2016

TURNTABLE LADDER 60M

M60L

SIMILAR VEHICLE

VEHICLE MAIN TECHNICAL DATA

VEHICLE'S MISSION:

The MAGIRUS "M60L" is a self propelled hydraulic ladder designed for effective rescue and fire fighting operations from high rise building and giving access to high rise locations. When the ladder is fully extended has a max. working height is 60M from ground level and is suitable for any intermediate height with possibility of vertical & horizontal simultaneous movements at the same time without mutual interference.

DIMENSIONS (valid for both type, Single Cab & Double Cab)

Overall Length	**13,00 M**
Overall Width	**2,50 M (rear view mirrors excluded)**
Overall Height	**4,00 M.**

WEIGHTS:

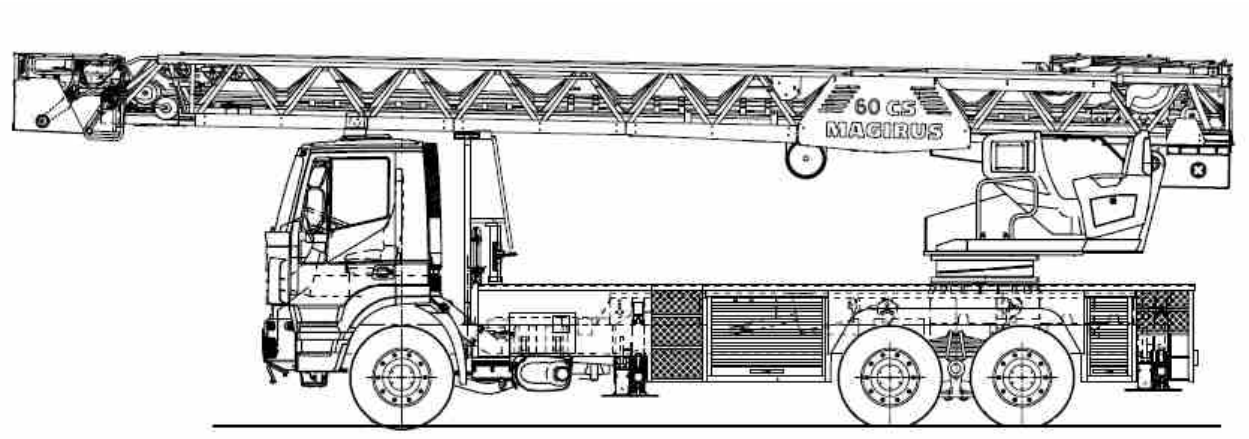
G.V.W.	**33.000 kg**
Operational weight	**28.500 kg approx (± 2,5% according to the options selected)**

PERFORMANCES:

Maximum speed	**100 Km/h approx.**

TURNTABLE LADDER:

Working Height:	**60M from ground level**
Rotation	**360°**
Elevation	**From -13° up to +75°**
Extension	**Telescopic type with six (6) sections**



SIMILAR LAY-OUT OF THE VEHICLE

ISO 9001 CERTIFICATES

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

IVECO S.p.A.

UNI EN ISO 9001:2008 (ISO 9001:2008)

CERTIFICATE

EQ ZERT

Quality Management System

ISO 9001:2008

CODE & INDUSTRY STANDARDS

Conformity

The fire-fighting equipment is supplied in perfect technical condition. Only the vehicle supplied by Iveco Magirus Brandschutztechnik and its fittings are subject to our conformity declaration.

The owner/operator is responsible for any changes, modifications, additional and retrofitted components – if this work is not completed by Iveco Magirus Brandschutztechnik. This makes the operator the manufacturer, obliging him to establish that the vehicle conforms to the relevant directives and to supply the requisite documentation.

The fire fighting equipment is designed and built to comply with the generally acknowledged rules of engineering. The following relevant standards and directives are among those with which the equipment complies:

- DIN EN ISO 12100, Parts 1 and 2: Safety of Machines
- DIN EN 294: Safety of Machines
- DIN EN 614-1: Safety of Machines – Ergonomy
- DIN EN 954, Part 1: Safety-Relevant Parts of Controllers
- DIN EN 982: Safety requirements on fluid engineering systems and components
- DIN EN 1037: Safety of Machines – Avoidance of unexpected starting
- DIN EN 1846, Parts 1 and 2: Fire service vehicles – Overview and general requirements
- DIN EN 60204, Part 1: Electrical Equipment on Machines
- DIN EN 14043: Rescue Vehicles for the Fire Service – Turntable Ladders with Combined Movements (Automatic Turntable Ladders)
- DIN EN 14044: Rescue Vehicles for the Fire Service – Turntable Ladders with Sequential Movements (Semi-Automatic Turntable Ladders
- DIN V 14011, Parts 6 and 9: Terminology from fire service practice; fire service vehicles, rescue vehicles, other vehicles used by the fire service
- DIN 31051: Principles of Maintenance
- DIN EN 349: Safety of Machines; Minimum distances to prevent crushing body parts

