GUJARAT STATE DISASTER MANAGEMENT AUTHORITY (GSDMA)

Tender Notice No. : 2/GSDMA/Fire Fighting and Search & Rescue equipments/2020

N Procure Tender ID: 403659

Date: 16/05/2020

Corrigendum-IV

Name of Work: Supply of fire Fighting and Search & Rescue equipments, With reference to the captioned subject matter, GSDMA has issued Corrigendum/Addendum to the Bid document, details as under: -

Detailed Tender Specifications:

S. No. Clause	Existing Tender Clause	Addendum/Corrigendum IV dated 16/05/2020
SECTION-1 **PAGE 9** **S. NO. 7** **7.1**	Delivery Period: 120 Working days from date of submission of security Deposit.	Delivery Period will as per schedule below mentioned days from issue of purchase order, date of submission of Security Deposit, and LC issued date (whichever is applicable and later: • Schedule 1 (Mist Fire tender multipurpose with Robot) – **180 days** • Schedule 2 (Command Vehicle) – **180 days** • Schedule 3 (Pickup Jeep/Van) – **180 days** • Schedule 4 (Hydraulic Fire fighting arm with five articulating section 55 meter) – **180 days** • Schedule 5 (Emergency Rescue vehicle/tender)- **180 days** • Schedule 6 (Water Bowser 20 KL) – **180 days** • Schedule 7 (Hydraulic Platform HLA 80 meter) – **180 days** • Schedule 8 (SCBA Training Gallery with cleaning, testing & refilling facilities) **- 180 days** • Schedule 9 (Foam Nurser) – **180 days** • Schedule 10 Hazmat Chemical Tender – **180 days** • Schedule 11 Personal Protection Equipments (PPE) – **180 days**

S. No. Clause	**Existing Tender Clause**	**Addendum/Corrigendum IV dated 16/05/2020**
Schedule 4 HYDRAULIC FIRE FIGHTING ARM WITH 5 ARTICULATING SECTION 55 mtr. 3. (Page 45)	**Technical Specifications:** • Gross Vehicle Weight: Not more than 42000kgs • Maximum working reach below the ground level : Not less than 37.5m	• Gross Vehicle Weight should be up-to **43,000/- Kgs** • Maximum working reach below the ground level should be not less than **35 mtrs**
Page 46 (2.1)	**Performance:** • Maximum horizontal working outreach: 51.6 meter • Maximum working reach below ground level: 37.5 meter	**Performance** • Maximum Horizontal Working Outreach should be **50 mtrs.** • Maximum working reach below Ground level should be not less than **35 mtrs.**
Page 47. (6.3)	**Cylinder:** 5th boom cylinder stroke : 1059mm	**Cylinder:** 5th Boon Cylinder Stroke should not be less than **1031mm** **Additional tender clause** OUTRIGGER FULL EXTENSION WITHIN 40 SECONDS. + 250 SECONDS FOR FULL UNFOLDING BOOM TO MAX HEIGHT OF 55 M (Auto). **OR** SPEED OF OPERATION FOR FIRE FIGHTING: TOTAL TIME OF OPERATIONFROM VEHICLE COMING TO STOP AND REACHING 55 METERTO be LESS THAN 300 SECONDS INCLUDINGOUTRIGGER OPERATION.

(Page 22) Section-II Terms & conditions (S.No.5)	**Price:** 5.1. Unless otherwise specifically stipulated, the price shall be inclusive of all taxes, royalties, octroi, costs, fees, duties, insurance, transportation, loading and unloading charges for consignee's stores and the details of which are provided in the price bid.	**PRICE**: GSDMA may accept CIF Indian Port price in US Dollar and all duties and Taxes (Port handling charges, Custom duty, cess on custom duty, GST, etc) should be included in invoice which may paid directly by GSDMA.
(Page 23) S. No. 7	**Terms of Payment:** 7.1. The payment shall be made to the supplier as under: Chassis Payment: Chassis payment shall be made against submission of Performa invoice from the chassis OEM and against Indemnity Bond. 100% of the invoice amount will be paid within 30 days of the delivery of the goods at the destination in good condition and submission of the documents as specified in the clause 21. 7.2. the payment of the bill shall be made after deducting government dues, if any 7.3. The payment shall be made in Indian rupees. 7.4. The payment of the bills shall be with held in the following circumstances: The goods/stores/material(s) are found sub standard or in non-acceptable condition Breach of condition of any contract by the supplier Previous government dues of the supplier	**TERMS OF PAYMENT;** Letter of Credit (LC) of 90% value shall be only released after final inspection and acceptance by inspecting officer and submission of shipping documents are received by GSDMA and 10% to be released after commissioning at HQ. , testing and training of personnel's at local level. (applicable for all schedules)

