Kettenkraftrad

WWII Dodge 3/4-ton trucks

DUKW Amphibious truck

Issue 2

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.

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kleines Kettenkraftrad SdKfz. 2

The Kettenkrad stands out as, perhaps, one of the most unique vehicles developed during the Second World War. The "tracked motorcycle" concept was conceived and patented by a German inventor, Heinrich Ernst Kniep, in June of 1939. This was in response to a request for light vehicle capable of moving small loads in mountainous terrain.

The NSU Werke of Neckarsulm, Germany developed the Kettenkrad. Interestingly, many of the 0-series prototypes used spoke wheels, not only in front, but also throughout the tracked portion of the vehicle and its attendant trailer. Trailers for the Kettenkrad were a concurrent development and are discussed later in this article. Although the concept was embraced immediately, the vehicle was not introduced to troop service until early June of 1941. The official designation was "kleines Kettenkraftrad SdKfz. 2." "Kettenkrad" became the common abbreviation soon after.

Production was eventually expanded to the Stöwer Werke and by war's end over 8,000 vehicles had been produced (although some sources state a lower figure). The French firm of SIMCA and NSU shared the licensed production of the Fiat Topolino car, and as a result, there was some discussion about adding SIMCA to the production stream, but this did not take place.

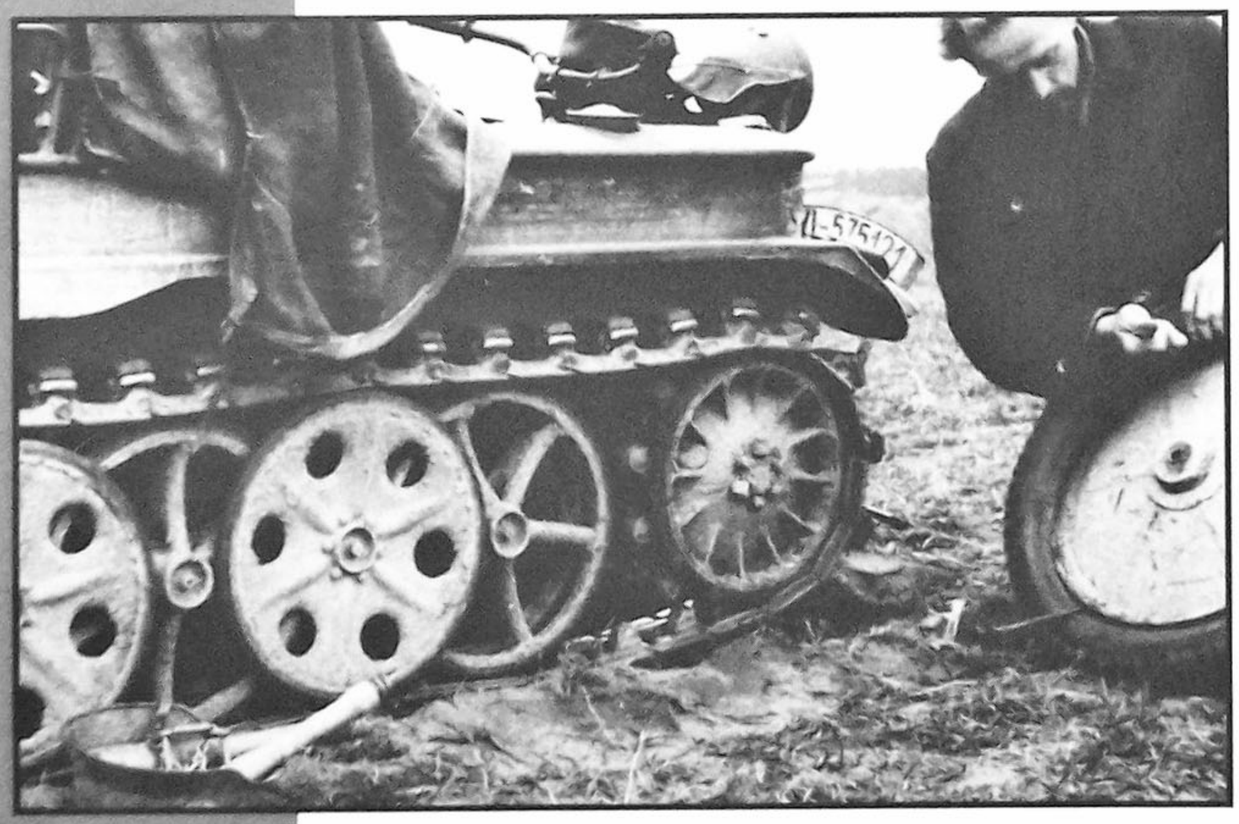
Production at the NSU Werkes is said to have continued until 1948 with some vehicles being imported into the U.S. to see use with the Forest Service. Details of this are sketchy. At least one (possibly more) French company offered rebuilt versions of discarded Kettenkrads after the war. These had the front wheel and steering gear removed and other modifications, to create a small farm tractor.

There were two sub-variants of the Kettenkrad, SdKfz. 2/1 "kleines Kettenkraftrad für Feldfernkabel" and SdKfz. 2/2 "kleines Kettenkraftrad für schwere Feldfernkabel." Both vehicles were used in conjunction with a trailer and had field communication wire spools mounted behind the driver. The 2/1 vehicle mounted a small wire spool and frame similar to the backpack piece used by the infantry. The 2/2 utilized much larger spools, two of which were mounted on a frame behind the driver. Additional spools were mounted in a specialized trailer (Sd.Ah. 1). Late in the war, portions of the Kettenkraftrad suspension were used to create the "Springer" demolition vehicle. This was designed as a replacement to the Borgward series and NSU (only) produced about 50 of these vehicles by war's end. **Above:** these two happy gents take their new Kettenkrad for a spin in the Russian countryside. This shots gives an excellent impression of the interleaving suspension and tracks. The license plate indicates Luftwaffe and the quilted cotton winter uniform further indicates that they are members of a Fallschirmjäger unit. This uniform was specifically issued to these units and was grayish-green on one side and white on the other. Their Kettenkrad still retains the foul weather cover mounted on the front of the handlebars. The driver utilizes the cold-weather gauntlets designed for motorcycle riders. (BA)

Another Luftwaffe vehicle. This may be an anti-aircraft unit as evidenced by the Flak 18 set-up in the background. Here, the vehicle is picking up some speed. When traveling this fast, the Kettenkrad's tracks barely touch the tops of the roadwheels. Although markings were usually sparse on the Kettenkrad, this vehicle contains three. The numeral 5 appears in a circle on both the front and rear of the vehicle, as well as the standard loading/shipping label. This label was commonly stenciled on the sides of soft skins and other vehicles. It contained pertinent information for both the shipping and use of the vehicle. The first line would contain the SdKfz. number and in this case reads, "Sd. Kfz 2." The next line reads, "Leergewicht 1235 Kg" (all weights were metric). This denotes the weight of the vehicle while empty (approximately 2,717 pounds). The third line reads, "Nutzlast 325 Kg." This denoted the useful load capacity (approximately 715 pounds). The fourth line reads, "Anhängelast 450 Kg" and this indicates the towing capacity (approximately 990 pounds). Often the stencil included a final line that read, "Verl. Kl." This was normally followed by a blank space and was meant to indicate any additional equipment provided with the vehicle. Occasionally, these stencils contained no numbers. Figures would be chalked in as the vehicle made its way along the logistics chain. (BA)

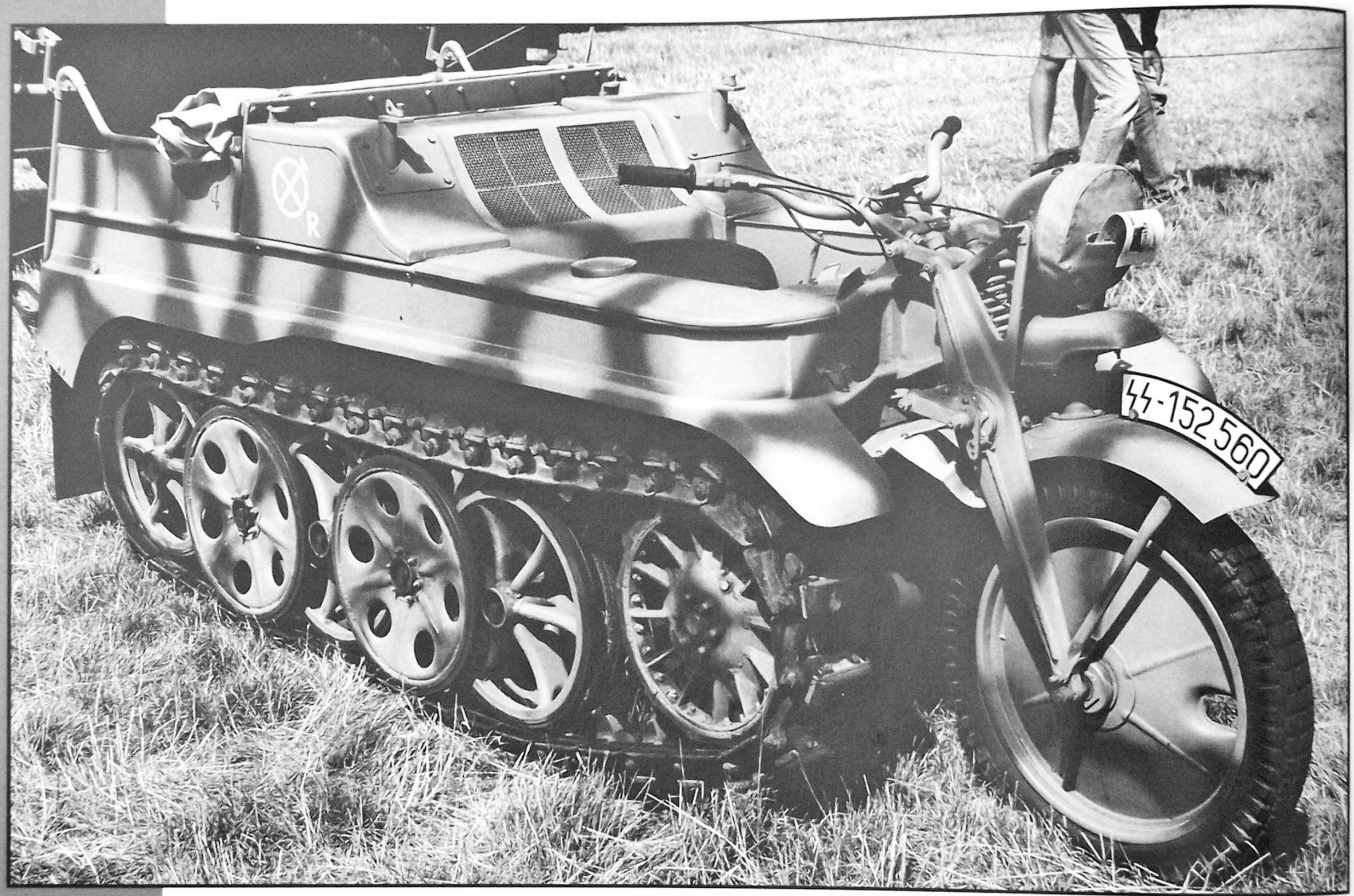
True to its intended role, the Kettenkrad was popular among troops serving in hilly or mountainous terrain. This vehicle is serving with a Fallschirmjäger unit in Italy during the spring of 1944. Because of its wide use, the Kettenkrad often took quite a beating from the troops. This vehicle is missing its headlight assembly as well as several of its rubber track pads. The folded metal brackets located to each side of the steering column are tow hooks. The hook portion on both has broken off. This appears to be a problem with many early Kettenkrads. Later vehicles had more robust, cast tow hooks located on the front of the superstructure. Among the trailers used with the Kettenkrad, this specialized version of the standard Infantriekarre lf.8. trailer was extremely popular. The standard cart could be fitted with a curved yoke for towing, a t-shaped bar for hand pulling, or a double-bar arrangement for use with a horse. This particular trailer is loaded with mortar rounds. This photo provides a good view of the brake assembly of the trailer, which was the primary difference between it and the standard cart. Brakes were a true necessity for a trailer loaded with anything close to its rated capacity. (BA)

This Kettenkrad negotiates a snowy and muddy track somewhere in the Caucasus during the winter of 1942. This vehicle belongs to either to 1. or 4.Gebirgs-Division, both of which served in that area at that time. The "edelweiss" marking visible on the front left fender and the rear body panel is of interest. It is very similar to the insignia embroidered on the Gebirgsjäger cap. The numeral 3 is also seen on the side body panel. The NSU logo is barely visible just to the left of the numeral. The lack of front marker lights indicates an earlier vehicle. This Kettenkrad pulls the standard Sd.Ah 1 trailer filled with what appears to be bags of grain. This version was the most numerous of the five types produced. The O-type was only used in conjunction with the prototype and used the highly impractical spoke wheels. The load bearing wheels on this vehicle are completely clogged with mud and have been rubbed smooth by the outer roadwheels. (BA)

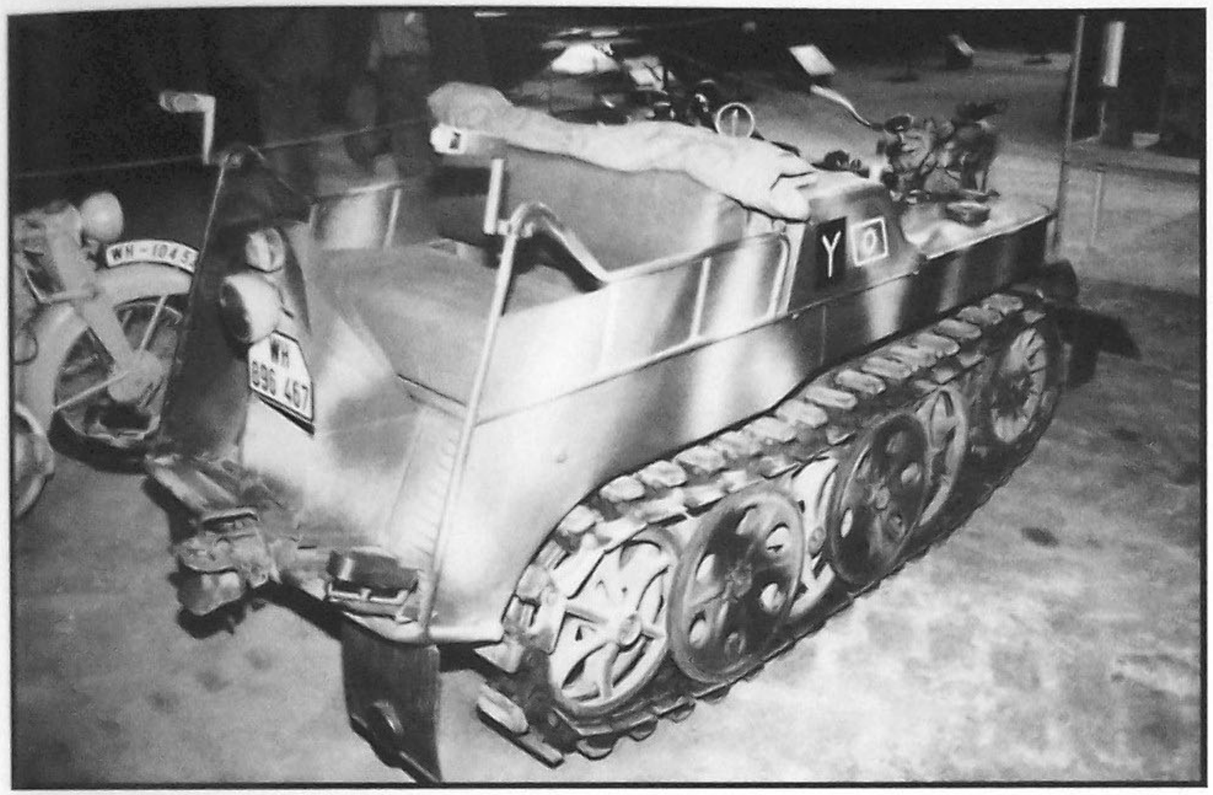


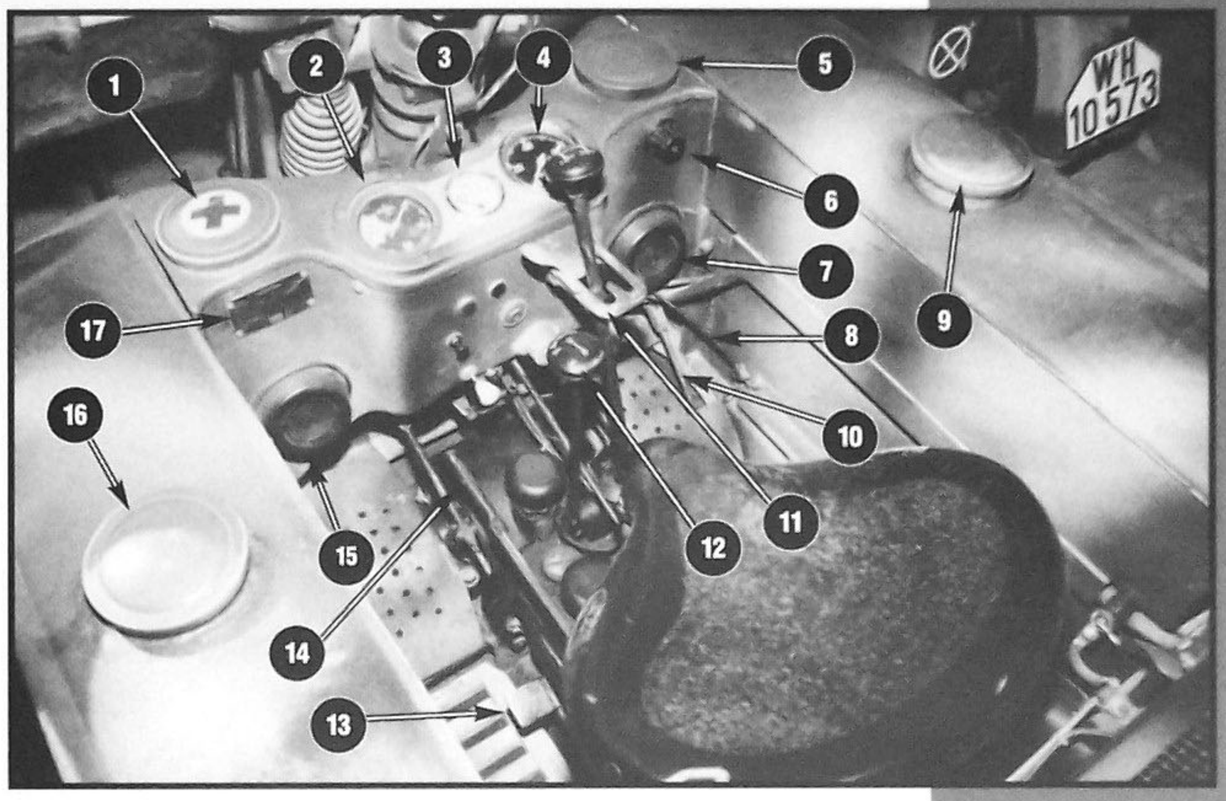
Above left: this shot is from the same general sequence as the previous photo. Also note the lack of front marker lights on this Kettenkrad. (BA) **Above center:** this Kettenkrad is serving with a Kradschutzen unit in the Deutsche Afrika Korps. It was possible to operate the Kettenkrad in this condition as the steering brakes were actuated as soon as the forks were moved more than 5cm from the center position. The front wheel actually only steered the vehicle in gentle turns. Every square centimeter of rubber track pad has worn away on this vehicle, revealing the metal bases. It is surprising that the tracks still function in this condition. Even though the inner track link sleeves were sealed, maintenance could still be a bear on these types of tracks. Each link contained over twenty parts. This vehicle tows what appears to be a modified trailer from a 2cm-flak gun. (BA) **Above right:** this is a good example of why the track pads were worn off in the previous photo. The super fine sand thrown up by every movement was not healthy for any machine. (BA) **Left:** changing a tire was much simpler and was just like changing any standard motorcycle or bicycle tire of the time. The wheel was quite simple and it consisted of two pieces of pressed steel welded together. The center hub was more complex and consisted of an inner and outer axle and a central shaft that housed a bearing race for each side of the wheel. (BA)

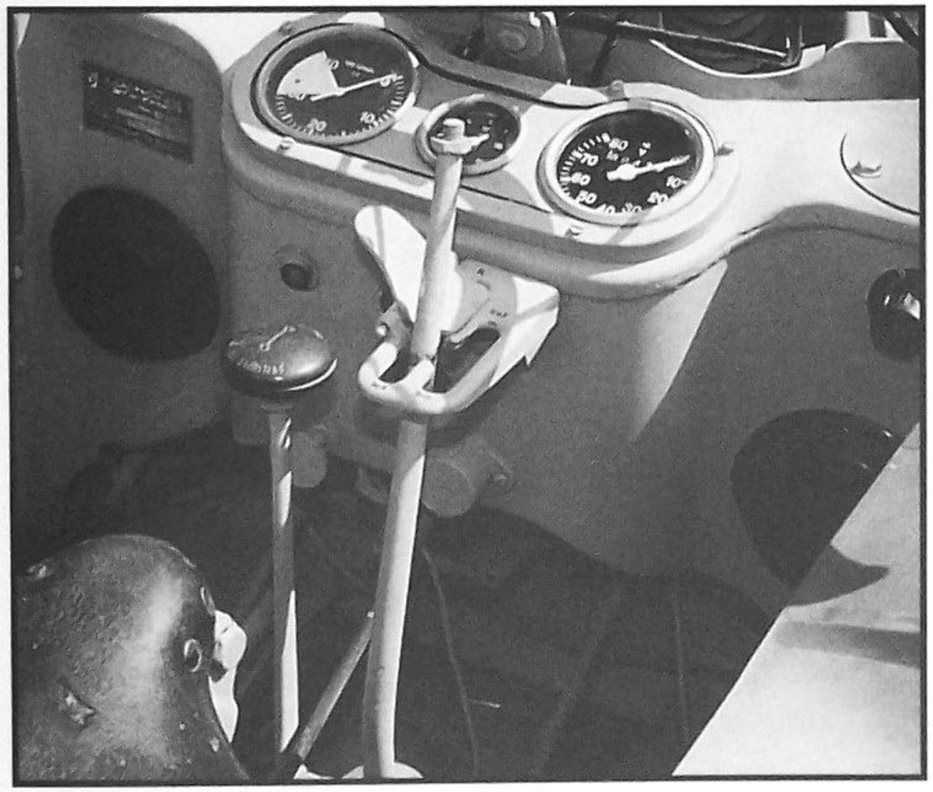
In a scene reminiscent of the film "Saving Private Ryan," 101st airborne troopers make good use of their newly acquired Kettenkrad and a captured stock of German gasoline in the French town of Carentan. The Kettenkrad was every bit as popular with allied soldiers as it was with the Germans, perhaps even more so due to its novel and unfamiliar design. There is plentiful photographic evidence of the vehicle being used by American, British and Commonwealth soldiers. There are even instances of Kettenkrads being repainted and remarked by the Americans. This vehicle sports several interesting features, including the late-style filled side-rails. Also compare the shape of the rear center partition with the other vehicles shown in these pages. The two soldiers riding in front are clearly airborne. Their heart-shaped helmet insignia mark them as members of the 502nd PIR of the 101. The soldier filling the gas cans is most likely part of the 327th glider regiment. Note the pockets on his jacket and the lack of airborne insignia on his shoulder. These two units (3rd battalion of the 502nd) were tasked with taking Carentan and linking the Omaha and Utah beachheads. Their opponents were the Fallschirmjagers of Kampfgruppe von der Heydte. The presence of civilians on the street of this rather battered Normandy town indicates that the fighting has moved further to the east, sometime after June 12th. (NA)

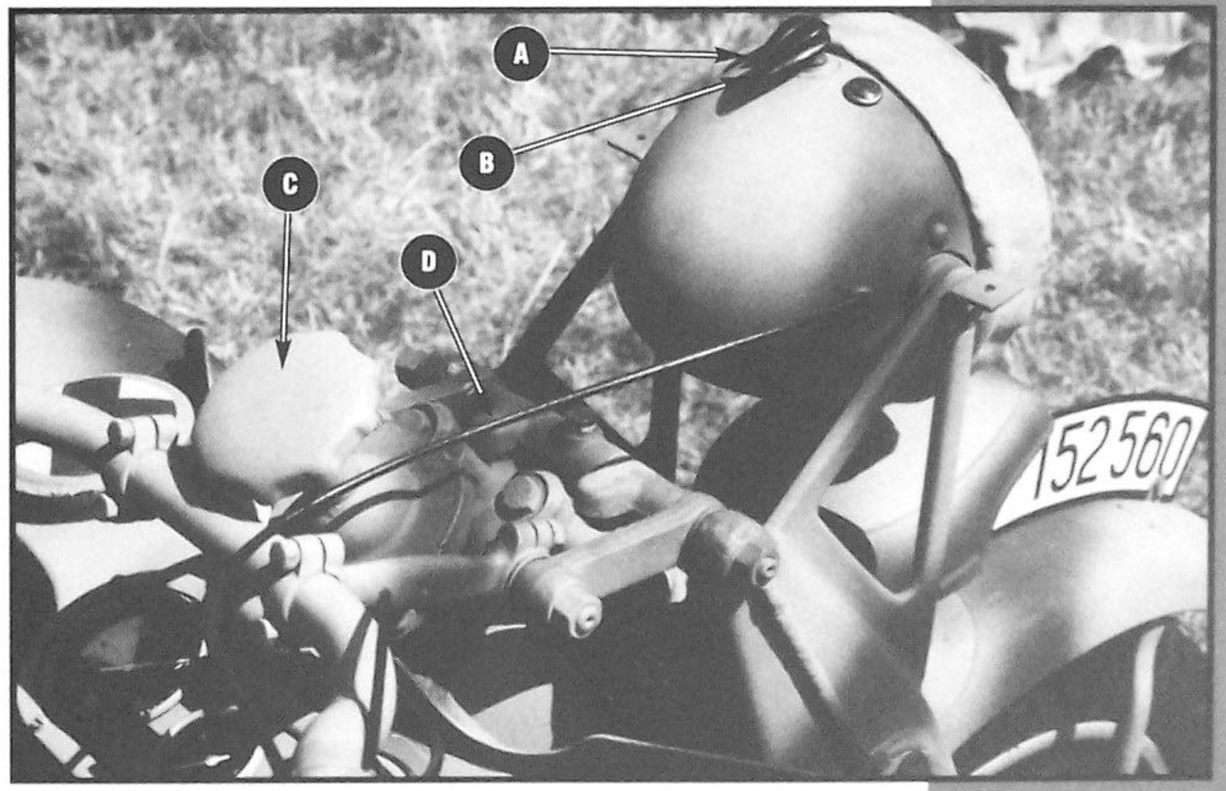


A surprising number of Kettenkrads survived the war. The vehicle was extremely appealing for anyone regularly traveling over rough terrain. Farmers, hunters and even resort owners made use of the Kettenkrad during the post-war period. The high-quality replacement parts that were created for the Kettenkrad by its owners after the war extended the life of the vehicles even more. And so many vehicles have now been restored to their original condition. This Kettenkrad was photographed at the IMPS War & Peace Military Vehicle Show in England in 1999. This shot provides an excellent view of the suspension. The inner spoke wheels were the load-bearing wheels, while the outer wheels extended the ground pressure and contact with the tracks. Very early Kettenkrads had wheels with eight metal spokes in the inner positions as opposed to the six spoke wheels seen here. This Kettenkrad has the later tow hooks located towards the bottom of the front body panel. This photo also provides a good view of the protective flap behind the steering column. Note the three wires leading from the right handle bar. The wire on the face of the bar was connected to the handgrip and this rotates to increase or decrease acceleration. The wire attached to the button on top of the bar leads to the front light and switches it on or off. The wire leading from behind the bar actuates the horn.

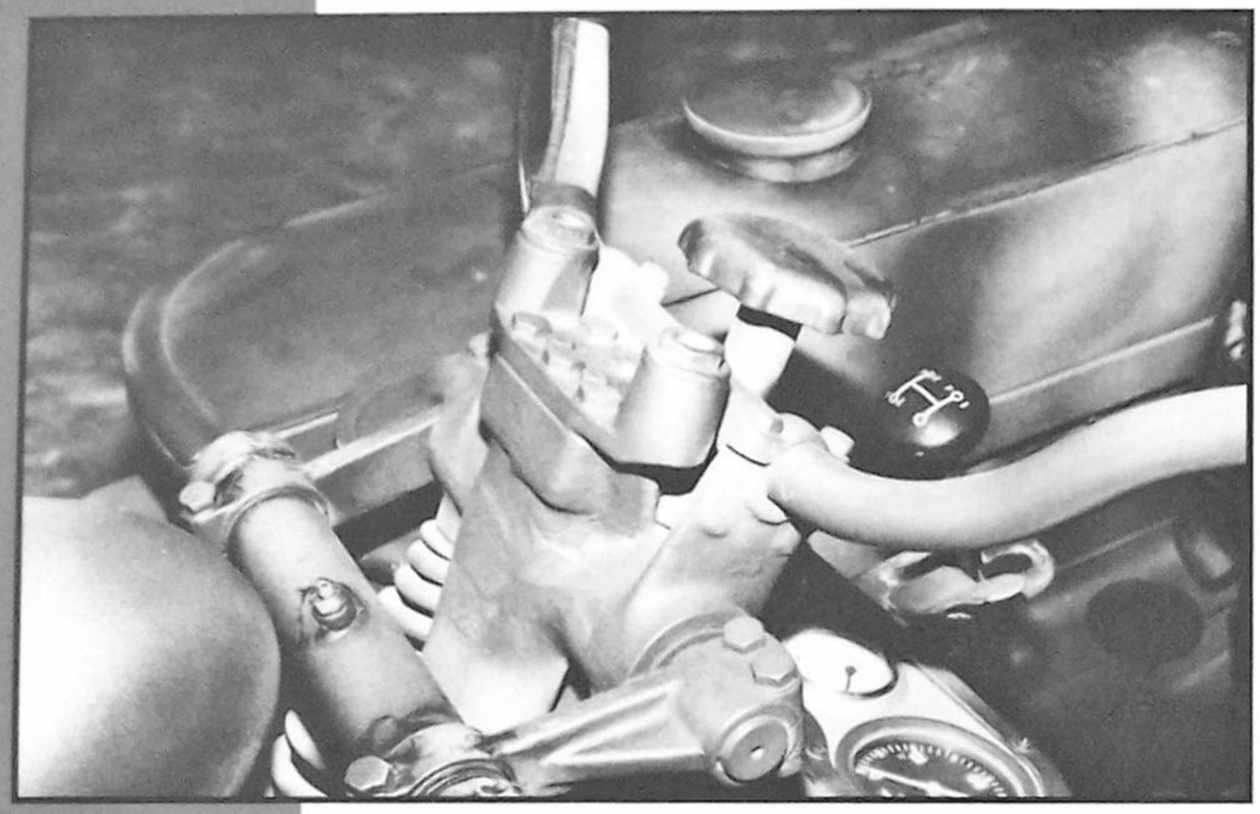


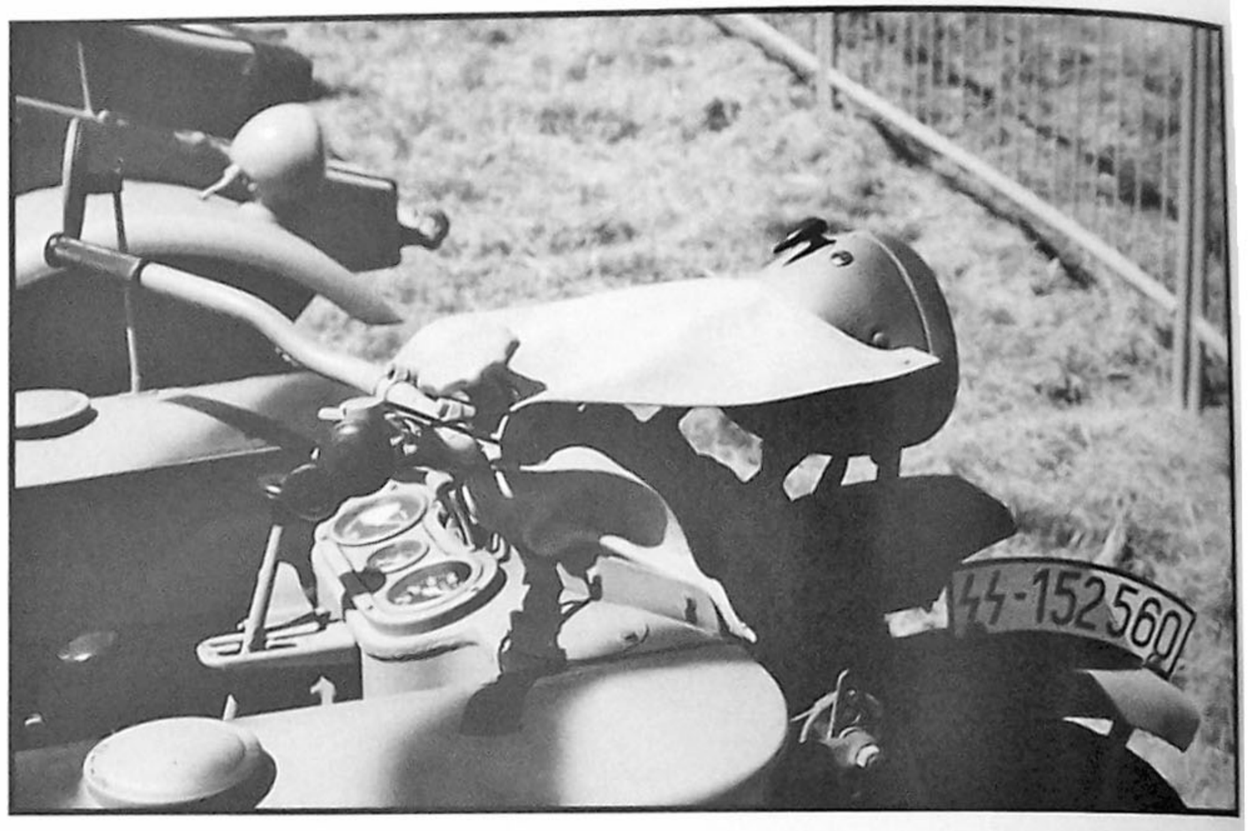


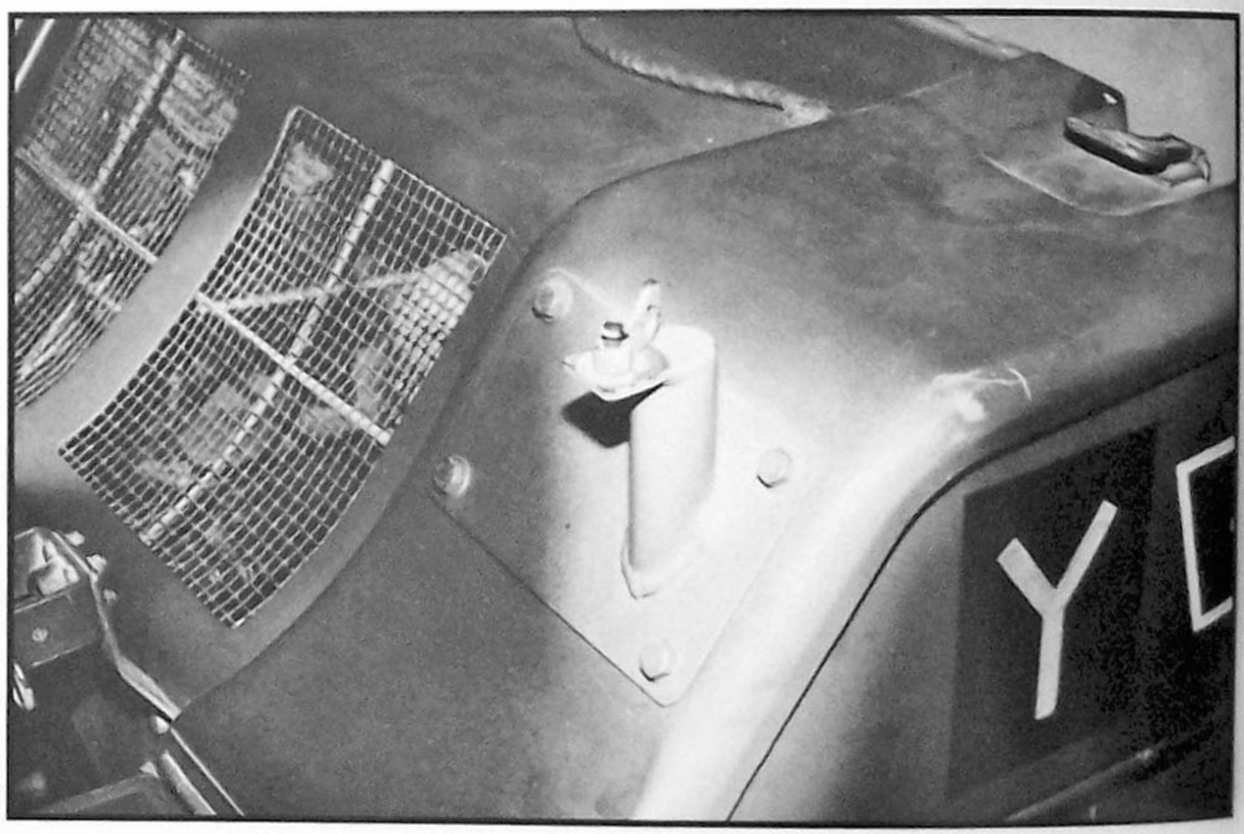




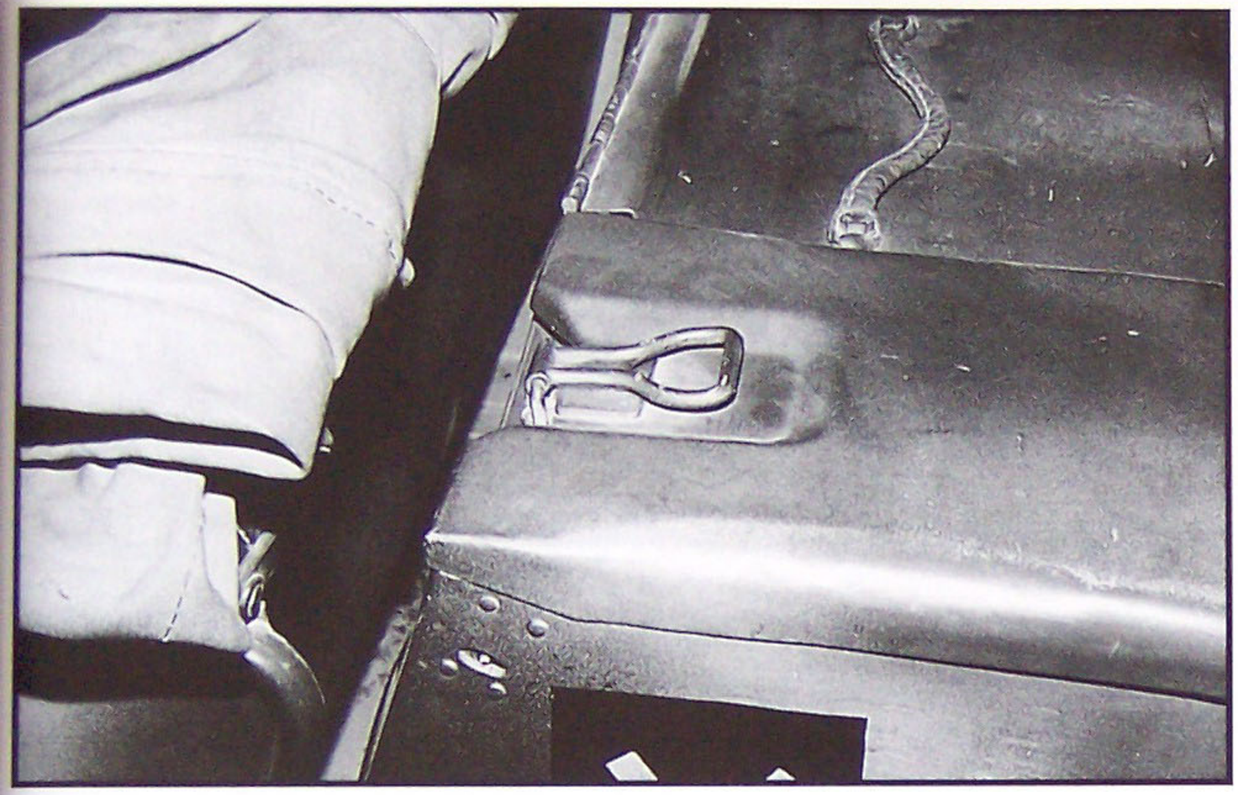
Top left: this Kettenkrad is currently located at the Bundeswehr museum at Münsterlager. The vehicle has been restored, but it does contain a few inaccurate details. For example, the track pads are not original, nor is rear taillight. The socket for the trailer light lead can be seen just above the light. **Top right:** an overview of the Munster vehicle's driving compartment. This is a good example of why the Kettenkrad was referred to as a "tracked motorcycle." The driver sat on a standard saddle and the controls were laid out very much like a motorcycle. 1) First-aid kit container. 2) Tachometer. 3) Temperature gauge. 4) Speedometer. 5) Tool kit compartment. 6) Driving light switch. 7) Right rubber kneepad. 8) Accelerator cable. 9) Right fuel tank filler cap. 10) Brake lever for right wheel. 11) Gearshift lever. 12) Control lever for auxiliary transmission. 13) Clutch pedal (brake pedal on opposite side). 14) Hand brake. 15) Left rubber kneepad. 16) Left fuel tank filler cap. 17) Factory ID plate. **Above left**: this closer view of the controls, shows the instrument cluster and the gearshift gate. The tab on the gate is to prevent the reverse gear from being thrown back too far. **Above right:** the top of the handlebars. A) Headlight switch. B) Battery indicator light. C) Steering damper knob. D) Power cable for headlight. Note the reinforcing rib on the front forks.

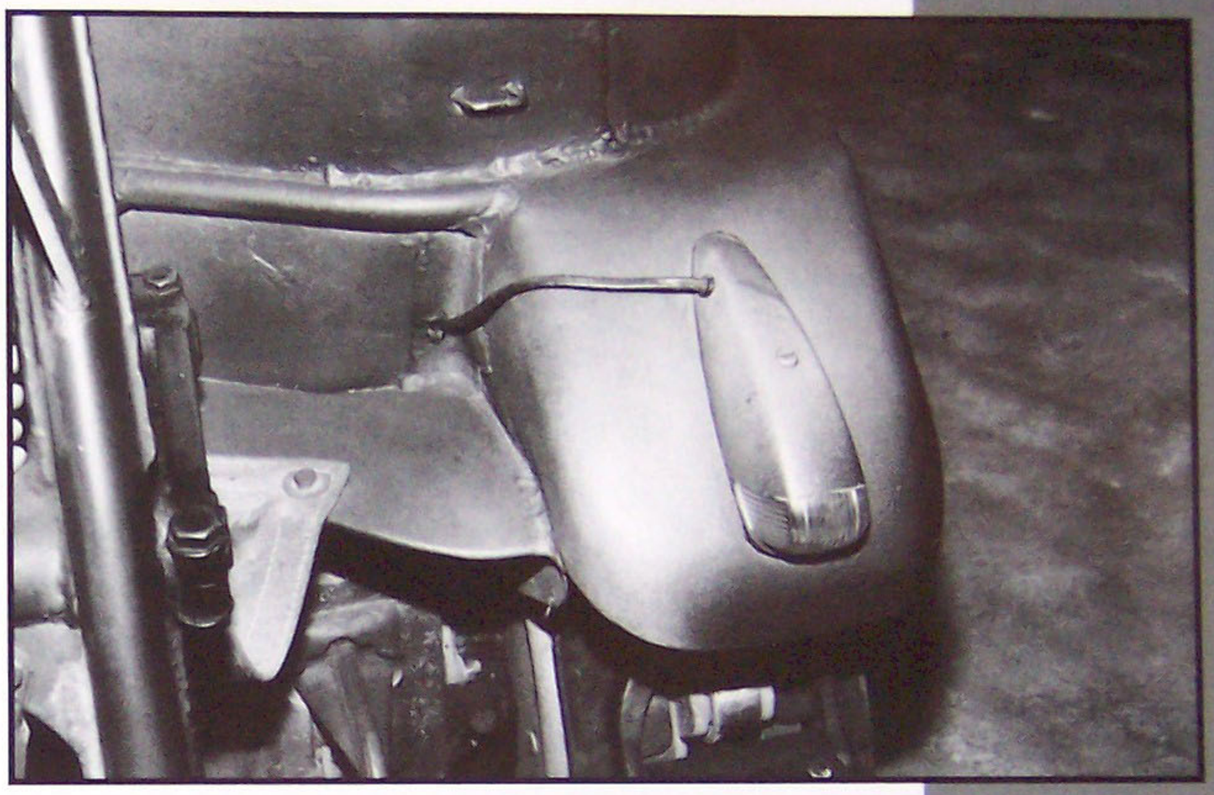


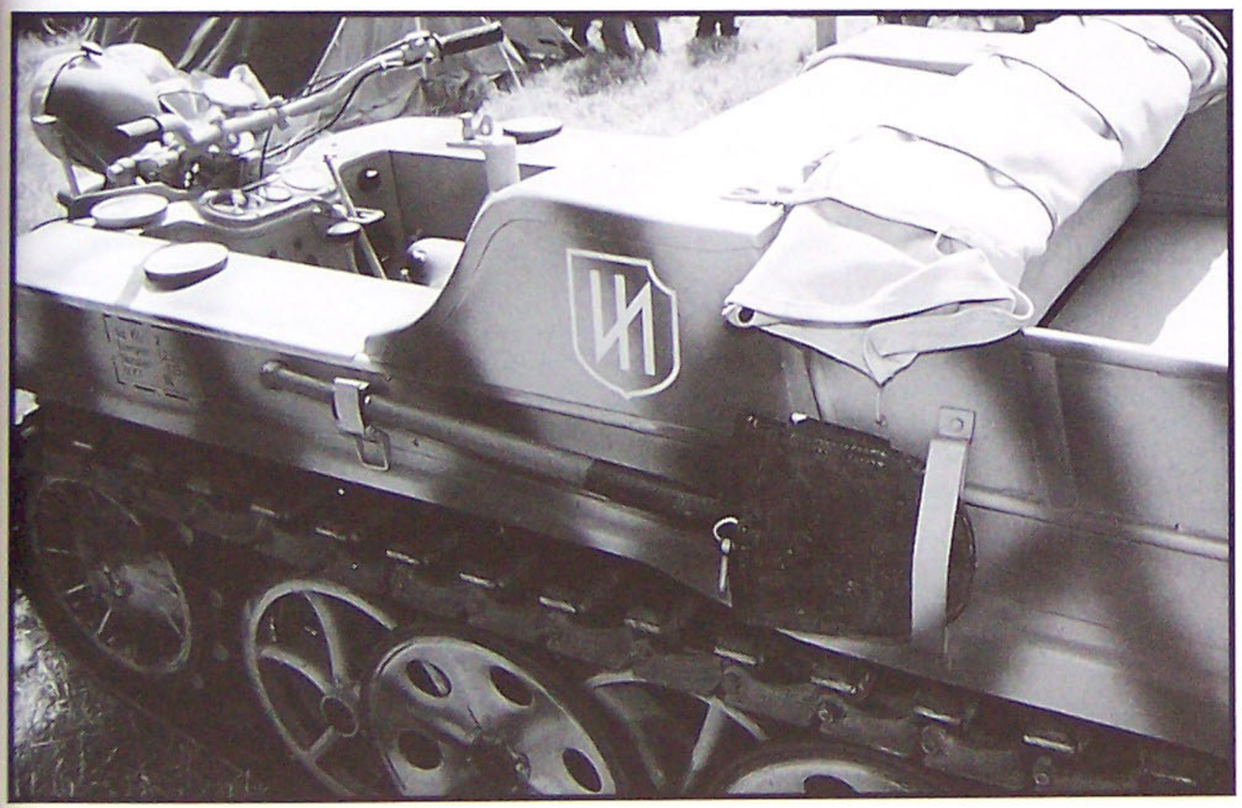


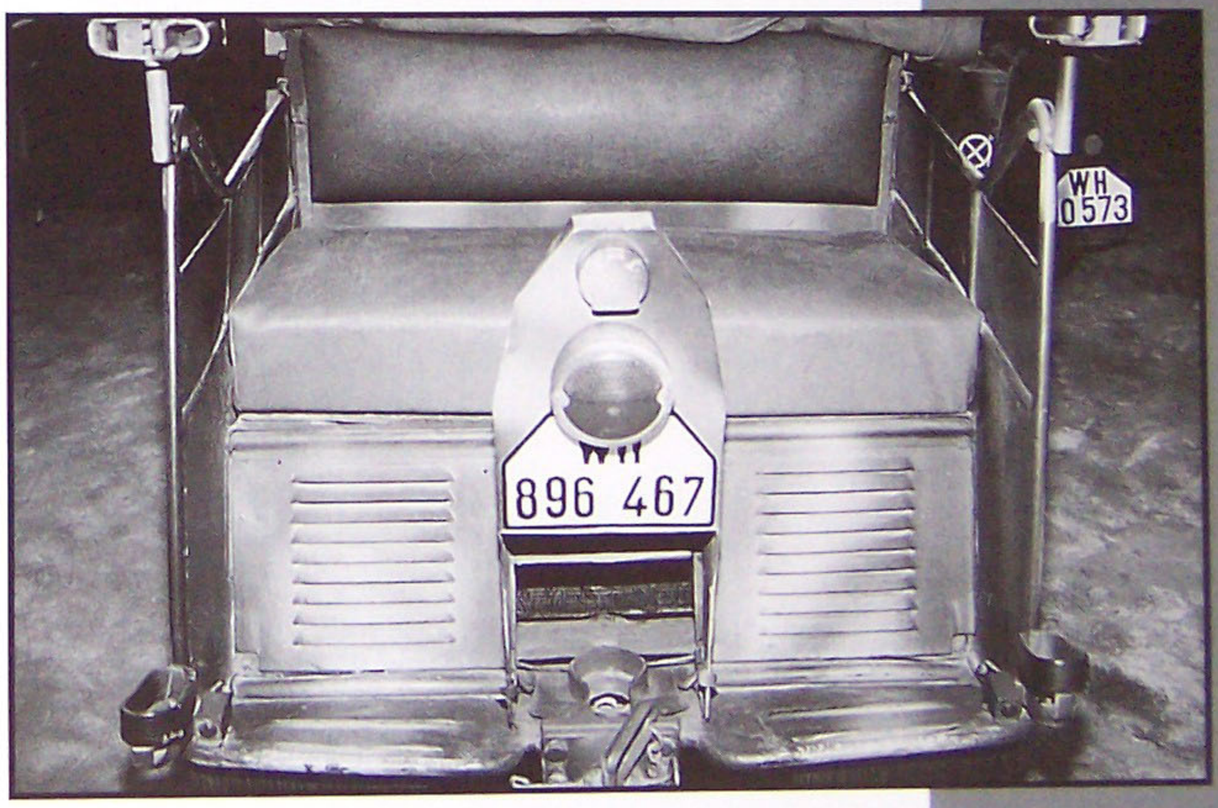


Top left: a closer view of the top of the steering column, showing the damping knob and the cast portion of the assembly. **Top right:** this is a replacement canvas cover for the top of the steering column. Note how it fastens to brackets on each side of the headlight. These brackets can be clearly seen in the photo on the lower right of the previous page. This particular cover is newly made and is missing the small hole in the upper right side for the light cable to feed through. **Above left:** two rifle racks are installed in the driver's area of this Kettenkrad. The clasp seen here corresponded to an oval sleeve on the floor of the vehicle. Two similar racks are installed on the rear of the Kettenkrad. Early vehicles were missing these details. This shot also provides a close-up view of the standard motorcycle saddle installed for the driver. **Above right:** this post and bracket was used to install another canvas cover over the driver's compartment. It was also a handy place to hang equipment from. The mesh for the engine compartment can also be seen here.



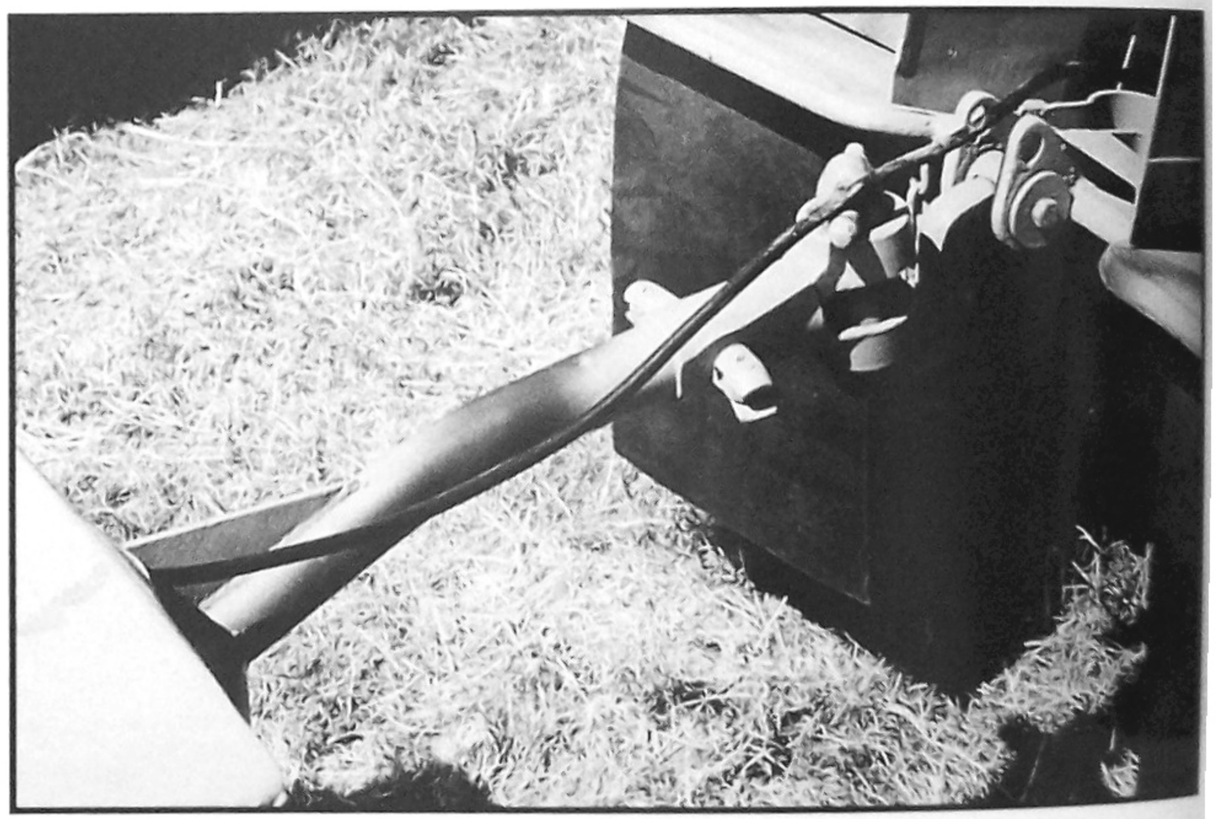




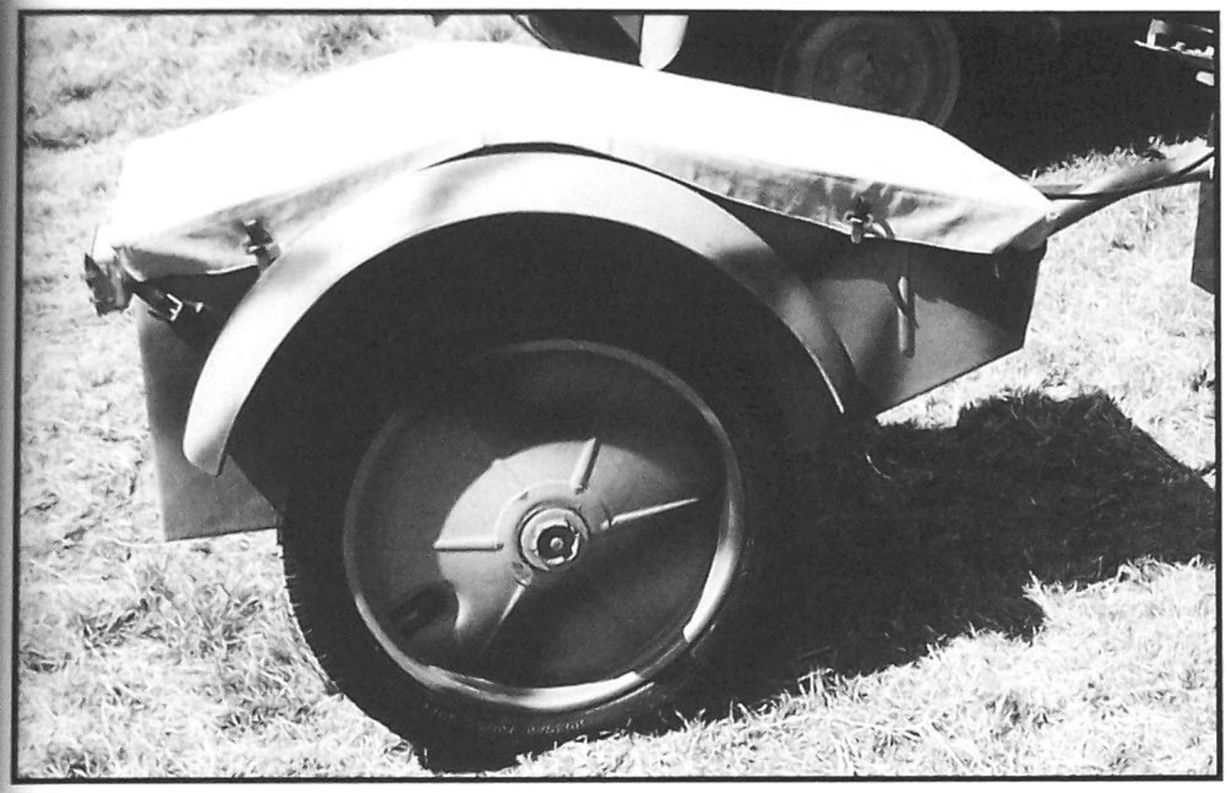


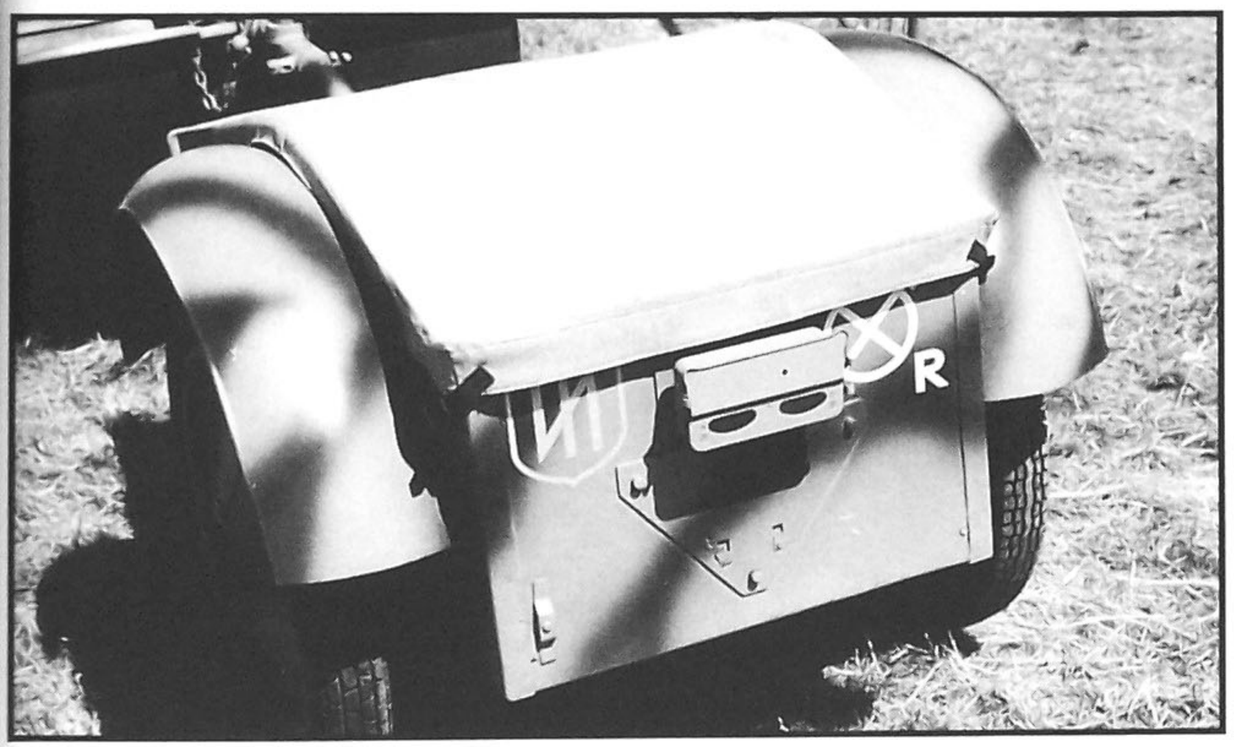
Top left: this is one of two clasps used to secure the engine access door. The canvas cover for the passenger area can be seen at left. **Top right:** the left side front marker light and its cord. The bottom attachment point for the steering column cover is also seen, as well as the very top of the front cast towing bracket. **Above left:** provision for a shovel was not part of the factory equipment of the Kettenkrad, but it is highly possible that it could have been done at the unit level workshops. This is another contemporary, restored vehicle. **Above right:** the back end of the Münster Kettenkrad. Both the seat bottom and the panels beneath it were removable for access to the engine and cooling system.

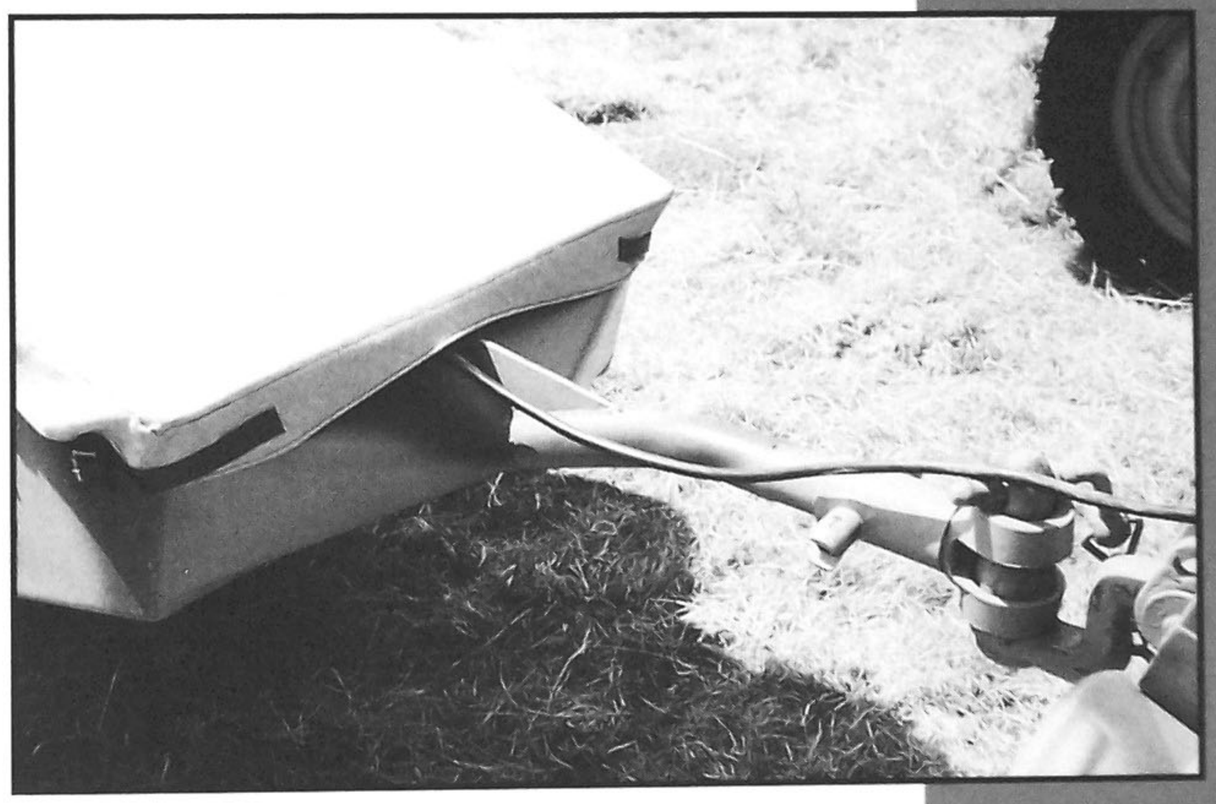
The in-line 4-cylinder Opel engine faced towards the rear of the vehicle and the housing for the radiator is just beneath the seat cushion. The driver could regulate the amount of air reaching the housing via the small door seen below the license plate. This door was controlled via a cable and a small lever on the left side of the driver's compartment. This shot affords a good view of the rear trailer light socket. Also note the small rectangular objects at the very bottom corner of the rear compartment. These are the rear taillights. There appears to be some variation in the shape of the center housing from vehicle to vehicle (disregard the rear marker light).



