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FUNCTIONAL REQUIREMENTS FOR EMERGENCY (RESCUE) TENDER FOR FIRE BRIGADE USE

(Second Revision)

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Indian Standard

FUNCTIONAL REQUIREMENTS FOR EMERGENCY (RESCUE) TENDER FOR FIRE BRIGADE USE

(Second Revision)

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Indian Standard

FUNCTIONAL REQUIREMENTS FOR EMERGENCY (RESCUE) TENDER FOR FIRE BRIGADE USE

(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 30 August 1985, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 The tender covered in this standard is designed both for use for fires and special service work, such as:

a) large fires in cities or large towns, difficult or special fire requiring the use of breathing apparatus, special equipment or illumination;

b) major electrical fires, for example, in power stations and transformers;

c) ship fires;

d) house collapes, lift, road transport, railway and machine accidents, etc, for which special equipment is required and is not available locally; and

c) major leakages of toxic or dangerous gases or gaseous liquids.

0.3 This standard was first published in 1959 and revised in 1967. This is further being revised considering the requirement of chassis for power, as now-a-days, 5 KVA petrol and diesel engine driven generating sets are available. The position of pump is being shifted from mid-position of the vehicle to rear side to facilitate easy removal. Accessories list is also modified most of which are normally required to assist in operation (*see* Appendix A), and is given for information and guidance. While revising the standard its title has been modified, since as it is the requirements are not specific and the standard could not be certifiable. The technical committee is considering a durability test, so as to ensure life for a suitable

period. As soon as this test is developed, it will be incorporated in this standard and the standard will be made certifiable.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard lays down the requirements regarding material, design and construction, workmanship and finish, accessories and equipment of emergency (rescue) tender for fire brigade use.

2. GENERAL REQUIREMENTS

2.1 The appliance shall be designed to carry the equipment listed in Appendix A. The equipment shall be arranged on a manner so as to allow the crew members to get ready in vehicle itself.

2.2 The appliance shall be suitable geared to provide a road speed of 70 km/h on a level ground. The acceleration shall be such that with a warm running engine, the fully laden appliance shall attain a speed of 64 km/h from a standing start, through the gears.

2.2.1 The appliance shall also be capable of being started from rest up a gradient of 1 in 4 when laden.

3. MATERIAL, SELECTION AND TREATMENT

3.1 The choice of materials to be used in the construction of the appliance shall be made with a view to combining lightness with strength and durability.

3.2 Timber shall not be used in the body construction.

3.3 The appliance shall be required for use in conditions with constant high humidity and heat. This shall be given full consideration while selecting the materials.

3.4 All metal parts exposed to atmosphere shall either be of corrosion resisting material or treated to resist corrosion.

*Rules for rounding off numerical values (*revised*).

3.5 Ferrous metal shall not be used for nickle or chromium plated fittings and the plating of all such fittings shall be of extra heavy quality.

4. DESIGN AND CONSTRUCTION

4.1 The chassis shall have the gross vehicle weight of not less than 8 500 kg including of equipments, crew members, etc and shall have the following dimensions:

Wheel base	not more than 4 500 mm
Turning circle	not more than 20 m
Road clearance	not less than 230 mm
Over-all Width	not more than 2 500 mm
Height	not more than 3 300 mm from ground level

4.2 Engine — The engine (oil fuel type) shall 6 cylinders. The engine shall be fitted with quick starting system. The engine shall be capable of driving the fully laden appliance at speed from starting without any preliminary running period, even under abnormally cold atmospheric conditions. The operating temperature of the engine cooling water shall be thermostatically controlled.

4 3 Fuel System

4.3.1 The fuel tank shall have a minimum capacity of 90 litres. A fuel tank contents gauge shall be fitted on the instrument panel in the driving compartment.

4.3.2 The filling orifice shall be of ample size, and shall be accessible position. The cap shall be clearly marked to show that it is for fuel, and an antiflash device shall be incorporated in it if the engine is petrol driven.

4.4 Electrical System

4.4.1 A heavy duty alternator/generator shall be fitted to the engine to supply the vehicle 12 or 24 V dc electrical system. The alternator/ generator shall be fitted with the necessary control unit.

4.4.2 A trickle charger shall be fitted in the cab and it shall be fitted with socket for connection to 230 V ac supply. A red pilot lamp, to indicate when the battery is being charged from an external supply shall be provided.

4.4.3 All important electrical circuits shall have separate fuses suitably indicated and grouped into a common fuse box, which shall be located

in an accessible position. Provision shall be made to carry spare fuses in this box.

4.5 Alternator Unit

4.5.1 A 230 V, 50 cycle alternator with its independent engine shall be provided.

4.5.2 The alternator shall be screen protected, continuously rated, self-regulating, self excited, class 'E' insulation type, having an output of not less than 5 k VA at 0·8 power factor, (4 kW) 220 V single phase, 50 cycles.

4.5.3 The alternator shall be equipped with a direct coupled flange mounted exciter which shall automatically keep the alternator voltage constant and provide an approximately straight line voltage characteristic within 5 percent at all loads, and at any pre-set factor between 0·8 and unity.