S. No. Clause	Existing Tender Clause	Addendum/Corrigendum IV dated 16/05/2020
For Schedule 8: SCBA training Gallery	**Terms of Payment (for all schedule):** 7.1. The payment shall be made to the supplier as under: • Chassis Payment: Chassis payment shall be made against submission of Performa invoice from the chassis OEM and against Indemnity Bond. • 100% of the invoice amount will be paid within 30 days of the delivery of the goods at the destination in good condition and submission of the documents as specified in the clause 21. 7.2. the payment of the bill shall be made after deducting government dues, if any 7.3. The payment shall be made in Indian rupees. 7.4. The payment of the bills shall be with held in the following circumstances: • The goods/stores/material(s) are found sub standard or in non-acceptable condition • Breach of condition of any contract by the supplier • Previous government dues of the supplier	**for Schedule 8** considering it magnitude as project and stage wise payment may be recommended as per clause: **1.** 20% advance along with order **2.** 20 % after submission of detail drawings **3.** 50% on against readiness and inspection of material at work prior dispatch **4.** Balance 10% after successful completion of installation, commissioning and training
Schedule 8 (e):	Refer layout drawing attached	Draft layout drawing will be uploaded.

S. No. Clause	Existing Tender Clause	Addendum/Corrigendum IV dated 16/05/2020
Section III (v):	the bidder shall furnish documentary evidence that it meets the financial requirement(s) i.e. total turn-over of the bidder shall be not less than INR 8,00,00,000/- (INR eight crore only) each year during the last three(3) financial years.	Total turn-over of bidder should be defined as minimum considering **all schedules** of tender: The annual turnover of bidder should be **Rs. 1.50 Crore** for each year during last three financial years,
For Schedule 8: SCBA training Gallery		**Addendum/Corrigendum IV dated 16/05/2020:** **Additional tender clause** **1.** Owing to specialize of the training system, it is very important that the bidder/OEM or authorized dealer have experience of setting up at least 3 BA training galleries I last five years. **2.** Inspections of the SCBA training gallery will be as per GSDMA order **3.** Also to maintain standard, it is also recommended pre dispatch factory inspection test. Team of GSDMA should visit OEM facility and entire equipments as per QAP should be tested and non approval of same material should get dispatched. **4.** SCBA training gallery location will be Gift City Gandhinagar, Gujarat, therefore applicable rules and regulations will be considered as per Gift City and GSDMA.

Schedule 4 Hydraulic Articulating Fire Fighting Arm – 55 Meters – 01 Unit (Detailed Specification)

1. General

The Multi Articulating Water Tower 55M is an aerial fire-fighting vehicle with 5 articulating sections for effective fire fighting in high rise buildings, industrial areas, etc on fire.

All components of the unit shall be manufactured with approved products, steadily improved and developed which guarantee reliable, long-lasting performance and safe operation.

2. Main operating data

2.1 Max. working height (with monitor) 55m

2.2 Max. working reach below the ground level Not Less than 35m

2.3 Working Rotation 360° continuous rotation

2.4 Transport height Not more than 4,000mm

2.5 Transport length Not more than 14,500mm

2.6 Transport width Not more than 2,500mm

2.7 Gross vehicle weight Not more than 43,000kgs

2.8 Maximum operating time: not more than 5 minutes, from vehicle coming to a halt and achieving 55 meters high reach.

3. Chassis

3.1 Model : Volvo or Mercedes

3.2 Vehicle type : EURO-6, RHD

3.3 Drive train : 10x4

3.4 Cab : Single, Day cab

3.5 Engine power : Not less than 500 hp / 2,500 Nm

3.6 Permitted total weight : Less than 51 ton

3.7 Intake / Exhaust System : Air intake / Exhaust outlet direction backwards

3.8 Gearbox : Automatic

3.9 Front Axle: Tire 385/65R22.5, Tubeless radial tire, Rim type : 11.75 x 22.5, Aluminum wheel

3.10 Rear Axle: Tire 315/80R22.5, Tubeless radial tire, Rim type : 8.25 x 22.5, Aluminum wheel
3.11 Tag Axle: Tire 385/65R22.5, Tubeless radial tire, Rim type : 11.75 x 22.5, Aluminum wheel

3.12 Spare Tire: Front axle 385/65R22.5, Tubeless radial tire, Rim type : 11.75 x 22.5, Aluminum Wheel.
3.13 Fuel tank : 300 liters.

