B60C

**VEHICLE TYRES** (manufacture B29); TYRE INFLATION; TYRE CHANGING OR REPAIRING; REPAIRING, OR CONNECTING VALVES TO, INFLATABLE ELASTIC BODIES IN GENERAL; DEVICES OR ARRANGEMENTS RELATED TO TYRES (testing of tyres G01M 17/02)

**NOTES**

1. In this subclass, the term "tyre" is to be understood as a separate ground-engaging, continuous element outside the periphery of the wheel rim and includes the tyre casing, cover, or jacket and any insert, e.g. inner tube. In the groups relating to repair or connection of valves, the term "tyre" is to be understood to include also inflatable elastic bodies other than tyres or inner tubes.

2. Attention is drawn to the note following the title of class B60.

**WARNINGS**

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
   - B60C 11/113 covered by B60C 11/0311
   - B60C 11/117 covered by B60C 11/032

2. 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.

**1/00** Tyres characterised by the chemical composition or the physical arrangement or mixture of the composition

**NOTE**

Tyres characterised by compositions only, i.e. having no significant tyre structure, are classified only with the compositions, e.g. C08K, C08L.

| 1/0008 | [Compositions of the inner liner] |
| 1/0016 | [Compositions of the tread] |
| 1/0025 | [Compositions of the sidewalls] |
| 2001/0033 | [Compositions of the sidewall inserts, e.g. for runflat] |
| 1/0041 | [Compositions of the carcass layers] |
| 2001/005 | [Compositions of the bead portions, e.g. clinch or chafer rubber or cushion rubber] |
| 2001/0058 | [Compositions of the bead apexes] |
| 2001/0066 | [Compositions of the belt layers] |
| 2001/0075 | [Compositions of belt cushioning layers] |
| 2001/0083 | [Compositions of the cap ply layers] |
| 2001/0091 | [Compositions of non-inflatable or solid tyres] |

**3/00** Tyres characterised by the transverse section (characterised by rail-engaging elements B60B 17/00)

| 2003/005 | [Twin tyres] |
| 3/02 | Closed, e.g. toroidal, tyres |
| 3/04 | characterised by the relative dimensions of the section, e.g. low profile (B60C 3/06 takes precedence) |

| 3/06 | . Asymmetric {asymmetric bead seats B60C 15/0236; asymmetric bead reinforcement B60C 2015/0696} |
| 3/08 | . collapsible into storage or non-use condition, e.g. space-saving spare tyres (run-flat tyres B60C 17/08) |

**5/00** Inflatable pneumatic tyres or inner tubes (B60C 1/00, B60C 9/00 - B60C 17/00 take precedence)

| 5/001 | . [filled with gas other than air] |
| 5/002 | . [filled at least partially with foam material] |
| 5/004 | . [filled at least partially with liquid (B60C 19/12 takes precedence)] |
| 5/005 | . [Ballast tyres] |
| 5/007 | . [made from other material than rubber] |
| 5/008 | . [Low pressure tyres, e.g. for all terrain vehicles] |
| 5/01 | . without substantial cord reinforcement, e.g. cordless tyres, cast tyres |
| 5/02 | . having separate inflatable inserts, e.g. with inner tubes; Means for lubricating, venting, preventing relative movement between tyre and inner tube (B60C 5/20 takes precedence) |
| 5/025 | . [separated by a part of the tyre (inflatable inserts with several inflatable chambers B60C 5/20)] |
| 5/04 | . Shape or construction of inflatable inserts (B60C 5/10 takes precedence) |
| 5/08 | . [having reinforcing means] |
| 5/10 | . [formed as a single discontinuous ring with contiguous ends which may be connected together] |
5/12 . without separate inflatable inserts, e.g. tubeless tyres with transverse section open to the rim (B60C 5/20 takes precedence)

5/14 . with impervious liner or coating on the inner wall of the tyre

5/142 . [made partially, i.e. not covering the whole inner wall]

2005/145 . . . [made of laminated layers]

2005/147 . . . [characterised by the joint or splice]

5/16 . . Sealing means between beads and rims, e.g. bands

5/18 . Sectional casings, e.g. comprising replaceable arcuate parts

5/20 . having multiple separate inflatable chambers (with additional tubes which become load supporting in emergency B60C 17/02)

5/22 . . the chambers being annular

5/24 . . the walls of the chambers extending transversely of the tyre

7/00 Non-inflatable or solid tyres (B60C 1/00 takes precedence; tyres or rims characterised by rail engaging elements B60B 17/00)