4.5.4 Two cable reels each with 30 m of cable shall be provided. The cable shall be a 3-core duty flexible cords 250 V grade having a conductor of cross-section 4 mm^2 (128/0·20 mm) conforming to IS : 434 (Part 1)-1964 or IS : 694-1977†.

4.5.5 Controls shall be mounted near the generator and shall consist of the following:

a) Hand throttle control;

b) Engine cooling water temperature gauge (if water cooled);

c) Ammeter;

d) Volt meter;

e) 14 amps single phase 3 pin plug with switch — 2 points; and

f) 30 amps single phase 3 pin plug with switch — 2 points.

4.6 Body Work

4.6.1 Enclosed accommodation for driver, officer-in-charge and 5 men shall be provided. The design of the cab shall be such that it shall afford maximum possible vision for the crew and shall ensure adequate ventilation to avoid discomfort to crew under tropical conditions. Adequate lighting shall be provided in the driving and crews

*Specification for rubber-insulated cables: Part 1 With copper conductors (*revised*).

†Specification for PVC insulated cables for working voltage up to and including 1 100 volts (*second revision*).

compartment and in the interior of the appliance. Doors shall be provided on both sides of the appliance, giving ready access to driver and crew. When necessary, non-slip steps and grab-rail handles shall be provided to assist the driver and crew in mounting and discounting speedily. The driver's seat shall be adjustable. All glasses fitted in windows shall be safety glasses. The construction of the cab roof shall be such that it shall support the weight of one man without damage. Dual sun visors and long arm outside-fitting type rear view miror shall be fitted to the cab.

4.6.1.1 An illuminated 'FIRE' sign shall also be fitted to the outer centerfront of the cab.

4.6.2 The body work shall be designed so as to enclose as much as possible of the appliance without interfering with necessary accessibility but at the same time, shall have clean lines.

4.6.3 Lockers shall be provided for provision of all equipment details in Appendix A. The door of the side lickers shall not be hinged at bottom. The height of the lockers from the bottom to the top of the opening shall be not less than 600 mm and the depth not less than 600 mm.

4.6.3.1 All lockers shall be fitted with internal lighting which shall be capable of being automatically switched 'ON' and 'OFF' by the opening and closing of the doors or lids. A master switch for isolating the locker lighting circuit shall also be provided.

4.6.4 Grab-rails and non-slip steps be provided to give access to the roof of the appliance and for easy and speedy removal and mouting of ladders.

4.6.5 A 10·5 m wooden aluminium extension ladder (*see* Appendix A) shall be mounted on suitable gallows fitted with rollers and designed to facilitate easy and quick removal of the ladder from the rear of the appliance. The head lock on the gallows shall be positive in action. No equipment shall be so positioned as to interfere with the easy and independent removal of the extention ladder.

4.6.5.1 In addition, two stretcher-ladders shall be mounted separately on the appliance in such a way that they would be easily, quickly and independently removed, when required. Specification of the stretcher-ladders shall be as follows:

a) *Stretcher ladder* — Main ladder section shall be manufactured from aluminium alloy and shall have following requirements:

Overall length	not less than 2·0 m
Overall width	not less than 600 mm
Centre of rungs	210 mm approximately

4.7 Stability — The stability of the appliance shall be such that when under fully equipped and loaded conditions (but excluding crew) if the surface on which the appliance stands is tilted to either side, the point at which overturning occurs is not passed at an angle of $27\frac{1}{2}°$ from the horizontal.

5. WORKMANSHIP AND FINISH

5.1 The standard of workmanship and finish of all mechanical and other parts shall be such that the parts normally required to be replaced can be supplied and will fit in correctly.

5.2 The appliance shall be painted fire-red colour conforming to shade No. 536 of IS : 5-1978*. The paint shall conform to IS : 2932-1974†.

5.3 The driving compartment, crew's compartment, inside the vehicle and inside lockers shall be painted cream. Lockers shall be finished in shadow board painting or replica of items to show the position of each piece of equipment.

5.4 All other parts except engine shall be painted black.

5.5 Necessary anti-corrosion and priming coats shall be applied before painting.

5.6 Painting and phosphating of the chasis shall be carried out to withstand the climatic conditions in the tropics.

6. INSTRUCTION BOOK AND ACCESSORIES

6.1 Instruction Book — Instruction book(s) for the guidance of the user, including both operating and normal maintenance procedures, shall be provided. The book(s) shall include an itemized and illustrated spare parts list, giving reference to all the wearing parts.

6.2 Accessories — The following accessories shall be provided in addition to these normally fitted on the chassis:

a) One 250 mm diameter bell shall be mounted externally. It can be operated from inside the driving/crew compartment;

b) *Fog lamps* — two, low mounted in front of appliance;

c) *Reversing light* — one, suitable situated to assist reversing;

*Colours for ready mixed paints and enamels (*third revision*).

