

# MSM LAND SYSTEM DIVISION







## MSM GROUP



**MSM GROUP Ltd.** was established in 2015 by transformation of MSM Martin Ltd., which dealt with construction, development, production and sales mainly with military material. MSM Martin Ltd. was founded in 2004 on the base of MSM Ltd. In next years the MSM Martin Ltd. took over several military companies located in the middle of Slovakia, and built on its traditional manufacturing activities in military and civil production.

Due to **ZVS** company inclusion into the group structure we can state that the origin of **MSM GROUP Ltd.** comes **back to 1927** when then Škoda Works in Plzeň, as a monopoly producer of ammunition technics decided to build so called „spare factory“ in Slovakia. The company was totally destroyed during the World War II, and it took several years while the production was restored to such extend, that its products were supplied not only for the Ministry of National Defense, but for many countries worldwide as well.

Today the **MSM GROUP Ltd.** makes use of rich experiences from the past and know-how of highly qualified workers and vast archive of technical documentation for all necessary procedures.

In 2009 the biggest Czech industry holding CSG (CZECHOSLOVAK GROUP) entered MSM as a co-owner.

### Why to cooperate with us:

More than 70 years experiences in the ammunition development, production and complete services in this field.

Long tradition in the MSM locations for the ammunition production processes with significant effects as the deep skilled personal, support industries, development fields, education etc.

### The resources and competencies:

1. Development of the product and the production process included complete documentation
2. Engineering construction of product including the prototype production and the pre-serial testing
3. Production line, tools and jigs engineering construction, and production
4. Production of various types of small, middle and large caliber ammunition and associated charges, fuses and primers for guns and cannons. Deliveries with all of necessary documentation, and certificates
5. Services during the ammo life cycle: Testing, Revision, Modernization, Life cycle prolongation, Disassembly, Ecological disposal
6. In the case also the production line development, production and the transfer with whole necessary technical support to customer plant
7. Services for military vehicles including the diagnostics (Tanks, Armoured vehicles, Self-propelled gun systems, ...)

Design, development, manufacturing and servicing of the radio navigation systems (NDB) for air traffic control. Repairing and modernization of various kinds of Armed Forces equipment in the segment of air defence equipment.

More information at [www.msm.sk](http://www.msm.sk)



Facility Trenčín



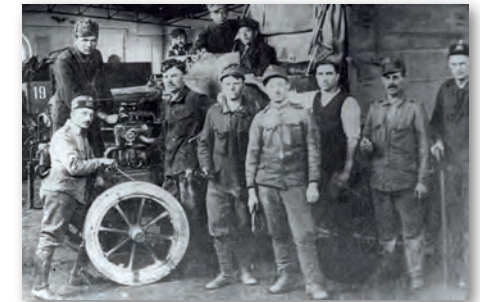
The company has been established in 1918 in Bratislava as a main car repair workshops for Western Slovakia. Later the company has been moved to the Trenčín city. After the World War II. the factory was rebuild and focused on military trophy technics. Since 1994 company implemented the technology to repair tanks, BMP and overhaul of UAZ vehicles. An important milestone in the history of the company was 2005 when it began production of light armoured vehicle Aligator 4x4, by which our army was equipped with. The company also provided installation of the simulators of T-55 and BMP. In the civilian sector, it offered mobile workshops used for field

repairs the construction of water projects, highways, maintenance of pipelines, etc. At the beginning of 2015 company MSM GROUP Ltd. took over MSM plant Trenčín together with several other companies operating in defence area located in the middle of Slovak.

The company MSM Trenčín specializes primarily to repair military wheeled and tracked technics, modernization of military and special vehicles, spare parts sales and manufacturing of mobile containers of series ISO 1C. Our plant in Trenčín has a permission to perform an authorized service TATRA TRUCKS vehicles to which provides spare parts and performs warranty and post-warranty service.

History

- 1918 The company has been established in Bratislava as a Main car repair workshops for Western Slovakia
- 1950 After the World War II. the factory was rebuild and focused on military trophy technics
- 1993 Start of the participation at the technical and material support for Army of Slovak republic within the NATO and the UN missions
- 1994 The implementation of the technology to repair tanks, BMP and overhaul of UAZ vehicles. The company also provided installation of the simulators of T-55 and BMP
- 2005 The start of the production of light armoured vehicle Aligator 4x4
- 2006 A state joint-stock company Vojensky opravarensky podnik (Military Repair Company) Trenčín was established
- 2006 Has been reached a permission to perform an authorized service TATRA vehicles to which provides spare parts and perform warranty and post-warranty service
- 2014 The incorporation as a branch plant into the MSM Martin Ltd.
- 2015 The MSM GROUP Ltd. establishing which is covering several companies operating in the defence area included very well known ZVS company, and MSM Martin Ltd. also





## IFV ŠAKAL Modernized Infantry Fighting Vehicle (BMP-2 Modernization)



Vehicle IFV ŠAKAL is applied for ensuring armament and meeting tasks of mechanized units equipped with original vehicles BMP.

The scope of modernization ensures keeping the requirements at high level of combat preparedness of these units, assures their capability in compliance with NATO standards while operating embattled and gives response to current trends of requirements for combat tracked vehicles.

Main specifications	
Length	max. 7,000 mm
Width	max. 3,200 mm
Height	max. 2,900 mm
Combat weight	max. 19,000 kg
Range	min. 400 km
Measured output	min. 16 kW/t
Wading depth	min. 1,300 mm
Crew	3 persons
Landing team	6 persons
Turret	Remotely controlled, stabilized in two axis, type optional, e.g. TURRA 30, SAMSON MkIIRWS etc.
Armament	30 mm cannon
	7.62 mm machine gun
	Anti-tank missiles
	Smoke grenade launchers



### Main modernizations

#### Vehicle protection

- Ballistic protection on level 3 (STANAG 4569) with internal ballistic padding
- Anti-mine protection of tracks on level 2a (STANAG 4569) and on level 1 under the belly
- Multispectral warning system operating in microwave and laser spectrums, cooperating with BMS and smoke-grenade launching system
- Camouflaged for visible and near-IR spectrum

#### Agility

- Power-pack, increased output, automatic gearbox

#### Battlefield survival

- Increased height of the landing team's compartment, ergonomic seats with increased anti-blast protection
- State-of-the-art fire extinguishing system in the motor compartment and anti-explosion protection of the crew and the landing team
- Independent heating and air conditioning of the crew and landing team compartments



#### C4I

- NATO – compatible radio
- Diagnostic system interconnected with BMS
- Data and communications platform for the 21st century soldier technology

#### Logistics

- Capability of extrication and removal in compliance with STANAG 4062 and 4478. Capable of road, railroad, maritime transport and airlift including the C-130 aircraft according to STANAG 3548
- 20 year longer lifespan

#### Destructiveness

- Capable of firing on light and medium hardened targets, live force and low-flying targets. Increased elevation and angular speed considerably improves efficiency of firing, including when on the move.
- Surveillance and targeting systems of the commander and gunner are able to detect and target during day, night and in reduced visibility. The commander is equipped with an independent optoelectronic panoramic surveillance system (optional).
- The commander's and gunner's stations are positioned in the combat area in front of the turret. The commander and gunner are both fully capable of controlling the turret, which is supported by the fire control system with an integrated BMS.