3.14 Brake System : Dual-circuit full air brakes (disc brakes), Disc brakes on front and rear axle Electronic Braking system

3.15 Instruments: English for display in instrument panel. Display on the dashboard for operating data

3.16 Electrical System: Batteries not less than 200AH, 2 pcs. Battery box, lockable, Alternator 120A

3.17 Others: Labels / publications in English, Jack, Safety triangle, Tool kit

4. Bodywork and stowage

4.1 Driver's cabin: Forward control type, hydraulically operated tilting driver cab for a crew of two (1 driver plus 1 fireman). The cab has an all-steel construction with adequate insulation against noise, vibration and extreme temperature and humidity.
4.2 Compartment: There are two compartments for keeping fire fighter's equipment or accessories in the body. One of compartments is arranged on the left and another is on the right side. Each compartment has a hinged and lockable door. In one of the compartments, MBC block for boom control system and combination box for electric system are installed.
4.3 Outrigger: 2 front and 2 rear outriggers are installed on the left and right sides. Front outrigger is an X-extension type and rear outrigger is a swing type. Outrigger control panels are equipped on both side of the vehicle.
4.4 Midship-mounted pedestal and boom. Pedestal and boom assembly are mounted in the middle of the vehicle.
4.5 Fire hoses and nozzle compartment: Fire hoses and nozzle compartment are installed on the vehicle. For preventing from being stolen, the compartment is designed as a lockable type.
4.6 Step: Step is to be installed to access onto the deck.
4.7 Deck: Deck is designed for anti slipping.

5. Booms

The Booms consist of a roll & zigzag folding type five section booms and provide better flexibility and easier access to the fire target through obstacles rather than using telescopic type of boom. All articulated booms except the first boom are vertically moving up to 90° and especially the fifth boom with vertical movement angle of 220°. Especially, its maximum horizontal outreach to the tip of water monitor is approx. 50 meters and the maximum working reach to the tip of water monitor below ground level is approx. 35 meters. The booms are able to be continuously rotated 360°. All booms are primed and painted for long life span.

The Booms are hydraulically driven and are welded by unique welding method to provide high durability and extreme accuracy. High tensile strength steels are used as load bearing structure for high strength and minimum flexing of the booms sections and the material of the boom STE690 (equivalent to ATOS80) or much stronger steel.

5.1 Performance

Max. working height (to water monitor) 55m
Max. horizontal working outreach 50m
Max. working reach below ground level 35m
Max. standing angle of the 1st boom 90° (+/- 2°)
Max. extension angle of the 2nd & 3rd boom 180 ° (+/- 2°)
Max. extension angle of the 4th boom 235 ° (+/- 2°)
Max. extension angle of the 5th boom 220 ° (+/- 2°)
Rotation 360 ° continuous rotation

5.2 Dimensions:

Each section length 1st Not less than 11,000mm
2nd Not less than 8,450mm
3rd Not less than 8,700mm
4th Not less than 11,400mm
5th Not less than 11,488mm

5.3 Cylinder:

1st Boom cylinder
Stroke 2,018mm (+/- 2mm)
Rated pressure 350Kgf/cm2
Proof pressure 450Kgf/cm2
2nd Boom cylinder
Stroke 1,993mm (+/- 2mm)
Rated pressure 300Kgf/cm2
Proof pressure 450Kgf/cm2

3rd Boom cylinder
Stroke 1,544mm (+/- 2mm)
Rated pressure 350Kgf/cm2
Proof pressure 450Kgf/cm2
4th Boom cylinder
Stroke 1,444mm (+/- 2mm)
Rated pressure 350Kgf/cm2
Proof pressure 450Kgf/cm2
5th Boom cylinder
Stroke 1,031mm (+/- 2mm)
Rated pressure 350Kgf/cm2
Proof pressure 450Kgf/cm2
5.4 Boom Operation Control:
PLC (Programmable Logic Controller) and CAN (Controller Area Network) system are utilized for
Boom operation.
All of boom operation is controlled by a cable remote controller and a wireless remote controller depending on user's convenience. Cable length of the remote controller is approximately 40 meters. Furthermore, the boom can be operated by the wireless remote controller within 100 meters if there is no wall or obstacle to block or disturb the frequency between the boom and controller. Even though the end of boom is far away from the operator, the operator can operate the boom and see the target point to put out the fire at the screen through the camera installed at the end of the boom.
5.5 Lifting Hook: 1 lifting hook with a sensor giving weight limit of 200kgs is to be installed on the 5th boom section.