2007/005 . . [made by casting, e.g. of polyurethane]

7/02 . made from ropes or bristles

7/04 . made of wood or leather

7/06 . made of metal

7/08 . built-up from a plurality of arcuate parts

7/10 . characterised by means for increasing resiliency (highly resilient wheels B60B 9/00)

7/102 . . [Tyres built-up with separate rubber parts]

7/105 . . [using foam material]

2007/107 . . [comprising lateral openings]

7/12 . . using enclosed chambers, e.g. gas-filled (inflatable tyres B60C 5/00)

7/125 . . . [enclosed chambers defined between rim and tread]

7/14 . . using springs

7/143 . . . [having a lateral extension disposed in a plane parallel to the wheel axis]

2007/146 . . . [extending substantially radially, e.g. like spokes]

7/16 . . . of helical or flat coil form

7/18 . . . disposed radially relative to wheel axis

7/20 . . . disposed circumferentially relative to wheel axis

7/22 . having inlays other than for increasing resiliency, e.g. for armouring

7/24 . characterised by means for securing tyres on rim or wheel body

7/26 . . . using bolts

7/28 . . . using straps or the like, e.g. vulcanised into the tyre

9/00 Reinforcements or ply arrangement of pneumatic tyres (inserts having reinforcing means B60C 5/08; bead structure, e.g. turnup or overlap construction, B60C 15/00; tyre cords per se D02G 3/48; fabrics per se D03D, D04H; metal ropes or cables per se D07B 1/06) (B)

NOTE

When classifying in this group, classification is also made in subclass B32B insofar as any layered product is concerned

9/0007 . . [Reinforcements made of metallic elements, e.g. cords, yarns, filaments or fibres made from metal]

2009/0014 . . [Surface treatments of steel cords]

2009/0021 . . [Coating rubbers for steel cords]

9/0028 . . [Reinforcements comprising mineral fibres, e.g. glass or carbon fibres]

2009/0035 . . [Reinforcements made of organic materials, e.g. rayon, cotton or silk]

9/0042 . . [Reinforcements made of synthetic materials]

9/005 . . [Reinforcements made of different materials, e.g. hybrid or composite cords]

9/0057 . . [Reinforcements comprising preshaped elements, e.g. undulated or zig-zag filaments]

9/0064 . . [Reinforcements comprising monofilaments]

2009/0071 . . [characterised by special physical properties of the reinforcements]

2009/0078 . . [Modulus]

2009/0085 . . [Tensile strength]

2009/0092 . . [Twist structure]

9/02 . . . Carcasses

9/0207 . . . [Carcasses comprising an interrupted ply, i.e. where the carcass ply does not continuously extend from bead to bead but is interrupted, e.g. at the belt area, into two or more portions of the same ply]

2009/0215 . . . [Partial carcass reinforcing plies, i.e. the plies neither crossing the equatorial plane nor folded around the bead core]

2009/0223 . . . [comprising a cushion layer between adjacent carcass plies]

9/023 . . . [built up from narrow strips, individual cords or filaments, e.g. using filament winding]

9/0238 . . . [characterised by special physical properties of the carcass ply]

2009/0246 . . . [Modulus of the ply]

2009/0253 . . . . [being different between adjacent plies]

2009/0261 . . . . . [being different within the same ply]

2009/0269 . . . . . . [Physical properties or dimensions of the carcass coating rubber]

2009/0276 . . . . . . . [Modulus; Hardness; Loss modulus or “tangens delta”]

2009/0284 . . . . . . . . [Thickness]

9/0292 . . . . [Carcass ply curvature (sidewall curvature B60C 13/003)]

9/04 . . the reinforcing cords of each carcass ply arranged in a substantially parallel relationship

2009/0408 . . . . [Carcass joints or splices]

2009/0416 . . . . [Physical properties or dimensions of the carcass cords]

2009/0425 . . . . . [Diameters of the cords; Linear density thereof]

2009/0433 . . . . [Modulus]
crown-reinforcing or cushioning layers
Structure or arrangement of belts or breakers, built-up from rubberised plies each having all with belt joints or splices