## KBV-12 PATRIOT 4x4

## A Medium Armored Tactical Multi-Mission Vehicle



The KBV-12 PATRIOT 4x4 is a medium-class armored wheeled combat vehicle for all terrain operations. This vehicle is equipped with a remote controlled weapons station with gun mounts, potentially carrying 7.62 mm or 12.7 mm machine guns, automatic grenade launchers, and anti-tank weapons systems.

This compact combat vehicle has been designed as a multi-purpose tactical vehicle in configurations suitable for artillery support, general military reconnaissance, command and control, electronic warfare or RCIED jammer carrier, CIMIC/PSYOPS vehicle, cooperation with civilian authorities, etc.

This armored vehicle fulfils all STANAG standards applicable to this type of equipment. At the same time, the vehicle complies with all road traffic regulations; therefore, it can be operated safely on public roads for emergency management or training purposes.

### Main features and operation modes

- Outstanding mobility and obstacle crossing capabilities, high speed in terrain conditions
- The air suspension system brings added comfort and allows the driver to increase the clearance by 70 mm or lower the max height by 100 mm on the go
- This vehicle is dedicated for missions even under extreme temperature conditions or for very hard terrain operations
- Compatible with special superstructures or supporting equipment and will not affect functional and driving capabilities of the vehicle
- Transportation of the crew or troops
- Fighting operations possible with the remote controlled weapons station
- Possibility of non-stop full-range combat operations during low intensity conflicts
- Detachable weapons systems, which can be used outside of the vehicle, provide high fire power and increase the defensive capacities of the crew

Main specifications	
Chassis	TATRA FORCE 4x4 with central backbone tube and independent swinging air suspended half axles
Gross vehicle weight	12 t, technically up to 15 t, max. load on axle 7,5 t (each)
Engine	CUMMINS ISB, Euro III, 6 cylinder diesel engine, 210 kW, torque 970 Nm
Transmission/Transfer case	Allison 3200SP, automatic 6+1/TATRA 2.30, 2 speed
Wheels, tires	14.00R20, run-flat equipped, central tire inflation system while moving operated from the driver's seat, disc brakes with ABS, no wheel hub reductions
Max. speed, Min. Range	130 km/h, 500 km
Turning-diameter (curb-to- curb)	15.5 m ± 1 m
Vertical step/trench	500 mm/900 mm
Max. gradient /Fording	60 %/1,200 mm, no additional preparations
Crew	1 + 1 + 4
Operating-temperature range	-32 °C to +49 °C

Technical data:	
Armored body	no-frame, patented bolt-together design, proven solution called "Kitted Hull Concept"
Ballistic protection	Level 3 according to STANAG 4569
Anti-mine protection	Level 2a/2b according to STANAG 4569
Main weapons system	remote controlled weapons station equipped with gun mounts, carrying potentially 7.62 mm or 12.7 mm machine guns,
Additional weapons systems	automatic grenade launchers, and anti-tank weapons systems
Electricity	24 V









# ALIGATOR 4x4 MASTER II Light Weight Armoured Vehicle

**ALIGATOR 4x4 MASTER** is the basic vehicle platform, from which all the fleet variants can be derived. The essential characteristics as detailed hereunder are standard across the fleet variants. The vehicle has been developed to NATO standards in order to undertake a wide range of roles such as tactical combat vehicle, mobile command and communications post, internal security role for PSP missions, VIP transport, police, border patrol, surveillance and reconnaissance, target acquisition, military policing and civil control.

## Powertrain and Driveline system:

### Engine:

1. CUMMINS ENGINE ISB 6,7 E 3245, EURO 3,
2. Advertised Power: 180 kW @ 2,500 rpm
  - a) 242BHP @ 2,500rpm
  - b) Peak Torque: 925 Nm @ 1,700rpm; 682 lbft @ 1,700rpm
3. Configuration: 6 cylinder in-lin
4. Displacement: 6.7 Litre

### Transmission:

The driveline comprises of Allison transmission 2,500 SPT with torque converter TC221 with SAE 3 housing and T-case adapter for direct mounted (None Allison) auxiliary gear box, coupling not included.

- Gears: 6 forward, 1 reverse  
 Max Power: 254 I<MJ with shift energy management  
 Max Input torque: 895 Nm in gear 1,2,6  
 Max Input torque: 950 Nm in gear 3,4,5  
 Converter stall torque ratio: 1.73

**Max vehicle weight: 15,000 kg**

and 2x integral distribution gearbox. with differential locking, and reduction hub assemblies are used. The transmission is electronically controlled and fully integrated with the engine EMS. The transfer gearbox includes a differential, which incorporates a differential lock. Drive is permanent all-wheel drive to independent coil sprung wheel stations using gas telescopic shock absorbers. High quality differentials, with differential locking, and reduction hub assemblies are used.

### Other possible optional equipment as per the requirements of the customer:

- Fire detection and suppression system for engine, cabin, tires
- Shooting ports with same level of protection
- Self Recovery Winch
- Special sand Filters and heavy duty air, oil and fuel filters
- Bullet Proof Fuel Tank
- Special Filtration with indicator in the Cabin
- One spare wheel with Tyre and Run Flat.
- Navigation System
- Preparation for the radio, etc.
- Amphibious mode can be provided
- Ballistic protection can be upon request increased with add-on armouring up to STANAG Level III
- Anti-mine protection can be upon request increased with add-on armouring up to STANAG Level II A, B

Technical data:		
Name	Aligator 4x4 Master II	
Crew	2 - 9 (10) + equipment	
Configuration	3 doors variant 5 doors variant Left hand drive Right hand drive	4 x 4
Payload	3,130 kg	6,900 lb
Gross vehicle weight	12,000 kg	26,455 lb
Overall length	5,500 mm	18 ft 0.5 in
overall width	2,499 mm	8 ft 2 in
Overall height	2,054 mm	6 ft 9 in
Ground Clearance	400 mm	1 ft 3.75 in
Tyres	20"	
Armour	STANAG 4569, Level 3	
Propulsion type	Cummins 6,700 cm <sup>3</sup> , 185kW at 2,500 rpm, torque 925 Nm at 1,500 rpm	
Gearbox	Allison, 6-gear, automatic	
Max.road speed	130 km/h shortly in urgent situations max. 145 km/h	81 mph
Max. speed of cruise	"5.5 km/h only with integration of external kit for amphibious mode"	
Fuel Consumption	25 l/100 km	11.3 mi/Imp gal
Cruising Range on Road	min. 700 km	min. 435 mi
Angle of Approach/Departure	70 ° / 42 °	
Fording Depth	1.5 m	59 in
Side tilt	40%	
Trench Crossing	0.85 m	34 in
Vertical Obstacle	0.45m	18 in
Developed	Kerametal, a.s., Slovak Republic	
License for production and further development	Slovak Training Academy, s.r.o. and asociated companies of MSM Group	







## IFV CORSAC 8x8 A Medium Mission Vehicle

- MSM Group is a partner of GENERAL DYNAMICS European Land Systems
- We have qualification for manufacturing, general overhaul and other maintenance services and repairs of existing variants of IFV CORSAC 8x8.
- We are an owner of specific licenses and permissions for manufacturing and service of IFV CORSAC 8x8, we are a co-owner of intellectual property of the vehicle.



