CPC COOPERATIVE PATENT CLASSIFICATION

B60W CONJOINT CONTROL OF VEHICLE SUB-UNITS OF DIFFERENT TYPE OR DIFFERENT FUNCTION; CONTROL SYSTEMS SPECIALLY ADAPTED FOR HYBRID VEHICLES; ROAD VEHICLE DRIVE CONTROL SYSTEMS FOR PURPOSES NOT RELATED TO THE CONTROL OF A PARTICULAR SUB-UNIT

NOTES

1. This subclass does not cover the control of a single sub-unit; such control is classified in the relevant place for the sub-unit, e.g. F02D, F16H. Where a single sub-unit is controlled by means of signals or commands from other sub-units, the control of this single sub-unit is classified in the relevant place for this sub-unit. For example, the control of variable-ratio gearing by means of signals from the engine or the accelerator is classified in the subclass for gearing, F16H.
2. Conjoint control of driveline units, e.g. engines, and variable-ratio gearing occurring only transiently during ratio shift and being also characterised by the control of the gearing is also classified in the subclass for gearing, F16H.
3. In groups B60W 20/00 - B60W 50/00, the first place priority rule is applied, i.e. at each hierarchical level, classification is made in the first appropriate place.
4. When classifying in group B60W 10/00, classification must also be made in groups B60W 20/00-B60W 50/00 in order to identify the purpose or use of the control.
5. In this subclass, the following terms are used with the meanings indicated:
   - "conjoint control" means that a programmed or condition-responsive { main} automatic controller on board the vehicle, embodying control logic for vehicle sub-units of different type or different function, sends control signals to actuators of two or more vehicle sub-units, { three or more vehicle sub-units for groups B60W 30/00-B60W 30/16}, so that the sub-units act together to solve a particular problem or in response to a paticular driving condition, { in order to improve stability, comfort or safety by managing the global dynamics of the vehicle};
   - "drive control system" means an electronic system in a road vehicle for automatically controlling the movement { by managing the global dynamics} of that vehicle in order to take certain actions { in order to improve stability, comfort or safety};
   - "road vehicle" means a { motorised passenger} vehicle normally under the control of a human driver for transportation on roads, e.g. an automobile, truck or bus;
   - "sub-unit" means one of the following vehicle systems: { driveline systems, e.g.} propulsion system, clutch system, change-speed gearing system, system for distributing drive torque between front and rear axles, axle differential system, brake system, steering system, suspension system, { and, particularly for hybrid vehicles,} energy storage means, fuel cells, or auxiliary equipment.

10/00 **Conjoint control of vehicle sub-units of different type or different function** (for propulsion of purely electrically-propelled vehicles with power supplied within the vehicle B60L 11/00)

NOTE

When classifying in this group, each controlled sub-unit must be separately identified by a classification in a relevant place in this group.

10/02 . including control of driveline clutches
10/023 . . {Fluid clutches, e.g. torque converters}
10/026 . . {Clutches for bridging a fluid gearing, e.g. lock-up}
10/04 . including control of propulsion units
10/06 . . including control of combustion engines
10/08 . . including control of electric propulsion units, e.g. motors or generators
10/10 . including control of change-speed gearings
10/101 . . Infinitely variable gearings
10/103 . . . of fluid type
10/105 . . . of electric type
10/107 . . . with endless flexible members
10/108 . . . Friction gearings
10/109 . . . . of the toroïd type
10/11 . . Stepped gearings
10/111 . . . with separate change-speed gear trains arranged in series
10/113 . . . with two input flow paths, e.g. double clutch transmission selection of one of the torque flow paths by the corresponding input clutch
10/115 . . . with planetary gears
10/119 . including control of all-wheel-driveline means, e.g. transfer gears or clutches for dividing torque between front and rear axle (B60W 10/14 takes precedence)
10/12 . including control of differentials
10/14 . . Central differentials for dividing torque between front and rear axles
10/16 . . Axle differentials, e.g. for dividing torque between left and right wheels
10/18 . including control of braking systems
10/182 . . {including control of parking brakes}
10/184 . . with wheel brakes
10/188 . . . hydraulic brakes

WARNING

this group is not complete pending a reorganisation, see also B60W 10/184

10/192 . . . electric brakes

WARNING

this group is not complete pending a reorganisation, see also B60W 10/184

10/196 . . acting within the driveline, e.g. retarders
10/198 . . with exhaust brakes
10/20 . including control of steering systems
10/22 . including control of suspension systems
10/24 . including control of energy storage means
10/26 . . for electrical energy, e.g. batteries or capacitors
10/28 . including control of fuel cells
10/30 . including control of auxiliary equipment, e.g. air-conditioning compressors or oil pumps

