

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

F16D COUPLINGS FOR TRANSMITTING ROTATION; CLUTCHES; BRAKES

NOTE

Attention is drawn to the following places:

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| A01D 69/08 , A01D 69/10 | Clutches or brakes of harvesting machines for grass or cereals; |
| A61C 1/18 | Clutches in dental machines for boring or cutting; |
| B21B 35/14 | Drive couplings for metal-rolling mills; |
| B30B 15/10 | Brakes specially adapted for presses; |
| B30B 15/12 | Clutches specially adapted for presses; |
| B41J 33/52 | Braking devices for ribbon-feed devices in selective printing mechanisms; |
| B60K 17/00 | Arrangement or location of clutches in vehicles; |
| B61H | Brakes peculiar to rail vehicles; |
| B62B 5/04 | Braking mechanisms for hand carts; |
| B62B 9/08 | Braking mechanisms for children's carriages or perambulators; |
| B62C 7/00 | Braking mechanisms for animal-drawn vehicles; |
| B62L | Cycle brakes; |
| B66D 5/00 | Braking devices for lifting or hoisting gear; |
| E21B 17/02 | Couplings for drilling rods; |
| H02P 3/04 | Brakes for electric motors, generators, dynamo-electric converters; |
| H04L 13/04 | Clutches for apparatus for transmission of coded digital information. |

WARNINGS

- The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:

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| F16D 3/19 | covered by | F16D 3/50 ; |
| F16D 3/27 | covered by | F16D 3/265 ; |
| F16D 27/07 | covered by | F16D 27/06 , F16D 27/14 ; |
| F16D 48/12 | covered by | B60K 23/0808 . |
- In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

Couplings {for transmitting mechanical rotation} (fluid couplings [F16D 31/00](#) - [F16D 39/00](#); couplings or joints specially adapted for deep-drilling rods or sucker rods [E21B](#); for transmitting motion through a wall without relatively-moving surfaces [F16J 15/50](#))

- 1/00 Couplings for rigidly connecting two coaxial shafts or other movable machine elements** (attachment of wheels to axles for railway carriages [B60B](#); for attachment of cranks to their shafts [F16C 3/10](#))
- 1/02 . for connecting two abutting shafts or the like
- 1/027 . . non-disconnectable, e.g. involving gluing, welding or the like
- 1/033 . . by clamping together two faces perpendicular to the axis of rotation, e.g. with bolted flanges
- 1/04 . . with clamping hub; with hub and longitudinal key
- 1/05 . . . with radial clamping due to axial loading of at least one pair of conical surfaces

- 1/06 . for attachment of a member on a shaft or on a shaft-end (attachment of marine propellers on shafts [B63H 23/34](#))
- 2001/062 . . {characterised by adaptors where hub bores being larger than the shaft}
- 1/064 . . non-disconnectable
- 1/068 . . . involving gluing, welding or the like
- 1/072 . . . involving plastic deformation (plastic welding [F16D 1/068](#))
- 1/076 . . by clamping together two faces perpendicular to the axis of rotation, e.g. with bolted flanges
- 1/08 . . with clamping hub; with hub and longitudinal key
- 1/0805 . . . {with radial clamping due to deformation of a resilient body or a body of fluid ([F16D 1/091](#) takes precedence; elastic couplings [F16D 3/80](#); fluid pressure clutches [F16D 25/04](#))}
- 1/0811 . . . {with radial clamping due to tilting of a hub part or ring about a diametral axis}

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| 1/0817 | . . . {with radial clamping due to rotation along an eccentric surface, e.g. arcuate wedging elements (similar clutches F16D 17/00 ; similar free-wheel clutches F16D 41/06)} | 1/097 | with clamping effected by ring expansion only, e.g. with an expanded ring located between hub and shaft |
| 1/0823 | . . . {with radial clamping of a helical wrap spring on the shaft or in the hub bore (similar clutches F16D 13/025 , F16D 13/08 , F16D 27/025 , F16D 27/105 ; similar slip couplings F16D 7/022 ; similar free-wheel clutches F16D 41/206)} | 1/10 | . Quick-acting couplings in which the parts are connected by simply bringing them together axially |
| 1/0829 | . . . {with radial loading of both hub and shaft by an intermediate ring or sleeve (F16D 1/0817 , F16D 1/0823 , F16D 1/093 take precedence)} | 1/101 | . . {without axial retaining means rotating with the coupling} |
| 1/0835 | {due to the elasticity of the ring or sleeve} | 2001/102 | . . {the torque is transmitted via polygon shaped connections} |
| 1/0841 | {due to axial loading of the ring or sleeve, e.g. Belleville washers} | 2001/103 | . . {the torque is transmitted via splined connections} |
| 1/0847 | . . . {with radial clamping due to a radial screw} | 1/104 | . . having retaining means rotating with the coupling and acting only by friction |
| 1/0852 | . . . {with radial clamping between the mating surfaces of the hub and shaft (F16D 1/0805 - F16D 1/0817 , F16D 1/09 take precedence)} | 1/108 | . . having retaining means rotating with the coupling and acting by interengaging parts, i.e. positive coupling |
| 1/0858 | {due to the elasticity of the hub (including shrink fits)} | 1/112 | . . . the interengaging parts comprising torque-transmitting surfaces, e.g. bayonet joints |
| 1/0864 | {due to tangential loading of the hub, e.g. a split hub} | 1/116 | . . . the interengaging parts including a continuous or interrupted circumferential groove in the surface of one of the coupling parts (circlips for retaining hubs on shafts F16B 21/18) |
| 1/087 | {due to other loading elements in the hub or shaft} | 1/12 | . allowing adjustment of the parts about the axis (during motion F16D 3/10) |
| 1/0876 | . . . {with axial keys and no other radial clamping} | 3/00 | Yielding couplings, i.e. with means permitting movement between the connected parts during the drive (couplings disconnectable simply by axial movement F16D 1/10; slip couplings F16D 7/00) |
| 1/0882 | {the key being axially tapered and tightening when loaded axially} | 3/005 | . {incorporating leaf springs, flexible parts of reduced thickness or the like acting as pivots} |
| 1/0888 | {the key having two axially tapered interengaging parts} | 3/02 | . adapted to specific functions (universal joints, see the appropriate groups) |
| 1/0894 | . . . {with other than axial keys, e.g. diametral pins, cotter pins and no other radial clamping} | 3/04 | . . specially adapted to allow radial displacement, e.g. Oldham couplings |
| 1/09 | . . . with radial clamping due to axial loading of at least one pair of conical surfaces ({ tapered keys F16D 1/0882 }) | 3/06 | . . specially adapted to allow axial displacement |
| 2001/0903 | {the clamped shaft being hollow} | 3/065 | . . . {by means of rolling elements} |
| 2001/0906 | {using a hydraulic fluid to clamp or disconnect, not provided for in F16D 1/091 } | 3/08 | . . Couplings for intersecting shafts, provided with intermediate bars bent in an angle corresponding with the angle of intersection |
| 1/091 | and comprising a chamber including a tapered piston moved axially by fluid pressure to effect clamping | 3/10 | . . Couplings with means for varying the angular relationship of two coaxial shafts during motion |
| 1/092 | the pair of conical mating surfaces being provided on the coupled hub and shaft | 3/12 | . . specially adapted for accumulation of energy to absorb shocks or vibration (by making use of fluid elements F16D 3/80) |
| 1/093 | using one or more elastic segmented conical rings forming at least one of the conical surfaces, the rings being expanded or contracted to effect clamping (F16D 1/091 takes precedence) | 3/14 | . . combined with a friction coupling for damping vibration or absorbing shock |
| 1/094 | using one or more pairs of elastic or segmented rings with mutually mating conical surfaces, one of the mating rings being contracted and the other being expanded | 3/16 | . Universal joints in which flexibility is produced by means of pivots or sliding or rolling connecting parts |
| 2001/0945 | {using multiple pairs of elastic or segmented rings to effect clamping} | 3/18 | . . the coupling parts (1) having slidably-interengaging teeth |
| 1/095 | with clamping effected by ring contraction only ({ for connecting two abutting shafts F16D 1/02 }) | 3/185 | . . . {radial teeth connecting concentric inner and outer coupling parts} |
| 2001/0955 | {the clamping is effected by hub contraction, i.e. a compression of the hub instead of the ring} | 3/20 | . . one coupling part entering a sleeve of the other coupling part and connected thereto by sliding or rolling members (F16D 3/18 , F16D 3/24 take precedence) |
| 1/096 | the ring or rings being located between the shaft and the hub | | NOTE "coupling parts" means the driving member and the driven member of the coupling to be mounted on and rotate as a unit with the shafts or their equivalents between which the coupling is placed. An intermediate member |

F16D 3/20

(continued)

interconnecting these parts is regarded as such an equivalent.

