ARMOR AT WAR SERIES

7011

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THE T-28, T-34, T-34-85 AND T-44 MEDIUM TANKS

Steven J. Zaloga, Jim Kinnear
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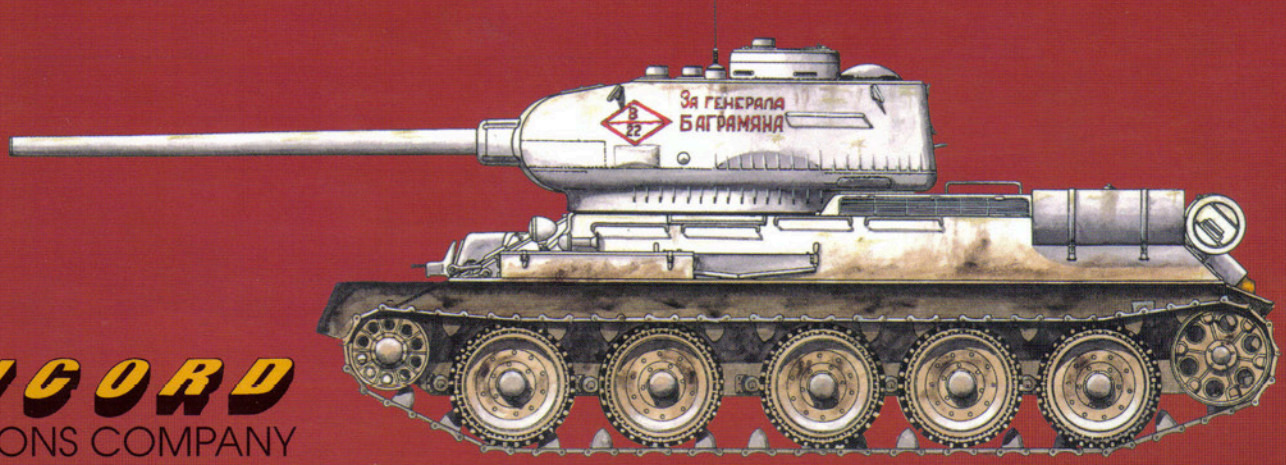

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Soviet Medium Tanks in Combat

The subject of this book is Soviet medium tanks in combat in World War 2 covering the T-28, T-34, T-34-85, and T-44. This will be followed by a companion book on Soviet heavy tanks of World War 2 including the T-35, KV and IS-2. This book has attempted to draw together a diverse selection of photographs to illustrate the evolution of the Soviet tank force during the Second World War, or as it is known in Russia, the Great Patriotic War. The core of this book consists of over 100 new photographs, never before published, located in archives in Russia and central Europe. Photo research in Russia was conducted by Andrey Aksenov and Aleksandr Koshchavtsev, in Poland by Janusz Magnuski, and in Czechoslovakia by Ivan Bajtos and Jiri Hornat.

Operation Babarossa

At the outbreak of the Great Patriotic War in June 1941, the Red Army possessed the world's largest tank force. In fact, the Red Army tank forces was larger than the rest of the world tank forces combined, numbering some 23,106 tanks. By comparison, the German tank force in June 1941 had 5,262 tanks of which 3,671 were committed to the invasion of the USSR on 22 June 1941. The bulk of the Soviet tank force was made up of two older types: the T-26 infantry tank and the BT fast cavalry tank. There were small numbers of older medium and heavy tanks including the archaic T-28 medium tank (600) and T-35 heavy tank (40). The most technically significant element of the 1941 tank force were two new designs, the T-34 medium tank and the KV heavy tank.

The T-34 was intended to replace the BT cavalry tank, and was based on Soviet experiments in tank warfare in Spain in 1937-38, and in fighting against the Japanese in 1938-39. These tank battles, although small scale by later World War 2 fighting, had important technological lessons for the Soviet tank designers. It made clear that the existing levels of armor protection, little changed since World War I, were completely inadequate when faced with contemporary tank and anti-tank guns. This prompted the Soviets to adopt "shell proof armor" on the T-34 and KV, so that when production started in 1940, they were unquestionably the best armored tanks in the world. Secondly, the fighting convinced the Soviets of the soundness of equipping their tanks with a good dual-purpose gun of superior performance to the opposition. The Soviets considered it essential that their medium and heavy tanks be capable of defeating opposing tanks. But the Soviets also recognized that tank-vs.-tank combat is not that common, and that a tank had to be armed with a gun firing a useful high explosive round to deal with anti-tank guns, enemy infantry and other more typical adversaries. This attitude stands in contrast to several armies (notably the British) which often built designs stressing one firepower capability to the exclusion of the other. Anticipating foreign improvements, the new Soviet tanks leap-frogged forward in armament, going from a 45mm gun to a 76mm gun. Once again, this made both tanks the better armed than any contemporary tanks.

Finally, the wartime experiences convinced the Soviets of the vulnerability of gasoline engines on tanks, leading them to adopt a new diesel engine. This engine, the V-2, has been the standard powerplant of Soviet medium tanks since then, having been used (in improved form) through the 1990s on the T-72 and currently on the T-90 tank.

Besides the T-34 and KV, the Red Army intended to replace the T-26 infantry tank with the new T-50. It had severe engineering and cost problems, and so was not available when war broke out. This twist of fate had enormous implications for Soviet tank programs in World War 2. The T-34 cavalry tank was pressed into both cavalry and infantry tank roles becoming the standard medium tank by default, much to the benefit of the Soviet armored force.

The new T-34 and KV tanks were available in substantial numbers in June 1941 with some 508 KV and 967 T-34 in service. The best German tanks were the PzKpfw III, armed with a 37mm gun, and the PzKpfw IV, armed with a short 75mm gun with poor anti-armor performance. There were 1,449 PzKpfw III and 517 PzKpfw IV available in June 1941. They were inferior to the new Soviet tanks in armor, firepower and mobility. The revolutionary configuration of the T-34 tank established it as the technological pace-setter of World War II tank design. The locus of tank technology shifted from its traditional centers in England and France, eastward toward Germany and the Soviet Union. Germany soon responded to the challenge of matching the T-34 and this technological arms race between Germany and the Soviet Union set the pace for worldwide tank development throughout World War 2.

In spite of substantial numerical superiority, and important qualitative superiority, the Soviet tank force was decisively defeated by the smaller and more modestly equipped German tank force in the summer of 1941. The roots of this defeat are connected mainly in the Red Army's lack of preparedness for war, exacerbated by the corrosive influences of the purges of the officer ranks in the late 1930s. From a technological standpoint, the defeat highlighted shortcomings in Soviet tank design philosophy. The T-34 tank design stressed the "Big 3": armor, firepower and mobility, to the exclusion of other key tank-fighting features. Crew layout was poor; the turret crew was only two which meant that the commander could not execute his command functions and had to double as gunner. The commander was not provided with adequate vision devices, and the hatch design made it impossible for the tank commander to ride with his head outside the tank as was the German practice to gain situational awareness. Soviet tank commanders, already hampered by inadequate training, were overwhelmed with the simple mechanics of operating the tank. They were unable to exploit terrain or determine the location and status of friend and foe around them.

This meant that Soviet tank crews were hindered in carrying out cooperative battlefield tactics, making them vulnerable to the better coordinated German tank units. The Soviets did not fully appreciate the revolutionary implications of radio technology on the command and control of tank units and few tanks had radios. This was in part due to a Soviet mistrust of radio communications stemming from the disastrous results of poor Russian radio security in the 1905 war with Japan and the 1914 battles with Germany. These early failures discouraged proper tactical radio doctrine in the army in the 1930s, which was further exacerbated by the backwardness of the Russian electronics industry. The radio shortcomings had a synergistic effect with the poor command and control features of the tank, leading to abysmal tank tactics. Soviet tank units were very vulnerable to the more experienced German tank and anti-tank units. Total Soviet tank losses from June to December 1941 were 20,500; German losses from 22 June 1941 through the end of February 1942 were only 3,402, a 6:1 exchange ratio. While the causes of the high Soviet losses were more clearly attributable to strategic and tactical failures, technical design flaws aggravated these problems.

Battle for the Factories

In the summer of 1941, Soviet leaders faced the critical decision of whether to leave the tank factories in place and risk losing them to the advancing German forces, or halt tank production in spite of the heavy battlefield losses and move them to the safety of the Urals. Stalin gambled and ordered the factories moved, sacrificing short term production. It was a bold, and ultimately successful decision. However, it had dramatic effects on tank design, since it forced the Soviets to freeze any further qualitative improvements for more than 18 months.

The main Soviet design bureau for the T-34 tank was located in Kharkov, Ukraine as part of the Kharkov Locomotive Plant (KhPZ Zavod No. 183). At the time, the locomotive plant was the only manufacturer of the T-34, though efforts were already underway before the war to establish a second plant at Stalingrad (now Volgograd) at the site of the Stalingrad Tractor Plant. The T-34 design bureau, headed by Aleksandr Morozov, was ordered to evacuate Kharkov along with the staff and equipment of the locomotive plant. It was reestablished in Nizhni Tagil at the site of the Urals Railcar Plant (Uralvagonzavod No. 183). This plant has since become the largest of all Soviet (and Russian) tank plants. The first T-34 tank from the new production plant was not ready until 20 December 1941. To compensate for the temporary loss of the Kharkov plant, in July 1941 the Krasnoye Sormovo Plant No. 112 in Gorki was ordered to begin preparing to manufacture the T-34; the first were delivered to the Moscow front in November 1941.

With the Red Army barely surviving in the winter of 1941-42, every effort was made to increase tank production. Efforts to technically improve the T-34 were frozen. The Morozov design bureau, now called the GKB-T-34 (Main T-34 Design Bureau) had already developed an improved T-34, called T-34M, which circumvented many of the problems mentioned before by increasing the turret size, adding a commander's vision cupola and improving the suspension by transitioning from the Christie style of springs to a torsion bar system. Instead of continuing the technology race, the tank designers were told to freeze their designs and concentrate on making the tanks easier and cheaper to manufacture. For example, the original 1941 version of the F-34 76.2mm tank gun had 861 parts; the 1942 production version had only 614. Production time of the T-34 was cut in half and the cost was driven down from 269,500 rubles in 1941 to 193,000 in 1942.

While Soviet design stagnated due to production pressures, the Germans took the opposite approach and began an intensive effort to field a superior new tank. In the short term, the PzKpfw IV was rearmed with a more effective long 75mm gun making it capable of penetrating the T-34. Work on the new Tiger I heavy assault tank was accelerated, and it would appear on the Eastern Front in January 1943. The Tiger was a wild over-reaction to the tank panic that had set in after the first encounters with Soviet T-34 and KV tanks in the summer of 1941. The new Soviet tanks were impervious to most German tank and anti-tank guns. The Germans set out to trump the Red Army by fielding an even heavier and better armed tank. However, the resulting Tiger was so expensive that it could never be manufactured in quantity. Only 1,354 were produced during the entire war, equal to less than a month of T-34 production. As a lower cost alternative to the Tiger I, the Germans developed the Panther, ostensibly a medium tank, but in fact nearly double the weight of the original T-34. It would be manufactured in larger numbers than the Tiger (5,976), but still not enough to entirely replace the outdated PzKpfw IV which remained the most numerous German tank through the war.

The Soviet concentration on production paid off. The Soviet tank inventory rose from 7,700 tanks in January 1942 to 20,600 tanks at the beginning of 1943, in spite of massive combat losses in 1942 due to the inept tactical use of the new tank corps. German tank inventories also rose during the same period from 4,896 in January 1942 to 5,648 in January 1943. But discounting obsolete types, the combat-ready inventory actually fell slightly, from 4,084 at the end of 1941 to 3,939 at the end of 1942. The year 1942 saw the German and Soviet armored forces on their most equal. The Soviet numerical advantage was slight, and its technological edge was gradually worn away by German technical improvements. The Germans continued to display a great deal more tactical finesse in the employment of armored formations and anti-tank defense. Soviet tank losses in 1942 were 15,000, while German losses (on all fronts) were 2,648 or an exchange ratio of over 6:1, nearly as bad as the 1941 disaster.

The Technological Imperative Revived

The 1942 defeat at Stalingrad was the high water mark of the German advance on the Eastern Front. Although often called the turning point of the war, Germany retained the strategic initiative until six months later at the battle of Kursk in the summer of 1943. The most important change in the Soviet tank force was in its organization and training. From the autumn of 1941 until mid 1942, the Soviet tank force was organized into small tank brigades or regiments, since it had neither the equipment nor skilled leadership to handle tank divisions. The first of the new tank corps, which were actually tank divisions in Western terms, were very roughly handled by the more experienced Wehrmacht tank force in the bloody battles around Kharkov in the summer of 1942. However, the Red Army continued to learn its lessons and by the early winter the Soviet tank corps began to display considerable more success, especially in the Stalingrad counteroffensive. At the operational level, the Soviet high command was beginning to learn to employ the tank corps to best effect. General Georgi Zhukov and the many other senior Soviet commanders had come to appreciate that tank corps and their close relations, the mechanized corps, were best employed as exploitation forces in offensive operations after the enemy's initial defenses had been overcome. As a result, the Red Army fielded two basic type of armored formations during the war. About 60% of the armor was committed in the tank and mechanized corps intended for deep operations. The remaining 40% were organized into independent brigades, regiments and battalions that were assigned to the infantry to assist in breaking through the defenses, or during defensive operations in blunting German armored attacks.

Technically, the Soviet tank force in the summer of 1943 was not significantly different from its condition in mid 1942. By now, the Soviet factories were turning out T-34s in increasing numbers, and it had become the staple of the Red Army's tank and mechanized corps. It was still armed with the same 76mm gun as in 1942, and protected by the same level of armor.

The KV-1 had proven a disappointment in 1942, having no firepower advantage over the T-34. Nor was its armor invulnerable to German anti-tank weapons as it had been in 1941. Its weight caused tactical mobility problems

without conferring relative invulnerability, and it was plagued by lingering technical problems, especially a poor transmission. As a result, its armor thickness was actually reduced in 1942, and the KV-1 was removed from the tank corps and segregated into separate tank regiments for infantry support. A portion of the production lines at Chelyabinsk shifted to T-34 production and consideration was given to ending heavy tank production completely in favor of the T-34.

In June 1942, the Red Army authorized the development of a "universal tank". The idea was to combine the better armor of the KV with the superior mobility of the T-34; the 76mm tank gun remained the same. The universal tank would replace both the T-34 and the KV-1. The heavier armor was necessary as the advent of the German long 75mm gun in May 1942 had made the T-34 vulnerable for the first time to the standard German tank at normal combat ranges. Two designs were competitively developed in Nizhni-Tagil and Chelyabinsk, an uparmored and improved T-34 called the T-43, and a reduced-weight KV called the KV-13. While the idea of standardizing on a single, universal type was desirable, the focus on armored protection proved to be a mistake.

In the event, neither type was ready when the German and Soviet armor forces clashed on the steppes of central Russia during Operation Citadel, the German attack on the Kursk-Orel salient. The Kursk-Orel battles highlighted the growing capabilities of the Red Army and the growing weaknesses of the German armed forces. The Germans continued to use their panzer force to secure the breakthrough. While these blitzkrieg tactics had worked amazingly well in 1939-1941, by the summer of 1943 they were no longer viable. Infantry in combination with anti-tank guns could stop an armored attack, particularly when echeloned in the depth that the Red Army had organized at Kursk. The quality of German tank crews continued to deteriorate due to heavy combat losses and shortages of fuel and equipment for training. The Wehrmacht panzer force had to compete for new tanks with the growing Waffen SS panzer formations. The Waffen SS panzer units developed a hard earned reputation for tactical ferocity, but in combat actions above battalion level they seldom displayed the finesse of their less favored, but more skillfully-led Wehrmacht comrades.

Once the German tank force had exhausted itself against the staunch Red Army defense, the Soviet tank forces were unleashed. In a shattering counter-attack, the Red Army pushed the Wehrmacht back across the Russian steppes and through Ukraine in a savage series of battles that lasted into the winter of 1943-44. Although the Soviets did not have a tank to equal the Panther, it simply didn't matter. The Red Army made its most destructive advances against the poorly armed German infantry using highly effective combined arms tactics. Soviet rifle units, supported by pulverizing barrages of artillery and by KV heavy tanks and SU-76 assault guns, probed the German lines and pushed through where the thin crust was weakest. Once the gap was found, the tank corps and the mechanized corps poured in. Although the German panzer force could continue to give the Red Army tank force a bloody nose, no sooner did they secure a local victory but that other Red Army tank units crashed through the thin crust of German forces in another sector.

New Tactics, New Guns

The T-43 or KV-13 might have entered production in the summer of 1943 but for the arrival of excellent new German tanks. Tiger Is were encountered in small numbers on the Leningrad front starting in January 1943 and one was promptly captured by the Soviets and examined. Although clearly superior to the KV in armor, mobility and firepower, few were encountered in combat before the summer of 1943. But during the battle of Kursk in June 1943, the Germans introduced the first Panthers, and the numbers of Tigers dramatically increased. The Panther had been specifically developed to deal with the T-34, and was intended to become the standard tank of the German armored force. Soviet tank formations were decimated at long ranges in several lop-sided encounters. For the first time during the war, tank panic set in amongst the Soviet units, and the tank force demanded tanks with a "longer arm" to be able to deal with the new German designs.

The priority assigned to Soviet tank production was clearly needed given the Soviet rates of combat losses, but it distracted the tank design bureaus from preparing for technological improvements by the Germans. The inadequately-armed "universal tank" requirement indicated that the Soviet Army did not anticipate the German shift towards heavier, better armed tanks, and were unprepared with a new tank gun capable of dealing with them. This was hardly unusual, as the same fate befell the US Army in 1944.

This failure by the Red Army helped give more influence to the tank designers who had been pushing for larger guns, a traditional preference that had been suppressed by the production managers in 1942-43. A crash program was instituted in the late summer of 1943. A new 85mm tank gun, derived from the 85mm anti-aircraft gun, was adapted into a new three-man turret for the T-34-85. This ignored the increased armor sought on the T-43 universal tank, but did recognize the command deficiencies of the earlier T-34s. This tank entered service in small numbers in March 1944 as the T-34-85, and proved an immediate success. Although its gun was not as effective as either the Panther's long 75mm gun or the Tiger I's 88mm gun, it restored a measure of balance in the technological arms race since it could defeat either tank under the right circumstances. Furthermore, being based on a virtually unchanged T-34 chassis, it did not upset production to the extent that the costly new Panther had done to German industry.

The decision to simply re-arm the existing T-34 hull, rather than move to the production of a more thoroughly improved tank such as the T-44, is illustrative of Soviet tank design philosophy during the war. Unlike the German policy, which was willing to incur a continual string of production and logistics difficulties to acquire modest (and in many cases irrelevant) technical improvements, the Soviet designers were forced to compromise in order to ensure ease of production, high production rates, and logistical harmony with the supply system. Although German industrial resources were more than double those of the Soviet Union, the incredible blunders in German industrial policy meant that the Red Army would outnumber the Wehrmacht in nearly all major categories of combat arms, but especially in tanks.

The arrival of the T-34-85 in March 1944 did not reverse the German technical advantage in tank technology but did level the playing field. The T-34-85 was superior to the most common German tank, the PzKpfw IV Ausf J in armor and firepower, though it was still not evenly matched against the Panther. The Panther could penetrate the T-34-85 frontally at 1,200 meters against the gun mantlet and turret front, and from 300 meters against the glacis plate. The T-34-85's improved BR-365P hypervelocity armor piercing

(HVAP) 85mm ammunition with its special tungsten-carbide core could penetrate 138mm of armor at 500m at 60°, finally giving it the capability of penetrating the Panther frontally, though not at ranges as far as the Panther. Both the Panther and T-34-85 could obtain penetrations against one another from the sides at 2,500 meters, the T-34-85 having a slight range advantage against the Panther's weak turret sides. A T-34-85's real advantage was in numbers. At the end of May 1944, the Wehrmacht had only 304 Panthers on the whole Eastern Front; production of the T-34-85 was running at about 1,200 per month in the spring of 1944 and there were about 7,200 produced by the time the summer 1944 offensive started. It was largely irrelevant whether the T-34-85 was evenly matched against the Panther the summer of 1944, as there were few confrontations with Panthers. The T-34-85's gun was more than effective against the PzKpfw IV and StuG III that made up the bulk of the German armored force on the Eastern Front.

Seeds of Cold-War Armor

With the war turning decisively in the Soviet Union's favor, the Morozov design bureau began to develop the new T-44 tank, originally codenamed *Obiekt 136*, which embodied the technical lessons of the wartime tank design effort. Free from the production constraints of the mid war years, the design represented the first generational break from the T-34. It would form the basis for nearly 20 years of Soviet medium tank production, from the T-44 of 1944 through the T-62 of 1962. The Obiekt 136 used a turret and gun system virtually identical to that on the T-34-85. The main departure in the design came in the hull. The hull form was extremely simple, its compact size made possible by a radically different transverse engine layout. The powerplant was a derivative of the wartime V-2 diesel that powered the T-34, KV and IS, but mated to a new transmission. The suspension externally resembled the T-34, but internally, torsion bars had replaced the Christie-style spring suspension in order to provide more internal volume. The first trials series of the tank entered production in 1944. No large scale production of the tank was undertaken during World War 2 due to severe teething problems with the design, especially its new powertrain. This tank represented the culmination of Soviet wartime design, with an impressive mixture of design simplicity and high combat effectiveness for a 30 ton tank. It is interesting to note that the Soviets were able to come very close to the combat capabilities of the German Panther in a design that weighed only about 65% as much.

In 1943, the Germans had been able to maintain a combat equilibrium on the Eastern Front by offsetting their numerical weakness with modest technological advantages, and superior crew and small unit performance. In 1943, they were still destroying about 4 Soviet tanks for every one of their own lost, thereby dulling the impact of Soviet numerical advantages. However, in 1944, the Germans were not able to maintain the equilibrium due to the revival in Soviet tank design, substantial armor transfers to Western Europe in the spring of 1944 to deal with the forthcoming Allied invasion of France, and a diminishing disparity in German vs. Soviet tank crew tactical skills.

The Wehrmacht was not outfought by the Red Army at the tactical level, but at the operational and strategic level. In the summer of 1944, Hitler was again successfully deceived by Stalin. The Wehrmacht concentrated its heaviest panzer forces in northern Ukraine expecting the Red Army to attack across the Ukrainian plains into the flat tank country of central Poland. Instead, the Red Army executed an unexpected Operation Bagration offensive through the marshy and wooded reaches of Byelorussia, encircled and annihilating Army Group Center in the worst German defeat of the war. The German infantry held a wide front of reinforced trenches, supported mostly by StuG III assault guns and towed anti-tank guns. There was only a single Tiger battalion, and only a few battalions of Panthers in all of Byelorussia when the attack started. Once the Red Army pushed through the initial German defenses in the first few days of the attack, the Germans had no reserves in the region to stem the rapid Soviet tank advances. The capital city of Minsk fell to a Soviet tank corps that hardly encountered any German armor whatsoever in a week of fighting.

