CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING
(NOTES omitted)

TRANSPORTING

B60 VEHICLES IN GENERAL
(NOTE omitted)

B60Y INDEXING SCHEME RELATING TO ASPECTS CROSS-CUTTING VEHICLE TECHNOLOGY

2200/00 **Type of vehicle**
2200/10 . Road Vehicles
2200/11 . . Passenger cars; Automobiles
2200/112 . . . City movers, small sized city motor vehicles
2200/114 . . . Racing vehicles, e.g. Formula one, Karts
2200/116 . . . Ambulances
2200/12 . . Motorcycles, Trikes; Quads; Scooters
2200/122 . . . Trikes
2200/124 . . . Buggies, Quads
2200/126 . . . Scooters
2200/13 . . Bicycles; Tricycles
2200/132 . . . All terrain bikes
2200/134 . . . Racing bikes
2200/14 . . Trucks; Load vehicles, Busses
2200/141 . . . Light trucks
2200/142 . . . Heavy duty trucks
2200/1422 . . . . Multi-axle trucks
2200/143 . . . Busses
2200/1432 . . . . Low floor busses
2200/144 . . . Garbage trucks, e.g. refuse trucks
2200/145 . . . Haulage vehicles, trailing trucks
2200/146 . . . Silo or fluid transporting vehicles
2200/147 . . . Trailers, e.g. full trailers or caravans
2200/148 . . . Semi-trailers, articulated vehicles
2200/15 . . Fork lift trucks, Industrial trucks
2200/16 . . Vehicles with lowerable bed or chassis, e.g. to facilitate loading
2200/20 . Off-Road Vehicles
2200/22 . . Agricultural vehicles
2200/221 . . . Tractors
2200/222 . . . Harvesters
2200/223 . . . Ridable lawn mowers
2200/224 . . . Boom carrying vehicles, e.g. for irrigation
2200/225 . . . Walk behind vehicles, e.g. motorized wheel barrows
2200/23 . . Ridable golf cars
2200/24 . . Military vehicles
2200/25 . . Track vehicles
2200/252 . . Snowmobiles
2200/254 . . Tanks
2200/30 . Railway vehicles
2200/31 . . Locomotives
2200/33 . . Rail cars; Waggons
2200/34 . . Monorails
2200/37 . . Roller coasters
2200/39 . . having track following mechanism for lateral stability
2200/40 . Special vehicles
2200/41 . . Construction vehicles, e.g. graders, excavators
2200/411 . . . Bulldozers, Graders
2200/412 . . . Excavators
2200/413 . . . Compactors
2200/414 . . . Pavers
2200/415 . . . Wheel loaders
2200/416 . . . Cranes
2200/417 . . . Articulated frame vehicles
2200/42 . . Amphibious vehicles
2200/43 . . Variable track or wheelbase vehicles
2200/44 . . Multi-axle long vehicles, with independently drivable or steerable wheels
2200/45 . . Vehicles having steerable wheels mounted on a vertically moving column
2200/46 . . Arctic-/Extraterrestric explorers
2200/47 . . Climbing vehicles, e.g. facade climbing devices
2200/48 . . . Stair-climbing vehicles
2200/49 . . Movable platforms, Load ramps, e.g. working platforms
2200/50 . Aeroplanes, Helicopters
2200/51 . . Aeroplanes
2200/52 . . Helicopters
2200/60 . Industrial applications, e.g. pipe inspection vehicles
2200/62 . . Conveyors, floor conveyors
2200/64 . . Beam Hoists
2200/66 . . Containers; Pallets; Skids
2200/80 . Other vehicles not covered by groups B60Y 2200/10 - B60Y 2200/60
2200/81 . . Toys
2200/83 . . Perambulators; Buggies; Strollers
2200/84 . . Wheelchairs
2200/86 . . Carts; Golf carts
2200/90 . Vehicles comprising electric prime movers
2200/91 . . Electric vehicles
2200/912 . . . Electric vehicles with power supply external to vehicle, e.g. trolley buses or trams
2200/92 . . Hybrid vehicles