Above left: the rear rifle rack on the Beltring vehicle. This shot provides another view of the center housing. This vehicle has the correct rear marker light installed. **Top right:** the rear tow hook of the Münster vehicle is the heavier type developed for towing the 10.5cm LG 40 recoilless gun used by Fallschirmjäger units. **Above right:** this is the more common type of tow hook installed on Kettenkrads. The pintle itself is very similar to those seen on other German light vehicles, such as the Demag D7. The hinged base, however, was uniquely designed for the Kettenkrad. This allowed it to cross obstacles of significant depth without "jack-knifing" the trailer. Here, the boom of the Sd.Ah 1 trailer is installed.







There were six different trailers designed during the war exclusively for the Kettenkrad. The first was designed with the prototype and never reached production status. The second, seen here, was the most numerous and was a derivation of the earlier prototype with a longer hitch pole and solid disk wheels. This trailer had the designation of Sd.Ah. 1 (sonderanhänger: "special trailer"). The third type was designed specially for use with Gebirgsjäger units and was a modification of the standard infantry cart (see previous photo). The fourth type was designed at the request of the Luftwaffe for a heavier trailer for Fallschirmjäger units. This trailer was of heavy, tubular construction and utilized four small, broad rubber tires. The fifth type was nearly identical to the second type, but it was equipped with special fittings to store communications cable and was used in conjunction with the Kettenkrad SdKfz. 2/1. This trailer had the designation of Sd.Ah. 1/1. The final type, was another modification of the Sd.Ah. 1. It was modified to include a partition across its width and mounts for two large spools of communications wire. This trailer had the designation of Sd.Ah. 1/2 and was used in conjunction with the SdKfz. 2/2. **This page:** four additional views of the Sd.Ah. 1. A canvas tarp was provided to protect the interior of the trailer, which was of all steel construction. Several trailers could be linked together and the base plate for the auxiliary hitch can be seen in the photo above left. The cord seen above right could be plugged into the socket in the middle of the rear partition.

World War II Dodge 1/2-ton and 3/4-ton military trucks

Perhaps no other vehicle, other than the Jeep, is more representative of the "Arsenal of Democracy" than the Dodge 3/4-ton truck. Manufactured to U.S. Army specifications, they were issued in a variety of configurations and models. Although the focus of this article is the Dodge 3/4-ton trucks, the WW2 Dodge story would not be complete without some mention of the earlier Dodge series of 1/2-ton military trucks.

Dodge first entered its association with the U.S. military in 1934 when it designed and produced a 1 1/2-ton cargo truck. This vehicle is notable because it was the first truck to feature "on-demand" four-wheel drive. The truck could be switched from two to four wheel drive via a lever inside the cab. The four-wheel drive system was also unique in that it utilized components of a rear differential for the front axle. With war looming on the horizon in 1940, the Army asked Dodge to develop a new series of 1/2-ton trucks using as many existing components as possible. The result was the "VC" series and these were essentially civilian trucks with standard sheet metal bodywork. The VC series ran into some 4,641 units with models ranging from VC-1 through VC-6. The VC series gave way to the WC series in 1941. The WC 1/2-ton series were greatly simplified for ease of production and many of the components were strengthened, redesigned and improved. All of the bodywork was changed to reflect the truck's role. Large open fenders, easy access engine panels and a broad steel radiator structure were among the many improvements. **Above and right:** the WC 23, Command Car. These and the following shots are from the British evaluation series taken in 1941. Although they considered accepting the entire series, only certain models were eventually used. Most were later replaced with British trucks or heavier U.S. models (IWM).

The designation "WC" was an internal Chrysler Corporation sales designation and did not stem from the initial term "weapons carrier." The 1/2-ton trucks were technically referred to as the T 207 series. This was later to change to T 211 and then to T 215. The WC 1 was simply based on a civilian pick-up truck design with a closed sheet metal cab and a square, low cargo box on the back. The series was originally powered with a 217 cubic inch straight-six engine. Later models used the 230 cubic inch straight six used in the 3/4-ton. The 1/2-tons utilized a four-speed transmission with a one-speed transfer case. As each model completed its production run, refinement of the existing designs created new models.

As such, the basic weapons carrier, closed-cab pick-up eventually encompassed the series designations WC 1, WC 5, WC 12, WC 14, WC 20, WC 40 and WC 41. A soft-top version of the weapons carrier was also developed and this was series designation WC 3, WC 4, WC 13, WC 21 or WC 22. Other versions in the series included a carry-all version (essentially a panel truck with windows), series designation WC 10, WC 17 and WC 26; a panel truck, series designation WC 11, WC 19 and WC 42; and a command car, series designation WC 6, WC 7, WC 8, WC 15, WC 16, WC 23, WC 24 and WC 25.

The Canadian division of Chrysler also produced a variant of the basic hard cab 1/2-ton weapons carrier. This was the Dodge T212-D8A, 8 CWT. This vehicle contained minor modifications to enable it to mesh with the Commonwealth logistics system, such as British 9.25 x 16 wheels and tires. It also had a slightly smaller engine. The D8 saw service with Commonwealth units in North Africa and Italy. The 1/2-ton series was to eventually encompass over 77,000 trucks. The series saw widespread use by the U.S. military during its training phase in 1940-1941. During this time, the Army continually evaluated the various models and eventually concluded that the truck was too light for the needs of an army fully geared for world conflict. **Above:** the command car with the canvas top folded and stowed. The WC 23 was the final refinement of the command car design and it utilized the larger 230 cubic inch 6-cylinder engine also used in the 3/4-ton series. All WC 23 command cars were outfitted to take a radio and a large box on the left side of the truck held a 12-volt battery with an antenna base was located directly above it. Model WC 25 was permanently fitted with a radio. The WC 24 was identical to the WC23, but with a winch. This photograph provides an excellent view of the 1/2-ton's distinctive curved steel radiator guard (IWM).

Although sturdy, many of the components of the 1/2-ton were still based on those found on civilian trucks. The frame, for example, was almost completely straight and lacking the vertical rigidity of "dropped" frames. The wheels were also weak, as they were nearly identical to standard civilian truck rims. Some 1/2-ton trucks remained in service throughout the war, being declared "limited standard" for the last time in 1947. A similar 1/2-ton truck was also produced by International Harvester specifically for the Marine Corps. By early 1942, the Army was asking Chrysler to develop a new and heavier vehicle. **Above:** the WC 42 panel truck during evaluation by the British. This last variant of the panel truck was designed with help from the British. They were looking for a vehicle that could be outfitted with heavy radio sets and used as a communications vehicle. The WC 42 used the same sheet metal body as the earlier WC 11 and 19 versions, but it was specifically fitted with additional batteries. Three 12-volt batteries were installed in racks on the rear floor as well as additional seats and storage areas. This vehicle is already sporting a fresh, regulation British camouflage scheme and registration number. The "Z" prefix denotes a truck of under 1-ton in weight. Interestingly, WC 42s seen in the field used the "M" prefix, denoting cars or light utilities (IWM).

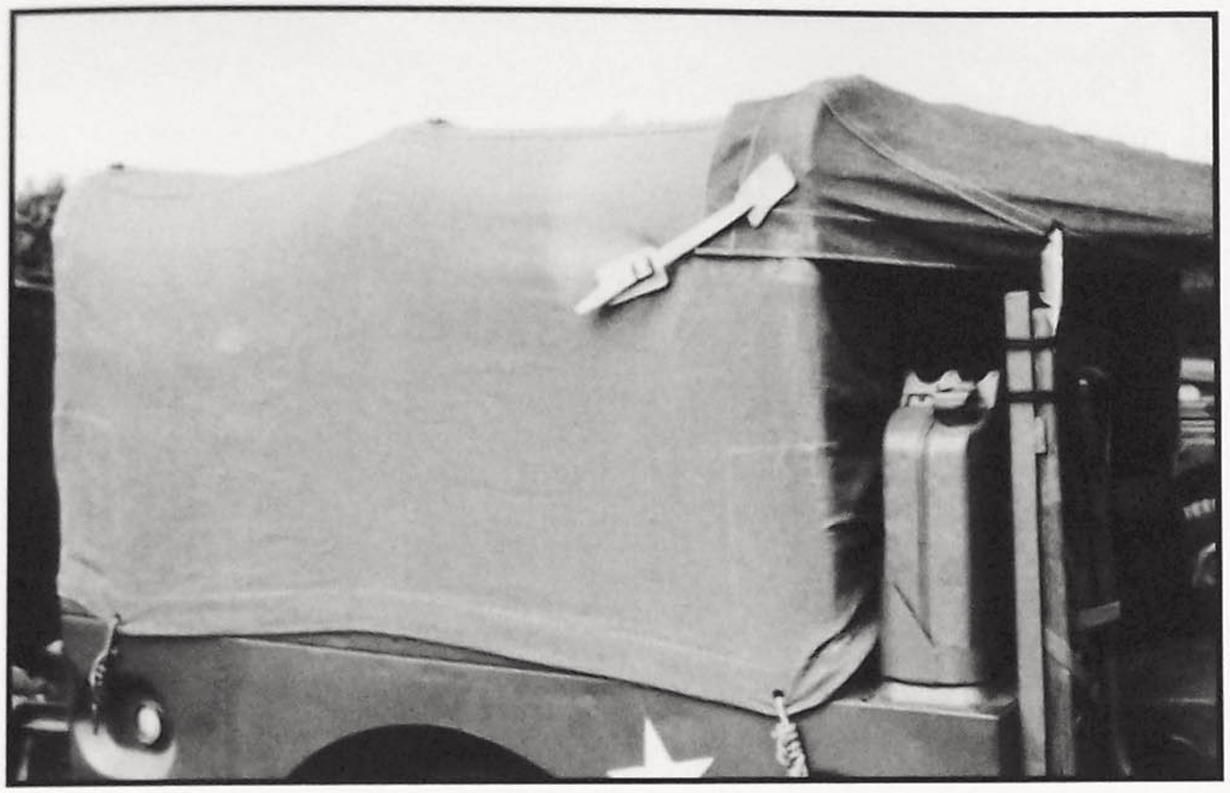
All 650 WC 42s produced were delivered to the British army and saw service in North Africa and Italy. At least one photo, of an 8th army WC 42, shows it with a square hatch cut into the right hand side of the vehicle. This had been further covered with a removable tarp. Other desert modifications included an air scoop on the roof to improve circulation in the rear of the vehicle and side racks for Jerry cans. **Above:** a rear 3/4 view of the previous vehicle. The large antenna mount is visible on the upper left of the photo. The placard in front of the rear tire indicates that this is a Dodge (Fargo). This is in reference to the Fargo division of Chrysler that was responsible for the manufacture of this truck. The WC 42 was later replaced in British Army service by the Chevrolet 1 1/2-ton G 7105 (IWM). **Inset:** this shows the basic layout of the rear of the truck (IWM).

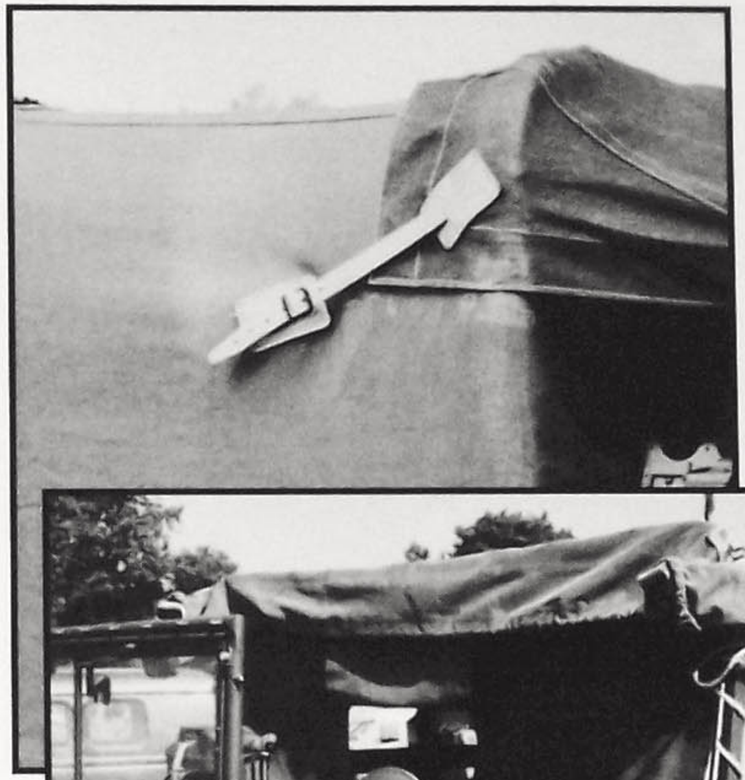
By 1941, it was clear that the existing 1/2-ton series would be inadequate for the needs of the quickly expanding U.S. Army. The army again turned to the Chrysler Corp. and work began to redesign an efficient tactical vehicle to meet the army's demanding standards. This was to be the first Dodge truck designed completely and specifically for the U.S. Army and the redesign was from the ground up. When design work did commence, it was centered around the weapons carrier version and in some respects this work was also tied into the development of a new tank destroyer vehicle, later known as the M6. The new truck frame was constructed of heavy gauge steel channel that was "double dropped" at the axle positions for greater strength. The term refers to the frame curving down at the points prior to the axle positions. This also served to reduce the overall height of the vehicle, lowering the center of gravity and maintaining a sufficient chassis to ground clearance. The axles and other drive train components were also redesigned to a heavier and more durable standard. The front and rear springs were 1 3/4 inches wide and were 39 and 52 inches long respectively. **Above:** this and the following two photos are British evaluation shots of the WC 51 taken in late 1942. Although impressed with the capabilities of the Dodge, with their requirement for right hand drive vehicles, it was not accepted into widespread service (IWM).

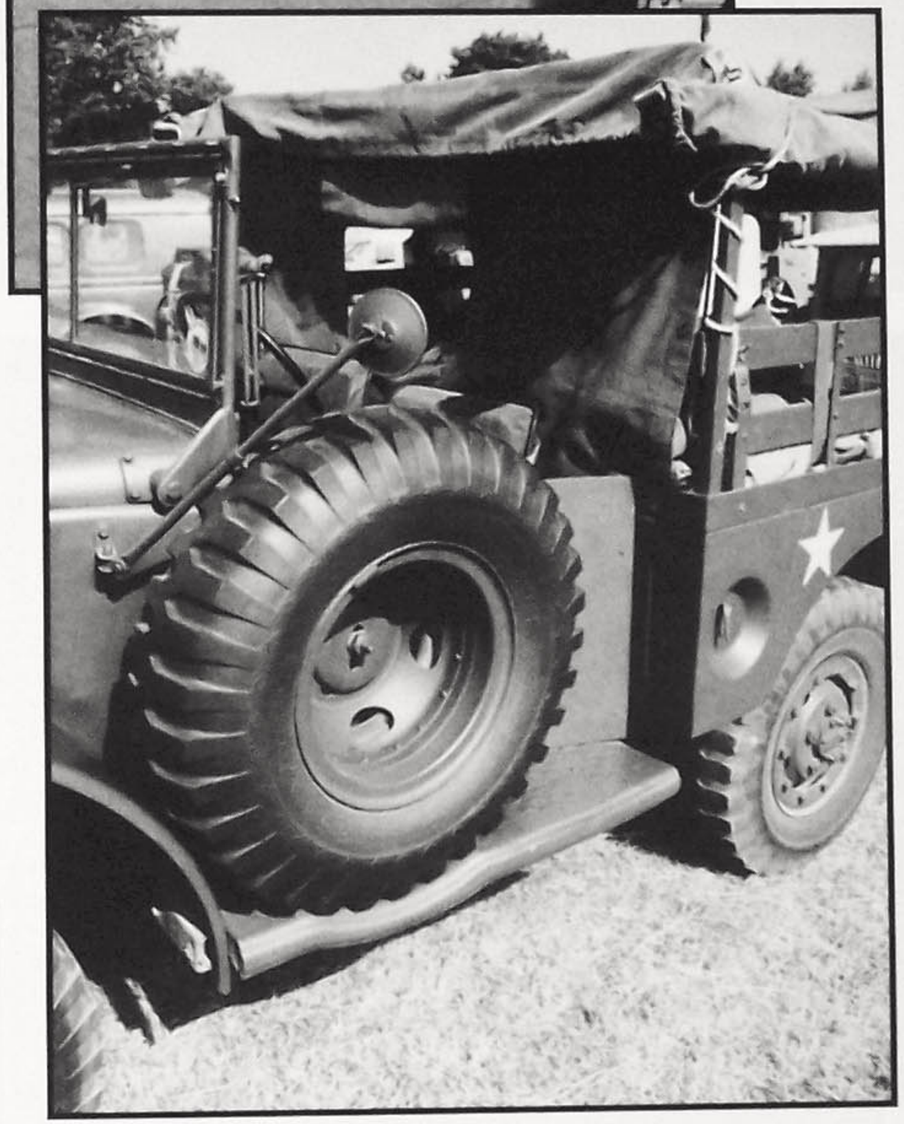
The power plant of the WC 51 was the same one used in late versions of the 1/2-ton trucks, the Dodge L-head 6-cylinder, in line engine. This engine could displace 230.2 cubic inches and was capable of generating 54.5 bhp at 1,600 RPM and 92 bhp at the engine's maximum RPM of 3,200. A four-speed transmission was used with a single speed transfer case. Power was transmitted by a short drive shaft to the transfer case and then to the front and rear axles. The vehicle could be driven in either two or four wheel drive. In fourth gear, the vehicle could reach the respectable speed of 55 mph on hard surfaces. The bodywork was also completely redesigned. The curved grill of the 1/2-ton gave way to a flat, simplified version of the steel grate. The front coachwork was much simpler and lower in profile. For ease of maintenance, the radiator cap now protruded through the top of the radiator housing. The rear cargo area, which was quite narrow on the 1/2-ton, was expanded and lengthened. The bed was capable of carrying ten troops or up to 1,200 pounds of cargo. Chrysler Corp.'s final engineering designation for the new vehicle was T214 and this was applied to the entire "WC" series of 3/4-ton vehicles. Production began in 1942 at the Chrysler Corporation's Dodge Brothers factory on Mound Road outside of Detroit, Michigan (present day Warren, Michigan). **Above:** an excellent profile portrait of the WC 51 (IWM).

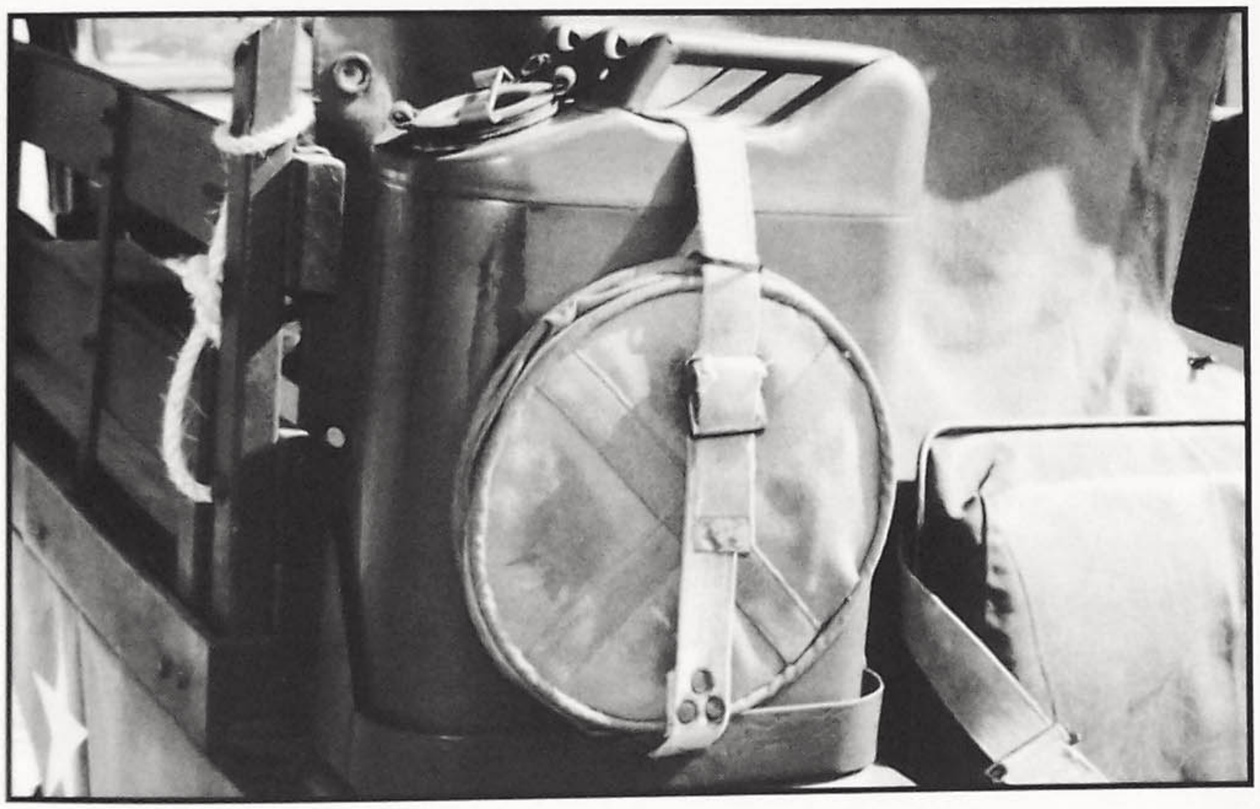
While the weapons carrier received the model code of WC 51, those vehicles with a winch installed had the model code WC 52. As mentioned, some of the design features of the cargo bed were influenced by the need to create the M6 Gun Motor Carriage. This vehicle mounted the 37mm gun behind an armored shield. The weapon faced to the rear and rounds were stowed in bins built into the sides of the cargo bed. The M6 was found to be only minimally effective when it first entered service in North Africa in 1942. Although the M6 was stilled issued at the time of the Normandy landings, in June of 1944, it was a brave soul that would use it to challenge any of the late war German tanks. In spite of this, a conversion kit for the WC 52 was stilled listed in army ordinance manuals in May of 1945. Most M6s were later converted back into weapons carriers or into ambulances (see later in this section). The Chrysler Corp.'s model code for the M6 was WC 55. The weapons carrier was also produced by Chrysler Corp.'s Canadian subsidiary. Its designation was D3/4APT-T 236. U.S. Army registration numbers for the WC 51 ran from W-252293 to W-254792, W-259135 to W-289212, 291910 to 291992, 293685 to 294209 and 2110000 to 2125113. WC 52 registration numbers ran from W-245845 to W-246394, W-289213 to W-291384, 291993 to 292512, 2160419 to 2179292 and 2180276 to 2199555.

The extraordinarily robust nature of the WC series made the vehicles attractive for a variety of civilian as well as military uses. Many surplus vehicles were used as towing and maintenance vehicles in the immediate postwar period. It was so popular as a surplus item, that Dodge developed its line of Power Wagon civilian trucks largely based on its experience with the WC series. Many of the U.S. Army's Dodges continued their service through the Korean War until replaced with the more modern Dodge M37. The final production total for the WC 51 and WC 52 was 48,500. Many thousands of Dodges were given to European nations through the Military Assistance Program where they served for decades. Some having been only recently taken out of service. The armies of Belgium, Austria, Switzerland, Israel, France and Sweden were all notable post-war users. **Above:** the Dodge 3/4-ton trucks have proven very popular with vehicle restoration enthusiasts and thousands are back in near original condition in the United States and Europe. This truck was photographed in England in 1999. If its registration number correctly corresponds with the vehicle serial number, it would indicate a WC 51 and that the winch was the owner's addition. This is not an uncommon practice. All WC 51 and WC 52 vehicles were soft-topped and this shot gives a good impression of how the various canvas sections cover the vehicle.

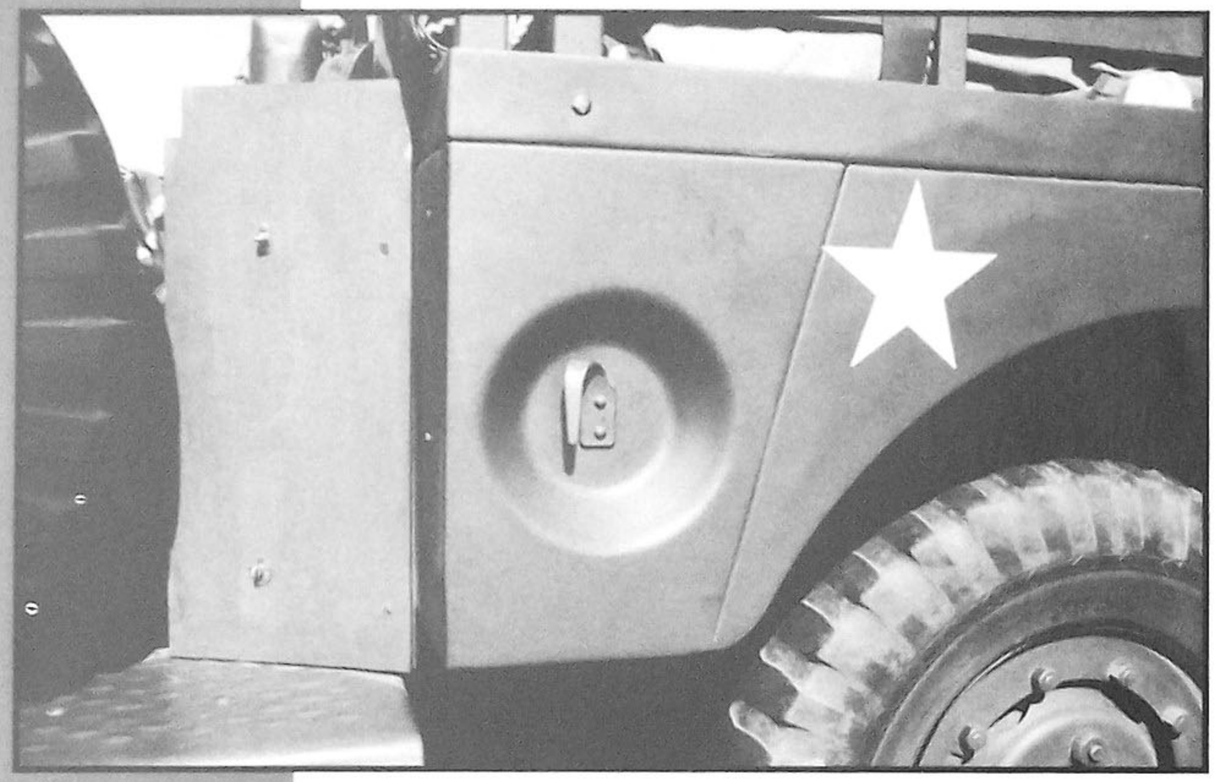


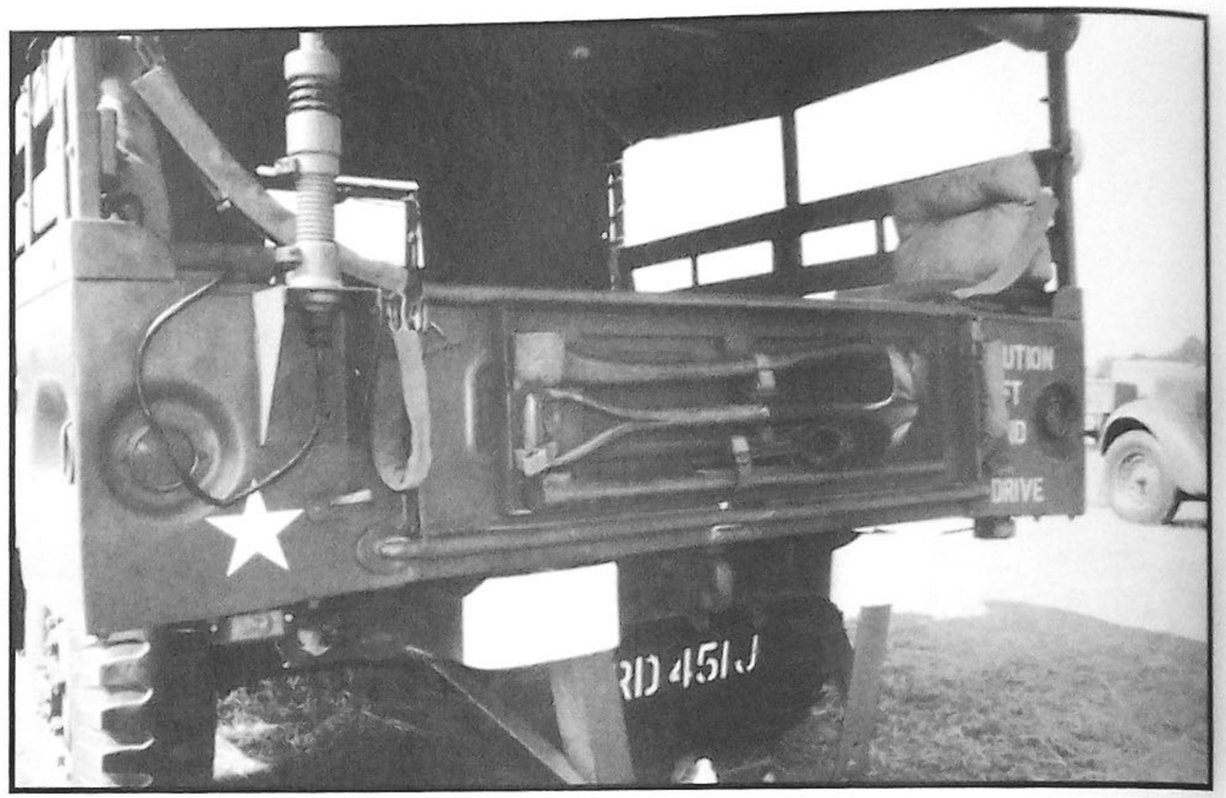


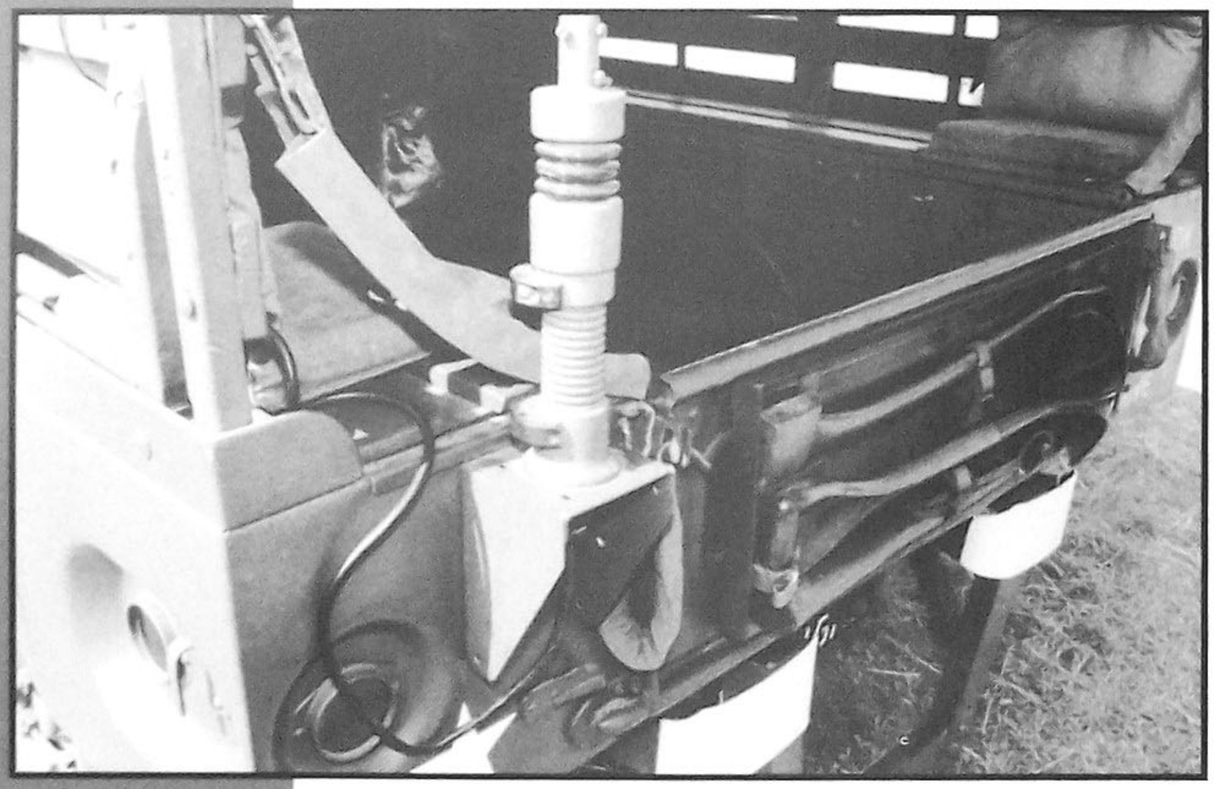


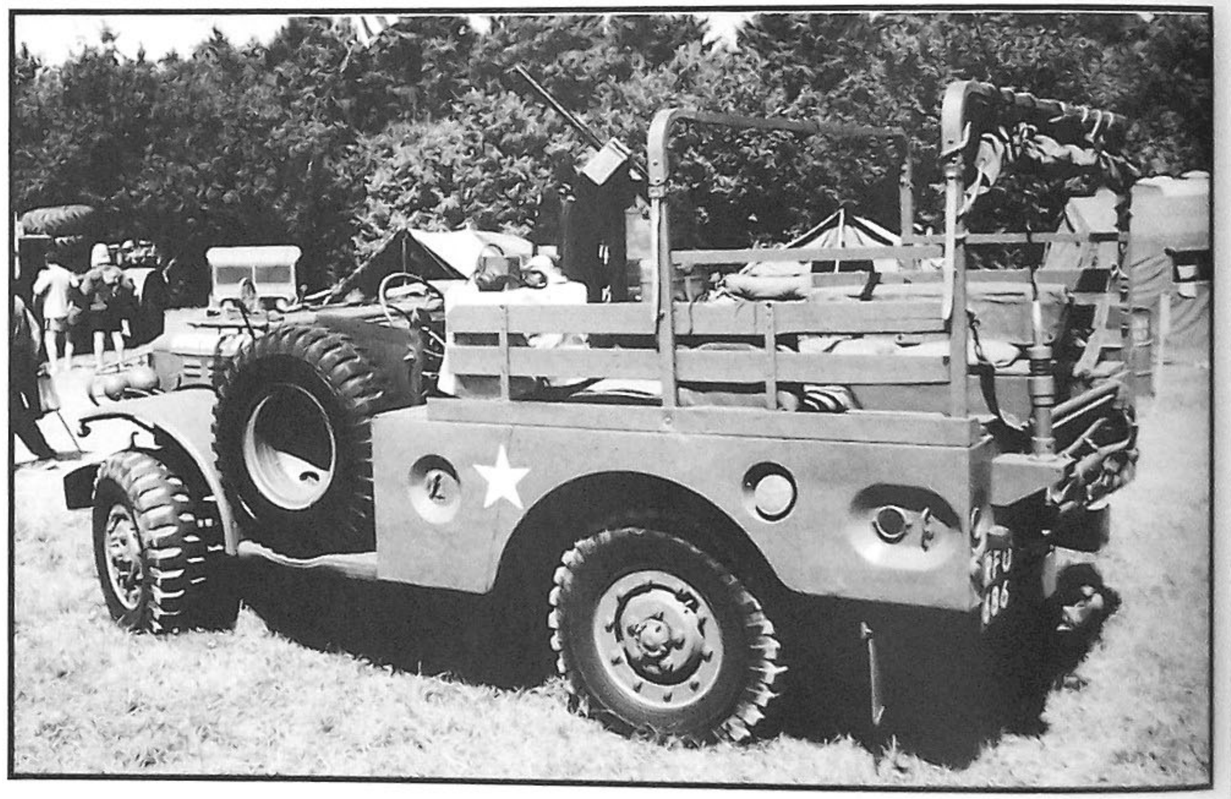


Top left and right: these two close-up shots of the rear tarp show how the front section is attached to the rear with reinforced leather patches and straps. **Above left and right:** Because of the location of the spare tire, the driver had to exit the vehicle on the right side. This could present a problem if the driver was forced to exit in a hurry. Further compounding this was the location of the two gas can racks on the right side running board. Later in the production run, a modification was made to locate the rear most rack to the top of the bodywork as shown here. This gave a bit more clearance for entry and exit. The tool rack was also relocated in front of this location as seen in the photo at upper left. The circular object attached to the front of the can is a collapsible canvas water container. These and the following photos are all of contemporary, restored vehicles.

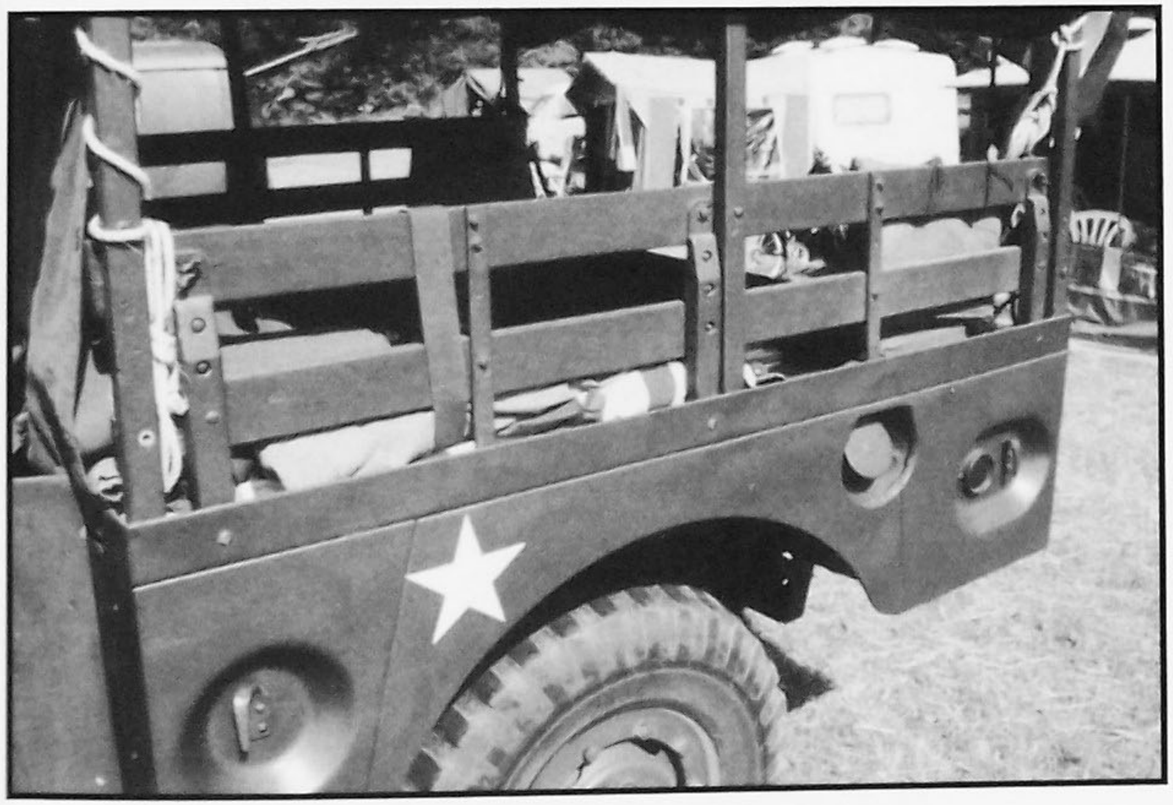


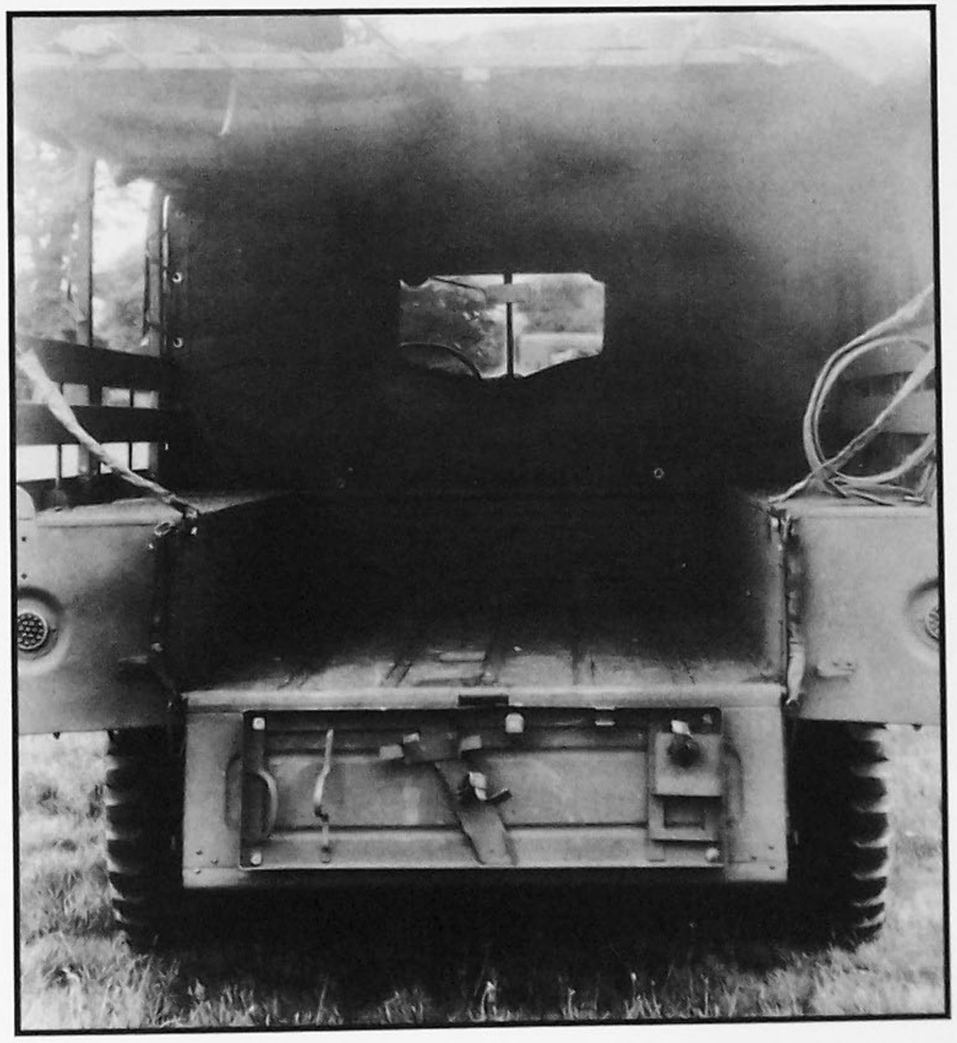




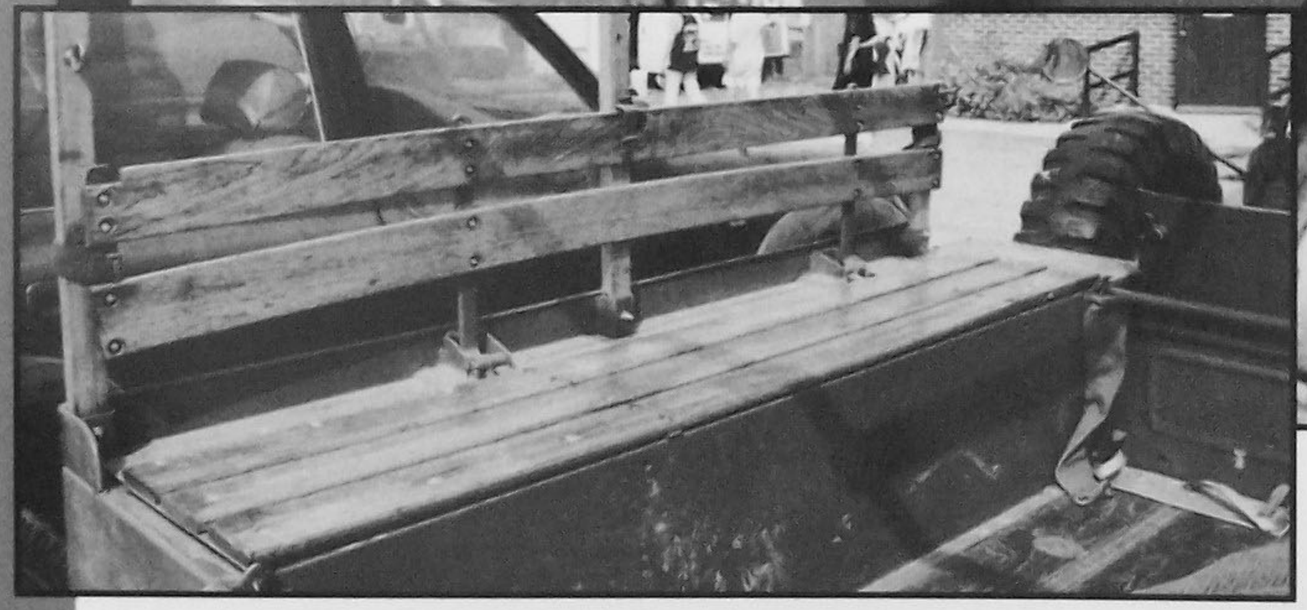


Top left: two folded metal hooks are located within depressions on either side of the rear cargo body. These hooks secure the canvas top and the recesses prevented the hooks from snagging on brush or other objects. **Top right:** the rear tailgate could be folded down and was secured on the inside with two safety chains. Note that the rear reflectors are also recessed in the bodywork. This and the photo at the lower left show the standard rectangular tool rack seen on many U.S. soft skins and armored vehicles. This rack held the regulation GI shovel, ax and pick ax. The pick is stored with the head detached. Above left: the WC 51 and 52 were not commonly used as radio vehicles, but this collector has installed an antenna mount on his truck and has also made provision for the installation of a radio set in the bed. Although this was not an "official" modification, it is certainly probable that such a modification could have been made to a wartime vehicle. **Above right:** military vehicle enthusiasts, much like their counterparts in the vintage car hobby, often attempt to make their vehicles as unique as possible. Many times these modifications are based on a wartime photo and other times they are just at the fancy of the owner. This vehicle has the forward canvas support removed and a pedestal mount installed with a .30 caliber machine gun mounted on top (in this case a non-working replica). He has also installed an antenna.

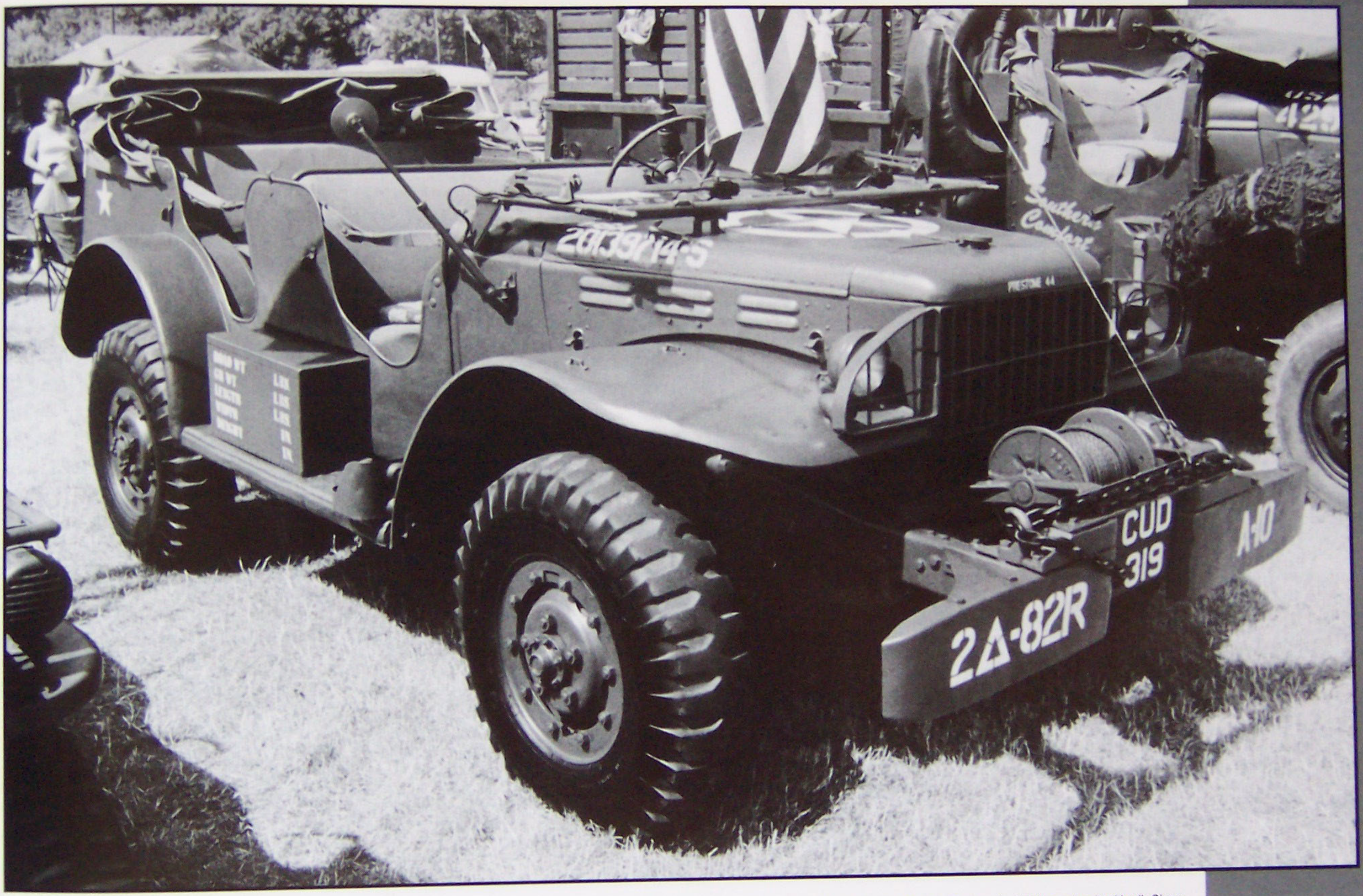




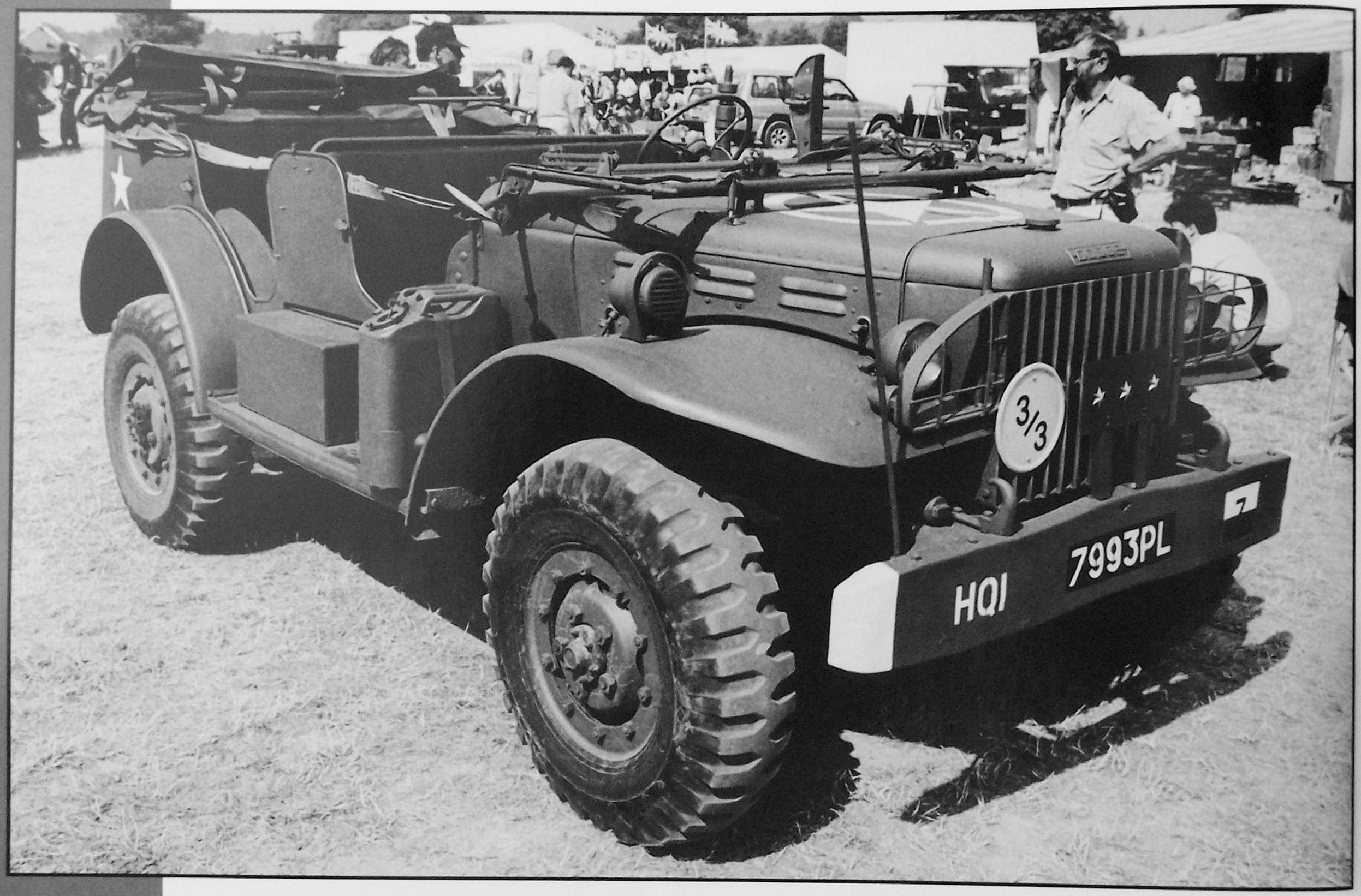
Top left: this is the right hand side of the cargo bed, showing the recessed hooks. The rearmost hook location on both sides also encompasses a reflector. **Top right:** this is the early configuration for the right side gas can racks. **Above right:** the left side of the cargo bed. The wooden racks seen here are called "lazy backs" and they could be folded up or down. **Right:** another shot from the British wartime evaluation series. On this very early production model, the tool rack is installed inside the rear tailgate (IWM).



These three shots afford excellent views of the supports and framework of the rear canvas cover. The main components are wood, while the curved linking sections are made from formed steel sheeting. The wooden components of the seating areas were sometimes seen in their natural wood color, but were more commonly seen painted in olive drab. On this example, the lazy backs are secured to the side top supports with leather straps. The large shot illustrates one of the major external changes to the WC 51 and 52, the relocation of the rear tool rack in an upright position to the right side body panel. The left-hand gas can was also relocated just to rear of the rack (also see page 25). This same change was also made to the Dodge 1 1/2-ton 6 x 6 truck, during its production run.

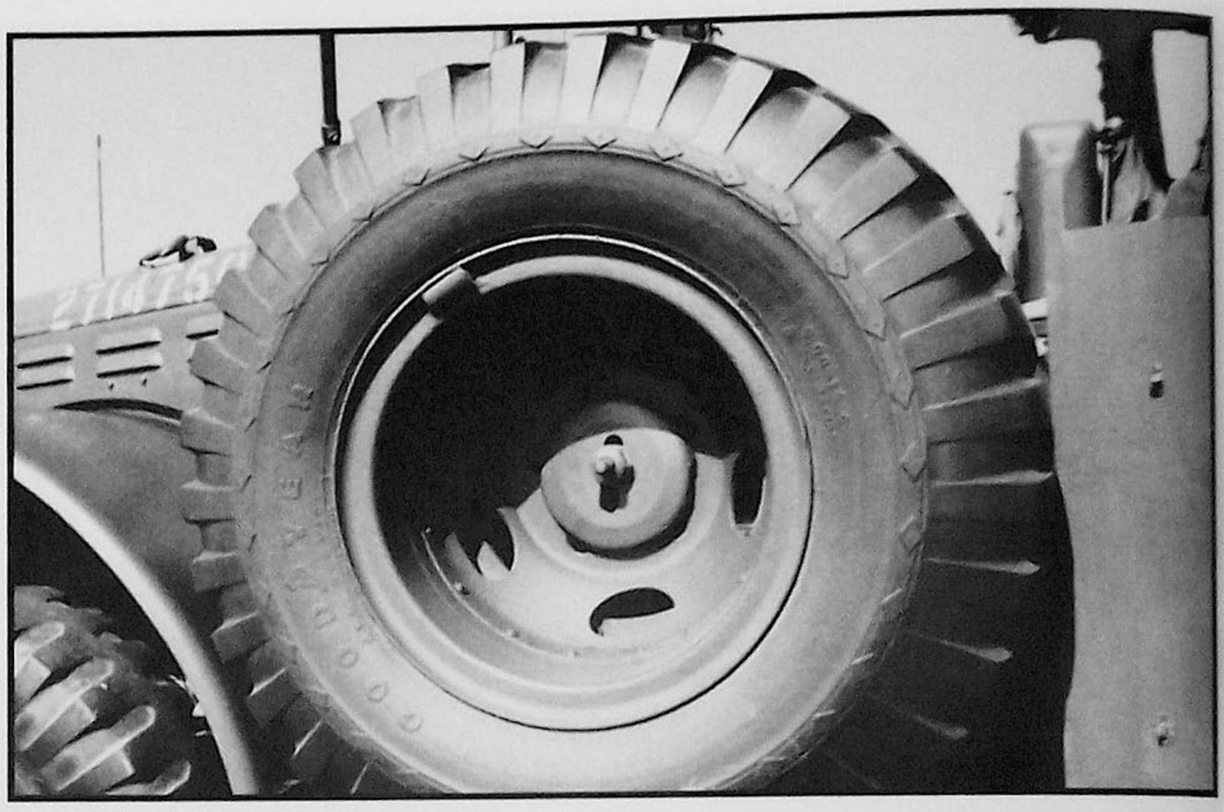


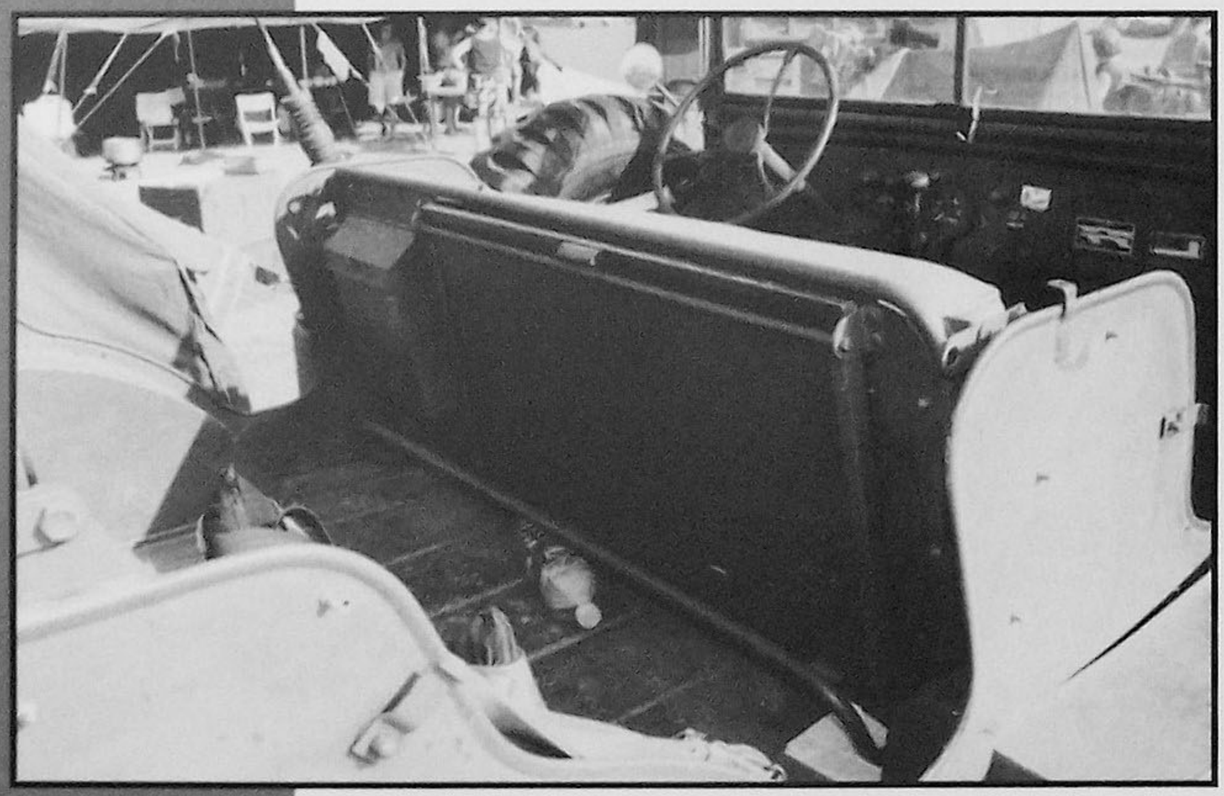
The WC 56-command car is a direct descendant of the 1/2-ton command car. Because of the new design, the truck's overall profile is much smaller. The bodywork is also much improved over the 1/2-ton. The cutouts in the side are wider and deeper making it easier to get in and out of the vehicle. The command car received the designations WC 56 (no winch installed) and WC 57 (winch installed). **Above:** this beautifully restored WC 57 was photographed at a military vehicle meet in Southern England. The car has been given a glossy coat of OD and the tires are dressed. This would be rare in the field, but it was possible to give matte military paint a slight sheen by lightly coating it with oil. Given that the command car was normally issued to HQ units, many were periodically dressed up for special occasions such as troop reviews and VIP visits. This shot gives a good idea of the basic layout of the vehicle. Note the canvas safety straps mounted in each body cut out. The car is nearly all original, except for the leather seats, which have been replaced here with canvas. The owner has done his homework; the registration number is a valid one for a winch-equipped WC 57.

