

# CPC COOPERATIVE PATENT CLASSIFICATION

## F MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING (NOTE omitted)

### ENGINEERING IN GENERAL

## F16 ENGINEERING ELEMENTS AND UNITS; GENERAL MEASURES FOR PRODUCING AND MAINTAINING EFFECTIVE FUNCTIONING OF MACHINES OR INSTALLATIONS; THERMAL INSULATION IN GENERAL

### F16H GEARING

#### NOTES

- Combinations including mechanical gearings are classified in groups [F16H 37/00](#) or [F16H 47/00](#), unless they are provided for in groups [F16H 1/00](#) - [F16H 35/00](#).
- In this subclass, sets of rigidly-connected members are regarded as single members.
- In this subclass, the following terms or expressions are used with the meanings indicated:
  - "toothed gearing" includes worm gearing and other gearing involving at least one wheel or sector provided with teeth or the equivalent, EXCEPT gearing with chains or toothed belts, which is treated as friction gearing;
  - "conveying motion" includes transmitting energy, and means that the applied and resultant motions are of the same kind, though they may differ in, e.g. speed, direction extent;
  - "rotary" implies that the motion may continue indefinitely;
  - "oscillating" means moving about an axis to an extent which is limited by the construction of the gearing, and which may exceed one revolution, the movement being alternately forwards and backwards during continued operation of the gearing;
  - "reciprocating" means moving substantially in a straight line, the movement being alternately forwards and backwards during continued operation of the gearing;
  - "reversing" or "reversal" means that an applied movement in one direction may produce a resultant movement in either of two opposed directions at will;
  - "central gears" includes any gears whose axis is the main axis of the gearing.
- Attention is drawn to the following places:
 

<a href="#">A01D 69/06</a>	Gearings in harvesting machines
<a href="#">A63H 31/00</a>	Gearing for toys
<a href="#">B21B 35/12</a>	Toothed-wheel gearing for metal-rolling mills
<a href="#">B60K</a>	Arrangement of transmissions in vehicles
<a href="#">B61C 9/00</a>	Transmissions for railway locomotives
<a href="#">B62D 3/00</a>	Vehicle steering gears
<a href="#">B62M</a>	Transmissions for cycles
<a href="#">B63H 23/00</a>	Transmissions for marine propulsions
<a href="#">B63H 25/00</a>	Marine steering gears
<a href="#">B64C 27/12</a> , <a href="#">B64C 27/58</a>	{ Transmissions for helicopters }
<a href="#">B64D 35/00</a>	{ Transmissions for aircraft }
<a href="#">F01-F04</a>	Machines, engines, pumps
<a href="#">F15B 15/00</a>	Gearings associated with fluid-actuated devices
<a href="#">G01D 5/04</a>	Gearing used in indicating or recording apparatus in connection with measuring devices
<a href="#">H03J 1/00</a>	Driving arrangements for tuning resonant circuits
<a href="#">H04L 13/04</a>	Driving mechanisms for apparatus for transmission of coded digital information.

#### Toothed gearings for conveying rotary motion

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|-------------|--|
| <b>1/00</b> | <b>Toothed gearings for conveying rotary motion</b><br>(specific for conveying rotary motion with variable gear ratio or for reversing rotary motion <a href="#">F16H 3/00</a> ) |
| 1/003       | . {Unidirectionally torque-transmitting toothed gearing}   |
| 1/006       | . {the driving and driven axes being designed to assume variable positions relative to one another during operation}   |
| 1/02        | . without gears having orbital motion  |
| 1/04        | . . involving only two intermeshing members  |
| 1/06        | . . . with parallel axes   |

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|-------|---|
| 1/08  | . . . . the members having helical, herringbone, or like teeth          |
| 1/10  | . . . . one of the members being internally toothed                     |
| 1/12  | . . . with non-parallel axes  |
| 1/125 | . . . . {comprising spiral gears only}                                  |
| 1/14  | . . . . comprising conical gears only                                   |
| 1/145 | . . . . . {with offset axes, e.g. hypoid gearings}                      |
| 1/16  | . . . . comprising worm and worm-wheel                                  |
| 1/163 | . . . . . {with balls between the co-operating parts}                   |
| 1/166 | . . . . . {with members rotating around axes on the worm or worm-wheel} |

1/18	. . . the members having helical, herringbone, or like teeth (F16H 1/14 takes precedence)	1/34	. . involving gears essentially having intermeshing elements other than involute or cycloidal teeth (in worm gearing F16H 1/30)
1/20	. . involving more than two intermeshing members	1/36	. . with two central gears coupled by intermeshing orbital gears
1/203	. . . {with non-parallel axes (F16H 1/22 takes precedence)}	1/46	. . Systems consisting of a plurality of gear trains each with orbital gears, {i.e. systems having three or more central gears}
1/206	. . . {characterised by the driving or driven member being composed of two or more gear wheels}	1/48	. . Special means compensating for misalignment of axes {, e.g. for equalising distribution of load on the face width of the teeth}
1/22	. . . with a plurality of driving or driven shafts; with arrangements for dividing torque between two or more intermediate shafts	<b>3/00</b>	<b>Toothed gearings for conveying rotary motion with variable gear ratio or for reversing rotary motion (speed-changing or reversing mechanisms F16H 59/00 - F16H 63/00)</b>
1/222	. . . . {with non-parallel axes}	3/001	. {convertible for varying the gear ratio, e.g. for selecting one of several shafts as the input shaft}
1/225	. . . . {with two or more worm and worm-wheel gearings}	3/002	. {using gears having teeth movable out of mesh (F16H 3/16, F16H 3/20 and F16H 3/42 take precedence)}
1/227	. . . . {comprising two or more gearwheels in mesh with the same internally toothed wheel}	3/003	. {the gear ratio being changed by inversion of torque direction}
1/24	. . involving gears essentially having intermeshing elements other than involute or cycloidal teeth (F16H 1/16 takes precedence)	3/005	. . {for gearings using gears having orbital motion}
1/26	. . Special means compensating for misalignment of axes	3/006	. {power being selectively transmitted by parallel flow paths, e.g. dual clutch transmissions}
1/28	. with gears having orbital motion	2003/007	. . {with two flow paths, one being directly connected to the input, the other being connected to the input through a clutch}
1/2809	. . {with means for equalising the distribution of load on the planet gears}	2003/008	. . {comprising means for selectively driving countershafts}
1/2818	. . . {by allowing limited movement of the ring gear relative to the casing or shaft}	3/02	. without gears having orbital motion
1/2827	. . . {by allowing limited movement of the planet carrier, e.g. relative to its shaft}	3/04	. . with internally-toothed gears
1/2836	. . . {by allowing limited movement of the planet gears relative to the planet carrier or by using free floating planet gears}	3/06	. . with worm and worm-wheel or gears essentially having helical or herring-bone teeth
1/2845	. . . {by allowing limited movement of the sun gear}	3/08	. . exclusively or essentially with continuously meshing gears, that can be disengaged from their shafts
1/2854	. . {involving conical gears}		<b>NOTE</b>
1/2863	. . {Arrangements for adjusting or for taking-up backlash}		In this group, gears which can be put out of mesh are not taken into consideration if they are used for reversal only.
2001/2872	. . {comprising three central gears, i.e. ring or sun gear, engaged by at least one common orbital gear mounted on an idling carrier}	2003/0803	. . . {with countershafts coaxial with input or output shaft}
2001/2881	. . {comprising two axially spaced central gears, i.e. ring or sun gear, engaged by at least one common orbital gear wherein one of the central gears is forming the output}	2003/0807	. . . {with gear ratios in which the power is transferred by axially coupling idle gears to each other}
2001/289	. . {comprising two or more coaxial and identical sets of orbital gears, e.g. for distributing torque between the coaxial sets}	2003/0811	. . . {using unsynchronised clutches}
1/30	. . in which an orbital gear has an axis crossing the main axis of the gearing and has helical teeth or is a worm	2003/0815	. . . {using torque sharing, i.e. engaging two gear ratios simultaneously to transfer large torque, e.g. using one slipping clutch}
1/32	. . in which the central axis of the gearing lies inside the periphery of an orbital gear	2003/0818	. . . {comprising means for power-shifting}
1/321	. . . {the orbital gear being nutating}	2003/0822	. . . {characterised by the arrangement of at least one reverse gear}
2001/322	. . . {comprising at least one universal joint or flexible coupling, e.g. a Cardan joint}	2003/0826	. . . {wherein at least one gear on the input shaft, or on a countershaft is used for two different forward gear ratios}
2001/323	. . . {comprising eccentric crankshafts driving or driven by a gearing}	3/083	. . . with radially acting and axially controlled clutching members, e.g. sliding keys
2001/324	. . . {comprising two axially spaced, rigidly interconnected, orbital gears}	3/085	. . . with more than one output shaft
2001/325	. . . {comprising a carrier with pins guiding at least one orbital gear with circular holes}		
2001/326	. . . {comprising linear guiding means guiding at least one orbital gear}		
2001/327	. . . {with the orbital gear having internal gear teeth}		
2001/328	. . . {comprising balancing means}		

3/087	. . . characterised by the disposition of the gears ( <a href="#">F16H 3/083</a> , <a href="#">F16H 3/085</a> take precedence)	3/32	. . . . . and an additional shaft
<b>NOTE</b>		3/34	. . . with gears shiftable otherwise than only axially
When counting the countershafts, the reverse countershaft is not taken into consideration if it is used for reversal only.		3/36	. . . with a single gear meshable with any of a set of coaxial gears of different diameters
3/089	. . . . all of the meshing gears being supported by a pair of parallel shafts, one being the input shaft and the other the output shaft, there being no countershaft involved	3/363	. . . . {the teeth of the set of coaxial gears being arranged on a surface of generally conical shape}
3/091	. . . . including a single countershaft	3/366	. . . . {the teeth of the set of coaxial gears being arranged on a generally flat, e.g. disc-type, surface}
3/0915	. . . . . {with coaxial input and output shafts}	3/38	. . . with synchro-meshing
3/093	. . . . with two or more countershafts	3/385	. . . . {with braking means}
2003/0931	. . . . . {each countershaft having an output gear meshing with a single common gear on the output shaft}	3/40	. . . Gearings for reversal only
2003/0933	. . . . . {with coaxial countershafts}	3/42	. . with gears having teeth formed or arranged for obtaining multiple gear ratios, e.g. nearly infinitely variable
2003/0935	. . . . . {with multiple countershafts comprising only one idle gear and one gear fixed to the countershaft}	3/423	. . . {the teeth being arranged on a surface of generally conical shape}
2003/0936	. . . . . {with multiple countershafts comprising only two idle gears and one gear fixed to the countershaft}	3/426	. . . {the teeth being arranged on a generally flat, e.g. disc-type surface}
2003/0938	. . . . . {with multiple gears on the input shaft directly meshing with respective gears on the output shaft}	3/44	. using gears having orbital motion
3/095	. . . . . with means for ensuring an even distribution of torque between the countershafts	2003/442	. . {comprising two or more sets of orbital gears arranged in a single plane}
3/097	. . . . . the input and output shafts being aligned on the same axis	2003/445	. . {without permanent connection between the input and the set of orbital gears}
3/10	. . . with one or more one-way clutches as an essential feature	2003/447	. . {without permanent connection between the set of orbital gears and the output}
3/12	. . . with means for synchronisation not incorporated in the clutches	3/46	. . Gearings having only two central gears, connected by orbital gears ( <a href="#">F16H 3/68</a> - <a href="#">F16H 3/78</a> take precedence)
2003/123	. . . . {using a brake}	3/48	. . . with single orbital gears or pairs of rigidly-connected orbital gears
3/126	. . . . {using an electric drive}	3/50	. . . . comprising orbital conical gears
3/14	. . . Gearings for reversal only	3/52	. . . . comprising orbital spur gears
3/145	. . . . {with a pair of coaxial bevel gears, rotatable in opposite directions}	3/54	. . . . . one of the central gears being internally toothed and the other externally toothed
3/16	. . essentially with both gears that can be put out of gear and continuously-meshing gears that can be disengaged from their shafts	3/56	. . . . . both central gears being sun gears
<b>NOTE</b>		3/58	. . . with sets of orbital gears, each consisting of two or more intermeshing orbital gears
In this group, gears which can be put out of mesh are not taken into consideration if they are used for reversal only.		3/60	. . . Gearings for reversal only
3/18	. . . Gearings for reversal only	3/62	. . Gearings having three or more central gears ( <a href="#">F16H 3/68</a> - <a href="#">F16H 3/78</a> take precedence)
3/20	. . exclusively or essentially using gears that can be moved out of gear	3/64	. . . composed of a number of gear trains, the drive always passing through all the trains, each train having not more than one connection for driving another train
<b>NOTE</b>		3/66	. . . composed of a number of gear trains without drive passing from one train to another
In this group, gears which can be put out of mesh are not taken into consideration if they are used for reversal only.		3/663	. . . . {with conveying rotary motion between axially spaced orbital gears, e.g. a stepped orbital gear or Ravigneaux}
3/22	. . . with gears shiftable only axially	3/666	. . . . {with intermeshing orbital gears ( <a href="#">F16H 3/663</a> takes precedence)}
3/24	. . . . with driving and driven shafts coaxial	3/68	. . in which an orbital gear has an axis crossing the main axis of the gearing and has helical teeth or is a worm
3/26	. . . . . and two or more additional shafts	3/70	. . in which the central axis of the gearing lies inside the periphery of an orbital gear
3/28	. . . . . an additional shaft being coaxial with the main shafts	3/72	. . with a secondary drive, e.g. regulating motor, in order to vary speed continuously
3/30	. . . . with driving and driven shafts not coaxial	3/721	. . . {the secondary drive being an energy dissipating device, e.g. regulating brake, in order to vary speed continuously}
		3/722	. . . . {the secondary drive being a fluid throttle}

- 3/724 . . . {using externally powered electric machines}
- 3/725 . . . . {with means to change ratio in the mechanical gearing}
- 3/727 . . . {with at least two dynamo electric machines for creating an electric power path inside the gearing, e.g. using generator and motor for a variable power torque path}
- 3/728 . . . . {with means to change ratio in the mechanical gearing}
- 3/74 . . Complexes, not using actuatable speed-changing or regulating members, e.g. with gear ratio determined by free play of frictional or other forces
- 3/76 . . with an orbital gear having teeth formed or arranged for obtaining multiple gear ratios, e.g. nearly infinitely variable
- 3/78 . . Special adaptation of synchronisation mechanisms to these gearings

#### **Gearing for conveying rotary motion by endless flexible members**

##### **7/00 Gearings for conveying rotary motion by endless flexible members (specific for conveying rotary motion with variable gear ratio or for reversing rotary motion F16H 9/00)**

- 7/02 . with belts; with V-belts
- 7/023 . . {with belts having a toothed contact surface or regularly spaced bosses or hollows for slipless or nearly slipless meshing with complementary profiled contact surface of a pulley}
- 2007/026 . . {with belts running in a mist of oil}
- 7/04 . with ropes
- 7/06 . with chains
- 7/08 . Means for varying tension of belts, ropes or chains (pulleys of adjustable construction F16H 55/52)
- 2007/0802 . . {Actuators for final output members}
- 2007/0804 . . . {Leaf springs}
- 2007/0806 . . . {Compression coil springs}
- 2007/0808 . . . {Extension coil springs}
- 2007/081 . . . {Torsion springs}
- 2007/0812 . . . {Fluid pressure}
- 2007/0814 . . . . {with valves opening on surplus pressure}
- 2007/0817 . . . . {with means for venting unwanted gas}
- 2007/0819 . . . {Rubber or other elastic materials}
- 2007/0821 . . . {working with gravity}
- 2007/0823 . . . {Electric actuators}
- 2007/0825 . . . {influenced by other actuators of output members}
- 7/0827 . . {for disconnecting the drive}
- 7/0829 . . {with vibration damping means}
- 7/0831 . . . {of the dry friction type}
- 7/0834 . . . {of the viscous friction type, e.g. viscous fluid}
- 7/0836 . . . {of the fluid and restriction type, e.g. dashpot}
- 7/0838 . . . {of the dissipating material type, e.g. elastomeric spring}
- 2007/084 . . . {having vibration damping characteristics dependent on the moving direction of the tensioner}
- 2007/0842 . . {Mounting or support of tensioner}
- 2007/0844 . . . {Mounting elements essentially within boundaries of final output members}
- 2007/0846 . . {comprising a mechanical stopper}
- 7/0848 . . {with means for impeding reverse motion}
- 2007/0851 . . . {Wedges}

