= 152 mm howitzer M1943 (D @-@ 1) =

The D @-@ 1 howitzer M1943 (Russian : 152 @-@ mm gaubitsa obr . 1943 g . (D @-@ 1)) is a Soviet World War II @-@ era 152 @.@ 4 mm howitzer . The gun was developed by the design bureau headed by F. F. Petrov in 1942 and 1943 , based on the carriage of the 122 mm howitzer M1938 (M @-@ 30) and using the barrel of the 152 mm howitzer M1938 (M @-@ 10) . The powerful and mobile D @-@ 1 , with its wide range of ammunition , significantly increased the firepower and breakthrough abilities of Red Army tank and motor rifle formations . Several hundred D @-@ 1s were manufactured before the end of World War II .

Post World War II , the D @-@ 1 saw combat in numerous conflicts during the mid- to late 20th century . The long operational history of D @-@ 1 howitzers in national armies of numerous countries is a testimony to its qualities ; the gun still remains in service in a number of post @-@ Soviet states and some other countries . The D @-@ 1 is widely considered a valuable element of Soviet artillery .

= = Development and production = =

= = = Background = = =

In 1941 the Soviet Union decided to cease production of the 152 mm howitzer M1938 (M @-@ 10) . One of the reasons was the disbanding of the Rifle Corps between August and September 1941 and the consequent removal of the corps artillery . Moreover , all 152 mm howitzers were excluded from divisional artillery . As a result , there was no series production of 152 mm howitzers during 1942 .

However , the rifle corps were re @-@ established in late 1942 and the previous organization of artillery at the corps level was reintroduced . As a result of the halting of 152 mm howitzer production , the Red Army corps artillery lacked a weapon more mobile than the heavy 152 mm howitzer @-@ gun M1937 (ML @-@ 20) (typically employed by army @-@ level and Reserve of the Main Command artillery units) , but more powerful than the 122 mm howitzer M1938 (M @-@ 30) .

= = = Response to the challenge = = =

In 1942 , trying to solve the problem of lack of a suitable mobile 152 mm howitzer , the design bureau headed by F. F. Petrov started to work privately on a new howitzer , based on the carriage of the M @-@ 30 and the barrel of the M @-@ 10 (which was fitted with a muzzle brake in order to reduce the recoil and thus prevent damage to the lighter carriage) . The approach allowed production to begin on the new howitzer almost immediately from the stockpile of parts for both earlier guns . Given the war situation and shortages of artillery , this solution was both elegant and expedient .

Early in 1943 Petrov notified the People 's Commissar of Armaments Dmitriy Ustinov about the new project . On 13 April Ustinov informed Petrov that the State Committee of Defence had requested for five of the new guns to be sent to the testing grounds on 1 May . On 5 May , two pieces were received for trials ; two days later , on 7 May the gun was recommended for adoption , and on 8 August 1943 it was officially adopted as the 152 mm howitzer M1943 . One and a half months later , the first series production D @-@ 1 howitzers were delivered to the Red Army representatives .

= = = Production = = =

The D @-@ 1 was manufactured solely at No. 9 Plant (UZTM) in Sverdlovsk from late 1943 to 1949 . During World War II , the howitzer was only produced in small numbers because Plant No. 9 was also responsible for the mass production of the 122 mm howitzer M @-@ 30 . This resulted in

critical shortages of the 152 mm howitzers in the Red Army corps artillery until the end of the war .

= = Description = =

The D @-@ 1 howitzer was essentially a combination of the barrel of the 152 @-@ mm howitzer model 1938 (M @-@ 10) on the carriage of the 122 @-@ mm howitzer M1938 (M @-@ 30) . Since the new carriage was lighter than that of the M @-@ 10 , the barrel was fitted with a massive double @-@ baffle muzzle brake DT @-@ 3 to soften the shock of recoil . The breech block was of interrupted screw type , the recoil system consisted of a hydraulic buffer and a hydro @-@ pneumatic recuperator . The separately loaded ammunition included a variety of shells and eight different propellant charges in cartridges .

