

LIGHT TANK M-41 WALKER BULLDOG IN THE BRAZILIAN ARMY



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The Second World War's is over. The cold war takes place. The United States Army feels the need of a new and fast combat car to replace the already old-fashioned M-24 Chaffee.

In **1949** the prototype of the T-37 appears and becomes with some modifications in the T-41, and later in the T-41E1 and T-41E2. They will be adopted to be the standard fast car in United States. From 1950 on, it was named **M-41 Little Bulldog**, later changed to **Walker Bulldog**, in honor of General W.W.Walker, who died in a Jeep accident, in Korea, 1951.

From a technical point of view, the M-41 was very similar to the M-24, with a rolling train of five pairs of wheels, suspension with torsion bars, rear motor of 500 HP, which gave a high speed on highways, easy to be repaired and substituted in the battlefield, armed with a 76,2mm cannon with mouth brake, smoke extractor adapted for the anti-tank shot. It had a very thin and entirely welded tower, of an excellent characteristic.

In 1951, it becomes part of the North American armoured units as the standard fast light tank. A whole series of tactical support vehicles are developed from this tank: self propelled cannons, troop transportation, anti-aircraft vehicles, etc. The Cleveland Tank Arsenal, belonging to General Motors Corporation was in charge of the whole production.

Its “fire baptism” in the Vietnam war (1965 – 1975). It was operated by the North Americans and also by Vietnam southern army, even participating in the anti-guerrilla fight. The first battle involving North and South Vietnam tanks, occurred in February 1971, in the Lam Read Sound 719 operations. The M-41 managed to destroy six T-54 as well as sixteen PT-76.

5.500 **M-41** were manufactured from 1950 the beginning of the 1970's. In the early sixties the model is sold to several Southeast Asian countries, Europe and Latin America (Brazil, Argentina and Uruguay).



M-41 of the 3rd REGIMENT of COMBAT CARS carrying the national pavilion. Independence Day – September 7th, 1969 in front of the Army Department, old War Department, in Rio de Janeiro. Credit for photo: Brazilian Army

The first **50 M-41** arrived in Brazil in August, 1960, and were distributed to the **Mechanized Recognition Regiments**. The 1st one was in Santo Angelo, the 2nd in Porto Alegre, both in Rio Grande do Sul. Others were sent to the Mechanized Regiment of Recognition in Rio de Janeiro, (then Estado da Guanabara), replacing the old M-3 Stuart them under used. These armoured vehicles came through the Military Help Program (MAP), established between the United States and Brazil.

In the following years, up to the beginning of 1970, approximately **340 M-41** arrived in Brazil in the **M-41 A1 and A3 versions**. The difference from one to the other was the motor model, because the M-41 A3 had a fuel injection system and the motor designation was changed from AT 895-3 to AT 895-5. Besides this the cannon elevation system was higher and it could also receive infra-red equipment. Externally, they were identical. They were a sign of a great power in South-American, thus becoming very convenient to Brazil. They gradually replaced **M-3 Lee** and **M-4 Sherman** of the Brazilian army.



The South America Combat modern Cars. (Independence Day) 7 of September 1967, in Rio de Janeiro. M-41 Brazilian Army. Credit for photo: Brazilian Army



M-41 in September 7th, 1969 (Independence Day), in Rio de Janeiro. Credit for photo: Brazilian Army

Several Brazilian army units still operate the M-41 in their modernized version done by Bernardini Company, all in the Armoured Chivalry Regiment – RCB: the 20th in Campo Grande, MS, the 9th in São Gabriel, the 6th in Alegrete, the 4th in São Luiz Gonzaga, all in the state of Rio Grande do Sul, as well as in the Andrade Neves Chivalry School Regiment, in Rio de Janeiro, state of Rio de Janeiro. All the exceeding vehicles are gathered in the Maintenance Regional Park 2, in São Paulo.



M-41 C belonging to the School of Chivalry Regiment Andrade Neves, in Rio de Janeiro, RJ. They received these combat cars in 1995. Credit for photo: Brazilian Army

These Combat Cars were never operated in effective combats, but in the largest operation ever conducted by the Brazilian Army involving a big number of several combat car models (M-4 Sherman, M-3 Stuart, M-41 Walker Bulldog) during a long period of time. For over a week, involving several displacements and in real situations the crew was obliged to “live” in the vehicles. During the

Revolution, in 1964, the M-41 were used to defend important sites of cities, such as Rio de Janeiro and the federal capital, Brasília.



