

GAZ-67 Tchapayev



in detail®

The Russian WWII Light Utility Truck in Lešany Museum Collection

Special thanks to Alex Guzun for scanned copy of book
Special regards to my friend Grigorij Zhadan (owner of GAZ67B)

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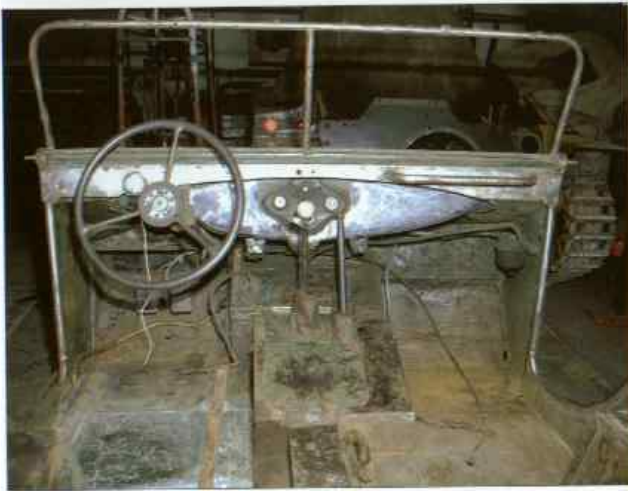
History of Gorkhy automobile works (GAZ) is connected with development of car industry in the USSR. While in the USA in 1928 more than 28 million cars were in use, in the USSR the number had been mere 20 600. Construction of a new automobile works with a capacity of 100 000 units per year had been one of the most important points of the five year plan. Expanding industrial town of Nizhny Novgorod was selected as a location for the new plant. The lack of experience with mass production led to negotiations with Henry Ford in 1928. On May 31st 1929 an agreement with Ford Motor Company was reached, enabling the USSR technical assistance with construction of a new plant, training of personnel in the USA and production of automobiles under Ford licence. For 72 million Rubles the USSR bought 72 000 not assembled automobiles of Ford "A" and "AA" that were completed in the USSR still before the new plant was launched.





**GAZ in the
Reconstruction**





In January 1941 V.A. Gratshev, designer of GAZ-61 was appointed to lead a team to design a new cross country vehicle. Technically the new vehicle was supposed to be based on GAZ-61 and the first photos of American cross country vehicle Bantam were used for design purposes. Works on the new project progressed extremely fast. First works begun on February 3rd 1941 and as soon as March 25th first GAZ-64 rolled from the production lines. All in all only 51 days were sufficient. Successful Army trials of two pre-series models took place between April 17th-27th 1941. In June 1941 comparative field tests with German two engine Metro G 1200 vehicle followed. By end of August 1941 series production started and till end of 1941 602 units

left the factory. During fall of 1941 GAZ-64 vehicles started to meet its US pattern mate the Bantam BRC on the Russian front (Bantams supplied under Lend-Lease Agreement). Despite undoubted quality of GAZ-64 it still carried several shortages. One of these was the used engine that suffered lubrication problems and engine cooling was far from perfect. During 1942 only 67 units of GAZ-64 left production and as of April 1943 all chassis produced were used for armored version of GAZ-64 the BA-64. In February 1943 works to modernize the GAZ-64 begun. Main changes included increasing gauge of wheels from 1278 mm at front axle and 1245 at rear axle to 1446 mm and 1449 mm





respectively. Distance between axles remained 2100 mm. Such changes meant increased vehicle stability as well as enforcement of chassis including wheels base. These changes eliminated one of the drawback of GAZ-64 - frequent breaing of chassis parts. Changes were carried on engine as well. The output increased from 50 HP to 54 HP but with all changes it was still the same old Ford engine type that powered the NAZ-Y "AA" vehicles back in 1932. Changes on the engine continued till August. First GAZ-67 with final changes left production lines on August 21st 1943. In autumn of the same year it successfully passed all tests including towing of ZIS-3 76 mm Gun with weight of 1850 Kg. GAZ factory suffered heavy

losses due to air strikes in June 1943 and was unable to start mass production of GAZ-67. Despite all negative circumstances first serial GAZ-67 left GAZ factory on September 23rd. Till end of 1943 718 units were produced, till May 9th 1945 production reached 4851 units. Under East front conditions these numbers can be taken as small scale production. Prototype of modernized version the GAZ-67B was produced in January 1944. Till June it passed Army trials and immediately was accepted for production. Several changes in production took place in 1948. Most significant of these being cooler cover. Production continued till 1953 and total production numbers reached 62 843 units.