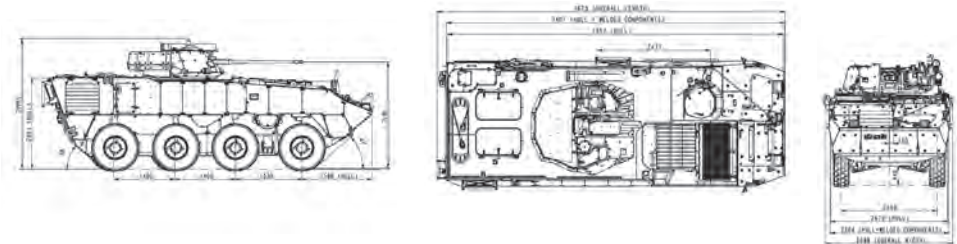
### IFV CORSAC 8x8 basic version BOV

Operating weight:..... 14,500 kg  
 Max. Combat weight:..... 24,000 kg  
 Max. useful load: ..... 9,500 kg

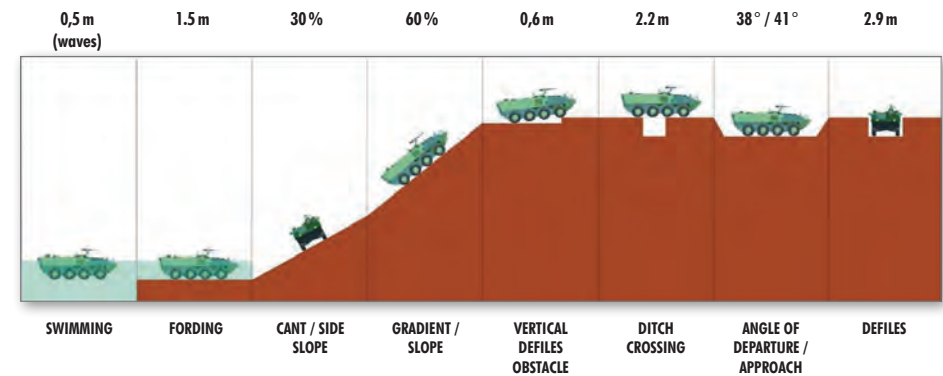
Tires: ..... 365/80 R20  
 Bright height: ..... 448 mm RoRo C-130 air transportable

#### Main technical data:

Weight	17,6 tones (basic ballistic shield) 22,0 tones (increased ballistic shield)
Length	7,430 mm
Width	2,670 mm
Height	2,950 mm
Crew	3+6
Main armament	30 mm fire gun, type 2A42
Secondary armament	MG 7.62x54 mm or 12.7x108 mm
Engine	diesel Cummins EURO 111, 455 hp ( 335 kW)
Aggregate	wheels 8x8
Range	700 km
Speed	100–110 km/h (road)
Wading	11 km/h
Place of manufacture	Slovak Republic



### IFV CORSAC 8x8 Baseline mobility



Maximum speed: 110 km/h  
 Minimum sustained speed: 3.5 km/h  
 Maximum reverse speed: 14 km/h  
 Maximum swim speed: 10 km/h

Turning diameter: 21.6 m (with steering brake)  
 17.1 – 21.6 m  
 Autonomy: 600 up to 700 km









## TITUS® 6x6 Tactical Infantry Transport & Utility System

TITUS® is the ultimate armoured vehicle, designed to deal with all the constraints of modern hybrid warfare. Developed in close cooperation with TATRA TRUCKS, the prime contractor for the Czech and Slovak armed forces, Nexter's TITUS® continues a long and proud lineage including Leclerc MBT, VBCI and ARAVIS®, all combat-proven in many theatres of operation.

The vehicle combines Nexter's extensive experience and state-of-the-art technology with the unique chassis supplied by TATRA EXPORT.

Tactical commanders can now call upon a 6x6 vehicle that is customizable for a constantly evolving environment. TITUS® is the multirole armoured vehicle of the 21<sup>st</sup> century. From infantry transport to combat support and combat service support functions, from peacekeeping operations to counter-insurgency, TITUS® brings unrivalled technology and the Nexter touch into the heart of the action.



### MODULES

A family of modules that respond to the full range of mission types.

A range of 'pre-defined' operational kits to rapidly adapt the vehicle to local tactical priorities.



**TRANSPORT**  
Armoured Personnel Carrier – APC



**COMMAND & CONTROL**  
Command Post – CP



**TARGET ACQUISITION**  
Forward Support Team – FST



**MEDICAL SUPPORT**  
Ambulance – AMB



**FIRE SUPPORT**  
Self Propelled 120 mm Mortar – SP 120 MORT



**MOBILITY SUPPORT**  
Engineers – ENG



**RECOVERY**  
Service



**RESUPPLY**  
Cargo



**URBAN AREA**  
Unmanned Vehicle for Intelligence Collection (Nerva® LG)  
Assault ladder for investigating buildings

### Basic technical data:

WEIGHT AND DIMENSIONS	Curb weight	17 t
	Combat weight	23 t
	Gross weight	27 t
	Width	2.55 m
	Height	2.73 m (roof)
	Length	7.77 m
	Ground clearance	0.3/0.4/0.5 m
PROTECTION	Standard	Rear compartment: level 2; power pack: level 1; windows: level 2; mines: level 4a/3b; IED blast: 50 kg
	Combat	Rear compartment: level 3; power pack: level 2; windows: level 3; mines: level 4a/3b; IED blast: 100 kg; IED splinters: 155 mm
	Additional	Rear compartment: level 4; power pack: level 3; windows: level 3 + additional protection; mines level 4a/4b; IED blast: 150 kg; IED splinters: 155 mm; RPG protection
MOBILITY	Power pack	Engine: 500 HP; automatic gearbox (6+1)
	Steering	1st and 3rd axle steered; 13 m turning diameter
PERFORMANCES	Range	700 km
	Maximum speed	110 km/h
	Slope	60 %
	Step	700 mm
	Side slope	30 %
	Fording capability w/o preparation	1.2 m
HUMAN INTEGRATION	Crew	3 + 10
	Modular capacity up to 2 + 12	
	Internal volume	14.4 m <sup>3</sup>
	Stowage capacity	2.4 m <sup>3</sup> inside, 1.5 m <sup>3</sup> outside







## DANA-M1 M

➤ DANA-M1 M is the next step in the modernization of the self-propelled howitzer 152mm vz.77, which in 2011 launched the company CZECHOSLOVAK GROUP a.s. under the name of DANA-M1.

