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IS 943 (1979): Functional Requirements for 680-1/Min
Trailer Pump For Fire Brigade Use [CED 22: Fire Fighting]



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IS : 943- 1979
(Reaffirmed 2008)

Indian Standard

FUNCTIONAL REQUIREMENTS FOR
680-l/min TRAILER PUMP FOR
FIRE BRIGADE USE
(*Second Revision*)

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FUNCTIONAL REQUIREMENTS FOR 680-l/min TRAILER PUMP FOR FIRE BRIGADE USE (*Second Revision*)

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AMENDMENT NO. 1 APRIL 1981

TO

IS:943-1979 FUNCTIONAL REQUIREMENTS FOR 680-l/min
TRAILER PUMP FOR FIRE BRIGADE USE

(Second Revision)

Corrigendum

*(Page 14, Appendix B, informal table, second
lumn, against Sl No. 1, line 1) - Substitute '75 mm'
r '100 mm'.*

DC 22)

Reprography Unit, ISI, New Delhi, India

AMENDMENT NO. 2 DECEMBER 1983

TO

IS : 943 - 1979 FUNCTIONAL REQUIREMENTS OF 680-1/min
TRAILER PUMP FOR FIRE BRIGADE USE

(Second Revision)

Alterations

(Page 5, clause 4.1, line 2) - Substitute
'IS:1601-1960*' for 'IS:1603-1960*'.

(Page 5, clause 4.1, line 3) - Substitute 'at
least 5 percent' for 'sufficient'.

(Page 5, clause 4.1.2, line 1) - Substitute
'4.1.2 In case of water cooled engine indirect' for
'4.1.2 Indirect'.

(Page 5, foot-note with '*' mark) - Substitute
the following for the existing foot-note:

'*Specification for performance of constant
speed internal combustion engines general purposes.'

(Page 6, clause 4.3.2) - Substitute the following
for the existing clause:

'4.3.2 The impeller shall be dynamically balanced
for maximum operating speed along with any other
unmachined rotating parts on proper balancing equipment.
The pump casing shall be of robust construction and
tested to withstand 1.5 times the shut off pressure at
maximum operating speed or twice the operating pressure,
whichever is higher.'

(Page 6, clause 4.3.3, line 2) - Substitute
'27 \pm 2°C' for '16.5°C'.

[Page 6, clause 4.3.3 (a)(3), second sentence] -
Substitute the following for the existing sentence:

'However, deduction at the rate of 1 percent of every
5 percent change in humidity shall be made when humidity
changes from 75 percent to 95 percent.'

(Page 7, clause 4.3.5, lines 1 and 2) - Delete
the following words '(with engine cover closed)'.

(Page 7, clause 4.4, lines 2 and 3) - Substitute
'24 seconds from the time it is engaged' for '24 seconds
and'.

(Page 7, clause 4.5, line 2) - Substitute 'clutch
flexible couplings or any other suitable measure shall'
for 'clutch shall'.

(BDC 22)

Indian Standard
**FUNCTIONAL REQUIREMENTS FOR
680-l/min TRAILER PUMP FOR
FIRE BRIGADE USE**
(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 10 August 1979, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 This standard was first published in 1959 and was first revised in 1966. The second revision has been prepared incorporating all the amendments issued so far including the one deleting the provisions relating to electrically or manually operated fuel pumps. In this revision provisions have also been made regarding overall dimensions of the unit, choice of materials for different components.

0.2.1 A list of equipment which is not part of this appliance, most of which are normally required to assist in operations of this appliance is given at Appendix A for information and guidance.

0.3 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 or analysis, 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, and performance tests of 680-l/min trailer pump for fire brigade use.

*Rules for rounding off numerical values (revised).

2. GENERAL REQUIREMENTS

2.1 The trailer pump shall consist of a pump, having a capacity of not less than 680-l/min at 0.7 MN/m² (7.0 kgf/cm²) pressure, driven by an internal combustion engine. The combined unit being permanently mounted on a trailer with a pump at the rear, and shall be capable of being towed to safety by a standard vehicle.

2.2 Overall Dimensions — The overall length of the whole unit shall not exceed 3.3 m, the height shall not exceed 1.6 m (with spot light), and the wheel track shall not exceed 1.4 m.

