

Tender Ref:

Tech. Specs of Armored Driver's Cabin (Flat type-RHD) for BEML HMV 8x8
Doc No. BEML/GAT/R&D DEFENCE /MGS/A-CAB/003, Dt: 25.04.2020
E Bid No:6300033592



Sl no.	Description	Vendor Response
1	<p>GENERAL DESCRIPTION:</p> <p>Armored Cabin is required for sustaining the blast pressures upto STANAG Level 1.</p> <p>This cabin will be integrated on BEML High Mobility Vehicle 8x8. The requirement of the cabin includes Right Hand Drive, Co-Driver and 2 crew members. The windshields used on the cabin must be blast proof to STANAG Level I standard. The Cabin structure is made out of tubular square and rectangle tubes to resist the blast pressure, dynamic loads. The Armored plates are welded over the structure to form a cabin.</p> <p>The vehicle has four axle rows with constant drive of all axles. When overcoming difficult terrain you can use a system which enables, during the driving, to alter (according to terrain character) the tyre inflation pressures.</p> <p>The unique conception of a four-axle vehicle with a central back-bone tube and independently sprung half-axes and air-cooled engine allows driving in the rough terrains and various climatic zones; with a temperature ranging from – 40 °C up to + 55 °C.</p>	
	<p>The vehicle body consists of:</p> <ul style="list-style-type: none"> – Cabin for driver, Co Driver, 2 nos. emergency seats and 2 sets split berth – Vehicle platform body <p>Refer Appendix C for installation dimensions.</p> <p>To the front frame there is attached an all-metal two-door tilting cabin for driver and crew. In the cabin roof there is a tilting rectangular hatch / manhole. The cabin is locked in the driving position by a system of levers controlled from the LH side of the vehicle. The tipping of the cabin (after unlocking) is done with the help of a hydraulic cylinder and hand pump located on the LH side behind the driver's cabin. The driver and co-driver's seats are adjustable. There are two emergency seats for two persons and this seat is fitted with lap belts. Cabin should be provided with HVAC (Heating ventilation air conditioning system) and vaporization vents on the FRP dash boards.</p> <p>During the driving all crew including driver and Co driver must be tied with safety belts. On the instrument panel, firmly connected to the cabin front wall, there are check instruments and elements serving for the vehicle control.</p>	
2	<p>SCOPE OF WORK:</p> <p>Development of Armoured Driver's cabin for BEML High Mobility Vehicle 8x8, Fabrication, Pre-treatment, CED dip paint & top coat, Furnishing of cabin aggregates, Interior ABS Trims, Installation and internal testing.</p>	
3	<p>CABIN STRUCTURE:</p> <p>The cabin shall have all driving controls on right hand side, made from hollow structural steel with Tubes and Hat cross section, drop down cab type with two doors and on front wind shield partitioned in the centre. Driver cabin should be equipped with Armored glass for the following places:</p> <ol style="list-style-type: none"> a) Driver Cabin Front Windshield (LH and RH) b) Driver / Co Driver Door Fixed Window glass - single piece each <p>Technical requirements of armored glass is enclosed in Appendix B.</p> <p>Front structure, Side structure LH & RH & Roof structure of the cabin should be provided with provision for cladding the outer surface with armored steel sheets so as to withstand blast pressure upto STANAG Level 1. Vendor has to obtain confirmation from BEML finalizing the technical details of armored steel plates to be used on the cabin shell for cladding. Strengthened cabin to withstand blast pressure & Temperature of exhaust gases from Muzzle of BARREL. Protection against small arms tentatively as per STANAG Level-I to be provided. Cabin structure should be covered with armored sheet of 6 mm* (approx) on all surfaces (Front, rear, side wall, top, doors). Cabin floor structure and engine tunnel should be covered using Galvanized carbon steel with extra deep draw of cold rolled /hot rolled sheets of 3 mm (approx) thick.</p> <p>The cabin is sealed against entry of dust and is to be waterproof, with shower test, as per IS:11865-2006.</p> <p>The cabin should be tested to withstand 1000 hours salt spray life as per ASTM: B117</p> <p>The detailed arrangement is as shown in Dwg No: 459 CA 02014.</p> <p>Drivers Cabin should be provided with 2 doors for the entry and egress of following members</p> <ol style="list-style-type: none"> 1. Driver 2. Co Driver <p>Each Door should be equipped with major items having following features</p> <ol style="list-style-type: none"> 1. Fixed Armoured glass 2. Suitable door locking mechanism as per CMVR requirements 3. Handles on the door for Firm Holding 4. Door Hinges as per CMVR requirements 5. Pockets for storing water bottles (2 nos. 1 ltrs each) 	

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	6. Cigarette ash tray (1 no)	