2300/00 **Purposes or special features of road vehicle drive control systems**
2300/02 . Control of vehicle driving stability
2300/022 . . Stability in turns or during cornering
2300/0223 . . . related to over-steering

2300/0227 . . . related to under-steering
2300/045 . . Improving turning performance, e.g. agility of a vehicle in a curve
2300/0453 . . . about the pitch axis
2300/0457 . . . about the roll axis
2300/06 . Automatic manoeuvring for parking
2300/08 . Predicting or avoiding probable or impending collision
2300/085 . . Taking automatic action to adjust vehicle attitude or components thereof in preparation for collision, e.g. adjusting bumpers or wheels or braking for nose dropping
2300/09 . . Taking automatic action to avoid collision, e.g. braking or steering
2300/095 . . Predicting travel path or likelihood of collision
2300/0952 . . . the prediction being responsive to vehicle dynamic parameters
2300/0954 . . . the prediction being responsive to traffic or environmental parameters
2300/097 . . Vehicle operation after collision
2300/10 . Path keeping
2300/12 . . Lane keeping
2300/14 . Cruise control
2300/143 . . Speed control
2300/146 . . . Speed limiting
2300/16 . . Control of distance between vehicles, e.g. keeping a distance to preceding vehicle
2300/162 . . . Speed limiting therefor
2300/165 . . . Automatically following the path of a preceding lead vehicle, e.g. "electronic tow-bar"
2300/17 . . . with provision for special action when the preceding vehicle comes to a halt, e.g. stop-and-go
2300/18 . Propelling the vehicle
2300/18008 . . related to particular drive situations
2300/18016 . . . Start-stop drive, e.g. in a traffic jam
2300/18025 . . . Drive off, accelerating from standstill
2300/18033 . . . Reversing
2300/18041 . . . . Rocking, i.e. fast change between forward and reverse
2300/1805 . . . at stand still, e.g. engine in idling state
2300/18058 . . . Creeping
2300/18066 . . . Coasting
2300/18075 . . . . with torque flow from driveshaft to engine, i.e. engine being driven by vehicle
2300/18083 . . . . without torque flow between driveshaft and engine, e.g. with clutch disengaged or transmission in neutral
2300/18091 . . . Preparing for stopping
2300/181 . . . Hill climbing or descending
2300/18108 . . . Braking
2300/18116 . . . . Hill holding
2300/18125 . . . . Regenerative braking
2300/18133 . . . . Engine braking
2300/18141 . . . . Braking for parking
2300/1815 . . . Cornering
2300/18158 . . . Approaching intersection
2300/18166 . . . Overtaking, changing lanes
2300/18175 . . Preventing, or responsive to skidding of wheels
2300/18183 . . Propulsion control with common controlling member for different functions
2300/18191 . . Propulsion control with control means using analogue circuits, relays or mechanical links
2300/182 . . Selecting between different operative modes, e.g. comfort and performance modes
2300/184 . . Preventing damage resulting from overload or excessive wear of the driveline
2300/1845 . . . Preventing of breakage of drive line components, e.g. parts of the gearing
2300/186 . . . Excessive wear or burn out of friction elements, e.g. clutches
2300/1865 . . . . Overheating of driveline components
2300/188 . . Controlling power parameters of the driveline, e.g. determining the required power
2300/1882 . . . characterised by the working point of the engine, e.g. by using engine output chart
2300/1884 . . . Avoiding stall or over-speed of the engine
2300/1886 . . . Controlling power supply to auxiliary devices
2300/1888 . . . . Control of power take off [PTO]
2300/19 . . Improvement of gear change, e.g. synchronisation or smoothing gear shift
2300/192 . . Power-up or power-down of the driveline, e.g. start up of a cold engine
2300/194 . . . related to low temperature conditions, e.g. high viscosity of hydraulic fluid
2300/20 . . Reducing vibrations in the driveline
2300/202 . . . related or induced by the clutch
2300/205 . . . related or induced by the engine
2300/207 . . . related to drive shaft torsion, e.g. driveline oscillations
2300/22 . . Reducing road induced vibrations, suppressing road noise
2300/24 . . Adaptation to external conditions, e.g. road surface conditions
2300/244 . . . Adaptation to traffic conditions
2300/26 . . Dangerous conditions
2300/28 . related to towing or towed situations
2300/30 . related to stationary vehicle situations, e.g. parked vehicles
2300/301 . . Kneeling, e.g. for letting passengers on or off
2300/303 . . Lowering or adjusting the floor for loading or unloading
2300/305 . . . Adjusting floor height to loading ramp level
2300/306 . . . Mechanism to lock the height
2300/308 . . Jacking-up for changing tyre or for vehicle inspection
2300/42 . Control of clutches
2300/421 . . Control of lock-up type clutches, e.g. in a torque converter
2300/423 . . Control of power take-off clutches
2300/424 . . Control of freewheel clutches
2300/425 . . Control of clutches to regulate engine speed or torque
2300/426 . . Reducing engagement shocks in main clutch
2300/427 . . Control of clutch touch point, e.g. kiss point
2300/428 . . Reducing clutch wear
2300/429 . . Control of secondary clutches in drivelines
2300/43 . Control of engines
2300/431 . . Control of engine air-fuel ratio
2300/432 . . Control of engine fuel injection
2300/433 . . Control of engine throttle
2300/434 . . Control of engine inlet air duct by secondary means
2300/435 . . Control of engine cylinder cut-off