†Specification for enamel, synthetic, exterior (a) under-coating, (b) finishing (*first revision*).

d) *Revolving beacon light* — two, of blue colour and shall be capable of throwing revolving beams of light round 360° with beams inclined upward, horizontally and downward. These shall be mounted on the cab-roof and second on roof at rear and shall be operated from the vehicle battery;

e) *Wind screen wipers (electrically operated) — of approved design* — two;

f) *Tools* — All tools required for normal routine maintenance of the appliance, which are not included in the kit for the chassis;

g) *Search light* — two, adjustable to give flood or beam light and shall be mounted in convenient position on the appliance but at the same time, shall be capable of being readily removed and mounted on tripods away from the appliance. These shall each be supplied complete with tripod and not less than 30 m of TRS cable on reel mounted on the appliance;

h) *Spot light* — two, adjustable and shall be mounted in convenient position on the roof of the appliance; and

j) One, 12 volts battery operated siren shall be mounted in a convenient position.

7. MARKING

7.1 Each appliance shall be clearly and permanently marked with the following information:

a) Manufacturer's name or trade-mark, if any; and

b) Year of manufacture.

APPENDIX A

(*Clauses* 0.3, 3.1, 4.6.3 *and* 4.6.5)

SCHEDULE OF EQUIPMENT TO BE CARRIED ON THE APPLIANCE

Sl No.	*Item*	*Quantity*
1.	Breathing apparatus, positive pressure type with spare cylinders [*see* IS : 10245 (Part 2)-1982*]	6 sets
2.	Protective suits	4

*Specification for breathing apparatus : Part 2 Open-circuit breathing apparatus.

Sl No.	*Item*	*Quantity*
3.	Oxygen resuscitation apparatus ballow type	1 set
4.	First-aid medical outfit (for 50 persons)	2 sets
5.	Blankets, woolen (IS : 1681-1972*)	6
6.	Blanket, asbestos 2 × 2 m (in case)	1
7.	Oxy-accetylene cutting plant, complete with 5 litre cylinders or equivalent and 10 m lengths of bubing, portable or trolley mounted	1 set
8.	Oxygen cylinder, spare 5 1 (*see* Sl No. 1)	1
9.	Gauges for oxy-acetylene cutting plant, spare	2
10.	Leather gloves, for use with item 9	2 pairs
11.	Goggles dark glasses for use with item 9	4 pairs
12.	Chain, lifting 3 tonnes, complete with end rings and shackles	6 m
13.	Chain-sling, double leg, complete with rings	1
14.	Rope-sling, sisel	1
15.	Hydraulic rescue tools, 15-25 tonnes, complete in box	1 set
16.	Hydraulic rescue tools, 5-8 tonnes, complete in box	1 set
17.	Pulling and lifting machine, lifting 3 tonnes or pulling 5 tonnes, complete with wire rope and hook	2 sets
18.	Pulling and lifting machine, lifting 1·5 tonnes or pulling 2·5 tonnes, complete with wire rope and hook	2 stes
19.	Portable, electrically operated, 30 cm dia-circular saws, 220 V.	1
20.	Portable, electric drill with different size spart bits, 220 V.	1
21.	Engineer's tools (*see* Note 1)	1 set
22.	Carpentor's tools (*see* Note 2)	1 set
23.	Special tools for refrigerators, where required	1 set
24.	Set of keys and securing plate for passenger lift	1 set

*Specification for hospital blanket, woollen, dyed (*first revision*).

Sl No.	*Item*	*Quantity*
25.	Fire hook (*see* IS : 927-1981*)	1

††Specification for rubber gloves for electrical purposes.

Sl No.	Item	Quantity
45.	Oil-can, pressure feed	1
46.	Oil	1 can (1 *l*)
47.	Grease	1 tin (1 kg)
48.	Life jacket	1
49.	Lifebuoy	1
50.	Rubber dinghy	2
51.	Hand lamps	4
52.	Flood lights 500 W-220 V	4
53.	Asbestos gloves	4 pairs
54.	Safety goggles	4
55.	Traffic guide conical	4
56.	Safety belt with hook	2
57.	Dry powder fire extinguisher 10 kg (*see* IS : 2171-1985*)	1
58.	Mechanical foam 9 lit fire extinguisher (*see* IS : 10204-1982†)	1
59.	Canvas salvage sheet 3 000 × 3 000 mm	1
60.	Blower and exhauster (*see* IS : 941-1985‡)	1
61.	Deep lift suction pump 400 l/min.	1
62.	Wireless set	1

NOTE 1 — Engineer's tools consist of right angle 150 mm, scale 300 mm, spirit level 200 mm, hammer 0·5 kg, centre punch, pipe wrench 300 mm, hacksaw with blades 300 mm, screw spanner 150 mm and 200 mm, fixed spanner set 6 mm to 22 mm, assorted files 200 mm, insulated plier 150 mm and screw drivers 150 mm and 300 mm.

NOTE 2 — Carpenter's tools consist of planner, chisel assorted, hammer 0·5 kg, hand drill, wooden mallet, right angle 200 mm and woodsaw 450 mm.

*Specification for portable fire extinguishers, dry powder type (*third revision*).

†Specification for portable fire extinguisher mechanical foam type.

‡Specification for blower and exhausters (*second revision*).

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