CHASSIS MAIN TECHNICAL DATA

Chassis / model:	***IVECO / Trakker AD380T42H*** *model year 2017 or latest at time of order*
G.V.W.	33.000 Kg.
Transmission:	**6 x 4 (drive on rear axles)**
Steering:	Left-hand, hydraulic power steering system recirculating-ball type.
Engine:	**IVECO mod. "Cursor-13"** diesel direct injection six (6) in line cylinders, four stroke, turbocharged with intercooler. Variable speed governor. - Emissions level according to Euro3 regulations - Displacement: 12.880 cm^3 - Bore: 135mm - Stroke: 150mm. **- Max. output: 420 HP** (309 kW) at 1900 rpm **- Max. torque: 1900 Nm.** (194 kgm) at 900-1485 rpm **NOTE: no power loss from sea level up-to 1500 m. above the sea level.**
Cooling system:	Heavy duty type, water-cooled forced by pump, with tubular finned tropical radiator and power safe fan, adequate for GCC climate conditions.
Gear-box:	**Automatized Gearbox brand ZF (Germany)**, can be used in two different modes: with automatic shifting and with manual gear selection, in both case clutch pedal is not necessary and is not provided in the cabin. Reverse gear fitted with back light and buzzer (backup warning device).
Differential lock:	Fitted on the rear axles
Brake system:	Pneumatic with two independent circuits, conforms to the EEC regulations and standards, with ABS system for better braking performances.
Brakes:	Disc type at front axle and drum type at rear axles; Engine brake fitted by decompression turbo brake; Hand brake pneumatically hand operated acting on rear wheels.
Suspension:	Semielliptic leaf-springs fitted with stabilizer bars (anti-roll bars) and double acting hydraulic telescopic shock absorbers.
Tyres:	Single at front axle and double at rear axle, size 385/65R22,5 or equivalent, mixed for on & off-road type, tubeless, brand MICHELIN.
Max. Speed:	**100 Km/h approx.** (without speed limiter)
Electrical System:	Voltage 24V fed by Nr.2 batteries 12V and 220 A/h each Heavy duty alternator 2240W (80A x 28V) / Starter 24V Rapid Starting Kit fed from external source also provided (see page 12).
Fuel tank:	made of steel**,** 300L capacity
Miscellaneous:	- Heavy duty steel bumper connected with chassis frame, with towing hook - Headlamp protection grilles - Accessories (chassis tool box, spare wheel, jack and wheel chocks).

DRIVER'S & CREW CAB

Type	Original IVECO **SINGLE CABIN** for fire fighting operations, offering excellent space, suitable for **one (1) driver and one (1) fireman.** Forward control, fully tilt-able type**,** it is made in all steel construction with integral anti-corrosion treatment by cataphoretic dip.
Doors	◆ n. 2 (one on each side) lockable type, with winding windows.
Accommodation (1 + 1 Seats)	◆ n.1 adjustable driver's seat; ◆ n.1 co-driver seat, adjustable, beside the driver's seat;
Internal equipment	**Air Conditioning System**, suitable for GCC weather conditions;

SIMILAR CABIN

ERGONOMIC & MODERN DASHBOARD WITH TRIP COMPUTER AND ALL MAIN INSTRUMENTS & GAUGES

F.F. Controls	◆ P.T.O. engagement/disengagement control; ◆ "pump engaged" warning light; ◆ emergency electrical equipment switches; ◆ storage lockers/folding steps/ladder "not stowed" warning lights.

