Symbol	Typ	Titel
F	**Sektion**	**SECTION F — MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING**
F16	**Klasse**	**ENGINEERING ELEMENTS OR UNITS; GENERAL MEASURES FOR PRODUCING AND MAINTAINING EFFECTIVE FUNCTIONING OF MACHINES OR INSTALLATIONS ; THERMAL INSULATION IN GENERAL**
F16F	**Unterklasse**	**SPRINGS; SHOCK-ABSORBERS; MEANS FOR DAMPING VIBRATION**
F16F 1/00	**Hauptgruppe**	**Springs (working with fluid F16F 5/00, F16F 9/00)**
F16F 1/02	1-Punkt Untergruppe	. made of steel or other material having low internal friction (F16F 1/36 takes precedence); Wound, torsion, leaf, cup, ring or the like springs, the material of the spring not being relevant [6]
F16F 1/04	2-Punkt Untergruppe	. . Wound springs
F16F 1/06	3-Punkt Untergruppe	. . . with turns lying in cylindrical surfaces
F16F 1/08	3-Punkt Untergruppe	. . . with turns lying in mainly conical surfaces
F16F 1/10	3-Punkt Untergruppe	. . . Spiral springs with turns lying substantially in plane surfaces
F16F 1/12	3-Punkt Untergruppe	. . . Attachments or mountings
F16F 1/13	4-Punkt Untergruppe	. . . . comprising inserts or spacers between the windings for changing the mechanical or physical characteristics of the spring [6]
F16F 1/14	2-Punkt Untergruppe	. . Torsion springs consisting of bars or tubes
F16F 1/16	3-Punkt Untergruppe	. . . Attachments or mountings
F16F 1/18	2-Punkt Untergruppe	. . Leaf springs
F16F 1/20	3-Punkt Untergruppe	. . . with layers, e.g. anti-friction layers, or with rollers between the leaves
F16F 1/22	3-Punkt Untergruppe	. . . with means for modifying the spring characteristic
F16F 1/24	3-Punkt Untergruppe	. . . Lubrication; Covers, e.g. for retaining lubricant
F16F 1/26	3-Punkt Untergruppe	. . . Attachments or mountings (B60G 11/10 takes precedence) [5]
F16F 1/28	4-Punkt Untergruppe	. . . . comprising cylindrical metal pins pivoted in close-fitting sleeves
F16F 1/30	4-Punkt Untergruppe	. . . . comprising intermediate pieces made of rubber or similar elastic material
F16F 1/32	2-Punkt Untergruppe	. . Cup springs; Dished disc springs (diaphragms F16J 3/00)
F16F 1/34	2-Punkt Untergruppe	. . Ring springs, i.e. annular bodies deformed radially due to axial load
F16F 1/36	1-Punkt Untergruppe	. made of plastics, e.g. rubber; made of material having high internal friction
F16F 1/362	2-Punkt Untergruppe	. . made of steel wool or compressed hair [6]
F16F 1/364	2-Punkt Untergruppe	. . made of cork, wood or the like material [6]
F16F 1/366	2-Punkt Untergruppe	. . made of fibre reinforced plastics [6]
F16F 1/368	3-Punkt Untergruppe	. . . Leaf springs [6]
F16F 1/37	2-Punkt Untergruppe	. . of foam-like material, e.g. sponge rubber
F16F 1/371	2-Punkt Untergruppe	. . characterised by inserts or auxiliary extension elements, e.g. for rigidification (F16F 1/366, F16F 1/387 take precedence) [6]

Symbol	Typ	Titel
F16F 1/373	2-Punkt Untergruppe	. . characterised by having a particular shape [6]
F16F 1/374	3-Punkt Untergruppe	. . . having a spherical or the like shape [6]
F16F 1/376	3-Punkt Untergruppe	. . . having projections, studs, serrations or the like on at least one surface (F16F 1/387 takes precedence) [6]
F16F 1/377	3-Punkt Untergruppe	. . . having holes or openings (F16F 1/387 takes precedence) [6]
F16F 1/379	2-Punkt Untergruppe	. . characterised by arrangements for regulating the spring temperature, e.g. by cooling [6]
F16F 1/38	2-Punkt Untergruppe	. . with a sleeve of elastic material between a rigid outer sleeve and a rigid inner sleeve or pin
F16F 1/387	3-Punkt Untergruppe	. . . comprising means for modifying the rigidity in particular directions [6]
F16F 1/393	3-Punkt Untergruppe	. . . with spherical or conical sleeves [6]
F16F 1/40	2-Punkt Untergruppe	. . consisting of a stack of similar elements separated by non-elastic intermediate layers
F16F 1/41	3-Punkt Untergruppe	. . . the spring consisting of generally conically arranged elements [6]