9/06 the cords extend diagonally from bead to bead and run in opposite directions in each successive carcass ply, i.e. bias angle ply (B60C 9/07, B60C 9/09 take precedence)
9/07 the cords curve from bead to bead in plural planes, e.g. S-shaped cords
9/08 the cords extend transversely from bead to bead, i.e. radial ply (B60C 9/07 takes precedence)
9/09 combined with other carcass plies having cords extending diagonally from bead to bead, i.e. combined radial ply and bias angle ply
9/10 the reinforcing cords within each carcass ply arranged in a crossing relationship
9/11 Woven, braided, or knitted plies
9/12 built-up with rubberised layers of discrete fibres or filaments
9/13 with two or more differing cord materials
9/14 built-up with sheets, webs, or films of homogeneous material, e.g. synthetics, sheet metal, rubber
9/18 asymmetric to the midcircuitferential plane of the tyre
9/187 Structure or arrangement of belts or breakers, crown-reinforcing or cushioning layers
9/1814 square woven
9/1821 [comprising discrete fibres or filaments]
9/1828 [characterised by special physical properties of the belt ply]
9/1835 [Rubber strips or cushions at the belt edges (compositions B60C 2001/0075)]
9/1842 [Width or thickness of the strips or cushions]
9/185 [between adjacent or radially below the belt plies]
9/1875 [radially above the belt plies]
9/1864 [wrapped around the edges of the belt]
9/1871 [with flat cushions or shear layers between belt layers]
9/1878 [with flat cushions or shear layers between the carcass and the belt]
9/1885 [with belt ply between adjacent carcass plies]
9/1892 [with belt ply radial inside the carcass structure]
9/20 built-up from rubberised plies each having all cords arranged substantially parallel
9/2003 [characterised by the materials of the belt cords]
9/2006 [consisting of steel cord plies only]
9/2009 [comprising plies of different materials]
9/2012 [with particular configuration of the belt cords in the respective belt layers]
Tyre tread bands; Tread patterns; Anti-skid inserts

- [Diameters of the cords; Linear density thereof]
- [Modulus of the cords]
- [Density of the cords in width direction]
- [with variable density]
- [Tensile strength]
- [Elongation of the reinforcements at break point]
- [Twist structures]
- [characterised by the course of the cords, e.g. undulated or sinusoidal]
- [with different cords in the same layer]
- [built-up of arcuate parts]
- [Folded plies]
- [further characterised by an endless zigzag configuration in at least one belt ply, i.e. no cut edge being present]
- [characterised by the belt or breaker dimensions or curvature relative to carcass (B60C 9/30 takes precedence)]
- [characterised by belt curvature]
- [being substantially flat]
- [asymmetric to the midcircumferential plane of the tyre]

11/00 Tyre tread bands; Tread patterns; Anti-skid inserts

- [characterised by the tread rubber]
- [Physical properties or dimensions]
- [Modulus or tan delta]
- [Thickness of the tread]
- [comprising different tread rubber layers]
- [with cap and base layers]
- [with different cap rubber layers in the axial direction]
- [having an asymmetric arrangement]
- [with different base rubber layers in the axial direction]
- [characterised by the curvature of the tyre tread]
- [built-up by narrow strip winding]
- [Shape of the shoulders between tread and sidewall, e.g. rounded, stepped, cantilevered (arrangements of grooves or ribs on the sidewalls B60C 13/02)]
- [provided with a recessed portion]
- [different rubber for tread wings]
- [Replaceable treads]
- [Tread patterns]
- [directional pattern, i.e. with main rolling direction]
- [Asymmetric patterns]
- [Patterns comprising block rows or discontinuous ribs]
- [further characterised by the groove cross-section]
- [Patterns comprising tread lugs arranged parallel or oblique to the axis of rotation]
- [directional type]
- [further characterised by the groove cross-section]
- [irregular patterns with particular pitch sequence]
- [Patterns comprising isolated recesses]