3. MATERIAL

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

3.1.1 All the parts which form water-ways or come in contact with water, shall be of corrosion-resisting material or be treated for corrosion resistance. All metal parts exposed to atmosphere shall either be of corrosion-resisting material or treated in an approved manner to prevent corrosion. The following choice of materials shall be followed:

a) Trailer chassis frame	Suitable mild steel sections so as to fulfil requirements given in 4.10 and 6.2
b) Axle	Carbon steel or mild steel so as to fulfil requirements given in 4.7.3
c) Pump casing	Aluminium alloy Grade 4600A of IS:617-1975* or leaded tin bronze (Grade II of IS:318-1962†)
d) Impeller ring and impeller neck ring	Leaded tin bronze (Grade II of IS:318-1962†)
e) Pump shaft	Stainless steel Grade 04Cr18Ni10 of IS:6603-1972‡
f) Engine cover and pump panel	Mild steel sheets (IS:513-1973§ ordinary grade)

*Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (*second revision*).

†Specification for leaded tin bronze ingots and castings (*revised*).

‡Specification for stainless steel bars and flats.

§Specification for cold rolled carbon steel sheets (*second revision*).

4. DESIGN AND CONSTRUCTION

4.1 Engine — The IC engine shall have not less than 4 cylinders and shall conform to IS:1603-1960*. The brake horse power developed shall be at maximum working load. Engine shall have sufficient power to work the pump at its rated output at 0.7 MN/m^2 (7 kgf/cm^2) pressure and shall have sufficient reserve power. The engine if of petrol type shall have dual-coil ignition with automatic cut out. The engine shall be provided with a generator/alternator for charging 12 V battery with capacity of 92 Ah at 10 hour rate.

4.1.1 In case of petrol engine, in addition to battery starting system a well designed and permanently attached type hand starting device shall be fitted so as to be easily accessible with means to ensure reliable and quick starting of the engine. In case of diesel engine preferably hand cranking arrangement shall be provided.

4.1.2 Indirect cooling system of the open circuit type in which water is discharged to waste shall be provided so that engine temperature is maintained in range of temperature recommended by engine manufacturers. This shall consist of header tank incorporating copper coils. Water for cooling in the tank shall be fed from the main centrifugal pump and after having circulated through the coils shall go to waste which shall not exceed 30-1/min. Drain plug shall be provided. Filter capable of being cleaned readily when the pump is in operation, shall also be provided.

4.1.3 Lubricating system shall be provided with an accessible external filter and means to gauge with reasonable accuracy during running the level of the oil in the sump preferably by a tubed dip stick. The oil filter shall be so arranged as to permit oil to be replenished while the unit is in operation.

4.1.4 The engine exhaust shall be arranged so as to discharge away from the pump operating position.

4.1.5 The engine fuel tank and water tank shall be protected by a suitably designed cover so arranged as to give easy access to the engine for operational purposes without removing the whole cover. The engine cover should be louvered so as to permit adequate air circulation. The battery shall be easily removable and shall have covers. It shall be held securely so that it does not fall during towing.

4.2 Fuel System

4.2.1 A fuel tank of adequate capacity for a minimum continuous run of 2 hours without refuelling and a graduated dip stick should be provided.

*Specification for performance of variable speed internal-combustion engines for automotive purposes.

4.2.2 The filling orifice of ample size shall be positioned away from the exhaust pipe and shall be accessible without removing the engine covers. The cap shall be clearly marked with type of fuel and shall incorporate an anti-flash device.

4.2.3 There shall be one fuel pump which shall be mechanically operated. It shall be preferably provided with a drain plug.

4.3 Pump

4.3.1 The pump shall be of the single stage centrifugal type and so designed as to afford easy access to the impeller. The pump shaft shall be carried on anti-friction bearings. Glands of suitable type shall also be provided. A drain plug shall be provided at the bottom of the pump casing.

4.3.2 The impeller shall be dynamically balanced. The pump shall show no leakage when subjected to a hydraulic pressure of 2.5 MN/m^2 (25 kgf/cm^2).

4.3.3 The pump shall be tested for its performance duties given in **4.3.4** at the water temperature of 16.5°C and at a pressure of 760 mm Hg to give its rated outputs. The following allowances (deductions) shall be made:

a) Allowance for output:

- 1) One percent for every 2.5°C rise in water temperature;
- 2) Four percent for every 300 m above mean sea level; and
- 3) No allowance shall be made for humidity up to 75 percent. However, suitable deduction shall be made when humidity ranges from 75 percent to 95 percent.

b) Allowance for lift:

- 1) 30 cm for every 300 m above mean sea level, and
- 2) One percent for 2.5°C rise in water temperature.