20/00 Control systems specially adapted for hybrid vehicles

NOTE

Classification is also made in B60K 6/42 for the different types of hybrid electric vehicles

20/10 . Controlling the power contribution of each of the prime movers to meet required power demand
20/11 . . using model predictive control [MPC] strategies, i.e. control methods based on models predicting performance
20/12 . . using control strategies taking into account route information
20/13 . . in order to stay within battery power input or output limits; in order to prevent overcharging or battery depletion
20/14 . . . in conjunction with braking regeneration
20/15 . . Control strategies specially adapted for achieving a particular effect
20/16 . . . for reducing engine exhaust emissions
20/17 . . . for noise reduction
20/18 . . . for avoiding ageing of fuel
20/19 . . . for achieving enhanced acceleration
20/20 . Control strategies involving selection of hybrid configuration, e.g. selection between series or parallel configuration
20/30 . Control strategies involving selection of transmission gear ratio
20/40 . Controlling the engagement or disengagement of prime movers, e.g. for transition between prime movers
20/50 . Control strategies for responding to system failures, e.g. for fault diagnosis, failsafe operation or limp mode

30/00 Purposes of road vehicle drive control systems not related to the control of a particular sub-unit, e.g. of systems using conjoint control of vehicle sub-units, {or advanced driver assistance systems for ensuring comfort, stability and safety or drive control systems for propelling or retarding the vehicle (anti-lock brake systems [ABS] B60T 8/00)}

30/02 . Control of vehicle driving stability
30/025 . . {related to comfort of drivers or passengers}
30/04 . . related to roll-over prevention
2030/041 . . . {about the pitch axis}
2030/043 . . . {about the roll axis}
30/045 . . Improving turning performance

WARNING

This group is not complete pending a reorganisation, see also B60W 30/02

30/06 . Automatic manoeuvring for parking (controlling only the steering B62D 15/0285)

WARNING

B60W 30/06 and subgroups are not complete pending a reorganisation; see provisionally also group B62D 15/0285

30/08 . {Active safety systems} predicting or avoiding probable or impending collision {or attempting to minimise its consequences}
2030/082 . . {Vehicle operation after collision}
30/085 . . Taking automatic action to adjust vehicle attitude in preparation for collision, e.g. braking for nose dropping
30/09 . . Taking automatic action to avoid collision, e.g. braking and steering
30/095 . . Predicting travel path or likelihood of collision
30/0953 . . . {the prediction being responsive to vehicle dynamic parameters}
30/0956 . . . {the prediction being responsive to traffic or environmental parameters}
30/10 . Path keeping {(cruise control for automatically following a preceding vehicle B60W 30/165)}
30/12 . . Lane keeping
30/14 . {Adaptive} cruise control
30/143 . . {Speed control (B60W 30/16 takes precedence)}
30/146 . . . {Speed limiting}
30/16 . . Control of distance between vehicles, e.g. keeping a distance to preceding vehicle
30/162 . . . {Speed limiting therefor}
30/165 . . . Automatically following the path of a preceding lead vehicle, e.g. "electronic tow-bar"
30/17 . . . with provision for special action when the preceding vehicle comes to a halt, e.g. stop and go
30/18 . Propelling the vehicle

WARNING

Subgroups of B60W 30/18 are note complete. Documents from B60K 41/00 and B60W 30/18 are in the process of being reorganised to the new groups

30/18009 . . {related to particular drive situations}
30/18018 . . . {Start-stop drive, e.g. in a traffic jam}
30/18027 . . . {Drive off, accelerating from standstill}
30/18036 . . . {Reversing}
30/18045 . . . . {Rocking, i.e. fast change between forward and reverse}
30/18054 . . . {at stand still, e.g. engine in idling state (hill holding B60W 30/18118)}
30/18063 . . . {Creeping}
30/18072 . . . {Coasting}
2030/18081 . . . . {With torque flow from driveshaft to engine, i.e. engine being driven by vehicle}