- 2007/0853 . . . {Ratchets}
- 2007/0855 . . . . {comprising a clip member engaging with the rack teeth}
- 2007/0857 . . . {Screw mechanisms}
- 2007/0859 . . . {Check valves}
- 2007/0861 . . {comprising means for sensing tensioner position}
- 2007/0863 . . {Finally actuated members, e.g. constructional details thereof}
- 2007/0865 . . . {Pulleys}
- 2007/0868 . . . . {comprising means for changing working diameter of pulley}
- 2007/087 . . . {Sprockets}
- 2007/0872 . . . {Sliding members}
- 2007/0874 . . . {Two or more finally actuated members}
- 2007/0876 . . {Control or adjustment of actuators}
- 2007/0878 . . . {Disabling during transport}
- 2007/088 . . . {Manual adjustment}
- 2007/0882 . . . {the tension being a function of temperature}
- 2007/0885 . . . {the tension being a function of engine running condition}
- 2007/0887 . . . {the tension being a function of load}
- 2007/0889 . . {Path of movement of the finally actuated member}
- 2007/0891 . . . {Linear path}
- 2007/0893 . . . {Circular path}
- 2007/0895 . . . {Internal to external direction}
- 2007/0897 . . . {External to internal direction}
- 7/10 . . by adjusting the axis of a pulley
- 7/12 . . . of an idle pulley
- 7/1209 . . . . {with vibration damping means}
- 7/1218 . . . . . {of the dry friction type}
- 7/1227 . . . . . {of the viscous friction type, e.g. viscous fluid}
- 7/1236 . . . . . {of the fluid and restriction type, e.g. dashpot}
- 7/1245 . . . . . {of the dissipating material type, e.g. elastomeric spring}
- 7/1254 . . . . . {without vibration damping means}
- 7/1263 . . . . . {where the axis of the pulley moves along a substantially straight path}
- 7/1272 . . . . . {with means for impeding reverse motion}
- 7/1281 . . . . . {where the axis of the pulley moves along a substantially circular path}
- 7/129 . . . . . {with means for impeding reverse motion}
- 7/14 . . . of a driving or driven pulley
- 7/16 . . . . without adjusting the driving or driven shaft
- 7/18 . Means for guiding or supporting belts, ropes, or chains (construction of pulleys F16H 55/36)
- 2007/185 . . {the guiding surface in contact with the belt, rope or chain having particular shapes, structures or materials}
- 7/20 . . Mountings for rollers or pulleys
- 7/22 . Belt, rope, or chain shifters
- 7/24 . Equipment for mounting belts, ropes, or chains

##### **9/00 Gearings for conveying rotary motion with variable gear ratio, or for reversing rotary motion, by endless flexible members (control of change-speed or reversing-gearings conveying rotary motion F16H 59/00 - F16H 63/00)**



9/02	without members having orbital motion	15/02	without members having orbital motion
9/04	using belts, V-belts, or ropes (with toothed belts F16H 9/24; pulleys of adjustable construction F16H 55/52)	15/04	Gearings providing a continuous range of gear ratios
9/06	engaging a stepped pulley	15/06	in which a member A of uniform effective diameter mounted on a shaft may co-operate with different parts of a member B
9/08	engaging a conical drum (F16H 9/12 takes precedence)	15/08	in which the member B is a disc with a flat or approximately flat friction surface
9/10	engaging a pulley provided with radially-actuable elements carrying the belt	15/10	in which the axes of the two members cross or intersect
9/12	engaging a pulley built-up out of relatively axially-adjustable parts in which the belt engages the opposite flanges of the pulley directly without interposed belt-supporting members	15/12	in which one or each member is duplicated, e.g. for obtaining better transmission, for lessening the reaction forces on the bearings
9/125	{characterised by means for controlling the geometrical interrelationship of pulleys and the endless flexible member, e.g. belt alignment or position of the resulting axial pulley force in the plane perpendicular to the pulley axis}	15/14	in which the axes of the members are parallel or approximately parallel
9/14	using only one pulley built-up out of adjustable conical parts	15/16	in which the member B has a conical friction surface
9/16	using two pulleys, both built-up out of adjustable conical parts	15/18	externally
2009/163	{Arrangements of two or more belt gearings mounted in parallel, e.g. for increasing transmittable torque}	15/20	co-operating with the outer rim of the member A, which is perpendicular or nearly perpendicular to the friction surface of the member B
2009/166	{Arrangements of two or more belt gearings mounted in series, e.g. for increasing ratio coverage}	15/22	the axes of the members being parallel or approximately parallel
9/18	only one flange of each pulley being adjustable	15/24	internally
9/20	both flanges of the pulleys being adjustable	15/26	in which the member B has a spherical friction surface centered on its axis of revolution
9/22	specially adapted for ropes	15/28	with external friction surface
9/24	using chains or toothed belts, belts in the form of links; Chains or belts specially adapted to such gearing	15/30	with internal friction surface
2009/245	{with idle wheels to assist ratio change}	15/32	in which the member B has a curved friction surface formed as a surface of a body of revolution generated by a curve which is neither a circular arc centered on its axis of revolution nor a straight line
9/26	with members having orbital motion	15/34	with convex friction surface
		15/36	with concave friction surface, e.g. a hollow toroid surface
		15/38	with two members B having hollow toroid surfaces opposite to each other, the member or members A being adjustably mounted between the surfaces

#### Other friction gearing for conveying rotary motion

<b>13/00</b>	<b>Gearing for conveying rotary motion with constant gear ratio by friction between rotary members</b>		
13/02	without members having orbital motion	2015/383	{with two or more sets of toroid gearings arranged in parallel}
13/04	with balls or with rollers acting in a similar manner	2015/386	{with two or more sets of toroid gearings arranged in series}
13/06	with members having orbital motion	15/40	in which two members co-operative by means of balls, or rollers of uniform effective diameter, not mounted on shafts
13/08	with balls or with rollers acting in a similar manner	15/42	in which two members co-operate by means of rings or by means of parts of endless flexible members pressed between the first mentioned members
13/10	Means for influencing the pressure between the members	15/44	in which two members of non-uniform effective diameter directly co-operate with one another
13/12	by magnetic forces	15/46	Gearings providing a discontinuous or stepped range of gear ratios
13/14	for automatically varying the pressure mechanically	15/48	with members having orbital motion
<b>15/00</b>	<b>Gearings for conveying rotary motion with variable gear ratio, or for reversing rotary motion, by friction between rotary members (control of change-speed or reversing-gearings conveying rotary motion F16H 59/00 - F16H 63/00)</b>	15/50	Gearings providing a continuous range of gear ratios
15/01	characterised by the use of a magnetisable powder or liquid as friction medium between the rotary members		

15/503	. . . {in which two members co-operate by means of balls or rollers of uniform effective diameter, not mounted on shafts}	19/0628	. . . . {the flexible member, e.g. a cable, being wound with one string to a drum and unwound with another string to create reciprocating movement of the flexible member}
15/506	. . . {in which two members of non-uniform effective diameter directly co-operate with one another}	19/0636	. . . {the flexible member being a non-buckling chain}
15/52	. . . in which a member of uniform effective diameter mounted on a shaft may co-operate with different parts of another member	19/064	. . . {the flexible push member uses a bended profile to generate stiffness, e.g. spreading belts}
15/54	. . . in which two members co-operate by means of rings or by means of parts of endless flexible members pressed between the first-mentioned members	19/0645	. . . {the flexible push or pull member having guiding means, i.e. the flexible member being supported at least partially by a guide to transmit the reciprocating movement (the flexible member being a non-buckling chain F16H 19/0636)}
15/56	. . Gearings providing a discontinuous or stepped range of gear ratios	19/065	. . . {with flexible members between discs creating reciprocation by relative rotation of the discs}
<b>19/00</b>	<b>Gearings comprising essentially only toothed gears or friction members and not capable of conveying indefinitely-continuing rotary motion (with intermittently-driving members F16H 27/00 - F16H 31/00)</b>	19/0654	. . . {using twisting movement of flexible members to modify the axial length of the mechanism}
19/001	. {for conveying reciprocating or limited rotary motion}	19/0659	. . . {combined with means for creating non-linear characteristics, e.g. cams; Means for creating different velocity on forward and reverse stroke}
19/003	. . {comprising a flexible member}	19/0663	. . . {with telescopic means, e.g. for supporting or shielding the reciprocating member}
19/005	. . . {for conveying oscillating or limited rotary motion}	2019/0668	. . . {with open loop, e.g. with the free ends of the flexible member fixed to the casing, e.g. when the drive means are arranged on the carriage}
19/006	. . . {for converting reciprocating motion into another reciprocating motion}	19/0672	. . . {characterised by means for tensioning the flexible member}
2019/008	. . {Facilitating the engagement or stopping of gear sections}	2019/0677	. . . {characterised by the means for fixing the flexible member to a drum}
19/02	. for interconverting rotary {or oscillating} motion and reciprocating motion	2019/0681	. . . {the flexible member forming a closed loop}
19/025	. . {comprising a friction shaft}	2019/0686	. . . . {the flexible member being directly driven by a pulley or chain wheel}
19/04	. . comprising a rack	2019/069	. . . {with means for generating two superposed movements, e.g. for driving a X-Y table}
19/043	. . . {for converting reciprocating movement in a continuous rotary movement or <i>vice versa</i> , e.g. by opposite racks engaging intermittently for a part of the stroke}	2019/0695	. . . {Generating pivoting movement of a joint}
2019/046	. . . {Facilitating the engagement or stopping of racks}	19/08	. for interconverting rotary motion and oscillating motion
19/06	. . comprising {flexible members, e.g. an} endless flexible member	2019/085	. . {by using flexible members}
<b>WARNING</b>		<b>Gearing for conveying or converting motion by means of levers, links, cams or screw-and-nut mechanisms</b>	
Groups <a href="#">F16H 19/0604</a> - <a href="#">F16H 19/0672</a> are not complete pending reclassification; see also this group		<b>21/00</b>	<b>Gearings comprising primarily only links or levers, with or without slides (<a href="#">F16H 23/00</a> takes precedence)</b>
19/0604	. . . {with means to double or half the stroke of the reciprocating member}	21/02	. the movements of two or more independently-moving members being combined into a single movement
2019/0609	. . . {the reciprocating motion being created by at least one drum or pulley with different diameters, using a differential effect}	21/04	. Guiding mechanisms, e.g. for straight-line guidance
2019/0613	. . . {the flexible member being a toothed belt or chain engaging a rack}	21/06	. which can be made ineffective when desired
19/0618	. . . {the flexible member, e.g. cable, being wound on a drum or thread for creating axial movement parallel to the drum or thread}	21/08	. . by pushing a reciprocating rod out of its operative position
19/0622	. . . {for converting reciprocating movement into oscillating movement and <i>vice versa</i> , the reciprocating movement is perpendicular to the axis of oscillation}	21/10	. all movement being in, or parallel to, a single plane
		21/12	. . for conveying rotary motion
		21/14	. . . by means of cranks, eccentrics, or like members fixed to one rotary member and guided along tracks on the other
		21/16	. . for interconverting rotary motion and reciprocating motion
		21/18	. . . Crank gearings; Eccentric gearings
		21/20	. . . . with adjustment of throw

21/22	. . . . with one connecting-rod and one guided slide to each crank or eccentric	25/125	. . . {having the cam on an end surface of the rotating element}
21/24	. . . . . without further links or guides	2025/127	. . . {using electric solenoids for generating the reciprocating motion}
21/26	. . . . . with toggle action	25/14	. . with reciprocation perpendicular to the axis of rotation (crank or eccentric gears without swinging connecting-rod F16H 21/36)
21/28	. . . . . with cams or additional guides	25/16	. for interconverting rotary motion and oscillating motion
21/30	. . . . . with members having rolling contact	25/18	. for conveying or interconverting oscillating or reciprocating motions
21/32	. . . . . with additional members comprising only pivoted links or arms	25/183	. . {conveying only reciprocating motion, e.g. wedges}
21/34	. . . . with two or more connecting-rods to each crank or eccentric	25/186	. . {with reciprocation along the axis of oscillation}
21/36	. . . . without swinging connecting-rod, e.g. with epicyclic parallel motion, slot-and-crank motion	25/20	. . Screw mechanisms (with automatic reversal F16H 25/12)
21/365	. . . . . {with orbital gearing having a ratio of 2:1 between central gear and orbital gear}	25/2003	. . . {with arrangements for taking up backlash (F16H 25/2209 takes precedence)}
21/38	. . . . with means for temporary energy accumulation, e.g. to overcome dead-centre positions	25/2006	. . . . {with more than one nut or with nuts consisting of more than one bearing part}
21/40	. . for interconverting rotary motion and oscillating motion	25/2009	. . . . {with radial preloading}
21/42	. . . with adjustable throw	2025/2012	. . . . {using a spring member creating rotary torque for counter rotating the two nuts, e.g. a torsion bar}
21/44	. . for conveying or interconverting oscillating or reciprocating motions	25/2015	. . . {Means specially adapted for stopping actuators in the end position; Position sensing means}
21/46	. with movements in three dimensions [3D]	25/2018	. . . {with both screw and nut being driven, i.e. screw and nut are both rotating}
21/48	. . for conveying rotary motions	25/2021	. . . {with means for avoiding overloading}
21/50	. . for interconverting rotary motion and reciprocating motion	25/2025	. . . {with means to disengage the nut or screw from their counterpart; Means for connecting screw and nut for stopping reciprocating movement (F16H 25/2015 takes precedence)}
21/52	. . for interconverting rotary motion and oscillating motion	2025/2028	. . . {using screw profiles with high efficiency for converting reciprocating motion into oscillating movement}
21/54	. . for conveying or interconverting oscillating or reciprocating motions	2025/2031	. . . {Actuator casings}
<b>23/00</b>	<b>Wobble-plate gears; Oblique-crank gears</b>	2025/2034	. . . . {Extruded frame casings}
23/02	. with adjustment of throw by changing the position of the wobble-member (gears in which the transmission ratio is changed by adjustment of a wobble-plate F16H 29/04; gears with gyroscopic action, e.g. comprising wobble-plates F16H 33/10)	2025/2037	. . . {Actuator supports or means for fixing piston end, e.g. flanges}
23/04	. with non-rotary wobble-members	2025/204	. . . {Axial sliding means, i.e. for rotary support and axial guiding of nut or screw shaft}
23/06	. . with sliding members hinged to reciprocating members	2025/2043	. . . {Screw mechanisms driving an oscillating lever, e.g. lever with perpendicular pivoting axis}
23/08	. . connected to reciprocating members by connecting-rods	2025/2046	. . . {with gears arranged perpendicular to screw shaft axis, e.g. helical gears engaging tangentially the screw shaft}
23/10	. with rotary wobble-plates with plane surfaces	25/205	. . . {comprising alternate power paths, e.g. for fail safe back-up}
<b>25/00</b>	<b>Gears comprising primarily only cams, cam-followers and screw-and-nut mechanisms</b>	2025/2053	. . . {Screws in parallel arrangement driven simultaneously with an output member moved by the screws}
25/02	. the movements of two or more independently moving members being combined into a single movement	25/2056	. . . {Telescopic screws with at least three screw members in coaxial arrangement}
25/04	. for conveying rotary motion	2025/2059	. . . {Common movement by two screws or two nuts, e.g. two connected screws with opposite thread direction}
25/06	. . with intermediate members guided along tracks on both rotary members	2025/2062	. . . {Arrangements for driving the actuator}
2025/063	. . . {the intermediate members being balls engaging on opposite cam discs}	2025/2065	. . . . {Manual back-up means for overriding motor control, e.g. hand operation in case of failure}
2025/066	. . . {the intermediate members being rollers supported in a chain}		
25/08	. for interconverting rotary motion and reciprocating motion (F16H 23/00 takes precedence)		
25/10	. . with adjustable throw		
25/12	. . with reciprocation along the axis of rotation, e.g. gears with helical grooves and automatic reversal		
25/122	. . . {Gears with helical grooves and automatic reversal}		