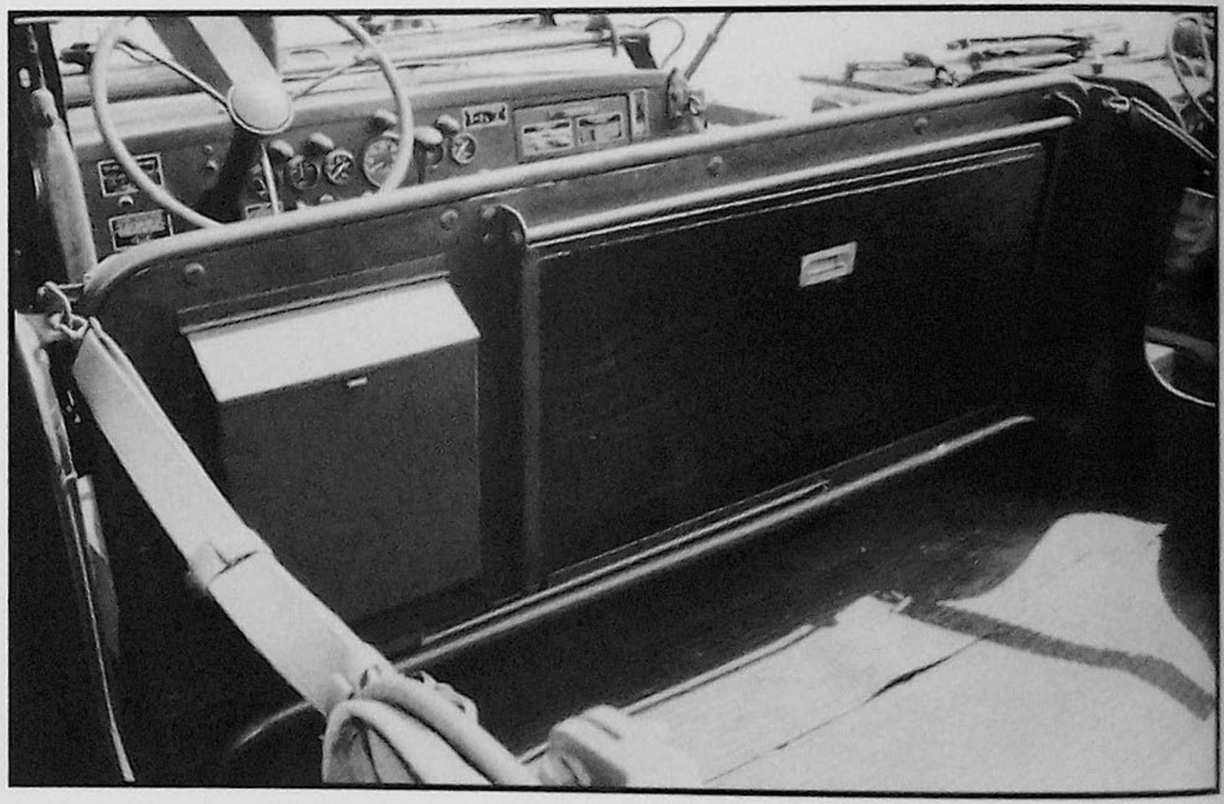


The new bodywork includes a large luggage storage area that is accessed via a door in the rear of the truck. Inside, the seats are leather-clad (versus canvas in all other models) over tubular frames. An additional tube element is integrated into the frame of the front seat to serve as a footrest for the rear passengers. There are two large bench seats in the front and back. Attached to the back of the front seat there is a folding map table and a small, wooden map case. A radio set could also be mounted in this area on a metal frame. To power the additional radio equipment, a large, 12-volt battery was installed in a metal box on the left-hand side running board of the truck. **Above:** another fully restored command car, this time a WC 56. This car differs somewhat from the first one shown. The car's seats here are leather replacements and the owner has added the three-star placard to the front and rear of the car. He has also added the standard bridging classification disk to the front grill and a GI rifle rack to the left side. The owner may have also added the siren and guard mounted on the left fender. This was not standard equipment on the WC 56, but it was a listed item in the ordinance parts list. Sirens were installed on a variety of U.S. Army vehicles in the Second World War, including the Sherman tank.

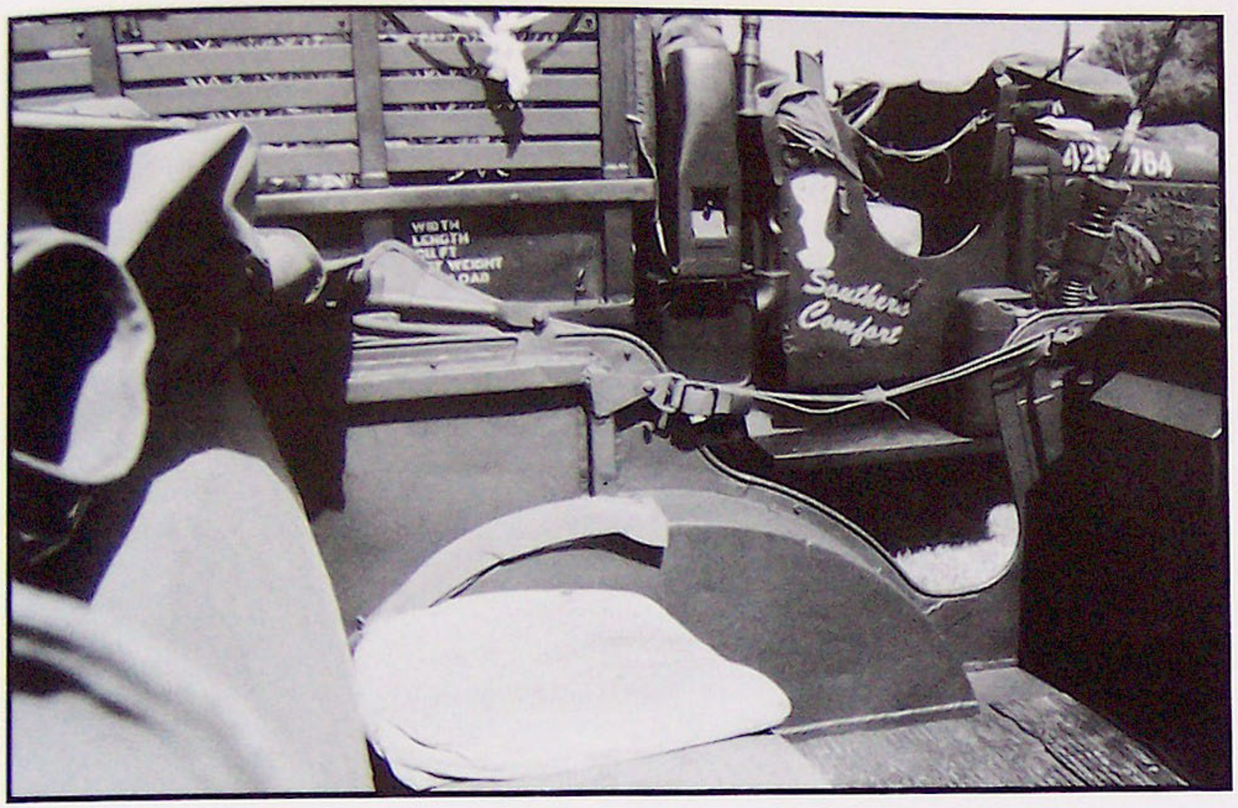
The command car was also built with a radio set permanently installed in front of the rear seat and in this configuration it had the model code of WC 58. All versions of the command car are equipped with an elaborate folding canvas top. This is fitted over a tube frame and is attached with metal snaps to the front windshield and the rear bodywork. Canvas covered metal door frames are also supplied and when not in use they were stored in the rear luggage compartment (also see page 32). **Above:** a rear view of the previous car. The canvas top has been simply pushed back on its frame here. It could also be neatly stowed with straps when collapsed. The large 12-volt battery box can be seen on the right side of the vehicle. This was a common place to paint the loading stencil, which can be seen on the vehicle on page 27. The British owner of this WC 56, accustomed to a right hand drive vehicle, has installed a metal rod on the right fender to help him better judge its location. The presence of the Dodge logo stamped into the radiator cover (seen in the previous photo) indicates that this is an earlier vehicle. Registration numbers for the WC 56 ran from W-20167957 to W-20182608 and 2091084 to 2092118. WC 57 registration numbers ran from 20184953 to 20185868, 2092119 to 2092618 and 20291158 to 20295751. WC 58 registration numbers ran from W-20182609 to W-20184952.

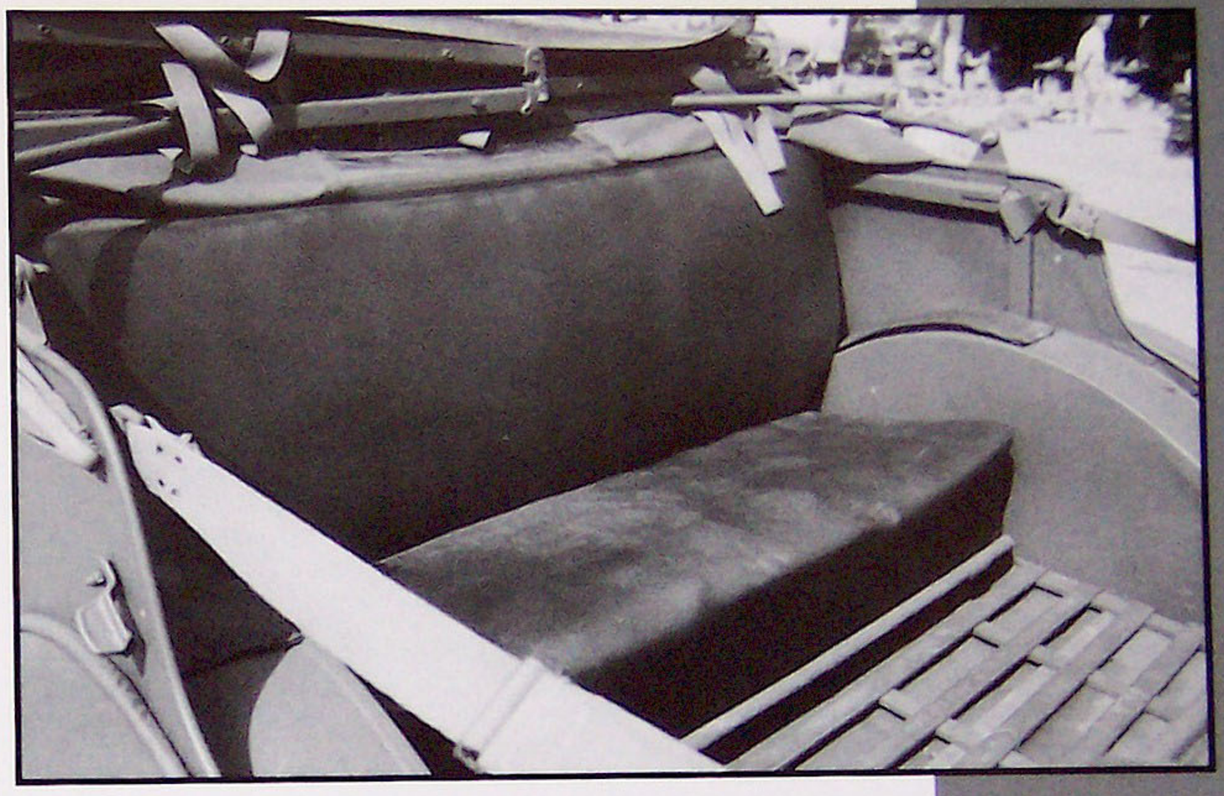


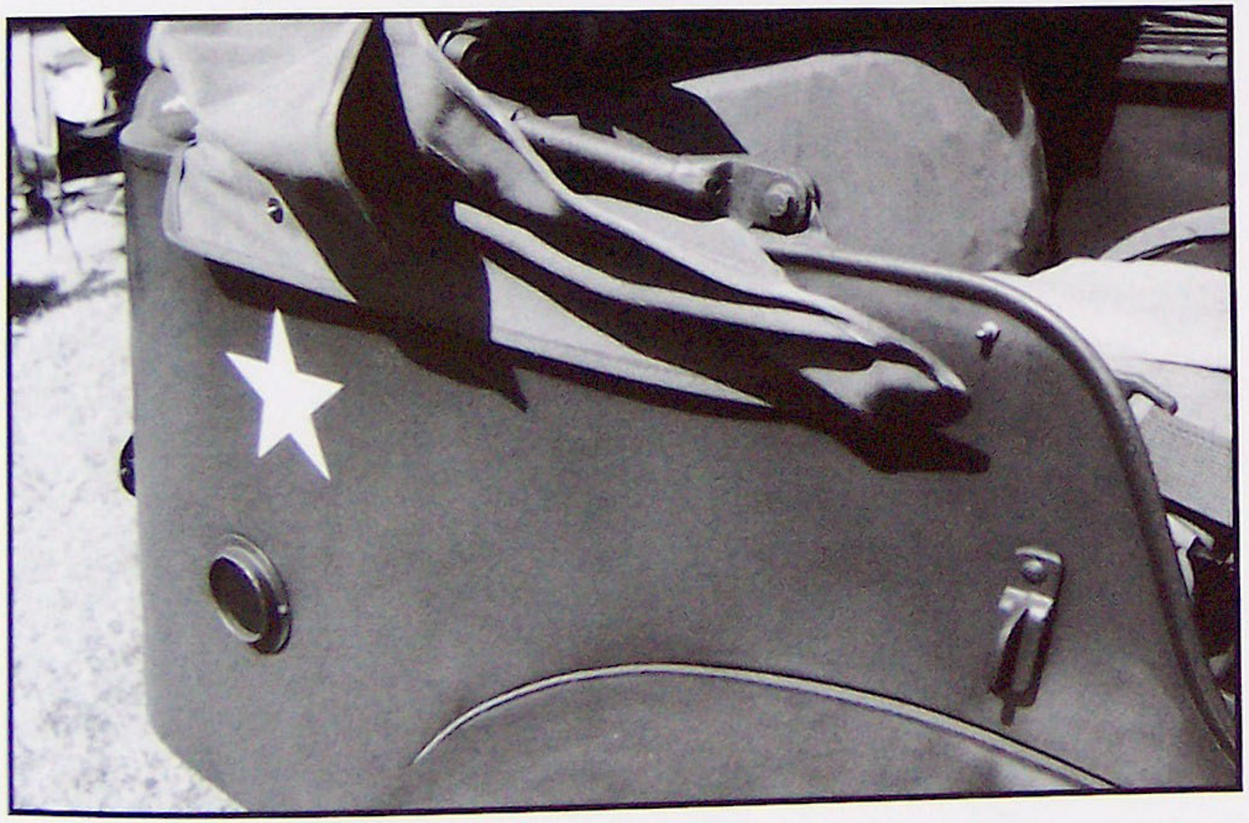


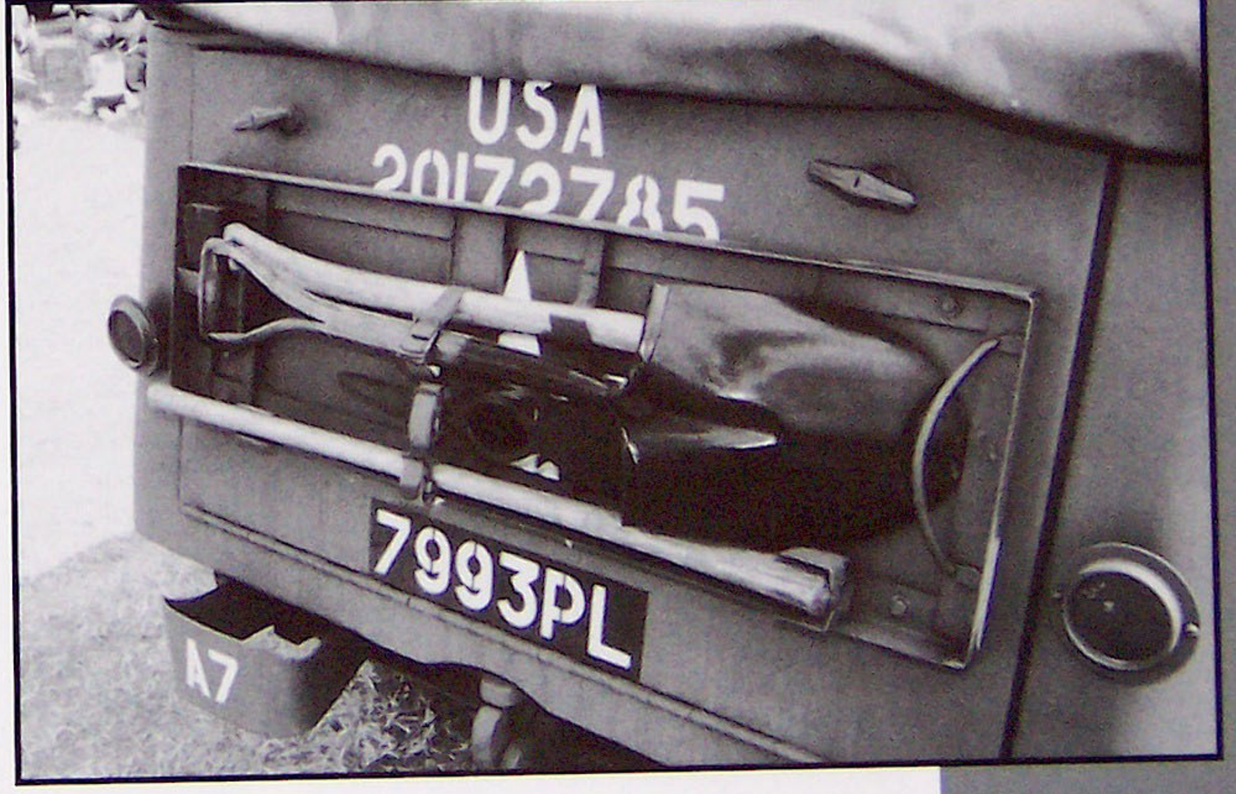


Top left: the left hand side of a restored WC 56. This shows the location of the spare tire and the left-side gas can rack. The placement of the spare tire here was common to the weapons carrier, the command car, the carryall and the 1 1/2-ton 6 x 6. Note how the left-hand side running board is formed to fit the tire. **Top right:** this close-up (of a weapons carrier) shows the common connector disk and nut, which was used to secure the tire to its short frame. **Above left and right:** the backside of the front seat. The large rectangle is the map table, while the smaller object to its left it the map case. The footrest is also visible. Standard equipment for the command car included a large rubber mat to cover the rear floor as seen in the right hand photo.

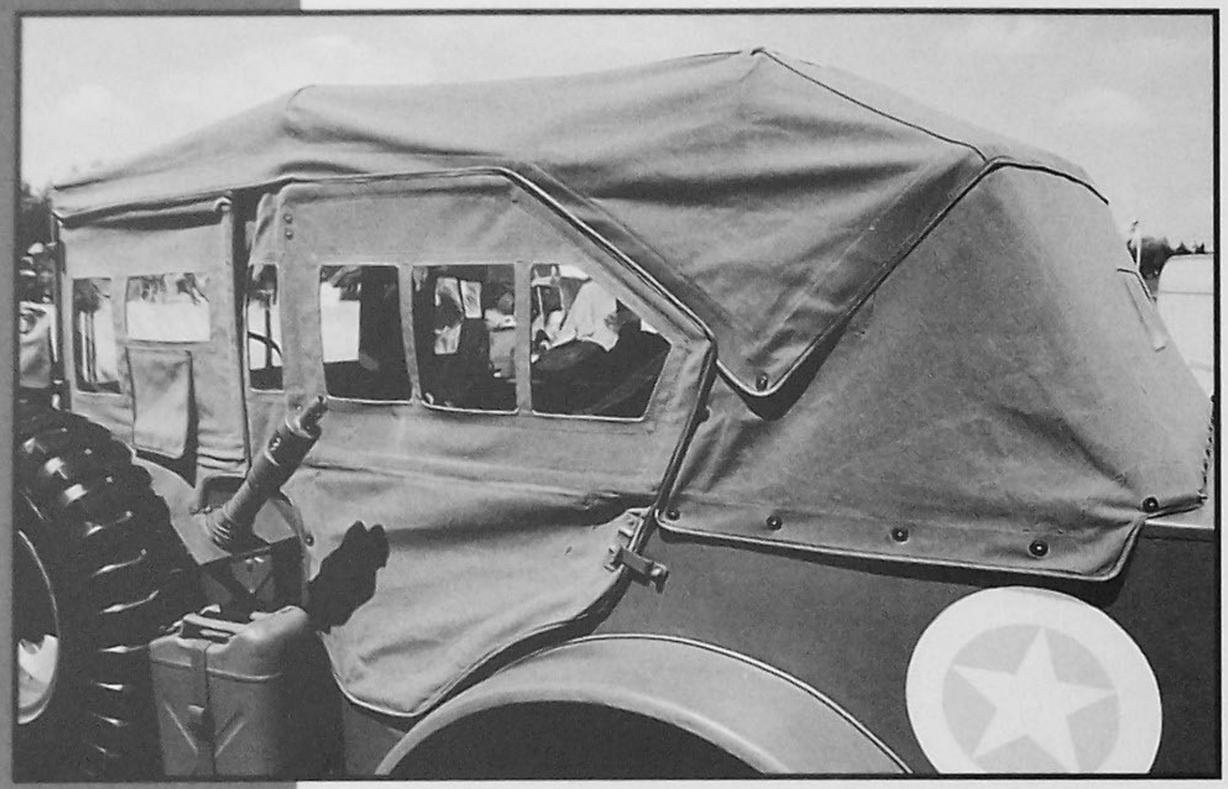


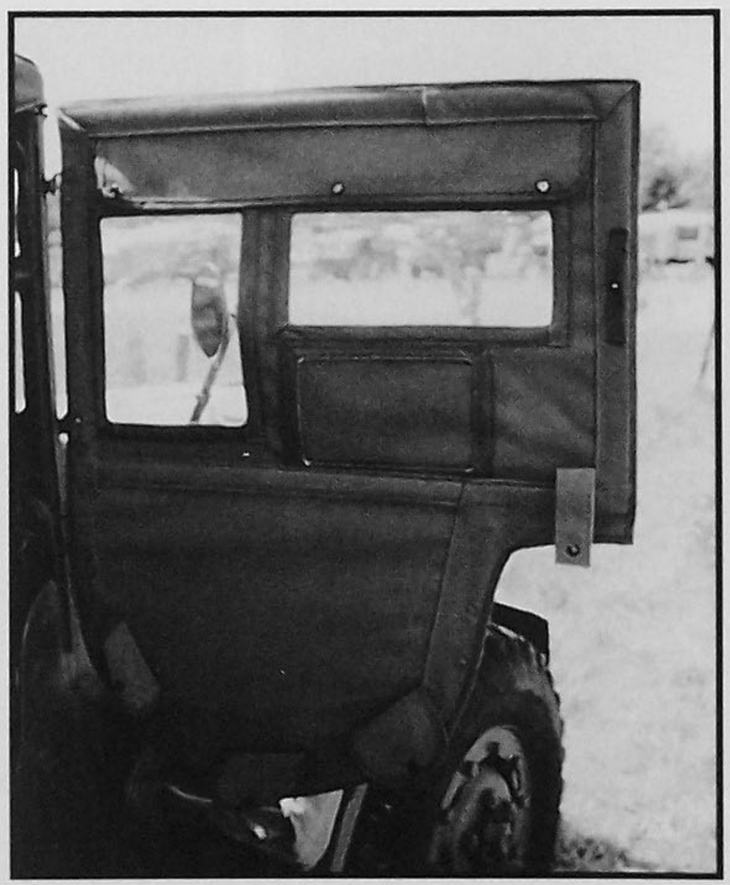






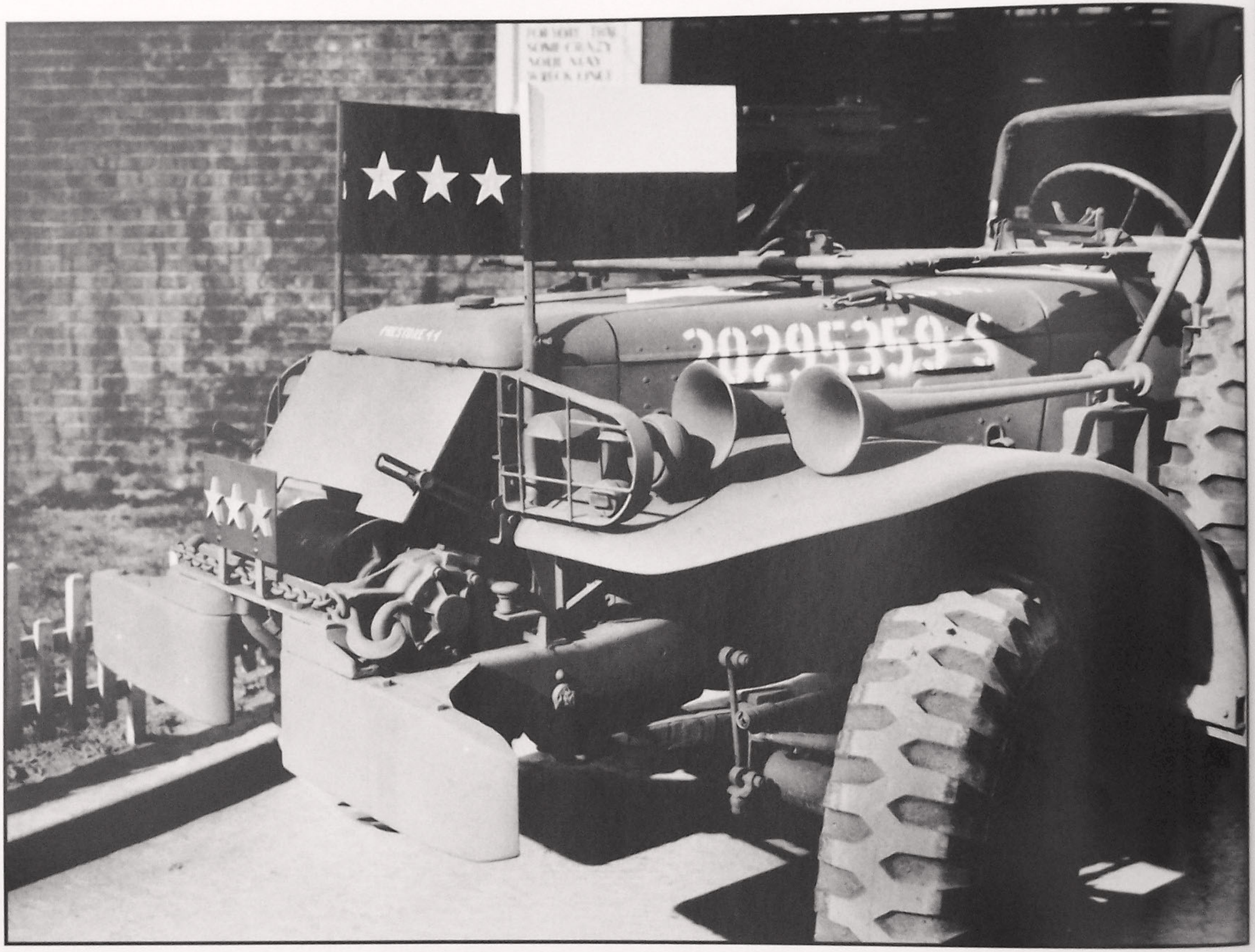
Top left: a look at the left rear wheel well. This shows the frame construction of the inner bodywork. Also note the way the safety strap is attached to a pivoting fixture on the left and a metal buckle on the right. This was as close as 1940's military automotive design got to safety technology! The leather seats and the armrests have been recovered with canvas cloth. **Top right:** this is the seat covering that the command car left the factory with. The owner has made a good effort to duplicate the original red-dish colored leather. The original leather covering would be quite rare on a restored vehicle and this is no exception. Also note the leather elbow pads fastened to the top of the wheel wells. **Above left:** the right rear quarter panel. It is interesting how the folded top settles around the bodywork. The small latch at the lower right side of the photo is for fastening the canvas door. These latches can be seen in the other photos as well. **Above right:** a good, close-up view of the rear tool rack. Although the metal por-tions of the tools here are glossy black, standard issue tools were olive drab. Also disregard the civilian number plate located below the tool rack.





This sequence shows the complete canvas top system in place. This is a reproduction made according to the original specifications. This is quite common on restored vehicles, as the cotton canvas material would have degraded after several years. There are several companies in the U.S. and Europe that specialize in this type of reproduction. The cover is made in several pieces, the largest being the top. This is integrated into the rear portion and a collapsible steel tube frame holds up the whole. Rows of metal snaps run along the area behind the rear seat and along the top of the windshield frame to hold the top in place. The doors are canvas-covered frames that are hinged off a smaller covered frame installed between them. Small squares of clear plastic provide a view outside. The small canvas panels on the inside of the front doors are used for ventilation.

Perhaps the most famous individual Dodge 3/4-ton truck was General George S. Patton's WC 57. This was one of a number of specially modified vehicles that Patton used during the Second World War. His first (in combat) was an M3A1 White Scout Car used in North Africa. This was modified with the addition of armored roof panels and an additional .50 caliber machine gun. In Europe, he also favored a modified M20 utility car. Patton also customized a number of Jeeps and he seems to have preferred to switch vehicles on a regular basis. **Above:** this standard WC 57 command car was modified in the summer of 1944 just prior to the activation of the 3rd Army. The modifications were completed by a local U.S. Army ordinance workshop in England. The most obvious addition is the large pedestal mount for the .50 caliber machine gun. This has necessitated the relocation of the gas can and rack to the right rear quarter panel. The reflector normally installed in that position has been moved further forward on the panel. The bows for the canvas top have been completely removed (along with the clasps for the doors) and a large bar has been installed over the front seat. This was to allow Patton to stand as he traveled in the car. A small folding panel has been added to the rear of the car to increase its luggage capacity. The panel is fashioned from the rear tailgate of a weapons carrier (NA).

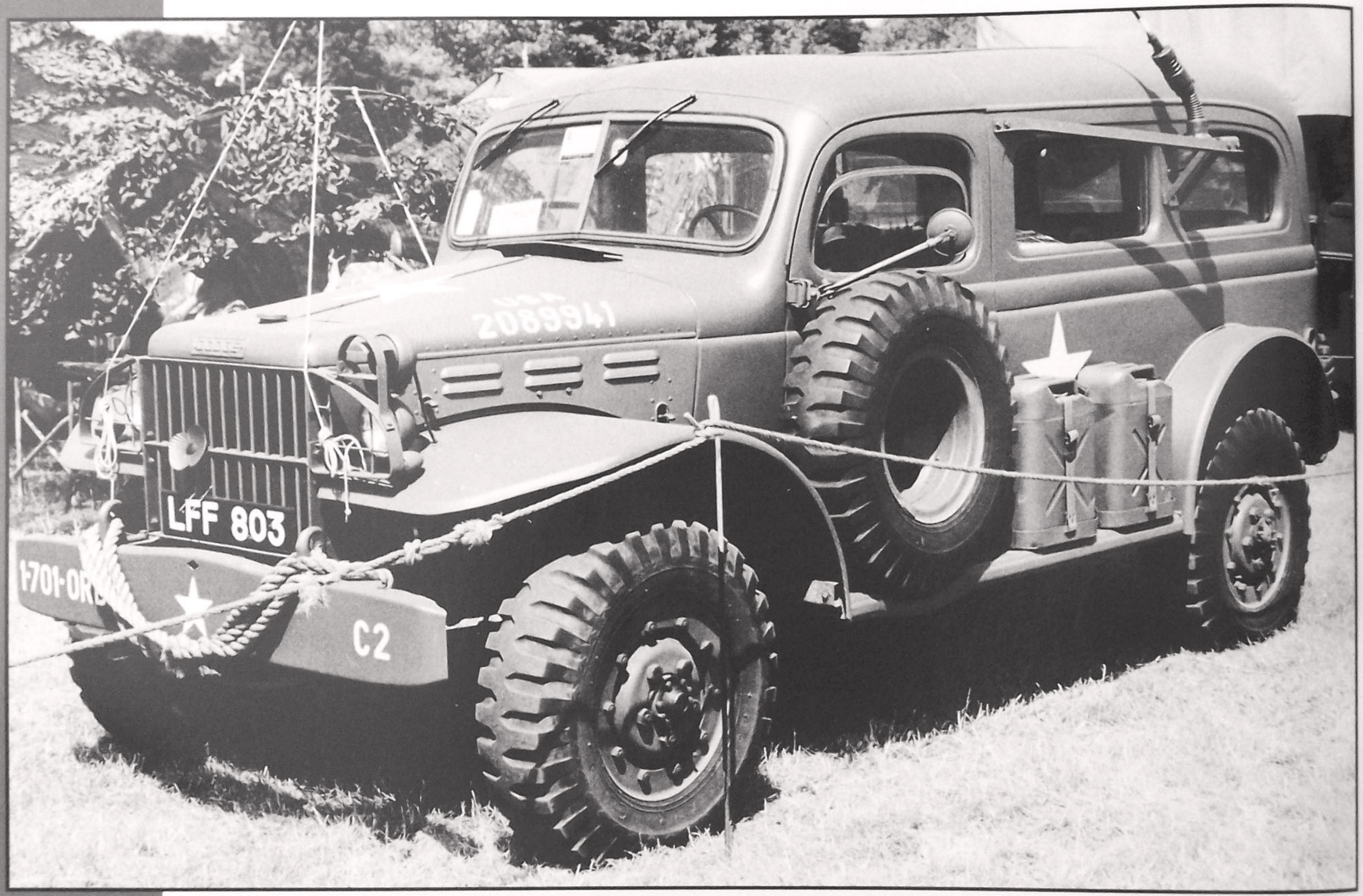


Above: this close-up of the front end shows more of the modifications made. A small armor panel has been installed on hinges in front of the radiator to add a modest amount of protection to this vital area. Steel slides from a foldable windshield have been installed to allow the panel to be adjusted according to the outside temperature. Patton knew that adding too much plating would compromise the mobility of the car, but he insisted on protecting a few key areas. Just in front of the armor plate is a star placard. This was a red-painted piece of metal sheeting with neatly formed white stars attached. The stars were cut from wood and each was attached with two small screws. An identical placard was mounted on the rear bumper. The front command pennants are made from rear-view mirror mounts from a 2 1/2-ton truck. The pennants are steel sheet. The left hand one is white above red and the right hand, three star pennant is red with white stars (also cut out of wood). The left-hand pennant would later receive the red white and blue emblem of the 3rd Army. It's not seen in this photo, but a siren is mounted on the right hand side of the frame, next to the winch. The siren is just visible in the previous photo. This shot also gives an excellent impression of the Braden 5,000-pound winch and the front suspension (NA).

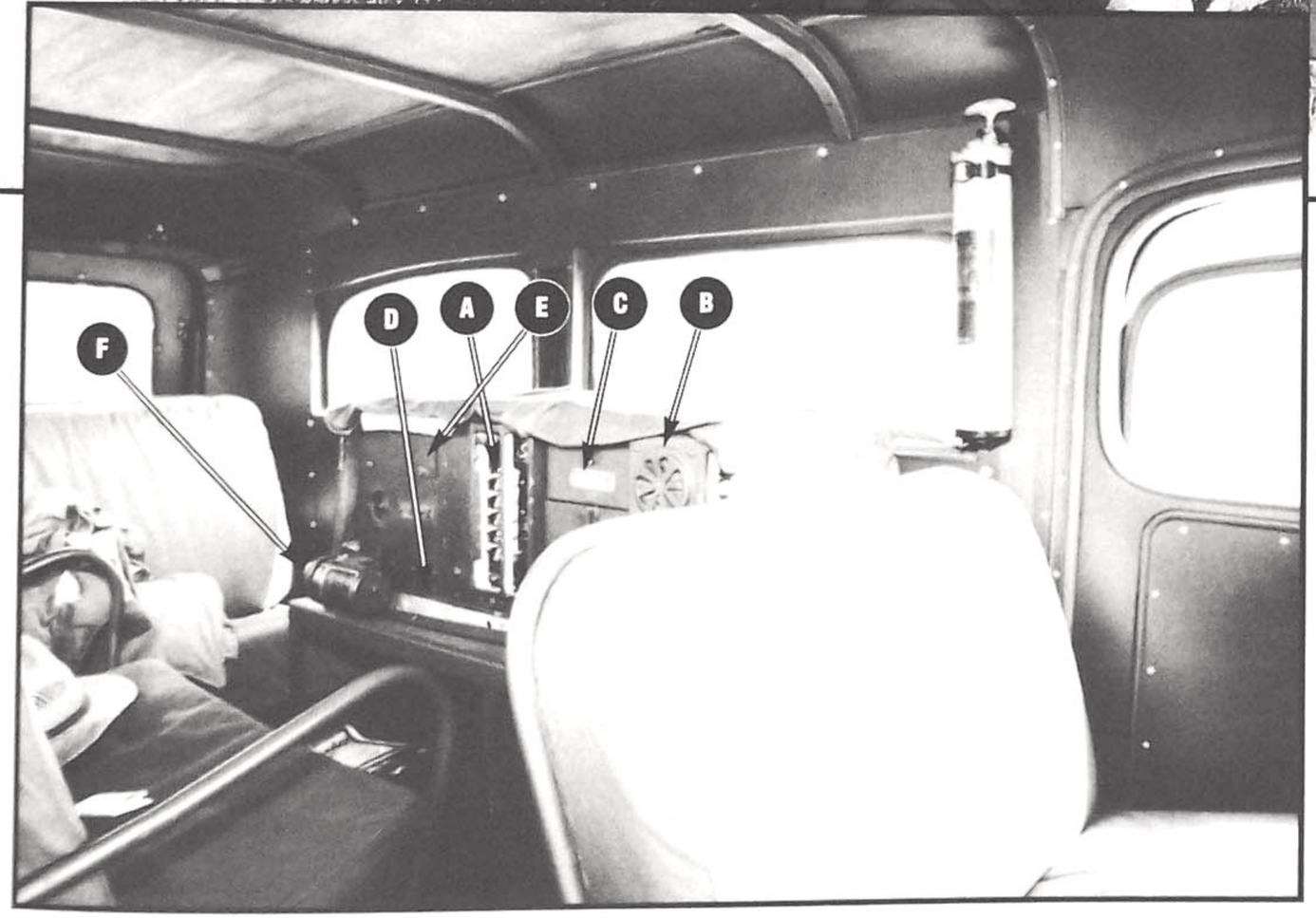
A close-up of the Browning M2 .50 caliber machine gun and its mount. The mount is a modified version of the M24A2 Pedestal Truck Mount. This mount was specifically issued for use on the 3/4 weapons carrier. The mount here has been modified by cutting away two of the three lower braces. A single brace has been retained and this has also been modified to attach it to the front fender. It's not known if the weapon was ever used to defend the car (note the lack of the "butterfly" trigger pieces here), but if adequately supplied with ammunition, it could be a devastating defensive weapon. The M2 .50 caliber machine gun was a 12.7mm weapon that was originally designed as an anti-tank gun. It could fire a tracer round (Tracer, M1), an armor piercing round (Armor Piercing, M2) and an incendiary round (Incendiary, M1). The weapon seen here is the "flexible" type for use with all types of vehicles. Its rate of fire is from 450 to 575 rounds per minute. To prevent the barrel from burning out, ordinance manuals recommended short bursts of 100 to 150 rounds per minute, with a steady rate of 40 rounds per minute. However, in field conditions the gun proved much more resilient. The M2 was nearly unique in the arsenal of Second World War weapons. In spite of its effectiveness, it was never copied by the Germans like the bazooka or the 8-inch gun (NA).

As mentioned above, Patton's WC 57 was armored in certain areas. He was realistic about what and what could not be armored, but the real meat of the added armor was in and around the rear passenger compartment. The entire floor was covered with 1/4-inch steel panels, as were the wheel wells. The Germans were masters at laying and dispersing landmines and were especially good at concealing them on roads. Patton saw the result of these practices first-hand in North Africa and this modification was born from that experience. **Above:** here an ordnance worker puts the finishing touches on the welds securing the armor plate. The presence of a star on one of the floor panels indicates that this material has been salvaged from another vehicle. The entire interior of the car has been removed for this work and some interesting details have been revealed. The attachment points for the leather arm rests can be seen on the left as well as the wire lead openings for the radio antenna located on the right side of the photo. The small box structure on the left side of the photo is also interesting (NA).

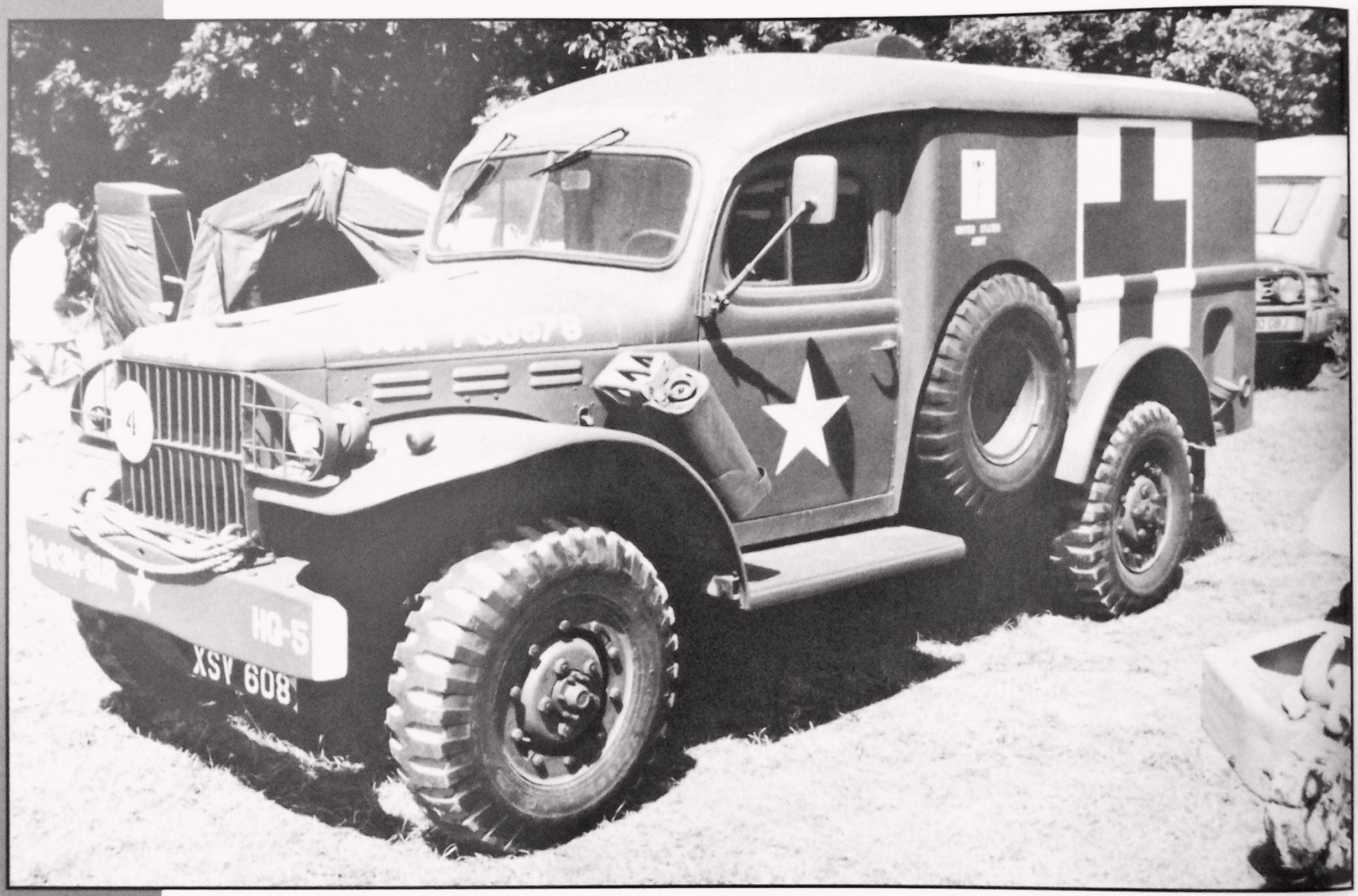
Above: regardless of the vehicle modified, Patton always insisted on installing large, loud air horns. The source of these particular parts is not known, but they are most likely custom made for this application. Commercial grade truck air horns were generally installed inside the engine compartment and these examples are nearly as long as the Dodge's front end! A special bracket has been fabricated to support them and the electrical leads are still to be installed (NA). **Left:** Patton also used a Dodge command car in Italy. This was a standard WC 56 car with very few modifications. Patton is seen here speaking with a GI just before his entrance to the port town Messina, Sicily on August 17, 1943 (NA).



The Dodge "carryall" was a military version of the popular civilian station wagon. It was originally conceived for the 1/2-ton platform and it was also part of the redesigned family of 3/4-ton vehicles. The bodywork was based on a 1930's panel truck with windows installed along the sides. The body is of all steel construction with the exception of the roof, which is stiffened fabric over a wooden frame. This is also sealed to be watertight. The reason for this odd method of closing in the roof was that it was cheaper than producing the large die that would be necessary to stamp out a panel of this size. The carryall was produced primarily for use as a command and radio vehicle and so, like the command car, it was equipped with the large auxiliary 12-volt battery and box. This was located towards the rear of the right side of the truck. The engine hood was slightly different that the other 3/4-ton trucks in that it sloped upward towards the windshield. It shared this trait with the WC-54 ambulance. The bodywork was constructed for Dodge by Proctor-Keefe Body Co., of Detroit, Michigan. **Above:** This near perfect example is owned by an English collector and was photographed in the summer of 2000. This view shows a number of the unique features of the carryall such as the additional blackout light on the left front fender and the large antenna base and its mount. Also note the dual gas can mounts on the left



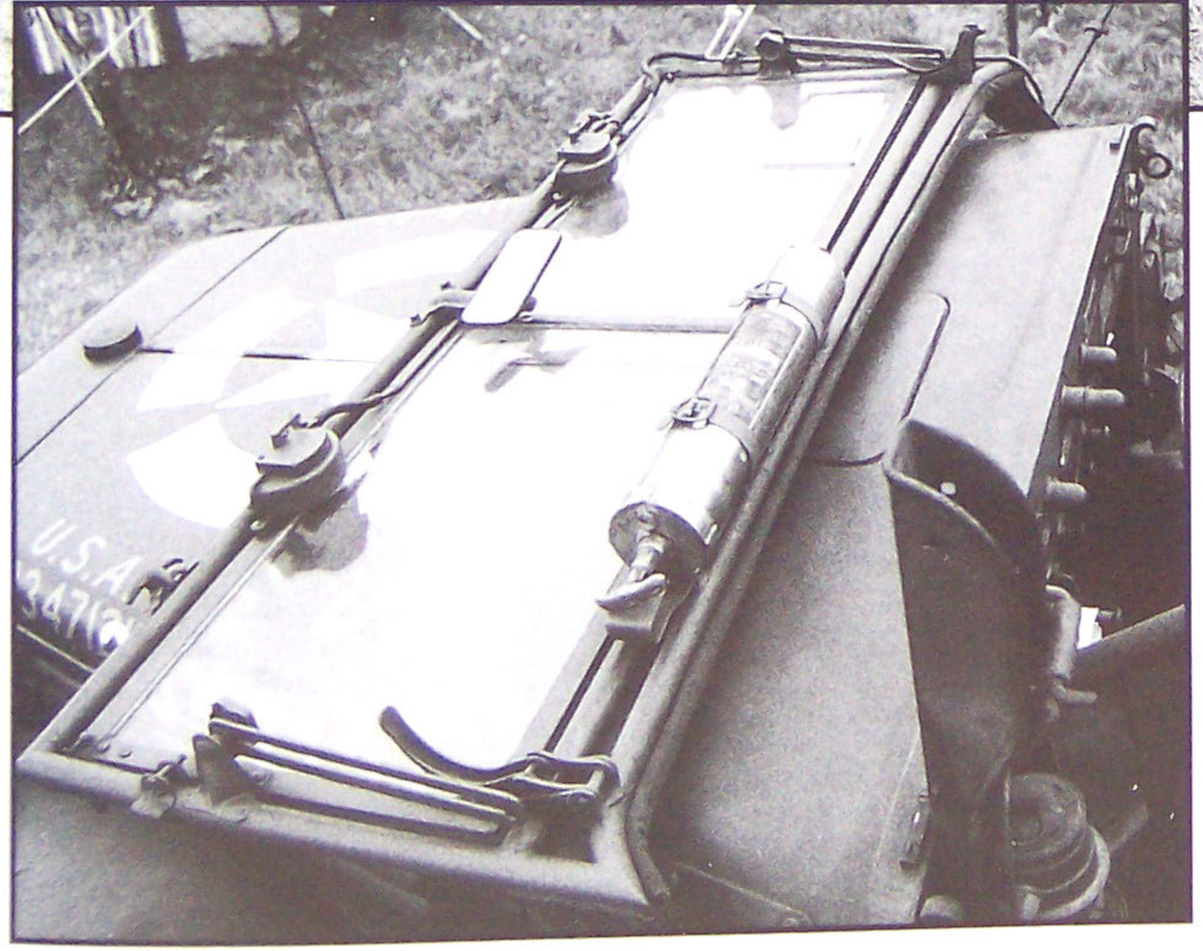
running board. 4,800 WC 53 carryalls were produced with registration numbers running from W-2072128 to W-2073327, W-20163146 to W-20167956, 20260793 to 202612157, 2089952 to 2091083, 2089952 to 2091083, 2089156 to 2089175 and 2089176 to 2089947. No WC 53s were produced with a winch. At least two carryalls were converted into Command Field Sedans with the addition of a left side passenger door, a luggage rack and spot lights. **Top left:** this right side shot shows the large 12-volt battery box in front of the rear wheel well. **Top right:** The rear doors consisted of two horizontal pieces that opened out and down. This differed from the original panel truck design that utilized two vertical side-opening doors. **Left:** The interior of the carryall could be configured in a number of ways. Here it has been configured as a radio vehicle. This is the original configuration of this restored carryall and the radio is still operational. The radio is the SCR-528 (SCR = Signal Corps Radio). This set consisted of the BC-604 transmitter (A), the BC-603 receiver (B), the CH-264 chest (C), the FT-237 mount (D), control boxes BC-739-A (E), the A-62 phantom antenna (F) and the related cords, cables, microphones and headsets.When the carryall was fitted with a radio, it carried extensive radio suppression gear that included ground straps, special lock washers for the the body bolts, and filters and resistors throughout the vehicle electrics. Note the location of the decontamination device on the front left door jam.



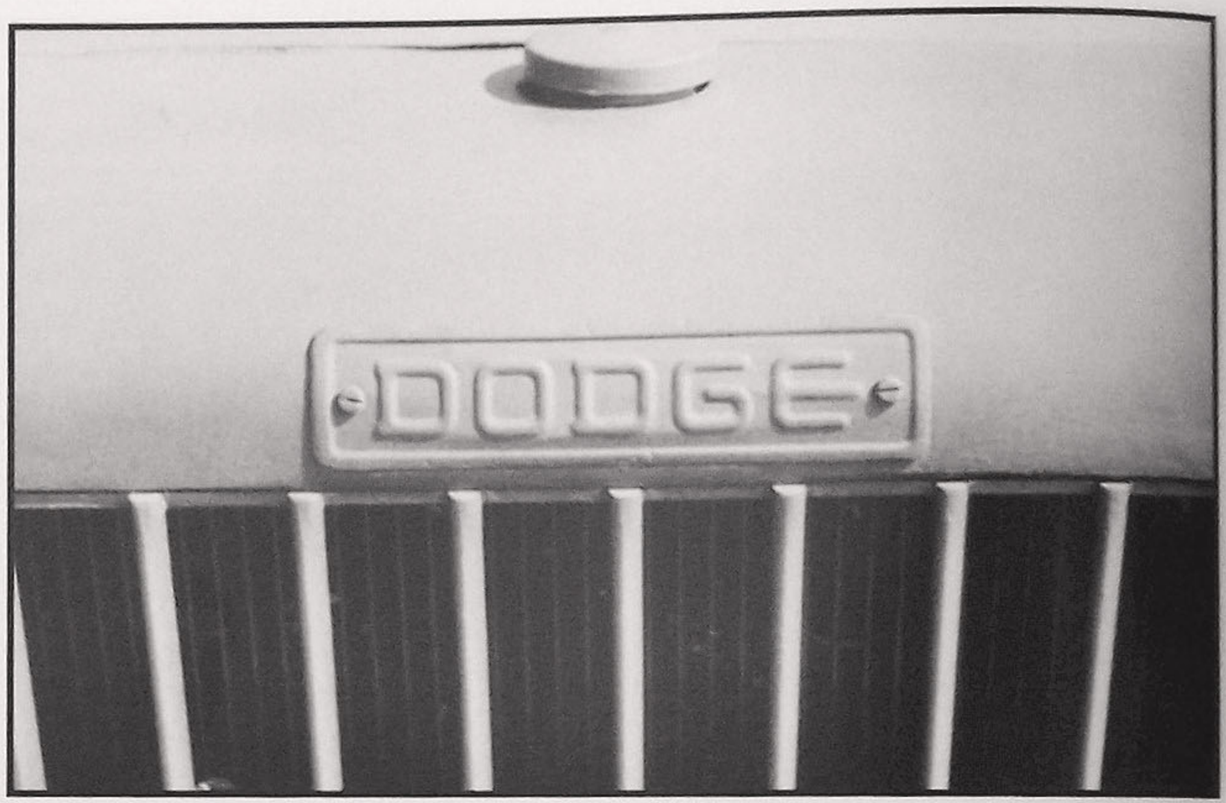
The WC 54 ambulance was yet another redesign of an existing 1/2-ton vehicle. It shared a similar body design with its predecessor, but utilized all the new components of the 3/4-ton series. The WC 54 was a big leap ahead in evacuation technology and greatly improved the comfort of wounded soldiers. The body was all reinforced steel sheet and the engine hood, windshield and front side doors were identical to the carryall. The WC 54 did have a huge, stamped metal roof panel. Two large vertical doors and a metal step provided access to the rear compartment. To improve sanitary conditions, the interior walls and roof were covered with Masonite board and the metal floor was covered with linoleum. There were two upper stretcher racks with two folding seats below. These could also each accommodate a stretcher. The interior was provided with a dome light and small ventilator that was mounted in the roof. The rear springs were altered to provide a smoother ride and the trucks longer wheelbase (114 inches, versus the 98-inch wheelbase of the weapons carrier) also assisted in this. WC 54 ambulance bodies were produced for Dodge by Wayne Works of Richmond, Indiana. 22,857, WC-54s were produced with registration numbers running from W-77841 to W-78690, W-78691 to W-79999, W-710000 to W-718635, 75068 to 75083, 718636 to 719045 and 721000 to 732635. WC 54 ambulances were not manufactured with a winch.

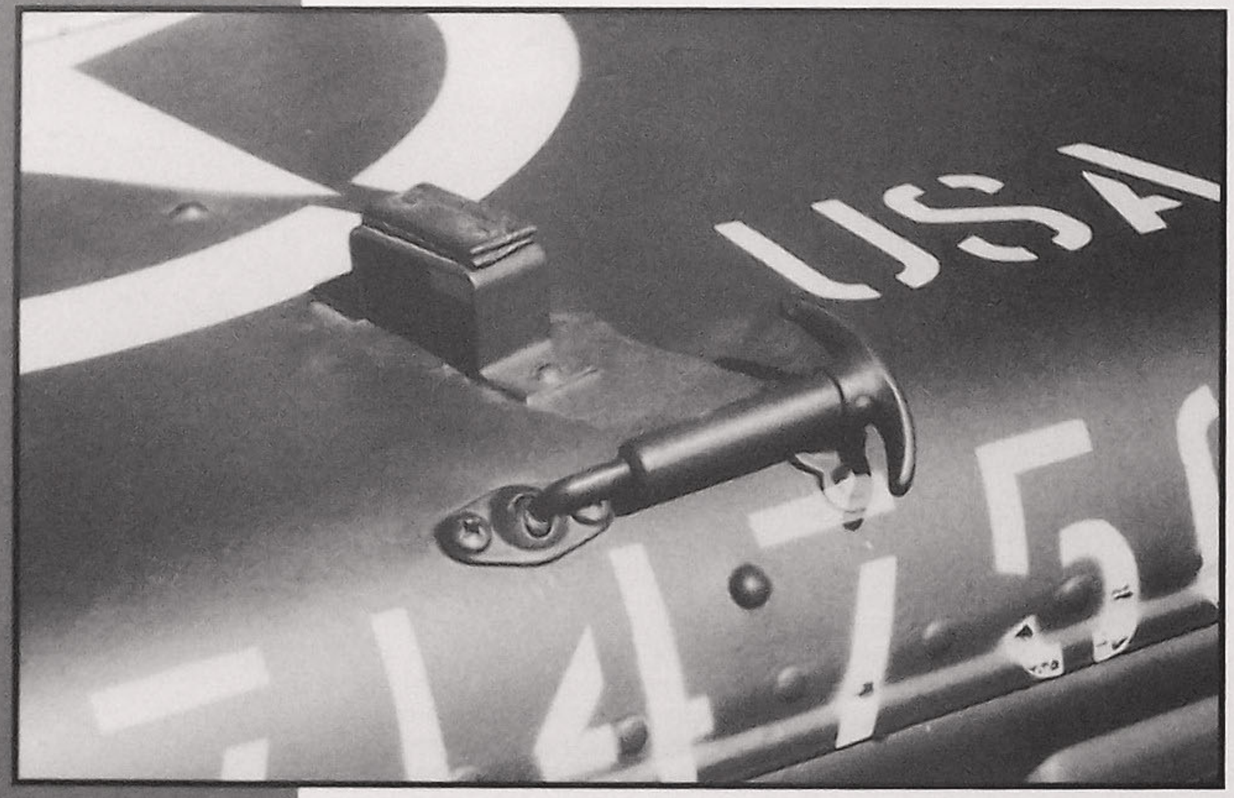
There were never enough WC 54 ambulances to meet the demand and starting in January of 1945, surplus WC 51 weapons carriers and M6 GMCs were rebodied to receive a folding ambulance structure made of wood and other non-strategic materials. This vehicle received the designation of WC 64 KD. The ambulance structure was shipped into theater knocked-down, hence the term "KD." **Above and left:** it is rare to see this vehicle restored and these photos show the added ambulance structure from several angles. The truck retains its entire original bodywork forward of the rear structure. The KD body had three access doors for the rear compartment and this made it much easier to remove patients in cold weather. The WC 64 also had modified rear springs to soften the ride. After the war, a more elaborate modification of surplus vehicles was created with a substantial sheet metal body. This was known as the S7 MA 51 Boyertown ambulance. Thousands of both types were supplied to Europe and other areas of the world through MAP.

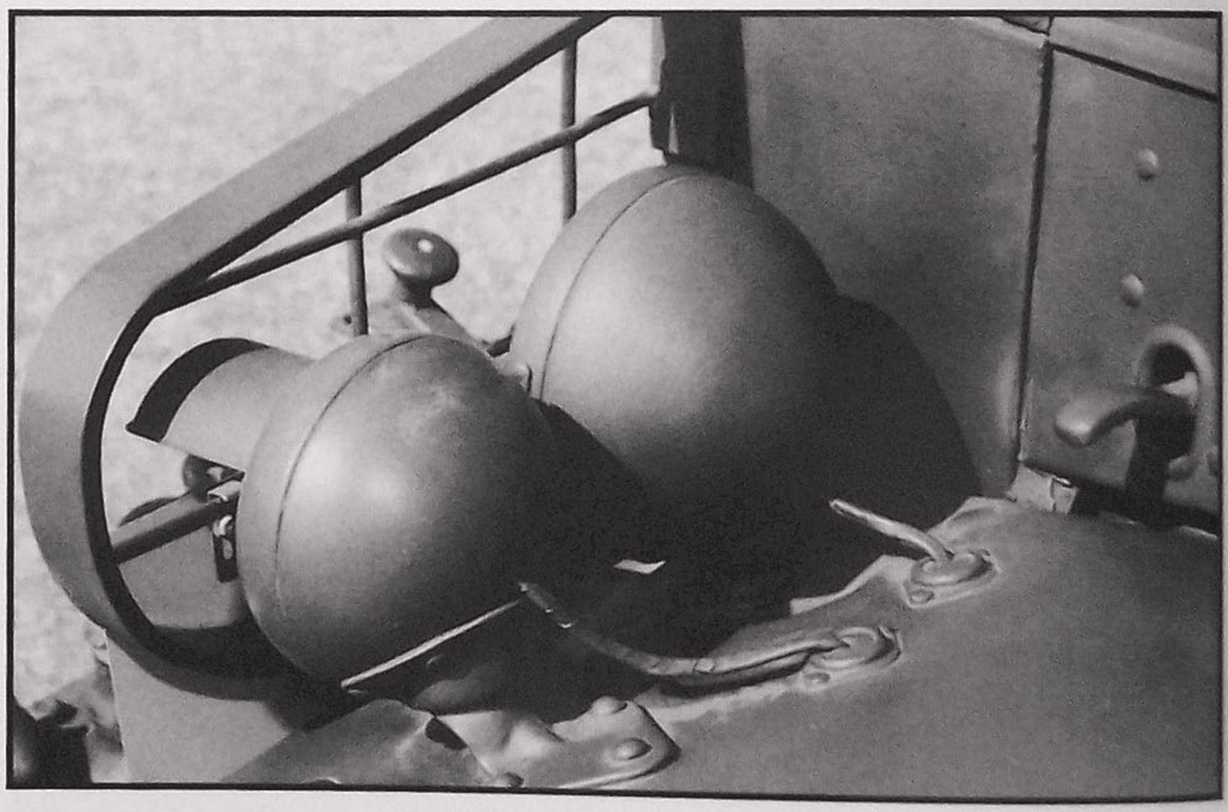
When the U.S. Army changed its rifle squad from eight to ten men, it was requested that Chrysler look into the possibility of creating an elongated version of the standard WC 51 weapons carrier. The result was the 1 1/2-ton 6 x 6 T223 series of vehicles, known as WC 62 with no winch and WC 64 with a winch installed. The truck was truly a stretched version of the weapons carrier and its service parts were 96% interchangeable with those of the 3/4-ton series. From the cab forward it was nearly identical to the 4 x 4. The new, lengthened cargo bed could carry up to 12 troops on two large side benches. There was also an additional rear-facing seat located between the two front seats. The role of the T223 was as a general personnel, cargo and towing vehicle and at this, it excelled. Its introduction came at a time when the GMC 2 1/2-ton truck was in high demand and in many respects the T223 filled the shoes of the GMC admirably. Its many uses included being a prime mover for the 57mm gun and it was sometimes used as an ambulance where additional cross-country mobility was a factor. Several of the changes that were later made in the production run of the 4 x 4 series were originally made on the 6 x 6. Many of these were internal, but some of the significant external changes were the relocation of the tool rack to the front right side and the remounting of one of the five-gallon cans and its rack just



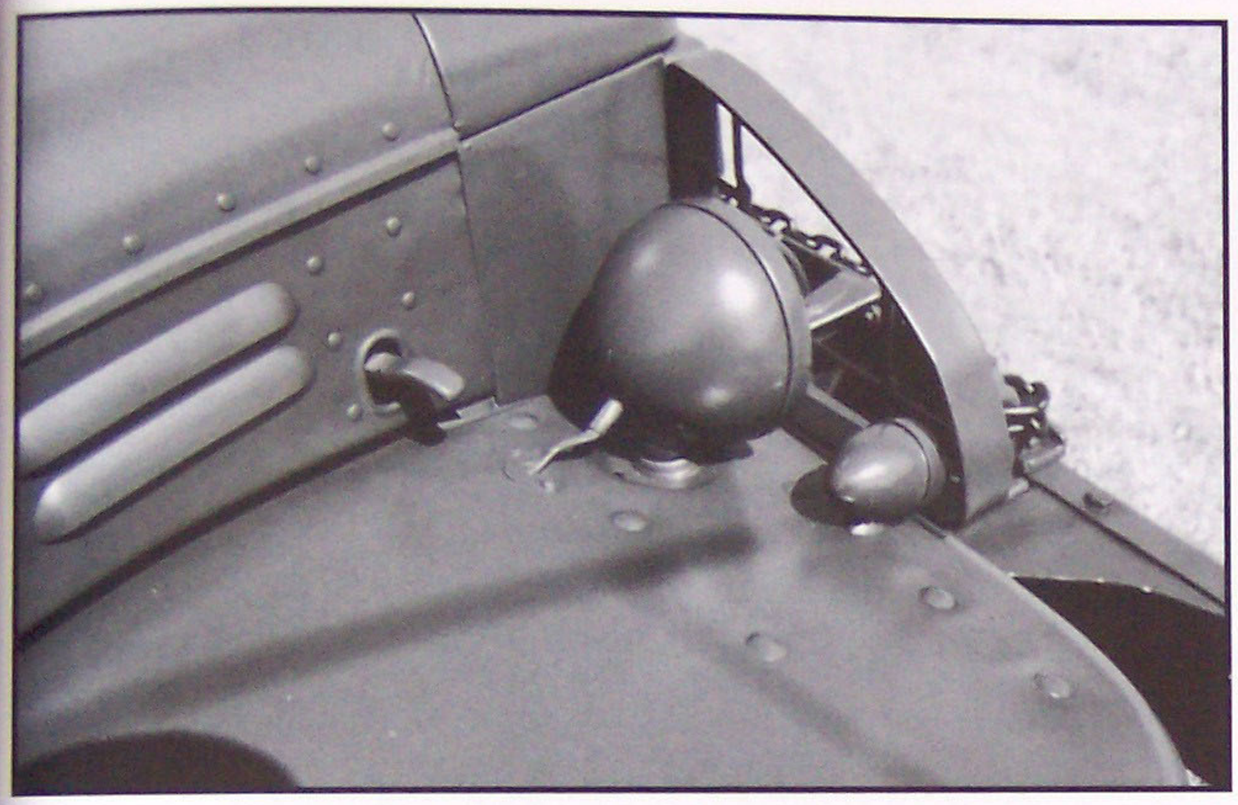
behind it. Certain mechanical components, introduced in the 6 x 6 series, were also later incorporated into the 4 x 4. Designed slightly heavier for use in the 6 x 6, these parts included the front axle and the steering arm and drag link, among others. The engine was the same as that found in the 4 x 4 T214s, but it used a separate serial number. Because of the 6-wheel drive configuration, the T223s used a two-speed transfer case instead of the one-speed used on the T214. The engine and drive train of the T223 offered only a slight reduction in speed when compared with the 3/4-ton trucks, coming in at 50 mph. The shots on these pages represent two different restored vehicles. The shot on page 42 shows how the rear soft-top could rolled into itself. The forward portion was normally attached to the front windshield. **Top left:** this shows off the rear cargo body to good advantage. The long rear lazy backs could be folded down for carrying cargo. The tires are not original. **Top right and above right:** the cargo body was quite spacious. The very first T223s had metal cargo bodies, but this was changed to wood with steel panels with the 3,100th vehicle produced. **Left:** another change started with the T223 and integrated into all later Dodge trucks with a windshield, was the relocation of the decontamination unit to the windshield's lower edge. Approximately 43,000 T223s were produced with registration numbers running from 3297503 to 3328846 on the WC 62 and 3328847 to 3342502 on the WC 63.