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| <p>3/202 . . . one coupling part having radially projecting pins, e.g. tripod joints</p> <p>2003/2023 {with linear rolling bearings between raceway and trunnion mounted shoes}</p> <p>2003/2026 {with trunnion rings, i.e. with tripod joints having rollers supported by a ring on the trunnion}</p> <p>3/205 the pins extending radially outwardly from the coupling part</p> <p>3/2052 {having two pins}</p> <p>3/2055 {having three pins, i.e. true tripod joints}</p> <p>3/2057 {having four or more pins, e.g. with compensation for relative pin movement}</p> <p>3/207 the pins extending radially inwardly from the coupling part</p> <p>3/22 . . . the rolling members being balls, rollers, or the like, guided in grooves or sockets in both coupling parts</p> <p>3/221 the rolling members being located in sockets in one of the coupling parts</p> <p>3/223 the rolling members being guided in grooves in both coupling parts</p> <p>2003/22303 {Details of ball cages}</p> <p>2003/22306 {having counter tracks, i.e. ball track surfaces which diverge in opposite directions}</p> <p>2003/22309 {Details of grooves}</p> <p>2003/22313 {Details of the inner part of the core or means for attachment of the core on the shaft}</p> <p>2003/22316 {Means for fastening or attaching the bellows or gaiters}</p> <p>2003/2232 {Elements arranged in the hollow space between the end of the inner shaft and the outer joint member}</p> <p>2003/22323 {Attachments to the shaft of the inner joint member whereby the attachments are distanced from the core}</p> <p>2003/22326 {Attachments to the outer joint member, i.e. attachments to the exterior of the outer joint member or to the shaft of the outer joint member}</p> <p>3/2233 where the track is made up of two curves with a point of inflexion in between, i.e. S-track joints</p> <p>3/2237 where the grooves are composed of radii and adjoining straight lines, i.e. undercut free [UF] type joints</p> <p>3/224 the groove centre-lines in each coupling part lying on a sphere</p> <p>3/2245 where the groove centres are offset from the joint centre</p> <p>3/226 the groove centre-lines in each coupling part lying on a cylinder co-axial with the respective coupling part</p> <p>3/2265 {the joints being non-telescopic}</p> <p>3/227 the joints being telescopic</p> <p>3/229 Prismatic coupling parts having each groove centre-line lying on planes parallel to the axis of the respective coupling part (F16D 3/224, F16D 3/226 take precedence)</p> | <p>3/24 . . comprising balls, rollers, or the like between overlapping driving faces, e.g. cogs, on both coupling parts</p> <p>3/26 . . Hooke's joints or other joints with an equivalent intermediate member to which each coupling part is pivotally or slidably connected (F16D 3/18, F16D 3/20 take precedence)</p> <p>3/265 . . . {in which one coupling part has a tongue received with the intermediate member(s) in a recess with a transverse axis in the other coupling part}</p> <p>3/28 . . . in which the interconnecting pivots include elastic members</p> <p>3/30 . . . in which the coupling is specially adapted to constant velocity-ratio</p> <p>3/32 by the provision of two intermediate members each having two relatively perpendicular trunnions or bearings</p> <p>3/33 with ball or roller bearings</p> <p>3/34 parts being connected by ridges, pins, balls, or the like guided in grooves or between cogs</p> <p>3/36 . . . in which each pivot between the coupling parts and the intermediate member comprises a single ball</p> <p>3/38 . . . with a single intermediate member with trunnions or bearings arranged on two axes perpendicular to one another (F16D 3/36 takes precedence)</p> <p>3/382 {constructional details of other than the intermediate member}</p> <p>3/385 {Bearing cup; Bearing construction; Bearing seal; Mounting of bearing on the intermediate member (mounting of bearing in fork F16D 3/382)}</p> <p>3/387 {Fork construction; Mounting of fork on shaft; Adapting shaft for mounting of fork}</p> <p>3/40 with intermediate member provided with two pairs of outwardly-directed trunnions on intersecting axes</p> <p>3/405 {Apparatus for assembling or dismantling}</p> <p>3/41 with ball or roller bearings</p> <p>3/42 with ring-shaped intermediate member provided with bearings or inwardly-directed trunnions</p> <p>3/43 with ball or roller bearings</p> <p>3/44 . . . the intermediate member being connected to the coupling parts by ridges, pins, balls, or the like guided in grooves or between cogs</p> <p>3/46 each coupling part embracing grooves or ridges on the intermediate member</p> <p>3/48 . . one coupling part having pins arranged parallel to the axis and entering holes in the other coupling part</p> <p>3/50 . . with the coupling parts connected by one or more intermediate members (F16D 3/16 takes precedence)</p> <p>3/52 . . comprising a continuous strip, spring, or the like engaging the coupling parts at a number of places</p> <p>3/54 . . Couplings comprising a chain or strip surrounding two wheels arranged side by side and provided with teeth or the equivalent</p> |
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| 3/56 | . . comprising elastic metal lamellae, elastic rods, or the like, e.g. arranged radially or parallel to the axis, the members being shear-loaded collectively by the total load | 7/005 | . {the torque being transmitted and limited by rolling friction, e.g. ball bearings axially loaded} |
| 3/58 | . . . the intermediate members being made of rubber or like material | 7/007 | . {the torque being transmitted and limited by rolling surfaces skidding, e.g. skew needle rollers} |
| 3/60 | . . comprising pushing or pulling links attached to both parts (F16D 3/64 takes precedence) | 7/02 | . of the friction type (couplings in which overload initiates a decrease of coupling pressure or a disconnection, see the relevant groups for clutches {, e.g. for friction overload clutches F16D 43/21 }) |
| 3/62 | . . . the links or their attachments being elastic | 7/021 | . . {with radially applied torque-limiting friction surfaces (F16D 7/022 takes precedence)} |
| 3/64 | . . comprising elastic elements arranged between substantially-radial walls of both coupling parts | 7/022 | . . {with a helical band or equivalent member co-operating with a cylindrical torque limiting coupling surface} |
| 3/66 | . . . the elements being metallic, e.g. in the form of coils | 7/024 | . . {with axially applied torque limiting friction surfaces} |
| 3/68 | . . . the elements being made of rubber or similar material | 7/025 | . . . {with flat clutching surfaces, e.g. discs} |
| 3/70 | . . comprising elastic elements arranged in holes in one coupling part and surrounding pins on the other coupling part | 7/027 | {with multiple lamellae} |
| 3/72 | . . with axially-spaced attachments to the coupling parts (F16D 3/56 takes precedence) | 7/028 | . . . {with conical friction surfaces} |
| 3/725 | . . . {with an intermediate member made of fibre-reinforced resin (made of rubber-like material F16D 3/74 ; shafts made of fibre-reinforced resin F16C 3/026)} | 7/04 | . of the ratchet type (similar gearings based on repeated accumulation and delivery of inertia-energy F16H 33/08 ; {overload clutches of the ratchet type F16D 43/202 }) |
| 3/74 | . . . the intermediate member or members being made of rubber or other {rubber-like} flexible material | 7/042 | . . {with at least one part moving axially between engagement and disengagement (F16D 7/08 takes precedence)} |
| 2003/745 | {Tyre type coupling, i.e. bellows with only one fold} | 7/044 | . . . {the axially moving part being coaxial with the rotation, e.g. a gear with face teeth} |
| 3/76 | . . shaped as an elastic ring centered on the axis, surrounding a portion of one coupling part and surrounded by a sleeve of the other coupling part | 7/046 | . . . {with a plurality of axially moving parts} |
| 3/77 | . . . the ring being metallic | 7/048 | . . {with parts moving radially between engagement and disengagement (F16D 7/10 takes precedence)} |
| 3/78 | . . shaped as an elastic disc or flat ring, arranged perpendicular to the axis of the coupling parts, different sets of spots of the disc or ring being attached to each coupling part, e.g. Hardy couplings | 7/06 | . . with intermediate balls or rollers |
| 3/79 | . . . the disc or ring being metallic | 7/08 | . . . moving axially between engagement and disengagement |
| 3/80 | . in which a fluid is used (fluid couplings allowing continuous slip F16D 31/00 - F16D 35/00) | 7/10 | . . . moving radially between engagement and disengagement |
| 3/82 | . . with a coupling element in the form of a pneumatic tube (similar clutches F16D 25/04) | 9/00 | Couplings with safety member for disconnecting, e.g. breaking or melting member |
| 3/84 | . Shrouds, e.g. casings, covers; Sealing means specially adapted therefor | 9/02 | . by thermal means, e.g. melting member |
| 3/841 | . . {Open covers, e.g. guards for agricultural p.t.o. shafts} | 9/04 | . by tensile breaking |
| 3/843 | . . {enclosed covers} | 9/06 | . by breaking due to shear stress |
| 3/845 | . . . {allowing relative movement of joint parts due to the flexing of the cover} | 9/08 | . . over a single area encircling the axis of rotation, e.g. shear necks on shafts (F16D 9/10 takes precedence) |
| 2003/846 | {Venting arrangements for flexible seals, e.g. ventilation holes} | 9/10 | . . having a part movable after disconnection so as to provide reconnection, e.g. advanceable shear pins |
| 3/848 | . . . {allowing relative movement of joint parts due to sliding between parts of the cover} | | |
| 5/00 | Impulse couplings, i.e. couplings that alternately accelerate and decelerate the driven member | | |
| 7/00 | Slip couplings, e.g. slipping on overload, for absorbing shock (combined with yielding shaft couplings F16D 3/14; fluid slip couplings F16D 31/00 - F16D 35/00) | | |
| 7/002 | . {the torque being transmitted and limited by yielding of an elastomeric race} | | |
| | | | Clutches with mechanically-actuated clutching members (automatic clutches F16D 41/00 - F16D 45/00) |
| | | 11/00 | Clutches in which the members have interengaging parts (arrangements for synchronisation F16D 23/02) |
| | | 2011/002 | . {using an external and axially slidable sleeve for coupling the teeth of both coupling components together} |
| | | 2011/004 | . {using an internal or intermediate axially slidable sleeve, coupling both components together, whereby the intermediate sleeve is arranged internally at least with respect to one of the components} |
| | | 2011/006 | . {Locking or detent means, i.e. means to keep the clutch in engaged condition} |
| | | 2011/008 | . {characterised by the form of the teeth forming the inter-engaging parts; Details of shape or structure of these teeth} |

- 11/02 . . . disengaged by a contact of a part mounted on the clutch with a stationarily-mounted member
- 11/04 . . . with clutching members movable only axially
- 11/06 . . . with clutching members movable otherwise than only axially, e.g. rotatable keys
- 11/08 . . . actuated by moving a non-rotating part axially (actuating-mechanism in the relevant groups)
- 11/10 . . . with clutching members movable only axially
- 11/12 . . . with clutching members movable otherwise than only axially
- 11/14 . . . with clutching members movable only axially (F16D 11/02, F16D 11/08 take precedence)
- 11/16 . . . with clutching members movable otherwise than only axially (F16D 11/02, F16D 11/08 take precedence)
- 13/00 Friction clutches (arrangements for synchronisation F16D 23/02)**
- 13/02 . . . disengaged by the contact of a part mounted on the clutch with a stationarily-mounted member
- 13/025 . . . {with a helical band or equivalent member with two or more turns embracing a drum or the like (electromagnetically actuated F16D 27/105)}
- 13/04 . . . with means for actuating or keeping engaged by a force derived at least partially from one of the shafts to be connected (automatic clutches F16D 43/00)
- 13/06 . . . with clutching members movable otherwise than only axially (F16D 13/08, F16D 13/12 take precedence)
- 13/08 . . . with a helical band or equivalent member, which may be built up from linked parts, with more than one turn embracing a drum or the like, with or without an additional clutch actuating the end of the band (F16D 13/02 takes precedence; {similar slip couplings F16D 7/022; similar clutches electromagnetically actuated F16D 27/025, F16D 27/105} ; similar free-wheel clutches F16D 41/20; similar brakes F16D 49/02)
- 13/10 . . . with clutching members co-operating with the periphery of a drum, a wheel-rim, or the like (F16D 13/02 - F16D 13/08 take precedence; similar brakes F16D 49/00)
- 13/12 . . . with an expansible band or coil co-operating with the inner surface of a drum or the like (F16D 13/02 takes precedence; similar brakes F16D 51/02)
- 13/14 . . . with outwardly-movable clutching members co-operating with the inner surface of a drum or the like (F16D 13/02, F16D 13/06, F16D 13/12 take precedence; similar brakes F16D 51/00)
- 13/16 . . . shaped as radially-movable segments
- 13/18 . . . shaped as linked or separately-pivoted segments
- 13/20 . . . with clutching members co-operating with both the periphery and the inner surface of a drum or wheel-rim (similar brakes F16D 53/00)
- 13/22 . . . with axially-movable clutching members (similar brakes F16D 55/00)
- 13/24 . . . with conical friction surfaces {cone clutches}
- 13/26 . . . in which the or each axially-movable member is pressed exclusively against an axially-located member
- 13/28 . . . with means for increasing the effective force between the actuating sleeve or equivalent member and the pressure member
- 13/30 . . . in which the clutching pressure is produced by springs only
- 13/32 . . . in which two or more axially-movable members are pressed from one side towards an axially-located member
- 13/34 . . . with means for increasing the effective force between the actuating sleeve or equivalent member and the pressure member
- 13/36 . . . in which the clutching pressure is produced by springs only
- 13/38 . . . with flat clutching surfaces, e.g. discs
- 13/385 . . . {double clutches, i.e. comprising two friction disc mounted on one driven shaft (with two concentric driven shafts F16D 21/06)}
- 13/40 . . . in which the or each axially-movable member is pressed exclusively against an axially-located member
- 13/42 . . . with means for increasing the effective force between the actuating sleeve or equivalent member and the pressure member
- 13/44 . . . in which the clutching pressure is produced by springs only
- 13/46 . . . in which two axially-movable members, of which one is attached to the driving side and the other to the driven side, are pressed from one side towards an axially-located member
- 13/48 . . . with means for increasing the effective force between the actuating sleeve or equivalent member and the pressure member
- 13/50 . . . in which the clutching pressure is produced by springs only
- 13/505 . . . {Devices located between the flywheel and the driven disc, and biasing the driven disc away from the flywheel towards the disengaged position}
- 13/52 . . . Clutches with multiple lamellae {Clutches in which three or more axially moveable members are fixed alternately to the shafts to be coupled and are pressed from one side towards an axially-located member (F16D 13/385 takes precedence)}
- 13/54 . . . with means for increasing the effective force between the actuating sleeve or equivalent member and the pressure member
- 13/56 . . . in which the clutching pressure is produced by springs only
- 2013/565 . . . {with means for releasing the clutch pressure in case of back torque}
- 13/58 . . . Details {(tools for assembling or disassembling clutches B25B 27/0064)}
- 2013/581 . . . {Securing means for transportation or shipping}
- 13/583 . . . {Diaphragm-springs, e.g. Belleville (co-operation with a disengaging thrust ring or bearing F16D 23/14)}
- 13/585 . . . {Arrangements or details relating to the mounting or support of the diaphragm on the clutch on the clutch cover or the pressure plate}
- 2013/586 . . . {the cover housing is formed by diaphragm springs}
- 2013/588 . . . {the diaphragm springs are arranged outside the cover housing}
- 13/60 . . . Clutching elements (friction lining or attachment thereof F16D 69/00)
- 13/62 . . . Clutch-bands; Clutch shoes; Clutch-drums (brake-bands, brake-shoes, brake-drums F16D 65/00)