4.3.4 The pump when tested in conditions mentioned in **4.3.3** shall be capable of giving the following duties when running at not more than 4 000 rev/min of impeller-shaft and working with all internal and external strainers (except basket strainer) fitted.

<i>Output</i>	<i>Pressure</i>
l/min	MN/m^2 (kgf/cm^2)
1 000	0.42 (4.2)
865	0.56 (5.6)
680	0.70 (7.0)
590	0.84 (8.4)

4.3.5 The pump shall run continuously for a period of 4 hours (with engine cover closed) delivering rated output at 3 m lift and at 0.7 MN/m^2 (7 kgf/cm^2). During this test the water in the engine cooling system shall not be replaced and the temperature of engine lubricating oil shall not exceed the specified value.

4.3.6 The suction eye shall be provided with a standard 75 mm male round thread suction connection (*see* IS:902-1974*) with internal strainer and blank cap. The strainer shall be readily removable, but be retained firmly in position when in use. The pump shall be provided with delivery valve (*see* IS:4928-1968†) with a 63-mm female instantaneous hose connection and blank cap. Means shall be provided for relieving pressure between the valve and the cap.

4.4 The primer shall be capable of lifting water at least 7.0 m (measured from water level to the centre of the pump) in not more than 24 seconds and shall be preferably be fully automatic.

4.5 Transmission — The assembly of the pump and engine shall be as compact as possible. A clutch shall preferably be incorporated between the pump and the engine. The engine and pump shall be mounted on antivibration mounting so as to reduce vibration to minimum.

4.6 Control and Instruments — The illuminated control panel provided adjacent to the suction eye and delivery valve shall include the following:

- a) Ignition switch,
- b) Throttle control,
- c) Ammeter,
- d) Choke for petrol engine,
- e) Gauges:
 - i) Compound gauge calibrated as follows:
 - Vacuum—0 to 75 cm Hg
 - Pressure—0 to 0.5 MN/m^2 (0 to 5 kgf/cm^2)
 - ii) Pressure gauge calibrated from 0 to 1.6 MN/m^2 (0 to 16 kgf/cm^2)
- f) Temperature gauge,
- g) Oil pressure gauge,
- h) Pump and pump panel light,
- j) Spot light (adjustable),
- k) Primer control (if primer is not fully automatic), and
- m) Fuel contents gauge.

*Specification for suction hose couplings for fire fighting purposes (*second revision*).

†Specification for quick closing clack-valve for centrifugal pump outlet.

4.7 Trailer

4.7.1 The trailer frame shall incorporate two semi-elliptic springs (*see* IS:1135-1973*) and axle. Heavy duty tyres of 6'00×16 size and 6 ply rating shall be used for the unit. The whole unit shall be compact and the pumping unit shall be so mounted as to bring centre of gravity as low as possible.

4.7.2 The centre of gravity of the whole unit shall be slightly forward of the wheel axle when the towing eye is 66 cm above the ground level. The trailer shall not tilt backward when resting on front leg. No part of the trailer shall have a clearance less than 23 cm when the trailer is tilted so as to raise the height of the eye 65 cm or to lower it to 45 cm. In towing position the height of the towing eye shall normally be 55 cm above ground level.

4.7.3 When the fully laden trailer is being towed at 20 km/h in cross the country for 2 km and in normal traffic conditions on tar road for 10 km, the trailer shall hold the road wall. The axle shall not distort and the alignment of the wheels is ensured.

4.7.4 Efficient brakes shall be provided on the two wheels, operated through compensating gear by over-run. A hand lever situated in an accessible position at the front of the trailer frame shall be provided for operating the brake when the trailer is disconnected from the towing vehicle. The 'Off' position of the trailer frame shall be towards the front of the trailer and there shall be a ratchet or similar device to hold the brake in the 'ON' position.

4.7.5 Two handles (manhandling bars) of mild steel each not less than 50 cm long, which can be folded and secured along the frame when not in use, shall be provided at the front of the trailer frame. These handles shall be at least 15 cm above the level of the towing eye.

