

2040

Pershing/Patton

in action



DON GREER



Armor Number 40
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Pershing/Patton

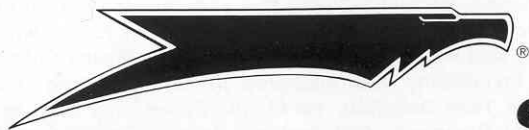
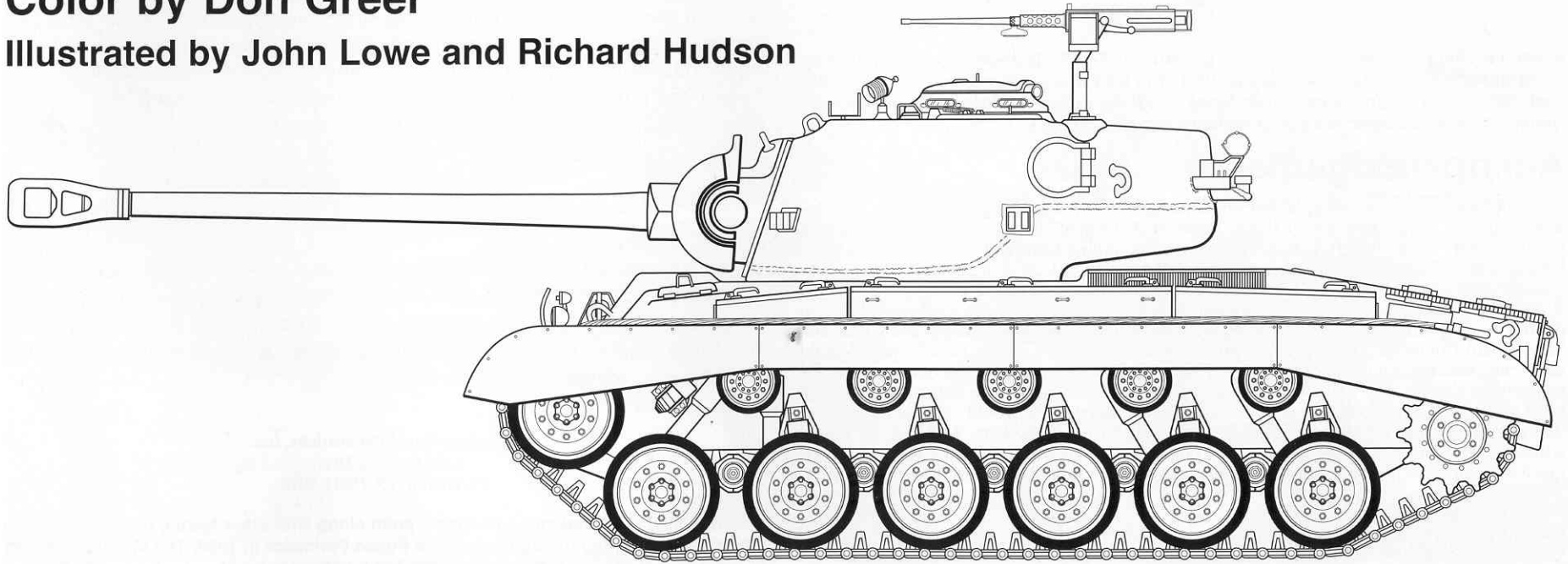
**T26/M26/M46 Pershing
and M47 Patton**

in action

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Color by Don Greer

Illustrated by John Lowe and Richard Hudson



Armor Number 40

squadron/signal publications



Introduction

The state of America's armored force was, to put it kindly, abysmal in 1939. The National Defense Act of 1920 had assigned tanks to the infantry and led to the abolishment of the Tank Corps formed during World War One. To get around this legal restriction, tanks assigned to the cavalry were designated 'Combat Cars'. There was an attempt to create a 'mechanized force' by the early 1930s, but this was short-lived. Consequently, when World War Two erupted in September of 1939 the US armored force was lacking in direction. Its equipment, handicapped by restricted budgets since the 1920s, was composed largely of obsolete vehicles.

This state of events did not last long. Germany stunned the world with its *Blitzkrieg* (Lightning War) style of armored warfare, conquering Poland in a month, then overrunning nearly all of Western Europe during a six-week campaign in the spring of 1940. This dramatic series of victories shocked the United States military and, in July of 1940, the Army created the 'Armored Force' in direct response to the German panzer divisions. Although this was a move in the right direction, two doctrines evolved under the direction of the Army Ground Force (AGF), who was responsible for all matters related to ground forces. The Army created a separate, defensively oriented, force of lightly armored, highly mobile vehicles that would be deployed against breakthroughs which had occurred in France. These 'tank destroyers' would carry a larger gun than that of the tanks, since it was envisioned that they would be the main force to deal with enemy tanks. The role of tanks would be to serve as an exploitation force, much like that of cavalry, in the new armored divisions. Additionally, the tanks would support infantry forces in separate tank battalions. While it was foreseen that these tanks would occasionally be forced to deal with enemy armor, this was not their primary mission. The US Army was the only force to follow this dual doctrine in terms of tank warfare.

When US ground forces were finally committed against the Germans in North Africa in 1942, some of the armored units were equipped with the new **M4 Sherman** tank. When first introduced, the M4 was comparable with foreign tanks then in service. The vehicle was mechanically reliable, had adequate armor protection, and offered good mobility. It was armed with a dual-purpose 75MM gun that allowed it to both engage enemy armor and provide support for ground troops. Nevertheless, the M4 was viewed by some as less than adequate for infantry support and a new tank, designated the **M6** heavy tank, was designed to supplement it. The M6 was plagued by mechanical difficulties and offered no significant improvement over the M4. A small number were produced, but the intended production run was canceled due to its inherent problems; the few vehicles manufactured were used for testing.

The T20E3 was a T20 equipped with a torsion bar suspension in place of the Horizontal Volute Spring Suspension (HVSS). The new suspension improved the ride, while a wider track reduced ground pressure. It was originally intended to be armed with a 3-inch (7.62 cm) gun, but was equipped instead with a 76MM cannon. The basic hull lines were carried over to the later M26 design. (Hunnicut)



While the Sherman pilot model (**T6**) was under development, work was also being done to design a heavy infantry support tank – the **T14** – for the British under Lend-Lease. This led to an interest in a similar vehicle for use by US forces and work began on this vehicle, designated the **T20**, in late 1942. The T20 was envisioned as a more compact version of the M4 with heavier frontal armor. The vehicle also had a relatively high speed for an infantry support tank since it was also to be used with the armored divisions. The T20 was powered by the new 500 horsepower (HP) Ford V8 gasoline engine, which was also used on both the T14 and the new M4A3. A torque-converter fluid drive transmission, similar to that used on the T6, was incorporated into the design. The T20 was also to be tested employing a variety of main guns.

The first T20 pilot was completed in May of 1943 and was equipped with a Horizontal Volute Spring Suspension (HVSS) system. At the same time, the pilot vehicles **T22** and **T23** were also added to the series. The T22 was to be fitted with a mechanical transmission, while the T23 was equipped with an electric drive transmission system. The Army also showed an interest in fitting one of the pilot T20s with a torsion bar suspension under the designation **T20E3**.

The T20 series vehicles had both the engine and transmission mounted in the rear of the tank. This was in contrast to the M4 Sherman, which had the transmission in the front. A long drive shaft, running through the fighting compartment, was a feature that contributed to the Sherman's high silhouette. Packaging the engine and transmission together in the rear allowed a lower hull profile and thicker armor without a significant rise in weight or a decrease in performance. The T20, T22, and T23 were delivered for testing during the first half of 1943, but only the 76MM gun equipped T23 offered a significant potential for future development. The T23's main problem was its electric drive transmission. While this type of transmission had distinct advantages compared to more conventional transmissions, its weight, technical complexity, and high cost made its use prohibitive.

The T23's initial testing went fairly well; by May of 1943 the Ordnance Department gave serious consideration to placing the tank into limited production. This did not occur, since the AGF felt the M4 was quite sufficient for the Army's needs, while the Armored Force felt the T23 was too heavy and transmission too unreliable for field use. Additionally, the fighting in North Africa brought the M4 face-to-face with the German PzKpffw VI Tiger I heavy tank. The Tiger I and its 88MM gun completely dominated the M4 and the Tiger's armor proved nearly impervious to the Sherman's 75MM weapon at all but close range. As a result of these encounters, the Armored Force asked for a new design with a heavier gun and thicker armor. Despite their misgivings, the Ordnance Department ordered the T23 into limited production with 250 vehicles eventually rolling off the assembly lines. None saw combat – as a complete vehicle. The Army was impressed with the T23's turret and higher velocity 76MM gun and ordered them into production where they were mated to M4A1 and M4A3 Sherman hulls. These vehicles saw extensive combat. Additionally, the Army developed a variant of the T23 known as the **T23E3**. This vehicle was fitted with a torsion bar suspension like that used on the earlier T20E3.

The T23E3 was also a T23 equipped with a torsion bar suspension and wide track. The T23 was ordered into limited production, with 250 built. These were used for testing and none were sent into combat. The T23 series turret and 76MM gun was used to upgrade the M4 Sherman with the more powerful 76MM gun to better deal with the new generation of German tanks coming into service. (Hunnicut)



Combat reports of the Tiger I resulted in two further T series tanks, the **T25** and the **T26**. Similar in overall design to the T23, both vehicles were armed with a 90MM gun. The T25 was fitted with an HVSS suspension, while the T26 had a torsion bar suspension. Apart from their suspension, the primary difference between the two vehicles was armor protection. The T25 had three inches (7.6 cm) of frontal armor and the T26 had four inches (10.2 cm). The initial pilot models had the same electric drive transmission as the T23, but its mechanical complexity, reliability problems, and weight rendered it unsuitable. A torque-converter fluid drive transmission was used in its place. This change led to the designations **T25E1** and **T26E1** for these vehicles. By May of 1944, 40 T25E1s and ten T26E1s had been manufactured and delivered for testing.

Unfortunately, there was still a great deal of resistance to a new tank, especially one so heavily armed and armored. The full impact of the Tiger I and the new Panther had yet to be realized by the Army General Staff, Ordnance, Army Ground Forces, and even the Armored Force. It was generally felt that the Sherman, especially with new 76MM gun version coming into service, would be quite capable of handling the new German armor threat. At the same time, the AGF under Lt General Lesley McNair still felt the Tank Destroyer force should be the main opponent to the German armor and continually vetoed requests for production of a tank equipped with a 90MM gun. These vetoes seriously disrupted efforts to develop a more heavily armed and armored replacement for the M4.

Despite this opposition and complacency, a few officers realized that the M4 would be unable to handle the new family of German armor on the battlefield. During the winter of 1943/1944, Lt General Jacob Devers, former head of the Armored Force, and Brig General Maurice Rose, a combat commander, both pushed for the acceleration of the T26E1 program. This program would give US armored troops a tank capable of handling the Tiger – and any new German tank under development. Devers' continuing pressure, despite opposition from the AGF and McNair, eventually led to the issue being sent to the War Department in Washington for resolution. The War Department ordered the T26E1 into limited production with a target date of the spring of 1945 set for 250 completed vehicles.

McNair and the AGF continued their efforts to derail the program, making an attempt to have the T26E1 replaced by the lighter T25E1 armed with a 76MM weapon. These attempts met with failure; the War Department ordered an increase in T26E1 production to 2000 vehicles – a move that did not sit well with McNair or the AGF. Included in this order were 200 infantry support variants armed with a 105MM howitzer under the designation **T26E2**.

Ironically, bureaucratic haggling took place prior to the Normandy invasion. After the initial landings in June of 1944, the Army high command was shocked by the losses incurred during the fighting. A combination of the confining *bocage* (hedgerow) terrain, German anti-tank weapons, and the Tiger and Panther tanks took a tremendous toll of M4s. Losses were close to five times the projected estimates. What was even more damaging was the realization that the Sherman was inferior to the Tiger and Panther and stood little chance of defeating them except

The T25 series resulted from combat reports of the new German Tiger I tank encountered in North Africa and Sicily. It was more heavily armored than the T23 series and was fitted with a 90MM gun. The T25 pilot vehicle was fitted with the HVSS, but this subsequent T25E1 was equipped with a torsion bar suspension. The T25E1 also had a torqmatic transmission in place of the heavier electric drive used in the T25. (Hunnicut)



under the best possible conditions. Tankers soon developed a Tiger and Panther 'phobia' and there was a serious lack of confidence in the tank. During the fighting, the defensively oriented tank destroyer doctrine was revealed as being of little use during offensive operations. In a strange twist of fate, General McNair – the tank destroyer proponent and leader in the fight to keep 90MM guns out of the new tanks – was killed during a bombing mistake in the initial stages of Operation COBRA (the breakout from Normandy) while visiting the front lines. It is unknown whether or not McNair realized the failure of his views, which resulted from his inspection tours along the Normandy front.

There were a number of solutions to the problem of armament and armor protection. The 76MM gun was capable of taking on the new German tanks with its new High Velocity Armor Piercing (HVAP) ammunition, but this was in short supply. The M4's thin armor was augmented using a variety of field modifications ranging from extra armor plate salvaged from other tanks, sandbags, and concrete. General George S. Patton was incensed by these field modifications, claiming the extra weight seriously affected the tanks' transmissions, engines, and suspensions, and also showed a lack of faith in the quality of American weapons. Some thought was given to upgunning the M4 with a 90MM weapon, but this gun was mounted in a new turret on the M10 tank destroyer under the designation M36¹. Although this increased firepower helped, the M36 was not a tank; the cry went out for a new, more heavily armed and armored tank.

M25E1 and M26E1 testing took on new significance as a result of the field reports from Normandy. The electric drive transmission used in the original T25 and T26 was still not suitable for field use and the lighter armor of the T25E1 was deemed insufficient. The T26E1, with its heavier armor, became the focus of the Army's attention. Trials showed the vehicle's design was basically sound, although some problems did arise. These included differential cooling problems, clogged radiators, engine and flywheel connection failures, and poor and insufficient 90MM ammunition storage. Additionally, when the gun fired, the muzzle blast kicked up a large dust cloud, which obscured the target for a significant amount of time. The incorporation of mechanical solutions and a muzzle brake to reduce the dust cloud resulted in a modified version being designated the **T26E3**. T26E3 production began at the Fisher Tank Arsenal in November of 1944. Ten vehicles were completed by month's end and an additional 232 T26E3's were manufactured by the end of February of 1945. Additional production was started at the Detroit Tank Arsenal in March of 1945.

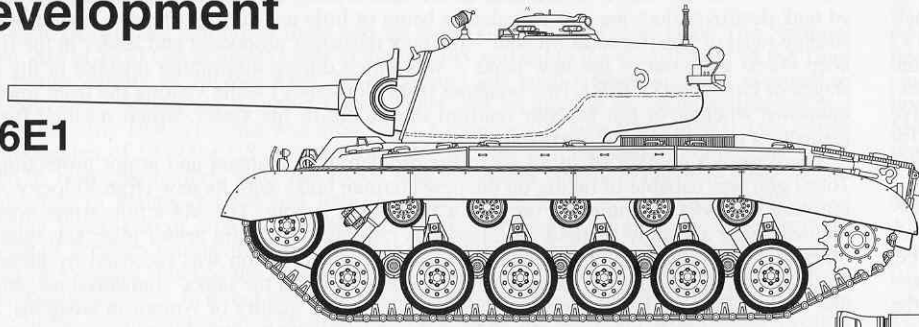
¹ See US Tank Destroyers in Action, #2036, squadron/signal publications, 1998.

The T26 series was similar to the T25, but had four inches (10.2 cm) of frontal armor versus the T25's three inches. The T26E1, like the T25E1, had a torqmatic transmission in place of the electric drive of the pilot T25. The T26E1 would evolve into the basic Pershing design as the T26E3 and M26. This T26E1 pilot would eventually be rebuilt as the 'Super Pershing' and saw limited action during the European War's final days. (Hunnicut)

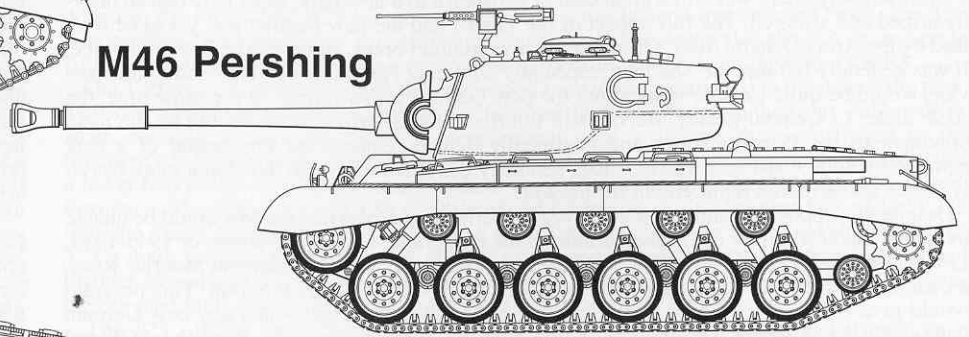


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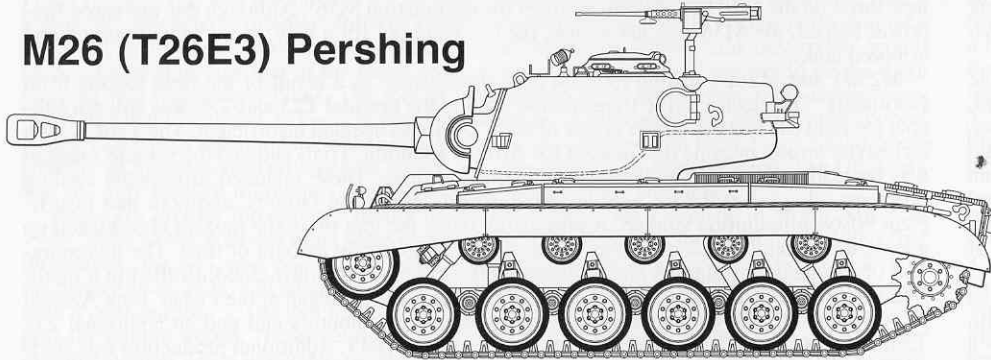
T26E1



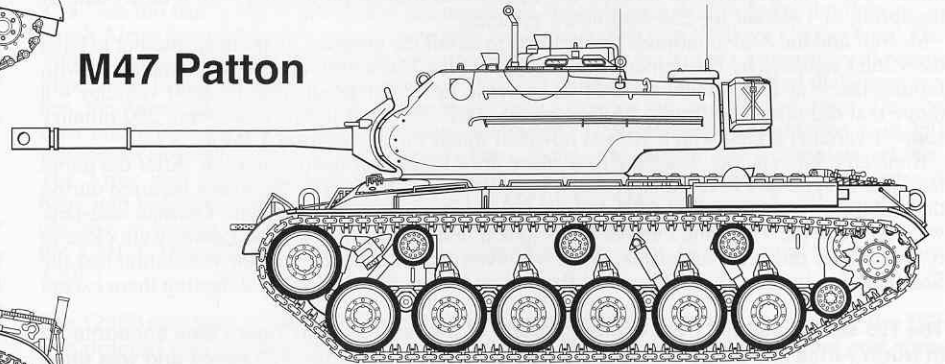
M46 Pershing



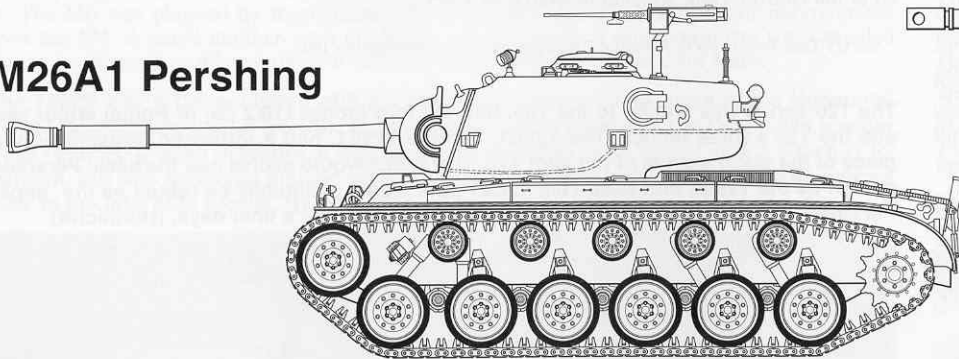
M26 (T26E3) Pershing



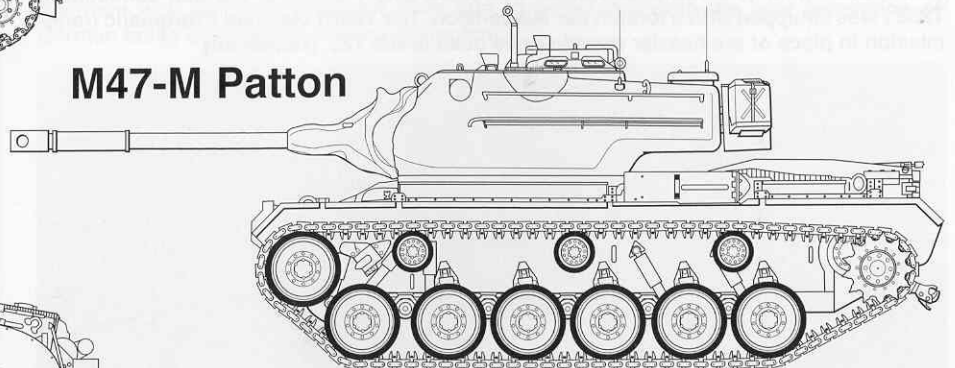
M47 Patton



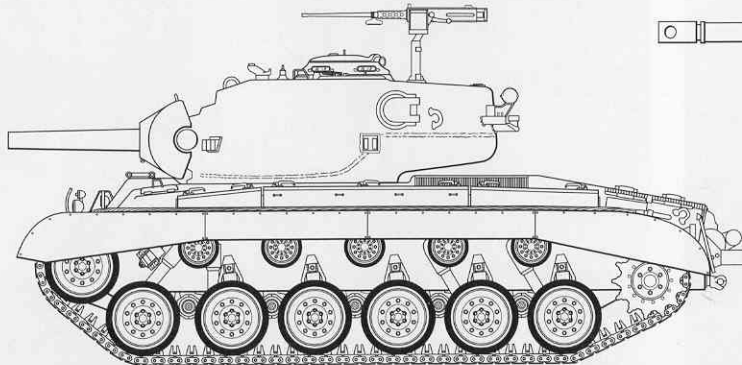
M26A1 Pershing



M47-M Patton



M45



T26E3

The new T26E3 was totally unlike the Sherman in almost every way. It had a wide, low slung, angular look instead the tall boxy silhouette typical of the M4 series. Its torsion bar suspension had only just come into use on the M24 Chaffee light tank and M18 tank destroyer. The 90MM main gun was the heaviest gun then fitted to an American tank, with only the open-topped M36 tank destroyer carrying a similar weapon. Its thicker armor, while not impervious to German gunfire, provided much more protection than the armor fitted to the M4. This was the vehicle that US tankers had been asking for since the Normandy invasion.

The boat shaped hull was composed of both armor steel castings and rolled armor plates. The front hull was a V-shaped casting whose smooth surface was broken only by the .30 caliber (7.62MM) bow machine gun bulge on the starboard side. The assistant driver operated the .30 caliber M1919A4 machine gun. The weapon was aimed by observing the fall of tracer rounds through a periscope. The tank driver was seated on the port side of the front hull. A bulged casting was placed between the two drivers to house the air cleaner. Both drivers were given side opening, overhead hatches. Each driver was provided with two periscopes, one in the hatch and one between the hatch and air cleaner. Each driver was also provided with a circular, floor mounted escape hatch. Dual controls were provided for each driver and were connected to the controlled differential in the rear of the hull by a series of linked rods. Adjustable seats allowed the drivers to ride with their heads outside for better visibility when not under fire.

The large turret, equipped with a 90MM M3 gun, was mounted immediately behind the drivers' compartment. One of the problems cited with the T26E1 was the lack of sufficient ammunition stowage; there was only room for 42 rounds in water-protected bins placed under the turret platform and basket. A number of solutions were suggested, including eliminating the bow machine gun position, but eventually the rotating turret platform and basket were removed. The floor bins were enlarged and their protective water jackets removed. Additional racks were installed on each side of the fighting compartment and a ready rack for ten rounds was added in the loader's position on the left side of the turret. These changes increased the available ammunition to 70 rounds. The gunner sat on the right side and used an M71C telescopic sight for target acquisition. The commander sat behind him and had both an M6 periscope in the tur-

The new T26E3 heavy tank was a complete departure from the M4 Sherman. It was low, wide, and angular in appearance. Its 90MM gun was able to take on the German Tiger and Panther tanks with a much better chance of success than the M4's smaller 75MM and 76MM guns. Its armor protection was much better than the Sherman, but not totally impervious to German fire. This vehicle is fitted with the single pin T81 track, while production models were equipped with the T80E1 track. (PAM)



ret roof and six vision blocks in the cupola. Both the loader and gunner were also provided with periscopes.

Front hull armor ranged in thickness from three inches (7.6 CM) to four inches (10.2 CM), while side armor was between two inches (5.1 CM) and three inches thick. The rest of the T26E1's hull armor was 0.75 inches (1.9 CM) to two inches thick.

The turret was, by necessity, large to provide adequate operating space and balance for the large 90MM gun. The gun shield was 4.5 inches (11.4 CM) thick, while the turret front was four inches thick. The side and rear turret armor was three inches thick, while the turret roof was only one inch (2.54 CM). The turret could be traversed both hydraulically and manually and could complete a 360° turn in 15 seconds. The gun elevation and depression were +20° and -10°, respectively. The manually loaded gun could achieve a maximum rate of fire of eight rounds per minute. There was no stabilizer system fitted to the gun. A .30 caliber M1919A4 coaxial machine gun was fitted on the left side of the main gun and a .50 caliber (12.7MM) M2HB machine gun was fitted to a flexible mount atop the turret for use against aircraft and ground targets. Spare tracks were mounted on the port side of the turret, while a small stowage rack was fitted to the starboard side.

Overall, the 90MM M3 gun gave the T26E3 a weapon capable of taking on the new German tanks with a good chance of success. The rounds weighed approximately 43 pounds (19.5 KG), with slight variations between different types of ammunition. The gun was comparable to both the 75MM and 88MM guns carried by the Panther and Tiger I respectively in terms of armor penetration. Despite its smaller caliber, the Panther's 75MM gun had a slight edge in penetration performance due to its higher muzzle velocity. The T26E3's 90MM gun was far superior to either the 75MM or 76MM guns mounted on the Sherman and would have been of great value had it been available during Normandy and later campaigns.