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| 13/64 | . . . Clutch-plates; Clutch-lamellae (brake-plates, brake-lamellae F16D 65/12) | 21/02 | . for interconnecting three or more shafts or other transmission members in different ways (in endless-track vehicles B62D) |
| 2013/642 | {with resilient attachment of frictions rings or linings to their supporting discs or plates for allowing limited axial displacement of these rings or linings} | 21/04 | . . with a shaft carrying a number of rotatable transmission members, e.g. gears, each of which can be connected to the shaft by a clutching member or members between the shaft and the hub of the transmission member |
| 13/644 | {Hub construction} | 21/06 | . . at least two driving shafts or two driven shafts being concentric |
| 13/646 | {Mounting of the discs on the hub} | 2021/0607 | . . . {Double clutch with torque input plate in-between the two clutches, i.e. having a central input plate} |
| 13/648 | {for clutches with multiple lamellae} | 2021/0615 | {the central input plate is supported by bearings in-between the two clutches} |
| 13/66 | of conical shape | 2021/0623 | {the central input plate having a damper in-between the two clutches} |
| 13/68 | Attachments of plates or lamellae to their supports {(one or more discs connected to the linings transmitting torque to one or more discs connected to the hub by helical springs in windows in the discs, i.e. rotary vibration dampers F16F 15/12)} | 2021/063 | . . . {Electric arrangements for clutch control} |
| 13/683 | {for clutches with multiple lamellae} | 2021/0638 | . . . {Electrically actuated multiple lamellae clutches} |
| 13/686 | {with one or more intermediate members made of rubber or like material transmitting torque from the linings to the hub} | 2021/0646 | . . . {Electrically actuated clutch with two clutch plates} |
| 13/69 | Arrangements for spreading lamellae in the released state | 2021/0653 | . . . {Hydraulic arrangements for clutch control} |
| 13/70 | . . Pressure members, e.g. pressure plates, for clutch-plates or lamellae; Guiding arrangements for pressure members {(clutch flywheels comprising two or more masses with a rotational damper F16F 15/12)} | 2021/0661 | . . . {Hydraulically actuated multiple lamellae clutches} |
| 2013/703 | . . . {the pressure plate on the flywheel side is combined with a damper} | 2021/0669 | . . . {Hydraulically actuated clutches with two clutch plates} |
| 2013/706 | . . . {the axially movable pressure plate is supported by leaf springs} | 2021/0676 | . . . {Mechanically actuated multiple lamellae clutches} |
| 13/71 | . . . in which the clutching pressure is produced by springs only | 2021/0684 | . . . {Mechanically actuated clutches with two clutch plates} |
| 13/72 | . . Features relating to cooling | 2021/0692 | . . . {with two clutches arranged axially without radial overlap} |
| 13/74 | . . Features relating to lubrication | 21/08 | . Serially-arranged clutches interconnecting two shafts only when all the clutches are engaged (F16D 13/08, F16D 13/12 take precedence) |
| 13/75 | . . Features relating to adjustment, e.g. slack adjusters | 23/00 | Details of mechanically-actuated clutches not specific for one distinct type |
| 13/752 | . . . {the adjusting device being located in the actuating mechanism arranged outside the clutch (adjusting "Bowden" mechanisms F16C 1/22)} | 23/02 | . Arrangements for synchronisation, also for power-operated clutches (shape or mounting of interengaging parts of clutch members to facilitate engagement F16D 11/08) |
| 13/755 | . . . {the adjusting device being located in or near the release bearing} | 23/025 | . . {Synchro rings} |
| 13/757 | . . . {the adjusting device being located on or inside the clutch cover, e.g. acting on the diaphragm or on the pressure plate} | 23/04 | . . with an additional friction clutch (synchro rings per se F16D 23/025) |
| 13/76 | . specially adapted to incorporate with other transmission parts, i.e. at least one of the clutch parts also having another function, e.g. being the disc of a pulley | 23/06 | . . . and a blocking mechanism preventing the engagement of the main clutch prior to synchronisation |
| 15/00 | Clutches with wedging balls or rollers or with other wedgeable separate clutching members (freewheels, freewheel clutches F16D 41/00) | 23/0606 | {the blocking mechanism comprising an axially-extending shouldered pin passing through a hole in a radial wall} |
| 17/00 | Clutches in which the drive is transmitted solely by virtue of the eccentricity of the contacting surfaces of clutch members which fit one around the other | 23/0612 | {the blocking mechanism comprising a radial pin in an axial slot with at least one branch} |
| 19/00 | Clutches with mechanically-actuated clutching members not otherwise provided for | 2023/0618 | {Details of blocking mechanism comprising a helical spring loaded element, e.g. ball} |
| 21/00 | Systems comprising a plurality of actuated clutches (for synchronisation F16D 23/04) | 2023/0625 | {Details of members being coupled, e.g. gears} |
| | | 2023/0631 | {Sliding sleeves; Details thereof} |
| | | 2023/0637 | {Details relating to the hub member on which the sliding is arranged} |
| | | 2023/0643 | {Synchro friction clutches with flat plates, discs or lamellae} |

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| 2023/065 | {Means to provide additional axial force for self-energising, e.g. by using torque from the friction clutch} | 25/04 | . in which the fluid actuates an elastic clutching, {i.e. elastic actuating} member, e.g. a diaphragm or a pneumatic tube (F16D 25/02 takes precedence; coupling using a pneumatic tube F16D 3/82) |
| 2023/0656 | {Details of the tooth structure; Arrangements of teeth} | 25/042 | . . {the elastic actuating member rotating with the clutch} |
| 2023/0662 | {Details relating to special geometry of arrangements of teeth} | 25/044 | . . . {and causing purely axial movement} |
| 2023/0668 | {Details relating to tooth end or tip geometry} | 25/046 | . . . {and causing purely radial movement} |
| 2023/0675 | {Details relating to special undercut geometry} | 25/048 | . . {the elastic actuating member not rotating with a coupling part} |
| 2023/0681 | {Double cone synchromesh clutches} | 25/06 | . in which the fluid actuates a piston incorporated in, {i.e. rotating with} the clutch (F16D 25/02 takes precedence) |
| 2023/0687 | {Clutches with electrical actuation} | 25/061 | . . the clutch having interengaging clutch members |
| 2023/0693 | {Clutches with hydraulic actuation} | 25/062 | . . the clutch having friction surfaces |
| 23/08 | . . with a blocking mechanism that only releases the clutching member on synchronisation (in combination with an additional friction clutch F16D 23/06) | 25/063 | . . . with clutch members exclusively moving axially |
| 23/10 | . . automatically producing the engagement of the clutch when the clutch members are moving at the same speed; Indicating synchronisation | 25/0632 | with conical friction surfaces, e.g. cone clutches |
| 23/12 | . Mechanical clutch-actuating mechanisms arranged outside the clutch as such (specific for combined clutches F16D 21/00; mechanisms specific for synchronisation F16D 23/02) | 25/0635 | with flat friction surfaces, e.g. discs |
| 2023/123 | . . {Clutch actuation by cams, ramps or ball-screw mechanisms} | 25/0638 | with more than two discs, e.g. multiple lamellae |
| 2023/126 | . . {Actuation by rocker lever; Rocker levers therefor} | 25/064 | the friction surface being grooved |
| 23/14 | . . Clutch-actuating sleeves {or bearings}; Actuating members directly connected to clutch-actuating sleeves {or bearings} | 25/065 | . . . with clutching members having a movement which has at least a radial component |
| 2023/141 | . . . {characterised by using a fork; Details of forks} | 25/08 | . with fluid-actuated member not rotating with a clutching member (F16D 25/02 takes precedence {F16D 25/048 takes precedence}) |
| 23/142 | . . . {with a resilient member acting radially between the bearing and its guide means} | 2025/081 | . . {Hydraulic devices that initiate movement of pistons in slave cylinders for actuating clutches, i.e. master cylinders} |
| 23/143 | . . . {Arrangements or details for the connection between the release bearing and the diaphragm} | 25/082 | . . {the line of action of the fluid-actuated members co-inciding with the axis of rotation} |
| 23/144 | {With a disengaging thrust-ring distinct from the release bearing, and secured to the diaphragm} | 25/083 | . . . {Actuators therefor (F16D 25/085 - F16D 25/087 take precedence)} |
| 23/145 | {Arrangements for the connection between the thrust-ring and the diaphragm} | 25/085 | . . . {the clutch actuation being of the pull type} |
| 23/146 | {Arrangements for the connection between the thrust-ring and the release bearing} | 25/086 | . . . {the clutch being actuated by a push rod extending coaxially through the input or output shaft} |
| 23/147 | . . . {bearing with rolling elements having at least one race or part fixed to the race blind axially, e.g. cup-shaped} | 25/087 | . . . {the clutch being actuated by the fluid-actuated member via a diaphragm spring or an equivalent array of levers (F16D 25/085, F16D 25/086 take precedence)} |
| 23/148 | . . . {Guide-sleeve receiving the clutch release bearing} | 25/088 | . . {the line of action of the fluid-actuated members being distinctly separate from the axis of rotation} |
| Clutches actuated non-mechanically (arrangements for synchronisation F16D 23/02; fluid clutches F16D 31/00 - F16D 39/00; automatic clutches F16D 41/00 - F16D 45/00; dynamo-electric clutches H02K 49/00; clutches using electrostatic attraction H02N 13/00) | | 25/10 | . Clutch systems with a plurality of fluid-actuated clutches (arrangements or mounting of clutches in vehicles B60K 17/00) |
| 25/00 | Fluid-actuated clutches | 25/12 | . Details not specific to one of the before-mentioned types |
| 25/02 | . with means for actuating or keeping engaged by a force derived at least partially from one of the shafts to be connected | 25/123 | . . {in view of cooling and lubrication} |
| | | 25/126 | . . {adjustment for wear or play} |
| | | 25/14 | . . {Fluid pressure control} |
| | | 27/00 | Magnetically- {or electrically-} actuated clutches; Control or electric circuits therefor (clutches with magnetisable particles F16D 37/02; {with electro-rheological fluids F16D 37/008}) |
| | | 2027/001 | . {Means for electric connection of the coils of the electromagnetic clutches} |
| | | 2027/002 | . {Electric or electronic circuits relating to actuation of electromagnetic clutches} |

- 27/004 . {with permanent magnets combined with electromagnets}
- 2027/005 . {Details relating to the internal construction of coils or to clutches having more than one coil in the same housing}
- 2027/007 . {Bias of an armature of an electromagnetic clutch by flexing of substantially flat springs, e.g. leaf springs}
- 2027/008 . {Details relating to the magnetic circuit, or to the shape of the clutch parts to achieve a certain magnetic path}
- 27/01 . with permanent magnets
- 27/02 . with electromagnets incorporated in the clutch, i.e. with collecting rings ([F16D 27/004 takes precedence](#))}
- 27/025 . . {and with a helical band or equivalent member co-operating with a cylindrical coupling surface}
- 27/04 . . with axially-movable friction surfaces
- 27/06 . . . with friction surfaces arranged within the flux
- 27/08 . . . with friction surfaces arranged externally to the flux
- 27/09 . . and with interengaging jaws or gear-teeth
- 27/10 . with an electromagnet not rotating with a clutching member, i.e. without collecting rings ([F16D 27/004 takes precedence](#))}
- 27/102 . . with radially movable clutching members ([F16D 27/105 takes precedence](#))
- 27/105 . . with a helical band or equivalent member co-operating with a cylindrical coupling surface
- 27/108 . . with axially movable clutching members
- 27/11 . . . with conical friction surfaces, e.g. cone clutches
- 27/112 . . . with flat friction surfaces, e.g. discs
- 27/115 with more than two discs, e.g. multiple lamellae
- 27/118 . . with interengaging jaws or gear teeth
- 27/12 . Clutch systems with a plurality of electro-magnetically-actuated clutches ([F16D 27/004 takes precedence](#))}
- 27/14 . Details
- 28/00** **Electrically-actuated clutches** (arrangements for synchronisation [F16D 23/02](#); clutches actuated directly by means of an electromagnet [F16D 27/00](#); automatic clutches [F16D 43/00](#) - [F16D 45/00](#); external control [F16D 48/00](#))
- 29/00** **Clutches and systems of clutches involving both fluid and magnetic actuation**
- 29/005 . {with a fluid pressure piston driven by an electric motor}

Couplings or clutches with a fluid or a semi-fluid as a power-transmitting means ([fluid gearing F16H 39/00](#) - [F16H 49/00](#))

- 31/00** **Fluid couplings or clutches with pumping sets of the volumetric type, i.e. in the case of liquid passing a predetermined volume per revolution**
- 31/02 . using pumps with pistons or plungers working in cylinders
- 31/04 . using gear-pumps
- 31/06 . using pumps of types differing from those before-mentioned
- 31/08 . Control of slip