4.7.6 Two eyes for the attachment of drag ropes shall be provided in suitable positions. Four slinging eyes shall be provided two of which may be drag eyes.

4.7.7 Two jack legs in the rear and one in the front capable of being lowered into position and adequately secured to provide a suitable base for the unit, when pumping or standing unattached, shall be provided. The legs shall have 200 mm round mild steel plates dished upwards welded to the base of the pipe legs to prevent penetration into the earth when standing unattached. The legs shall be capable of being positively locked in the 'housed' position.

4.7.8 Provision shall be made on the trailer for carrying equipment detailed in Appendix B.

*Specification for leaf spring for automobile suspension (*second revision*).

4.8 Stability

4.8.1 The stability of the whole unit shall be such that under equipped conditions and with the front supported to produce the normal towing position, if the surface on which the appliance stands is tilted to either side to an angle of 25° from the horizontal, the point at which the overturning occurs is not passed.

4.9 Towing Eye and Draw Bar

4.9.1 The towing eye and draw bar shall be of substantial construction and the towing eye shall have an internal diameter of 75 mm. The towing eye shall be of high quality forged steel of not less than 630 MN/m² (63×10^3 kgf/cm²), ultimate tensile stress or other suitable material capable of giving similar performance. The shank shall be adequately machined with adequate radius at the shoulders.

4.9.2 To ensure that the housing will withstand shock loads inherent under towing conditions, it is essential that the design of the eye and housing, and the means of fixing the housing to the trailer chassis frame will take care of a draw pull of 11 kN (1 100 kgf) without being over stressed.

4.9.3 The shank of the towing eye shall be mounted in the housing so as to absorb shocks in both directions of movement; forward to cushion the shock of taking the tow load, and backward to regulate the rate of application of brakes. The compensation mechanism shall be such as to give a smooth tow at all reasonable speeds on average road surface.

4.10 Mass — The mass of the complete unit shall not exceed 750 kg including water, fuel and oil but without equipments as mentioned in Appendix B.

5. WORKMANSHIP AND FINISH

5.1 All parts of the appliance shall be of good workmanship.

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

6. INSTRUCTION BOOK, ACCESSORIES AND EQUIPMENT

6.1 Instruction book or books including both operating normal maintenance procedure shall be supplied for the guidance of the user. The book or books shall include an itemized and illustrated spare parts list giving reference numbers of all the parts.

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

†Specification for enamel, exterior (a) undercoating, (b) finishing (*first revision*).

6.2 Accessories — The following accessories shall be provided:

- a) *Electric Tail-light with Number Plate* — The electric cable from this light shall terminate in a plug at the front of the trailer.
- b) *Tools* — A kit of all essential tools required for normal maintenance of the appliance.
- c) *Head Light* — Head light of not more than 150 mm diameter on the trailer pump.

6.3 Equipment — The list of the equipment to be provided in the trailer are given in Appendix B.

7. MARKING

7.1 The trailer pump shall be clearly and permanently marked with the following information:

- a) Manufacturers' name or trade-mark;
- b) The output capacity of the pump in l/min; and
- c) Year of manufacture.

A P P E N D I X A

(Clause 0.2.1)

LIST OF EQUIPMENTS RECOMMENDED FOR USE WITH THE APPLIANCE

Sl No.	Equipment	Quantity
1.	63-mm unlined flax canvas hose (<i>see</i> IS:4927-1968*), or 63 mm controlled percolation hose (<i>see</i> IS: 8423- 1977†) 30 m length	6 No.
2.	Aluminium extension ladder, 7.5 m (<i>see</i> IS: 4571- 1977‡)	1 No.
3.	63-mm rubber reinforced lined hose, 30 m length (<i>see</i> Type II of IS : 636-1979§)	6 No.
4.	Hose straps	12 No.

*Specification for unlined flax canvas hose for fire fighting.

†Specification for controlled percolating hose for fire fighting.

‡Specification for aluminium extension for ladders fire brigade use.

§Specification for fire fighting hose (rubber lined woven-jacketed) (*second revision*).