	7. Suitable sealing on the door panel to prevent water ingress, dust ingress	
	8. Inner surface of the door to be provided with ABS trims and suitable sound / vibration damping materials.	
	The corner fastenings of the front glass are protected with strips against possible damage due to branches of trees. The cabin is sealed against entry of dust and water. There are three hinged sun visor screens on top of the front glass for screening against sunlight. There is a manhole in the roof which could be closed. The lid of the manhole is held against a spring stop in the open position and clamped by a bolt in the closed position.	
4	CABIN MOUNTING:	
	1. Mounting of the swing cabin onto the frame is done using sleeves in the front and prismatic rubber at the rear. Clamping of the cabin in the running condition is done by a control mechanism from the left side.	
	2. The detailed front mounting as shown in Dwg No: 459 CA 02014	
	3. The cab lock release mechanism has to be of mechanical linkages arrangement (Tie-rod & Lever to secure the Cabin). Hydraulic system for tilting mechanism of the cabin and Cabin mountings with lock arrangement to be provided.	
	4. Mechanical stay will be provided in case of failure of Hydraulic system for tilting mechanism as shown in below figure.	
5	CABIN INTERIORS:	
	1. Engine tunnel profile and dimensions of the existing arrangement is to be provided as given in fig shown below. Detailed rear cutout for engine profile as shown in Dwg No: 459 CA 02014	
	2. The tunnel bottom is to be covered with thermal insulation of 40 mm thick placed between external & internal panels. The stowage provision to be provided below sleeper berth.	
	3. The Gear Shift Lever (GSL) is to be mounted on the engine tunnel as shown in fig below.	
	4. The cut out details for GSL on engine tunnel as shown in Dwg No: 459 CA 02014	
	5. High & low speed gear pre selector switch should be provided on the dashboard.	
	6. The parking brake and controls for drive selection has to be placed on the tunnel (driver side) as shown in fig below:	
	7. Also, individual switches have to be provided in dashboard for drive selection as shown in fig below.	
	8. The sleeper berth has to be of split type (for two berths) with width of 560mm each for better comfort. Positioning of berth will be decided at a later stage.	
	9. The duct for Heater is presently available only for legroom area of Driver & Co-driver. Provision should be made for adding AC ducts & louvers to deliver air to face of driver, co-driver and demisting has to be done. Air duct (ABS trim) has to be used for engine cooling riveted to engine tunnel as per existing arrangement. Climate control facility to be provided.	
	10. Accelerator pedal shall be of mechanical type.	
	11. The clutch and brake pedals are of pendent type as illustrated below figure. Vendor can suggest suitable Brake and clutch pedal meeting CMVR norms.	
	12. The cut out details for Steering column as shown in Dwg No: 459 CA 02014	
	2. A provision has to be made for diesel fired heater of 2 KW/24V system exhaust pipe mounted below floor panel on RH side.	
	13. Wind screen washer tank (5 ltrs capacity) shall be mounted on the LH side floor panel (near co-driver leg room).	
	14. Provision to be made for storing of first aid box, fire extinguisher bottle inside the cabin	
	15. Engine compartment lamp shall be provided to facilitate servicing of engine.	
	16. Mounting brackets for NBC system to be provided.	
	Front Cowl:	
