



health

Department:
Health
REPUBLIC OF SOUTH AFRICA

NATIONAL TREASURY: REPUBLIC OF SOUTH AFRICA

EMERGENCY MEDICAL SERVICES

AMBULANCE CONVERSION TECHNICAL SPECIFICATION: LIGHT RESCUE 4x4

NOTE:

1. All materials used in the construction of the rescue vehicle conversion must meet relevant SANAS/SABS standards
2. Conversion to be approved by the relevant End-User Department after a “prototype” has been inspected and met approval
3. Contractor must be an accredited ISO 9000 manufacturer – registered MIB converter and registered with the OEM providers
4. All conversion aspects and related workmanship must carry at least 36 months warranty
5. Contractors to submit detailed project plan which should include midway inspection or at any time during production of each vehicle by the end user
6. Sign off will depend on end user acceptance as per the prototype specification

List of abbreviations

| | | |
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| LHS | - | Left hand side (passenger side) |
| RHS | - | Right hand side (driver side) |
| OEM | - | Original equipment manufacturer |
| CNC | - | Computer Numerical Control |
| SMD | - | Surface mount device |
| LED | - | Light-Emitting Diode |
| GMAW | - | Gas metal arc welding |
| GTAW | - | Gas tungsten arc welding |

Light rescue side and back view



| | REQUIREMENTS | COMMENTS | YES | NO |
|--------------------------------------|---|----------|-----|----|
| SECTION ONE: VEHICLE EXTERIOR | | | | |
| 1.1 | Take original load bin off vehicle. Constructed rescue body fitted directly to the chassis | | | |
| 1.2 | Take out leaf springs, add extra leaves and adjust to suit new body weight | | | |
| 1.3 | Vehicle chassis needs to be extended with additional mounting brackets | | | |
| 1.4 | Provisions need to be made to accept a rear bumper step | | | |
| SECTION TWO: RESCUE BODY | | | | |
| 2.1 | The original load box of the body must be replaced with a new Composite construction Aluminium body | | | |
| 2.2 | The new body will have following approximate external dimensions and be open plan: Length: 2500mm Width: 1780mm Height: 1200mm (top of vehicle chassis) <u>or as per end-user</u> | | | |
| 2.3 | The sub frame will be constructed from 6,3mm aluminium channel and strongly welded in place. Reinforcing needs to be put in place to hold various attachments on the floor. The main body frame must be of sufficient strength to bear the load imposed on it. The sub frame will be bolted to the chassis by means of steel brackets. 16mm High Tensile steel bolts, washers and 16mm nuts | | | |
| 2.4 | Mounting onto the chassis must be of such a nature so as to keep the centre of gravity as low as possible | | | |
| 2.5 | All Aluminium body exterior, | | | |

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| | Gutter, Front, Rear and roof are to be bonded onto a main frame using a component UV resistant high modules Polyurethane based adhesive | | | |
| 2.6 | The entire Aluminium frame, Tail panel, Floor and related items to be joined by fusion welding method GMAN or GTAW | | | |
| 2.7 | The entire body must be of sufficient substance as to withstand disintegration in the event off a rollover accident | | | |
| SECTION THREE: BODY COMPOSITION | | | | |
| 3.1 | Bulkhead The bulkhead, LHS front post and RHS front post needs to be strong enough to withstand a rollover and accept various Emergency Rescue equipment Fuel inlet on the post needs to be recessed left or right (vehicle dependent) | | | |
| 3.2 | Sides The LH and RH side of body is open. Roller doors will be used on both sides and run the full length of the opening On bottom skirting there should be provision for a step | | | |
| 3.3 | Rear The rear of the body will have a full bonded on panel with a door to allow storage for the Stokes basket. Allowances for tail lights in this panel, (Heights as regulated by the road traffic act) | | | |
| 3.4 | Roof The roof will be strong enough to support a patient or rescue persons. It will have allowances to store the Stokes basket under the roof skin as well as 8x lashing eyes on top of roof. A custom made Aluminium roof | | | |

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| | <p>rack to be made and bolted onto roof. It will be $\pm 200\text{mm}$ above the roof and hold a ladder (supplied by end user) and cut outs for rotating spot lights (size of cut out dependent on the light used).</p> <p>A step ladder needs to be made to access the top of the roof. Ladder is mounted on the rear of the body.</p> <ul style="list-style-type: none"> The roof will have an Aluminium Checker plate finish | | | |
| 3.5 | <p>Floor</p> <p>A minimum of 2mm Aluminium sheet will be bonded onto the sub frame with a component UV resistant high modules Polyurethane (colour to be determined by end user) based adhesive</p> | | | |
| SECTION FOUR: INTERIOR & FITTINGS | | | | |
| All internal equipment to be supplied by end user for custom made brackets to hold rescue equipment | | | | |
| Brackets for Rescue Equipment | | | | |
| Layout of the equipment determined by the end user | | | | |
| 4.1 | All equipment needs to be securely fastened and strapped in the event of a collision or roll over | | | |
| 4.2 | <p>Cutter, Spreader, Rams and Hydraulic pump needs to be on a draw/pull out system.</p> <p>Generator set (if applicable) needs to be on a draw/pull out system.</p> <p>Any other draw/pull out system to be determined by the end user</p> | | | |
| 4.3 | A tray with shelves to hold Stokes basket needs to securely fasten onto provisions made in the roof | | | |
| 4.4 | All equipment needs to be Epoxy Coated in various colour (colours determined by end user) for placement of equipment in their allocated areas | | | |
| 4.5 | All areas inside to be Polyurethane in light grey or other colour as specified by end user | | | |