The engine compartment was located immediately behind the fighting compartment and turret. Power was provided by a Ford GAF, Y-type, eight cylinder, four cycle gasoline powerplant coupled to a torqmatic transmission and controlled differential. The GAF developed 500 HP at 2600 revolutions per minute (RPM). This was the same engine used in the M4A3 Sherman medium tank, but the new T26E3 tank was nearly ten tons (9.1 MT) heavier than the Sherman. This resulted in the T26E3 being slower and having lower overall performance. The torqmat-

The sloped front hull was equipped with a .30 caliber (7.62MM) machine gun for the assistant driver's use. Attachment points for towing shackles were positioned low on the upper glacis plate, but these could also serve as shot traps. The bulged armor housing for the air cleaner was set between the drivers' positions. The turret was equipped with a single shell ejection port on the port side. The port turret side also served as a stowage point for extra track links. Stowage mounts for the commander's .50 caliber (12.7MM) machine gun are fitted to the turret rear. (Hunnicut)





The starboard side of the turret held a rack for the drivers' foul weather hatch hoods, but these were rarely carried there under normal field conditions. Three storage boxes are mounted atop each fender. The small box behind the last stowage container is the first aid box. A tow cable was normally coiled around the small L shaped brackets on the hull rear. The fender turnbuckles and rods were added to keep them from sagging and fouling the tracks. (Hunnicut)

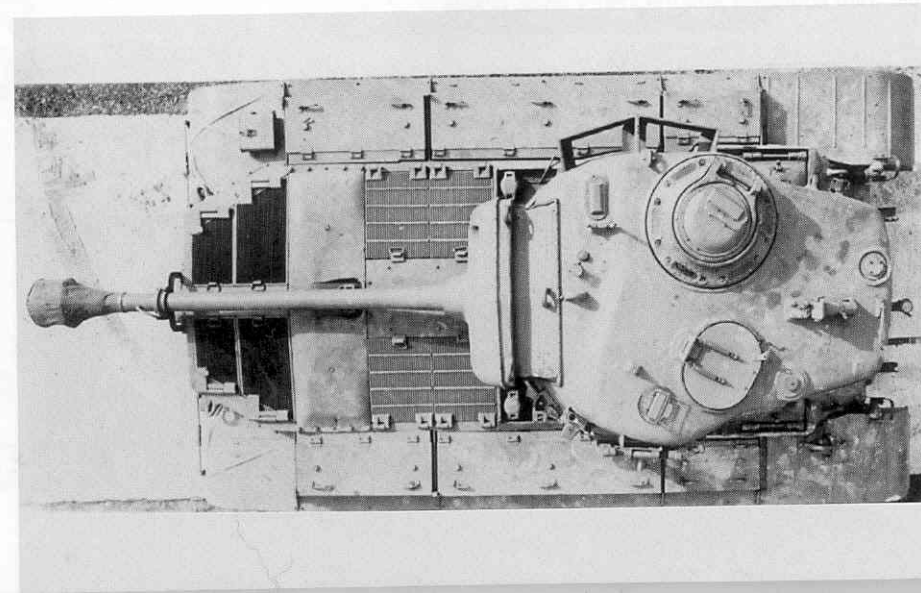
The T26E3 featured six dual bogie wheels on a torsion bar suspension. The torsion bars provided a much smoother ride than the older Vertical Volute Suspension System (VVSS) used on the M4. The torsion bars, coupled with the wider tracks, gave the T26 good mobility for its size and weight. The drive sprocket was at the rear – a feature that eliminated the need for a drive shaft under the turret, thus allowing a lower silhouette. The vehicle tarpaulin is stowed on the tanks fenders. This vehicle appears to have a snap-on, rubberized fender skirt. (Hunnicut)

ic transmission was located behind the engine and provided three forward gears and one reverse gear. It was connected to the differential located at the rear of the hull, which provided power to the drive sprockets. The drive sprockets drove a 24-inch (61 cm) wide single pin steel track designated T81. There were 82 track shoes per side and the track tension was adjusted by increasing or decreasing the tension of the idler wheel located at the front of the hull. The ground pressure amounted to 12.5 pounds per square inch. The new torsion bar suspension had six sets of double bogie wheels on each side. Each wheel was 26 inches (66 cm) in diameter and shod with a solid rubber tire. The spring steel torsion bars ran across the hull floor. The first two and last two sets of bogies were controlled by hydraulic shock absorbers. All of the wheel arms were equipped with hull mounted volute type bumper springs, which acted as stops for upward movement of the bar arms. There were also five sets of double return rollers bolted to each side of the hull underneath the fenders. Three stowage boxes were mounted on each fender.

The T26E3 weighed in at 46 tons (41.73 MT) fully loaded and had a maximum road speed on level surfaces of 30 miles per hour (48.3 kmh) over short distances and 25 miles per hour (40.2 kmh) for sustained travel. Its range on 183 gallons (693 L) of gasoline was approximately 100 miles (161 km). The engine held 32 quarts (30.3 L) of oil.

T26E3 production began at the Fisher Tank Arsenal in November of 1944 with ten vehicles completed by the end of the month. This production rate increased in December to 30 vehicles, 70 in January of 1945, and 132 in February. The Detroit Tank Arsenal began production in March and between the two plants 194 tanks were manufactured. At this point the tank was redesignated the M26 as production became standardized. Initially, 6000 T26s were authorized for production, but the order was reduced to 2000 vehicles as the war's end came into sight.

The commander's cupola was on the starboard side of the turret and featured six vision ports with a periscope in the hatch. The oval shaped loader's hatch is to port. The loader's periscope is mounted forward and left of the hatch. Behind the hatches are two circular antenna mounts and the stowed mount for the .50 caliber machine gun. The large armored grills behind the turret cover the engine compartment, while those further aft cover the transmission. The flat, rectangular panel between the grills covers the radiators. Three storage containers for equipment and personnel gear are mounted on both fenders. (Hunnicut)



T26 Service

Following the breakout from the Normandy Beachhead in the summer of 1944, American tank losses declined and complacency returned to the American high commands in Washington and Europe. This complacency was abruptly shattered in December when the Germans launched their major offensive in the Ardennes – the Battle of the Bulge. This sudden increase in fighting further sapped the strength of armored units that had still not recovered from their summer losses. Additionally, the Germans also began to field larger numbers of the PzKpff VI King Tiger or Tiger II; only a small number of these massive tanks had been encountered prior to the Ardennes offensive. The press picked up on the American tankers' complaints regarding the Sherman and a scandal was soon brewing in the press reports being read in the US.

At this time there was a suggestion by the head of the Ordnance Research Department, Major General G.M. Barnes, that half of the initial production run of 40 T26E3s be sent to Europe for testing. The remaining half was sent to Fort Knox, Kentucky for normal trials. The AGF, as expected, objected to this plan, wanting the tank to be put through standard test work at Fort Knox before being issued to troops in the field. Incensed, Gen Barnes threatened to take the matter directly to General George C. Marshall, the Army Chief of Staff. This solved the problem and the 20 T26E3s arrived in Antwerp, Belgium as part of the Zebra Mission in January of 1945.

The Zebra Mission was an effort by the Army to test as many new weapons systems as possible under combat conditions. With the realization that the war in Europe was quickly drawing to a close, the Zebra Mission took on added urgency. Several new weapons systems, still not quite ready for field use, were rushed to the battlefield while others remained in the US undergoing regular trials. It was hoped that the information gleaned from tests under combat conditions would be extremely helpful in future development of these systems and related projects.

After a series of transportation problems, the T26s were split up and assigned equally to the 3rd and 9th Armored Divisions (AD) of the 12th Army. In the 3rd AD, the tanks were allotted one per company to the 32nd and 33rd Armored Regiment. In the 9th AD, five T26s were assigned to A Company, 14th Tank Battalion, while in the 19th Tank Battalion one was given to A Company and two each were assigned to B and C Company. Training for all of the crews took place in February. The 3rd AD crews completed their training by February 20th, while those from the 9th AD finished by the end of the month.

The first engagement took place on the night of 26 February, when a Tiger I knocked out FIREBALL, from F Company, 33rd Armor near Elsdorf. The next day, an E Company tank evened the score, knocking out a Tiger I at 900 yards (823 m) and two late model PzKpff IV medium tanks at 1200 yards (1097 m). These ranges were unheard of for the Sherman. The 9th Armored Division suffered their first casualty during the night of 1 March when two high explosive rounds disabled one of A Company's tanks. Another T26 from the 3rd Armor was lost early in March when a German Nashorn self-propelled anti-tank gun hit it with a single 88mm round at under 300 yards (274 m). This set the turret on fire, which blew up after the crew escaped. Although deemed repairable, the T26 was used for spare parts and was the only complete loss for the Zebra team. On 6 March, a PzKpff V Panther was destroyed in front of the Cologne Cathedral by a side shot from a T26 of the 32nd Armor. The high point of the tank's combat service came the next day (7 March), when a T26 tank platoon found the massive Ludendorff Bridge intact across the Rhine River at Remagen and helped secure it. This unit was assigned to A Company, 14th Tank Battalion, Combat Command B, 9th AD under the command of Lieutenant John Grimbal. Although the bridge was damaged, it was the only intact bridge over the Rhine and was used to funnel tanks, troops, and supplies across this river – the last natural obstacle left for the Germans to defend in the West. Due to their weight, the T26's were not allowed on the damaged structure, but were eventually ferried over five days later.

By late March, additional T26s began arriving from the US. Most of these were again allocated to the 12th Army, with the 2nd Armored Division getting 22 tanks and the 5th Armored Division receiving 18. Eventually, 30 additional tanks were sent to Patton's 3rd Army, all of these going to the 11th Armored Division. This group of T26s was the last to see combat as German resistance collapsed and the war in Europe drew to a close. Three hundred T26s were eventually delivered to Europe, but only 200 of these vehicles were assigned to armored units. Only those tanks from



A column of T26E3s from the 2nd Armored Division moves up through Wessel, Germany toward the Rhine in the spring of 1945. The area is obviously secured as the guns are locked in the traveling position. The gun traveling lock was attached to the rear hull. A canvas cover was placed over the near tank's muzzle brake to keep moisture and dirt out of the main gun. (PAM)



A T26E3 from A Company, 14th Tank Battalion, 9th Armored Division, sits in a field near Vettweiss, Germany on 1 March 1945. It was part of a five-tank platoon commanded by Lt John Grimball. On 7 March, four of these T26E3s took part in the capture of the Remagen Bridge, the only bridge over the Rhine captured intact by US forces. (PAM)

This Pershing from C Company, 19th Tank Battalion, 9th Armored Division, moves up a road between Thum and Grinnick on 1 March. The drivers' foul weather hoods are stored in the turret side rack, while the vehicle tarp is stowed alongside the starboard fender storage containers. A yellow air identification panel has been tied across the rear deck. (PAM)

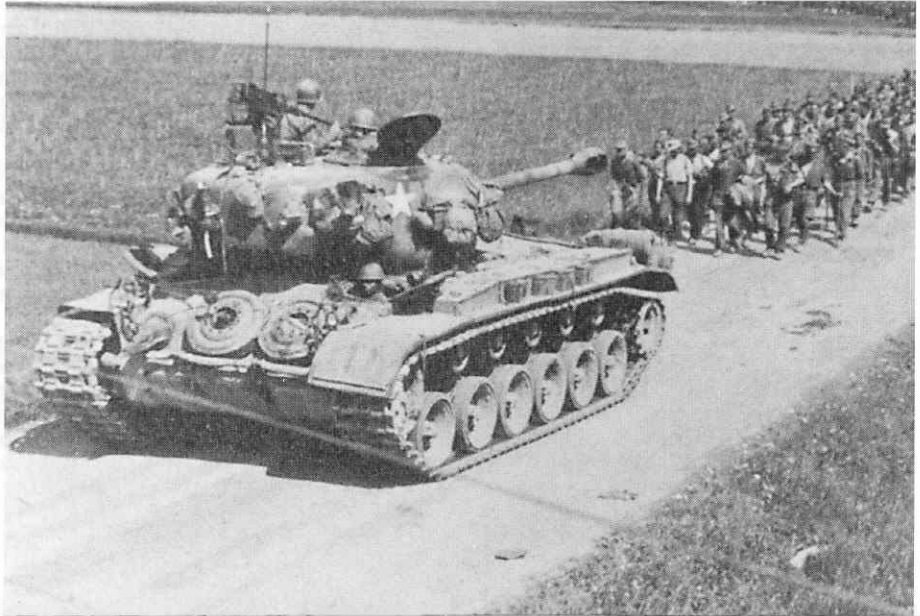


the Zebra Mission saw any prolonged combat.

There was one special T26 that also saw service. This was the first pilot T26E1 which had been rearmed with the powerful new 90MM T15E2 gun. The T15E2 had a much longer barrel and a higher muzzle velocity than the M3 gun used on the T26E3s. This lone tank received the designation T26E4 and was assigned to the 3rd Armored Division. The tank had additional armor added for greater protection – an 80MM (3.15 in) thick piece of Panther armor was attached to the mantlet, while 40MM (1.6 in) of boilerplate was added to the front hull in a V-shaped attachment. Later, more armor in the form of elongated wings was added to the sides of the turret. The long gun required the addition of two cylinder-enclosed springs mounted on top of the turret to help counterweight the guns. An additional counterweight was added to the turret rear. This 'Super Pershing,' as it was nicknamed, saw action only once when it destroyed a German tank at a range of 1500 yards (1372 m) near the Weser River on 4 April.

After the end of the war in Europe, attention then turned to the war in the Pacific where the fierce fighting for Okinawa was underway. Tank losses to Japanese 47MM guns were heavy and it was decided to send 12 T26E3s, now redesignated M26s, to Okinawa. Shipping problems and delays slowed their transit and it wasn't until 21 July that the tanks finally arrived on the island. By then, the fighting on Okinawa was over. Since planning was underway for the invasion of Japan (Operations OLYMPIC and CORONET), these tanks were split up between the 193rd and 711th Tank Battalions for training. The dropping of the atomic bombs on Hiroshima and Nagasaki in August of 1945 ended the need for such an invasion; the M26s never saw combat against Japanese forces in World War Two.

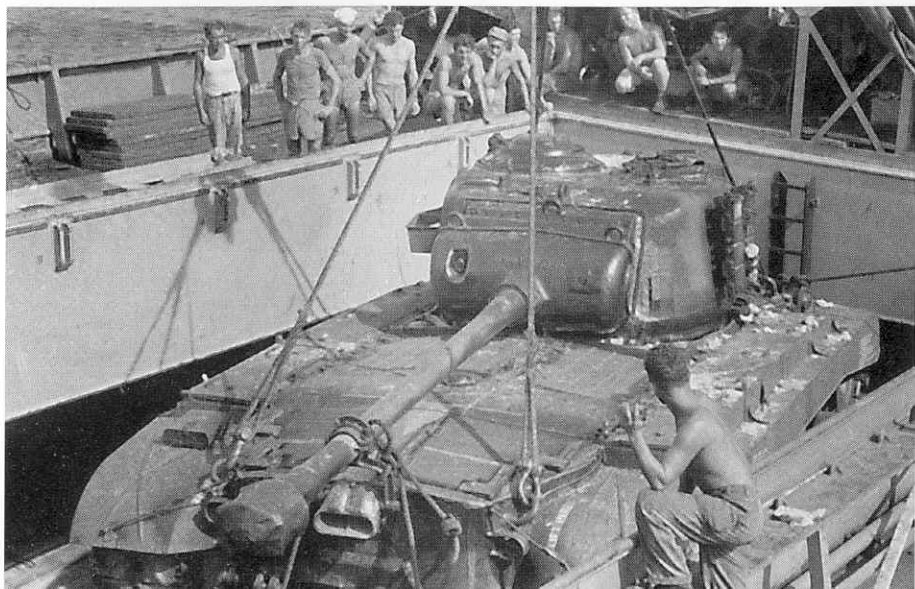
A column of German prisoners is escorted toward captivity by this Pershing from the 11th Armored Division. Unlike most photographed T26s, this one is well covered by a large amount of extra gear – including two spare bogie wheels tied to the front of the hull. The spare wheels also provided a degree of protection against enemy anti-tank fire.





The pilot model T26E1 was fitted with the 90mm T15E1 gun. This weapon was comparable in performance to the 88mm gun mounted in the Tiger II. Additional armor was welded to the front hull and gun mantlet. Two cylinders with coiled springs were mounted atop the turret and attached to the mantlet to help compensate for the longer, heavier gun barrel. (Hunnicut)

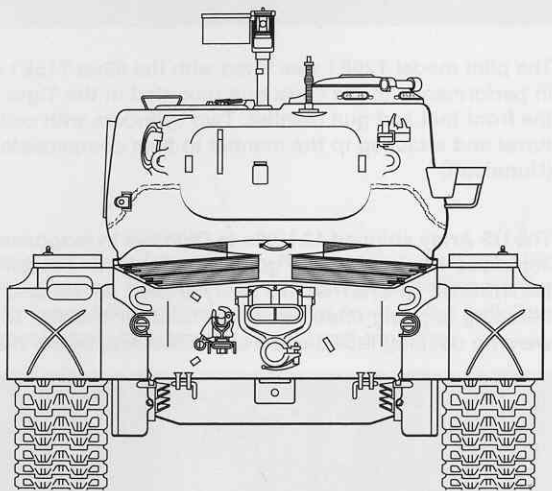
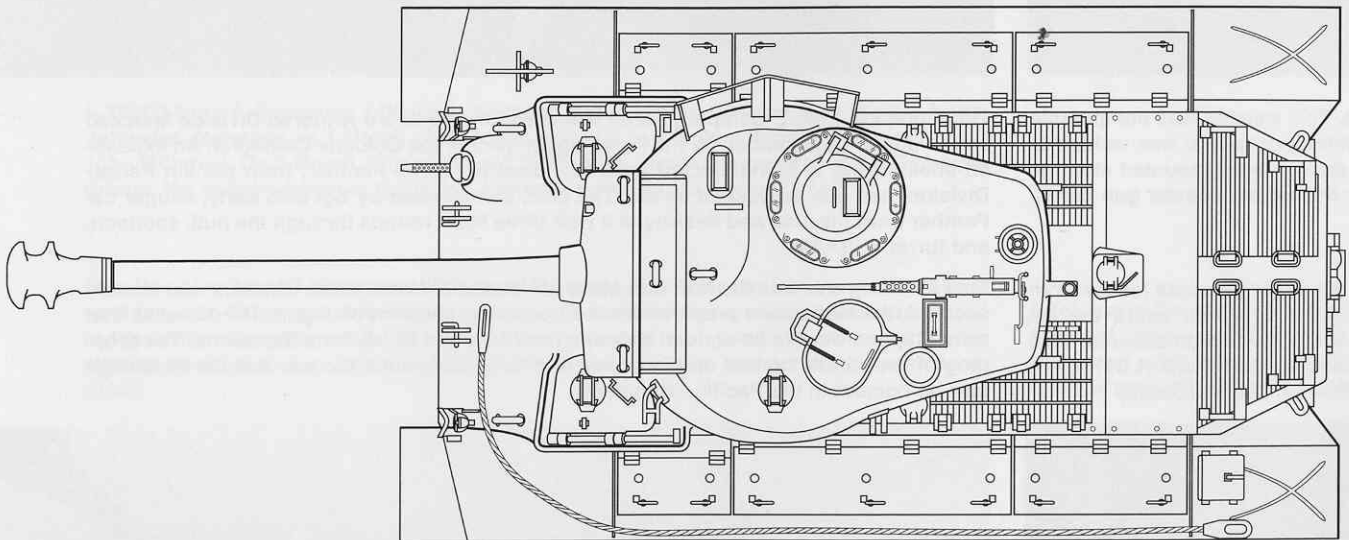
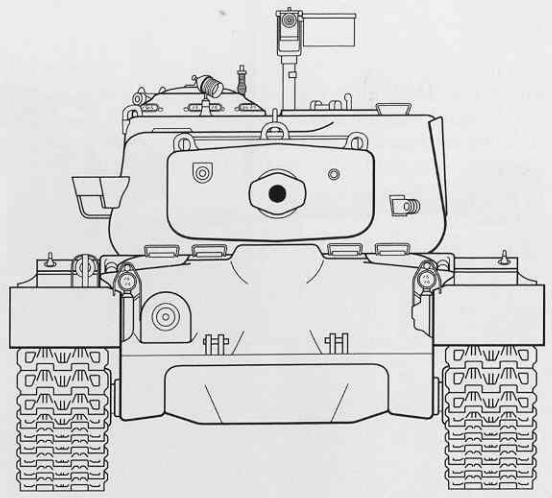
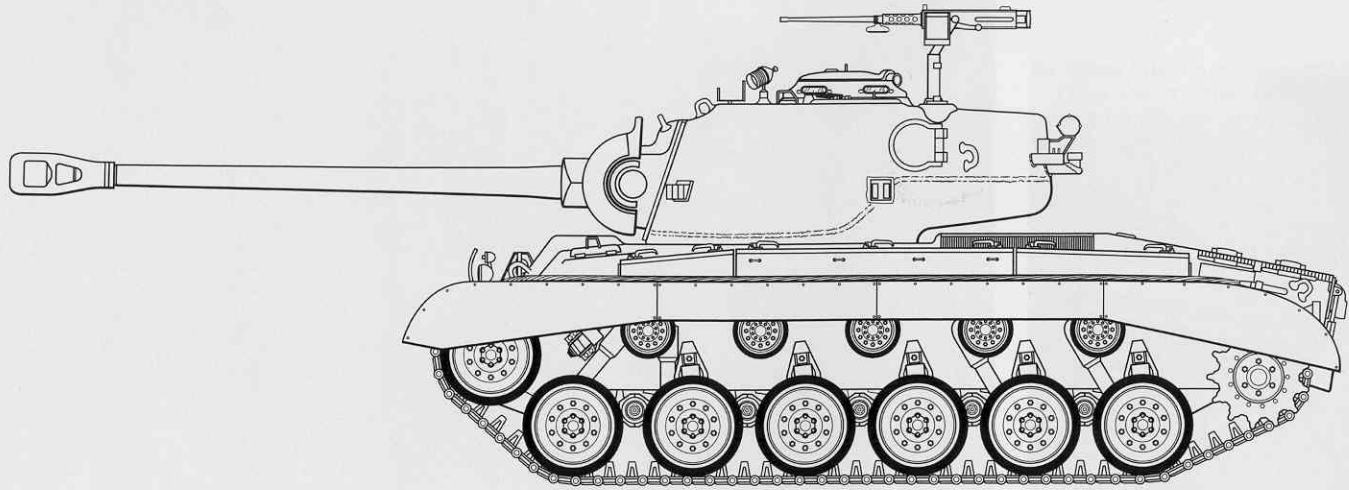
The US Army shipped 12 M26s to Okinawa in response to heavy M4 Sherman losses from Japanese 47mm anti-tank guns. A mix-up in shipping orders while on board the SS KATHERINE D. SHERWOOD delayed their arrival until after the island was secured. This Pershing is being lifted out of the hold for transfer to a Landing Craft Tank (LCT); there were no docking facilities at Naha, Okinawa, where they were unloaded. (Green)



This Pershing from E Company, 32nd Armored Regiment, 3rd Armored Division knocked out a Panther tank (hidden by the Pershing) in front of the Cologne Cathedral. An expended shell casing is being ejected from the turret port. The Panther, from the 9th Panzer Division, had just ambushed an M4. The M26, commanded by Sgt Bob Early, caught the Panther from the side and destroyed it with three 90mm rounds through the hull, sponson, and turret. (USA/NA)

This Pershing was one the first four M26s off-loaded at Naha. Since Okinawa was already secured, the tanks were prepared for the upcoming invasion of Japan. The 12 tanks that were shipped were to be divided between the 193rd and 711th Tank Battalions. The dropping of the atomic bombs on Hiroshima and Nagasaki ended the war and the Pershings saw no combat in the Pacific. (Hunnicut)





M26 Pershing Specifications

Length:.....28 feet 4.5 inches (8.6 M)
 Width:.....11 feet 6.3 inches (3.5 M)
 Height:.....9 feet 1.4 inches (2.8 M)
 Combat Weight:...92,355 pounds (41,892.2 KG)
 Powerplant:.....One 500 HP Ford GAF liquid-cooled, V-8,
 gasoline engine

Armament:.....One 90MM M3 gun with 70 rounds and one .30
 caliber (7.62MM) M1919A4 machine gun with
 2500 rounds in turret; one .50 caliber (12.7MM)
 M2HB machine gun with 550 rounds on turret
 roof; and one .30 caliber M1919A4 machine
 gun with 2500 rounds in right front hull.

Maximum Speed:..25 MPH (40.2 KM/H) sustained on road
 Maximum Range:..Approximately 100 miles (161 KM)
 Crew:.....Five

M26 Pershing

The T26E3 became standardized as the M26 Heavy Tank in March of 1945, but the tank was later reclassified as the M26 Medium Tank. Following the practice of naming tanks after famous American generals, the M26 was nicknamed the **Pershing**¹. Based on reports from both the Zebra Mission and tests at Fort Knox and Aberdeen Proving Ground, Maryland, small changes were incorporated into the vehicle while on the assembly line or later retrofitted in service. The main problem that did turn up was the lack of both power and range. The M26 used the same engine as the M4A3 Sherman, but weighted nearly ten tons more. Unfortunately, little could be done about this. There were also some problems with the transmission and differential working loose from their mounts, but both issues were solved by the addition of exterior reinforcements. The elevation housing on the 90MM gun proved to be weak and a stiffener plate was added as a stopgap measure. A stronger forging was devised on the assembly line to eventually solve the problem.

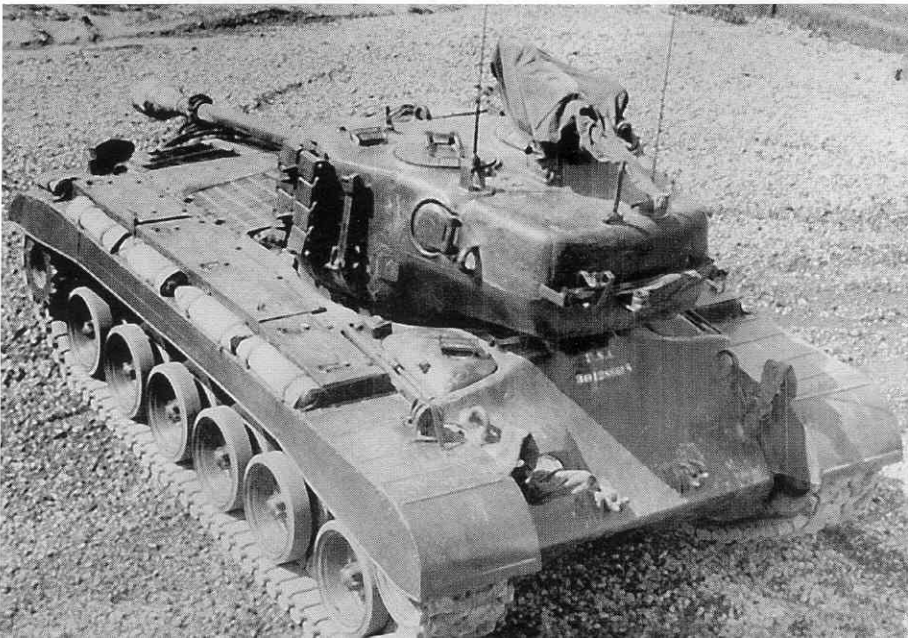
The ventilator housing between the drivers was also thickened and, unlike the T26E3 bulge, the later housing was more squared off. The hull machine gun bulge was also changed, later versions having a squared off facing and being marginally larger than the original. The driver's hatches were also enlarged, since experience had shown that fully equipped tank crewmen had difficulty getting through the original smaller hatches.