- 33/00** **Rotary fluid couplings or clutches of the hydrokinetic type**
- 33/02 . controlled by changing the flow of the liquid in the working circuit, while maintaining a completely filled working circuit
- 33/04 . . by altering the position of blades
- 33/06 . controlled by changing the amount of liquid in the working circuit
- 33/08 . . by devices incorporated in the fluid coupling, with or without remote control
- 33/10 . . . consisting of controllable supply and discharge openings
- 33/12 controlled automatically by self-actuated valves
- 33/14 . . . consisting of shiftable or adjustable scoops
- 33/16 . . by means arranged externally of the coupling or clutch ([mounting of such means in vehicles B60K 23/00](#), e.g. [B60K 23/02](#))
- 33/18 . Details ([applicable also to fluid gearing F16H 41/24](#))
- 33/20 . . Shape of wheels, blades, or channels with respect to function
- 35/00** **Fluid clutches in which the clutching is predominantly obtained by fluid adhesion** ([F16D 37/00 takes precedence](#) ; arrangements of viscous clutches in four-wheel drives - [B60K 17/3465](#) and [B60K 17/351](#))
- 35/005 . {with multiple lamellae}
- 35/02 . with rotary working chambers and rotary reservoirs, e.g. in one coupling part
- 35/021 . . {actuated by valves}
- 35/022 . . . {the valve being actuated by a bimetallic strip ([F16D 35/026 takes precedence](#))}
- 35/023 . . . {the valve being actuated by a bimetallic coil ([F16D 35/026 takes precedence](#))}
- 35/024 . . . {the valve being actuated electrically, e.g. by an electromagnet ([F16D 35/026 takes precedence](#))}
- 35/025 . . . {the valve being actuated by inertia, e.g. using a flyweight or a centrifugal mass ([F16D 35/026 takes precedence](#))}
- 35/026 . . . {actuated by a plurality of valves; the valves being actuated by a combination of mechanisms covered by more than one of groups [F16D 35/022](#) - [F16D 35/025](#)}
- 35/027 . . {actuated by emptying and filling with viscous fluid from outside the coupling during operation}
- 35/028 . . {actuated electrically, e.g. by an electromagnet ([valves actuated electrically F16D 35/024](#))}
- 35/029 . . {actuated by varying the volume of the reservoir chamber}
- 37/00** **Clutches in which the drive is transmitted through a medium consisting of small particles, e.g. centrifugally speed-responsive**
- 2037/001 . {Electric arrangements for clutch control}
- 2037/002 . {characterised by a single substantially axial gap in which the fluid or medium consisting of small particles is arranged}
- 2037/004 . {characterised by multiple substantially axial gaps in which the fluid or medium consisting of small particles is arranged}

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| 2037/005 | . {characterised by a single substantially radial gap in which the fluid or medium consisting of small particles is arranged} | 41/076 | {the wedging coupling members being non-releasably joined to form a single annular piece, e.g. either the members being integral projections from the piece, or the piece being an elastic ring cast round the radial centres of the members} |
| 2037/007 | . {characterised by multiple substantially radial gaps in which the fluid or medium consisting of small particles is arranged} | | |
| 37/008 | . {the particles being carried by a fluid, to vary viscosity when subjected to electric change, i.e. electro-rheological or smart fluids (composition of such fluids C10M 171/001)} | 41/08 | . . with provision for altering the freewheeling action |
| 37/02 | . the particles being magnetisable | 41/082 | . . . {the intermediate coupling members wedging by movement other than pivoting or rolling} |
| 39/00 | Combinations of couplings according to two or more of the groups F16D 31/00 - F16D 37/00 | 41/084 | . . . {the intermediate coupling members wedging by pivoting or rocking} |
| | | 41/086 | . . . {the intermediate members being of circular cross-section and wedging by rolling (F16D 41/10 takes precedence)} |
| | | 41/088 | {the intermediate members being of only one size and wedging by a movement not having an axial component, between inner and outer races, one of which is cylindrical} |
| | | 41/10 | . . . with self-actuated reversing |
| | | 41/105 | {the intermediate members being of circular cross-section, of only one size and wedging by rolling movement not having an axial component between inner and outer races, one of which is cylindrical} |
| 41/00 | Freewheels or freewheel clutches (cycle brakes controlled by back-peddalling B62L 5/00 {; one-way linear clutches F16B 2007/16}) | 41/12 | . with hinged pawl co-operating with teeth, cogs, or the like (F16D 41/02, F16D 41/24 take precedence) |
| 41/02 | . disengaged by contact of a part of or on the freewheel or freewheel clutch with a stationarily-mounted member | 41/125 | . . {the pawl movement having an axial component} |
| 41/04 | . combined with a clutch for locking the driving and driven members (F16D 41/02, F16D 41/24 take precedence) | 41/14 | . . the effective stroke of the pawl being adjustable |
| 41/06 | . with intermediate wedging coupling members between an inner and an outer surface (F16D 41/02, F16D 41/24 take precedence) | 41/16 | . . the action being reversible |
| 2041/0601 | . . {with a sliding bearing or spacer} | 41/18 | . with non-hinged detent (F16D 41/02, F16D 41/24 take precedence) |
| 2041/0603 | . . {Sprag details} | 41/185 | . . {the engaging movement having an axial component} |
| 2041/0605 | . . {Spring details} | 41/20 | . with expandable or contractable clamping ring or band (F16D 41/02, F16D 41/24 take precedence) |
| 2041/0606 | . . {the intermediate coupling members having parts wedging by movement other than pivoting or rolling but combined with pivoting or rolling parts, e.g. shoes on pivot bars or on rollers} | 41/203 | . . {having coils overlapping in a single radial plane, e.g. Archimedian spiral} |
| 2041/0608 | . . {Races with a regular polygon shape} | 41/206 | . . {having axially adjacent coils, e.g. helical wrap-springs} |
| 41/061 | . . the intermediate members wedging by movement having an axial component | 41/22 | . with clutching ring or disc axially shifted as a result of lost motion between actuating members (F16D 41/02, F16D 41/24 take precedence) |
| 41/063 | . . the intermediate members wedging by moving along the inner and the outer surface without pivoting or rolling, e.g. sliding wedges (F16D 41/061 takes precedence) | 41/24 | . specially adapted for cycles |
| 41/064 | . . the intermediate members wedging by rolling and having a circular cross-section, e.g. balls (F16D 41/061 takes precedence) | 41/26 | . . with provision for altering the action |
| 2041/0643 | . . . {the intermediate coupling members being of more than one size} | 41/28 | . . with intermediate wedging coupling members |
| 2041/0646 | . . . {the intermediate coupling members moving between recesses in an inner race and recesses in an outer race} | 41/30 | . . with hinged pawl co-operating with teeth, cogs, or the like |
| 41/066 | . . . all members having the same size and only one of the two surfaces being cylindrical | 41/32 | . . with non-hinged detent |
| 2041/0665 | {characterised by there being no cage other than the inner and outer race for distributing the intermediate members} | 41/34 | . . with expandable or contractable clamping ring or band |
| 41/067 | and the members being distributed by a separate cage encircling the axis of rotation | 41/36 | . . with clutching ring or disc axially shifted as a result of lost motion between actuating members |
| 41/069 | . . the intermediate members wedging by pivoting or rocking, e.g. sprags (F16D 41/061 takes precedence) | 43/00 | Automatic clutches (varying the relationship between two coaxial shafts F16D 3/10; freewheels, freewheel clutches F16D 41/00) |
| 41/07 | . . . between two cylindrical surfaces | 43/02 | . actuated entirely mechanically |
| 41/073 | {each member comprising at least two elements at different radii} | 43/04 | . . controlled by angular speed (F16D 43/24 takes precedence; clutches in which the drive is transmitted through a medium consisting of small particles F16D 37/00) |
| | | 43/06 | . . . with centrifugal masses actuating axially a movable pressure ring or the like |

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| 43/08 | the pressure ring actuating friction plates, cones or similar axially-movable friction surfaces | 43/30 | . Systems of a plurality of automatic clutches |
| 43/09 | in which the carrier of the centrifugal masses can be stopped | 45/00 | Freewheels or freewheel clutches combined with automatic clutches |
| 43/10 | the centrifugal masses acting directly on the pressure ring, no other actuating mechanism for the pressure ring being provided | 47/00 | Systems of clutches, or clutches and couplings, comprising devices of types grouped under at least two of the preceding guide headings |
| 43/12 | the centrifugal masses acting on, or forming a part of, an actuating mechanism by which the pressure ring can also be actuated independently of the masses | 47/02 | . of which at least one is a coupling (elastic attachment of clutch parts, see the groups for the clutches {clutch flywheels with damping devices F16F 15/10}) |
| 43/14 | . . . with centrifugal masses actuating the clutching members directly in a direction which has at least a radial component; with centrifugal masses themselves being the clutching members | 47/04 | . of which at least one is a freewheel (F16D 47/02, F16D 47/06 take precedence; freewheels combined with a clutch to lock the driving and driven members of the freewheel F16D 41/04, F16D 41/26) |
| 2043/145 | {the centrifugal masses being pivoting} | 47/06 | . of which at least one is a clutch with a fluid or a semifluid as power-transmitting means |
| 43/16 | with clutching members having interengaging parts | 48/00 | External control of clutches |
| 43/18 | with friction clutching members | 48/02 | . Control by fluid pressure |
| 43/20 | . . controlled by torque, e.g. overload-release clutches, slip-clutches with means by which torque varies the clutching pressure | 2048/0203 | . . {with an accumulator; Details thereof} |
| 43/202 | . . . of the ratchet type (slip couplings of the ratchet type F16D 7/04) | 48/0206 | . . {in a system with a plurality of fluid-actuated clutches} |
| 43/2022 | {with at least one part moving axially between engagement and disengagement (F16D 43/206 takes precedence)} | 2048/0209 | . . {characterised by fluid valves having control pistons, e.g. spools} |
| 43/2024 | {the axially moving part being coaxial with the rotation, e.g. a gear with face teeth} | 2048/0212 | . . {Details of pistons for master or slave cylinders especially adapted for fluid control (for other details of pistons in master or slave cylinders F16D 2025/081 or F16D 25/082)} |
| 43/2026 | {with a plurality of axially moving parts} | 2048/0215 | . . {for damping of pulsations within the fluid system} |
| 43/2028 | {with at least one part moving radially between engagement and disengagement (F16D 43/208 takes precedence)} | 2048/0218 | . . {Reservoirs for clutch control systems; Details thereof} |
| 43/204 | with intermediate balls or rollers | 2048/0221 | . . {Valves for clutch control systems; Details thereof} |
| 43/206 | moving axially between engagement and disengagement | 2048/0224 | . . {Details of conduits, connectors or the adaptors therefor specially adapted for clutch control} |
| 43/208 | moving radially between engagement and disengagement | 2048/0227 | . . {Source of pressure producing the clutch engagement or disengagement action within a circuit; Means for initiating command action in power assisted devices (for details of the source or means per se F16D 25/088, F16D 29/005)} |
| 43/21 | . . . with friction members (slip couplings of the friction type F16D 7/02) | 2048/023 | . . . {by pedal actuation (for pedals per se G01G 1/30)} |
| 43/211 | {with radially applied torque-limiting friction surfaces} | 2048/0233 | . . . {by rotary pump actuation} |
| 43/213 | {with axially applied torque-limiting friction surfaces} | 2048/0236 | {with multiple independent pumps, e.g. one per clutch, or for supplying fluid to different systems} |
| 43/215 | {with flat friction surfaces, e.g. discs} | 2048/0239 | {One fluid source supplying fluid at high pressure and one fluid source supplying fluid at low pressure} |
| 43/216 | {with multiple lamellae} | 2048/0242 | {Two or more rotating pumps driven together by the same power source, e.g. connected by a shaft, or a single pump having two or more fluid outputs} |
| 43/218 | {with conical friction surfaces} | 2048/0245 | {Electrically driven rotary pumps} |
| 43/22 | . . controlled by both speed and torque | 2048/0248 | {Reversible rotary pumps, i.e. pumps that can be rotated in the two directions} |
| 43/24 | . . controlled by acceleration or deceleration of angular speed | 2048/0251 | {Electric motor driving a piston, e.g. for actuating the master cylinder (for details of the actuator per se F16D 29/00)} |
| 43/25 | . . controlled by thermo-responsive elements | 2048/0254 | . . . {Double actuation, i.e. two actuation means can produce independently an engagement or disengagement of the clutch} |
| 43/26 | . . acting at definite angular position or disengaging after {consecutive} definite number of rotations (actuating by means of stationary abutment F16D 11/02, F16D 13/02, F16D 15/00; control of change-speed or reversing-gearings conveying rotary motion F16H 59/00 - F16H 63/00) | | |
| 43/28 | . actuated by fluid pressure | | |
| 43/284 | . . controlled by angular speed | | |
| 43/286 | . . controlled by torque | | |