2025/2068	. . . .	{Means for returning linear actuator to zero position, e.g. upon occurrence of failure by using a spring}	25/2295	. . . .	{Rings which are inclined or can pivot around an axis perpendicular to the screw shaft axis}
2025/2071	. . . .	{Disconnecting drive source from the actuator, e.g. using clutches for release of drive connection during manual control}	25/24	. . .	Elements essential to such mechanisms, e.g. screws, nuts ( <a href="#">F16H 25/22</a> takes precedence)
2025/2075	. . . .	{Coaxial drive motors}	25/2409	. . . .	{one of the threads being replaced by elements specially formed for engaging the screw or nut, e.g. pins, racks, toothed belts}
2025/2078	. . . .	{the rotor being integrated with the nut or screw body}	25/2418	. . . .	{Screw seals, wipers, scrapers or the like}
2025/2081	. . . .	{Parallel arrangement of drive motor to screw axis}	25/2427	. . . .	{one of the threads being replaced by a wire or stripmetal, e.g. spring}
2025/2084	. . . .	{Perpendicular arrangement of drive motor to screw axis}	2025/2436	. . . .	{Intermediate screw supports for reducing unsupported length of screw shaft}
2025/2087	. . . .	{using planetary gears}	2025/2445	. . . .	{Supports or other means for compensating misalignment or offset between screw and nut}
2025/209	. . . .	{using worm gears}	25/2454	. . . .	{Brakes; Rotational locks}
2025/2093	. . . .	{using conical gears}	2025/2463	. . . .	{using a wrap spring brake, i.e. a helical wind up spring for braking or locking}
2025/2096	. . . .	{using endless flexible members}	25/2472	. . . .	{Safety nuts}
25/22	. . .	with balls, rollers, or similar members between the co-operating parts; Elements essential to the use of such members	2025/2481	. . . .	{Special features for facilitating the manufacturing of spindles, nuts, or sleeves of screw devices}
25/2204	. . . .	{with balls}	2025/249	. . . .	{Materials or coatings for screws or nuts}
25/2209	. . . .	{with arrangements for taking up backlash}	<b>Gearings with intermittently-driving member</b>		
25/2214	. . . .	{with elements for guiding the circulating balls}	27/00	<b>Step-by-step mechanisms without freewheel members, e.g. Geneva drives</b>	
25/2219	. . . .	{Axially mounted end-deflectors}	27/02	. . .	with at least one reciprocating or oscillating transmission member
25/2223	. . . .	{Cross over deflectors between adjacent thread turns, e.g. S-form deflectors connecting neighbouring threads}	27/04	. . .	for converting continuous rotation into a step-by-step rotary movement
25/2228	. . . .	{the device for circulation forming a part of the screw member}	27/045	. .	{Mechanism comprising a member with partially helical tracks}
25/2233	. . . .	{with cages or means to hold the balls in position}	27/06	. .	Mechanisms with driving pins in driven slots, e.g. Geneva drives
25/2238	. . . .	{using ball spacers, i.e. spacers separating the balls, e.g. by forming a chain supporting the balls}	27/08	. .	with driving toothed gears with interrupted toothing
2025/2242	. . . .	{Thread profile of the screw or nut showing a pointed "gothic" arch in cross-section}	27/10	. .	obtained by means of disengageable transmission members, combined or not combined with mechanisms according to group <a href="#">F16H 27/06</a> or <a href="#">F16H 27/08</a>
25/2247	. . . .	{with rollers}	29/00	<b>Gearings for conveying rotary motion with intermittently-driving members, e.g. with freewheel action</b>	
25/2252	. . . .	{Planetary rollers between nut and screw}	29/02	. . .	between one of the shafts and an oscillating or reciprocating intermediate member, not rotating with either of the shafts ( <a href="#">F16H 29/20</a> , <a href="#">F16H 29/22</a> take precedence)
2025/2257	. . . .	{with means for shifting planetary rollers axially, e.g. into central position}	29/04	. .	in which the transmission ratio is changed by adjustment of a crank, an eccentric, a wobble-plate, or a cam, on one of the shafts
25/2261	. . . .	{arranged substantially perpendicular to the screw shaft axis}	29/06	. . .	with concentric shafts, an annular intermediate member moving around and being supported on an adjustable crank or eccentric
25/2266	. . . .	{arranged substantially in parallel to the screw shaft axis ( <a href="#">planetary rollers F16H 25/2252</a> )}	29/08	. .	in which the transmission ratio is changed by adjustment of the path of movement, the location of the pivot, or the effective length, of an oscillating connecting member
2025/2271	. . . .	{with means for guiding circulating rollers}	29/10	. .	in which the transmission ratio is changed by directly acting on the intermittently driving members
2025/2276	. . . .	{using roller spacers, i.e. spacers separating the rollers, e.g. by forming a complete chain}	29/12	. .	between rotary driving and driven members ( <a href="#">F16H 29/20</a> , <a href="#">F16H 29/22</a> take precedence)
2025/228	. . . .	{Screw mechanisms having rollers being supported by the screw shaft and engaging the nut}			
25/2285	. . . .	{with rings engaging the screw shaft with the inner perimeter, e.g. using inner rings of a ball bearing}			
25/229	. . . .	{Eccentric rings with their axis arranged substantially parallel to the screw shaft axis}			



29/14	. . in which the transmission ratio is changed by adjustment of an otherwise stationary guide member for the intermittently-driving members	35/008	. {for variation of rotational phase relationship, e.g. angular relationship between input and output shaft}
29/16	. . in which the transmission ratio is changed by adjustment of the distance between the axes of the rotary members	35/02	. for conveying rotary motion with cyclically varying velocity ratio
29/18	. . . in which the intermittently-driving members slide along approximately radial guides while rotating with one of the rotary members	35/06	. Gearings designed to allow relative movement between supports thereof without ill effects (special means compensating for misalignment of axes <a href="#">F16H 1/26</a> , <a href="#">F16H 1/48</a> )
29/20	. the intermittently-acting members being shaped as worms, screws, or racks	35/08	. for adjustment of members on moving parts from a stationary place
29/22	. with automatic speed change	35/10	. Arrangements or devices for absorbing overload or preventing damage by overload
<b>31/00</b>	<b>Other gearings with freewheeling members or other intermittently driving members (<a href="#">F16H 21/00</a>, <a href="#">F16H 23/00</a>, <a href="#">F16H 25/00</a> take precedence)</b>	2035/103	. . {with drive interruption by structural failure of overload preventing means, e.g. using shear pins}
31/001	. {Mechanisms with freewheeling members}	2035/106	. . {Monitoring of overload}
31/002	. . {Hand-driven ratchets}	35/12	. Transmitting mechanisms with delayed effect
31/003	. {Step-by-step mechanisms for rotary motion}	35/14	. Mechanisms with only two stable positions, e.g. acting at definite angular positions
31/004	. . {with pawls driven by a rotary cam}	35/16	. Mechanisms for movements or movement relations conforming to mathematical formulae
31/005	. . {with pawls driven by a reciprocating or oscillating transmission member ( <a href="#">F16H 31/002</a> , <a href="#">F16H 31/004</a> take precedence)}	35/18	. Turning devices for rotatable members, e.g. shafts
31/006	. . {with friction means}	<b>37/00</b>	<b>Combinations of mechanical gearings, not provided for in groups <a href="#">F16H 1/00</a> - <a href="#">F16H 35/00</a> (combinations of mechanical gearing with fluid clutches or fluid gearing <a href="#">F16H 47/00</a>)</b>
31/007	. {Step-by-step mechanisms for linear motion}	37/02	. comprising essentially only toothed or friction gearings
31/008	. . {with friction means}	37/021	. . {toothed gearing combined with continuously variable friction gearing}
<b>33/00</b>	<b>Gearings based on repeated accumulation and delivery of energy</b>	37/022	. . . {the toothed gearing having orbital motion}
33/02	. Rotary transmissions with mechanical accumulators, e.g. weights, springs, intermittently-connected flywheels	2037/023	. . . {the combined gearing being provided with at least two forward and one reverse ratio in a serially arranged sub-transmission}
33/04	. . Gearings for conveying rotary motion with variable velocity ratio, in which self-regulation is sought	2037/025	. . . {having continuously variable friction gearing, i.e. CVT, in which the ratio coverage is used more than once to produce the overall transmission ratio coverage, e.g. by shift to end of range, then change ratio in sub-transmission and shift CVT through range once again}
33/06	. . . based essentially on spring action	2037/026	. . . {Layouts with particular features of reversing gear, e.g. to achieve compact arrangement}
33/08	. . . based essentially on inertia	37/027	. . {toothed gearing combined with a gear using endless flexible members for reversing rotary motion only ( <a href="#">F16H 37/06</a> takes precedence)}
33/10	. . . . with gyroscopic action, e.g. comprising wobble-plates, oblique cranks	2037/028	. . {having two distinct forward drive ratios and one reverse drive ratio arranged in series with a continuously variable transmission unit}
33/12	. . . . with a driving member connected differentially with both a driven member and an oscillatory member with large resistance to movement, e.g. Constantinesco gearing	37/04	. . Combinations of toothed gearings only ( <a href="#">F16H 37/06</a> takes precedence)
33/14	. . . . having orbital members influenced by regulating masses	37/041	. . . {for conveying rotary motion with constant gear ratio}
33/16	. . . . . which have their own free motion, or consist of fluid		<b>WARNING</b>
33/18	. . . . . of which the motion is constrained		This group is not complete pending a reorganisation; see also subgroups of <a href="#">F16H 1/00</a>
33/185	. . . . . {the masses being fixed to the orbital members}		
33/20	. for interconversion, based essentially on inertia, of rotary motion and reciprocating or oscillating motion		
<b>35/00</b>	<b>Gearings or mechanisms with other special functional features</b>		
2035/001	. {Gearings with eccentrically mounted gears, e.g. for cyclically varying ratio}	37/042	. . . {change gear transmissions in group arrangement}
2035/003	. {Gearings comprising pulleys or toothed members of non-circular shape, e.g. elliptical gears}	37/043	. . . . {without gears having orbital motion}
2035/005	. {Gearings or mechanisms preventing back-driving}	2037/044	. . . . . {comprising a separate gearing unit for shifting between forward or reverse}
2035/006	. {Gearings or mechanisms for stopping or limiting movement, e.g. stopping a movement after a few turns}	2037/045	. . . . . {comprising a separate gearing unit for shifting between high and low ratio range}

37/046	. . . . {with an additional planetary gear train, e.g. creep gear, overdrive}	2037/103	. . . . . {Power-split transmissions with each end of a CVT connected or connectable to a planetary gear set having four or more connections, e.g. a Ravigneaux set}
2037/047	. . . {comprising one or more orbital gear sets coaxial with a first shaft and having more than one drive connection to a second shaft parallel to the first shaft}	2037/104	. . . . . {Power-split transmissions with at least one end of a CVT connected or connectable to two or more differentials}
2037/048	. . . {Combinations of parallel shaft and orbital motion gearing, wherein the orbital motion gearing has more than one connection with the parallel shaft gearing}	2037/105	. . . . . {characterised by number of modes or ranges, e.g. for compound gearing}
2037/049	. . . {Forward-reverse units with forward and reverse gears for achieving multiple forward and reverse gears, e.g. for working machines}	2037/106	. . . . . {with switching means to provide two variator modes or ranges}
37/06	. . with a plurality of driving or driven shafts; with arrangements for dividing torque between two or more intermediate shafts	2037/107	. . . . . {with switching means to provide three variator modes or ranges}
37/065	. . . {with a plurality of driving or driven shafts <a href="#">(F16H 37/0806 takes precedence)</a> }	2037/108	. . . . . {with switching means to provide four or more variator modes or ranges}
37/08	. . . with differential gearing	37/12	. Gearings comprising primarily toothed or friction gearing, links or levers, and cams, or members of at least two of these types <a href="#">(gearings with cranks, eccentrics, or like members fixed to one rotary member and guided along tracks on the other F16H 21/14; crank or eccentric gearings with cams or additional guides, or with members having rolling contact F16H 21/28, F16H 21/30)</a>
37/0806	. . . . {with a plurality of driving or driven shafts}	37/122	. . {for interconverting rotary motion and oscillating motion}
37/0813	. . . . . {with only one input shaft}	37/124	. . {for interconverting rotary motion and reciprocating motion}
37/082	. . . . . {and additional planetary reduction gears}	37/126	. . . {Guiding mechanism using levers combined with gearings for straight line output movement, e.g. by using gears or pulleys with ratio 2:1}
37/0826	. . . . . {with only one output shaft}	2037/128	. . {Generating reciprocating motion by a planetary gear (ratio 2:1) using endless flexible members}
37/0833	. . . . {with arrangements for dividing torque between two or more intermediate shafts, i.e. with two or more internal power paths}	37/14	. . the movements of two or more independently-moving members being combined into a single movement
37/084	. . . . . {at least one power path being a continuously variable transmission, i.e. CVT}	37/16	. . with a driving or driven member which both rotates or oscillates on its axis and reciprocates
37/0846	. . . . . {CVT using endless flexible members}	<b>Fluid gearing</b>	
37/0853	. . . . . {CVT using friction between rotary members having a first member of uniform effective diameter cooperating with different parts of a second member}	39/00	<b>Rotary fluid gearing using pumps and motors of the volumetric type, i.e. passing a predetermined volume of fluid per revolution <a href="#">(control of exclusively fluid gearing F16H 61/38)</a></b>
37/086	. . . . . {CVT using two coaxial friction members cooperating with at least one intermediate friction member}	2039/005	. {comprising arrangements or layout to change the capacity of the motor or pump by moving the hydraulic chamber of the motor or pump}
2037/0866	. . . . . {Power-split transmissions with distributing differentials, with the output of the CVT connected or connectable to the output shaft}	39/01	. Pneumatic gearing: Gearing working with subatmospheric pressure
2037/0873	. . . . . {with switching means, e.g. to change ranges}	39/02	. with liquid motors at a distance from liquid pumps
2037/088	. . . . . {Power-split transmissions with summing differentials, with the input of the CVT connected or connectable to the input shaft}	39/04	. with liquid motor and pump combined in one unit
2037/0886	. . . . . {with switching means, e.g. to change ranges}	39/06	. . pump and motor being of the same type
2037/0893	. . . . . {characterised in that the ratio of the continuously variable transmission is different from zero when the output shaft speed is zero}	39/08	. . . each with one main shaft and provided with pistons reciprocating in cylinders
37/10	. . . . at both ends of intermediate shafts	39/10	. . . with cylinders arranged around, and parallel or approximately parallel to the main axis of the gearing
2037/101	. . . . . {Power-split transmissions with one differential at each end of a continuously variable transmission, i.e. CVT}	2039/105	. . . . . {at least one pair of motors or pumps sharing a common swash plate}
2037/102	. . . . . {the input or output shaft of the transmission is connected or connectable to two or more differentials}	39/12	. . . . . with stationary cylinders
		39/14	. . . . . with cylinders carried in rotary cylinder blocks or cylinder-bearing members
		39/16	. . . . with cylinders arranged perpendicular to the main axis of the gearing

