



BATTLE TANK



INTRODUCTION

Tank is a self-propelled armoured fighting vehicle, capable of heavy firepower, primarily of a high muzzle velocity direct fire main gun necessary to engage armoured and other targets, with high cross-country mobility, with a high level of self-protection, and which is not designed and equipped primarily to transport combat troops.

MAIN COMPONENTS

- Engine Compartment
- Hull
- Turret
- Optical Periscope
- Main gun
- Tracks
- Armoured skirt
- Driver hatch

CONSTRUCTIONAL DETAILS

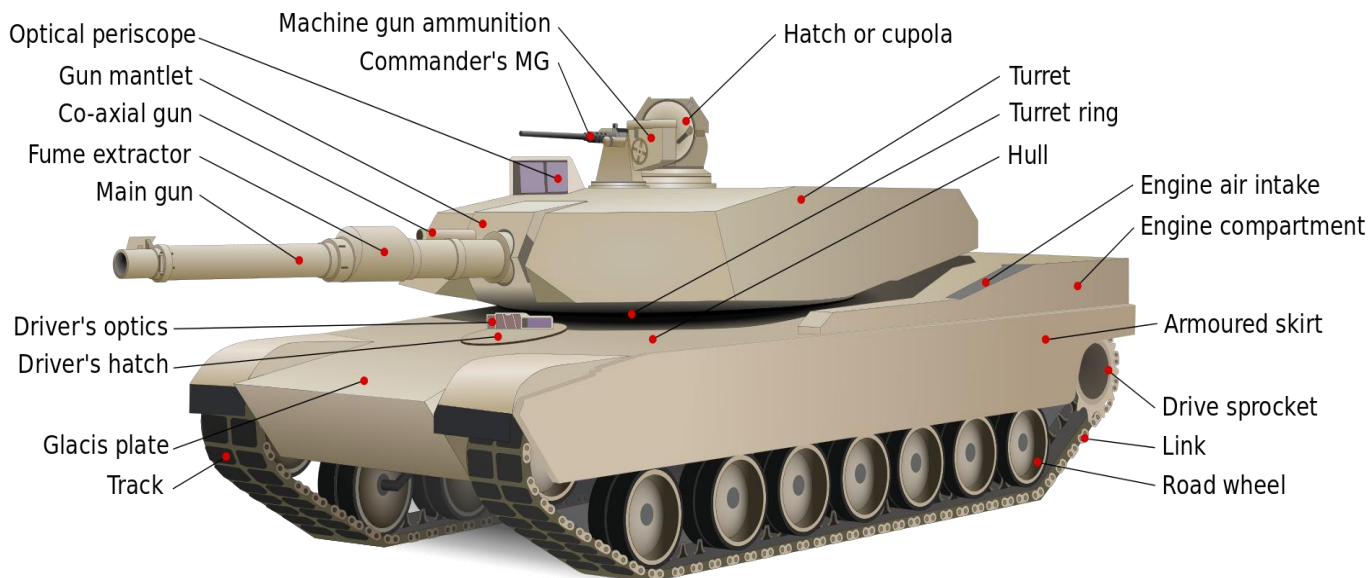
The hull is the bottom part of the tank where the driver cabin is located. The turret is the top part of the tank where the main gun is fixed. The main gun can be rotated freely by the use of turret ring. The loading for the main gun is done inside the hull. The whole tank is equipped with the armoured skirt for protecting the tank from opposite army bullets. The driver hatch is the entry door for the tank driver and it is provided in between the hull and the turret. The tank is moved by means of tracks instead of tyres. The view for the driver to drive the tank is given by the use of Optical periscope.

Until the 1960s, tank armour consisted of homogeneous steel plates or castings. The thickness of this armour varied from 8 mm on early tanks to 250 mm at the front of the German Jagdtiger of 1945. After World War II, opinions differed about the value of armour protection. Tanks such as the Leopard 1 and AMX-30 had relatively thin armour for the sake of light weight and greater mobility, which was considered to provide a greater chance of battlefield survival. Other tanks, such as the Chieftain, had heavier armour, up to 120 mm thick at the



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front, and the Arab-Israeli wars of 1967 and 1973 demonstrated the continued value of heavy armour.



At the same time, new types of armour were developed that were much more effective than homogeneous steel, particularly against shaped-charge warheads. The new types were multi-layered and incorporated ceramics or other non-metallic materials as well as steel. The first was successfully developed in Britain under the name of Chobham armour. Armour of its kind was first adopted in the early 1970s in the M1 and Leopard 2; it then came into general use in place of simple steel armour. Fighting in Lebanon in 1982 saw the first use, on Israeli tanks, of explosive reactive armour, which consisted of a layer of explosive sandwiched between two relatively thin steel plates. Designed to explode outward and thus neutralize the explosive penetration of a shaped-charge warhead, reactive armour augmented any protection already provided by steel or composite armour. The increased protection afforded to tanks inevitably increased their weight. Some tanks introduced during the 1950s and '60s, such as the T-54 and AMX-30, weighed only 36 tons, but the Chieftain already weighed 54 tons. Most tanks introduced during the 1980s, such as the M1 and the Leopard 2, also weighed more than 50 tons, and the Challenger weighed as much as 62 tons.

In spite of the progressive increases in weight, tanks' speed and agility actually increased because they were provided with more powerful engines. After World War II, tank engines had an output of 500 to 800 horsepower, but, starting with the MBT-70, their output increased to 1,500 horsepower. Engines of this power were installed in the M1 and the Leopard 2, giving them power-to-weight ratios of more than 20 horsepower per ton. Most tank engines of the immediate postwar years had 12 cylinders in a V-configuration and at first were of the



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spark-ignition gasoline type. But Soviet tanks already had diesel engines, and from the 1960s almost all tanks were diesel-powered. This increased their range of operation because of the greater thermal efficiency of the diesels, and it reduced the risk of catastrophic fires that could erupt if the armour was perforated by enemy weapons.

The development of gas turbines led in the 1960s to the use of one, in combination with a diesel engine, in the Swedish S-tank. After that, a 1,500-horsepower gas turbine was adopted to power by itself the M1 and M1A1. A gas turbine also powered the Soviet T-80, introduced in the 1980s. All other new tanks of the 1980s continued to be powered by diesels because of their greater fuel economy. Since the speed of tanks over rough ground depended not only on the power of their engines but also on the effectiveness of their suspensions, the latter developed considerably in the post-war era. Almost all tanks adopted independently located road wheels, sprung in most cases by transversely located torsion bars. Exceptions to this were the Centurion and Chieftain and the Merkava, which used coil springs. To improve their ride over rough ground still further, most tanks built during the 1980s were fitted with hydro pneumatic instead of metallic spring units.