2030/1809 . . . . {Without torque flow between driveshaft and engine, e.g. with clutch disengaged or transmission in neutral}
30/181 . . . {Preparing for stopping}
30/18109 . . . {Braking}
30/18118 . . . . {Hill holding}
30/18127 . . . . {Regenerative braking}
30/18136 . . . . {Engine braking}
30/18145 . . . {Cornering}
30/18154 . . . {Approaching an intersection}
30/18163 . . . {Lane change; Overtaking manoeuvres}
30/18172 . . {Preventing, or responsive to skidding of wheels}
30/18181 . . {Propulsion control with common controlling member for diffent functions}
30/1819 . . {Propulsion control with control means using analogue circuits, relays or mechanical links}
30/182 . . Selecting between different operative modes, e.g. comfort and performance modes
30/184 . . Preventing damage resulting from overload or excessive wear of the driveline
30/1843 . . . {Overheating of driveline components (B60W 30/186 takes precedence)}
30/1846 . . . {Preventing of breakage of drive line components, e.g. parts of the gearing}
30/186 . . . excessive wear or burn out of friction elements, e.g. clutches
30/188 . . Controlling power parameters of the driveline, e.g. determining the required power
30/1882 . . . {characterised by the working point of the engine, e.g. by using engine output chart}
30/1884 . . . {Avoiding stall or overspeed of the engine}
30/1886 . . . {Controlling power supply to auxiliary devices}
30/1888 . . . . {Control of power take off [PTO]}
30/19 . . Improvement of gear change, e.g. by synchronisation or smoothing gear shift
30/192 . . Mitigating problems related to power-up or power-down of the driveline, e.g. start-up of a cold engine
30/194 . . . related to low temperature conditions, e.g. high viscosity of hydraulic fluid
30/20 . . Reducing vibrations in the driveline
2030/203 . . . {related or induced by the clutch}
2030/206 . . . {related or induced by the engine}

40/00 Estimation or calculation of {non-directly measurable} driving parameters for road vehicle drive control systems not related to the control of a particular sub unit, {e.g. by using mathematical models}

40/02 . related to ambient conditions
40/04 . . Traffic conditions
40/06 . . Road conditions
40/064 . . . Degree of grip
40/068 . . . Road friction coefficient
40/072 . . . Curvature of the road
40/076 . . . Slope angle of the road
40/08 . related to drivers or passengers
2040/0809 . . {Driver authorisation; Driver identical check}
2040/0818 . . {Inactivity or incapacity of driver}
2040/0827 . . . {due to sleepiness}
2040/0836 . . . {due to alcohol}
2040/0845 . . . {due to drugs}
2040/0854 . . . {due to driver cheating, e.g. to circumvent driver tests}
2040/0863 . . . {due to erroneous selection or response of the driver}
2040/0872 . . {Driver physiology}
2040/0881 . . {Seat occupation; Driver or passenger presence}
2040/089 . . {Driver voice}
40/09 . . Driving style or behaviour
40/10 . related to vehicle motion
40/1005 . . {Driving resistance}
40/101 . . Side slip angle of tyre
40/103 . . Side slip angle of vehicle body
40/105 . . Speed
40/107 . . Longitudinal acceleration
40/109 . . Lateral acceleration
40/11 . . Pitch movement
40/112 . . Roll movement
40/114 . . Yaw movement
40/12 . related to parameters of the vehicle itself, {e.g. tyre models}
40/13 . . Load or weight
2040/1307 . . . {Load distribution on each wheel suspension}
2040/1315 . . . {Location of the centre of gravity}
2040/1323 . . . {Moment of inertia of the vehicle body}
2040/133 . . . . {about the roll axis}
2040/1338 . . . . {about the pitch axis}
2040/1346 . . . . {about the yaw axis}
2040/1353 . . . {Moment of inertia of a sub-unit}
2040/1361 . . . . {the component being the engine}
2040/1369 . . . . {the component being the clutch}
2040/1376 . . . . {the component being the transmission}
2040/1384 . . . . {the component being the wheel}
2040/1392 . . . {Natural frequency of components}

50/00 Details of control systems for road vehicle drive control not related to the control of a particular sub-unit, {e.g. process diagnostic or vehicle driver interfaces}

WARNING

New subgroups of IPC8 are not yet complete. Documents from B60K, in particular B60K 41/00 and subgroups, are in the process of being reclassified to the new groups

2050/0001 . {Details of the control system}
2050/0002 . . {Automatic control, details of type of controller or control system architecture}
2050/0003 . . . {In analogue systems, e.g. continuous systems}
2050/0004 . . . {In digital systems, e.g. discrete-time systems involving sampling}
2050/0005 . . . . {Processor details or data handling, e.g. memory registers or chip architecture}
2050/0006 . . . . {Digital architecture hierarchy}
2050/0008 . . . {Feedback, closed loop systems or details of feedback error signal}
2050/0009 . . . . {Proportional differential [PD] controller}
2050/001 . . . . {Proportional integral [PI] controller}
2050/0011 . . . . {Proportional Integral Differential [PID] controller}
2050/0012 . . . {Feedforward or open loop systems}
2050/0013 . . . {Optimal controllers}
2050/0014 . . . {Adaptive controllers}
2050/0016 . . . {State machine analysis}