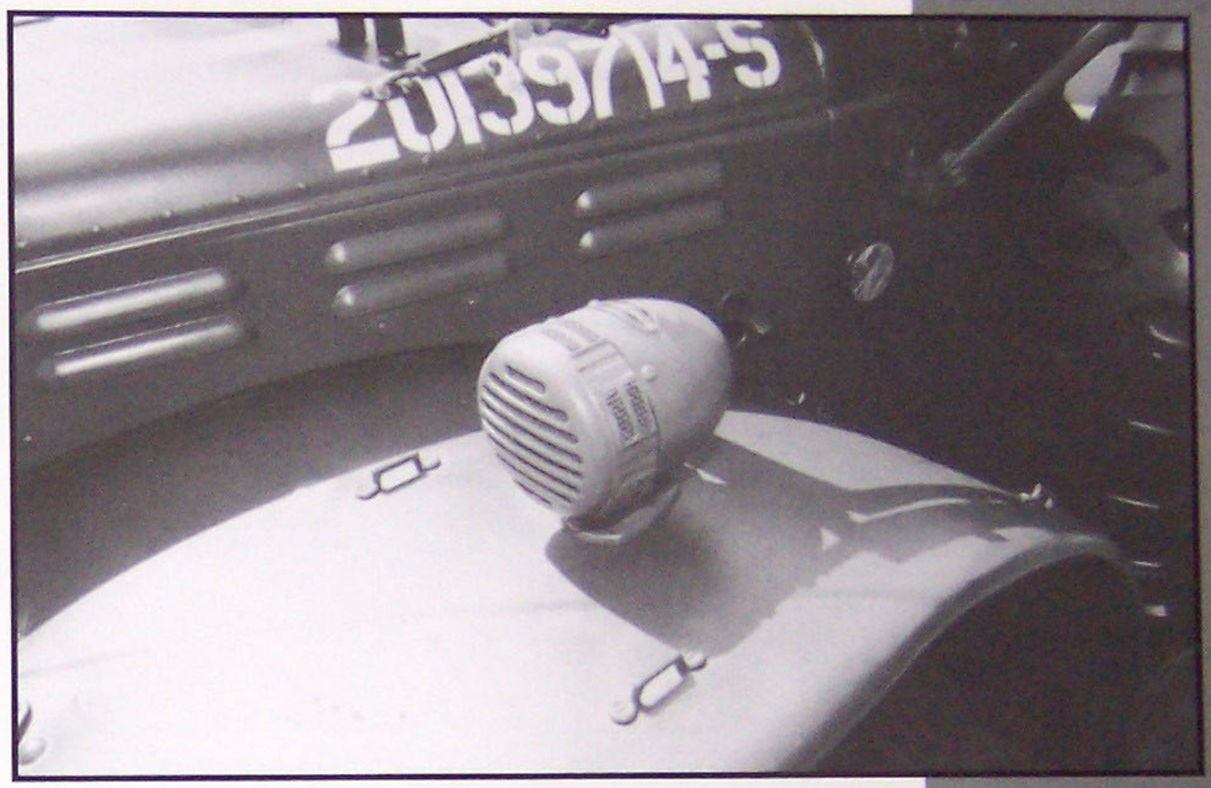


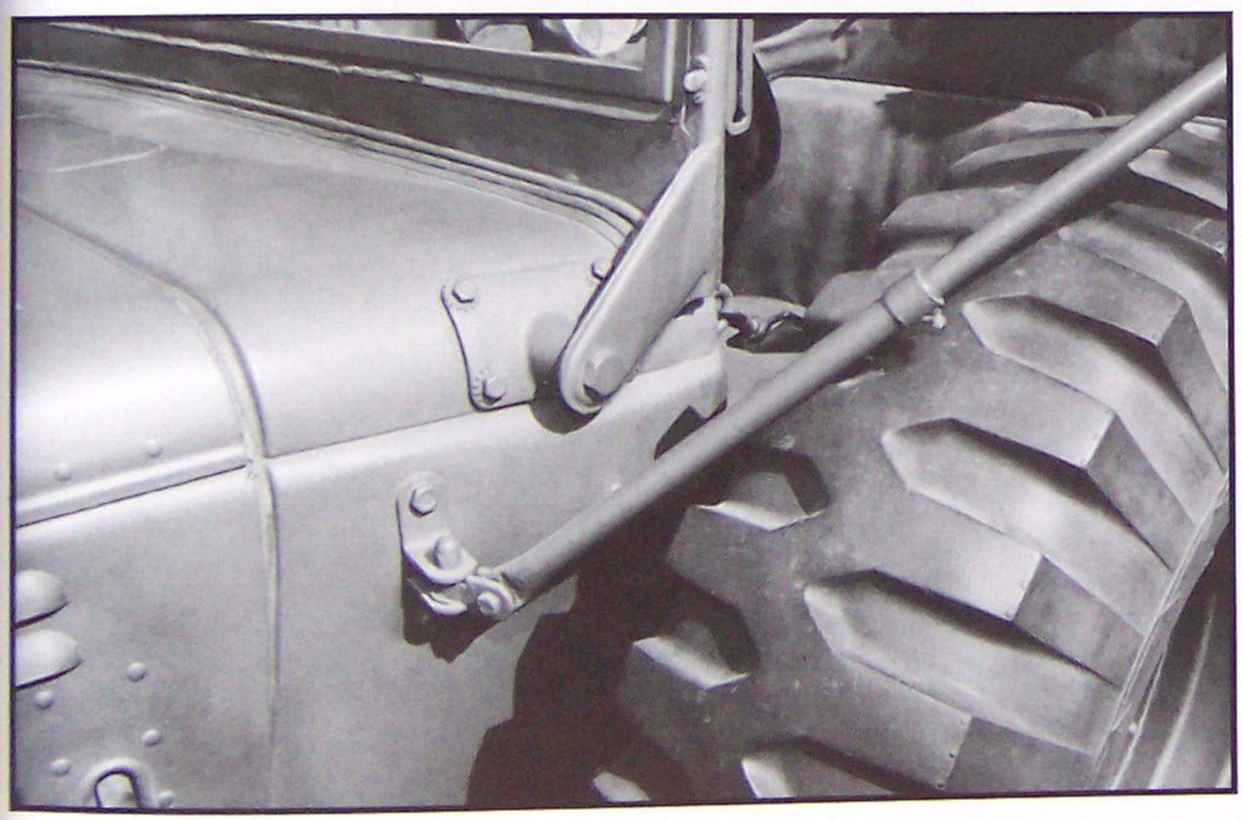


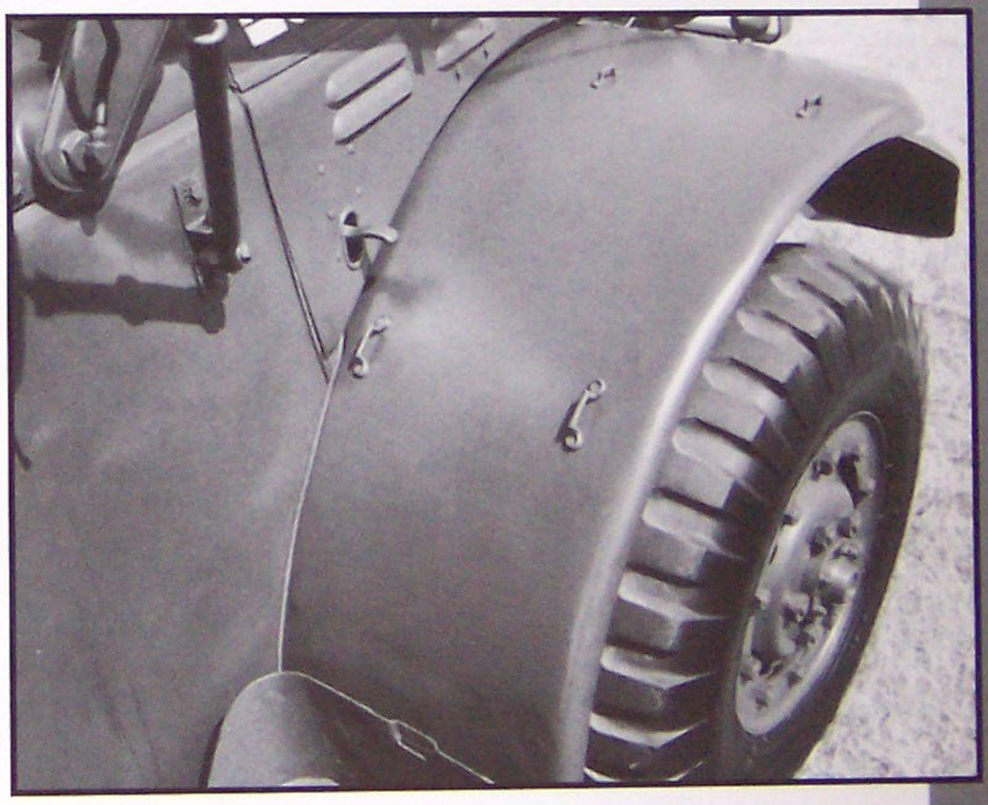


Standardization of parts was one of the primary goals of the Chrysler designers. Individual T214 trucks all had unique bodywork from the firewall back, but forward of this all the 3/4-ton trucks are nearly identical. The same holds true for most of the other chassis and mechanical components and this applied to the 1 1/2-ton 6 x 6, as well. The photos on the next six pages show many of these common components. **Top left and right:** all the Dodges except the carryall and the ambulance used the same front body panels. The engine hood was hinged down its center and each half could be opened independently. The two latches seen protruding on the side panel were simply lifted up to disengage the locking mechanism. The Dodge emblem was seen on all 1/2-ton and 3/4-ton trucks until early 1943, when the government ordered all manufacturers' stamps removed from all locations except ID plates. **Above left:** there are two of these latches located on the hood and they are used to secure the windshield. The bracket next to it has a rubber pad and the windshield rests here. A similar latch is used on the Jeep. **Above right:** the left-hand headlight position as seen from the rear. Note the hood latch in the right corner of the photo.

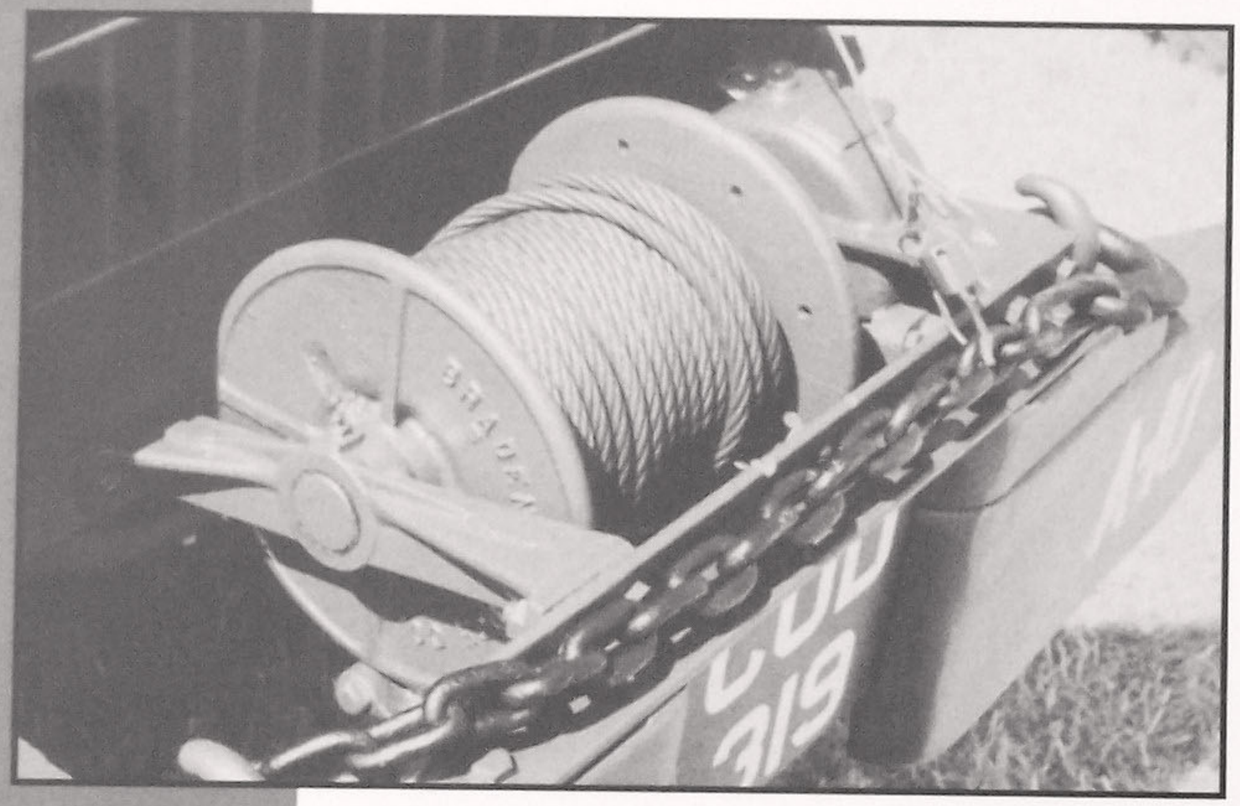


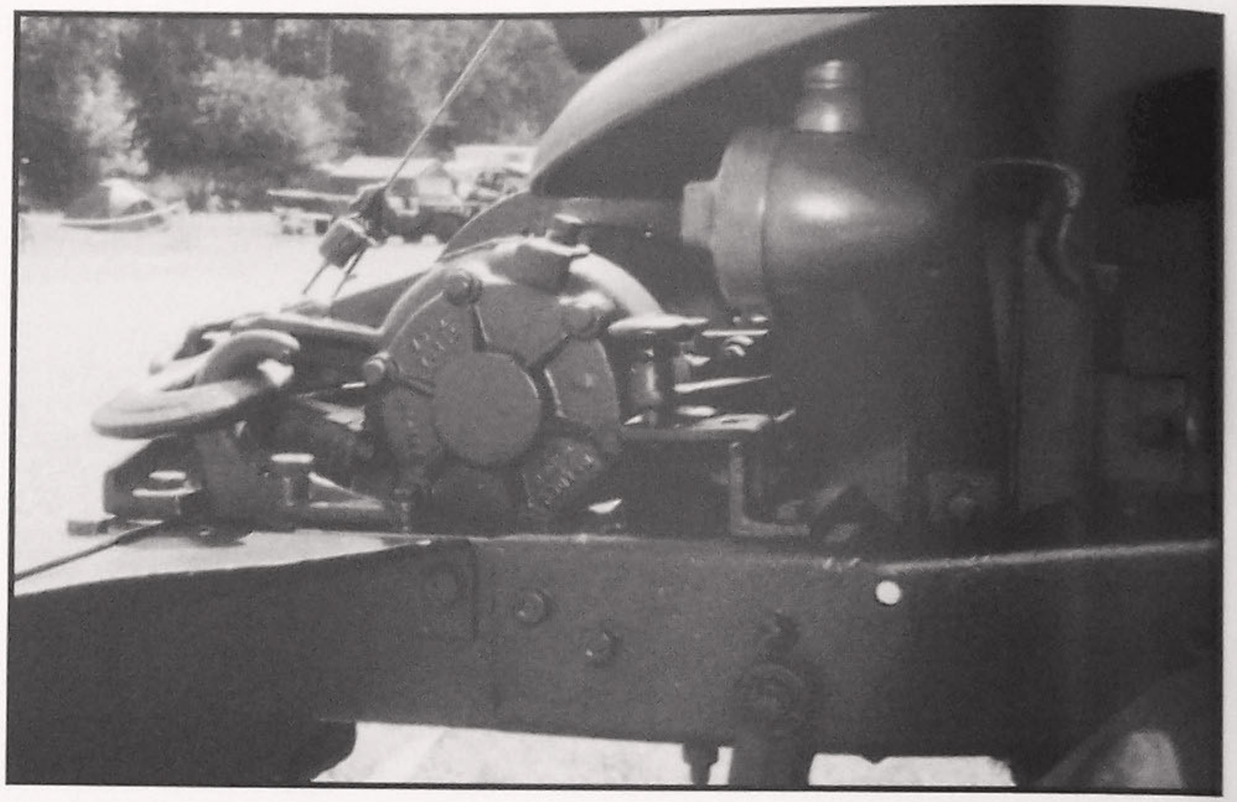


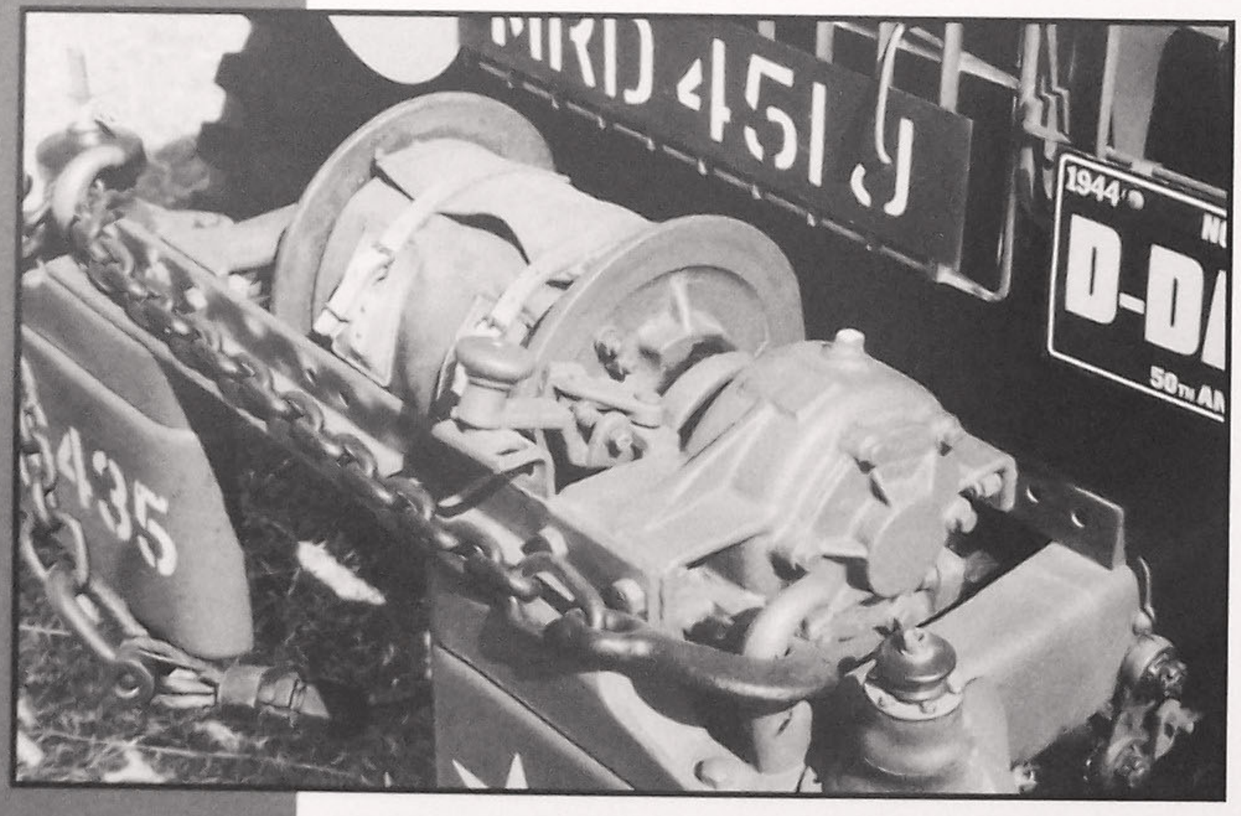


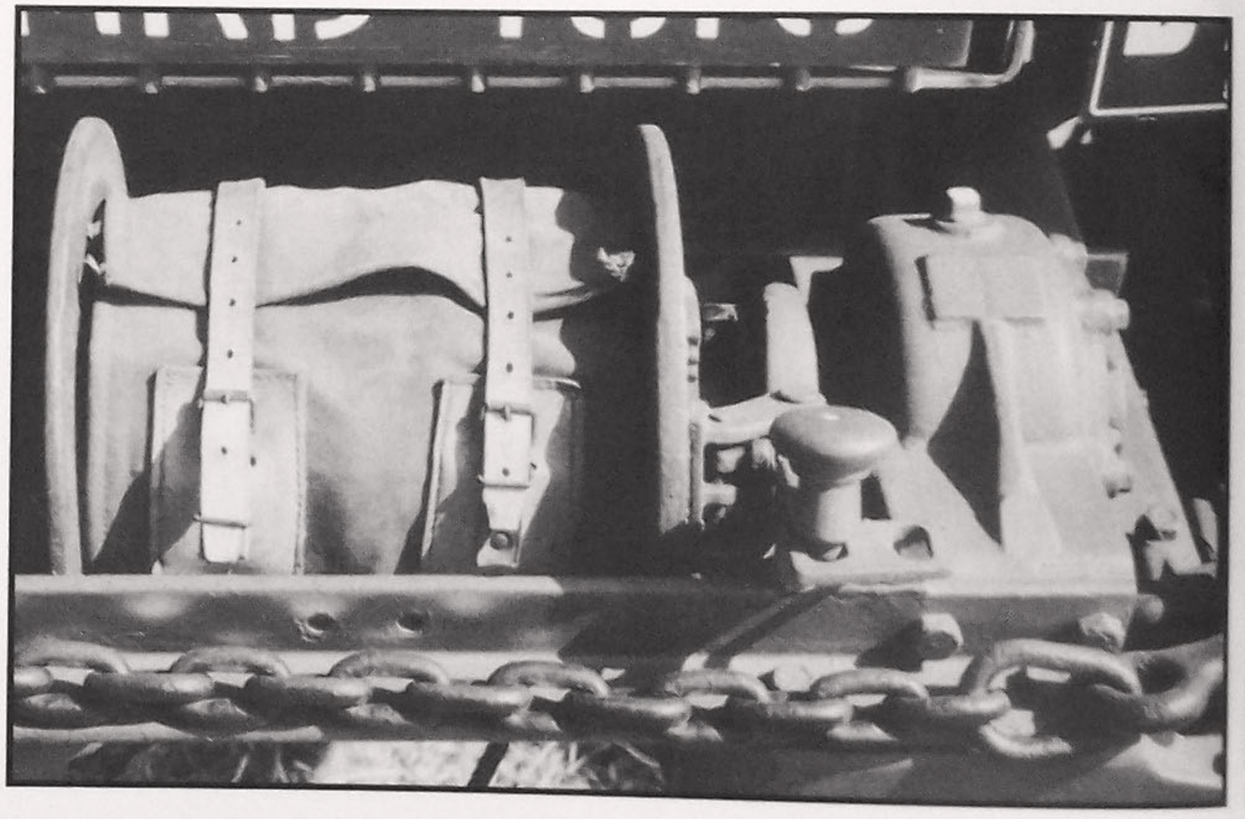


Top left: the right hand headlight position. A hood latch is also visible here. **Top right:** as mentioned previously, a siren was not standard on the command car, but it was common enough. This close-up shows a siren mounted on the right front fender of a command car. This siren is the same type that is mounted on some models of the Sherman tank. Its availability in armored units would make it easy to obtain. **Above left:** the driver's rear-view mirror could be adjusted by loosening a small nut on its lower section. The mirror stalk was extra long to allow it to clear the spare tire mounted next to it. **Above right:** many mid-to-late production Dodges had equipment rings fastened to their front fenders. These could be used to secure straps, which in turn would secure tarps, bedrolls or other objects.



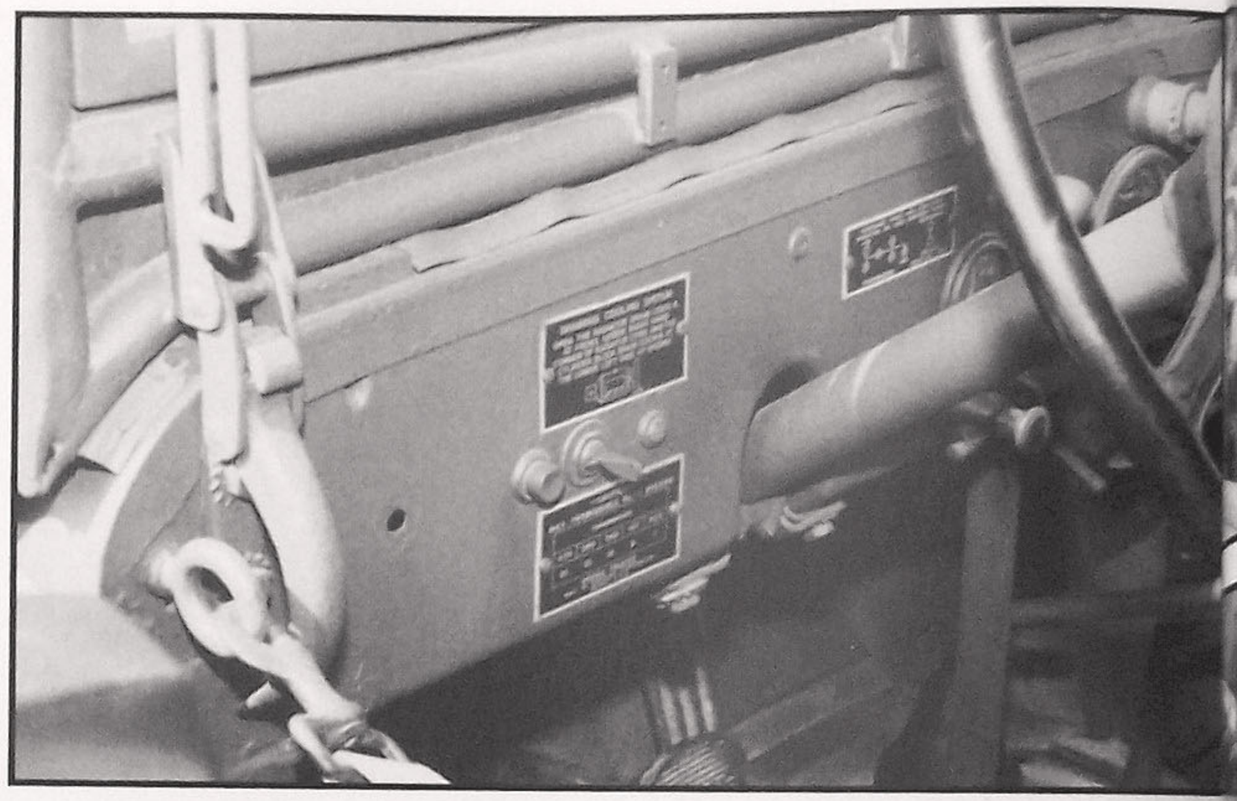


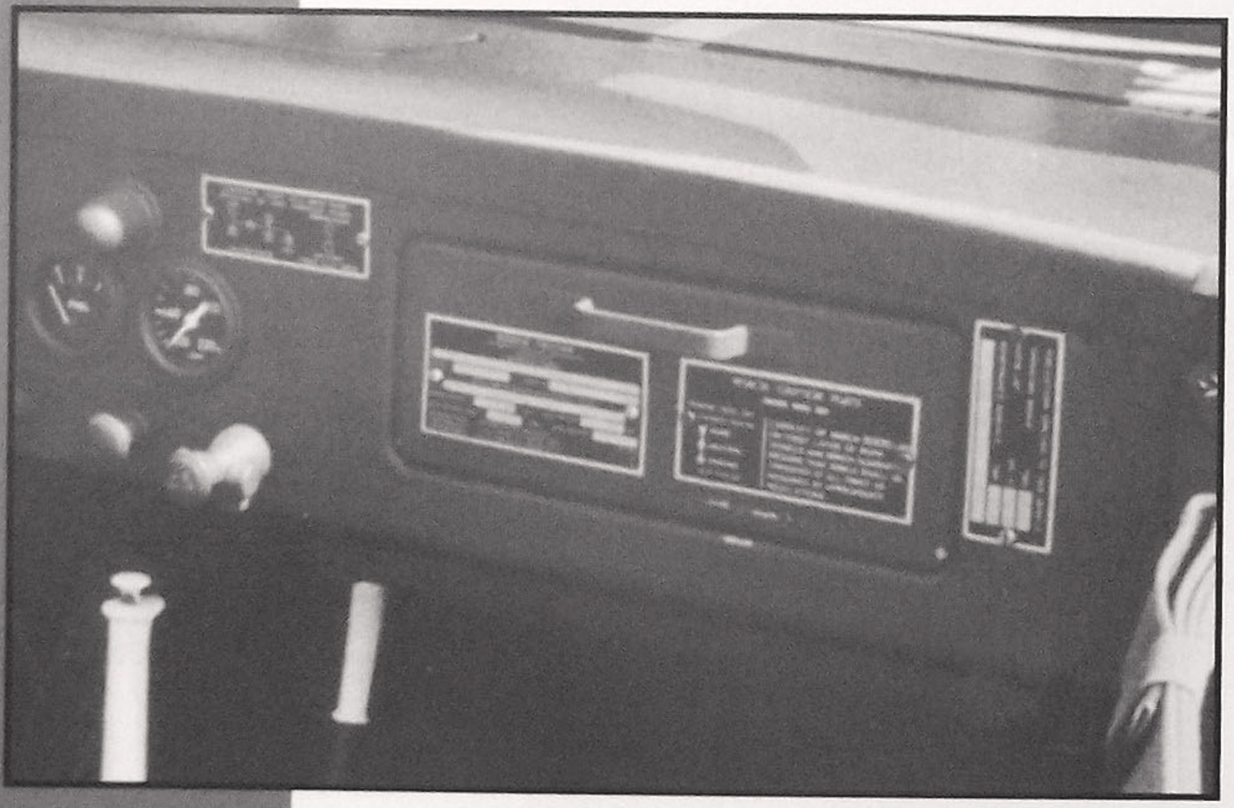


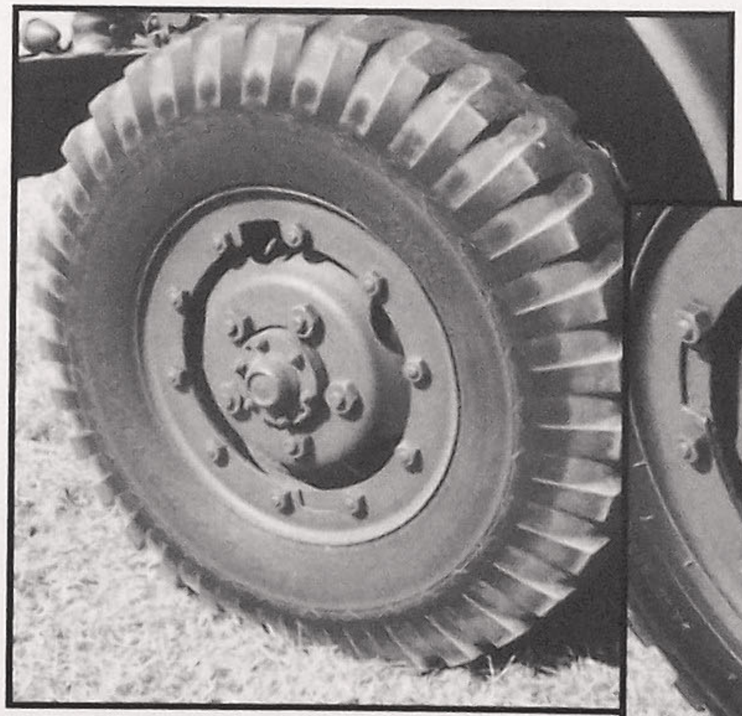


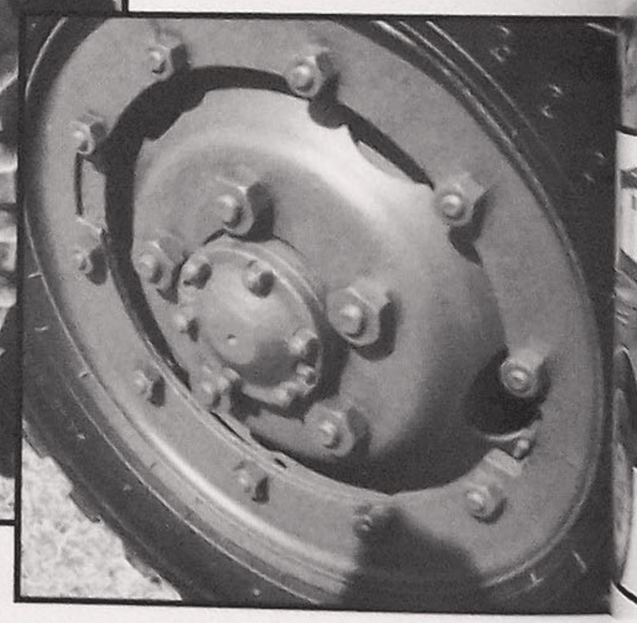
The Braden 5,000-pound winch (seen in the two top photos) was standard equipment on the WC 52, WC 57 and the WC 63 trucks. All the winches for the Dodge 3/4-ton trucks were supplied by the Braden Winch Co., of Tulsa, Oklahoma. The winch was a power take off type that was linked to a shaft leading to the transmission. This shaft was engaged by a lever in the driver's compartment. It had neutral, high and low positions. Later, the 5,000-pound winch was superceded by a 7,500 pound model (seen in the bottom two photos), also made by Braden. To engage the winch, the shift yoke and the PTO lever inside the driver's compartment first had to be placed in the neutral position. The shift yoke is the knob-like device located at the front of the winch on the 7,500 pound model and in the rear on the 5,000-pound version. This released the winch drum and allowed the cable to be played out by hand. It was recommended that all of the cable be played out in order to maximize the pulling power of the winch. When the load was secured, the yoke was shifted to the engaged position and the PTO lever shifted to either high of low, depending on the load. The heavy chain seen in these photos was also standard equipment on any winch-equipped Dodge truck. These were supplied to Dodge by the American Chain Co., of York Pennsylvania. The canvas and leather cover shown above is an interesting and rarely seen detail.

These three views of the windshield show the mechanism used to adjust the windshield glass. The star shaped knob was loosened and, as the windshield glass moved out, the knob axle moved along the sliding track. The two shots at right also show the windshield wiper motors and their wiring.

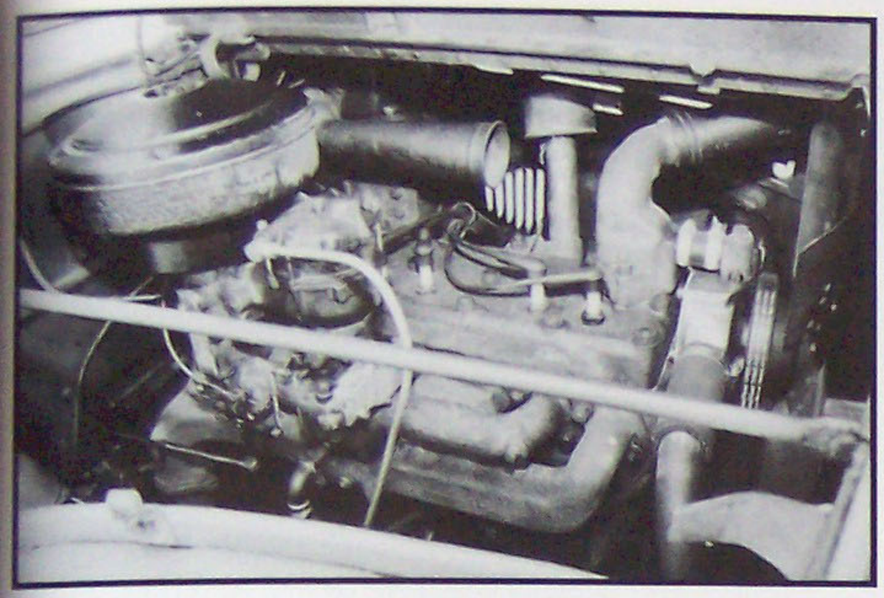


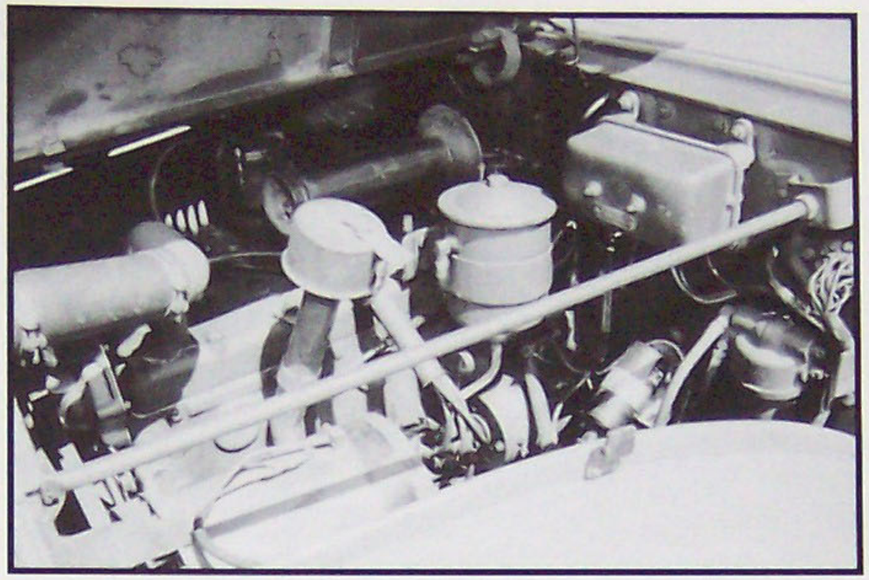


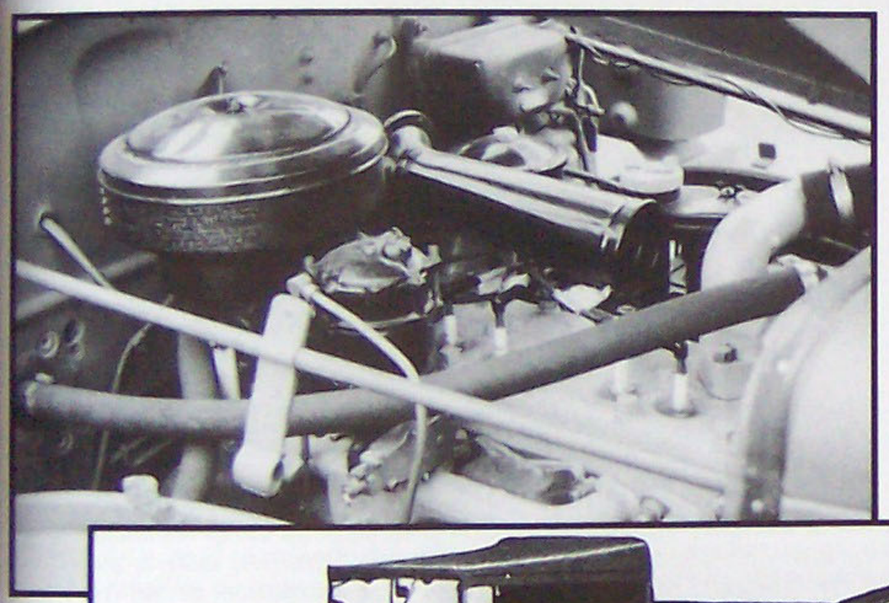


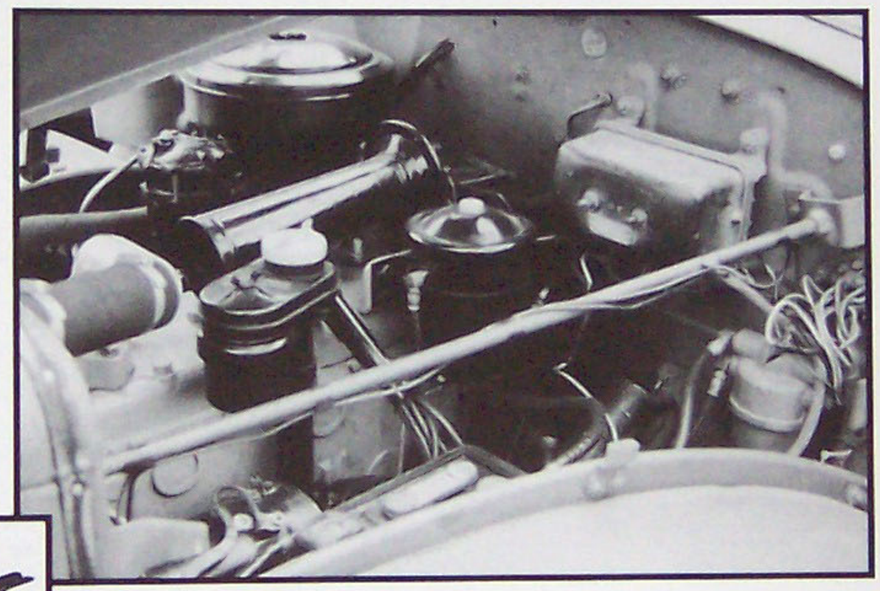


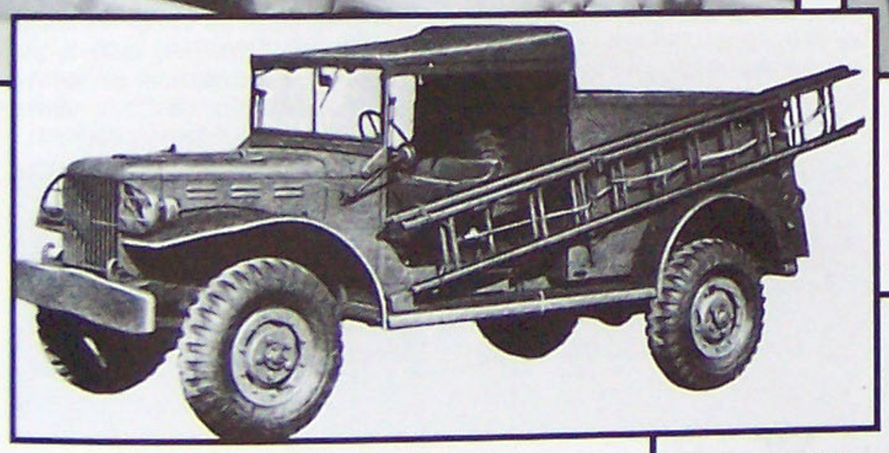
Top left and right, and above left: various views of the dashboard and controls. There were a number of instruction placards located throughout the dashboard. The shot at the upper right also shows the attachment lever for the windshield. **Right:** the Dodge 3/4-ton series used heavily reinforced 16 x 6.50-inch "combat wheels." These are divided rim type that consisted of a heavy-duty commercial grade hub attached to an outer steel rim with ten bolts. Although the hubs differed from front to back (front on the left, back on the right in these two photos), the wheels were interchangeable.

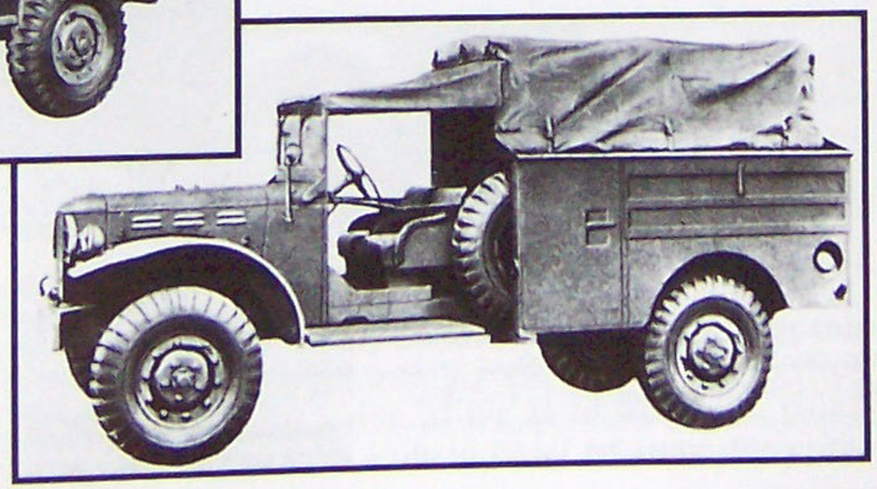


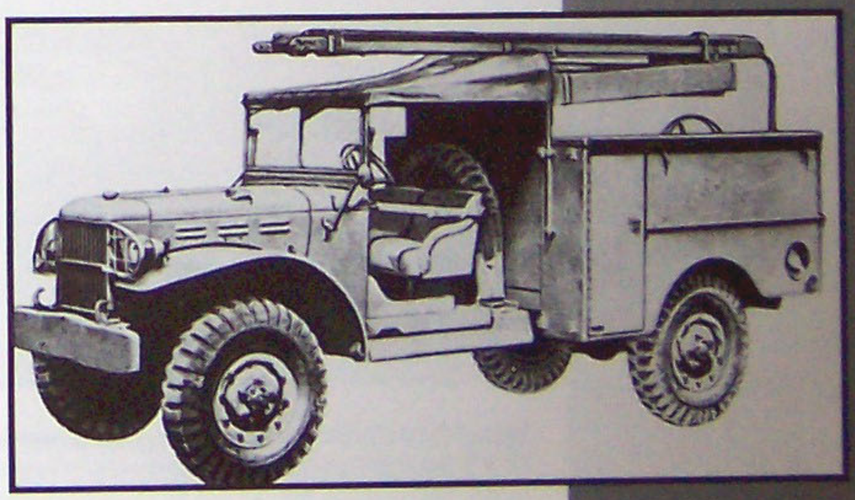








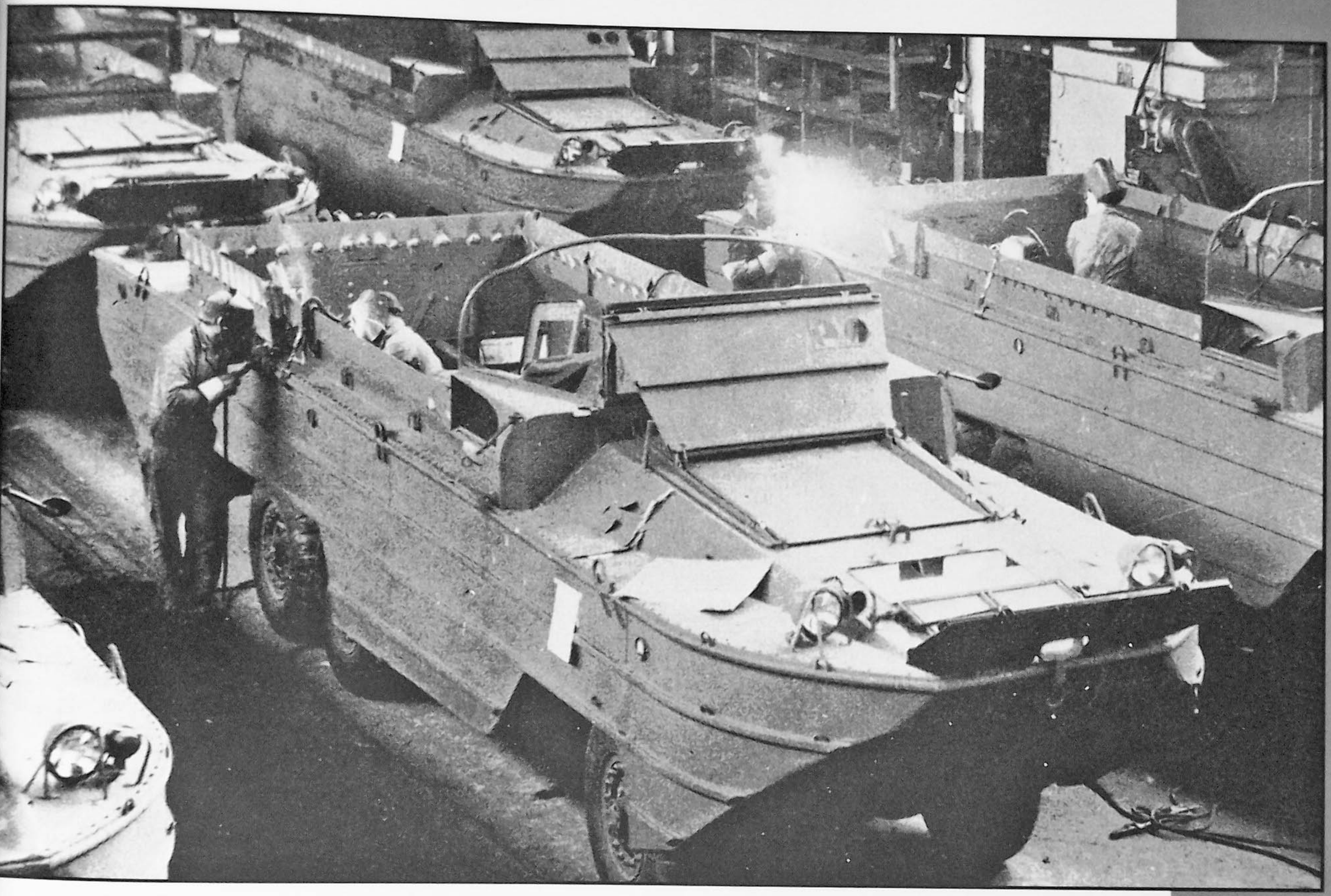




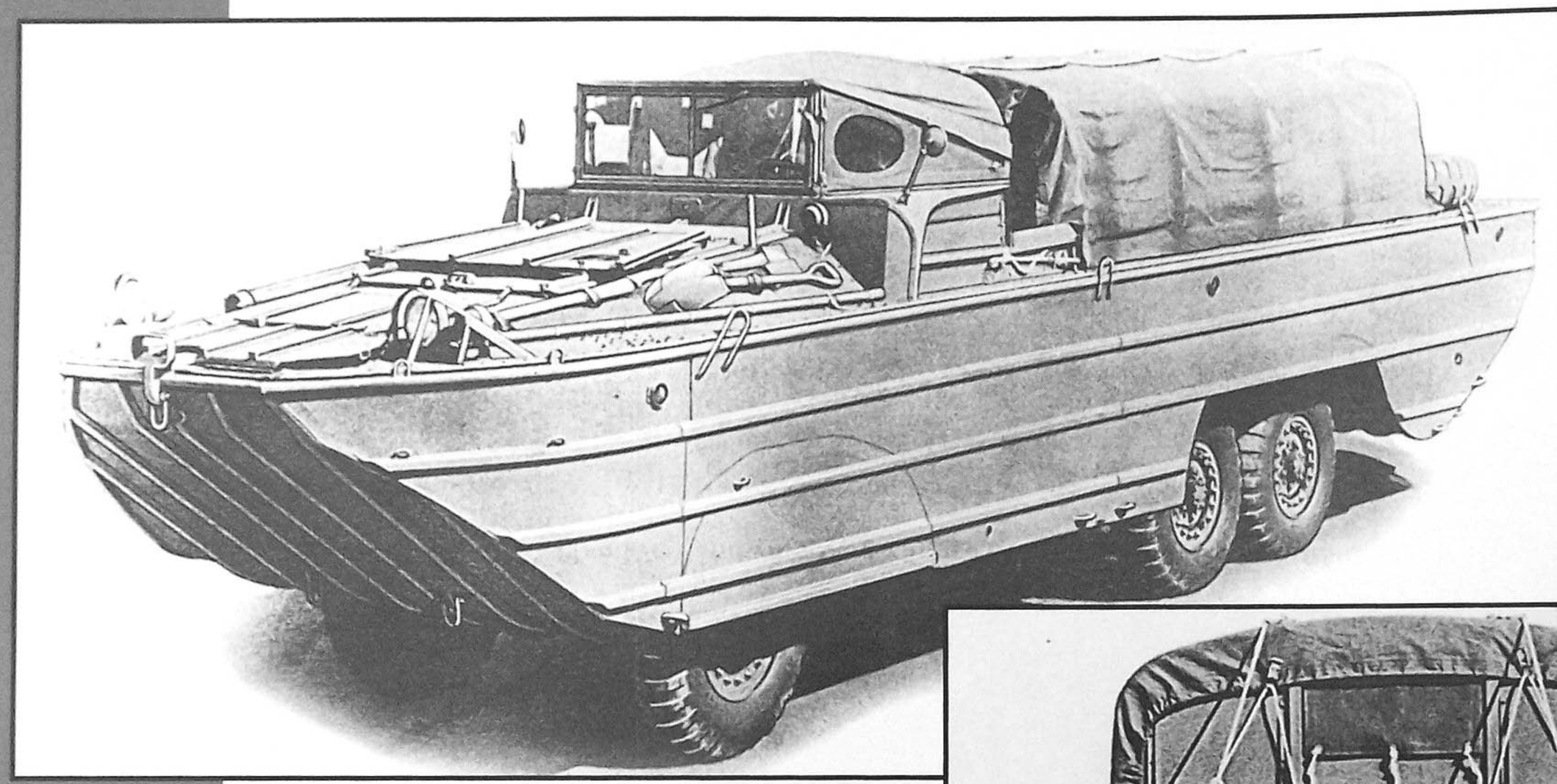
Top: four views of the 230 L-head 6 cylinder engine. In the top two shots the engine is installed in a weapons carrier and in the two shots below it is installed in an ambulance. Note the difference in the height of the firewall. These two restorations are relatively complete. The basic engine color was a very light gray color. This included the block, bell housing, water pump, manifolds, thermostat, carburetor and all the engine compartment sheet metal. The shift tower, which protruded through the body, was painted in olive drab. The oil filter housing, fan, starter, generator, air cleaner, horn and the engine filler cap were all painted semi-gloss black. **Below:** three vehicles not covered in depth here, but certainly worthy of mention are the WC 59 Telephone Maintenance (on the left), the WC 60 Emergency Repair Chassis (center) and the WC 61 Telephone Maintenance (below, right). All these T214 Dodges were manufactured in very small numbers. Only 549 WC 59s were constructed with registration numbers running from 0015366 to 0015914. The WC 59 rear bodywork was made for Dodge by the Highway Trailer Co. of Ederton, Wisconsin. A scant 296 WC 60s were constructed with registration numbers running from 0015915 to 0015986 and 0026383 to 0026606. The WC 60 rear bodywork was built by American Coach & Body Co. of Cleveland, Ohio. The more modern WC 61 Telephone Maintenance vehicle is extremely rare in photos or on the restoration circuit. Only 58 are known to have been built and no registration data is available. The WC 61 bodywork was also done by American Coach & Body.

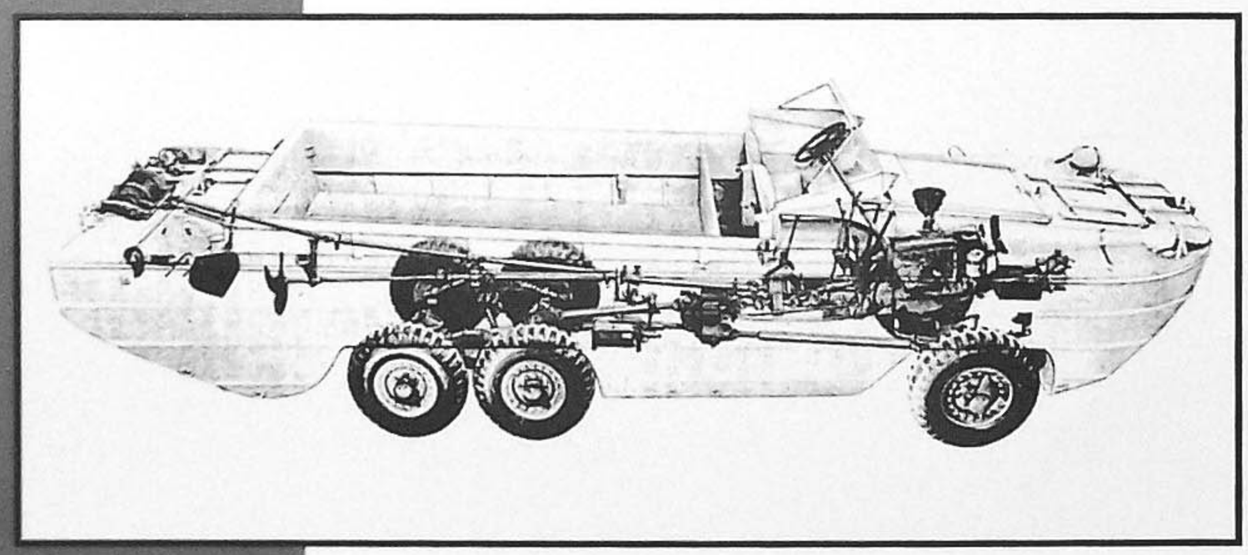
2.5 ton Amphibian Truck, 6x6, GMC DUKW-353

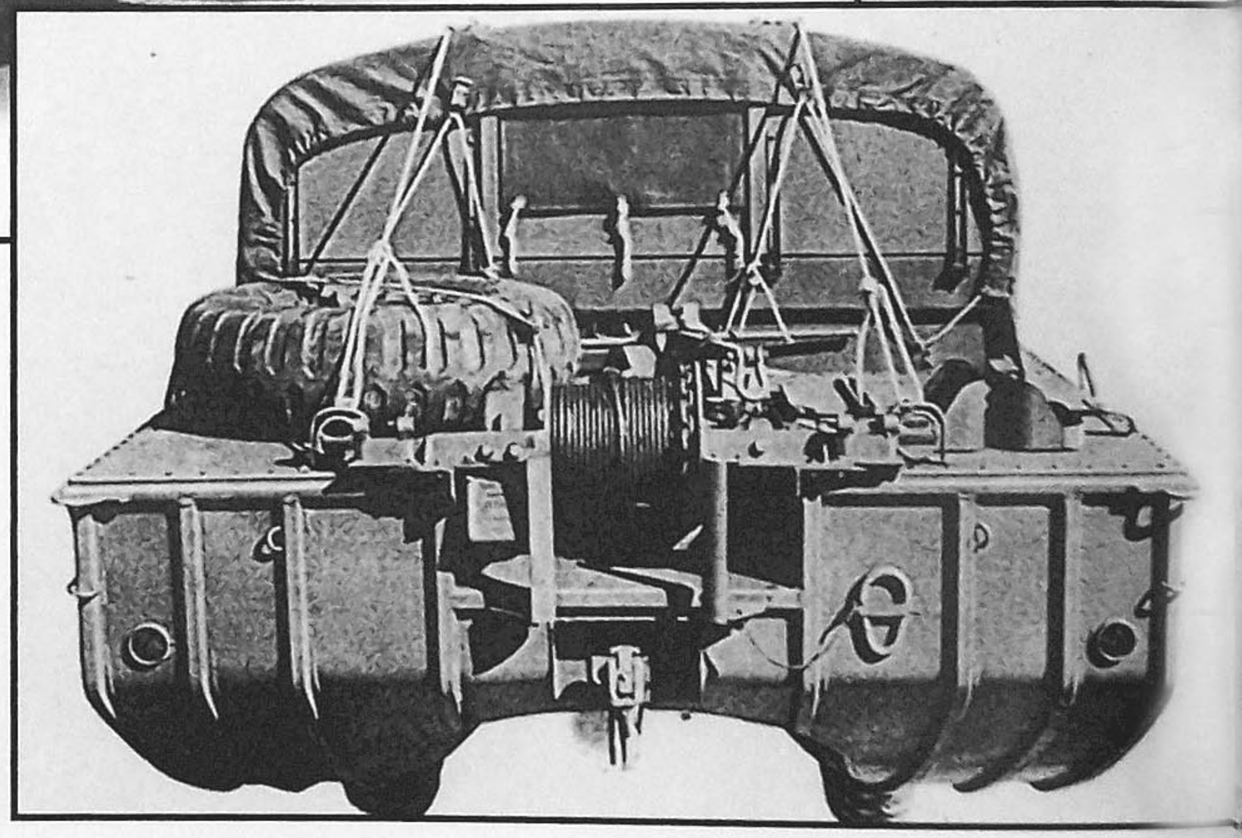
When the United States began planning for its involvement in the Second World War, it quickly became clear that a major portion of its strategy would involve amphibious operations. The United States Quartermaster Corps approached the National Defense Research Committee to study the feasibility of converting existing truck platforms into amphibious vehicles. The main purpose of such vehicles would be to move men and supplies quickly from ship to shore in the absence of a sound port facility. The NDRC was a group of civil engineers and technicians assembled by the government to objectively analyze military equipment problems without influence or prejudice from the military itself. The NRDC studies eventually lead to the development of several amphibious vehicles. Among them, were the "AC-2 Aqua Cheetah" 3/4-ton and the amphibious version of the 1/4-ton Jeep. Although the amphibious Jeep entered into series production, the U.S. military remained highly skeptical about the development of a larger vehicle. Apparently, this was due to their own very demanding criteria that the vehicle was to have nearly identical performance capabilities on land as it had in the ocean. **Above:** this rather silly propaganda shot shows a Duck emerging from the surf with a load of GIs. The Duck was not a combat vehicle and it would have rarely, if ever, been used to assault a contested beach (IWM).



