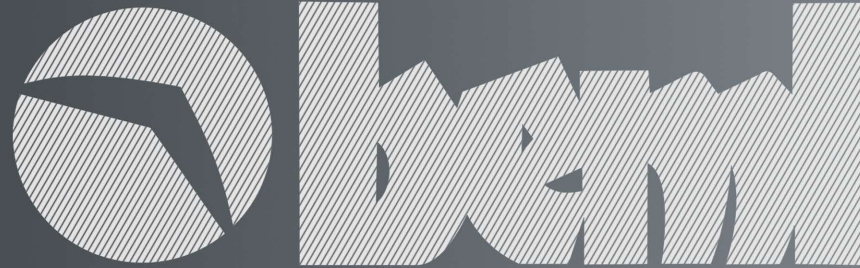




D E F E N C E





BEL Limited

is a leading multi-technology and multi-location Schedule 'A' Company under the Ministry of Defence, Government of India. The company manufactures high quality products for diverse sectors of economy such as Defence, coal, mining, steel, cement, power, construction, irrigation, road building, metro, railways and aviation.

It has emerged as the front runner in heavy engineering industry with a track record of growth and revenues for over five decades. BEL has its operation under three distinct business verticals; Defence & Aerospace, Mining & Construction and Rail & Metro. Over the years, BEL has demonstrated its engineering prowess and technical expertise by harnessing state-of-the art technologies.



8500+

High Mobility Vehicles
supplied to Defence services.

350+

ARV's
supplied to Defence services.

3200+

Trailers / Military Wagons
supplied to Defence services.

330+

Pontoon Bridge Systems
supplied to Defence services.

18000+

Passenger railway coaches
supplied to Indian Railways.

1650+

Metro Cars
supplied to Metro Corporations

850+

EMUs
supplied to Indian Railways.

32500+

Mining & Construction Equipments
supplied to Defence & Mining.

27500+

Engines (76HP - 700HP)

• Turnover of more than **\$ 472 million (USD)**

• **5600** Employees

• **AS9100D** Certifications

• **ISO 3834**

• **NADCAP**

• **ISO 9001**

• **ISO 14001**

• **BS OHSAS 18001**

OUR EQUIPMENT

HIGH MOBILITY

Vehicles (HMOV)