- [tread comprising channels under the tread surface, e.g. for draining water]
11/1218 . . . . [Three-dimensional shape with regard to depth and extending direction]
11/1222 . . . . [Twisted or warped shape in the sipe plane]
2011/1227 . . . . [having different shape within the pattern]
2011/1231 . . . . [being shallow, i.e. sipe depth of less than 3 mm]
11/1236 . . . . [with special arrangements in the tread pattern]
11/124 . . . . [inclined with regard to a plane normal to the tread surface]
2011/1245 . . . . [being arranged in crossing relation, e.g. sipe mesh]
11/125 . . . . [arranged at the groove bottom]
2011/1254 . . . . [with closed sipe, i.e. not extending to a groove]
11/1259 . . . . [Depth of the sipe]
11/1263 . . . . [different within the same sipe]
2011/1268 . . . . [being different from sipe to sipe]
11/1272 . . . . [Width of the sipe]
2011/1277 . . . . [being narrow, i.e. less than 0.3 mm]
11/1281 . . . . [different within the same sipe, i.e. enlarged width portion at sipe bottom or along its length]
2011/1286 . . . . [being different from sipe to sipe]
2011/129 . . . . [Sipe density, i.e. the distance between the sipes within the pattern]
2011/1295 . . . . [variable]
11/13 . . . . characterised by the groove cross-section, e.g. for buttressing or preventing stone-trapping
11/1307 . . . . [with special features of the groove walls]
11/1315 . . . . [having variable inclination angles, e.g. warped groove walls]
11/1323 . . . . [asymmetric]
2011/133 . . . . [comprising recesses]
2011/1338 . . . . [comprising protrusions]
11/1346 . . . . [covered by a rubber different from the tread rubber]
11/1353 . . . . [with special features of the groove bottom]
2011/1361 . . . . [with protrusions extending from the groove bottom]
11/1369 . . . . [Tie bars for linking block elements and bridging the groove]
11/1376 . . . . [Three dimensional block surfaces departing from the enveloping tread contour]
11/1384 . . . . [with chamfered block corners]
11/1392 . . . . [with chamfered block edges]
11/14 . . . . Anti-skid inserts, e.g. vulcanised into the tread band
2011/142 . . . . [Granular particles, e.g. hard granules]
2011/145 . . . . [Discontinuous fibres]
2011/147 . . . . [Foamed rubber or sponge rubber on the tread band]
11/16 . . . . of plug form, e.g. made from metal, textile
11/1606 . . . . [retractable plug]
11/1612 . . . . [actuated by fluid, e.g. using fluid pressure difference]
11/1618 . . . . [actuated by temperature, e.g. by means of temperature sensitive elements]
11/1625 . . . . [Arrangements thereof in the tread patterns, e.g. irregular]
11/1631 . . . . [inclined with regard to the radial direction]
11/1637 . . . . [Attachment of the plugs into the tread, e.g. screwed]
11/1643 . . . . [with special shape of the plug-body portion, i.e. not cylindrical]

11/165 . . . . . . [conical]
11/1656 . . . . . . [concave or convex, e.g. barrel-shaped]
11/1662 . . . . . . [helical-shaped]
11/1668 . . . . . . [with an additional collar]
11/1675 . . . . . . [with special shape of the plug- tip]
11/1681 . . . . . . [Spherical top portions]
11/1687 . . . . . . [Multiple tips]
11/1693 . . . . . . [Attachment of the plug-tip within the plug-body]
11/18 . . . . . . of strip form, e.g. metallic combs, rubber strips of different wear resistance (B60C 11/20 takes precedence)
11/185 . . . . . . [of metal comb form, lamellar shaped or blade-like]
11/20 . . . . in coiled form
11/22 . . . . Tread rings between dual tyres
11/24 . . . . Wear-indicating arrangements
11/243 . . . . [Tread wear sensors, e.g. electronic sensors]
11/246 . . . . [Tread wear monitoring systems (tyre pressure monitoring B60C 23/04)]

13/00 Tyre sidewalls; Protecting, decorating, marking, or the like, thereof (B60C 17/08 takes precedence; tyre shoulders B60C 11/01; removable tyre sidewall trim rings B60B 7/01)
13/001 . . . . [Decorating, marking or the like]
13/002 . . . . [Protection against exterior elements]
13/003 . . . . [characterised by sidewall curvature (carcass ply curvature B60C 9/0292)]
13/004 . . . . [of the internal side of the tyre]
2013/005 . . . . [Physical properties of the sidewall rubber]
2013/006 . . . . [Modulus; Hardness; Loss modulus or "tangens delta"]
2013/007 . . . . [Thickness]
2013/008 . . . . [built-up by narrow strip winding]
13/009 . . . . [comprising additional bead cores in the sidewall]
13/02 . . . . Arrangement of grooves or ribs
13/023 . . . . [preventing watersplash]
2013/026 . . . . [provided at the interior side only]
13/04 . . . . having annular inlays or covers, e.g. white sidewalls
2013/045 . . . . [comprising different sidewall rubber layers]

15/00 Tyre beads, e.g. ply turn-up or overlap
15/0009 . . . . [features of the carcass terminal portion]
15/0018 . . . . [not folded around the bead core, e.g. floating or down ply]
15/0027 . . . . [with low ply turn-up, i.e. folded around the bead core and terminating at the bead core]
15/0036 . . . . [with high ply turn-up, i.e. folded around the bead core and terminating radially above the point of maximum section width]
15/0045 . . . . [with ply turn-up up to the belt edges, i.e. folded around the bead core and extending to the belt edges]
15/0054 . . . . [with ply turn-up portion parallel and adjacent to carcass main portion]
15/0063 . . . . [with ply turn-up portion diverging from carcass main portion]
15/0072 . . . . [with ply reverse folding, i.e. carcass layer folded around the bead core from the outside to the inside]
15/0081 . . . . [the carcass plies folded around or between more than one bead core]
Seating or securing means between beads and rims of tubeless tyres B60C 5/16; means for securing solid tyres on rims B60C 7/24; rims B60B 21/00