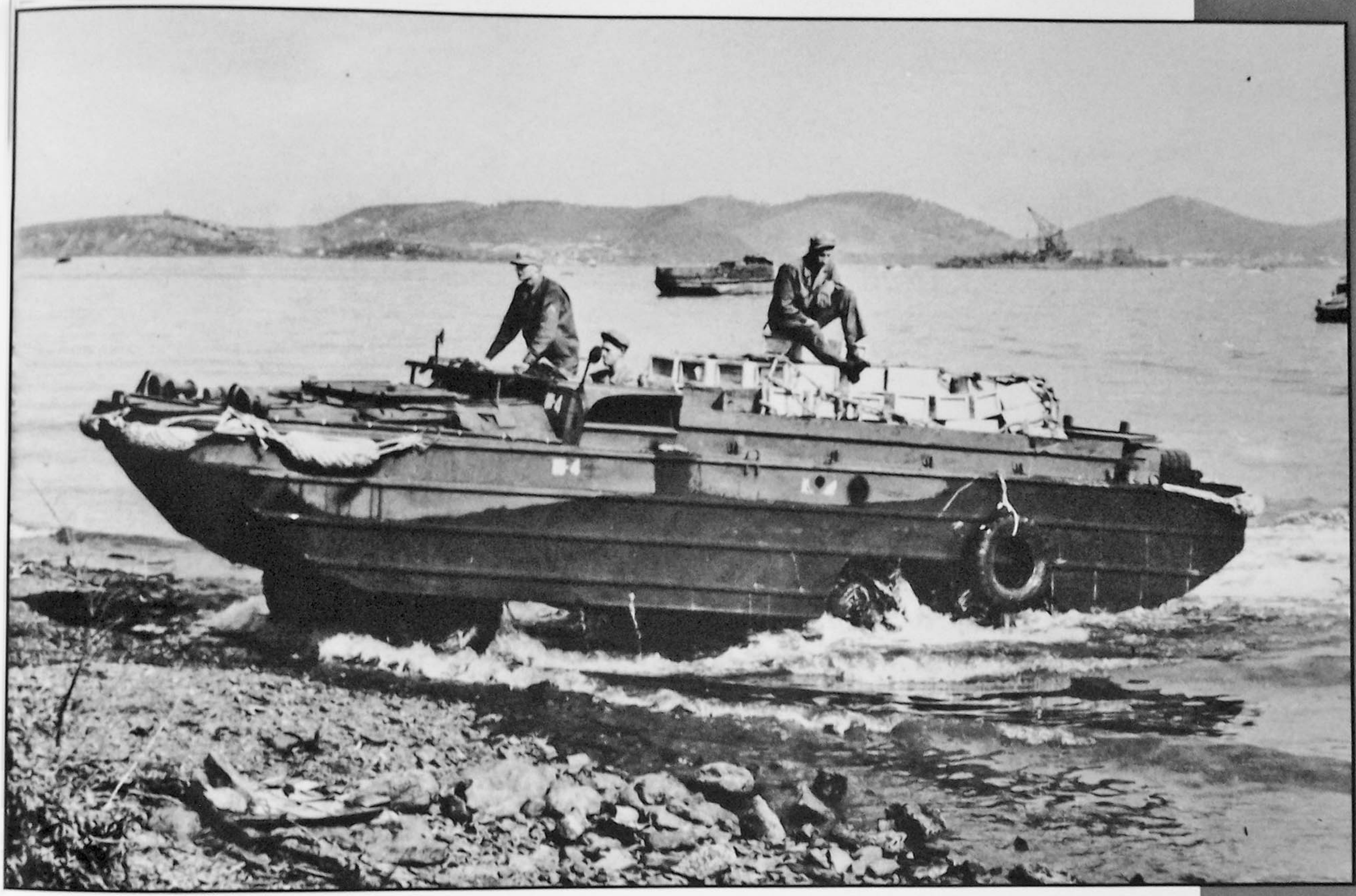
The NRDC was eventually succeeded by the Office of Scientific Research and Development at the beginning of 1942 and they continued to aggressively pursue the concept in spite of continued opposition from the Army. Working with the naval construction firm of Sparkman & Stephens, along the Yellow Truck Co. (a subsidiary of GMC) the OSRD finally developed a prototype amphibious truck. This was based on the longer wheel base AFKWX 353 forward cab truck. Legend has it that the Army was still stubborn on standardizing the trucks, until two were successfully involved in a dramatic sea rescue off the coast of Cape Cod, Massachusetts. The standard wheel base 2 1/2-ton, 6 x 6 truck GMC truck was finally selected as a base vehicle (CCKW 353) and an initial order was placed for 2,000 vehicles. The final version of the Duck was equipped with an integral watertight hull designed so that the truck chassis and drive units are attached both to and in, the body of the hull. **Above:** the production floor of the Yellow Truck Co. These are early vehicles as evidenced by the two small portholes in the front surf guard. In addition to other small changes, later Ducks had a rectangle in this same spot (NA).



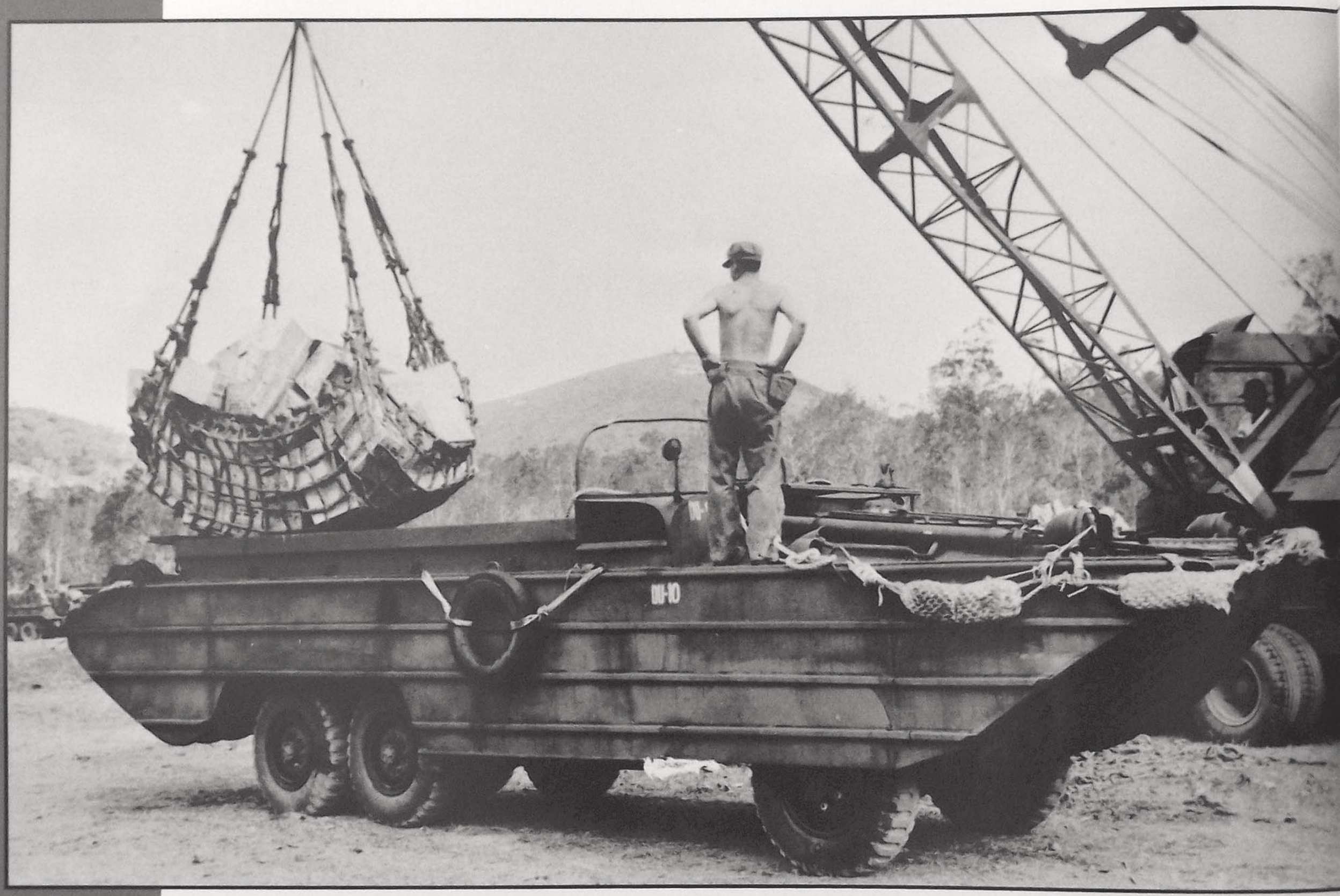




Standardized in October 1942, the first 2,005 Ducks were slightly different than the later ones. These early Ducks had a vertical windshield and had the spare tire mounted on the left-hand side of the rear winch. Later production Ducks had an improved and slightly redesigned windshield for better protection against the surf. For land operations, the Duck utilized its six–wheel drive and a conventional steering-gear assembly. **Top:** this is the tech manual shot of the early Duck model. The lack of a rear wheel fairing was another early feature, although on many later Ducks this were either lost or discarded by the crew. **Above left:** this tech manual drawing shows how the various drive shafts run though the vehicle. The power take-off shaft for the winch is notable for its long length. **Above:** this shows the rear of the early type, with the spare tire mounted on the left.



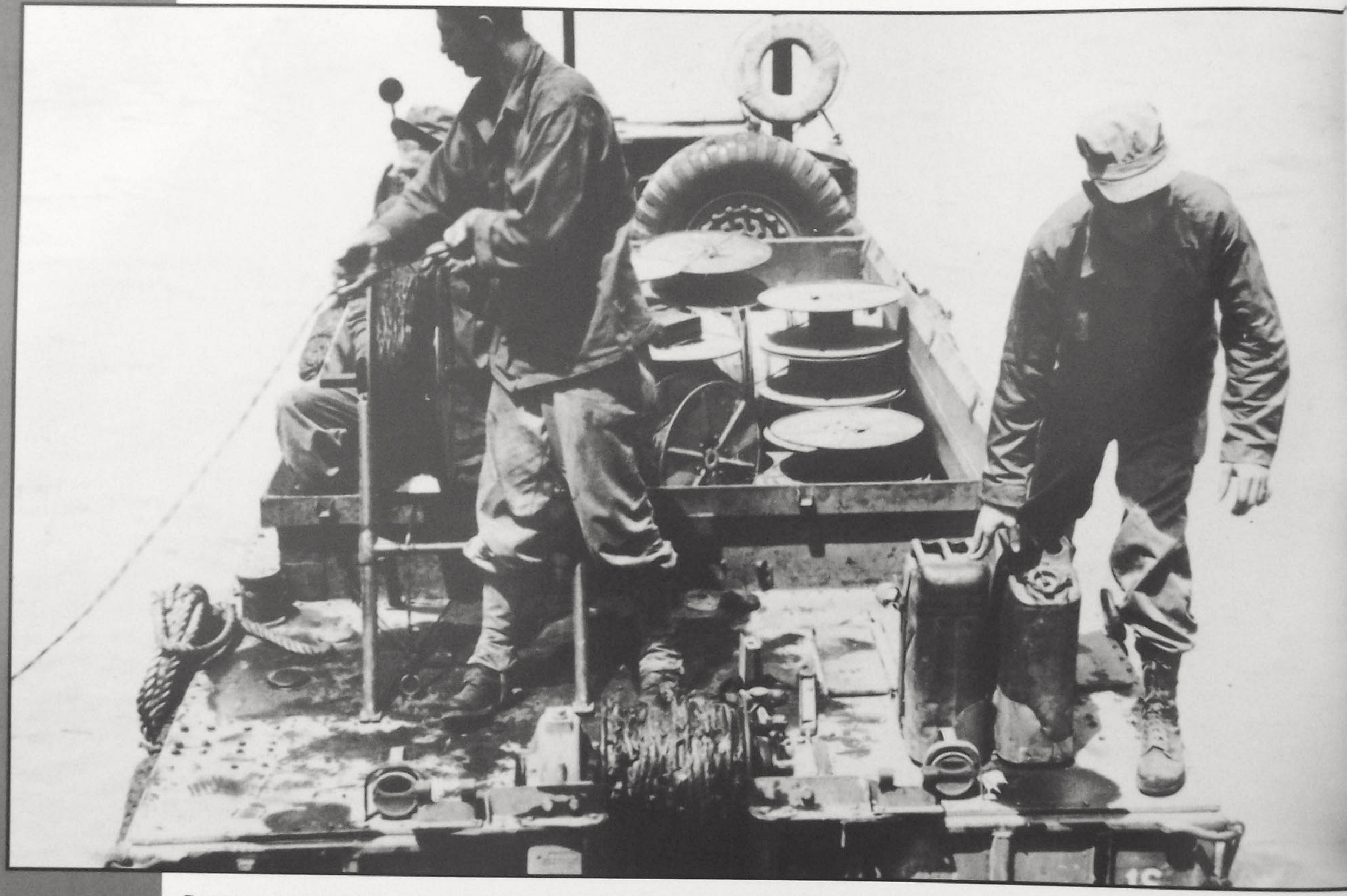
In the water, the Duck is propelled with a bladed propeller and is steered by the combined use of the front wheels and a rudder that is connected to and operated by the steering-gear column. The nickname "Duck" was derived from the vehicle's official nomenclature of DUKW-353. All GMC trucks were assigned a variety of letters to define their use and capabilities. A separate letter was used to define the truck's year of design, the vehicle type, whether it front or rear wheel drive and if the vehicle had a longer than normal wheel base. In the case of the Duck we have "D" for 1942, "U" for amphibian, "K" for front wheel drive and "W" for rear wheel drive. **Above:** the very first operational use of the Duck was in March of 1943 during the American invasion of New Caledonia in the South Pacific. This Duck has just disengaged its propeller and is accelerating onto shore. Note that the cargo is encased in a net for quick loading and unloading (IWM).



Springs and driving axles are attached to the outside bottom of the Duck's hull and these are suspended in water when the vehicle is in use as a boat. The welded steel hull is slanted forward of the driver's compartment, to the rear of the rear wheels and along both sides. A crash rail is installed all around the hull at deck height. The driver's compartment is open, with removable canvas top and an open back, and removable side curtains. The windshield can be folded forward, or tilted upward and outward.

Above: whenever possible cargo was kept within its sling as it was off-loaded. This meant for a quick trip on the shore side. When the weather was good and the surf calm, the driver could lower the surf shield and the windshield as shown here. The crane appears to be the massive Biderman P1 Crane Truck, which is equipped with the 20-ton Michigan TM16 crane (IWM).

The Duck is equipped with a two-speed transfer case and this permits drive of both the front and rear axles, or only the rear axle, as required. The water propeller transfer case, mounted in line between transmission and transfer case, permits engagement or disengagement of the water propeller. A marine rudder and controls are provided for use in water. **Above:** one of the many uses for the Duck was the running of communication wire across both land and water obstacles. Here, an Army Duck is employed at this task on an island of the Admiralty group in the Southwest Pacific. Every fourth Duck was outfitted with the M36 Truck Mount, which could mount either the .30 caliber or .50 caliber machine gun. Interestingly, the soldier in the foreground wears the popular molded rubber and canvas jungle boots (IWM).



The cargo compartment of the Duck could accommodate approximately 25 men and their equipment or an approximately 5,000 pound payload. Hatches in the rear deck and floor provide access to the tool and storage hold, the rudder operating mechanism and rear winch shaft. Two hatches in the bow facilitate access to the engine, accessories and forward compartment. **Above:** a second shot of vehicle seen in the previous photo. Communications wire was also run from ships in harbor areas directly onto the beach. Here the crew is laying cable down on to the seabed. By the look of the empty wire reels in the cargo bed, they have been at it for some time. In order to make greater use of the rear deck the crew has relocated the spare tire and sand anchor to the rear of the driving compartment. Again, note the jungle boots on the man at the right (IWM).

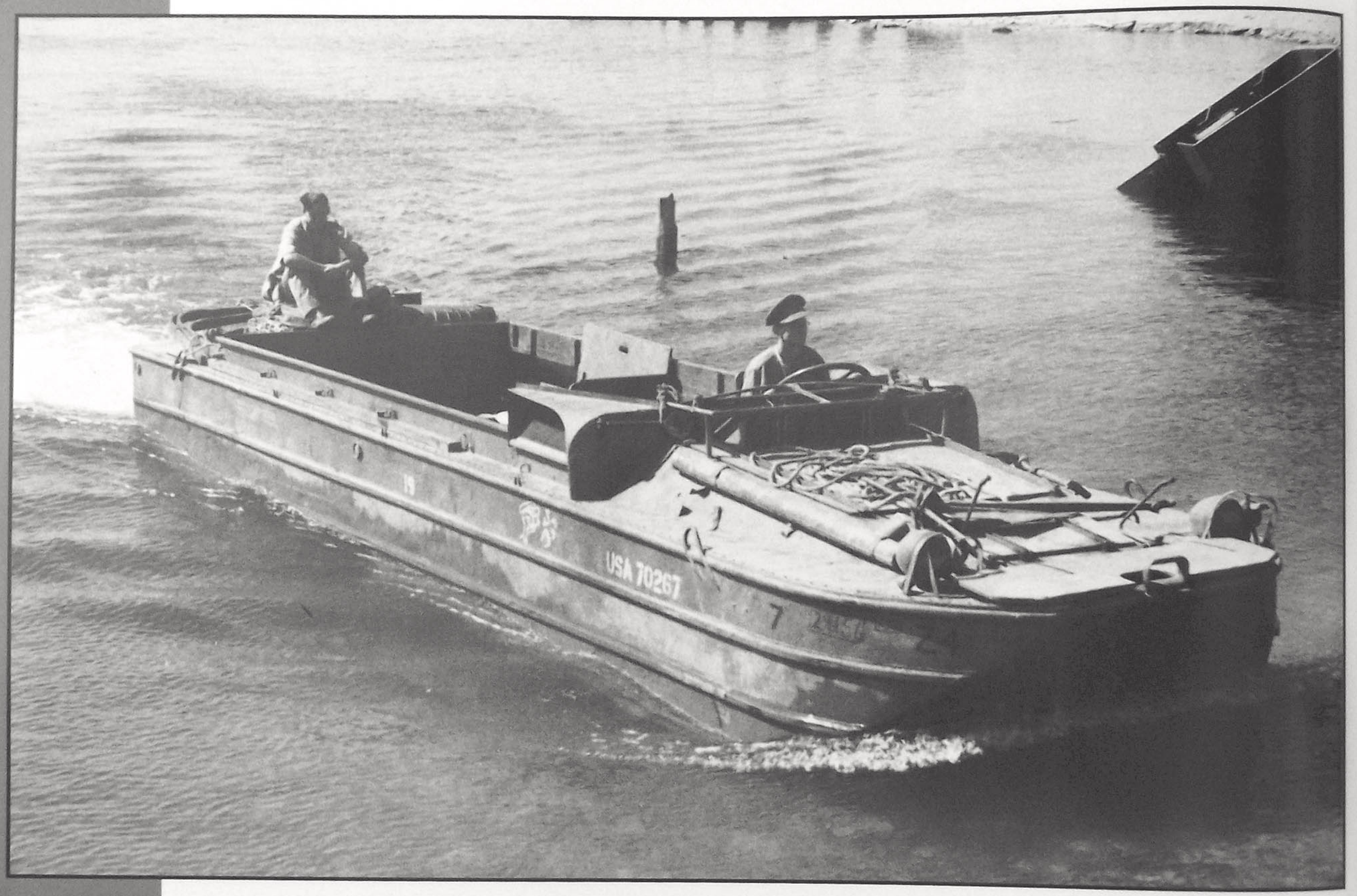
A Gar Wood 10,000-pound winch is mounted at the rear of the Duck. Cable guides are provided to permit operation at either the front or the rear. An anchor with a shackle is also furnished. One ring type life preserver and three life preserver jackets are supplied as standard. True to it nautical use, mooring eyes, suitable davit eyes and fender eyes for rope fenders are also provided. Because it spends a good part of its life in the water, a 60-gallon per minute rotary pump and a 260-gallon per minute centrifugal pump are used to pump water out of the hull. A 50-gallon per minute hand pump is furnished for emergency use. **Above:** the British were quite pleased with the performance of the Duck and quickly deployed it when it became available. Here, the Duck is being tested in North Africa with a 6-pounder gun as a payload (IWM).

Above: another of the British test vehicles participating in invasion exercises for the upcoming Sicilian operation. The W-S serial number is interesting. This Duck is numbered sequentially with the vehicle on the previous page and it also is loaded with a 6-pounder. The gun would still have to be lifted out of the cargo compartment with a crane. One of the major drawbacks of the Duck was that it was not equipped with a loading ramp. The designers felt that the addition of a ramp would compromise the vehicle's watertightness (IWM).

Above: a British Duck moves inland from "George" beach in the late afternoon sunshine of July 12th, 1943. The invasion of Sicily was the first operational use of the Duck in British service. Judging by the expressions of the crew, they are pretty happy with the truck. The arrow on the tree at right has been placed by the Beach Master to assist returning vehicles in finding the beachhead. It may seem obvious, but with drivers unaccustomed to the terrain, it was vital to keep the stream of men and material flowing (IWM).

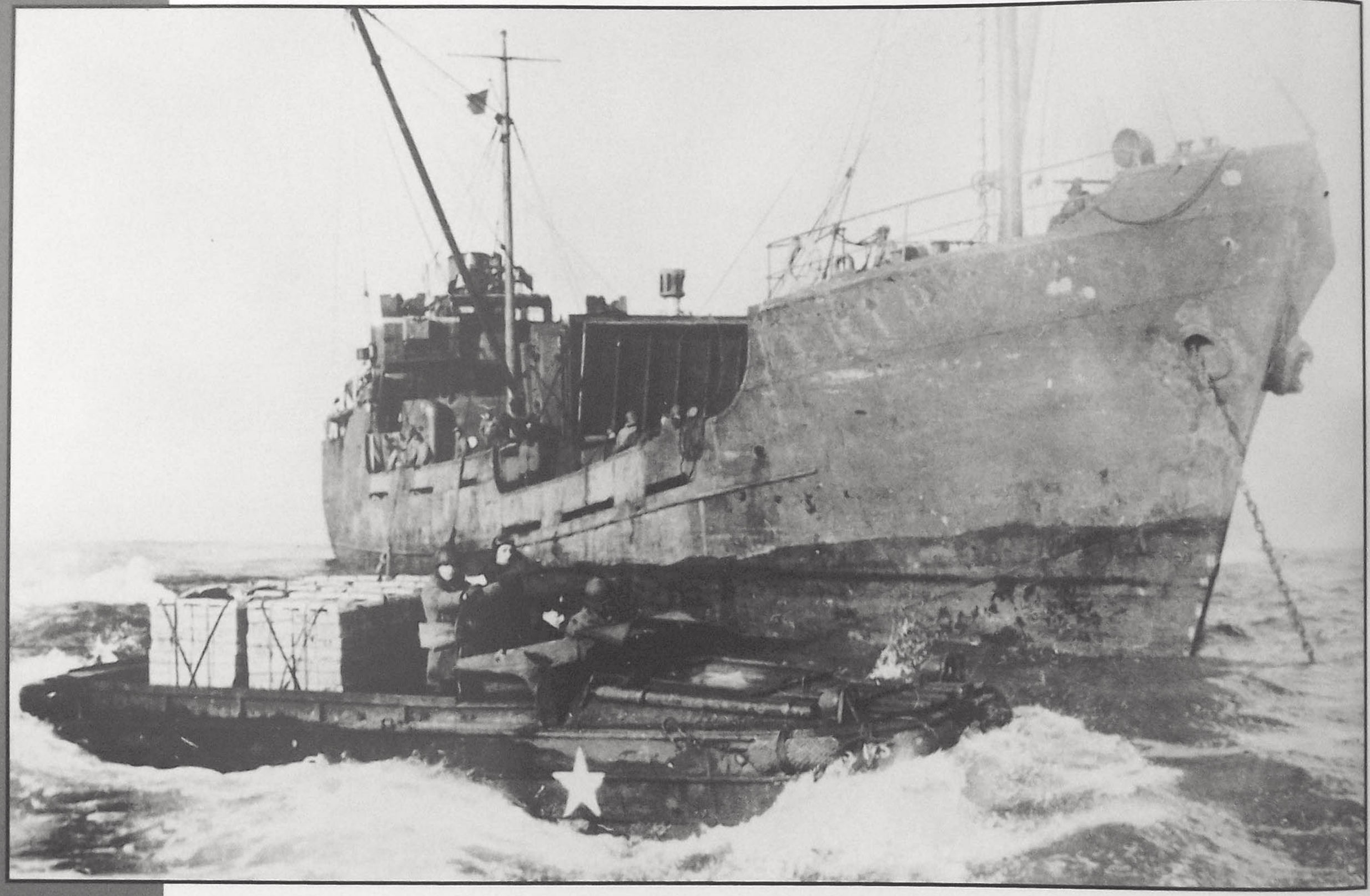
Above: taken on July 9th, 1943, this shot shows a line of British Ducks waiting to take on a load of palletized five-gallon fuel cans. These Ducks are transporting supplies between the Sicilian port of Messina and the Italian mainland. The forward-most vehicle has its rear splash shield in place. This served to prevent water from splashing back into the cargo compartment and was also the rear support for the cargo bed canvas cover. This shot provides an excellent view of the front rope bumpers and davits. Note also that none of the vehicles seen here have their rear wheel fairing in place (IWM).

Above: British General Montgomery uses a Duck while touring of the troops in early July, 1943. This photo was taken on July 12th while Monty was on his way to visit Lord Louis Mountbatten in Syracuse, Sicily. The Duck has a number of interesting features. It contains the "HD" marking indicative of the British 5th Infantry Division on the driver's bulkhead. This division was attached to the 8th army at this time. The lower front end of this Duck is particularly well lit and the lower tow shackles and their enclosures are visible (IWM).



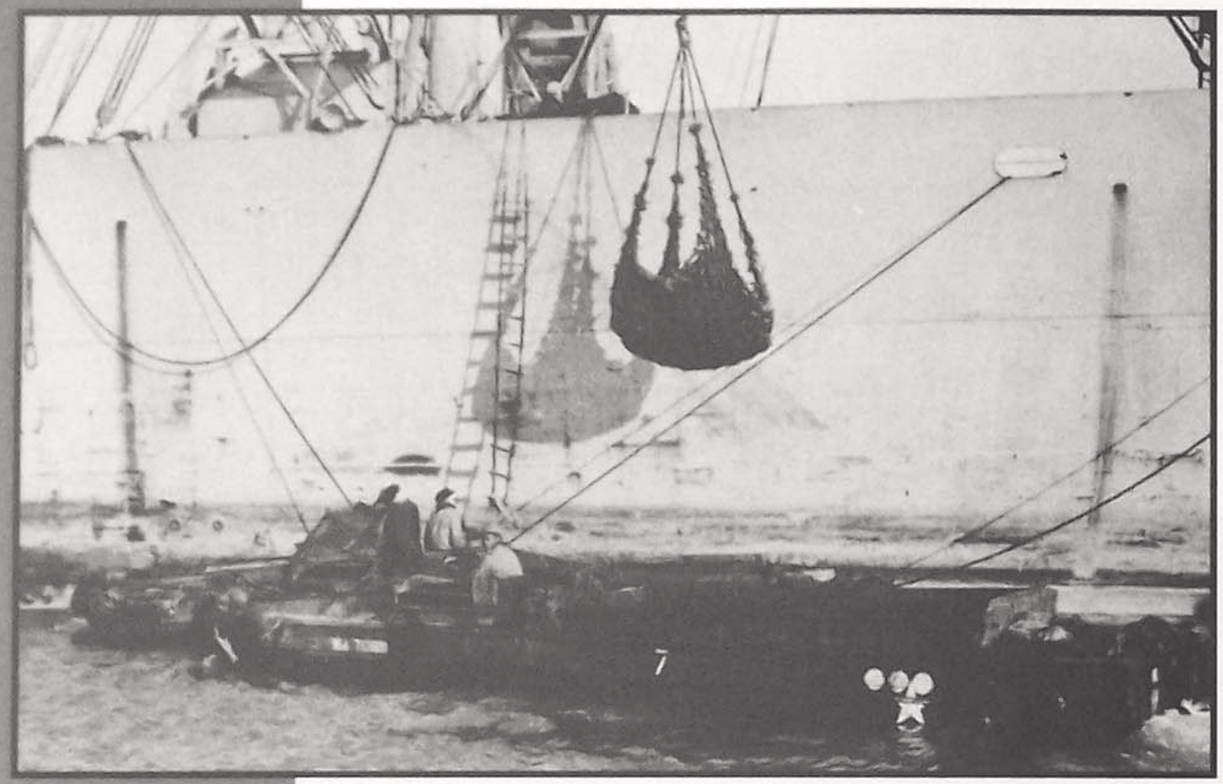
Above: prior to the invasion of Southern Italy in late August of 1943, the harbor facilities at Reggio, Italy were heavily damaged by the retreating Germans, making them ineffective for use with ships. This was a role in which the Duck shined. Shortly after capturing the town, engineers cleared ramps in the harbor to allow the Duck to run in and out from the harbor. Here, a U.S. registered Duck makes its way to one of those ramps. This photo shows how much the draft of the Duck increased when it was not loaded. Compare this with other photos of fully loaded vehicles. The lack of freeboard was not a hindrance in the balmy warm weather conditions of the Mediterranean, but it would be in the rougher seas of Northwestern Europe (IWM).

During the invasion of Sicily, the southern port town of Licata also received heavy damage.The inner harbor was practically useless, but some of the outer piers were able to be repaired. The causeway linking them was also heavily damaged and while that was being repaired, hundreds of Ducks were used to move supplies to the inner harbor. The Duck was something the Germans had not anticipated! (IWM)



Prior to the Normandy landings, there were several practice exercises to work out the wrinkles in not only combat landing procedures, but also cargo landing procedures as well. Here, Ducks off-load a cargo of C-rations from a Liberty ship anchored off the southern coast of England. This photo was taken from another Duck and it shows how little freeboard the Duck had while fully loaded (IWM).

Another Duck from the same unit makes its way into the practice beach. A Chemical Warfare Unit provides the smoke cover. Fortunately for the soldiers on both sides of the war, this was the limit of their involvement in combat operations. These two photos may have been taken at the same time as the infamous Slapton Sands exercise, which took place off the coast of Devon, England. This large-scale invasion practice maneuver was disrupted by nine German E-boats on April 27th, 1944. The attack resulted in the sinking of two LSTs as well as serious damage to another. Over 700 soldiers and sailors were killed in the attack. The units involved actually suffered greater casualties at Slapton Sands than they did on D-Day (IWM).



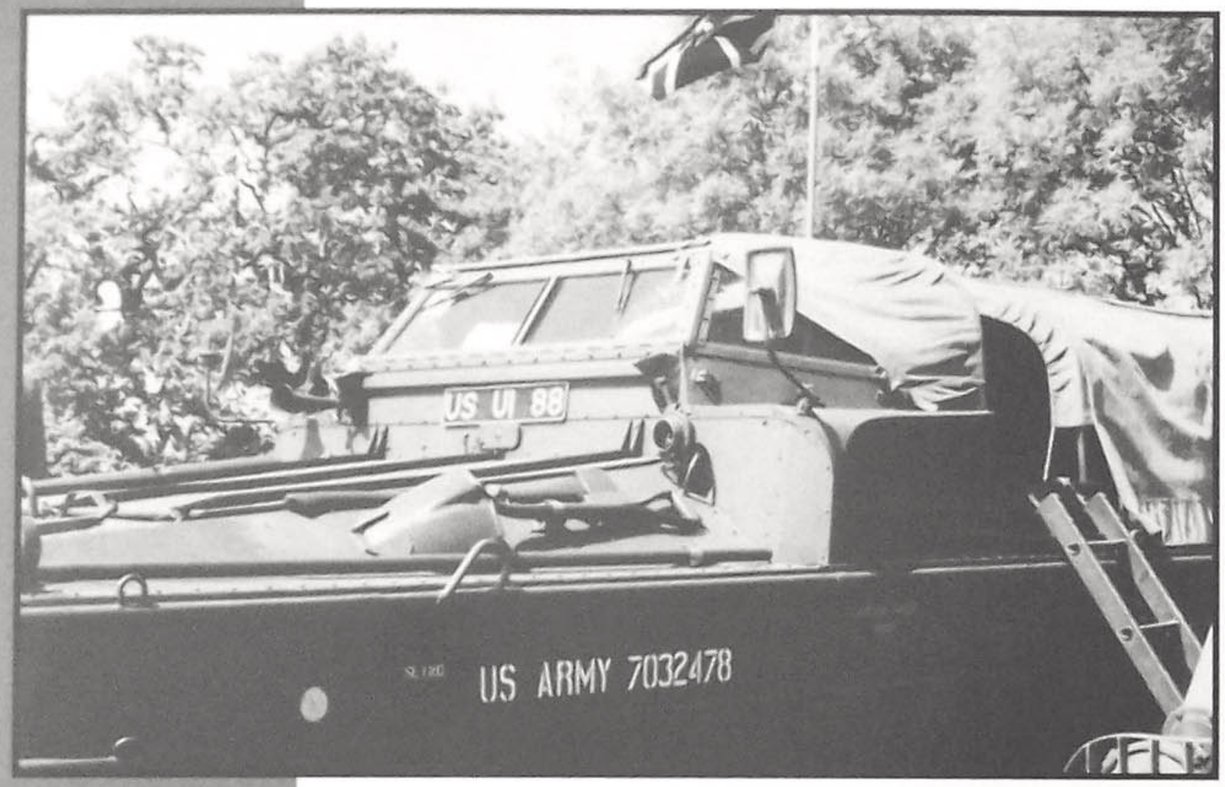
Top left: the French port of LeHarve was severely damaged by the Germans in the fighting following the allied landings. However, it continued to be a very busy place, thanks to the Duck. Here, supplies are off-loaded from a Liberty Ship into the Ducks of the 470th and 819th Amphibious Truck Companies on November 15th, 1944. Over 500,000 long tons of supplies were moved by Ducks in LeHarve between June, 1944 and early May of 1945 (NA). **Top right:** between March 7th and March 31st, 1945, seven allied armies crossed the Rhine to support the bridgehead established at Remagen. Among them was the U.S. Seventh Army under General Patch. The next four photos depict Ducks from the Seventh Army. This vehicle is moving a 105mm howitzer across the river (NA). **Above left:** black GIs stack a load of five-gallon gas cans in the back of a Duck. The cans have been fastened together in pairs to make loading easier (NA). **Above right:** a Duck takes the strain on the far side of the river. A rough landing ramp has been hastily constructed from loose bricks. This Duck has the M36 gun mount installed. This was installed at a much greater height on the Duck than on other vehicles in order to keep the gun clear of water (NA).

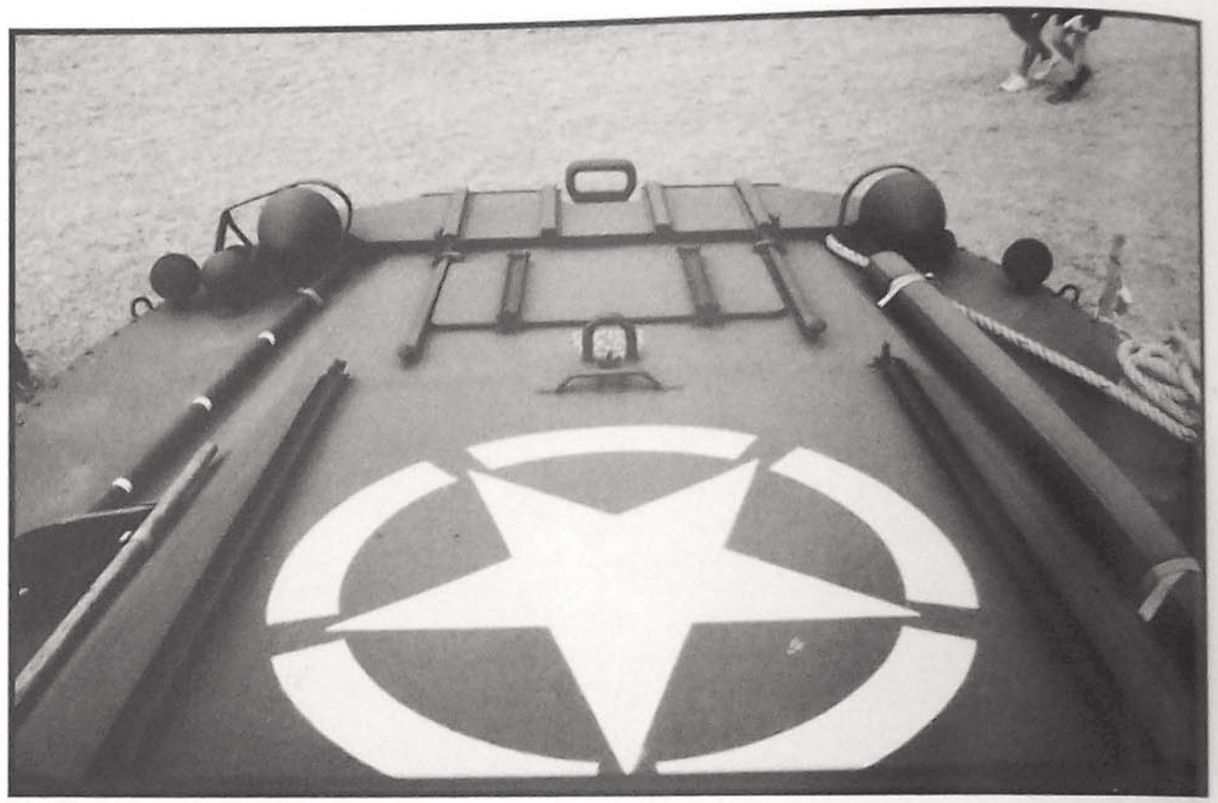
Above: another Seventh Army Duck slides into the Rhine. The considerable size of the cargo here and in the other photos strongly indicates the presence of a crane or a hoist near the loading sight. The lack of a loading ramp, such as that installed on the LVT-3 and LVT-4, meant that cargo such as the Jeep seen here, needed to be lifted in and out of the vehicle. After 1943, approximately one in five Ducks were equipped with an A-frame lifting jib. This consisted of two steel tubes joined at the top and supported by cables attached to the body of the Duck. This was installed over the rear winch so that it could be used as a power source. This vehicle, as well as the others in the sequence, contains large and elaborate name artwork (NA).

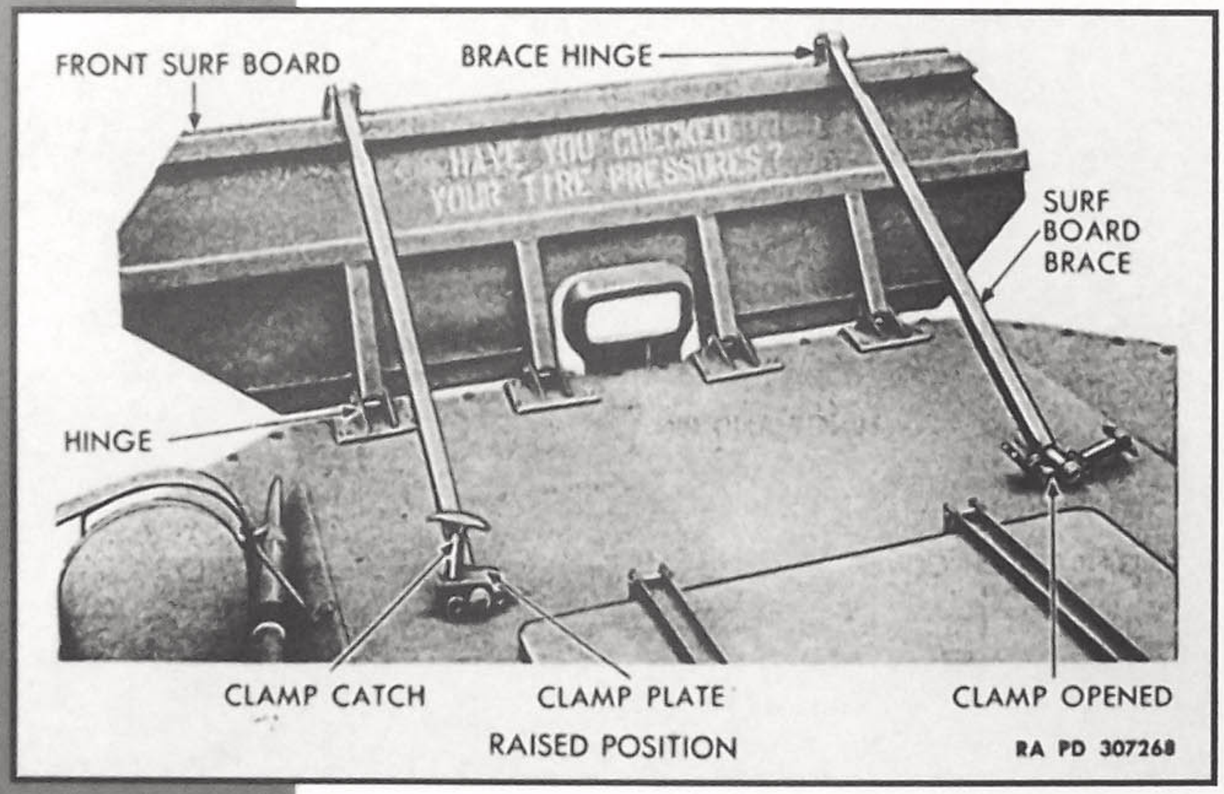
Over 21,000 Ducks were produced during the war for the U.S. Army and Marines as well as lend lease. Thousands of Ducks survived the war to see service with NATO armies, where they continued to be used extensively. The British only retired their Ducks in 1974. The French Army and the Mexican Army are know to have relinquished their Ducks as late as 1980! Ducks were also popular with civilian authorities involved in water rescue and some of those remained in service into the 1990s. **Above:** this is a Duck owned by a private collector in the UK. This vehicle was purchased from the French Army and extensively restored. It is a later pattern Duck, note the presence of the air inflation system on the tires.

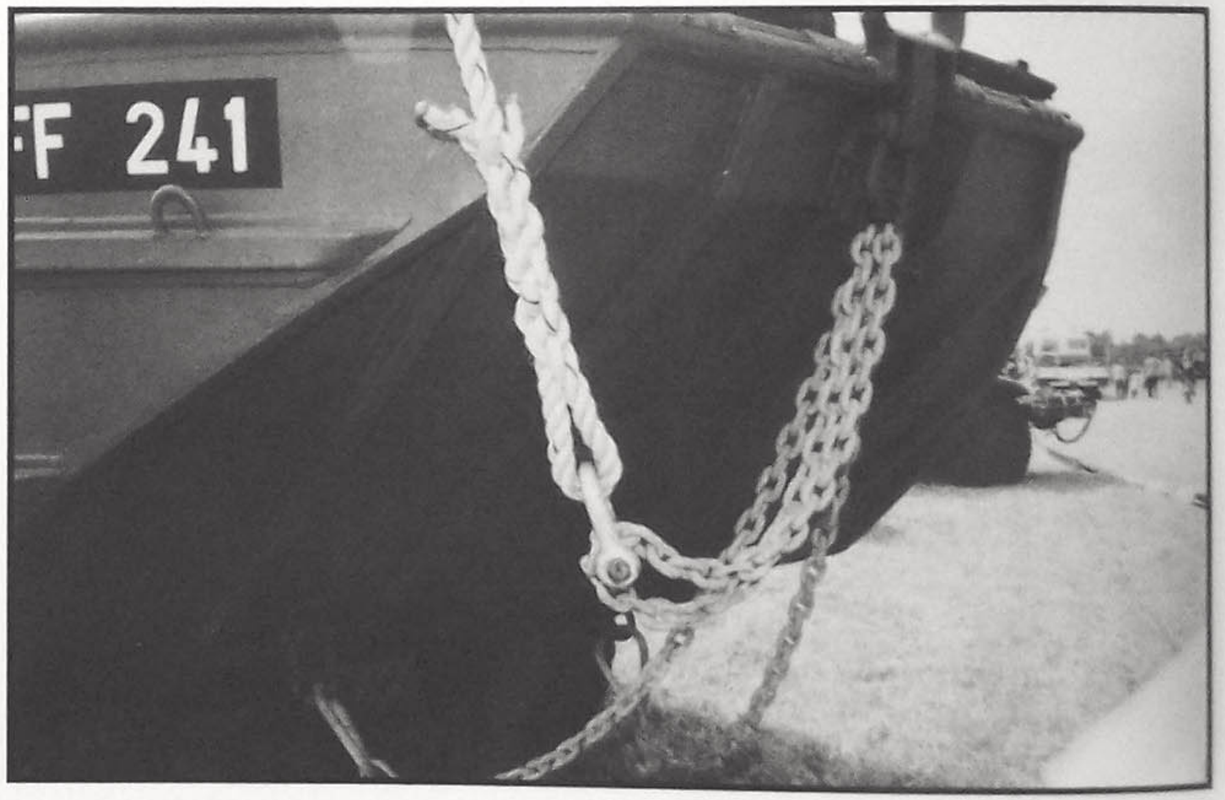
Because of the versatile nature of the Duck, it was used as a basis for a number of specialized vehicles. Among the many experiments was a plan to link several Ducks together for use as a bridge. Although these experiments were not successful, such thinking was to eventually lead to the development of modern military bridging equipment, such as the M2 Alligator. Ducks were also sometimes linked together for use as ferries, bringing into shore large objects, such as partially disassembled airplanes.

Several specialized Ducks, mounting an enormous Merriweather fire-fighting ladder, were designed for use by U.S. Rangers on D-Day. These were to assist in scaling the cliffs at Pont du Hoc. However, the large shell craters created by the pre-landing bombardment prevented them from being properly deployed. **Above:** a rear view of the previous Duck. The tires are not the original pattern.

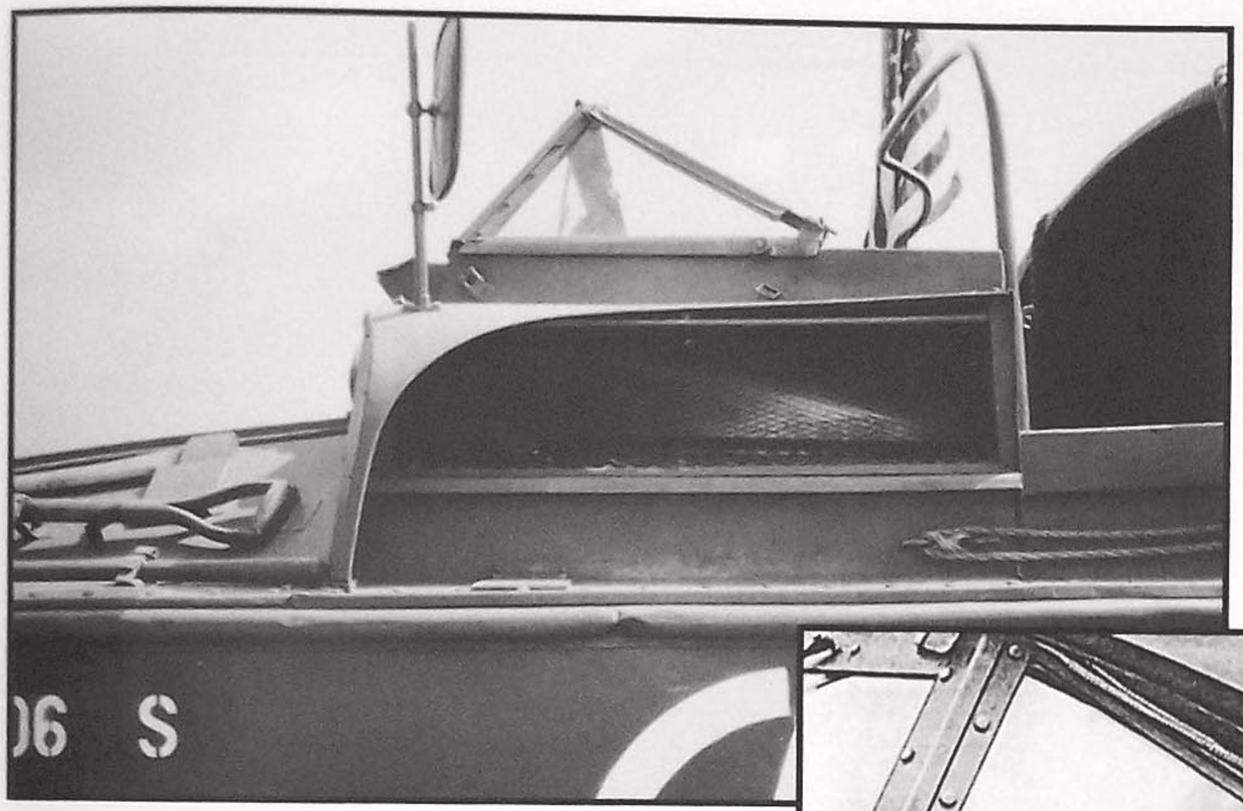


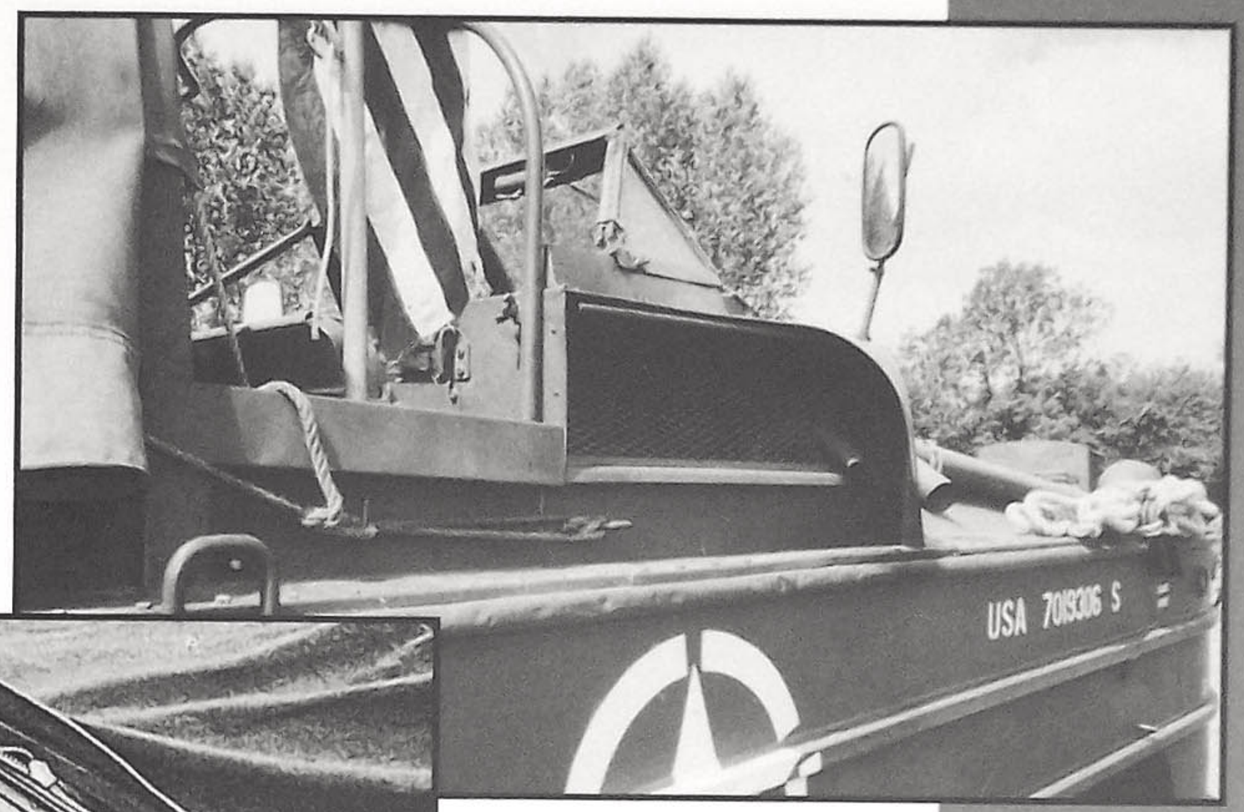


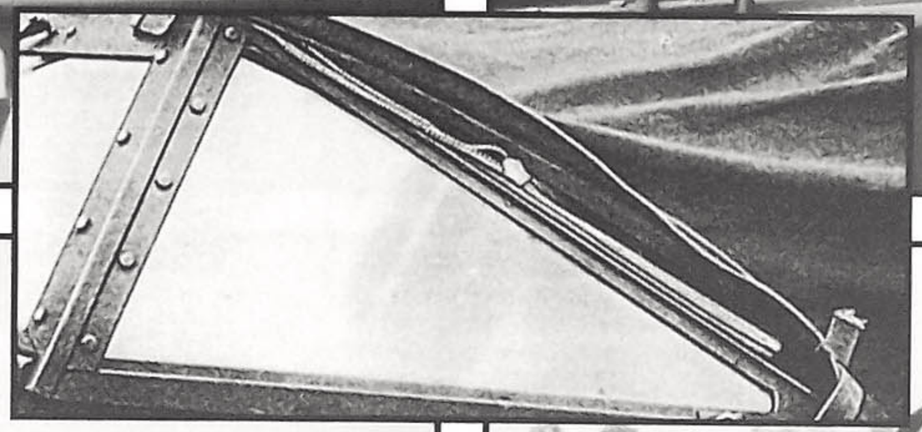




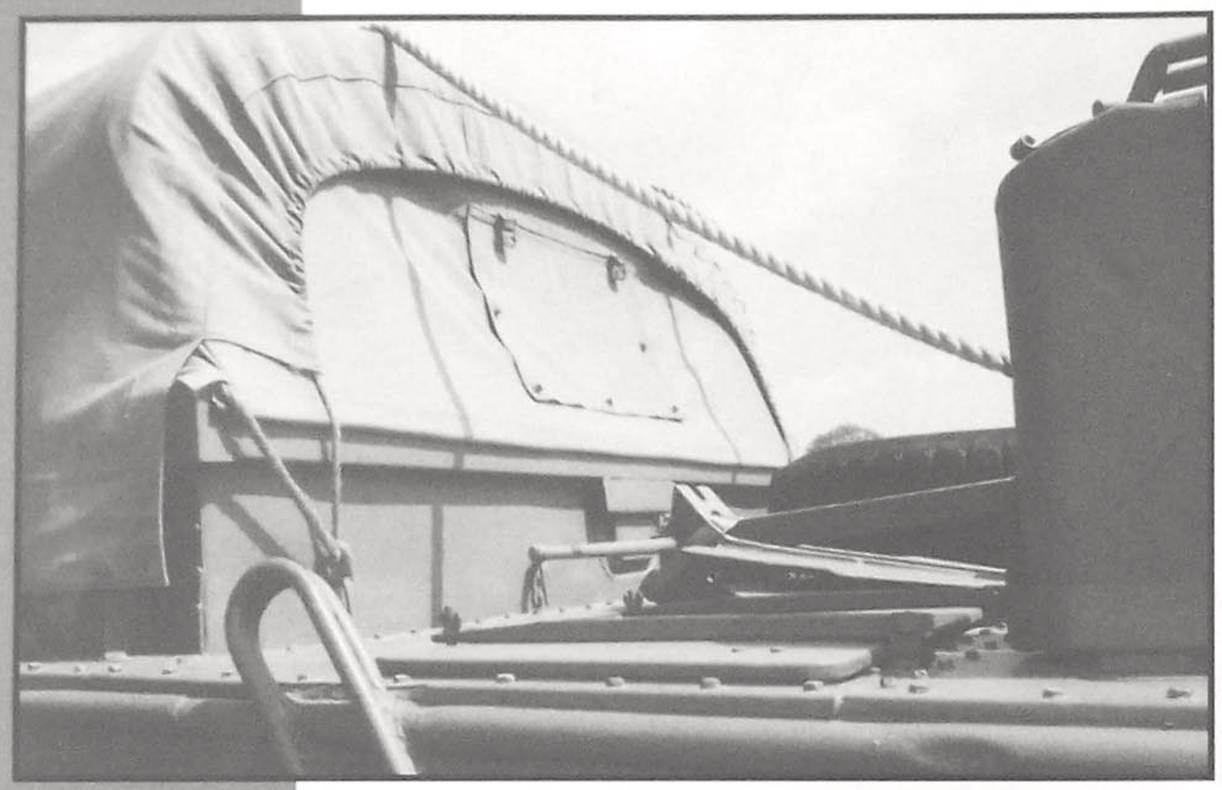
Top left: the windshield area of a late Duck. The slanted side panels and the slant of the windshield are distinguishing features of vehicles produced from vehicle 2006 on. **Top right:** the front hood area of the same Duck. The panel with the star is the engine access hatch. The smaller panel forward of the engine access panel is for a storage compartment. The forward-most panel is the front "surfboard," which was used to prevent water from washing over the driver's position. **Above left:** this tech manual shot shows how the surfboard is to be positioned. **Above right:** this close-up of the front-end shows the addition of a "ready chain," used in the event the vehicle became stuck.

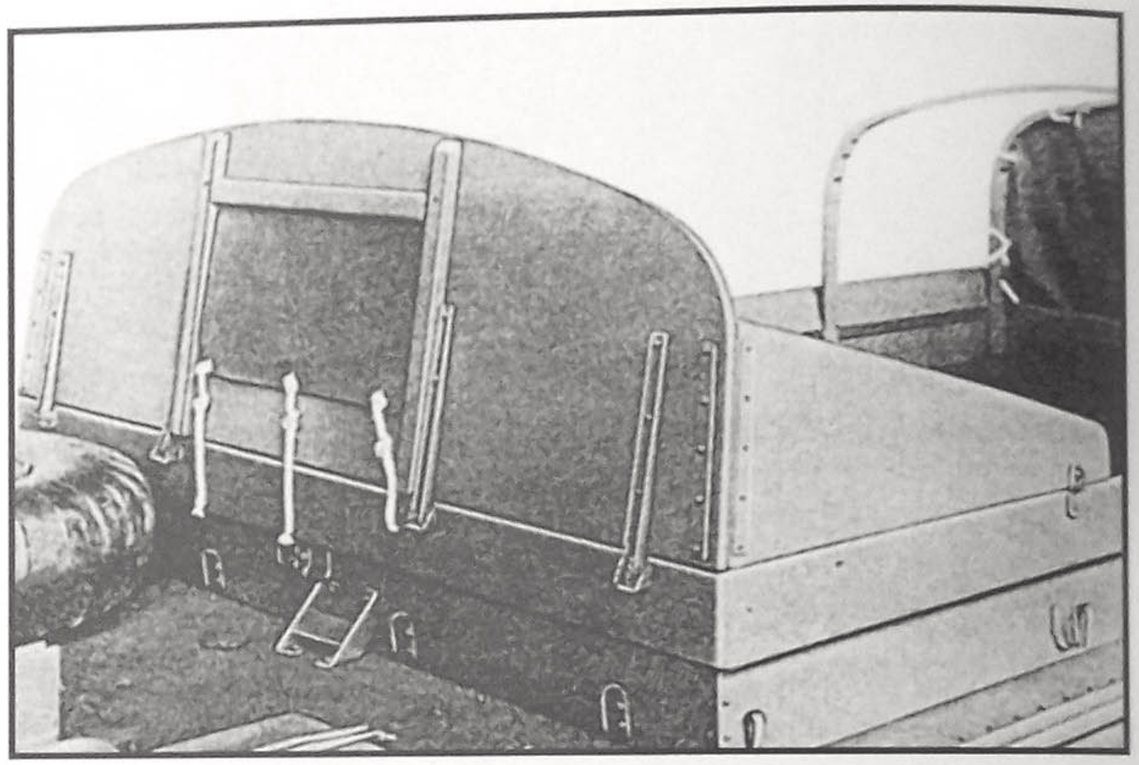


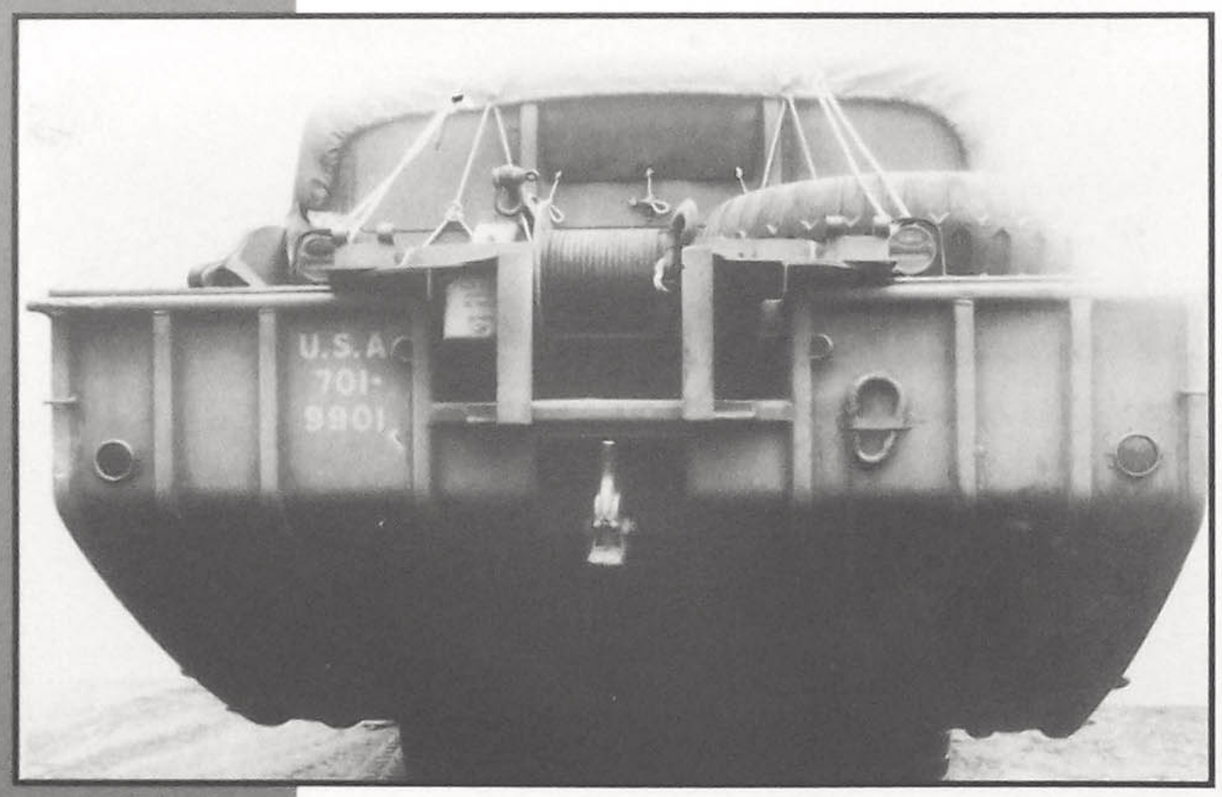


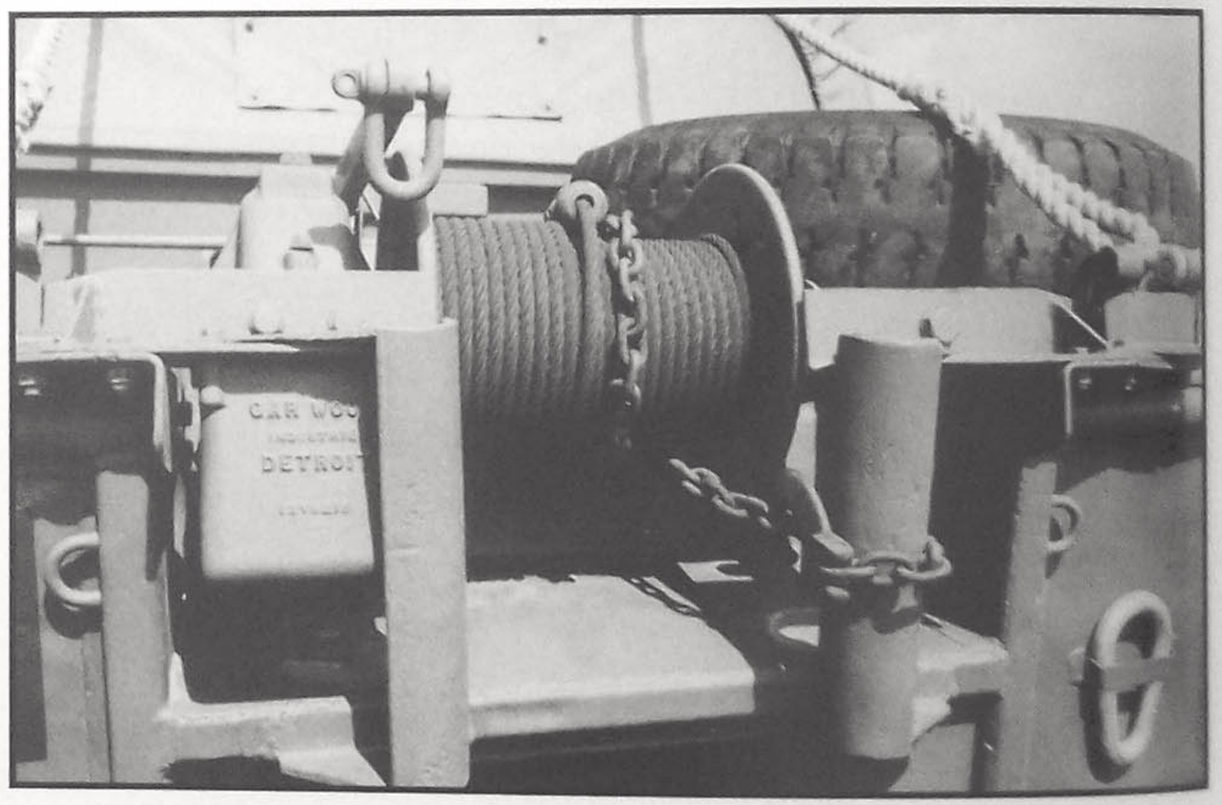


Top left and right: these two large side vents exhausted hot air from the engine compartment. **Inset:** this tech manual photo shows how the canvas top was attached to the side windshield panel. **Above left and right:** the front end lights and their frames. Several of the tie-down points can be seen in these photos. These were used to secure the various rope bumpers used in mooring the Duck. The large tube seen in the shot at right is a hand-pump for removing water from the cargo bed. The numberplate seen here is a civilian item.