F16F 1/42	2-Punkt Untergruppe	. . characterised by the mode of stressing
F16F 1/44	3-Punkt Untergruppe	. . . loaded mainly in compression
F16F 1/46	3-Punkt Untergruppe	. . . loaded mainly in tension
F16F 1/48	3-Punkt Untergruppe	. . . loaded mainly in torsion
F16F 1/50	3-Punkt Untergruppe	. . . loaded mainly in shear
F16F 1/52	3-Punkt Untergruppe	. . . loaded in combined stresses
F16F 1/54	4-Punkt Untergruppe	. . . . loaded in compression and shear
F16F 3/00	**Hauptgruppe**	**Spring units consisting of several springs, e.g. for obtaining a desired spring characteristic (including fluid springs F16F 5/00, F16F 13/00)**
F16F 3/02	1-Punkt Untergruppe	. with springs made of steel or of other material having low internal friction
F16F 3/04	2-Punkt Untergruppe	. . composed only of wound springs
F16F 3/06	3-Punkt Untergruppe	. . . of which some are placed around others in such a way that they damp each other by mutual friction
F16F 3/07	2-Punkt Untergruppe	. . combined with chambers filled with gas or liquid
F16F 3/08	1-Punkt Untergruppe	. with springs made of a material having high internal friction, e.g. rubber
F16F 3/087	2-Punkt Untergruppe	. . Units comprising several springs made of plastics or the like material (F16F 1/40 takes precedence) [6]
F16F 3/093	3-Punkt Untergruppe	. . . the springs being of different materials, e.g. having different types of rubber [6]
F16F 3/10	2-Punkt Untergruppe	. . combined with springs made of steel or other material having low internal friction
F16F 3/12	3-Punkt Untergruppe	. . . the steel spring being in contact with the rubber spring, e.g. being embedded in it [6]
F16F 5/00	**Hauptgruppe**	**Liquid springs in which the liquid works as a spring by compression, e.g. combined with throttling action; Combinations of devices including liquid springs**
F16F 6/00	**Hauptgruppe**	**Magnetic springs; Fluid magnetic springs**
F16F 7/00	**Hauptgruppe**	**Vibration-dampers; Shock-absorbers (using fluid F16F 5/00, F16F 9/00; specific for rotary systems F16F 15/10)**
F16F 7/01	1-Punkt Untergruppe	. using friction between loose particles, e.g. sand [6]

Symbol	Typ	Titel
F16F 7/02	1-Punkt Untergruppe	. with relatively-rotatable friction surfaces that are pressed together (F16F 7/01 takes precedence; one of the members being a spring F16F 13/02) [6]
F16F 7/04	2-Punkt Untergruppe	. . in the direction of the axis of rotation
F16F 7/06	2-Punkt Untergruppe	. . in a direction perpendicular or inclined to the axis of rotation
F16F 7/08	1-Punkt Untergruppe	. with friction surfaces rectilinearly movable along each other (F16F 7/01 takes precedence) [6]
F16F 7/09	2-Punkt Untergruppe	. . in dampers of the cylinder-and-piston type [6]
F16F 7/10	1-Punkt Untergruppe	. using inertia effect
F16F 7/104	2-Punkt Untergruppe	. . the inertia member being resiliently mounted [6]
F16F 7/108	3-Punkt Untergruppe	. . . on plastics springs [6]
F16F 7/112	3-Punkt Untergruppe	. . . on fluid springs [6]
F16F 7/116	3-Punkt Untergruppe	. . . on metal springs [6]
F16F 7/12	1-Punkt Untergruppe	. using plastic deformation of members
F16F 7/14	1-Punkt Untergruppe	. of cable-support type, i.e. frictionally-engaged loop-forming cables
F16F 9/00	**Hauptgruppe**	**Springs, vibration-dampers, shock-absorbers, or similarly-constructed movement-dampers using a fluid or the equivalent as damping medium (F16F 5/00 takes precedence; connection of valves to inflatable elastic bodies B60C 29/00; door-operating appliances with fluid braking systems E05F)**
F16F 9/02	1-Punkt Untergruppe	. using gas only
F16F 9/04	2-Punkt Untergruppe	. . in a chamber with a flexible wall
F16F 9/05	3-Punkt Untergruppe	. . . the flexible wall being of the rolling diaphragm type [5]
F16F 9/06	1-Punkt Untergruppe	. using both gas and liquid
F16F 9/08	2-Punkt Untergruppe	. . in a chamber with a flexible wall
F16F 9/084	3-Punkt Untergruppe	. . . comprising a gas spring contained within a flexible wall, the wall not being in contact with the damping fluid, i.e. mounted externally on the damper cylinder [6]