6. Rotation Ring Gear:

Boom rotation is driven by ring gear and reducer that is engaged to it. Locking brake is installed in the reducer, which is activated when no hydraulic pressure coming in and prevents unintended ring gear rotation.

7. Stabilizing System:

The stabilizing system consists of hydraulically powered outriggers mounted in their housings in the main frame.
Each outrigger legs are fitted with self-aligning foot plate to spread the load evenly and to allow operation on uneven ground.
7.1 Front outrigger, X-extension Driven by Hyd. Cylinder, Max. width (center to center) : 8,930mm
(+/- 100mm)
7.2 Rear outrigger, Swing-support, Driven by Hyd. Cylinder, Max. width (center to center) :
11,900mm (+/- 100mm).

7.3 Outrigger Operation Control.

All the outrigger operation is automatically controlled by a remote controller. 2 outrigger control panels are installed on the left and right side of the vehicle, and outrigger operation on the left & right side is manually controlled by the control panel on each side.
- Boom working radius is automatically adjusted to the extension range of each outrigger.
- Loading weight of each outrigger to the ground is shown on the remote controller screen.
- With only one touch on the switch, all outriggers can be automatically extended and leveled.
- Outriggers on the left and right side can be extended separately before leveling operation.
- All outriggers can be retracted together to the transport position only with one touch of switch.

8. Waterway

Waterway is connected from the fire pump to the water monitor installed at the end of the last boom. It is installed next to the boom and synchronized with the boom operation.
Its size is 4 inches and it is made of stainless steel STS304.

9. Electric water monitor & nozzle

9.1 Electric water monitor:
The water monitor is installed at the end of the boom and can be moved up and down by a remote controller. It is also swiveled to both sides within the respective limit.
Model: Akron Brass Stream Master II 3480
Flow Capacity: Approx. 2,000 GPM
Vertical Travel: Up 90° / Down 45°
Horizontal Sweep: 45°
Stream pattern shall be variable from straight stream to full fog spray.
9.2 Nozzle.
Model: Akron Brass Akromatic 5177
Flow capacity: 250 ~ 1,250 GPM
Electric Pattern Control

10. CCTV Camera & Camera Screen

10.1 CCTV Camera
A compact water-proof camera monitoring system comprises a normal color view installed on top of the monitor. The camera has a hardened glass to prevent breakage, scratches and damage.
This camera itself shall have PTZ function, however, only zoom function is enabled as it is installed on top of the water monitor to follow the same direction of the monitor's movement.
This camera permits the bird-eye’s view of the entire area of operation and it also allow the user to zoom into a point of interest.
There shall be quick connectors provided for electronic connection and mounting of the camera for quick connection / disconnection

or replacement.

10.2 Camera Screen

The operator can watch any fire target or scenery transmitted from the camera at the screen installed in the compartment. Size : 7”

11. Thermal imaging camera

Thermal Imaging Camera is a type of thermo graphic camera used in firefighting. By rendering infrared radiation as visible light, it allows firefighters to see areas of heat through smoke, darkness, or heat-permeable barriers. Furthermore, it is normally used in cases where people are trapped where rescuers cannot find them. It is fixed on the electric water monitor and all views are transmitted to the camera screen installed at the compartment.

There shall be quick connectors provided for electronic connection and mounting of the camera for quick connection / disconnection or replacement.

12. Hydraulic system

Hydraulic power is provided by a pump driven by the vehicle power take-off. The filtration of the oil consists of suction strainer in the suction line, pressure filters in pressure circuit, return filter in return line to provide maximum reliability by protecting the hydraulics oil against foreign particles.

Hydraulic oil tank is integrated into the main frame for good protection and the tank is fitted with oil level gauge, temperature gauge, suction connections for easy maintenance and draining outlet with closing valve.

12.1 Main hydraulic boom pump

Displacement Not less than 60cc/rev

12.2 MBC BLOCK

Hydraulic modular boom control block

Check valves mounted directly on the hydraulic boom cylinders serve as a protective device in case of hose ruptures or overloading.

The speed is adjusted to the optimum rating for all boom movements. This control block makes easy operating of boom and outrigger.

This block is fully proportional operating.

12.3 Electric cooler to be installed.

13. Electric system

The electric supply is taken from the chassis battery which is kept charged when the engine is running. Voltage of the system is 24V DC and all circuits have been fitted with their specific fuses.

13.1 Siren and public address system

Electric siren is installed in the vehicle. Control panel of the system is conveniently installed for the driver and a variety of sounds are available, i.e. fire fighting, ambulance, police, boat horn, etc.