Problems with the fenders drooping down and hitting the tracks were handled by adding turnbuckles to the front and rear fenders so that tension could be added to keep them from hanging down. The initial production tanks were fitted with 24 inch (61 CM) wide T81 tracks, but later vehicles were equipped with the 23 inch (58.5 CM) T80E1 track like that fitted to the M4A3E8 with Horizontal Volute Suspension System (HVSS).

During the combat testing in Europe, an **M26E1** fitted with the 90MM T15E1 long barreled

¹ The tank was named for General John J. 'Black Jack' Pershing, commander of the American Expeditionary Force in World War One.

The T26E3 Heavy Tank was reclassified as the M26 Heavy Tank. This designation was later changed to the M26 Medium Tank and the vehicle named the Pershing. This fully stowed M26 has protective covers over the 90MM gun muzzle, .30 caliber bow machine gun, and .50 caliber machine atop the turret. (PAM)

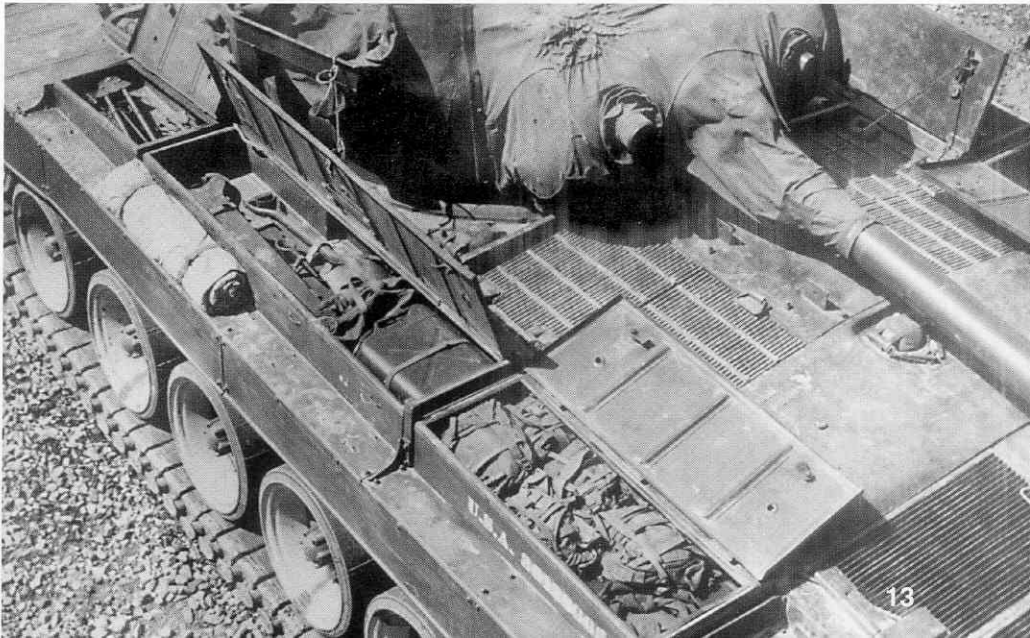


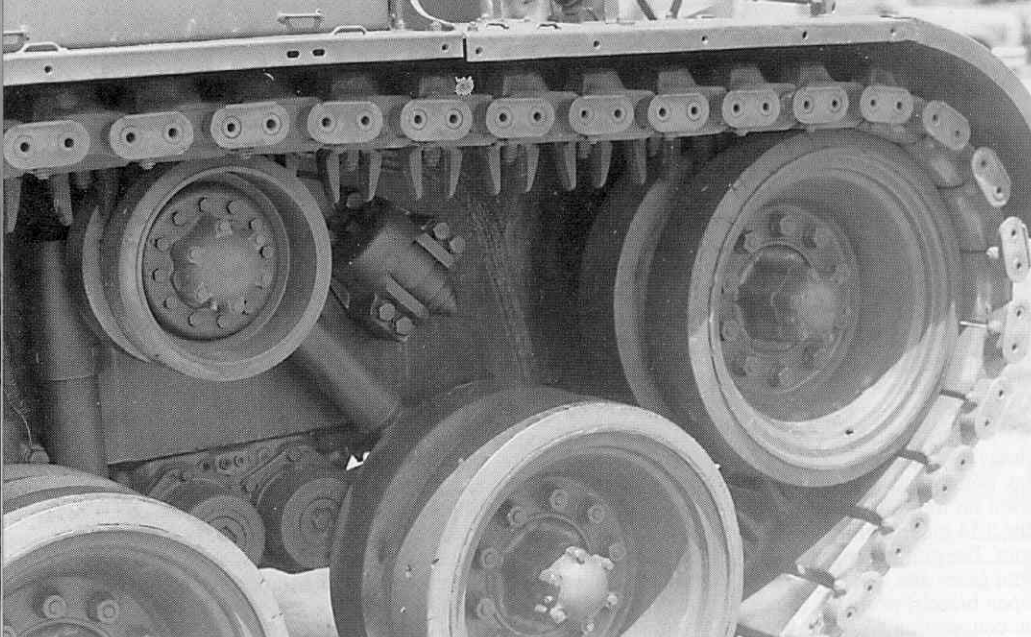
gun was shipped to Europe for evaluation as the **T26E4** (Temporary Pilot). Work continued on this version with a new gun mount to take the weight and length of the new gun without the external springs needed for balance. Plans were drawn up to produce 1000 of these vehicles, but the war's end resulted in the cancellation of this order – only 25 T26E4s were produced. The main problem with this gun was its use of cumbersome two-piece ammunition that reduced the firing rate.

The last development of the T26 series was the **T26E5**, which followed in the pattern of the M4A3E2 'Jumbo' Sherman assault tank. The T26E5 carried the same 90MM M3 gun as the M26, but it was more heavily armored. The mantlet was 11 inches (28 CM) thick and the turret front was 7.5 inches (19 CM) thick. The sides were 3.5 inches (8.9 CM) thick; the rear was five inches (12.7 CM) thick, while the front was six inches (15.2 CM) thick on the upper hull and four inches (10.2 CM) thick on the lower hull. Twenty-seven T26E5s were produced – all were used for test purposes.

The only actual new version of the M26 to see service (except for the M45 discussed separately) was the M26A1. This was an M26 fitted with a 90MM M3A1 gun. The weapon came out of attempts to develop a new gun, the T54. This gun had similar performance to the T15E1 used on the 'Super Pershing,' but used one-piece ammunition. Budgetary restrictions caused the T54 gun program to be dropped and efforts were refocused on improving the standard M3 gun. The gun was equipped with a bore evacuator and muzzle brake. The bore evacuator pulled gun gases and smoke from the barrel and prevented them from entering the turret through the open breech, while the muzzle brake was used to reduce recoil forces. The gun modifications, in conjunction with an effort to upgrade the M26 with a new engine to improve its range and performance, resulted in a new vehicle designated the **T40**. The T40, in turn, eventually resulted in the later **M46**.

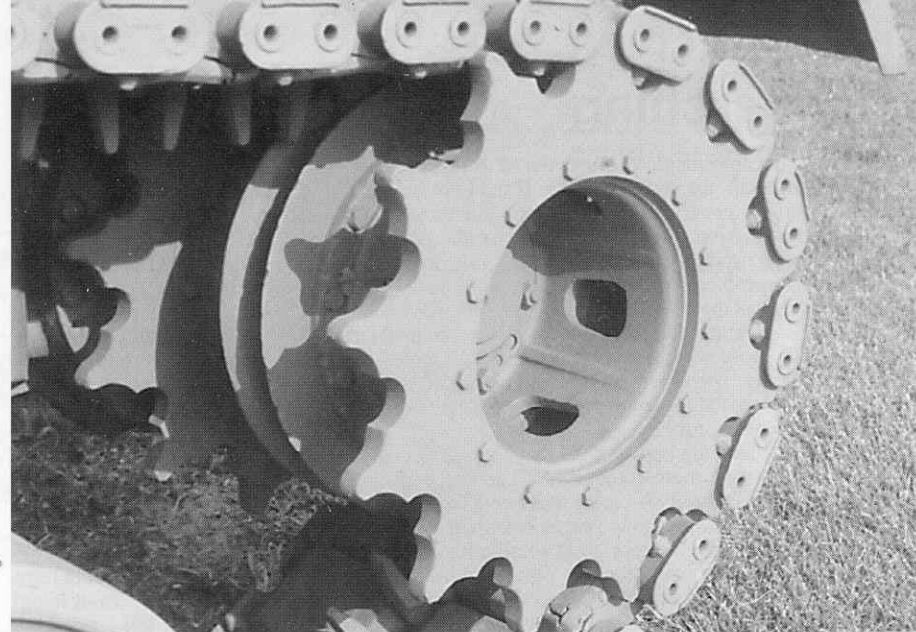
The storage containers on top of both fenders provided room for both military and personnel gear and protection from the elements. The containers were hinged on the inboard side to allow opening from the outboard side. These were made of sheet metal and offered no protection from bullets or shrapnel. A tarpaulin is secured to the port fender. (PAM)





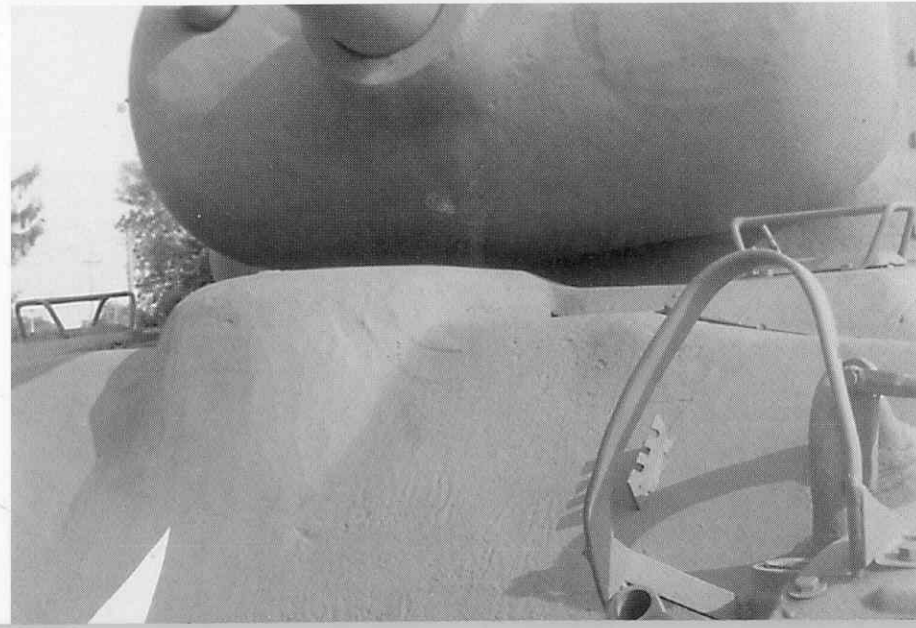
The torsion bar suspension mounted six dual sets of 26 inch (66 cm) by six inch (15.2 cm) wheels on either side of the hull. These wheels were covered with solid rubber tires. Five dual sets of rubber surfaced track return rollers were mounted approximately between the bogie wheels on either side just below the fenders. Shoe guides on the track pass through channels inside the road wheels, return rollers, and idler wheel. (Author)

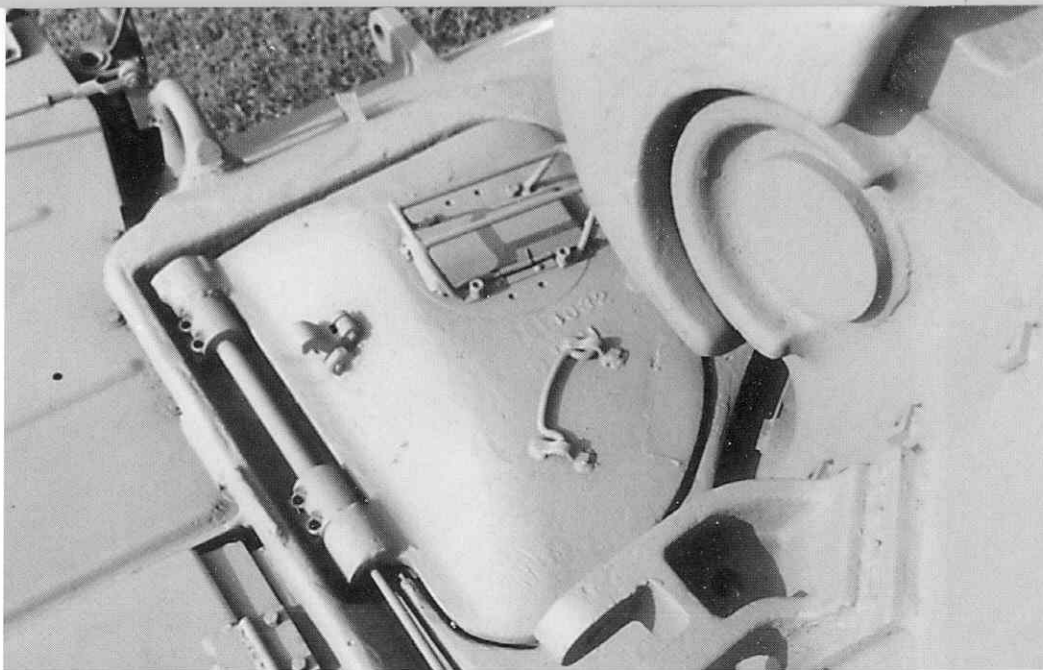
The front of the M26 had four inches (10.2 cm) of armor sloped at 46° on the upper surface and three inches at 53° on the lower surface. Two sets of towing shackles are located at the lower edge of the upper glacis plate. The ball mount for the assistant driver's .30 caliber machine gun is mounted on the lower starboard front plate. This particular Pershing has the squared off casting for the ventilator fan. (Author)



The rear mounted drive sprocket had a guide flange between the two drive hubs to keep the track centered. Six oblong holes in between the sprocket and the flange allowed the discharge of mud and debris. Teeth on the sprocket engaged the track through gaps in the track shoes. (Author)

This M26 featured a more rounded ventilator fan casting. This area was found to be a weak point on early production Pershings and was thickened to increase protection. A welded version of this housing was apparently fitted to a small number of hulls. (Author)

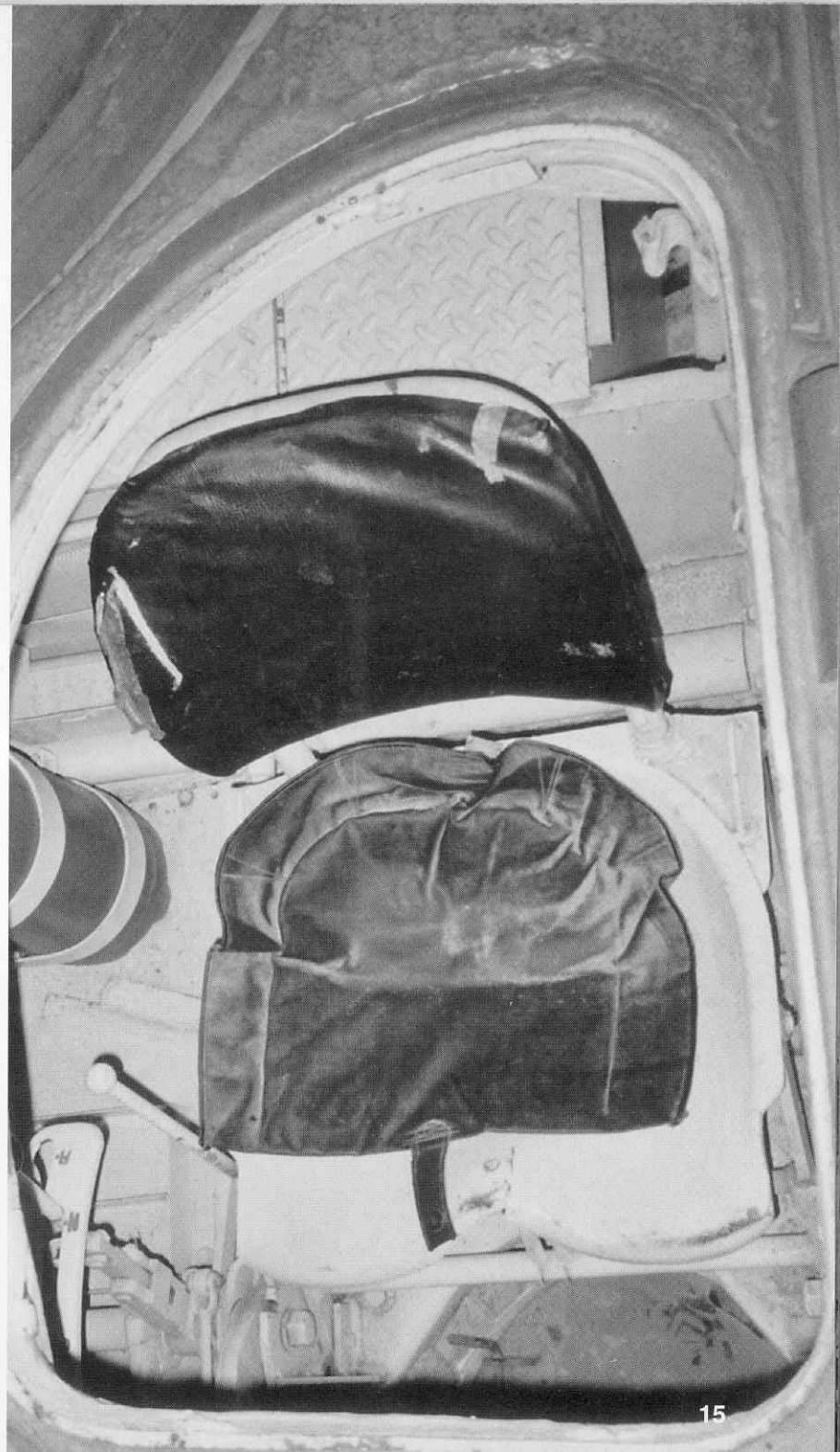
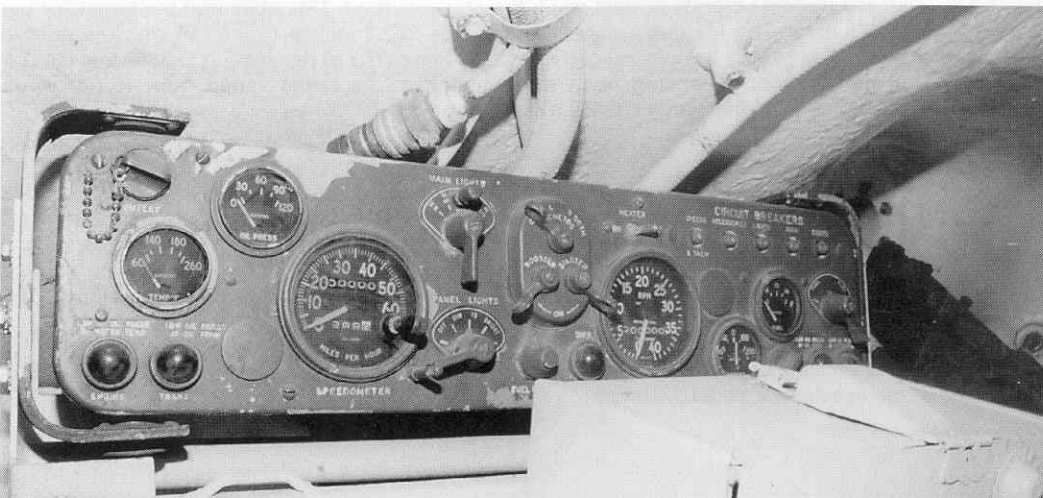




(Above) The driver (port) and assistant driver (starboard) were seated to either side of the ventilator casting. Access to their positions was through mirror image hatches that opened outward. Each hatch was fitted with a periscope and a guard immediately above it. The small hook on the outboard side engages the hinge bar when the hatch is opened to keep it from closing. (Author)

(Right) Both drivers' seats could be raised or lowered as required. The seat was raised for driving with the hatch open and lowered when the hatch was closed. The gear selector lever and a fire extinguisher are mounted to starboard of the seat. The dark object in front of the seat is the belly escape hatch, which was used if the driver could not exit the vehicle through the upper hatch. (Ward)

(Below) The instrument panel was centrally mounted to permit both drivers to see the dials and operate the switches. The 60 MPH (96.6 KM/H) reading on the speedometer is somewhat optimistic – the M26's top speed on roads amounted to some 25 MPH (40.2 KM/H). Spare periscope heads were stowed in the box in front of the instrument panel. US armored vehicle interiors are painted semi-gloss white (FS27875). (Author)



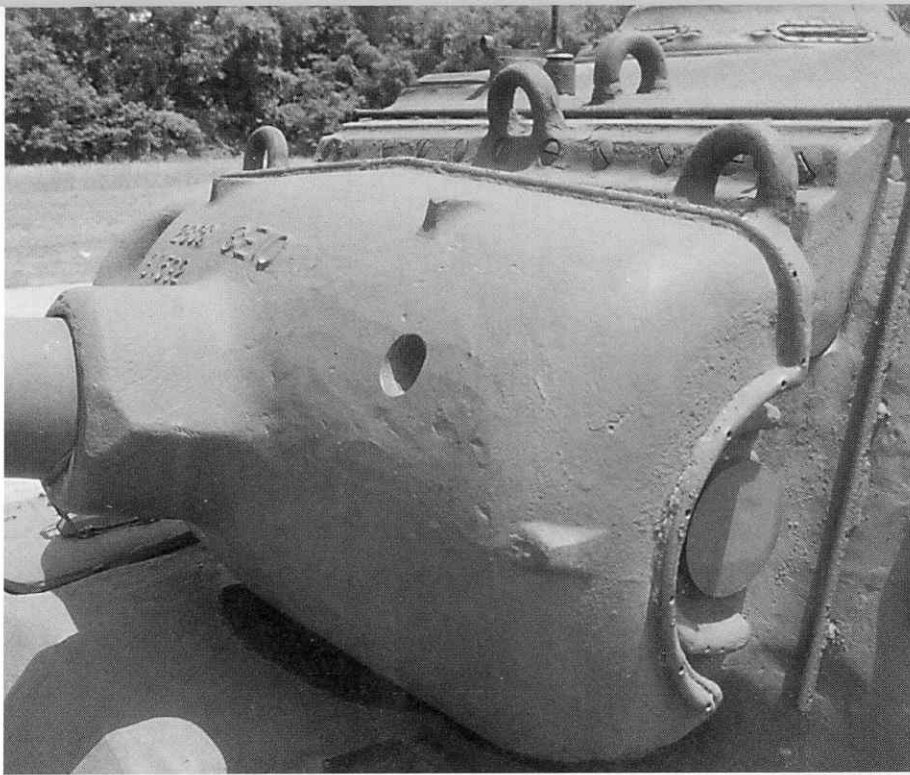


(Above Left) The assistant driver's position was almost a mirror image of the driver's position. Both drivers had dual controls in case one of the drivers was unable to function. The dark circular plate in front of the seat is the belly escape hatch. In addition to his driving and maintenance duties, the assistant driver also operated the bow mounted .30 caliber machine gun. (Author)

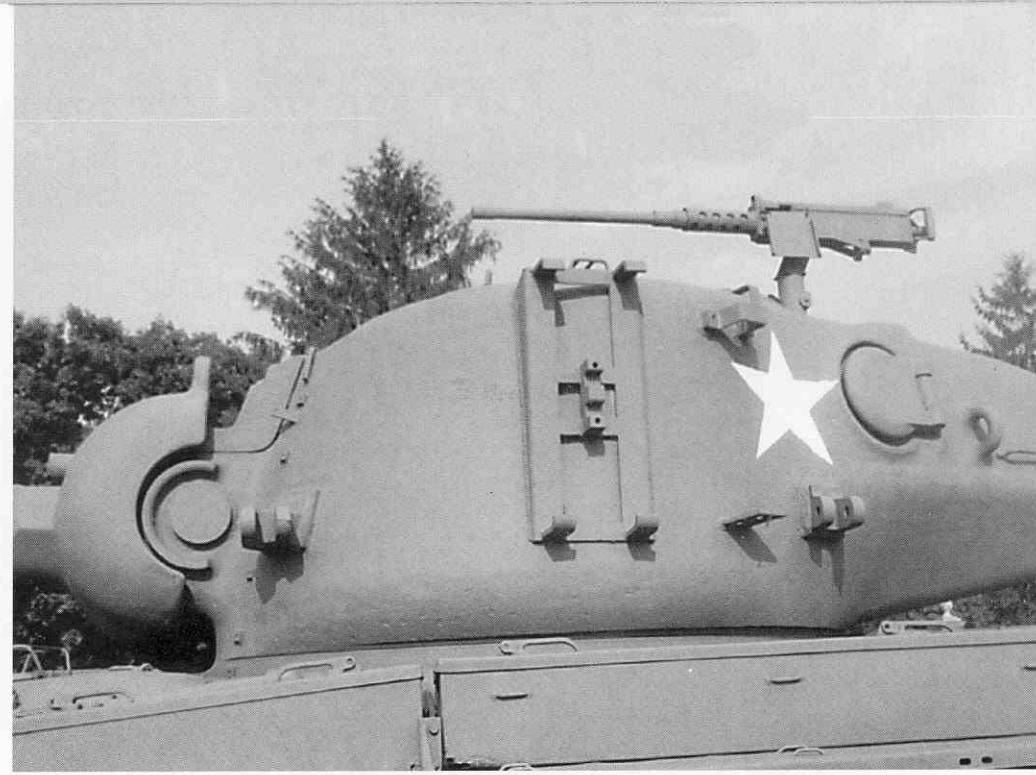
(Above) The 90mm M3 gun of the M26 featured a muzzle brake to lessen recoil forces and direct the muzzle blast to the sides. The muzzle brake was added after tests using the T26 kicked up large clouds of dust when the gun was fired. This obscured the target for the tank's crew. The M3 gun's overall length was 202.2 inches (513.6 cm) with the muzzle brake. The muzzle velocity ranged from 2650 feet (807.7 m) per second to 3350 feet (1021.1 m) per second, depending upon the ammunition. Its range varied from 15,700 yards (14,356 m) to 21,500 yards (19,659.6 m). (Author)