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| 2048/0257 | . . {Hydraulic circuit layouts, i.e. details of hydraulic circuit elements or the arrangement thereof} | 49/06 | . . fluid actuated |
| 2048/026 | . . . {The controlling actuation is directly performed by the pressure source, i.e. there is no intermediate valve for controlling flow or pressure} | 49/08 | . shaped as an encircling band extending over approximately 360 degrees |
| 2048/0263 | . . . {Passive valves between pressure source and actuating cylinder, e.g. check valves or throttle valves} | 49/10 | . . mechanically actuated (self-tightening F16D 49/20) |
| 2048/0266 | . . . {Actively controlled valves between pressure source and actuation cylinder} | 49/12 | . . fluid actuated |
| 2048/0269 | . . . {Single valve for switching between fluid supply to actuation cylinder or draining to the sump} | 49/14 | . shaped as a fluid-filled flexible member actuated by variation of the fluid pressure |
| 2048/0272 | . . . {Two valves, where one valve is supplying fluid to the cylinder and the other valve is for draining fluid to the sump} | 49/16 | . Brakes with two brake-blocks (self-tightening F16D 49/20) |
| 2048/0275 | . . . {Two valves arranged in parallel, e.g. one for coarse and the other for fine control during supplying or draining fluid from the actuation cylinder} | 49/18 | . Brakes with three or more brake-blocks (self-tightening F16D 49/20) |
| 2048/0278 | . . . {Two valves in series arrangement for controlling supply to actuation cylinder} | 49/20 | . Self-tightening brakes (with helical or coil with more than one turn F16D 49/02) |
| 2048/0281 | . . . {Complex circuits with more than two valves in series or special arrangements thereof not provided for in previous groups} | 49/22 | . . with an auxiliary friction member initiating or increasing the action of the brake |
| 2048/0284 | . . . {characterised by valve arrangements supplying fluid to a two chamber- cylinder} | 51/00 | Brakes with outwardly-movable braking members co-operating with the inner surface of a drum or the like (similar clutches F16D 13/14) |
| 2048/0287 | . . . {Hydraulic circuits combining clutch actuation and other hydraulic systems} | 2051/001 | . {Parts or details of drum brakes} |
| 2048/029 | {Hydraulic circuits combining clutch actuation with clutch lubrication or cooling} | 2051/003 | . . {Brake supports} |
| 2048/0293 | {Hydraulic circuits combining clutch and transmission actuation} | 2051/005 | . . {Protective covers} |
| 2048/0296 | . . . {Hydraulic circuits controlled exclusively by hydraulic pressure, i.e. with no electrically controlled valves} | 2051/006 | . . {Braking members arranged axially spaced, e.g. side by side} |
| 48/04 | . . providing power assistance | 2051/008 | . . {Brakes with only one substantially rigid braking member} |
| 2048/045 | . . . {Vacuum boosters therefor} | 51/02 | . shaped as one or more circumferential band (similar clutches F16D 13/12) |
| 48/06 | . Control by electric or electronic means, e.g. of fluid pressure | 51/04 | . . mechanically actuated |
| 48/062 | . . {of a clutch system with a plurality of fluid actuated clutches} | 51/06 | . . fluid actuated |
| 48/064 | . . {Control of electrically or electromagnetically actuated clutches (F16D 48/062, F16D 48/068 take precedence)} | 51/08 | . shaped as an expansible fluid-filled flexible member |
| 48/066 | . . {Control of fluid pressure, e.g. using an accumulator (F16D 48/062, F16D 48/068 take precedence)} | 51/10 | . shaped as exclusively radially-movable brake-shoes |
| 48/068 | . . {using signals from a manually actuated gearshift linkage} | 51/12 | . . mechanically actuated |
| 48/08 | . . Regulating clutch take-up on starting | 51/14 | . . fluid actuated |
| 48/10 | . . Preventing unintentional or unsafe engagement | 51/16 | . shaped as brake-shoes pivoted on a fixed or nearly-fixed axis |
| Brakes (electrodynamic brake systems for vehicles in general B60L; dynamo-electric brakes H02K) | | 51/18 | . . with two brake-shoes |
| 49/00 | Brakes with a braking member co-operating with the periphery of a drum, wheel-rim, or the like (similar clutches F16D 13/10) | 51/20 | . . . extending in opposite directions from their pivots |
| 49/02 | . shaped as a helical band or coil with more than one turn, with or without intensification of the braking force by the tension of the band or contracting member (similar clutches F16D 13/08) | 51/22 | mechanically actuated |
| 49/04 | . . mechanically actuated | 51/24 | fluid actuated |
| | | 51/26 | . . . both extending in the same direction from their pivots |
| | | 51/28 | mechanically actuated |
| | | 51/30 | fluid actuated |
| | | 51/32 | . . with three or more brake shoes |
| | | 51/34 | . . . extending in opposite directions from their pivots |
| | | 51/36 | mechanically actuated |
| | | 51/38 | fluid actuated |
| | | 51/40 | . . . all extending in the same direction from their pivots |
| | | 51/42 | mechanically actuated |
| | | 51/44 | fluid actuated |
| | | 51/46 | . Self-tightening brakes with pivoted brake shoes, {i.e. the braked member increases the braking action} |
| | | 51/48 | . . with two linked or directly-interacting brake shoes |
| | | 51/50 | . . . mechanically actuated |
| | | 51/52 | . . . fluid actuated |

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| 51/54 | . . with three or more brake-shoes, at least two of them being linked or directly interacting | 55/04 | . . by moving discs or pads away from one another against radial walls of drums or cylinders |
| 51/56 | . . . mechanically actuated | 55/06 | . . . without self-tightening action |
| 51/58 | . . . fluid actuated | 55/08 | Mechanically-actuated brakes |
| 51/60 | . . with wedging action of a brake-shoe, e.g. the shoe entering as a wedge between the brake-drum and a stationary part | 55/10 | Brakes actuated by a fluid-pressure device arranged in or on the brake |
| 51/62 | . . . mechanically actuated | 55/12 | comprising an expansible fluid-filled flexible member coaxial with the brake |
| 51/64 | . . . fluid actuated | 55/14 | . . . with self-tightening action, e.g. by means of coacting helical surfaces or balls and inclined surfaces |
| 51/66 | . . an actuated brake-shoe being carried along and thereby engaging a member for actuating another brake-shoe | 55/15 | initiated by means of brake-bands or brake-shoes |
| 51/68 | . . . mechanically actuated | 55/16 | Mechanically-actuated brakes |
| 51/70 | . . . fluid actuated | 55/18 | Brakes actuated by a fluid-pressure device arranged in or on the brake |
| 53/00 | Brakes with braking members co-operating with both the periphery and the inner surface of a drum, wheel-rim, or the like (similar clutches F16D 13/20) | 55/20 | comprising an expansible fluid-filled flexible member coaxial with the brake |
| 55/00 | Brakes with substantially-radial braking surfaces pressed together in axial direction, e.g. disc brakes (similar clutches F16D 13/38) | 55/22 | . . by clamping an axially-located rotating disc between movable braking members, e.g. movable brake discs or brake pads |
| 2055/0004 | . {Parts or details of disc brakes} | 55/224 | . . . with a common actuating member for the braking members |
| 2055/0008 | . . {Brake supports} | 55/2245 | {in which the common actuating member acts on two levers carrying the braking members, e.g. tong-type brakes (similar brakes for rail vehicles B61H 5/00)} |
| 2055/0012 | . . . {integral with vehicle suspension} | 55/225 | the braking members being brake pads |
| 2055/0016 | . . {Brake calipers} | 55/2255 | in which the common actuating member is pivoted |
| 2055/002 | . . . {assembled from a plurality of parts} | 55/226 | in which the common actuating member is moved axially {, e.g. floating caliper disc brakes} |
| 2055/0025 | . . . {comprising a flat frame member} | 55/2262 | {the axial movement being guided by open sliding surfaces, e.g. grooves} |
| 2055/0029 | . . . {Retraction devices} | 55/2265 | the axial movement being guided by one or more pins {engaging bores in the brake support or the brake housing} |
| 2055/0033 | . . {Fully-enclosing housings} | 55/22655 | {Constructional details of guide pins} |
| 2055/0037 | . . {Protective covers} | 55/227 | by two {or more} pins |
| 2055/0041 | . . {Resilient elements interposed directly between the actuating member and the brake support, e.g. anti-rattle springs} | 55/228 | . . . with a separate actuating member for each side |
| 2055/0045 | . . {Braking members arranged non-symmetrically with respect to the brake disc} | 55/24 | . with a plurality of axially-movable discs, lamellae, or pads, pressed from one side towards an axially-located member |
| 2055/005 | . . {Brakes straddling an annular brake disc radially internally} | 55/26 | . . without self-tightening action |
| 2055/0054 | . . {Brakes located in the radial gap between two coplanarly arranged annular brake discs} | 55/28 | . . . Brakes with only one rotating disc |
| 2055/0058 | . . {Fully lined, i.e. braking surface extending over the entire disc circumference} | 55/30 | mechanically actuated |
| 2055/0062 | . . {Partly lined, i.e. braking surface extending over only a part of the disc circumference} | 55/31 | by means of an intermediate leverage |
| 2055/0066 | . . {Brakes having more than one actuator on the same side of the disc} | 55/32 | actuated by a fluid-pressure device arranged in or on the brake |
| 2055/007 | . . {Pins holding the braking members} | 55/33 | by means of an intermediate leverage |
| 2055/0075 | . {Constructional features of axially engaged brakes} | 55/34 | comprising an expansible fluid-filled flexible member coaxial with the brake |
| 2055/0079 | . . {with braking members arranged non-symmetrically with respect to the rotor} | 55/36 | . . . Brakes with a plurality of rotating discs all lying side by side |
| 2055/0083 | . . {with brake actuator located radially inside of an annular rotor} | 55/38 | mechanically actuated |
| 2055/0087 | . . {with brake actuator located between two coplanar annular rotors} | 55/39 | by means of an intermediate leverage |
| 2055/0091 | . . {Plural actuators arranged side by side on the same side of the rotor} | 55/40 | actuated by a fluid-pressure device arranged in or on the brake |
| 2055/0095 | . . {Plural rotors with different properties, e.g. to influence working conditions like wear or temperature} | 55/41 | by means of an intermediate leverage |
| 55/02 | . with axially-movable discs or pads pressed against axially-located rotating members | 55/42 | comprising an expansible fluid-filled flexible member coaxial with the brake |
| 55/025 | . . {with two or more rotating discs at least one of them being located axially} | | |

- 55/44 . . . with the rotating part consisting of both central plates and ring-shaped plates arranged concentrically around the central plates
- 55/46 . . with self-tightening action
- 55/48 . . . with discs or pads having a small free angular travel relative to their support, which produces the self-tightening action
- 55/50 . . . with auxiliary friction members, which may be of different type, producing the self-tightening action
- 57/00 Liquid-resistance brakes; {Brakes using the internal friction of fluids or fluid-like media, e.g. powders (for braking drums, barrels or ropes of cranes, lift hoists or winches B66D 5/026)}**
- 57/002 . {comprising a medium with electrically or magnetically controlled internal friction, e.g. electrorheological fluid, magnetic powder}
- 57/005 . {Details of blades, e.g. shape}
- 57/007 . {with variable brake geometry, e.g. axially movable rotor or stator}
- 57/02 . with blades or like members braked by the fluid
- 57/04 . with blades causing a directed flow, e.g. Föttinger type
- 57/06 . comprising a pump circulating fluid, braking being effected by throttling of the circulation
- 59/00 Self-acting brakes, e.g. coming into operation at a predetermined speed**
- 59/02 . spring-loaded and adapted to be released by mechanical, fluid, or electromagnetic means
- 61/00 Brakes with means for making the energy absorbed available for use (F16D 57/00 takes precedence)**
- 63/00 Brakes not otherwise provided for; Brakes combining more than one of the types of groups F16D 49/00 - F16D 61/00**
- 63/002 . {Brakes with direct electrical or electro-magnetic actuation}
- 63/004 . {comprising a rotor engaged both axially and radially by braking members, e.g. combined drum and disc brakes}
- 63/006 . {Positive locking brakes}
- 63/008 . {Brakes acting on a linearly moving member}
- 65/00 Parts or details (similar members for clutches F16D 13/58)**
- 65/0006 . {Noise or vibration control}
- 65/0012 . . {Active vibration dampers}
- 65/0018 . . {Dynamic vibration dampers, e.g. mass-spring systems}
- 65/0025 . {Rust- or corrosion-preventing means}
- 65/0031 . {Devices for retaining friction material debris, e.g. dust collectors or filters}
- 65/0037 . {Devices for conditioning friction surfaces, e.g. cleaning or abrasive elements}
- 65/0043 . {Brake maintenance and assembly, tools therefor}
- 65/005 . {Components of axially engaging brakes not otherwise provided for}
- 65/0056 . . {Brake supports}
- 65/0062 . . . {integral with vehicle suspension, e.g. with the steering knuckle}
- 65/0068 . . {Brake calipers}
- 65/0075 . . . {assembled from a plurality of parts}
- 65/0081 . . {Brake covers}
- 65/0087 . . {Brake housing guide members, e.g. caliper pins; Accessories therefor, e.g. dust boots}
- 65/0093 . . {Brake housing guide members, e.g. caliper pins; Accessories therefor, e.g. dust boots}
- 65/02 . Braking members; Mounting thereof ([friction linings or attachment thereof F16D 69/00](#))
- 2065/022 . . {Rollers}
- 2065/024 . . {the braking surface being inclined with respect to the rotor's axis of rotation at an angle other than 90 degrees, e.g. comprising a conical rotor}
- 2065/026 . . {characterised by a particular outline shape of the braking member, e.g. footprint of friction lining}
- 65/028 . . {Rollers}
- 65/04 . . Bands, shoes or pads; Pivots or supporting members therefor
- 65/06 . . . for externally-engaging brakes
- 65/062 {engaging the tread of a railway wheel}
- 65/065 {Brake bands}
- 65/067 {with means for mounting, e.g. end connection members}
- 65/08 . . . for internally-engaging brakes
- 65/09 Pivots or supporting members therefor
- 65/091 {for axially holding the segments}
- 65/092 . . . for axially-engaging brakes, e.g. disc brakes
- 65/095 Pivots or supporting members therefor
- 65/097 Resilient means interposed between pads and supporting members {or other brake parts}
- 65/0971 {transmitting brake actuation force, e.g. elements interposed between brake piston and pad}
- 65/0972 {transmitting brake reaction force, e.g. elements interposed between torque support plate and pad}
- 65/0973 {not subjected to brake forces}
- 65/0974 {acting on or in the vicinity of the pad rim in a direction substantially transverse to the brake disc axis}
- 65/0975 {Springs made from wire}
- 65/0976 {acting on one pad only}
- 65/0977 {Springs made from sheet metal}
- 65/0978 {acting on one pad only}
- 65/0979 {acting on the rear side of the pad or an element affixed thereto, e.g. spring clips securing the pad to the brake piston or caliper}
- 65/10 . . Drums for externally- or internally-engaging brakes
- 65/12 . . Discs; Drums for disc brakes
- 65/121 . . . {consisting of at least three circumferentially arranged segments}
- 65/122 . . . {adapted for mounting of friction pads}
- 65/123 . . . {comprising an annular disc secured to a hub member; Discs characterised by means for mounting}
- 65/124 {adapted for mounting on the wheel of a railway vehicle}
- 65/125 . . . {characterised by the material used for the disc body}
- 65/126 {the material being of low mechanical strength, e.g. carbon, beryllium; Torque transmitting members therefor}