GAZ in the Reconstruction

Army technical Museum at Lešany obtained GAZ-67B in 1999. The same year it passed the restoration with very successful results thanks to original parts. Museum visitors had a chance to see the restored vehicle for the first time in May 2000. Since then it regularly takes part of military historical vehicles gatherings.

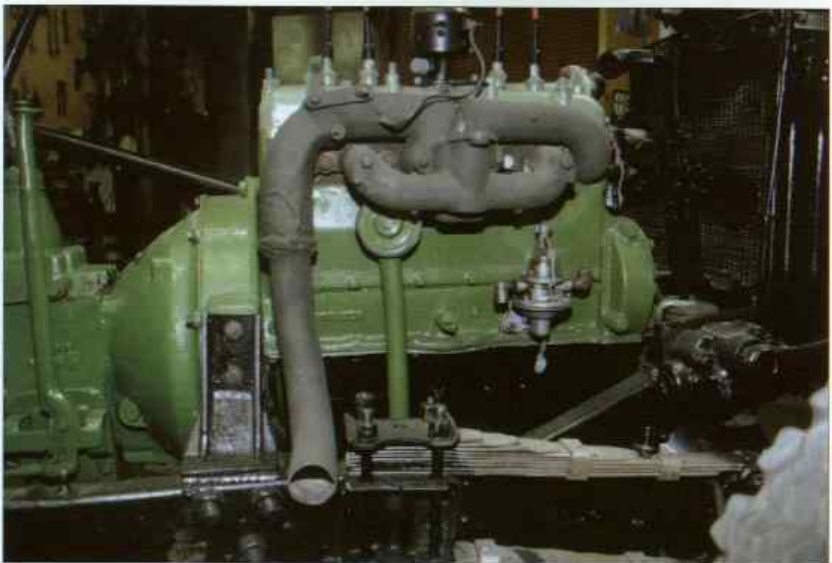




Engine Details

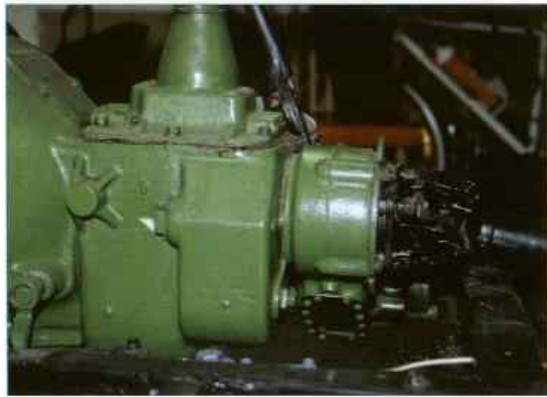
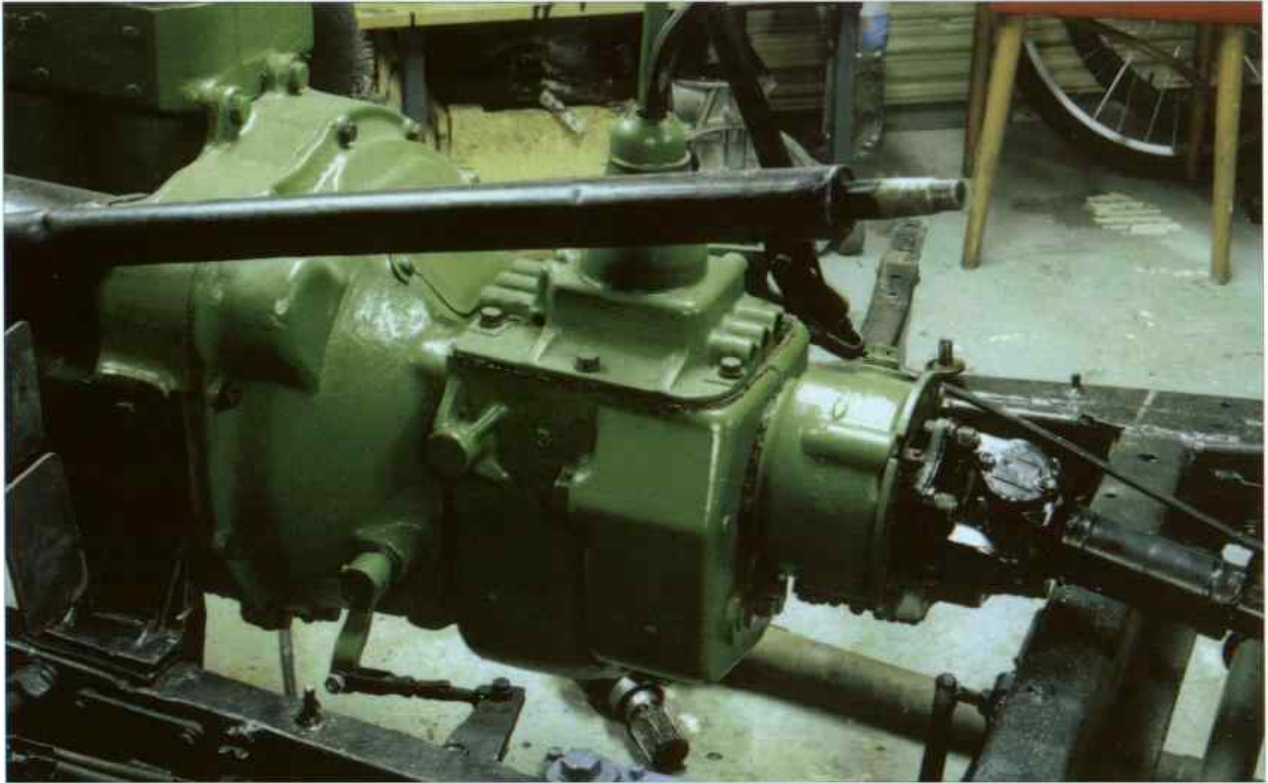
Heart of the vehicle is the petrol powered four stroke in-line water cooled engine GAZ M-1 SV distribution and capacity of 3285 cubic cm. Maximum output of 40 KW (54 HP) reached at 2800 R.P.M. Maximum torque 17 Kg/m at 1500 R.P.M. This engine being

slightly redesigned original Ford engine that powered the first NAZ - "AA" that were leaving production lines in 1932. Advantages of this engine was sufficient power enabling GAZ-67 to tow ZIS-2 or ZIS-3 Guns. GAZ-67B equipped with this engine had a top speed of 90 Km/h, with 800 Kg load at 60 Km/hour. Fuel consumption on roads reached about 30 litres per 100 Km. Intake and exhaust pipes are clearly seen on the photos as well as distributor and dynamo. This particular engine was carburettor equipped. Cooler is seen with a six blade fan (on photo two are missing).



Transmission Details





GAZ-67 was equipped with mechanical gear box with four speeds forward, one reverse and one speed with reduction gear with a possibility of swithing off front wheel drive. Use of this gear reduction was rather problematic as it frequently lead to rear wheel drive breakdowns. Continuous axle shifting was at 4,444:1. None of the speed being synchronized. Note on the right lower photo the handle for switching off front wheel drive.





Front Axle details



The upper photo shows overall view of front axle with torque transmission on front steerable wheels. Well seen is differential and gear steering.

Four lower photos show details of front left wheel. Note double longitudinal quarter elliptical springs with double shock absorbers.





Left upper photos show detail of front left wheel plus steering handle. Other photos show details of right wheel with longitudinal quarter elliptical springs. Note also exhaust pipe.