BODYWORK

Construction	Superstructure made in ***"ALU-FIRE SYSTEM"*** , with **body frame made completely by high quality aluminium** extrusion profiles connected with special joints with screw and **without any welding**, and properly panelled by light alloy sheets. By this new conception, manufacturing process Iveco Magirus get a body-work entirely made of aluminium, whose main advantages are: ➢ Longer lasting; ➢ Very low maintenance, because any corrosion is completely avoided; ➢ Bigger reserve of usable carrying capacity, because bodywork is lighter; ➢ Flexibility in setting up internal lockers partitions; ➢ Easiness of repair in case of eventual accident.
Storage lockers	The Turntable Ladder is provided with total **6 (six) storage lockers** located three (3) on each side of the vehicle, closed by anodized light alloy roller shutters with wide handle grip and internal automatic illumination. These storage lockers are provided with separate compartment for each type of equipment and fixing devices to contain safely and easily reach the ancillary materials supplied with the vehicle.
Working deck	The surface of the roof is completely covered with light alloy anti-slip chequered plates in order to allow a safe walking-on.
Side Ladders	Provided on each side of the vehicle allowing an easy access to the platform of the bodywork and to the main control stand seat.

SIMILAR LAY-OUT OF THE BODYWORK

MAIN TECHNICAL INFO

The new "M60L" turntable ladder is equipped with the unique MAGIRUS CS (Computer Stabilized) active anti-swinging system.

All movements of the ladder are detected by the computer immediately at the start of movement, and actively dampened by hydraulic counteraction initiated within fractions of a second by computer models calculated in advance. This also applies if sudden squalls occur or if there are operative swinging (e.g. when a person jumps into the cage).

Moreover the MAGIRUS "M60L" offers the following main new advantages and improvements:

- **High reach capability thanks to its six (6) telescopic sections allowing the possibility to install a Rescue Lift for very fast up & down movements.**
- **Height from rescue cage floor 58,5 M.**
- **Working Height up to 60 M.**
- **Horizontal projection from of 17,9M (with 2 men on the cage) up to 20,4M (with one man on the top).**
- **Outrigger projection up to 5,2M in order to improve ladder stabilization.**
- **Rescue cage with 300 Kg capacity.**
- **Ladder turret with automatic self-levelling and ground compensation.**
- **CS technology (active oscillation damping by Computer Stabilization).**

LADDER HYDRAULIC SYSTEM

The vehicle is provided with and hydraulic ladder system made out of high quality steel profiles electrically welded.

Its vertical outreach is 58,5M measured from rescue cage bottom line, and its working height is 60M.

(Refer to the working diagram attached on the next page).

The ladder is made by six (6) telescopic sections suitable to the ladder outreach.

Ladder installed on chassis by means of turntable having unlimited 360° rotation possibility in either direction.

Ladder angle range: downward inclination to –10° and elevation up to +75°.

Power generated by a hydraulic pump driven by PTO on chassis engine.

Ladder elevation & depression movements are driven by two hydraulic cylinders.

Elevation, depression, vertical & horizontal simultaneous movements are possible at the same time without mutual interference.

Extension and retraction of the ladder is carried out by means of two extension and two retraction cables which are wound on a cable winch.
An hydraulic motor drives the winch.

The ladder is provided with the new Magirus lateral adjustment system which is capable of keeping automatically levelled the turntable and the main control stand up to 8,5° slope, even during the rotation of the ladder.

All ladder oscillations are stabilised or actively damped by means of the new CS computer system (CS – Computer Stabilised).

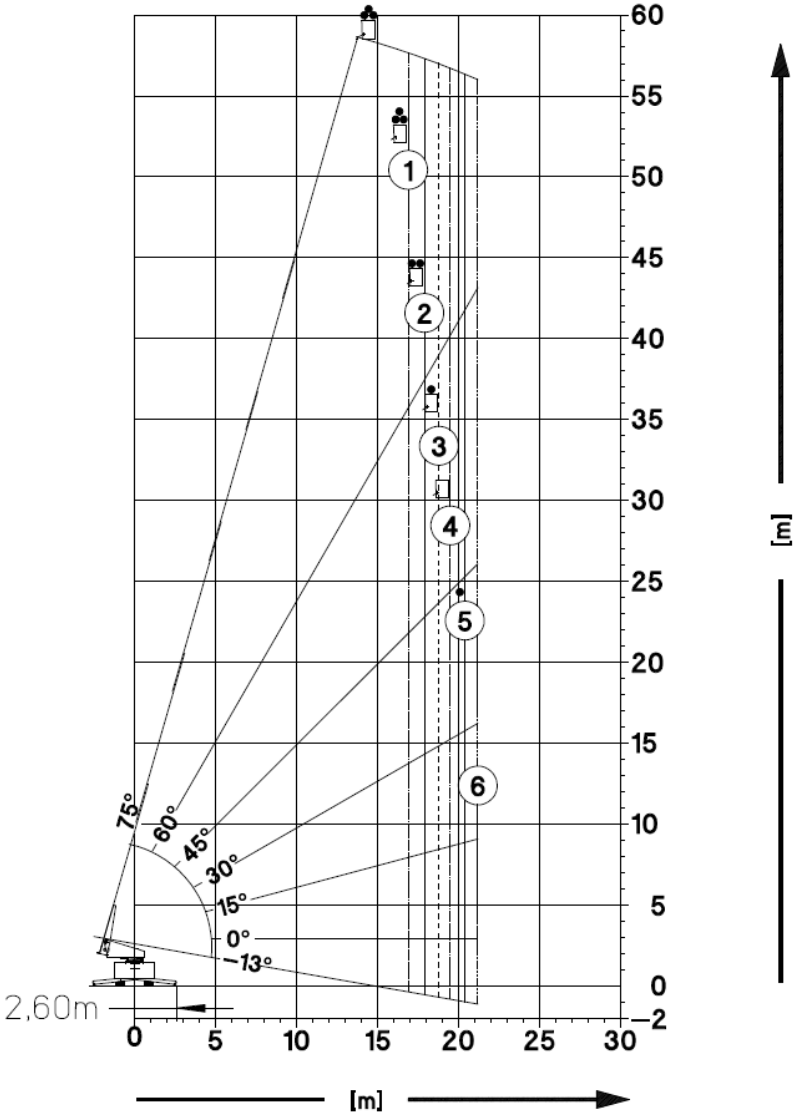
Ladder movement is automatically switched off at the operation limit and a visual indication appears on the operating panel diagram.

