

RESTRICTED

CERTIFICATE

Certified that the Specification No. VFJ / AHSP / TSS/TECHNICAL SPECIFICATION /UPGRADED MPV 4X4 Specification of Upgraded Mine Protected Vehicle (ARMY Version) has been framed on - 10 July 2021 and this is issue – 1 contains 10 pages and they have been serially numbered from 01 to 10.

(Authority: GM approved noting no. AHSP/TSS/Upgraded MPV/Specification/21 Dated: 08.07.2021)



(Rajiv Kumar)

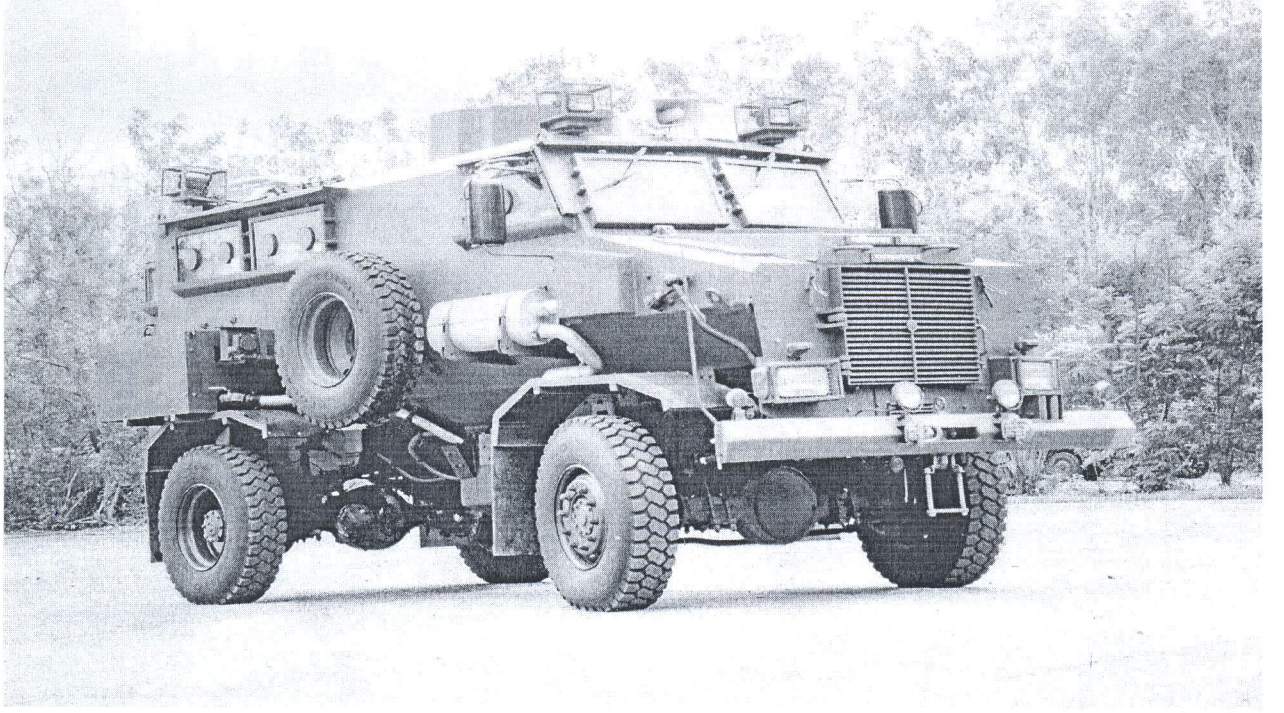
JOINT GENERAL MANAGER
VEHICLE FACTORY JABALPUR

Date : 10 July 2021

RESTRICTED

अपग्रेडेड युक्तिरथ 4x4(आर्मी)

UPGRADED MINE PROTECTED VEHICLE 4x4 (ARMY)



तकनीकी साहित्य एवं विशेष निर्देश

TECHNICAL LITERATURE & SPECIFICATION



MANUFACTURED BY

VEHICLE FACTORY JABALPUR -482009

MADHYA PRADESH

YUKTHIRATH

THE UPGRADED MINE PROTECTED VEHICLE (ARMY) –UPGRADED MPV 4X4

01. GENERAL:

The Upgraded Mine protected vehicle (MPV), designed and manufactured by Vehicle Factory, Jabalpur is four wheeled armoured personal carrier offering protection to the occupants against land mines and small arms (Level-III). The vehicle can accommodate ten personnel in addition to driver and co-driver / commander.