	1. Covering front bonnet cover with Meshing cut for cooling air of engine.	
	2. Mechanical linkage with release handle above accelerator pedal shall be provided for bonnet / hood release mechanism.	
	3. The systems & accessories mounted inside the front cowl are shown in pictures below:	
	4. Oil heating equipment is placed on the right side under front cowl.	
	5. Hinged front cowl to be provided with mechanical stay to facilitate working on the front mounted equipments	
	Roof hatch:	
	1. The roof hatch has to be of rectangular in shape placed above co-driver seat as shown in fig below:	
	2. The detailed roof hatch cutout details as shown in Dwg No: 459 CA 02014	
	3. Tubular Structure with cladding sheets to be provided.	
	4. Hard board with 3mm thick / ABS trims to be provided.	
	5. Roof hatch to be provided with spring loaded pull type lock for closed condition	
	6. Rubber & pressed panel to be provided for sealing during closed condition.	
	7. A handle to be provided for roof hatch open & close operation.	
	Driver's Seat:	
	The driver's seat as shown in fig. below, it should be of adjustable according to the driver's requirement and is to be adjustable in forward - Reverse, Top - Bottom directions. Driver's seat should be capable of being adjusted in height (+/- 100 mm) as well as horizontally (+/- 100 mm) as per leg length of the driver. Supplier can suggest CMVR approved seats and provide suitable mounting provision in the cabin. The seats are to be covered tightly with artificial leather. Two seater crew seats with leather upholstery with safety belts are to be fitted over engine cover. Driver seat and Co Driver seat with three point seat belts meeting CMVR norms need to be provided.	
6	CABIN FITMENTS & ACCESSORIES:	
	LH/RH Side Fitments:	
	1. Coat hanger & holder clips have to be provided.	

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	2. Rigid type handles shall be provided on "A" & "B" pillars for ingress driver & crew members, meeting the CMVR requirements.	
	3. A suitable insulation shall be added between outer skin & interior ABS trim.	
	4. Interior lamps to be fitted above the door cut meeting the CMVR requirements.	
	5. Map Reading Lamp to be provided in front of Co driver seat.	
	Bulk head & Front Panel Fitments:	
	1. Clutch & Brake Assy: Integrated Pedal unit consisting of Clutch and Brake pedal should be provided, meeting the CMVR requirements .	
	2. Engine idle speed and engine shut off lever has to be fitted on the dashboard.	
	3. The steering column assy meeting CMVR norms to be provided.	
	Necessary trim for steering column assy has to be provided.	
	4. The cut out details of steering column as shown in Dwg No: 459 CA 02014	
	5. The column is to be fitted with a steering wheel of diameter 475 mm.	
	6. Single Lever combination switches to be used as shown in fig below:	
	7. For fresh air control through louvers inside cabin mechanical linkages to be provided.	
	8. Four demister vents have to be provided.	
	9. Two numbers of windshield wipers with two speed controls & linkages shall be provided.	
	10. Flexible hoses are to be used for connecting to the heater.	
	11. Two handles to be provided on cabin front end for windshield cleaning.	
	12. Engine oil temperature dependent heater to be used.	
	Roof Fitments:	
	1. A search light has to be fitted on the roof of cabin which can be operated by the driver	
	2. Two beacon lamps with metal guards to be provided diagonally at RH front corner & LH rear corner	
	3. Two handles are to be provided inside the cabin on the roof for use by the crew members seated on the Co Driver seat.	
	4. Three sun visors to be provided (with provision for rotating & folding)	
	5. Roof trim fastening to be done using screw & washer for roof trim mtg.	
	6. Bracket to be provided for air intake mounting on roof.	
	7. Stopper (rubber & strip) to be provide to lock hatch during fully open condition.	
	8. LMG Gun Mount provision to be provided on top of roof near the hatch.	
	9. Gun mounting clips / Gun butts mounting provision to be provided.	
	Rear Panel Fitments:	
	1. Air intake with mounting bracket has to be provided on RH side.	
	Other Fitments:	
	1. Box for documents and holders for extinguishing equipment, to be placed behind the seats of driver and co-passenger.	
	2. Roof lighting to be placed on top of right door.	
	3. LH & RH direction indicators, two on the sides and two on the front hinged cowl to be provided meeting CMVR norms.	
	4. Control Unit with knobs for the operation of centralized tyre inflation system (CTIS) should be provided on the panel to LH side of Driver, for the inflation/deflation of tyres from the driver cabin.	