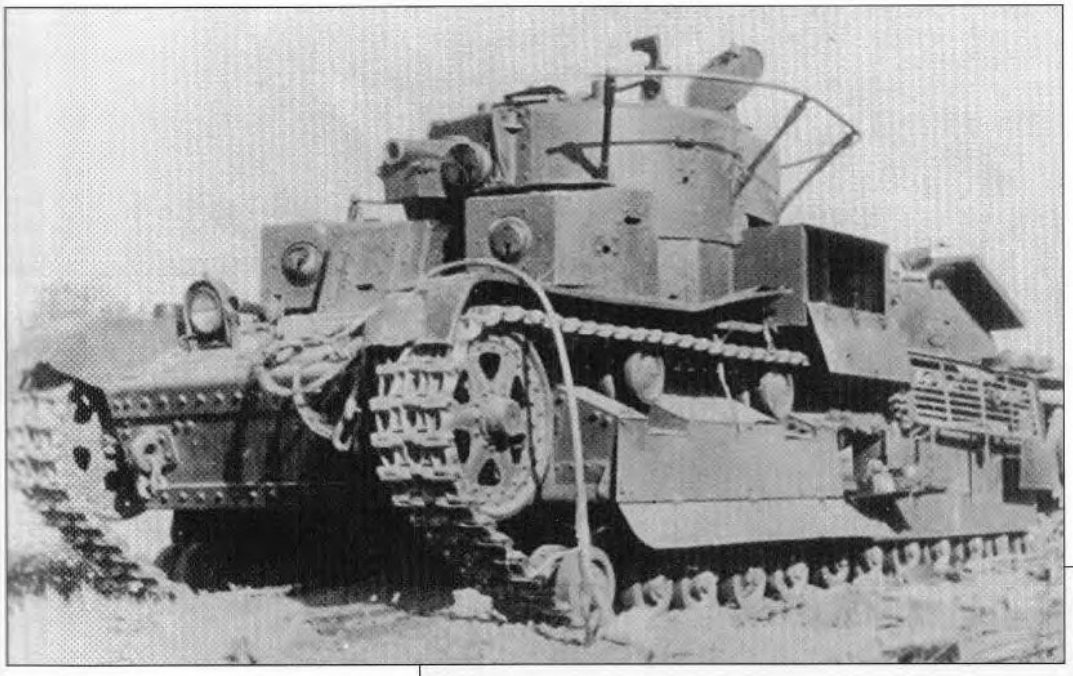
By August 1944, the end was in sight. The successful Allied amphibious invasion of Normandy forced the Wehrmacht to fight a two front war. Hitler attempted to stem the Soviet assault in Byelorussia by draining tank forces out of Ukraine. While in the process of doing so, the Red Army launched its second major offensive of the summer from western Ukraine towards Lvov and Sandomierz in eastern Poland. By August, the Wehrmacht in France had been destroyed in the Falaise encirclement. In the East, the Wehrmacht had been pushed out of the Soviet Union except along the Baltic. Romania, with its precious oil fields, was about to fall into Soviet hands, and the Red Army had reached German soil with attacks into East Prussia.

During the late autumn of 1944, fighting on the Eastern Front was concentrated on the northern and southern flanks. The Red Army continued to struggle against the German's tenacious defense of East Prussia and the Baltic coast, while in the south, fierce battles erupted in Hungary around Budapest. In the center, the Red Army forces in Poland took up defensive positions along the Vistula river while building up for the final winter offensive. This was launched in January 1945 with an aim of reaching the next major geographic obstacle, the Oder river in eastern Germany. By this stage of the war, the Red Army was irresistible. It was no longer a matter of whether the Red Army would defeat the Wehrmacht, it was simply a question of when and for how many casualties.

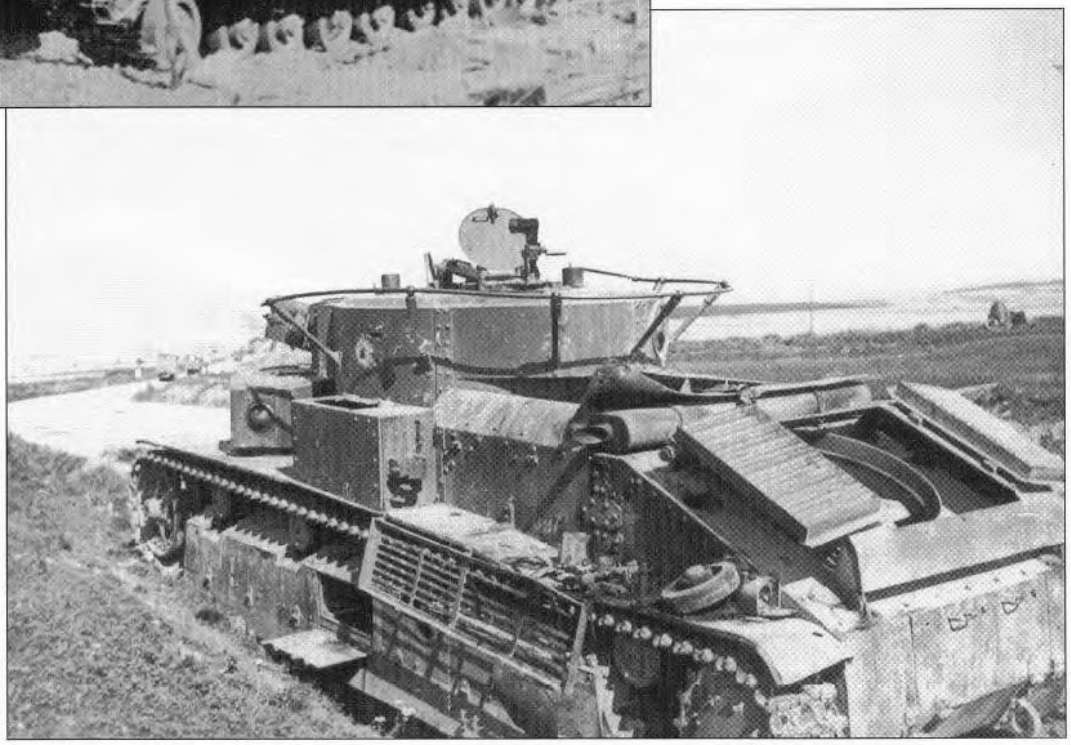
The T-34-85 was the last significant medium tank to enter Red Army service during the war years. In the end, the T-34-85 was not as technologically sophisticated as the rival German Panther in terms of armor, firepower, or mobility. But the technological disparity was not great enough to substantially effect battlefield performance in any meaningful way. To their credit, the Soviet tanks were considerably simpler and cheaper to produce, allowing the Soviet Union to continue to build up a substantial quantitative advantage over the German armored forces in 1944-45. Furthermore, by 1944, the T-34 was a battle-tested design, and not plagued by the technical flaws that continued to hinder the operational use of the Panther. The Soviet effort was further aided by the arrival of Lend-Lease tanks such as the M4A2 Sherman, but more importantly by the arrival of substantial quantities of Lend-Lease American trucks, which were the logistical life blood of Red Army mechanized formations. Although the T-34 was not equal on a one-to-one basis with the best German tanks, its durability, economy and suitability to the Soviet style of war made it a far more effective weapon than any of its German rivals. Its only real rival to the title of "the best tank of World War 2" would be the American Sherman, for many of the same reasons.

One of the prototypes of the T-34 Model 1940 is seen here during trials at the NIIBT (Scientific Research Institute for Armor Technology) at Kubinka in the Moscow region during 1940. The prototype differs from the series production vehicles in many details including the absence of much of the hull tool stowage, the armor strips around the driver's hatch and other features. Although the series production tanks retained the mounting lug for the tank gun search light, it was seldom, if ever, fit on production vehicles. (NIIBT Archive, Kubinka)

Few photos from the 1941 campaign have survived and this is one of the rare examples. Here we see the crew of a T-34 Model 1940 consisting of the crew commander, F.A. Molyut, the driver A.A. Tolmagayev and G. A. Fomin talking over their orders with their heavily camouflaged tank behind them. (N. G. Kolly)



The only other Soviet medium tank to see combat in World War 2 was the T-28. This tank had similar performance to the German PzKpfw IV, though its layout and suspension was somewhat more archaic. This particular tank of the 5th Tank Division was knocked out in the fighting near Alitus, Lithuania during the first day of Operation Barbarossa, 22 June 1941. It is the standard production model with the KT-28 short-barrel 76.2mm gun. (USNA)



A T-28 knocked out on the roadside during the fighting in Ukraine in July 1941. There appears to be signs of a penetration on the left turret side. The open armored louvers over the engine fan in the rear suggests that the tank was abandoned due to mechanical problems before being hit. Mechanical breakdown was one of the primary causes of Soviet tank losses in 1941 due to lack of spare parts, and crew inexperience.

Finnish troops inspect a T-28 Model 1938 knocked out near Prassa on the Karelian isthmus in September 1941. This is one of the late production vehicles fitted with the improved L-10 76.2mm tank gun which gave better anti-armor performance.

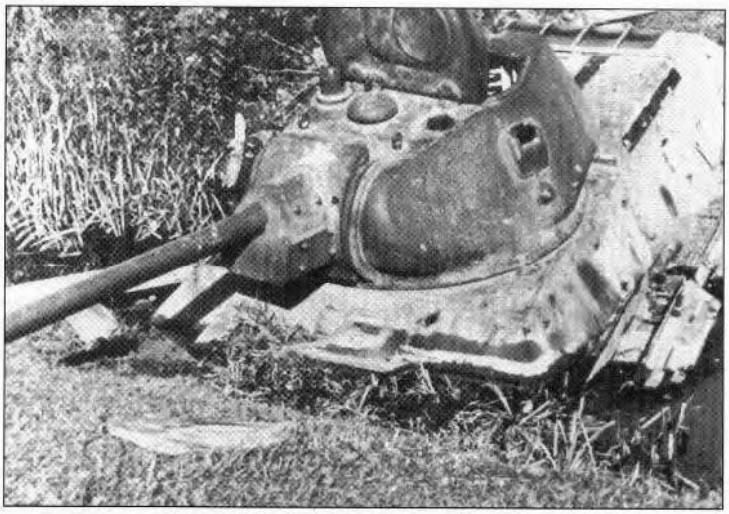
A T-34 Model 1940 knocked out during the Operation Barbarossa fighting. This is one of the late production Model 1940s, evident from the fact that the commander's periscope has been deleted from the turret hatch and plated over. The T-34 was so well armored that it was nearly impervious to German tank gun fire from the front. This tank has been knocked out by hits against its thinner rear armor.

A rare view of a T-34 Model 1941 moving into combat on the Western Front in the summer of 1941. In the foreground is a 45mm Model 1932 anti-tank gun, the standard Red Army anti-tank gun of this period. The T-34 Model 1941 differed from its predecessor the Model 1940 in the gun; the short L-11 76.2mm gun was replaced by the improved F-34 76.2mm gun which gave it better anti-tank performance. (Petrusov)

A T-34 Model 1941 and a BT-7M lay abandoned during the Operation Barbarossa fighting in Ukraine in June-July 1941. The T-34 here is a factory-fresh vehicle with nearly full tool stowage, even the wooden chocks on the rear fenders.

A T-34 Model 1941 lies abandoned in a river after the battle at Zelva on 7 July 1941. This is a very early example of the cast turret being used on the T-34 Model 1941. On this early version of the turret, the roof immediately behind the hatch is horizontal; the welded turret had this panel slightly inclined. (USNA)

Children play around a T-34 Model 1940 of Vlasov's 4th Mechanized Corps abandoned on the streets of Lvov in June 1941. This is from a well known sequence of photos and shows a spare transmission lashed down on the rear deck. The early T-34s suffered from serious mechanical teething problems which led to high losses due to mechanical breakdown during the summer 1941 fighting. Vlasov's corps had 313 T-34s, making it one of the most potent forces in the Ukraine. However, it was ill-handled by the front command and had little impact on the fighting. (USNA)



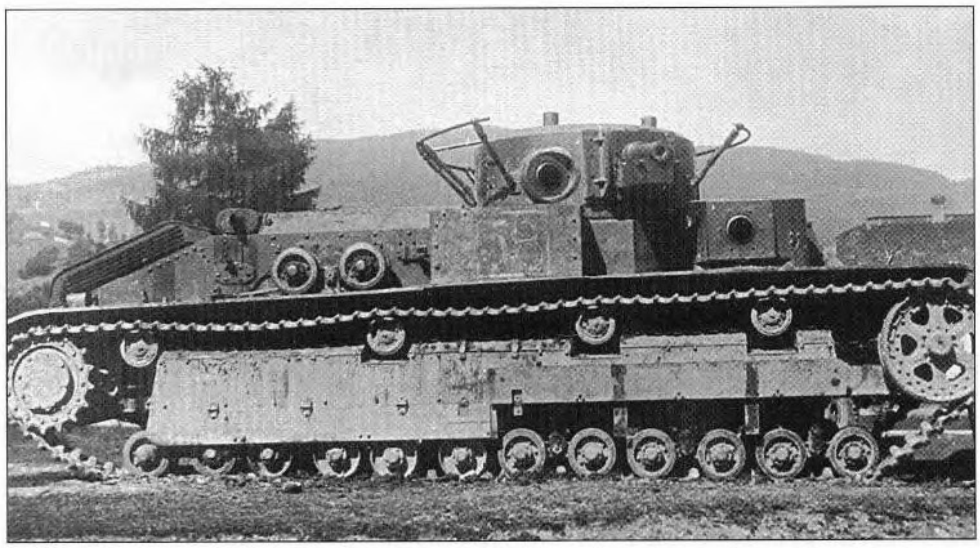
A close up of the turret of a T-34 Model 1941 which ended its service career after slipping into a bog near Mushchkotishchi during the fighting there on 1 August 1941. The vehicle has lost the periscope over the gunner's station as well as the cover over the left side armored periscope. This photo provides a good view of the early cast turret of the T-34 Model 1941. (USNA)

One of the less common variants of the T-34 Model 1940 was the type with the cast turret, as seen here. This is a tank from Vlasov's 4th Mechanized Corps, knocked out during fighting along the Lvov-Jaworow road on 30 June 1940. (USNA)

A cast-turret T-34 Model 1941 abandoned in a roadside ditch near Jazow Stary in eastern Poland on 25 June 1941. One shell impact is evident on the front side of the turret, which did not penetrate. The large rectangular boxes on the side of the hull are spare fuel containers, and are actually the same type used on late production BT-7 tanks.

A Russian combat photographer takes photos of a T-34 Model 1941 moving into action on the Western Front in Byelorussia in the late summer 1941. In contrast to the vehicles committed to the fighting in the opening phase of Operation Barbarossa, this tank has far less standard stowage and is missing the external fuel tanks, jacks and other tools. It is a commander's tank, with a radio. At this point in the war, usually only the platoon commander had a radio receiver, and only the company commander had a transmitter-receiver. (D. Velikzhanin)

This is a standard production T-28 with the KT-28 gun abandoned by the Red Army in Ukraine in the summer of 1941. The Hungarian Army was so bereft of heavy armor that they put it into their own service during the late summer of 1941. (Ivar Bajtos)



A platoon of T-34 Model 1941 move into action in the late summer of 1941. The gunner in the near tank has been injured as is evident from the bandage. This tank has several of the features peculiar to the early production T-34 Model 1941 including the two-piece front fender, the circular plate covering the periscope opening on the turret hatch, and the higher left side tool stowage box on the fender. (Finikov)

A T-34 Model 1941 appears at the front in the late summer of 1941. This is a vehicle which has probably arrived recently from the factory, as the tow cable is still covered in lubricated wax paper. This is a platoon or company commander's vehicle, evident from the radio pot on the right side. Note that this is a later production type without the circular plate on the turret hatch.

A pair of T-28s go into action in the late summer of 1941. Few T-28s survived the summer 1941 fighting. Both vehicles are fitted with the standard P-40 anti-aircraft machine gun mounting on the roof, and the nearest vehicle has the later style whip radio antenna instead of the more common "clothes-line" antenna. These T-28s have an unusual tactical marking consisting of a four-digit number in a rectangle, and the nearest tank also has a large white rectangle at the rear.

A detailed close-up of a T-34 Model 1940 knocked out during the 1941 fighting and sent back to Germany for technical evaluation. This provides a good view of the early cast turret and other details. For example, this tank is fitted with the turret hatch periscope, rarely seen in place, though the upper cover has been blown off presumably when the tank was hit. It is missing several other small parts.

An excellent view of a new production cast-turret T-34 Model 1941 abandoned in a town square during Operation Barbarossa in June-July 1941. This vehicle has a complete set of tools and fuel tanks, as well as two turret periscopes. Later in 1941-42, the tool stowage and other features were simplified to cut down on cost.

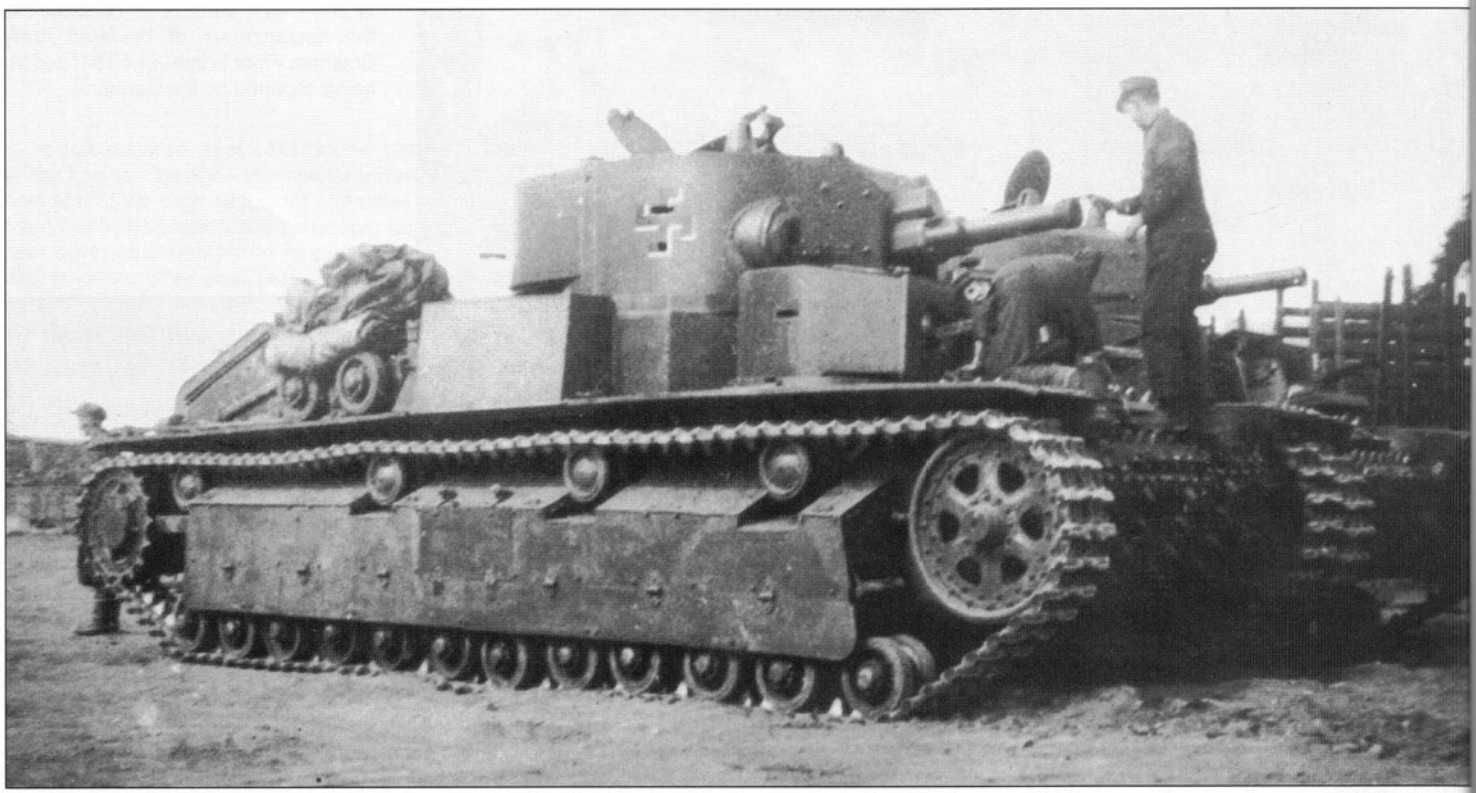
Finnish troops inspect a T-34 Model 1941 captured on the Karelian isthmus in the autumn of 1941. This vehicle has a tactical insignia consisting of a bisected rectangle with the number 30/204 inside. Combat damage is evident on this tank including a solid penetration of the bow near the right tow hook and a missing side turret vision port armored cover.

A T-34 Model 1941 with the standard welded turret abandoned in the town square of Vinnitsa in Ukraine in July 1941. Vinnitsa in Ukraine was the headquarters of the Red Army Southern Front in late June 1941 before being captured by the Germans.

The T-28 continued to see service well into the war, but mainly in enemy hands. This is a T-28 in Finnish service, numbered R-48. In the winter of 1940-41 it had this unusual paint scheme of light blue bands on a white snow camouflage.

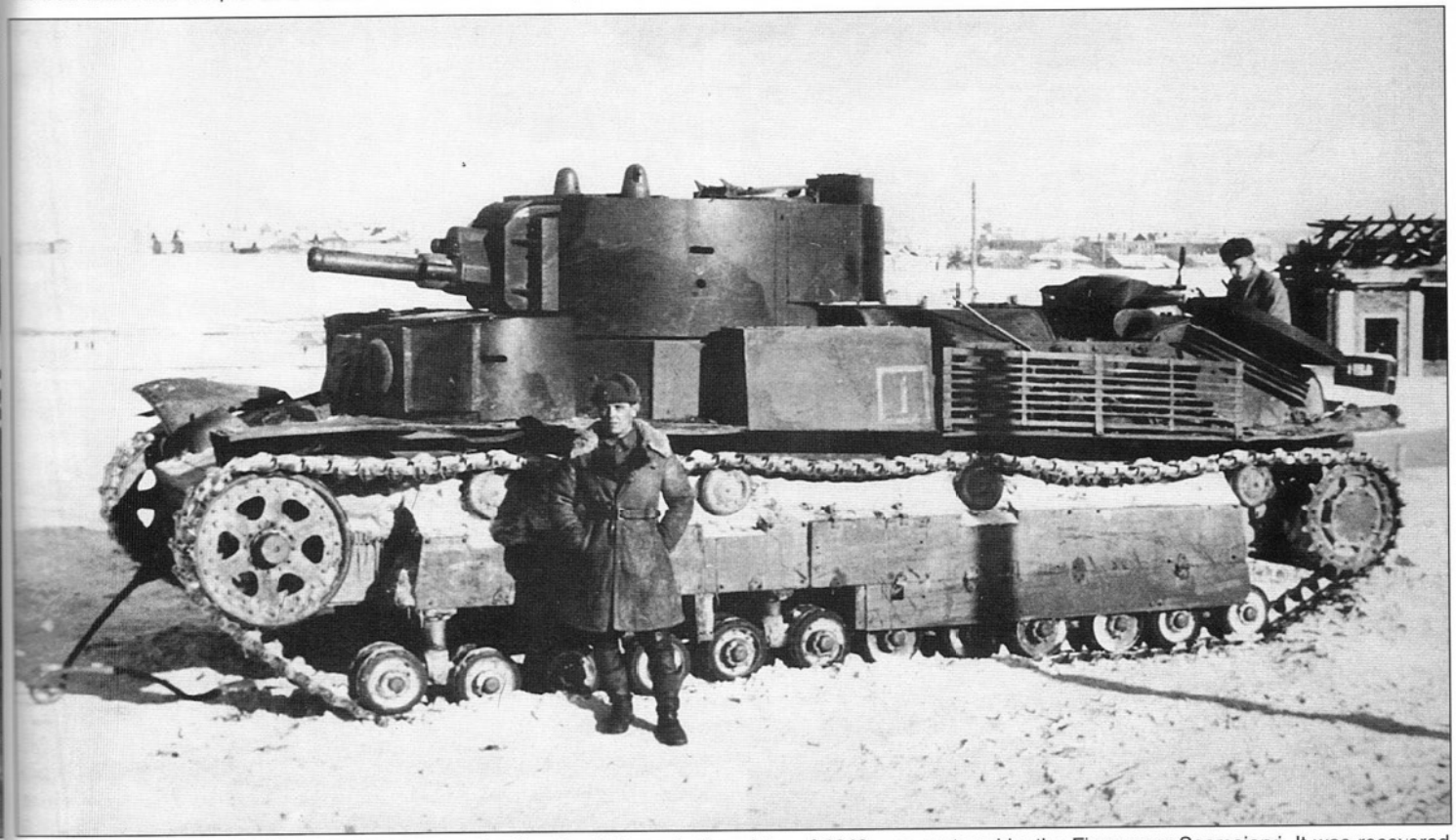
The T-28 saw some fighting in the winter of 1941 in the Leningrad and Moscow areas. On the Leningrad front, the T-28s were sometimes used with armored sledges, first developed during the Russo-Finnish war as seen here. This allowed the tank to tow a small assault engineer team to attack thick bunkers.