02. CONSTRUCTION OF THE VEHICLE:

The body (hull) is V-shaped monocoque structure built with high strength alloy armour steel, composite armour panels and transparent bullet resistant panels (Bullet Resistant Glasses). All the major automotive aggregates except axles and **auxiliary gear box** are encased in the monocoque hull for maximum safety.

The life cycle of the vehicle is extended considerably as body construction does not suffer from fatigue degeneration and result in minimum down time following the detonation of land mine under the vehicle. The design facilitates easy replacement of Axles and other aggregates in the field. The Metallic Gun Port are provided within the glass for small arms firing and rotating turret on roof for 7.62 LMG/ 5.56 LMG firing is provided to facilitate counter attack.

2.85 T Air conditioner is provided for crew comfort and remote controlled rotating search light on roof top provided for searching operations in the night. The vehicle is provided with pneumatically operated Rear door for entry & exist and four hatches in the roof for emergency exit. The vehicle is equipped with Audio Visual Warning Device to warn in the event of drop in fuel pressure and increase radiator coolant temp beyond specified to avoid engine freeze.

Run flat system with tubeless tyres are provided for maximum safety in the event of bullet piercing the tyres. The vehicle is equipped with 20 Ltrs drinking water tanks and medical stretchers.

The automotive aggregates are of Ashok Leyland which consists of the engine, gear box, auxiliary gear box, both axles, shock absorbers, etc.

RESTRICTED



03. PROTECTION LEVEL:

Mine Blast: The vehicle offers protection against 14 Kg TNT blast under Tyre and 10 Kg TNT blast under Hull. It also offers protection against standoff (5 mtrs) directional blast of 10 Kg TNT from both sides.

Small Arms: It offers protection against 7.62 SLR firing from 10 mts distance all around including roof top.

The High hardness Armour Steel plates are inspected as per BP R&D inspection criteria no.: 52/01/97-DD(W)-01(Rev-01) and medium hardness armour steel plates are inspected as per specn no: CQA(M)-51 & CQA(M)-47/JSS 9515-021. The composite armour Panels are inspected as per ODC VFJ Specification No.ODC-VFJ/SP/COMPOSITE ARMOUR/02 Dated 23.10.2019

04. BULLET RESISTANT GLASSES:

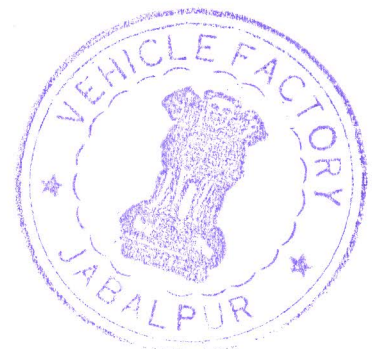
Splinter proof Bullet Resistant Glasses which are capable of withstanding 7.62 mm SLR firing from 10 mtr. distance is used for viewing purpose. The vehicle is fitted with ten such window panels including wind shield in two parts, one each for driver and co-driver / commander side glass, two on each side for troopers viewing and one no. each on rear door flaps. These Bullet Resistant Glasses in the metal frame are fixed to the vehicle with fasteners to facilitate easy replacement if required. Metallic Gun Ports are provided within the side Glasses, Driver & Co-driver side glass to facilitate counter attack for firing the small arms/Gun.