2300/436 . . Control of engine ignition
2300/437 . . Control of engine valves
2300/44 . Control of engine at idle speed
2300/45 . Engine shutdown at standstill
2300/46 . Engine injection cut at coasting
2300/47 . Engine emissions
2300/472 . . Catalyst reactivation
2300/474 . . Catalyst warm up
2300/476 . . Regeneration of particle filters
2300/48 . Engine direct start by injecting fuel and fire
2300/49 . Engine push start or restart by use of vehicle kinetic energy
2300/50 . Engine start by use of flywheel kinetic energy
2300/51 . Driving or powering of engine accessories
2300/52 . Engine fuel consumption
2300/525 . . by reducing drag torque, e.g. by closing valves to reduce pumping
2300/53 . Engine over-speed
2300/54 . Engine overload, high loads on engine
2300/55 . Engine low load mode
2300/56 . Engine stall prevention
2300/57 . Engine torque resume after shifting
2300/58 . Engine torque vibration dampers, e.g. flywheels, dual-mass-springs
2300/60 . Control of electric machines, e.g. problems related to electric motors or generators
2300/61 . . Inductive lock-up
2300/62 . . Mechanical lock-up, e.g. using brake to immobilise the rotor
2300/63 . . Starter motor mode
2300/64 . . Drag run or drag torque compensation, e.g. motor to drive engine with drag torque or engine speed is brought to start speed before injection and firing
2300/65 . . Reduce shocks on mode change, e.g. during engine shutdown
2300/66 . . Control for gear shift synchronisation
2300/67 . . High load on electric machines, e.g. overheating
2300/68 . . Over-speed of electric machines
2300/69 . . Motor boost, e.g. short time overpower
2300/70 . Control of gearings
2300/71 . . Limiting transmission input torque
2300/72 . . Facilitate disengaging of gears, e.g. by inducing a torque reversal
2300/73 . . Synchronisation of shaft speeds
2300/74 . . Reducing shift shocks
2300/75 . . Dither torque, e.g. to remove tooth butting
2300/77 . . Torque reversal, e.g. avoid clunks when changing between driving and coasting
2300/78 . . Power split
2300/785 . . . Geared neutral
2300/80 . Control of differentials
2300/82 . . Torque vectoring
2300/84 . . Differential locking
2300/88 . Reducing brake wear
2300/89 . Repartition of braking force, e.g. friction braking versus regenerative braking
2300/90 . Releasing parking brake at start
2300/91 . Battery charging
2300/92 . Battery protection from overload or overcharge