2050/0017 . . . {Modal analysis, e.g. for determining system stability}
2050/0018 . . . {Method for the design of a control system}
2050/0019 . . {Control system elements or transfer functions}
2050/002 . . . {Integrating means}
2050/0021 . . . {Differentiating means}
2050/0022 . . . {Gains, weighting coefficients or weighting functions}
2050/0024 . . . . {Variable gains}
2050/0025 . . . . {Transfer function weighting factor}
2050/0026 . . . {Lookup tables or parameter maps}
2050/0027 . . . {Minimum/maximum value selectors}
2050/0028 . . . {Mathematical models, e.g. for simulation}
2050/0029 . . . . {Mathematical model of the driver}
2050/0031 . . . . {Mathematical model of the vehicle}
2050/0032 . . . . . {Quarter vehicle model, i.e. only one vehicle corner}
2050/0033 . . . . . {Single-track, 2D vehicle model, i.e. two-wheel bicycle model}
2050/0034 . . . . . {Multiple-track, 2D vehicle model, e.g. four-wheel model}
2050/0035 . . . . . {Multiple-track, 3D vehicle model, e.g. including roll and pitch conditions}
2050/0036 . . . . . {Multiple-track, 3D multi-body vehicle model, e.g. combination of models for vehicle sub-units}
2050/0037 . . . . {Mathematical models of vehicle sub-units}
2050/0039 . . . . . {of the propulsion unit}
2050/004 . . . . . {of the clutch}
2050/0041 . . . . . {of the drive line}
2050/0042 . . . {Transfer function lag; delays}
2050/0043 . . {Signal treatments, identification of variables or parameters, parameter estimation or state estimation}
2050/0044 . . . {In digital systems}
2050/0045 . . . . {using databus protocols}
2050/0047 . . . {Digital-analogue (D/A) or analogue-digital (A/D) conversion}
2050/0048 . . . {Addition or subtraction of signals}
2050/0049 . . . . {Signal offset}
2050/005 . . . {Sampling}
2050/0051 . . . . {combined with averaging}
2050/0052 . . . {Filtering, filters}
2050/0054 . . . . {Cut-off filters, retarders, delaying means, dead zones, threshold values or cut-off frequency}
2050/0055 . . . . . {High-pass filters}
2050/0056 . . . . . {Low-pass filters}
2050/0057 . . . {Frequency analysis, spectral techniques or transforms}
2050/0058 . . . {Signal modulation for data transmission}
2050/0059 . . . {Signal noise suppression}
2050/006 . . . {Interpolation; Extrapolation}
2050/0062 . {Adapting control system settings}
2050/0063 . . {Manual parameter input, manual setting means, manual initialising or calibrating means (for vehicle control input means, control panels see B60K 37/00)}
2050/0064 . . . {using a remote, e.g. cordless, transmitter or receiver unit, e.g. remote keypad or mobile phone}
2050/0065 . . . {using a personalised data carrier, e.g. magnetic card, memory card or electronic ignition key}
2050/0066 . . . {using buttons or a keyboard connected to the on-board processor}
2050/0067 . . . . {Confirmation by the driver}
2050/0068 . . . {Giving intention of direction, e.g. by indicator lights, steering input}
2050/007 . . {Switching between manual and automatic parameter input, and vice versa}
2050/0071 . . . {Controller overrides driver automatically}
2050/0072 . . . {Controller asks driver to take over}
2050/0073 . . . {Driver overrides controller}
2050/0074 . . . {Driver shifts control to the controller, e.g. by pressing a button}
2050/0075 . . {Automatic parameter input, automatic initialising or calibrating means}
2050/0077 . . . {involving external transmission of data to or from the vehicle}
2050/0078 . . . . {using Global Position System data}
2050/0079 . . . . {using telemetry}
2050/008 . . . . . {using data transmitted between vehicles, e.g. for platooning, control of inter-vehicle distance}
2050/0081 . . . . . {using satellite communication}
2050/0082 . . . {for initialising the control system}
2050/0083 . . . {Setting, resetting, calibration}
2050/0085 . . . . {Setting or resetting initial positions}
2050/0086 . . . . {Recalibrating datum positions, e.g. by using check cycles}
2050/0087 . . . . {Resetting start and end points of actuator travel}
2050/0088 . . . . {Adaptive recalibration}
2050/0089 . . . {Historical data record of previous events}
2050/009 . . . {Priority selection}
2050/0091 . . . . {of control inputs}
2050/0093 . . . . . {of the engine}
2050/0094 . . . . {of control units}
2050/0095 . . . {Automatic control mode change}
2050/0096 . . . . {Control during transition between modes}
50/0097 . {Predicting future conditions}
50/0098 . {Details of control systems ensuring comfort, safety or stability not otherwise provided for}
50/02 . Ensuring safety in case of control system failures, e.g. by diagnosing, circumventing or fixing failures
50/0205 . . {Diagnosing or detecting failures; Failure detection models}
2050/021 . . . {Means for detecting failure or malfunction}
2050/0215 . . . {Sensor drifts or sensor failures}
2050/022 . . . {Actuator failures}
50/0225 . . {Failure correction strategy}
50/023 . . Avoiding failures by using redundant parts
50/029 . . Adapting to failures or work around with other constraints, e.g. circumvention by avoiding use of failed parts
2050/0292 . . . {Fail-safe or redundant systems, e.g. limp-home or backup systems}
2050/0295 . . . {Inhibiting action of specific actuators or systems}
2050/0297 . . . {Control Giving priority to different actuators or systems}
50/032 . . Fixing failures by repairing failed parts, e.g. loosening a sticking valve