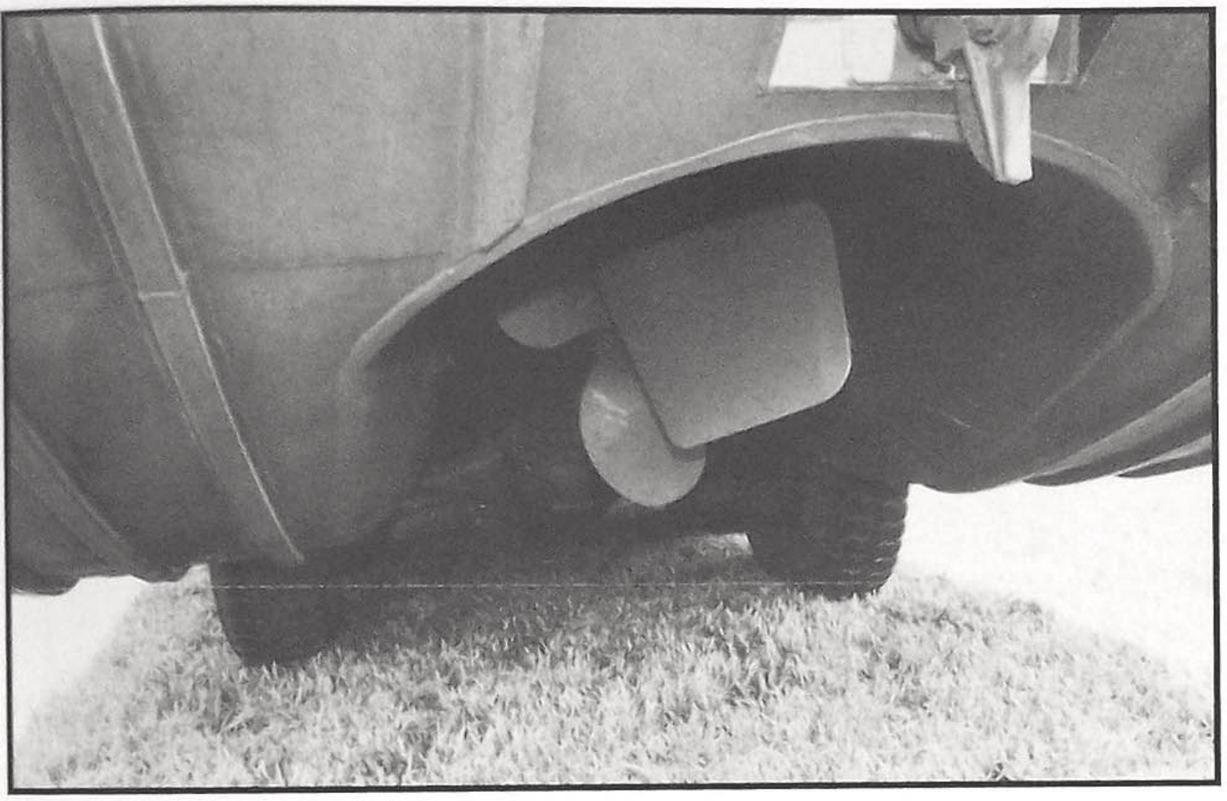


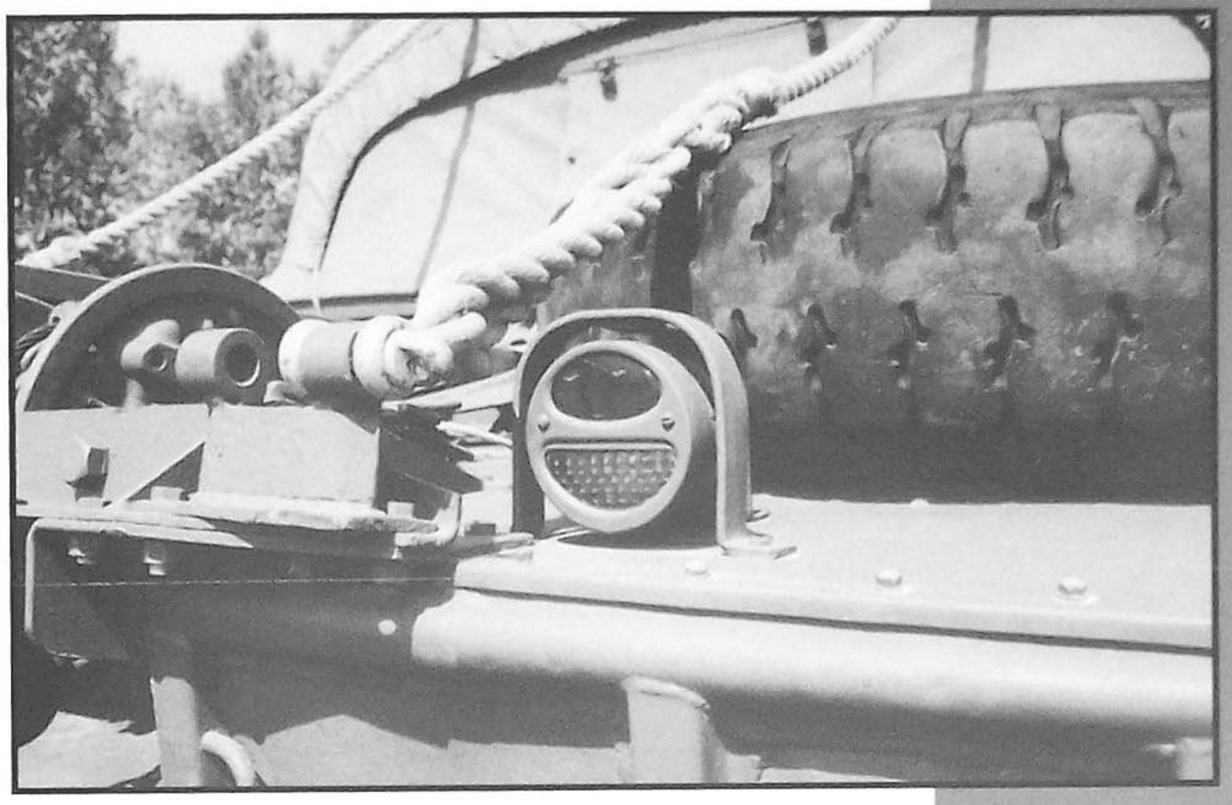


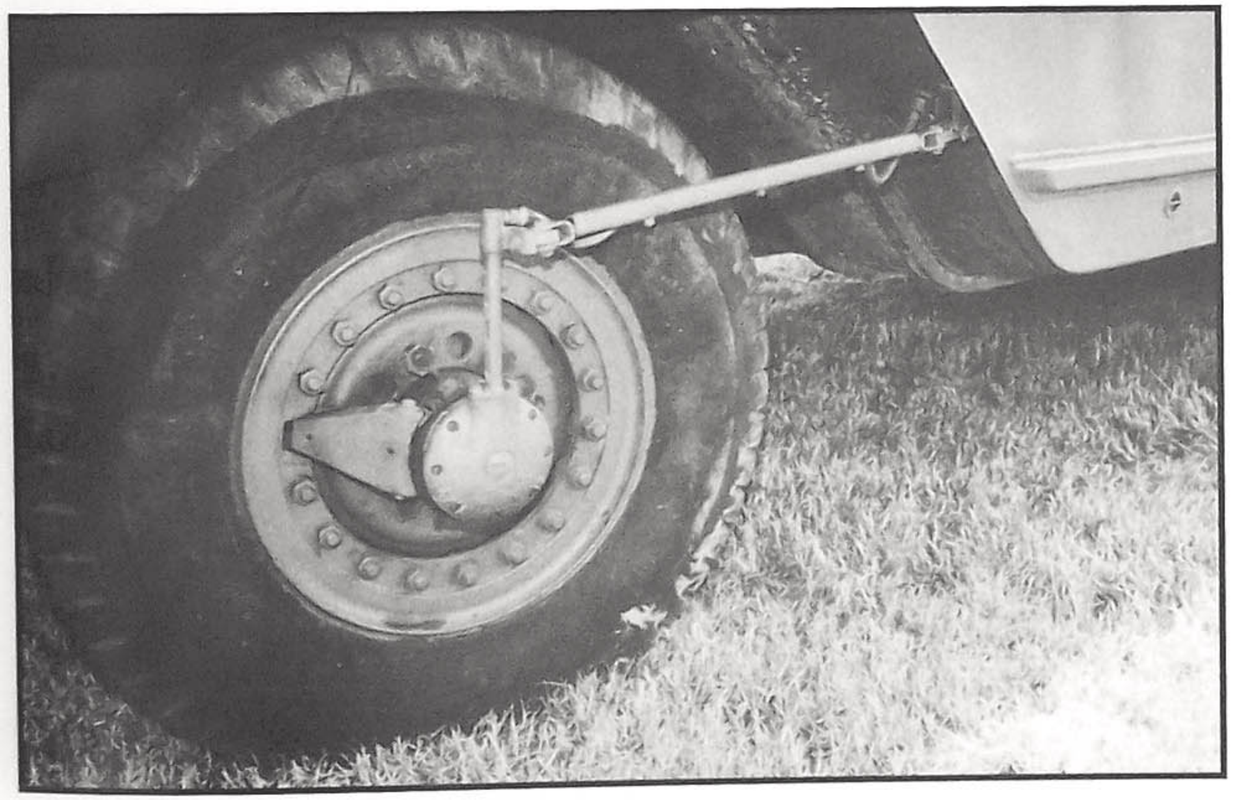


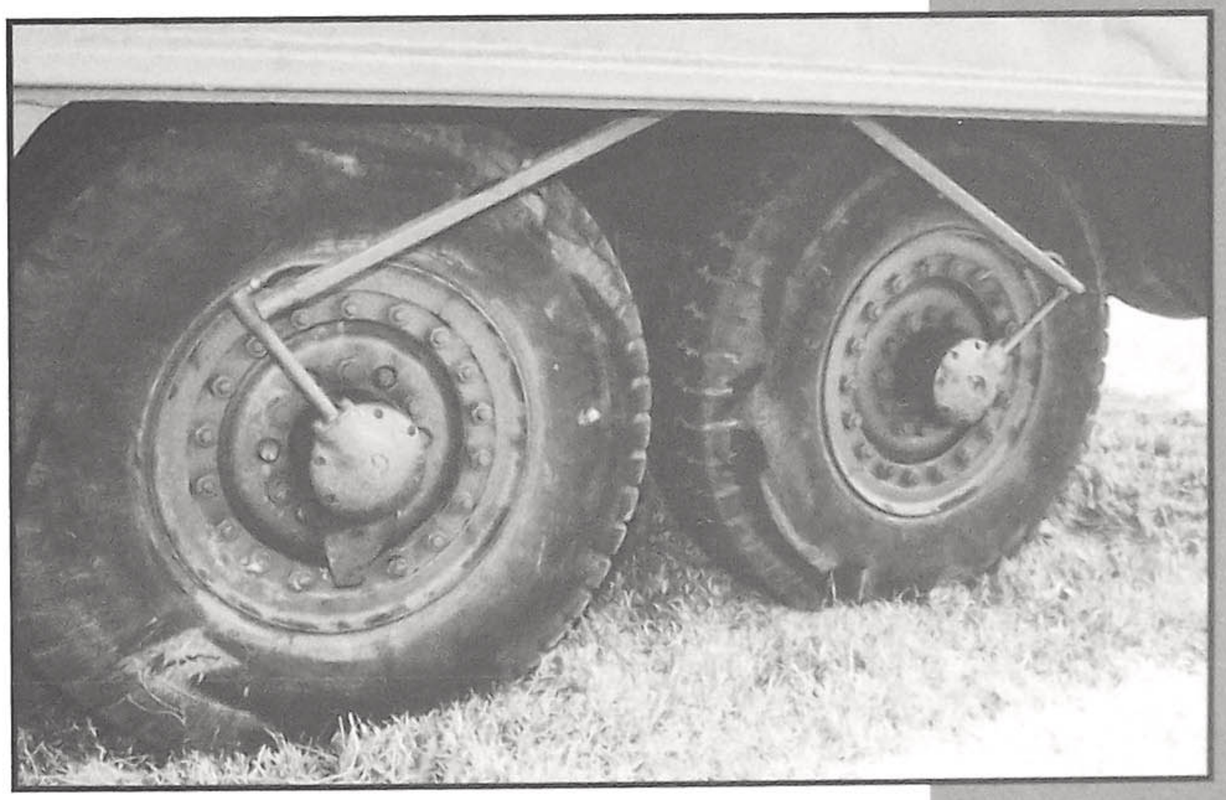


Top left and right: the cargo bed of the Duck could be completely covered with a system of tarpaulins. The rear surfboard served as the attachment point for the rear of the cover. Bows, such as those on a standard 2 1/2-ton truck supported the canvas over the cargo compartment. The photo at the upper left also shows the large metal loops welded to the side of the Duck. These (there were four) allowed the Duck to be off-loaded directly from a ship, an essential option if the Duck is to start its job in a hurry. Also seen in this shot is the large sand anchor, which is mounted on the rear deck. **Above left:** in order to extricate itself from difficult shorelines, the Duck was equipped with a Gar Wood 10,000-pound winch. A variety of pulleys, snatch blocks and eyehooks were supplied so that the winch could be pulled from nearly all directions. One of the eyehooks is installed on the rear of the body, just to the right of the winch (IWM). **Above right:** a close-up of the winch. An attachment point for the A-frame jib (looking somewhat like a hinge), which are found on all Ducks, can be seen at the extreme right edge of the photo.

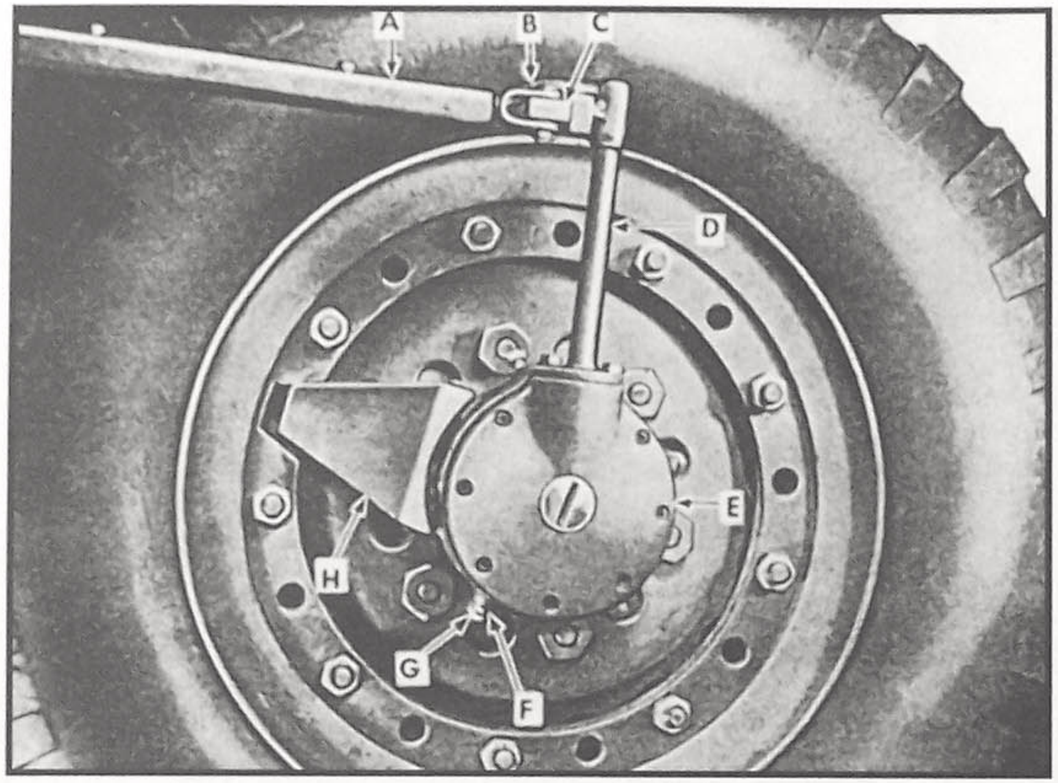








Top left: the rudder and propeller housing. The rudder was controlled by the vehicle's steering wheel and could not be disengaged. A lever located to the right of the driver could disengage the propeller. A shaft connected to the transmission drove the propeller. It was recommended that it be disengaged as soon as the Duck's front wheels exited the water in order to provided more power to the rear wheels. **Top right:** a close-up of the rear marker light and one of the jib connection points. **Above left and right and overleaf:** Ducks built after December, 1943 had an integral tire inflation system. It was important to lower the tire pressure of the Duck in order to improve its traction over soft ground. Of course, when the Duck returned to a hard surface, higher tire pressure was required. The system was basically a series of rubber tubes enclosed in within steel channels. Several different mechanisms allowed the system to follow the movement of the wheels. The center hubs were actually considered the inflation devices. Inspired by their lend-lease vehicles, the Russians copied this system for use on their post-war BTR-152 armored truck. They also produced they own version of the Duck, the ZIL-485. The Russian vehicle was equipped with a rear-loading ramp, overcoming one of the Duck's major shortcomings.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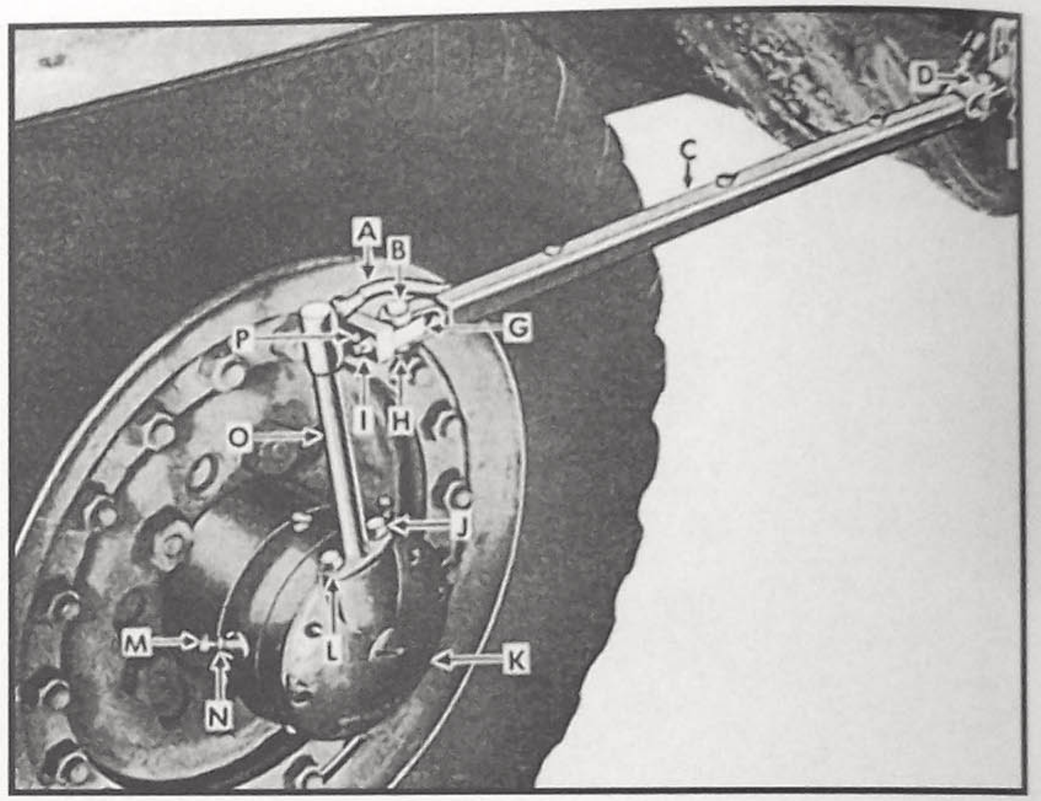
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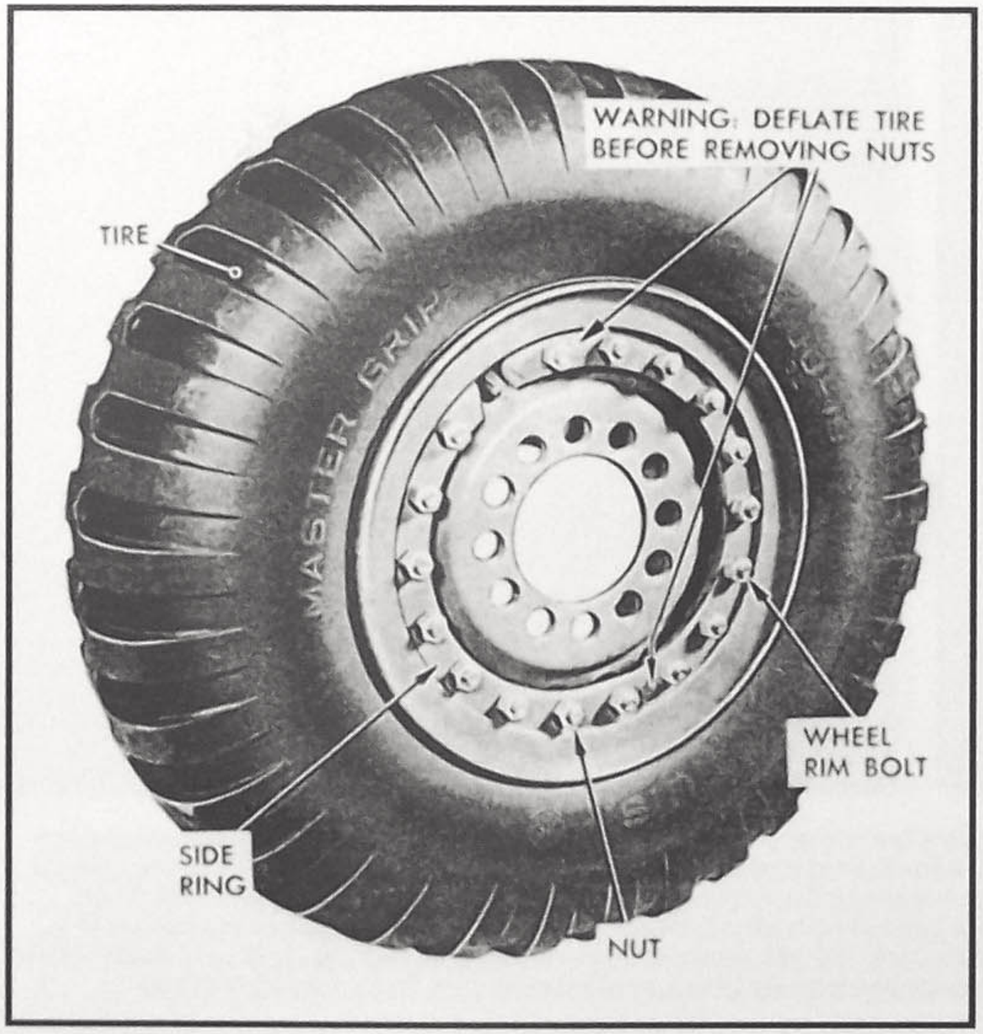
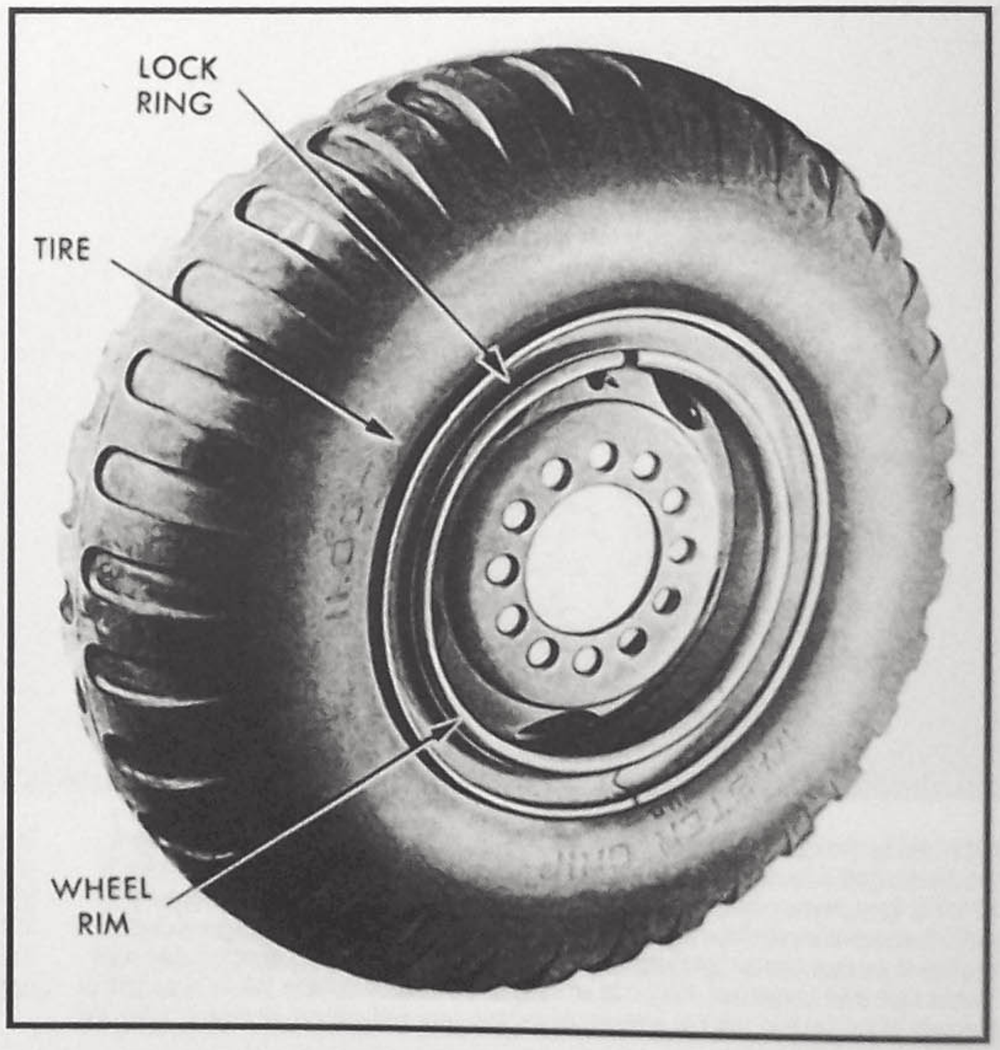

WARNING: DEFLATE TIRE
BEFORE REMOVING NUTS
TIRE
MASTER GRIP
WHEEL
RIM BOLT
SIDE
RING
NUT


LOCK
RING
TIRE
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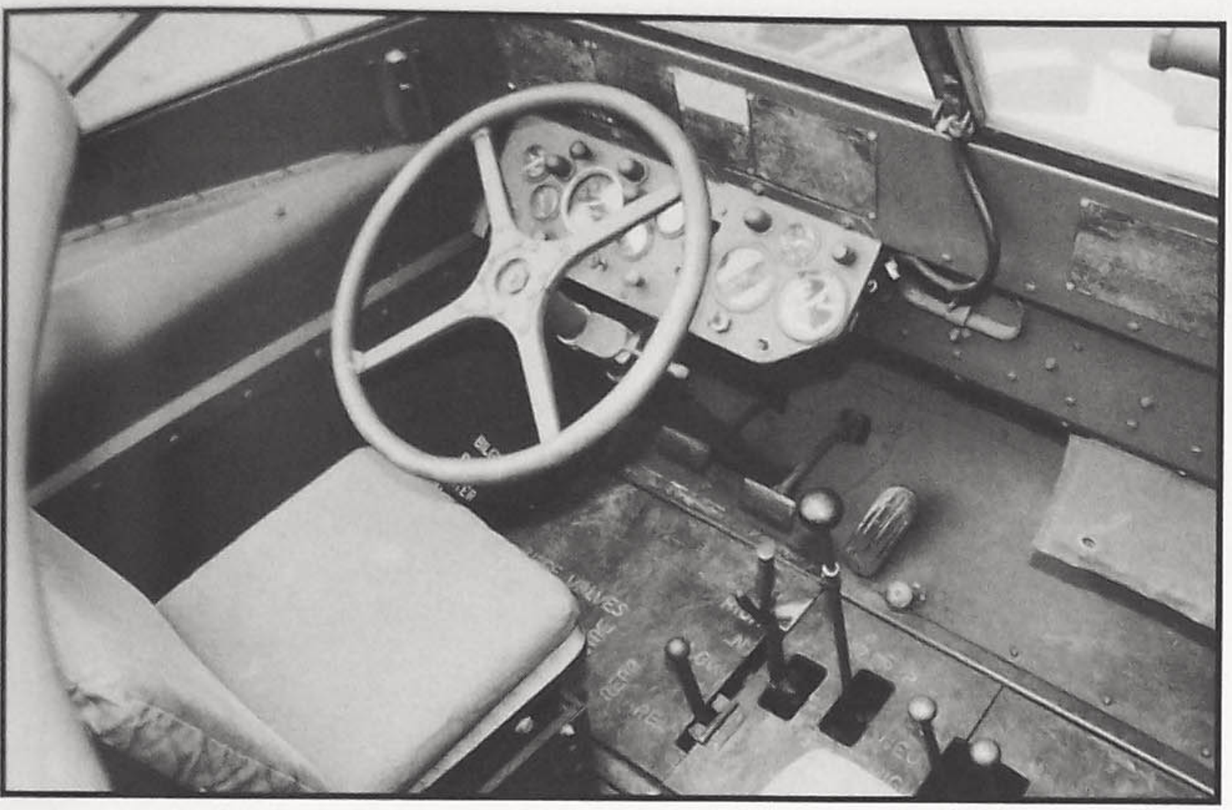
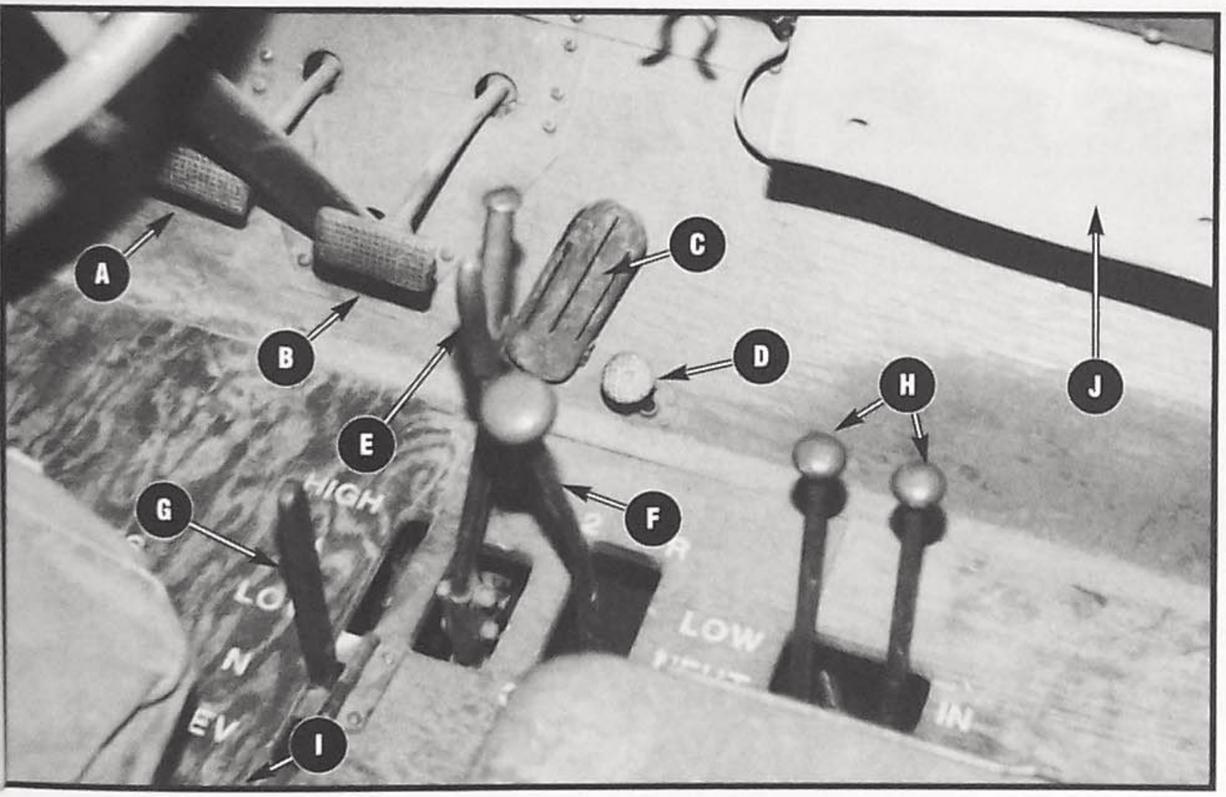
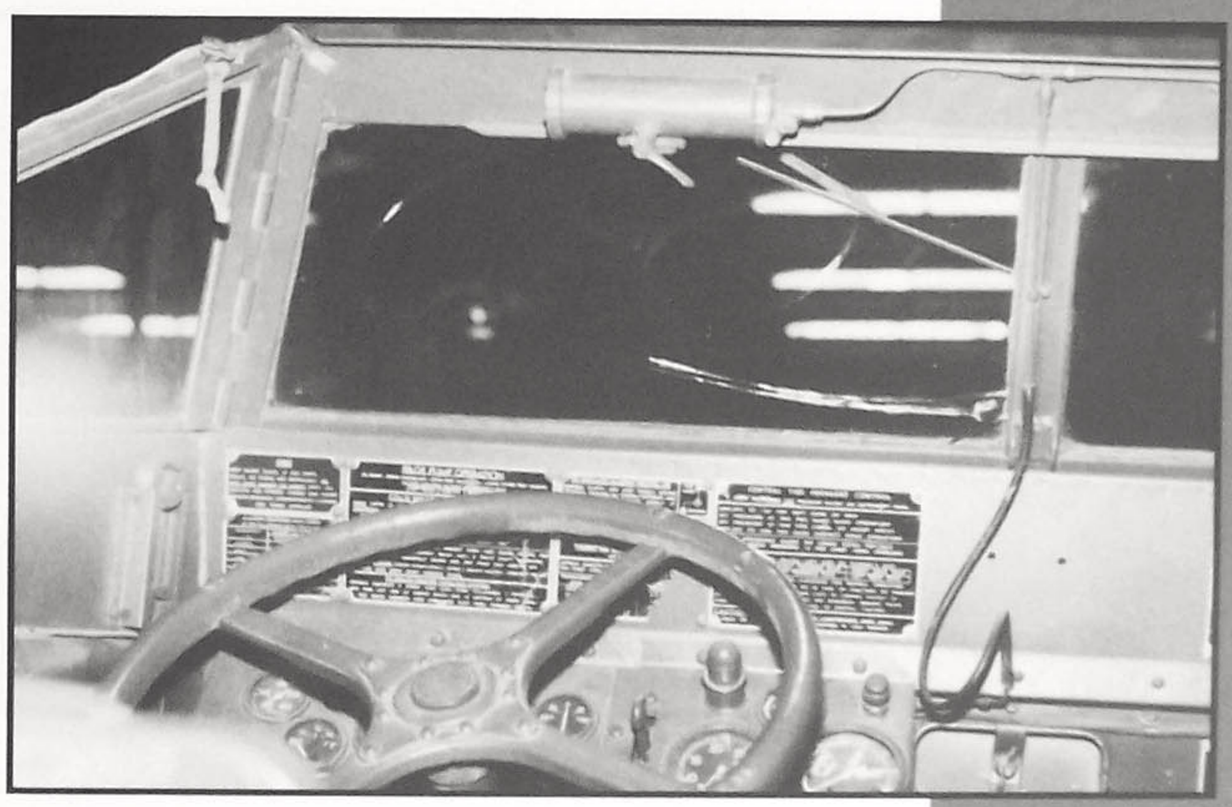
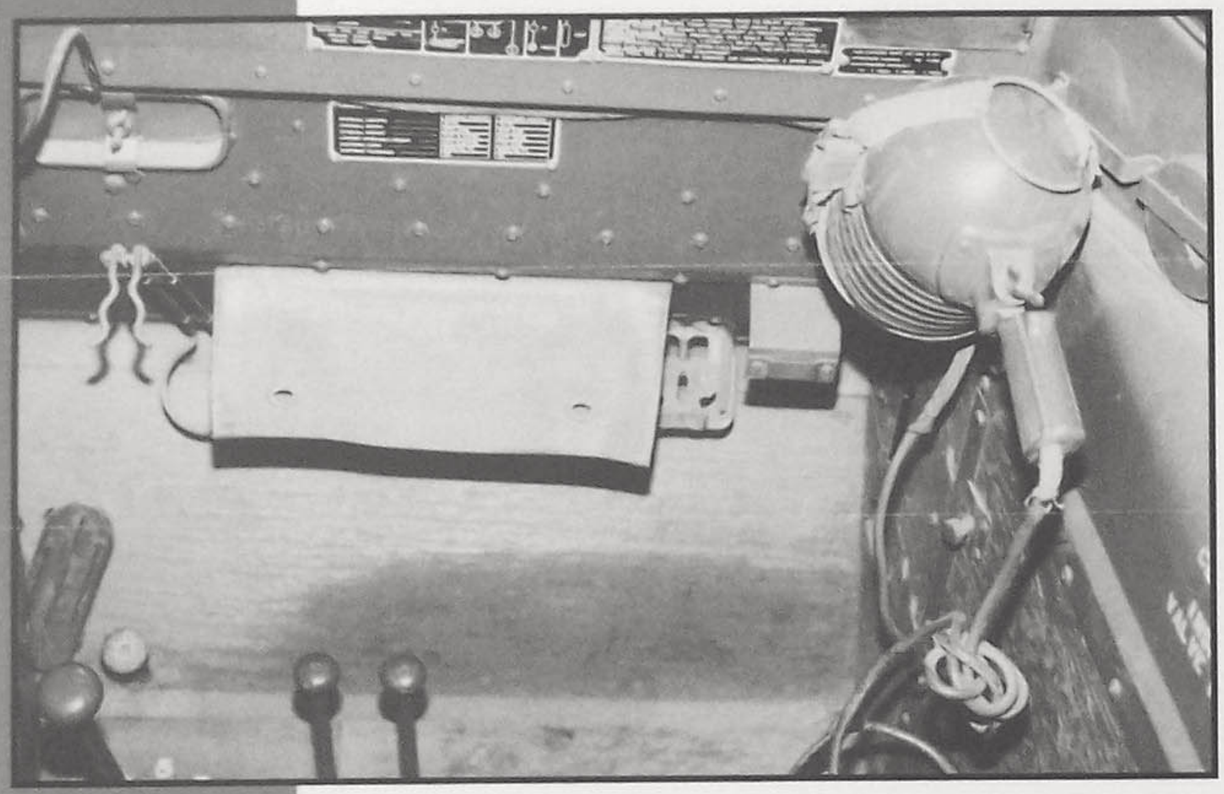
RIM

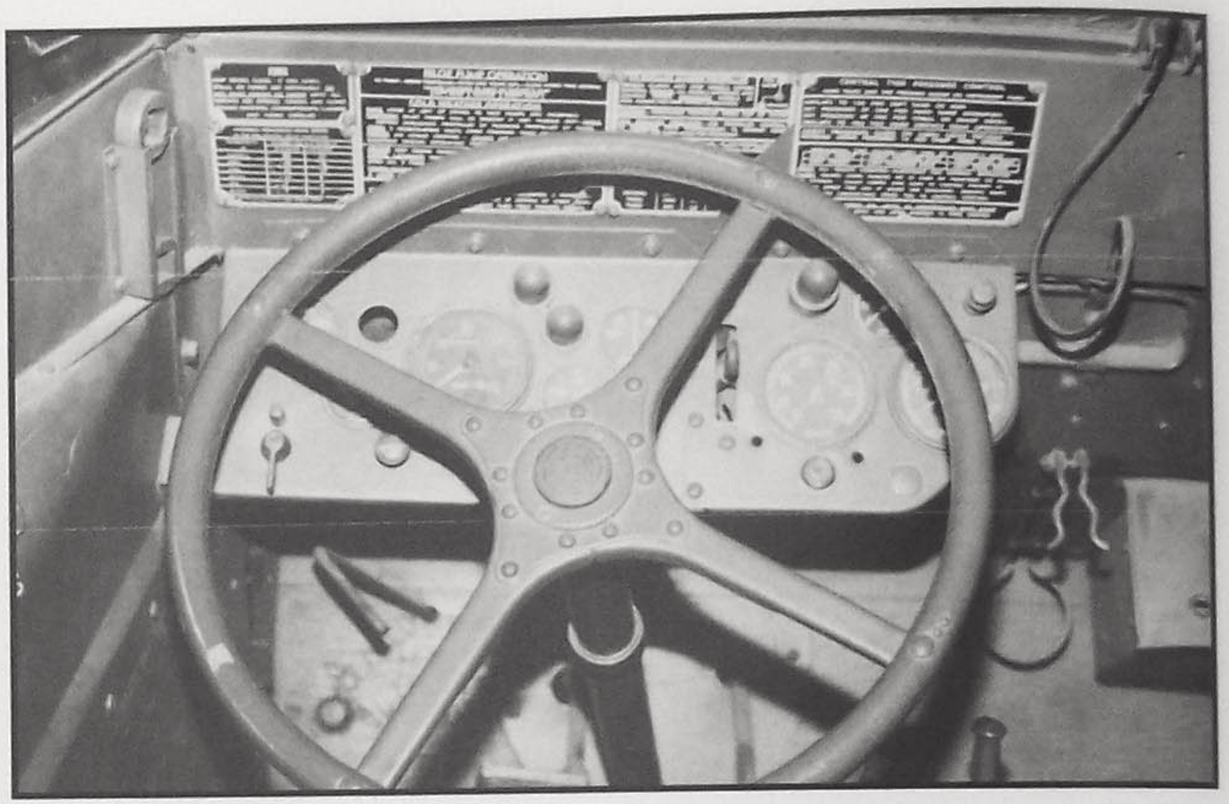


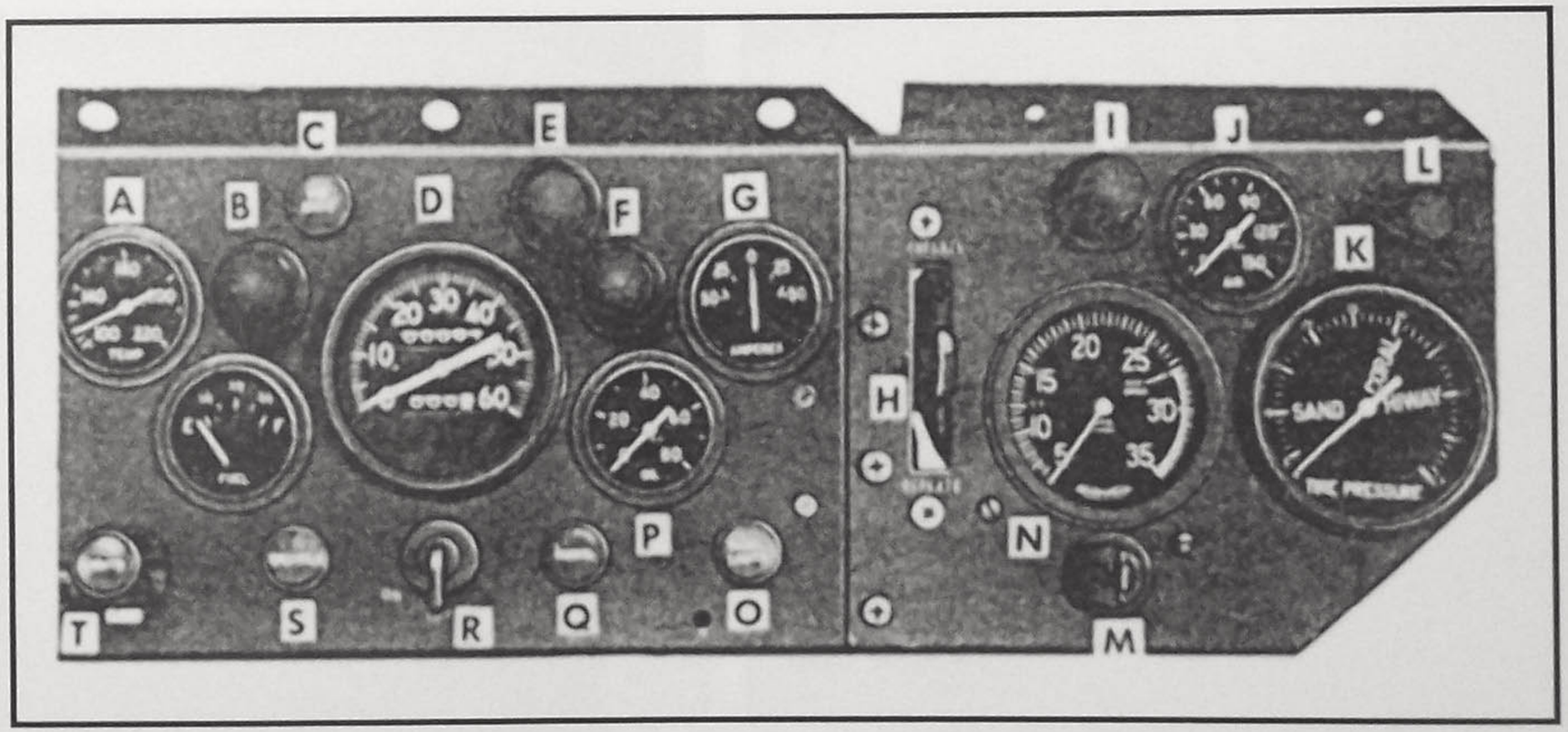




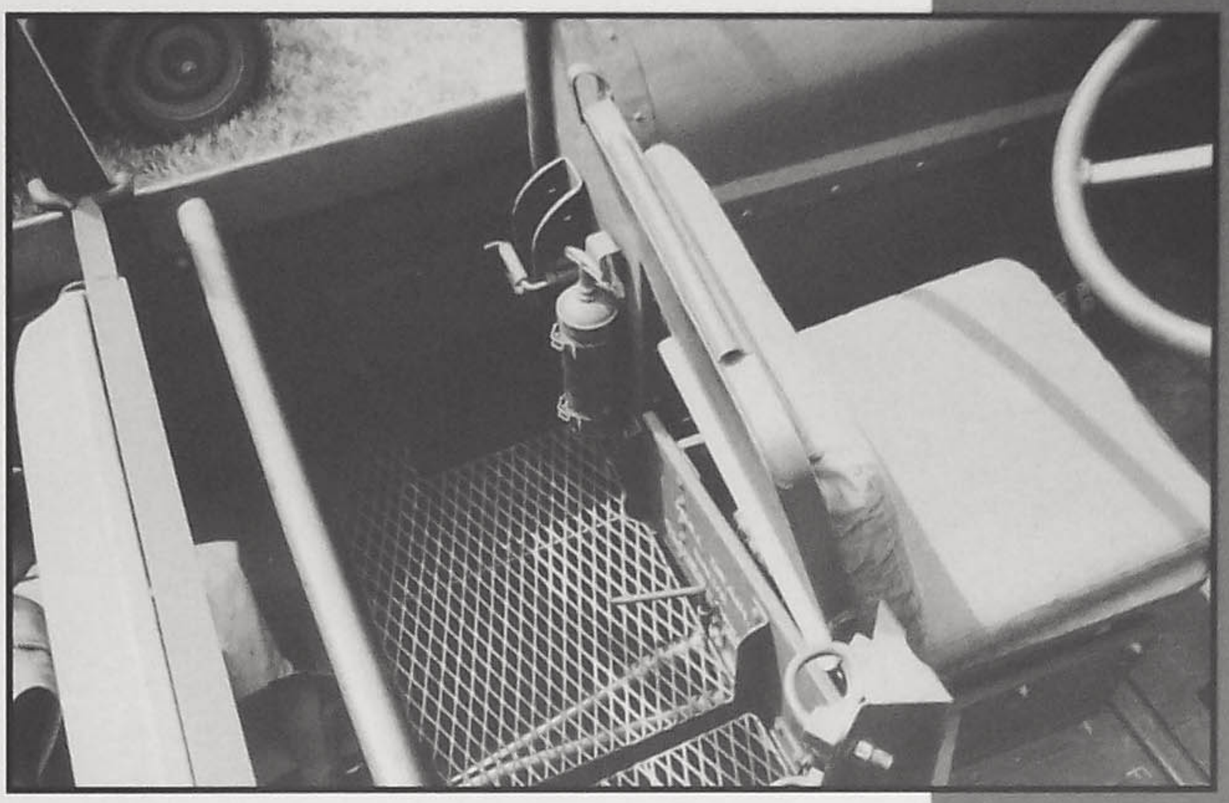
Opposite page, bottom: like most U.S. military trucks in the Second World War, the Duck used reinforced "combat wheels," composed of a heavy-duty commercial hub reinforced with an outer, bolted ring. These two tech manual shots demonstrate the various parts of the assembly. **Top left and right:** the driver's compartment was festooned with placards to instruct the driver on the various functions of the vehicle. The four directly in front of the steering wheel are (left to right): the water entry instruction plate, the propeller instruction plate, the fire caution plate, the maximum permissible road speed plate and the tire pressure instruction plate. On the passenger side: the bilge pump instruction plate, the winch transmission and transfer case instruction plate and the vehicle ID and data plate. **Above left:** the driver's control levers between the front seats. A) clutch pedal. B) brake pedal. C) gas pedal. D) starter pedal. E) hand brake lever. F) transmission shift lever. G) winch shifting lever. H) transfer case shifting levers. I) water propeller shift lever (not seen). J) map compartment. (Brian Keough). **Above right:** the left inside of the windshield. The motor assembly was somewhat heavier than that used on the standard 2 1/2-ton truck. The chances of its use were considerably greater! (Tom Ossola)

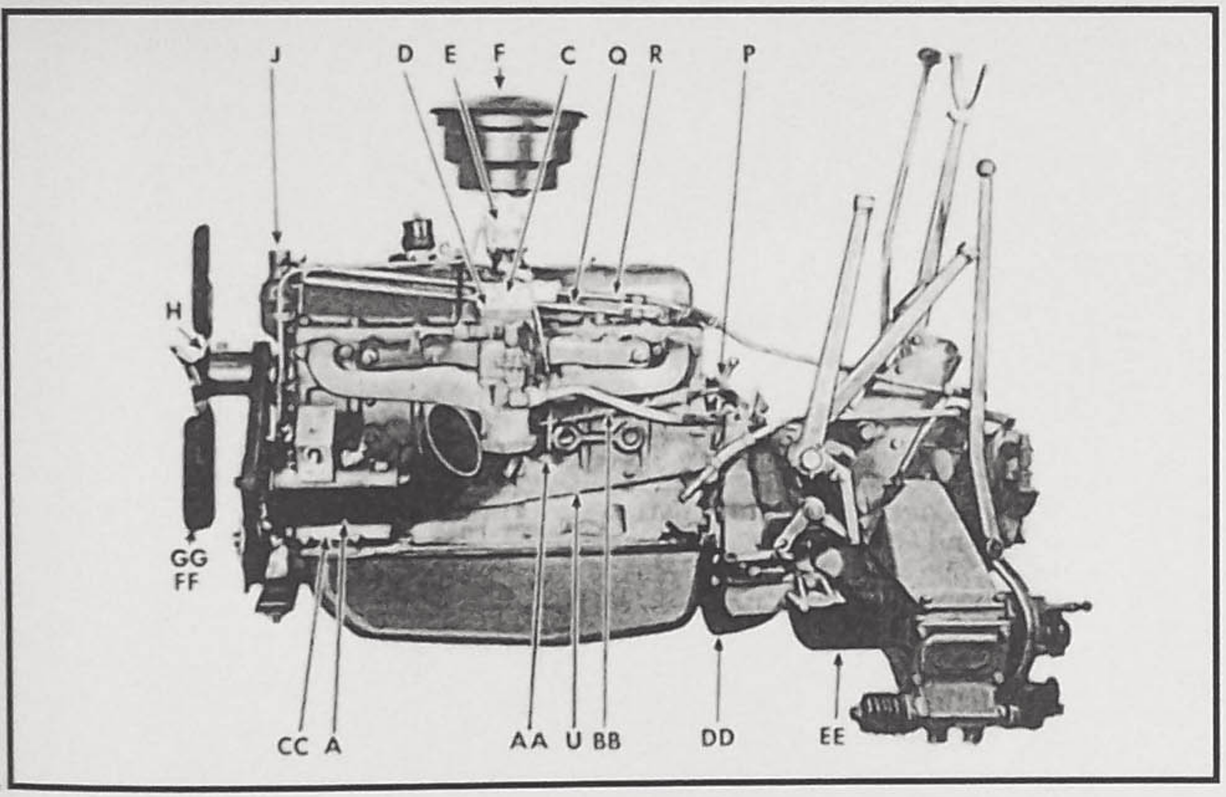


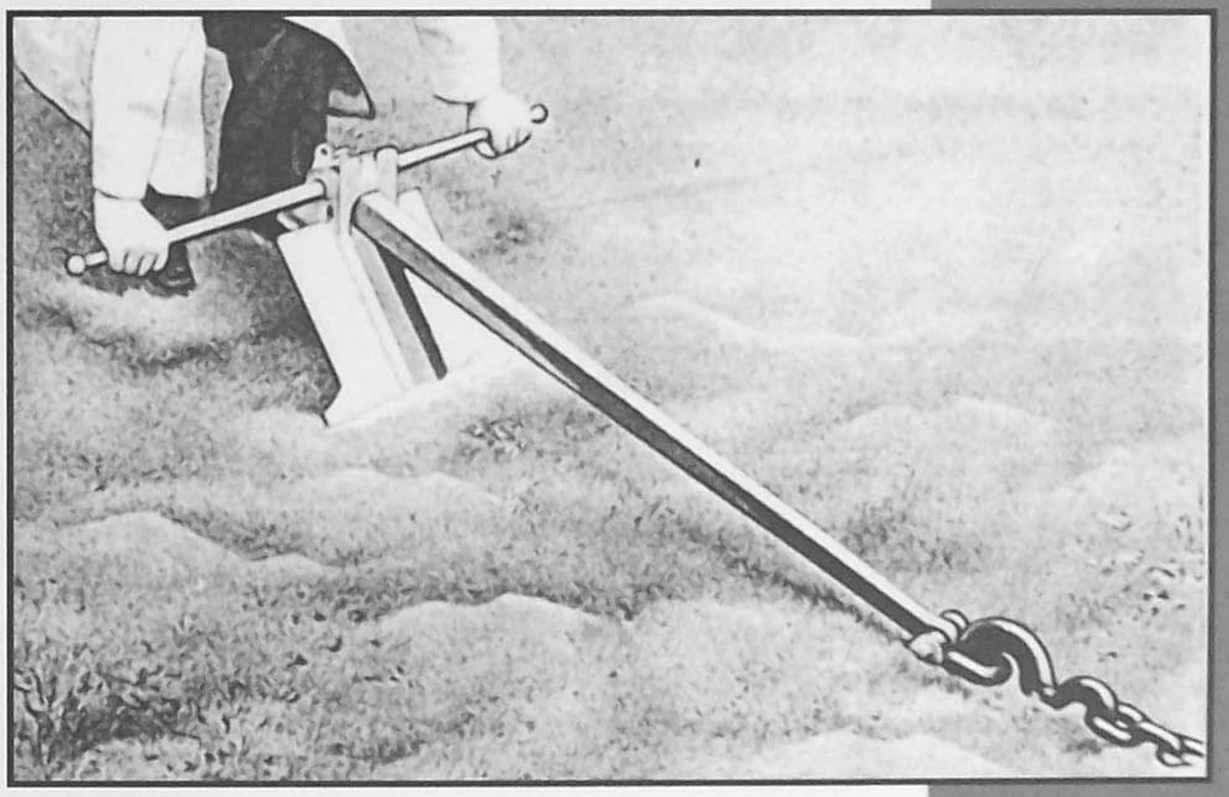




Top left: a close-up of the passenger seat areas and the map compartment. Note the canvas flap. The searchlight is a post-war addition to this former Canadian Defense Force vehicle (Tom Ossola). **Top right:** a close-up of the driver's controls of the Canadian vehicle. A fire extinguisher bracket has been installed next to the driver. **Above:** the tech manual shot of the instrument panel. A) temperature gauge. B) panel light. C) black-out driving light. E) panel light. F) panel light. G) ammeter. H) tire pressure control lever. I) panel light. J) air tank pressure. K) tire pressure gauge. L) windshield wiper control. M) tachometer release key. N) tachometer. O) panel light switch. P) oil gauge. Q) check button. R) ignition switch. S) throttle button. T) main light switch.







Top left and right: the grates located behind the front seats are part of the Duck's engine cooling system. An exterior vent would not have practical on the Duck, for obvious reasons. The mounting points for the M36 gun mount can be seen in both photos. These were provided on every Duck manufactured. In the top right photo, the fire extinguisher and the rifle rack (to its left) can be seen. **Above left:** the Duck used the GMC Model "270" six-cylinder in-line engine. The engine was nearly identical to that used in the standard 2 1/2-ton truck, but the transmission differed considerably due to the many additional shift levers and linkages used on the Duck. **Above right:** the Duck was equipped to get itself out of difficult situations. Among the many devices supplied to assist in this was a large sand anchor. This could be wedged into solid ground and attached to the vehicle's winch. This tech manual shot shows a lab-coated technician placing the anchor in soft sand.

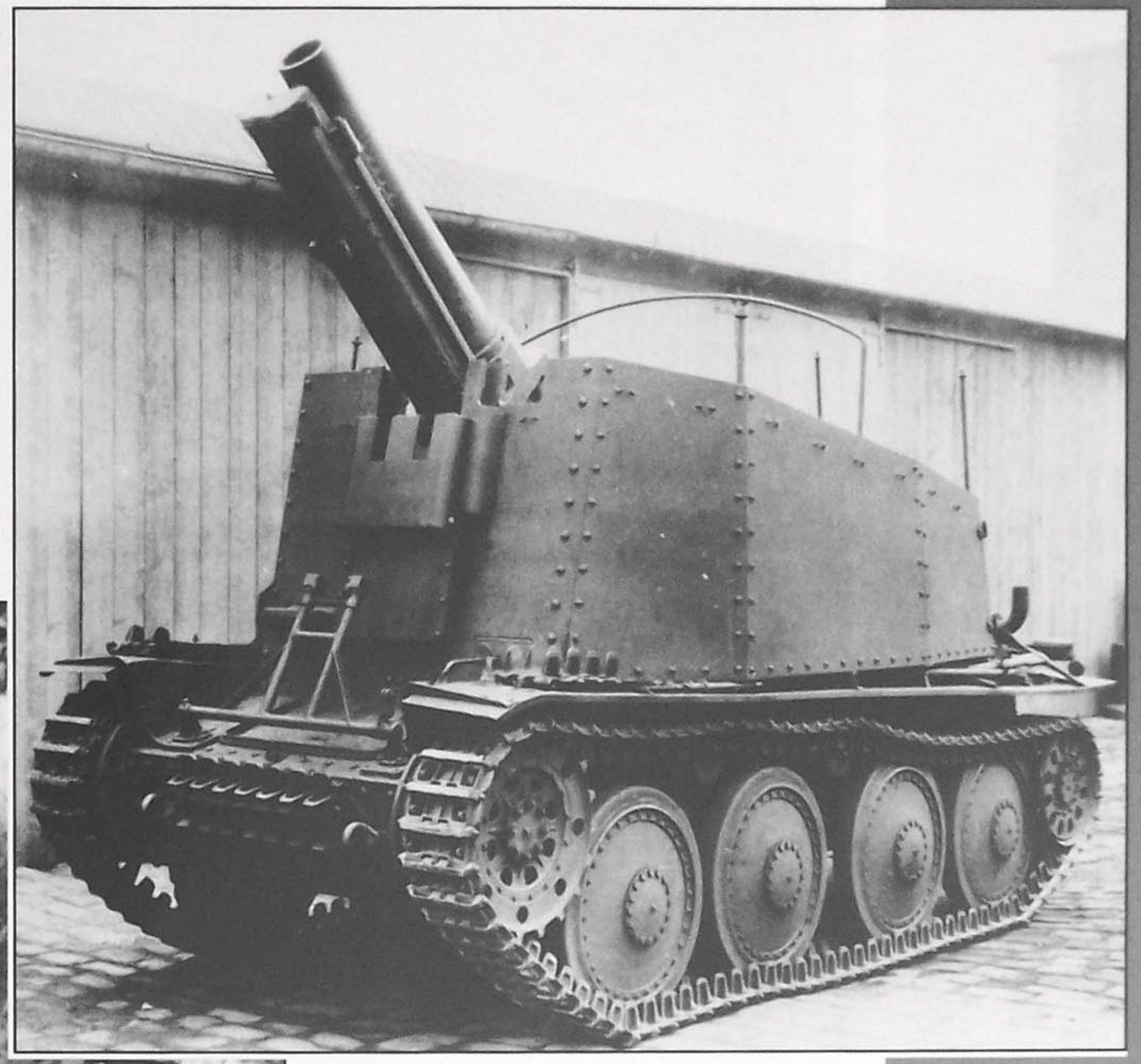
Peripherally related to our story is the 1/4-ton amphibian truck, sometimes known as the "Seep," (for sea Jeep), General Purpose Amphibian, or just the amphibious Jeep. The GPA was developed simultaneously with the Duck and it shared the Duck's basic design. It utilized a number of the Jeep's components such as the frame, axles, and engine. Like the Duck, the GPA used a power take off shaft to drive the rear-mounted propeller and a rudder that was linked to the steering wheel. The army had envisioned a fast, nimble reconnaissance vehicle that was oblivious to water obstacles. Although the cross-country capabilities of the GPA were virtually the same as the Jeep, it had the narrow freeboard of the Duck and had to be gently eased into the water. Rivers in developed areas such as northwest Europe often have built-up banks that prevented the GPA from entering safely. Unlike the Duck, it had a pathetically low loading capacity and was of little use along side its bigger brother. From 1943 to 1944, Ford built nearly 13,000 amphibious Jeeps. The Russians were quite enamoured of the GPAs they received through lend lease, eventually receiving the bulk of the production. The Russians also produced they own version in the 1950s, known as the GAZ-46. **Above:** a GPA on a training mission in Texas, 1943 (NA).

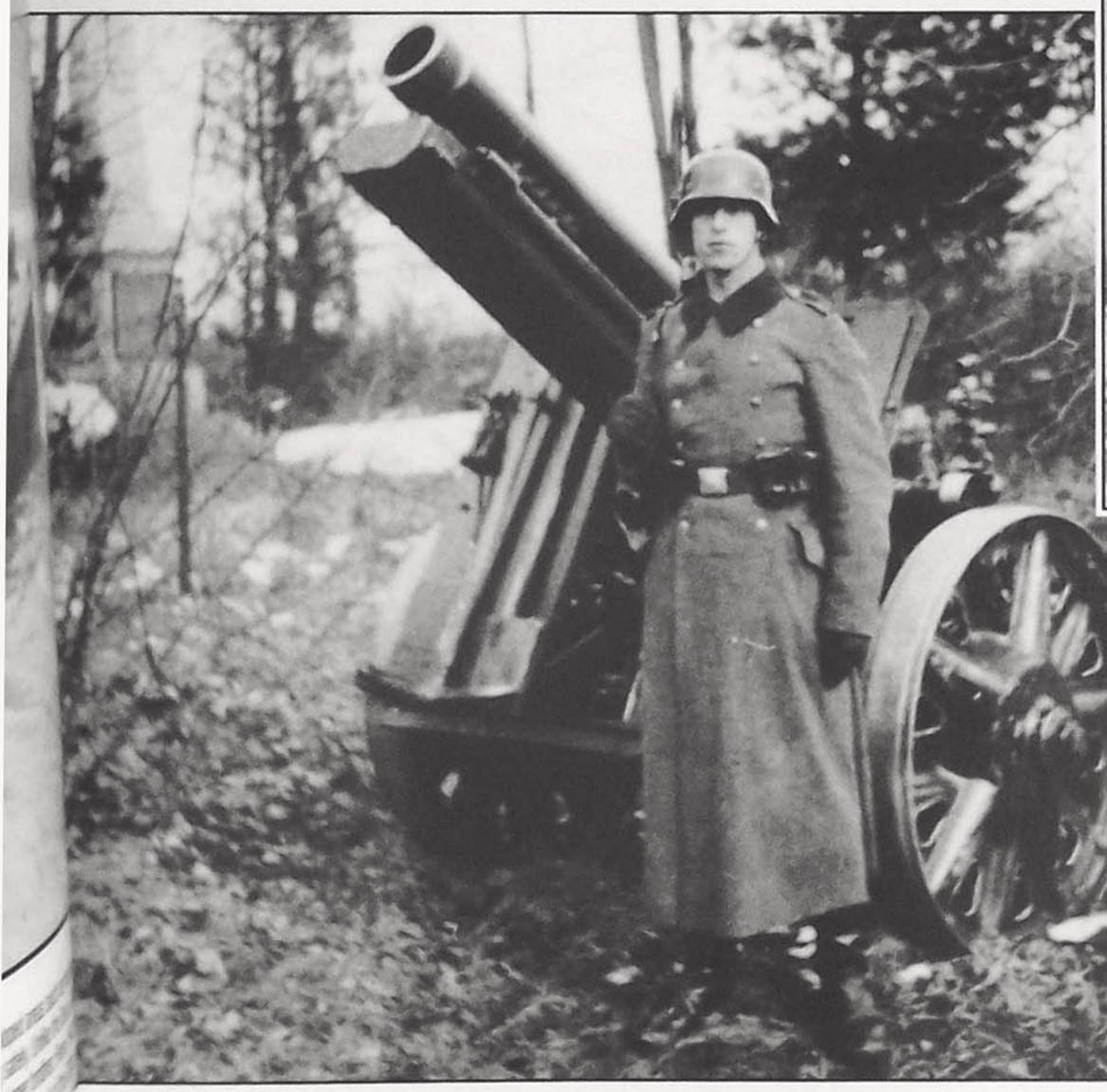
The sIG 33/1 Grille SPG

The Grille self-propelled gun was a unique and very versatile development. Its roots can be found in the early stage of the war, when the Pzkw 38 (t) light tanks were withdrawn from frontline service due to their then limited battle value.