The implemented upgrade items keep the well established combat & service features of the DANA system unchanged and at the same time transform the weapon into an up-to-date and more powerful system.

DANA-M1 M is characterized by high speed and shooting accuracy, excellent clearness, good manoeuvrability and long-term proven reliability of the operation. These properties predetermine it, as well as its predecessors to continue to play an important role in the modern period of artillery support

### The chassis upgrade

The chassis upgrade preserves the main characteristics of the version DANA-M1, which led to improved driveability and manoeuvrability of the vehicle and includes:

- servo-system ZF with auxiliary cylinder
- electronic gear shifting
- lighting with system BLACKOUT

Other changes have been realized on the engine T3-930 with an intercooler, where a single turbocharger provides the engine supercharging and two original air cleaners have been replaced by one more efficient.

Other changes occurred in the upgraded cabin, where from ergonomic point of view the internal space has been improved by modifying control cabinets. The performance increasing of independent heating and utilization of dependent and independent air conditioning improves the crew comfort in extreme climatic conditions.

The increasing of the flow and modifications of hydraulic circuit control of the drawing-out and retracting of supports shorten the readiness to fire or leaving of firing position.

Modernization of cable assemblies meets the requirements for implementing the system of communication and control C4I.

Proposed optional equipment meets customer requirements and provides vehicle versatility by fire support of troops.



### Optional equipment

- auxiliary for power auxiliary power unit (APU)
- system of communication and control C4I
- fire control system (FCS)
- camera for night vision of the driver
- electronic inclinometer
- parking cameras











## BMP-1 Infantry Fighting Vehicle

➤ The BMP-1 armoured personnel carrier is amphibious waterproof tracked vehicle featuring good armour protection and maneuvering abilities. The BMP-1 is equipped with a heavy 73 mm gun and a coupled 7.62 mm machine gun. The BMP-1 is designed to transport a motorized combat infantry unit of 8 members. The armoured personnel carrier is equipped with a manually loaded launching device.

### Basic technical data:

Weight:	13,250 kg
Engine type:	UTD-20, 6 cylinders in „V“ system
Engine output:	220 kW
Main dimensions (length x width x height):	6,735 x 2,949 x 2,070 mm
Maximum speed:	65 km/h
Seaworthiness maximal speed:	6 km/h
73 mm gun:	2A28
Coupled 7.62 mm machine gun – type:	PKT



## BMP-1 Recovery Vehicle

➤ The recovery vehicle is an amphibious tracked armoured unit mounted on the modified chassis of the BMP carrier. It features high maneuverability and good travelling qualities in heavy terrain.

After mounting a blade used as a support, it is used for the recovery of pieces of armoured and mechanised units up to a weight of 15,000 kg with follow-up towing to the repair site. It can also clear vehicle-blocked roads. The crew of three is capable of providing basic and simple repairs in the field with the use of the vehicle's multifunctional equipment. For protection, the vehicle is equipped with a 7.62 mm machine gun

### Basic technical data:

Weight:	14,300 kg
Engine type:	UTD-20, 6 cylinders in „V“ system
Main dimensions (length x width x height):	7,130 x 2,949 x 2,350 mm
Winch (towing force (in direct pulling)):	125 kN
Ploughshare (max. anchoring force):	up to 345 kN (depends on the soil density)
Crane (max. loading capacity):	6 500 kg
Main armament (caliber, type, name):	7.62 mm, machine gun, PKT



# BMP-2



The BMP-2 was fitted with a new two-man turret. The most obvious improvement being the replacement of the BMP-1's non-stabilized 73 mm low velocity gun by a more versatile and effective fully-stabilized dual-fed 30-mm cannon. The previous gun had a maximum range of only 1 300 m. Also it could not be used against air targets. The 30-mm cannon proved to be successful. Later it was used on a number of Soviet/Russian armored vehicles, as well as attack helicopters. This cannon fires HE-FRAG, HE and armor-piercing rounds. It can engage armored targets at a range of 1 500 m, ground targets at a range of 4 000 m and helicopters at a range of up to 2 500 m. There is also a coaxial 7.62-mm machine gun. Some BMP-2 IFVs are additionally fitted with a 40 mm automatic grenade launcher.



A (AT-4 Spigot) or Konkurs (AT-5 Spandrel) ATGW launcher may be mounted over the turret. These missiles have a range of up to 2 500 m and 4 000 m respectively. Also a portable anti-tank launcher is often carried inside the vehicle.

Welded steel armor of the BMP-2 provides all-round protection against 12.7 mm rounds. Front arc of this IFV offers partial protection against 20 mm ammunition. Vehicle is also fitted with NBC protection and automatic fire suppression systems.



Main specifications	
Crew	3 (+7 passengers)
Length	6.72 metres (22 ft 1 in)
Width	3.15 metres (10 ft 4 in)
Height	2.45 metres (8 ft 0 in)
Armor	23–33 mm
Main armament	30 mm automatic cannon 2A42
Secondary armament	7.62 mm machine gun (PKTM)
	9M113 Konkurs ATGM
Engine	diesel UTD-20S1
	300 hp (225 kW)
Suspension	torsion bar
Operational range	600 km (370 mi)
Speed	65 km/h (40 mph) (road)
	45 km/h (28 mph) (off-road)
	7 km/h (4.3 mph) (water)

A rather cramped interior remained but the number of troops carried was reduced to seven. Vehicle commander was relocated from a position behind the driver to the turret. Normally commander dismounts with the troops. Each soldier has its own firing port and associated vision block.

This infantry fighting vehicle is powered by a UTD-20S1 turbocharged diesel engine, developing 300 hp. It is an improved version of the BMP-1 engine. Transmission and running gear is almost identical to that of its predecessor. Engine and transmission can be easily removed and replaced in field conditions.

Vehicle is fully amphibious. On water it is propelled by its tracks.

There are a number of variants of the BMP-2. Czechoslovakia and India developed their own variants, including armored ambulance, armored engineering vehicle, bridging reconnaissance vehicle and many other.





**Main  
Battle Tank**

## T-55A/T-55AM2

➤ The T-55A tank is a medium weight tracked combat vehicle equipped with a 100 mm gun, an anti-aircraft machine gun of 12.7 mm caliber and two light machine guns of 7.62 mm caliber.

The T-55M is equipped with a few modernized means, i.e. a laser sight with 5 km range, the KLADIVO firing control system, and an infrared rangefinder.

