# Bigger is Better: The T-80BVM Tank Modernization

**OE Watch Commentary:** The accompanying excerpted article from *Svobodnaya Pressa* discusses the armor-piercing fin-stabilized discarding sabot tracer (APFSDS-T) 3BM60 Svinets-2 round that upgraded T-80BV tanks will now be capable of firing (after the upgrade the tank will be referred to as a T-80BVM). The Svinets-2's core consists of depleted uranium and tungsten, and is reportedly capable of penetrating up to 830mm of rolled homogeneous armor (RHA). In comparison, *Svobodnaya Pressa* states that a similar round for the American M829A1 Abrams penetrates up to 700 mm, the M829A2 Abrams 750 mm, and the M829A3 Abrams 770 mm. Apparently, the kinetic energy of these rounds is very important, the Russians are keen to get longer and heavier rounds into tank barrels. The Svinets-2 is reportedly 740mm long but the new Armata tank has a similar 125mm gun that is capable of firing a 1000mm long shell capable of piercing 900-1000mm of RHA. It appears likely that if the Armata is fielded, it may be equipped with a 152mm cannon to facilitate larger and much heavier rounds, including barrel-launched antitank guided missiles (ATGMs), as the Russians may be reaching the capability limits of their 125mm tank guns in terms of RHA penetration.

The accompanying interview of Major General Sergey Kisel, Commander of the 1st Guards Tank Army, published in *Krasnaya Zvezda*, sheds some light on how he and likely most of the Russian Ground Forces see the differences between the T-72, T-80, and T-90, as all three platforms are evidently found within the 1st Guards Tank Army. In terms of modernization, the T-80BV, T-72B3, and T-90A are all apparently perceived to be at roughly the same level of modernization and combat capability. Although the T-80 has been criticized due to its gas guzzling turbine engine, there are specific uses for it. The T-80 was designed to be a high-speed "breakthrough tank" on the battlefield and it also could be Russia's tank for the arctic region, as the turbine engine is less problematic in cold weather conditions than more conventional diesel engines.
**End OE Watch Commentary (Bartles)**

Source: Vladimir Tuchkov, "Т-80БВ: «Реактивный» танк получил урановые снаряды (The T-80BV: 'Jet' Tank Provided with Uranium Shells)," *Svobodnaya Pressa*, 23 December 2018. https://svpressa.ru/war21/article/219941/

*The upgraded Russian T-80BVM tank was provided with the capability to employ gun ammunition using depleted uranium, according to the Russian Federation Defense Ministry. This is the armor-piercing fin-stabilized subcaliber 3BM60 Svinets-2 projectile, the core of which is made of depleted uranium with added tungsten to give hardness. Such shells are called "crowbars" and are used in almost all countries in which there is a tank-manufacturing industry.*

*When choosing uranium as a material for the production of "crowbars," its radioactive properties are not taken into account. The value of this material lies, first, in its large specific mass, which is equal to 19 grams per cubic centimeter. This is much higher than the specific weight not only of iron, 7.9 grams per cubic centimeter, but also of lead, 11.3 grams per cubic centimeter.*

*According to the laws of elementary physics, a higher mass projectile has greater kinetic energy. An additional quality is achieved due to the fact that the "crowbar" has a significantly smaller diameter than the caliber of the gun. Due to this, the air resistance in flight is reduced and there is a smaller drop in speed. The armor-piercing ability increases correspondingly.*

*The modernized T-80 tank also uses the Svinets-1 subcaliber projectile in which the core is made of tungsten carbide. It is able to pierce 700-740 mm homogeneous (single-composition) armor at a distance of 2 kilometers. With the Svinets-2 this feature reaches 800-830 mm. For comparison, the American M829A1 subcaliber projectile can pierce up to 700 mm homogeneous armor, the M829A2 750 mm, and the M829A3 770 mm… Second, uranium is a pyrophoric material. Once inside a tank, the "crowbar" shatters into tiny fragments that self-ignite, causing a fire. That is, another striking factor is added…*