Light Tanks M-41 Walker Bulldog, in Rio de Janeiro, during the Revolution of 1964. Credit for photo: Brazilian Army

The fact of owning a considerable quantity of these Light Combat Cars, the Army, along with private initiatives accomplished a modernization program of their M-41 and M A3. In 1978, a M-41 was sent to Bernardini Industry and Commerce Company, a traditional safe manufacturer since 1912. The joint enterprise between that company and the Bellicose Material Board, through the Army Research and Development Institute brought into life the modernized version denominated of M-41B in Brazil.



One of the two M-41B with Cockerill/Engesa of 90mm cannon in tests. Notice the chassis lengthening in the rear part for the new motor diesel, and the same original model tower M-41 with new cannon. Credit for photo: Bernardini S/A

This modernization was due to the necessity of updating the main armoured vehicles in the Army, having in mind that the acquisition of new vehicles were then, just impossible for financial and political difficulties.

The reasoning at that time was of economic order, based on the eternal "resource lack". Inspired in the successful repotentiality work carried on by Israel, a big program was developed in the country to transform the already obsolete vehicles into more efficient and modern ones. Thus, the program included various vehicles such as the Armoured on wheels 6x6 M-8 Greyhound, several models of the famous Half-Tracks, very common during the Second World War, tractor M-4 - weighed artillery

tugboats - , light combat cars M-3 Stuart, which gave birth to a well-known vehicle family series X-1, Light Combat Cars M-41, Car Armoured of troops transportation M-113 and self propelled howitzers M-108. The national projects of the armoured on wheels and caterpillars (Cascavel, Urutu, Tamoyo, Osório, etc.) should not be forgotten.

Several problems arose being solved little by little. The military vehicle small quantities, did not motivate manufacturers, especially the multinationals; there was no autonomy to develop or adopt modifications in the products. Then, the decision was to carry on what was possible not being able to execute what was desirable.

The initial idea was to postpone the useful life of M-41 until the nineties. Then the armoured Brazilian projects would be mature enough and several genuine Brazilian companies would be ready to supply the Army demand. They could maintain themselves through exportations and the industries would be consolidating their defense products in the market. This could be true in the eighties, however impossible for the nineties. At the beginning of the new century and millenium, it becomes fiction, we are obliged us, again, to import second-hand vehicles, some of them below our needs, due more to political problems than to technical ones.

The Light Combat Car M-41 was the best we had even talking about numbers in terms. It was the base of all the armoured vehicles in the Army, from the big 5th Armoured Chivalry Brigade Unit to the smaller units (1st, 2nd, 3rd, 4th and 5th Regiment of Combat Cars, 4th, 6th, 9th and 20th Armoured Chivalry Regiment) plus the Bellicose Material School – EsMB, the birth place of the armoured and the maintenance Temple of the Army. Initially the modernization was the change in its motor from gasoline to a diesel model Scania DS14, keeping the original transmission box which turned into a big problem for the operators. The axis breakage between box and the motor, caused at large, the inviability of these vehicles. Another complicator fact was the lengthening of the rear part for the placement of the new diesel motor, which changed the vehicle gravitational center, causing caterpillars damages, problems not solved since then. But the main problem was in the weapon equipment. The original one of a 76mm cannon, was replaced by the Bernardini Co model, equipped it with a Cockerill of 90mm cannon, similar to the one used, in the armoured **EE-9 Cascavel** manufactured by Engesa under Belgium's license, as well as the **XIA2 Carcará** family manufactured by Bernardini Co. Only two armoured vehicles received these cannons for tests. Several operated which the 76mm cannon with was denominated version M-41B. Afterwards they were rebuilt as C with a 90mm cannon.



M-41 C of the 3rd Regiment of Combat Cars with cannon of 90mm. Exhibition in Rio de Janeiro, RJ, 1999. Credit for photo: Author's collection



Detail of the rear of M-41 C. The motor compartment increased and only one leakage instead of the two in the original model. Credit for photos: Author's collection



Two M-41 in the Conde de Linhares Military Museum in Rio de Janeiro, M-41 and M-41 C. Credit for photos: Author's collection

The conclusion of the army personnel after the tests was that instead of buying new cannons to equip all of the M-41, the Army would use the original 76mm cannon original, coating it and afterwards drilling it to 90mm caliber, with the same number of line number of Cockerill Engesa, thus using the same ammunition of EE-9 Cascavel. The Army had then adopted the 90mm caliber as a standard pattern.