(Using axially extending bead seating, i.e. the bead and the lower sidewall portion extend in the axial direction (B60C 15/0206 takes precedence)

(Using inside rim bead seating, i.e. the bead being seated at a radially inside side of the rim)

( Supplementary means for securing the bead

( the bead being clamped by rings, cables, rim flanges or other parts of the rim

( the bead being pierced by bolts, rivets, clips or other elements

( the bead being secured by turned-in rim flanges, e.g. rim of the clincher type

( the bead being secured by clip-hook elements not forming part of the rim flange

( the bead being secured by protrusions of the rim extending from the bead seat, e.g. lump or serrations

( the bead being secured by bead extensions which extend over and wrap around the rim flange

( Securing tyres without beads; Securing closed torus or tubular tyres

( Asymmetric bead seats, e.g. different bead diameter or inclination angle (asymmetric transverse section B60C 3/06; asymmetric bead reinforcement B60C 2015/0696)

( Bead contour, e.g. lips, grooves or ribs

( with bead extensions located radially outside the rim flange position, e.g. rim flange protectors

( Bead lips at the bead toe portion, i.e. the axially and radially inner end of the bead

( with reverse bead seat inclination, i.e. the axially inner diameter of the bead seat is bigger than the axially outer diameter thereof

( Spacers between beads (emergency load supporting means B60C 17/00)

( inflatable

( Tyres permanently fixed to the rim, e.g. by adhesive, by vulcanisation

( Bead cores (producing bead-rings or bead-cores for tyres B29D 30/48)

( characterised by the material of the core, e.g. alloy

( characterised by a wrapping layer

( Cable cores, i.e. cores made-up of twisted wires

( Polygonal cores characterised by the winding sequence

( multiple, i.e. with two or more cores in each bead

( Flapper strips, fillers, or chafing strips [and reinforcing layers for the construction of the bead]

( characterised by features of the bead filler or apex (compositions of the apex rubber B60C 2001/0058)

( comprising several parts, e.g. made of different rubbers

( Dimensions of the bead filler in terms of numerical values or ratio in proportion to section height

( characterised by features of the chafer or clinch portion, i.e. the part of the bead contacting the rim

( comprising a cushion rubber other than the chafer or clinch rubber

( adjacent to the carcass turnup portion

( provided at the terminal edge portion of a carcass or reinforcing layer

( comprising a bead reinforcing layer

( using flippers in contact with and wrapped around the bead core and, at least partially, in contact with the bead filler

( using chippers between the carcass layer and chafer rubber wrapped around the bead

( between carcass main portion and bead filler not wrapped around the bead core

( between carcass turn-up and bead filler not wrapped around the bead core

( at the axially inner side of the carcass main portion not wrapped around the bead core

( at the axially outer side of the carcass turn-up portion not wrapped around the bead core

( with particular configuration of the cords in the respective bead reinforcing layer

( comprising cords at an angle of maximal 10 degrees to the circumferential direction

( comprising cords at an angle of 10 to 30 degrees to the circumferential direction

( comprising cords at an angle of 30 to 60 degrees to the circumferential direction

( comprising cords at an angle of 60 to 90 degrees to the circumferential direction

( the cord angle being different or variable within the same layer

( characterised by the course of the cords, e.g. undulated or sinusoidal

( Physical properties of the bead reinforcing layer, e.g. modulus of the ply

( Physical properties or dimensions of the coating rubber

( Physical properties or dimensions of the cords, e.g. modulus of the cords

( Cord density in width direction

( characterised by particular materials of the cords

( Asymmetric bead reinforcement, e.g. arrangement of bead reinforcing layer or apex

17/00 Tyres characterised by means enabling restricted operation in damaged or deflated condition; Accessories therefor (having multiple separate inflatable chambers B60C 5/20; additional shear belt layers B60C 9/18)