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| 4.6 | A minimum of 2.5kg DCP fire extinguisher shall be fitted in the equipment compartment (scene use) and a 1kg or 1.5kg fire extinguisher to be fitted in the driver compartment in a suitable position (end user consultation) | | | |
| SECTION FIVE: EXTERIOR FINISH | | | | |
| 5.1 | All exterior finishing needs to be sprayed the same colour as existing vehicle colour | | | |
| 5.2 | Roller doors or equivalent, with all its accessories needs to be epoxy coated white | | | |
| 5.3 | Step ladder and roof rack need to be sprayed the same colour as existing colour of vehicle | | | |
| SECTION SIX: ELECTRICAL | | | | |
| 6.1 | A second, auxiliary battery (12V) is to be fitted. The battery must be a lead-acid, deep cycle battery with a minimum rating of 80A/h. The second battery is to be connected to the vehicle's main battery via an automatic isolator/combiner | | | |
| 6.2 | The isolator/combiner must engage when either one of the batteries' voltage exceeds 13.1V and disengage when combined battery voltage is below 12.8V. The Isolator/combiner is to have a continuous current rating of 120A (minimum). Both main and auxiliary side of the isolator/combiner to be fused (100A). The auxiliary battery 12V DC is to be distributed via a distribution board | | | |
| 6.3 | A 6 way blade fuse panel is to be fitted near the auxiliary battery. This fuse holder will be used for third party connections. The fuse panel must make provision for: <ul style="list-style-type: none"> • 2-Way radio – 2A • Vehicle tracking device – 5A | | | |

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| | <ul style="list-style-type: none"> • MI System – 5A • 3 x Spares | | | |
| 6.4 | <p>External caravan socket placed on left hand rear with a power indicator light.</p> <p>Power should be directed to the additional battery charger for the auxiliary battery to charge from.</p> <p>Battery monitor placed next to the Distribution board in the left front of the rear compartment</p> | | | |
| 6.5 | A 2.5mm ³ wire x 20-meter extension lead with matching coupler and reel is to be provided | | | |
| 6.6 | Off shore power to supply current to a battery charger to charge batteries if vehicle stands for long periods | | | |
| 6.7 | A battery monitor/indicator light should be placed inside the driver cab to allow visual confirmation of both batteries' charging status | | | |
| 6.8 | <p>Optional: An auto eject electrical input system is to be provisioned on the outside of the vehicle to allow connection to grid (shore) power.</p> <p>Upon sensing engine start, plug ejects from receptacle and away from vehicle path.</p> <p>After eject, weatherproof cover snaps into position over inlet.</p> | | | |
| 6.9 | <p>An indicator light is to be fitted inside the power inlet to indicate the presence of grid power.</p> <p>The power socket to be mounted on the LHS on the skirting panel</p> | | | |
| 6.10 | <p>Two remote controlled spotlights to be fitted to each side of the rescue body roof.</p> <p>Option 1: Spot lights may be either GO lights. Each spotlight to be capable of at least 360-degree rotation and 70-degree tilt. The remote-controlled lights to be of 12V supply. Each lamp to be</p> | | | |

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| | <p>protected by a stainless-steel cover or equivalent (size determined by light type used). The cover must be made in such a way as to allow for freedom of movement but at the same time protecting the lights</p> <p>Option 2: 6 sets of LED spotlights (2 left, 2 right and 2 angled to be forward facing)</p> | | | |
| 6.11 | <p>The driver and passenger door to be fitted with red LED strip light along the trailing edge of the door. 20cm per strip; 6 x 50/50 SMT LED per strip.</p> <p>Strip light to switch on when door is opened and off when door is closed (using existing door switches)</p> | | | |
| 6.12 | <p>Park Distance control</p> <p>Park distance control supplied as an optional extra if not supplied by the OEM</p> | | | |
| 6.13 | <p>Rear Camera</p> <p>A rear facing camera shall be mounted on the rear above the doors.</p> <p>The screen for the camera shall be incorporated into the dash</p> | | | |
| 6.14 | <p>6000kg capacity Winch needs to be mounted on a winch plate or Heavy-Duty Off-Road Bumper. The original nudge bar to go back onto vehicle if a winch plate is used. If a nudge bar is not provided by the OEM, the converter must provide one.</p> <p>A LED bar or spot light to go mounted on nudge bar or Heavy-Duty Off-Road Bumper with its own switch needs to clearly marked inside the cab with a LED light.</p> <p>Fitment of Winch plate or Heavy-Duty Off-Road Bumper to be decided by end user.</p> | | | |
| 6.15 | INTERIOR LIGHTING | | | |
| | All interior lighting should be rigid | | | |