13.2 LED light bar

Type: V-type

Voltage: DC24V

Color: Red
13.3 Reverse backing system
During reverse backing of the vehicle, it automatically works with warning sound.

14. Safety Devices

All load bearing hydraulic cylinders is fitted with interlock valve directly integrated into the cylinder structure to prevent the booms or the outriggers from retracting in case of a pipe or hose failure.
An emergency stop switch is provided next to outrigger control levers and a remote controller to provide immediate and complete "freezing" of all systems in case of an unexpected emergency.
- Outrigger auto leveling & auto retraction to the transport position.
- Boom auto extension (to the memorized position) & auto retraction to the rest position.
- Obstacle sensor at the tip of end boom.
- Impact prevention function (boom & vehicle)
- Boom auto stop function when detecting fall over hazard
- Boom valve and outrigger valve driven by CAN (Controller Area Network)
- Display of outrigger & boom condition on the remote controller screen.

15. Backup System

One standby pump is installed with engine for emergency operation.

It consists of the hydraulic pump and engine.
15.1 Standby hydraulic pump, Pump type: Piston pump, Pump capacity: 6 cc/rev
15.2 Standby engine, model: Vanguard 21 Gross HP
The engine to be designed-engineered to dependably take on the most demanding commercial applications. Energetic and quick starting, this powerhouse features a number of advanced technologies and integrated components that are proven to elevate the reliability standard, which helps hardworking people get a lot more done in less time

Features & benefits

FEATURES	BENEFITS
Oil Gard Low Oil Shutdown System	Significantly reduces the chance of engine damage due to insufficient lubrication
Dura-Bore Cast Iron Cylinder Sleeve	Assures long engine life and improved oil control
V-Twin OHV Technology	Superior balance, low vibration, lower emissions, improved valve life, better

	fuel economy and higher HP/Weight
Cooler Cleaner Technology (efficient fan, improved debris management)	Efficiently reduces engine and oil temperatures by 25-30 degrees while effectively managing airborne debris
Pressure Regulated Full Flow Oil Filtration	Keeps oil clean longer, extends time between oil changes and extends bearing life
Dual Clean Air Cleaner	Industrial Pleated paper with foam pre-cleaner for extended engine life
Mechanical Compression Release	Smooth easy starting, longer starter life and provides an instant return to maximum power
Lubrication	
Oil Drain	Convenient drain locations for trouble-free maintenance
Full Pressure Lubrication w/ Spin-On Oil Filter	Cleans oil and protects engine components to ensure maximum lubrication and long life
Centrally Located Oil Pump and Pickup	Faster priming and allows for a higher angle of operation
Oil Cooler	Reduces oil temperature, improves lubrication, and extends oil change intervals
Oil Dipstick	Provides easy access to check oil levels
Mechanical	
FEATURES	BENEFITS
Modern Light Weight Pistons w/ Optimized Compliant Ring Package	Lowers noise, oil consumption, emissions and reduces wear
High Efficiency Head Design	Angled ports optimizes tumble and mixture preparation for improved efficiency, smoother idle, lower emissions and more power

Mechanical Governor	Improved speed control and more available power
Magnetron® Electronic Ignition	Quick dependable starts with no maintenance required
Simulated Dynamic Crankshaft Balance Techniques	Improves engine vibration
New Idle Down	Automatically lowers RPM when power not required. Results in lower fuel consumption and lower noise.
Sound	
Poly-Core Blower Housing	Lowers noise level and improves sound quality
Phase Modulated Flywheel Fan	Lowers noise level and improves sound quality
Acoustically Contoured Crankcase	Lowers noise level and improves sound quality
Lo-Tone Muffler	Lowers noise level and improves sound quality

Stand-by engine specs:

Gross Horsepower*	21
Engine Displacement (cc)	627 cc (38.26 cu in)
Number of Cylinders	Two
Engine Configuration	Horizontal
Bore	2.97in (75mm)
Stroke	2.76in (70mm)
Compression Ratio	8.4:1

Ignition System	Magnetron®
Lubrication System	Full Pressure w/ Spin On Oil Filter
Carburetor	Two Barrel Float Feed
Engine Cooling	Air

Engine Fuel	Gasoline or Gaseous
Governor	Mechanical
Cylinder Block	Aluminum Alloy with Dura-Bore Cast Iron Sleeve
Crankshaft	Ductile Iron
Starter	Rewind or Electric

16. Inbuilt Fire Pump:

An inbuilt fire pump shall be provided and suitably powered to provide 4000 liters per minute @ 10 bar. The pump outlet shall have, 2 female instantaneous couplings of 63mm. with valves. A main valve to feed the boom monitor.