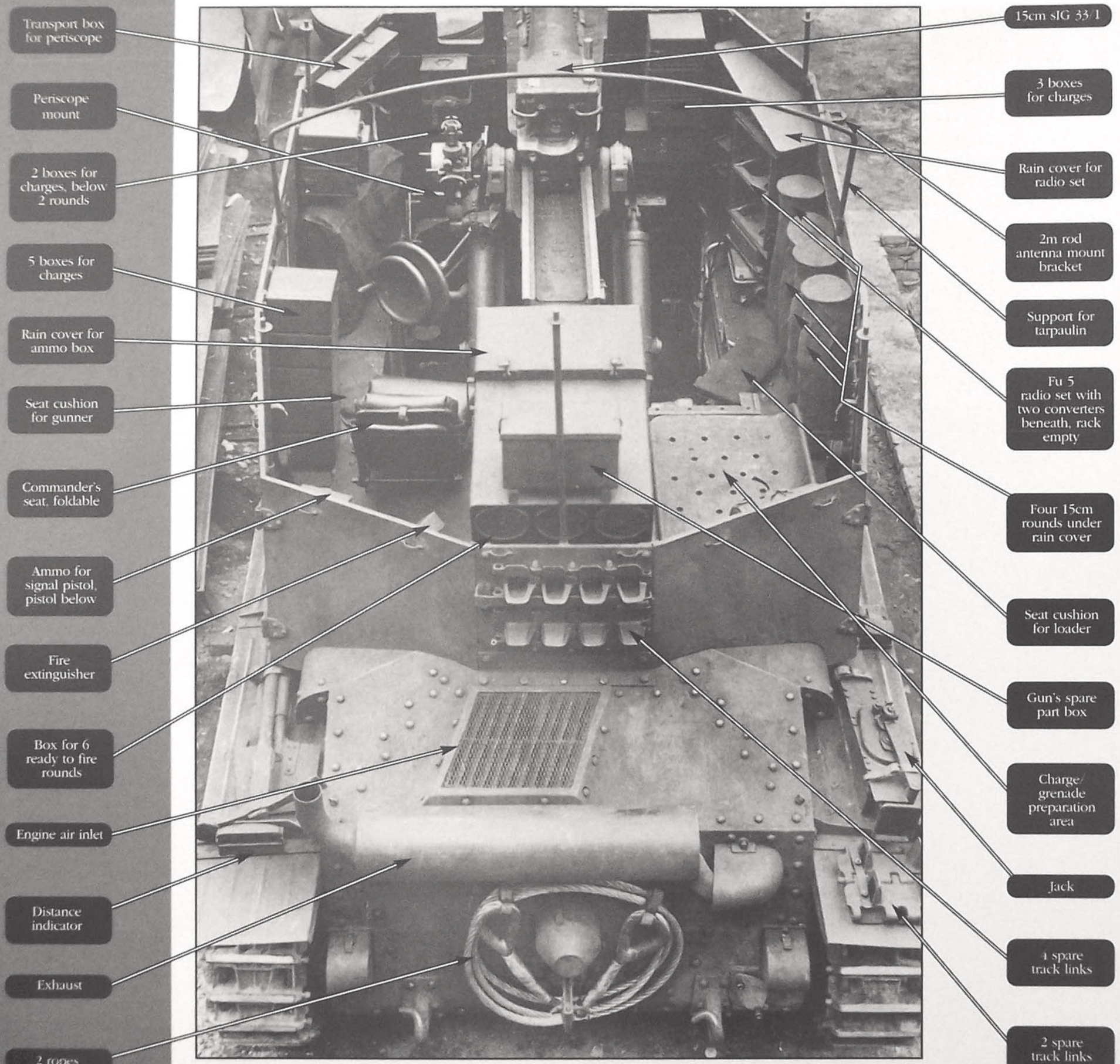
In the early 1930's, in response to the requirement for a heavy direct support weapon for infantry units, the firm of Rheinmetall designed its medium howitzer. Despite the large caliber of 15 cm, it was classified as an infantry gun. Designated as 15 cm sIG 33 (schweres Infanteriegeschütz), it was introduced in 1936. Principally, two versions were built. Ausf. A had a full steel carriage and Ausf. B, which had a composite steel /alloy carriage to save weight. Both versions were produced either for horse drawn (15 cm sIG 33) or motor drawn (15 cm sIG 33 (Kfz)). The versions B, C, D were prototypes with only a few samples built.

The sIG was a conventional gun, consisting of a massive one-piece carriage with two large wheels. It was designed for both flat and high trajectory to meet all requirements of the





Above: the first prototype of the sIG 33 (SfI 38) Grille produced by BMM. The vehicle is still finished in plain matte dark gray. At the rear of the superstructure a support beam for the fragile fender is fitted, a detail later dropped. Note also that the front plate shows a rectangular opening at the lower right edge, which was welded tight. The gun is near maximum elevation, the spring assisted protective plate below following its movement. The two cut-outs were dropped with series production vehicles. The vehicle shows some further differences to the later Grille. A Notek light mount is visible on the fender. The location of the jack was different, it's place being occupied by some extra track links. (Photo Netik) **Left:** a photo of the 15 cm sIG 33 taken before the war. This is probably the Ausf. A with massive steel wheels originally intended to be horse drawn. The Rundblickfernrohr 38 periscope is mounted onto the Richtaufsatz. A shovel and a pick-ax are mounted on the gun shield, a detail seldom seen. The color of the gun is Panzergrau, a very dark color. This tone was not dull, note the sheen on the wheel. (Photo Seeler)



infantry. The gun was able to fire HE, smoke and AT rounds at ranges between 1,000 and 4,700 meters. All standard fuses were available. The muzzle velocity was low, 210 meters per second with full charge, 125 m/s with lowest charge. An exceptionally remarkable projectile was the 15 cm Stielgranate 42. This fin-stabilized grenade was loaded right into the muzzle. With a maximum range of 1,000 meters, it was fired directly at strong points or mine fields.

With a weight of 1,750 kg (Ausf. B 1,550 kg) the sIG 33 was relatively heavy for an infantry gun. Rapidly taking up new positions was a difficult procedure. This insufficient mobility in immediate proximity of the line of fire was a constant problem. Any attempt to keep down weight was defeated by the shortages of alloy. Production of the weight-saving versions Ausf. C, D and E could never be commenced. Despite these factors, the heavy infantry gun was a successful and reliable design. Impact in the aim was regarded as sufficient and all range figures were within the requirements. The 15 cm sIG 33 was produced unchanged until the end of the war.

Organization

A standard infantry division (motorized) had one company of six sIG 33 in stock. For use with the rifle brigades of the tank divisions, a specialized SP gun was required. In 1939, six companies (s. Infanteriegeschütz

Left: a good view into the interior of the prototype. Compared with the later production vehicle, the location of the Fu 5 radio set is different. Accordingly, the boxes containing the charges were mounted in different places. Note the small fender support, which was mounted on the left side only. The right fender carrying the heavy jack had no reinforcement. The combustion air inlet was of the standard Pzkw 38 (t) type. (Photo Netik)

Kompanie (Sf.) Nr. 701 through 706) allocated to six tank divisions, received the sIG 33 mounted on Pzkw I/B hulls. Although these vehicles had limited battle value, they brought precious experiences.

The development of the Grille

The limited mobility of the sIG 33, normally drawn by the Demag 1-ton prime mover (Sd.Kfz. 10), did not come up to the character of the new, highly mobile units. Thus a self-propelled solution based on a fully tracked vehicle was required. The first of these early SP guns, based on the Pzkw I Ausf. B, resulted in an overstressed vehicle. A second batch was based on a modified Pzkw II chassis, with comparably poor results. Although these solutions did not fulfill their expectations, they showed both the advantages and necessity of fully tracked artillery SP guns.

When available in sufficient numbers, the Pzkw 38 (t) chassis was adopted for this purpose. As early as 1940, work started on mounting the sIG 33/1 (/1 = modified for usage with SP vehicles) on the chassis of this proven light tank. The firm of Alkett (Altmärkische Kettenfabrik), which developed many successful designs during the war, undertook construction of a prototype. In 1941-1942, when the chassis of the ex-Czech light tank became available in larger numbers, limited mass production was ordered. Between February and April of 1943 BMM in Prague produced 90 units of the first production batch,

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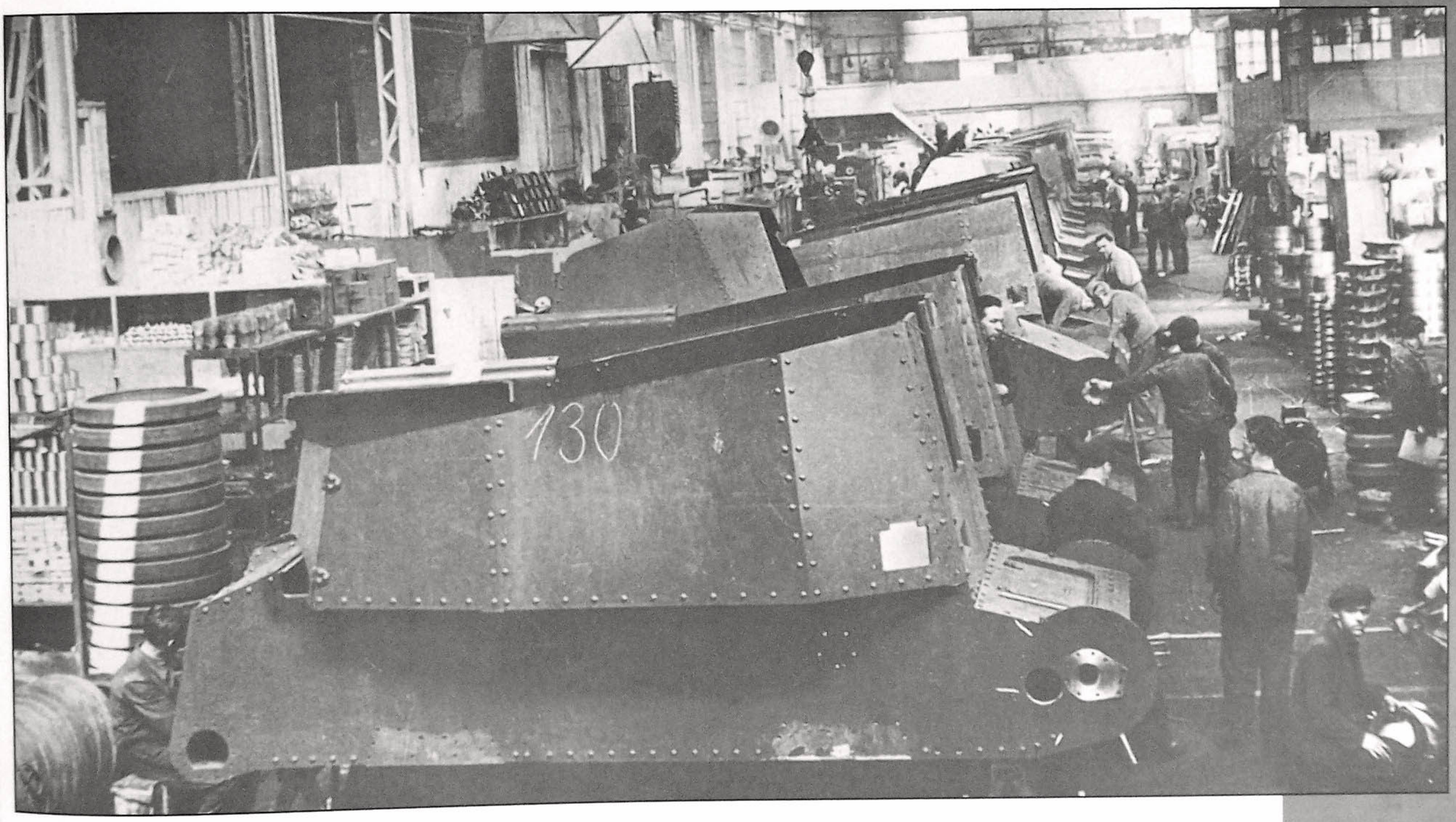
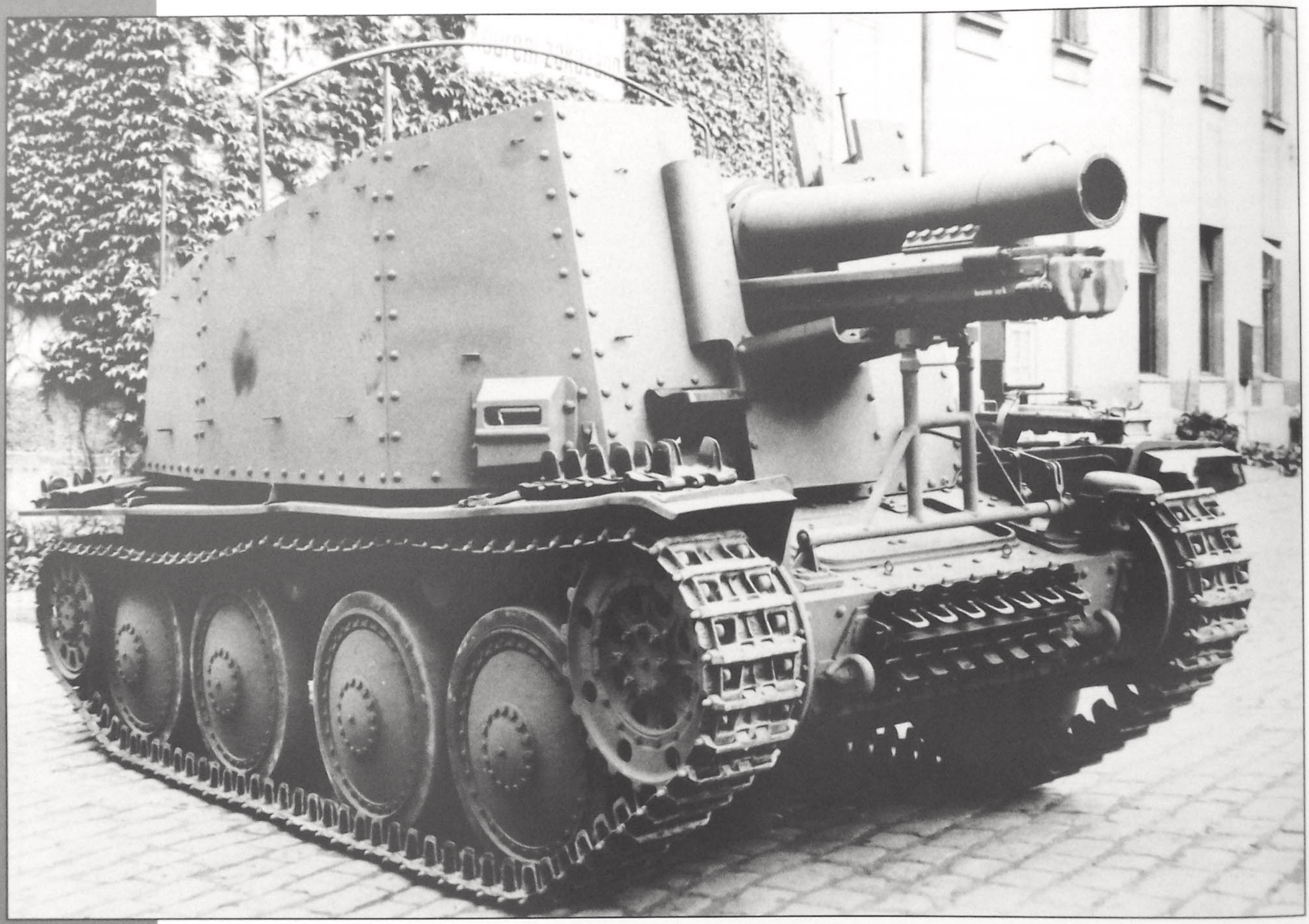
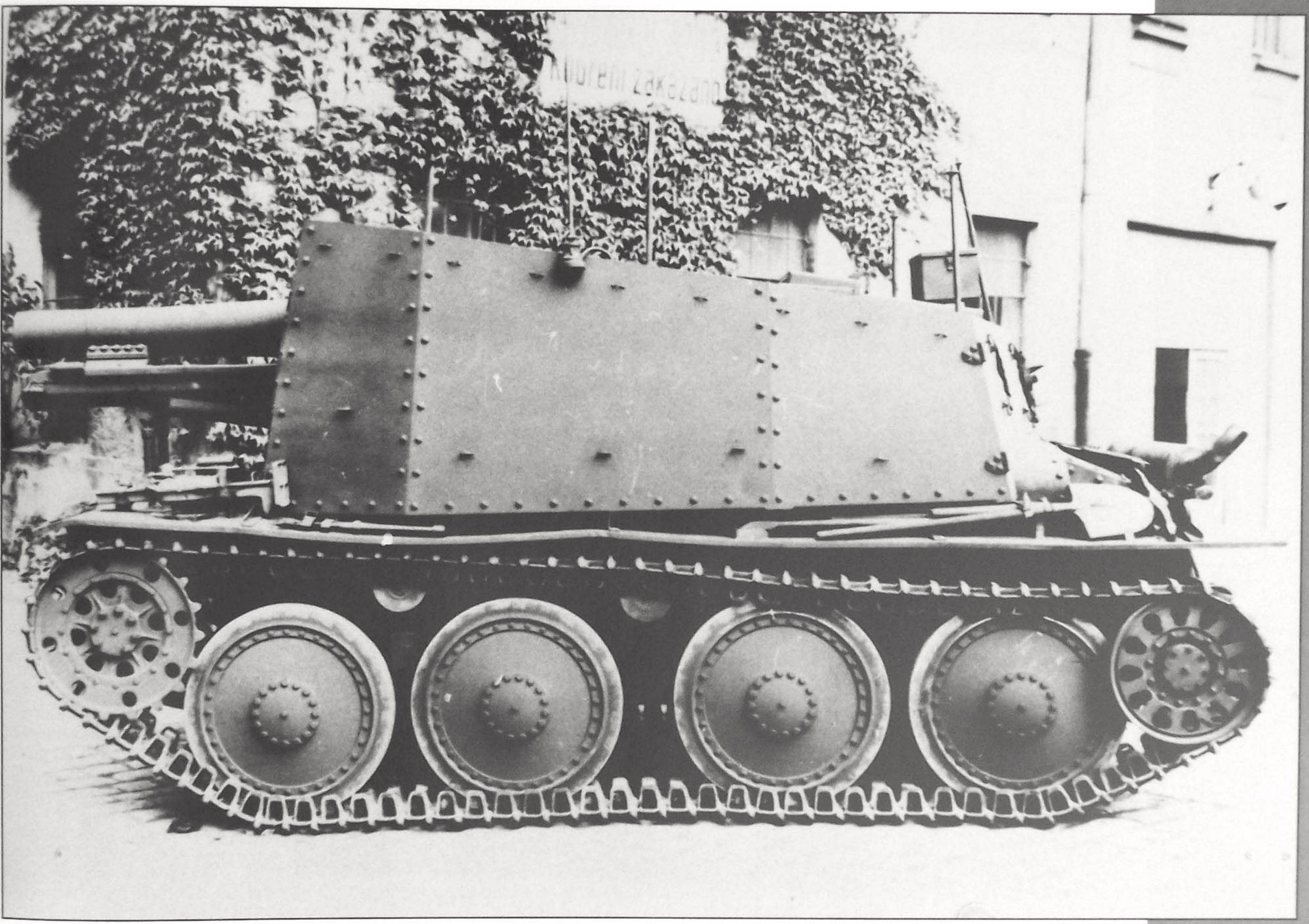


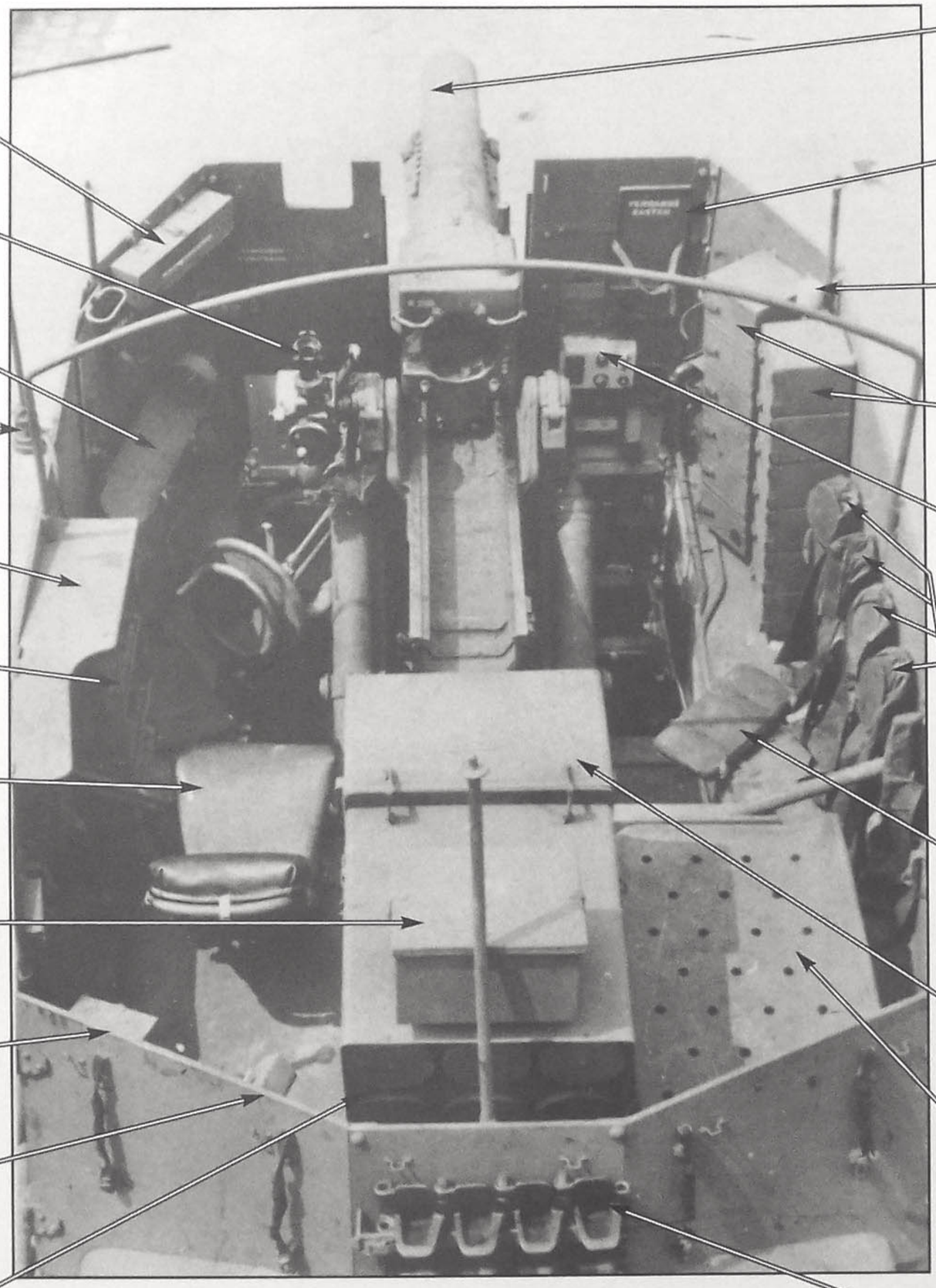
Above: a view into the BMM production hall. Several unfinished Grille Ausf. H can be detected. In the background the prototype of the GW 38 is visible. (Photo Netik)



One of the first production vehicles. Still painted in dark gray, this "Grille" waits for delivery. The tools were relocated, the jack was now mounted on the left fender. The fender was less fragile here. Note that the color (Panzergrau) appears to be completely dull here. (Photo Netik)



The Grille from the side. Note the variety of tools mounted to the already damaged track cover. Lots of loops are spread over the superstructure walls, these were used to apply foliage. The Grille was small enough to conceal behind bushes or smaller trees, or any sort of natural camouflage that was added. (Photo Netik)



The modified interior of the production model. Note that the Fu 5 radio set now is situated at the left hand side within the reach of the commander. Six ready rounds were stored in the box arrangement to the right of the commander's seat. Although the inside was also cramped, work was not too difficult for the crew. The perforated plate was used for packing cartridges and setting of fuses. (Photo Netik)

the 15 cm sIG 33/1 Grille Ausf. H.

The superstructure of the Pzkw 38 (t) chassis was partly removed and the sIG 33/1 was mounted in the center of the vehicle upon a massive trestle. This had a V-shaped reinforcement on the bolted chassis floor. The drive shaft led between this reinforcement to the transmission in the front. A tread plate covered this arrangement. Around the gun a simple, armored box-like superstructure was fitted, which was open at the top. The driver's seat remained very close to the gun, not a very comfortable place. The wireless operator's seat to the left was removed, leaving space for personal gear.

Three men crewed the fighting compartment and their arrangement changed during development (see photos). Series production vehicles had the "Geschützführer," the commander, being seated at the extreme left rear on a folding back seat fixed upon the engine cover, with the wireless mounted to his left. From here he could survey the vehicle's interior quite easily. Additionally, he had an intercom to contact his crew. The K1 (Kanonier 1), the gunner, had a simple seat cushion to the left of the gun's breech. He was responsible for operating the gun's sighting device and traverse/elevating mechanism. He furthermore had to release the gun from the travel rest with a large lever. To the right of the breech, the K2 (the loader) was situated on a seat cushion. He handled the different types of grenades, packed the cartridges and set and fixed the fuses according to the commander's orders.

According to the technical manual D 2025, the Grille Ausf. H carried 10-12 grenades. When carrying out special missions, the vehicle could be loaded with up to 19 grenades. This was allowed only in emergency

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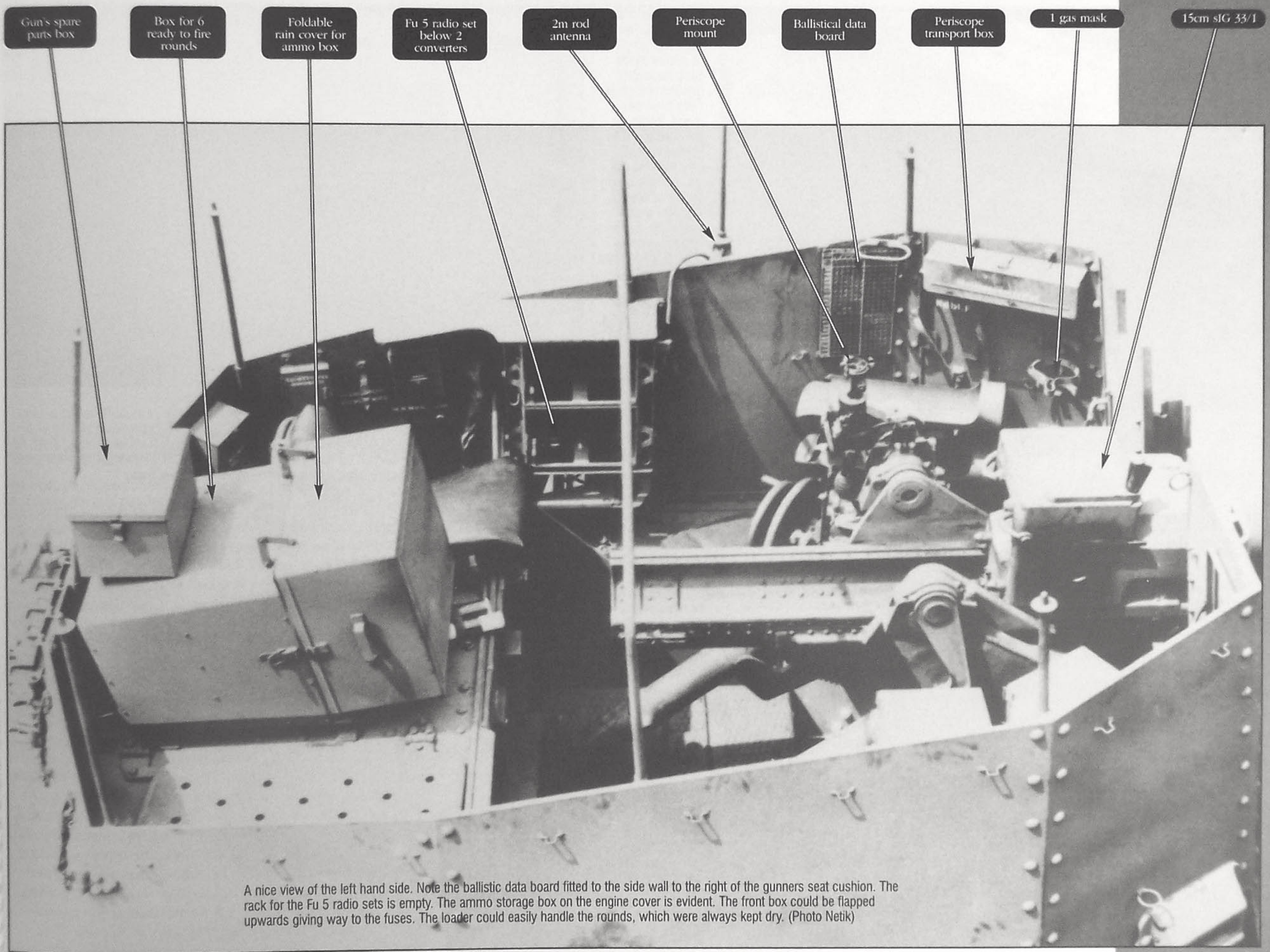
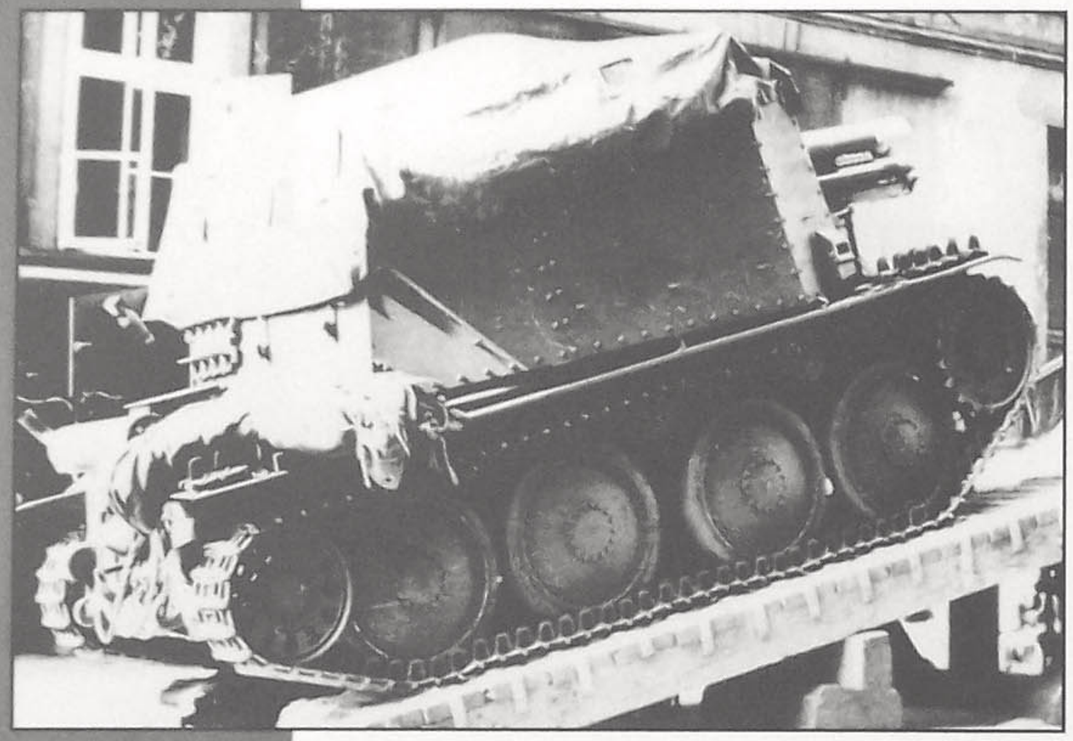
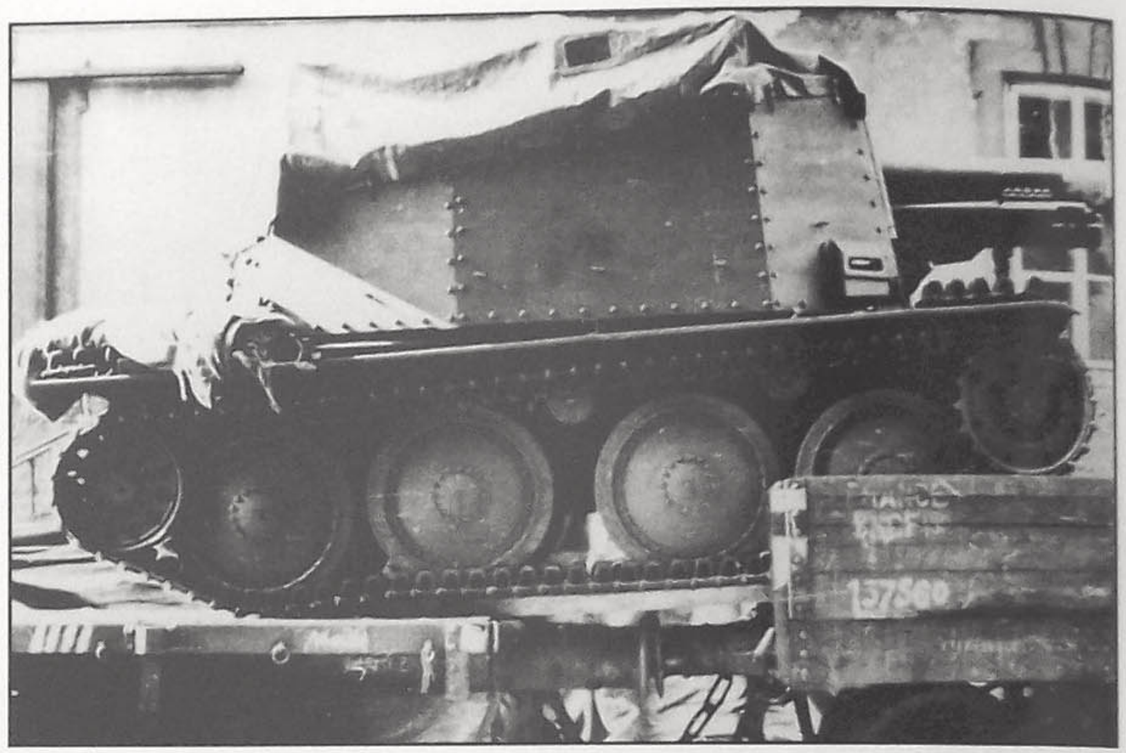


A nice view of the left hand side. Note the ballistic data board fitted to the side wall to the right of the gunners seat cushion. The rack for the Fu 5 radio sets is empty. The ammo storage box on the engine cover is evident. The front box could be flapped upwards giving way to the fuses. The loader could easily handle the rounds, which were always kept dry. (Photo Netik)



Left: a Grille driving on a railway flatcar. The ramp seems to be custom made, but is apparently massive enough to carry these light-weight SP guns. The vehicle is still finished in plain gray. Note the rain cover, which is similar to that fitted to 7.62 mm armed Marder IIIs. Some window sections allowed limited sight for the crew. The open rear door shows a fire extinguisher. (Photo Netik)



Above: this SP gun is driving slowly from flatcar to flatcar to reach its final position. The Pzkw 38 (t) was an easy vehicle to handle, as the Czech-made drive gear was one of Praga-Wilson's finest developments. The flatcar is of French origin, SNCF. The large tarpaulin on the rear fender is not part of the Grilles equipment. Possibly it was used to further cover it during railway transport. (Photo Netik)

Used in the east, this Grille of Leibstandarte was captured almost intact by the Soviets. The colors are difficult to identify. It was camouflaged with dark green stripes over dark yellow base. It is however possible that the dark areas were Panzergrau, with dark yellow mottling applied over it. Note the white tactical marking, denoting the unit as the 6th Co. of a recce btn. The antenna mount is empty. (Photo Netrebenko)

situations. The sIG 33/1 Grille was provided with a Fu 5 radio set, consisting of one transmitter and one receiver, plus converters. In production vehicles, this arrangement was mounted within the commanders reach, at the left side of the fighting compartment.

The vehicle received the designation 15cm sIG 33/1 "Grille" for cricket (not "Bison," as often quoted). Other designations were "Sfl 38" or "sIG 33 (Sfl 38)"

Resuming, it can be stated that the sIG 33 (Sfl 38) Grille Ausf. H was exactly the vehicle the support units demanded. It was light and agile with an excellent mobility even in rough terrain. The chassis of the Pzkw 38 (t) was battle proven and had a very high reliability. Tracks and running wheel had a long service life.

This concept proved to be successful, therefore the next production lot based on the Geschützwagen 38 (t), was an improved and specialized artillery SP gun using basically the same technology. This vehicle was intended to carry the sIG 33 (Grille Ausf. K), the 7,5 cm Pak 40 (Marder III Ausf. M) or the 2 cm Flak 38 (Flakpanzer 38). Later in 1944, the sIG 33 was mounted on the chassis of the Hetzer tank hunter. Still using the drive train and running gear of the old Pzkw 38 (t), this solution was produced in limited numbers until the end of the war showing the guiding design of the ex-Czech chassis. It is interesting that the manual warned "that the Grille should never be used in the role of an assault gun."

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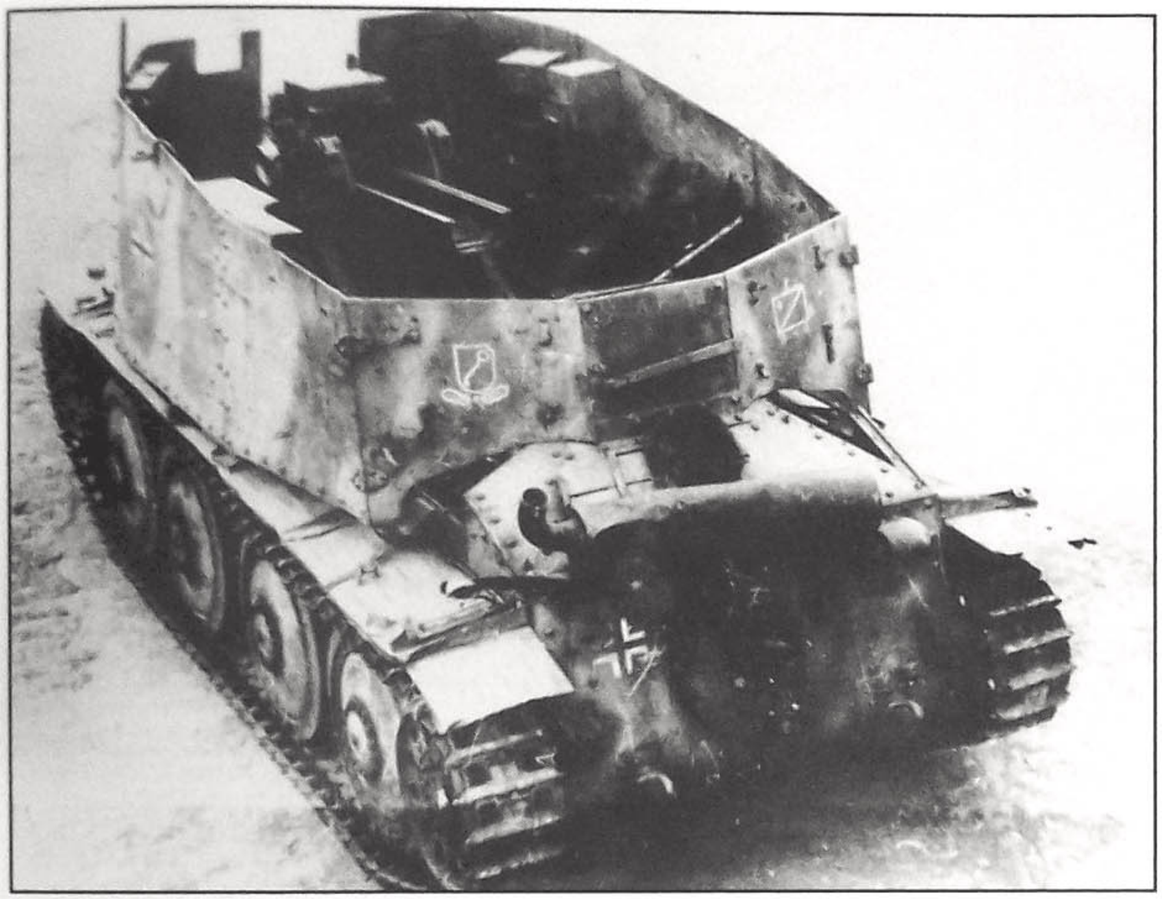
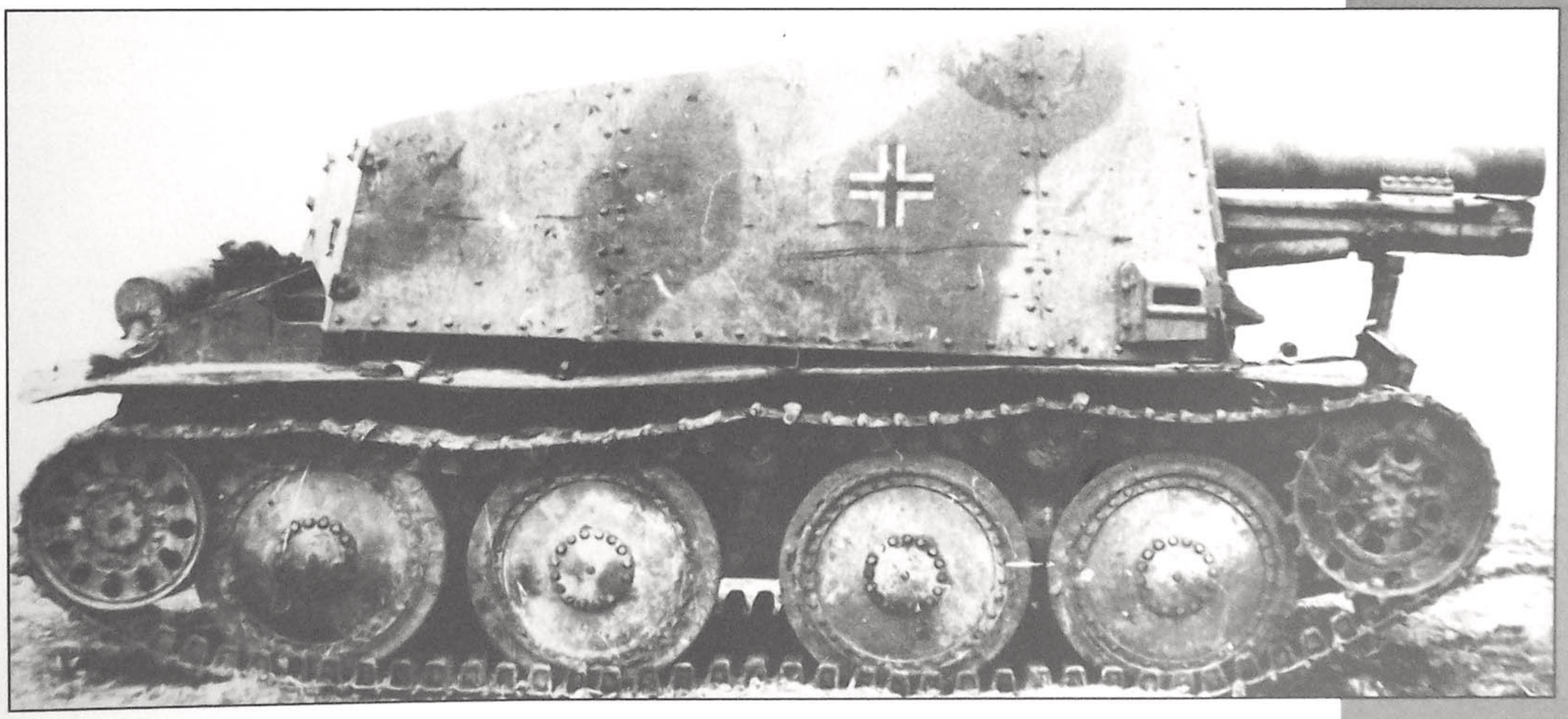
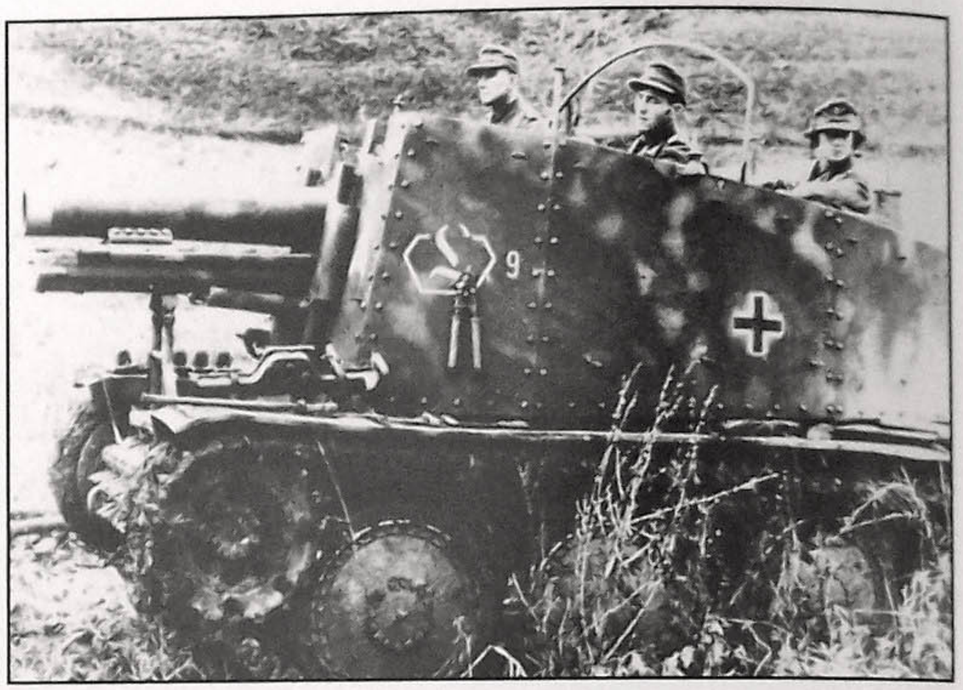


Above left: the rear view unveils more details. Next to the tactical marking the key symbol of "LAH" is visible. The exhaust air outlet upon the engine cover shows a small dome, which can be closed with a shutter. This was possibly done in winter to accelerate warming-up of the engine. (Photo Netrebenko) **Above right:** Grille during a pause. The crew's attempt to conceal the vehicle is quite acceptable. Note that the canvas support is mounted. (Photo Buchner) **Right:** a side view of the LAH vehicle. Note that snow clasps are fitted to the tracks in certain distances. This simple, but effective device was also available for the Hetzer tank hunter. (Photo Netrebenko)

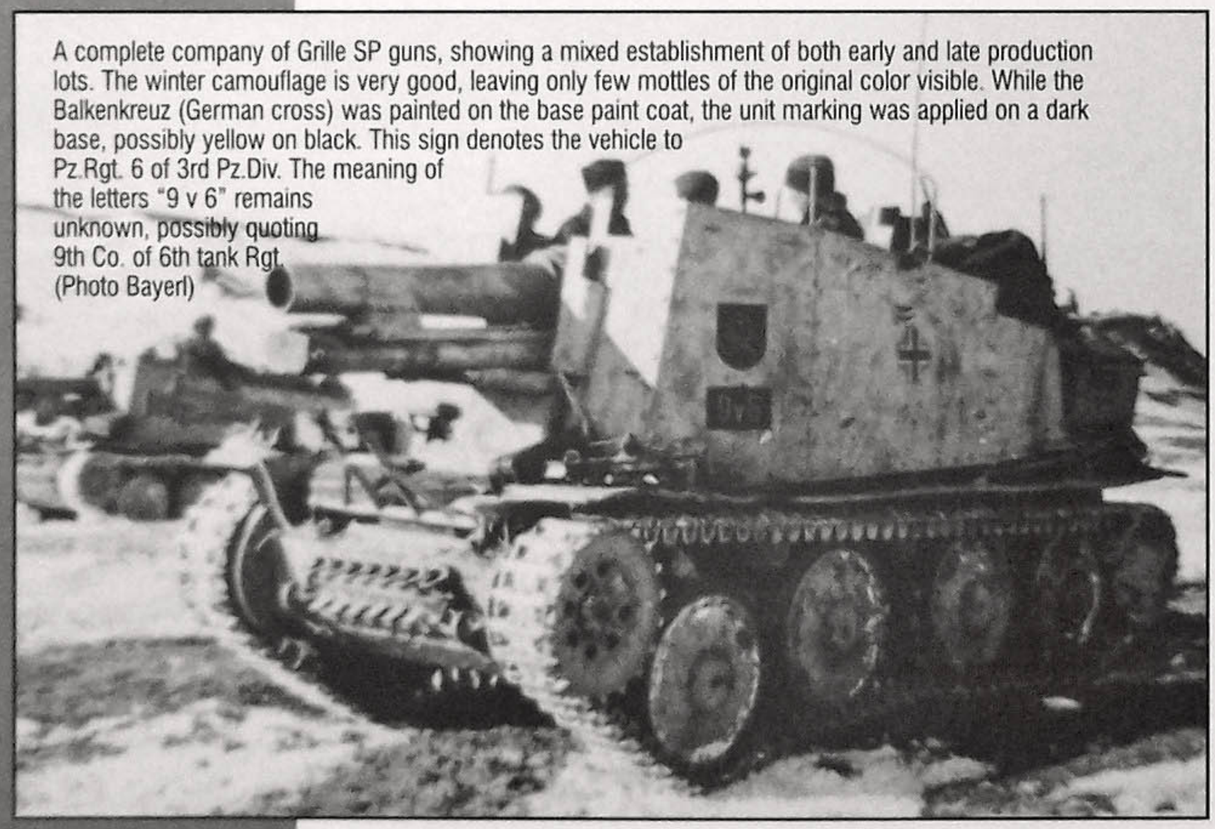


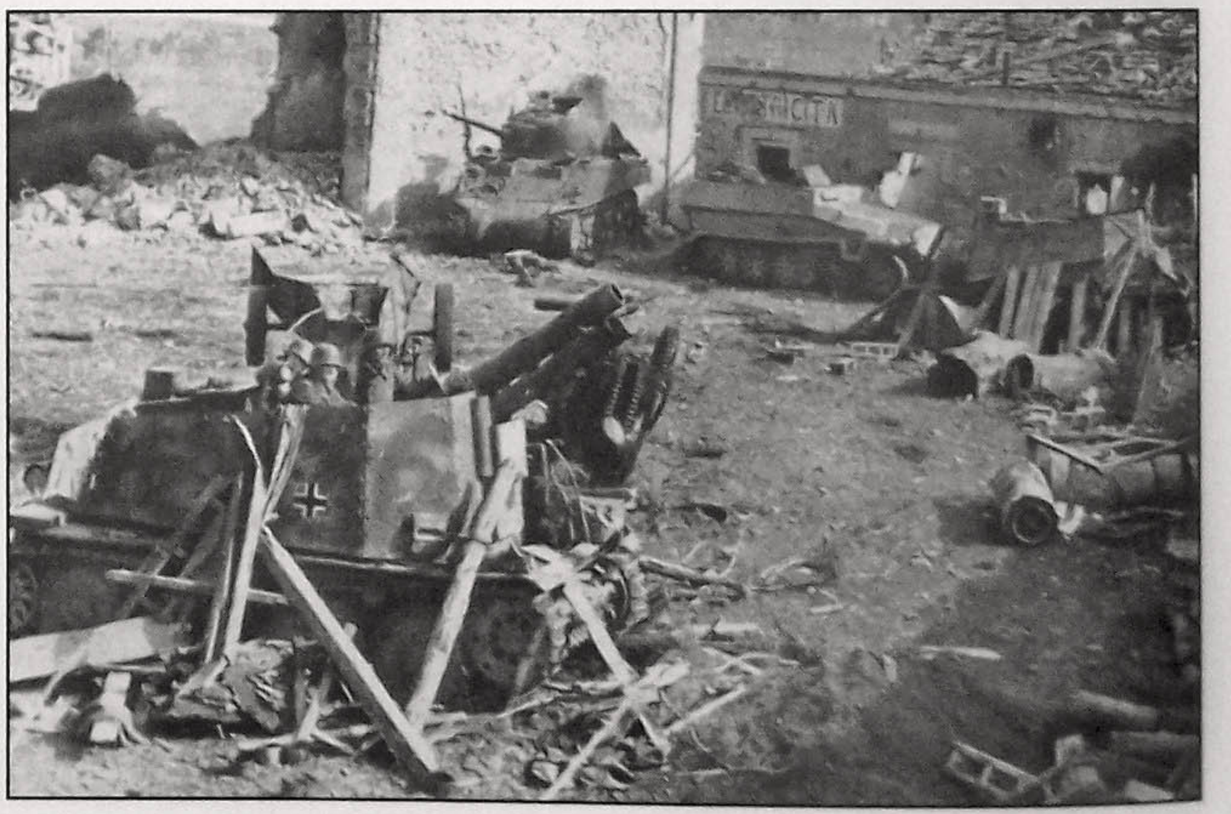
Waiting for the things to come. This Grille of an unidentified unit stands in the shadow of its bigger brother, the Tiger MBT. Still, these highly successful support weapons were important for all German combat in the east. The vehicle shows a worn-off winter coating applied over the dark yellow base. A muzzle cover is fitted. (Photo Bayerl)

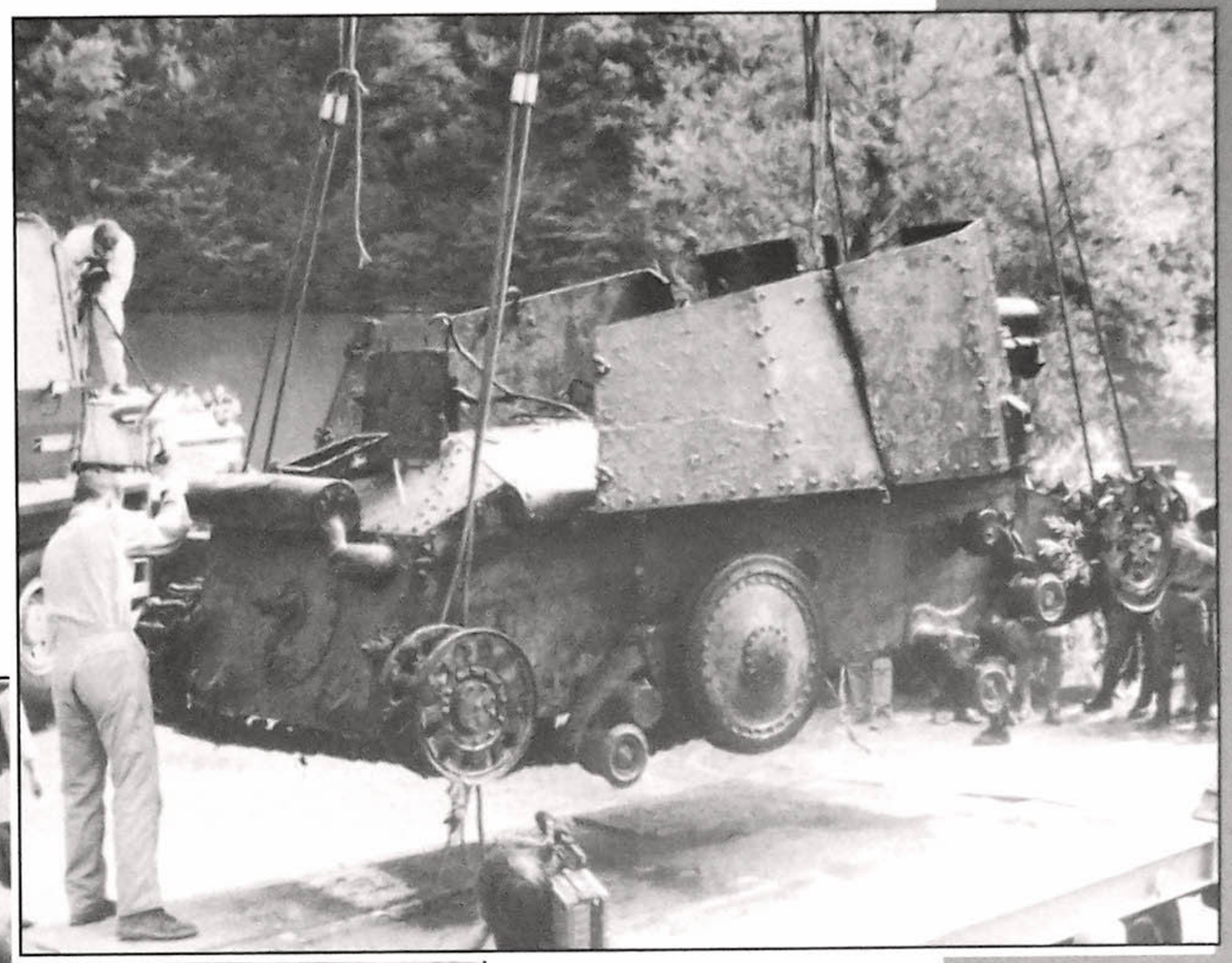


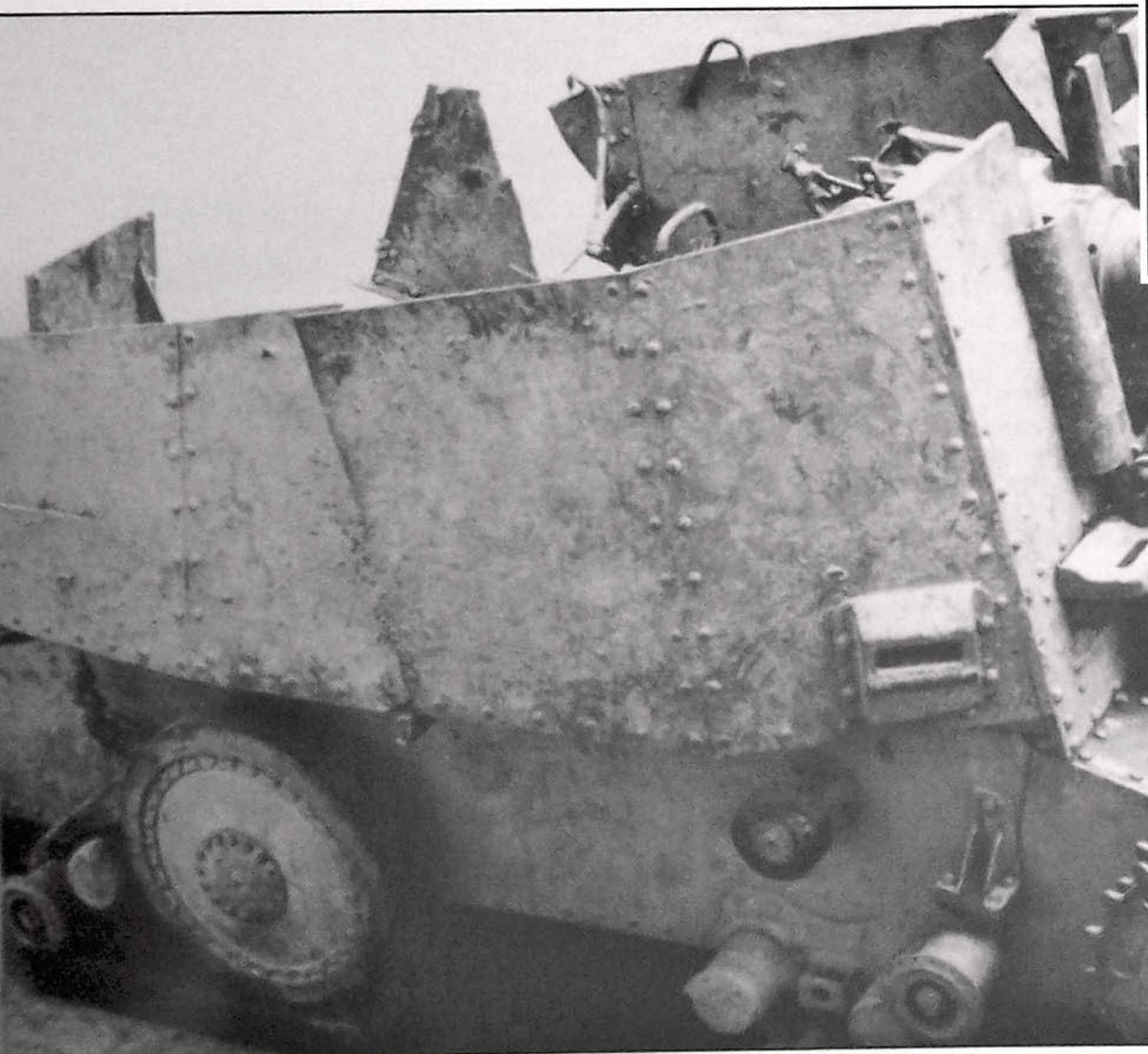
Above: a Grille of 9./Pz.Gren.L.Rgt. 901 (9th co., Panzergrenadier-Lehrregiment 901), assigned to Panzerlehr-Division, photographed during anti-partisan duties in Bosnia, late autumn 1943. The vehicle shows heavy mottling of dark green and dark brown over the dark yellow base color. The unit marking is evident, behind this a black weight classification label is barely visible. (Photo Bayerl) **Below:** two Grille in position near the Italian town of Carroceto, Aprilia. Two destroyed Shermans litter the town center. In the background a Sd.Kfz. 251/1 is visible, possibly the forward observer of this platoon. Also difficult to detect, the SP guns are camouflaged with dark brown stripes over the dark yellow base. Judged by the ammo packages packed in front of the guns, action has already lasted for a while. Two sorts of packages are visible, wooden racks and wickerwork tubes. (Propaganda photo)

A complete company of Grille SP guns, showing a mixed establishment of both early and late production lots. The winter camouflage is very good, leaving only few mottles of the original color visible. While the Balkenkreuz (German cross) was painted on the base paint coat, the unit marking was applied on a dark base, possibly yellow on black. This sign denotes the vehicle to Pz.Rgt. 6 of 3rd Pz.Div. The meaning of the letters "9 v 6" remains unknown, possibly quoting 9th Co. of 6th tank Rgt. (Photo Bayerl)





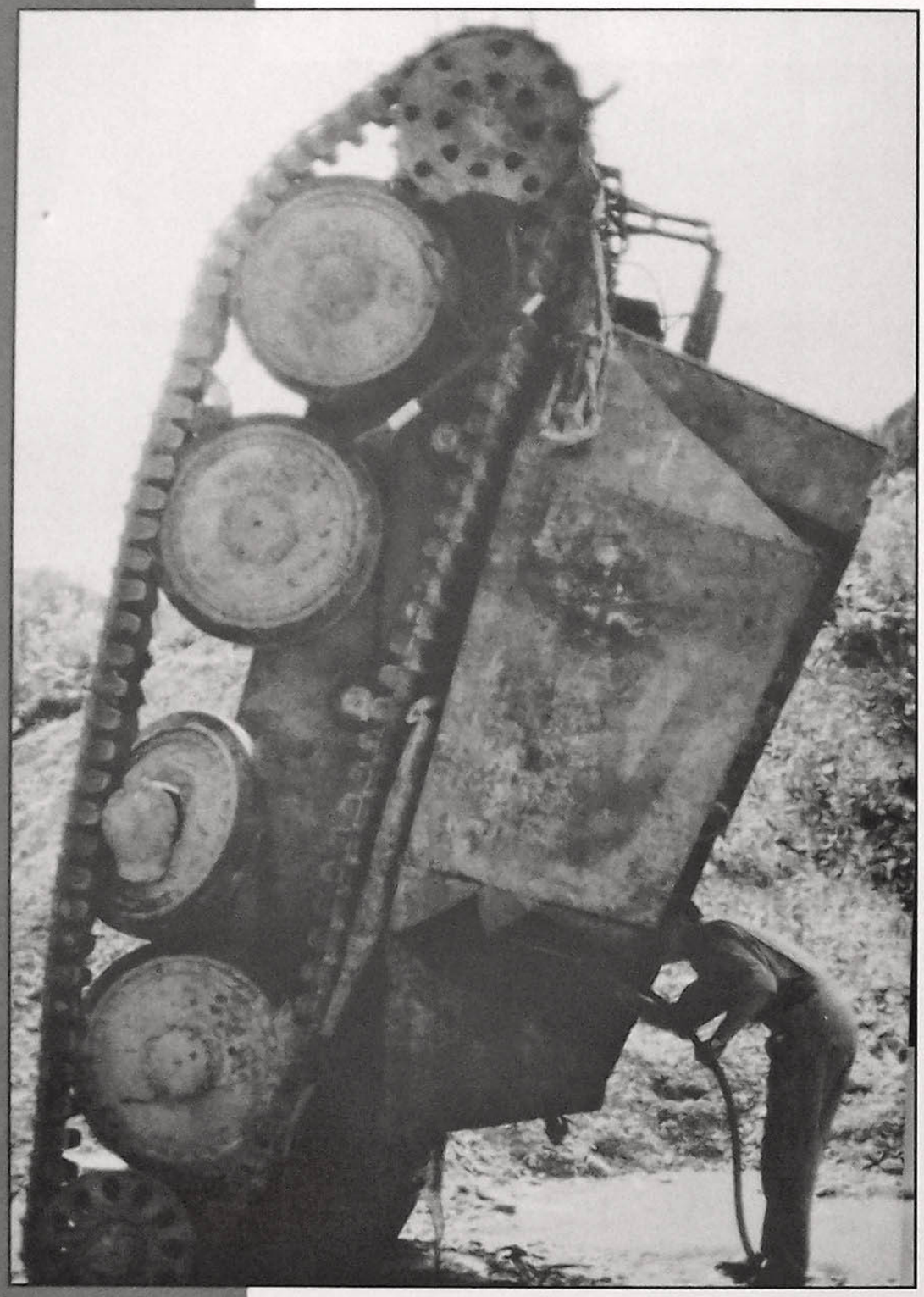




Above left: hundreds of spectators are viewing the Grille slowly emerging from the bottom of the river Enns. Several failed attempts to recover the SP gun inflicted further damage. (Photo Loidl)

Above right: the flatbed trailer is waiting. Note that many parts of the running gear were left in the water, further search was necessary. Still some running wheels and a number of track links are missing. (Photo Loidl)

Left: the overall good state of the vehicle is amazing. (Photo Loidl)



The recovery of 2115

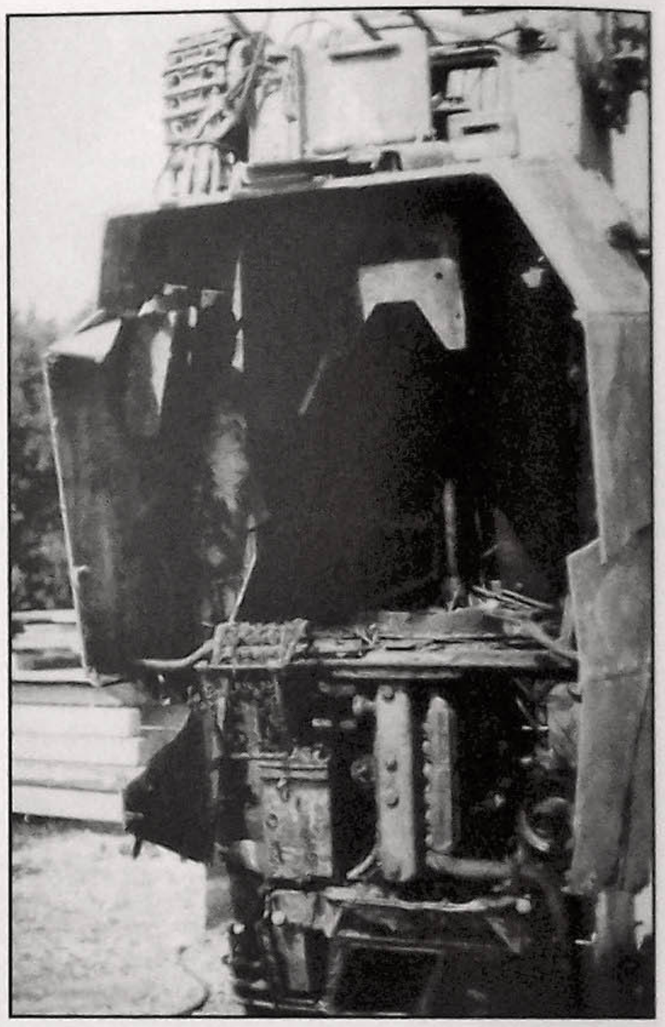
Yes, it was true! Hour after hour, divers had stirred up the mud in the river Enns until finally the gadget was found. Iron, actually scrap. But not for Mr. Josef Loidl, the manager of the Automobile Museum in the town of Lauffen, Austria. A dream came true for him—a German WW II vintage tank, and a unique vehicle at that, would be a true attraction for his collection. Now that the veteran was found, recovery could start.

