

## **59            Liquid pumps, liquid servomotors, other liquid lifting apparatus**

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- 59a            Liquid pumps with reciprocating pistons, also diaphragm pistons, as well as piston pumps for fire engines**
  - 59b            Centrifugal pumps, centrifuges and other turbine pumps**
  - 59c            Pulsometers and compressed-air liquid lift pumps, jet pumps, hydraulic rams**
  - 59d            Bucket pumps, bucket wheels and other water-lifting mechanisms**
  - 59e            Rotary piston pumps**
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### **59a            Liquid pumps with reciprocating pistons, also diaphragm pistons, as well as piston pumps for fire engines (pressure equalisers 14g; oil pumps 46c2-105; fuel pumps 47e-22 – 47e-24)**

- 59a-1            Tubular well and deep well pumps
- 59a-2            Feed water and hot water pumps, pumps for displacing materials from receptacles under low pressure, general (boiler feed pumps 13b)
- 59a-3            Pumps for viscous and impure materials, sewage pumps, pumps with feed screws, concrete-mix pumps
- 59a-4            Acid pumps
- 59a-5            Metering pumps, liquid distribution and pumps for two separate liquids and with air cushion (42e)
- 59a-6            Pumps utilising the kinetic energy of the liquid in motion
- 59a-7            Draining machines, pump-rod compensating (85d)
- 59a-8            Pumps operated by hand and foot, insofar as the pump is concerned
- 59a-9            Pumps operated by steam engines, insofar as the pump is concerned (14d)
- 59a-10           Compressed-air and hydraulic-motor driven pumps, also hydraulic rods, insofar as the pump is concerned (46d-5/01; 47h-18; 47h-22; 88b-1)
- 59a-11           Pumps with windmill and combustion engine drive as well as electric drive (control of electric drive 21c-62) as far as the pump is concerned
- 59a-12           Differential pumps
- 59a-13           Two-cylinder pumps
- 59a-14           Pumps with concentrically arranged parallel pistons (27b-7; 46c2-106)
- 59a-15           Radial-piston pumps (27b-7; 14a-14; 27c-1; 27c-2)
- 59a-16           Pumps with controlled valves, slide valves, also vacuum suction cylinders
- 59a-17           Pumps without special valves: pistons or cylinder serving at the same time as control gear (27b-8; 27b-9)
- 59a-18           Pump regulation devices for automatic starting and stopping (21c-62; 58a-2)
- 59a-19           Regulation of the pump delivery
- 59a-20           Electric regulation of pumps
- 59a-21           Safety devices, distribution of the liquid to different delivery lines in pumps (47e-27 – 47e-29)
- 59a-22           Float overflow pump regulation
- 59a-23           Other regulation devices for pumps, except 59a-18 – 59a-22
- 59a-24           Crank guides, cams and eccentric drives
- 59a-25           Pump gear drives
- 59a-26           Pumps with oppositely moving pistons in one cylinder (27b-6)
- 59a-27           Pumps with spring and weight drives
- 59a-28           Special drives for pumps, except 59a-24 – 59a-27

- 59a-29 Arrangement of automatic valves for pumps
- 59a-30 Pump air chamber
- 59a-31 Pump strainers, filters etc., emptying devices (85c-6)
- 59a-32 Pistons for pumps (47f-19) piston packings (47f-22/70; 47f-22/75)
- 59a-33 Cylinders and stuffing boxes (47f-18; 47f-23 – 47f-26), pump connecting elements and rods
- 59a-34 Special pump components except for 59a-29 – 59a-33
- 59a-35 Diaphragm and collapsible tube pumps (27b-13; 46c2-97)
- 59a-36 Piston pumps for fire engines (45f; 59b; 61a-15; 63c-4; 63c-87)