50/035 . . Bringing the control units into a predefined state, e.g. giving priority to particular actuators
50/038 . . Limiting the input power, torque or speed
50/04 . Monitoring the functioning of the control system
2050/041 . . {Built in Test Equipment [BITE]}
2050/043 . . . {Testing equipment at KEY-ON}
50/045 . . {Monitoring control system parameters}
2050/046 . . . {involving external transmission of data to or from the vehicle, e.g. via telemetry, satellite, Global Positioning System [GPS]}
2050/048 . . . . {displaying data transmitted between vehicles, e.g. for platooning, control of inter-vehicle distance}
50/06 . Improving the dynamic response of the control system, e.g. improving the speed of regulation or avoiding hunting or overshoot
2050/065 . . {by reducing the computational load on the digital processor of the control computer}
50/08 . Interaction between the driver and the control system
50/082 . . {Selecting or switching between different modes of propelling}
50/085 . . {Changing the parameters of the control units, e.g. changing limit values, working points by control input}
50/087 . . {where the control system corrects or modifies a request from the driver}
50/10 . . Interpretation of driver requests or demands
50/12 . . Limiting control by the driver depending on vehicle state, e.g. interlocking means for the control input for preventing unsafe operation
50/14 . . Means for informing the driver, warning the driver or prompting a driver intervention
2050/143 . . . {Alarm means (B60W 50/16 takes precedence)}
2050/146 . . . {Display means}
50/16 . . . Tactile feedback to the driver, e.g. vibration or force feedback to the driver on the steering wheel or the accelerator pedal

2300/00 Indexing codes relating to the type of vehicle

2300/10 . Buses
2300/105 . . Ambulances
2300/12 . Trucks; Load vehicles
2300/121 . . Fork lift trucks, Clarks
2300/123 . . Light trucks
2300/125 . . Heavy duty trucks
2300/126 . . . Multi-axles trucks
2300/128 . . . Silo or fluid transporting vehicles
2300/13 . Independent Multi-axle long vehicles
2300/135 . . Vehicles having wheels mounted on a vertical steerable column
2300/14 . Trailers, e.g. full trailers, caravans (relation between towing and towed vehicle B60Y 2300/28)
2300/145 . . Semi-trailers
2300/15 . Agricultural vehicles
2300/152 . . Tractors
2300/154 . . Boom carrying vehicles, e.g. for crop spraying
2300/156 . . Ridable lawn mowers
2300/158 . . Harvesters
2300/16 . Cranes
2300/17 . Construction vehicles, e.g. graders, excavators
2300/18 . Four-wheel drive vehicles
2300/185 . . Off-road vehicles
2300/26 . Military
2300/28 . Racing vehicles, e.g. Formula one cars
2300/285 . . Go-karts
2300/30 . Toys
2300/32 . Amphibious vehicles
2300/34 . Compact city vehicles
2300/345 . . Three wheelers not including single track vehicles
2300/36 . Cycles; Motorcycles; Scooters
2300/362 . . Buggies; Quads
2300/365 . . Scooters
2300/367 . . Tricycles
2300/38 . Wheelchairs; Perambulators
2300/40 . Carts, e.g. trolleys
2300/405 . . Golf carts
2300/42 . Loading ramps
2300/43 . Snowmobile
2300/44 . Tracked vehicles
2300/45 . Skid-steer
2300/46 . Variable track or wheelbase vehicles
2300/48 . Low or lowerable bed vehicles
2300/50 . Tilting frame vehicles