*Meanwhile, their power was at variance with tank guns. The increase in quality was achieved by increasing projectile length to 740 mm. The ammunition turned out to be promising since the loading machinery in the country's then tanks could only work with smaller length ammunition. But new guns with the appropriate machinery, that were adapted for the new ammunition, were soon created for new modifications of T-90A and T-72B3 tanks. The initial velocity of the Svinets-2 core was 1750 meters per second and mass was 4.6 kg. The American M829A3 had a projectile velocity of 1675 meters per second and mass of 4.9 kg. For the T-80 tank to be able to use nonstandard length armor-piercing subcaliber projectiles, its latest modification was equipped with a new 2A46M-4 gun.*

*Currently the tank ammunition designers are increasing the power of "crowbars" by creating the new fin-stabilized armor-piercing subcaliber Vakuum projectile for the T-14 Armata tank. This tank uses the 2A82M gun, which is a new gun for this range of tanks. The length of the projectile reaches 1000 mm. According to reports, it should pierce 900-1000 mm of homogeneous armor.*

*All the above ammunition is used for 125 mm caliber, and the American ones 120 mm smoothbore guns. However, Uralvagonzavod is working on the creation of a second modification of the T-14. This will use the 2A83 152 mm caliber gun…*

"*The upgraded Russian T-80BVM tank was provided with the capability to employ gun ammunition using depleted uranium.*"

*(continued)*

# *Continued:* Bigger is Better: The T-80BVM Tank Modernization

Source: Viktor Khudoleyev, "По заветам первогвардейцев (According to the First Guardsmen)," *Krasnaya Zvezda*, 14 December 2018. http://redstar.ru/po-zavetam-pervogvardejtsev/

***What is the 1st Guards Tank Army like today? What tasks does it face?***

*[Kisel] The army incorporates motorized rifle, tank, artillery, surface-to-air missile, and missile formations and military units, including the celebrated Tamanskaya Motorized Rifle Division and Kantemirovskaya Tank Division. Today, in terms of combat composition, these are unique formations, unequaled in the Ground Forces in terms of combat potential…*

***With what are the army's formations and units equipped? Which modern models of armament and military hardware are coming into military formations now?***

*Today the 1st Tank Army is fully supplied with modern models of fighting vehicles developed by our engineers. There are modernized T-72B3 tanks with reinforced protection equipped with the latest multichannel thermal imaging sight, a ballistic calculator, an improved armament stabilizer, an automatic target tracker, and other innovations. Their electronics make it possible significantly to enhance the accuracy of hitting targets. Our main battle tank, the T-72B3, possesses sufficient specifications to detect and destroy any enemy on the battlefield. The T-72B3 is a reliable tank. It differs from foreign models in that it is far smaller – which makes it less vulnerable. At the same time it has a faster rate of fire and possesses good marching capabilities. We also have subunits with T-90 tanks that differ fundamentally from other vehicles in terms of the degree of protection for the crew, the long firing range, and more powerful engine.*

*T-80BV and T-80U tanks, which have gotten a good name for themselves, remain in the arsenal. The armament system on the T-80BV is the same as on the T-72B3 and the T-90. A special feature of the T-80BV is that this tank is capable of operating at low temperatures. Its gas turbine engine, whose design does not provide for a cooling liquid, is undemanding in frosts. The T-80BV and the T-80U are distinguished by unique marching specifications and are capable of covering large distances in a short space of time. The T-80 was originally developed as a breakthrough tank and can reach a speed of 90 kph…*

***Recently digital technologies, automated control systems, UAVs, and robotized systems have been actively introduced in the Armed Forces. How is this affecting modern tank combat?***

*The technologies, including digital technologies, that are now in the service of our Armed Forces, including the 1st Guards Tank Army, predetermine the success of combat and ensure the enemy's total defeat.*

*The introduction of increasingly complex technical systems requires constant raising of the servicemen's level of knowledge and combat training. Thus, a tankman is obliged to have thorough knowledge of hardware, ballistics, and the special features of modern combined-arms combat, which has become exponentially more complex in recent decades. Today demands are made of a tank commander that at one time were made of commanders of large subunits.*


Танк Т-80БВМ (T-80BVM main battle tank).

*Source: Vitaly V. Kuzmin, https://www.vitalykuzmin.net/Military/ARMY-2018-Demonstration-part-1/i-PGvmxT6/A, CC BY-SA 4.0 (https://creativecommons.org/licenses/by-sa/4.0).*