

Symbol	Typ	Titel
F	Sektion	SECTION F — MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING
F01	Untersektion	ENGINES OR PUMPS
F01	Klasse	MACHINES OR ENGINES IN GENERAL (combustion engines F02; machines for liquids F03, F04); ENGINE PLANTS IN GENERAL; STEAM ENGINES
F01L	Unterklasse	CYCLICALLY OPERATING VALVES FOR MACHINES OR ENGINES (valves in general F16K) <u>Valve-gear for internal-combustion piston engines or for other machines or engines with positive working-fluid displacement (valve-gear specially for steam engines or specially for other machines or engines with variable fluid distribution F01L 15/00-F01L 35/00)</u>
F01L 1/00	Hauptgruppe	Valve-gear or valve arrangements, e.g. lift-valve gear (lift valve and valve seat assemblies <u>per se</u> F01L 3/00; slide-valve gear F01L 5/00; actuated non-mechanically F01L 9/00; valve arrangements in working piston or piston-rod F01L 11/00; modifications of valve-gear to facilitate reversing, braking, starting, changing compression ratio, or other specific operations F01L 13/00)
F01L 1/02	1-Punkt Untergruppe	. Valve drive (transmitting-gear between valve drive and valve F01L 1/12)
F01L 1/04	2-Punkt Untergruppe	. . by means of cams, camshafts, cam discs, eccentrics, or the like (F01L 1/10 takes precedence)
F01L 1/047	3-Punkt Untergruppe	. . . Camshafts [6]
F01L 1/053	4-Punkt Untergruppe	 overhead type [6]
F01L 1/06	3-Punkt Untergruppe	. . . the cams, or the like, rotating at a higher speed than that corresponding to the valve cycle, e.g. operating four-stroke engine valves directly from crankshaft
F01L 1/08	3-Punkt Untergruppe	. . . Shape of cams
F01L 1/10	2-Punkt Untergruppe	. . by means of crank- or eccentric-driven rods
F01L 1/12	1-Punkt Untergruppe	. Transmitting-gear between valve drive and valve (simultaneously operating two or more valves F01L 1/26)
F01L 1/14	2-Punkt Untergruppe	. . Tappets; Push-rods
F01L 1/16	3-Punkt Untergruppe	. . . Silencing impact; Reducing wear
F01L 1/18	2-Punkt Untergruppe	. . Rocking arms or levers
F01L 1/20	1-Punkt Untergruppe	. Adjusting or compensating clearance, i.e. lash adjustment
F01L 1/22	2-Punkt Untergruppe	. . automatically
F01L 1/24	3-Punkt Untergruppe	. . . by fluid means, e.g. hydraulically
F01L 1/245	4-Punkt Untergruppe	 Hydraulic tappets [6]
F01L 1/25	5-Punkt Untergruppe	 between cam and valve stem [6]
F01L 1/255	5-Punkt Untergruppe	 between cam and rocker arm [6]
F01L 1/26	1-Punkt Untergruppe	. characterised by the provision of two or more valves operated simultaneously by same transmitting-gear; peculiar to machines or engines with more than two lift valves per cylinder (with coaxial valves F01L 1/28)
F01L 1/28	1-Punkt Untergruppe	. characterised by the provision of coaxial valves; characterised by the provision of valves co-operating with both intake and exhaust ports
F01L 1/30	1-Punkt Untergruppe	. characterised by the provision of positively opened and closed valves, i.e. desmodromic valves
F01L 1/32	1-Punkt Untergruppe	. characterised by the provision of means for rotating lift valves, e.g. to diminish wear

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F01L 1/34	1-Punkt Untergruppe	. characterised by the provision of means for changing the timing of the valves without changing the duration of opening
F01L 1/344	2-Punkt Untergruppe	. . changing the angular relationship between crankshaft and camshaft, e.g. using helicoidal gear [6]
F01L 1/348	3-Punkt Untergruppe	. . . by means acting on timing belts or chains [6]
F01L 1/352	3-Punkt Untergruppe	. . . using bevel or epicyclic gear [6]
F01L 1/356	3-Punkt Untergruppe	. . . making the angular relationship oscillate [6]
F01L 1/36	1-Punkt Untergruppe	. peculiar to machines or engines of specific type other than four-stroke cycle
F01L 1/38	2-Punkt Untergruppe	. . for engines with other than four-stroke cycle, e.g. with two-stroke cycle (F01L 1/26, F01L 1/28 take precedence)
F01L 1/40	2-Punkt Untergruppe	. . for engines with scavenging charge near top dead-centre position, e.g. by overlapping inlet and exhaust time (scavenging aspects F02B)
