

CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

TRANSPORTING

B60 VEHICLES IN GENERAL

(NOTE omitted)

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 particular 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 toroid 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	20/50	. Control strategies for responding to system failures, e.g. for fault diagnosis, failsafe operation or limp mode
10/16	. . Axle differentials, e.g. for dividing torque between left and right wheels		
10/18	. including control of braking systems	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)}
10/182	. . {including control of parking brakes}		
10/184	. . with wheel brakes	30/02	. Control of vehicle driving stability
10/188	. . . hydraulic brakes	30/025	. . {related to comfort of drivers or passengers}
	WARNING	30/04	. . related to roll-over prevention
	this group is not complete pending a reorganisation, see also B60W 10/184	2030/041	. . . {about the pitch axis}
10/192	. . . electric brakes	2030/043	. . . {about the roll axis}
	WARNING	30/045	. . Improving turning performance
	this group is not complete pending a reorganisation, see also B60W 10/184		WARNING
10/196	. . acting within the driveline, e.g. retarders		This group is not complete pending a reorganisation, see also B60W 30/02
10/198	. . with exhaust brakes		
10/20	. including control of steering systems	30/06	. Automatic manoeuvring for parking (controlling only the steering B62D 15/0285)
10/22	. including control of suspension systems		WARNING
10/24	. including control of energy storage means		B60W 30/06 and subgroups are not complete pending a reorganisation; see provisionally also group B62D 15/0285
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	30/08	. {Active safety systems} predicting or avoiding probable or impending collision {or attempting to minimise its consequences}
20/00	Control systems specially adapted for hybrid vehicles { (hybrid vehicle design, B60K 6/00; electric vehicles B60L) }	2030/082	. . {Vehicle operation after collision}
20/10	. Controlling the power contribution of each of the prime movers to meet required power demand	30/085	. . Taking automatic action to adjust vehicle attitude in preparation for collision, e.g. braking for nose dropping
20/11	. . using model predictive control [MPC] strategies, i.e. control methods based on models predicting performance { (utilising navigation and traffic information in the control strategy B60W 20/12) }	30/09	. . Taking automatic action to avoid collision, e.g. braking and steering
20/12	. . using control strategies taking into account route information { (estimation or calculation of non-directly measurable driving parameters B60W 40/00) }	30/095	. . Predicting travel path or likelihood of collision
20/13	. . in order to stay within battery power input or output limits; in order to prevent overcharging or battery depletion	30/0953	. . . {the prediction being responsive to vehicle dynamic parameters}
20/14	. . . in conjunction with braking regeneration	30/0956	. . . {the prediction being responsive to traffic or environmental parameters}
20/15	. . Control strategies specially adapted for achieving a particular effect	30/10	. Path keeping { (cruise control for automatically following a preceding vehicle B60W 30/165) }
20/16	. . . for reducing engine exhaust emissions	30/12	. . Lane keeping
20/17	. . . for noise reduction	30/14	. {Adaptive} cruise control
20/18	. . . for avoiding ageing of fuel	30/143	. . {Speed control (B60W 30/16 takes precedence) }
20/19	. . . for achieving enhanced acceleration	30/146	. . . {Speed limiting}
20/20	. Control strategies involving selection of hybrid configuration, e.g. selection between series or parallel configuration	30/16	. . Control of distance between vehicles, e.g. keeping a distance to preceding vehicle
20/30	. Control strategies involving selection of transmission gear ratio { (control of change speed gearings, together with other vehicle sub-units B60W 10/10 ; HEV transmission gearing B60K 6/36 ; gearings and control thereof F16H) }	30/162	. . . {Speed limiting therefor}
20/40	. Controlling the engagement or disengagement of prime movers, e.g. for transition between prime movers { (power-up or power-down of the driveline B60W 30/192) }	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	2030/206	. . . {related or induced by the engine}