Schedule 5 Emergency Rescue Vehicle/tender: Annexure 7 (Detail Specification)

Hydraulic Rescue Tools For Urban Search & Rescue: The Hydraulic Rescue tools shall be portable & light-weight, & shall be suitable to be used by one man. They shall be supplied in a set form, & consist of equipment like spreader, cutter, telescopic ram & hoses, power pack or hand pump along with all the tools accessories which shall comply with requirements stipulated under EN13204 or equivalent national/ international standards. For the safety of the operators, victims & bystanders, the tools shall be powered by non-toxic, mineral based hydraulic oil. Any toxic fluid shall not be used. All pressure hoses shall have a safety factor of four times the maximum working pressure. All tools, hoses & pumps shall be equipped with compact, non-drip quick-connect couplings for fast & easy connection. All female couplers shall be equipped with automatic self-locking to prevent accidental disconnecting. The couplers would have 360 degrees movement for easy uncoiling. The hydraulic rescue tools shall be designed to withstand a test pressure of two times their maximum working pressure. Each tool shall be equipped with two internal safety valves for protection against mechanical or hydraulic overload for each cylinder, &each tool shall have a separate safety valve for protection against overpressure in case one of the return couplers is disconnected. Moreover, all tools shall be tested for safety according to the American UL requirements (e.g. full load cycle tests)&comply with the European CE safety standards & European Norm (EN 13204&NFPA 1936). All hydraulic rescue tools shall be equipped with automatic double pressure check valves to hold any load in any position when control valve is in neutral position, in case of disconnected couplers, or pressure drops. Cutters &spreaders shall be provided with a non-slip, U-shaped carrying handle with integrated LED lights which allow the operator to reposition the tool from one side to the other without the need to reposition the hand or to release the handle. Carrying handle would be mounted in such a way that the tool is balanced, even when it is picked up with one hand. Position of carrying handle & control handle shall allow easy operation for right as well as left handed operators. The tools shall be provided with double acting hydraulic cylinder with a dead-mans control, &shall be able to operate easily with one hand by the operator in any position. The tools shall have one hose system with pressure &return line within the same hose. Hoses shall be fitted in the centre of the handle to avoid personal harm in case of leakage &shall allow full 360° rotation. The tool body, yokes, & spreader arms shall be made out of aluminium alloy for solid construction with lowest weight. The tools construction shall allow under water use for long periods without the risk of any material damage to any part of the tool. All hydraulic tools, pumps, hoses & accessories would be fully operational at temperatures of -20 up to + 55° C. Operation & safety instructions shall shown be on the tools & shall be in pictogram style to be easily understood.

Spreader: The spreader shall be double acting hydraulically operated device of light weight construction made of anti corrosive high strength material capable of being lifted, & operated manually with ease. It would be capable of spreading &pulling with the combination of chains. A male connector shall be fitted to the tool to connect the hose. It shall be provided with spreading tips made of fully hardened, high tensile tool steel with proper serrations outside & inside for a perfect grip during spreading as well as squeezing operation. The tips shall be mounted on the spreader arms by means of a quick locking system. Quick lock system shall provide possibility to change spreading tips for cutting tips or pulling adaptors single handed, without loose parts & without extra

tools. Pulling adaptors & pulling chains shall be offered as accessories. These accessories shall be of the quick lock type. Pulling adaptors shall be equipped with shortening hooks which easily fit in each shackle of pulling chains to ensure quick connection. Pulling chains shall be equipped with shortening hooks to easily mount the chains to any object of whatever size or shape. The spreader shall have following specifications:

Max. Spreading distance	≥ 820 mm
Min. Spreading force measured at 25 mm from the tips as per EN 13204	≥ 60 kN.
Max. Spreading force	≥ 520kn
Max. Squeezing force	≥ 125kn
Max. Pulling distance	≥ 700 mm
Max. Pulling force with pulling attachments	≥ 80 kN.
Weight	≤ 20 kgs

Cutter: The cutter shall be double acting hydraulically operated light weight construction. Details & design features &its controls & material of construction such as blades, cylinders etc. shall be given in offer. Cutter shall be capable of cutting of various sections such as solid ground bar, hallow round bar, flat section, square tube, rectangular tube etc. It would also cut the door pillars of new generation cars. A male connector shall be fitted to the tool to connect the hose. The cutting blades shall be of shock resistant non corroding alloy steel, hardened & ground & shall be exchangeable & regrindable. The material of the cutting blades & hardness shall be indicated in offer. Cutter shall be able to cut sections as stipulated in EN 13204&NFPA 1936. It shall have following specifications:

Blade opening	≥ 180 mm
Cutting force	≥ 1400 Kn
Weight ready for use	≤ 16 kgs.
Capable of cutting round bar	≥ 40 mm
Material of steel shall conform to EN 10025-1-2000 table 5, type S 235 JR	
Mandatory Compliance category of cutting performance as per NFPA 1936	A8,B8,C7,D9,E9
Mandatory Compliance category of cutting performance as per EN 13204	1K,2K,3K,4K,5K

Combination Tool* (CT 5150 C)*: The combi tool shall be double acting hydraulically operated of light weight construction made of anti corrosive high strength material. The combi tool shall be capable of cutting of various sections such as solid round bar, hollow round bar, flat section, square tube, rectangular tube etc. It would also cut the door pillars of new generation cars. A male connector shall be fitted to the tool to connect the hose**.** The blades shall be of shock resistant non corroding alloy steel, hardened & ground & shall be exchangeable & regrindable. Tool shall have following specifications:

Spreading Distance	≥ 375 mm
Spreading force measured at 25 mm from the tips as per EN 13204	≥ 4.3 T
Max. Spreading force	≥ 185 Tons
Cutting force	≥ 68 Tons
Squeezing force	≥ 8.5 Tons
Pulling Force	≥ 10 Tons
Weight	≤ 15 kgs.
Capable of cutting round steel bar	≥ 36 mm
Material of steel shall conform to EN 10025-1-2000 table 5, type S 235	
Mandatory Compliance category of cutting performance as per NFPA 1936	A7,B8,C8,D8,E8
Mandatory Compliance category of cutting performance as per EN 13204	**1J,2J,3K,4K,5K**

Telescopic Ram*:* The ram cylinder shall be double acting hydraulically operated device of light weight construction suitable for manual application with ease. The details & design features of the ram & its controls & material used for construction of its major components such as pistons, cylinders & other components shall be given in the offer. A laser pointer shall be fitted inside the cross head for facilitating right & precise placement. The ram shall be capable of lifting & spreading. A male connector shall be provided to connect the hose. The telescopic ram shall have following specifications:

Max. Spreading force 1st plug.	≥ 210kn
Max. Spreading force 2nd plug.	≥ 100kn
Length retracted	≤ 570 mm
Stroke 1st plug.	≥ 375 mm
Stroke 2nd plug.	≥ 350 mm
Total stroke	≥ 725 mm
Max. Length	≥ 1275 mm

Weight	≤15 kgs

Rescue Ram*:* The ram cylinder shall be double acting hydraulically operated device of light weight construction suitable for manual application with ease. The details & design features of the ram & its controls & material used for construction of its major components such as pistons, cylinders & other components shall be given in the offer. The ram shall be capable of lifting & spreading operation. A male connector shall be fitted to the tool to connect the hose. Ram shall have following specifications:

Max. Spreading force	≥ 150 kn
Max. Pulling force	≥ 25 kn
Spreading / pulling stroke	≥ 340 mm
Retracted length	≥ 600 mm
Max. Length	≥ 950 mm
Weight	≤ 13 kgs

The following accessories like shall be supplied with the Ram

Flat Base (round)	2 Nos.
Connection piece	1 No.
Extension pipe 165 mm	1 No.
Extension pipe 330 mm	1 No.
Extension pipe 500 mm	1 No.
Wedge piece	1 No.
Conical Tip	1 No.
Cross head	2 Nos.
Pulling attachments	1 Set
Pulling chains	1 Set

Hydraulic Power Pack Petrol Engine Operated: The hydraulic power pack shall be capable of powering a tool independently & have connection possibility for additional tools. The hydraulic pump shall be driven by a 4-cycle, single cylinder, air cooled petrol engine. The power of the engine shall be sufficient to drive the hydraulic pump to give output sufficient to operate the two tools simultaneously. Petrol tank shall be such that, it allows the engine to run for one hour. Starting system shall be hand recoil type. Engine & the pump shall be mounted on tubular frame with integrated handle. Noise level when the engine is running shall not be more than 85 dB at 1 Mtr. Provision shall be made to refill petrol & hydraulic oil through opening which shall be covered with

threaded cap. All hot parts of the power pack shall be properly shielded to avoid possibility of injury to the operator. There shall be provision of light near valve block for ease in operation during night. All controls on the power pack shall be easily accessible & properly labelled in English language. Weight of the power pack including hydraulic oil & fuel shall not be more than 25 kgs.The power pack shall be provided with 3 stage axial pump with a minimum output of 2800–3000 cc/min per valve in the first stage & at least 1100-1250 cc/min per valve in the second stage & at least 500cc in the third stage. Each pump shall be provided with an automatic change-over valve that switches the first stage output to no load to assure the high output in first stage & second stage. Each pump shall be protected with two internal safety valves, factory set at a suitable maximum pressure. Capacity of hydraulic oil tank shall be approx 2.5 litres to supply the sufficient quantity of oil to two tools simultaneously with ample reserve capacity for the re-circulation of oil to avoid the overheating in prolonged operation. Specifications are given below:-