4X4



6X6



8X8



12X12

VEHICLE PLATFORM

for Missile/Gun/Radar



PINAKA
8X8



AKASH
8X8



PRITHVI
8X8



BRAHMOS
12X12



SWATHI
WLR 8X8



MGS
ARMOURED
CABIN
8X8



MGS
8X8



CPV
8X8

BRIDGING

Systems



15m
SARVATRA



PMS
Bridge Set



10m
SSBS



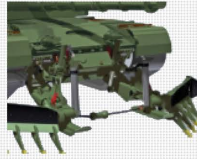
5m
SSBS

DE-MINING

Equipments



TWMP
T-90



TWMP
ARJUN MBT



EMP
T-90



SMCS
BMP-II



TRAWL
T-72/T-90

MINE LAYING

Equipments



MMME
6X6



MMLSP
8X8



SPMB
8X8

OUR EQUIPMENT

RECOVERY & REPAIR

Vehicles



HRV
8X8



MRV
8X8



LRV
4X4



ARJUN
ARRV



ARV
WZT-3

ARMOURED

Vehicles



MBPV Mk-II
4X4



ATCV

TRAILERS



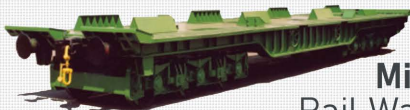
20t



50t



70t



Military
Rail Wagons



Mobile Trailer for
Large Antenna

AGGREGATES

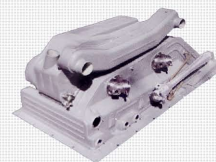
for Tanks



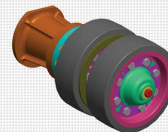
BMP
Transmission



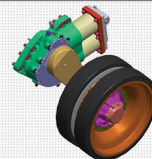
T-72
Transmission



Ejector & Air
Cleaner System



Twin Top
Roller



Advanced Hydro-gas
Suspension Unit

ARJUN ARRV

Armoured Recovery & Repair Vehicle



The role of an Armoured Recovery and Repair Vehicle (Arjun ARRV) is to recover disabled combat tanks and take them to a place, where they can be repaired and replenished to be ready for battle again. Each individual tank is an important combat asset and keeping it battle-fit at the right location is a major logistic effort. ARRV is equipped with 20t capacity Crane for Assembly & Disassembly of aggregates in field, 50t capacity single line Hydraulic winch for recovery, Anchor-cum-Dozer for light dozing, set of tools and accessories, welding and cutting devices for repair works in field along with common systems of Arjun MBT like communications, crew protection systems, navigation etc.,



Armoured Recovery
Vehicle

ARV WZT-3 recovery vehicle is a high-speed, tracked armour vehicle designed to fulfill some activities on a modern battlefield. Immediate participation in vehicle repairs with the help of sophisticated tools & instruments, execution of disassembly & assembly works by means of hydraulic crane & recovery winches, keeping constant two-sided communications among the vehicles by use of ARV Transmitter - Receiver.

SARVATRA

Bridge System



SARVATRA is mounted on indigenously manufactured BEML High Mobility Vehicle (HMV) 8x8 and offers combat assault bridging solution to mechanized forces.

SARVATRA is a multi-span mobile bridging system, with individual span of 15m and one set of the equipment can bridge wet & dry obstacles up to 75m span in steps of 15m. SARVATRA is designed for Military Load Classifications(MLC-70). It is having Double " A" shaped trestle which provides excellent stability, advanced hydraulics ensures continuous and smooth operation. It can also be used as emergency bridge during natural calamities like floods & earth quakes. Sarvatra Bridge can be customized.

PMS Bridge Set



The Pontoon Bridge Set is a floating Bridge launched to transport military vehicles over water obstacles and marshy grounds.

It consists of various members like

- MID Stream Pontoon
- Shore Pontoon
- Pavement Laying Truck
- Truck Mounted Crane
- Dolly
- Boat

Midstream, Shore and Road laying members are loaded on separate vehicles thereby allowing for easy transportation of the equipments. The midstream members are joined together to form the floating bridge. Shore members are connected to the midstream members & serves as the transition section between the floating part and the bank. The bulldozer attachment fitted on the Road-Laying truck is used for preparing approach roads, removal of obstacles etc. The truck mounted crane is used for loading / unloading of various members at launching site.

MBPV Mk-II

Medium Bullet Proof Vehicle 4x4

Medium Bullet Proof Vehicle (MBPV) MK-II offers ballistic protection and hand grenade blast protection for the troops operates in counter insurgent environments and can be used as Armoured Personnel Carriers. MBPV is optimally designed to resist Small arm fires, blasts and has a greater potential to enhance the survivability of armed troops in asymmetric conflict zones.



Indigenous designed and developed MBPV is a heavy duty, all weather off-road mobility vehicle with 360° rotatable collapsible turret on BEML 4x4, RH drive, back bone chassis with semi articulated axles and hydraulic shock absorbers for superior road handling, unmatched manoeuvrability and excellent off the road capabilities.

The vehicle has ABS, power steering, central tyre inflation system, fully automatic transmission and a high power to weight ratio. The seating capacity is 2+8 and the vehicle can be adapted for various roles such as ambulance, command post vehicle etc.,



Armoured Troop Carrier Vehicle

Armoured Troop Carrier is developed on High Mobility 4x2 chassis providing protection against armour piercing rounds and meeting International protection Standards and can carry crews upto 2 + 22.

The vehicle can be customized for the following applications as

- Armoured Bus
- Command and Control Vehicle
- Armoured Ambulance
- Surveillance & Reconnaissance Vehicle

The vehicle has a light weight steel composite body on robust chassis, provides advantage of high protection level withstanding armoured piercing ammunitions, ease of maintenance and low cost of ownership. The vehicle is having a powerful 170 hp engine with a maximum speed of 80 kmph and high ground clearance enabling it to have excellent off the road capability to negotiate ditches and obstacles, as well as mud, snow, sand and unpaved roads. Dedicated compartments for Driver, Control room and Equipments with split Air conditioned Cabin, Two PTZ cameras on either end of the vehicle with 360° rotation capability to provide all round coverage.