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| 65/127 | . . . {characterised by properties of the disc surface; Discs lined with friction material} | 65/52 | . . . self-acting in one direction for adjusting excessive play |
| 65/128 | . . . {characterised by means for cooling} | 65/54 | by means of direct linear adjustment |
| 2065/13 | . . {Parts or details of discs or drums} | 65/543 | {comprising a plastically-deformable member} |
| 2065/1304 | . . . {Structure} | 65/546 | {for mounting within the confines of a drum brake} |
| 2065/1308 | {one-part} | 65/56 | with screw-thread and nut |
| 2065/1312 | {circumferentially segmented} | 65/561 | {for mounting within the confines of a drum brake} |
| 2065/1316 | {radially segmented} | 65/562 | {arranged between service brake actuator and braking member, and subjected to service brake force} |
| 2065/132 | {layered} | 65/563 | {arranged adjacent to service brake actuator, e.g. on parking brake lever, and not subjected to service brake force} |
| 2065/1324 | {carrying friction elements} | 65/565 | {arranged diametrically opposite to service brake actuator, and subjected to service brake force} |
| 2065/1328 | {internal cavities, e.g. cooling channels} | 65/566 | {having a temperature-sensitive element preventing adjustment when brake is hot} |
| 2065/1332 | {external ribs, e.g. for cooling or reinforcement} | 65/567 | {for mounting on a disc brake} |
| 2065/1336 | {integral part of vehicle wheel} | 65/568 | {for synchronous adjustment of actuators arranged in parallel} |
| 2065/134 | . . . {Connection} | 65/58 | with eccentric or helical body |
| 2065/1344 | {permanent, e.g. by casting} | 65/60 | for angular adjustment of two concentric parts of the brake control systems |
| 2065/1348 | {resilient} | 65/62 | . . . self-acting in both directions for adjusting excessive and insufficient play |
| 2065/1352 | {articulated} | 65/64 | by means of direct linear adjustment |
| 2065/1356 | {interlocking} | 65/66 | with screw-thread and nut |
| 2065/136 | {with relative movement radially} | 65/68 | with eccentric or helical body |
| 2065/1364 | {with relative movement axially} | 65/70 | for angular adjustment of two concentric parts of the brake control system |
| 2065/1368 | {with relative movement both radially and axially} | 65/72 | . . hydraulic |
| 2065/1372 | {outer circumference} | 65/74 | . . . self-acting in one direction |
| 2065/1376 | {inner circumference} | 65/76 | . . . self-acting in both directions |
| 2065/138 | {to wheel} | 65/78 | . Features relating to cooling |
| 2065/1384 | {to wheel hub} | 2065/781 | . . {involving phase change of material} |
| 2065/1388 | {to shaft or axle} | 2065/782 | . . {the brake-actuating fluid being used as a coolant} |
| 2065/1392 | {Connection elements} | 2065/783 | . . {cooling control or adjustment} |
| 2065/1396 | {Ancillary resilient elements, e.g. anti- rattle or retraction springs} | 2065/784 | . . {the coolant not being in direct contact with the braking surface} |
| 65/14 | . Actuating mechanisms for brakes; Means for initiating operation at a predetermined position (brake control systems, parts thereof B60T) | 2065/785 | . . {Heat insulation or reflection} |
| | NOTE | 2065/786 | . . {Fluid spray devices} |
| | In this group, it is desirable to add the indexing codes of groups F16D 2121/00 - F16D 2131/00 relating to actuators. | 2065/787 | . . {Pumps} |
| 65/16 | . . arranged in or on the brake | 2065/788 | . . {Internal cooling channels} |
| 65/18 | . . . adapted for drawing members together {, e.g. for disc brakes} | 2065/789 | . . {External cooling ribs} |
| 65/183 | {with force-transmitting members arranged side by side acting on a spot type force- applying member} | 65/80 | . . for externally-engaging brakes |
| 65/186 | {with full-face force-applying member, e.g. annular} | 65/807 | . . . with open cooling system, e.g. cooled by air |
| 65/22 | . . . adapted for pressing members apart {, e.g. for drum brakes} | 65/813 | . . . with closed cooling system |
| 65/28 | . . arranged apart from the brake | 65/82 | . . for internally-engaging brakes |
| 65/38 | . Slack adjusters | 65/827 | . . . with open cooling system, e.g. cooled by air |
| 2065/383 | . . {for adjusting the spring force in spring-applied brakes} | 65/833 | . . . with closed cooling system |
| 2065/386 | . . {driven electrically} | 65/84 | . . for disc brakes {(discs characterised by means for cooling F16D 65/128)} |
| 65/40 | . . mechanical | 65/847 | . . . with open cooling system, e.g. cooled by air |
| 65/42 | . . . non-automatic | 65/853 | . . . with closed cooling system |
| 65/44 | by means of direct linear adjustment | 66/00 | Arrangements for monitoring working conditions, e.g. wear, temperature |
| 65/46 | with screw-thread and nut | | |
| 65/48 | with eccentric or helical body | | |
| 65/50 | for angular adjustment of two concentric parts of the brake control system | | |

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| 2066/001 | . {Temperature} | 69/04 | . Attachment of linings |
| 2066/003 | . {Position, angle or speed} | 69/0408 | . . {specially adapted for plane linings} |
| 2066/005 | . {Force, torque, stress or strain} | 69/0416 | . . {specially adapted for curved linings} |
| 2066/006 | . {without direct measurement of the quantity monitored, e.g. wear or temperature calculated from force and duration of braking} | 2069/0425 | . . {Attachment methods or devices} |
| 2066/008 | . {of clutches} | 2069/0433 | . . . {Connecting elements not integral with the braking member, e.g. bolts, rivets} |
| 66/02 | . Apparatus for indicating wear | 2069/0441 | . . . {Mechanical interlocking, e.g. roughened lining carrier, mating profiles on friction material and lining carrier} |
| 66/021 | . . {using electrical detection or indication means} | 2069/045 | . . . {Bonding} |
| 66/022 | . . . {indicating that a lining is worn to minimum allowable thickness} | 2069/0458 | {metallurgic, e.g. welding, brazing, sintering} |
| 66/023 | {directly sensing the position of braking members} | 2069/0466 | {chemical, e.g. using adhesives, vulcanising} |
| 66/024 | {Sensors mounted on braking members adapted to contact the brake disc or drum, e.g. wire loops severed on contact} | 2069/0475 | {comprising thermal treatment} |
| 66/025 | {sensing the position of parts of the brake system other than the braking members, e.g. limit switches mounted on master cylinders} | 2069/0483 | {Lining or lining carrier material shaped <u>in situ</u> } |
| 66/026 | . . . {indicating different degrees of lining wear} | 2069/0491 | {Tools, machines, processes} |
| 66/027 | {Sensors therefor} | 71/00 | Mechanisms for bringing members to rest in a predetermined position (combined with or controlling clutches F16D 43/26; means for initiating operation of brakes at a predetermined position F16D 65/14; means for securing members after operation F16B 1/02) |
| 66/028 | . . . {with non-electrical sensors or signal transmission, e.g. magnetic, optical} | 71/02 | . comprising auxiliary means for producing the final movement |
| 67/00 | Combinations of couplings and brakes; Combinations of clutches and brakes (combinations of couplings and clutches F16D 47/02; conjoint control of brake systems and driveline clutches in vehicles B60W 10/02, B60W 10/18) | 71/04 | . providing for selection between a plurality of positions (F16D 71/02 takes precedence) |
| 67/02 | . Clutch-brake combinations | | |
| 67/04 | . . fluid actuated | | |
| 67/06 | . . electromagnetically actuated | | |
| 69/00 | Friction linings; Attachment thereof; Selection of coating friction substances or surfaces (clutching elements F16D 13/60; braking members F16D 65/02) | 2121/00 | Type of actuator operation force |
| 2069/001 | . {Material of friction lining and support element of same or similar composition} | 2121/005 | . {unspecified force for releasing a normally applied brake} |
| 2069/002 | . {Combination of different friction materials} | 2121/02 | . Fluid pressure |
| 2069/003 | . {Selection of coating friction materials} | 2121/04 | . . acting on a piston-type actuator, e.g. for liquid pressure |
| 2069/004 | . {Profiled friction surfaces, e.g. grooves, dimples} | 2121/06 | . . . for releasing a normally applied brake |
| 2069/005 | . {having a layered structure} | 2121/08 | . . acting on a membrane-type actuator, e.g. for gas pressure |
| 2069/006 | . . {comprising a heat-insulating layer} | 2121/10 | . . . for releasing a normally applied brake |
| 2069/007 | . . {comprising a resilient layer} | 2121/12 | . . for releasing a normally applied brake, the type of actuator being irrelevant or not provided for in groups F16D 2121/04 - F16D 2121/10 |
| 2069/008 | . . {Layers of fibrous materials} | 2121/14 | . Mechanical |
| 2069/009 | . {Linings attached to both sides of a central support element, e.g. a carrier plate} | 2121/16 | . . for releasing a normally applied brake |
| 69/02 | . Compositions of linings; {Methods of manufacturing} | 2121/18 | . Electric or magnetic |
| | NOTE | 2121/20 | . . using electromagnets |
| | Indexing codes F16D 69/021 - F16D 2250/0053 are used for indexing aspects relating to compositions or manufacturing of friction linings | 2121/22 | . . . for releasing a normally applied brake |
| 69/021 | . . {containing asbestos} | 2121/24 | . . . using motors |
| 69/022 | . . . {in the form of fibres} | 2121/26 | . . . for releasing a normally applied brake |
| 69/023 | . . {Composite materials containing carbon and carbon fibres or fibres made of carbonizable material} | 2121/28 | . . using electrostrictive or magnetostrictive elements, e.g. piezoelectric elements |
| 69/025 | . . {Compositions based on an organic binder} | 2121/30 | . . . for releasing a normally applied brake |
| 69/026 | . . . {containing fibres} | 2121/32 | . . using shape memory {or other thermo-mechanical} elements |
| 69/027 | . . {Compositions based on metals or inorganic oxides} | 2121/34 | . . . for releasing a normally applied brake |
| 69/028 | . . . {containing fibres} | 2123/00 | Multiple operation forces |
| | | 2125/00 | Components of actuators |
| | | 2125/02 | . Fluid-pressure mechanisms |
| | | 2125/023 | . . {Pumps} |
| | | 2125/026 | . . {Pressure-to-pressure converters, e.g. hydropneumatic} |