Engine (Petrol operated)	$\leq$ 2.5 kw
Capacity oil tank (effective)	Min. 4liters
Pump type	3 stage axial pump
Weight	$\leq$ 23 kgs
No. of tools connected	Two
No. of tools to be operated simultaneously	Two

Hydraulic Hose: High quality 'Thermo Plastic' hose of 10 Mtrs. length each for pressure & return line with quick connect couplings suitable to connect power pack & tools shall be supplied with the pump. Total 2 Nos. of hoses of 10 Mtrs. each shall be supplied with the pump. The hoses shall be in two different colours to identify easily. Non-interchangeable hydraulic coupling designed for quick connection / disconnecting shall be provided with dust caps, complete with automatic self-locking system. The hoses shall have the working pressure suitable for tools & the busting pressure of the hoses shall be 4 times the working pressure.

***Manual Hand Pump*:** A lightweight hydraulic hand pump shall be supplied as a standby unit for power pack to operate the tools. It shall be of 2 stage design with oil capacity of not less than 1750 cc & shall be capable of developing adequate pressure for operating all the tools including the telescopic ram up to their full capacity. It shall be possible to operate the pump even when placed in an inclined/vertical position. The weight of the pump shall not be more than 8 kgs.

Pneumatic Lifting Bags: The Pneumatic Lifting Bags should be portable & light-weight, & should be in set form, consisting of bags, hose assembles, Pressure gauges, pressure reducers, safety valve, Air bottle connector, & controller. The Bags should be in pairs & the lifting capacities should be between 10 to 85 Metric tons at 12-bar air pressure. The lifting capacity on higher side by 5% is allowed than the specified loads. The Pneumatic Lifting Bags & its accessories should comply with all the requirements stipulated

under EN 13731. The copy of the EN certificate must be enclosed with the tender. The Bags should be type tested for artificial aging, 48 bar bursting pressure, dynamic fatigue loading, impact test, impulse loading, drop test, piercing test & abrasion test & certificate to that effect should be attached with tender. Each Bag should be constructed of Kevlar reinforced nitrile rubber with 3 layers aramide reinforcement covering the entire top & bottom surface of each lifting bag. Each Bag should be equipped with a brass valve connection 1/8" NPT internal thread & vulcanized into the reinforced corner of bag to which a male connector of quick connect coupling should be threaded in. This male connector should be replaceable if it gets damaged. Each Lifting Bags should have a yellow center mark molded into both sides of the lifting bags to centralize the bags when used in multiples. It should have reflective markings on all sides of the bag for easy identification when operating in the dark areas. The lifting bags should have an inter locking nonskid surface molded into each side of the bags. The lifting bags should be of black colour with florescent strips on all four sides for better visibility while working in dark areas & during night time. The bags should be provided with a warning & information labels. The information & the warning labels must be in English language & in pictograms for clear understanding. The insertion height of deflated lifting bag should not be more than 28mm. The air bags should be chemical & ozone resistant with carrying /handles straps shall be attached to the bags above 35ton lifting capacity. The Pneumatic Lifting Bags should be able to use in a temp. range of -20^0 c to + 55^0 c. Each set of high pressure pneumatic lifting bags shall comprise of two bags in 6 sizes in term of maximum lift capacities i.e. 6 bags per set with accessories as indicated in the table below.

Lifting capacity	Inflation height ≤	Dimensions≤	Weight ≤	Quantity
16 tons	250 mm	450 x 375 mm	05 kgs.	2 Nos.
31 tons	325 mm	600 x 525 mm	10 kgs.	2 Nos.
53 tons	415 mm	760 x 680 mm	16 kgs.	2 Nos.

The Total of 6 Nos. airbags will be supplied with the following accessories:-

Sl.	**Description**	**Quantity**
1.	Pressure reducer 200/ 300 bar to 12 bar	03Nos.
2.	Dual Controller	03Nos.
4.	Air Hose 10 Mtrs. with couplings	06Nos.
5.	Shut off hose with safety valve	06Nos.
6.	Connection piece to connect two air cylinders	03Nos.