39/18	. . . . . the connections of the pistons being at the outer ends of the cylinders	2045/007	. {comprising a damper between turbine of the fluid gearing and the mechanical gearing unit}
39/20	. . . . . the connections of the pistons being at the inner ends of the cylinders	45/02	. with mechanical clutches for bridging a fluid gearing of the hydrokinetic type ( <a href="#">control of torque converter lock-up clutches F16H 61/14</a> )
39/22	. . . with liquid chambers shaped as bodies of revolution concentric with the main axis of the gearing	2045/0205	. . {two chamber system, i.e. without a separated, closed chamber specially adapted for actuating a lock-up clutch}
39/24	. . . . with rotary displacement members, e.g. provided with axially or radially movable vanes passing movable sealing members	2045/021	. . {three chamber system, i.e. comprising a separated, closed chamber specially adapted for actuating a lock-up clutch}
39/26	. . . with liquid chambers not shaped as bodies of revolution or shaped as bodies of revolution eccentric to the main axis of the gearing	2045/0215	. . {Details of oil circulation}
39/28	. . . . with liquid chambers formed in rotary members	2045/0221	. . {with damping means}
39/30	. . . . with liquid chambers formed in stationary members	2045/0226	. . . {comprising two or more vibration dampers}
39/32	. . . . . with sliding vanes carried by the rotor	2045/0231	. . . . {arranged in series}
39/34	. . . in which a rotor on one shaft co-operates with a rotor on another shaft	2045/0236	. . . {with axial dampers, e.g. comprising a ramp system}
39/36	. . . . toothed-gear type	2045/0242	. . . {with viscous dampers}
39/38	. . . . Displacement screw-pump type	2045/0247	. . . {having a turbine with hydrodynamic damping means}
39/40	. . . Hydraulic differential gearings, e.g. having a rotary input housing with interconnected liquid chambers for both outputs	2045/0252	. . . {having a damper arranged on input side of the lock-up clutch}
39/42	. . pump and motor being of different types	2045/0257	. . . {having a pump adapted for use as a secondary mass of the damping system}
41/00	<b>Rotary fluid gearing of the hydrokinetic type</b> ( <a href="#">control of exclusively fluid gearing F16H 61/38</a> )	2045/0263	. . . {the damper comprising a pendulum}
41/02	. with pump and turbine connected by conduits or ducts	2045/0268	. . . {the damper comprising a gearing}
41/04	. Combined pump-turbine units	2045/0273	. . {characterised by the type of the friction surface of the lock-up clutch}
41/22	. . Gearing systems consisting of a plurality of hydrokinetic units operating alternatively, e.g. made effective or ineffective by filling or emptying or by mechanical clutches	2045/0278	. . . {comprising only two co-acting friction surfaces}
41/24	. Details	2045/0284	. . . {Multiple disk type lock-up clutch}
2041/243	. . {Connections between pump shell and cover shell of the turbine}	2045/0289	. . . {Details of friction surfaces of the lock-up clutch}
2041/246	. . {relating to one way clutch of the stator}	2045/0294	. . . {Single disk type lock-up clutch, i.e. using a single disc engaged between friction members}
41/26	. . Shape of runner blades or channels with respect to function	47/00	<b>Combinations of mechanical gearing with fluid clutches or fluid gearing</b>
41/28	. . with respect to manufacture, e.g. blade attachment	47/02	. the fluid gearing being of the volumetric type
2041/285	. . . {of stator blades}	2047/025	. . {the fluid gearing comprising a plurality of pumps or motors}
41/30	. . relating to venting, lubrication, cooling, circulation of the cooling medium	47/04	. . the mechanical gearing being of the type with members having orbital motion
41/32	. Selection of working fluids	2047/045	. . . {the fluid gearing comprising a plurality of pumps or motors}
43/00	<b>Other fluid gearing, e.g. with oscillating input or output</b>	47/06	. the fluid gearing being of the hydrokinetic type
43/02	. Fluid gearing actuated by pressure waves	47/065	. . {the mechanical gearing comprising gearing of the friction or endless flexible member type}
45/00	<b>Combinations of fluid gearings for conveying rotary motion with couplings or clutches</b> ( <a href="#">gearing systems consisting of a plurality of hydrokinetic units operating alternatively F16H 41/22</a> )	47/07	. . using two or more power-transmitting fluid circuits ( <a href="#">F16H 47/10 takes precedence</a> )
	<b>NOTE</b>	47/08	. . the mechanical gearing being of the type with members having orbital motion
	Clutches for varying working conditions in fluid torque-converters are regarded as part of the torque converter	47/085	. . . {with at least two mechanical connections between the hydrokinetic gearing and the mechanical gearing}
2045/002	. {comprising a clutch between prime mover and fluid gearing}	47/10	. . . using two or more power-transmitting fluid circuits
2045/005	. {comprising a clutch between fluid gearing and the mechanical gearing unit}	47/12	. . . the members with orbital motion having vanes interacting with the fluid

**48/00 Differential gearings (cooling or lubricating of differential gearing [F16H 57/04](#))****NOTE**

When classifying in this main group, in the absence of an indication to the contrary, classification is made in all appropriate places.

- 2048/02 . {Transfer gears for influencing drive between outputs}
- 2048/04 . . {having unequal torque transfer between two outputs}
- 48/05 . Multiple interconnected differential sets
- 48/06 . with gears having orbital motion
- 48/08 . . comprising bevel gears
- 2048/082 . . . {characterised by the arrangement of output shafts}
- 2048/085 . . . {characterised by shafts or gear carriers for orbital gears}
- 2048/087 . . . {characterised by the pinion gears, e.g. their type or arrangement}
- 48/10 . . with orbital spur gears
- 2048/102 . . . {with spur gears engaging face gears}
- 2048/104 . . . {characterised by two ring gears}
- 2048/106 . . . {characterised by two sun gears}
- 48/11 . . . having intermeshing planet gears
- 48/12 . without gears having orbital motion
- 48/14 . . with cams
- 48/142 . . . {consisting of linked clutches using axially movable inter-engaging parts}
- 48/145 . . . . {with friction clutching members}
- 48/147 . . . {with driven cam followers or balls engaging two opposite cams}
- 48/16 . . with freewheels
- 48/18 . . with fluid gearing
- 48/19 . . consisting of two linked clutches
- 48/20 . Arrangements for suppressing or influencing the differential action, e.g. locking devices
- 2048/201 . . {with means directly braking the orbital gears}
- 2048/202 . . {using freewheel clutches}
- 2048/204 . . {Control of arrangements for suppressing differential actions}
- 2048/205 . . . {using the steering as a control parameter}
- 2048/207 . . . {using torque sensors}
- 2048/208 . . . {using flywheels}
- 48/22 . . using friction clutches or brakes
- 48/24 . . using positive clutches or brakes
- 48/26 . . using fluid action, e.g. viscous clutches
- 2048/265 . . . {with a fluid throttling means}
- 48/27 . . using internally-actuable fluid pressure, e.g. internal pump types
- 48/28 . . using self-locking gears or self-braking gears
- 2048/282 . . . {using the axial movement of axially movable bevel gears}
- 48/285 . . . with self-braking intermeshing gears having parallel axes and having worms or helical teeth
- 48/29 . . . with self-braking intermeshing gears having perpendicular arranged axes and having worms or helical teeth
- 48/295 . . using multiple means for force boosting
- 48/30 . . using externally-actuable means
- 2048/305 . . . {using manual actuators}
- 48/32 . . . using fluid pressure actuators

- 48/34 . . . using electromagnetic or electric actuators
- 2048/343 . . . . {using a rotary motor}
- 2048/346 . . . . {using a linear motor}
- 48/36 . characterised by intentionally generating speed difference between outputs
- 2048/362 . . {using a continuously variable transmission}
- 2048/364 . . {using electric or hydraulic motors}
- 2048/366 . . {using additional non-orbital gears in combination with clutches or brakes}
- 2048/368 . . {using additional orbital gears in combination with clutches or brakes}
- 48/38 . Constructional details (the outer casing comprising the differential and supporting input and output shafts [F16H 57/037](#))
- 2048/382 . . {Methods for manufacturing differential gearings}
- 2048/385 . . {of the ring or crown gear}
- 2048/387 . . {Shields or washers}
- 48/40 . . characterised by features of the rotating cases
- 2048/405 . . . {characterised by features of the bearing of the rotating case}
- 48/42 . . characterised by features of the input shafts, e.g. mounting of drive gears thereon
- 2048/423 . . . {characterised by bearing arrangement}
- 2048/426 . . . . {characterised by spigot bearing arrangement, e.g. bearing for supporting the free end of the drive shaft pinion}

**49/00 Other gearings**

- 49/001 . {Wave gearings, e.g. harmonic drive transmissions}
- 2049/003 . . {Features of the flexsplines therefor}
- 49/005 . {Magnetic gearings with physical contact between gears}
- 2049/006 . {Wave generators producing a non-elliptical shape of flexsplines, i.e. with a qualified different shape than elliptical}
- 2049/008 . {Linear wave gearings, i.e. harmonic type gearing imposing a strain wave to a straight flexible member engaging a second member with different pitch to generate linear motion thereof}

**Details of gearing or mechanisms****51/00 Levers of gearing mechanisms**

- 51/02 . adjustable

**53/00 Cams or cam-followers, e.g. rollers for gearing mechanisms**

- 53/02 . Single-track cams for single-revolution cycles; Camshafts with such cams
- 53/025 . . {characterised by their construction, e.g. assembling or manufacturing features}
- 53/04 . . Adjustable cams
- 53/06 . Cam-followers ([F16H 53/08](#) takes precedence)
- 53/08 . Multi-track cams, e.g. for cycles consisting of several revolutions; Cam-followers specially adapted for such cams

**55/00 Elements with teeth or friction surfaces for conveying motion; Worms, pulleys or sheaves for gearing mechanisms (of screw-and-nut gearing [F16H 25/00](#))**

- 55/02 . Toothed members; Worms
- 55/06 . . Use of materials; Use of treatments of toothed members or worms to affect their intrinsic material properties



2055/065	. . . {Moulded gears, e.g. inserts therefor}	55/286	. . . . . {with asymmetric layout of the yoke}
55/08	. . Profiling	55/288	. . . . . {comprising two or more pressure yokes}
55/0806	. . . {Involute profile}	55/30	. . Chain-wheels
55/0813	. . . . {Intersecting-shaft arrangement of the toothed members}	55/303	. . . {for round linked chains, i.e. hoisting chains with identical links}
55/082	. . . . {Skewed-shaft arrangement of the toothed members, i.e. non-intersecting shafts}	2055/306	. . . {with means providing resilience or vibration damping in chain sprocket wheels}
55/0826	. . . {Novikov-Wildhaber profile}	55/32	. Friction members
55/0833	. . . {Flexible toothed member, e.g. harmonic drive}	2055/325	. . {characterized by roughness or hardness of friction surface}
55/084	. . . {Non-circular rigid toothed member, e.g. elliptic gear}	55/34	. . Non-adjustable friction discs
55/0846	. . . {Intersecting-shaft arrangement of the toothed members (F16H 55/0813, F16H 55/0826, F16H 55/0833, F16H 55/084 take precedence)}	55/36	. . Pulleys (with features essential for adjustment F16H 55/52)
55/0853	. . . {Skewed-shaft arrangement of the toothed members (F16H 55/082, F16H 55/0826, F16H 55/0833, F16H 55/084 take precedence)}	2055/363	. . . {with special means or properties for lateral tracking of the flexible members running on the pulley, e.g. with crowning to keep a belt on track}
2055/086	. . . {Silent gear profiles}	2055/366	. . . {with means providing resilience or vibration damping}
2055/0866	. . . {Profiles for improving radial engagement of gears, e.g. chamfers on the tips of the teeth}	55/38	. . . Means or measures for increasing adhesion
55/0873	. . . {for improving axial engagement, e.g. a chamfer at the end of the tooth flank}	55/40	. . . with spokes (F16H 55/48 takes precedence)
55/088	. . . {with corrections on tip or foot of the teeth, e.g. addendum relief for better approach contact}	55/42	. . . Laminated pulleys
55/0886	. . . {with corrections along the width, e.g. flank width crowning for better load distribution}	55/44	. . . Sheet-metal pulleys
2055/0893	. . . {for parallel shaft arrangement of toothed members}	55/46	. . . Split pulleys
55/10	. . Constructively simple tooth shapes, e.g. shaped as pins, as balls	55/48	. . . manufactured exclusively or in part of non-metallic material, e.g. plastics (F16H 55/38, F16H 55/42, F16H 55/46 take precedence)
55/12	. . with body or rim assembled out of detachable parts	55/49	. . . Features essential to V-belts pulleys
55/14	. . Construction providing resilience or vibration-damping (F16H 55/06 takes precedence)	55/50	. . . Features essential to rope pulleys
55/16	. . . relating to teeth only	55/52	. . Pulleys or friction discs of adjustable construction
55/17	. . Toothed wheels (worm wheels F16H 55/22; chain wheels F16H 55/30)	55/54	. . . of which the bearing parts are radially adjustable
55/171	. . . {Toothed belt pulleys}	55/56	. . . of which the bearing parts are relatively axially adjustable
2055/173	. . . {Crown gears, i.e. gears have axially arranged teeth}	55/563	. . . . {actuated by centrifugal masses}
2055/175	. . . {specially adapted for easy repair, e.g. exchange of worn teeth}	55/566	. . . . {only adjustable when pulley is stationary}
2055/176	. . . {Ring gears with inner teeth}	57/00	<b>General details of gearing (of screw-and-nut gearing F16H 25/00; of fluid gearing F16H 39/00 - F16H 43/00)</b>
2055/178	. . . {combined with clutch means, e.g. gear with integrated synchroniser clutch}	57/0006	. {Vibration-damping or noise reducing means specially adapted for gearings (devices for varying tension of belts, ropes or chains with damping means F16H 7/0829; toothed members with construction providing vibration damping F16H 55/14; reducing vibrations or noise of the gearbox casing F16H 57/028; suppression of vibrations or noise of gear selectors F16H 59/0208; control of hydrostatic fluid gearing preventing or reducing vibrations or noise F16H 61/4183)}
55/18	. . . Special devices for taking up backlash {(for gears having orbital motion F16H 1/2863)}	2057/0012	. . {for reducing drive line oscillations}
2055/185	. . . . {using compound gears with coincident teeth of different material, e.g. laminated construction of metal and elastomeric gear layers, where elastic layer is slightly oversized}	57/0018	. {Shaft assemblies for gearings (camshafts with single track cams F16H 53/02)}
55/20	. . . . for bevel gears	57/0025	. . {with gearing elements rigidly connected to a shaft, e.g. securing gears or pulleys by specially adapted splines, keys or methods}
55/22	. . for transmissions with crossing shafts, especially worms, worm-gears	57/0031	. . {with gearing elements rotatable supported on the shaft (F16H 57/021 takes precedence)}
55/24	. . . Special devices for taking up backlash	57/0037	. . {Special features of coaxial shafts, e.g. relative support thereof}
55/26	. . Racks	2057/0043	. {Mounting or adjusting transmission parts by robots}
55/28	. . . Special devices for taking up backlash		
2055/281	. . . . {Cylindrical or half-cylindrical bushings around the rack, e.g. using special wedges to reduce play}		
55/283	. . . . {using pressure yokes}		
55/285	. . . . {with rollers or balls to reduce friction}		