### Basic technical data:

Weight:	41,500 kg
Engine type:	V-55 AM2, 12 cylinders in „V“ system
Engine output:	456 kW
Max. firing speed:	50 km/h
Main gun, type D 10-T2S calibre:	100 mm
Firing maximal speed:	7 rounds/min



**Main  
Battle Tank**

## T-72

➤ The T-72 Tank is a medium weight combat vehicle equipped with a 125 mm main gun, a co-axial PKMT, and a 12.7 mm machine gun for anti-aircraft defence. It also has a 7.62 mm machine gun.

### Basic technical data:

Weight:	43,000 kg
Engine type:	V-46.6, Water cooled V-12
Engine output:	573 kW
Maximum speed:	60 km/h
Main gun, type 2A46 calibre:	125 mm
Auto loader:	8 rounds/min





## VT-55A Recovery Tank

➤ The VT-55 recovery tank is an armoured tracked vehicle designed to recover and tow immobile tanks and other vehicles in different terrain conditions. The VT-55 is designed on a T-55 chassis. The winch towing power is 735 kN (75Mp). It is utilized to lift loads of up to 1600/2000 kg (depends on the crane type).



## VT-72

➤ The T-72 was manufactured under licence in Slovakia (when it was part of the former Czechoslovakia) by ZTS Martin AS and as such, they built an ARV designated the VT-72B from 1989 onwards. The vehicle was exported to East Germany and India, as well as being passed on to successor states from the break up of Czechoslovakia – Czech Republic and Slovakia in 1993.

### Basic technical data:

Weight:	35,000 kg
Engine type:	V 55A, V-12 cylinders
Engine output:	426 kW
Maximum speed:	50 km/h
Cable working length:	200 mm
Cable diameter:	28 mm
Crane payload:	1,600/2,000 kg
Welding apparatus:	140–230 A

### Basic technical data:

Weight:	45.8 tons	
Engine type:	V-46, Stroke, multi-fuel, diesel with liquid cooling and filling centrifugal blower	
Maximum speed:	60 km/h	
Chassis length overall:	8.15 m	
Height overall:	2.64 m	
Width overall:	3.46 m	
Main armament (caliber, type, name):	12.7 mm anti-aircraft machine gun NSVT, RPG-7: 1 piece, 7.62 mm machine gun vz. 1958: 2 items	
Additional info:	Main Winch:	– Tensile strength: max 300 kN – A working rope length: 200 m – Rope diameter: 29.5 mm – Max tensile strength through a pulley 600 kN – Max pulling power through the two pulleys 900 kN
	Auxiliary winch:	– Tensile strength: 10 kN – Rope diameter: 6.3 mm – A working rope length: 400 m
	Crane:	– Capacity: up to 19 ton, 18 ton in the clean out (from the edge of the vehicle) 1.9m and a maximum hook height of 5.5m above ground







**Modernization version**

## RM-70 M1 Multiple Rocket Launcher

The RM-70 M1 multiple rocket launcher is a new, modified generation of the original Czechoslovak Army's version RM-70 and the heavier variant of the BM-21 Grad multiple rocket launcher, providing enhanced performance over its parent artillery system. It is designed to be used against manpower, firing devices, motorized infantry arrangements, tanks and other combat vehicles.

The rocket launcher with loading device is based on a T-815 VPR9 chassis (or on the chassis to the customer's requirement). Sighting by dependent PG-1M aiming rule sight, motor powered or manual guidance to target. Electrical switch-on. Firing in batches and/or individually.

### Technical – Tactical data:

Weight incl. 80 shells and crew:	25,000 kg
Bullet shells mass JROF:	66.35 kg
Maximum range:	20,380 m
Total area impacted by volley of shells (40 shots):	to 70 ha
Time of volley of bullet shells firing (40 shoots):	2–30 s
Rocket launcher crew:	4 men
Top cruising speed of loaded rocket launcher:	
on asphalt roads:	85 km/h
on dirt roads:	35 km/h
in terrain:	25 km/h
Rocket launcher length:	9,100 mm
Rate of ammunition supply:	40 + 40 bullet shells

Possible modification also on different chassis.



## BM-21 A Self-Propelled Multiple Rocket Launcher System

The BM-21 MT is an upgraded project of the original 122 mm BM-21 Grad rocket launcher. It is a firing support means for the ground troops, designed for the focused carpet destruction of the enemy's position, their resources, military equipment and human forces within a distance of 2,000 to 20,000 m.

The main goal of the upgrade was to streamline the firing, its accuracy, shorten the preparatory time to start firing and leaving the firing position. The main emphasis was laid to automate and simplify operations related to the launch and control of effective firing, resulting in a fully autonomous system capable of immediate reaction without the need for organic integration within firing units with separate firing elements (units).

### Basic technical data:

Weight (including 40 rockets)	14,850 kg
Rocket launcher	9K51 (BM-21)
Crew	3
Caliber	122 mm
Number of barrels	40
Minimum range	1,600 m
Maximum range	20,380 m
One round time (all 40 rockets) within	20 s
Effective area of destruction (salvo of 40 rockets)	70 ha
Max. speed	90 km/h





**Armoured Personnel Carrier**

## OT-64 SKOT 8x8

➤ The OT-64 Skot is (still in active servis in many countries) Wheeled amphibious personnel carrier is a combat and transport vehicle jointly developed and used by Czechoslovakia and Poland in place of the similar Soviet BTR-60 (8 x 8) APC. It is an Middle wheight combat vehicle designed for transport of 20 persons (including the driver and co-driver) or to transport 2000 kg of material on the road, in the field or the water. The driver and commander have each their side door, away team can get off the back double doors or bulky roof hatches. The crew is also available fire ports built into the side of the hull. It was characterised by a very good design combat and running characteristic



**Armoured Personnel Carrier**

## BRDM-2

➤ The BRDM-2 is an armoured patrol car used by Russia and before that the Soviet Union. It was also known under the designations BTR-40PB, BTR-40P-2 and GAZ 41-08. This vehicle, like many other Soviet designs, has been exported extensively and is in use in at least 38 countries. It was intended to replace the earlier BRDM-1 with a vehicle that had improved amphibious capabilities and better armament.

Basic technical data:	
Weight:	7,000 kg
Engine type:	GAZ-41 – 140 hp Gasoline
Speed – max. road:	95 km/h
Chassis length overall:	5.75 m
Height overall:	2.31 m
Width overall:	2.75 m
Speed – max. swim:	10 km/h
Main armament – caliber, type, name:	14.5 mm, Heavy, Machinegun, KPVT

Basic technical data:	
Crew:	2
Passengers:	2+10
Configuration:	8 x 8
Weight:	12,200 kg
Length:	7.44 meters
Width:	2.55 meters
Firing height:	2.5 meters
Ground clearance:	0.46 meters
Wheelbase:	1.3 + 2.15 + 1.3 meters
Maximum road speed:	94 km/h
Maximum water speed:	9 km/h
Maximum road range:	710 km
Armor:	10 mm Turret 15 mm Hull







**TATRA 815**

## Container Workshop

➤ Mechanical container workrooms are intended to provide service as well as more extensive hardware repairs in the area of their usage. Loaded on the carrier, they can serve for providing technical help in any place of defect or hardware damage. Standard equipment allows to conduct basic locksmithery and assembly works including flame welding and electric arc welding.