	5. Top working search light for working with the additional accessories to be provided	
	6. Storage space for documents to be provided on the inner side of doors.	
	7. Adjustable rear view mirrors to be provided on both sides.	
	8. Suitable bracketary to be provided for mounting of NBC filtration unit below the berth	
	9. Control Unit with knobs for the operation / engagement of Axle differential lock and Inter-axle Differential Lock to be provided on the panel to LH side of Driver.	
	10. Exhaust Brake engagement lever should be provided near the driver's seat.	
	11. Location for holding infrared equipment "PNV-57" on the floor left part of engine cover under the fixed bed to be provided.	
	12. Electric horn, Head lamp with leveller, side direction indicators, Wide angle & proximity mirror etc., should be provided meeting CMVR requirements.	
	1. CABIN INSULATION:	
	The floor of the cabin is plain and made of steel plate with internal anti-vibration isolation, and rubber matting. External surface of the floor is also provided with anti-vibration coating. Holes for draining of any water that may enter are provided on the front part of the floor along with rubber plugs for closing the same.	
	Parts of the floor of the driver's cab form the cover for the engine. On the outer surface of the cover away from the engine thermal and sound insulation is stuck—on, in the front portion and is held in position by punched plate.	
	The floor mats are of 3 piece construction to be provided with 10 mm thick insulation. Rexin to be used with paste to fix the floor mat on the tunnel surface. Also, rubber sheets with anti skid surface have to be pasted in emergency seat leg room.	
8	DIMENSIONS OF CABIN:	
	Main dimensions and weight for cabin are indicated below for ref.	
	Length	: 2140 mm
	Width	: 2400 mm
	Height	: 1800 mm
	Weight	: 1650 ± 5% kg

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	The dimensional details of cabin as shown in Dwg No: 459 CA 02014	
9	ELECTRICAL AND ELECTRONIC SYSTEMS: Details are enclosed in Appendix D.	
10	PAINT DETAILS: Pre treatment CED painting and top coat painting as per CSN 5450 KHAKI. Colour Type: AKRYL LV EM 020 - SYMPO, Minimum thickness 55 microns.	
11	SHOWER TEST: Shower test for Cabin to be conducted as per IS: 11865-2006.	
12	PACKING & FORWARDING: The cabin assy. shall be packed to withstand transit damages.	
13	CAUTION ON STORAGE: Cabins must be stored in covered areas or alternatively by tarpaulin covers on the product. In the storage area, there must not be any large storage of acids or other harmful materials which cause corrosion.	
14	SPARES SUPPLY: 1. Spare Parts Catalogues · The supplier shall provide illustrated spare parts list (ISPL)/spare parts catalogues for the cabin assembly in Hard and soft format. · Operation, Maintenance and Overhaul manuals shall be provided in Hard and soft format. 2. Spares, Special Tools and Testing Equipment The supplier shall provide the spares and special tools in accordance with the delivery schedule of BEML. The supplier shall supply spares for at least 24 months from the date of completion of the contract. The supplier shall supply the following items of spares: a. Spares for maintenance of cabin for a period of 24 months. b. General maintenance tools, Special maintenance tools required for maintenance, repair and overhaul of the cabin. c. Recommended list of consumable spares required for maintenance, repairs and overhaul of cabin. d. Special testing tools & Gauges for maintenance and diagnostics of various equipment e. The manuals and full operating instructions. f. The means and instructions which describe the parameters of each item of Special tools, Testing and Diagnostic Equipment. g. Lifting shackles/Straps for handling & placement of cabin on chassis is to be provided.	
15	MAINTAINABILITY FEATURES: The following maintainability features should be incorporated 1. Standardization 2. Clear labels for all the units 3. BITE facility (Self diagnostics) 4. Easy accessibility of fuses 5. Standard color coding and labeling for wires as per the circuit diagram. 6. Locking and locating devices for all plugs and sockets for proper assembly / disassembly. 7. Cables carrying power and signal should be separated properly and tagged for easy identification. 8. Polarity of the connectors should be indicated for proper connection.	