A T-34 Model 1942 passes through the town of Izyum, south of Kharkov in late January 1942, during the savage winter fighting there. In January, the Red Army attempted to surround the Wehrmacht in the key city of Kharkov, this tank belonging to one of the four tank brigades of Lt.Gen. A.M. Gorodianskiy's 6th Army. The Red Army managed to capture the town, but it fell again in the summer 1942 Kharkov fighting. On this tank's gun mantlet is the Russian work "Vpered" (Forward) while there is a slogan on the turret side starting with "Smert" (Death). This is one of the earliest known pictures of the T-34 Model 1942 showing the earliest production type with the old welded turret and the headlight still mounted on the glacis plate. (B. Vdovenko)



The most effective version of the T-28 was the T-28E which had appliqué armor added around the turret. This conversion was done immediately before the outbreak of the war, mainly on T-28 Model 1938 with the L-10 gun. This particular example was captured by the Finnish Army and put into their service serving with Ps.Keskus near Varkaus in the summer of 1942.

This is another view of the same tank from the opposite page, also in Izyum in late January 1942. A part of a slogan can be seen on the turret side, probably "Za Rodinu" (For the Homeland). Notice that there is a color band on the turret roof, probably red. The Red Army commonly used turret bands in various colors and shapes as a means of air identification to prevent their own aircraft from strafing friendly troops.



This T-28E from a Red Army unit fighting on the Karelian isthmus in the winter of 1942 was captured by the Finns near Saamajarvi. It was recovered and sent back to Finland where it was repaired and put back into service as R-152. This gives a very good view of the appliqué armor on the tank turret. There were also panels of armor added on the front of the small sub-turrets.

Model 1941 tanks of Katukov's 1st Guards Tank Brigade in operations near Moscow in March 1942. Katukov's brigade, formerly named the 4th Tank Brigade of the 16th Army, was the first Soviet tank unit of the war to be honored with the Guards distinction in November 1941. The brigade was so honored due to its superior performance in halting German armored attacks at the gates of Moscow during the critical fighting there in the winter of 1941-42. This photo was probably taken after the unit had been sent back to the rear for re-equipping after the hard fighting of the previous months. The unusual camouflage scheme consists of whitewash over the usual dark green, but with patches of dark green left unpainted. These unpainted swathes then had a white criss-cross pattern painted over. This was actually the official Red Army winter camouflage pattern, but it was very seldom seen except on the Moscow Front in the winter of 1941-42. (N. G. Kolly)

A T-34 Model 1941 in operation in the Moscow area in February 1942. This is an early example of one of the tanks built at the Stalingrad Tank Plant (STZ). The main T-34 plant at Kharkov was evacuated to Nizhni Tagil in the late summer of 1941 before the city was captured by the Germans. As a result, most of the new T-34s reaching service in late 1941 and early 1942 came from STZ. STZ introduced a modified welded turret with a flat, riveted back panel as seen here. (F. Kislov)

A T-34 Model 1941 moving forward on the Western Front near Moscow in April 1941. Several units area had these unusual large bins added on the right rear of the tank in late 1941 and early 1942. Their purpose remains a mystery. The vehicle tactical number is 1/045 inside a red diamond. The diamond was a standard tactical sign on Red Army tanks during World War 2 as the diamond was the tactical map symbol for tanks in the Red Army.

"Tank desant" troops clamber forward towards a pair of T-34 tanks during training with the 116th Tank Brigade in the Volga Military District in March 1942. The Red Army lacked half-track infantry transporters and so depended on improvisations such as carrying the infantry on the tanks themselves. Although often an effective tactic, it was horribly costly to the infantry.

Senior Lieutenant Sukharev leads a column of T-34 Model 1941 tanks of the 116th Tank Brigade in March 1942 shortly after it was formed in the Volga Military District. This photo illustrates several points about early Soviet tank tactics. The large one-piece hatch on T-34s was very ill-suited to tank tactics since it was awkward for the commander to see forward with the hatch open except by leaning around the hatch- not comfortable on a moving tank, and not safe when enemy snipers were present. Secondly, the lieutenant here is using a flag to signal to his other tanks due to the lack of radios. Once again, a poor alternative in coordinating tank platoons. Also worth noting is the early style PT-4-7 periscopic sight. This sight had an armored cover which folded over the side. This was awkward to use, and later tanks used the "armored gumdrop" PTK-5 periscope. (D. Chernov)

Soviet troops prepare heavy equipment to be moved on a ferry boat. The two T-34 Model 1941s are fully equipped, including four boxes of extra 76mm main gun ammunition lashed on their engine decks. The variant of these tanks is easy to determine, as they still have the rectangular rear access panel over the transmission; the Model 1942 had a circular hatch. These vehicles carry full tool stowage, including the side hull external fuel tanks, rarely seen after 1941. In the background are a standard STZ-NATI-3 tractor towing a standard army supply trailer, and behind it a GAZ M-415 pick-up truck with a military license plate number painted on it. (E. Everikhin)

A T-34 Model 1941/42 of unidentified unit in the summ of 1942. This vehicle is excellent illustration of t evolutionary link between t Model 1941 and Model 1942 tanks from the Stalingrad ST This tank has some Model 19 features such as the new patte tow hooks. But its other featur are strictly from the Model 19 including the early driver's hatc hull stowage features and so c The running gear uses the ne all-steel spoked whee introduced in the spring of 19 due to shortages of rubbe Besides the vehicle tactic number, notice the white a identification band on the roof the turret. (D. Velikzhanin)

The three tanks seen in the other photos move forward. This rear view clearly shows that tank 71 and 73 are T-34 Model 1941s with the distinctive rectangular access hatch. This also gives a good view of the white air identification band, and the open PT-4-7 periscopic sight. (D. Velikzhanin)

Another view of the same T-34 tank platoon. Tank numbers 71 and 7 in contrast to tank 85 have cast turrets. Plants such as STZ depended o several satellite plants to provide key subcomponents such as turr castings and other subcomponents, so there could be a considerab mixture of details on tanks produced the same day. (D. Velikzhanin)

A pair of STZ-65 tractors tow a T-34 Model 1943 out of a bog nea Sukhinichi, south west of Kaluga in the summer of 1942. The second tract is out of view to the left, though the tow cable can be seen. This tank wa attached to a tank unit of the 50th Army, the westernmost Red Army forc facing the German Army Group Center in the summer of 1942.

A trio of T-34 Model 1942 tanks move forward during operations on the Southwestern Front in the summer of 1942. During the early summer, the German 1. Panzer Armee enveloped the Soviet bulge south of Kharkov and pushed the front all the way back to the Volga river. This was the key prelude to the assault southward towards Stalingrad and the Caucasus.

A young boy does maintenance work on a T-34 Model 1942 in a tank plant in 1942. The heavy losses of troops forced the Soviet industry to employ young boys, women and old men to make up for the drain of workers into the army. This T-34 has had an extra layer of appliqué armor welded to the glacis plate.

A Stalingrad STZ T-34 Model 1942 looks on while Red Army troops inspect a captured German Unic P-107 half-track. This half-track was originally in French Army service and captured in the 1940 campaign. These French vehicles were popular with the Wehrmacht due to their cross-country performance and were used in some numbers on the Eastern Front.

The crew of a T-34 Model 1942 with welded turret cook their meal during a lull in the fighting in 1942. This is an intermediate production Model 1942 with the improved cast turret. It has several of the mid-1942 improvements including the new PTK-5 periscope, the new hand-holds, and the armored cover over the hull machine gun.

A T-34 Model 1942 knocked out during the fighting on the Southwestern Front in the summer of 1942. This tank has many of the detail features of the vehicles produced at Gorki's Kranoye Sormovo Plant No. 112, notably its distinctive pattern of infantry hand-holds. This tank has suffered a fire which has completely burned the rubber off the roadwheels. (USNA)

This is another example of T-34 Model 1942 tanks built at Krasnoye Sormovo No. 112 in Gorki. However, these tanks have had appliqué armor welded on to the hull front, and spare track links added for further protection. This extra armor was due to the advent of the long-barreled L/48 gun on German PzKpfw IV tanks in the summer of 1942 which could penetrate the T-34s frontal armor.

There are very few photos of tanks taken during the course of actual fighting, and this is a rare example. Here, a pair of T-34 Model 1943 tanks move forward in the face of German artillery fire during the summer 1942 fighting. (Kilishko)

An older T-34 Model 1941 carries a squad of Red Army riflemen during fighting in the summer of 1942. The riflemen are armed for the most part with the normal Moisin Nagant rifle, but the squad leader at the front has a PPSh burp gun, the third infantryman from the front is armed with a DP "piano player" light machine gun, and a PTRD anti-tank rifle can be seen resting at the rear of the tank. (Soloviev)

A T-34 Model 1943 of the 106th Tank Brigade, 12th Tank Corps, Western Front in autumn 1942. This tank corps conducted a series of costly and inept attacks on the Western Front against Army Group Center in July-August 1942 and was sent to the Moscow Military District in the fall to re-equip. Its 86th Tank Brigade was replaced by this unit, the 106th Tank Brigade, which was led by Maj. Vasiliy S. Arkhipov who had won the Hero of the Soviet Union decoration as a tank company commander with the 35th Tank Brigade in the war with Finland in 1940. The brigade was equipped with these new Model 1943 tanks in July 1942. This particular tank, number 169 is named "Molotov" after the Soviet foreign minister and Stalin's closest aide. (K. Lishko)

Another view of the 106th Tank Brigade during training in the Moscow Military District in September 1942. To the right is tank number 174 Timoshenko named after the Soviet marshal, and tank 166 Suvorov, named after the Russian general of the Napoleanic wars. These have the typical mid-1942 wheel mix consisting of three all steel wheels in the center, and a rubber rimmed spoked wheel at the front and rear stations. The early 1942 style of all steel road wheels was found to be too destructive as it set up harmonic vibrations that caused crew fatigue and premature track loss. The 12th Tank Corps was nearly wiped out in heavy tank fighting in January-March 1943, but after re-equipping yet again played a prominent role in the Kursk-Orel fighting in the summer of 1943 where it was redesignated as the 6th Guards Tank Corps. (K. Lishko)

A T-34 Model 1943 approaches a knocked out German PzKpfw III and PzKpfw 38(t) during fighting on the Western Front west of Moscow in September 1942. This is an early production Model 1943 with the initial style of turret casting. The Model 1943 was characterized by a new hexagonal turret that was easier to manufacture, better armored and more spacious than the type used on the previous types. (Krichevskiy)

A pair of T-34 Model 1941/42 of the STZ type sit under tents while at a German tank repair station on 25 September 1942. These were used by 3.SS Panzer Division "Totenkopf" as is evident from the insignia on the turret sides. There was some reluctance to use captured Soviet tanks in spite of their evident combat value due to the recognition problem they posed in combat. No matter how prominently marked with German insignia, they tended to attract German tank and anti-tank gun fire.

Troops of a Soviet tank brigade inspect a column of new T-34 Model 1942 tanks in the marshaling yards outside the STZ plant in Stalingrad. The STZ tanks can be distinguished by small detail features peculiar to that plant, including the interlocking glacis plate armor, and the hatchet-shaped mantlet fronts.

Citizens of Stalingrad wave as a column of new T-34 Model 1942 tanks are driven to the front in August 1942. By late August, the front-line was in the suburbs of Stalingrad as the Wehrmacht's Sixth Army moved relentlessly forward. The lead tank is fitted with the hatchet-shaped mantlet produced at the neighboring Barrikady plant, while the following tank has a welded turret with the distinctive undercut found only on STZ tanks.

A good example of a STZ T-34 Model 1942 with welded turret. This shows most of the key distinguishing features including the Barrikady hatchet-shaped gun cover, the front turret undercut, the rear turret flat plate, the glacis (and hull rear) interlock. This vehicle has a panel of appliqué armor welded to the hull front. The slogan on the turret side is "Za Stalina!", For Stalin!

A T-34 Model 1942 moves forward under the cover of smoke. This is another example of a T-34 manufactured at Krasnoye Sormovo in Gorki with its distinctive handholds. Rather strangely, this tank is still fitted with the mounting clasps for the side hull fuel tanks, even though these were seldom issued with new tanks in 1942. Gorki continued to produce tanks with the small two-man Model 1942 cast turret even after other plants had switched to the larger hexagonal Model 1943 turret.

A platoon of T-34s move across the steppes in Ukraine in the autumn of 1942. The tank in the foreground is a Krasnoye Sormovo T-34 Model 1942. A look at the rear will show why tanks are fitted with fenders! In the background are two T-34 Model 1943 tanks.

A pair of T-34 Model 1943 tanks from the same unit as the above photo. Once again, the loss of the rear fenders has caused the rear of the tank to become encrusted with mud thrown up by the tracks. The T-34 had a distinct advantage over German tanks of the period as its wide tracks enabled it to keep moving in soft soil conditions such as this which would have caused a German PzKpfw IV to become bogged down.

With the von Paulus' Sixth Army trapped in Stalingrad, the Red Army launched Operation Uranus to cut it off and destroy it. Here, a T-34 Model 1943 of the Southwestern Front passes through a Russian village on the Middle Don. This vehicle is camouflaged in a scruffy whitewash finish, and carries spare 76mm ammunition boxes lashed to the side. This photo provides a good view of the early pattern of rear external stowage tanks beginning to appear in late 1942. These are lower than the standard production types. (D. Velikzhanin)

Another T-34 Model 1943 of the same tank brigade moves forward in December 1942. This tank is towing an equipment sledge carrying a large amount of 76mm tank gun ammunition, as well as a Maxim machine gun on its PM-10 wheeled mount. (D. Velikzhanin)

In the fall of 1942, Leningrad was still encircled, but attempts were made to loosen the noose. Here a pair of T-34 Model 1942 tanks with tank desant troops move to the front. These vehicles have the extensive appliqué armor peculiar to the Leningrad Front. This type of appliqué armor was developed by tank rebuilding plants inside Leningrad, especially Plant No. 27.

Opposing the Leningrad Front to the north on the Karelian isthmus was the Finnish Army and its small tank force. This is a pair of Finnish T-34s, followed by a pair of T-28E tanks at Aanislinna on 1 October 1942. The T-34 to the right is shown in the color plates later in the war.

The crew of a captured Finnish T-34 Model 1943 in Aanislinna in October 1942. This is one of the early production Model 1943 turrets, distinguished by the turret casting at the base of the turret. In the summer of 1942, Finland organized an armored division around its one tank brigade and an infantry brigade.

The crew of a T-34 Model 1943 commanded by Lt. I. V. Kazadayev receive instruction during fighting on the North Caucasus Front in early 1943. This crew was credited with destroying 7 German tanks, 2 armored cars, 6 artillery pieces, and 27 trucks during the Stalingrad fighting. The turret slogan is "Za Stalina!" (For Stalin). Barely evident in the background is a Lend-Lease M3A1 scout car and a truck. (M. Ozerskiy)

The crew of a T-34 Model 1943 commanded by Guards Lt. Vlasenko arm their tank with ammunition. Most of the ammunition in the T-34 was stowed in the hull floor or along the lower walls, so it was often easier to load it through the driver's hatch than through the turret roof. The crewman nearest the camera is wearing a sheepskin *kozhuk*. These were popular because of their warmth, but were hard to wear in the cramped interior of the T-34.

One of the Red Army's best tank commanders, Gen. Pavel Rotmistrov, stands in front of a T-34 Model 1943 during operations by his 5th Guards Tank Army in the early winter of 1943. Rotmistrov had commanded the 7th (3rd Guards) Tank Corps during the Stalingrad operation, and his skillful leadership led to his rapid advancement in the tank force. During the battle of Kursk that summer, he would command the tank forces that launched the counteroffensive against the Germans at Prokhorovka, signaling the German defeat in Operation Citadel.

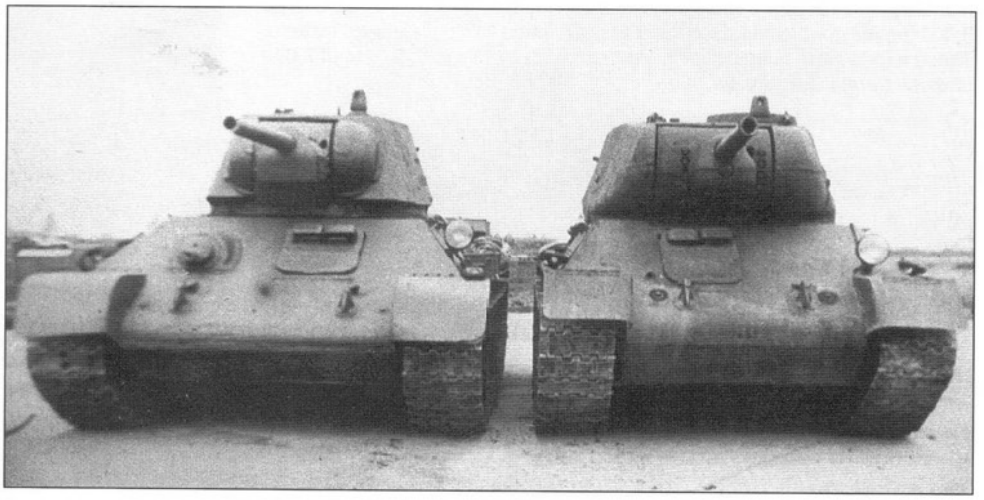
During the early winter of 1943, the Red Army and the Wehrmacht engaged in a grueling series of winter battles as the Soviets tried to exploit the German defeat at Stalingrad. This represented the heaviest concentration of Soviet armor in winter operations to date, and an important prelude to the summer battle at Kursk. This is a T-34 Model 1943 knocked out in the fighting. This vehicle had obviously been knocked out and repaired before, as there is a piece of appliqué welded to the upper edge of the glacis plate above the hull machine gun. The vehicle carries the name "Moskovskiy Kholkoznik" in red, indicating that the tank was purchased by donations from collective farms in the Moscow region. Note that this vehicle still does not have a radio, and that the attachment point for the radio pot on the right side of the hull is plugged. The Soviets still lagged the Germans in fielding radios in their tanks, and did not catch up until later in 1943.

By early 1943, there was an effort to equip the T-34 with additional external fuel tanks to provide greater range. This was due to the greater success of the Soviet tank in offensive tank operations and so the need for greater range. The tank corps however had too few trucks to refuel the tanks during the course of operations, so a better expedient was simply to carry more diesel fuel on the tank. This T-34 Model 1943 has racks for the new cylindrical fuel cans on the hull side, though the cans themselves are missing.

A view of another T-34 Model 1943 from the tank brigade named after the Moskovskiy Kholkhoznik. This tank is fitted with the typical mid-war suspension arrangement with three metal spoked wheels in the center, and a rubber rimmed wheel at the first and last station for a better ride. This tank is also fitted with one of the new cylindrical fuel cans.

A good example of a mid-war T-34 Model 1943. It has the new cylindrical fuel tanks, and a full set of tank desant hand-holds. The vehicle tactical number is 45-05, a common marking practice in 1943; the first two digits are the unit code number and the last two are the individual vehicle number. This tank is finished in a scruffy whitewash finish.

The advent of more powerful German tank guns in 1942 convinced Soviet tank designers for the need for better tank armor. As a result, the T-34 was redesigned with much thicker armor, resulting in the T-43. The T-43 employed a new three-man turret for better tank tactics, but otherwise shared about 60% parts in common with the T-34 Model 1943.



A comparative view between the T-34 Model 1943 and the T-43. Although the T-43 was superior to the T-34 in many respects, in the end the project was canceled when it was realized that the Red Army needed tanks with better guns, not thicker armor. This led to the T-34-85 instead.

Red Army tank brigades move to the front in preparation for the cataclysmic battle at Kursk. The writing on the turret side is from the "Trade Unions of the Cooperative Centers". Although patriotic slogans were common on Soviet tanks in 1941-42, by 1943-44 the practice had become for various organizations to raise funds to pay for a unit of tanks and aircraft as a patriotic gesture. In return, all of the tanks of the unit would have the name of the sponsoring organization painted on the side. The tank's tactical number, "615" is painted on the gun armored cover, not a common practice.

Most T-34 Model 1943 had turrets made from a combination of castings and rolled armor plate. The Uralmash plant in Sverdlovsk which manufactured turrets for the Chelyabinsk and UZTM tank plants had a large 5,000 ton forge which enabled them to make huge turret stampings instead. These turrets were quite distinctive due to their rounded shape. About 2,670 of these turrets were made.

Another view of the same tank with its Uralmash turret. There is an obvious penetration of the gun mantlet which led to a fire that burned out this tank. There was a slogan on the turret side "Smert", but the bottom portion is so charred that it cannot be read. Notice the racks for cylindrical fuel tanks at the rear. During early 1943, the standard practice was to carry two tanks, one on each side; later in 1943 this was increased to three tanks, two on the right, one on the left.

A T-34 Model 1943 moves forward during fighting in the summer of 1943. The markings are unusual and consist of the number 2 in a lozenge-shaped geometric sign. While Soviet tanks were nearly bare of markings in 1941-42, the organization of larger tank units, especially the tank corps in 1942, created a greater need for tactical insignia to be painted on to keep track of units during movement.

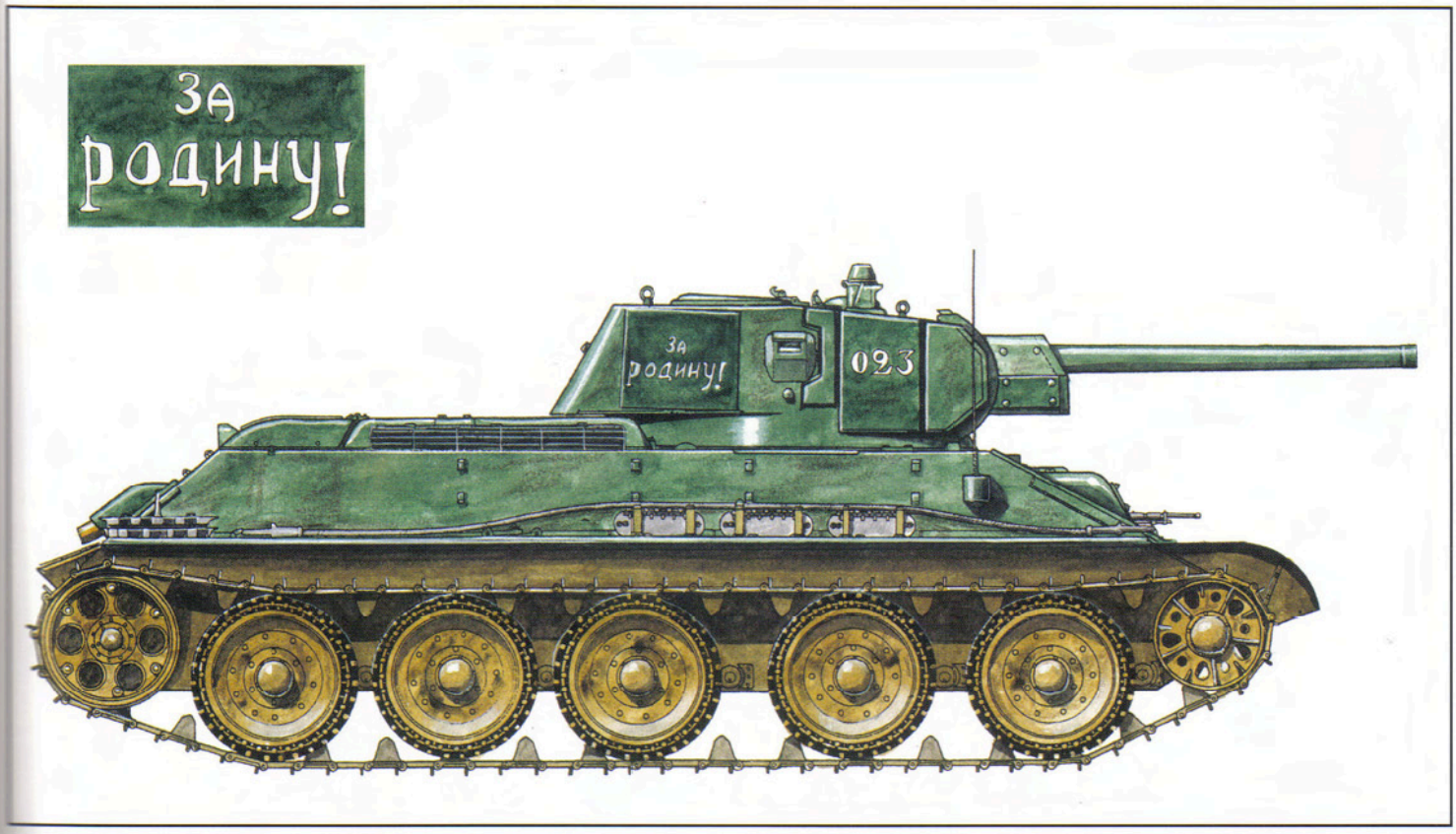
The crews of the 5th Guards Tank Corps enjoy a musical interlude prior to the outbreak of fighting in the Kursk area in July 1943. This unit used a four digit tactical code, the first two digits indicating the brigade (20th or 21st Tank Bdes.), and the second giving the vehicle tactical number. The 5th Gds. Tank Corps was one of the first armored reserve units committed to help repulse the II SS Panzer Korps attack at Kursk, and in mid-July was shifted to the 6th Guards Army for the counter-offensive once the German attack had been decisively stopped at Prokhorovka.