The selected types of wheeled or tracked hardware can be equipped by suites of special products, for example a suite of universal products for tracked hardware repairs JEKUP. They can be completed by machining container workrooms for providing repairs connected with the production or renovation of individual components.



## Mobile ISO Containers Production

➤ Container ISO 1C – Mobile drinking water treatment plant and its technological solution is designed for conversion of raw groundwater and surface water to drinking water

Water treatment means mixing in the reactor wherein the separation of the suspended solids and sludge sedimentation sand filtration and the uptake of the carbon.

The occurrence of heavy metals leads to their elimination combination of precipitation reactions and absorbing.

Raw water is pumped pumping by submersible pump with flotation device and is fed by hose (l.25 m) to enter the process. Feed line is dispensed by 40% FeCl<sub>3</sub> coagulant by dosing pump.

Water flow is guiding according to the level of the mixed water pump speed converter of raw water.

Water-treatment of raw water is removed from the solid matter iron manganese aggressive CO<sub>2</sub> α – activity and radon.





## Decontamination vehicle DEKVOZ

Decontamination vehicle is assigned for performing the entire decontamination of outside and inside surfaces of military technics, armament and material, incl. oversized technics, decontamination of terrain, building objects and creating the high water curtain for stoppage of ground cloud of dangerous chemical substances. Vehicle is able to meet the requirements individually, and also by the way of establishing of decontamination workplaces or within link for decontamination technics. Vehicle is able of transport over unpaved roads and in the middle challenging terrain in every season, weather and day and night. It is tailored to transport by rail, by ship or by air. Squad of vehicle is consists of 3 members.

Determination of decontamination device:

1. Meeting the tasks of military character
  - Decontamination of outside and inside area of military technics,
  - Decontamination of material,
  - Decontamination of outside and inside area of building objects,
  - Decontamination of terrain,
  - Fire fighting
2. Meeting the tasks of unmilitary character
  - Liquidation of after-effects industrial or ecological disasters,
  - Removal of acts of God after-effects,
  - Removal of dangerous chemical substances leakage from devices of industrial infrastructure



## Mobile container PSYOPS

An off-road heavy truck – special built-up with workplace for production of PSYOPS products (mobile container PSYOPS) allows immediate delivery of a large number of individual printed messages to specific tactical area of interest. The vehicle is a mobile means of department / center of CIMIC and PSYOPS designed for tactical level in support of brigadier grouping in foreign operations using the high-rate reproductive capacity. The workplace as rapidly deployable mobile system will be used for tactical PSYOPS team and will allow PSYOPS units producing leaflets, brochures, newspapers and other information products in civilian and military volatile environment.

### Basic technical data:

Dimensions - L x W x H (mm)	max. 8200 x 2600 x 3500 (without beacons and air conditioning)
Gross weight	max 19.000 kg
Axle	4 x 4
Number of persons carried	4
Range	min 600 km
Electric set – generator	9,6 kVA, 400/230 V
Max. speed	90 km/h
Engine, output	diesel, min 230 kW







## TATRA AV 15 Salvage Car

➤ Salvage car AV 15 is a special vehicle designed to needs of the army, evacuation and rescue organizations, organizations performing works and fire departments.

### Basic technical data:

RESCUE WINCH	
Working length of rope behind the car	150 m
BULLDOZER EQUIPMENT	
Max. depth of cut below the plane travel	250 mm
CRANE PART	
Fully rotatable, oscillate, one telescopic swivel bracket with	250 mm extension
Without jib crane capacity	15,000 kg
Capacity, extended boom crane with	4,000 kg
DIMENSIONS OF A VEHICLE	
Length	9,360 mm
Width	2,500 mm
Height (cab)	3,240 mm
Wheelbase	1,650 mm + 2,970 mm + 1,450 mm
MOTOR	
Type	Tatra T3-930-50
The volume of	19,000 cm <sup>3</sup>
Power	265 kW
Speed of	80 km/h



## ZU-2-23 23 mm

➤

### Basic technical data:

Weight:	950 kg
Length:	4.57 m
Height:	2.87 m
Width:	1.83 m
Armament:	
Anti-Aircraft gun:	Twin 23 mm air-cooled ZAP 23 cannons with 360-degree traverse
Maximum effective range (vertical):	2500 m
Rate of fire:	Maximum: 800–1000 rds/min/barrel, Sustained: 200 rds/min/barrel
Type of ammunition:	API-T, HEI-T
Basic Load:	INA
Fire Control:	Optical-mechanical sight



Mortar ANTOS-LR



Mortar ANTOS

## 60 mm Mortar ANTOS-LR / 60 mm Ultralight Commando Mortar ANTOS

The 60 mm mortar ANTOS-LR designed to reinforce fire power of the paratroops, recco and special units. It serves as a supporting artillery weapon of military units at squad or platoon level. ANTOS mortar is an extremely light weapon designed for paratroops and special units.

### Basic technical data:

	ANTOS	ANTOS-LR
Calibre:	60.7 mm	60.7 mm
Barrel length:	650 mm	1 000 mm
Weight of weapon incl. storage package and accessories:	21 kg ± 10 %	<15.6 kg
Elevation:	(45÷85)°	(45÷85)°
Minimum range (+ 21°C, 85°):	(primary charge 0) 80 m	(primary charge 0) 120 m
Maximum range (+ 21°C, 45°):	(full charge 1) 1 230 m	(full charge 3) 2 930 m
Maximum operating pressure:	in the barrel 18 MPa	54 MPa
Range of operating temperature:	(-30÷+60) °C	(-30÷+60) °C
Firing mode:	gravity trigger on the handgrip	gravity -



## 60 mm Mortar Bombs of NATO standard

### Basic technical data:

	Mortar Bomb HEI	Mortar Bomb HEF	Mortar Bomb JUMP	Mortar Bomb SMK	Mortar Bomb ILL-IR
	High Explosive with Incendiary Effect	High Explosive with Frangmentation Effect	Dummy for the Training	Smoke effect with the same ballistics as the life bomb	Illuminating Infrared
Weight of mortar bomb	1.420 g	1.420 g	1 290 ± 30 g	1.420 g	1.200 g
Weight of explosive	215 g	270 g	-	-	-
Weight of smoke-producing corpuscle	-	-	-	120 g	-
Weight of primary propelling charge	5.0g	5.0g	-	5.0g	5.0g
Weight of augmenting charge (pair)	2 x 3.5 g	2 x 3.5 g	-	2 x 3.5 g	2 x 3.5 g
Weight of amplifier (BP)	0,35g	0,35g	-	0,35g	0,35g
Length of the bomb with fuse	293 ± 2 mm	293 ± 2 mm	284 mm	293 ± 2 mm	273 mm
Range (at 21°C) – elevation 85°	85° 80m	85° 80m	-	85° 80m	85°
Range (at 21°C) – elevation 45°	45° 1230m	45° 1230m	-	45° 1200m	45°
Fuse type	AF 66	AF 66	-	MZ-35	-
Primer screw	Own Design				
Weight of the wooden box with 10 bombs	20 kg	20 kg	20 kg	20 kg	20 kg