( comprising sidewall rubber inserts, e.g. crescent shaped inserts

( two or more inserts in each sidewall portion

( comprising portions of different rubbers in a single insert

( comprising additional reinforcements

( comprising grooves or ribs, e.g. at the inner side of the insert
17/065 . . . (made-up of foam inserts (tyres filled with foam B60C 5/002))
17/066 . . . (made-up of plural spherical elements provided in the tyre chamber)
17/068 . . . (comprising springs, e.g. helical springs)
17/08 . Means facilitating folding of sidewalls, e.g. run-flat sidewalls (for storage purposes B60C 3/08)
17/10 . Internal lubrication
17/103 . . . (by means of surface coating, e.g. PTFE)
17/106 . . . (Composition of the lubricant)

19/00 Tyre parts or constructions not otherwise provided for
19/001 . . . (Tyres requiring an asymmetric or a special mounting)
19/002 . . . (Noise damping elements provided in the tyre structure or attached thereto, e.g. in the tyre interior)
19/003 . . . (Balancing means attached to the tyre)
19/004 . . . (Tyre sensors other than for detecting tyre pressure)
19/005 . . . (Magnets integrated within the tyre structure)
19/006 . . . (Warning devices, e.g. devices generating noise due to flat or worn tyres)
19/007 . . . (triggered by sensors)
19/008 . . . (Venting means, e.g. for expelling entrapped air)
19/04 . Tyres with openings closeable by means other than the rim; Closing means therefor
19/08 . Electric charge dissipating arrangements
19/082 . . . (comprising a conductive tread insert)
19/084 . . . (using conductive carcasses)
19/086 . . . (using conductive sidewalls)
19/088 . . . (using conductive beads)
19/12 . Puncture preventing arrangements (B60C 9/00 takes precedence; inflatable inserts having reinforcing means B60C 5/08 (; sealing compositions per se B29C 73/163; devices for introducing sealing compositions into the tyre B29C 73/166))
19/122 . . . (disposed inside of the inner liner)
19/125 . . . (disposed removably on the tyre)
19/127 . . . (for inner tubes)

23/00 Devices for measuring, signalling, controlling, or distributing tyre pressure or temperature, specially adapted for mounting on vehicles (measuring in general G01, e.g. G01L 17/00; remote signalling in general G08); Arrangement of tyre inflating devices on vehicles, e.g. of pumps, of tanks (supplying air for tyre inflation B60S 5/04); Tyre cooling arrangements
23/001 . . . (Devices for manually or automatically controlling or distributing tyre pressure whilst the vehicle is moving)
23/002 . . . (by monitoring conditions other than tyre pressure or deformation)
23/003 . . . (the control being done on the vehicle, i.e. comprising a rotating joint between a vehicle mounted tank and the tyre)
23/004 . . . (the control being done on the wheel, e.g. using a wheel-mounted reservoir)
23/005 . . . (Devices specially adapted for special wheel arrangements)