16	ACCEPTANCE CRITERIA: The stage inspection & acceptance of Cabin assembly will be carried out in two stages as per mutually agreed ATP as indicated below: 1. Stage inspection: Cabin structure will be inspected as per the approved drawing. Welding checks, Inspection measuring fixtures and DPT Test report to be submitted. 2. BEML team & Inspection agency will participate and witness the Factory Acceptance Test (FAT) at Supplier premises, before dispatch. 3. Cabin will be integrated on 8x8 truck chassis at BEML premises. The inspection checks & performance evaluation by road trials will be carried out along with the Inspection agency. 4. Developed Driver's Cabin will be checked by jointly by BEML Team and Inspection Agency as per Provisional Acceptance Test Plan Doc No. BEML/GAT/R&D DEFENCE/MGS/A-CAB/003, dt: 25.04.2020. During inspection if any failure occurs, vendor should carry out Rectifications / Modifications to address the failure and meet the technical requirements.	
17	WARRANTY: The supplier shall be responsible for any defect or failure of components of cabin due to defective design, material or workmanship for a period of 24 months from the date of acceptance of the cabin	

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	The repair and/or replacement of failed components and equipment and installation of repaired/replaced components/equipment shall be taken by the supplier on his own charge at the Site.	
	The supplier shall bear custom duty, freight charges and all other expenses involved in collection of defective components and equipment from the Site, and transportation to the manufacturer's works in India and its return to site after repairs.	
	Further, should any design modification be required to any components or equipment as a consequence of failure analysis, the period of 24 months shall recommence from the date when the modified part is commissioned into service and modification shall be carried out free of charge.	
	The supplier shall carry out all replacement and repairs under the warranty promptly and satisfactorily on notification of the defect by BEML.	
18	SERVICES:	
	1. Associate with BEML during Integration, Testing and Commissioning of the cabin assembly on BEML High Mobility Vehicle chassis 8x8 at BEML premises and also provide training to the BEML team.	
	2. Associate with BEML during the performance evaluation road trials by the inspection agency.	
19	SCOPE OF SUPPLY:	
	1. Vendor has to quote for furnished cabin with and without armored sheets individually.	
	2. On receipt of PO, Supplier has to acknowledge and come out with an action plan for execution of the work involved with timeline.	
	3. On receipt of PO, BEML will provide design of Cabin structure in 3d model format in IGES with GA drawing in AUTOCAD / PDF format	
	4. All technical information regarding all the accessories fitted outside and inside will be provided by BEML. Vendor has to study and source the accessories meeting CMVR norms from OEMs based on the approval from BEML.	
	5. Development & Supply of fully furnished cabin assembly along with recommended spares and tools.	
	6. Supplier has to provide work status report covering the development aspects, manufacturing activities on monthly basis.	
	7. Firm has to execute detailed design (finalizing design of front structure, rear structure, side structure, cabin floor structure, roof structure) based on the conceptual model in 3d CAD in neutral format provided by BEML.	
	i. At the end of the design, Firm has to provide finalized.	
	1. General arrangement drawings with details of Cabin structure with BOM	
	2. Details of Armored steel to be used on the Cabin structure	
	3. Details of hollow / square / rectangular structural steel tubes with cladding of armored sheet to be used on the Cabin welded structure	
	4. Details of Driver control aggregates meeting CMVR norms -	
	a. Steering column assy including the column, control knobs, horn	
	b. Gear shift linkage on cabin	
	c. Accelerator linkages with - Brake & Clutch integral pedal unit.	
	d. HVAC and its controls, routings	
	e. Interior Trims (ABS)	
	f. Roof Hatch	
	g. Laminated Glass (Type, Contour)	
	h. Seats with 3 point seat belt - Driver, Crew Seat	
	i. Centralized Tire Inflation System	
	8. BEML will review the drawings and provide feedbacks & clearance for manufacturing.	
	9. Vendor has to procure all furnishing items meeting CMVR norms after taking approval from BEML	
	10. Vendor has to integrate the Cabin aggregates on the cabin structure and will be responsible for functional demonstration of cabin functionality.	
	One no. Driver's Cabin (with interior seating, accessories etc) will be installed on BEML HMV 8x8 vehicle. Functionality will be demonstrated.	