## **59b Centrifugal pumps, centrifuges and other turbine pumps**

- 59b-1 Impellers and guide rings, diffusers for centrifugal pumps
- 59b-2 Materials, casings, air elimination, stuffing boxes, seals, starting devices, stone traps and other structural parts of centrifugal pumps
- 59b-3 Shaft relieving for centrifugal pumps
- 59b-4 Stages, controls, regulation (regulation and starting devices for electric drive motors 21c-59/30 – 21c-59/37; 21c-59/60 – 21c-59/65), operation and assembly of centrifugal pumps
- 59b-5/01 Pumps with rotating liquid rings, water-ring water pumps
- 59b-5/11 Vacuum displacement centrifugal pumps
- 59b-5/21 Vertical shaft centrifuges
- 59b-5/31 Pumps for removal of shell-line waste
- 59b-5/41 Centrifugal pumps for waste waters
- 59b-5/51 Centrifugal pumps for acids
- 59b-5/61 Electrically driven immersion centrifugal pumps
- 59b-5/99 Other centrifugal pumps

## **59c Pulsometers and compressed-air liquid lift pumps, jet pumps, hydraulic rams**

### **Pulsometers and the like**

- 59c-1 Pulsometers in general
- 59c-2 Control mechanisms for pulsometers
- 59c-3 Condensation-water lift pumps (for boiler feeding 13b-22 – 13b-25)

### **Compressed-air liquid lift pumps and the like**

- 59c-4/01 Compressed-air liquid lift pumps with floats
- 59c-4/02 Compressed-air liquid lift pumps without floats
- 59c-5 Progressive delivery by means of compressed-air lift pumps
- 59c-6 Mixed air liquid lift pumps, mammoth pumps
- 59c-7 Compressed-air lift pumps for acids (12f-1)
- 59c-8 Explosion water lift pumps
- 59c-9 Compressed-air liquid lift pumps of various kinds, vacuum liquid lift pumps
- 59c-10 Lift pump installations

### **Jet pumps or injectors**

- 59c-11 Simple steam jet pumps, single-stage (13b-25; 13b-36; 27d-1; 27d-2)
- 59c-12 Double steam jet pumps, two-stage
- 59c-13 Regulation of steam jet pumps
- 59c-15 Exhaust steam (live steam) jet pumps
- 59c-16 Water jet pumps (27d-1)
- 59c-17 Hydraulic rams

## **59d Bucket pumps, bucket wheels and other water-lifting mechanisms**

- 59d-1 Bucket pump apparatus (bucket pumps for lubricating oil 47e-26)

- 59d-2 Bucket pumps
- 59d-3 Water-lifting apparatus of various kinds, chain pump systems
- 59e Rotary piston pumps (14h; 27c-1 – 27c-6; 42e-7; 46a5; 46d-5/05; 47f-22; 47f-26; 47h-18; 63c-34; 88h-2)**
- 59e-1 Pumps with sliding or swinging abutments, e.g. throttle-type, parallel, or stepwise rotating abutments
- 59e-2 Pumps with valved pistons or members rotating as rotary pistons on the impeller, the cylinder or the like, in a swinging motion, e.g. throttling, parallel, or stopped members
- 59e-3/01 Gear pumps and pumps with gear-type engagement piston cylinders in general, also gear (plastic) spinning pumps
- 59e-3/02 Gear pumps and pumps with piston cylinders internally engaging in the manner of gears
- 59e-4 Pumps with oscillating pistons, so-called vane pumps
- 59e-5 Pumps with eccentric motion of piston, or abutment
- Screw pumps**
- 59e-6/01 with single axis, e.g. water worm gear
- 59e-6/02 with double axis, interlocking
- 59e-6/03 with crown gear abutments, e.g. Hindley's screw
- 59e-7 Pumps with alternately moving and stopping pistons, and pistons of various angular velocity
- Special structures**
- 59e-8/01 Spiral pumps and the like
- 59e-8/02 Viscosity pumps and the like
- 59e-8/03 Hose and band pumps and the like
- 59e-8/04 Pumps with ball-shaped easing and the like, also hemispheric and zone-shaped pumps
- 59e-9/01 Output control
- 59e-9/02 No load devices
- 59e-9/03 Reversing gear
- 59e-9/04 Sealing
- 59e-9/05 Other details