A OT-34 flamethrower tank in action in the summer of 1943. Although the flamethrower itself cannot be seen in this view, this T-34 Model 1943 can be distinguished as a flamethrower tanks by the location of the radio pot on the rear of the turret. The radio was moved from the right side of the hull front to the turret to accommodate the flamethrower equipment. The vehicle carries the legend "From the Tatar ASSR to the Front", and the vehicle tactical number is D-50.

This is a side view of the OT-34 Model 1943 when it underwent trials at Kubinka in 1943. This particular example is fitted with the distinctive Uralmash turret. The repositioning of the radio pot to the turret rear is very evident in this view. The addition of the commander's cupola on the T-34 Model 1943 was another change introduced in 1943. It was originally planned to add the cupola from the KV-1S, but this was rejected as it did not have a hatch. (NIIBT Kubinka)

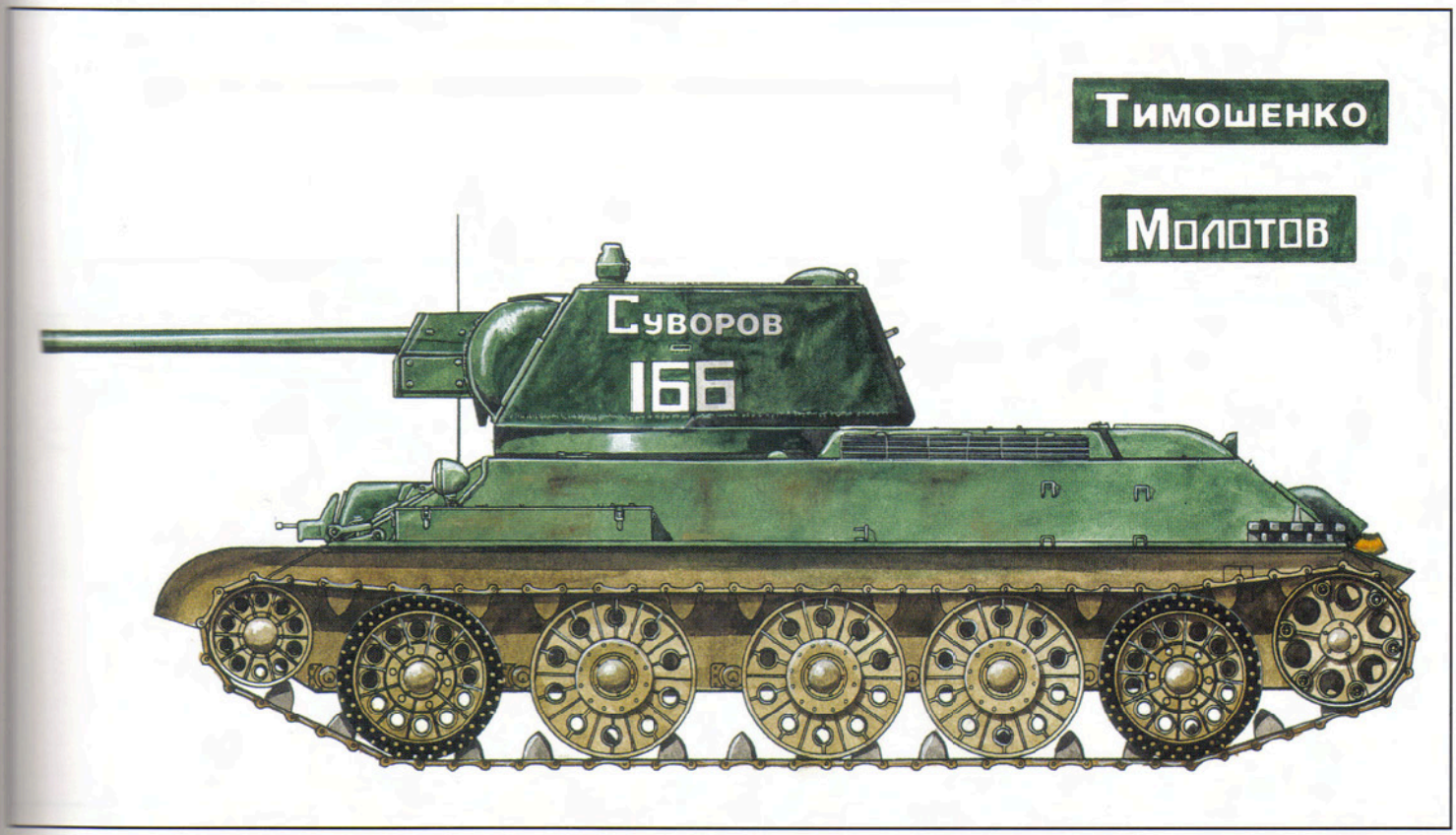
This front view of a OT-34 at Kubinka more clearly shows the ATO-42 flame-gun. The flamethrower was mounted in the hull front in place of the usual bow machine gun. The greater attention paid to flame-throwing tanks in 1943 was due to the shift in Red Army operations. As the Red Army moved to the offensive, such weapons were more necessary to overcome German fortified strongholds. (NIIBT Kubinka)

Waffen SS troops inspect a T-34 Model 1943 knocked out during the summer fighting. This is a very early production T-34 Model 1943 and the absence of a plug for the radio is worth noting. The slogan on the side, in Ukrainian instead of Russian, is "Za radyansku Ukrainu!" (For Soviet Ukraine). (USNA)



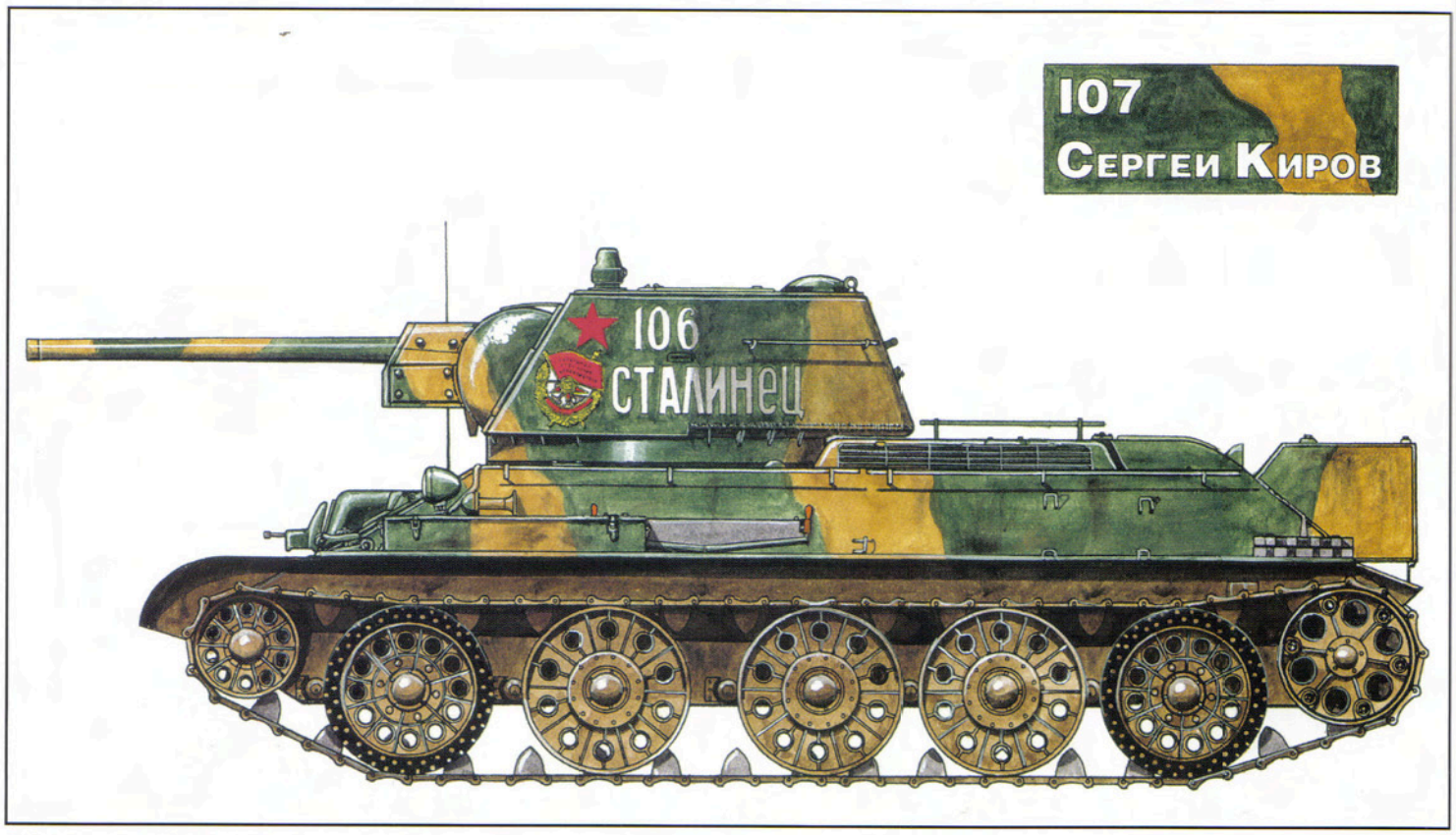
T-34 Model 1941/42 s ekranami, Separate Tank Regiment, Leningrad Front, 1942

During the fighting in Leningrad in 1942, the 27th Rebuilding Plant began adding extra armor plate to older T-34s due to the advent of newer German tank guns such as the long 75mm gun. This particular example is on a T-34 Model 1941/42 built at the Stalingrad Tractor Plant (STZ) with its distinctive interlocked hull armor plates. This tank is finished in the usual Soviet dark green. On the rear of the turret is the patriotic slogan "Za Rodinu" (For the Homeland), and the tank carries a tactical number, 023.



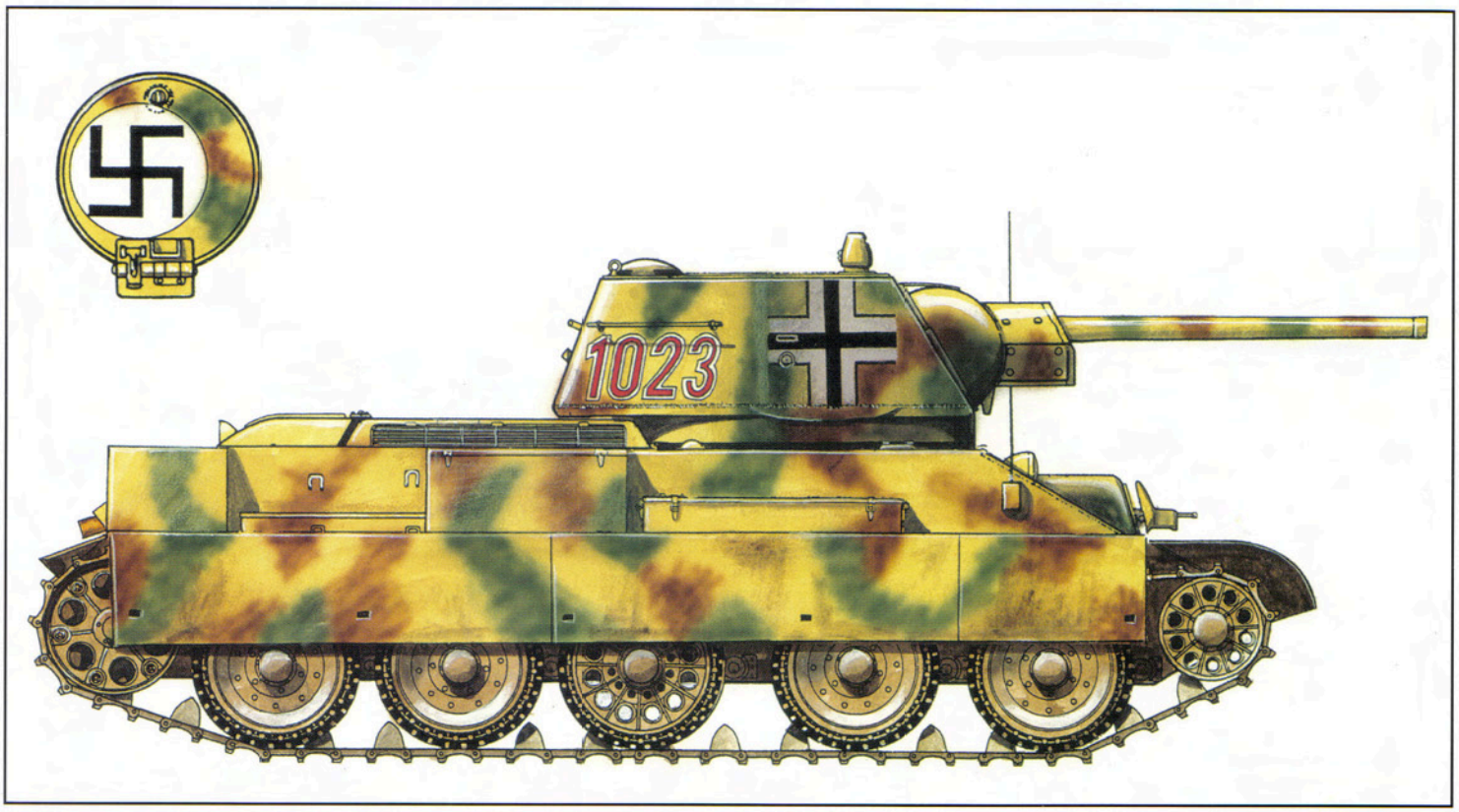
T-34 Model 1943, 106th Tank Brigade, 12th Tank Corps, Western Front, autumn 1942

This tank brigade had the practice of naming its tanks after prominent Soviet officials and Russian generals. This particular tanks is named after Gen. Suvorov, hero of the Napoleanic wars. Some other examples of markings used in the unit were Timoshenko (tank number 174, top inset), the WW 2 Soviet general, and Molotov (tank number 169), Stalin's adviser and foreign minister.



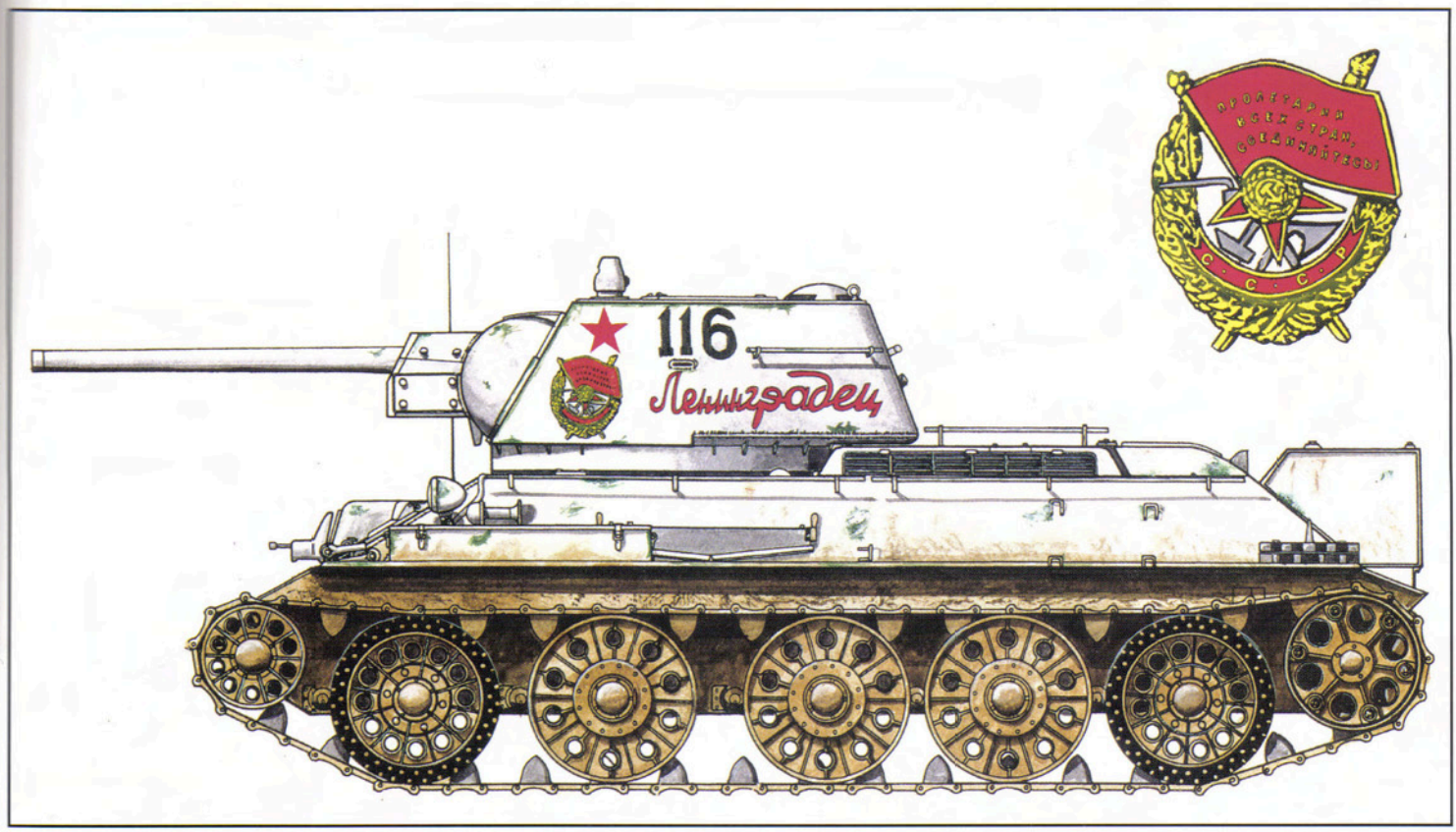
T-34 Model 1943, 30th Guards Tank Brigade, Leningrad Front, summer 1943

This unit, formerly the 61st Tank Brigade, was re-equipped from T-60 light tanks to T-34 Model 1943 tanks in the spring of 1943. As was common in 1943, it was given a two tone camouflage finish of earth brown over the usual dark green factory paint. This unit had been decorated with the Order of the Red Banner, which was painted prominently on the front of the turret. The vehicle is named Stalinets. One of the other tanks in the unit (107) was named Sergei Kirov as shown in the inset drawing, after the prominent Leningrad party official whose murder in the 1930s was the ostensible reason for the Great Purge.



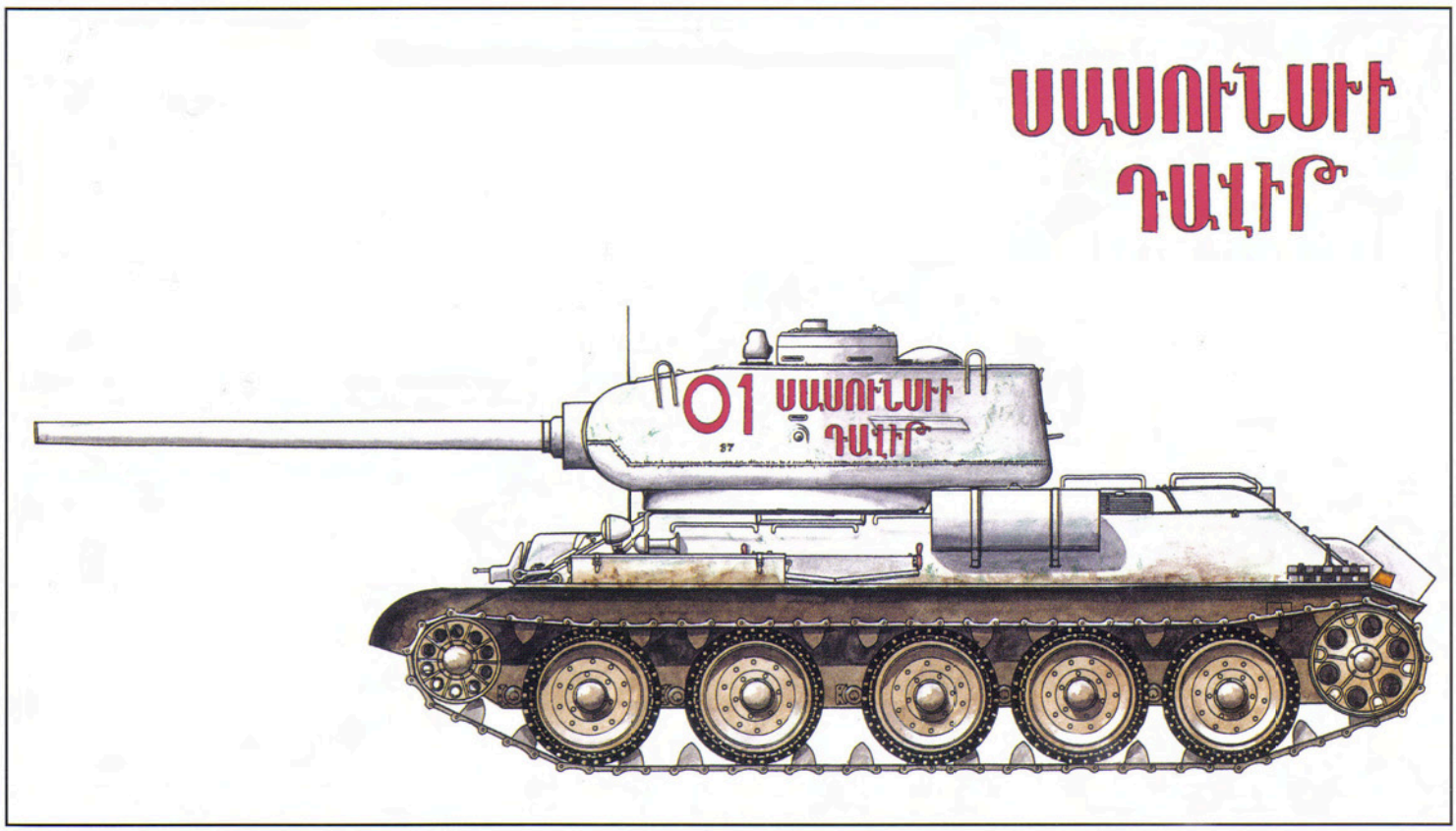
T-34 Model 1943, 2.SS Panzer Division "Das Reich", Operation Citadel, Kursk, 1943

The Das Reich Division made some use of captured T-34 tanks during the summer 1943 fighting. To prevent friendly fire accidents, some of the tanks had side skirts added to make them look more like German tanks. In addition, the German *balkankreuz* was painted prominently on the front sides of the turret. For air identification, a swastika on a white circle was painted on the loader's hatch on the right side of the turret. It is finished in the usual German scheme of RAL 7028 dark yellow with spray painted patterns of RAL 6003 olive green and RAL 8017 red brown.