20	PROJECT SCHEDULE:	
	This comprises of following phases & shall be executed as per terms & conditions mentioned in SO:	
	1. Re-engineering, Development & Inspection of cabin at Supplier premises	
	2. Integration, Testing, Commissioning and Training at BEML premises	
	3. Road / Field Trails of the integrated vehicle	
	1. PROJECT DELIVERABLES FROM SUPPLIER:	
	1. Fully furnished cabin assembly, qty as indicated in the SO.	
	2. Inspection & testing of cabin to be carryout at supplier premises.	
	3. One set of Tools and equipments required for Normal maintenance to be provided along with the supply.	
	4. The recommended spare parts for Trials of cabin to be provided along with the supply.	
	5. Reports of the Factory Acceptance Test (FAT) and check sheets to be provided along with the supply.	
	6. Workshop manual, Parts catalogue in English to be provided.	
	7. User Manual should be in English and Hindi to be provided.	
	8. Material Certification and Staff Qualification documents for fabricated items to be provided along with the supply.	
	9. One set of soft copy and hard copy of all above documents to be provided.	

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SI No.	Description	BEML P/N
1	Assy Armored Driver Cabin for BEML HMV 8x8 (RHD) for MGS project	459 CA 02014
	APPENDIX A	
	TECHNICAL INFORMATIVE DATA ON BEML HIGH MOBILITY VEHICLE 8X8	
	a. Cabin Dimensional Data:	
	1. Main dimensions and weight for Cabin:	
	a. Length - 2140 mm	
	b. Width - 2400 mm	
	c. Height - 1800 mm	
	d. Weight of outfitted cabin - 1650 kg ± 5%	
	2. Overall dimensions with Cabin mounted on Chassis:	
	a. Overall Width : 2500 mm	
	b. Overall Height : 3000 mm (Over cabin hatch)	
	c. Height over beacons : 3100 mm	
	b. Technical data of Clutch, Gearbox, Differentials, Steering & Brakes:	
	Clutch	
	Kind..... Single-plate type with Diaphragm spring hydraulically actuated with pneumatic booster.	
	Number of plates1	
	The vehicle engine is fitted with single-plate; friction type clutch with Belleville/ Diaphragm spring & is mounted onto the flywheel and is protected by the clutch housing. The clutch control is of hydraulic type with pneumatic booster and thereby the force necessary for depression of the clutch pedal is reduced.	
	Adjustment Data	
	Clutch pedal play..... min. 4 mm, max. 11 mm (measured in vertical plane)	
	Necessary clutch control force..... max. 195 N	
	Gearboxes	
	Gearbox	
	Kind Gearbox with gear wheels and direct shifting has ten forward gear speeds and two reverse gear speeds.	
	ShiftingManual, mechanical, with pneumatic booster	
	Shifting of constant meshes.....Electro-pneumatic with pre-selection on gear-shift lever(H & L selection switch)	
	Gear ratio:	
	Gear 1 2 3 4 5 R with High and Low speed selector	
	Transfer Gearbox	
	KindTwo-stage, step-down type, with gears in constant mesh, shifting of both the gear speeds and neutral is done by gear coupling in electro-pneumatic system	
	Mechanism on transfer gearbox case of gear speeds shifting, drive and engagement of winch with driving shaft	
	Differentials	
	Differentials Torque divider, two inter-axle differentials and four axle differentials. All differentials have three couples of satellites.	
	Differential locks engaged by shifting gear couplings controlled by Pneumatic working cylinders and pneumatic cocks	
	Steering	
	Kind Mechanical, power-assisted with hydraulic working cylinder	
	Steering gearbox With worm and one steering finger carried on needles in bushing	
	Overall number of steering wheel revolutions to achieve full steering lock 5 2/3	
	Diameter of steering wheel 475 mm	
	Steering wheels play max. 18° with engine running	

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	Brake System	
	Operating air overpressure 830 ±20 kPa (8.3 ± 0.2 kg/sq.cm)	
	Service Brake	
	Kind Two-circuit type, foot operated, pneumatic, with	
	Single hose indirect acting or two-hose direct acting control of brakes of connecting vehicles	
	Emergency and Parking Brakes	
	Kind Spring type, controlled by manual brake	
	valve, acting on wheels of second front and both rear axles	
	Exhaust Brake	
	KindExhaust type, electro-pneumatically controlled by electromagnetic switch on control panel	
	The vehicle brake system shall enable to connect connecting vehicles with pneumatic brakes of single- and two hose connecting system and operating pressure 830 ± 20 kPa (8.3 ± 0.2 kg/sq.cm). All the equipment shall be of the pneumatic brake system, located under the draught line (1,400 mm) is of watertight or water-resistant type.	