If there are malfunctions of safety devices, the ladder remains fully capable of operation but is automatically returned to the maximum area of operation that remains possible.

HYDRAULIC EMERGENCY SYSTEM

In case of main hydraulic system failure or breakdown an additional emergency pump is provided for setting the ladder into housing position or raising the same.
Such pump can be driven either from the electric generator installed on the ladder or as alternative from an electric external source.

LADDER WORKING DIAGRAM



1		16,9m
2		17,9m
3		18,9m
4		19,5m
5		20,4m
6		21,2m

STABILIZING SYSTEM

The vehicle is provided with N° 4 "low profile" side outriggers quadric-cross construction, hydraulically driven for levelling when operating the ladder section, diagonal shape. Separate control of each outrigger is possible. Automatic levelling system when operating the ladder.
Light reflective finishing. Warning yellow lights.
Two dedicated control panels at rear of body (one on right and one on left).
Providing a level indication system reading of 8,5 degrees of vertical line.

The exceptional stability of the vehicle is attained by rear axle suspension locking and the hydraulically operated Vario CS Jacking System with computer stabilized technology. All jacks can be extended individually and infinitely from approx. 2,5M up to 5,2M.
The projection values are continuously adapted and processed by the computer who always calculate the projection range. The working area range of the turntable ladder therefore increases continuously with every centimetre of jacking width.

ADVANTAGES OF THIS SYSTEM:
- **Projection of jacks individually operated; and infinitely adjustable control;**
- **Vehicle tyres are always touching the ground. So the parking brake can be still used for avoiding any possibility of sliding;**
- **The "low profile" jacking design (diagonal shape) is allowing easy stepping over and the use of the ladder in narrow streets with parked vehicles around.**



MAIN CONTROL STAND

Main operator control stand and control colour display panel are fully equipped with elevation, depression and rotation controls, plus safe operation status indicator on ladder control panel in English language.

Safety features cut out the system automatically in case of malfunction, overload or maximum reach in addition to safety features for personnel plus emergency interruption feature of ladder movements (dead man pedal).

Control of vehicle engine on/off is possible from main control panel, from cage panel and from driver's cab.

Control panel made of special material resisting corrosion, direct water effect & adverse weather conditions; this also apply on controls, indicators and gauges.

Ladder control display (TFT – multicolour type) provided indicating safe ladder section movement during elevation & lowering in addition to angle indicator side panel.

Provision consisting in a flexible plastic cover is provided to protect the control panel when ladder is not in use

- Ergonomically designed weather-proof seat
- Automatically adjustable seat inclination
- Multi-functional joysticks for controlling the ladder

Depending on operational requirements, the operator can change the inclination angle of the display housing thus adapting to his needs.

The full colour control display plus text-men for all ladder functions and status messages, full colour movement diagrams, and logical pictograms for easy handling. Slide-open cover protects against weather and damage.

RESCUE CAGE

Rescue Cage automatic foldable type, permanently fixed on the top of the ladder (but can be also removed).