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| | LED strip lights, using 50/50 SMT Cool White LED at 30 LED per meter unless otherwise stated LED strip lights must run the full length of the body inside. Light switch needs to clearly marked inside the cab on the controller | | | |
| 6.16 | EMERGENCY LIGHTING | | | |
| | 6-LED Red Clusters to be used throughout except where otherwise noted. Cluster rows must be individually controlled and dual color optional (e.g., red/white or red/amber) | | | |
| | 5 sets of 6LED clusters generation4 or newer to be used on the new body above the cab. Lights need to be arranged in five forward facing clusters | | | |
| | On each side of the vehicle, one cluster to be positioned top rear (Red), top middle (Amber) and top front (Red) | | | |
| | On the rear, two clusters at top left, two clusters top right (Red) and one in the centre (Amber) | | | |
| | Four clusters to be fitted in the radiator grill (left and right). These clusters to be red/white | | | |
| | A two channel flasher unit is to be used to flash all clusters. Converter must be able to supply the wiring diagram to end-user on request | | | |
| | Single colour clusters must flash both rows simultaneously. Dual colour cluster must flash each colour alternately | | | |
| 6.17 | SIREN | | | |
| | Output 200W with 2 speakers (placed in engine compartment, as close as possible to grill and facing outward in the direction of the grill) <ul style="list-style-type: none"> Wail, yelp & phaser tones | | | |

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| | <ul style="list-style-type: none"> • Dual tone (stereo) - one tone through speaker • Touch control panel • Horn ring control <ul style="list-style-type: none"> ○ press twice to activate response mode - lights & siren on ○ press again to change tone ○ press twice to silence siren ○ press once to switch lights off | | | |
| 6.18 | All instruments, gauges and switches shall be clearly marked as to their use | | | |
| SECTION SEVEN: WINDOWS | | | | |
| 7.1 | The driver and passenger door windows shall be fitted with Anti Smash and Grab safety film 100mic clear or a maximum of 35% tint Safety Film or equivalent | | | |
| SECTION EIGHT – PAINTING AND MARKING | | | | |
| 8.1 | Yellow and green segmented Battenberg style, high visibility markings made from reflective material on the LHS and RHS of vehicle | | | |
| 8.2 | Star of life on Bonnet, LHS and RHS with Protekta Glaze clear coat for added scratch resistance and UV protection | | | |
| 8.3 | To be indicated on the LHS and RHS respectively: <ol style="list-style-type: none"> 1. The respective “Province” 2. Emergency Medical Services 3. Fleet number | | | |
| 8.4 | The word ‘Rescue’ to be displayed on bonnet, with a reflective strip below. Size: 600mm x 150mm as well as on the rear of vehicle | | | |
| 8.5 | The word ‘Diesel/Petrol’ (vehicle dependent) to be displayed below the fuel cap | | | |

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| 8.6 | High visibility segmented chevron patterned reflective marking to cover the entire back panel of the vehicle. Vinyl specification: Orange and lime green 3M | | | |
| 8.7 | Large call sign to be displayed on vehicle roof (approximately 785 x 355mm) | | | |
| 8.8 | The words "No Smoking" decal to be stuck on the inside where visible (or alternatively the international "No Smoking" pictograph sign may be applied). This will also be required in the driver's compartment | | | |
| 8.9 | All vehicles will be marked as per provincial end-user requirements in 3M Vehicle reflective materials | | | |







Vinyl Specifications :

3M IJ680-10 Cast Reflective Digital Print Vinyl - White

CMYK breakdown :

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|---|-------------------|--------------------------------|
|  | Yellow Reflective | Y - 100 |
|  | Red Reflective | C - 0 M -100 Y -100 K - 20 |
|  | Black | K - 100 |
|  | Green Reflective | C - 84 M - 26 Y - 43 K - 10 |

Measurement Breakdown :

| Item | Measurement |
|--|----------------|
|  | 130mm X 130mm |
|  | 130mm X 130mm |
|  | 301mm X 290mm |
| EMERGENCY MEDICAL SERVICES | 211mm X 83mm |
| Side Fleet Number A116 | 1667mm X 91mm |
| GAUTENG PROVINCE | 1055mm X 91mm |
|  | 553mm X 350mm |
|  | 362mm X 360mm |
| Roof Fleet Number A116 | 2018mm X 790mm |