The carriage was nearly identical to the carriage of the M @-@ 30 . It had suspension and steel wheels with pneumatic rubber tires . The trails were initially of riveted construction , but were eventually replaced in production by welded ones . Late production pieces were equipped with caster wheels to ease manhandling . Time to set up for combat was about two minutes . In an emergency it was possible to fire without splitting trails ; however this was at the price of a drastically reduced traverse (1 ° 30 ') . Since the gun was not equipped with a limber , it could be towed only by vehicle . The maximum towing speed was 40 km / h on paved roads , 30 km / h on cobbled roads and 10 km / h off @-@ road . To give the crew some protection from bullets and shell fragments , the gun was fitted with a shield .

= = = Comparison with contemporary howitzers = = =

From a technical and tactical point of view , the D @-@ 1 project provided the Red Army (RKKA) corps artillery with a modern 152 mm howitzer , which combined both good mobility and firepower . When compared with a typical contemporary howitzer of similar caliber , the D @-@ 1 had shorter range , but was much lighter . For example , the German 15 cm sFH 18 had a range of 13 @,@ 325 meters - about one kilometer longer than that of the D @-@ 1 - but also weighed almost two tons more (5 @,@ 510 kilograms in traveling position) . The same can be said of the US 155 @-@ mm howitzer M1 (14 @,@ 600 meters , 5 @,@ 800 kilograms) or the 149 mm howitzer manufactured by the Italian Ansaldo (14 @,@ 250 meters , 5 @,@ 500 kilograms) . A German howitzer with characteristics similar to those of the D @-@ 1 ? the 15 cm sFH 36 ? did not reach mass production . Compared with older pieces such as the French Schneider model 1917 (11 @,@ 200 meters , 4 @,@ 300 kg) , the D @-@ 1 had the advantage in both weight and range .

= = Organization and employment = =

The D @-@ 1 was employed by corps artillery and the reserve of the main command units . In 1944 , the rifle corps of the Red Army had one artillery regiment each . Those regiments consisted of five batteries (totaling 20 guns) , equipped with the D @-@ 1 along with various other 152 mm howitzers , 122 mm gun M1931 / 37 (A @-@ 19) , 152 mm howitzer @-@ gun M1937 (ML @-@ 20) or 107 mm gun M1910 / 30 . Reserve of the Main Command included howitzer regiments (48 pieces) and heavy howitzer brigades (32 pieces) . Those could be merged to form artillery divisions .

The Red Army employed D @-@ 1 howitzers from 1944 onwards , during the final stages of World War II . The D @-@ 1 was used primarily used against personnel , fortifications and key structures in the enemy rear . The anti @-@ concrete G @-@ 530 shell was also sometimes used against armored vehicles with good results . During its service the gun earned a reputation for being reliable and accurate . The D @-@ 1 was finally withdrawn from service in the mid @-@ seventies .

After the war the gun was supplied to many countries around the globe , including former Warsaw Pact allies , such as Poland . As of the early 2000s it remains in service in Afghanistan , Albania , China , Cuba , Hungary , Iraq , Mozambique , Syria , Vietnam and other countries . The gun was employed in the Arab @-@ Israeli Conflict and also in some conflicts in former republics of Soviet

Union . The long operational history of D @-@ 1 howitzers in the national armies of numerous countries is an additional testimony to its qualities .

The D @-@ 1 was seen in use during the April 2016 battles between the Nagorno @-@ Karabakh Defense Army and the Azerbaijani Forces . It was used by the NKR Defense Forces .

Surviving D @-@ 1 howitzers can be seen in various military museums and war memorials , e. g. in the Museum of Artillery and Engineering Forces , Saint Petersburg , Russia ; in the Museum of Heroic Defense and Liberation of Sevastopol on Sapun Mountain , Sevastopol ; in the Museum of the Great Patriotic War , Kiev , Ukraine ; in Pozna? Citadel , Poland and in Polatsk , Belarus , as a memorial piece .