HIGH MOBILITY VEHICLES



4X4

BEML High mobility vehicle HMV 4x4 is designed for rough terrain, difficult climatic and environment conditions. Due to its specific design features, this truck is particularly suitable for expeditionary forces.

The 4x4 all-wheel drive chassis employs new development of the independent suspension and backbone tube frame, which are unique characteristics, which allows each wheel to move independently, with improved steering, and maximum tyre-to-ground contact, while featuring extreme resistance of the chassis against torsion and bending.



6X6

BEML High mobility vehicle HMV 6X6 is used for General Service role in Indian Army. This is an all terrain vehicle intended for transport of personnel. The vehicle is also used for towing trailers weighing up to 65t on public roads and up to 16t on cross country roads.

Planetary wheel hub reductions, independent wheel suspension with swinging semi-axles, axles sprung by Leaf spring type on rear axles, torsion bars and telescopic shock absorbers on front axle. The vehicle can be customised for different applications.



8X8

BEML High mobility vehicle HMV 8x8 is an all-terrain tactical, Heavy-duty vehicles designed for rough terrain, difficult climatic and environment conditions, which can be used for mounting superstructures such as RADAR/ Missile systems, Bridge laying system, etc., for Indian Army. 8x8 drive all differentials lockable, Planetary wheel hub reductions, Independent wheel suspension with swinging semi-axes and axles sprung by Leaf spring type on both front and rear axles and telescopic shock absorbers on front axle. The equipment is provided with a winch for self- recovery and recovery of other vehicles. The vehicle can be customized for different applications.



12X12

BEML High Mobility Special Military Vehicle 12x12 is designed to carry specific special payloads up to 42t with clear platform length of 13m for long loads with cross country capability for transporter with automatic transmission. Permanent 8 wheel drive with 4 wheel drive engageable, all differential lockable, with Two front and the rearmost axles steerable. The equipment is provided with Hydraulically operated self-recovery winch, Air-conditioned cabin and ABS system. Independent wheel suspension with swing half axles, which will enables the vehicle to negotiate Rough terrain mobility and provides better vehicle control

HRV 8X8

Heavy Recovery Vehicle

BEML HRV 8x8 vehicle is designed to recover stuck-up, buried or overturned casualties of armoured or engineering vehicles. This has a recovery crane with lifting capacity of 20 tonne @ 2m radius with Hydraulic stabilizers. Light dozing upto 250mm with dozer attachment.



The recovery winch has a pull of 15 tons for effective length of 150m. This vehicle is provided with all wheel drive for maximum traction, swinging half axles for better cross country mobility, centralized tyre inflation, deflation system, self recovery from front and rear. It can tow rigid and suspended load upto 11 tons, tow trailers upto 15 tons in cross country and 65 tons on highways.



TRANSPORTER VEHICLE for BMP tanks

Transporter vehicle has been customized to ease logistics and ensure faster deployment of BMP tanks at critical areas, as this vehicle is having shorter Turn circle diameter, compared with combination of Truck and Trailer.

Loading platform is designed for dual role viz., Transportation of BMP tanks and General-purpose logistic carrier. It is equipped with light weight mechanical ramp system for easy loading and unloading of BMP tanks.

Loading platform is custom designed and tailor made for installing on BEML HMV 8X8 vehicle. Loading platform can be folded back and can be used as general-purpose logistic carrier.



TANK TRANSPORTER HMV 8X8

BEML HMV 8X8 with 4 door cabin is an all terrain vehicle mainly used for tank transporter role in Indian Army. The vehicle is also used for transport of personnel & platform for keeping dummy weight while towing trailer for better road traction, is having a payload capacity of more than 11t.

The vehicle can tow trailers on public roads up to 100t and on terrain conditions trailer weighing up to 25t. The vehicle is provided with a winch for self recovery & for loading of dead tanks on to the trailer. The vehicle is provided with centralized tyre inflation / deflation system inside the cabin which enables inflation / deflation of tyres depending on terrain conditions.