<i>Sl No.</i>	<i>Equipment</i>	<i>Quantity</i>
5.	Instantaneous couplings female 63 mm (<i>see</i> IS : 903-1975*)	12 No.
6.	Instantaneous couplings male 63 mm (<i>see</i> IS : 903-1975*)	12 No.
7.	Rubber washers for 63 mm couplings (<i>see</i> IS : 937-1965†)	24 No.
8.	Dividing breachings, with control, 63 mm instantaneous (<i>see</i> IS : 5131-1969‡)	1 No.
9.	Collecting breachings, 63 mm instantaneous (<i>see</i> IS : 905-1965§)	1 No.
10.	Double female couplings (<i>see</i> IS : 901-1975)	2 No.
11.	Stand pipe, double outlet (<i>see</i> IS : 5714-1970¶)	1 No.
12.	Branch with revolving head (with branch pipe) for 63 mm size instantaneous hose couplings (<i>see</i> IS : 906-1965**)	1 No.
13.	Hand controlled branch	1 No.
14.	Nozzles with branch pipe (<i>see</i> IS : 903-1975*)	
	i) 6 mm	2 No.
	ii) 12 mm	2 No.
	iii) 20 mm	1 No.
	iv) 25 mm	2 No.
15.	Fire extinguisher, dry powder type, 2 kg capacity (<i>see</i> IS : 2171-1976††)	1 No.

*Specification for fire hose delivery couplings, branch pipe, nozzles and nozzle spanner (*second revision*).

†Specification for washers for water fittings for fire fitting purposes (*revised*).

‡Specification for dividing breaching, with control, for fire brigade use.

§Specification for delivery breachings, dividing and collecting instantaneous pattern for fire fighting purposes (*revised*).

||Specification for couplings, double male and double female, instantaneous pattern, for fire fighting (*second revision*).

¶Specification for hydrant, stand-pipe for fire-fighting.

**Specification for branch with revolving head for fire fighting purposes (*second revision*).

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

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<i>Sl No.</i>	<i>Equipment</i>	<i>Quantity</i>
16.	Fire extinguisher, carbon-dioxide type, 4.5 kg capacity (see IS: 2878-1976*)	1 No.
17.	File bastard 30 cm	1 No.
18.	Fire buckets (see IS: 2546-1974†)	6 No.
19.	First aid box for 10 persons	1 set
20.	Rubber gloves (see IS: 4770-1968‡)	2 pairs
21.	Fireman axe (see IS: 926-1970§)	1 No.
22.	Shovels [see IS: 274 (Part I)-1966]	1 No.
23.	Pick axe, 1 kg weight (see IS: 273-1973¶)	1 No.
24.	Crow bar with chisel and claws, 1 m length (see IS: 704-1968**)	1 set
25.	Hand rip saw, 65-mm (see IS: 5098-1969††)	1 No.
26.	Spanner adjustable, 30-cm (see IS: 6169-1971‡‡)	1 No.
27.	Fire hook (see IS: 927-1964§§)	2 No.
28.	Shears or bolt clippers (see IS: 5200-1969)	1 No.
29.	Asbestos gauntlets	2 No.

*Specification for portable fire extinguishers, carbon-dioxide type (*first revision*).

†Galvanized mild steel fire bucket (*first revision*).

‡Specification for rubber gloves for electrical purposes.

§Specification for firemen's axe (*first revision*).

||Specification for shovels: Part I General purposes shovels (*second revision*).

¶Specification for picks and beaters (*second revision*).

**Specification for crow-bars and claw-bars (*first revision*).

††Specification for cross-cut and rip saws.

‡‡Specification for single ended open-jaw adjustable wrenches.

§§Specification for fire hooks (*revised*).

|||Specification for bolt clippers.

<i>Sl No.</i>	<i>Equipment</i>	<i>Quantity</i>
30.	Foam compound for producing mechanical foam 20 litres drum (<i>see</i> IS : 4989-1974*)	5 No.
31.	Foam making branch pipe FB-2 (<i>see</i> IS : 2097-1969†)	1 No.
32.	Head collecting two ways (<i>see</i> IS : 904-1965‡)	1 No.
33.	Rope (long line) 30 m long	1 No.
34.	Branch pipe universal (<i>see</i> IS : 2871-1974§)	1 No.
35.	Rope (guy line) 30 m long	1 No.
36.	Rope (lowering line) 30 m long	1 No.
37.	Key hydrant (<i>see</i> IS : 910-1972)	2 No.
38.	Rope drag light	1 No.
39.	Rope (short line) 15 m long	1 No.
40.	Hose clamp [IS : 5612 (Part I)-1973¶]	6 No.
41.	Sledge hammer 6.5 kg	1 No.
42.	Jack screw, lifting 6 tonne	1 No.
43.	Tool bag	1 No.
44.	Grease gun	1 No.
45.	Oil can (2 litres)	1 No.
46.	Petrol can (9 litres)	1 No.
47.	Oil filling funnel	1 No.
48.	Petrol filling funnel	1 No.