2057/005	. {Mounting preassembled units, i.e. using pre-mounted structures to speed up final mounting process}	2057/02086	. . {Measures for reducing size of gearbox, e.g. for creating a more compact transmission casing}
2057/0056	. {Mounting parts arranged in special position or by special sequence, e.g. for keeping particular parts in his position during assembly}	2057/02091	. . {Measures for reducing weight of gearbox}
2057/0062	. {Tools specially adapted for assembly of transmissions}	2057/02095	. . {Measures for reducing number of parts or components}
2057/0068	. {Repairing of transmissions by using repair kits}	57/021	. . Shaft support structures, e.g. partition walls, bearing eyes, casing walls or covers with bearings
2057/0075	. {Modifying standard transmissions from manufacturer, e.g. by adding an extension for additional ratios}	2057/0213	. . . {Support of worm gear shafts}
2057/0081	. {Fixing of, or adapting to transmission failure}	2057/0216	. . . {Intermediate shaft supports, e.g. by using a partition wall}
2057/0087	. {Computer aided design [CAD] specially adapted for gearing features; Analysis of gear systems}	57/022	. . . Adjustment of gear shafts or bearings (for compensating misalignment of axes of toothed gearings without orbital motion <a href="#">F16H 1/26</a> ; for compensating misalignment of axes of planetary gears <a href="#">F16H 1/48</a> )
2057/0093	. {Means or measures for transport, shipping or packaging}	2057/0221	. . . . {Axial adjustment}
57/01	. Monitoring wear or stress of gearing elements, e.g. for triggering maintenance	2057/0222	. . . . {Lateral adjustment}
2057/012	. . {of gearings}	2057/0224	. . . . {using eccentric bushes}
2057/014	. . {of friction elements in transmissions}	2057/0225	. . . . {with means for adjusting alignment}
2057/016	. . {Monitoring of overload conditions}	2057/0227	. . . . {Assembly method measuring first tolerances or position and selecting mating parts accordingly, e.g. special sized shims for transmission bearings}
2057/018	. . {Detection of mechanical transmission failures}	2057/0228	. . . . {Mounting with rough tolerances and fine adjustment after assembly}
57/02	. Gearboxes; Mounting gearing therein	57/023	. . Mounting or installation of gears or shafts in the gearboxes, e.g. methods or means for assembly
<b>NOTE</b>		2057/0235	. . . {specially adapted to allow easy accessibility and repair}
When classifying in this group, in the absence of an indication to the contrary, classification is made in all appropriate subgroups.		57/025	. . Support of gearboxes, e.g. torque arms, or attachment to other devices
57/02004	. . {the gears being positioned relative to one another by rolling members or by specially adapted surfaces on the gears, e.g. by a rolling surface with the diameter of the pitch circle}	57/027	. . characterised by means for venting gearboxes, e.g. air breathers
2057/02008	. . {characterised by specific dividing lines or planes of the gear case}	57/028	. . characterised by means for reducing vibration or noise
2057/02013	. . {Extension units for gearboxes, e.g. additional units attached to a main gear}	57/029	. . characterised by means for sealing the gearboxes, e.g. to improve airtightness
2057/02017	. . {characterised by special features related to the manufacturing of the gear case, e.g. special adaptations for casting}	57/03	. . characterised by means for reinforcing gearboxes, e.g. ribs
2057/02021	. . {with means for adjusting alignment}	57/031	. . characterised by covers or lids for gearboxes
2057/02026	. . {Connection of auxiliaries with a gear case; Mounting of auxiliaries on the gearbox}	57/032	. . characterised by the materials used
2057/0203	. . {the gearbox is associated or combined with a crank case of an engine}	2057/0325	. . . {Moulded casings made from plastic}
2057/02034	. . {Gearboxes combined or connected with electric machines}	57/033	. . Series gearboxes, e.g. gearboxes based on the same design being available in different sizes or gearboxes using a combination of several standardised units
2057/02039	. . {Gearboxes for particular applications}	2057/0335	. . . {Series transmissions of modular design, e.g. providing for different transmission ratios or power ranges}
2057/02043	. . . {for vehicle transmissions}	57/035	. . Gearboxes for gearing with endless flexible members
2057/02047	. . . . {Automatic transmissions}	57/037	. . Gearboxes for accommodating differential gearings (rotating cases for differential gearings <a href="#">F16H 48/40</a> )
2057/02052	. . . . {Axle units; Transfer casings for four wheel drive}	57/038	. . Gearboxes for accommodating bevel gears ( <a href="#">F16H 57/037</a> takes precedence)
2057/02056	. . . . {for utility vehicles, e.g. tractors or agricultural machines}	57/039	. . Gearboxes for accommodating worm gears
2057/0206	. . . . {for commercial vehicles, e.g. buses or trucks}	57/04	. Features relating to lubrication or cooling {or heating} (control of lubrication or cooling in hydrostatic gearing <a href="#">F16H 61/4165</a> )
2057/02065	. . . . {for motorcycles or squads}	57/0401	. . {using different fluids, e.g. a traction fluid for traction gearing and a lubricant for bearings or reduction gears}
2057/02069	. . . {for industrial applications}	57/0402	. . {Cleaning of lubricants, e.g. filters or magnets}
2057/02073	. . . . {Reduction gearboxes for industry}		
2057/02078	. . . {for wind turbines}		
2057/02082	. . . {for application in vehicles other than propelling, e.g. adjustment of parts}		

- 57/0404 . . . {Lubricant filters}
- 57/0405 . . {Monitoring quality of lubricant or hydraulic fluids}
- 57/0406 . . {Absorption elements for lubricants, e.g. oil felts}
- 57/0408 . . {Exchange, draining or filling of transmission lubricant}
- 57/0409 . . {characterised by increasing efficiency, e.g. by reducing splash losses}
- 57/041 . . {Coatings or solid lubricants, e.g. anti-seize layers or pastes}
- 57/0412 . . {Cooling or heating; Control of temperature}
- 57/0413 . . . {Controlled cooling or heating of lubricant; Temperature control therefor}
- 57/0415 . . . {Air cooling or ventilation; Heat exchangers; Thermal insulations}
- 57/0416 . . . . {Air cooling or ventilation}
- 57/0417 . . . . {Heat exchangers adapted or integrated in the gearing}
- 57/0419 . . . . {Thermal insulations}
- 57/042 . . {Guidance of lubricant}
- 57/0421 . . . {on or within the casing, e.g. shields or baffles for collecting lubricant, tubes, pipes, grooves, channels or the like}
- 57/0423 . . . . {Lubricant guiding means mounted or supported on the casing, e.g. shields or baffles for collecting lubricant, tubes or pipes}
- 57/0424 . . . . {Lubricant guiding means in the wall of or integrated with the casing, e.g. grooves, channels, holes}
- 57/0426 . . . . {Means for guiding lubricant into an axial channel of a shaft}
- 57/0427 . . . {on rotary parts, e.g. using baffles for collecting lubricant by centrifugal force}
- 57/0428 . . . . {Grooves with pumping effect for supplying lubricants}
- 57/043 . . . {within rotary parts, e.g. axial channels or radial openings in shafts}
- 57/0431 . . . . {Means for guiding lubricant directly onto a tooth surface or to foot areas of a gear, e.g. by holes or grooves in a tooth flank}
- 57/0432 . . . {Lubricant guiding means on or inside shift rods or shift forks}
- 57/0434 . . {relating to lubrication supply, e.g. pumps; Pressure control}
- 57/0435 . . . {Pressure control for supplying lubricant; Circuits or valves therefor}
- 57/0436 . . . {Pumps}
- 57/0438 . . . . {Pumps of jet type, e.g. jet pumps with means to inject high pressure fluid to the suction area thereby supercharging the pump or means reducing cavitations}
- 57/0439 . . . . {using multiple pumps with different power sources or a single pump with different power sources, e.g. one and the same pump may selectively be driven by either the engine or an electric motor}
- 57/0441 . . . {Arrangements of pumps}
- 57/0442 . . . {for supply in case of failure, i.e. auxiliary supply}
- 57/0443 . . . {for supply of lubricant during tilt or high acceleration, e.g. problems related to the tilt or extreme acceleration of the transmission casing and the supply of lubricant under these conditions}
- 57/0445 . . . {for supply of different gearbox casings or sections}
- 57/0446 . . . {the supply forming part of the transmission control unit, e.g. for automatic transmissions}
- 57/0447 . . {Control of lubricant levels, e.g. lubricant level control dependent on temperature}
- 57/0449 . . . {Sensors or indicators for controlling the fluid level}
- 57/045 . . {Lubricant storage reservoirs, e.g. reservoirs in addition to a gear sump for collecting lubricant in the upper part of a gear case}
- 57/0452 . . . {Oil pans}
- 57/0453 . . . {Section walls to divide a gear sump}
- 57/0454 . . . {Sealings between different partitions of a gearing or to a reservoir ([means for sealing gearboxes F16H 57/029](#))}
- 57/0456 . . {Lubrication by injection; Injection nozzles or tubes therefor ([oil mist or spray lubrication F16H 57/0458](#))}
- 57/0457 . . {Splash lubrication}
- 57/0458 . . {Oil-mist or spray lubrication; Means to reduce foam formation}
- 57/046 . . . {Oil-mist or spray lubrication}
- 57/0461 . . . {Means to reduce foam formation}
- 57/0463 . . {Grease lubrication; Drop-feed lubrication}
- 57/0464 . . . {Grease lubrication}
- 57/0465 . . . {Drop-feed lubrication}
- 57/0467 . . {Elements of gearings to be lubricated, cooled or heated}
- 57/0468 . . . {Shift rods or shift forks}
- 57/0469 . . . {Bearings or seals}
- 57/0471 . . . . {Bearing}
- 57/0472 . . . . {Seals}
- 57/0473 . . . {Friction devices, e.g. clutches or brakes}
- 57/0475 . . . {Engine and gearing, i.e. joint lubrication or cooling or heating thereof}
- 57/0476 . . . {Electric machines and gearing, i.e. joint lubrication or cooling or heating thereof}
- 57/0478 . . . {Synchromesh devices}
- 57/0479 . . . {Gears or bearings on planet carriers}
- 57/048 . . {Type of gearings to be lubricated, cooled or heated}
- 57/0482 . . . {Gearings with gears having orbital motion}
- 57/0483 . . . . {Axle or inter-axle differentials}
- 57/0484 . . . . {with variable gear ratio or for reversing rotary motion}
- 57/0486 . . . . {with fixed gear ratio ([axle or inter-axle differentials F16H 57/0483](#))}
- 57/0487 . . . {Friction gearings}
- 57/0489 . . . . {with endless flexible members, e.g. belt CVTs}
- 57/049 . . . . {of the toroid type}
- 57/0491 . . . . {of the cone ring type}
- 57/0493 . . . {Gearings with spur or bevel gears ([axle or inter-axle differentials with spur or bevel gears F16H 57/0483](#))}
- 57/0494 . . . . {with variable gear ratio or for reversing rotary motion}

- 57/0495 . . . . {with fixed gear ratio}
- 57/0497 . . . {Screw mechanisms}
- 57/0498 . . . {Worm gearings}
- 57/05 . . of chains
- 57/08 . of gearings with members having orbital motion
- 57/082 . . {Planet carriers}
- 2057/085 . . {Bearings for orbital gears}
- 2057/087 . . {Arrangement and support of friction devices in planetary gearings, e.g. support of clutch drums, stacked arrangements of friction devices}
- 57/10 . . Braking arrangements
- 57/12 . Arrangements for adjusting or for taking-up backlash not provided for elsewhere
- 2057/121 . . {using parallel torque paths and means to twist the two path against each other}
- 2057/122 . . . {by using two independent drive sources, e.g. electric motors}
- 2057/123 . . {using electric control means}
- 2057/125 . . {Adjustment of backlash during mounting or assembly of gearing}
- 2057/126 . . {Self-adjusting during operation, e.g. by a spring}
- 2057/127 . . . {using springs}
- 2057/128 . . {using axial positioning of gear wheel with addendum modification on gear width, i.e. backlash is compensated by axial positioning of a slightly conical gear wheel}

#### **Control of gearings conveying rotary motion**

##### **NOTES**

1. Attention is drawn to the Notes after the title of subclass [B60W](#).
2. In groups [F16H 59/00](#) - [F16H 63/00](#), clutches positioned within a gearbox are considered as comprising part of the gearings.
3. In groups [F16H 59/00](#) - [F16H 63/00](#), the following terms or expressions are used with the meaning indicated:
  - "final output element" means the final element which is moved to establish a gear ratio, i.e. which achieves the linking between two power transmission means, e.g. reverse idler gear, gear cluster, coupling sleeve, apply piston of a hydraulic clutch;
  - "mechanism" means a kinematic chain consisting either of a single element or alternatively of a series of elements, the position of each point on the kinematic chain being derivable from the position of any other point on the chain, and therefore, for a given position of a point on one of the elements forming the kinematic chain there is only one position for each of the other points on the elements forming the kinematic chain;
  - "final output mechanism" means the mechanism which includes the final output element;
  - "actuating mechanism" means the mechanism, the movement of which causes the movement of another mechanism by being in mutual contact;
  - "final actuating mechanism" means the mechanism actuating the final output mechanism.
  - {"mechanical force" means the force transmitted by an actuating mechanism or the human body}
4. Combinations of features individually covered by group [F16H 61/00](#) and one or both of groups [F16H 59/00](#) and [F16H 63/00](#) are classified in group [F16H 61/00](#).
5. Combinations of features individually covered by groups [F16H 59/00](#) and [F16H 63/00](#) are classified in group [F16H 63/00](#).
6. When classifying in groups [F16H 59/00](#) - [F16H 63/00](#), control inputs or types of gearing, which are not identified by the preceding notes concerning combinations, and which are

considered to represent information of interest for search, may also be classified. Such non-obligatory classification should be given as "additional information", e.g. selected from subgroup [F16H 61/66](#) relating to the type of gearing controlled or from group [F16H 59/00](#) relating to control inputs

- 59/00 Control inputs to {control units of} change-speed- or reversing-gearings for conveying rotary motion**
- 2059/003 . {Detecting or using driving style of a driver, e.g. for adapting shift schedules}
- 2059/006 . {Overriding automatic control}
- 59/02 . Selector apparatus

##### **NOTE**

Selection apparatus of general applicability or of interest apart from its use in control of gearings conveying rotary motion is also classified in subclass [G05G](#)

- 59/0204 . . {for automatic transmissions with means for range selection and manual shifting, e.g. range selector with tiptronic}
- 59/0208 . . {with means for suppression of vibrations or reduction of noise}
- 59/0213 . . {with sealing means, e.g. against entry of dust}
- 59/0217 . . {with electric switches or sensors not for gear or range selection, e.g. for controlling auxiliary devices}
- 2059/0221 . . {for selecting modes, e.g. sport, normal, economy}
- 2059/0226 . . . {for selecting particular shift speeds, e.g. a fast shift speed with aggressive gear change}
- 2059/023 . . {Selectors for gearings using voice control}
- 2059/0234 . . {Selectors for gearings using foot control}
- 2059/0239 . . {Up- and down-shift or range or mode selection by repeated movement}
- 2059/0243 . . . {with push buttons, e.g. shift buttons arranged on steering wheel}
- 2059/0247 . . . {with lever or paddle behind steering wheel}
- 2059/0252 . . {with means for initiating skip or double gear shifts, e.g. by moving selection lever beyond a threshold}
- 2059/0256 . . {Levers for forward-reverse selection only, e.g. for working machines having a separate lever for switching between forward and reverse mode}
- 2059/026 . . {Details or special features of the selector casing or lever support}
- 2059/0265 . . . {Selector lever support with pivot axis offset, e.g. support by four bar linkage to create pivoting centre outside the mechanism}
- 2059/0269 . . . {Ball joints or spherical bearings for supporting the lever}
- 2059/0273 . . . {Cardan or gimbal type joints for supporting the lever}
- 59/0278 . . {Constructional features of the selector lever, e.g. grip parts, mounting or manufacturing}
- 2059/0282 . . . {Lever handles with lock mechanisms, e.g. for allowing selection of reverse gear or releasing lever from park position}
- 2059/0286 . . . {with range or splitter selector on selector lever}
- 2059/0291 . . {comprising safety means for preventing injuries in case of accidents}
- 2059/0295 . . {with mechanisms to return lever to neutral or datum position, e.g. by return springs}