MISSILE Support & Launcher Vehicles



High Mobility Vehicle 8x8 is designed as a common base vehicle for all 4 variants of PINAKA Missile System viz., Launcher vehicle, Command post vehicle, Replenishment vehicle & Loader cum replenishment vehicle and also for other Missile projects like PRITHVI vehicle, BRAHMOS vehicle, AKASH vehicle etc.,

Military truck chassis is capable of operating in tough terrains and extreme climatic conditions like high and low ambient temperatures, high humidity, high altitude and in dusty environment. High ride quality - reduced vibrations and road shocks provide improved driver comfort and safety for transport of sensitive and special electronic goods, equipment and troops.

RADAR Support Vehicles



High Mobility Vehicle HMV 8x8 is designed as a common base vehicle authorised for reconnaissance and support battalions of mechanized infantry for controlling the surveillance grid, collection of surveillance inputs from radars, collation of data and its dissemination.

As these vehicles operate with mechanized forces and therefore combine the operational requisites of mobility, protection and communication.

Radars mounted on HMV 8x8 vehicle platform are

- Weapon Locating Radar (WLR) - "SWATHI"
- "ROHINI"
- Indian Doppler RADAR - "INDRA"
- "ASHWINI" Radar
- 3D Tactical Control Radar (3DTCR)
- Air Defence Tactical Control Radar (ADTCR)
- Air Defence Fire Control Radar (ADFCR)
- Low Level Transportable Radar (LLTR)

HMV 8X8

for DHANUSH MGS

Mounted Gun System

BEML HMV 8X8 is designed to mount indigenously developed 155 mm / 52 Cal howitzer gun. The vehicle is designed to hold 18 shells and is typically operated by seven crew members. BEML HMV 8X8 has been configured with gun carrying platform & outriggers to be deployed during firing. Strengthened chassis and mounting platform for Gun base integration.

It is designed to hold 18 shells and is typically operated by seven crew members. BEML High Mobility Vehicle 8x8 has been configured with gun carrying platform. The Customized vehicle chassis provides the vehicle an exceptional resistance to shocks & vibrations, protects superstructure from torsion & stresses. High ride quality - reduced vibrations and road shocks provide improved driver comfort and safety for transport of sensitive and special goods, equipment and troops.



HMV 8X8

with Armoured Cabin

Chassis for Mounted Gun System with Armoured Cabin

BEML & DRDO (VRDE) designed HMV 8x8 for Mounted Gun System application.

Strengthened, low height Armoured Cabin is designed to withstand blast Pressure & Temperature of exhaust gases from muzzle. The cabin has protection against small arms as well. Cabin is equipped with powerful HVAC and seating provisions for six crew members.



The vehicle chassis provides an exceptional resistance to shocks & vibrations, protects superstructure from torsion & stresses. An auxiliary cabin has been provided on the chassis to accommodate single crew. High ride quality - reduced vibrations & road shocks provide improved driver comfort and safety for transport of sensitive special goods, equipments and troops. The chassis is strengthened for MGS role.

MMME Mk-II

Mechanical Minefield Marking Equipment

MMME Mk-II is developed on BEML 6x6 prime mover, designed for speedy marking/fencing of mine fields with minimal human intervention. Marking/fencing is carried out with the help of Long angle Iron Pickets (LAIPs) and rope. The pickets are placed mechanically with the help of this equipment at an interval of 10/15 meters and then rope is tied at two locations on to the picket thus making a fence around the minefield.



MMME Mk-II is a semi-automated system wherein handling of picket and tying of rope on to the picket is done manually however the most arduous task of hammering the picket into the ground up to the desired depth is done mechanically with built in automation. The system is designed to operate in plains, as well as semi-desert & desert, in all weather conditions. The equipment also records the details of fencing operation like picket number, burying depth and inter-picket spacing etc.

MMLSP HMV 8X8

Mechanical Munition Layer Self-Propelled

High Mobility Vehicle HMV 8X8
for Mechanical Munitions
layer-Self Propelled (MML-SP)
to lay / bury Bar mines in soil at
various depths.