*Specification for foam compound for producing mechanical foam for fire fighting (*first revision*).

†Specification for foam-making branches.

‡Specification for 2-way and 3-way suction collecting heads for fire fighting purposes (*revised*).

§Specification for branch pipe, universal, for fire fighting purposes.

||Specification for combined key for hydrant, hydrant cover and lower valve (*first revision*).

¶Specification for hose-clamps and hose-bandages for fire brigade use: Part I Hose clamps.

APPENDIX B

(*Clauses 4.7.8 and 6.3*)

EQUIPMENT TO BE PROVIDED IN TRAILER PUMP

<i>Sl No.</i>	<i>Equipment</i>	<i>Quantity</i>
1.	100 mm suction hose (<i>see</i> IS : 2410-1963*) in 4.5 m lengths with 75 mm suction hose coupling (<i>see</i> IS : 902-1974†)	2 No.
2.	Suction wrenches for 100 mm suction hose couplings (<i>see</i> IS : 4643-1968‡)	2 No.
3.	Suction strainer for 100 mm suction hose (<i>see</i> IS : 907-1975§)	1 No.
4.	63 mm delivery hose (<i>see</i> IS : 4927-1968) in 30 m lengths with instantaneous couplings (<i>see</i> IS : 903-1975¶)	4 No.
5.	Rope manila 15 m length (<i>see</i> IS : 1084-1969**)	1 No.
6.	Suction adopter 100 mm right hand thread female × 63 mm instantaneous male	1 No.
7.	Branch pipe 63 mm (<i>see</i> IS : 903-1975¶)	2 No.

*Specification for suction hose of rubber for fire services.

†Specification for suction hose couplings for fire fighting purposes.

‡Specification for suction wrenches for fire brigade use.

§Specification for suction strainers, cylindrical and shoe types, for fire fighting purposes (*revised*).

||Specification for unlined flax canvas hose for fire fighting.

¶Specification for fire hose delivery couplings, branch pipe, nozzles and nozzle spanner (*second revision*).

**Specification for manila ropes (*second revision*).

(Continued from page 2)

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- 930-1977 Wooden extension ladders for fire fighting purposes (*first revision*)
- 931-1973 Wheeled fire escape (*first revision*)
- 938-1973 Functional requirements for 1 350-l/min small fire engine (*second revision*)
- 941-1977 Blowers and exhauster for fire fighting (*first revision*)
- 942-1966 275-l/min portable pump set for fire fighting (*first revision*)
- 943-1979 680-l/min trailer pump for fire brigade use (*second revision*)
- 944-1979 1 800-l/min trailer pump for fire brigade use (*second revision*)
- 946-1977 Functional requirements for motor fire engine (*second revision*)
- 947-1960 Towing tender for trailer pump for fire brigade use
- 948-1970 Water tender, type A, for fire brigade use (*first revision*)
- 949-1967 Emergency tender for fire brigade use and rescue tender for general purposes (*first revision*)
- 950-1970 Water tender, type B, for fire brigade use (*first revision*)
- 951-1977 Combined foam and Co₂ crash tender (*second revision*)
- 954-1974 Functional requirements for carbon-dioxide tender for fire brigade use (*first revision*)
- 955-1964 Dry powder tender for fire brigade use
- 956-1975 Functional requirements for rescue tender for air fields (*first revision*)
- 957-1967 Control van for fire brigade use
- 1941 (Part I)-1976 Functional requirements for electric motor sirens: Part I AC 3 phase 50 hz, 450 V type (*second revision*)
- 2097-1969 Foam making branch
- 2696-1974 Functional requirements for 1 125-l/min light fire engine (*first revision*)
- 2930-1964 Hose laying tender for fire brigade use
- 4571-1977 Aluminium extension ladders for fire brigade use (*first revision*)
- 4989-1974 Foam compound for producing mechanical foam for fire fighting (*first revision*)
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- 6067-1971 Water tender Type X for fire brigade use

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