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| 2125/04 | . . Cylinders | 2127/04 | . . for manual operation |
| 2125/06 | . . Pistons | 2127/06 | . Locking mechanisms, e.g. acting on actuators, on release mechanisms or on force transmission mechanisms |
| 2125/08 | . . Seals, e.g. piston seals | 2127/08 | . Self-amplifying or de-amplifying mechanisms |
| 2125/10 | . . Plural pistons interacting by fluid pressure, e.g. hydraulic force amplifiers using different sized pistons | 2127/085 | . . {having additional fluid pressure elements} |
| 2125/12 | . . Membrane or diaphragm types | 2127/10 | . . having wedging elements |
| 2125/14 | . . Fluid-filled flexible members, e.g. enclosed air bladders | 2127/12 | . . having additional frictional elements |
| 2125/16 | . . Devices for bleeding or filling | 2129/00 | Type of operation source for auxiliary mechanisms |
| 2125/18 | . Mechanical mechanisms | 2129/02 | . Fluid-pressure |
| 2125/20 | . . converting rotation to linear movement or <u>vice versa</u> | 2129/04 | . Mechanical |
| 2125/22 | . . . acting transversely to the axis of rotation | 2129/043 | . . {Weights} |
| 2125/24 | Rack-and-pinion | 2129/046 | . . {Flywheels} |
| 2125/26 | Cranks | 2129/06 | . Electric or magnetic |
| 2125/28 | Cams; Levers with cams | 2129/065 | . . {Permanent magnets} |
| 2125/30 | acting on two or more cam followers, e.g. S-cams | 2129/08 | . . Electromagnets |
| 2125/32 | acting on one cam follower | 2129/10 | . . Motors |
| 2125/34 | . . . acting in the direction of the axis of rotation | 2129/12 | . . Electrostrictive or magnetostrictive elements, e.g. piezoelectric |
| 2125/36 | Helical cams, Ball-rotating ramps | 2129/14 | . Shape memory {or other thermo-mechanical} elements |
| 2125/38 | with plural cam or ball-ramp mechanisms arranged concentrically with the brake rotor axis | 2131/00 | Overall arrangement of the actuators or their elements, e.g. modular construction |
| 2125/40 | Screw-and-nut | 2131/02 | . of the actuator controllers |
| 2125/405 | {with differential thread} | 2200/00 | Materials; Production methods therefor |
| 2125/42 | Rack-and-worm gears | 2200/0004 | . metallic |
| 2125/44 | . . transmitting rotation | 2200/0008 | . . Ferro |
| 2125/46 | . . . Rotating members in mutual engagement | 2200/0013 | . . . Cast iron |
| 2125/48 | with parallel stationary axes, e.g. spur gears | 2200/0017 | . . . corrosion-resistant |
| 2125/50 | with parallel non-stationary axes, e.g. planetary gearing | 2200/0021 | . . . Steel |
| 2125/52 | with non-parallel stationary axes, e.g. worm or bevel gears | 2200/0026 | . . Non-ferro |
| 2125/54 | with non-parallel non-stationary axes | 2200/003 | . . . Light metals, e.g. aluminium |
| 2125/56 | . . . Shafts for transmitting torque directly | 2200/0034 | . non-metallic |
| 2125/565 | {flexible} | 2200/0039 | . . Ceramics |
| 2125/58 | . . transmitting linear movement | 2200/0043 | . . . Ceramic base, e.g. metal oxides or ceramic binder |
| 2125/582 | . . . {Flexible element, e.g. spring, other than the main force generating element} | 2200/0047 | . . . Ceramic composite, e.g. C/C composite infiltrated with Si or B, or ceramic matrix infiltrated with metal |
| 2125/585 | {arranged in parallel with a force-applying member} | 2200/0052 | . . Carbon |
| 2125/587 | . . . {Articulation, e.g. ball-socket} | 2200/0056 | . . Elastomers |
| 2125/60 | . . . Cables or chains, e.g. Bowden cables | 2200/006 | . containing fibres or particles |
| 2125/62 | Fixing arrangements therefor, e.g. cable end attachments | 2200/0065 | . . Inorganic, e.g. non-asbestos mineral fibres |
| 2125/64 | . . . Levers | 2200/0069 | . . being characterised by their size |
| 2125/645 | {with variable leverage, e.g. movable fulcrum} | 2200/0073 | . . having lubricating properties |
| 2125/66 | . . . Wedges | 2200/0078 | . laminated |
| 2125/68 | . . . Lever-link mechanisms, e.g. toggles with change of force ratio | 2200/0082 | . Production methods therefor |
| 2125/70 | . . . Rods | 2200/0086 | . . Moulding materials together by application of heat and pressure |
| 2127/00 | Auxiliary mechanisms | 2200/0091 | . . Impregnating a mat of fibres with a binder |
| 2127/001 | . {for automatic or self-acting brake operation} | 2200/0095 | . . Mixing an aqueous slurry of fibres with a binder, e.g. papermaking process |
| 2127/002 | . . {speed-responsive} | 2250/00 | Manufacturing; Assembly |
| 2127/004 | . . {direction-responsive} | 2250/0007 | . Casting |
| 2127/005 | . . {force- or torque-responsive} | 2250/0015 | . . around inserts |
| 2127/007 | . {for non-linear operation} | 2250/0023 | . Shaping by pressure |
| 2127/008 | . {Trigger mechanisms} | 2250/003 | . Chip removing |
| 2127/02 | . Release mechanisms | 2250/0038 | . Surface treatment |
| | | 2250/0046 | . . Coating |
| | | 2250/0053 | . . Hardening |

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| 2250/0061 | . Joining | 2500/1064 | . . . Electric |
| 2250/0069 | . . Adhesive bonding | 2500/1066 | . . . Hybrid |
| 2250/0076 | . . Welding, brazing | 2500/1068 | . . . Engine supercharger or turbocharger |
| 2250/0084 | . Assembly or disassembly | 2500/108 | . . Gear |
| 2250/0092 | . Tools or machines for producing linings | 2500/1081 | . . . Actuation type |
| 2300/00 | Special features for couplings or clutches | 2500/1082 | Manual transmission |
| 2300/02 | . Overheat protection, i.e. means for protection against overheating | 2500/1083 | Automated manual transmission |
| 2300/021 | . . Cooling features not provided for in group F16D 13/72 or F16D 25/123 , e.g. heat transfer details | 2500/1085 | Automatic transmission |
| 2300/0212 | . . . Air cooling | 2500/1086 | . . . Concentric shafts |
| 2300/0214 | . . . Oil or fluid cooling | 2500/1087 | . . . Planetary gearing |
| 2300/06 | . Lubrication details not provided for in group F16D 13/74 | 2500/1088 | . . . CVT |
| 2300/08 | . Details or arrangements of sealings not provided for in group F16D 3/84 | 2500/11 | . . Application |
| 2300/10 | . Surface characteristics; Details related to material surfaces | 2500/1102 | . . . Lawnmower |
| 2300/12 | . Mounting or assembling | 2500/1105 | . . . Marine applications |
| 2300/14 | . Clutches which are normally open, i.e. not engaged in released state | 2500/1107 | . . . Vehicles |
| 2300/18 | . Sensor; Details or arrangements thereof | 2500/111 | Agricultural |
| 2300/22 | . Vibration damping | 2500/1112 | Heavy vehicle |
| 2300/24 | . Concentric actuation rods, e.g. actuation rods extending concentrically through a shaft | 2500/1115 | Racing |
| 2300/26 | . Cover or bell housings; Details or arrangements thereof | 2500/1117 | Motorcycle |
| 2500/00 | External control of clutches by electric or electronic means | 2500/112 | . . Details of the arrangement of the system |
| 2500/10 | . System to be controlled | 2500/30 | . Signal inputs |
| 2500/102 | . . Actuator | 2500/302 | . . from the actuator |
| 2500/1021 | . . . Electrical type | 2500/3021 | . . . Angle |
| 2500/1022 | Electromagnet | 2500/3022 | . . . Current |
| 2500/1023 | Electric motor | 2500/3023 | . . . Force |
| 2500/1024 | combined with hydraulic actuation | 2500/3024 | . . . Pressure |
| 2500/1025 | with threaded transmission | 2500/3025 | . . . Fluid flow |
| 2500/1026 | . . . Hydraulic | 2500/3026 | . . . Stroke |
| 2500/1027 | Details about the hydraulic valves | 2500/3027 | . . . Torque |
| 2500/1028 | . . . Pneumatic | 2500/3028 | . . . Voltage |
| 2500/104 | . . Clutch | 2500/304 | . . from the clutch |
| 2500/10406 | . . . Clutch position | 2500/30401 | . . . On-off signal indicating the engage or disengaged position of the clutch |
| 2500/10412 | Transmission line of a vehicle | 2500/30402 | . . . Clutch friction coefficient |
| 2500/10418 | Accessory clutch, e.g. cooling fan, air conditioning | 2500/30403 | . . . Number of clutch actuations |
| 2500/10425 | Differential clutch | 2500/30404 | . . . Clutch temperature |
| 2500/10431 | 4WD Clutch dividing power between the front and the rear axle | 2500/30405 | Estimated clutch temperature |
| 2500/10437 | Power Take Off clutch | 2500/30406 | . . . Clutch slip |
| 2500/10443 | . . . Clutch type | 2500/30407 | Clutch slip change rate |
| 2500/1045 | Friction clutch | 2500/30408 | . . . Relative rotational position of the input and output parts, e.g. for facilitating positive clutch engagement |
| 2500/10456 | Synchro clutch | 2500/30409 | Signals detecting the transmission of zero torque |
| 2500/10462 | Dog-type clutch | 2500/3041 | . . . from the input shaft |
| 2500/10468 | Fluid adhesion clutch | 2500/30412 | Torque of the input shaft |
| 2500/10475 | Magnetic field, e.g. electro-rheological, magnetisable particles | 2500/30415 | Speed of the input shaft |
| 2500/10481 | Automatic clutch, e.g. centrifugal masses | 2500/30417 | Speed change rate of the input shaft |
| 2500/10487 | Fluid coupling | 2500/3042 | . . . from the output shaft |
| 2500/10493 | One way clutch | 2500/30421 | Torque of the output shaft |
| 2500/106 | . . Engine | 2500/30423 | Signal detecting the transmission of zero torque |
| 2500/1062 | . . . Diesel | 2500/30425 | Estimation of the transmitted clutch torque, e.g. applying dynamic torque balance equation |
| | | 2500/30426 | Speed of the output shaft |
| | | 2500/30428 | Speed change rate of the output shaft |
| | | 2500/305 | . . from the clutch cooling |
| | | 2500/3051 | . . . Flow amount of cooling fluid |
| | | 2500/3053 | On/off signal indicating the presence of cooling oil flow |
| | | 2500/3055 | . . . Cooling oil properties |