It is designed to carry a weight of 300 Kg (or 3 persons).
The cage is made of steel treated against corrosion with barriers & partitions made of aluminium. It is provided with two front wide entrances allowing the fire-man to get into the cage easily and quickly and one rear entrance from the ladder steps.
Self Protection water curtain is also provided by means of a front nozzle.

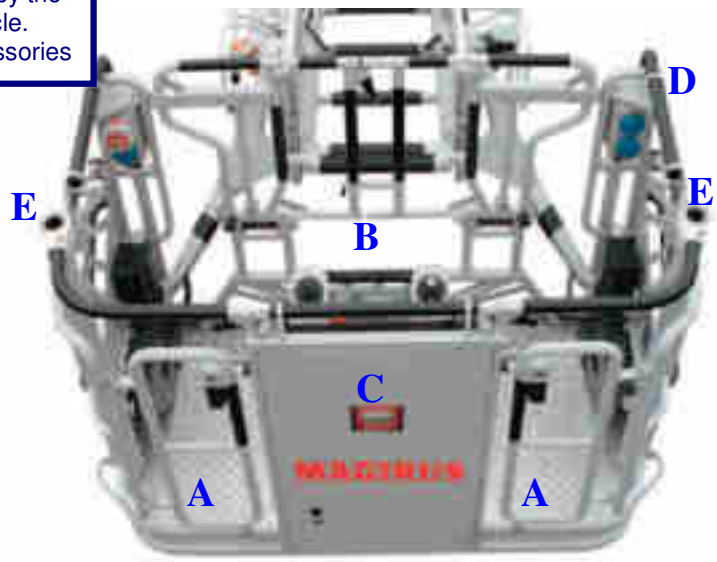
It is provided with a complete Cage Control System of ladder movement in addition to main control one on base. All the function are electronically transmitted via cables to the main hydraulic control system.

The Rescue Cage permanently fixed on top of the ladder, but during driving operations it is in horizontal position and it comes automatically in the working position while extending the outrigger system.
With this system the cage is ready for use as soon as the ladder is stabilized.

The Turntable Ladder is provided with the following accessories to be used in the Cage

- **Qty 1 Water Monitor (2.000L/min. capacity)**
- **Qty 1 Ventilator electric type**
- **Qty 1 Stretcher with rotating device**
- **Qty 2 Halogen Lights 500W each driven via electric generator (also supplied).**

RESCUE CAGE FITTINGS:
A) Qty 2 Front Doors (one on each side)
B) Qty 1 Rear Door (to ladder section)
C) Qty 1 Front Light (in the center)
D) Qty 2 Electric Sockets 220V fed by the generator supplied with the vehicle.
E) Qty 2 Fixings for the above accessories



MONITOR

AUTOMATIC MONITOR	Model APF 2.5 IM-E, single barrel monitor with variable nozzle Operated by means of electronic joystick from the ground and also directly from the rescue cage
Movements	by electro-hydraulic motor remote controlled type
Coverage	◆ Horizontal rotation 360° ◆ Vertical elevation -15° + 70°
Output	2.000 L/min
Throwing range	◆ Water straight stream 50M / Water spray jet 30M. ◆ Foam straight stream 40M approx.

Communication between top rescue cage and main seat platform is always possible by means of a hand-free intercom-system with integrated microphone & loudspeaker.

LIFT INSTALLATION

A Rescue Lift is installed on ladder set for going up & down (from the ground level up to top of ladder) with a capacity for two persons in one time, can be utilized during various ladder elevations.

The Lift is designed to carry 300 Kg (or 3 persons) with a speed of 1,6M/sec. allowing to reach the top of the ladder (starting from ground level) in less than 39 seconds.

Automatic slowing system on start & stop and automatic stop when limit positions are reached.

The lift equipment is consisting in:

- **The lift winch on the lower ladder section, hydraulically driven by an oil pressure motor, with proportional control of lift speed.**
- **Push button for lift or ladder operation at main control stand.**
- **Automatically extending guide rails at the base of the bottom ladder so that the lift can be lowered down to the ground.**

Additional safety devices:

- **Automatic mechanical safety brake in case of cable breaks.**
- **Hydraulically ventilated brakes in the cable winch.**
- **Safety device to prevent loose lift cable.**

EMERGENCY ELECTRICAL EQUIP.

In addition to the standard electrical equipment foreseen by the International regulations and the local traffic regulations, the following equipment is provided:

AUDIBLE WARNING DEVICES

- N.1 set of multi-tone electronic siren with P.A. system 100W (wail/yelp/two-tone system) and microphone in the cab.