F16F 9/088	3-Punkt Untergruppe	. . . comprising a gas spring with a flexible wall provided within the cylinder on the piston rod of a monotubular damper or within the inner tube of a bitubular damper [6]
F16F 9/092	3-Punkt Untergruppe	. . . comprising a gas spring with a flexible wall provided between the tubes of a bitubular damper [6]
F16F 9/096	3-Punkt Untergruppe	. . . comprising a hydropneumatic accumulator of the membrane type provided on the upper or the lower end of a damper or separately from or laterally on the damper [6]
F16F 9/10	1-Punkt Untergruppe	. using liquid only; using a fluid of which the nature is immaterial
F16F 9/12	2-Punkt Untergruppe	. . Devices with one or more rotary vanes turning in the fluid, any throttling effect being immaterial
F16F 9/14	2-Punkt Untergruppe	. . Devices with one or more members, e.g. pistons, vanes, moving to and fro in chambers and using throttling effect
F16F 9/16	3-Punkt Untergruppe	. . . involving only straight-line movement of the effective parts
F16F 9/18	4-Punkt Untergruppe	. . . . with a closed cylinder and a piston separating two or more working spaces therein
F16F 9/19	5-Punkt Untergruppe	. . . . . with a single cylinder

Symbol	Typ	Titel
F16F 9/20	5-Punkt Untergruppe	. . . . . with the piston-rod extending through both ends of the cylinder
F16F 9/22	4-Punkt Untergruppe	. . . . with one or more cylinders, each having a single working space closed by a piston or plunger
F16F 9/24	5-Punkt Untergruppe	. . . . . with a single cylinder and a single piston or plunger
F16F 9/26	5-Punkt Untergruppe	. . . . . with two cylinders in line and with the two pistons or plungers connected together
F16F 9/28	5-Punkt Untergruppe	. . . . . with two parallel cylinders and with the two pistons or plungers connected together
F16F 9/30	1-Punkt Untergruppe	. with solid or semi-solid material, e.g. pasty masses, as damping medium
F16F 9/32	1-Punkt Untergruppe	. Details
F16F 9/34	2-Punkt Untergruppe	. . Special valve constructions (valves in general F16K); Shape or construction of throttling passages
F16F 9/342	3-Punkt Untergruppe	. . . Throttling passages operating with metering pins
F16F 9/344	3-Punkt Untergruppe	. . . Vortex flow passages [6]
F16F 9/346	3-Punkt Untergruppe	. . . Throttling passages in the form of slots arranged in cylinder walls
F16F 9/348	3-Punkt Untergruppe	. . . Throttling passages in the form of annular discs operating in opposite directions
F16F 9/36	2-Punkt Untergruppe	. . Special sealings, including sealings or guides for piston-rods
F16F 9/38	2-Punkt Untergruppe	. . Covers for protection or appearance
F16F 9/40	2-Punkt Untergruppe	. . Arrangements for preventing froth
F16F 9/42	2-Punkt Untergruppe	. . Cooling arrangements
F16F 9/43	2-Punkt Untergruppe	. . Filling arrangements, e.g. for supply of gas
F16F 9/44	2-Punkt Untergruppe	. . Means on or in the damper for manual or non-automatic adjustment; such means combined with temperature correction (F16F 9/53, F16F 9/56 take precedence; temperature correction only F16F 9/52) [5, 6]
F16F 9/46	3-Punkt Untergruppe	. . . allowing control from a distance
F16F 9/48	2-Punkt Untergruppe	. . Arrangements for providing different damping effects at different parts of the stroke (F16F 9/53, F16F 9/56 take precedence) [5, 6]
F16F 9/49	3-Punkt Untergruppe	. . . Stops limiting fluid passage, e.g. hydraulic stops
F16F 9/50	2-Punkt Untergruppe	. . Special means providing automatic damping adjustment (F16F 9/53, F16F 9/56 take precedence) [5, 6]
F16F 9/504	3-Punkt Untergruppe	. . . Inertia-sensitive means [6]
F16F 9/508	3-Punkt Untergruppe	. . . Means responsive to the velocity of movement of the piston [6]
F16F 9/512	3-Punkt Untergruppe	. . . Means responsive to load action on the damper or fluid pressure in the damper [6]