NOTE

B60C 23/001, B60C 23/02, B60C 23/04, B60C 23/06 or B60C 23/08

23/006 . . . (having two wheels only)
23/007 . . . (having multiple wheels arranged side by side)
23/008 . . . (having wheels on more than two axles)
23/009 . . . (having wheels on a trailer)
23/02 . Signalling devices actuated by tyre pressure (hand-held tyre pressure gauges G01L 17/00)
23/04 . . . mounted on the wheel or tyre
23/0401 . . . (characterised by the type of alarm)
23/0403 . . . (Mechanically generated audible signals, e.g. by buzzer or whistle signals)
23/0405 . . . (Mechanically generated visible signals, e.g. by using a gauge needle)
23/0406 . . . (Alarms noticeable from outside the vehicle, e.g. indication in side mirror, front light or audible alarms (B60C 23/0403, B60C 23/0402 take precedence)
23/0408 . . . (transmitting the signals by non-mechanical means from the wheel or tyre to a vehicle body mounted receiver)
23/041 . . . (Means for supplying power to the signal-transmitting means on the wheel)
23/0411 . . . . . . . (Piezo-electric generators)
23/0413 . . . . . . . (Wireless charging of active radio-frequency circuits)
23/0415 . . . . . . . (Automatically identifying wheel mounted units, e.g. after replacement or exchange of wheels)
23/0416 . . . . . . . (allocating a corresponding wheel position on vehicle, e.g. front/left or rear/right)
23/0418 . . . . . . . (Sharing hardware components like housing, antenna, receiver or signal transmission line with other vehicle systems like keyless entry or brake control units)
23/042 . . . . . . . (cooperating with wheel hub mounted speed sensors)
23/0422 . . . . . . . . [characterised by the type of signal transmission means]
23/0423 . . . . . . . . [Photo-electric, infra-red or visible light means]
23/0425 . . . . . . . . [Means comprising permanent magnets, e.g. Hall-effect or Reed-switches]
23/0427 . . . . . . . . [Near field transmission with inductive or capacitive coupling means]
23/0428 . . . . . . . . [using passive wheel mounted resonance circuits]
23/043 . . . . . . . . [using transformer type signal transducers, e.g. rotary transformers]
23/0432 . . . . . . . . [using vehicle structural parts as signal path, e.g. chassis, axle or fender]
23/0433 . . . . . . . . [Radio signals]
23/0435 . . . . . . . . [Vehicle body mounted circuits, e.g. transceiver or antenna fixed to central console, door, roof, mirror or fender]
23/0437 . . . . . . . . [Means for detecting electromagnetic field changes not being part of the signal transmission per se, e.g. strength, direction, propagation or masking]
23/0438 . . . . . . . . [comprising signal transmission means, e.g. for a bidirectional communication with a corresponding wheel mounted receiver]
23/044 . . . . . . . . [Near field triggers, e.g. magnets or triggers with 125 KHz]
23/0442 . . . . . . . . [the transmitted signal comprises further information, e.g. instruction codes, sensor characteristics or identification data]
23/0444 . . . . . . . . [Antenna structures, control or arrangements thereof, e.g. for directional antennas, diversity antenna, antenna multiplexing or antennas integrated in fenders]
23/0445 . . . . . . . . [Means for changing operating mode, e.g. sleep mode, factory mode or energy saving mode]
23/0447 . . . . . . . . [Wheel or tyre mounted circuits]
23/0449 . . . . . . . . [Passive transducers, e.g. using surface acoustic waves, backscatter technology or pressure sensitive resonators (near field passive transducers B60C 23/0428)]
23/045 . . . . . . . . [Means for detecting electromagnetic field changes not being part of the signal transmission per se, e.g. strength, direction, propagation or masking]
23/0452 . . . . . . . . [Antenna structure, control or arrangement (vehicle tyre mounted antennas H01Q 1/2241)]
23/0454 . . . . . . . . [Means for changing operation mode, e.g. sleep mode, factory mode or energy save mode]
23/0455 . . . . . . . . [Transmission control of wireless signals]
23/0457 . . . . . . . . [self triggered by timer]
23/0459 . . . . . . . . [self triggered by motion sensor]
23/0461 . . . . . . . . [externally triggered, e.g. by wireless request signal, magnet or manual switch]
23/0462 . . . . . . . . [Structure of transmission protocol]
23/0464 . . . . . . . . [to avoid signal interference]
23/0466 . . . . . . . . [with signals sent by transmitters mounted on adjacent vehicles]
23/0467 . . . . . . . . [Electric contact means, e.g. slip-rings, rollers, brushes]
23/0469 . . . . . . . . [Transmission by sound, e.g. ultra-sound]
23/0471 . . . . . . . . [System initialisation, e.g. upload or calibration of operating parameters]
23/0472 . . . . . . . . [to manually allocate ID codes or mounting positions, e.g. by service technicians]
23/0474 . . . . . . . . [Measurement control, e.g. setting measurement rate or calibrating of sensors; Further processing of measured values, e.g. filtering, compensating or slope monitoring]
23/0476 . . . . . . . . [Temperature compensation of measured pressure values]
23/0477 . . . . . . . . [Evaluating waveform of pressure readings]
23/0479 . . . . . . . . [Communicating with external units being not part of the vehicle, e.g. tools for diagnostic, mobile phones, electronic keys or service stations]
23/0481 . . . . . . . . [System diagnostic, e.g. monitoring battery voltage, detecting hardware detachments or identifying wireless transmission failures]
23/0483 . . . . . . . . [Wireless routers between wheel mounted transmitters and chassis mounted receivers]
23/0484 . . . . . . . . [Detecting an ongoing tyre inflation]
23/0486 . . . . . . . . [comprising additional sensors in the wheel or tyre mounted monitoring device, e.g. movement sensors, microphones or earth magnetic field sensors]
23/0488 . . . . . . . . [Movement sensor, e.g. for sensing angular speed, acceleration or centripetal force]