F01L 1/42	2-Punkt Untergruppe	. . for machines or engines characterised by cylinder arrangement, e.g. star or fan
F01L 1/44	1-Punkt Untergruppe	. Multiple-valve gear or arrangements, not provided for in preceding subgroups, e.g. with lift and different valves
F01L 1/46	1-Punkt Untergruppe	. Component parts, details, or accessories, not provided for in preceding subgroups
F01L 3/00	Hauptgruppe	Lift valves, i.e. cut-off apparatus with closure members having at least a component of their opening and closing motion perpendicular to the closing faces; Parts or accessories thereof
F01L 3/02	1-Punkt Untergruppe	. Selecting particular materials for valve members or valve seats; Valve members or valve seats composed of two or more materials
F01L 3/04	2-Punkt Untergruppe	. . Coated valve members or valve seats
F01L 3/06	1-Punkt Untergruppe	. Valve members or valve seats with means for guiding or deflecting the medium controlled thereby, e.g. producing a rotary motion of the drawn-in cylinder charge (for rotating lift valves F01L 1/32)
F01L 3/08	1-Punkt Untergruppe	. Valve guides; Sealing of valve stem, e.g. sealing by lubricant
F01L 3/10	1-Punkt Untergruppe	. Connecting springs to valve members
F01L 3/12	1-Punkt Untergruppe	. Cooling of valves
F01L 3/14	2-Punkt Untergruppe	. . by means of a liquid or solid coolant, e.g. sodium, in a closed chamber in a valve
F01L 3/16	2-Punkt Untergruppe	. . by means of a fluid flowing through or along valve, e.g. air (for sealing only F01L 3/08)
F01L 3/18	3-Punkt Untergruppe	. . . Liquid cooling of valve
F01L 3/20	1-Punkt Untergruppe	. Shapes or constructions of valve members, not provided for in preceding subgroups of this group
F01L 3/22	1-Punkt Untergruppe	. Valve seats not provided for in preceding subgroups of this group; Fixing of valve seats
F01L 3/24	1-Punkt Untergruppe	. Safety means or accessories, not provided for in preceding subgroups of this group
F01L 5/00	Hauptgruppe	Slide-valve gear or valve arrangements (with pure rotary or oscillatory movement F01L 7/00)
F01L 5/02	1-Punkt Untergruppe	. with other than cylindrical, sleeve, or part-annularly-shaped valves, e.g. with flat-type valves
F01L 5/04	1-Punkt Untergruppe	. with cylindrical, sleeve, or part-annularly-shaped valves
F01L 5/06	2-Punkt Untergruppe	. . surrounding working cylinder or piston
F01L 5/08	3-Punkt Untergruppe	. . . Arrangements with several movements or several valves, e.g. one valve inside the other (with part-annularly-shaped valves F01L 5/12)

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F01L 5/10	4-Punkt Untergruppe	 with reciprocating and other movement of same valve
F01L 5/12	3-Punkt Untergruppe	. . . Arrangements with part-annularly-shaped valves
F01L 5/14	1-Punkt Untergruppe	. characterised by the provision of valves with reciprocating and other movements (surrounding working cylinder or piston F01L 5/06)
F01L 5/16	2-Punkt Untergruppe	. . with reciprocating and other movement of same valve, e.g. longitudinally and in cross direction of working cylinder
F01L 5/18	2-Punkt Untergruppe	. . with reciprocatory valve and other slide valve
F01L 5/20	1-Punkt Untergruppe	. specially for two-stroke engines (F01L 5/06, F01L 5/14 take precedence)
F01L 5/22	1-Punkt Untergruppe	. Multiple-valve arrangements (with valves surrounding working cylinder or piston F01L 5/06; with reciprocatory and other slide valves F01L 5/18; specially for two-stroke engines F01L 5/20)
F01L 5/24	1-Punkt Untergruppe	. Component parts, details, or accessories, not provided for in preceding subgroups of this group
F01L 7/00	Hauptgruppe	Rotary or oscillatory slide-valve gear or valve arrangements (slide valves with combined rotary and non-rotary movements, combinations of rotary and non-rotary slide valves F01L 5/00)
F01L 7/02	1-Punkt Untergruppe	. with cylindrical, sleeve, or part-annularly-shaped valves (of disc type F01L 7/06; of conical type F01L 7/08)