(Left) The bow machine gun was meant for general suppression fire while on the move and could not be fired accurately. Tracers were used to walk the bullets onto the target while sighting through the periscope. Accuracy was greatly improved when the vehicle was stationary. The .30 caliber Browning M1919A4 was an air-cooled machine gun, which measured 41 inches (104.1 cm) long and weighed 31 pounds (14.1 kg) empty. The M1919A4's muzzle velocity was 2800 feet (853.4 m) per second and its cyclic rate of fire was 500 rounds per minute. The M26 was supplied with 2500 rounds of ammunition for this weapon and for the coaxial .30 caliber gun. The rectangular object under the gun is the accelerator pedal. (Author)



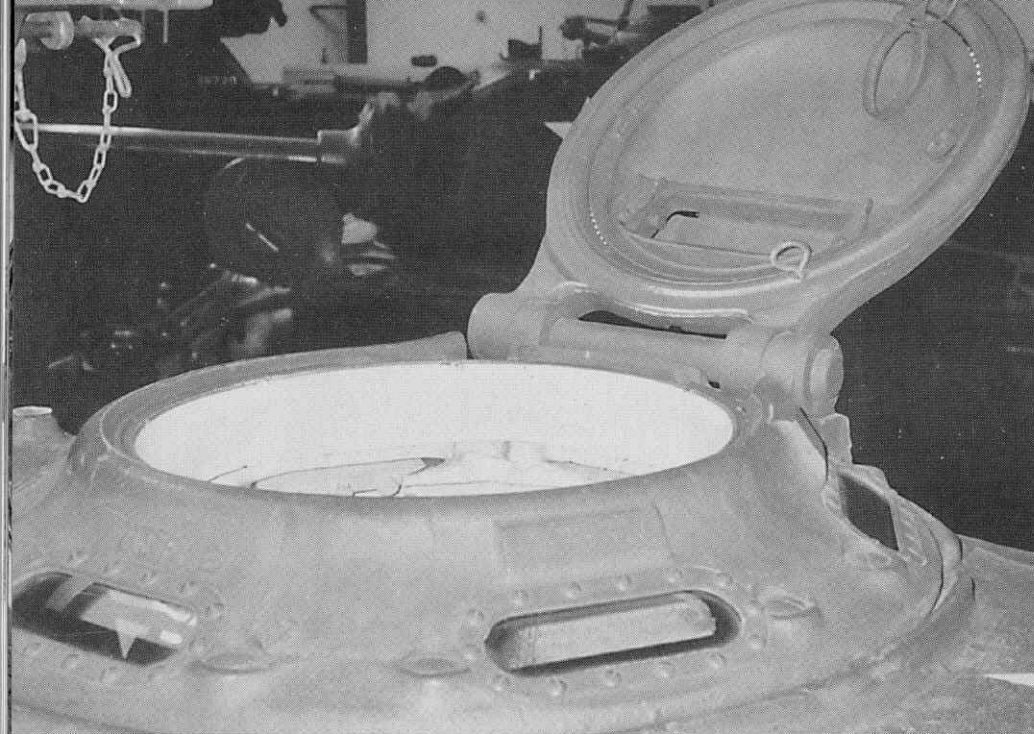
(Above) The gun mantlet was 4.5 inches (11.4 cm) thick, with three openings: one for the main gun in the center, one for the gunner's telescopic sight to starboard, and one for the co-axial .30 caliber machine gun to port. The mantlet had a rough cast appearance with the manufacturer's casting marks imbedded on the upper right portion. The 90mm M3 gun was mounted on a trunion aft of the mantlet. This weapon's elevation and depression ranged from +20° to -10°. (Author)



(Above Right) The port side of the turret featured two fittings for a hoisting device interded to lift the power train. This feature was used at tank depots, when turrets were removed for power train servicing. Most M26s had these fittings removed and replaced with patches. The large rectangular rack is the spare track holder, which held two track shoes. This allowed the crew to easily replace a shoe in the field. The track assembly tool mount is placed aft of the track holder. A .50 caliber machine gun is mounted on the turret roof. (Author)

(Right) Stowage brackets for the commander's .50 caliber machine gun are welded to the turret rear. This weapon was not always installed on M26s in service. The breech and barrel were disassembled and fitted to the brackets. The round hatch on the port side is the shell ejection port. The loader ejected spent shell casings through this hatch after they were removed from the main gun. The patched position for the power train lifting brackets is down and to the left of the ejection port. (Author)





(Above Left) The rotating commander's cupola was equipped with six direct vision ports around its periphery. A single M6 periscope was fitted into the one-piece hatch. The periscope rotated 360° inside the hatch, which allowed the commander to view targets with the hatch closed. The hatch interior is Olive Drab (FS34087), the same color as the tank's exterior surfaces. (Ward)

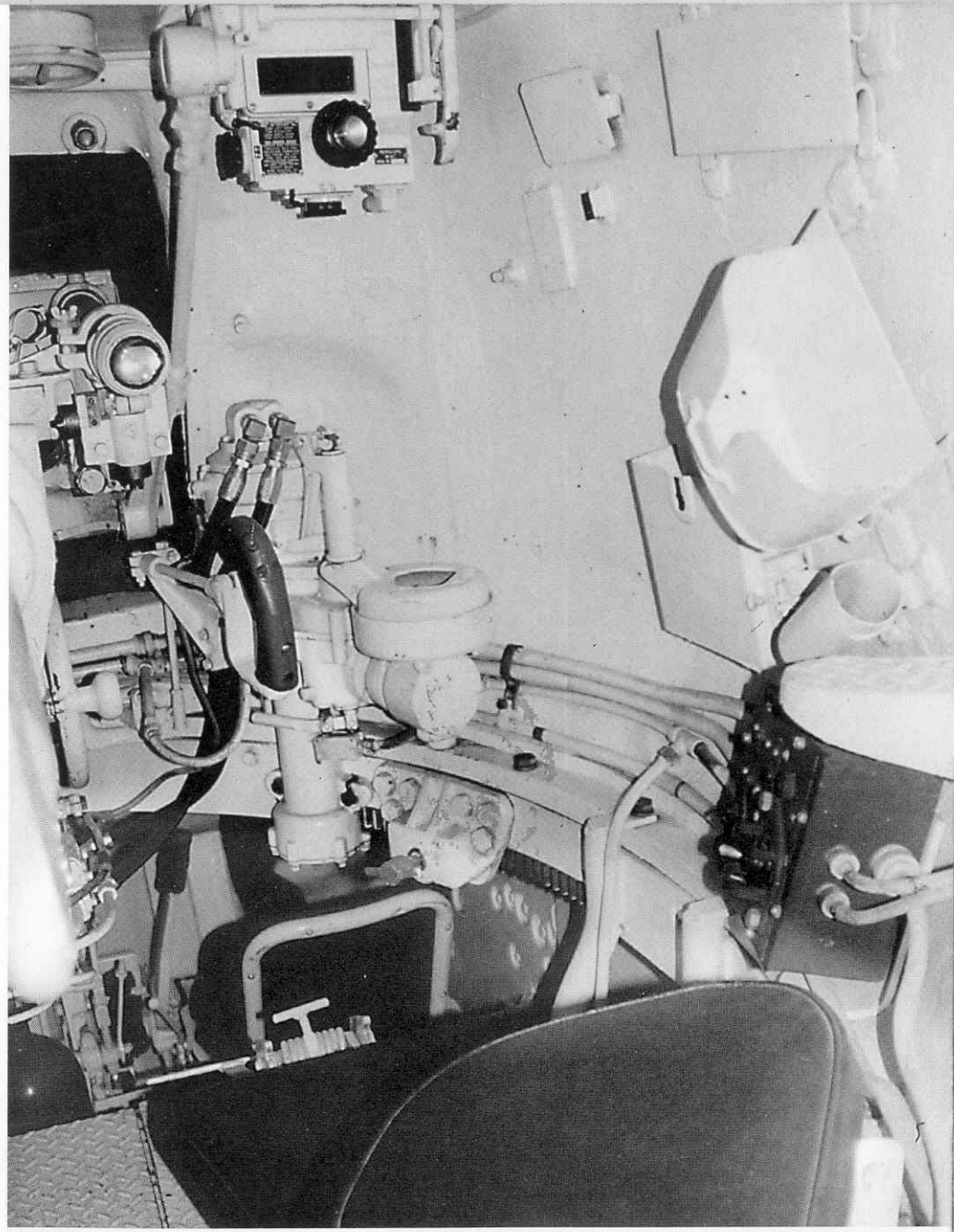
(Above) The center of the turret was dominated by the 90mm gun's massive vertical drop breechblock. The loader's M6 periscope is set into the turret roof directly above the 90mm ammunition ready rack. This rack held ten rounds, while the other 60 rounds were placed on the port and starboard sides and floor of the fighting compartment. (Author)



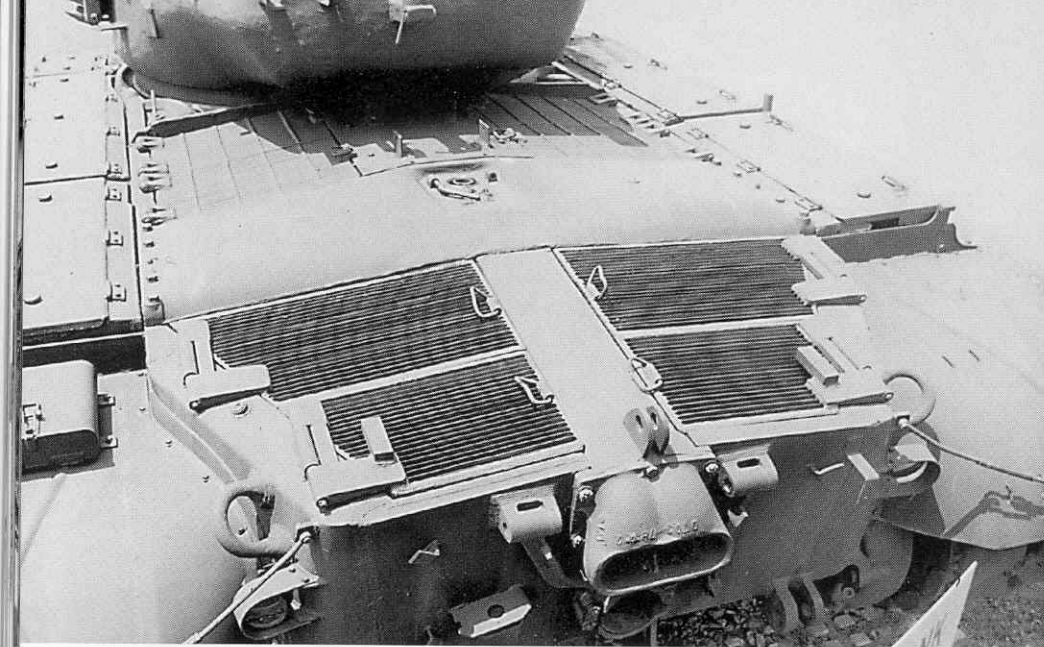
(Left) A single .50 caliber Browning M2HB machine gun was mounted on the turret roof and used against both ground and aerial targets. The machine gun mount was initially set on the rear of the turret roof, but it was moved forward on some vehicles to improve the firing arcs. The air-cooled M2HB (for Heavy Barrel) is 57 inches (144.8 cm) long and weighs 85 pounds 2 ounces (38.6 kg) unloaded. Its muzzle velocity is 2900 feet (883.9 m) per second and its cyclic rate of fire is 800 rounds per minute. The M26 carried 550 rounds of .50 caliber ammunition. The oval loader's hatch was set into the turret roof to the left of the commander's hatch. (Author)



The loader's position held ten vertically mounted rounds of 90mm ammunition in the ready rack. The M26 used both armor piercing ammunition against enemy tanks and high explosive rounds against soft targets. The .30 caliber co-axial machine gun was mounted directly to port of the main gun. Spent machine gun rounds were funneled into a canvas bag fitted under the weapon. (Ward)



The gunner sat to starboard of the main gun and in front of the commander. The gunner's M10F fire control periscope is in the upper left corner, while his M71C telescopic sight is below and to the left. The turret power traverse control and trigger are to the lower right. The round object to its right is the manual traverse control. The square box by the seat is the turret switch box. (Author)



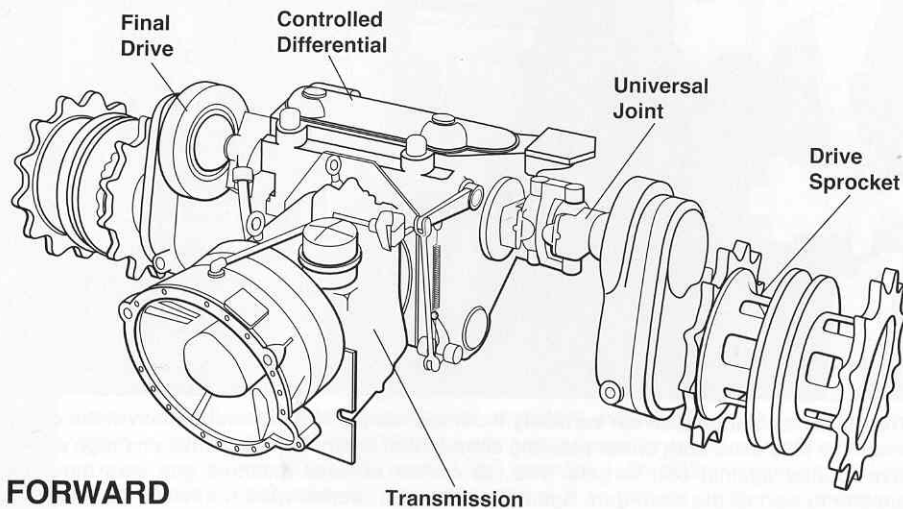
The M26 rear deck featured two sets of armored grills to cover the engine and drive train. The long rectangular covering between the grills covers the fans and radiators. The radiator fill cap is in the center of the engine deck. (Author)

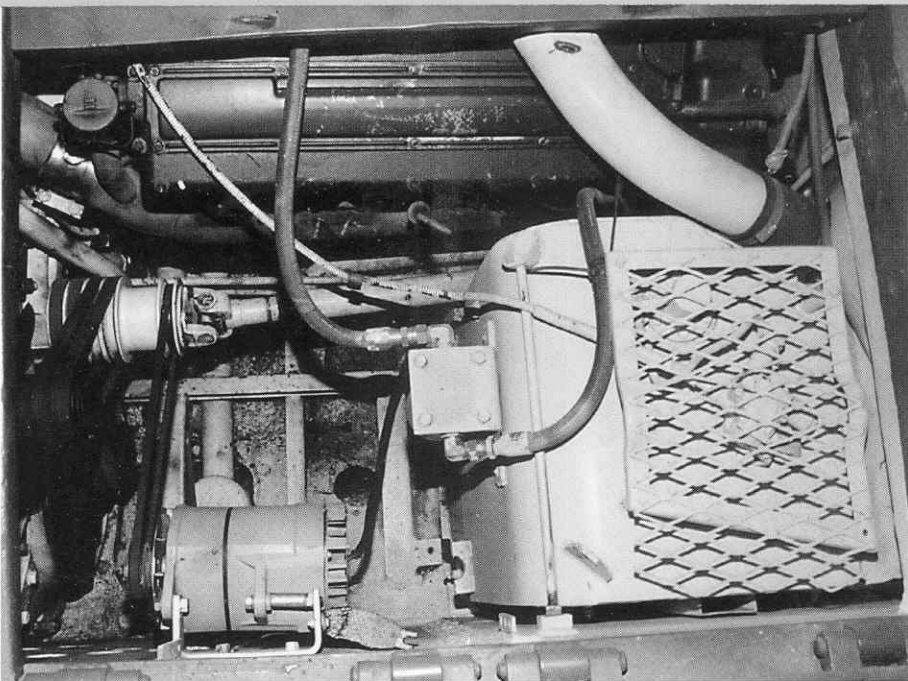
T26E3 testing revealed that the thin sheet metal fenders tended to droop and foul the tracks. Turnbuckles and rods were added to the fenders to help keep them straight. These fittings were not fitted to the Zebra mission T26E3s deployed to Europe in early 1945, but were added later. (Author)



The engine exhaust pipes and barrel travel lock were mounted on the rear hull. Tow cable fittings and a mount for the tow cable were also located on the rear hull plate. The towing pintle is installed on the towing bracket. (Author)

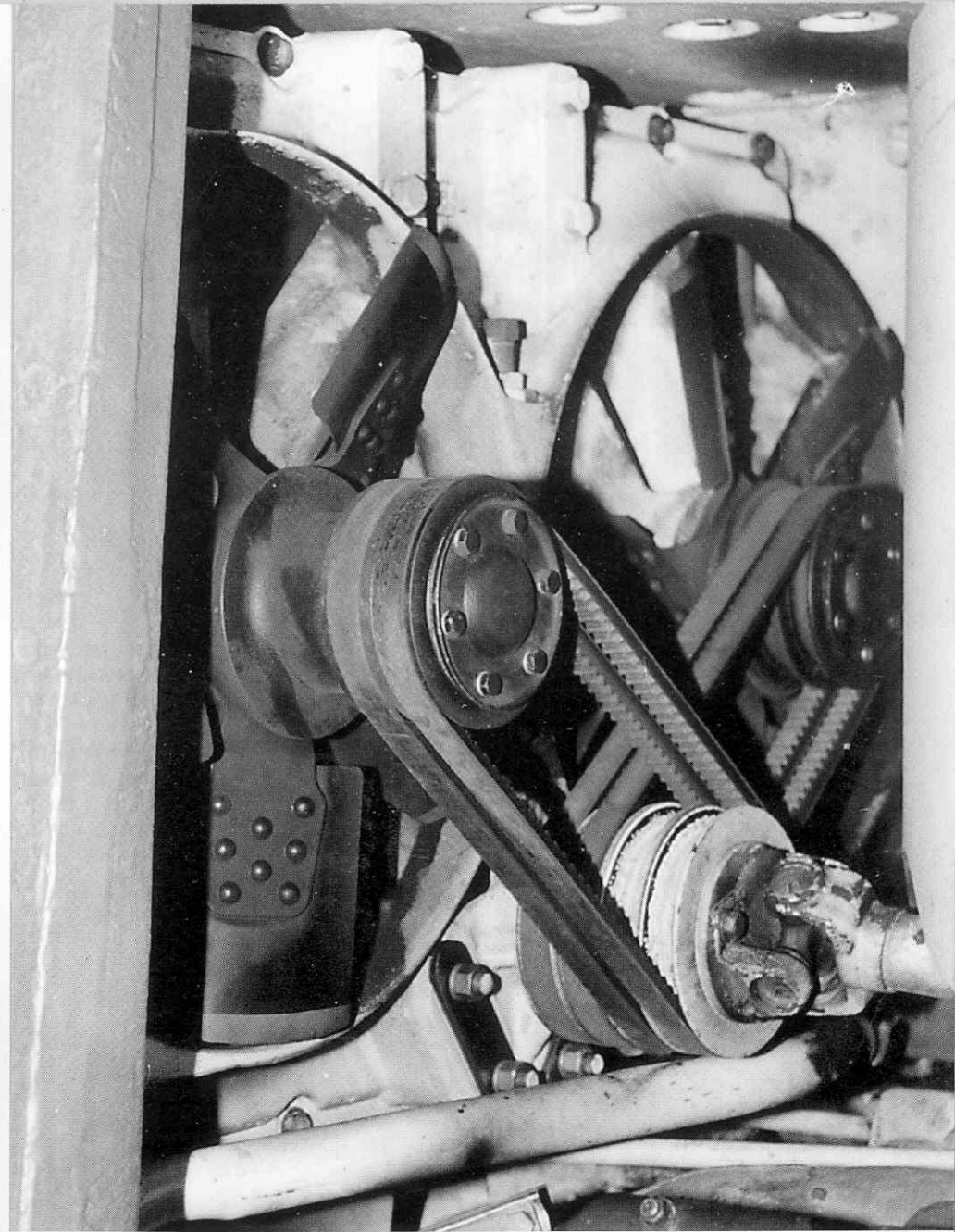
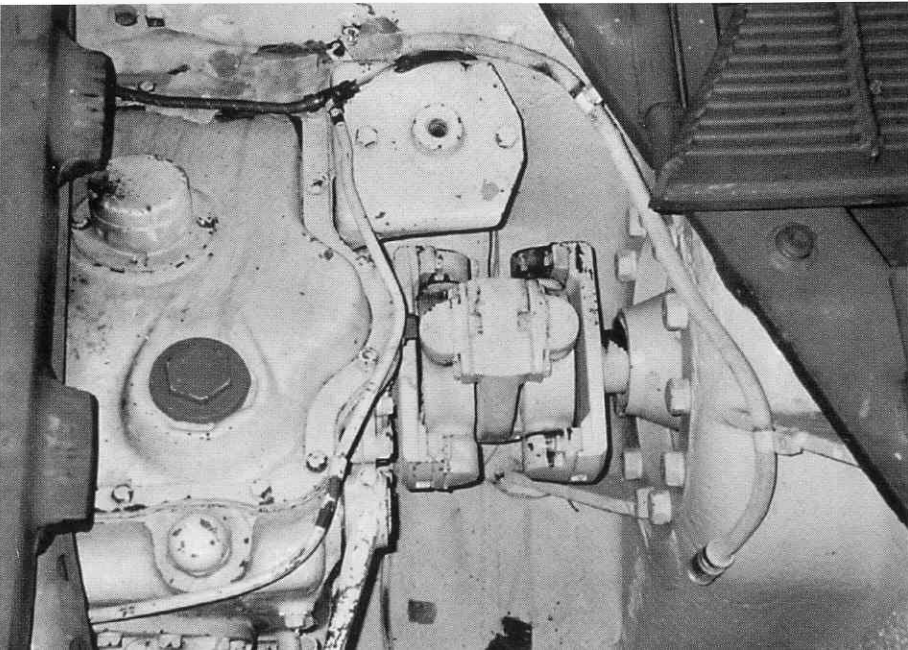
Transmission Assembly





Opening the starboard armored engine grill covers reveals the right side of the Ford GAF engine at the top, a fuel cell at lower right, and a non-standard generator at the lower center. The auxiliary generator – normally mounted below the main generator – is missing. The drive shaft in the background was used to turn the engine cooling fans. This is a restored M26 at the World War II Vehicle Museum in Hubbard, Ohio. (Author)

The engine, transmission, and differential were mounted in the M26's rear hull. The port differential connected to the final drive and drive sprocket via a universal joint. The starboard side is a mirror image of this differential. (Ward)



The cooling fan drive shaft connected to a series of pulleys and belts to turn the fans. During the Korean War, the lack of proper fan belts led directly to the loss of the first three M26s committed to the fighting. The M26s were the only medium tanks in Korea at the time and the only Allied tanks able to take on the North Korean T-34/85s. (Author)



The second T26E4 (Temporary Pilot) Pershing shows the extreme long length of the 90mm T15E1 gun barrel. The weapon's overall length of 272.9 inches (693.2 cm) was 70.7 inches (179.6 cm) longer than the M3 gun fitted to standard M26s. The long cylinder enclosed springs were designed to compensate for the length and the 3420 pound (1551.3 kg) weight of the barrel. Unlike the 'Super Pershing' shipped to Germany, this version was converted from a standard T26E3 as evidenced by the oval loader's hatch. Added armor was fitted to the mantlet and front hull, while a counterweight was mounted on the turret rear. (Hunnicuttt)

The T26E4 was later fitted with a hydro-pneumatic equilibrator fitted to the gun mount inside the turret. This solved both the problem of balancing the long T15E2 gun barrel and protecting the combat damage prone external springs. The T15E2 gun used two-piece

ammunition – projectile and powder – which reduced its rate of fire to four rounds per minute, compared to the M3 gun's eight rounds per minute. One thousand T26E4s were ordered, but the war's end reduced the output to a mere 25 tanks. (Hunnicuttt)

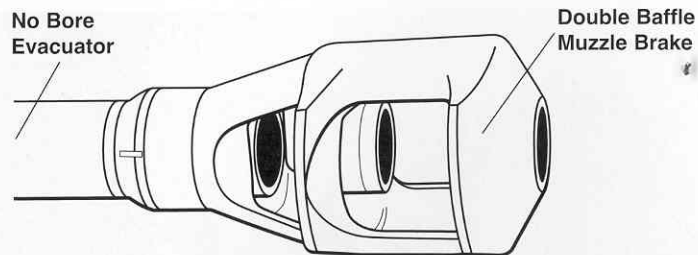




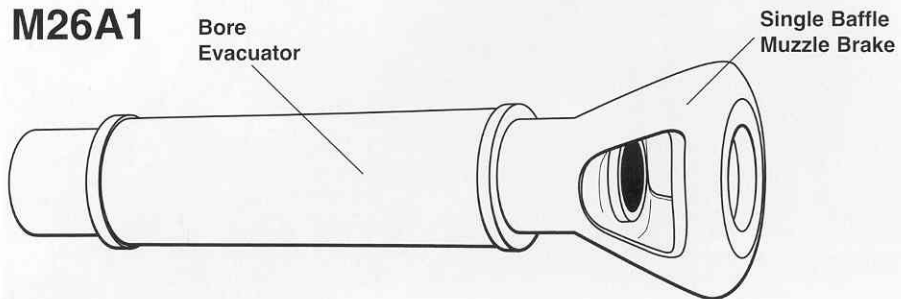
The T26E5 was a heavy assault version of the Pershing, similar in concept to the 'Jumbo' Sherman. The overall armor protection was greatly increased, which raised the vehicle's weight nearly five tons (4.5 MT). The use of T80E1 track with 5-inch (12.7 cm) extenders kept the ground pressure below that of the standard M26. Nevertheless, the speed over rough terrain had to be kept down to avoid suspension damage. The T26E5 was equipped with the standard 90mm M3 gun tube and muzzle brake. (Hunnicuttt)

Muzzle Brake Development

M26

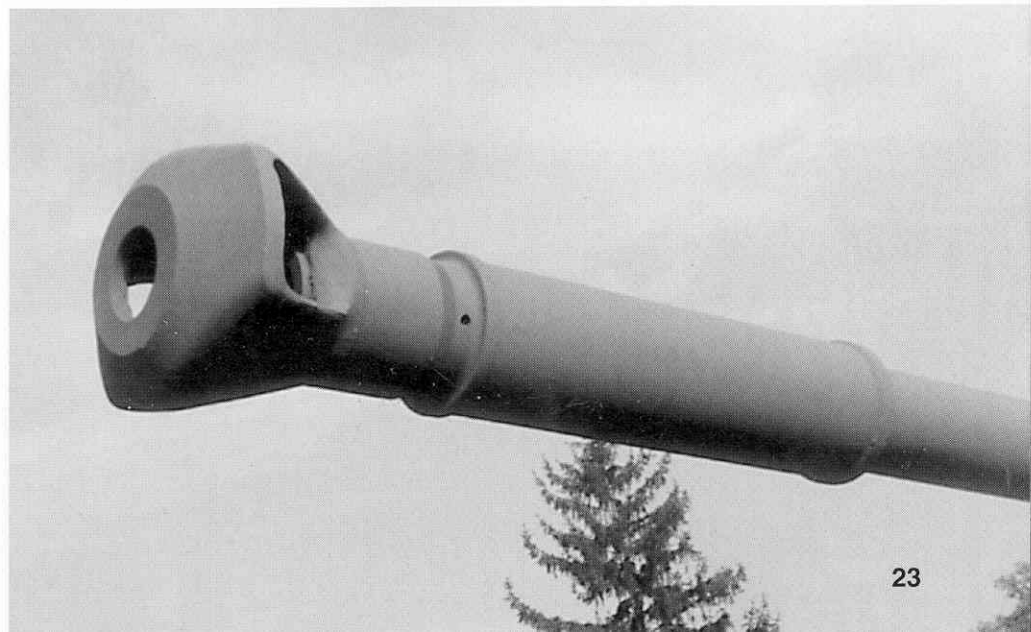


M26A1



The M26E1 was an M26 fitted with the long 90mm T54 gun. This weapon fired a one-piece 90mm round, unlike the cumbersome two-piece round used by the T15E2 gun mounted in the T26E4. The barrel was not as long as the T15E2 gun and featured a single baffle muzzle brake. Its performance was similar to the T15E2, but limited funding curtailed further development after the war. (Hunnicuttt)

The M26A1 was basically an M26 upgraded with the 90mm M3A1 gun. This gun featured a revised, single baffle muzzle brake in place of the double baffle brake used on M26s. Aft of the muzzle brake is the bore evacuator, which pulls smoke and fumes out of the gun and turret. (Author)



M26 Service

The US Army quickly reduced its strength throughout the world following the end of World War Two. With the introduction of the atomic bomb, armchair strategists postulated that ground warfare was obsolete and there was little need for conventional combat units. As a result, the strength of the Army was gutted and what little remained was basically a hollow shell. Many of the M26s were put into storage or used as gate guards or monuments. Some M26s were assigned to armor units in Europe during the uneasy peace between the western Allies and the USSR. After the end of the war, the Soviet Union began to clamp an iron hold on the countries it had 'liberated' until the United States and its allies realized all the war had done was substitute one totalitarian dictatorship for another. Signs of this new struggle began to emerge with the Soviet backed guerrilla campaign in Greece, the Berlin Blockade, and the raising of Winston Churchill called the 'Iron Curtain.' Despite the attention focused on Europe, it was in Asia that actual war was to break out between the Free World and the Communists.