This equipment is capable of laying multiple mines depending on type of terrain. All the operations in the equipment are automatically carried out with electrical and hydraulic actuators. The actuators are operated by Electronic controller automatically based on inputs from operator and sensors. This vehicle has shorter turn circle diameter for effective maneuverability and customized hydraulic side winching for self recovery operation.

TWMP T-90

Track Width Mine Plough

T-90 TWMP (Track Width Mine Plough) has been developed to meet the demands of the modern Main Battle Tank (MBT). The TWMP gives a tank the ability to rapidly force a passage through mined obstacles by creating a cleared path for the T-90 Main Battle Tank.

- Clears mines in front of the track width of the vehicle (tread way)
- Designed to operate in a wide range of soils including loose sand and loams
- Designed to minimize the traction effort
- Designed to minimize the effects of detonating mines and requires minimal maintenance



EMP T-90

Engineer Mine Plough



T-90 Engineer Mine Plough gives a tank the ability to rapidly force a passage through mined obstacles by creating a cleared path for armored fighting vehicles to follow. The mine free path is prepared by a raking action that brings buried or concealed mines to the surface and moves them to the side.

- Clears mines in front of the track of host vehicle.
- Clears mines buried at certain depths.
- Can operate at temperatures ranging from -20 deg C to + 55 deg C.
- Heavy duty jacks are mounted on EMP facilities for easy fitting and removal. No crane is required for fitting and removals.

TRAWL

T-72



The TRAWL is a Mine breaching equipment attached to the front side of host vehicle (T72/T90 tank). TRAWL is a combination of TRAWL Roller and Track Width Mine Plough (TWMP) used either together or independently depending on the requirement. Additionally two nos. of Electro Magnetic Device (EMD) are fitted at the front to detonate magnetically influenced mines

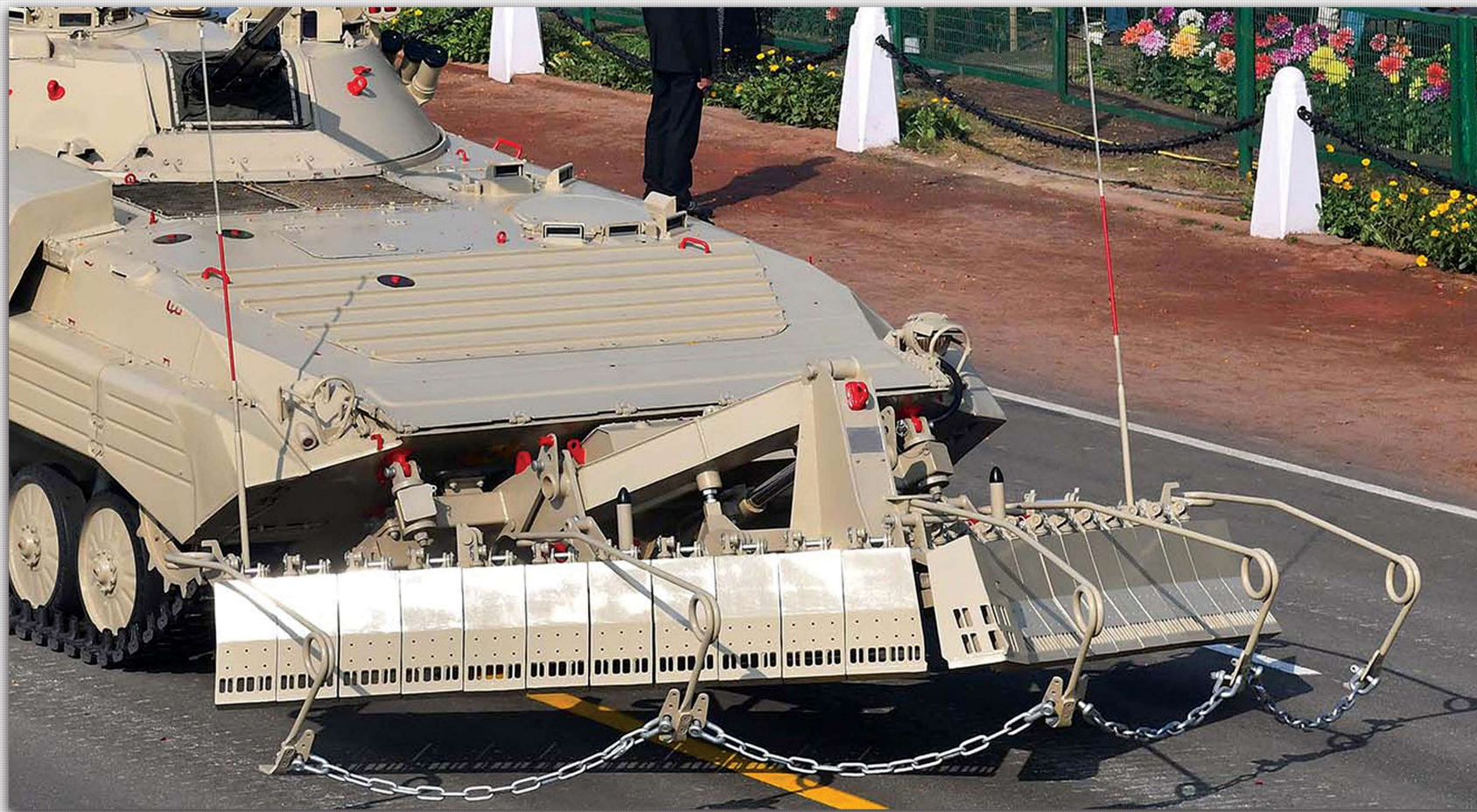
Roller system consists of set of three heavy rollers on either side of the host vehicle fitted at vehicle front at a distance of 3.5m which exerts adequate pressure on buried mines to detonate them much ahead of tank to avoid damage to the tank and crew. The roller system is designed to withstand four explosions. The TWMP is fitted at front of host vehicle's track on either side. The TWMP is operated by hydraulic actuators and required hydraulic supply is tapped from the tank.