05. POWER PACK:

The engine is a four strokes, water cooled, in line, turbocharged, charge air cooler, six-cylinder diesel engine model Hino HA57L165 developing a power of 165 KW@ 2500 rpm. Power is transmitted via a single plate Diaphragm dry friction type clutch to a synchromesh gear box with six forward and one reverse gear.

The drive from the gear box is transmitted to a transfer case through an intermediate Propeller shaft with universal joints.

RESTRICTED



06. SUSPENSION:

Semi-elliptical Leaf spring suspension with shock absorber is provided both on the front and rear axles. These are over slung. Specially fabricated mounting brackets are provided to support the spring assemblies and total eight brackets are bolted to the hull.

07. BRAKES:

The brake system is pneumatic on the rear axle and front axle. The service brake is dual circuit having independent lines for front and rear wheels only. Engine exhaust brake is also provided inside the engine compartment.

The vehicle is fitted with dual circuit fail safe brake system with fully pneumatic brakes, on the rear wheels and front wheels. The hand break is pneumatic spring actuated on the rear wheels and pneumatically operated on front wheel. Front and rear brakes are independent of each other having two separate air reservoirs so that even if one brake line fails, other is functional.

In the event of the air pressure in the system falling below a specific value, brakes will automatically apply. All break actuators and pneumatic valves are encased. Only the hoses below the hull are exposed. When the engine cannot be started and the vehicle has to be towed, the parking brakes have to be released manually to move the vehicle.

08. STEERING SYSTEM:

The steering is power assisted and the hydraulic pump is driven by the engine through gear train. The steering gear box is of re-circulating ball type. The power steering system reduces the effort required by the driver during driving.

09. PNEUMATIC SYSTEM:

The pneumatic system provides air pressure for the following:

- (a) Service brakes
- (b) Parking brake.
- (c) Air horn
- (d) Rear axle differential lock
- (e) Tyre inflator
- (f) Exhaust Break
- (g) Auxiliary Gear Box gear changing
- (h) Door & Bonnet operating system



RESTRICTED



10. ELECTRICAL:

The electrical system is 24-volt negative earth by means of 2 x 12-volt rechargeable wet cell batteries.

Four, 24 V powerful search lights are mounted with guard are mounted on the roof top one no. in each corner of the vehicle. These search lights can rotate 360 deg and can be operated remotely from the controls at dash board. Four fans i.e. two in front and two in rear, 6 cabin lights i.e. 2 in front and 4 in rear are provided in the trooper's cabin.

These are in addition to the main head lights and fog lamps in front side indicators at front and rear and brake / parking lights at rear.

11. SEATS AND SEATING CAPACITY:

Two adjustable seats (forward and back ward movement) one for Driver and other for Co-driver are provided with adjustable safety belts. Bench type seats with foam rubber are provided for troopers on both sides of the vehicle in trooper's cabin. Adjustable safety belts are provided for safety of the troopers. Guns and ammunition can be stored under the seats.

Ten troopers can be seated in the cabin in addition to driver and co-driver / commander.

12. HEAVY DUTY BUMPER:

Heavy duty bumper is provided in front of the vehicle. The front bumper is fitted with 2 'D' shackles and one towing pin. With this the MPV can be towed/lifted with another MPV or any; "B" class vehicles.

13. DOOR:

One rear door with two flaps is provided for entry and exit of the crew including driver and co-driver / commander. Both the flaps of the rear door are pneumatically operated.

14. BONNET:

The pneumatically operated bonnet is provided for easy maintenance of engine compartment.

15. FUEL TANK:

210 Ltrs capacity Fuel tank is encased inside that for maximum protection from small arms firing and mine blasts.

16. COUNTER ATTACKING FACILITY FROM INSIDE THE VEHICLE:

a) Firing ports:

Total Twelve Firing ports, five number on each side of the vehicle within the bullet proof glass and one number on each of the rear door are provided to facilitate small arms firing by the troops / crew.

b) Rotary Turret:

One rotary turret is provided on the roof of the vehicle in between driver and trooper cabin to facilitate firing from 7.62 LMG / 5.56 LMG. The rotary turret can rotate 360 drg, and can be locked at selected position while firing. The gunner can conveniently fire by standing on fuel tank. Armour guard is provided all around the turret for gunner's protection.