2302/00 Responses or measures related to driver conditions

2302/01 . Preventing starting of the vehicle
2302/03 . Actuating a signal or alarm device
2302/05 . Leading to automatic stopping of the vehicle
2302/07 . Disabling particular vehicle functions, e.g. to affect the driving style
2302/09 . Reducing the workload of driver

2304/00 Optimising design; Manufacturing; Testing

2304/01 . Minimizing space with more compact designs or arrangements
2304/03 . Reducing weight
2304/05 . Reducing production costs, e.g. by redesign
2304/07 . Facilitating assembling or mounting
2304/072 . . by preassembled subunits
2304/074 . . by improved accessibility
2304/076 . . by add-on parts, e.g. retrofit
2304/078 . . by interchangeable parts, e.g. new part adapting to old design
2304/09 . Testing or calibrating during manufacturing

2306/00 Other features of vehicle sub-units

2306/01 . Reducing damages in case of crash, e.g. by improving battery protection
2306/03 . Lubrication
2306/05 . Cooling
2306/07 . Heating of passenger cabins
2306/09 . Reducing noise
2306/11 . Noise generation, e.g. drive noise to warn pedestrians that an electric vehicle is approaching
2306/13 . Failsafe arrangements
2306/15 . Failure diagnostics

2400/00 Special features of vehicle units

2400/10 . Energy storage devices
2400/102 . . for hydrogen fuel
2400/104 . . for liquid petrol gas
2400/106 . . for gasoil
2400/11 . Electric energy storages
2400/112 . . Batteries
2400/114 . . Super-capacities
2400/14 . Hydraulic energy storages, e.g. hydraulic accumulators
2400/15 . Pneumatic energy storages, e.g. pressure air tanks
2400/16 . Mechanic energy storages
2400/162 . . Flywheels
2400/164 . . Springs
2400/20 . Energy converters
2400/202 . . Fuel cells
2400/204 . . Generator sets, engine and generator as one unit
2400/206 . . Thermo-electric generators
2400/208 . . Peltier or Thomson elements for cooling or heating
2400/209 . . Piezoelectric elements
2400/21 . External power supplies
2400/212 . . by power from overhead cables using trolleys
2400/214 . . by power from domestic supply, e.g. plug in supplies
2400/216 . . by solar panels
2400/30 . Sensors
2400/301 . . for position or displacement
2400/3012 . . . using Hall effect
2400/3015 . . . Optical cameras
2400/3017 . . . Radars
2400/3018 . . Flow-meters