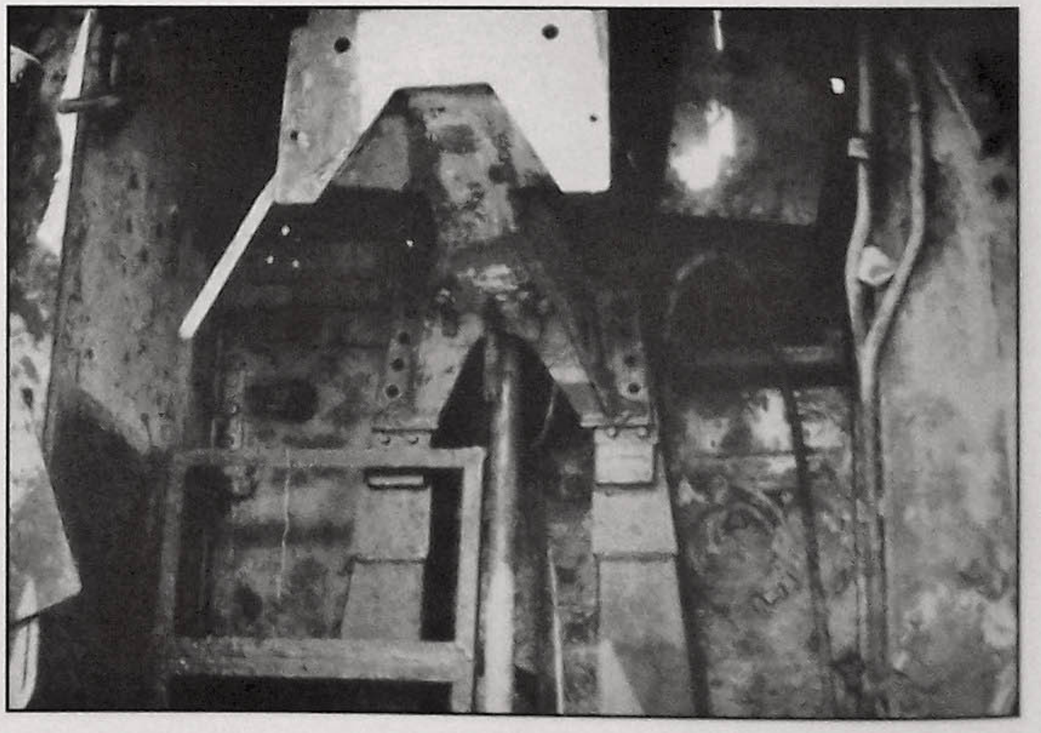
The search for this relic of the last war had dragged out for years. Hints from the local residents proved that a tank had been thrown into the river around March/April 1945, possibly to dispose of this war stuff the simple way. Some recall the events of this time with ease. Unfortunately, finding the exact location after 50 years became a consuming venture. Now all worries were put aside. The divers were able to identify this discovery immediately: a self-propelled gun, armed with the 15 cm sIG 33/1, nicknamed Grille (for cricket). Even better, the first production type with a rear mounted engine. This was a true sensation!

The proprietary rights would be solved months before the tank was found. Mr. Loidl managed to get the tank after one year of paper war. All other museums and private persons were rejected, among these some German institutions.

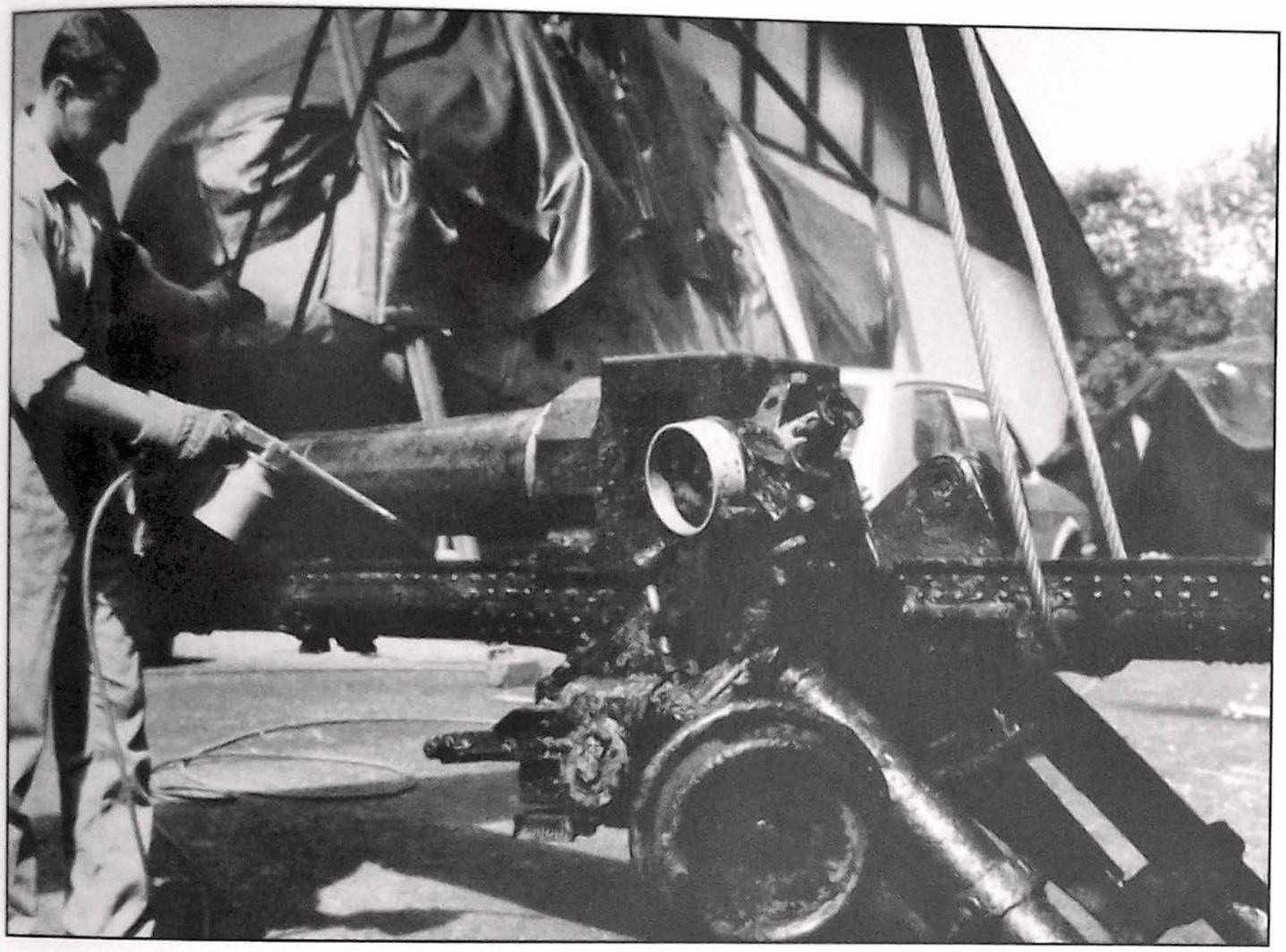
In mid 1998 recovery was set to start—this sounded pretty simple. The river Enns, one of the largest mountain streams in Austria, proved to be a true challenge for Loidl's team. As each day progressed, more problems emerged. First, a 40-ton pontoon

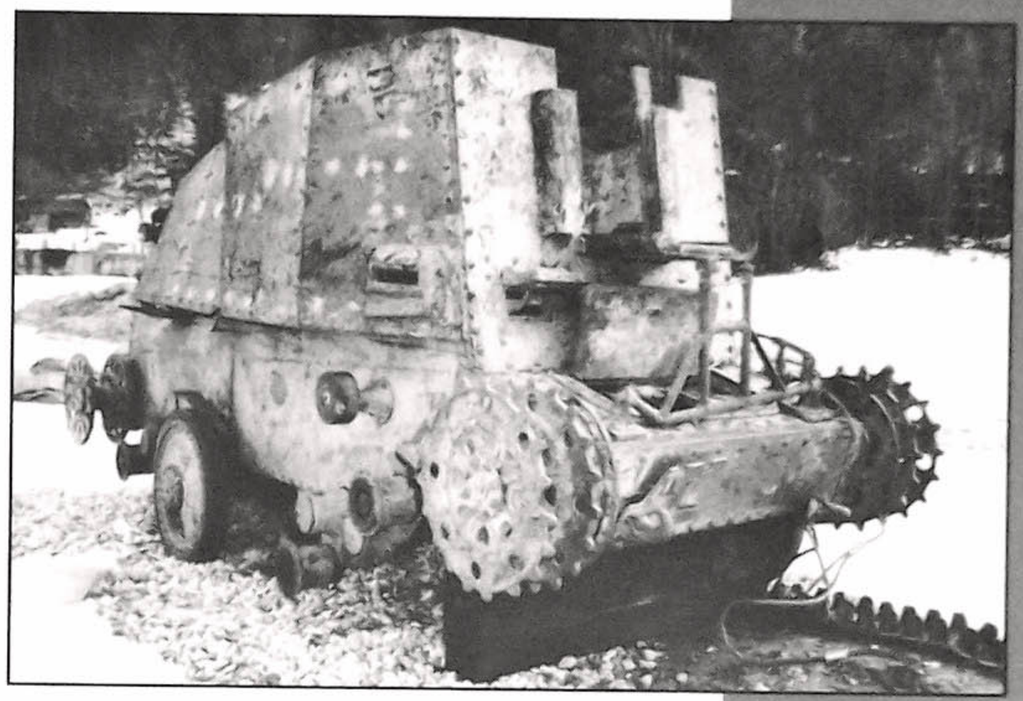
(text continued on page 93)

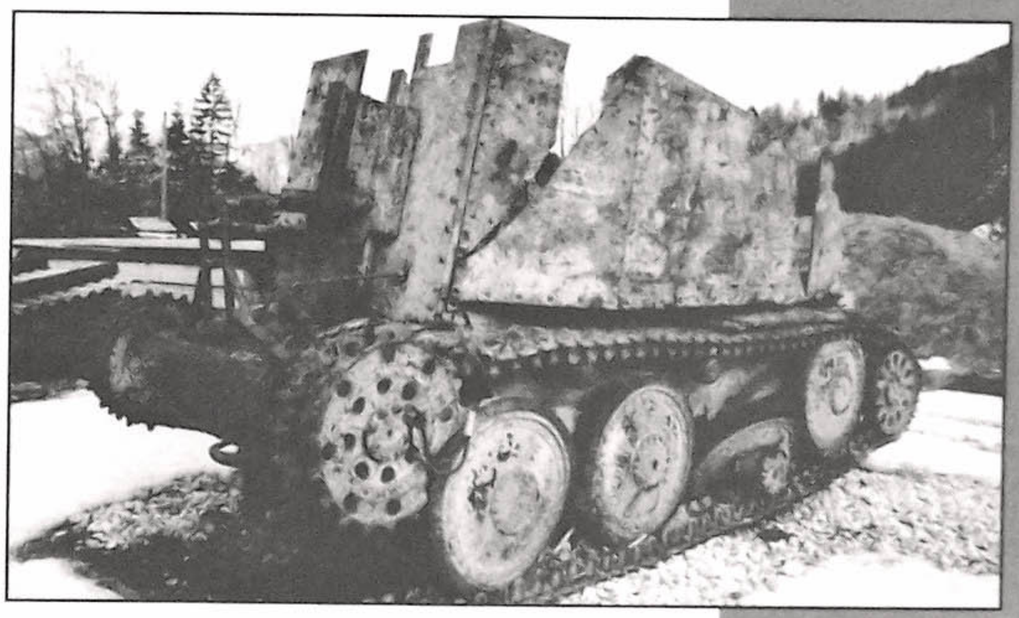


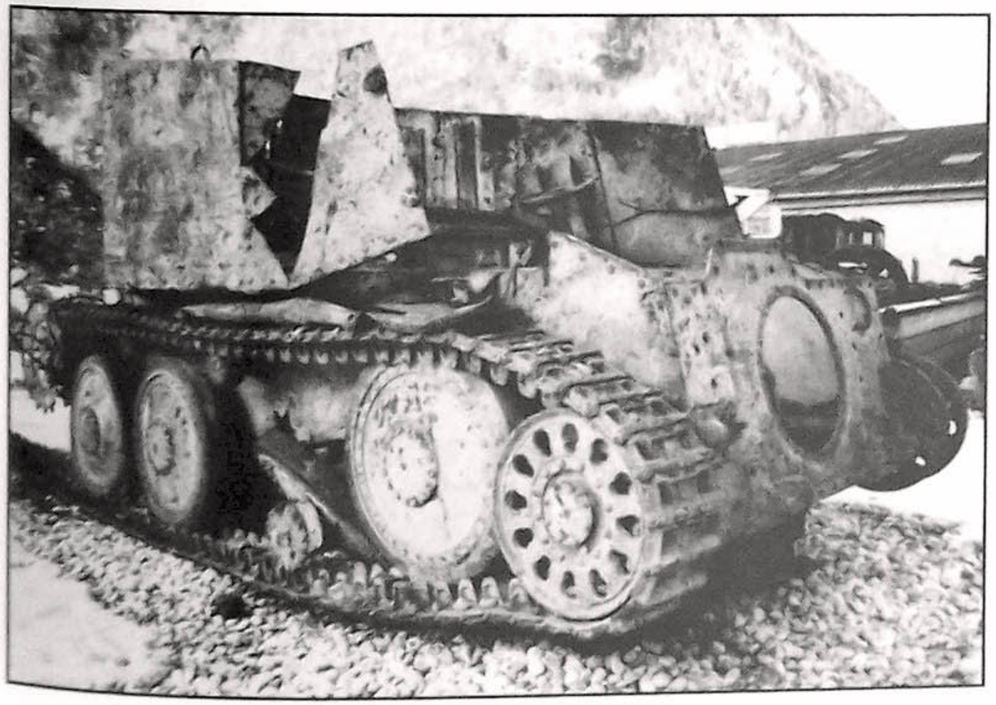


Above left: delivered to the museum yard, clean up of the Grille started immediately. The crane held the tank in a somewhat unusual position, while an employee works with the high pressure cleaner. (Photo Loidl) **Above right:** a view into the vehicle. The gun is already removed, leaving the trestle visible. The engine is still in place. (Photo Loidl) **Right:** a closer view to the gun mount. The trestle is of welded construction. Below this, a V-shaped reinforcement is visible, a rather crude construction. (Photo Loidl)

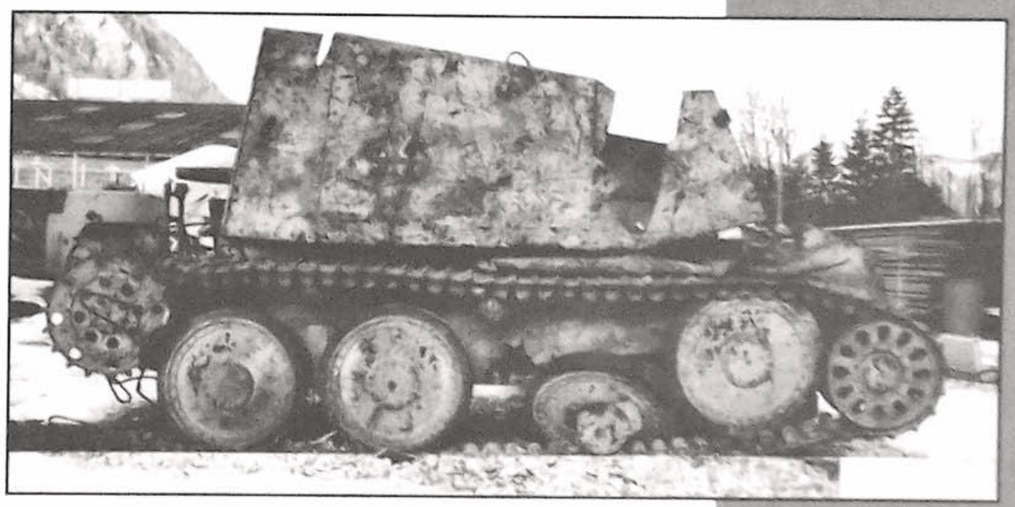


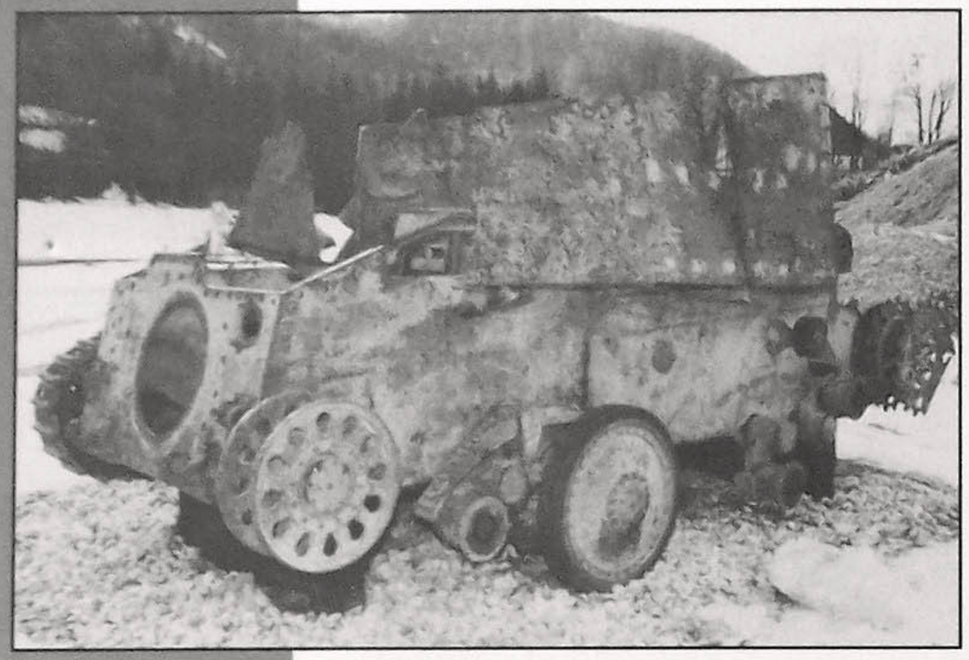


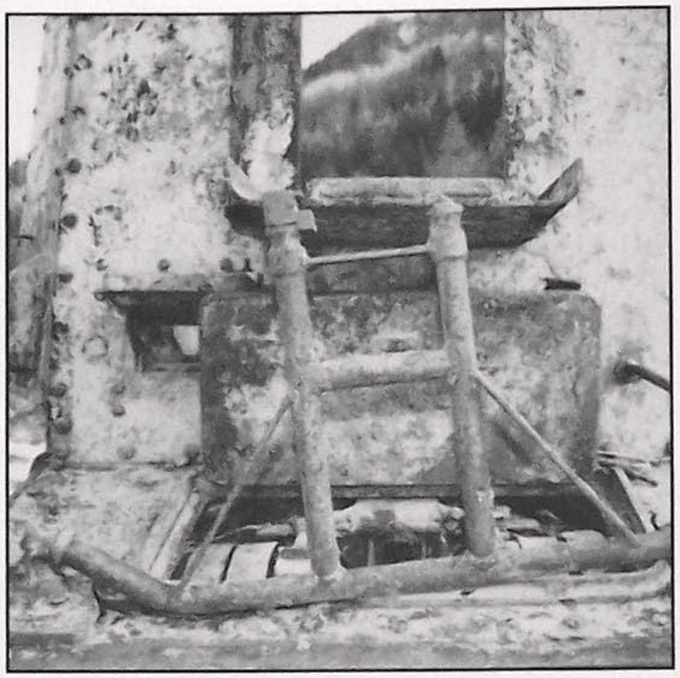


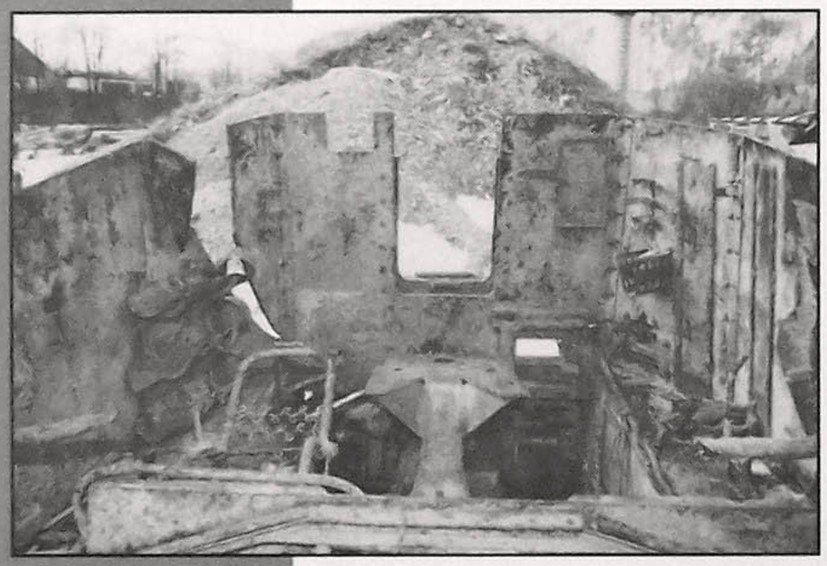


Above left: the gun receives a wash with a rust-converter, partly to loosen 40 years of rust, partly to conserve the parts until further restoring takes place. (Photo Loidl) **Above right:** the Grille from the right hand side. The drive sprocket is damaged and the complete front running wheel assembly is missing. The chassis of the Pzkw 38 (t) was used almost unchanged. **Right center:** the left part of the superstructure shows a broken plate, probably damaged when the tank was sunk in the river. The drive sprocket is missing some teeth. **Below right:** the armor plate at the extreme right is broken as well. When hitting the ground, the rear running wheel assembly was also destroyed. **Left:** this photo shows the engine compartment. The engine and engine cover plate were already removed.









Above left: this view shows the degree of damage inflicted to the running gear.

Above center: the gun travel rest is slightly damaged. The large lid allowed access to the transmission.

Above right: another view of the travel rest. The transmission cover flap is closed. Note the vertically shifting armor plate in the background. When the gun is elevated, this plate would follow the movement always covering the gap between superstructure and gun cradle.

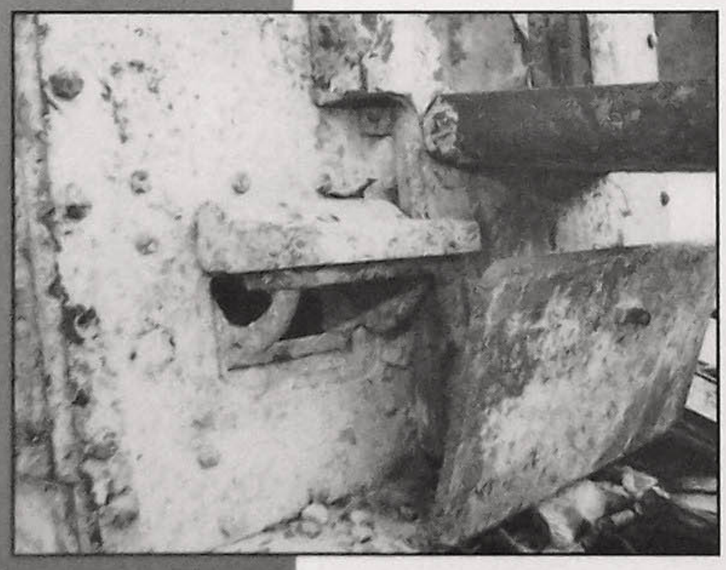
Left: a good view into the fighting compartment. There was enough space for the 4-man crew, only the driver lived on the uncomfortable side.

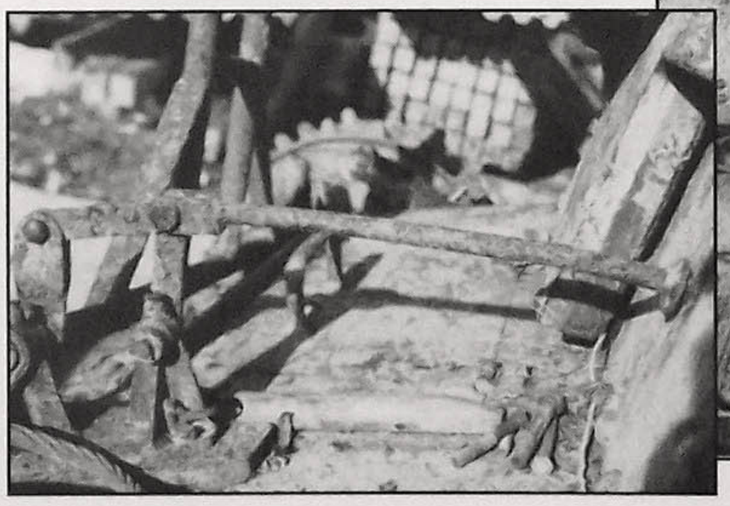
Below left: the drivers' visor was a standard Pzkw 38 (t) part and can be seen on a variety of vehicles.

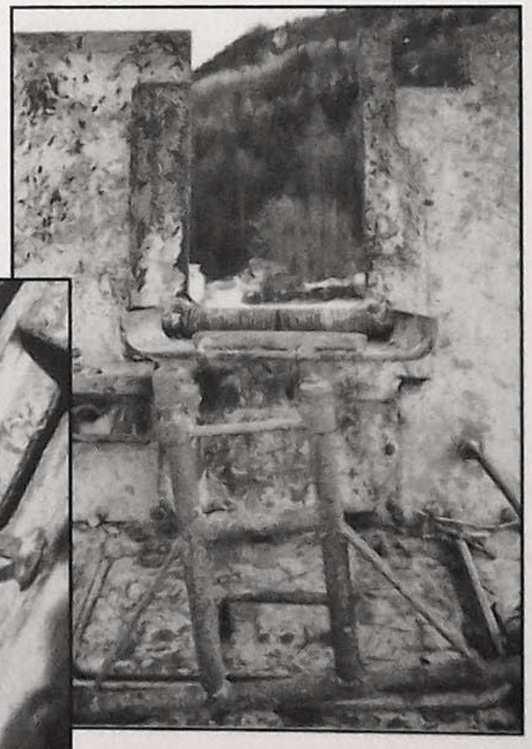
Below center: a close up to the gun travel rest crank.

Below: this view shows the large spring of the gun's protection plate. The complete superstructure was bolted, a construction characteristic of the many ex-Czech vehicles used by Germany.

Below right: here the complete gun cradle protection is visible. When elevating the gun, the now horizontal plate would follow this movement.

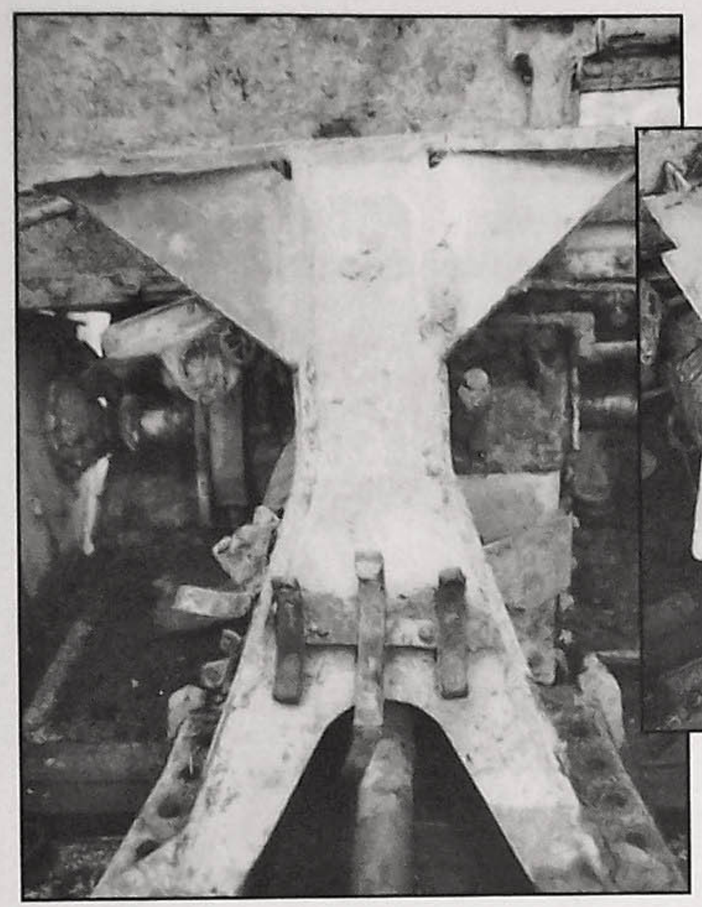


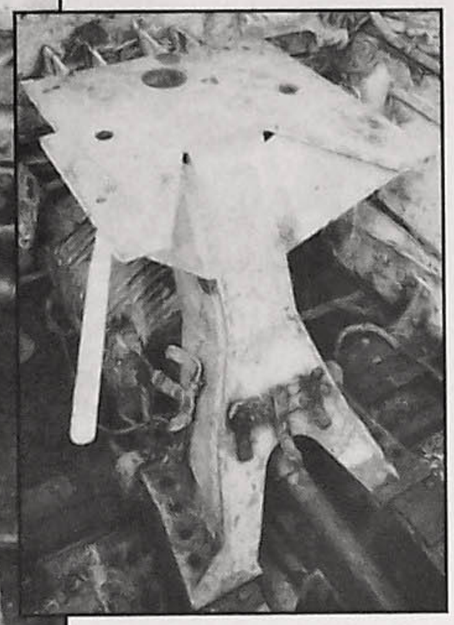




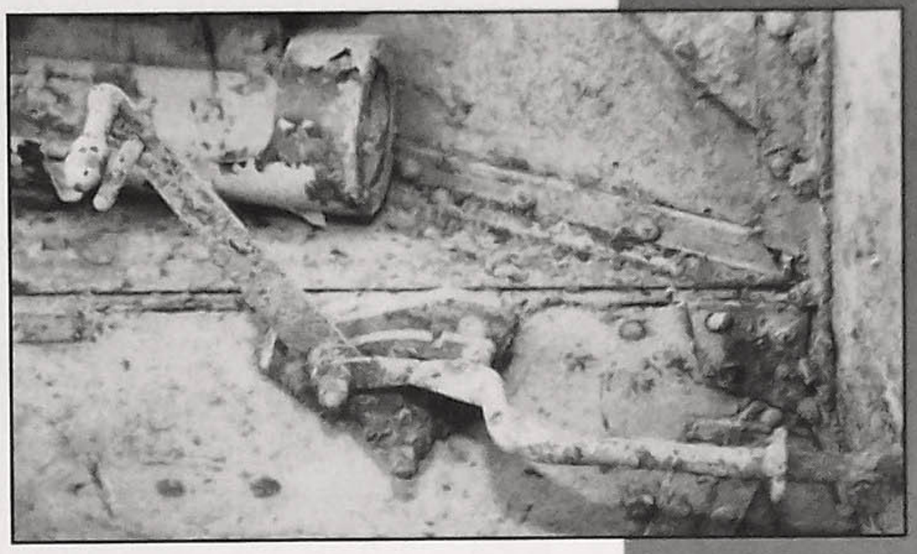
(a floating bridge) had to be constructed and a large excavator was installed on it. After two long days of underwater activity, a giant crater was dug out 12 meters in depth, which contained the tank. With shovels and hands, work continued underwater until identification was possible. Delighted with the result of the search, Loidl's crew started recovery. By this time, the weather changed, a thunderstorm approached. Due to this storm, the pontoon had to be shipped to a calm bay. The spell of bad weather, accompanied by high water, made further progress impossible. The team was forced to cease recovery for several months. In autumn 1998, better weather made continuation of the recovery possible. The crater however had vanished, and the excavator needed two days to find it again.

Again, fate apparently worked against Loidl's team—the weather changed again and the crater filled with sand and mud a second time. The start of winter stopped all further efforts. Mr. Loidl, who had made a tremendous financial investment and now seemed defeated by the monstrous river Enns, considered the complete suspension of the recovery. Finally in the





Above left and center: the trestle carried the sIG 33/1. This massive carrier was of welded construction. It was fixed to the bottom with eight massive bolts. Additionally, the trestle was fixed to the frontal plate as well. Brackets for two gas masks are visible.The gun mount trestle had to be open to the bottom to give way for the drive shaft. Two metal beams reinforced the trestle itself.



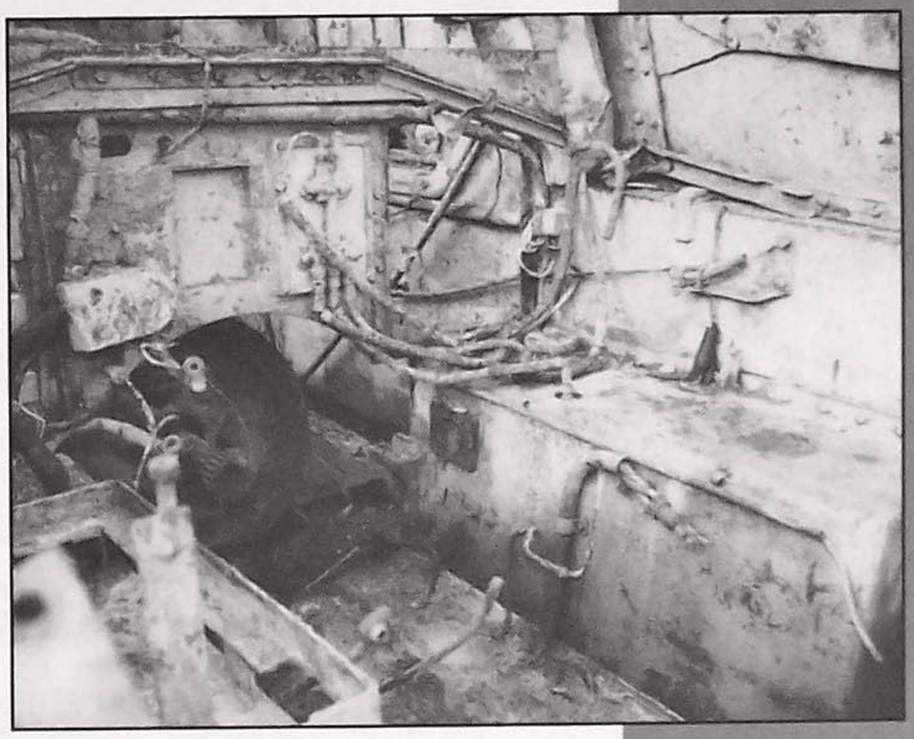
Above right: the release lever for the gun mount crank. The lever could be fixed in two positions.

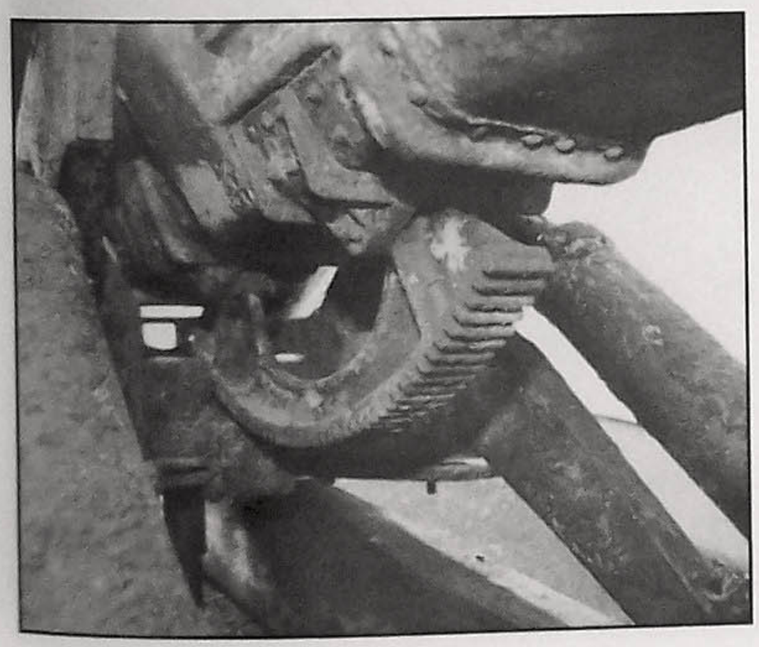
Right: a view of the fuel tank and the firewall.

Below left: the large sprocket of the elevation mechanism.

Below: the cradle houses the recuperator.

Below right: the 15 cm sIG 33/1 is stored. Again the relatively good state of the guns is astonishing.



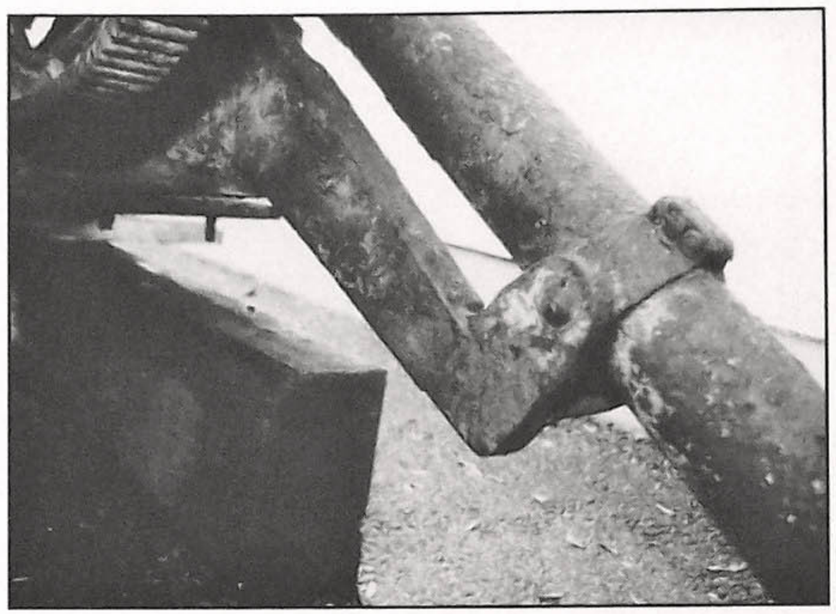


summer of 1999, a further attempt was undertaken and now Loidl succeeded.

When the Grille was found again, four steel ropes were attached at its edges and the tank was slowly lifted. With the self-propelled gun hanging under the hull, the pontoon was slowly hauled to firm ground. Only here was it possible to lift it out of the water. Now the Grille stands on the museum yard, roughly cleaned and dismounted. After 50 years under water it waits for restoration, which will hopefully be finished in 2002.

The fate of 2115

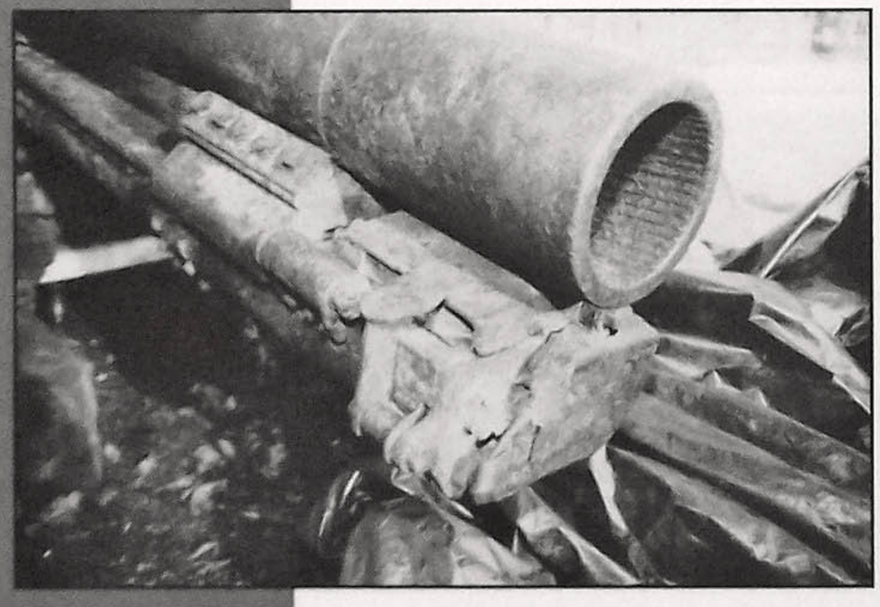
To learn more about the vehicle, it was necessary to determine the chassis no. (Fahrgestell-Nummer), which is 2115. This was subsequently passed over to a specialist in the United States, Mr. Tom Jentz and with his help the Grille's history was unveiled. According to this number, the vehicle was attached to the Pz.Gren.Div. "Großdeutschland" (GD) in April 1943. 2115 appeared a second time in the divisions' papers in September 1943, so this information is reliable. The vehicle fought with GD in the east and was possibly sent for major repair works to a depot in 1944. Towards the end of 1944, a new unit was formed from cadre and training units of GD called Führer-Grenadierbrigade

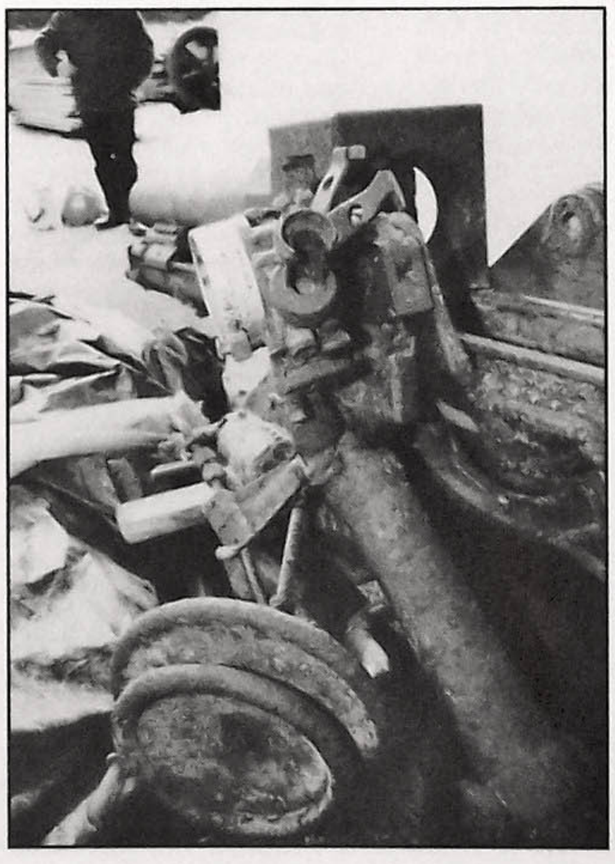


Above: the equilibriators were fixed at the side pointing to the rear.

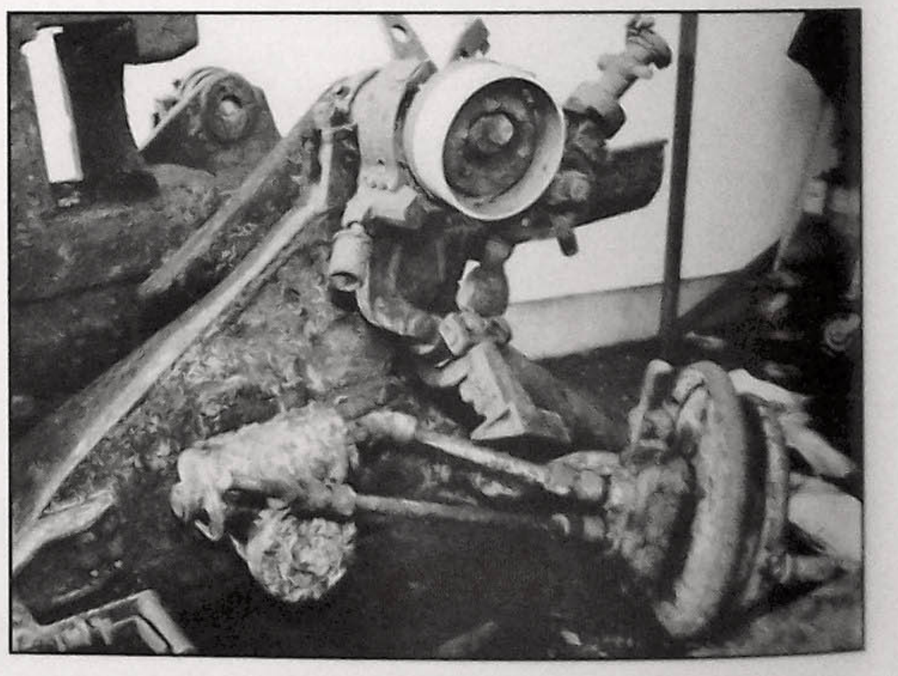
Above right: the massive lever of the equilibriator.

Below left: the muzzle of the sIG 33/1. Note the rifling inside the barrel.





Below center and right: the side traverse and elevation gear was handled with one mechanism. Both the hand wheels were mounted on one central shaft. Above these, the gun sight mount is visible.



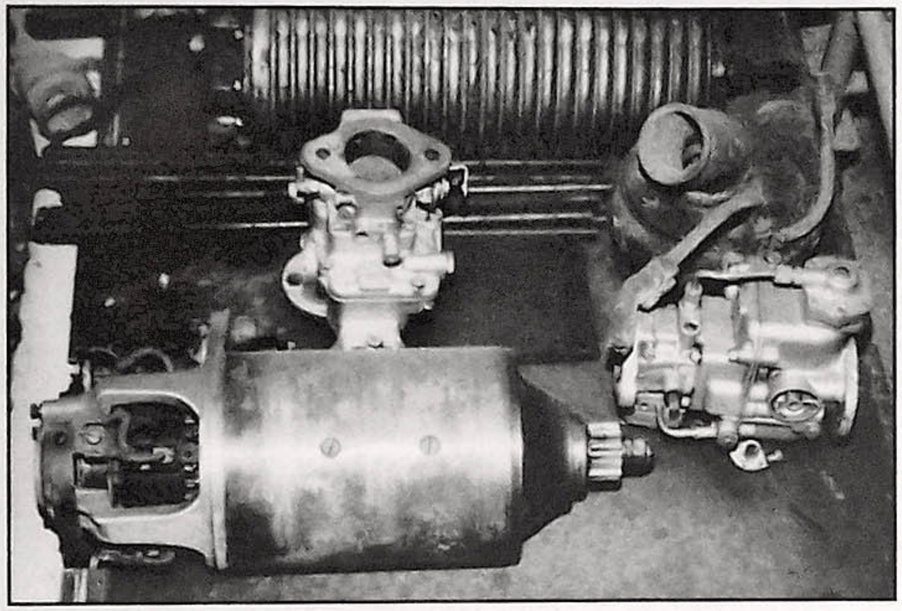
(FGB). Between the years 1944/1945 FGB was renamed to Führer-Grendierdivision (FGD) for disguise reasons, a true paper tiger. FGD fought towards the end of the war around Vienna, Austria, retreating to the west. Probably our Grille was issued to FGB and found its way to the Salzburg area with the remnants of the Führer-Begleitdivision. Here it was slipped into the river Enns.

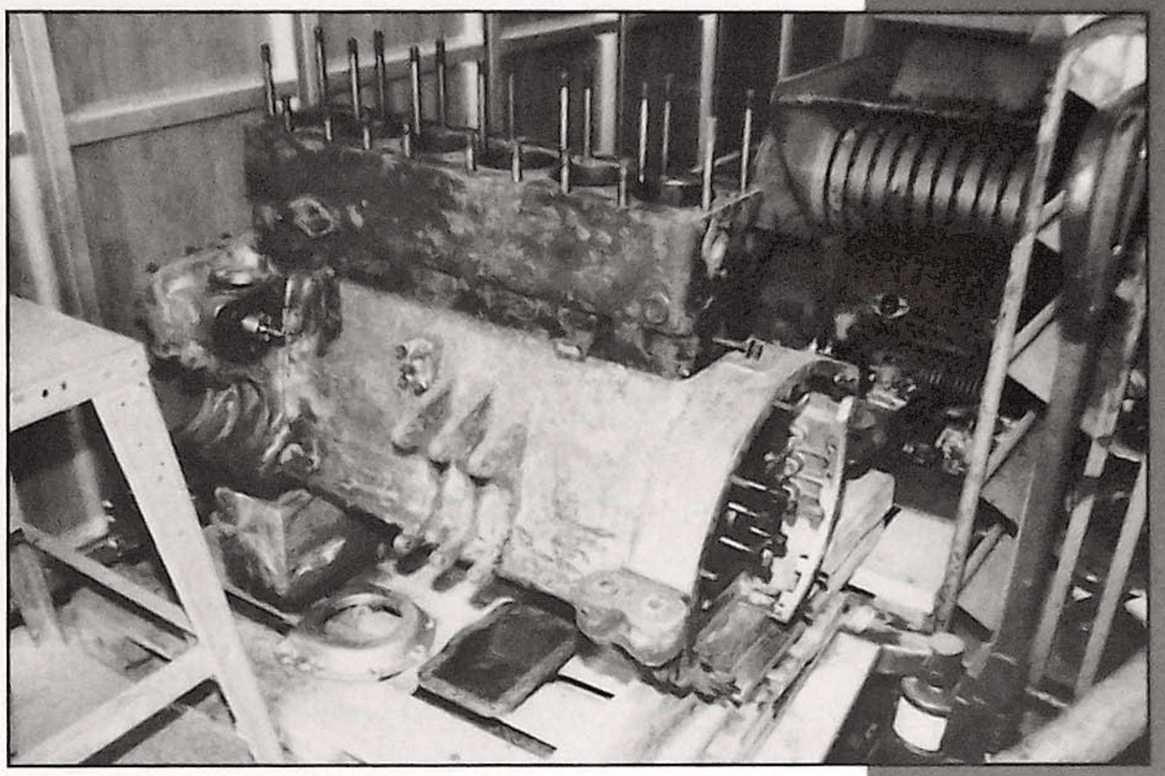
The future of 2115

The recovered Grille was in remarkable condition. Of course, there were some parts of the running gear missing and the superstructure shows cracked side plates. Regardless of this, Mr. Loidl declared that the museum would be able to repair the vehicle to running condition.

Acknowledgements

The author wishes to thank Mr. Josef Loidl for giving access to his freshly recovered Grille. Mr. Tom Jentz also helped with valuable information. Furthermore, the gentlemen Bayerl, Buchner, Fleischer, Netik, Netrebenko and Seeler provided precious wartime photos.
Additional information was given by the following publications:
Die motorisierten Schützen und Panzergrenadiere 1935 bis 1945 by W. Fleischer.
Waffen Revue Vol. 59, 60, Germany.
Technical Manual D 2025, Author.



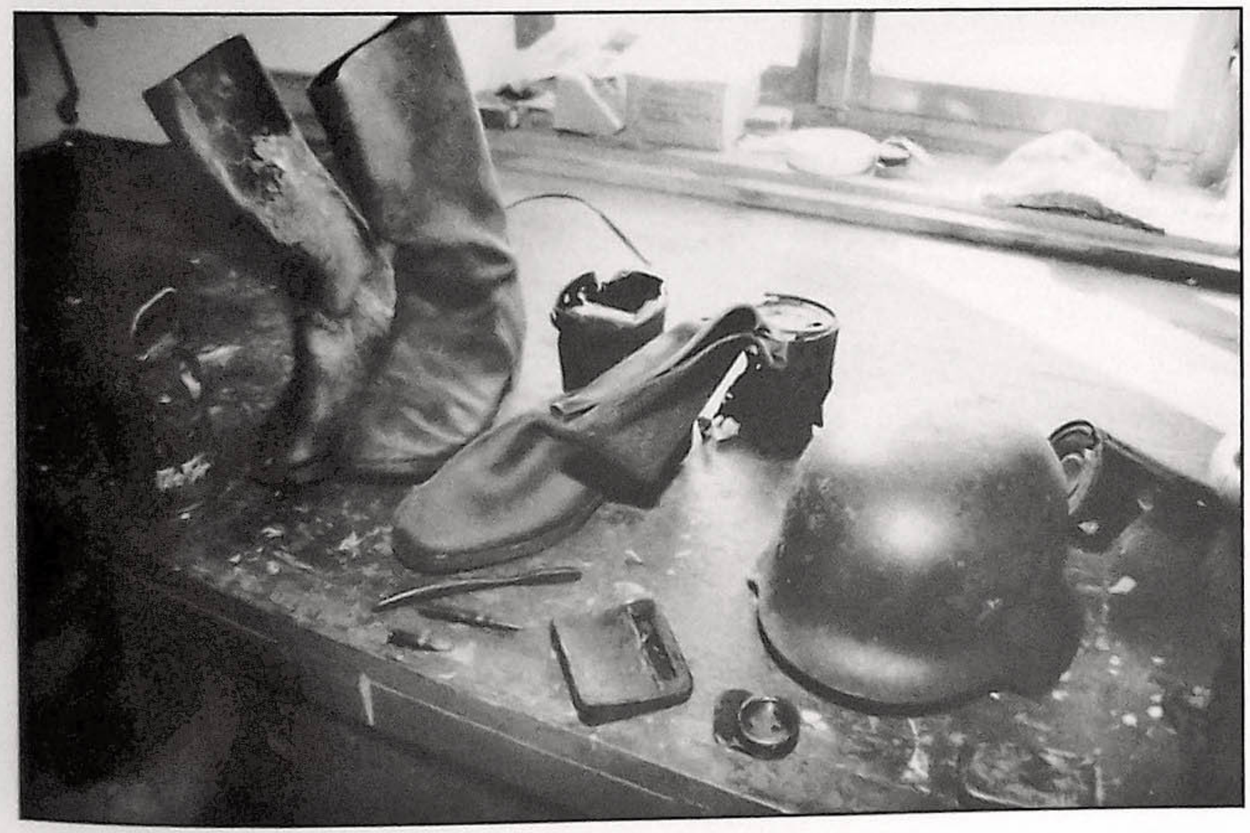


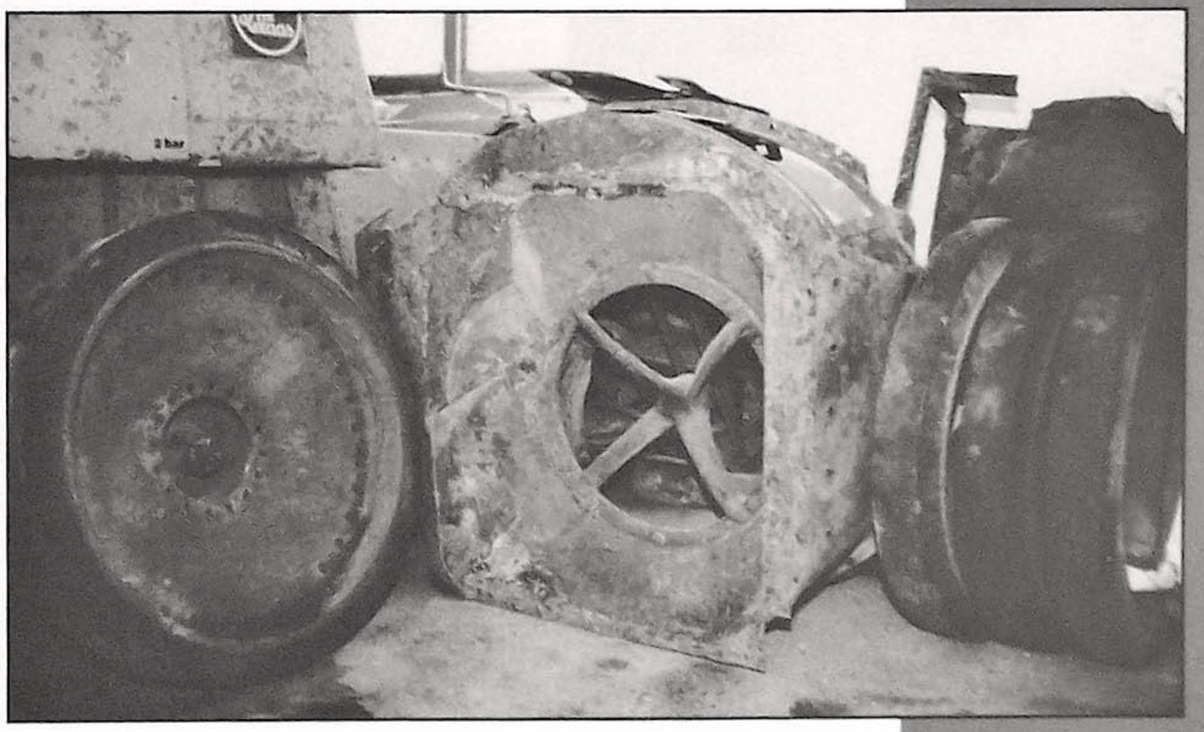
Left: parts of the engine are already cleaned. Carburetor and dynamo are already working.

Above right: the engine block. The 7.75 liter, six-cylinder engine delivered 140 PS.

Below left: while cleaning up the Grille, a lot of parts were found in the mud. Among them were boots, steel helmets and food rations.

Below right: more parts of the Grille puzzle.





Schwere Geschützkompanie (6 sIG 33/Sfl 38)
Heavy Infantry Gun Company

Company Commander

Co. Cdr. Squadron
2 Kettenkrad (Sd.Kfz. 2)
1 Spw (Sd.Kfz. 251/3)
1 Spw (Sd.Kfz. 251/11)

Supply Squadron
1 le. Pkw (Kfz. 1)
2 Lkw.3-ton, 4x4, fuel
1 Lkw.3-ton, 4x4, field-kitchen
1 Lkw.3-ton, 4x4, transport

Repair Squadron
1 le. Pkx (Kfz. 1)
1 Lkw.3-ton, 4x4, workshop
1 Lkw.3-ton, 4x4, transport

Recovery Squadron
1 12 to Zgkw (Sd.Kfz. 8)

Train
1 Lkw.3-ton, 4x2, transport

1st Platoon
1 Kettenkrad (Sd.Kfz. 2)
1 Spw (Sd.Kfz. 251/1
2 sIG 33 (Sfl 38)
1 le. Pkw (Kfz. 1)
2 Lkw 3-ton, 4x4, ammo
2 ammo trailer (Sd.Anh. 31)

2nd Platoon
1 Kettenkrad (Sd.Kfz. 2)
1 Spw (Sd.Kfz. 251/1)
2 sIG 33 (Sfl 38)
1 le. Pkw (Kfz. 1)
2 Lkw 3-ton, 4x4, ammo
2 trailer (Sd.Anh. 31)

3rd Platoon
1 Kettenkrad (Sd.Kfz. 2)
1 Spw (Sd.Kfz. 251/1
2 sIG 33 (Sfl 38)
1 le. Pkw (Kfz. 1)
2 Lkw 3-ton, 4x4, ammo
2 ammo trailer (Sd.Anh. 31)

Ammo Squadron
3 Lkw.3-ton, 4x4
3 ammo trailer (Sd.Anh. 31)

According to Kriegsstärkenachweis Nr. 1120 a, 1944