F16F 9/516	3-Punkt Untergruppe	. . . resulting in the damping effects during contraction being different from the damping effects during extension [6]
F16F 9/52	3-Punkt Untergruppe	. . . in case of change of temperature (combined with external adjustment F16F 9/44)
F16F 9/53	2-Punkt Untergruppe	. . Means for adjusting damping characteristics by varying fluid viscosity, e.g. electromagnetically [5]
F16F 9/54	2-Punkt Untergruppe	. . Arrangements for attachment
F16F 9/56	2-Punkt Untergruppe	. . Means for adjusting the length of, or for locking, the spring or damper, e.g. at the end of the stroke [6]

Symbol	Typ	Titel
F16F 9/58	2-Punkt Untergruppe	. . Stroke limiting stops, e.g. arranged on the piston rod outside the cylinder (F16F 9/49 takes precedence) [6]
F16F 11/00	**Hauptgruppe**	**Vibration-dampers or shock-absorbers working with both friction and a damping fluid**
F16F 13/00	**Hauptgruppe**	**Units comprising springs of the non-fluid type as well as vibration-dampers, shock-absorbers, or fluid springs (F16F 5/00 takes precedence)**
F16F 13/02	1-Punkt Untergruppe	. damping by frictional contact between the spring and braking means (frictionally coacting wound springs F16F 3/06)
F16F 13/04	1-Punkt Untergruppe	. comprising both a plastics spring and a damper, e.g. a friction damper [6]
F16F 13/06	2-Punkt Untergruppe	. . the damper being a fluid damper, e.g. the plastics spring not forming a part of the wall of the fluid chamber of the damper (F16F 13/26 takes precedence) [6]
F16F 13/08	3-Punkt Untergruppe	. . . the plastics spring forming at least a part of the wall of the fluid chamber of the damper (F16F 13/20-F16F 13/24 take precedence) [6]
F16F 13/10	4-Punkt Untergruppe	. . . . the wall being at least in part formed by a flexible membrane or the like (F16F 13/12-F16F 13/18 take precedence) [6]
F16F 13/12	4-Punkt Untergruppe	. . . . Single chamber dampers (F16F 13/14 takes precedence) [6]
F16F 13/14	4-Punkt Untergruppe	. . . . Units of the bushing type [6]
F16F 13/16	5-Punkt Untergruppe	. . . . . specially adapted for receiving axial loads [6]
F16F 13/18	4-Punkt Untergruppe	. . . . characterised by the location or the shape of the equilibration chamber, e.g. the equilibration chamber surrounding the plastics spring or being annular (F16F 13/14 takes precedence) [6]
F16F 13/20	3-Punkt Untergruppe	. . . characterised by comprising also a pneumatic spring (F16F 13/22 takes precedence) [6]
F16F 13/22	3-Punkt Untergruppe	. . . characterised by comprising also a dynamic damper (dampers using inertia effect per se F16F 7/10) [6]
F16F 13/24	3-Punkt Untergruppe	. . . the central part of the unit being supported by one element and both extremities of the unit being supported by a single other element, i.e. double acting mounting [6]
F16F 13/26	2-Punkt Untergruppe	. . characterised by adjusting or regulating devices responsive to exterior conditions [6]
F16F 13/28	3-Punkt Untergruppe	. . . specially adapted for units of the bushing type (F16F 13/30 takes precedence) [6]
F16F 13/30	3-Punkt Untergruppe	. . . comprising means for varying fluid viscosity, e.g. of magnetic or electrorheological fluids [6]
F16F 15/00	**Hauptgruppe**	**Suppression of vibrations in systems (vehicle seat suspension devices B60N 2/50); Means or arrangements for avoiding or reducing out-of-balance forces, e.g. due to motion (testing static or dynamic balance of machines or structures G01M 1/00)**
F16F 15/02	1-Punkt Untergruppe	. Suppression of vibrations of non-rotating, e.g. reciprocating, systems; Suppression of vibrations of rotating systems by use of members not moving with the rotating system (layered products B32B; suppression of vibration in ships B63)
F16F 15/023	2-Punkt Untergruppe	. . using fluid means [6]
F16F 15/027	3-Punkt Untergruppe	. . . comprising control arrangements [6]
F16F 15/03	2-Punkt Untergruppe	. . using electromagnetic means (F16F 9/53 takes precedence) [5]
F16F 15/04	2-Punkt Untergruppe	. . using elastic means (single elements or their attachment F16F 1/00-F16F 13/00) [2]