	WARNING	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}
	Subgroups of B60W 30/18 are not complete. Documents from B60K 41/00 and B60W 30/18 are in the process of being reorganised to the new groups	40/02	. related to ambient conditions
30/18009	. . {related to particular drive situations}	40/04	. . Traffic conditions
30/18018	. . . {Start-stop drive, e.g. in a traffic jam}	40/06	. . Road conditions
30/18027	. . . {Drive off, accelerating from standstill}	40/064	. . . Degree of grip
30/18036	. . . {Reversing}	40/068	. . . Road friction coefficient
30/18045	. . . . {Rocking, i.e. fast change between forward and reverse}	40/072	. . . Curvature of the road
30/18054	. . . {at stand still, e.g. engine in idling state (hill holding B60W 30/18118)}	40/076	. . . Slope angle of the road
30/18063	. . . {Creeping}	40/08	. related to drivers or passengers
30/18072	. . . {Coasting}	2040/0809	. . {Driver authorisation; Driver identical check}
2030/18081	. . . . {With torque flow from driveshaft to engine, i.e. engine being driven by vehicle}	2040/0818	. . {Inactivity or incapacity of driver}
2030/1809	. . . . {Without torque flow between driveshaft and engine, e.g. with clutch disengaged or transmission in neutral}	2040/0827	. . . {due to sleepiness}
30/181	. . . {Preparing for stopping}	2040/0836	. . . {due to alcohol}
30/18109	. . . {Braking}	2040/0845	. . . {due to drugs}
30/18118	. . . . {Hill holding}	2040/0854	. . . {due to driver cheating, e.g. to circumvent driver tests}
30/18127	. . . . {Regenerative braking}	2040/0863	. . . {due to erroneous selection or response of the driver}
30/18136	. . . . {Engine braking}	2040/0872	. . {Driver physiology}
30/18145	. . . {Cornering}	2040/0881	. . {Seat occupation; Driver or passenger presence}
30/18154	. . . {Approaching an intersection}	2040/089	. . {Driver voice}
30/18163	. . . {Lane change; Overtaking manoeuvres}	40/09	. . Driving style or behaviour
30/18172	. . {Preventing, or responsive to skidding of wheels}	40/10	. related to vehicle motion
30/18181	. . {Propulsion control with common controlling member for different functions}	40/1005	. . {Driving resistance}
30/1819	. . {Propulsion control with control means using analogue circuits, relays or mechanical links}	40/101	. . Side slip angle of tyre
30/182	. . Selecting between different operative modes, e.g. comfort and performance modes	40/103	. . Side slip angle of vehicle body
30/184	. . Preventing damage resulting from overload or excessive wear of the driveline	40/105	. . Speed
30/1843	. . . {Overheating of driveline components (B60W 30/186 takes precedence)}	40/107	. . Longitudinal acceleration
30/1846	. . . {Preventing of breakage of drive line components, e.g. parts of the gearing}	40/109	. . Lateral acceleration
30/186	. . . excessive wear or burn out of friction elements, e.g. clutches	40/11	. . Pitch movement
30/188	. . Controlling power parameters of the driveline, e.g. determining the required power	40/112	. . Roll movement
30/1882	. . . {characterised by the working point of the engine, e.g. by using engine output chart}	40/114	. . Yaw movement
30/1884	. . . {Avoiding stall or overspeed of the engine}	40/12	. related to parameters of the vehicle itself{, e.g. tyre models}
30/1886	. . . {Controlling power supply to auxiliary devices}	40/13	. . Load or weight
30/1888	. . . . {Control of power take off [PTO]}	2040/1307	. . . {Load distribution on each wheel suspension}
30/19	. . Improvement of gear change, e.g. by synchronisation or smoothing gear shift	2040/1315	. . . {Location of the centre of gravity}
30/192	. . Mitigating problems related to power-up or power-down of the driveline, e.g. start-up of a cold engine	2040/1323	. . . {Moment of inertia of the vehicle body}
30/194	. . . related to low temperature conditions, e.g. high viscosity of hydraulic fluid	2040/133	. . . . {about the roll axis}
30/20	. . Reducing vibrations in the driveline	2040/1338	. . . . {about the pitch axis}
2030/203	. . . {related or induced by the clutch}	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}	2050/0044	. . . {In digital systems}