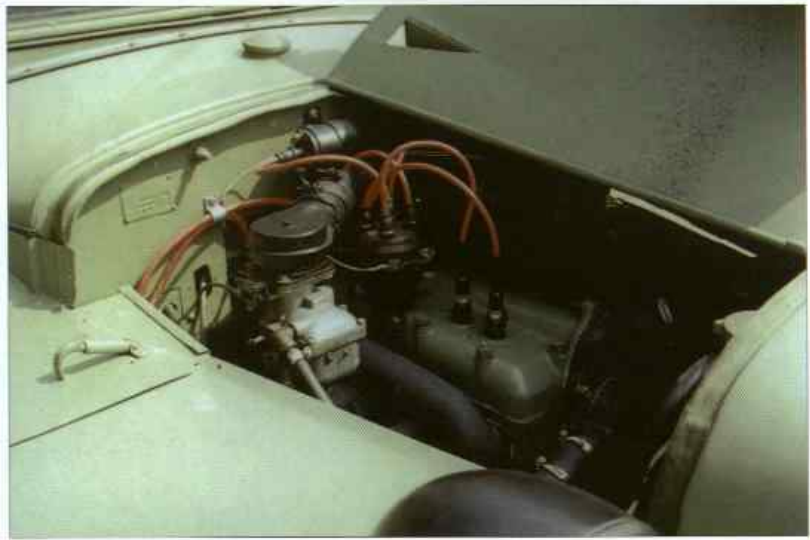






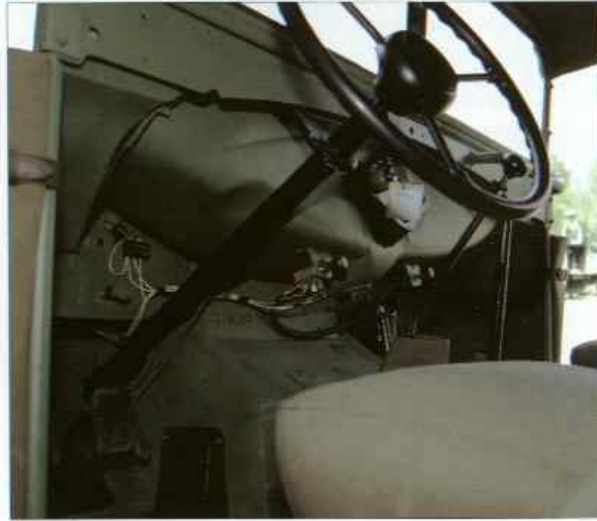
Photos on both pages show rear vehicle frame and transmission with torque transition on rear wheels. Well seen is differential with cardan shaft and longitudinal half elliptical springs with shock absorbers. Note also high pressure pipes for brake fluid distribution to hydraulic brakes.







Interior Details





On opposite page upper photo shows wind screen wiper and passenger's handle on the dash board. Lower photos show classical layout of pedals (from left) clutch-brake-accelerator. On left side from pedals note the foot switch of main and long-distance lights. Above accelerator foot starter switch. On left lower photo - from left-shifting gear, hand brake and handles for switching off front wheel drive. Above handles three switches are located. From left - lights switch, handle for air intake flap and carburettor choke handle.



Note containers on both sides of rear seat and foldable canvas mechanism frame.



Above photo shows GAZ-67 with "closed" canvas doors for bad weather drive.



Exterior Details

Other photos show vehicle details with canvas top. First front windscreen was unscrewed and folded backwards. Canvas was fixed on the frame of the windscreen. By installing the windscreen into upright position the canvas was stretched.



This page shows various details of GAZ-67: fixing of rear wheel, headlamp, hook on front bumper and hub of a wheel and disc of front and rear wheel.



Towing device was destined to tow maximum load of 800 Kg. Reality was sometimes different and the vehicles were used to tow ZIS-2 and ZIS-3 Guns with 1850 Kg weight.





Short wave radiostation 3 RK dating from 1941. Formely it was destined for horse transportation. The length of an antenna is well seen on the lower left photo. In this case it consisted of four parts. The upper part being in star pattern. The location on the vehicle show photos on the right.



Opened battery box is seen on the left upper photo, upper mid photo show antenna mast and partly folded "star" top. Right photos show the box of the radiostation and the battery box. Both were almost identical. Folded antenna in the battery box closing is seen on the middle photo. (opposite page)





One of the most famous weapon used by GAZ crews was the heavy machine gun Maxim 7.62 mm calibre 1910 type. This weapon was a development of US designer Maxim living in England. 1910 type machine gun was designed during the nineties of 19th century. This machine gun expanded to all over the world and Russian army incorporated this model in 1910. Production in the USSR lasted till the end of WW II.