SMCS BMP-II

Surface Mine Clearing System

The SMCS gives a vehicle the ability to safely clear surface laid mines and munitions on roads and soft terrain. The mine free path is prepared by a "Vee" blade that moves mines from the front of the vehicle safely to either side, well clear of the vehicle tracks.

- To achieve the necessary action, the "Vee" blade is divided into several blade segments, each of which is free to move in response to ground contours
- It fits to the front of the BMP-II without modification
- Clears a safe lane approximately 4.25 m wide



TWMP ARJUN MBT

Track Width Mine Plough

The Track Width Mine Plough (TWMP) gives the Arjun Main Battle Tank (MBT) the ability to rapidly force a passage through mine field by creating a cleared path.

- Rapidly clears mines from the track width of the host vehicle.
- Designed to minimize the effect of detonating mines.
- Designed to minimize the traction effort required.
- Capable of operating in a wide range of soil conditions.





20t Trailer

This 20t Capacity low deck trailer used for transportation of light duty tanks, dozers (BD 80, BD 50) and wheeled equipments. The front portion of the trailer is provided with turntable which is steerable to 68° both sides, twin line air brake system with ABS, emergency brakes and lever/knob operated parking brakes.



50t Trailer

50t Trailer is a 12 twin wheeled heavy duty full trailer designed to go in rough terrains with a payload capacity of 50t. The trailer is used for transporting battle tanks in Indian Army and it is towed by in-service BEML Tank Transporter. Trailer is provided with turntable which is steerable to 54° both sides, twin line air brake system with ABS, emergency brakes and lever/knob operated parking brakes.



70t Trailer

70t Trailer is a 40 wheeled heavy duty full trailer designed to go in rough terrains with a payload capacity of 70t. The trailer is used for transporting battle tanks, tracked vehicles, earthmoving and other heavy equipment. The trailer is having advanced hydraulic suspension with provision of lifting individual axles, steering of 4 rows of axles. Dual brake system, emergency break & knob operated parking brakes.