	c. Technical data on Bulbs & Fuses of Electrical system:	
	Details enclosed in Appendix D	
	Appendix E	
	Technical Requirements of Armored Glass	
	1. Driver cabin should be equipped with Armored glass for the following places:	
	a) Driver Cabin Front Split Windshield (LH and RH)	
	b) Driver, Co Driver Door Fixed Window glass - single piece	
	c) Side and Rear Wall Fixed Window glass	
	2. Before finalization of glass requirements vendor has to take drawing approval from BEML.	
	a. The blast resistant glass shall meet clause D3 with DIN standard 52290 PART 3 / equivalent IS.14443.1997. meeting STANG Level 1	
	b. The approx. overall size of glass should be 755 x 565 x 25 thk (mm)	
	c. The safety glass as per IS:2553 PART 2	
	d. Edge grinding as per SAE J6738 TYPE 4	
	e. Test reports as per above glass standard	
	3. Proper sealant to be used to fix the glass to frame ensuring water leak proof & vibration resistant.	
	4. The detail specification of the sealant TERSON PU 8590 UHV-MT,	
	a. Colour - black	
	b. Density - 1.27 g/cm3	
	c. Shore hardness - approx. 60	
	d. Tensile strength - approx. 7 MPa	
	e. Elongation at break - approx. 350%	
	f. Shear modulus g10 - approx. 1.5 MPa	
	g. Shear strength - approx. 5 mpa	
	h. Recommended application temperature : 15° C to 50° C	
	Electric Power Sources:	
	The voltage of vehicle electrical accessories is 24V.	
	All circuits are protected by fuses located in the fuse boxes on the RH upper part of the instrumentation panel	
	Wiper motor, Horn, Bulbs, Headlamp with protection grid, Search light, Buzzer on driver side, Map reading lamp, Roof marker lamp, Reading lamp, Indicator lamps, Head lamps.	
	Relay Holder, fuse box, battery charging socket, Service lamp socket, Horn changeover switch, Jump start arrangement, Electronic cooling control system, Heater and Hot air	
	Distribution system to be provided	
	Alternator : Non water tight 28V/120A	

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	Technical specification:	
	Type of electrical system: One conductor and negative pole grounding	
	Batteries (Accumulators) : 12V, 180 Ahr, 02 batteries connected in series	
	Head lamps : 2 Water tight (lower)	
	2 Non-Water tight (upper)	
	Fog head lamp : 2 Water tight (halogen bulbs)	
	Heater : independent, multi-fuel breeze	
	Full output : 1900W, Decreased o/p : 900W	
	Rear cluster lamp (with port)/Without port (right)	
	Front and side turn signals	
	Horn : non watertight, electro-pneumatic	
	Sockets : One ZAB for external starting two for preservation charger, two for auxiliary lamps, one for inspection lamp & infrascopes, two 7-pole type trailer, one 7-pole socket for towing, one auxiliary socket for illumination.	