F16F 15/06	3-Punkt Untergruppe	. . . with metal springs (with rubber springs also F16F 15/08)
F16F 15/067	4-Punkt Untergruppe	. . . . using only wound springs [6]
F16F 15/073	4-Punkt Untergruppe	. . . . using only leaf springs [6]
F16F 15/08	3-Punkt Untergruppe	. . . with rubber springs

Symbol	Typ	Titel
F16F 15/10	1-Punkt Untergruppe	. Suppression of vibrations in rotating systems by making use of members moving with the system (by balancing F16F 15/22; with flywheels acting variably or intermittently F16H)
F16F 15/12	2-Punkt Untergruppe	. . using elastic members or friction-damping members, e.g. between a rotating shaft and a gyratory mass mounted thereon (F16F 15/16 takes precedence) [6]
F16F 15/121	3-Punkt Untergruppe	. . . using springs as elastic members, e.g. metallic springs (F16F 15/131 takes precedence) [6]
F16F 15/123	4-Punkt Untergruppe	. . . . Wound springs [6]
F16F 15/124	4-Punkt Untergruppe	. . . . Plastics springs, e.g. made of rubber (F16F 15/123 takes precedence) [6]
F16F 15/126	5-Punkt Untergruppe	. . . . . consisting of at least one annular element surrounding the axis of rotation [6]
F16F 15/127	4-Punkt Untergruppe	. . . . using plastics springs combined with other types of springs [6]
F16F 15/129	3-Punkt Untergruppe	. . . characterised by friction-damping means (F16F 15/131 takes precedence) [6]
F16F 15/131	3-Punkt Untergruppe	. . . the rotating system comprising two or more gyratory masses [6]
F16F 15/133	4-Punkt Untergruppe	. . . . using springs as elastic members, e.g. metallic springs [6]
F16F 15/134	5-Punkt Untergruppe	. . . . . Wound springs [6]
F16F 15/136	5-Punkt Untergruppe	. . . . . Plastics springs, e.g. made of rubber (F16F 15/134 takes precedence) [6]
F16F 15/137	5-Punkt Untergruppe	. . . . . the elastic members consisting of two or more springs of different types [6]
F16F 15/139	4-Punkt Untergruppe	. . . . characterised by friction-damping means [6]
F16F 15/14	2-Punkt Untergruppe	. . using freely-swinging masses rotating with the system
F16F 15/16	2-Punkt Untergruppe	. . using a fluid (devices connecting input and output members F16D)
F16F 15/167	3-Punkt Untergruppe	. . . having an inertia member, e.g. ring [6]
F16F 15/173	4-Punkt Untergruppe	. . . . provided within a closed housing [6]
F16F 15/18	2-Punkt Untergruppe	. . using electric means (dynamo-electric devices H02K)
F16F 15/20	1-Punkt Untergruppe	. Suppression of vibrations of rotating systems by favourable grouping or relative arrangement of the moving members of the system or systems
F16F 15/22	1-Punkt Untergruppe	. Compensation of inertia forces
F16F 15/24	2-Punkt Untergruppe	. . of crankshaft systems by particular disposition of cranks, pistons, or the like
F16F 15/26	2-Punkt Untergruppe	. . of crankshaft systems using solid masses, other than the ordinary pistons, moving with the system
F16F 15/28	1-Punkt Untergruppe	. Counterweights; Attaching or mounting same (for roll-type closures E06B 9/62)
F16F 15/30	1-Punkt Untergruppe	. Flywheels (F16F 15/16 takes precedence; suppression of vibrations in rotating systems using elastic members or friction-damping members moving with the system F16F 15/12; rotary-body aspects in general F16C 13/00, F16C 15/00) [6]
F16F 15/305	2-Punkt Untergruppe	. . made of plastics, e.g. fibre reinforced plastics (FRP) [6]
F16F 15/31	2-Punkt Untergruppe	. . characterised by means for varying the moment of inertia [6]
F16F 15/315	2-Punkt Untergruppe	. . characterised by their supporting arrangement, e.g. mountings, cages, securing inertia member to shaft (F16F 15/31 takes precedence) [6]

Symbol	Typ	Titel
F16F 15/32	1-Punkt Untergruppe	. Correcting- or balancing-weights or equivalent means for balancing rotating bodies, e.g. vehicle wheels [2, 5]
F16F 15/34	2-Punkt Untergruppe	. . Fastening arrangements therefor [5]
F16F 15/36	2-Punkt Untergruppe	. . operating automatically [5]