2400/3019 . . Fluid level sensors
2400/302 . . Temperature sensors
2400/303 . . Speed sensors
2400/3032 . . . Wheel speed sensors
2400/304 . . Acceleration sensors
2400/3042 . . . Collision sensors
2400/3044 . . . Vibration sensors
2400/305 . . Force sensors
2400/306 . . Pressure sensors
2400/307 . . Torque sensors
2400/308 . . Electric sensors
2400/3084 . . . Electric currents sensors
2400/3086 . . . Electric voltages sensors
2400/40 . Actuators for moving a controlled member
2400/402 . . Manual actuators, i.e. input levers or linkages therefor
2400/4024 . . . with adjustable positions
2400/4026 . . . providing feel, e.g. with feedback force
2400/404 . . Electro-magnetic actuators, e.g. with an electromagnet not rotating for moving a clutching member
2400/4045 . . . Electro-magnetic valves, i.e. solenoids
2400/405 . . Electric motors actuators
2400/406 . . Hydraulic actuators
2400/408 . . Pneumatic actuators
2400/41 . . Mechanical transmissions for actuators
2400/411 . . . Bowden cables or linkages
2400/4115 . . . . Lost motion linkages
2400/4117 . . . . Slack adjustments
2400/412 . . . Screw-nut mechanisms
2400/414 . . . Ramp or cam mechanisms
2400/416 . . . Centrifugal actuators
2400/418 . . Power assistance, e.g. servo-motors
2400/4185 . . . Mechanical assistance, i.e. using springs or accumulators without feedback control
2400/4187 . . . Servo-motors, e.g. electric or fluidic with feedback control
2400/42 . Clutches or brakes
2400/421 . . Dog type clutches or brakes
2400/422 . . Synchromesh type clutches or brakes
2400/423 . . Electromagnetic clutches, e.g. powder type clutches
2400/424 . . Friction clutches
2400/4242 . . . of dry type
2400/4244 . . . of wet type, e.g. using multiple lamellae
2400/425 . . Viscous couplings
2400/426 . . Hydrodynamic couplings, e.g. torque converters
2400/427 . . One-way clutches
2400/428 . . Double clutch arrangements; Dual clutches
2400/43 . Engines
2400/431 . . Gas turbine engines
2400/432 . . Diesel Engines
2400/433 . . Gas Engines, e.g. using LPG, natural gas or gasifiers
2400/434 . . Hydrogen fuel engines
2400/435 . . Supercharger or turbochargers
2400/436 . . Electromagnetic engines valves
2400/44 . . Exhaust turbines driving generators
2400/442 . . Exhaust gas recirculation [EGR]
2400/446 . . Exhaust gas reformers, e.g. treated by fuel cells
2400/46 . Engine start hydraulic or electric motors
2400/47 . Starter generator drive systems
2400/48 . Vibration dampers, e.g. dual mass flywheels
2400/60 . Electric Machines, e.g. motors or generators
2400/602 . . DC Machines
2400/604 . . AC Machines, e.g. asynchronous motors
2400/607 . . Axial flux machines
2400/608 . . Clutch motors, i.e. having rotating stators
2400/61 . Arrangements of controllers for electric machines, e.g. inverters
2400/70 . Gearings
2400/702 . . Worm gearings
2400/71 . . Manual or semi-automatic, e.g. automated manual transmissions
2400/72 . . Continous variable transmissions [CVT]
2400/73 . . Planetary gearings
2400/732 . . . with intermeshing planetary gears, e.g. Ravigneaux
2400/74 . . Shaft brakes, e.g. input shaft brakes
2400/75 . . Power shifting, e.g. without interruption of drive torque
2400/76 . . Automatic gearshift to neutral
2400/77 . . Gearshift position determination, e.g. check of neutral position
2400/78 . . Pumps, e.g. jet type
2400/785 . . . Pump drives
2400/79 . . Drive shafts, output shafts or propeller shafts
2400/795 . . . Power take off
2400/80 . Differentials
2400/802 . . Differential locking systems
2400/804 . . Torque vectoring arrangements
2400/81 . Braking systems
2400/82 . Four wheel drive systems
2400/83 . Steering input members
2400/84 . Rear wheel steering; All wheel steerings
2400/85 . Skid-steer systems, e.g. for tracked vehicles
2400/86 . Suspension systems
2400/87 . Auxiliary drives
2400/88 . . Air conditioners, e.g. compressor drives
2400/89 . . Cooling systems, e.g. fan drives
2400/90 . Driver alarms
2400/902 . . giving haptic or tactile signals
2400/92 . Driver displays

2410/00 Constructional features of vehicle sub-units

2410/10 . Housings
2410/102 . Shaft arrangements; Shaft supports, e.g. bearings
2410/1022 . . Concentric shaft arrangements
2410/104 . Hydraulic valves
2410/105 . Valve bodies; Mounting of hydraulic controllers
2410/111 . Aggregate identification or specification, e.g. using RFID
2410/113 . Mount clips, snap-fit, e.g. quick fit with elastic members
2410/114 . Shields, e.g. for heat protection
2410/115 . Electric wiring; Electric connectors
2410/12 . Production or manufacturing of vehicle parts
2410/121 . . Metal parts manufactured by moulding
2410/122 . . Plastic parts manufactured by moulding
2410/123 . . Over-moulded parts
2410/124 . . Welded parts
2410/125 . . Bounded parts
2410/13 . Materials or fluids with special properties
2410/132 . . Magnetic, e.g. permanent magnets

2410/134 . . Rheological, magneto- or electro- fluids
2410/136 . . Memory alloys