59/04	. .	Ratio selector apparatus	2059/366	. .	{Engine or motor speed}
59/041	. . .	{consisting of a final output mechanism, e.g. ratio selector being directly linked to a shift fork}	59/38	. .	of gearing elements
59/042	. . .	{comprising a final actuating mechanism}	2059/385	. . .	{Turbine speed}
59/044	. . .	{consisting of electrical switches or sensors}	59/40	. . .	Output shaft speed
59/045	. . .	{consisting of fluid valves}	2059/405	. . .	{Rate of change of output shaft speed or vehicle speed}
2059/047	. . .	{with essentially straight linear movement for gear selection, e.g. straight selection movement using detent mechanism for improving feeling}	59/42	. . .	Input shaft speed
2059/048	. . .	{with means for unlocking select or shift movement to allow access to reverse gear position}	2059/425	. . . .	{Rate of change of input or turbine shaft speed}
59/06	. . .	the ratio being infinitely variable	59/44	. .	dependent on machine speed (, e.g. the vehicle speed) (F16H 59/46 takes precedence)
2059/065	. . . .	{Inching pedals for setting the ratio of a hydrostatic transmission}	2059/443	. . .	{Detecting travel direction, e.g. the forward or reverse movement of the vehicle}
59/08	. .	Range selector apparatus	2059/446	. . .	{Detecting vehicle stop, i.e. the vehicle is at stand still, e.g. for engaging parking lock}
2059/081	. . .	{using knops or discs for rotary range selection}	59/46	. .	dependent on a comparison between speeds
2059/082	. . .	{for different transmission modes}	2059/462	. . .	{Detecting synchronisation, i.e. speed difference is approaching zero}
2059/083	. . . .	{Overdrive or overdrive cut-off}	2059/465	. . .	{Detecting slip, e.g. clutch slip ratio}
2059/084	. . . .	{Economy mode}	2059/467	. . . .	{of torque converter}
2059/085	. . . .	{Power mode}	59/48	. .	Inputs being a function of acceleration
2059/086	. . . .	{Adaptive mode, e.g. learning from the driver}	59/50	. .	Inputs being a function of the status of the machine, e.g. position of doors or safety belts
2059/087	. . . .	{Winter mode, e.g. to start on snow or slippery surfaces}	2059/503	. .	{Axle-load distribution}
2059/088	. . . .	{Fast forward-reverse-sequence, e.g. rocking mode}	2059/506	. .	{Wheel slip}
59/10	. . .	comprising levers	59/52	. .	dependent on the weight of the machine, e.g. change in weight resulting from passengers boarding a bus
59/105	. . . .	{consisting of electrical switches or sensors}	2059/525	. . .	{the machine undergoing additional towing load, e.g. by towing a trailer}
59/12	. . .	comprising push button devices	59/54	. .	dependent on signals from the brakes, e.g. parking brakes
59/14	. .	Inputs being a function of torque or torque demand	59/56	. .	dependent on signals from the main clutch
59/141	. .	{of rate of change of torque or torque demand}	59/58	. .	dependent on signals from the steering
2059/142	. .	{of driving resistance calculated from weight, slope, or the like}	59/60	. .	Inputs being a function of ambient conditions
2059/144	. .	{characterised by change between positive and negative drive line torque, e.g. torque changes when switching between coasting and acceleration}	2059/605	. .	{Traffic stagnation information, e.g. traffic jams}
2059/145	. .	{being a function of power demand of auxiliary devices}	59/62	. .	Atmospheric pressure
2059/147	. .	{Transmission input torque, e.g. measured or estimated engine torque}	59/64	. .	Atmospheric temperature
2059/148	. .	{Transmission output torque, e.g. measured or estimated torque at output drive shaft}	59/66	. .	Road conditions, e.g. slope, slippery
59/16	. .	Dynamometric measurement of torque	2059/663	. . .	{Road slope}
59/18	. .	dependent on the position of the accelerator pedal	2059/666	. . .	{Determining road conditions by using vehicle location or position, e.g. from global navigation systems [GPS]}
2059/183	. . .	{Rate of change of accelerator position, i.e. pedal or throttle change gradient}	59/68	. .	Inputs being a function of gearing status
2059/186	. . .	{Coasting}	2059/6807	. .	{Status of gear-change operation, e.g. clutch fully engaged}
59/20	. . .	Kickdown	2059/6815	. .	{Post shift value of gearing, i.e. calculated or estimated parameters after shift is completed, e.g. estimated output torque after shift is performed}
59/22	. . .	Idle position	2059/6823	. .	{Sensing neutral state of the transmission}
59/24	. .	dependent on the throttle opening	2059/683	. .	{Sensing pressure in control systems or in fluid-controlled devices, e.g. by pressure sensors}
59/26	. .	dependent on pressure	2059/6838	. .	{Sensing gearing status of hydrostatic transmissions}
59/28	. . .	Gasifier pressure in gas turbines	2059/6846	. . .	{the flow in hydrostatic transmissions circuits, e.g. high, low or differential pressures}
59/30	. . .	Intake manifold vacuum	2059/6853	. . .	{the state of the transmission units, i.e. motor or pump capacity, e.g. for controlled shifting of range gear}
59/32	. . .	Supercharger pressure in internal combustion engines	2059/6861	. . .	{the pressures, e.g. high, low or differential pressures}
59/34	. .	dependent on fuel feed	2059/6869	. . .	{the pump speed}
59/36	. .	Inputs being a function of speed	2059/6876	. . .	{the motor speed}
2059/363	. .	{Rate of change of input shaft speed, e.g. of engine or motor shaft}			

2059/6884	. . . {Sensing or calculating the pump torque}	61/0059	. {Braking of gear output shaft using simultaneous engagement of engaging means, e.g. clutches or brakes, applied for different gear ratios}
2059/6892	. . . {Sensing or calculating the motor torque}	2061/0062	. {Modifying an existing transmission control from a manufacturer for improvement or adaptation, e.g. by replacing a valve or an electric part}
59/70	. . dependent on the ratio established	2061/0065	. {Modifying or tuning an existing transmission control for racing, e.g. adaptation of valves for very fast shifting}
2059/702	. . . {Rate of change of gear ratio, e.g. for triggering clutch engagement}	2061/0068	. {Method or means for testing of transmission controls or parts thereof}
2059/704	. . . {Monitoring gear ratio in CVT's}	2061/0071	. . {Robots or simulators for testing control functions in automatic transmission}
2059/706	. . . {Monitoring gear ratio in stepped transmissions, e.g. by calculating the ratio from input and output speed}	2061/0075	. {characterised by a particular control method}
2059/708	. . . {Sensing reverse gear, e.g. by a reverse gear switch}	2061/0078	. . {Linear control, e.g. PID, state feedback or Kalman}
59/72	. . dependent on oil characteristics, e.g. temperature, viscosity	2061/0081	. . {Fuzzy logic}
2059/725	. . . {Sensing or calculating temperature of oil in friction devices, e.g. wet clutches, to prevent overheating of friction linings}	2061/0084	. . {Neural networks}
59/74	. Inputs being a function of engine parameters (F16H 59/14 takes precedence)	2061/0087	. . {Adaptive control, e.g. the control parameters adapted by learning}
2059/743	. . {using engine performance or power for control of gearing}	2061/009	. . {using formulas or mathematic relations for calculating parameters}
2059/746	. . {Engine running state, e.g. on-off of ignition switch}	2061/0093	. . {using models to estimate the state of the controlled object}
59/76	. . Number of cylinders operating	2061/0096	. . {using a parameter map}
59/78	. . Temperature	61/02	. characterised by the signals used
<b>61/00</b>	<b>Control functions within {control units of} change-speed- or reversing-gearings for conveying rotary motion {; Control of exclusively fluid gearing, friction gearing, gearings with endless flexible members or other particular types of gearing}</b>	<b>NOTES</b>	
61/0003	. {Arrangement or mounting of elements of the control apparatus, e.g. valve assemblies or snapfittings of valves; Arrangements of the control unit on or in the transmission gearbox}	1. Control units where gearshift is controlled by an electric circuit, are classified in <a href="#">F16H 61/0202</a>	
61/0006	. . {Electronic control units for transmission control, e.g. connectors, casings or circuit boards}	2. Control units where gearshift is controlled by hydraulic signals and a subfunction, e.g. kickdown, is controlled by an electric circuit, are classified in <a href="#">F16H 61/0262</a> with indexing of the electric features	
61/0009	. . {Hydraulic control units for transmission control, e.g. assembly of valve plates or valve units}	61/0202	. . {the signals being electric}
2061/0012	. {Transmission control for optimising power output of driveline}	61/0204	. . . {for gearshift control, e.g. control functions for performing shifting or generation of shift signal}
2061/0015	. {Transmission control for optimising fuel consumptions}	61/0206	. . . . {Layout of electro-hydraulic control circuits, e.g. arrangement of valves}
2061/0018	. {Transmission control for optimising exhaust emissions}	2061/0209	. . . . {with independent solenoid valves modulating the pressure individually for each clutch or brake}
61/0021	. {Generation or control of line pressure}	61/0211	. . . . . {characterised by low integration or small number of valves}
61/0025	. . {Supply of control fluid; Pumps therefor}	61/0213	. . . . . {characterised by the method for generating shift signals}
61/0028	. . . {using a single pump driven by different power sources}	2061/0216	. . . . . {Calculation or estimation of post shift values for different gear ratios, e.g. by using engine performance tables}
61/0031	. . . {using auxiliary pumps, e.g. pump driven by a different power source than the engine}	2061/0218	. . . . . {Calculation or estimation of the available ratio range, i.e. possible gear ratios, e.g. for prompting a driver with a display}
2061/0034	. . . {Accumulators for fluid pressure supply; Control thereof}	2061/022	. . . . . {Calculation or estimation of optimal gear ratio, e.g. best ratio for economy drive or performance according driver preference, or to optimise exhaust emissions}
2061/0037	. . {characterised by controlled fluid supply to lubrication circuits of the gearing}	2061/0223	. . . . . {Generating of new shift maps, i.e. methods for determining shift points for a schedule by taking into account driveline and vehicle conditions}
2061/004	. {Venting trapped air from hydraulic systems}		
2061/0043	. {Cleaning of hydraulic parts, e.g. removal of an orifice clogging}		
2061/0046	. {Details of fluid supply channels, e.g. within shafts, for supplying friction devices or transmission actuators with control fluid}		
2061/005	. {Supply of electric power, e.g. batteries for back up supply}		
2061/0053	. {Initializing the parameters of the controller}		
2061/0056	. {Powering down of the controller}		

2061/0225	. . . . .	{Modifying of shift maps by manual control, e.g. by learning values from the driver during manual shift mode}	61/0295	. . .	{Automatic gear shift control, e.g. initiating shift by centrifugal forces}
2061/0227	. . . . .	{Shift map selection, i.e. methods for controlling selection between different shift maps, e.g. to initiate switch to a map for up-hill driving}	61/0297	. . .	{Gear shift control where shifting is directly initiated by the driver, e.g. semi-automatic transmissions}
2061/023	. . . . .	{Drive-off gear selection, i.e. optimising gear ratio for drive off of a vehicle}	61/04	. .	Smoothing ratio shift
2061/0232	. . . . .	{Selecting ratios for bringing engine into a particular state, e.g. for fast warming up or for reducing exhaust emissions}	61/0403	. .	{Synchronisation before shifting}
2061/0234	. . . . .	{Adapting the ratios to special vehicle conditions}	2061/0407	. . .	{by control of clutch in parallel torque path}
2061/0237	. . . . .	{Selecting ratios for providing engine braking}	2061/0411	. . .	{by control of shaft brakes}
2061/0239	. . . . .	{Selecting ratios for preventing or cancelling wheel slip}	2061/0414	. . .	{by retarder control}
2061/0241	. . . . .	{Adapting the ratio to special transmission conditions, e.g. shifts during warming up phase of transmission when fluid viscosity is high}	2061/0418	. . .	{by using different synchronisation devices simultaneously, e.g. for faster synchronisation}
2061/0244	. . . . .	{Adapting the automatic ratio to direct driver requests, e.g. manual shift signals or kick down}	2061/0422	. . .	{by an electric machine, e.g. by accelerating or braking the input shaft}
61/0246	. . . .	{characterised by initiating reverse gearshift}	2061/0425	. .	{Bridging torque interruption}
61/0248	. . .	{Control units where shifting is directly initiated by the driver, e.g. semi-automatic transmissions}	2061/0429	. . .	{by torque supply with a clutch in parallel torque path}
61/0251	. . .	{Elements specially adapted for electric control units, e.g. valves for converting electrical signals to fluid signals}	2061/0433	. . .	{by torque supply with an electric motor}
2061/0253	. . . .	{Details of electro hydraulic valves, e.g. lands, ports, spools or springs}	61/0437	. .	{by using electrical signals ( <a href="#">F16H 61/0403</a> and <a href="#">F16H 61/061</a> take precedence)}
2061/0255	. . . .	{Solenoid valve using PWM or duty-cycle control}	2061/044	. .	{when a freewheel device is disengaged or bridged}
2061/0258	. . . .	{Proportional solenoid valve}	2061/0444	. .	{during fast shifting over two gearsteps, e.g. jumping from fourth to second gear}
2061/026	. . . .	{On-off solenoid valve}	2061/0448	. . .	{using a particular sequence of gear ratios or friction members}
61/0262	. .	{the signals being hydraulic}	2061/0451	. .	{during swap-shifts, i.e. gear shifts between different planetary units, e.g. with double transitions shift involving three or more friction members}
61/0265	. . .	{for gearshift control, e.g. control functions for performing shifting or generation of shift signals}	2061/0455	. .	{during shifts involving three or more shift members, e.g. release of 3-4 clutch, 2-4 brake and apply of forward clutch C1}
61/0267	. . . .	{Layout of hydraulic control circuits, e.g. arrangement of valves}	2061/0459	. .	{using map for shift parameters, e.g. shift time, slip or pressure gradient, for performing controlled shift transition and adapting shift parameters by learning}
61/0269	. . . .	{characterised by low integration or small number of valves}	2061/0462	. .	{by controlling slip rate during gear shift transition}
61/0272	. . . .	{characterised by initiating reverse gearshift}	2061/0466	. .	{Smoothing shift shock by apply or release of band brake servos, e.g. overlap control of band brake and a clutch or <i>vice versa</i> }
61/0274	. . .	{Control units where shifting is directly initiated by the driver, e.g. semi-automatic transmissions}	2061/047	. .	{by preventing or solving a tooth butt situation upon engagement failure due to misalignment of teeth}
61/0276	. . .	{Elements specially adapted for hydraulic control units, e.g. valves}	2061/0474	. .	{by smoothing engagement or release of positive clutches; Methods or means for shock free engagement of dog clutches}
2061/0279	. . . .	{Details of hydraulic valves, e.g. lands, ports, spools or springs}	2061/0477	. .	{by suppression of excessive engine flare or turbine racing during shift transition}
2061/0281	. . . .	{Rotary shift valves, e.g. with a rotary moveable spool for supply of fluid to different channels}	2061/0481	. .	{during range shift from drive (D) or reverse (R) to neutral (N)}
61/0283	. . . .	{Governor valves}	2061/0485	. .	{during range shift from neutral (N) to reverse (R)}
61/0286	. . . .	{Manual valves}	2061/0488	. .	{during range shift from neutral (N) to drive (D)}
2061/0288	. . . .	{Relay valve, e.g. valve arranged between shift valve and servo}	2061/0492	. .	{for high engine torque, e.g. during acceleration or uphill driving}
61/029	. . . .	{Throttle valves}	2061/0496	. .	{for low engine torque, e.g. during coasting, sailing or engine braking}
61/0293	. .	{the signals being purely mechanical}	61/06	. .	by controlling rate of change of fluid pressure
			61/061	. . .	{using electric control means}
			2061/062	. . . .	{for controlling filling of clutches or brake servos, e.g. fill time, fill level or pressure during filling}