	Instrument panel & control equipment of the vehicle:	
	9.5.1 Panel of Instruments and Switches: 1- Switch of lamp for illumination of towing hook (To be used with the contour lights switched on) 2 - Tachometer c/w engine hours counter 3 - Electronic speedometer c/w counter of distance covered 4 - Double air pressure gauge in brake system 5 - Button switch to stop the engine 6 - Oil pressure gauge c/w warning signal lamp of low oil pr 7 - Convoy light switch 8 - Control levers of heating and ventilation 9 - Fuel gauge with warning signal lamp for low fuel 10 - Air pressure gauge for tyres inflation 11 - Winch controller 12 - Change-over switch of headlamps (upper - lower) 13 - Emergency flasher (hazard warning lights) switch 14 - change-over switch to shift in auxiliary gears 15 - Push-button switch for engine brake 16 - Switch for special warning lights - beacons (To be used when transporting an over dimensional cargo) 17 - Fan switch 18 - Switch for electric fuel pump 19 - Ignition box with starter 20 - Switch for fog headlamps 21 - Interior Dome light switch 22 - Rotary switch for outer illumination 23 - Voltmeter	
	24 - The instrument panel should also include following features • Alternator not charging warning • Winch rope completely paid out (for safety reasons) • Excessive Engine temperature • Low Engine oil pressure warning • Audio & visual indication for Winch in operation	

Tender Ref:

Tech. Specs of Armored Driver's Cabin (Flat type-RHD) for BEML HMV 8x8
Doc No. BEML/GAT/R&D DEFENCE /MGS/A-CAB/003, Dt: 25.04.2020
E Bid No:6300033592



Sl no.	Description	Vendor Response
	<p>9.5.2 Signal Lamps: consists of: 1 – Driver's cab signal lamp (red) 2 – Signal lamp of special warning lights (yellow) 3 – Signal lamp of engine electronic cooling malfunction (red) 4 – Signal lamp of engine overheating (red) 5 – Signal lamp of air overpressure in brake circuits (red) 6 – Signal lamp of air overpressure drop in spring cylinders of service brake (red) 7. Signal lamp of parking brake (red) 8 – Signal lamp of towing hook illumination (yellow) 9 – Signal lamp of vehicle turn signals (green) 10 – Signal lamp of trailer turn signals (green) 11 – Signal lamp of accumulators charging (red) 12 – Signal lamp of high beams (blue) 13 – Signal lamp of front wheels drive and inter-axle differentials locks engagement 14 – Signal lamp of axle differentials locks engagement (green) 15 – Signal lamp of electric delivery pump operation (white) 16 – Signal lamp of emergency flasher (hazard warning lights) (red) 17 – Signal lamp of air cleaner (white) 18 – Signal lamp of fog lamps (green) 19 – Signal lamp of engine preheating (yellow)</p>	
	PANEL INSTRUMENTS & SWITCHES	
	9.7.1 Voltmeter	
	9.7.2 Electronic Speedometer It is a combined instrument that records the total and daily distance covered in Km, instantaneous speed and real time. The range is 0 to 120 Km/h. Clock setting arrangement provided.	
	<p>Ignition box (to be provided with key not removed warning) STOP – Position to remove the key and to lock the steering wheel. After removing the Key, the steering will be locked 0 - In this position it starts to be active Vehicle illumination, hazard warning lights, multi-fuel heater and brake lights. If it is difficult to turn the key to this position, gently move the steering wheel until the steering lock pawl releases. 1 - Other electric circuits are ON 2 - Position to start the engine</p>	
	Winch controller switch	
	<p>Fuse box All electric circuits are protected by ceramic fuses positioned in the fuse boxes located on the RH side under the upper cover of instrument panel. Other current fuses, diodes and relays are located in the fuse panel under the front vehicle bonnet</p>	
	<p>Combination switch Single lever switch with functionality for 1. Horn 2. Wipers (2 Speed) 3. High beam / Low beam 4. pass Beam 5. L H & RH turn</p>	
	<p>Control Knobs on the Manual brake valve panel for: 1- Tyres deflation 2- Tyres inflation 3- Axle differential locks engagement 4- Front axle drive and inter-axle differential lock engagement</p>	
	<p>Fuel gauge The gauge will indicate the fuel level which is part of the driver Instrument panel. The operating range is 0 to 1</p>	
	<p>Engine oil pressure (VDO) This gauge is part of the driver instrument panel. The operating range is 0 to 5bar</p>	
	<p>System air pressure gauge The gauge will indicate the system air pressure. The operating range is 0 to 10 bar</p>	
	Tachometer & Hour meter	

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Sl no.	Description	Vendor Response
	Tyre gauge The operating range is 0 to 10 (KPa x100)	
	Multi pin socket There is a 2-pin socket provided inside driver's cabin. This is for radio communication purpose and works on 24V dc	
	Wiring harness The cabin wire harness shall comply with the Standard FLRY-B to DIN 76722 / 72551. The cable size depends upon the current carrying capacity	
	Battery isolator switch This is to isolate battery from the system. It is fitted inside the driver's cabin i.e. behind the co-driver seat. It operates on 24v dc	