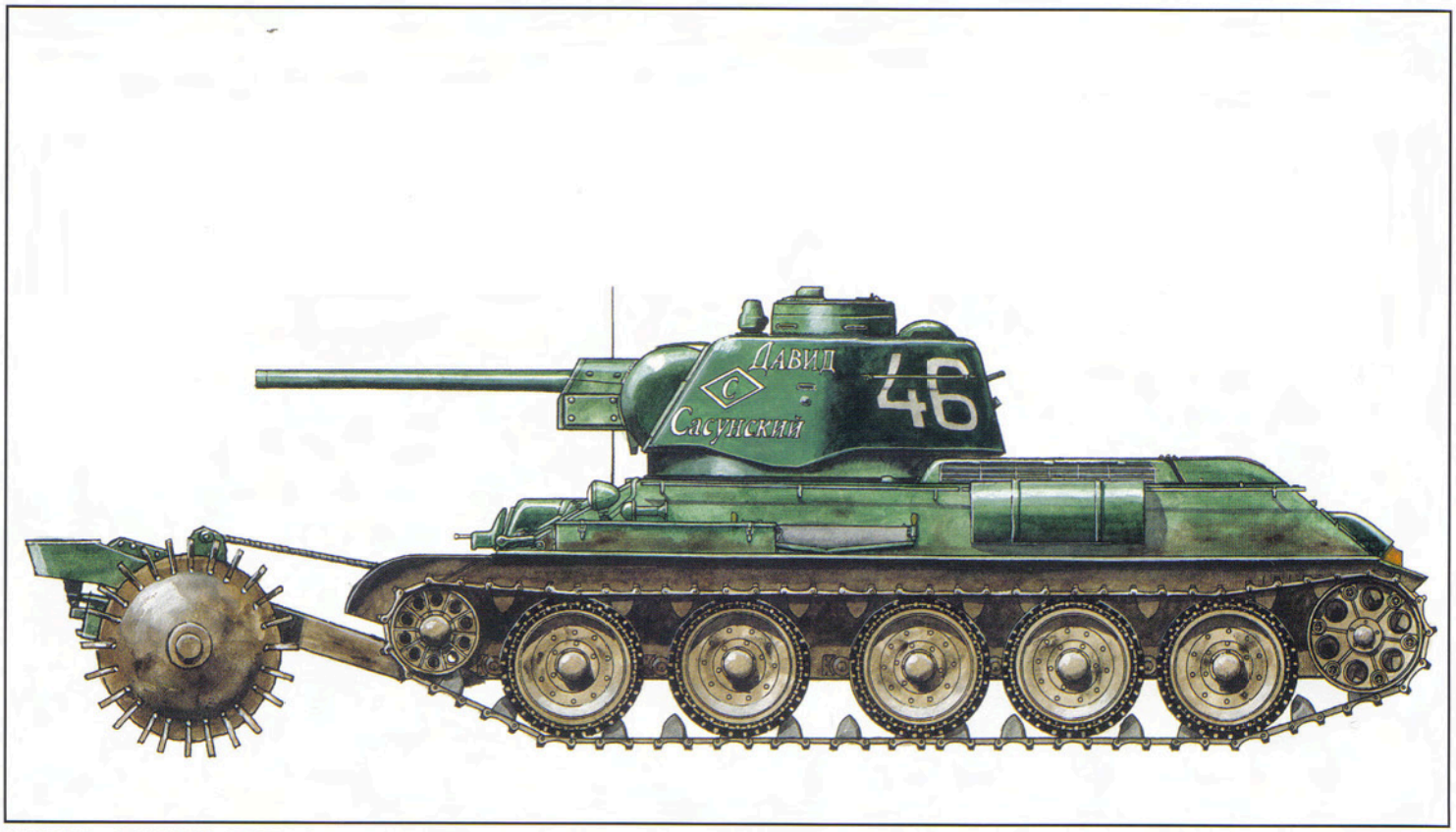
T-34 Model 1943, 30th Guards Tank Brigade, Krasnoye Selo, Leningrad Front, January 1944

This was the first tank to enter Krasnoye Selo near Leningrad during the winter 1944 fighting. The 30th Guards Tank Brigade repainted their tanks in winter white before the offensive, but the markings pattern remained similar. At the front of the turret is the Order of the Red Banner, followed by the vehicle tactical number and the vehicle name, in this case LENINGRADETS in Cyrillic script. In the summer of 1944, this unit was re-equipped with IS-2 tanks and fought with the 2nd Shock Army during the fighting north of Berlin in 1945.



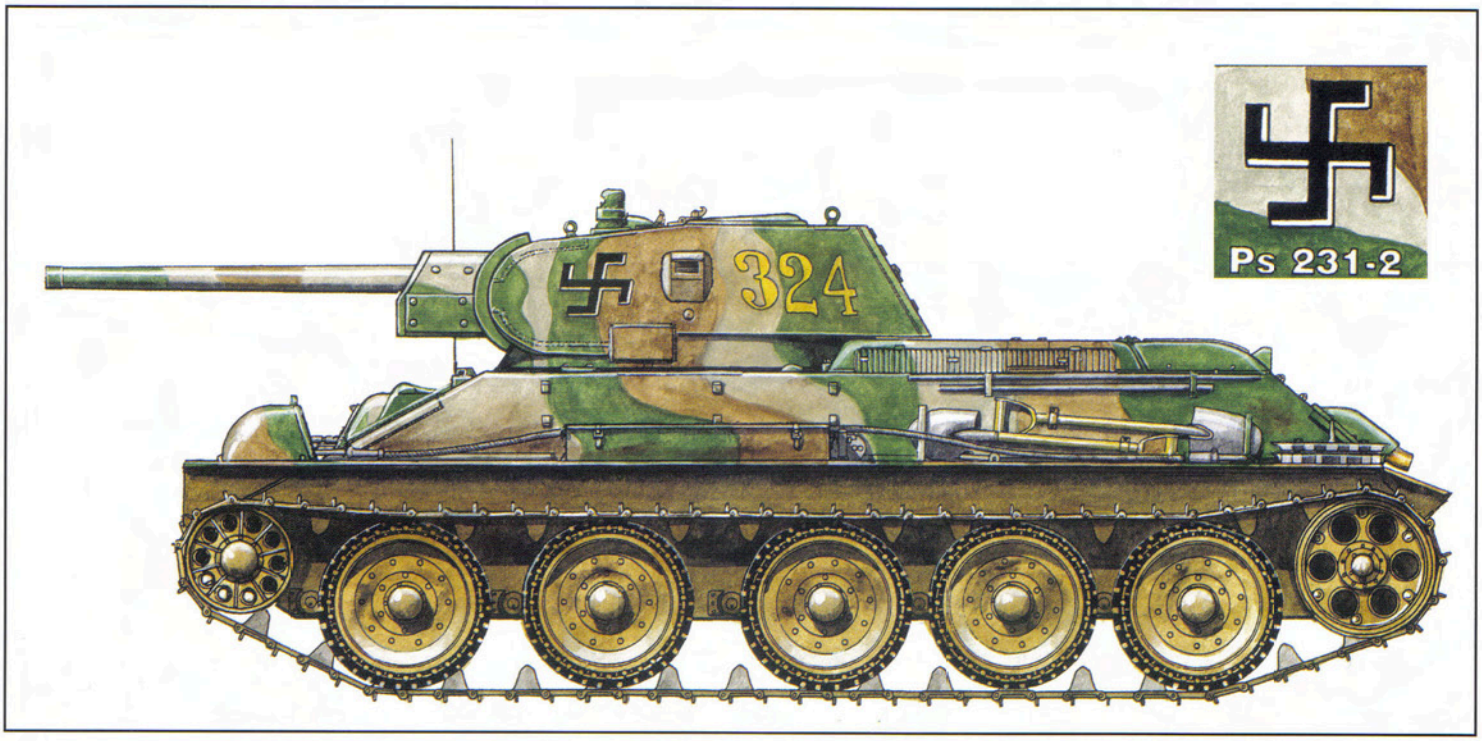
T-34-85 (D-5T), 119th Rifle-Tank Regiment, 2nd Ukrainian Front, March 1944

On 19 March 1944, the 119th Rifle-Tank Regiment became one of the first units re-equipped with the new T-34-85 with the early style D-5T gun mounting. The tanks were purchased by donations from Armenia, and so were named after an Armenian national hero, David Sasunskiy. The name was painted on the tank in Armenian script.



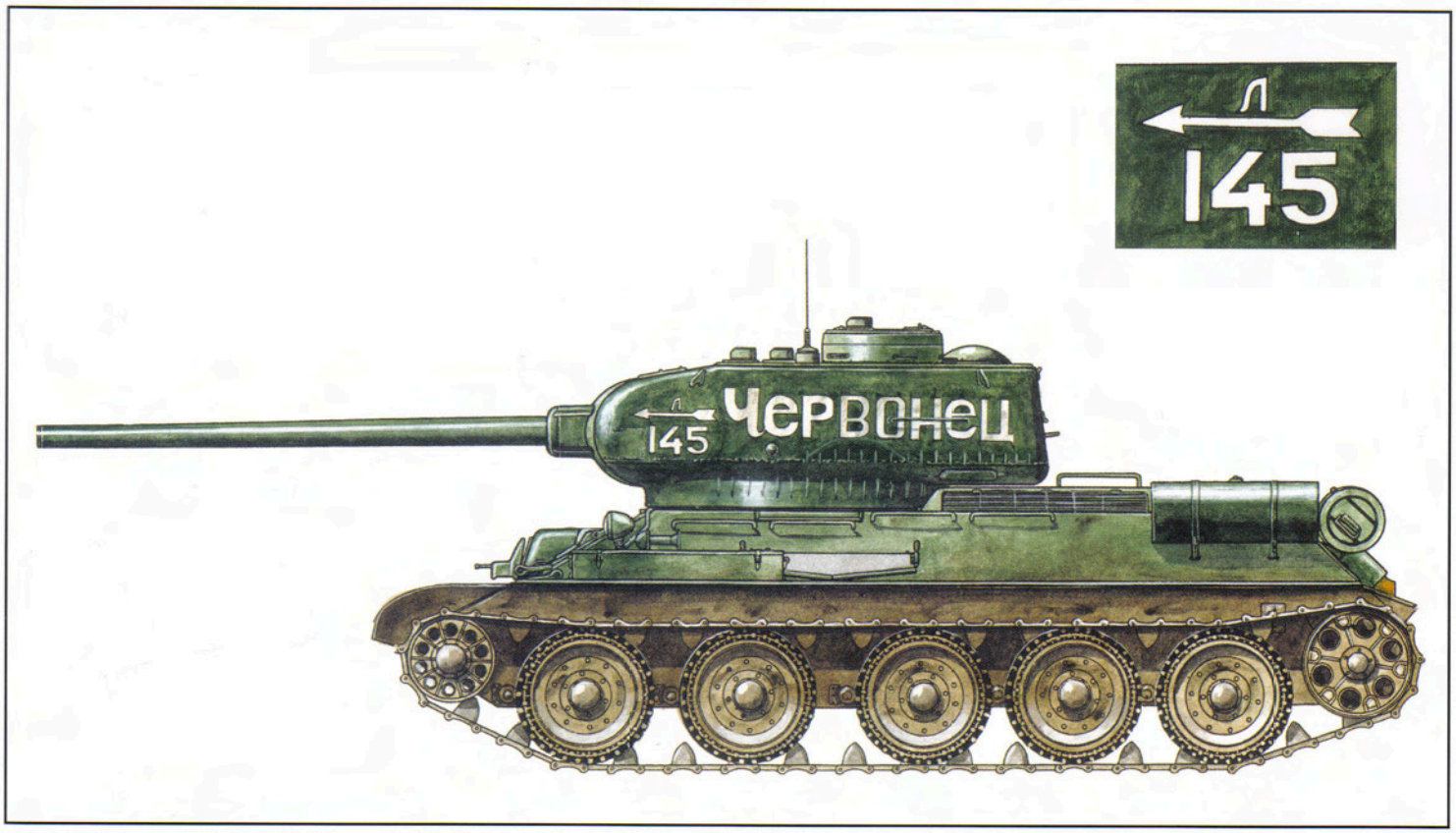
T-34 Model 1943, 119th Separate Engineer Tank Regiment, 1st Baltic Front, Operation Bagration, June 1944

On 26 May 1944, the 119th Rifle-Tank Regiment was re-equipped as an engineer-tank regiment for use in the planned assault in Byelorussia. This unit had previously been equipped with T-34-85 tanks, and so received some new T-34 Model 1943 tanks fitted with mine rollers. This unit had been equipped with tanks paid for by Armenian donations, and named after an Armenian national hero, David Sasunskiy. On the new mine roller tanks, David Sasunskiy was written on the turret in Cyrillic script, rather than in Armenian as on the previous tanks of the unit.



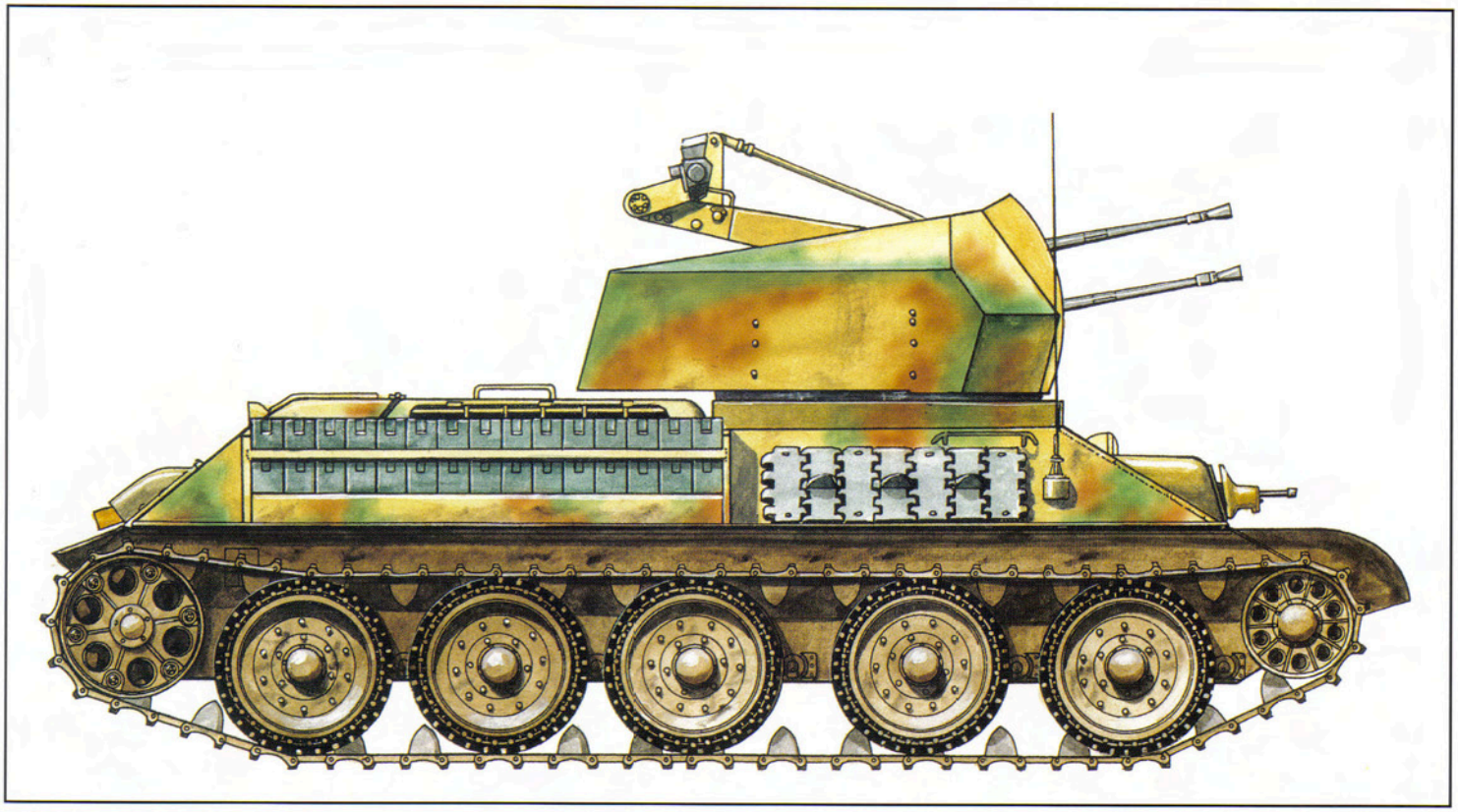
T-34 Model 1941, 3rd Company, 1st Tank Brigade, Finnish Armored Division, Enso, Finland, June 1944

The Finnish Army made use of whatever Soviet equipment it captured in good order. This is a T-34 Model 1941 captured in the 1941 campaign, and refurbished in Finnish workshops. Several changes are evident including the new fenders, and the early pattern Soviet headlights, based on the types used on the T-28 medium tank. This tank is finished in the standard Finnish three tone scheme of olive green (FS 34151), chocolate brown (30117) and warm light gray (36424). The *hakaristi* insignia is carried on both sides of the turret, rear of the turret, and bow (centered between two tow hooks). Although the *hakaristi* resembles the Nazi swastika, its use predates the German insignia. The vehicle serial number is carried on the bow below the *hakaristi* and on the rear hull plate over the rectangular transmission access door. The vehicle also had the number "105" painted in 6 inch high letters immediately under the hull machine gun.



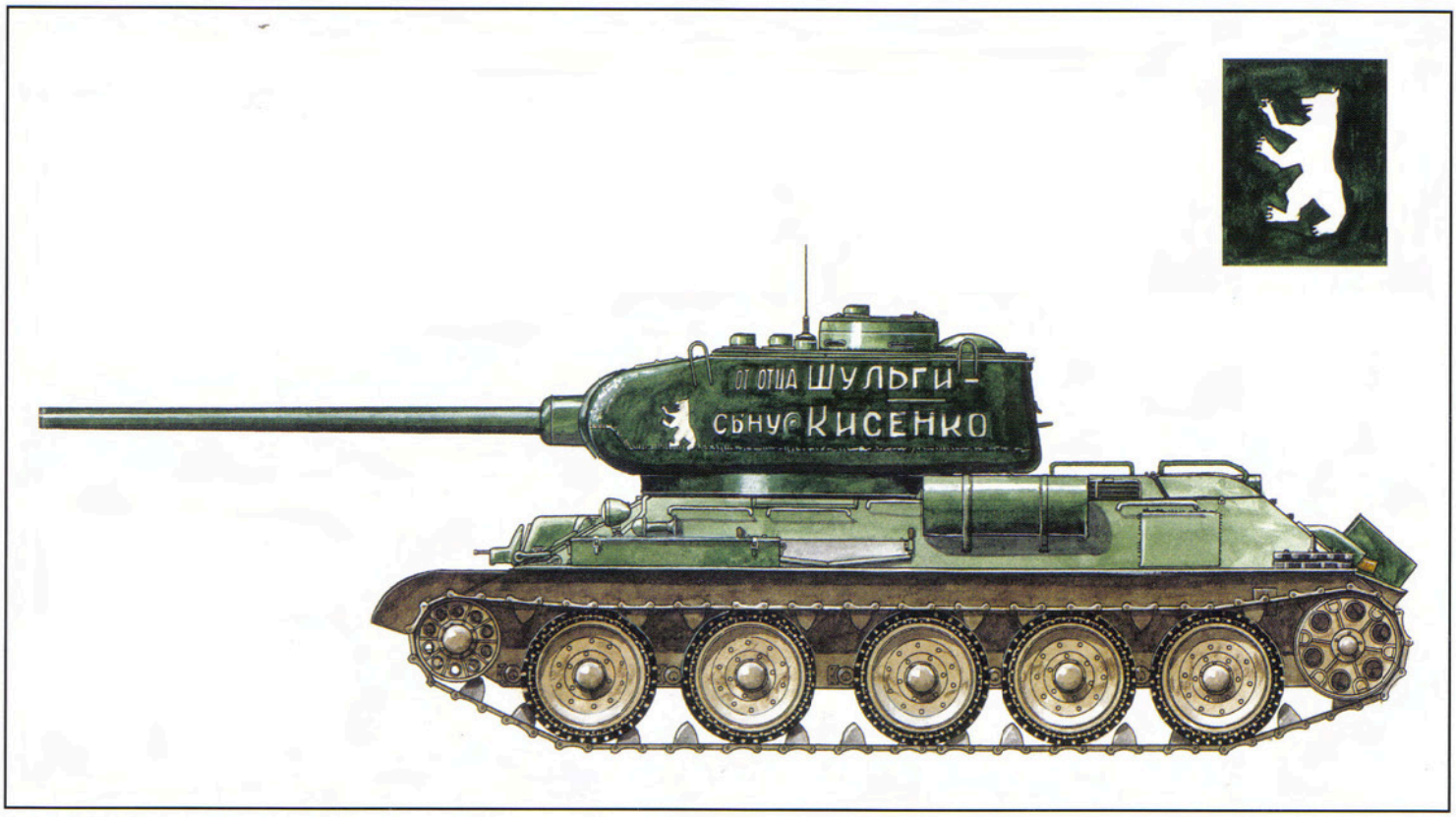
T-34-85 Model 1944, 4th Guards Tank Brigade, 2nd Guards Tank Corps, Operation Bagration, Byelorussia, July 1944

This was the tank commanded by Hero of the Soviet Union Lt. D. G. Frolikov during the Byelorussian campaign. The 2nd Guards Tank Corps adopted the arrow as its tactical symbol, the Cyrillic "L" above it indicating the brigade (after the brigade commander's name, Losik), and the vehicle tactical number below. The vehicle name is Chervonets, the slang expression for a ten-ruble bank note.



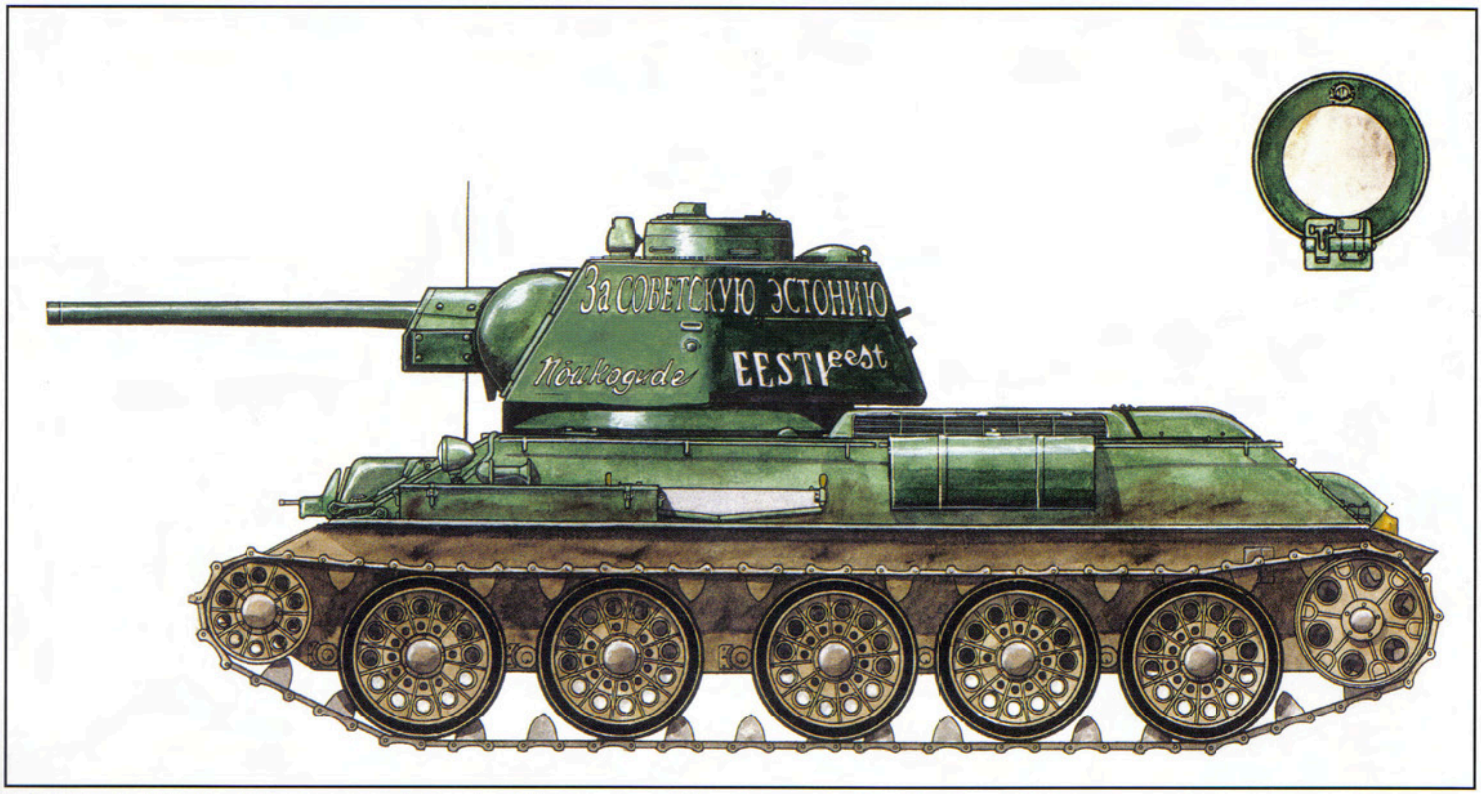
T-34/2cm Flakvierling 38, schw. Pz.Jaeger Abt. 653 (Elefant), Galicia, Poland, summer 1944

During its rebuilding in 1943/1944, this Elefant battalion built an improvised air defense vehicle by combining a T-34 Model 1943 hull with a quad 2cm Flakvierling 38 mount, with a new armor shield. Ammunition was stored in metal cases on a rack at the rear of the vehicle. This vehicle served with the Gruppe Fuhrer section along with a command Tiger tank, and a Bergepanther that had been refitted with a PzKpfw IV turret. It is finished in the usual German scheme of RAL 7028 dark yellow with spray painted patterns of RAL 6003 olive green and RAL 8017 red brown.