F01L 7/04	2-Punkt Untergruppe	. . surrounding working cylinder or piston
F01L 7/06	1-Punkt Untergruppe	. with disc-type valves
F01L 7/08	1-Punkt Untergruppe	. with conically- or frusto-conically-shaped valves
F01L 7/10	1-Punkt Untergruppe	. with valves of other specific shape, e.g. spherical
F01L 7/12	1-Punkt Untergruppe	. specially for two-stroke engines (F01L 7/04 takes precedence)
F01L 7/14	1-Punkt Untergruppe	. Multiple-valve arrangements (with valves surrounding working cylinder or piston F01L 7/04; specially for two-stroke engines F01L 7/12)
F01L 7/16	1-Punkt Untergruppe	. Sealing or packing arrangements specially therefor
F01L 7/18	1-Punkt Untergruppe	. Component parts, details, or accessories, not provided for in preceding subgroups of this group
F01L 9/00	Hauptgruppe	Valve-gear or valve arrangements actuated non-mechanically
F01L 9/02	1-Punkt Untergruppe	. by fluid means, e.g. hydraulic
F01L 9/04	1-Punkt Untergruppe	. by electric means
F01L 11/00	Hauptgruppe	Valve arrangements in working piston or piston-rod
F01L 11/02	1-Punkt Untergruppe	. in piston
F01L 11/04	2-Punkt Untergruppe	. . operated by movement of connecting-rod
F01L 11/06	3-Punkt Untergruppe	. . . operating oscillatory valve
F01L 13/00	Hauptgruppe	Modifications of valve-gear to facilitate reversing, braking, starting, changing compression ratio, or other specific operations
F01L 13/02	1-Punkt Untergruppe	. for reversing
F01L 13/04	1-Punkt Untergruppe	. for starting by means of fluid pressure
F01L 13/06	1-Punkt Untergruppe	. for braking
F01L 13/08	1-Punkt Untergruppe	. for decompression, e.g. during starting; for changing compression ratio
<u>Valve-gear or valve arrangements, e.g. with reciprocatory slide valves, specially for steam</u>		

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		<u>engines, or specially for other machines or engines with variable working-fluid distribution</u>
F01L 15/00	Hauptgruppe	Valve-gear or valve arrangements, e.g. with reciprocatory slide valves, other than provided for in groups F01L 17/00-F01L 29/00 (valve drive or external valve-adjustment during operation, <u>see</u> the relevant groups, e.g. F01L 31/00; tripping-gear or tripping of valves F01L 31/00)
F01L 15/02	1-Punkt Untergruppe	. with valves other than cylindrical, sleeve, or part-annularly-shaped, e.g. flat D-valves
F01L 15/04	2-Punkt Untergruppe	. . main valve being combined with auxiliary valve (of drag-valve type F01L 15/10)
F01L 15/06	3-Punkt Untergruppe	. . . of Meyer or Rider type, i.e. in which the expansion is varied at the expansion valve itself
F01L 15/08	1-Punkt Untergruppe	. with cylindrical, sleeve, or part-annularly-shaped valves; Such main valves combined with auxiliary valves
F01L 15/10	1-Punkt Untergruppe	. with main slide valve and auxiliary valve dragged thereby
F01L 15/12	1-Punkt Untergruppe	. characterised by having means for effecting pressure equilibrium between two different cylinder spaces at idling
F01L 15/14	1-Punkt Untergruppe	. Arrangements with several co-operating main valves, e.g. reciprocatory and rotary
F01L 15/16	2-Punkt Untergruppe	. . with reciprocatory slide valves only
F01L 15/18	1-Punkt Untergruppe	. Valve arrangements not provided for in preceding subgroups of this group
F01L 15/20	1-Punkt Untergruppe	. Component parts, details, or accessories, not provided for in preceding subgroups of this group
F01L 17/00	Hauptgruppe	Slide-valve gear or valve arrangements with cylindrical, sleeve, or part-annularly-shaped valves surrounding working cylinder or piston
F01L 17/02	1-Punkt Untergruppe	. Drive, or adjustment during operation, peculiar thereto, e.g. for reciprocating and oscillating movements or for several valves one inside the other
F01L 19/00	Hauptgruppe	Slide-valve gear or valve arrangements with reciprocatory and other movement of same valve, other than provided for in group F01L 17/00, e.g. longitudinally and in cross direction of working cylinder
F01L 19/02	1-Punkt Untergruppe	. Drive, or adjustment during operation, peculiar thereto