- 2061/064 . . . . {for calibration of pressure levels for friction members, e.g. by monitoring the speed change of transmission shafts}
- 61/065 . . . {using fluid control means}
- 61/067 . . . . {using an accumulator}
- 61/068 . . . . {using an orifice control valve ([F16H 61/067 takes precedence](#))}
- 61/08 . . Timing control
- 2061/085 . . . {Timing of auxiliary gear shifts}
- 61/10 . Controlling shift hysteresis
- 61/12 . Detecting malfunction or potential malfunction, e.g. fail safe ([in control of hydrostatic gearing F16H 61/4192](#)) {; Circumventing or fixing failures}
- 2061/1204 . . {for malfunction caused by simultaneous engagement of different ratios resulting in transmission lock state or tie-up condition}
- 2061/1208 . . {with diagnostic check cycles; Monitoring of failures}
- 2061/1212 . . . {Plausibility checks; Counting means for repeated failures}
- 2061/1216 . . . {Display or indication of detected failures}
- 2061/122 . . {Avoiding failures by using redundant parts}
- 2061/1224 . . {Adapting to failures or work around with other constraints, e.g. circumvention by avoiding use of failed parts}
- 2061/1228 . . {Fixing failures by repairing failed parts, e.g. loosening a sticking valve}
- 2061/1232 . . {Bringing the control into a predefined state, e.g. giving priority to particular actuators or gear ratios}
- 2061/1236 . . . {using fail priority valves}
- 2061/124 . . {Limiting the input power, torque or speed}
- 2061/1244 . . {Keeping the current state}
- 2061/1248 . . {Resuming normal operation}
- 2061/1252 . . {Fail safe valves}
- 2061/1256 . . {characterised by the parts or units where malfunctioning was assumed or detected}
- 2061/126 . . . {the failing part is the controller}
- 2061/1264 . . . . {Hydraulic parts of the controller, e.g. a sticking valve or clogged channel}
- 2061/1268 . . . . {Electric parts of the controller, e.g. a defect solenoid, wiring or microprocessor}
- 2061/1272 . . . {the failing part is a part of the final output mechanism, e.g. shift rods or forks}
- 2061/1276 . . . {the failing part is a friction device, e.g. clutches or brakes}
- 2061/128 . . . . {the main clutch}
- 2061/1284 . . . {the failing part is a sensor}
- 2061/1288 . . . {the failing part is an actuator}
- 2061/1292 . . . {the failing part is the power supply, e.g. the electric power supply}
- 2061/1296 . . . {the failing part is an electric machine forming part of the transmission}
- 61/14 . Control of torque converter lock-up clutches
- 61/141 . . {using means only actuated by centrifugal force}
- 61/142 . . . {the means being hydraulic valves}
- 61/143 . . {using electric control means}
- 2061/145 . . . {for controlling slip, e.g. approaching target slip value}
- 2061/146 . . . {for smoothing gear shift shock}
- 2061/147 . . . {during engine braking, e.g. to attenuate gear clunk when torque direction is changed}
- 61/148 . . {using mechanical control means}
- 61/16 . Inhibiting {or initiating} shift during unfavourable conditions {, e.g. preventing forward-reverse shift at high vehicle speed, preventing engine overspeed} ([F16H 61/18 takes precedence](#))
- 2061/161 . . {by checking feasibility of shifts, i.e. determine if requested shift can be successfully completed and post shift values are in an acceptable range}
- 2061/163 . . {Holding the gear for delaying gear shifts under unfavorable conditions, e.g. during cornering}
- 2061/165 . . {Preventing reverse gear shifts if vehicle speed is too high for safe shifting}
- 2061/166 . . {Preventing or initiating shifts for preventing stall or overspeed of engine}
- 2061/168 . . {Forced shifts into neutral for safety reasons, e.g. in case of transmission failure or emergency braking}
- 61/18 . Preventing unintentional or unsafe shift {, e.g. preventing manual shift from highest gear to reverse gear}
- 2061/185 . . . {Means, e.g. catches or interlocks, for preventing unintended shift into reverse gear}
- 61/20 . Preventing gear creeping {; Transmission control during standstill, e.g. hill hold control}
- 2061/202 . . {Active creep control for slow driving, e.g. by controlling clutch slip}
- 2061/205 . . {Hill hold control, e.g. with torque converter or a friction device slightly engaged to keep vehicle stationary}
- 2061/207 . . {by neutral control}
- 61/21 . Providing engine brake control
- 2061/213 . . {for emergency braking, e.g. for increasing brake power in emergency situations}
- 2061/216 . . {by using exhaust brakes}
- 61/22 . Locking {of the control input devices} ([constructional features of locking or disabling mechanisms F16H 63/34](#))
- 2061/223 . . {Electrical gear shift lock, e.g. locking of lever in park or neutral position by electric means if brake is not applied; Key interlock, i.e. locking the key if lever is not in park position}
- 2061/226 . . {Manual distress release of the locking means for shift levers, e.g. to allow towing of vehicle in case of breakdown}
- 61/24 . Providing feel, e.g. to enable selection
- 2061/241 . . {Actuators providing feel or simulating a shift gate, i.e. with active force generation for providing counter forces for feed back}
- 2061/242 . . {Mechanical shift gates or similar guiding means during selection and shifting}
- 2061/243 . . {Cams or detent arrays for guiding and providing feel}
- 2061/245 . . {Ramp contours for generating force threshold, e.g. cams or pushers for generating additional resistance for a reverse path}
- 2061/246 . . {Additional mass or weight on shift linkage for improving feel}
- 2061/247 . . {Detents for range selectors}
- 2061/248 . . {with audible signals for providing selection or shift feed back}



61/26	. Generation or transmission of movements for final actuating mechanisms	61/34	. . comprising two mechanisms, one for the preselection movement, and one for the shifting movement ( <a href="#">F16H 61/36 takes precedence</a> )
	<b>NOTES</b>	61/36	. . with at least one movement being transmitted by a cable
	1. The generation or transmission of movements comprising only the selector apparatus, is classified in group <a href="#">F16H 59/00</a> .	61/38	. Control of exclusively fluid gearing
	2. The generation or transmission of movements, when part of the final output mechanisms, is classified in group <a href="#">F16H 63/00</a> .	61/40	. . hydrostatic
61/28	. . with at least one movement of the final actuating mechanism being caused by a non-mechanical force, e.g. power-assisted	61/4008	. . . Control of circuit pressure
61/2807	. . . {using electric control signals for shift actuators, e.g. electro-hydraulic control therefor ( <a href="#">F16H 61/30</a> , <a href="#">F16H 61/32 take precedence</a> )}	61/4017	. . . . Control of high pressure, e.g. avoiding excess pressure by a relief valve
61/2815	. . . . {with a control using only relays and switches}	61/4026	. . . . Control of low pressure
2061/2823	. . . {Controlling actuator force way characteristic, i.e. controlling force or movement depending on the actuator position, e.g. for adapting force to synchronisation and engagement of gear clutch}	61/4035	. . . Control of circuit flow
2061/283	. . . {Adjustment or calibration of actuator positions, e.g. neutral position}	61/4043	. . . Control of a bypass valve
2061/2838	. . . {Arrangements with single drive motor for selecting and shifting movements, i.e. one motor used for generating both movements}	61/4052	. . . . by using a variable restriction, e.g. an orifice valve
2061/2846	. . . {Arrangements of actuators for enabling jump shifting for skipping of gear ratios}	61/4061	. . . Control related to directional control valves, e.g. change-over valves, for crossing the feeding conduits
2061/2853	. . . {Electromagnetic solenoids}	61/4069	. . . Valves related to the control of neutral, e.g. shut off valves
2061/2861	. . . {Linear motors}	61/4078	. . . Fluid exchange between hydrostatic circuits and external sources or consumers
2061/2869	. . . {Cam or crank gearing}	61/4096	. . . . with pressure accumulators
2061/2876	. . . {Racks}	61/4104	. . . . Flushing, e.g. by using flushing valves or by connection to exhaust
2061/2884	. . . {Screw-nut devices}	61/4131	. . . . Fluid exchange by aspiration from reservoirs, e.g. sump
2061/2892	. . . {other gears, e.g. worm gears, for transmitting rotary motion to the output mechanism}	61/4139	. . . . Replenishing or scavenging pumps, e.g. auxiliary charge pumps
61/30	. . . Hydraulic {or pneumatic} motors {or related fluid control means} therefor	61/4148	. . . Open loop circuits
2061/301	. . . . {for power assistance, i.e. servos with follow up action}	61/4157	. . . Control of braking, e.g. preventing pump over-speeding when motor acts as a pump
2061/302	. . . . {with variable force amplification, e.g. force is depending on selected gear or on actuator force (non-linear amplification)}	61/4165	. . . Control of cooling or lubricating
2061/304	. . . . {using telemotors, i.e. systems with master cylinder and linked shift actuator without external pressure source}	61/4174	. . . Control of venting, e.g. removing trapped air
2061/305	. . . . {Accumulators for fluid supply to the servo motors, or control thereof}	61/4183	. . . Preventing or reducing vibrations or noise, e.g. avoiding cavitations
2061/307	. . . . {Actuators with three or more defined positions, e.g. three position servos}	61/4192	. . . Detecting malfunction or potential malfunction, e.g. fail safe
2061/308	. . . . {Modular hydraulic shift units, i.e. preassembled actuator units for select and shift movements adapted for being mounted on transmission casing}	61/42	. . . involving adjustment of a pump or motor with adjustable output or capacity
61/32	. . . Electric motors {, actuators or related electrical control means} therefor	61/421	. . . . Motor capacity control by electro-hydraulic control means, e.g. using solenoid valves
2061/323	. . . . {for power assistance, i.e. servos with follow up action}	61/423	. . . . Motor capacity control by fluid pressure control means
2061/326	. . . . {Actuators for range selection, i.e. actuators for controlling the range selector or the manual range valve in the transmission}	61/425	. . . . Motor capacity control by electric actuators
		61/427	. . . . Motor capacity control by mechanical control means, e.g. by levers or pedals
		61/431	. . . . Pump capacity control by electro-hydraulic control means, e.g. using solenoid valves
		61/433	. . . . Pump capacity control by fluid pressure control means
		61/435	. . . . Pump capacity control by electric actuators
		61/437	. . . . Pump capacity control by mechanical control means, e.g. by levers or pedals
		61/438	. . . . Control of forward-reverse switching, e.g. control of the swash plate causing discharge in two directions
		61/439	. . . . Control of the neutral position, e.g. by zero tilt rotation holding means
		61/44	. . . with more than one pump or motor in operation
		61/444	. . . . by changing the number of pump or motor units in operation
		61/448	. . . . Control circuits for tandem pumps or motors

61/452	. . . .	Selectively controlling multiple pumps or motors, e.g. switching between series or parallel	2061/6614	. . . .	{Control of ratio during dual or multiple pass shifting for enlarged ratio coverage}
61/456	. . . .	Control of the balance of torque or speed between pumps or motors	2061/6615	. . . .	{Imitating a stepped transmissions}
61/46	. . . .	Automatic regulation in accordance with output requirements	2061/6616	. . . .	{the shifting of the transmission being manually controlled}
61/461	. . . .	{not involving a variation of the output capacity of the main pumps or motors}	2061/6617	. . . .	{Manual control of CVTs while continuously varying the ratio}
61/462	. . . .	for achieving a target speed ratio	2061/6618	. . . .	{Protecting CVTs against overload by limiting clutch capacity, e.g. torque fuse}
61/465	. . . .	for achieving a target input speed	61/662	. . . .	with endless flexible members
61/468	. . . .	for achieving a target input torque	2061/66204	. . . .	{Control for modifying the ratio control characteristic}
61/47	. . . .	for achieving a target output speed	2061/66209	. . . .	{dependent on ambient conditions}
61/472	. . . .	for achieving a target output torque	2061/66213	. . . .	{dependent on driver's choice}
61/475	. . . .	for achieving a target power, e.g. input power or output power	2061/66218	. . . .	{dependent on control input parameters other than ambient conditions or driver's choice}
61/478	. . . .	for preventing overload, e.g. high pressure limitation	2061/66222	. . . .	{the ratio is varied in order to reduce surface wear of belt or pulley}
61/48	. . . .	hydrodynamic	61/66227	. . . .	{controlling shifting exclusively as a function of speed and torque}
61/50	. . . .	controlled by changing the flow, force, or reaction of the liquid in the working circuit, while maintaining a completely filled working circuit	61/66231	. . . .	{controlling shifting exclusively as a function of speed}
61/52	. . . .	by altering the position of blades	61/66236	. . . .	{using electrical or electronic sensing or control means}
61/54	. . . . .	by means of axially-shiftable blade runners	61/6624	. . . .	{using only hydraulical and mechanical sensing or control means}
61/56	. . . . .	to change the blade angle	61/66245	. . . .	{using purely mechanical sensing or control means}
61/58	. . . .	by change of the mechanical connection of, or between, the runners	61/6625	. . . .	{controlling shifting exclusively as a function of torque}
61/60	. . . . .	exclusively by the use of freewheel clutches	61/66254	. . . .	{controlling of shifting being influenced by a signal derived from the engine and the main coupling}
61/62	. . . . .	involving use of a speed-changing gearing or of a clutch in the connection between runners <a href="#">(F16H 61/60 takes precedence; combinations of fluid gearings for conveying rotary motion with mechanical clutches for bridging a fluid gearing of the hydrokinetic type F16H 45/02)</a>	61/66259	. . . .	{using electrical or electronical sensing or control means}
61/64	. . . .	controlled by changing the amount of liquid in the working circuit	61/66263	. . . .	{using only hydraulical and mechanical sensing or control means}
61/66	. . . .	specially adapted for continuously variable gearings <a href="#">(control of exclusively fluid gearing F16H 61/38)</a>	61/66268	. . . .	{using purely mechanical sensing or control means}
2061/6601	. . . .	{with arrangements for dividing torque and shifting between different ranges}	61/66272	. . . .	{characterised by means for controlling the torque transmitting capability of the gearing}
2061/6602	. . . .	{with at least two dynamo-electric machines for creating an electric power path inside the transmission device, e.g. using generator and motor for a variable power torque path}	2061/66277	. . . .	{by optimising the clamping force exerted on the endless flexible member}
2061/6603	. . . .	{characterised by changing ratio in the mechanical gearing}	2061/66281	. . . .	{by increasing the line pressure at the occurrence of input torque peak}
2061/6604	. . . .	{Special control features generally applicable to continuously variable gearings}	2061/66286	. . . .	{Control for optimising pump efficiency}
2061/6605	. . . .	{Control for completing downshift at hard braking}	2061/6629	. . . .	{Detection of slip for determining level of wear}
2061/6607	. . . .	{Controls concerning lubrication or cooling}	2061/66295	. . . .	{characterised by means for controlling the geometrical interrelationship of pulleys and the endless flexible member, e.g. belt alignment or position of the resulting axial pulley force in the plane perpendicular to the pulley axis}
2061/6608	. . . .	{Control of clutches, or brakes for forward-reverse shift}	61/664	. . . .	Friction gearings
2061/6609	. . . .	{Control of clutches or brakes in torque split transmissions}	2061/6641	. . . .	{Control for modifying the ratio control characteristic}
2061/661	. . . .	{Conjoint control of CVT and drive clutch}	2061/6642	. . . .	{dependent on ambient conditions}
2061/6611	. . . .	{Control to achieve a particular driver perception, e.g. for generating a shift shock sensation}	2061/6643	. . . .	{dependent on driver's choice}
2061/6612	. . . . .	{for engine braking}	2061/6644	. . . .	{dependent on control input parameters other than ambient conditions or driver's choice}
			61/6645	. . . .	{controlling shifting exclusively as a function of speed and torque}
			61/6646	. . . .	{controlling shifting exclusively as a function of speed}

61/6647	. . . {controlling shifting exclusively as a function of torque}	63/206	. . . . {the final output mechanisms being mounted coaxially on a single shaft, e.g. mono rail shift mechanism}
61/6648	. . . {controlling of shifting being influenced by a signal derived from the engine and the main coupling}	2063/208	. . . . {using two or more selecting fingers}
61/6649	. . . {characterised by the means for controlling the torque transmitting capability of the gearing}	63/22	. . . . the final output mechanisms being simultaneously moved by the final actuating mechanism
61/68	. specially adapted for stepped gearings	63/24	. . each of the final output mechanisms being moved by only one of the various final actuating mechanisms
61/682	. . with interruption of drive	63/26	. . . some of the movements of the final output mechanisms being caused by another final output mechanism
61/684	. . without interruption of drive	63/28	. . two or more final actuating mechanisms moving the same final output mechanism
61/686	. . . with orbital gears	63/285	. . . {with a first final actuating member applying a force to two or more final output members and a second final actuating member locking in position another final output member}
61/688	. . . with two inputs, e.g. selection of one of two torque-flow paths by clutches	63/30	. . Constructional features of the final output mechanisms
61/70	. specially adapted for change-speed gearing in group arrangement, i.e. with separate change-speed gear trains arranged in series, e.g. range or overdrive-type gearing arrangements	63/3003	. . . {Band brake actuating mechanisms}
61/702	. . {using electric or electrohydraulic control means}	2063/3006	. . . . {moved by a non-mechanical force}
61/705	. . {using hydraulic and mechanical control means}	63/3009	. . . {the final output mechanisms having elements remote from the gearbox}
61/707	. . {using only mechanical control means}	63/3013	. . . {the final output mechanism being characterised by linkages converting movement, e.g. into opposite direction by a pivoting lever linking two shift rods}
<b>63/00</b>	<b>Control outputs {from the control unit} to change-speed- or reversing-gearings for conveying rotary motion {or to other devices than the final output mechanism}</b>	63/3016	. . . {Final output mechanisms varying the leverage or force ratio}
2063/005	. {Preassembled gear shift units for mounting on gear case}	63/302	. . . {Final output mechanisms for reversing}
63/02	. Final output mechanisms therefor; Actuating means for the final output mechanisms	63/3023	. . . {the final output mechanisms comprising elements moved by fluid pressure ( <a href="#">band brake actuating mechanisms F16H 63/3003</a> )}
2063/025	. . {Final output mechanisms for double clutch transmissions}	63/3026	. . . . {comprising friction clutches or brakes ( <a href="#">band brake actuating mechanisms F16H 63/3003</a> )}
63/04	. . a single final output mechanism being moved by a single final actuating mechanism	2063/303	. . . . {the friction member is actuated and released by applying pressure to different fluid chambers}
63/06	. . . the final output mechanism having an indefinite number of positions	2063/3033	. . . . {the brake is actuated by springs and released by a fluid pressure}
63/062	. . . . {electric or electro-mechanical actuating means}	2063/3036	. . . . {the clutch is actuated by springs and released by a fluid pressure}
63/065	. . . . {hydraulic actuating means}	63/304	. . . {the final output mechanisms comprising elements moved by electrical or magnetic force ( <a href="#">band brake actuating mechanisms F16H 63/3003</a> )}
63/067	. . . . {mechanical actuating means}	63/3043	. . . . {comprising friction clutches or brakes}
63/08	. . Multiple final output mechanisms being moved by a single common final actuating mechanism	2063/3046	. . . . {using electromagnetic clutch for coupling gear wheel to shaft}
63/10	. . . the final actuating mechanism having a series of independent ways of movement, each way of movement being associated with only one final output mechanism	2063/305	. . . . {using electromagnetic solenoids}
63/12	. . . . two or more ways of movement occurring simultaneously	2063/3053	. . . . {using linear motors}
63/14	. . . the final output mechanisms being successively actuated by repeated movement of the final actuating mechanism	2063/3056	. . . . {using cam or crank gearing}
63/16	. . . the final output mechanisms being successively actuated by progressive movement of the final actuating mechanism	2063/3059	. . . . {using racks}
63/18	. . . . the final actuating mechanism comprising cams	2063/3063	. . . . {using screw devices}
63/20	. . . with preselection and subsequent movement of each final output mechanism by movement of the final actuating mechanism in two different ways, e.g. guided by a shift gate	2063/3066	. . . . {using worm gears}
2063/202	. . . . {using cam plates for selection or shifting, e.g. shift plates with recesses or groves moved by a selector extension}	63/3069	. . . {Interrelationship between two or more final output mechanisms}
2063/204	. . . . {the gear shift lever being the immediate final actuating mechanism, e.g. the shift finger being a part of the gear shift lever}	2063/3073	. . . . {final output mechanisms mounted on a single shaft}
		2063/3076	. . . {Selector shaft assembly, e.g. supporting, assembly or manufacturing of selector or shift shafts; Special details thereof}