In June of 1950, the North Korean People's Army (NKPA) carried out a massive invasion of the US-backed Republic of Korea (ROK). Aided by both the USSR and China (which had just fallen to the Communists), the NKPA and its spearhead of Soviet-built T-34/85 tanks quickly routed the ROK forces, which lacked both armor and modern anti-tank weapons. American troops were rushed to Korea to help bolster the retreating ROK troops, but they also lacked armor and effective anti-tank weapons; their performance was little better than that of the South Korean's. M24 Chaffee light tanks were rushed to Korea, but their 75MM guns were of little use against the T-34s. The only medium tanks available in Japan were three M26s found at the Tokyo Ordnance Depot on 28 June. They needed extensive repair work and were hurriedly repaired for shipment to Korea. Their fan belts were in poor shape, but none were available for replacement. The substitute fanbelts stretched after a short period of time, causing the fans to stop and the engines to overheat. No regular replacements were available when the three M26 tanks were shipped to Korea in mid-July. Deployed to defend Chinju to the west of Pusan, the tanks were lost when American and ROK troops were forced to fall back. During

MARGARET, an M26 Pershing of the 73rd Tank Battalion, moves slowly up a Korean road during the late summer of 1950. The 73rd was one of four Tank Battalions sent to Korea in response to the North Korean invasion in June of 1950. Soviet-built T-34/85s backed the North Korean attack. At first, neither the South Koreans nor Americans had any tanks or effective anti-tank weapons to stop them. (Hunnicuttt)

the retreat, the M26s' engines overheated and their crews were forced to abandon the only three Allied medium tanks in Korea at the time.

More help was on the way. Four tank battalions (BN) were deployed as quickly as possible to Korea to stem the T-34 led NKPA onslaught. These were the 6th BN equipped with M46s, the 70th BN with M26s and M4E3E8s, the 73rd BN with M26s, and the 89th BN, a composite unit, with a single company of M26s. The 70th and 73rd BNs were the tank training units from the Armor School at Fort Knox and the Infantry school at Fort Benning, Georgia, respectively. Ironically, the 70th had to reclaim M26s sitting around Fort Knox as monuments to get enough Pershings to take to Korea. Apart from these units, the 1st Provisional Marine Brigade, which had been formed around the 5th Marine Regiment, brought with it a single company of M26s. These had replaced 105MM howitzer armed M4A3 Shermans and the Marine gunners had only been allowed to fire two rounds each in training before being deployed to Korea.

By the time these units had arrived in Korea, the US and ROK troops had been forced back into a small enclave around the coastal city of Pusan. The North Korean troops had gained a psychological superiority over the defending Allied troops, based partially on the fear the T-34/85 instilled on the troops. There were numerous instances when positions had been abandoned when attacks were led by the Soviet-built tanks. In some cases, just the rumor that T-34s were coming caused troops to 'bug out' with little or no resistance. This exaggerated fear of the T-34s came to an end on 17 August when a column of four T-34/85s carried out an attack in the 'Naktong Bulge,' on the Pusan Perimeter's west side. Ironically, it was not Army, but Marine Corps M26s that put an end to the supposed invincibility of the Russian tanks. In conjunction with Marine infantry, three of the four tanks were knocked out while the last one escaped. From this point on, the T-34 was never again viewed with the same fear it had evoked during the early days of the campaign. Although the T-34 was still a weapon to be respected, the American forces now knew that they had a superior tank manned by better trained crews.

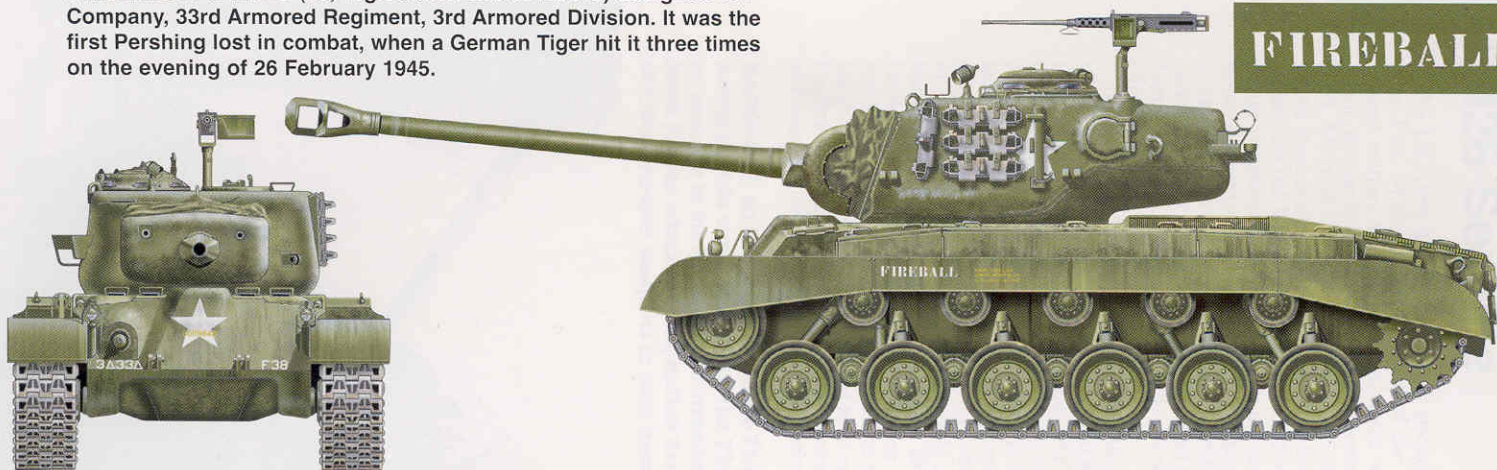
Throughout the rest of the summer the United Nations (UN) forces within the perimeter held the line against the NKPA forces. On 16 September, General Douglas MacArthur launched the Inchon invasion, followed a day later by a breakout from the perimeter. Tank led columns rushed northward toward the Marine led invasion force heading from Inchon to Seoul, South

C Company of the 73rd Tank Battalion seems to have named their tanks after girls in a rather uniform manner. The names were painted on the front hull and the side of the first fender storage bin. Driver positions on the front also carried the name and rank of the operator. ALICE is followed by MARGARET. (Hunnicuttt)



FIREBALL is a T26E3 (38, registration no. 30119848) assigned to F Company, 33rd Armored Regiment, 3rd Armored Division. It was the first Pershing lost in combat, when a German Tiger hit it three times on the evening of 26 February 1945.

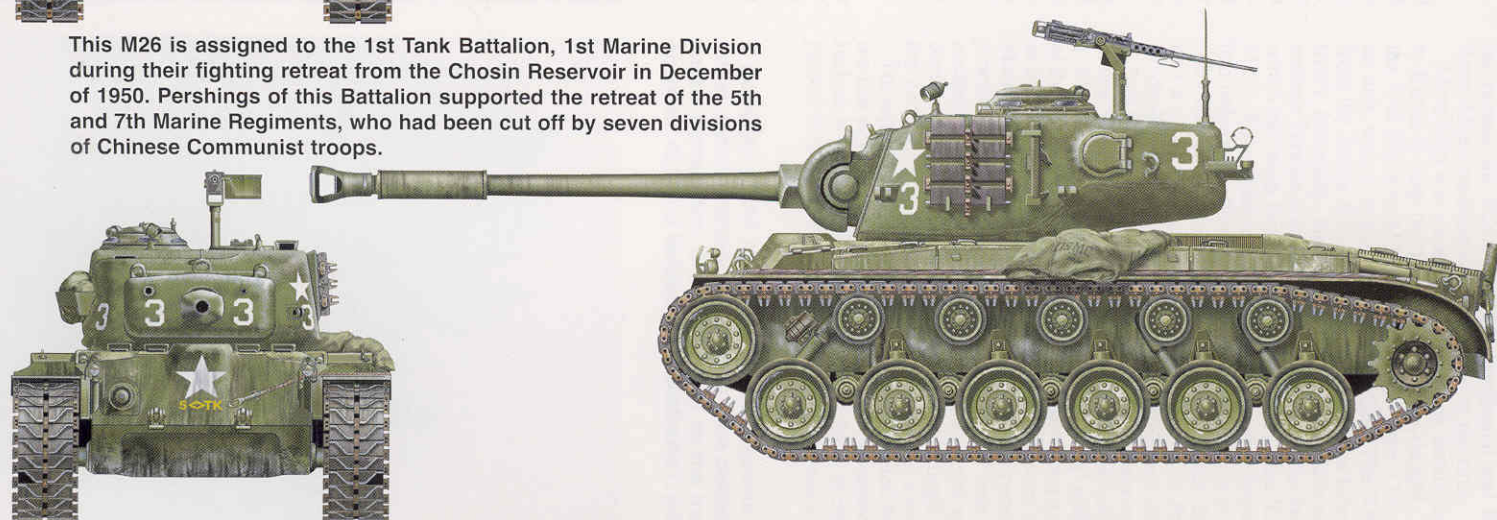
FIREBALL



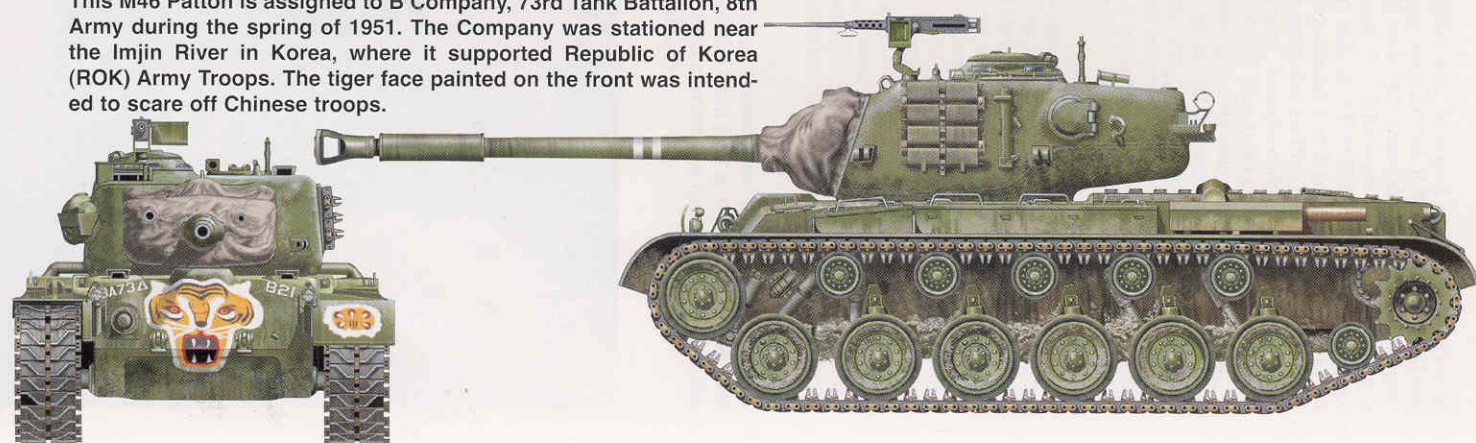
HELEN is an M45 assigned to the 6th Tank Battalion along Korea's Naktong River in September of 1950. The M45 was an M26 Pershing armed with a 105mm howitzer. The Battalion supported the breakout from the Pusan Perimeter following the Inchon landing on 16 September 1950.



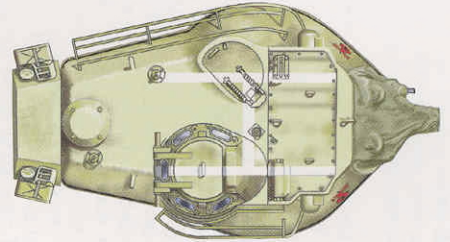
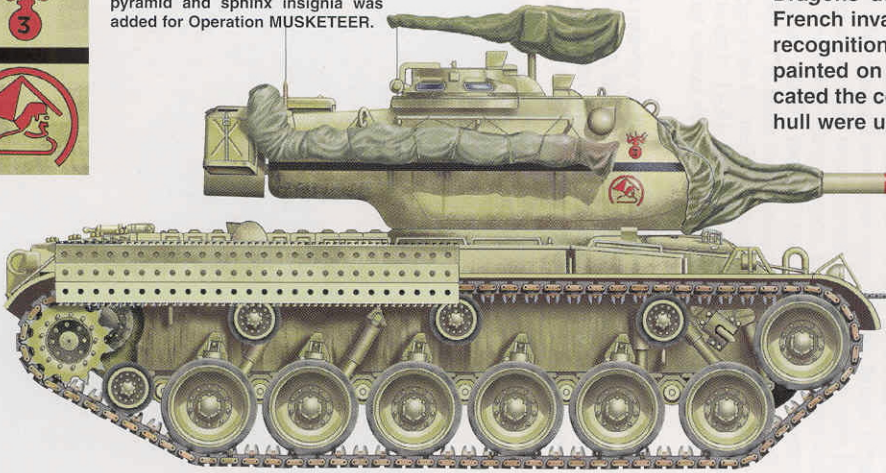
This M26 is assigned to the 1st Tank Battalion, 1st Marine Division during their fighting retreat from the Chosin Reservoir in December of 1950. Pershings of this Battalion supported the retreat of the 5th and 7th Marine Regiments, who had been cut off by seven divisions of Chinese Communist troops.



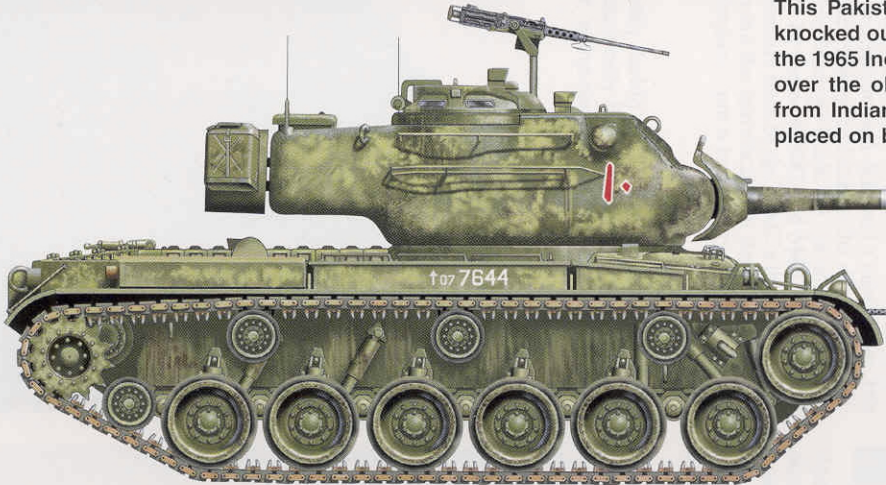
This M46 Patton is assigned to B Company, 73rd Tank Battalion, 8th Army during the spring of 1951. The Company was stationed near the Imjin River in Korea, where it supported Republic of Korea (ROK) Army Troops. The tiger face painted on the front was intended to scare off Chinese troops.



The flaming bomb indicated the M47's weight class, while the red pyramid and sphinx insignia was added for Operation MUSKETEER.



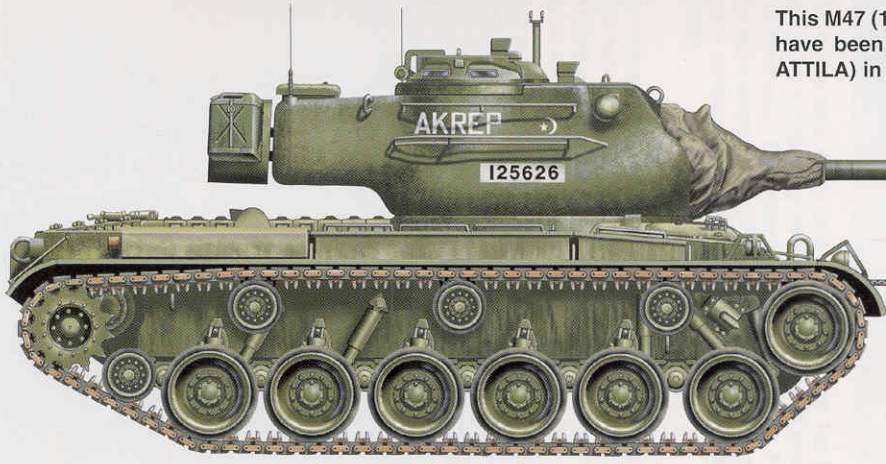
This M47 Patton was assigned to the French 8e *Régiment de Dragons* during Operation MUSKETEER – the 1956 Anglo-French invasion of Egypt at the Suez Canal. A white H for air recognition and a black stripe for ground recognition were painted on the turret. Four red bands on the gun barrel indicated the company. Pierced steel planks mounted on the rear hull were used to get tanks out of soft sand.



↑07 7644

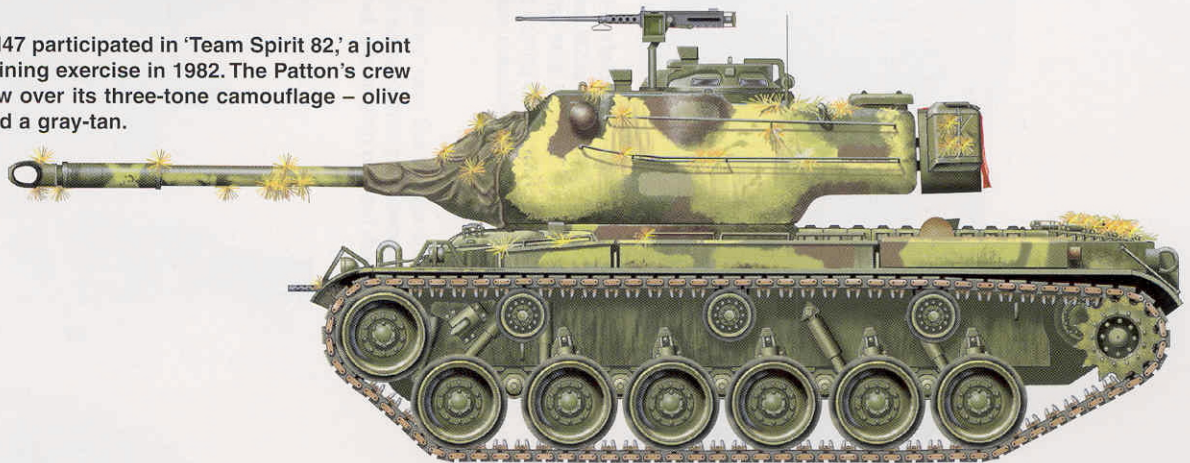
This plate was mounted on the center of the front hull and the upper right of the back hull.

This Pakistani 1st Armored Division M47 (10, 07 7644) was knocked out during heavy fighting around Assal Utter during the 1965 Indo-Pakistani War. A rough coat of mud was applied over the olive drab camouflage to help conceal the Patton from Indian anti-tank teams. A black registration plate was placed on both the front and rear hull.



This M47 (125626) of an unknown Turkish unit was believed to have been used in Turkey's invasion of Cyprus (Operation ATTILA) in August of 1974.

This South Korean M47 participated in 'Team Spirit 82,' a joint US/South Korean training exercise in 1982. The Patton's crew added mud and straw over its three-tone camouflage – olive drab, dark brown, and a gray-tan.



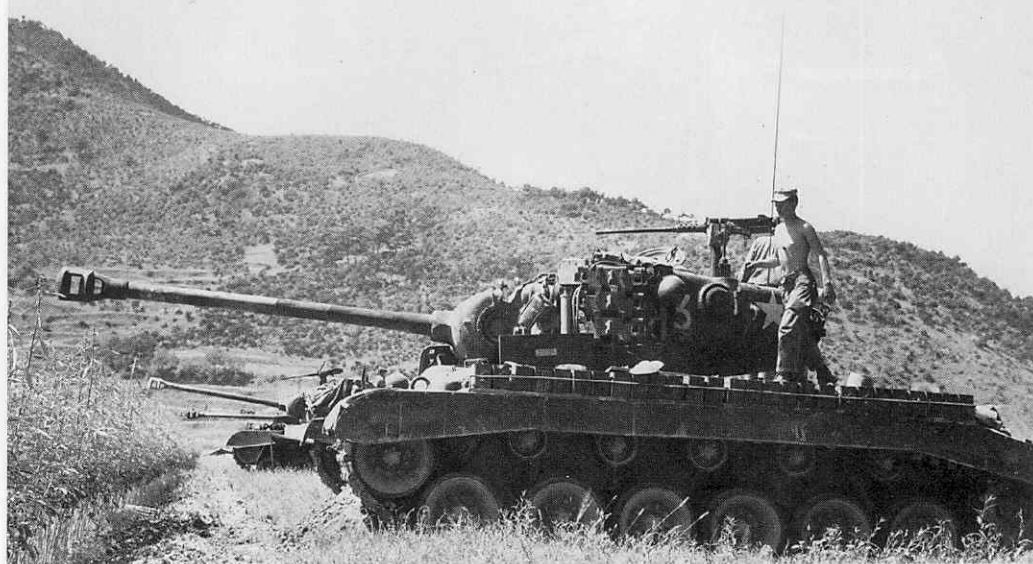
Korea's capital. Near Seoul, the Marine M26s decimated two new NKPA armored regiments, knocking out at least 16 T-34s in a little over a week. Continuing their northward push, the M26 units from Pusan also knocked out dozens of T-34s and SU-76 self-propelled guns as they swept all resistance aside.

By early fall, the American-led UN command was poised to enter North Korea and end the war. Pushing north in unsupported columns, the US, ROK, and allied forces ran into hundreds of thousands of undetected Chinese troops who had moved south from Manchuria across the Yalu River. Caught by surprise, the UN forces retreated, often in panic. In the one bright spot of the retreat the 1st Marine Division – surrounded by seven Chinese divisions – fought its way out of the Chosin Reservoir, bringing its wounded and dead. M26s played a major role in both defensive and offensive operations during the retreat – called an “*attack in another direction*” by the legendary Marine General Lewis ‘Chesty’ Puller. The UN forces were eventually able to stabilize the lines and regroup south of Seoul by early 1951.

The UN forces counter-attacked in the spring of 1951, with both M26s and M46s playing a prominent part, and were able to recoup much lost ground. The front had stabilized along the 38th Parallel by the summer of 1951, and – for the next two years – each side dug in and the war became one of static trenches and bunkers. The M26s were used for artillery fire support and on the line for direct fire against specific bunkers and positions along the Main Line of Resistance (MLR) during this phase of the war. The M26 suffered in the hilly terrain due to its lack of engine power. The Sherman, using the same powerplant, was ten tons lighter and thus had an easier time in the hills; it quickly became the tank of choice along the ridgelines.

When the Korean War ended with a cease-fire in the summer of 1953, the M26 was quickly eliminated from front line service. Some went to Reserve and National Guard units, but these too were soon retired. The M26 saw only limited foreign use due to the demands of the Korean War. Only France, Italy, and Belgium received enough M26s for operational use. By the late 1950s, the M26 had been replaced in service by the new M47 and M48, and later the M60. The latter three tanks could trace their direct ancestry back to the T26E3s that were pushing to the Rhine River in spring of 1945. It was not until the introduction of the M1 Abrams in the early 1980s that this lineage with the past was broken – not a bad achievement for a tank that almost didn't make it off the drawing boards.