F01L 21/00	Hauptgruppe	Use of working pistons or piston-rods as fluid-distributing valves or as valve-supporting elements, e.g. in free-piston machines
F01L 21/02	1-Punkt Untergruppe	. Piston or piston-rod used as valve member
F01L 21/04	1-Punkt Untergruppe	. Valves arranged in or on piston or piston-rod
F01L 23/00	Hauptgruppe	Valves controlled by impact of piston, e.g. in free-piston machines
F01L 25/00	Hauptgruppe	Drive, or adjustment during operation, of distribution or expansion valves by non-mechanical means
F01L 25/02	1-Punkt Untergruppe	. by fluid means
F01L 25/04	2-Punkt Untergruppe	. . by working fluid of machine or engine, e.g. free-piston machine
F01L 25/06	3-Punkt Untergruppe	. . . Arrangements with main and auxiliary valves, at least one of them being fluid-driven
F01L 25/08	1-Punkt Untergruppe	. by electric or magnetic means
F01L 27/00	Hauptgruppe	Distribution or expansion-valve gear peculiar to free-piston machines or engines and not provided for in groups F01L 21/00-F01L 25/00
F01L 27/02	1-Punkt Untergruppe	. the machine or engine having rotary or oscillatory valves
F01L 27/04	1-Punkt Untergruppe	. Delayed-action controls, e.g. of cataract- or dash-pot-type
F01L 29/00	Hauptgruppe	Reversing-gear (equally usable for control of degree of working fluid admission, and reversing being of secondary importance F01L 31/00)

Symbol	Typ	Titel
F01L 29/02	1-Punkt Untergruppe	. by displacing eccentric
F01L 29/04	1-Punkt Untergruppe	. by links or guide rods
F01L 29/06	1-Punkt Untergruppe	. by interchanging inlet and exhaust ports
F01L 29/08	1-Punkt Untergruppe	. specially for rotary or oscillatory valves
F01L 29/10	1-Punkt Untergruppe	. Details, e.g. drive
F01L 29/12	2-Punkt Untergruppe	. . Powered reverse gear
F01L 31/00	Hauptgruppe	Valve drive, valve adjustment during operation, or other valve control, not provided for in groups F01L 15/00-F01L 29/00 (sensing elements measuring the variable or condition to be controlled or regulated F01B)
F01L 31/02	1-Punkt Untergruppe	. with tripping-gear (for oscillatory valves F01L 31/06); Tripping of valves
F01L 31/04	2-Punkt Untergruppe	. . with positively-driven trip levers
F01L 31/06	1-Punkt Untergruppe	. with tripping-gear specially for oscillatory valves; Oscillatory tripping-valves, e.g. of Corliss type
F01L 31/08	1-Punkt Untergruppe	. Valve drive or valve adjustment, apart from tripping aspects; Positively-driven gear
F01L 31/10	2-Punkt Untergruppe	. . the drive being effected by eccentrics (F01L 31/14 takes precedence)
F01L 31/12	3-Punkt Untergruppe	. . . Valve adjustment by displacing eccentric
F01L 31/14	2-Punkt Untergruppe	. . Valve adjustment by links or guide rods, e.g. in valve-gears with eccentric drive
F01L 31/16	2-Punkt Untergruppe	. . the drive being effected by specific means other than eccentric, e.g. cams; Valve adjustment in connection with such drives
F01L 31/18	2-Punkt Untergruppe	. . specially for rotary or oscillatory valves
F01L 31/20	3-Punkt Untergruppe	. . . Valve adjustment
F01L 31/22	2-Punkt Untergruppe	. . specially for lift valves
F01L 31/24	3-Punkt Untergruppe	. . . Valve adjustment
		<u>Rotary or oscillatory slide-valve gear or lift-valve gear or such valve arrangements specially for steam engines or specially for other machines or engines with variable working-fluid distribution (drive, adjustment during operation, tripping-gear, reversing-gear, use of working pistons or piston-rods as valves or as valve-supporting elements, valve-gear or valve arrangements peculiar to free-piston machines or engines F01L 15/00-F01L 31/00)</u>
F01L 33/00	Hauptgruppe	Rotary or oscillatory slide-valve gear or valve arrangements
F01L 33/02	1-Punkt Untergruppe	. rotary
F01L 33/04	1-Punkt Untergruppe	. oscillatory
F01L 35/00	Hauptgruppe	Lift-valve gear or valve arrangements
F01L 35/02	1-Punkt Untergruppe	. Valves
F01L 35/04	1-Punkt Untergruppe	. Arrangements of valves in the machine or engine, e.g. relative to working cylinder