17. REAR VIEW MIRRORS:

The vehicle is provided with power operated rear view mirror system mounted one each left hand side and right hand side of the vehicle to facilitate driver to view rear of the vehicle. Rotation of Rear view mirrors can be controlled / operated from driver compartment. Two blind spot mirror (one for driver & co-driver each) is provided.

18. AUDIO VISUAL WARNING DEVICE (AVWD):

The vehicle is equipped with AVWD, which is audio as well as visual alarm device to warn the driver by indicating on display unit (visual warning by flickering light) and to make high sound output (audio warning), when crossing the temperature of the engine coolant beyond the acceptance limits and the pressure of the engine oil below the acceptable limits, while the vehicle is in running.

19. FLAME SENSOR AND FIRE EXTINGUISHER:

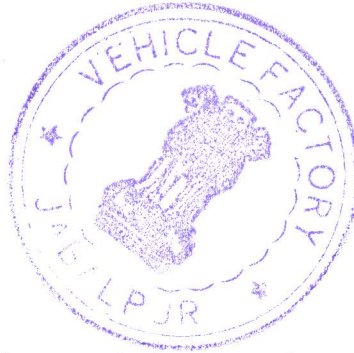
The Vehicle is equipped with flame sensor which activates alarm system in case fire inside the vehicle. Two Fire extinguisher, one behind driver seat and another at rear left corner are provided for emergency usage.

20. STRETCHER:

Stretcher (Medical purpose) – 2 No. are provided in the vehicle to carry injured personnel for emergency use.

RESTRICTED





21. RUNFLAT SYSTEM & TUBE LESS TYRES:

The vehicle is provided with two spare wheels mounted one each on either side of the vehicle. Powered winches are provided for easy dismantle and mounting of the spare wheels on the vehicle.

All the six wheels including the spare wheels are provided with Run flat system and Tubeless tyres, which facilitates running of the vehicle at a speed of 40-60 KMPH for a distance of minimum 40 kms in the event of Bullet piercing the tyres for the safety of the crew.

22. A.C. SYSTEM:

The Upgraded Mine Protected Vehicle is equipped with Split Type Air Conditioning system of 2.85 Ton capacity for crew comfort fitted on rear of the vehicle.

23.VEHICLE RECOVERY WINCH:

The Upgraded Mine protected vehicle is equipped with 10 Ton hydraulically driven recovery winch for recovery & pulling of the vehicle.

24.Public Address System:

To address a large public at a distance or over a large area, vehicle is equipped with public address system.PA system consisting of microphone, amplifier & loudspeaker.

25.Rear View Camera:

Upgraded Mine protected vehicle is fitted with rear view camera system, consisting of LCD monitor & camera with night vision capability.

26. First Aid Box:

Vehicle is equipped with one First Aid Box/kits used for treating minor traumatic injuries.

27.Chimney:

02 Nos Chimney with exhaust fan are fitted for expunging of gases generated inside the vehicle during counter attack.

28. For stacking of armament & ammunition a separated mounting bracket is provided inside the vehicle.

29. TOOL KIT:

Required tools like DE spanners, ring spanners, adjustable spanner, screw drivers, cutting pliers, wheel nut spanner. Tommy bar, inspection lamp, oil can, hammer, jack with handle, grease gun, First Aid Kit etc., are provided to meet the emergency maintenance and repair works.

30. PAINTING & UPHOLSTRY:

Vehicle will be coated with olive green colour paint over primer coating.

For cushioning, 40 mm thick foam is provided on roof of the vehicle and up to glasses on side plates. 10 mm thick foam is provided from firing ports portion to below the side plate. On floor 10 mm thick rubber cushioning is provided.