2400/00 Indexing codes relating to detected, measured or calculated conditions or factors

2420/00 Indexing codes relating to the type of sensors based on the principle of their operation

2420/10 . Transducer, e.g. piezoelectric elements
2420/20 . Resistance type, e.g. potentiometer as level indicator
2420/22 . Strain gauge
2420/225 . . Wheatstone bridge circuit
2420/24 . Capacitance type, e.g. as level indicator
2420/30 . Switches, e.g. mercury or ball type switches
2420/40 . Photo or light sensitive means, e.g. infrared sensors
2420/403 . . Image sensing, e.g. optical camera
2420/406 . . Fiber optic sensor
2420/42 . Image sensing, e.g. optical camera
2420/50 . Magnetic or electromagnetic sensors
2420/503 . . Hall effect or magnetoresistive, i.e. active wheel speed sensors
2420/506 . . Inductive sensors, i.e. passive wheel sensors
2420/52 . Radar, Lidar
2420/54 . Audio sensitive means, e.g. ultrasound
2420/60 . Doppler effect
2420/62 . Laser
2420/90 . Single sensor for two or more measurements
2420/905 . . the sensor being an xyz axis sensor

2422/00 Indexing codes relating to the special location or mounting of sensors

2422/10 . on a suspension arm
2422/20 . on or inside a spring
2422/202 . . the spring being a coil spring
2422/205 . . the spring being a pneumatic spring
2422/207 . . the spring being a leaf spring
2422/40 . on a damper
2422/50 . on a steering column
2422/70 . on the wheel or the tire
2422/80 . on wheel hub bearing
2422/90 . on bumper, e.g. collision sensor
2422/95 . Measuring the same parameter at multiple locations of the vehicle

2510/00 Input parameters relating to a particular sub-units
2510/02 . Clutches
2510/0208 . . Clutch engagement state, e.g. engaged or disengaged
2510/0216 . . . Clutch engagement rate
2510/0225 . . . Clutch actuator position
2510/0233 . . . of torque converter lock-up clutch
2510/0241 . . Clutch slip, i.e. difference between input and output speeds
2510/025 . . . Slip change rate
2510/0258 . . Clutch friction coefficient
2510/0266 . . Moment of inertia
2510/0275 . . Clutch torque
2510/0283 . . Clutch input shaft speed
2510/0291 . . Clutch temperature
2510/06 . Combustion engines, Gas turbines
2510/0604 . . Throttle position
2510/0609 . . . Throttle change rate
2510/0614 . . Position of fuel or air injector
2510/0619 . . . Air-fuel ratio
2510/0623 . . . Fuel flow rate
2510/0628 . . . Inlet air flow rate
2510/0633 . . Turbocharger state
2510/0638 . . Engine speed
2510/0642 . . . Idle condition
2510/0647 . . . Coasting condition
2510/0652 . . . Speed change rate
2510/0657 . . Engine torque
2510/0661 . . . Torque change rate
2510/0666 . . Engine power
2510/0671 . . Engine manifold pressure
2510/0676 . . Engine temperature
2510/068 . . Engine exhaust temperature
2510/0685 . . Engine crank angle
2510/069 . . Engine braking signal
2510/0695 . . Inertia
2510/08 . Electric propulsion units
2510/081 . . Speed
2510/082 . . . Speed change rate
2510/083 . . Torque
2510/084 . . . Torque change rate
2510/085 . . Power
2510/086 . . . Power change rate
2510/087 . . Temperature
2510/088 . . Inertia
2510/09 . Other types of propulsion units, e.g. fluid motors, or type not specified
2510/10 . Change speed gearings
2510/1005 . . Transmission ratio engaged
2510/101 . . . Transmission neutral state
2510/1015 . . Input shaft speed, e.g. turbine speed
2510/102 . . . Input speed change rate
2510/1025 . . Input torque
2510/103 . . . Input torque change rate
2510/1035 . . Input power
2510/104 . . Output speed
2510/1045 . . . Output speed change rate
2510/105 . . Output torque
2510/1055 . . . Output torque change rate
2510/106 . . Output power
2510/1065 . . . Transmission of zero torque
2510/107 . . Temperature
2510/1075 . . fluid pressure, e.g. oil pressure
2510/108 . . . pressure of control fluid
2510/1085 . . . pressure of working fluid
2510/109 . . Direction of power flow
2510/1095 . . Inertia
2510/12 . Differentials
2510/125 . . Locking status
2510/18 . Braking system
2510/182 . . Brake pressure, e.g. of fluid or between pad and disc
2510/184 . . Brake temperature, e.g. of fluid, pads or discs
2510/186 . . Status of parking brakes
2510/188 . . Parking lock mechanisms
2510/20 . Steering systems
2510/202 . . Steering torque
2510/205 . . Steering speed
2510/207 . . Oversteer or understeer
2510/22 . Suspension systems
2510/222 . . Stiffness
2510/225 . . Damping
2510/227 . . Oscillation frequency
2510/24 . Energy storage means
2510/242 . . for electrical energy
2510/244 . . . Charge state
2510/246 . . . Temperature
2510/248 . . . Age of storage means
2510/28 . Fuel cells
2510/285 . . Temperature
2510/30 . Auxiliary equipments
2510/305 . . Power absorbed by auxiliaries