= = Variants = =

In addition to the towed howitzer , Petrov 's team developed a vehicle @-@ mounted variant of the D @-@ 1 . Red Army offensive operations in the summer and fall of 1943 reawakened interest in the idea of a heavy " artillery " tank similar to the KV @-@ 2 , that could provide close fire support to rifle and tank units and would be capable of demolishing heavy fortifications . Probable causes for the development of such a vehicle were the cessation of mass production of the SU @-@ 122 medium assault gun and diversion of SU @-@ 152 heavy assault guns for anti @-@ tank actions . The tank variant of the D @-@ 1 was originally intended for mounting in a variant of the KV @-@ 1s heavy tank . It utilized the mount of the 85 mm D @-@ 5 , leading to the unofficial name D @-@ 1 @-@ 5 and eventually to the official designation of D @-@ 15 . Only one example was built . There is no information about the gun being mounted in the KV tank . By October 1943 Soviet authorities were anticipating the start of mass production of the powerful IS @-@ 2 heavy tank ; as a result the idea of a specialized artillery tank based on the obsolete KV chassis was dropped .

Another project combining the T @-@ 34 tank chassis with the D @-@ 15 gun was also considered . Designated SU @-@ D15 , the medium assault gun was intended as a replacement for the SU @-@ 122 . Although the project received a lot of support from the authorities it never entered production , both because of its shortcomings (the heavy gun put too much strain on the suspension and ammunition stowage was too limited) and because it was made redundant by the ISU @-@ 152 . However lessons learned mounting a powerful gun in the T @-@ 34 allowed for rapid development of the SU @-@ 100 tank destroyer .

= = Ammunition = =

The D @-@ 1 had a large variety of ammunition , including high @-@ explosive , armor @-@ piercing , HEAT , shrapnel , illumination , and chemical .

The D @-@ 1 used separate loading ammunition , with eight different charges . The charges included the " full charge " Zh @-@ 536 and smaller charges ranging from the " first " to " sixth " , which was the smallest . A " special charge " was used with the BP @-@ 540 HEAT projectile . Propellant charges were produced in " full " and " third " variants in munitions factories . All other charges were derived from them by removing small gunpowder bags from the charge cartridge . For flash suppression there was a special chemical mixture which was to be inserted into a cartridge before night firing . 152 mm projectiles for the D @-@ 1 weighed about 40 kg ; a difficult job for the loaders , who had to carry the projectiles alone .

When set to fragmentation mode , the OF @-@ 530 projectile produced fragments which covered an area 70 meters wide and 30 meters deep . When set to high @-@ explosive (HE) action , the exploding shell produced a crater about 3 @.@ 5 meters in diameter and about 1 @.@ 2 meters deep . Despite the D @-@ 1 's withdrawal from service in the mid- 1970s , the OF @-@ 530 is still fired from modern 152 mm ordnance pieces of the Russian Army .

The G @-@ 530 HEAC anti @-@ concrete shell had a muzzle velocity of 457 m / s when fired with the " first " charge . At a range of one kilometer it had a 358 m / s terminal velocity and was able to punch through up to 80 centimeters of reinforced concrete before detonating a TNT charge which increased the total penetration to 114 centimeters . The G @-@ 530 could not be fired with a " full "

charge without putting the crew at risk of having the shell explode in the barrel . A special version of the shell , the G @-@ 530Sh , was developed to allow use with the full charge .

The BP @-@ 540 HEAT projectile was not used during World War II . It had an armour penetration of 250 millimeters at an incident angle of 90 ° , 220 millimeters at 60 ° , 120 millimeters at 30 ° .

In the late 1950s old ammunition stocks for the D @-@ 1 were removed from the Soviet inventory . The only shells retained were the OF @-@ 530 , O @-@ 530 , G @-@ 530 / G @-@ 530Sh , and possibly chemical shells . The Soviet Army also possessed a 152 mm nuclear shell , but it is not clear whether that shell could be used with the D @-@ 1 .