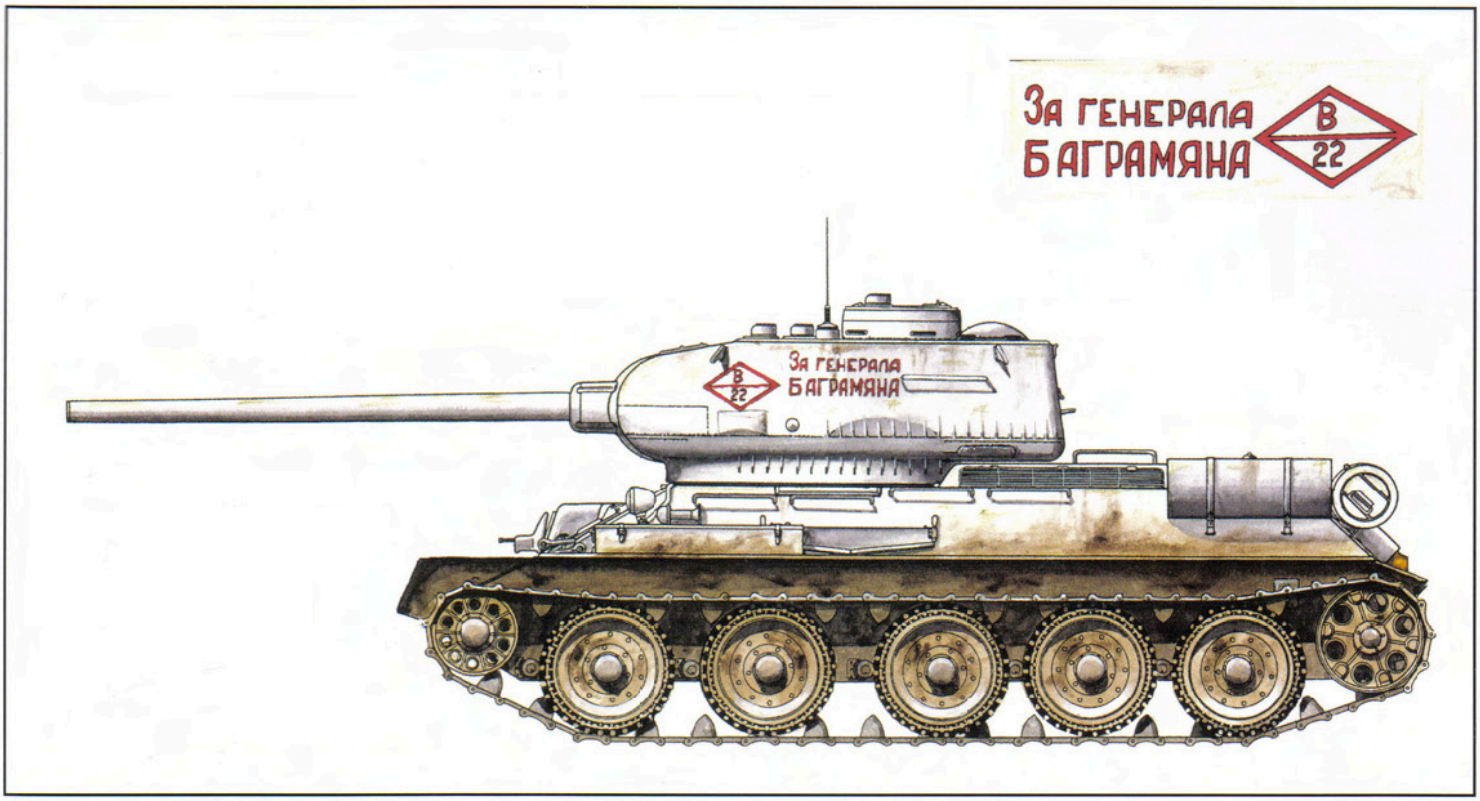
T-34-85, 36th Guards Tank Brigade, 4th Guards Mechanized Corps, Hungary, September 1944

This tank was commanded by Lt. I. A. Kisenko. The tank was purchased in the name of his father, Ya. F. Shulga by his collective farm, the A.S. Pushkin Kolkhoz in Pokrovskiy, Ukraine. This tank was knocked out during fighting for the city of Hatvan on the eastern approach to Budapest on 18 November 1944 and its crew was killed or wounded. The tank was later rebuilt and took part in the August 1945 operations against Japan, ending up on Sakhalin island. The tank retained its inscription during the later fighting. In 1971, the tank was retrieved and sent to Voroshilovgrad, where it was installed as a monument to the 4th Guards Mech. Corps. The 4th Guards Mech. Corps used animal symbols for its brigade insignia, a rampant bear in the case of the 36th Guards Tank Brigade as shown here.



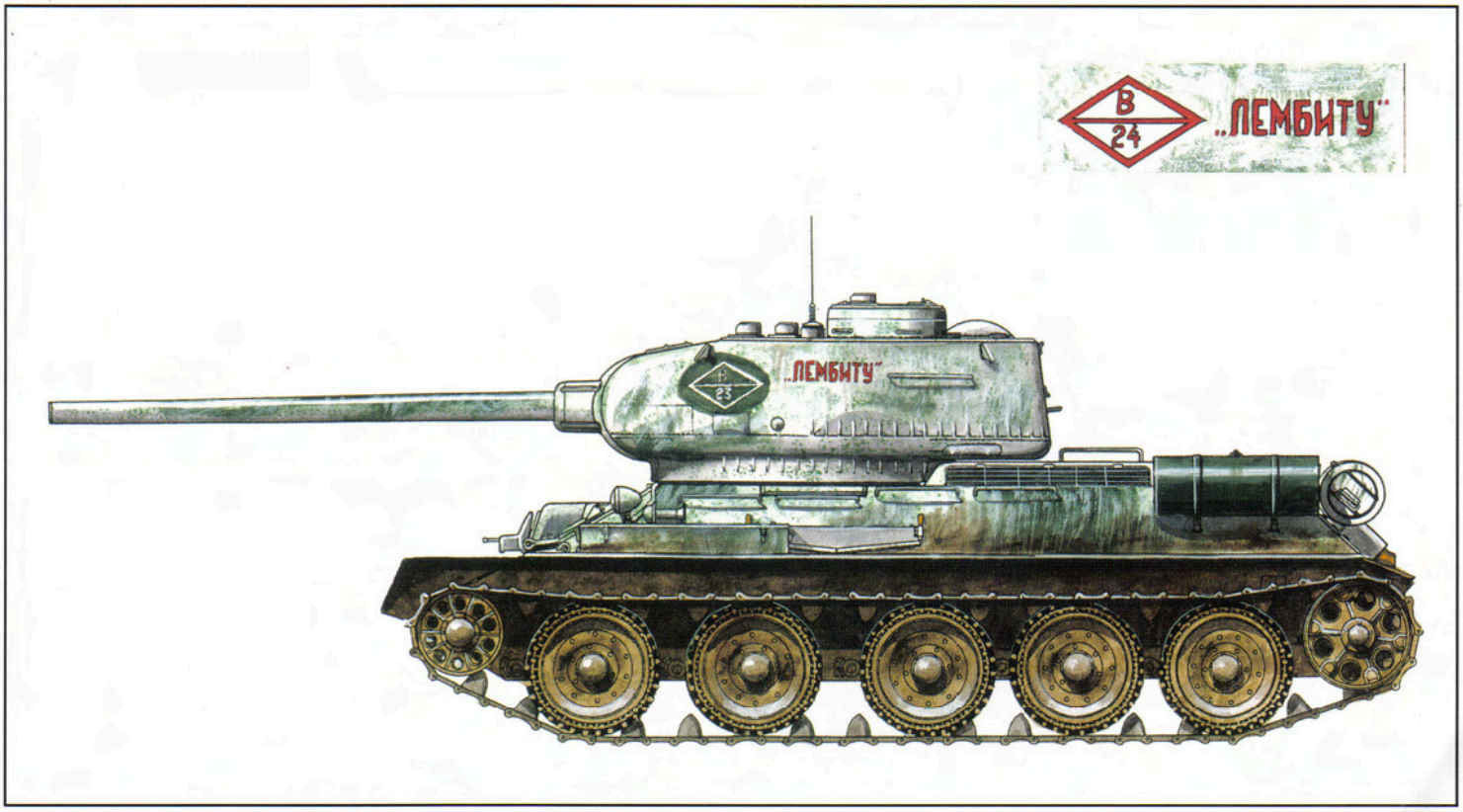
T-34 Model 1943, 45th Sep. Tank Regt., 8th Estonian Rifle Corps, 3rd Baltic Front, Tallin Operation, Autumn 1944

Commanded by Lt. Col. Eduard Kuslapu, and pre-war Estonian communist activist Heimi Rosse, this Estonian tank unit supported the 8th Estonian Rifle Corps in the summer 1944 fighting. Its tanks carried the slogan "Za Sovetskuyu Estoniyu" (For Soviet Estonia) on the top sides of the turret, and "Noukogude Eestieest" (Soviet Estonia) in Estonian below. These markings were painted on all tanks of the regiment, and remained in use through the 1945 fighting in Kurland. The inset drawing shows the hatch insignia, a small circle used for air identification during the Kurland campaign. On other Red Army armored vehicles, this marking was painted much larger, covering much of the roof.



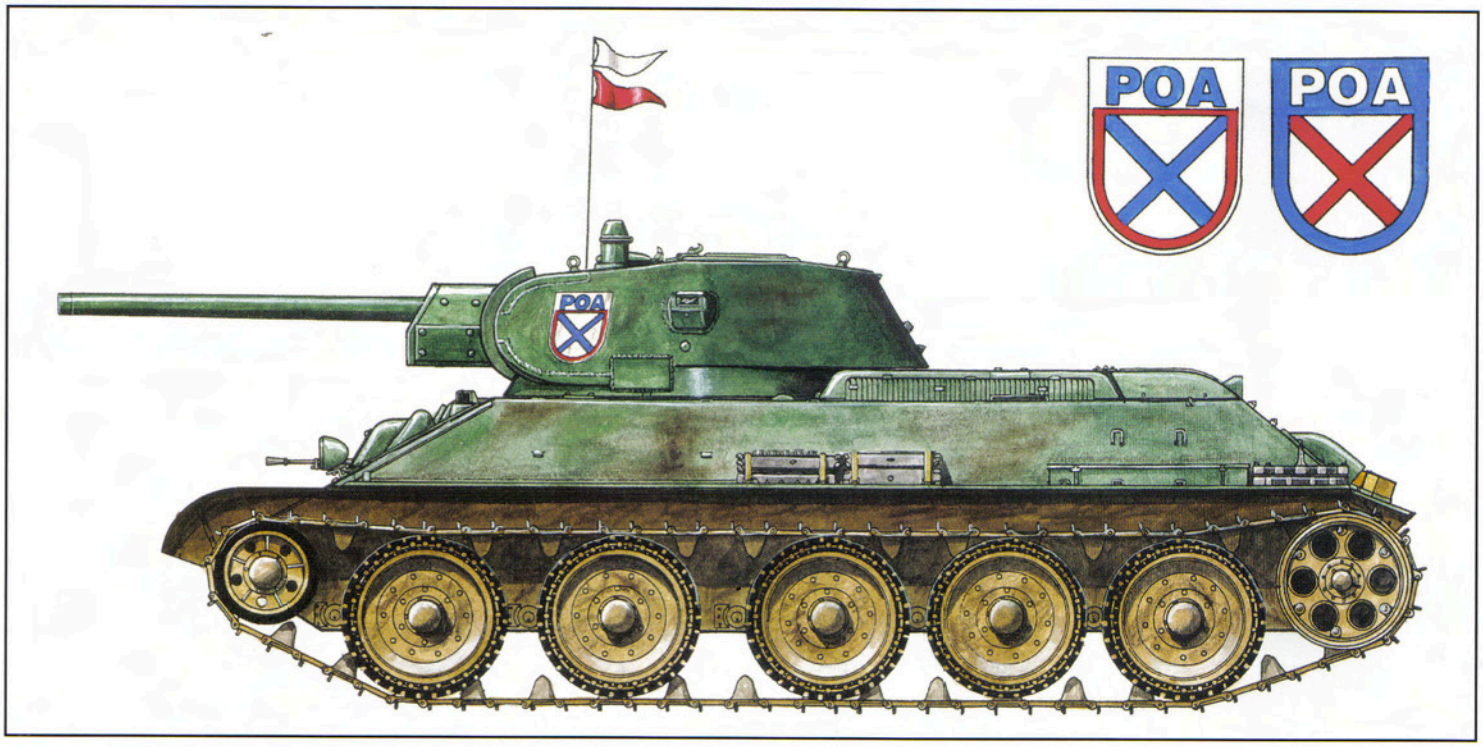
T-34-85, Tank Brigade, 3rd Byelorussian Front, Koenigsberg, East Prussia, January 1945

This tank, commanded by Senior sergeant Ostryakov, is painted in overall whitewash over the usual dark green finish. The slogan on the side of the tank is "Za generala Bagramiana" (For General Bagramian). Bagramian was the famous Soviet marshal who commanded the 3rd Byelorussian Front in 1945 during the East Prussia operations. The divided diamond was a common tactical marking on tanks, due to its relation to a similar insignia used to represent tanks on Soviet military maps. In this case, the upper half carries the Russian letter V, probably indicating the 3rd company (V is the 3rd letter in the Russian alphabet), while the 22 below is the vehicle tactical number. This particular vehicle has the tactical marking on a patch of the base dark green color. In the case of other tanks of this unit, the insignia was painted in red over whitewash as is shown in the inset drawing here.



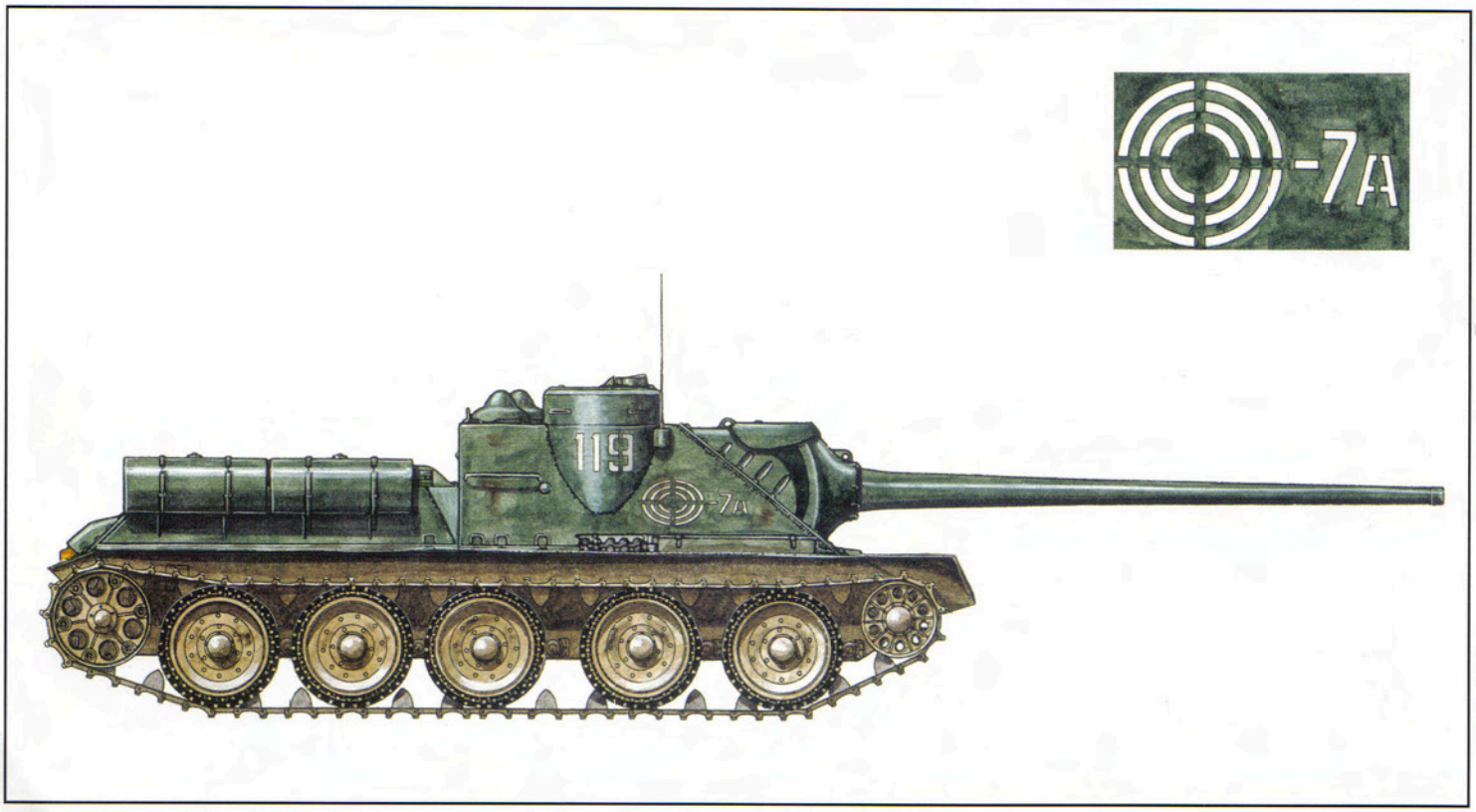
T-34-85, Tank Brigade, 3rd Byelorussian Front, East Prussia, January 1945

This tank was bought by an Estonian committee and named after the Estonian national hero Lembitu, a 13th century warrior who fought against the Teutonic Knights. The overall finish is a scruffy whitewash over the usual dark green finish. The markings consist of the name Lembitu written in Cyrillic script, and a tactical insignia. The tactical marking is essentially similar to that on the above plate, a bisected diamond with the Cyrillic V over the vehicle tactical number 23.



T-34 Model 1941, Kostenko's Reconnaissance Detachment, Vlasov's 1st Division, ROA, Prague, May 1945

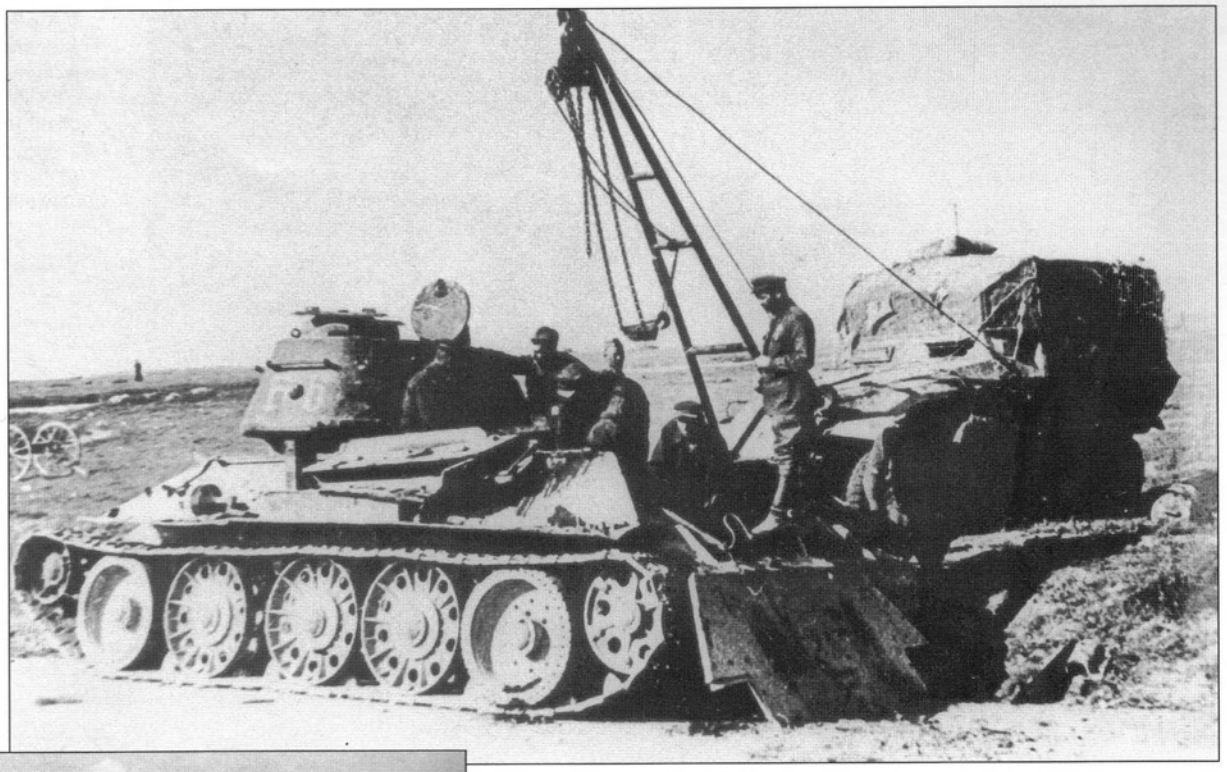
The Russkaya Osvobitelnaya Armiya (ROA-Russian Volunteer Army), better known as the Vlasov Army, was a force organized by the Wehrmacht in 1944 on the basis of captured Red Army troops. Although Hitler was opposed to the formation of allied Russian units, the desperate circumstances in 1945 led to his acquiescence to the organization of the Vlasov forces. At first, the division was equipped with captured Soviet equipment such as this T-34 tank and BA-10 armored cars. They were marked with the ROA insignia seen here, derived from the traditional Tsarist Russian St. Andrew's cross. At least one T-34 Model 1940 was painted with a variation shown on the right with the cross in red. The tanks sometimes carried numbers under the main gun tube on the face of the mantlet cover; in the case of this vehicle, the number was a crudely hand-painted "2". Towards the end of the war, the Vlasov division was in Prague, and with Germany collapsing, the Vlasov forces switched sides, and supported the Czech insurgents. The division also operated Hetzers in Russian colors and other German equipment, but most of the Soviet equipment had the ROA insignia painted out at the time of the Prague fighting.



SU-100 Model 1945, 383rd Guards SP Artillery Regt., 9th Tank Corps, 3rd Guards Tank Army, 1st Ukrainian Front Berlin, May 1945

The new SU-100 tanks destroyers were attached to special Guards formations, and this particular regiment was attached to the 9th Tank Corps for the Berlin operation. It carried the tank corps' insignia, a set of concentric circles, with the code-7A alongside, probably an identification code for this particular regiment. On the commander's cupola side is the vehicle tactical number, 119.

After suffering horrible equipment losses in 1941-42 due to the lack of sufficient repair equipment, by 1943 the Red Army had learned its lesson. Mobile field repair units were set up to recover and repair damaged tanks in the field. This T-34 Model 1943 is being repaired with the help of an improvised armored crane vehicle based on a captured German SdKfz 251 half-track.