VISUAL WARNING DEVICES

- N.2 Beacons on the top of cabin.
- N.4 Strobo Led Lights blue colour, located as follows:
  - two (2) at on the front cabin's grille
  - two (2) at rear of bodywork.
- N.4 Side Strobo Led Lights orange colour (2 on each side)
- N.1Beacon the rear of the body;

INTERCOMMUNICATION SYSTEM

Intercommunication system with mike and loudspeaker is provided between the rescue cage crew & ladder operators at the main control stand of the ladder.

RADIO PROVISION

A 24V-12V converter is installed in a suitable position in the cabin.
Pre-arrangement for the antenna to be installed on roof cabin is also provided.

LOCKERS LIGHTING

All side storage lockers and pump compartment are provided with fluorescent light, weather resistant type with automatic ignition at the opening of the storage lockers, with warning light fitted on the cabin dashboard indicating that the lights are "on". A lockers lights master switch in the cabin is also provided.

RAPID STARTING KIT

The vehicle is provided with a special electrical system, working at 220/230V 50 Hz, through an electric cable and quick-release self-ejecting plug, automatically released at starting the vehicle's engine. This system is working when the vehicle is parked allowing the immediate starting of the vehicle because of the automatic battery recharging complete with automatic device for energy preservation.

One electric cable 10M long to connect the system to the external source, fitted with the special self-ejecting plug above mentioned, is also provided with the vehicle.

MASTER SWITCH

A master switch to isolate the chassis batteries form the electrical system is provided in the cabin.

PAINTING

Cab & Bodywork	Fire Red RAL 3000 or Canary Yellow RAL 1016 (others on request).
Bumpers and fenders	white colour
Chassis frame	manufacturer standard colour dark grey
Storage lockers	in natural grey aluminium.
Stripes around vehicle	according to Customer requirements.
Writings & Logos	according to Customer requirements.

CORROSION PROTECTION

The vehicle is subjected to suitable finishing against foam corrosion and water effects.

Body frame parts are treated against corrosion by CATAPHORESIS process.

The elements for The CATAPHORESIS process are:

- Degreased two different times - washed - activated by organic crystals - fosfatated - washed two different times - passivated - re-washed three different times.
- Subsequently the parts to be treated are dipped in a bath of protective resins who reach also the points normally difficult to access.
- Thanks to the reciprocal attraction of (+) elements of the bath and the metallic surfaces (-) elements of the steel tubular, there is a total and long-lasting adherence to the metal of the paint.
- The parts are subsequently dried, protected and treated by finish coloured paint.

By this new anti-corrosion treatment system operating in our factory and used from many years in the IVECO Group, we obtain a high quality treatment of the body frame of the superstructure of the vehicle (which means better rust-proofness, longer life, better reliability and value keeping for years).

GENERAL STANDARDS

Country of Origin	All MAGIRUS Turntable Ladders are completely engineered, developed and manufactured in GERMANY.
Certifications	The vehicle is made according to the Quality standard of ISO-9001 and provided with CE Certificate.
Warranty	One year for full warranty bumper-to-bumper.
Spare Parts	Availability of spare parts is guaranteed for a period of 15 years from the date of production of the vehicle.

SIMILAR VEHICLES

ACCESSORIES & TOOLS

SUPPLIED WITH THE VEHICLE ON SUITABLE FIXING DEVICES

Fire Fighting & Rescue Equipment:

- Qty 1 Delivery Hose Ø 2½" 60M long;
- Qty 2 Hose bridges;
- Qty 2 Dry Powder Extinguisher 6Kg each;
- Qty 1 CO2 Extinguisher 5Kg each;
- Qty 1 Forcible entry tool, Hooligan type;
- Qty 1 Fire Axe with fibre-glass handle;
- Qty 1 Remote Controlled Monitor to be fixed in the cage;
- Qty 1 Stretcher with rotating support be fixed in the cage.

Accessories:

ENDRESS

- N. 1 Electric Generator petrol engine type 8KVA to provide electric power to the halogen lights in the cage and to the emergency pump.
- N. 2 Halogen lights 500W each to be fixed in the rescue cage;
- N. 1 Tool bag for the chassis (standard type);
- N. 1 Fire fighters tool box (professional type);
- N. 1 First Aid kit;
- N. 2 Wheel stoppers (chocks);
- N. 1 Spare wheel complete with spare tire (same size of the other ones supplied on the truck);
- N. 1 Hydraulic jack suitable for the vehicle.

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