23/0489 . . . . . . . . [for detecting the actual angular position of the monitoring device while the wheel is turning]
23/0491 . . . . . . . . [Constructional details of means for attaching the control device]
23/0493 . . . . . . . . [for attachment on the tyre]
23/0494 . . . . . . . . [Valve stem attachments positioned inside the tyre chamber]
23/0496 . . . . . . . . [Valve stem attachments positioned outside of the tyre chamber]
23/0498 . . . . . . . . [for rim attachments (B60C 23/0494, B60C 23/0496 take precedence)]
23/06 . Signalling devices actuated by deformation of the tyre, e.g. tyre mounted deformation sensors or indirect determination of tyre deformation based on wheel speed, wheel-centre to ground distance or inclination of wheel axle]
23/061 . . . . . . . . [by monitoring wheel speed (measuring distance traversed on the ground by vehicles G01C 22/00)]
23/062 . . . . . . . . [Frequency spectrum analysis of wheel speed signals, e.g. using Fourier transformation]
23/063 . . . . . . . . [Generating directly an audible signal by deformation of the tyre (by touching the ground B60C 23/085)]
23/064 . . . . . . . . [comprising tyre mounted deformation sensors, e.g. to determine road contact area]
<table>
<thead>
<tr>
<th>CPC</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>23/056</td>
<td>[axially fixing the rim, e.g. pulling devices]</td>
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<tr>
<td>25/0536</td>
<td>[radially fixing the rim, e.g. with gripping claws]</td>
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<tr>
<td>23/0542</td>
<td>[with self-centering means, e.g. gripping claws]</td>
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<tr>
<td>25/0542</td>
<td>[with self-centering means, e.g. gripping claws]</td>
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<tr>
<td>25/0545</td>
<td>[with rotary motion of tool or tyre support, e.g. turntables]</td>
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<tr>
<td>25/0548</td>
<td>[equipped with sensing means, e.g. for positioning, measuring or controlling]</td>
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<tr>
<td>25/0551</td>
<td>[mechanical]</td>
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<tr>
<td>25/0554</td>
<td>[optical, e.g. cameras]</td>
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<td>25/0557</td>
<td>[thermal]</td>
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<tr>
<td>25/056</td>
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<tr>
<td>25/0563</td>
<td>[Tools interacting with the tyre and moved in relation to the tyre during operation]</td>
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<tr>
<td>25/0566</td>
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<tr>
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<tr>
<td>25/0584</td>
<td>[Predetermined tool path, e.g. coulisse, multi-link]</td>
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<td>25/0587</td>
<td>[Programmed tool path, e.g. robot arm with multiple degrees of freedom]</td>
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<td>25/0589</td>
<td>[Conjoint tool path, e.g. robot arm with multiple degrees of freedom]</td>
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<tr>
<td>25/0593</td>
<td>[Multi-functional tools for performing at least two operations, e.g. bead breaking and bead seeking]</td>
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<td>25/0596</td>
<td>[Soaping devices]</td>
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<tr>
<td>25/12</td>
<td>for only seating the beads</td>
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<tr>
<td>25/122</td>
<td>acting on the tyre tread</td>
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<tr>
<td>25/125</td>
<td>for only breaking the beads</td>
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<tr>
<td>25/128</td>
<td>acting axially on the whole circumference of the bead or sidewall</td>
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<tr>
<td>25/13</td>
<td>acting axially on a part of the bead or sidewall only at localised regions of the bead or side wall</td>
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<tr>
<td>25/132</td>
<td>for removing and mounting tyres (for only seating the beads B60C 25/12; for only breaking the beads B60C 25/125)</td>
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<tr>
<td>25/135</td>
<td>having a tyre support or a tool, movable along wheel axis</td>
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<td>25/138</td>
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<td>25/14</td>
<td>Apparatus or tools for spreading or locating tyre beads</td>
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<td>25/142</td>
<td>[Devices for tightening or expanding the felly, devices for spreading the tyres]</td>
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<td>25/145</td>
<td>[for locating provisionally the beads of tubeless tyres against the sealing surfaces of the rims B60C 25/145]</td>
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<td>25/18</td>
<td>Tools for mounting or demounting air valves</td>
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<tr>
<td>25/185</td>
<td>[Automated devices, e.g. robots]</td>
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<tr>
<td>25/20</td>
<td>Tools for attaching metallic tyres, e.g. iron tyres upon wooden rims</td>
</tr>
</tbody>
</table>

27/00 Non-skid devices temporarily attachable to resilienttyrs or resiliently-tyred wheels
Tyres specially adapted for particular applications

2200/00

- for aircrafts
- for road vehicles, e.g. passenger cars
- for heavy duty vehicles
- for construction vehicles
- for agricultural vehicles
- for motorcycles, scooters or the like
- for bicycles
- for off-road use

Subject matter not provided for in other groups of this subclass

99/03
- [Tyre heating arrangements]
99/06
- [Computer aided tyre design or simulation]