The tankers of the 39th Guards Tank Brigade pose in front of a T-34 Model 1943 during the summer of 1943 on the Leningrad Front. This brigade, originally designated the 61st Tank Brigade, had been equipped entirely with T-60 light tanks until the spring of 1943, as these were the heaviest types that could be driven over the frozen Neva river in the winter. The brigade was re-equipped in preparation for offensive operations that summer with T-34 Model 1943 tanks. The brigade tanks were usually painted with the Order of the Red Banner insignia, and this particular tank carries the name Stalinets.

The Germans made occasional use of the T-34 Model 1943. This tank has been repainted in German colors and has had side skirts added in the hopes of making it look less Soviet. There is some dispute about this photo, some sources indicating that it shows a vehicle in Romania in the summer of 1944, while some German sources indicate it is a tank of the 2.SS Panzer Division which fought at Kursk in July 1943. (USNA)

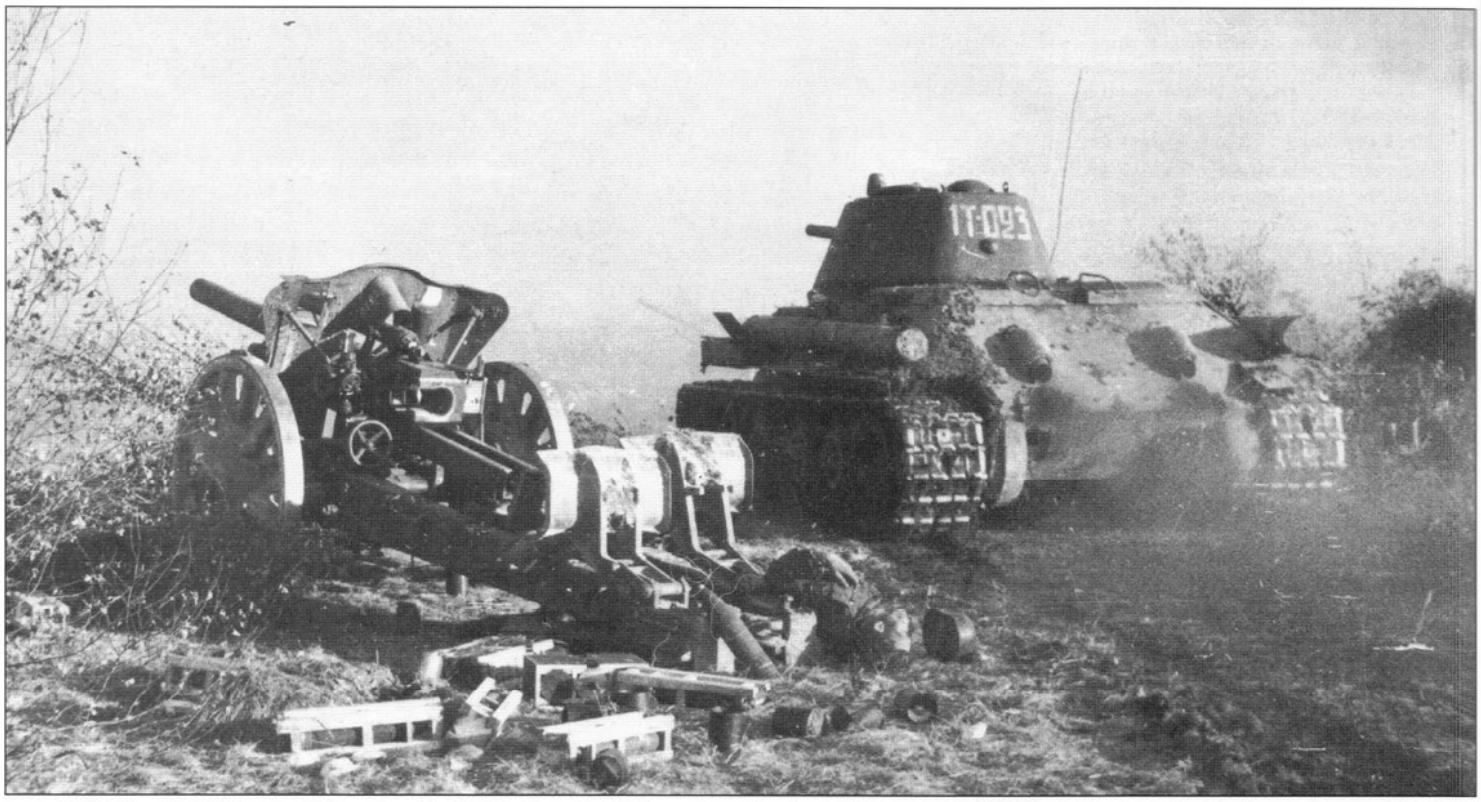
A T-34 Model 1943 with a squad of tank desant moves forward towards a collective farm in the Voroshilovgrad region in 1943. These troops are involved in training, as Voroshilovgrad had already been liberated by the Red Army in February 1943 by the Southwestern Front. (N. G. Kolly)

Another view of a group of tank desant on a T-34 Model 1943 near Voroshilovgrad in 1943. The large log on the side of the tank is used to unditch the tank. There were special attachment points on the track for the crew to lash the unditching beam. (N. G. Kolly)

The success of the German StuG III Sturmgeschutz prompted the Soviets to develop a similar vehicle, the SU-122. This was armed with a 122mm M-30 howitzer in a fixed casemate. These vehicles were intended to provide direct fire support during infantry operations.

An SU-122 in the village of Staritsa, in the Kalinin region in the summer of 1943. A total of 638 of these were built from late 1942 until 1943.

An SU-122 commanded by Lt. Samoylov during the fighting in the Kursk-Orel salient in July 1943. A Red Army combat cameraman looks on while Samoylov discusses plans with his crew. (V. S. Kinelovov)



A T-34 Model 1943 moves forward on the Kalinin Front in 1943 past an abandoned German FH 18 105mm howitzer. The tactical number on the T-34 Model 1943 is somewhat unusual, 1T-023.

A good example of the style of appliqué armor fitted to tanks on the Leningrad Front by rebuilding factories in the city. These T-34 Model 1942s are moving forward on 21 January 1944 during efforts by the 2nd Shock Army to finally lift the siege of the city. There were still significant numbers of old tanks in the Leningrad area, including old model T-34s such as these, T-28s and BT-7s as late as 1944 due to the isolation of the city.

A T-34 Model 1943 of the 30th Guards Tank Brigade enters Krasnoye Selo in January 1944. This was one of the best armor units on the Leningrad Front and later in the year was converted to an IS-2 Stalin heavy tank brigade. Like the rest of the brigade, this tank is marked with the Order of the Red Banner, and is named *Leningradets* in Cyrillic script on the turret side.

The appearance of the German Panther and Tiger tank on the Eastern Front forced the Red Army to develop antidotes. The first of these was the SU-85 tank destroyer, based on the T-34 Model 1943 hull and mounting the D-5S 85mm gun. These began to enter service in modest numbers late in 1943.This particular example is with the Polish 13th SP Artillery Battalion during winter training exercises.

A T-34 Model 1943 and a T-70 light tank of the 144th Separate Tank Battalion during operations on 17 February 1944. These separate tank battalions were generally used to provide support to rifle divisions. Note that the T-34 has no fewer than three wheel types, probably because the first two roadwheels had been blown off by mines. (B. Vdovenko)

Soviet infantry support a tank attack in the Dnestr region on 20 March 1944 during the fighting in southeastern Ukraine. By this stage in the war, the Soviet infantry is heavily equipped with automatic weapons. The nearest troops are all armed with PPSh burp guns, while the rifleman on the left has a German Schmeisser. The tank to the left has a pair of insulated felt boots (*valenki*) hanging on the turret side.

A T-34 Model 1943 with a full complement of tank desant troops drives past a burning Tiger I tank during the savage fighting in southeastern Ukraine by the 1st Ukrainian Front in March 1944. In spite of the poor weather, the Soviets continued their offensive operations with an aim to gain good jumping off points for the much anticipated summer 1944 offensive operations.

The Kursk battles had convinced the Red Army of the need for a better armed version of the T-34. The first of the T-34-85 tanks was manufactured at Krasnoye Sormovo Plant No. 112 in January 1944. There were delays in production of the planned ZiS-S-53 gun, so the first 800 tanks were armed with the alternative D-5T gun as seen here. This early variant can be distinguished from the standard type by the large circular collar at the base of the gun tube. This is one of the early T-34-85 sent to Kubinka for trials in early 1944. (NIIBT Kubinka)

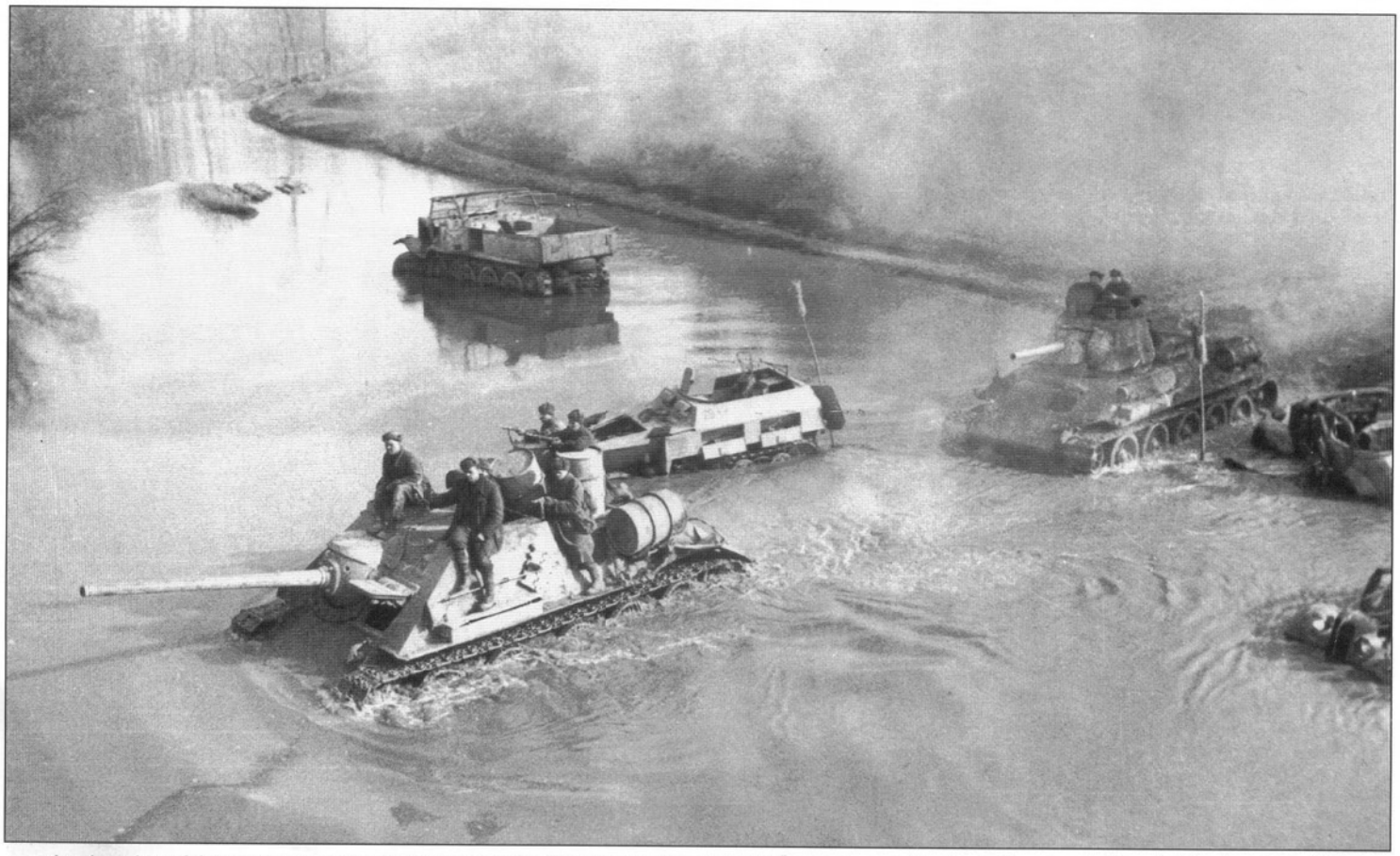
In March 1944, a ceremony was held to turn over tanks to 38th Separate Tank Regiment of the 53rd Army. These tanks were purchased with funds from the Russian Orthodox Church, and the tanks were named after Dimiti Donskoi, the legendary Russian warrior of the 14th century who had vanquished the Tatars in the battle at Kulikovo in 1380. This regiment was a mixed tank/flamethrower unit, and these are OT-34 flamethrower tanks, based on the T-34 Model 1943 chassis.

Metropolitan Nikolai of the Russian Orthodox Church inspects the tanks of the 38th Separate Tank Regiment. These are brand new T-34-85 tanks, among the first issued to Soviet troops in 1944. This unit subsequently was committed to the Umansko-Botoshankskiy operation in late March near the Ukrainian-Romanian border.

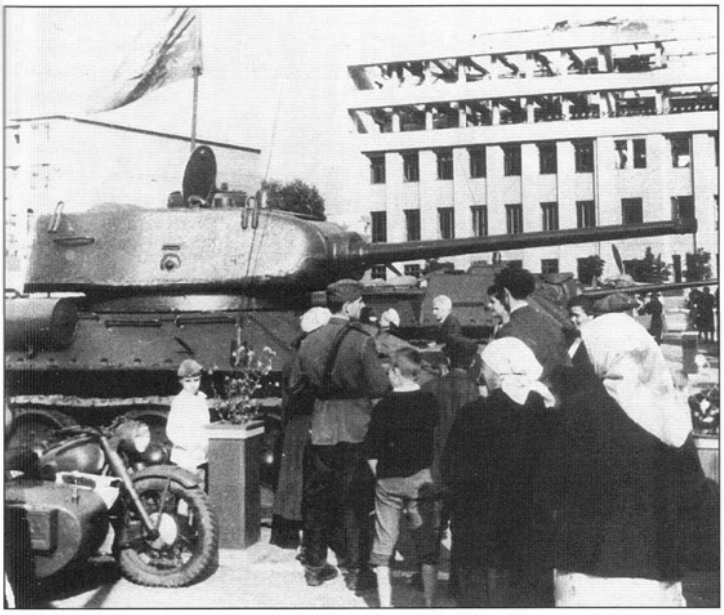
A column of new T-34-85 tanks moves towards the front on 20 March 1944. These tanks were turned over to the 119th Rifle-Tank Regiment the previous day. They carry the name David Sasunskiy on their turret sides, written in Armenian rather than Russian. The tank column had been purchased by donations of Armenian citizens, and the tanks named after an Armenian national hero. (L. Bernstein)

Another view of a T-34-85 of the 119th Rifle-Tank Regiment of the 2nd Ukrainian Front on 20 May 1944. This unit took heavy losses in the fighting in southeastern Ukraine in March-April 1944 and in May it was reorganized as a special tank-engineer regiment to conduct mine-clearing operations during Operation Bagration in Byelorussia. (L. Bernstein)

A mixed column of T-34 tanks and SU-85 assault guns from the 1st Ukrainian Front move down a river embankment while crossing the Dnestr river in the spring of 1944. The T-34 Model 1943 has the new pattern turret with the commander's cupola; the trailing vehicle also has an additional towing shackle added on the rear.



Another view of the same armored column crossing the Dnestr river with an SU-85 assault gun in the lead. The river is littered with abandoned German equipment, including a SdKfz 250 armored infantry vehicle and a derelict 3 ton half-track.



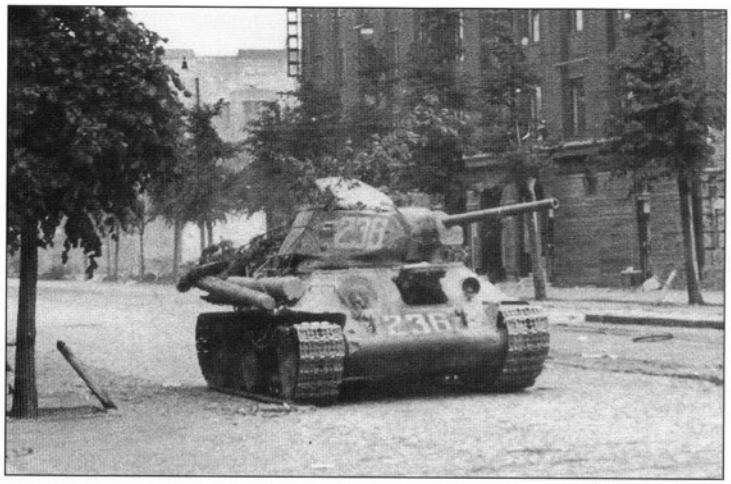
The Red Army holds an equipment exhibition in liberated Kharkov, the original home of the T-34 tank, in the spring of 1944. A centerpiece is an example of the new T-34-85 tank, with the early style turret and D-5T gun.

As the Red Army began to approach the borders of territories seized in 1939-40, greater efforts were made to legitimize these actions. Several units were formed with troops from the Baltic states. These included several tank units, including the Estonian 45th Tank Regiment. This unit was originally equipped with older T-34 Model 1942 tanks as seen during a presentation ceremony in the summer of 1943. However, by the time the unit saw combat in support of the 8th Estonian Rifle Corps in the autumn of 1944, it had been largely re-equipped with T-34 Model 1943 tanks. The slogan on these tanks says "For Soviet Estonia" at the top in Russian, and on the bottom in Estonian.

This is a good example of a late production T-34 Model 1943 with the commander's cupola. The Model 1943 was the most widely manufactured version of the 76mm gun types, and was produced from the spring of 1942 through the spring of 1944. This particular example was captured by the Wehrmacht in late 1943 and was sent to the CKD tank plant in Prague for technical evaluation.

The T-34-85 was first committed to action in March-April 1944 in the fighting in southeastern Ukraine. The initial version with the expedient D-5T gun mounting was quickly supplanted by the standard version with the ZiS-S-53 85mm gun as seen here. The original vehicles, manufactured in April 1944, still had the unusual upside-down "U" hooks on the turret, but the turret had several new features. The new gun can be distinguished by the different type of collar, and the commander's cupola has been pushed back further on the turret roof due to the introduction of a new articulated gunner's telescopic sight.

Although the T-34-85 was appearing in combat elsewhere on the Eastern Front, in the Leningrad sector, older tanks continued to be used in some numbers. This is an old T-34 Model 1941 serving with the 21st Army of the Leningrad Front after the city was captured from the Finnish Army on 20 June 1944. Strangely enough, this tank has been fitted with a cupola from a German PzKpfw III or PzKpfw IV tank!



Another tank from the same unit is seen on the streets of Vyborg on 20 June 1944. This is a war-weary old T-34 Model 1942- note that it is missing its number 2 and 4 road-wheels. All the tanks of this unit carried the three digit tactical number on the glacis plate as well as on the turret sides. (Suchatov)

Lt. M. Levshukov, tank commander of an older T-34 Model 1942 prepares ammunition prior to combat on 18 June 1944. This is the usual drill: the ammunition is fuzed, line-up and inspected before being loaded into the tank through the driver's hatch. This is probably a tank of the 24th Tank Regiment. (B. Vdovenko)

T-34 Model 1943 tanks move down the shattered streets of the Byelorussian city of Mogilev on 28 June 1944 during Operation Bagration. The Soviet summer offensive in Byelorussia was the single greatest defeat of the Wehrmacht on the Eastern Front in World War II, with 17 divisions annihilated and 50 other divisions put out of action. These are probably tanks of the 43rd Guards Tank Brigade of the 49th Army, commanded by Col. Mikhail P. Lukashev; the third vehicle in the column is a SU-85 of the 722nd Assault Gun Regiment. To the left is a Lend Lease Dodge 3/4 ton truck.

The attacks in Byelorussia were led by several special tank-engineer regiments equipped with PT-34 trawl tanks. These trawl tanks pushed heavy roller assemblies in front of themselves which detonated any mines in the way. This was one of the most hazardous missions of the offensive, as the German front lines were fortified with reinforced concrete bunkers and plenty of anti-tank guns.

Tanks of the 24th Tank Regiment, 46th Mechanized Brigade commanded by Col. Nikolai Manzhurin during the offensive in Byelorussia with the 1st Baltic Front on 18 July 1944. The tactical markings on this unit's tanks consist of the two digit tactical number in yellow and a white star. The star insignia is unusual; Soviet vehicle did not commonly use the red star except during peacetime. (B. Vdovenko)

Tank crews of the 24th Tank Regiment, 46th Mechanized Brigade are given instructions during Operation Bagration in June 1944. This unit was called the 46th Dukhovinskaya Brigade for its role in the liberation of Dukhovshchina on 19 September 1943. (B. Vdovenko)

Tanks of the 24th Tank Regiment, 46th Mechanized Brigade moving forward during the Byelorussian operations in July 1944. These independent mechanized brigades were not standard units in the Red Army, and were usually placed under front command for special missions, especially deep penetration raids. They were a mixed tank/infantry formation. (B. Vdovenko)

A T-34 Model 1943 of the 2nd Baltic Front moves forward towards Revel during operations in the summer of 1944. This is a relatively old vehicle with few of the 1943/44 features. The suspension is a hodge-podge of wheels, even including an old Model 1941 idler wheel!. The turret tactical number is D003. (V. Grebnev)

A T-34-85 of the 2nd Guards Tank Corps enters Minsk on 3 July 1944. The 2nd Guards Tank Corps had raced ahead of the other formations closing in on Minsk by bypassing the heaviest concentrations of German forces east of the city. The tanks of the 2nd Guards Tank Corps can be easily distinguished by their use of the white arrow design, partly visible under the boots of one of the soldiers on the turret.

Soviet tankers take a breather and talk to the local women during the summer 1944 offensive. The crew wears the usual one piece coverall. This was officially supposed to be black, but it also appeared in dark blue and even khaki.

A T-34 Model 1943 moves forward after having knocked out a German PzKpfw IV tank during the Lvov-Sandomierz offensive in late July 1944. This vehicle is heavily laden with spares including at least two crates of 76mm ammunition, and a spare drive sprocket on the left hull side. This tank carries the box-style rear fuel tank rather than the later cylindrical style. (G. Konovalov)

The 4th Guards Mechanized Corps of the 3rd Ukrainian Front moves into Romania on flatcars during the late summer of 1944. This is captured German rolling stock, as Soviet rolling stock could not operate on the narrower guage track in Romania. Aside from the T-34 Model 1943 on the lead car, the cars behind include a GAZ-AA truck, a captured German truck, and several SU-85 of the corps' 292nd Guards Assault Gun Regiment. (O. Lander)

The tanks of the 4th Guards Mechanized Corps off-load at a siding in Romania in the summer of 1944. This is probably in late August after Romania had switched sides, as there are several Romanian soldiers evident in the background. Note the PPSh burp gun stuck in the turret hand-hold. (O. Lander)

Another view of the 4th Mechanized Corps moving off the rail cars. This unit participated in the Iassi-Kishniev operation in Romania, ending up later in the year in Yugoslavia.

A detail view of the tank of Lt. Col. Vaynovskiy, of an unidentified tank brigade of the 1st Baltic Front, during operations in Byelorussia in the summer of 1944. The tactical insignia on the turret is probably the brigade's tactical insignia. (Bezrodniy)

A T-34 Model 1943 tank of the 13th Guards Mechanized Brigade, 4th Guards Mechanized Corps during operations on the 3rd Ukrainian Front in Romania in the late summer of 1944. The tank is undergoing repairs from a mobile repair vehicle. It would appear that the repair team is welding on the front mud guard.

A T-34 Model 1943 passes by a column of GPA (amphibious jeeps) during the 3rd Baltic Front's liberation of the Lithuanian capitol of Vilnius on 13 July 1944. This tank is fitted out as a PT-34 mine roller. It has the yoke for the mine rollers attached, but the wheels themselves are not fitted. Usually, the tanks moved into the assembly area without the roller wheels and they were carried separately on trucks until the needed to be attached. The amphibious jeeps were generally used by Soviet *razvedchik* scout units to secure small bridgeheads in advance of the main body of troops.

A Tiger I Tank uses the hulk of a burned out T-34-85 (D-5T) during the summer 1944 fighting. The T-34-85 has its gun in complete recoil which suggests that the gun's hydraulic recoil system failed.