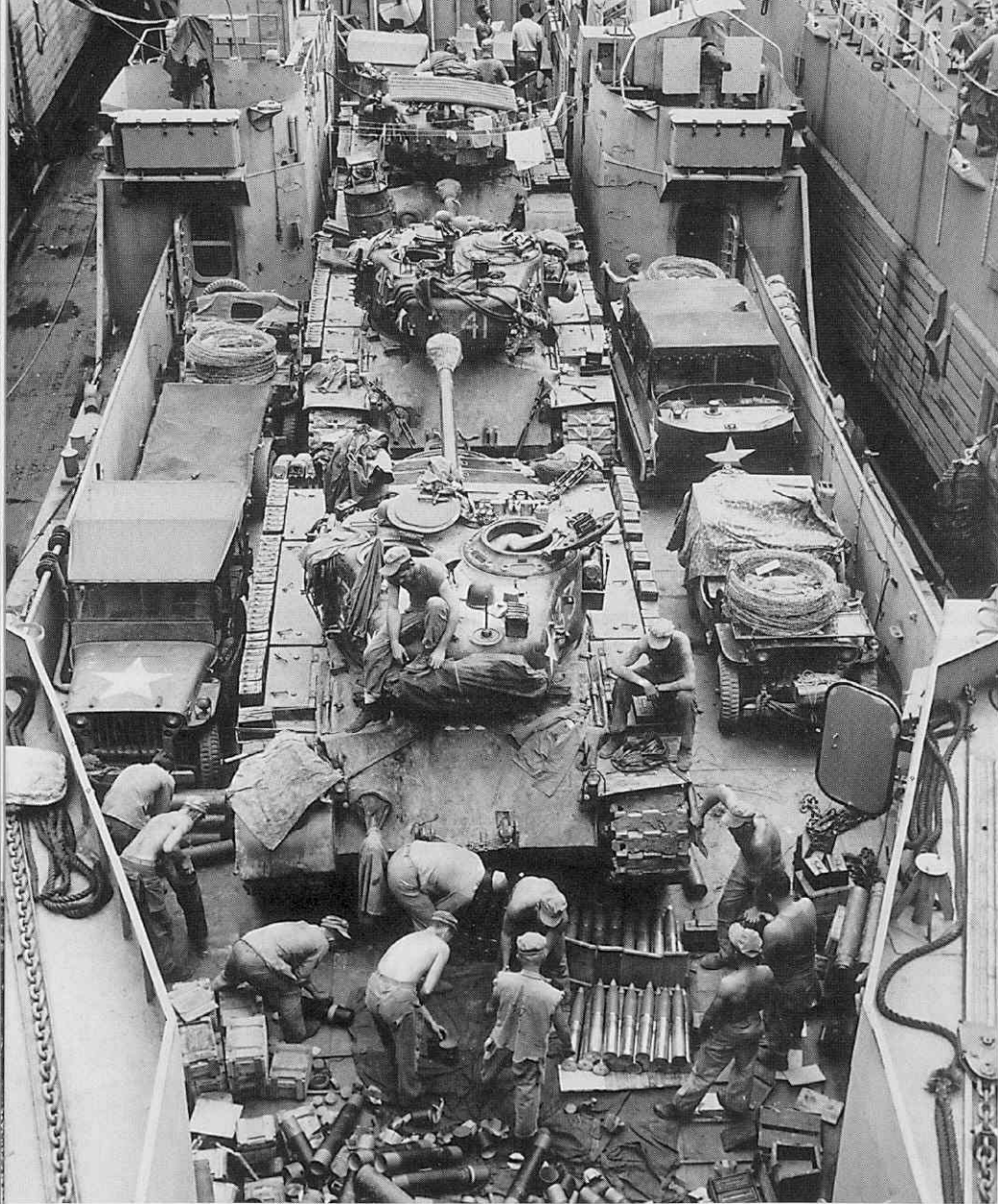
A heavily camouflaged Pershing sits in a small valley during a lull in the fighting in August of 1950. By this time, the U.S. had complete air superiority over the battlefield, but the situation on the ground was still somewhat fluid; camouflage was especially important against North Korean artillery fire. (Hunnicuttt)



Apart from the four Army tank battalions, the 1st Provisional Marine Brigade was also equipped with a company of Pershings. These three M26s sit in a field in the Naktong Bulge of the Pusan Perimeter in early September. The M26 in the foreground is believed to be the tank responsible for destroying three T-34s during the fighting on the perimeter. The tank's fenders are lined with .30 and .50 caliber machine gun ammunition boxes. (USMC/NA)

An M26 moves down a road nicknamed the 'Bowling Alley' near the village of Soi-ri. It was given the name due to the T-34/85 noise and shellfire coming straight down the road during the night of 21 August. The aerial recognition panel is billowing upward due to air from the engine cooling fans. (Hunnicuttt)





The 1st Provisional Marine Brigade was pulled out of the Pusan perimeter in early September for the upcoming Inchon invasion – scheduled for the middle of the month. These three M26s sit in the well deck of an LCT. The M26 in the foreground has three T-34 silhouettes painted on the top of the ventilator housing. Due to the heavy consumption of machine gun ammunition, wire racks were added to the fenders to carry extra ammunition cans. (USMC/NA)



This Marine Pershing has lost a track due to a land mine. Mines were an increasing problem on the Pusan perimeter when the fighting reached a stalemate. Primarily a defensive or anti-counteroffensive weapon, North Korean mines were used to keep United Nations forces hemmed into the small enclave around Pusan. (USMC/NA)

This appears to be the same Marine M26 with the three T-34 kills on the ventilator housing after disembarking from the LCT. Both front fenders and portions of the right side skirt are missing. The heavier clothing of the crew indicates colder weather, but the exact date is not known, perhaps the late fall of 1950 or the spring of 1951. (Green)





While the fighting went on in Korea, US forces in Europe prepared for the Soviets making a possible move against the NATO alliance. The crew of this M26 guards a road in a small village during an exercise. The battalion crest on the ventilator housing appears to have been covered over with mud. The tank is shod with later rubber chevron track which was less damaging to village streets. (PAM)



Few Pershings were supplied to other countries due to the demands of the Korean War; however, Belgium, France, and Italy all received enough M26s for operational use. These French Pershings move along a road near Rastatt, near the Rhine River, in the French occupation zone of Germany during the spring of 1953. (PAM)

DELIRIOUS rumbles along a muddy track during training near Mainz, Germany in February of 1952. The tank was assigned to D Company, 66th Tank Battalion and was conducting training with the 42nd Armored Infantry Battalion. The loose tow cables hanging over the fender are a major safety hazard; the cable could foul the running gear or possibly drag an infantryman off the tank if it was snagged by the tracks. (USA/NA)





The T26E2 was a 105mm M4 howitzer armed version of the T26E1 series heavy tank. The howitzer barrel was substantially shorter and lighter than the standard 90mm gun. This lighter weapon allowed the revised turret to have thicker turret and mantlet armor. The turret was otherwise similar to the T26E1. (Hunnicut)

The 105mm M4 howitzer was the same weapon used on the 105mm howitzer equipped Shermans in World War Two. The weapon fired a variety of high explosive, smoke, and anti-tank rounds. The T26E2 carried some 74 rounds of 105mm ammunition. It retained the co-axial and hull mounted .30 caliber machine guns as well as the turret roof mounted .50 caliber machine gun from the T26E1. (Hunnicut)



M45

While the T26E1 was under development, plans were also formulated to arm the vehicle with a 105mm howitzer. This had been done with the M4 for use by tank units in the indirect fire-support role and it was felt that the same should be done with the T26 chassis to utilize the vehicle in as many roles as possible. A wooden mock-up was built and plans were drawn up for the new turret and the necessary modifications to the fighting compartment to handle the storage for the 105mm ammunition. The first pilot turret was completed at the Fisher Tank Arsenal and was mated to a chassis built at the Detroit Tank Plant. This vehicle received the designation **T26E2**.

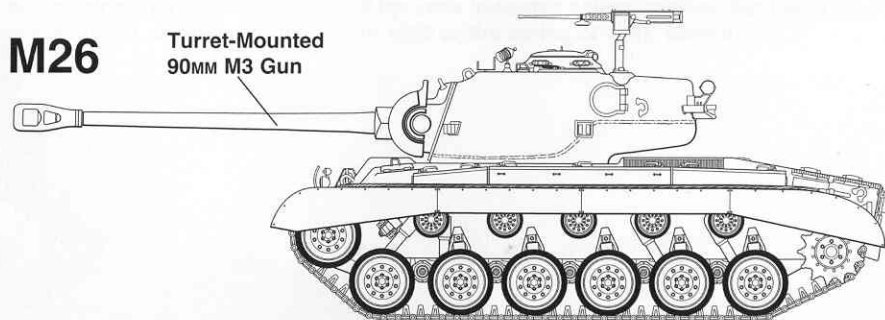
The 105mm M4 howitzer had an overall length of 101.3 inches (257.3 cm) and weighed 1140 pounds (517.1 kg). It could fire eight rounds per minute out to a maximum range of 12,205 yards (11,160.3 m). The turret-mounted howitzer's elevation and depression range was +35° to -10°.

The new turret was similar to the T26E1 turret, but was able to incorporate thicker armor due to the lighter weight of the 105mm howitzer compared to the 90mm gun. The new gun shield was eight inches (20.3 cm) thick and the turret front was five inches (12.7 cm) thick. The sides varied from three (7.6 cm) to five inches, while the turret roof remained one inch (2.54 cm) thick. The howitzer was fitted into a modified trunnion to lessen the impact of any shell hits. The howitzer mount was stabilized in both elevation and depression from +35° to -10°. Sighting was accomplished using an M76G telescope. The mount was also fitted with a coaxial .30 caliber (7.62mm) M1919A4 machine gun. This mount was initially designated the T117, but this was changed when the mount was standardized as the M71. The turret could be traversed either hydraulically or manually. The rate of fire amounted to eight rounds per minute. Seventy-four rounds were carried.

Interest in the vehicle declined with the winding down of the war in Europe and the initial pilot was not delivered to Aberdeen Proving Ground for testing until April of 1945. The original plan was to have both Fisher and Chrysler (Detroit Tank Arsenal) produce the T26E2, but with the end of the war the large order was cut back to a meager 185 vehicles – all produced by Chrysler. After testing and acceptance by the Army, the vehicle was redesignated the **M45**. A few tank battalions received these vehicles in their headquarters unit, but the vehicle saw limited service due to its small numbers.

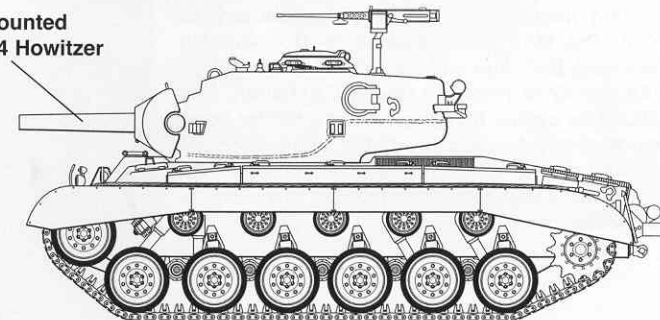
M26

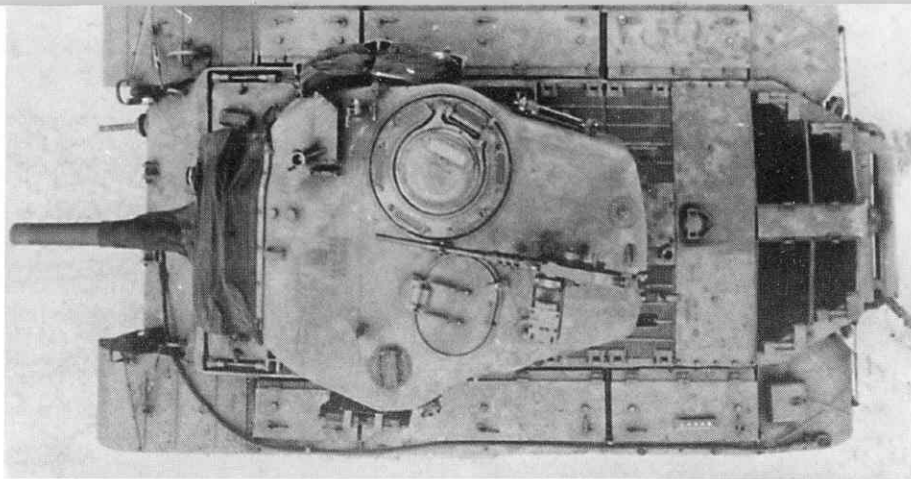
Turret-Mounted
90MM M3 Gun



M45

Turret-Mounted
105MM M4 Howitzer





Aside from the turret, the T26E2 chassis was a standard T26/M26 tank hull and powertrain. Internally there was some rearrangement to accommodate the 105MM ammunition, but otherwise there were few changes. Designated the M45, the tank's large initial production run was drastically curtailed when the war ended – only 185 were produced. (Hunnicuttt)

M45 Service

Interest in the M45 dropped off with the end of World War Two. Although it was issued to a few headquarters companies of M26 units, the small number produced precluded widespread deployment. This, coupled with the fact that there were a relatively large number of M4 105MM howitzer tanks still in service, meant that there was little need of the M45 in service. When the Korean War broke out in the summer of 1950, the 6th Tank Battalion deployed to Korea and took its M45s along with it. These vehicles saw service during the fighting around the Pusan Perimeter in the summer of 1950 and in the breakout drive following the Inchon landing in mid-September. From that point on, little is known about their use in the war. Given the small number of M45s available, it is believed these vehicles were withdrawn from the battlefield as the front stabilized around the 38th Parallel. This is the only known use of the M45 in combat and it does not appear that any other unit employed the M45 in Korea. No M45s were provided to foreign countries.

The only known use of the M45 in combat occurred during the early fighting in Korea. This M45 from the 6th Tank Battalion leads a column of vehicles across the Kumho River, a tributary of the Naktong River, during the breakout from the Pusan Perimeter in September of 1950. (USA/NA)



Another M45 crosses the Kumho on a ford previously surveyed and marked by engineers. At this time, the 6th Tank Battalion was supporting the 1st Cavalry Division during the breakout from the Pusan Perimeter. Their goal – to push north and link up with the invasion forces at Inchon – was met in late September. (Hunnicuttt)



M46

When production of the M26 ceased, approximately 2200 tanks had been built. Defense spending was cut tremendously after World War Two, especially since the advent of nuclear weapons made ground wars obsolete, according to some strategists. Nevertheless, some thought was given to the development of a new tank during the late 1940s due to the growing Cold War between the US and the Soviet Union. Budgetary restraints made US Army officials realize that there was little chance of funds becoming available for a new tank. Consequently, the Army looked for ways to improve the basic M26 design.

The main problem with the M26 was its low powered engine, sluggish performance, and range. A new engine and a transmission system were under development, which promised a substantial increase in horsepower and better control and maneuverability. These were the Continental AV-1790-1 engine and the Allison CD 850-1 cross-drive transmission. The new powerplant produced 810 horsepower (HP) as opposed to the 500 HP produced by the Ford GAF engine. The transmission used two hydraulically selected gear ranges driven through a torque converter. This system combined the work of the transmission, steering, and braking into a single compact unit. A "joy-stick" type control was provided for each driver, which resulted in easier control and reduced driver fatigue.

The Continental engine and Allison transmission package was fitted into a modified M26 under the designation M26E2. This pilot model was shipped to Aberdeen Proving Ground for testing in May of 1948. The test results were impressive, although the new engine and transmission components were prone to failure. The entire unit took up less space than the original M26 engine and transmission and there was no increase in weight. The rear engine deck was totally revised. Armored engine grills covered nearly the entire rear deck. The mufflers were rerouted to both sides of the fenders from the original rear position. Three square plates on the hull rear allowed access to the transmission.

The M26E2 was an M26 fitted with the new 810 HP Continental AV-1790-1 engine and Allison CD-850-1 cross-drive transmission. While the forward hull and turret were the same, the engine deck was significantly altered. Large mufflers were added at the rear of each fender. (Hunnicutt)

It was initially planned to arm the M26E2 with the 90MM T54 gun, but this was deleted since it was felt there was no need for a more powerful gun. The existing 90MM M3 gun was then modified with a bore evacuator and new muzzle brake and designated M3A1. A new M83 telescope was also added.

Authorization for ten modified M26s, designated T40, was approved in 1948. These vehicles used the improved AV-1790-3 engine. The Allison CD-850-1 transmission was later replaced with the improved CD-850-2 transmission. A small track tension idler was added between the last road wheel and the drive sprocket to help reduce chances of throwing a track during turns and over rough terrain. Nine of the ten T40s were sent to Aberdeen, Fort Knox, and Detroit Tank Arsenal for testing. The remaining vehicle was used for the T39 armored engineer vehicle. Eight of the nine tanks were eventually converted to the M46A1, while the last vehicle was used to simulate the T42 medium tank.

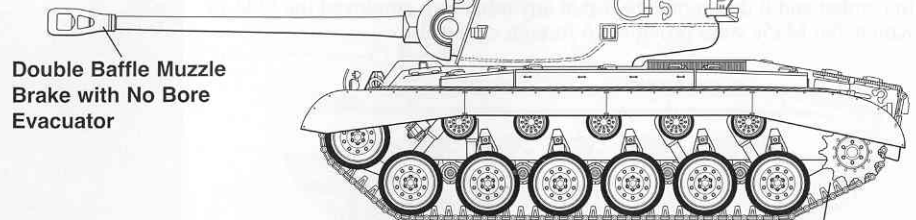
The T40 was standardized as the M46 Medium Tank in July of 1948. It was later given the name General Patton, but this was usually shortened to just Patton. At the same time, the M26 was reclassified as Limited Standard. The initial M46 production run was set at 800 vehicles for 1949. Plans were also formulated for the conversion of 1215 M26s for the 1950 fiscal year, but events in Korea disrupted this plan. The first production M46s were sent to Aberdeen for testing and differed only slightly from the T40. The square transmission access panels at the rear were changed to round plates and the engine and transmission were changed to the improved 810 hp AV-1790-5 and CD-850-3, respectively. Trials went smoothly and only minor problems were discovered.

Armor thickness was virtually unchanged on the M46 from the earlier M26 Pershing. The thickness ranged from three inches (7.6 CM) to four inches (10.2 CM) on the front and from two inches (5.1 CM) to three inches on the sides. The remaining armor ranged in thickness from 0.5 inches (1.3 CM) to two inches.

The M46 had a fully loaded weight of approximately 48.5 tons (44 MT), compared to the M26's 46.2 ton (41.9 MT) weight. The newer vehicle's sustained maximum road speed of 30 MPH (48.3 KMH) was 5 MPH (8 KMH) faster than the earlier M26's sustained speed. The M46 carried 232 gallons (878.2 L) of gasoline; however, its heavier weight reduced the range to approximately 80 miles (128.7 KM). The engine was supplied with 72 quarts (68.1 L) of oil.

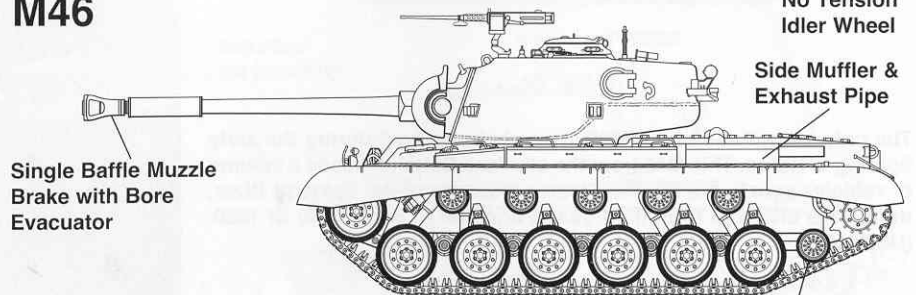
Unfortunately for the M46 program, the Korean War broke out in June of 1950; the anticipated availability of M26s for conversion to M46 standards never materialized. Although some

M26



Double Baffle Muzzle Brake with No Bore Evacuator

M46



Single Baffle Muzzle Brake with Bore Evacuator

No Tension Idler Wheel

Side Muffler & Exhaust Pipe

Tension Idler Wheel





The M26E2 rear hull was also changed compared to the M26. Hinged square hatches were added to the rear plate to provide access to the new transmission. While the M26 had its exhaust nestled between the barrel travel lock arms, the new exhausts were now ducted to mufflers mounted on each fender. (Hunnicuttt)

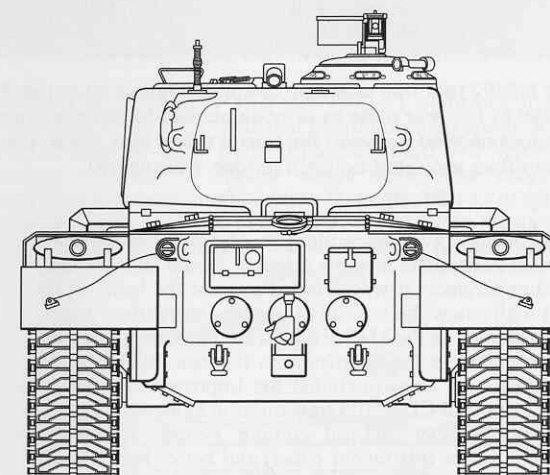
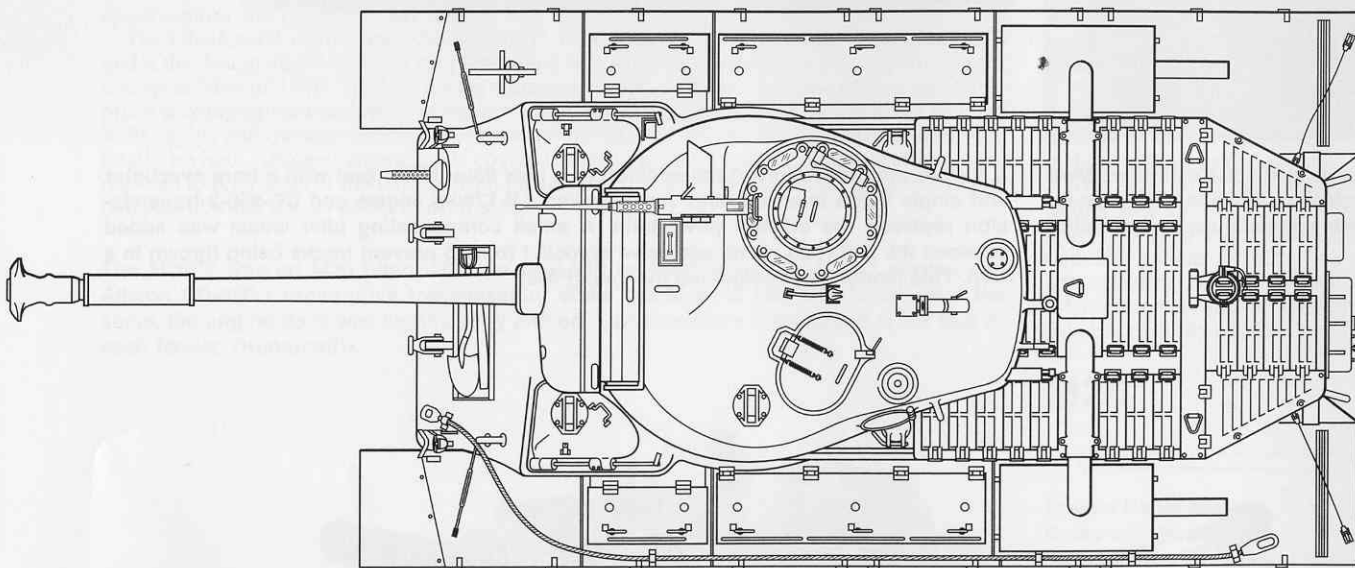
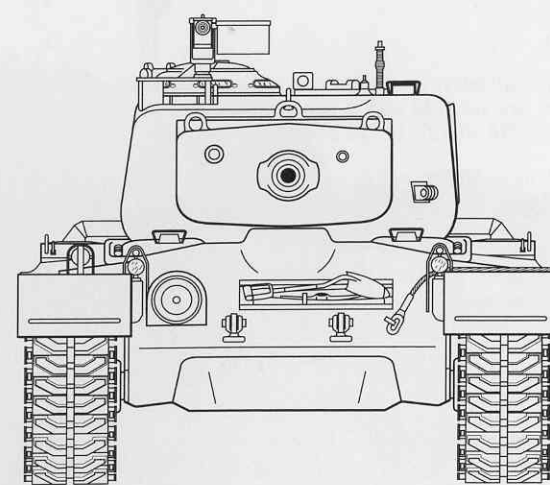
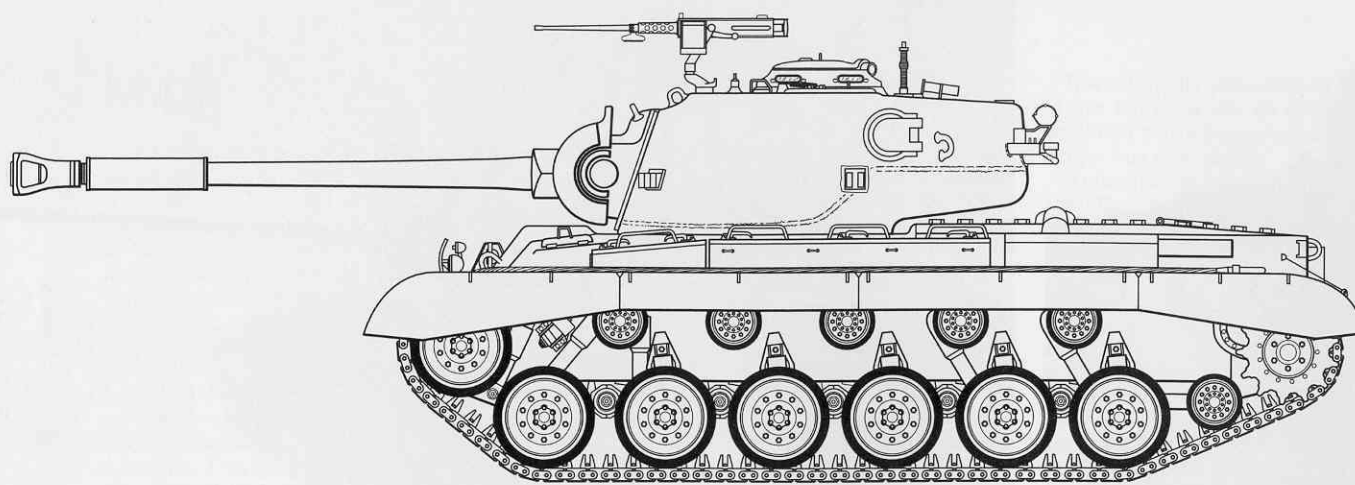


A further upgrade involved the addition of a new 90mm M3A1 gun with a bore evacuator and single baffle muzzle brake. An improved AV-1790-3 engine and CD-850-2 transmission replaced the original powertrain. A small compensating idler wheel was added between the last road wheel and drive sprocket to help prevent tracks being thrown in a turn. This model was designated the T40. (PAM)

thought was given to production of new M46s, it was viewed as obsolete in some respects. Based on trials and field experience, it was decided to mate the basic M46 hull with a new, ballistically improved turret then under development as the M47. There were numerous changes incorporated in the later hulls to increase their overall performance. These included the improved AV-1790-5B engine and CD-850-4 transmission along with a new fire extinguisher and oil cooling system. Improved brakes, a new instrument panel, and better hull wiring were the other main changes from the earlier M46. Authorization for the construction of 360 of this model, designated M46A1, was given in February of 1951. Externally, there was no discernible difference between the M46 and M46A1 – only their serial numbers telling them apart.