2520/00 Input parameters relating to overall vehicle dynamics
2520/04 . Vehicle stop
2520/06 . Direction of travel
2520/10 . Longitudinal speed
2520/105 . . Longitudinal acceleration
2520/12 . Lateral speed
2520/125 . . Lateral acceleration
2520/14 . Yaw
2520/16 . Pitch
2520/18 . Roll
2520/20 . Sideslip angle
2520/22 . Articulation angle, e.g. between tractor and trailer
2520/26 . Wheel slip
2520/263 . . Slip values between front and rear axle
2520/266 . . Slip values between left and right wheel
2520/28 . Wheel speed
2520/30 . Wheel torque
2520/40 . Torque distribution
2520/403 . . between front and rear axle
2520/406 . . between left and right wheel

2530/00 Input parameters relating to other vehicle conditions or values
2530/10 . Weight
2530/12 . Catalyst or filter state
2530/14 . Historical data
2530/145 . . Mileage
2530/16 . Driving resistance
2530/18 . Distance travelled

2530/20 . Tyre data
2530/22 . Towing force

2540/00 Input parameters relating to the driver
2540/02 . Driver's voice
2540/04 . Driver selection, e.g. driver confirmation
2540/06 . Ignition switch
2540/10 . Accelerator pedal position
2540/103 . . Accelerator thresholds, e.g. kickdown
2540/106 . . Rate of change
2540/12 . Brake pedal position
2540/14 . Clutch pedal position
2540/16 . Ratio selector position
2540/165 . . Rate of change
2540/18 . Steering angle
2540/20 . Direction indicator values
2540/22 . Psychological state; Stress level or workload
2540/24 . Drug level, e.g. alcohol
2540/26 . Incapacity of driver
2540/28 . Identity of driver
2540/30 . Driving style

2550/00 Input parameters relating to exterior conditions
2550/10 . from obstacle detection
2550/12 . Ambient conditions, e.g. wind or rain
2550/13 . Altitude
2550/14 . Road conditions, road types or road features
2550/141 . . Type of road
2550/142 . . Road slope
2550/143 . . Road profile
2550/145 . . Road altitude
2550/146 . . Road curve radius
2550/147 . . Road bumpiness, e.g. pavement or potholes
2550/148 . . Coefficient of friction
2550/16 . Country codes
2550/20 . Traffic related input parameters
2550/22 . . Traffic rules, e.g. traffic signs
2550/30 . . Distance or speed relative to other vehicles
2550/302 . . . the longitudinal speed of preceding vehicle
2550/304 . . . the lateral speed of preceding vehicle
2550/306 . . . the position of preceding vehicle
2550/308 . . . Distance between vehicles
2550/40 . Involving external transmission of data to or from the vehicle
2550/402 . . for navigation systems
2550/404 . . using telemetry
2550/406 . . using satellite communication
2550/408 . . Data transmitted between vehicles

2560/00 Other vehicle related input parameters not covered by groups B60W 2510/00 - B60W 2550/00
2560/02 . Remaining fuel quantity in tank
2560/04 . Fuel quality, e.g. water content due to age of fuel
2560/06 . Fuel type

2600/00 Indexing codes relating to automatic control systems or control processes