Another widely used type was the heavy machine gun SG-43 of 7,62 mm caliber designed by Godunov. This machine gun was incorporated into the Red Army in 1943. This was designed to substitute the old Maxim 1910 type. But more widely used it was only after WWII. Trials with this machine gun were carried in the turret of BA-64. Despite undoubt quality this machine gun did not become the standard weapon of the BA-64 due to its size.





GAZ-67 was used for towing various types of Soviet guns. The upper photos show the most widely tugged gun (behind the BA-64 as well) the 45 mm Antitank Gun type 37.

Its weight of 450 Kg did not represent a substantial load on GAZ vehicles. The Gun had a range of 4400 meters and muzzle velocity of 760 m/sec. It was characterized with a simple operation, but its penetration capacity was no match for medium tanks front armors.

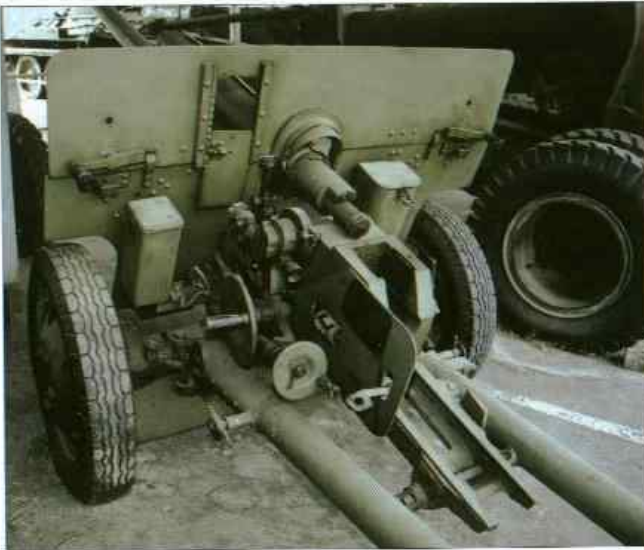


The next three photos show the regimental 76 mm Gun type 43. This Gun had a range of 8500 meters and a muzzle velocity of 327 m/sec. With its weight of 780 Kg it was on the tugging capacity limit of GAZ-67. This towing device had a capacity of 800 Kg. Far beyond this limit was the ZIS-2 Antitank Gun type 43 of 57 mm caliber with its weight of 1850 Kg. But GAZ 67 represented one of the most mobile means of transportation of this superb Gun with a range of 8400 meters and a muzzle velocity of 990 m/sec.





Another gun that was seen behind GAZ-67 was the 76 mm divisional Gun type 42 (ZIS-3). Also its weight of 1850 Kg exceeded the towing capacity of GAZ-67 and as well as with ZIS-2 its tugging lead to rear axle breakage. Though these problems were well known it did not discourage the Soviet army personnel from towing these heavy guns behind GAZ-67. Range of ZIS-3 was 13 290 meters and muzzle velocity 680 m/sec.





Production of armored cars in Gorkhy Automobile Works started already before WW II. Works on modification of chassis of GAZ-67 started as soon as July the 17th 1941 i.e. before the series production was launched. Likewise the GAZ-64 also the BA-64 had its foreign example. This time it was the German Sd.Kfz 221 Armored car. Works on prototype ended on January 9th 1942. On March 14th 1942 after passing the Army tests the BA-64 was accepted into the service of Red Army. On April 24th 1942 series production started and till the end of the month first 50 units rolled from the production lines. Till end of 1942 2486 BA-64s were produced. First combat these vehicles saw at Bryansk and Voronezh Front and later at Stalingrad.