Ten T40s were modified from M26s, but one vehicle was later used as a pilot engineer vehicle, the T39. This was fitted with a turret mounted British 6.5 inch (16.5 cm) demolition gun, a bulldozer blade, and a 20-ton (18.1 mT) winch on the rear deck. The T39 never went into production since the new M47 was just coming into service. (PAM)





M46 Pershing Specifications

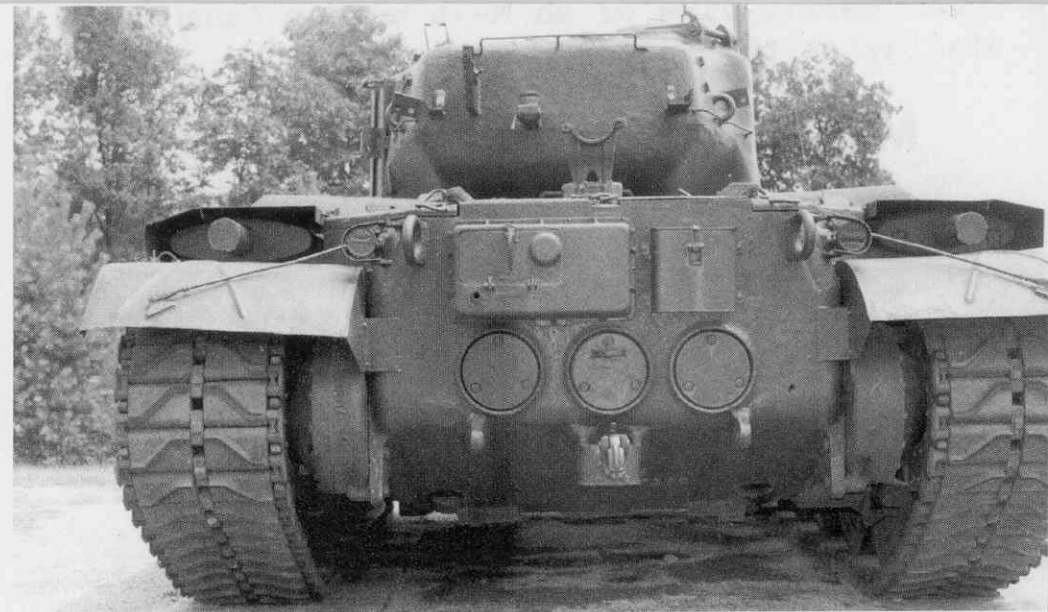
Length:.....27 feet 9.6 inches (8.5 M)
 Width:.....11 feet 6.3 inches (3.5 M)
 Height:.....10 feet 5.1 inches (3.2 M)
 Combat Weight:....Approximately 97,000 pounds (43,999.2 KG)
 Powerplant:.....One 810 HP Continental AV-1790-5A air-cooled,
 V-12, gasoline engine

Armament:.....One 90MM M3A1 gun with 70 rounds and one
 .30 caliber (7.62MM) M1919A4 machine gun
 with 2750 rounds in turret; one .50 caliber
 (12.7MM) M2HB machine gun with 550 rounds
 on turret roof; and one .30 caliber M1919A
 machine gun with 2750 rounds in right
 front hull.

Maximum Speed:..30 MPH (48.3 KM/H) sustained on road
 Maximum Range:..Approximately 80 miles (128.7 KM)
 Crew:.....Five



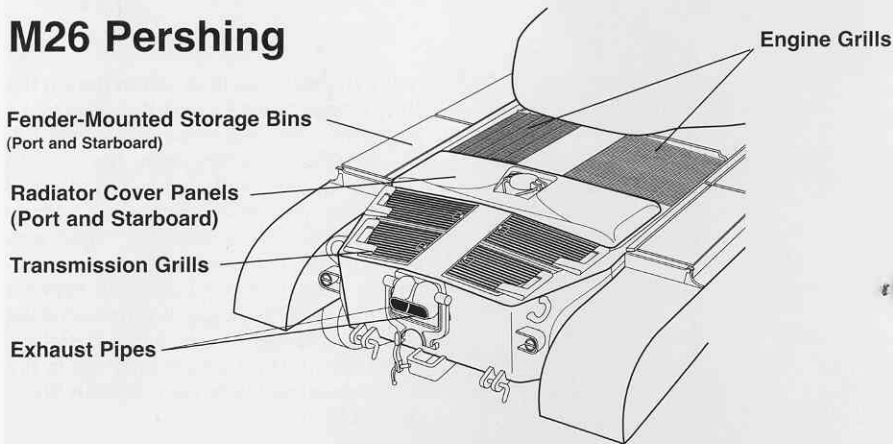
The T40 was later designated the M46 and can easily be distinguished from the M26 by the barrel bore evacuator, fender mounted mufflers and exhausts, and compensating idler wheel in front of the drive sprocket. The mufflers were eventually covered by metal shields to prevent burns to tank and maintenance crews. (Binder)



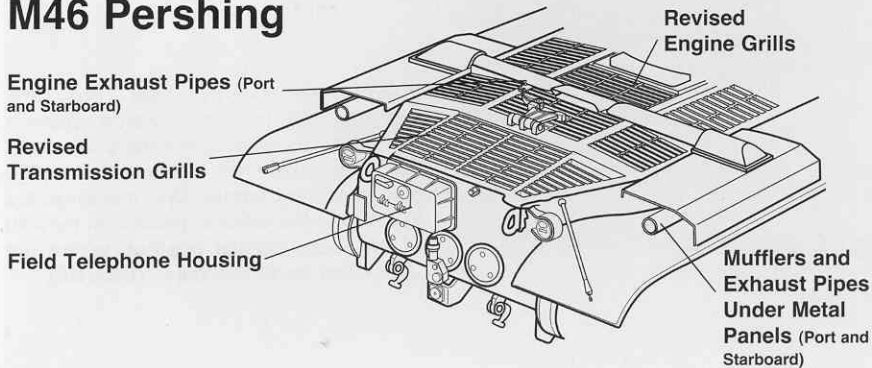
Three round bolt-on covers replaced the square transmission access hatches at the rear. The gun travel lock was relocated to the top of the engine deck. The rectangular box to port houses a field telephone, which allowed infantrymen to communicate with the tank crew when the tank was 'buttoned up.' The smaller box to starboard is the first aid storage box. (Binder)

Engine Deck Development

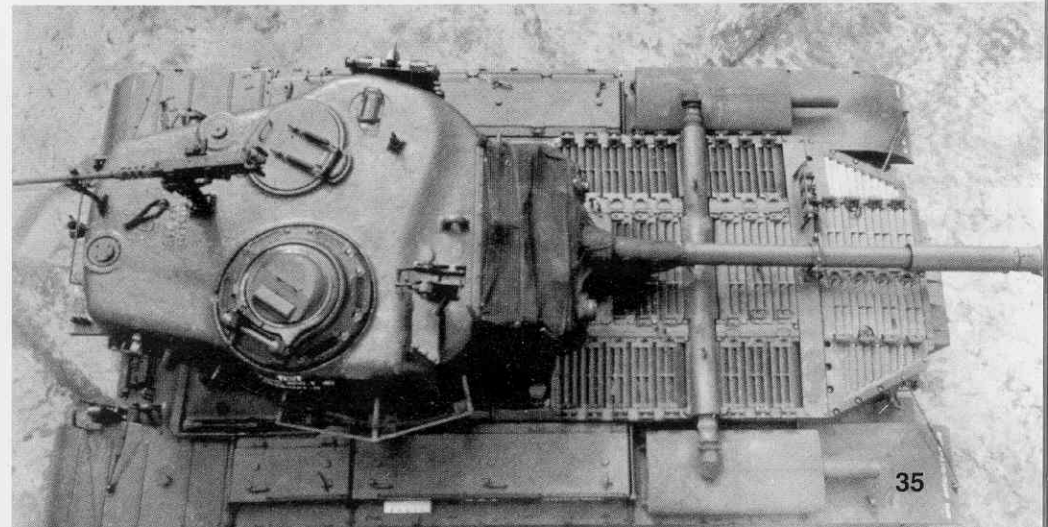
M26 Pershing



M46 Pershing



The M46 engine deck was significantly revised from that of the earlier M26. This revision was done to handle the new AV-1790-3 engine. Additional armored grills replaced the solid flat panel above the radiators, while outlets for the exhausts ran laterally to the mufflers on each fender. Metal panels covered the mufflers to reduce the risk of burns by crews. The turret was turned fully aft to reduce length for storage and transport. The 90mm main gun was secured to the engine deck by a travel lock fitted on the deck's center. This lock prevented the main gun from sudden vertical movements when the tank was in prolonged transit away from the combat zone. (PAM)



M46 Service

The M46 began to reach a few armored units during the latter part of 1949. When the Korean War broke out in June of 1950, the 6th Tank Battalion (BN) was fully equipped with the new tank. The 6th was one of four medium tank battalions to be rushed to Korea due to the critical need for medium tanks to deal with the North Korean T-34/85s. The unit was used mostly for infantry support during the early days of fighting around the Pusan Perimeter and, unlike the other tank battalions on the perimeter, did not run into enemy armor. The 6th Tank Battalion finally ran into eight T-34s during the UN push into North Korea in late October. All eight were knocked out along with an SU-76 self-propelled gun, with no losses to the 6th BN. Unfortunately, within a short time the entire UN army was forced to retreat by the sudden and surprise attack by massive Chinese forces, which had secretly crossed from Manchuria into the mountainous terrain of northern Korea. During the retreat, the 6th lost a number of M46s on railroad flatcars that were abandoned near the North Korean capital of Pyongyang. These were later destroyed by US air strikes to keep them from falling into the hands of the Chinese and North Koreans.

By early 1951, the UN forces had managed to regroup south of the South Korean capital of Seoul. A series of limited operations designed to inflict maximum casualties on the Chinese forces were carried out, including Operations KILLER and RIPPER. During RIPPER, many tank units painted their vehicles with tiger faces in order to frighten the supposedly superstitious Chinese troops. M46s of the 6th and newly arrived 64th Tank Battalions had some of the most colorful and elaborate schemes ever seen on tanks. Whether or not these faces frightened any Chinese troops is a matter of conjecture, but it had great positive effects on Allied tanker morale.

When the war finally settled into static trench warfare, more M46s arrived to make up loss-

es of both M26 and M46 tanks. The tanks were used mainly for indirect fire support or on the front lines for bunker busting in direct support. The M46 became the preferred tank of the two types because its more powerful engine and better transmission were better suited to the hilly terrain (the lighter M4 Sherman was still more suitable for movement up the hilly slopes). As the war became increasingly static, the M46 became secondary in importance to infantry and artillery. The M46s were sometimes used to help defend specific positions against enemy probing attacks. Since the Chinese preferred to attack at night, experiments were conducted with 18-inch (45.7 cm) searchlights mounted above the gun tube to help illuminate the enemy troops. Their use in this role proved valuable, although the searchlights were easily damaged by enemy counter fire. The M46 continued to soldier on in these various roles until the cessation of hostilities in July of 1953.

The M46 continued to serve in armored units for a number of years after Korea, but was gradually retired from service and assigned to Reserve and National Guard units. Only a small number of M46s were supplied to NATO countries. These were used solely for training in anticipation of these countries receiving the M47s. By the early 1960s, most M46s had been retired and scrapped or used as either training aids or as targets. Despite its relatively short career, the M46 and M46A1 served as an important link in the modern family of American tanks. The engine and transmission that it pioneered remained the automotive core of U.S. tank design until the advent of the M1 Abrams in the early 1980s. What started as a basic upgrade of the M26 series back in the late 1940s was to be part of the American tank design for over three decades – overall, not a bad return on the initial investment.



(Left) The M46 saw little action during the early stages of the Korean War. The tanks began to take on a more active role following China's entry into the war in October of 1950 and plans were made to carry out offensive operations. Many units painted their tanks in 'tiger' patterns to frighten the supposedly superstitious Chinese during Operation RIPPER in early 1951. These gaudily marked M46s from A Company, 6th Tank Battalion, 24th Infantry Division are lined up to fire on Chinese positions near the Han River. (USA/NA)

(Right) This M46 from the 73rd Tank Battalion, 7th Infantry Division wears a beautifully painted tiger head on its front hull. A tiger paw has been painted on the one remaining fender. Unit markings are just below the drivers' positions, instead of the more normal position where the upper and lower hull meet. (USA/NA)





The 64th Tank Battalion had a mixture of M4 Shermans and M26 and M46 Pershings during the spring offensive operations. Attached to the 3rd Infantry Division, many of its tiger heads were painted on a blue and white diagonally striped square, which was based on the division's shoulder patch – an extremely colorful combination. (USA/NA)



Tigers may be able to go anywhere, but some M46s are not so lucky. This 6th Battalion M46 pulls one of its fellow 'tigers' out of the mud during the spring thaw north of Chongpyong, Korea. The foreground M46 has one of the early type muffler covers, which did not extend all the way down the side of the muffler. (USA/NA)



Despite their ferocious appearance, these M46s from the 6th Tank Battalion were lost during a Chinese counterattack and the resulting retreat by the 24th Infantry during heavy fighting in the spring of 1951. The two M46s on the left appear to have been burnt out while the one on the right has appears to have thrown a track and suffered damage to the fenders. Tools are missing from the right tank's tool rack and the .30 caliber bow machine gun was removed from this vehicle. (USA/NA)



After the fighting stabilized along the 38th Parallel, M46s were often emplaced on hill positions to provide fire support or for 'bunker busting.' These Marines appear to be getting ready to fuel their M46. Fiberboard containers for the 90mm ammunition are stacked alongside the tank. The rounds were shipped in two-round wooden crates. (USMC/NA)



Elaborate bunkers were sometimes built around the tanks using sandbags, crates, and shell casings. This Marine M46 has just fired at an enemy bunker and the gun blast has raised a huge cloud of dust. This made it easy to spot the tank's position and sometime invited counter-battery fire from the North Korean lines. (USMC/NA)

The see-saw battles of 1950 and early 1951 gradually evolved into static lines, trenches, bunkers, and small probing attacks. The Chinese began to launch limited night attacks along the line to reduce losses to heavy US defensive fire. Some M46s were fitted with 18-inch (45.7 cm) searchlights to illuminate the battlefield. Although these lights proved helpful, they often drew heavy return fire and were easily damaged when they were switched on. (USMC/NA)





(Above Left) These two M46s were given a coat of white paint to camouflage them against the winter snows of early 1953. Unfortunately, there does not appear to be much snow around them as they move down a street in the gutted city of Chorwon. M26s and M46s were normally painted in the standard US Army Olive Drab (FS34087). (USA/NA)

(Above) The Chinese captured a large number of American 'bazooka' rocket launchers and used them against dug-in tanks along the hill positions and outpost line. Chain link fencing was added to the tanks to prematurely detonate the rocket rounds before they impacted the main armor. This dozer equipped Marine M46's turret is being fitted with the fencing at Hapor'ri, Korea in the spring of 1953. (USMC/NA)



(Left) This Marine tank crew has welded barbed-wire poles around their M46 turret to form a basket to catch shell casings. This helped reduce cleanup after a heavy fire mission. These Marines look cautiously toward enemy positions from 'Boulder City' shortly after the cease-fire agreement was signed on 27 July 1953. (USMC/NA)

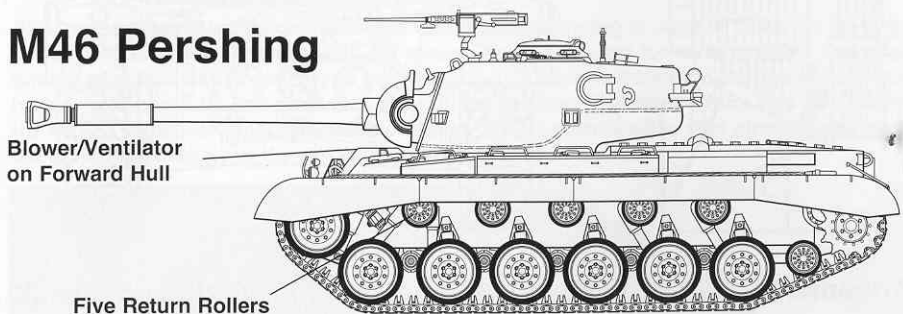
M47 Patton

The political and military situations facing the US around the world worsened as the Cold War heated up in 1948. In response to this the Army began developing plans for a new series of light, medium, and heavy tanks that shared common components. The resulting new medium tank was designated the **T42** and was similar to the T37 light tank under concurrent development. While the T37 was armed with a 76MM gun, the T42 was fitted with the 90MM T119 gun. This gun was designed for higher tube pressures, which increased its overall performance. It also featured a sophisticated stereoscopic rangefinder. The new turret was much more angular and offered better ballistic protection than the M26 and M46 turrets. The T42 was powered by the 500 HP Continental AOS-895-3 gasoline engine and used the General Motors CD-500-2 cross-drive transmission, both of which were improved versions of the same basic units used on the T37. This engine and transmission had been installed on one of the earlier T40s to test it under weight conditions similar to that of the T42. Tests showed the engine to be underpowered. This problem was to doom the project, but the Army still ordered six pilot T42s for test purposes. The initial pilot was delivered to Aberdeen Proving Ground, Maryland in December of 1950, just as US forces were suffering their second major setback of the six-month old Korean War.

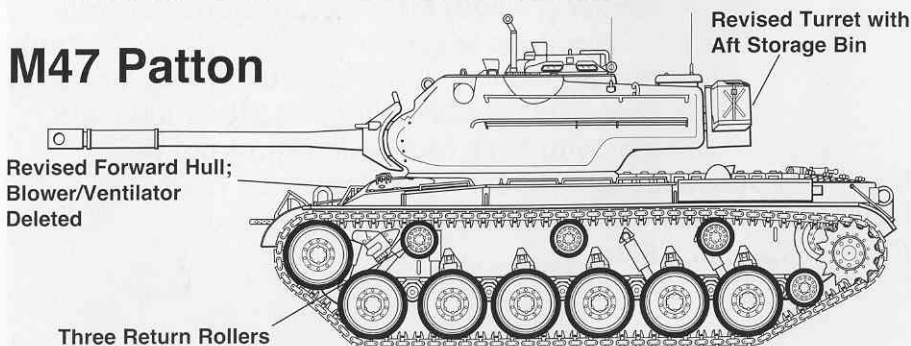
The Korean War had come as a shock to American political and military leaders. There was some thought that this was the opening round of World War Three and that the Soviet Union would initiate hostilities in Europe. There was a pressing need for a new battle tank since both the M26 and M46 were viewed as less than adequate to meet a possible threat from the Soviet Army and its European allies. Due to the T42 being underpowered, the Army was not willing to place it into production. The new turret with its more powerful 90MM gun and improved fire control system, however, were considered very modern and advanced in design. In July of 1950 it was suggested that the new turret be mated to the proven M46 chassis to produce an interim tank until a totally new design could be developed. This suggestion was approved in September. The Army bypassed the 'T' designation and simply designated the new tank the M47 in November. It was felt that the mating of the new turret to a proven chassis would be relatively straightforward and series production had already been ordered.

A pilot model was built in order to obtain test data before the initial M47s were delivered. A standard M46 was fitted with a T42 turret with the designation M46E1 at the Detroit Tank

M46 Pershing



M47 Patton



Arsenal and delivered to Aberdeen Proving Ground in March of 1951. In the meantime, the characteristics of the M47 were laid down. The basic M46 hull would be modified to increase the slope of the front hull to 60° and the blower between the two drivers would be eliminated. The blower was deemed unnecessary since the T42 turret had a blower on the rear roof. Deleting the blower on the hull front also helped to improve the hull's armor contours. The number two and four return rollers were also eliminated. Production tanks would also be fitted with the improved 810 HP AV-1790-5B engine and CD-850-4 transmission. The turret diameter was increased from 69 inches (175.3 CM) to 73 inches (185.4 CM) and an improved commander's cupola was installed. The M47 carried 71 rounds of ammunition, with 11 in the turret ready rack, six on either side of the hull walls, and the remaining 48 in the turret floor basket. M47 production began at the Detroit Tank Arsenal in June of 1951 and then at the American Locomotive Company. Initially, the Detroit Arsenal was under the control of the Ordnance Department, but the plant was turned over to the Chrysler Corporation in the summer of 1952. Aberdeen Proving Ground received their first M47 for testing in July. An additional seven M47s were shipped to Aberdeen for testing during the following year. Fort Knox also received a number of M47s for evaluation and testing.

The tests uncovered few problems with the proven chassis of the M46. The main problems dealt with the turret and the new fire control system. The new stereoscopic rangefinder was found to be hard to use without a great deal of training. Additionally, the system was supposed to have incorporated an IBM stabilizer, but this was dropped. This caused a loss in target acquisition capabilities. Changes were made in the power traverse and elevation mechanism to eliminate oscillation or lag time. Some realignment of turret components was also made to improve accessibility. Other minor modifications were ordered and these were retrofitted to tanks already built and incorporated into the production line.

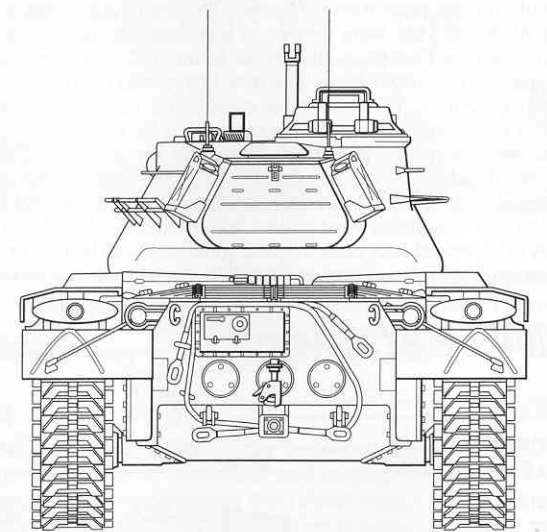
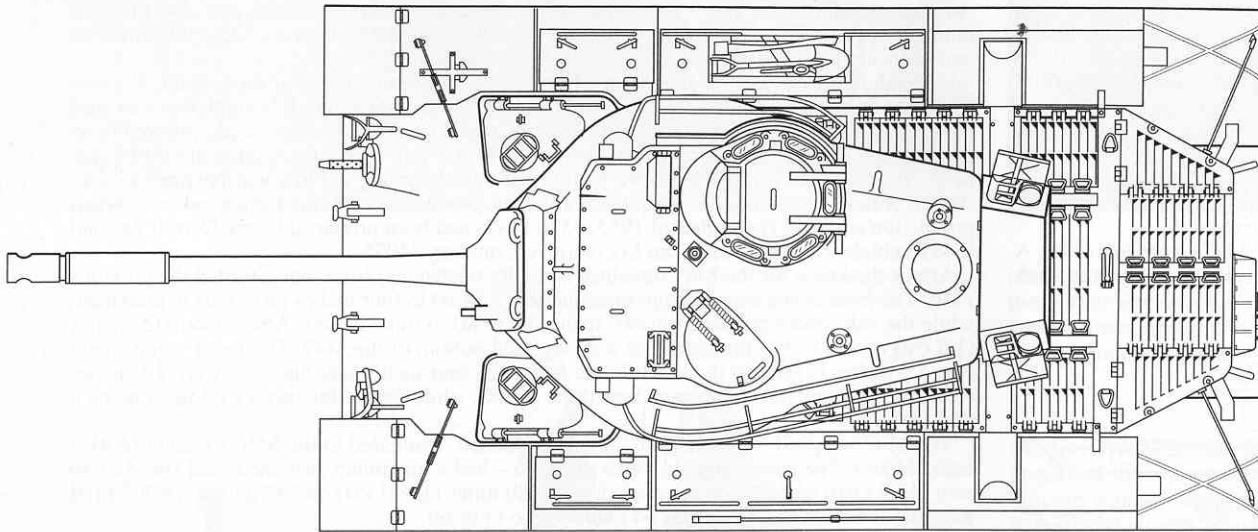
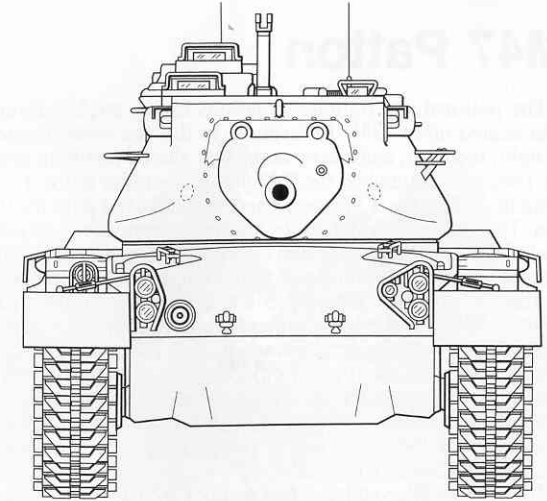
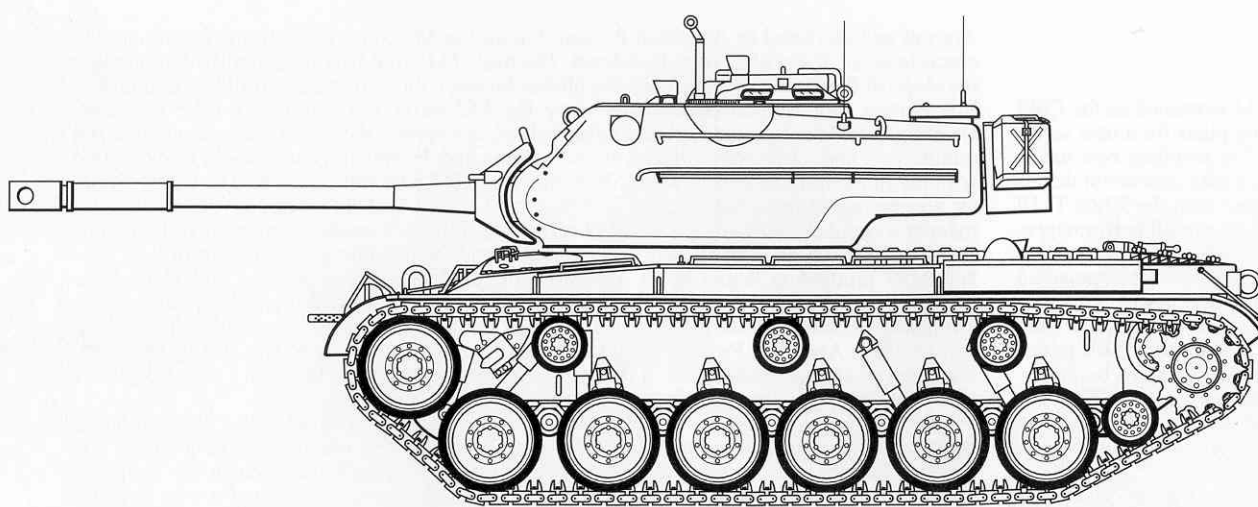
In April of 1952 it was recommended that the M47 be standardized for production; this was approved in May. At that time the M47 was named the General Patton II, though this was later changed to Patton 47. Neither of these names caught on – the M47 was simply referred to as the Patton. Over the course of production, the T119E1 gun was redesignated the 90MM gun M36. This gun had originally used a cylindrical muzzle brake, but this was changed to a T-shaped brake on later models. Despite the changes, production continued at a good pace; when production ended in November of 1953, 8576 M47s had been produced by the Detroit Arsenal (5481 vehicles) and the American Locomotive Company (3095).