2710/00 Output or target parameters relating to a particular sub-units
2710/02 . Clutches
2710/021 . . Clutch engagement state
2710/022 . . . Clutch actuator position
2710/023 . . . Clutch engagement rate
2710/024 . . . of torque converter lock-up clutch
2710/025 . . Clutch slip, i.e. difference between input and output speeds
2710/026 . . . Slip change rate
2710/027 . . Clutch torque
2710/028 . . Clutch input shaft speed
2710/029 . . Clutch temperature
2710/06 . Combustion engines, Gas turbines
2710/0605 . . Throttle position
2710/0611 . . . Throttle change rate
2710/0616 . . Position of fuel or air injector
2710/0622 . . . Air-fuel ratio
2710/0627 . . . Fuel flow rate
2710/0633 . . . Inlet air flow rate
2710/0638 . . Turbocharger state
2710/0644 . . Engine speed
2710/065 . . . Idle condition
2710/0655 . . . Coasting condition
2710/0661 . . . Speed change rate
2710/0666 . . Engine torque
2710/0672 . . . Torque change rate
2710/0677 . . Engine power
2710/0683 . . Engine manifold pressure
2710/0688 . . Engine temperature
2710/0694 . . Engine exhaust temperature
2710/08 . Electric propulsion units
2710/081 . . Speed
2710/082 . . . Speed change rate
2710/083 . . Torque
2710/085 . . . Torque change rate
2710/086 . . Power
2710/087 . . . Power change rate
2710/088 . . Temperature
2710/09 . Other types of propulsion units, e.g. fluid motors, or type not specified
2710/10 . Change speed gearings
2710/1005 . . Transmission ratio engaged
2710/1011 . . Input shaft speed, e.g. turbine speed
2710/1016 . . . Input speed change rate
2710/1022 . . Input torque
2710/1027 . . . Input torque change rate
2710/1033 . . Input power
2710/1038 . . Output speed
2710/1044 . . . Output speed change rate
2710/105 . . Output torque
2710/1055 . . . Output torque change rate
2710/1061 . . Output power
2710/1066 . . . Transmission of zero torque
2710/1072 . . Temperature
2710/1077 . . fluid pressure, e.g. oil pressure
2710/1083 . . . pressure of control fluid
2710/1088 . . . pressure of working fluid
2710/1094 . . Direction of power flow
2710/12 . Differentials
2710/125 . . Locking status
2710/18 . Braking system
2710/182 . . Brake pressure, e.g. of fluid or between pad and disc
2710/184 . . Brake temperature, e.g. of fluid, pads or discs
2710/186 . . Status of parking brakes
2710/188 . . Parking lock mechanisms

2710/20 . Steering systems
2710/202 . . Steering torque
2710/205 . . Steering speed
2710/207 . . Steering angle of wheels
2710/22 . Suspension systems
2710/223 . . Stiffness
2710/226 . . Damping
2710/24 . Energy storage means
2710/242 . . for electrical energy
2710/244 . . . Charge state
2710/246 . . . Temperature
2710/248 . . . Current for loading or unloading
2710/28 . Fuel cells
2710/285 . . Temperature
2710/30 . Auxiliary equipments
2710/305 . . target power to auxiliaries

2720/00 Output or target parameters relating to overall vehicle dynamics

2720/10 . Longitudinal speed
2720/103 . . Speed profile
2720/106 . . Longitudinal acceleration
2720/12 . Lateral speed
2720/125 . . Lateral acceleration
2720/14 . Yaw
2720/16 . Pitch
2720/18 . Roll
2720/20 . Sideslip angle
2720/22 . Articulation angle, e.g. between tractor and trailer
2720/24 . Direction of travel
2720/26 . Wheel slip
2720/263 . . Slip values between front and rear axle
2720/266 . . Slip values between left and right wheel
2720/28 . Wheel speed
2720/30 . Wheel torque
2720/40 . Torque distribution
2720/403 . . between front and rear axle
2720/406 . . between left and right wheel

2750/00 Output or target parameters relating to exterior, e.g. between vehicles

2750/30 . Distance or speed in relation to other vehicles
2750/302 . . the longitudinal speed of preceding vehicle
2750/304 . . the lateral speed of preceding vehicle
2750/306 . . the position of preceding vehicle
2750/308 . . the distance between vehicles
2750/40 . Involving external transmission of data to or from the vehicle

2900/00 Indexing codes relating to the purpose of, or problem solved of road vehicle drive control systems not otherwise provided for in groups B60W 30/00