2063/3079	. . .	{Shift rod assembly, e.g. supporting, assembly or manufacturing of shift rails or rods; Special details thereof}	63/486	. . .	{Common control of parking locks or brakes in the transmission and other parking brakes, e.g. wheel brakes}
2063/3083	. . .	{Shift finger arrangements, e.g. shape or attachment of shift fingers}	63/50	. .	Signals to an engine or motor
2063/3086	. . .	{Shift head arrangements, e.g. forms or arrangements of shift heads for preselection or shifting}	63/502	. . .	{for smoothing gear shifts}
2063/3089	. . .	{Spring assisted shift, e.g. springs for accumulating energy of shift movement and release it when clutch teeth are aligned}	2063/504	. . .	{for bringing engine into special condition by transmission control, e.g. by changing torque converter characteristic to modify engine set point to higher engine speed for better acceleration performance}
2063/3093	. . .	{Final output elements, i.e. the final elements to establish gear ratio, e.g. coupling sleeves or other means establishing coupling to shaft}	2063/506	. . .	{for engine torque resume after shift transition, e.g. a resume adapted to the driving style}
2063/3096	. . . .	{Sliding keys as final output elements; Details thereof}	2063/508	. . .	{for limiting transmission input torque, e.g. to prevent damage of transmission parts}
63/32	. . .	Gear shift yokes, {e.g. shift forks}	<hr/>		
2063/321	. . . .	{characterised by the interface between fork body and shift rod, e.g. fixing means, bushes, cams or pins}	<b>2200/00</b>	<b>Transmissions for multiple ratios</b>	
2063/322	. . . .	{characterised by catches or notches for moving the fork}	2200/0004	. .	comprising a power take off shaft
2063/324	. . . .	{characterised by slide shoes, or similar means to transfer shift force to sleeve}	2200/0008	. .	specially adapted for front-wheel-driven vehicles
2063/325	. . . .	{Rocker or swiveling forks, i.e. the forks are pivoted in the gear case when moving the sleeve}	2200/0013	. .	specially adapted for rear-wheel-driven vehicles
2063/327	. . . .	{essentially made of sheet metal}	2200/0017	. .	specially adapted for four-wheel-driven vehicles
2063/328	. . . .	{essentially made of plastics, e.g. injection molded}	2200/0021	. .	specially adapted for electric vehicles
63/34	. . .	Locking or disabling mechanisms	2200/0026	. .	comprising at least one creep low gear, e.g. additional gear for extra low speed or creeping
63/3408	. . . .	{the locking mechanism being moved by the final actuating mechanism}	2200/003	. .	characterised by the number of forward speeds
63/3416	. . . .	{Parking lock mechanisms or brakes in the transmission}	2200/0034	. .	the gear ratios comprising two forward speeds
63/3425	. . . . .	{characterised by pawls or wheels}	2200/0039	. .	the gear ratios comprising three forward speeds
63/3433	. . . . .	{Details of latch mechanisms, e.g. for keeping pawls out of engagement}	2200/0043	. .	the gear ratios comprising four forward speeds
63/3441	. . . . .	{Parking locks engaging axially}	2200/0047	. .	the gear ratios comprising five forward speeds
63/345	. . . . .	{using friction brakes, e.g. a band brakes}	2200/0052	. .	the gear ratios comprising six forward speeds
63/3458	. . . . .	{with electric actuating means, e.g. shift by wire}	2200/0056	. .	the gear ratios comprising seven forward speeds
63/3466	. . . . .	{using electric motors}	2200/006	. .	the gear ratios comprising eight forward speeds
63/3475	. . . . .	{using solenoids}	2200/0065	. .	the gear ratios comprising nine forward speeds
63/3483	. . . . .	{with hydraulic actuating means}	2200/0069	. .	the gear ratios comprising ten forward speeds
63/3491	. . . . .	{Emergency release or engagement of parking locks or brakes}	2200/0073	. .	the gear ratios comprising eleven forward speeds
63/36	. . . .	Interlocking devices	2200/0078	. .	the gear ratio comprising twelve or more forward speeds
63/38	. . .	Detents	2200/0082	. .	characterised by the number of reverse speeds
63/40	. .	comprising signals other than signals for actuating the final output mechanisms	2200/0086	. .	the gear ratios comprising two reverse speeds
63/42	. .	Ratio indicator devices	2200/0091	. .	the gear ratios comprising three reverse speeds
2063/423	. . .	{Range indicators for automatic transmissions, e.g. showing selected range or mode}	2200/0095	. .	the gear ratios comprising four reverse speeds
2063/426	. . .	{with means for advising the driver for proper shift action, e.g. prompting the driver with allowable selection range of ratios}	2200/20	. .	Transmissions using gears with orbital motion
63/44	. .	Signals to the control unit of auxiliary gearing	2200/2002	. .	characterised by the number of sets of orbital gears
63/46	. .	Signals to a clutch outside the gearbox	2200/2005	. . .	with one sets of orbital gears
63/48	. .	Signals to a parking brake {or parking lock; Control of parking locks or brakes being part of the transmission}	2200/2007	. . .	with two sets of orbital gears
63/483	. . .	{Circuits for controlling engagement of parking locks or brakes}	2200/201	. . .	with three sets of orbital gears
			2200/2012	. . .	with four sets of orbital gears
			2200/2015	. . .	with five sets of orbital gears
			2200/2017	. . .	with six sets of orbital gears
			2200/202	. .	characterised by the type of Ravigneaux set
			2200/2023	. . .	using a Ravigneaux set with 4 connections
			2200/2025	. . .	using a Ravigneaux set with 5 connections
			2200/2028	. . .	using a Ravigneaux set with 6 connections
			2200/203	. .	characterised by the engaging friction means not of the freewheel type, e.g. friction clutches or brakes
			2200/2033	. . .	with one engaging means
			2200/2035	. . .	with two engaging means
			2200/2038	. . .	with three engaging means
			2200/2041	. . .	with four engaging means
			2200/2043	. . .	with five engaging means



2200/2046	. . . with six engaging means	<b>2312/00</b>	<b>Driving activities</b>
2200/2048	. . . with seven engaging means	2312/02	. Driving off
2200/2051	. . . with eight engaging means	2312/022	. . Preparing to drive off
2200/2053	. . . with nine engaging means	2312/04	. Holding or hillholding
2200/2056	. . . with ten engaging means	2312/06	. Creeping
2200/2058	. . . with eleven engaging means	2312/08	. Rocking
2200/2061	. . . with twelve engaging means	2312/09	. Switching between forward and reverse
2200/2064	. . . using at least one positive clutch, e.g. dog clutch	2312/10	. Inching
		2312/12	. Parking
2200/2066	. . . using one freewheel mechanism	2312/14	. Going to, or coming from standby operation, e.g. for engine start-stop operation at traffic lights
2200/2069	. . . using two freewheel mechanism		
2200/2071	. . . using three freewheel mechanism	2312/16	. Coming to a halt
2200/2074	. . . using four freewheel mechanism	2312/18	. Strong or emergency braking
2200/2076	. . . using at least five freewheel mechanism	2312/20	. Start-up or shut-down
2200/2079	. . using freewheel type mechanisms, e.g. freewheel clutches	<b>2342/00</b>	<b>Calibrating</b>
2200/2082	. . . one freewheel mechanisms	2342/02	. Calibrating shift or range movements
2200/2084	. . . two freewheel mechanisms	2342/04	. Calibrating engagement of friction elements
2200/2087	. . . three freewheel mechanisms	2342/042	. . Point of engagement
2200/2089	. . . four freewheel mechanisms	2342/044	. . Torque transmitting capability
2200/2092	. . . at least five freewheel mechanisms	2342/06	. Determining which part to calibrate or timing of calibrations
2200/2094	. . using positive clutches, e.g. dog clutches	2342/10	. Calibrating valves
2200/2097	. . comprising an orbital gear set member permanently connected to the housing, e.g. a sun wheel permanently connected to the housing	<b>2700/00</b>	<b>Transmission housings and mounting of transmission components therein; Cooling; Lubrication; Flexible suspensions, e.g. floating frames</b>
<b>2300/00</b>	<b>Determining of new ratio</b>	2700/02	. Transmissions, specially for working vehicles
2300/02	. Computing a new ratio	2700/04	. . Starting devices or devices to start turning of shafts
2300/14	. Selecting a state of operation, e.g. depending on two wheel or four wheel drive mode	2700/06	. Protections for shifting mechanical transmissions
2300/18	. Determining the range	<b>2702/00</b>	<b>Combinations of two or more transmissions</b>
<b>2302/00</b>	<b>Determining the way or trajectory to new ratio, e.g. by determining speed, torque or time parameters for shift transition</b>	2702/02	. Mechanical transmissions with planetary gearing combined with one or more other mechanical transmissions
2302/02	. Optimizing the way to the new ratio	2702/04	. . Combinations of a speed-change mechanism without planetary gearing with a differential for driving a vehicle drive axle
2302/04	. Determining a modus for shifting	2702/06	. Combinations of transmissions with parallel force splitting paths having same output
2302/06	. Determining timing parameters of shifting, e.g. start of shifting	<b>2704/00</b>	<b>Control mechanisms and elements applying a mechanical movement</b>
<b>2306/00</b>	<b>Shifting</b>	2704/02	. Speed-change devices wherein the control lever actuates directly sliding gears pivoting around two non-parallel axis
2306/14	. Skipping gear shift	2704/04	. Speed-change devices with an intermediary mechanism placed between control member and actuator
2306/18	. Preparing coupling or engaging of future gear	<b>2706/00</b>	<b>Rotary transmissions with mechanical energy accumulation and recovery without means for automatic selfregulation essentially based on spring action or inertia</b>
2306/20	. Timing of gear shifts	<b>2708/00</b>	<b>Control devices for speed-changing geared mechanisms, e.g. specially adapted couplings for synchronising devices, devices to simplify control, control of auxiliary gearboxes</b>
2306/21	. . for auxiliary gear shifts	2708/02	. only the toothed wheels remain engaged
2306/22	. Swap shifting	2708/04	. . the control being mechanical
2306/24	. Interruption of shift, e.g. if new shift is initiated during ongoing previous shift	2708/06	. . the control being hydraulic or pneumatic
2306/30	. characterised by the way or trajectory to a new ratio, e.g. by performing shift according to a particular algorithm or function	2708/08	. . the control being electric
2306/32	. Preparing the opening or release of the torque transmitting element	2708/10	. only the toothed wheels may be disengaged
2306/36	. Filling the dead volume of actuators		
2306/40	. Shifting activities		
2306/42	. . Changing the input torque to the transmission		
2306/44	. . Removing torque from current gears		
2306/46	. . Uncoupling of current gear		
2306/48	. . Synchronising of new gear		
2306/50	. . Coupling of new gear		
2306/52	. . Applying torque to new gears		
2306/54	. . Synchronising engine speed to transmission input speed		

- 2708/12 . . the control being mechanical
- 2708/14 . . the control being hydraulic or pneumatic
- 2708/16 . wherein the gearing is not described or not essential
- 2708/18 . . the control being mechanical
- 2708/20 . . the control being hydraulic or pneumatic
- 2708/22 . . the control being electric
- 2708/24 . with a preselection system, mainly semi-automatic, e.g. with automatic preselection, but controlled at the intended moment, with force amplification
- 2708/26 . . only the toothed wheels remain engaged
- 2708/28 . . only the toothed wheels may be disengaged
- 2710/00 Control devices for speed-change mechanisms, the speed change control is dependent on function parameters of the gearing**
- 2710/02 . Control dependent on speed and torque, wherein only the toothed wheels remain engaged, control being mechanical
- 2710/04 . Control dependent on speed
- 2710/06 . . only the toothed wheels remain engaged
- 2710/08 . . . the control being mechanical
- 2710/10 . . . the control being hydraulic or pneumatic
- 2710/12 . . . the control being electric
- 2710/14 . Control dependent on speed, wherein only the toothed wheels may be disengaged, control being mechanical
- 2710/16 . the gearing is not described or not essential
- 2710/18 . . the control being mechanical
- 2710/20 . . the control being hydraulic or pneumatic
- 2710/22 . . the control being electric
- 2710/24 . Control dependent on torque
- 2710/26 . . wherein only the toothed wheels remain engaged, the control being mechanical
- 2712/00 Mechanisms for changing direction**
- 2712/02 . Automatic control, e.g. for an alternating movement
- 2712/04 . the control being hydraulic or pneumatic
- 2712/06 . only with toothed wheels or friction wheels
- 2712/08 . . only the toothed wheels may be disengaged
- 2712/10 . . with a combination of engaged and disengageable toothed wheels
- 2714/00 Different types speed-changing mechanisms for toothed gearing**
- 2714/02 . only with toothed wheels remaining engaged
- 2714/04 . with specially adapted devices
- 2716/00 Control devices for speed-change mechanisms of planetary gearings, with toothed wheels remaining engaged, e.g. also for devices to simplify the control or for synchronising devices combined with control devices**
- 2716/02 . the control being mechanical
- 2716/04 . the control being hydraulic or pneumatic
- 2716/06 . . Circuits thereof
- 2716/08 . the control being electric
- 2716/10 . only the toothed wheels may be disengaged, the control being mechanical
- 2716/12 . with preselection system, mainly semi-automatic, e.g. with automatic preselection, but controlled at the intended moment, with force amplification
- 2716/14 . . only with toothed wheels remaining engaged
- 2718/00 Mechanisms for speed-change of planetary gearing, the speed change control being dependent on function parameters of the gearing**
- 2718/02 . Control dependent on speed and torque, wherein only the toothed wheels remain engaged
- 2718/04 . . the control being mechanical
- 2718/06 . . the control being hydraulic or pneumatic
- 2718/08 . Control dependent on speed
- 2718/10 . . only the toothed wheels remain engaged
- 2718/12 . . . the control being mechanical
- 2718/14 . . . the control being hydraulic or pneumatic
- 2718/16 . . . the control being electric
- 2718/18 . Control dependent on torque
- 2718/20 . . only the toothed wheels remain engaged
- 2718/22 . . . the control being mechanical
- 2718/24 . . . the control being hydraulic or pneumatic
- 2718/26 . . . the control being electric
- 2720/00 Different types of speed-change gear mechanisms**
- 2720/02 . Gears with a non-circular rolling curve or gears with special teeth
- 2720/04 . Combining a planetary speed-change gearing with a motor vehicle drive axle differential