Armor thickness for the M47 remained virtually unchanged from that afforded the previous M46. The front armor ranged from three inches (7.6 CM) to four inches (10.2 CM) in thickness, while the side armor ranged from two inches (5.1 CM) to three inches. Armor from 0.5 inches (1.3 CM) to two inches protected the rear, top, and bottom of the M47. The turret's gun shield was 4.5 inches (11.4 CM) thick, while the front was four inches and the sides were 2.5 inches (6.4 CM). The rear turret thickness was three inches, while that of the turret roof was one inch (2.5 CM).

The M47 weighed 50.9 tons (46.2 MT) fully loaded, compared to the M46's weight of 48.5 tons (44 MT). The newer vehicle – like the M46 – had a maximum sustained road speed of 30 MPH (48.3 KMH) and a range of approximately 80 miles (128.7 KM) on 232 gallons (878.2 L) of gasoline. The M47's engine had 64 quarts (60.6 L) of oil.

The M47 saw only limited service with US forces before being replaced with the M48 Patton. Many M47s were supplied to American allies under the Military Assistance Program (MAP). Some thought was given to upgrading the M47 fleet with a heavier gun and a more efficient engine. The French successfully test fitted a 105MM Mk F1 gun that fired a non-rotating shaped charge round in an M47 turret in 1967. This was the same weapon fitted to their AMX-30 main battle tank. The M47 could also be fitted with the British 105MM L7 gun, or its American counterpart, the M68, with only minimal modifications. Unfortunately, the problem of the powerplant was not as easily fixed, but two possibilities did exist. The original gasoline engine had a high fuel consumption rate, which resulted in poor range along with a potential fire hazard. A German diesel engine, the 750 HP MB 837 Ea-500, could be fitted with little difficulty. This engine cut fuel consumption in half. Only minor modifications were needed to mate this engine to the CD-850 transmission. Successful tests of this modification were conducted in both Italy and Pakistan.

There was also interest in developing a program to upgrade the existing M47 fleet in the United States. The Tank Automotive Command submitted a study for such a program based



M47 Patton Specifications

Length:.....27 feet 11 inches (8.5 m)
 Width:.....11 feet 6.3 inches (3.5 m)
 Height:.....10 feet 11 inches (3.3 m)
 Combat Weight:.....101,800 pounds (46,176.5 kg)
 Powerplant:.....One 810 HP Continental AV-1790-5B air-cooled,
 12-cylinder, gasoline engine.

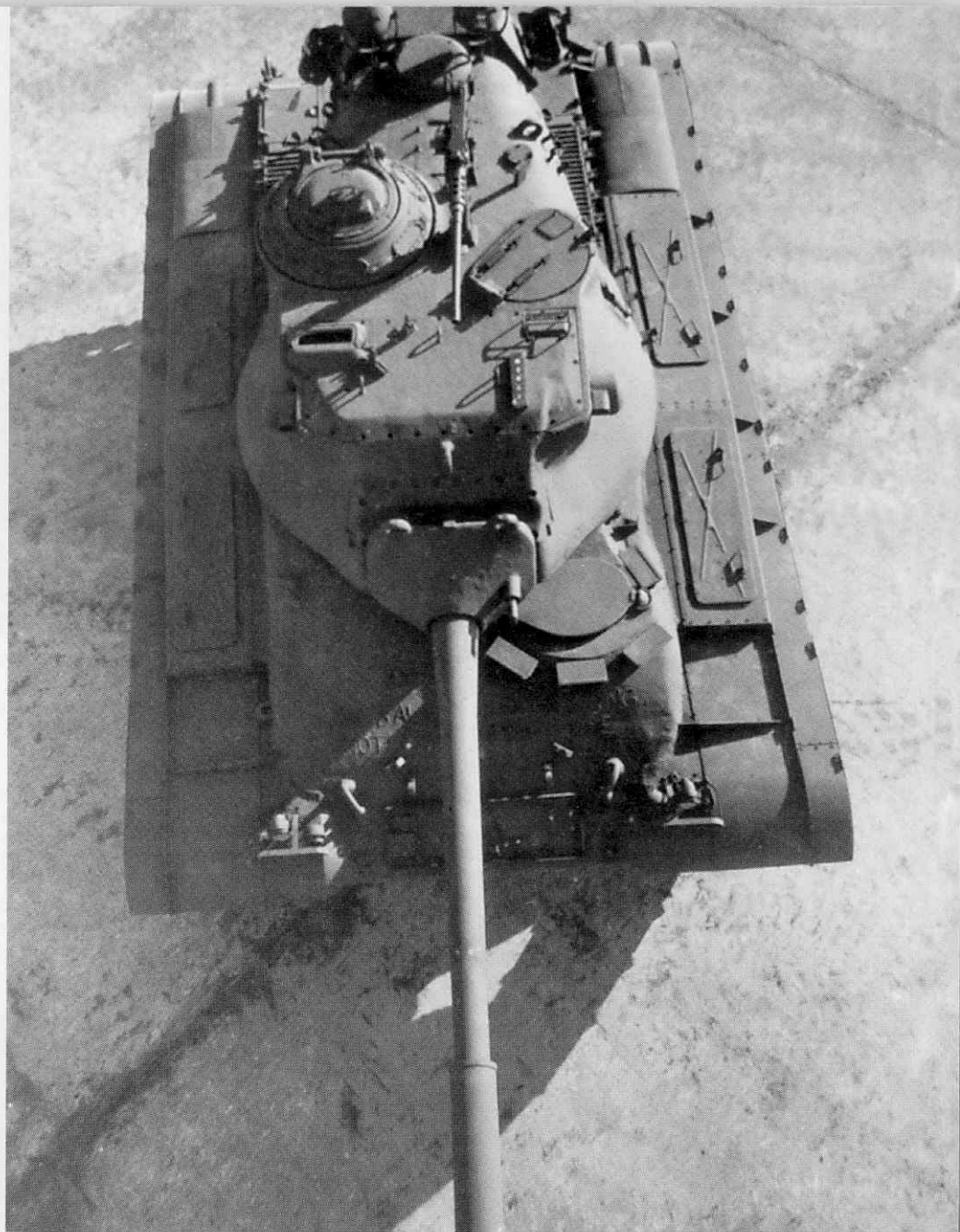
Armament:.....One 90MM M36 gun with 71 rounds and one .30
 caliber (7.62MM) M1919A4 machine gun with
 5575 rounds in turret; one .50 caliber (12.7MM)
 M2HB machine gun with 1700 rounds on turret
 roof; and one .30 caliber M1919A4 machine
 gun with 5575 rounds in right front hull.
 Maximum Speed:..30 MPH (48.3 kmh) sustained on road
 Maximum Range:..Approximately 80 miles (128.7 km)
 Crew:.....Five



The T42 was based on the T37 light tank and represented an attempt to field a new medium tank with a more powerful 90mm gun; however, the new tank was underpowered. The first pilot T42 was originally fitted with a single baffle muzzle brake, but this was later replaced with a cylindrical blast deflector. (PAM)

on components of the M60A1, the current American battle tank in 1968. This led to work on a full-scale design by Bowen-McLaughlin-York (BMY) of York, Pennsylvania. Designated the M47-M, the original AV-1790 gasoline engine was replaced with the new 750 HP AVDS-1790-2A diesel engine used in the M60 series. The rear deck and hull were also modified to the same configuration used by the M60. The modification required the relocation of the rear set of road wheels approximately four inches (10.2 cm) aft to provide clearance between the torsion bars and oil pan. The transmission was modified, bringing it up to the current CD-850-6A standards. The small track tension idler wheels between the last road wheels and the drive sprockets were removed, while friction snubbers replaced the original hydraulic shock absorbers. Internally, the assistant driver's position was eliminated and the space allocated to the storage for 22 rounds of additional ammunition. The bow machine gun was also eliminat-

After some discussion following the Korean War's beginning in June of 1950, the US Army decided to create an interim tank by mating the T42's new turret to an M46 hull. This course of action was necessary to counter growing Soviet strength in Europe until a totally new tank could be designed and placed into service. The interim tank was designated the M46E1; however, only one vehicle was built. Since production was already approved, the actual tank received the designation M47. (PAM)



Although the M42 was underpowered, the elongated and angular turret offered better ballistic protection than either the M26 or M46 turret. Additionally, the new turret featured a more sophisticated and accurate fire control system. The oval bulges on either side of the turret behind the gun are for the stereoscopic range finder. (PAM)



This early M47 was used for evaluation at Fort Knox, Kentucky. A .50 caliber (12.7MM) machine gun was mounted coaxially with the main gun. The range finder has not been fitted and the opening has been plated over. The angular shape of the new turret was markedly different from the squat, square profile of the M26/M46 turret. Additionally, the number two and four return rollers were deleted (PAM)

While the basic M46 hull was used, the upper glacis plate angle was increased from 46° to 60° and the blower was eliminated. This gave better ballistic protection and improved the armored contours of the hull. The slope of the turret sides is evident when it is viewed from head-on. (PAM)



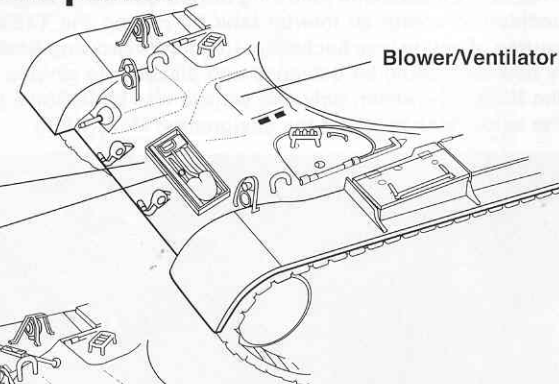
Unlike the flat M26/M46 turret front, the M47 had a pronounced arrowhead-like shape that gave exceptionally good ballistic protection. The smaller mantlet had the same armor thickness, but its 60° angular contour offered far better protection than the M26/M46 mantlet, which had 0°. The brackets are for a searchlight, while the round fittings on the turret are gun cover mounting points. (PAM)

Front Hull Development

M46 Pershing

46° Slope to Front Armor

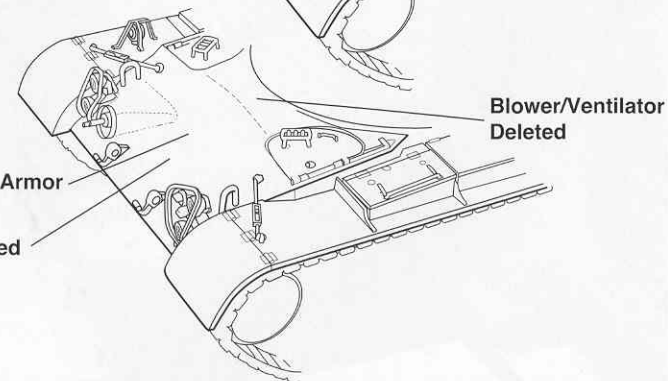
Tool Box on Front Armor



M47 Patton

60° Slope to Front Armor

Tool Box Deleted



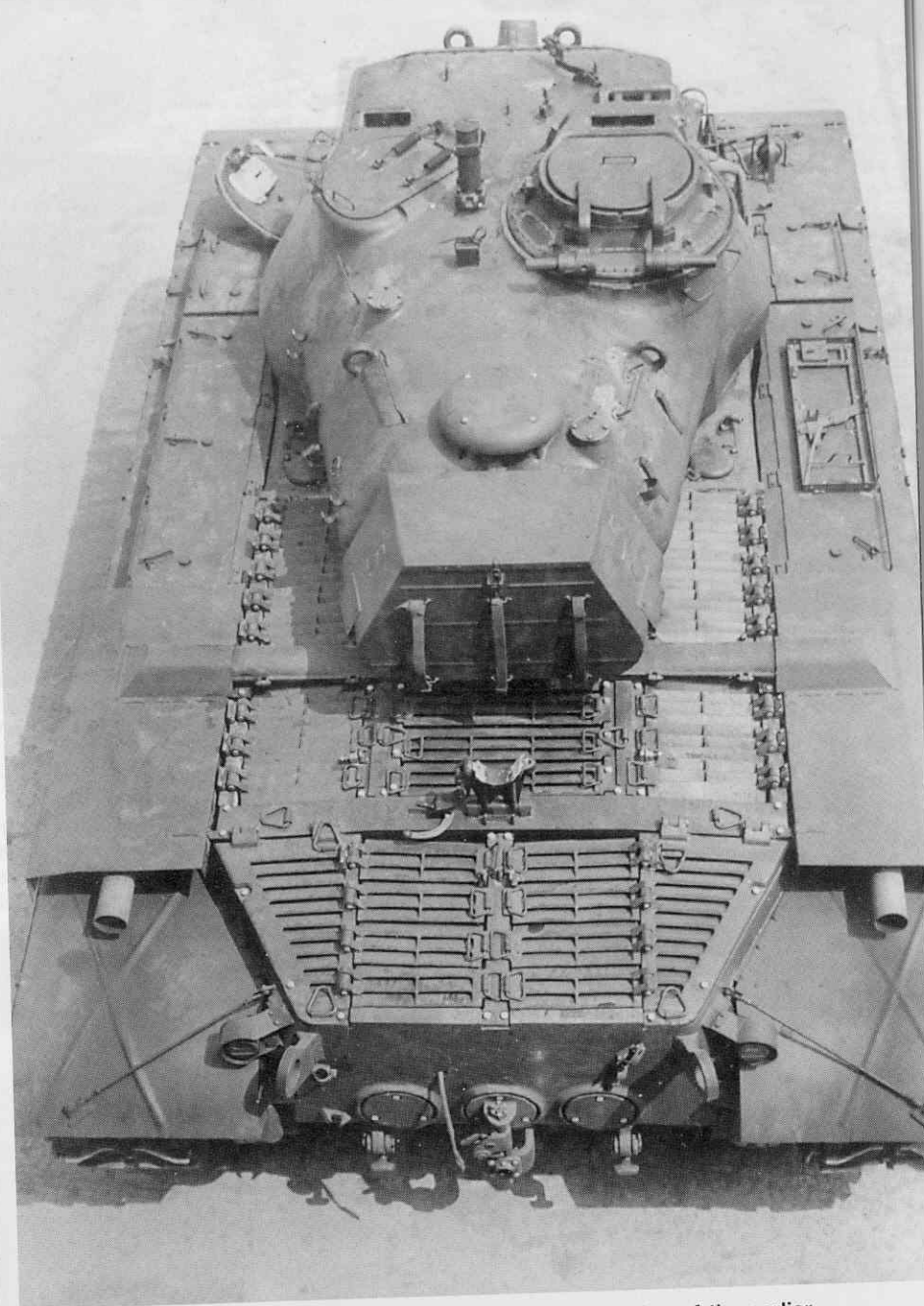


The roughly cast turret was equipped with both a loader's hatch and commander's cupola. The M47 commander's cupola was an improved version of the type used on the M46. The barrel travel lock for the commander's .50 caliber machine gun is mounted behind the loader's hatch. This location was somewhat further forward than on the M46. The ventilator/blower housing is to starboard in front of the storage box. (Author)

ed and a plate welded over the opening. A new Cadillac Gage hydraulic gun control system replaced the original system, improving target acquisition and bringing it up to current American tank standards.

Starting in February of 1972, BMY converted 400 M47s to M47Ms for Iran, with the work being completed in March of 1974. The company also converted 147 additional M47s to M47Ms in Iran for Pakistan from March of 1976 to August of 1977. Chrysler Espana modernized additional tanks for the Spanish Army under the designation **M47E**. In Israel, both Urdan and Israel Military Industries developed a two-phase program for modernizing the M47. The first phase involved replacing the original engine with the AVDS-1790-2C diesel powerplant. The second phase saw the 90mm gun replaced by the 105mm M68 gun and a new fire control system. This vehicle was designated the **M47RKM**. The Italian firm of OTO Melara also developed a similar program. These modification packages allowed the M47 to be upgraded at a fraction of the cost of a new main battle tank; however, it does not appear that these ever went into large scale distribution.

The sheet metal turret stowage box was attached to the turret rear using ten bolts. This box held spare tools and other equipment which could not be stored inside the vehicle. (Author)



The M47's engine deck and hull rear remained identical to that of the earlier M46. A new rear turret ventilator replaced the hull-mounted blower mounted between drivers. The turret contours were extremely well rounded to help deflect incoming rounds. A sheet metal stowage box was mounted on the turret bustle. (PAM)



Sheet metal shields covered the M47 mufflers to prevent accidental burns from the hot surface – a carryover design element from the previous M46. A metal cover was also placed over the exhaust piping coming out of the engine. The jerry can holder at the lower left was attached to the side of the storage box. (Author)

This beautifully restored M47 at the Patton Armor Museum had the engine deck replaced by clear plastic. This allowed visitors to see the complete engine, radiators, cooling fans, and transmission. The CD-850 transmission had two forward gears and one reverse gear. (Ward)



The M47 was equipped with the AV-1790-5B engine and CD-850-4 transmission. These soldiers are removing the entire power pack from the engine compartment during a training exercise at Fort Hood, Texas. The engine is to the left while the transmission is to the right. The square object in between is the oil cooler, while the round object is the cooling fan. (PAM)

Late in the M47's life, a number of attempts were made to upgrade the M47 with a diesel engine for better fuel economy. The M47-M was a modified Patton with the 750 HP diesel fueled AVDS-1790-2A engine then in use on the newer M60. The rear engine compartment was reworked and was basically identical to the M60. (PAM)



M47 Service

The M47 saw little service with US forces; the new M48 Patton began to be manufactured shortly after it went into service. The first M47s began reaching armored units in 1952, with the main emphasis being those in Europe where the USSR was felt to be the greatest threat. By 1953, the new M48 started to arrive and the M47 was declared 'limited standard' by 1955. The M47 was quickly withdrawn from the US inventory and replaced with the M48. The M47 never saw combat with American forces and was the only member of the Pershing/Patton family to achieve this distinction.

If the M47 saw only limited service with US forces, its career with other countries was far more extensive. Under the Military Assistance Program (MAP) most of the over 8000 M47s manufactured were sent to American allies. The majority of these tanks were exported to North Atlantic Treaty Organization (NATO) countries. M47s formed the backbone of these countries' armored units until replaced by newer tanks in the 1960s and 1970s. The M47's first action was with the French when M47s from the 8e *Régiment de Dragons* took part in the joint French-British invasion of the Suez Canal in 1956. The French M47s did not engage Egyptian armored units and saw only limited action in support of French paratroopers during the operation. The only other NATO ally to use the M47 in action was Turkey during its 1974 invasion of Cyprus. The Turkish M47s saw only limited action against Cypriot T-34/85s and ground forces and quickly overwhelmed their opponents by sheer weight of numbers.

The most serious employment of the M47 in combat, has occurred in the perennial hot spots of the Middle East and the volatile border between India and Pakistan. In 1965, India and Pakistan went to war over Jammu and Kashmir. The M47s, along with the M48, formed the bulk of the armored strength of Pakistan's two armored divisions, the 1st and 6th. During the fighting, the 1st Armored Division was deployed to Lahore to counter moves by Indian forces in the area. In the Assal Uttar area, the Pakistani tanks – without infantry support – were dec-

The M47, essentially an interim design, saw only limited service with US forces before being replaced by the M48. These M47s from the 141st Tank Battalion on a Landing Craft Tank (LCT) take part in a RHINE ROVER crossing exercise. They are part of the Blackland Forces during POWER PLAY exercises carried out in October of 1953. This Wyoming National Guard unit was ordered into Federal service in the fall of 1950 and not released back into state control until 1955. (PAM)



imated in close in fighting in dense cane fields. The Indians celebrated their victory by naming this area the '*Patton Nagar*' ('Patton Graveyard'), due to the large numbers of M47s and M48s destroyed or captured. The other major battle occurred in the Sialkot area, where the Pakistani 25th Cavalry, fighting a delaying action, severely mauled Centurion units of the Indian 1st Armored Division. Armored forces were not used extensively by either side during the renewed fighting in 1971, when India conquered East Pakistan (now Bangladesh).

In the Middle East, Jordan had received nearly 100 M47s from the US to equip its armored units, along with nearly 300 M48s. During the 1967 Six Day War with Israel, the M47s were employed on the West Bank of Jordan in the northern area around Jenin. The Israeli armored units were equipped mainly with Shermans and French-built AMX-13s and suffered numerous losses at the hands of the well-trained Jordanian tankers. The Israelis tankers used their air support effectively to overcome the tenacious Jordanian defenses and forced their opponents out in the open where air strikes and superior tactics eventually decimated the Jordanian tank force. By the end of the campaign, few if any of the M47s were still in service. Israeli tankers rated the Jordanians as the best among their opponents.

The M47 has also seen service in a number of other locations on a limited scale. Iran received approximately 400 M47s during the late 1950s. A modernization plant was set up during the early 1970s in order to upgrade their M47s, along with those of Pakistan and Jordan. The modified M47s were fitted with the AVDS-1790-2A diesel engine and CD-850-6A transmission. All of the Iranian tanks were modified along with approximately 150 Pakistani vehicles before the overthrow of the Shah in early 1979. Due to its backing of Iraq in the 1980-1988 war with Iran, the Jordanian M47s were not modified. The Iranian M47s saw action against Iraqi forces and suffered heavy losses. Iraq reportedly turned captured Iranian M47s over to Jordan as a reward for its support during the conflict.

Spain deployed a number of Pattons to the Spanish Sahara in the mid-1970s when trouble brewed up in the region, but little is known of their activities. Ethiopia moved two companies of M47s into the Ogaden Desert in 1977 to counter Eritrean guerrilla forces, but lost the majority of them in ambushes to the guerrillas. In an ironic twist of fate, American forces encountered M47s when they deployed to Somalia. Somalia had received 25 of these tanks from Saudi

This M47 from the 510th Tank Battalion takes part in field exercises in Germany in the mid-1950s. This unit was activated at Camp Polk, Louisiana in November of 1950. The spade marking on the turret side is an unusual sight on an M47. Patton markings were rather plain, aside from an occasional name. (PAM)





(Upper Left) Most of the M47s produced were supplied to friendly foreign governments under the Military Assistance Program (MAP). The Patton was the first modern post-war tank for many NATO countries. This French M47 takes part in a training exercise. The French were the first to take the Patton into combat when they used them in the abortive joint French/British attack on the Suez Canal in 1956. (PAM)

(Above) Major use of the M47 in combat came during the 1965 Indo-Pakistani War. Pakistani M47s were used in the heavy fighting around Assar Uttar where they were poorly deployed and suffered heavy losses. So many M47s were lost that the area became known to the Indian Army as the 'Patton Nagar' ('Patton Graveyard'). These three Pakistani M47s were knocked out and captured during the fighting in this area. (PAM)

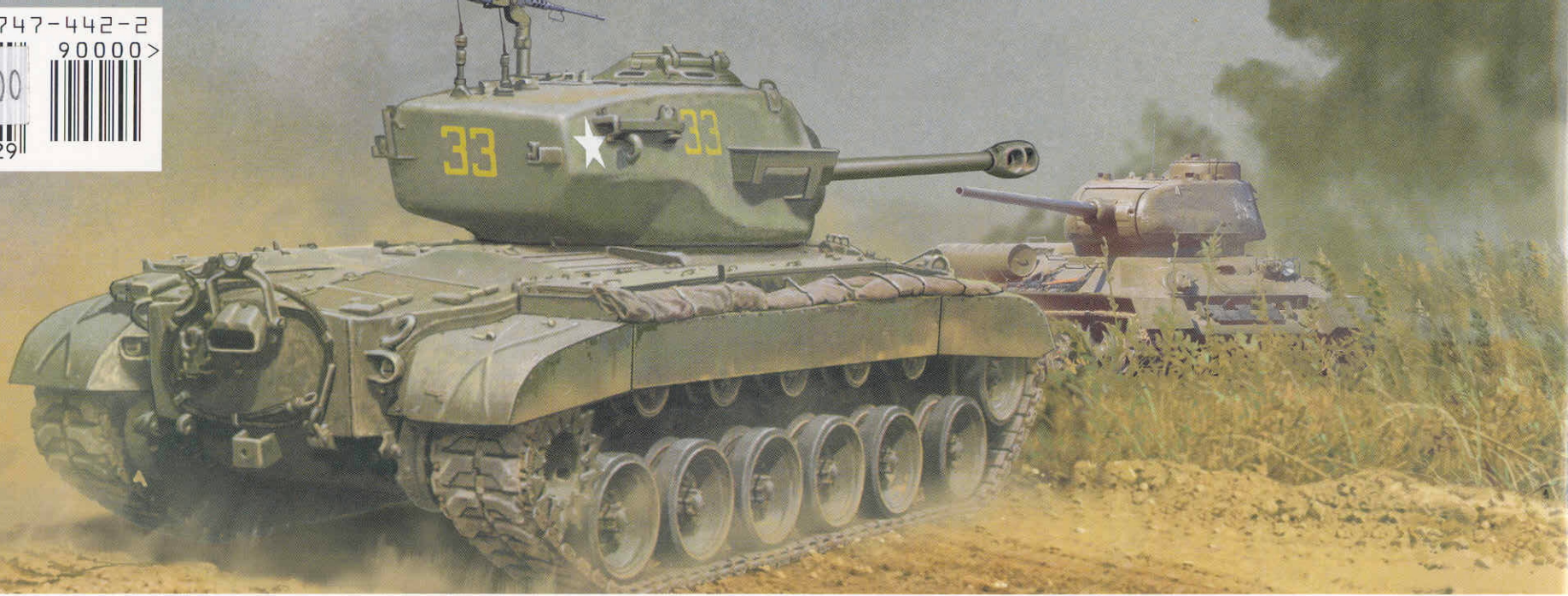
Arabia. A two-page photo spread in the 21 June 1993 issue of Newsweek Magazine showed at least three knocked out M47s with a Bell Jet Ranger helicopter flying overhead in the background. These were believed to have been destroyed by US AC-130 gunships and AH-1W Super Cobra helicopters. These weapons were not on the drawing boards when the M47 first went into production.

While the M47 remains in service around the world, its numbers are dwindling since it has been superseded by more modern battle tanks and a whole host of anti-

(Left) Jordan received nearly 100 M47s along with newer M48s to equip its armored units. These were used in the 1967 Six-Day War with Israel and proved tough opponents. They were able to inflict heavy losses on the Israeli tankers until being decimated by air strikes and out maneuvered by Israeli armor. This sand and olive drab M47 takes part in a parade in the Jordanian capital of Amman before the war. (PAM)

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(Above) A US Marine Corps M26 Pershing (Yellow 33) engages a North Korean T-34/85 in the Naktong Bulge of the Pusan Perimeter in August of 1950. This tank was assigned to A Company, 1st Tank Battalion, 1st Marine Brigade (Provisional).

(Below) A Royal Jordanian Army M47 Patton advances towards Jenin on the West Bank of the Jordan River in June of 1967. This tank was assigned to C Company of the 40th Armored Brigade during the Six-Day War with Israel.