## NSV, 12.7 mm Machine Gun

### Basic technical data:

Length of gun:	1,560 mm
Elevation:	-5 ° to +70 °
Traverse:	360 °
Muzzle velocity:	845 m/s
Combat rate of fire:	80 to 100 rounds/min
Maximum range:	6,000 m
Effective range of ground targets:	2000 m
Effective range of air targets:	1,500 m
Weight of gun:	25 kg
Weight of gun mainly:	9 kg



## DSHK Soviet, 12.7 mm Machine Gun

### Basic technical data:

Length:	1,625 mm
Barrel length:	1,070 mm
Cartridge:	12.7 mm
Rate of fire:	600 rounds/min
Muzzle velocity:	850 m/s (2,788 ft/s)
Feed system:	belt 50 rounds
Sights:	Iron/Optical
Weight:	34 kg (gun only)
	157 kg on wheeled mounting



## KPVT, 14.5 mm Heavy Machine Gun

### Basic technical data:

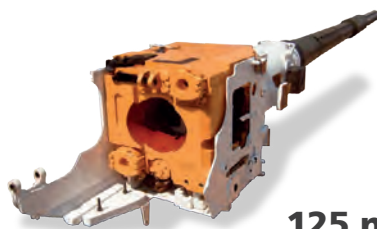
Length:	2,000 mm
Barrel length:	1,350 mm
Feeding belt:	40 or 50 rounds
Rate of fire:	600 rounds/min
Weight:	49.1 kg (gun body, KPVT)
	+ 105 kg (wheeled infantry mount) or 39 kg (infantry tripod)



## PKT/PKB, 7.62 mm Machine Gun Tank

### Basic technical data:

Length of gun:	1,100 mm
Theoretical rate of fire:	700-800 rounds/min
Combat rate of fire:	250 rounds/min
Maximum range:	3800 m
Muzzle velocity:	830 m/s
Effective range of ground targets:	1,000 m
Number of cartridges in the belt:	1,000 pcs
Weight of gun:	10.5 kg
Mainly weight:	3.2 kg



## 2A46/D-81T 125 mm Main Gun

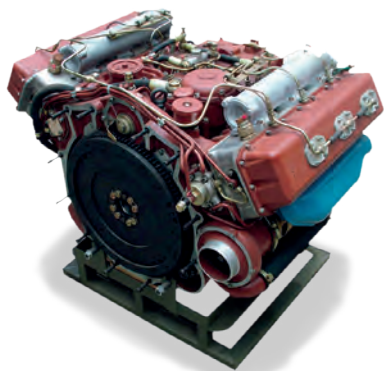
125 mm main gun (D-81T); artillery department indices 2A26 and 2A46 respectively) equip all Soviet and Russian tanks starting with the T-72, etc. They were developed by the Spetstekhnika (OKB-9) design bureau in Ekaterinburg (former Sverdlovsk), and are manufactured at the Motovilikha artillery plant in Perm.



## 2A28, 73 mm

### Basic technical data:

Round type:	PG-15V, OG-15V
Max aimed range of fire:	
PG-15V shell:	1300 m
OG-15V shell:	4400 m
Weight:	115 kg



## UTD-20

Basic technical data:	
Description:	Diesel
	6-cylinder V 120 degrees
	Direct injection
	4 Stroke
	Water cooled
Rating:	200 kw/300 hp at 2,600 rpm
Used in:	BMP
Starting system:	Compressed air/electric
Weight of engine:	665 kg
Engine dimensions – length:	834 mm
– width:	1,150 mm
– height:	757 mm



## V-46.6

Basic technical data:	
Description:	Multifuel
	12-cylinder V 60 degrees
	Direct injection
	4 Stroke
	Water cooled
Rating:	573 kW/780 hp at 2,000 rpm
Used in:	T-72, T-72M, T-72M1, VF-72
Starting system:	Compressed air/electric
Weight of engine:	980 kg
Engine dimensions – length:	1,480 mm
– width:	896 mm
– height:	902 mm



## V-55A

Basic technical data:	
Description:	Multifuel
	12-cylinder V 60 degrees
	Direct injection
	4 Stroke
	Water cooled
Rating:	427 kW/580 hp at 2,000 rpm
Used in:	T-55, T-55A, VF-55A, JVBT-55, MT-55A
Starting system:	Compressed air/electric
Weight of engine:	1,480 kg
Engine dimensions – length:	1,580 mm
– width:	905 mm
– height:	920 mm



## V-55AM2

Basic technical data:	
Description:	Multifuel
	12-cylinder V 60 degrees
	Direct injection
	4 Stroke
	Water cooled
Rating:	456 kW/620 hp at 2,000 rpm
Used in:	T-55 AM2
Starting system:	Compressed air/electric
Weight of engine:	910 kg
Engine dimensions – length:	1,580 mm
– width:	905 mm
– height:	920 mm



## TATRA T-815 8x8 LT Modernization



➤ The aim of modernization is to extend the life cycle of the TATRA T-815 8x8, 6x6 vehicle family and increase their usable properties. It offers a much cheaper alternative of variation of original vehicles of this series.

Modernization has been performed on singular groups with a view to improve technical parameters, reduce operating costs, maintenance and repair needs and finally reach the operating simplicity and comfort, increase the operation safety and reduce the environmental impact.

**Engine:** – type T3-930-50 – major change is the installation of new turbocharger with intercooler of filling air; Due to this modification the fuel consumption and smoke rate were reduced and cooling improved. Also the torque curve and power at low speeds have been improved.



**Gears:** – new gearbox TATRA 10TS130 with a system of semi-automatic gearing TATRA-NORGREN, which improves maneuverability and increases the user comfort of the driver.  
 – additional gearbox TATRA 230TRK. Using this additional gearbox, prevents the gear springing.  
 – by using the TATRA 10TS130 gearbox with an additional TATRA 230TRK gearbox, the transmission of drive torque on vehicle wheels will be realized on other transmission gear ratios, in lower engine service speed, thereby reducing the noise.

**Chassis:** – spring suspension the combination of leaf spring and air suspension improves the stability and reduces the tire wear.  
 – wheels and tires Michelin 14R20 with a system of underinflation Těléflov. The new under-inflation system ensures the pressure control in tires and its regulation depending on load and terrain conditions. This system increases the tire life, operation economy and safety.  
 – brakes – are equipped with ABS system.  
 – air system is guided in PE pipes with quick connectors.