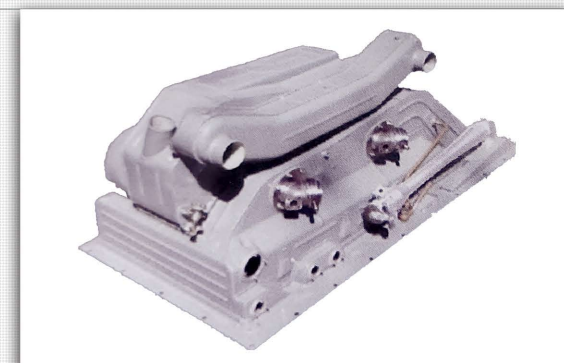
BMP Transmission

Mechanical Transmission with steering system has been Indigenously developed for an Infantry Combat Vehicle BMP -II tank, it is a critical power line aggregate of a tank with input power of 300 hp at 2600 rpm. Shifting of gears by mechanically with constant mesh gear type. BEML has supplied these transmission to AVNL and Indian Army, also providing support for Spares & Overhauling.



T-72 Hull

In-house development of armoured hull structure for T-72 battle tank, integrated with casting & forged aggregates. The hull structure of the vehicle houses a driver's cab at the front, a fighting section in the centre and a power pack at the rear of the hull.



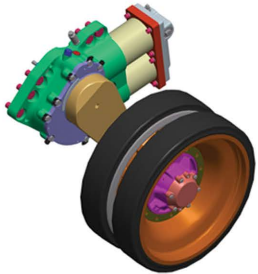
Ejector Air & Cleaner Assembly

Ejector & Air Cleaner assembly has been Indigenously developed for an Infantry Combat Vehicle BMP -II tank and made up of special aluminium alloy, Ejector will ejects the exhaust gases from the engine, generate smoke screen & cools the radiator. Air cleaner system separates the dust particles from the Air fed to the Engine by centrifugal action through cyclone tubes.



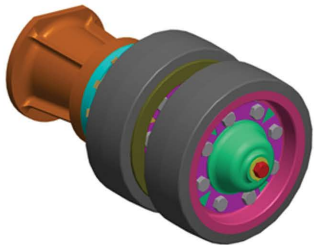
T-72 Transmission

The T-72 transmission consists of two planetary gearboxes LH & RH (each gearbox is structurally united with a planetary final drive). The gearbox provides 7 forward gears and 1 reverse gear. The gearbox is fitted with mechanical brake drives and friction clutches with metal-and-ceramic discs that feature enhanced wear resistance. The gearbox is installed in the housing available in the tank. Transmission overall weight is 1765 kg & Dimensions: Φ 635 mm & L- 920 mm, having a Maximum transmitted power of 620 kW.



Advanced Hydro gas Suspension for Arjun MBT

Indigenously developed based on CVRDE design for Arjun MBT & Arjun ARRV. The suspension system is intended for cushioning the impacts, shocks and for damping the oscillations of the hull when the vehicle moves over irregularities / obstacles of terrain in order to provide crew comfort & protecting the sensitive onboard equipment. The externally mounted suspension consists of one Advanced Hydro gas suspension unit(AHSU) for each wheel station.



Twin Top Roller

Indigenously developed aggregate for Arjun MBT & ARRV. Twin Top Rollers supports the track on the upper side between Sprocket and Track adjuster to prevent track sagging, also reduces the track whipping during running condition. Twin Top rollers are mounted on hull side plate, Four Top Rollers are mounted on each side of hull and it has twin rubberised rim wheels.

BUSINESS VERTICALS & PRODUCTS

DEFENCE & AEROSPACE

- High Mobility Trucks
- Recovery Vehicles
- Bridge Systems
- Vehicle for Missile Projects
- Tank Transportation Trailers
- Military Rail Wagons
- Mine Ploughs
- Crash Fire Tenders
- Snow Cutters
- Aircraft Towing Tractors
- Aircraft Weapon Loading Trolley
- Unmanned Aerial Vehicle
- QRSAM Motor Casing

MINING & CONSTRUCTION

- Bull Dozers
- Excavators
- Loaders
- Pipe Layers
- Wheeled Dozers
- Tyre Handlers
- Rope Shovels
- Dumpers
- Water Sprinklers
- Motor Graders
- Under Mining Equipment