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| 2500/3056 | | Cooling oil temperature | 2500/314 | . . | from the user |
| 2500/3058 | | Cooling oil pressure | 2500/31406 | . . . | input from pedals |
| 2500/306 | . . | from the engine | 2500/31413 | | Clutch pedal position |
| 2500/3061 | . . . | Engine inlet air flow rate | 2500/3142 | | Clutch pedal position rate |
| 2500/3062 | . . . | Engine braking signal indicating the use of the engine as a brake | 2500/31426 | | Brake pedal position |
| 2500/3063 | . . . | Engine fuel flow rate | 2500/31433 | | Brake pedal position threshold, e.g. switch |
| 2500/3064 | . . . | Temperature of the engine | 2500/3144 | | Accelerator pedal position |
| 2500/3065 | . . . | Torque of the engine | 2500/31446 | | Accelerator pedal position change rate |
| 2500/3066 | | Torque change rate of the engine | 2500/31453 | | Accelerator pedal position threshold, e.g. switch |
| 2500/3067 | . . . | Speed of the engine | 2500/3146 | . . . | input from levers |
| 2500/3068 | | Speed change of rate of the engine | 2500/31466 | | Gear lever |
| 2500/3069 | . . . | Engine ignition switch | 2500/31473 | | Parking brake lever |
| 2500/308 | . . | from the transmission | 2500/3148 | . . . | Detection of user presence |
| 2500/30801 | . . . | Number of shift actuations | 2500/31486 | . . . | Recognition of user style of driving, e.g. sportive, calm, nervous |
| 2500/30802 | . . . | Transmission oil properties | 2500/31493 | . . . | Switches on the dashboard |
| 2500/30803 | | Oil temperature | 2500/316 | . . | Other signal inputs not covered by the groups above |
| 2500/30805 | | Oil pressure | 2500/3161 | . . . | Signal providing information about the state of engine accessories |
| 2500/30806 | . . . | Engaged transmission ratio | 2500/3163 | . . . | Using the natural frequency of a component as input for the control |
| 2500/30807 | | Estimation of the engaged transmission ratio | 2500/3165 | . . . | Using the moment of inertia of a component as input for the control |
| 2500/30808 | | Detection of transmission in neutral | 2500/3166 | . . . | Detection of an elapsed period of time |
| 2500/3081 | . . . | from the input shaft | 2500/3168 | . . . | Temperature detection of any component of the control system |
| 2500/30812 | | Direction of rotation of the input shaft | 2500/50 | . . | Problem to be solved by the control system |
| 2500/30814 | | Torque of the input shaft | 2500/501 | . . | Relating the actuator |
| 2500/30816 | | Speed of the input shaft | 2500/5012 | . . . | Accurate determination of the clutch positions, e.g. treating the signal from the position sensor, or by using two position sensors for determination |
| 2500/30818 | | Speed change rate of the input shaft | 2500/5014 | . . . | Filling the actuator cylinder with fluid |
| 2500/3082 | . . . | from the output shaft | 2500/5016 | . . . | Shifting operation, i.e. volume compensation of the master cylinder due to wear, temperature changes or leaks in the cylinder |
| 2500/30822 | | Torque of the output shaft | 2500/5018 | . . . | Calibration or recalibration of the actuator |
| 2500/30825 | | Speed of the output shaft | 2500/502 | . . | Relating the clutch |
| 2500/30827 | | Speed change rate of the output shaft | 2500/50203 | . . . | Transition between manual and automatic control of the clutch |
| 2500/31 | . . | from the vehicle | 2500/50206 | . . . | Creep control |
| 2500/3101 | . . . | Detection of a brake actuation by a sensor on the brake (brake pedal actuation F16D 2500/31426) | 2500/50209 | | Activation of the creep control operation |
| 2500/3102 | . . . | Vehicle direction of travel, i.e. forward/reverse | 2500/50212 | | Accelerator pedal |
| 2500/3104 | . . . | Travelled distance | 2500/50215 | | Brake pedal |
| 2500/3105 | . . . | Operational Time of clutches during vehicle life | 2500/50218 | | Clutch pedal |
| 2500/3107 | . . . | Vehicle weight | 2500/50221 | | Manual switch actuated by the user |
| 2500/3108 | . . . | Vehicle speed | 2500/50224 | . . . | Drive-off |
| 2500/3109 | | Vehicle acceleration | 2500/50227 | . . . | Control of clutch to control engine |
| 2500/3111 | | Standing still, i.e. signal detecting when the vehicle is standing still or bellow a certain limit speed | 2500/5023 | . . . | Determination of the clutch wear |
| 2500/3112 | | Vehicle acceleration change rate | 2500/50233 | . . . | Clutch wear adjustment operation |
| 2500/3114 | . . . | Vehicle wheels | 2500/50236 | . . . | Adaptations of the clutch characteristics, e.g. curve clutch capacity torque - clutch actuator displacement |
| 2500/3115 | | Vehicle wheel speed | 2500/50239 | . . . | Soft clutch engagement |
| 2500/3117 | | Vehicle wheel torque | 2500/50242 | . . . | Cleaning of clutches, e.g. controlling the engine or the clutch to provoke vibrations eliminating particles from the clutch friction surfaces |
| 2500/3118 | | Slip of vehicle wheels | 2500/50245 | . . . | Calibration or recalibration of the clutch touch-point |
| 2500/312 | . . | External to the vehicle | 2500/50248 | | During assembly |
| 2500/3121 | . . . | Ambient conditions, e.g. air humidity, air temperature, ambient pressure | 2500/50251 | | During operation |
| 2500/3122 | | Ambient temperature | | | |
| 2500/3124 | . . . | Driving conditions, e.g. climbing hills, cornering, traffic | | | |
| 2500/3125 | . . . | Driving resistance, i.e. external factors having an influence in the traction force, e.g. road friction, air resistance, road slope | | | |
| 2500/3127 | | Road slope | | | |
| 2500/3128 | . . . | Distance from the vehicle to an external element, e.g. to an obstacle, to an other vehicle or a target | | | |

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| 2500/50254 | | Brake actuated | 2500/50808 | . . . | Cold starting |
| 2500/50257 | | During a creep operation | 2500/50816 | . . . | Control during a braking operation, e.g. during ABS control |
| 2500/5026 | | Gear engaged | 2500/50825 | . . . | Hill climbing or descending |
| 2500/50263 | | During standing still | 2500/50833 | . . . | Control during a stability control operation [ESP] |
| 2500/50266 | | Way of detection | 2500/50841 | . . . | Hill hold |
| 2500/50269 | | Engine speed | 2500/5085 | . . . | Coasting |
| 2500/50272 | | Gearing speed | 2500/50858 | . . . | Selecting a Mode of operation |
| 2500/50275 | | Estimation of the displacement of the clutch touch-point due to the modification of relevant parameters, e.g. temperature, wear | 2500/50866 | . . . | Parking, i.e. control of drive units during parking |
| 2500/50278 | | Stalling | 2500/50875 | . . . | Driving in reverse |
| 2500/50281 | | Transmitted torque | 2500/50883 | . . . | Stop-and-go, i.e. repeated stopping and starting, e.g. in traffic jams |
| 2500/50284 | . . . | Control of secondary clutch in the driveline, i.e. not including clutches in automatic transmission, e.g. in the vicinity of rear axle or on parallel drive shaft | 2500/50891 | . . . | Towing or towed |
| 2500/50287 | . . . | Torque control | 2500/51 | . . | Relating safety |
| 2500/5029 | | Reducing drag torque | 2500/5102 | . . . | Detecting abnormal operation, e.g. unwanted slip or excessive temperature |
| 2500/50293 | . . . | Reduction of vibrations | 2500/5104 | . . . | Preventing failures |
| 2500/50296 | . . . | Limit clutch wear | 2500/5106 | | Overheat protection |
| 2500/503 | . . | relating to the accumulator | 2500/5108 | . . . | Failure diagnosis |
| 2500/5035 | . . . | Filling level of an accumulator providing fluid for the engagement of the clutch | 2500/511 | | Leak detection |
| 2500/504 | . . | Relating the engine | 2500/5112 | | Using signals from redundant sensors |
| 2500/5041 | . . . | Control of engine accessories, e.g. air conditioning, pumps, auxiliary drive | 2500/5114 | . . . | Failsafe |
| 2500/5043 | . . . | Engine fuel consumption | 2500/5116 | . . . | Manufacture, testing, calibrating, i.e. test or calibration of components during or soon after assembly, e.g. at the end of the production line (F16D 2500/50248 takes precedence) |
| 2500/5045 | . . . | Control of engine at idle, i.e. controlling engine idle conditions, e.g. idling speed | 2500/5118 | . . . | Maintenance |
| 2500/5046 | . . . | Preventing engine over-speed, e.g. by actuation of the main clutch | 2500/512 | . . | Relating to the driver |
| 2500/5048 | . . . | Stall prevention | 2500/5122 | . . . | Improve passengers comfort |
| 2500/506 | . . | Relating the transmission | 2500/5124 | . . . | Driver error, i.e. preventing effects of unintended or incorrect driver inputs |
| 2500/50607 | . . . | Facilitating engagement of a dog clutches, e.g. preventing of gear butting | 2500/5126 | . . . | Improving response to driver inputs |
| 2500/50615 | . . . | Facilitating disengagement of a dog clutch, e.g. by applying a pretension on the disengaging elements | 2500/5128 | . . . | Driver workload reduction |
| 2500/50623 | . . . | Preventing transmission load change | 2500/52 | . . | General |
| 2500/5063 | . . . | Shaft dither, i.e. applying a pulsating torque to a (transmission) shaft to create a buzz or dither, e.g. to prevent tooth butting or gear locking | 2500/525 | . . . | Improve response of control system |
| 2500/50638 | . . . | Shaft speed synchronising, e.g. using engine, clutch outside transmission | 2500/70 | . . | Details about the implementation of the control system |
| 2500/50646 | . . . | Control of the main clutch to prevent or release a tooth-to-tooth condition in the transmission | 2500/702 | . . | Look-up tables |
| 2500/50653 | . . . | Gearing shifting without the interruption of drive | 2500/70205 | . . . | Clutch actuator |
| 2500/50661 | . . . | Limit transmission input torque | 2500/70211 | | Force |
| 2500/50669 | . . . | Neutral control, i.e. preventing creep or drag torque being transmitted in a transmission with a torque converter when the vehicle is stationary | 2500/70217 | | Pressure |
| 2500/50676 | . . . | Optimising drive-train operating point, e.g. selecting gear ratio giving maximum fuel economy, best performance | 2500/70223 | | Current |
| 2500/50684 | . . . | Torque resume after shifting | 2500/70229 | | Voltage |
| 2500/50692 | . . . | Simulate the characteristics of a torque converter | 2500/70235 | | Displacement |
| 2500/507 | . . | Relating the vehicle | 2500/70241 | | Angle |
| 2500/5075 | . . . | Prevention or regulation of vehicle's wheel slip | 2500/70247 | . . . | Engine |
| 2500/508 | . . | Relating driving conditions | 2500/70252 | . . . | Clutch torque |
| | | | 2500/70258 | | Throttle |
| | | | 2500/70264 | | Stroke |
| | | | 2500/7027 | | Engine speed |
| | | | 2500/70276 | | Slip |
| | | | 2500/70282 | | Time |
| | | | 2500/70288 | | Clutch pedal position |
| | | | 2500/70294 | . . . | Valve look-up tables |
| | | | 2500/704 | . . | Output parameters from the control unit; Target parameters to be controlled |
| | | | 2500/70402 | . . . | Actuator parameters |
| | | | 2500/70404 | | Force |
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| 2500/7041 | | Position | 2500/70668 | . . . | Signal filtering |
| 2500/70412 | | Clutch position change rate | 2500/70673 | . . . | Statistical calculations |
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| 2500/70416 | | Angle | 2500/70684 | | using regressions |
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| 2500/7042 | | Voltage | 2500/70694 | | with plausibility checks |
| 2500/70422 | . . . | Clutch parameters | 2500/708 | . . | Mathematical model |
| 2500/70424 | | Outputting a clutch engaged-disengaged signal | 2500/7082 | . . . | of the clutch |
| 2500/70426 | | Clutch slip | 2500/7085 | . . . | of the driver |
| 2500/70428 | | Clutch slip change rate | 2500/7087 | . . . | of the vehicle |
| 2500/7043 | | Clutch temperature | 2500/71 | . . | Actions |
| 2500/70432 | | From the input shaft | 2500/7101 | . . . | Driver alarm |
| 2500/70434 | | Input shaft torque | 2500/7102 | | by provoking vibrations of a vehicle part |
| 2500/70436 | | Input shaft speed | 2500/7103 | | Acoustic alarms |
| 2500/70438 | | From the output shaft | 2500/7104 | | Visual alarms |
| 2500/7044 | | Output shaft torque | 2500/7105 | . . . | Inhibit control automatically |
| 2500/70442 | | Output shaft speed | 2500/7106 | . . . | Gearshift to neutral |
| 2500/70444 | | Output shaft speed rate | 2500/7107 | . . . | Others |
| 2500/70446 | . . . | Clutch cooling parameters | 2500/7108 | | Engine torque calculation |
| 2500/70448 | | for regulating the amount of fluid flow | 2500/7109 | | Pulsed signal; Generating or processing pulsed signals; PWM, width modulation, frequency or amplitude modulation |
| 2500/7045 | | On/off switching of the cooling fluid flow | | | |
| 2500/70452 | . . . | Engine parameters | | | |
| 2500/70454 | | Engine speed | | | |
| 2500/70456 | | Engine speed change rate | | | |
| 2500/70458 | | Engine torque | | | |
| 2500/7046 | | Engine torque change rate | | | |
| 2500/70462 | | Opening of the throttle valve | | | |
| 2500/70464 | . . . | Transmission parameters | | | |
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| 2500/7047 | | Input shaft torque change rate | | | |
| 2500/70472 | | Input shaft speed | | | |
| 2500/70474 | | Input shaft speed change rate | | | |
| 2500/70476 | | Output shaft | | | |
| 2500/70478 | | Output shaft power | | | |
| 2500/7048 | | Output shaft torque | | | |
| 2500/70482 | | Output shaft torque change rate | | | |
| 2500/70484 | | Output shaft speed | | | |
| 2500/70486 | | Output shaft speed change rate | | | |
| 2500/70488 | | Selection of the gear ratio | | | |
| 2500/7049 | . . . | Brake parameters | | | |
| 2500/70492 | . . . | Vehicle parameters | | | |
| 2500/70494 | | Vehicle speed | | | |
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| 2500/70636 | . . . | Fuzzy logic | | | |
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| 2500/70657 | . . . | Predictor methods | | | |
| 2500/70663 | . . . | State analysis; Analysing potential states of the machine and developing control strategies at each state | | | |