The new model was characterized with a welded body with striking angled sides (not one armored plate was upright). Such a construction of the vehicle enhanced the bullet resistance. Driver was entering the vehicle via side foldable doors on both vehicle sides. Commander and gunner in one person was entering usually through top turret opening. Originally the vehicles had only driver's vision port in front. Soon this was found insufficient. Extra side lockable vision ports were installed on both sides of the fighting compartment. These were used as loop-holes. Turret missed any upper protection against hand-grenades. Only during April - May 1942 BA-64 were equipped with a wire mesh foldable to the sides (as on the German vehicles). Later the top was only canvas covered. Apart from frequent body and axles breakages due to heavy body superstructure fixed to the carriage the main problem represented the cooling of GAZ-M engine mounted into the armored body. The engine problem was partly overcome by installing an air intake on top of engine cover. Another problem was partly the exhaust fumes entering the combat compartment. During summer months the temperature inside the vehicle reached 60° C. Therefore in mid 1942 a new air intake for better ventilation was installed on roof covered with armored collar. Combination of small gauge combined with high resulted in small stability of the vehicle. As a result of this the BA-64 often overturned. The chassis suitable for cross-country GAZ-64 was insufficient for the armored version the BA-64. On October 29th 1942 the new version with increased gauge was ready for comparative trials with present vehicle. Changes corresponding to the GAZ-67 standard took place far later, in October-November 1944. Series production of BA-64B due to factory bombing was launched only in September 1943. Till end of that year 405 units left production lines, in 1944 2950 and in 1945 1742 units. Total WW II production amounted 8174 units of BA-64 and BA-64B. Only 3314 units survived the end of WW II. Last 62 units were produced in 1946. Total production of BA-64 and BA-64B reached during 1942-46 3901 and 5209 units respectively. BA-64 served for training purposes in the Red Army till 1953. BA-64B served in the Armies of Poland, Czechoslovakia, German Democratic Republic, Yugoslavia, North Korea and China. Last combat service it saw in the Korean War.

Main armament of BA-64 was the obsolete DT machine gun firing at maximum lower angle of 36° and maximum upwards angle of 54°. Total of 20 magazines of ammunition were carried in the vehicle. 7 magazines were





located on the left side of the fighting compartment, 12 on the right and one on the machine gun. Other weapons were personal weapons of crew and 6 hand-grenades F-1. BA-64 were also used for towing of 45mm Antitank guns. Some BA-64 were equipped with radiostations, though these were minimizing already cramped fighting compartment. Radiostations used were RB-64-142200 or 12-RP of Gorky works No. 197. Radiostations were enclosed in wooden or plastic boxes. First type used 1,7 meter long antenna, the second 2,2 meters antenna. Capacity of the battery lasted only for 20 hours receiving and 6 hours transmittion. Since 1944 BA-64 were equipped with 12-RPB with short antenna mast.

On both pages the photos show general view of BA-64 found in Army Technical Museum at Lešany. This particular vehicle served with 1st Czechoslovak Army Corps in the USSR. Because the vehicle survived WW II only as a wreckage without engine and chassis, it is exhibited temporarily with GAZ-69 chassis and engine. This not ideal combination enables the museum to exhibit both BA-64 alongside with GAZ-67. During past months the museum obtained large numbers of original parts and so BA-64 will soon be reconstructed into original state. Differences between GAZ-67 chassis from previous pages are clearly seen.

Layout of interior with minimum space for two man crew. Note machine gun DT, petrol tank, commander/driver's seat and magazine holders for DT ammunition.



Soviet caliber 12,7 mm (0,5 inch) DShK type 38 heavy machine gun in Anti-Aircraft version. This weapon was also incorporated in turret of BA-64 with minor changes in 1942. With this armament BA-64 was named the BA-64D. Only one prototype was produced. The advantage of this weapon - capability to penetrate 15 mm armored plate were not to be used. Weight of this weapon was 33,3 Kg and its size was clearly above the BA-64 capacity.



DShK type 38





Army Technical Museum at Lešany

Army Technical Museum at Lešany is display area of Historical Institute of Czech Republic Army, opened in former Artillery barracks on the left bank of Sázava river near to village of Krhanice, approximately 40 km south from Prague. Unique display is composed of 300 tanks, guns, armoured vehicles, trucks and motorcycles covering the era from 1890 till today.



Collection is suited into 8 halls and 5 roof covered areas. Visitors could become acquainted with Czech military vehicles design between the World Wars. Due to size of collection and due to fact that there is many world uniques displayed, this museum belongs to the most significant European institutions of this type.

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