**Driving:** – control monoblock with auxiliary circuit which enables the vehicle control (driving) in the event of the engine failure.



**Cabin:** – modernized, equipped with adjustable seats with retractor belts, fixed bed and a new panel board. It is equipped with independent heating and air conditioning.

**Wiring:** – internal, main and auxiliary lights in LED technology, lighting with an option of BLACKOUT mode.

**Body:** – is conceived as a logistic platform truck with aluminium sidewalls (side panels), equipped with handles for fixing and blocking the cargo. It is equipped with banquettes for transport of persons (after installation of tarpaulin) and angle fixing elements for the transport of ISO containers (after removing sidewalls).





# Heavy Duty High Mobility Tactical and Logistic Trucks TATRA



T 815-790R99 38 300 8x8.1R  
8x8 HMHD CHASSIS WITH ARMoured DOUBLE CAB Level  
Level 2 – 2a/2b STANAG 4569



T 815-7M0R39 29 306 6x6.1R  
6x6 HIGH MOBILITY HEAVY DUTY UNIVERSAL CONTAINER  
CARRIER



TITUS® – MRAP vehicle on TATRA 6x6 chassis



T 815-790R99 38 300 8x8.1R  
8x8 HMHD REFUELER 18,000 Liters



T 815-790R99 38 300 8x8.1R  
8x8 HIGH MOBILITY HEAVY DUTY CHASSIS



T 815-780R59 19 270 4x4.1R,  
the first 4x4 logistic truck with armoured cab, which meets Level 3 – 3a/3b according STANAG 4569



T 810-1R0R26 13 177 6x6.1R  
6x6 CARGO TRUCK / TROOP CARRIER



T 158 – 8P3R33.391 6x6.2  
6x6 CARGO / TROOP CARRIER

[www.tatratrucks.com](http://www.tatratrucks.com)



LAND SYSTEM DIVISION has a permission to perform an authorized service TATRA TRUCKS vehicles to which provides spare parts and performs warranty and post-warranty service.



# Explosive Reactive Armour

## General Description:

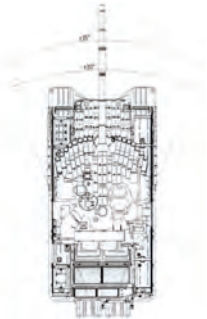
Explosive Reactive Armor is composed from effective multilayer dynamics elements and treated materials.

It enables to increase:

- Armor protection of the front of hull and turret against effect of ATGMs and hand ATMs with tandem warheads, artillery armor piercing and cumulative shells in front arc at turret traverse ranging  $\pm 35^\circ$  from longitudinal axis of the tank
- Armor protection of the turret top against effect of sub munition falling down to the tank
- Protective efficiency of the armor on the side of tank upto the end of third drive wheel for shooting angle in traverse range  $\pm 20^\circ$  in longitudinal axis of the tank
- Maximum weapon autonomy.
- Minimum time required for taking the firing position and preparation for launch of fire.

## Dynamic protection features:

- Safe to handle with
- Resistant against effect of Small Arms Ammo and grenade fragments (no-detonation possibility when incendiary weapons used like jellied gasoline, and welding works safety on the Tank)
- Applicable (safe to use) in temperature range from  $+70^\circ\text{C}$  up to  $-40^\circ\text{C}$
- Functional in temperature range from  $+60^\circ\text{C}$  up to  $-30^\circ\text{C}$
- Designed to guarantee the explosion effect not to be transferred to neighboring blocks of ERA
- Wide Angle Range of Dynamic Protection Effectiveness



## Layout of ERA blocks on T-72 M1

Layout of individual types of ERA blocks, their quantity and point of fixing there on hull and turret is marked with capital letter along with number index as follows:

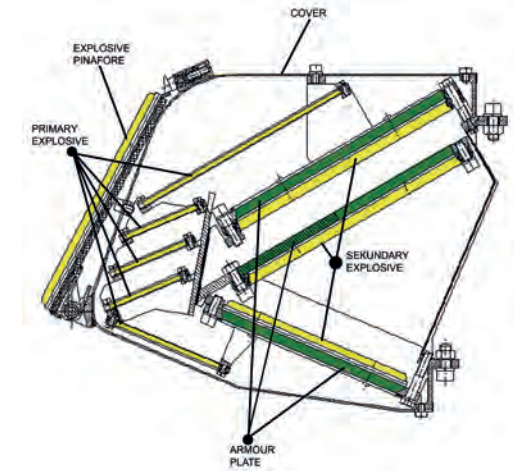


- A1 ÷ A38 hull head
- B1 ÷ B11 hull top
- C1 ÷ C28 hull left hand side
- D1 ÷ D28 hull right hand side
- E1 ÷ E19 turret head and side
- F1 ÷ F36 turret top

## ERA blocks structure:

Every block of ERA mostly consists from two basic parts as follows:

- Cover block of ERA with primary active part
- Carrying frame with secondary active part or two active parts.
- Individual blocks are proof against effects of small calibre armor piercing incendiary munitions after impact ranging from 12,7 to 30 mm calibre.
- The total weight of all blocks of ERA is 2700 kg per one tank whilst the weight of blocks there on turret is 1170 kg. Increased weight effects have been tested in the course of qualification and user tests.



## ➤ Ammo Production and Industry:

**ZVS Dubnica nad Vahom:** Production of various types of small, middle and large caliber ammunition and associated charges, fuzes and primers for guns and cannons. Also transfer of technology for production, testing and assembly of the ammunition including variety of components. Industry production of welded construction, metal and metal sheet processing and also the transformers production.



## ➤ Ammo Services:

**MSM Novaky:** Aimed at the ammunition area production covered whole ammo life cycle including the life cycle prolongation and the testing.

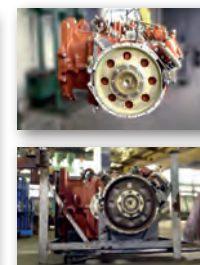
- Technological possibilities with munitions
1. Delaboration and disposal
  2. Repair and revision (extension of life cycle)
  3. Live, training and drill ammunition manufacturing



## ➤ Military vehicle service:

**MSM Trencin:** Complete service for military vehicles includes the diagnostics (Tanks, Armoured vehicles, Self-propelled gun systems, ...)

Welding, assembly and finalization of vehicles cabine, mainly the TATRA trucks.



## ➤ Electronic Industry:

**MSM Banska Bystrica:** Design, manufacturing and servicing of the radio navigation systems (NDB) for air traffic control (civil and military) as well as repairing and modernization of various kinds of Armed Forces equipment, especially in the segment of air defence equipment.

Another important product of the portfolio is own development and production of Ground Power Unit (GPU) for the aircraft starting.





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