The process was a solution for the M-41 problem. Several compartments were added around of the original tower giving a new car configuration, which received the designation of M-41 C (Caxias), having lateral skirts, not adopted in the other series. Curiously no Brazilian combat cars used lateral skirts to protect them against hollow ammunition load. Novatração Artefatos de Borracha S/A was in charge of the caterpillar's modernization.

Initially as the length of 76mm cannons was longer then the ones of 90 used in the EE-9 Cascavel; they were then cut to have the same size, later on it was discovered that size didn't interfere in the operation when transformed into 90mm. From then on the 76mm cannon was not cut. It is possible to find M-41 C with two cannon sizes in the 90mm caliber. The operation of a new drilling in the cannon caused some problems to several cars, for in some cases the internal walls, showed a thicker side than the other. This is still common in the remaining M-41C.

After some shots the tower was filled with smoke, causing problems to the crew's work, the gases extraction systems were not working consistently. This was never solved.

In fact, having transformed the 76mm cannon in to 90mm didn't do any better, it was even worse than the 76mm original. The 90mm ammunition was manufactured in Brazil, but not the 76mm one. (Example: Ammunition HE in the 76mm cannon, speed of 732m/s with 11,7kg of explosive and in the 90mm cannon, speed of 700m/s with 8,5kg of explosive). The idea was to export the technology developed in the reponentiality of the M-41, as a kit. But this be not true. The crisis in the Brazilian defense sector at the end of years 80 and 90 was fatal, the big projects died, the reponentialized or produced armoured vehicles came to a critical phase. They were substituted by second-hand material purchased from several countries. Then Brazil for the first time acquired the **MBT (Main Battle Tank)**, **M-60 A3 TTS** and **LEOPARD 1A 1**, respectively from the United States and Belgium, relegating almost at once all the already obsolete M-41C. However, they still render services to the several Army units, mostly in the formation of the future armoured force combatants. Uruguay is the only country in South American which, besides Brazil, operates a version of the M-41 denominated of M-41 A1U with the 90mm cannon Cockerill Mark IV, with a total of 22 units, modernized in Germany. The United States also tested a version of the M-41 with the 90mm cannon, denominated T-49 it was not carried on.

The development of the modernization project of the M-41 and others was not in vain, it has taught us many things. However, it is necessary to evaluate if learning with rights and wrongs will be used in the future. The Leopards soon will have to be modernized. We should think about our recent past, avoid errors or mistakes giving a good dead of emphasis on the rights. The Brazilians technicians should be encouraged to find ways of solving this old problem. The M-41 C are, no doubt the largest in number in the Brazilian Army and should survive for many years.



Partial facilities of Bernardini in São Paulo. Notice the M-41 C in final finishing phase. Credit for photo: Bernardini Company.



Publicity Photo as it would be in the final version of the M-41C (Caxias). Notice the lateral skirts of this vehicle. The other models series never used these skirts. Credit for photo: Bernardini Company.

At this point, Bernardini, experimented and ended up to develop a new Combat Car **TAMOYO**, that was nothing more than a direct derivative of the M-41, a little bit larger and with new “garments”, designed to have the 90 and 105mm cannon, depending on the version. Almost all the prototype components, wheels, caterpillars and even the 76mm cannon came from the M-41. The first prototype was elaborated together with **CeTEx (Army Technological Center)** in Rio de Janeiro, RJ. The prototype phase was the first and the only phase.



The first prototype (mock-up) of TAMOYO conceived in the Army Technological Center, in the 80's. Notice the similarities with the M-41; larger and with new garments. Credit for photos: Author's collection.



The prototype of TAMOYO II in tests, 1988, May. Credit for photo: Author's collection.

At the present time the Brazilian army still uses about 128 M-41 C in RCB (Armoured Chivalry Regiment) remaining of the modified by Bernardini S/A.

Unhappily TAMOYO's project wasn't ahead and he had to have been the substitute of the M-41, base for future developments of armoured in the country, but this is already other history...

Under the uncertainty of tomorrow, the **Armed Forces** and the “**National Industry**” should not be in condition of keeping, the rhythm of knowledge along with the modern technology of combat means. Development, research and the use of knowledge and learning constitute some of the most interesting aspects of the Military Science. Technology can not be purchased, it has to be developed...



The first M-41 modified by Bernardini S/A with motor Diesel Scania in June 1978. Credit for photo: Author's collection.