6.5x25 CBJ

And other cartridges against MT-LB armor and B7 class vehicle armor

CBJ Tech – Test protocol

Date: 2019-10-01	**Location**: Kungsbacka, Bunker (indoor test facility)	**Weather conditions**: Indoor, 21 deg C
Weapon systems tested: HK G3 - 7.62x51 Nato, AK5 A - 5.56x45 Nato, AKM - 7.62x39, AK 74 - 5.45x39, HK MP7 - 4.6x30, Glock 17 – 9x19 Nato and 6.5x25 CBJ		
Ammunition tested: 7.62x51 Nato Ball, 5.56x45 Nato Ball, 7.62x39 Ball, 5.45x39 Ball, 4.6x30 NM257, 6.5x25 CBJ APDS.		
Targets tested: 1: Armor plate from an MT-LB, Russian Armored Personnel Carrier. 2: Vehicle armor plate class B7.		
People present: Mikael Johansson, Bertil Johansson		
Additional information:		

Background, Purpose and Goal

One of the key features of the 6.5x25 CBJ APDS cartridge is the superior armor piercing capability compared to other cartridges of similar size.

The purpose of these tests is to make a side by side comparison with other relevant cartridges, by shooting at armor plates at the same distance.

The goal is to determine the difference in armor piercing capability between the 6.5x25 CBJ APDS and the other cartridges.

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Test Setup

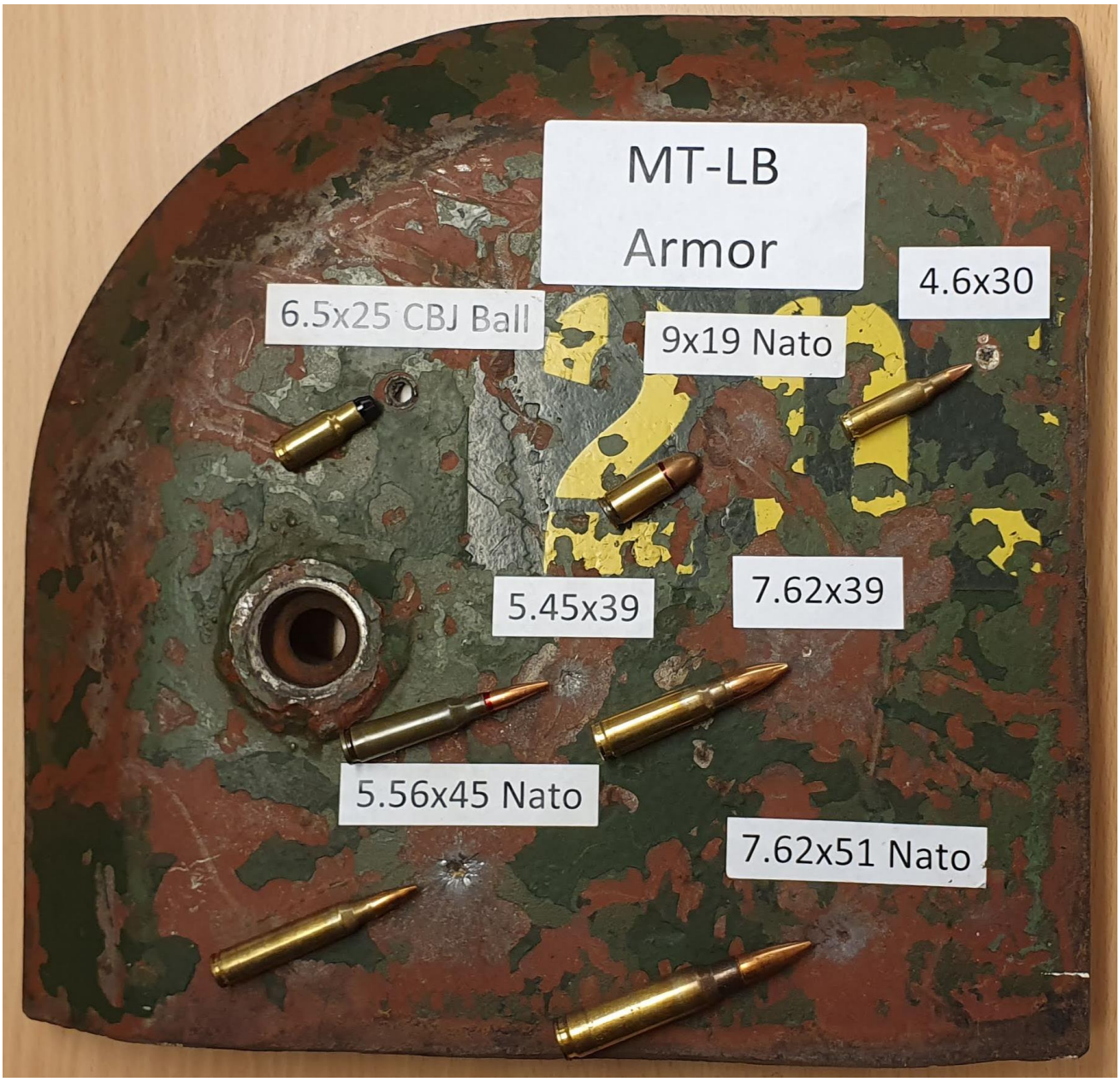
Test 1 – MT-LB armor

A piece of a rear door from a Russian MT-LB Armored Personnel Carrier was used for penetration tests with all the different cartridges in this test. The armor is 7mm thick and has a hardness of 450 HB.

All shots were fired at a distance of 10m from the target. The shooter shot through a ballistic shield to avoid getting injured by shrapnel.

Result:

Only the 6.5x25 CBJ APDS was able to penetrate the armor plate. None of the others were even close to penetration.



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Test 2 – Vehicle armor class B7

A piece of vehicle armor class B7 was used for penetration tests with the 7.62x51 Nato, 5.56x45 Nato, 9x19 Nato, 4.6x30 and the 6.5x25 CBJ APDS. The armor consists of a steel plate with a Kevlar liner behind it. The thickness of the steel is 4,3mm and the total thickness of the panel is 14mm.

All shots were fired at a distance of 10m from the target. The shooter shot through a ballistic shield to avoid getting injured by shrapnel.

Result:

Only the 6.5x25 CBJ APDS was able to penetrate the armor plate. None of the others were even close to penetration. An additional test at 50m range still resulted in full penetration with the 6.5x25 CBJ APDS.

This image shows the Kevlar on the backside of the panel.

The two red circles show the exit holes of the two 6.5x25 CBJ core projectiles that penetrated the panel.

Summary

The 6.5x25 CBJ APDS shows superior penetration capability against these two armor panels, compared to all the other tested cartridges. Even the much larger and faster projectiles from the 5.56x45 Nato and 7.62x51 Nato failed to penetrate the panels. The main reason for the difference in performance is related to the material in the different projectiles.

The 6.5x25 CBJ APDS is a subcaliber cartridge firing a tungsten core projectile from inside a discarding sabot. The tungsten heavy metal alloy used has a density of 17.6 g/cm^2, which is much higher compared to lead (11.35 g/cm^2), copper (8.5 g/cm^2) or steel (7.8 g/cm^2), which all of the other projectiles are made of in varying degrees. The tungsten also has a hardness comparable to steel.

The projectiles made of the weaker materials disintegrates upon hitting the hard surface of the armor plates, and thus fails to keep the energy focused in one small contact area, which is needed to for penetration. The high target hitting velocity (700m/s at 10m range from pistol barrel) of the 6.5x25 CBJ APDS, combined with the high density and strength of the tungsten core projectile is what gives it the superior armor piercing capability.