RAIL & METRO

- Metro Cars
- Integral Rail Coaches
- AC EMUS
- OHE Cars
- Steel & Aluminum Wagons
- Track Laying Equipment
- Utility vehicles
- Treasury Vans
- Spoil Disposal Units
- Broad gauge Rail Bus

MANUFACTURING UNITS

BANGALORE COMPLEX

- Rail & Metro Division

KGF COMPLEX

- Earth Movers Division
- Research & Development Complex
- Hydraulics & Power line Division
- Rail Coach Unit II
- Heavy Fabrication Unit

MYSORE COMPLEX

- Truck Division
- Engine Division

PALAKKAD COMPLEX

- Defence Division



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Railway Products exported to **Srilanka & Bangladesh**

Mining & Construction products exported **across the Globe**

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71 Equipment
04 Countries

North America

02 Equipment
02 Countries

Africa

409 Equipment
23 Countries

Europe

37 Equipment
10 Countries

Middle East

453 Equipment
11 Countries

CIS

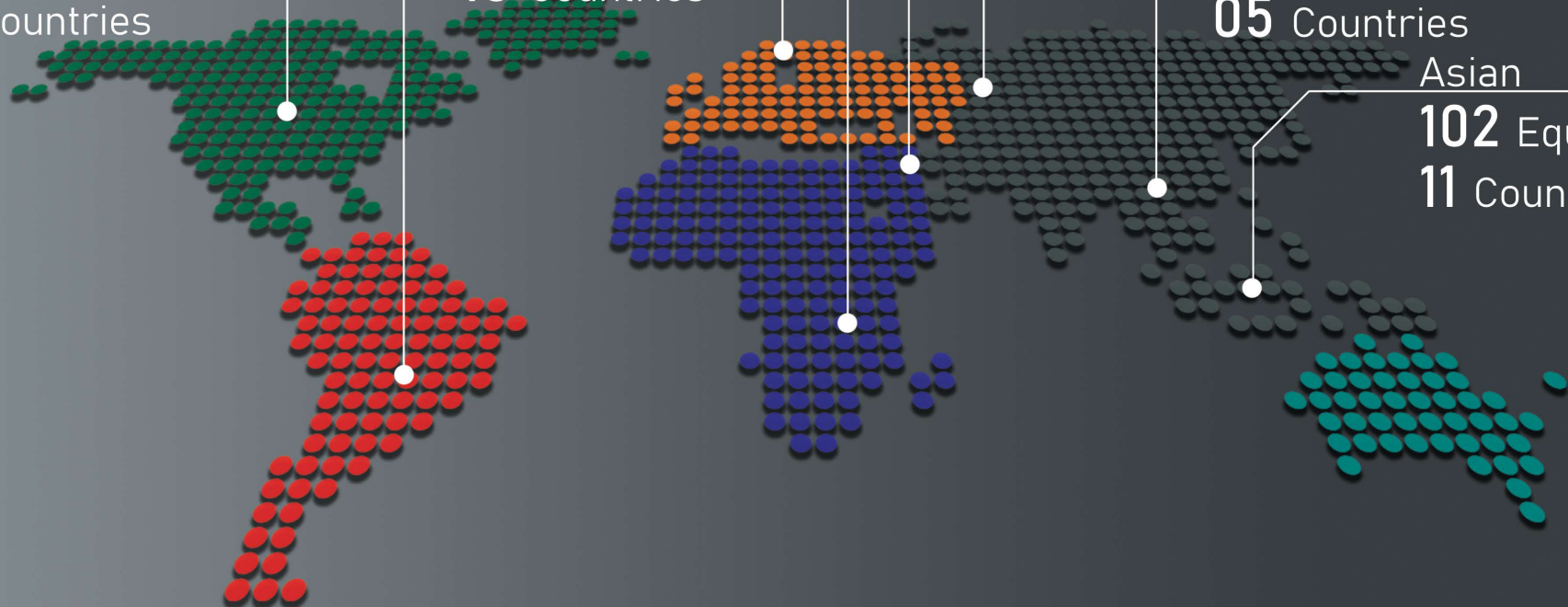
03 Equipment
02 Countries

SAARC

213 Equipment
05 Countries

Asian

102 Equipment
11 Countries





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