`By August, the Red Army had reached central Poland and was on the banks of the Vistula river south of Warsaw. Several substantial bridgeheads were seized on the western bank, at first using ferries and pontoon bridges to move the tanks across. Here, a T-34 Model 1943 waits its turn for the trip over the river. (G. B. Kapustianskiy)

Polish troops of the LWP (Polish Peoples Army) were committed to the Vistula bridgehead fighting, especially around Studzianki. This is a Polish SU-85 assault gun of the 13th Assault Gun Regiment, well camouflaged with brush.

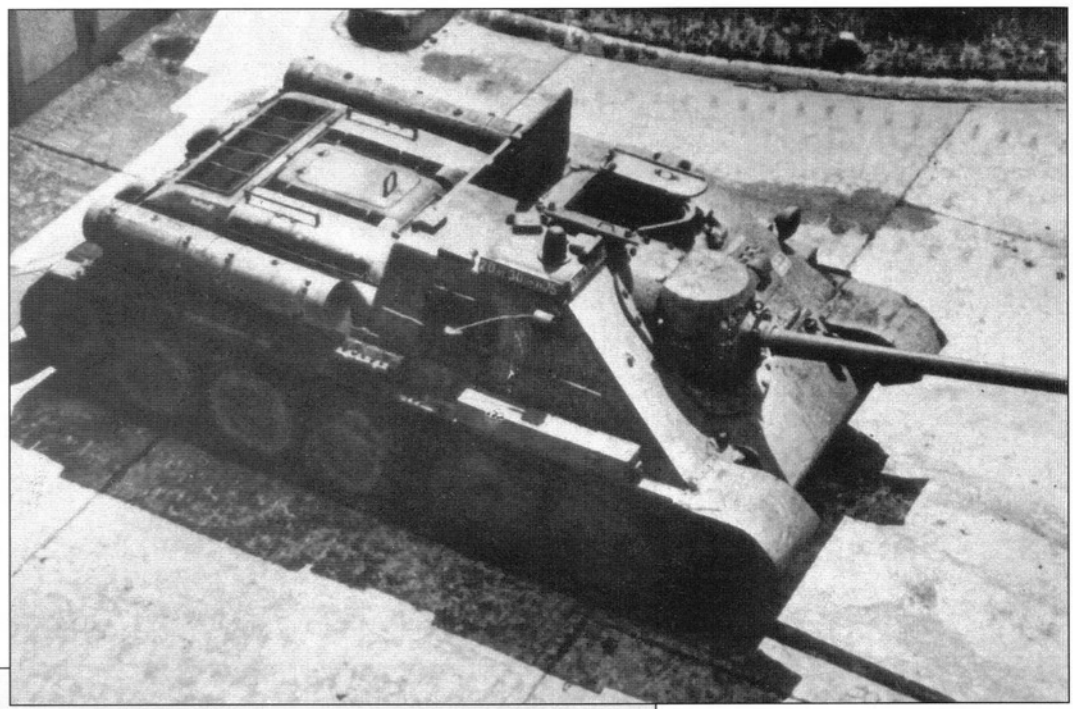
The Germans launched several large counterattacks against the Soviet inroads in Poland, especially in the Warsaw area. Soviet tank forces, overextended from the two month offensive, took heavy losses. This is a T-34-85 with the features usually found on those built at the Nizhni Tagil Plant No. 183, notably the turret with the flattened side. This is a spring 1944 turret, still showing the fairing around the right turret side pistol port.

Tanks of the Polish LWP's 2nd Tank Regiment, 1st Armored Brigade are ferried across the Vistula River to support operations against the Hermann Goering Panzer Division in the Studzianki bridgehead on 10 August 1944. Deck space was precious, so the unit's jeep has been loaded on to the engine deck of one of the T-34 Model 1943 tanks. This particular tank (236) was built at Krasnoye Sormovo Plant No. 112 in Gorki. After surviving the intense summer fighting, it was knocked out during the battle at Zabin on 19 February 1945.

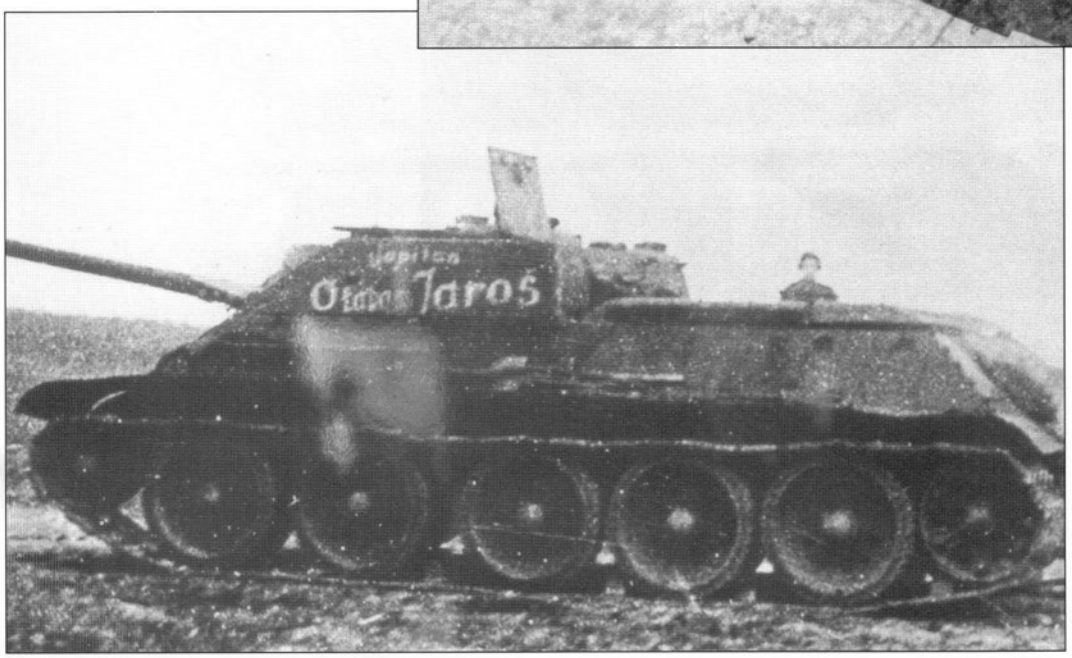
The crew of a tank of the 18th Guards Tank Brigade, 3rd Guards Tank Corps ride outside their vehicle as it passes through a birch forest on 16 September 1944. This unit fought as part of the 5th Guards Tank Army, and took part in the summer 1944 Operation Bagration and the campaign in Poland. During September, it was being husbanded in Poland and gradually rebuilt in anticipation of the forthcoming winter offensive. (B. Vdovenko)

A T-34-85, possibly of the 3rd Guards Tank Corps, in Poland in the summer of 1944. Behind it is a column of GPA amphibious jeeps. These Lend Lease vehicles were extremely popular with Soviet advance units due to the many water obstructions encountered in the summer offensive. The GPAs were sent in the lead to secure bridgeheads or to hunt for fords shallow enough for the tanks to cross. (B. Vdovenko)

The heavy losses suffered by the Wehrmacht in 1944 made it more susceptible to desertions. This is a T-34 Model 1943 converted as a propaganda vehicle with loudspeakers in armored containers on the fender. This tank was sent near the front lines with volunteers from amongst German POWs in an effort to encourage further desertions.



This is a good overview of the SU-85 in its standard configuration. As is evident from this view, the SU-85 carried four external fuel cylinders rather than the 3 usually carried on tanks at this time. The final production batch of 315 SU-85M assault guns was built on a modified superstructure that was developed for the succeeding SU-100 with an enlarged commander's cupola.



Besides its use in the Polish LWP, the SU-85 also saw combat with the Czechoslovak 1st Armored Brigade. This rare photo shows one of these vehicles, named "Kapitan Otakar Jaros" after a Czech hero. In Czechoslovak service, the SU-85 was commonly called the SD-85. (Prague Military History Institute)

Another allied force to use the T-34-85 was the Yugoslav 2nd Armored Brigade, raised in the Soviet Union in 1944. Here, a T-34-85 from the unit enters Belgrade on 20 October 1944, the slogan "On to Berlin" being written in Croatian.

River crossing is one of the greatest military challenges, especially with tanks. On 27 November 1944, Tolbukhin's 3rd Ukrainian Front seized bridgeheads over the Danube near Sombor during the fighting in Hungary. This is the view from a T-34-85 as tanks are ferried across the river. (Losik)

A view from the top of a T-34-85 as tanks of the 3rd Ukrainian Front are ferried across the Danube. These tanks were used to support the attacks by the 57th Army and 4th Guards Army, which reached the shores of Lake Balaton within a week. (Losik)

After the stunning victories of July 1944, the 2nd Guards Tank Corps took a heavy beating during fighting in East Prussia. Here a T-34-85 of the unit lays burned out with German half-tracks in the background. The unit's tactical insignia consisted of a white arrow with a Cyrillic letter above it, in this case "B". This marking identified it as part of the 25th Guards Tank Brigade, and the tactical number identifies it as belonging to the 2nd battalion.

Another victim of the intense fighting in East Prussia. This T-34-85 is a late spring 1944 production vehicle from Nizhni Tagil. This is evident from the fairing over the turret side pistol port, as well as the absence of the bulge on the turret side characteristic of tanks produced later in the summer. The bulge was the result of the addition inside the turret of an electric turret drive.

In the summer of 1944, the Red Army began trials of the new T-44 tank. This vehicle used a turret very similar to that on the T-34-85 tank, but the hull was completely redesigned to take advantage of the lessons of the fighting. This is the second prototype during trials at Kubinka in the summer of 1944. This vehicle had a driver's hatch that extended down over the glacis plate. This feature was removed on later vehicles as it adversely affected the front armor protection. (NIIBT Kubinka)

This is the third prototype of the T-44 at Kubinka in the summer of 1944. On this vehicle, the driver's hatch has been moved entirely to the top of the hull roof and the turret moved back on the hull slightly to accommodate it. Later in 1944, the designers also investigated upgunned versions, the T-44-100 with the D-5T 100mm gun, and the T-44-122 with the 122mm D-25T gun. (NIIBT Kubinka)

This is a side view of the second prototype of the T-44. Although the turret is similar to that on the T-34-85, it is by no means identical as is evident in this view. A total of 965 were built in 1944-45. The first three tank units were formed on the T-44 on 15 September 1944, the 6th Guards, 33rd Guards, and 63rd Guards Tank Brigades. However, units were organized to train troops on the new tanks. Due to prolonged teething problems with the tanks as well as a desire to keep the new design secret, no T-44s were used in combat in 1945. (NIIBT Kubinka)

In January 1945, the Red Army initiated its Vistula-Oder offensive which took it from central Poland into eastern Germany. This is a T-34-85 of the 3rd Byelorussian Front which was on the northern flank of the attack, moving against the German 3.Panzer Armee in East Prussia. The tactical marking on this tank is typical for this period, with the upper number in the diamond being a unit code, and the lower number being the vehicle's tactical number.

A column of T-34-85 tanks of the 3rd Byelorussian Front moving through a destroyed town in East Prussia in January 1944. Resistance in East Prussia was especially fierce as it was the first portion of Germany to fall into Soviet hands. The Soviets responded by using their preponderant advantage in artillery to pulverize objectives rather than waste more personnel. Although the Red Army was notoriously profligate with their expenditure of human lives in the first years of the war, by 1945 greater skill and a vastly reduced pool of young men made Soviet commanders much more prudent.

A T-34-85 tank from an unidentified tank unit of the 3rd Byelorussian Front during the fighting for the key port of Koenigsberg, in East Prussia, January 1945. This tank, commanded by Senior sergeant Ostryakov to the left has the marking on the side of the tank "Za generala Bagramiana" (For General Bagramian). Bagramian was the famous Soviet marshal who commanded the 3rd Byelorussian Front in 1945 during the East Prussia operations. (Soroka)

A column of T-34-85 supporting the 65th Motor Rifle Brigade of the 31st Tank Corps moves through Tost, Silesia on 22 January 1945 after the town was captured by the 21st Army, 1st Ukrainian Front during battles with the Wehrmacht's 4.Panzer Armee. Note that the commander in the lead tank has a DP "record player" light machine gun in front of him, probably from the tank desant squad on the tank.

A pair of SU-100 tank destroyers of the 384th Guards Heavy Assault Gun Regiment, 7th Guards Tank Corps enters Landsberg, Silesia during the Samdomierz-Silesia offensive by the 1st Ukrainian Front on 21 January 1945. The January offensive was the first time that the SU-100 tank destroyers were committed. They were the most powerful version of the T-34 tank fielded during the war.

The 1st Polish Army took part in the January offensive alongside the 1st Byelorussian Front, eventually participating in the liberation of Gdansk and the Polish Baltic coast. Here, a winter camouflaged T-34-85 of the chief of staff of the 1st Polish Armored Brigade rests in Wal Pomerski in Pomerania in February 1945. The Polish communist insignia, the Piast eagle, is evident on the front of the turret side.

A T-34-85 tank brigade moves forward during the advance by the 2nd Ukrainian Front into Austria in April 1945. These tank units had been involved in bruising tank battles with the Germans around Budapest, but German resistance was finally overcome in the early spring. (Bernshtein)

A T-34-85 tank of the 1st Ukrainian Front moves towards Berlin along the autobahn in April 1945. The wooden crates on the engine deck are additional 85mm ammunition. The cloth air identification panel on the rear is unusual in that the Red Army was supposed to use a white painted cross on the tank roof for Allied air recognition. It is possible that some units used the Anglo-American air identification method- an orange panel.

T-34-85s in a 2nd Byelorussian Front attack in Hungary in the early spring of 1945. Note the lack of helmets on the Soviet infantry- Soviet commanders had a difficult time convincing infantry to wear helmets, which were far less comfortable than the usual fur caps, especially in cold winter months.

A SU-85 of the Polish 13th Assault Gun Regiment in Germany in 1945 with the unit mascot, a stuffed dog, on the gun barrel. This is the vehicle of the commander of the 3rd battery, evident from the vehicle tactical number 330. The slogan on the wall says" Polish Soldiers Advance on Berlin".

A column of troops from the 2nd Motorcycle Battalion during the advance into Germany in April 1945. The Polish *rogatywka* square corner forage cap could be mistaken for the German forage cap when it lost its shape as is evident here.

A T-34-85 of the 1st Platoon, 2nd Motorcycle Battalion of the 1st Polish Army. Although nominally a motorcycle reconnaissance unit, this battalion was equipped with tanks to carry out its scouting missions.

A SU-85 of the Polish 13th Assault Gun Regiment in late April 1945. This is a rare example of a vehicle carrying both styles of air identification marking. The April marking was a white band around the turret, or in this case the superstructure. In late April-early May this was supposed to change to a large white triangle, as German tank units had begun to paint the recognition sign on their own vehicles. The white triangle marking is evident on the hull side below the radio pot.

The T-34-85 commanded by Sr. Lt. M. Anikanov, with the 2nd Byelorussian Front in Austria in April 1945. The unit tactical sign is K followed by a circled 3, and the vehicle's tactical number is 3193. (L. Bernshtein)

A T-34-85 of an unidentified Red Army unit moves into Germany in 1945. The lead tank appears to be a factory rebuild, as the hull is clearly from an earlier production tank with the rounded hull fillet. This practice was common through the war, as recovered tank wrecks were sent back to special rebuilding plants which would swap parts from various tank hulks to create a single workable tank.

Red Army Troops celebrate their advance into Berlin. In the background, the sign says "Berlin remains German".

A T-34-85 crew savors the victory in front of the devastated Reichstag building. The bedsprings were intended to offer protection against German *Panzerfaust* and *panzerschreck* anti-tank rockets. Although some units appropriated bed springs from German homes, there is some new historical evidence that suggests that the Red Army manufactured some of these screens in the spring of 1945 specifically for this purpose.

An SU-100 Model 1945, of the 383rd Gds. SP Artillery Regt., 9th Tank Corps, 3rd Guards Tank Army, 1st Ukrainian Front, in Berlin, in May 1945. This is an awards ceremony some time after the fighting judging from the signs that have been prepared proclaiming "Glory to the Soviet soldiers…"

While the Red Army was finishing its capture of Berlin and its environs, fighting continued south around Prague. This is a Polish T-34-85 of the 2nd Motorcycle Battalion, 1st Polish Armored Corps near the Zrawca river in Czechoslovakia in May 1945. This is a later 1944 production tank, evident from the side turret bulge under the number 240 on the turret. This bulge accommodated the new turret electrical traverse motor.

One of the first three Soviet tanks into Prague was this one, number 1-24 command by Lt. I. G. Goncharenko, of the 63rd Guards Tank Brigade, 10th Guards Tank Corps. This tank was later knocked out during a skirmish with a Hetzer tank destroyer during fighting in the city. It was later memorialized, incorrectly, for many years with an IS-2 heavy tank mounted on a pedestal numbered 23.

More T-34-85 tanks arrive in Prague, and Czech citizens jump on board. The city had been in the throes of a revolt, with Czech resistance seizing parts of the city from the demoralized German troops. Note the many German trucks in this view- these had been captured by the Red Army and but into use as is evident from the Russian military serial number painted on the cab door of the truck beyond the T-34-85.

Another of the T-34-85s of the 63rd Guards Tank Brigade that spearheaded the Soviet advance into Prague. As more tanks of its unit arrived, it was assigned to a static defense position in a park at Klarov, with the city's famous Hradcany castle in the background.

Another T-34-85 tank of the Guards 63rd Tank Brigade. This was one of the three units converted to T-44 tanks in September 1944, but re-equipped with T-34-85s when the decision was made against committing the new tank design to combat. This tank, probably 1-23, is covered with jubilant Czech citizens, including many armed members of the resistance wearing a variety of German, Austrian and fire department helmets.

A T-34-85 of the 63rd Guards Tank Brigade rests on one of the Danube river bridges with the Hradcany castle in the background. This is a 1944 production T-34-85, evident by the original style two-piece hatch on the commander's cupola. The 1945 production version had an enlarged cupola with a one piece hatch. In the background, a BM-13 Katyusha multiple rocket launcher column moves over the bridge.

A SU-100 tank destroyer moves through Humpolec in southeastern Bohemia in May 1945 with the crew riding on the outside. Although some towns were captured with very little resistance, there were several fierce tank battles even after the armistice had been signed.

The Czechoslovak 1st Armored Brigade parades through the city to the cheers of the crowd. This unit had been re-equipped with new T-34-85 tanks in 1945, having fought most of the war on older T-34 Model 1943 tanks. These tanks carry the Czechoslovak national insignia, a tri-color roundel, on the side of the turret.

A battery of SU-100 tank destroyers rests in the Prague suburbs after the fighting, and the crew converse with a local Czech citizen.

An SU-100 tank destroyer in Prague in May 1945. The wartime SU-100 tank destroyers lacked the large stowage box fitted to post-war vehicles as is evident in this view.

A column of SU-100 of the 2nd Ukrainian Front ambushed and knocked out by a German anti-tank gun during fighting near Brno, Czechoslovakia on 26 April 1945. This photo was taken some weeks after the battle and the vehicles are all missing their wheels. The wheels no doubt were spirited away by local farmers for whom such items were an invaluable modernization for their farm carts. The author has seen farm carts in the region with German and Soviet wheels on them well into the 1980s.

In the wake of the victory over Germany, there were numerous ceremonies between the Allies to celebrate. Here an American officer inspects a T-34-85 tank brigade in Austria in May 1945. (USNA)

Although the war ended for many units in May 1945, other units were shipped across the enormous breadth of Russia to take part in the August 1945 offensive against the Japanese Kwantung Army in Manchuria. Here a T-34-85 crosses a small stream. One tank corps, one mechanized corps, two tank divisions, and many smaller tank units were used by the Red Army in this rapid advance.

Following the war, many ceremonies were held to celebrate the victory. This particular T-34 Model 1942 of the 1st Polish Armored Brigade has been heavily decorated in commemoration of its combat service. The writing around the machine gun mount proclaims it as a veteran of the battle for Lenino, the first heavy commitment of Polish troops on the Eastern Front, while the writing on the bow notes that it took part in the battles for Lenino, Warka, Pomerania, Laba, Berlin and Prague, traveling some 2,940 km. This particular tank is still preserved at the Polish Army Museum in Warsaw.

The victory celebration in Moscow had heavy participation by the tank force as is evident from this view of one of the streets leading into Red Square where the tank columns are forming up. In the foreground are T-34-85 tanks, behind them are SU-100 tank destroyers. This is from the 24 June 1945 parade.

Celebrations were also held with Soviet units in occupied Germany. This T-34-85 serves as the backdrop for the first anniversary of the war in May 1946 at the *kaserne* of the 56th Guards Tank Brigade, 7th Guards Tank Corp in Wunsdorf, Germany. The writing on the tank lists the liberated cities in which the unit was involved including Proskurov, Lvov, Sandomierz, Czestochowa, Berlin and Prague. The writing on the turret ring notes that the unit traveled 3,572 km during the course of the fighting. (I Kolly)

The German tank *kasernes* were taken over by new owners in 1945. This is Wunsdorf *kaserne* which was taken over by the 55th Guards Tank Brigade, 7th Guards Tank Corps. The corps insignia was a circle followed by the -1, -2, or -3 indicating the 54th, 55th, or 56th Guards Tank Brigade.

The T-34-85 remained the principal medium tank of the Soviet Army well into the 1950s by which time it began to be replaced by the T-54. This is a staged propaganda shot of tank-infantry drills in 1949.

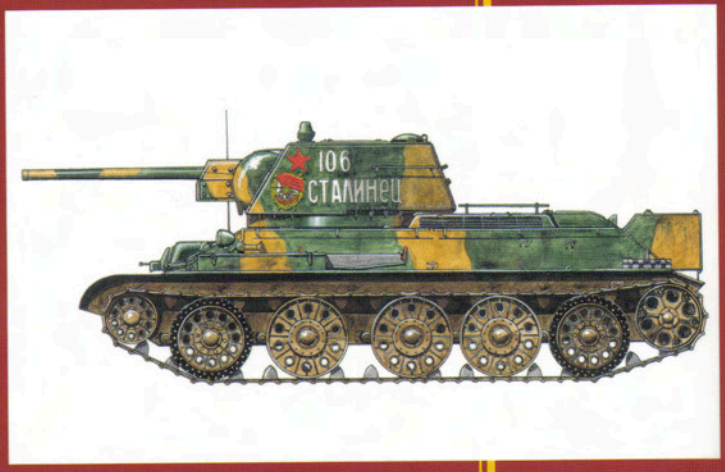
A rare view of a pair of T-34 Model 1943 on exercise shortly after the end of war in 1948. Generally, the older T-34 Model 1943 with their 76mm gun were retired, or placed in war reserves in favor of the more effective T-34-85.

Shortly after the end of the war, a slightly modified version of the T-34-85 was developed. This had a revised turret roof which separated the two roof ventilators, placing one forward of the loader's hatch to help better ventilate the gun breech. So far as is known, this variant did not see service in World War 2. A couple examples of this type are seen during summer wargames in the Leningrad Military District in 1946. (A. I. Starovov)

This was the fate of many war veteran T-34-85 tanks in the 1960s and 1970s- targets on Soviet gunnery ranges. In this case, this tank has just been hit by a guided anti-tank missile during the Dnepr wargames in Ukraine on 17 October 1967.

Some T-34-85 tanks remained in service for training purposes. One of the more unusual uses was for training Soviet anti-tank dogs. These dogs carried two satchels of high explosive on their sides and had a trigger post on their back. They were trained to run under tanks, and when they did so, the vertical post would bend down, detonating the explosive charge. These "guided mines" were used with limited success by the Red Army, and remarkably, the practice continued as late as June 1993 as is evident from this photo. The T-34-85 is the post-war type with the split ventilator domes on the roof.

Although the T-34-85 has disappeared from service in the current Russian Army, several dozen are kept in running order for annual displays commemorating the end of World War 2. This T-34-85, a post-war rebuild with the new night driving equipment and engine improvements, paraded at Kubinka on 31 August 1995 during Tanker's Day celebrations. The Guards insignia painted on the side became a common Soviet tank unit marking after World War 2, but was seldom seen on Soviet tanks during the war.



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