31. WORKMAN SHIP:

Complete fabrication of hull body is carried out with skilled and well trained welders. The welders are trained specially in welding of armour plates of various thickness and they will be periodically tested regarding their efficiency of armour welding. After fabrication of hull body, it will be inspected with qualified inspectors.

The assembly of suspension system, power pack system, brake system, and automotive aggregates are carried out with proper care to maintain the good working condition of the vehicle by trained man power.



32. TECHNICAL SPECIFICATION

OVER ALL DIMENSIONS:

LENGTH: 6600±50mm
WIDTH : 2800±50 mm
HEIGHT : 3120±50mm
WHEEL BASE: 3840±50 mm

GROUND CLERANCE:

Front: 305±20 mm
Rear: 305±20 mm

WEIGHTS:

Tare: 11670±50 kg
Pay load: 1500±50 kg
Gross Vehicle Weight: 13170±50 kg

PERFORMANCE:

Acceleration: (0-40 kmph) in 20 Sec
Cruising Range: 750 KM
Gross power to weight ratio: 12.52 KW/T
Max Gradeability: 30 deg
Water Wading: 1Mtr
Fuel efficiency: 3.6 KM/L@ 50kmph (Approx.)
Parking Brake Performance: 23 deg

ENGINE:

6 cylinder in line, HA57L 165 Diesel Engine with 165 KW @ 2500rpm
(with Intercooler) meeting BS- III norms Maximum Torque : 800Nm@ 1400-1900 rpm.

GEAR BOX: ALGB 93/18 Ashok Leyland Ltd

Gear Ratios:

Forward 1st : 6.72:1
Forward 2nd : 3.68:1
Forward 3rd : 2.15:1
Forward 4th : 1.41:1
Forward 5th : 1.00:1
Forward 6th : 0.79:1
Reverse : 6.03:1



Suspension: Semi elliptical Multi Leaf Spring & shock Absorbers.

Steering System: Rane TRW Steering, Stg Ratio- 20.4:1

Steering Wheel Diameter: 500 mm

Braking System:

Service Brake: Air Brake Dual Line

Parking Brake: Pneumatic (Front Optional Steep Parking Brake)

Exhaust Brake: Air actuated butterfly type on exhaust pipe after exhaust manifold

ROAD WHEELS AND TYRES:

Rim size: 9.00" x 22.5"

Tyres : Tubeless Tyre of size 13.00" R22.5" x XZL 154 K

Tyre Pressure – Front: 90 Psi

Rear: 90 Psi

ELECTRICAL:

Type : 24 V Negative Earth

Battery : 2 x 12 Volt 130 Ah – 20 h Rating

Starter Motor : Bosch/ Lucas

(27 Slots Pre-Engaged Type) 24V

Alternator : Bosch/Lucas – 24 V ,120 Amp

LIGHTING

Head Lamps : 100/90 W (2 Nos.)

Fog Lamps : 70 W (2 Nos.)

Stop Lamps : 2 W (2 Nos.)

Tail Lamps : 2 W (2 Nos.)

Side Indicators: 5 W (2 Nos.)

Reverse Lamp: 5 W (2 Nos.)

Engine compartment Lamps: 21 W (1 Nos.)

Fans : 24 Volts (4 Nos.)

Tube Light : 24 Volts (6 Nos.)

Search lights (with halogen lamp) : 100 W (4 Nos.)



RESTRICTED

FUEL TANK: Capacity of 210 Liters

SEATING CAPACITY: 10 + 2 MAX.

DOORS:

Type & position: Single Door with two shutters at Rear Side

Operation: Pneumatic

Door Lock Activation: Manual

HATCHES:

Location: 4 (2 On Driver's Compartment and 2 On Trooper's Compartments)

TURRET: 1

Location: behind the driver compartment and is in front portion of the trooper Cabin.

PROTECTION:

MINE BLAST: 14 Kg TNT under Tyres, 10 Kg TNT under Hull and 10 Kg TNT Standoff Blast (5 mts) on both sides

SMALL ARMS: All round 7.62mm SLR from 10 mts distance.