2050/0002	. . {Automatic control, details of type of controller or control system architecture}	2050/0045	. . . . {using databus protocols}
2050/0003	. . . {In analogue systems, e.g. continuous systems}	2050/0047	. . . {Digital-analogue (D/A) or analogue-digital (A/D) conversion}
2050/0004	. . . {In digital systems, e.g. discrete-time systems involving sampling}	2050/0048	. . . {Addition or subtraction of signals}
2050/0005	. . . . {Processor details or data handling, e.g. memory registers or chip architecture}	2050/0049	. . . . {Signal offset}
2050/0006	. . . . {Digital architecture hierarchy}	2050/005	. . . {Sampling}
2050/0008	. . . {Feedback, closed loop systems or details of feedback error signal}	2050/0051	. . . . {combined with averaging}
2050/0009	. . . . {Proportional differential [PD] controller}	2050/0052	. . . {Filtering, filters}
2050/001	. . . . {Proportional integral [PI] controller}	2050/0054	. . . . {Cut-off filters, retarders, delaying means, dead zones, threshold values or cut-off frequency}
2050/0011	. . . . {Proportional Integral Differential [PID] controller}	2050/0055	. . . . . {High-pass filters}
2050/0012	. . . {Feedforward or open loop systems}	2050/0056	. . . . . {Low-pass filters}
2050/0013	. . . {Optimal controllers}	2050/0057	. . . {Frequency analysis, spectral techniques or transforms}
2050/0014	. . . {Adaptive controllers}	2050/0058	. . . {Signal modulation for data transmission}
2050/0016	. . . {State machine analysis}	2050/0059	. . . {Signal noise suppression}
2050/0017	. . . {Modal analysis, e.g. for determining system stability}	2050/006	. . . {Interpolation; Extrapolation}
2050/0018	. . . {Method for the design of a control system}	2050/0062	. {Adapting control system settings}
2050/0019	. . {Control system elements or transfer functions}	2050/0063	. . {Manual parameter input, manual setting means, manual initialising or calibrating means (for vehicle control input means, control panels see B60K 37/00)}
2050/002	. . . {Integrating means}	2050/0064	. . . {using a remote, e.g. cordless, transmitter or receiver unit, e.g. remote keypad or mobile phone}
2050/0021	. . . {Differentiating means}	2050/0065	. . . {using a personalised data carrier, e.g. magnetic card, memory card or electronic ignition key}
2050/0022	. . . {Gains, weighting coefficients or weighting functions}	2050/0066	. . . {using buttons or a keyboard connected to the on-board processor}
2050/0024	. . . . {Variable gains}	2050/0067	. . . . {Confirmation by the driver}
2050/0025	. . . . {Transfer function weighting factor}	2050/0068	. . . {Giving intention of direction, e.g. by indicator lights, steering input}
2050/0026	. . . {Lookup tables or parameter maps}	2050/007	. . {Switching between manual and automatic parameter input, and vice versa}
2050/0027	. . . {Minimum/maximum value selectors}	2050/0071	. . . {Controller overrides driver automatically}
2050/0028	. . . {Mathematical models, e.g. for simulation}	2050/0072	. . . {Controller asks driver to take over}
2050/0029	. . . . {Mathematical model of the driver}	2050/0073	. . . {Driver overrides controller}
2050/0031	. . . . {Mathematical model of the vehicle}	2050/0074	. . . {Driver shifts control to the controller, e.g. by pressing a button}
2050/0032	. . . . . {Quarter vehicle model, i.e. only one vehicle corner}	2050/0075	. . {Automatic parameter input, automatic initialising or calibrating means}
2050/0033	. . . . . {Single-track, 2D vehicle model, i.e. two-wheel bicycle model}	2050/0077	. . . {involving external transmission of data to or from the vehicle}
2050/0034	. . . . . {Multiple-track, 2D vehicle model, e.g. four-wheel model}	2050/0078	. . . . {using Global Position System data}
2050/0035	. . . . . {Multiple-track, 3D vehicle model, e.g. including roll and pitch conditions}	2050/0079	. . . . {using telemetry}
2050/0036	. . . . . {Multiple-track, 3D multi-body vehicle model, e.g. combination of models for vehicle sub-units}	2050/008	. . . . . {using data transmitted between vehicles, e.g. for platooning, control of inter-vehicle distance}
2050/0037	. . . . . {Mathematical models of vehicle sub-units}	2050/0081	. . . . . {using satellite communication}
2050/0039	. . . . . {of the propulsion unit}	2050/0082	. . . {for initialising the control system}
2050/004	. . . . . {of the clutch}	2050/0083	. . . {Setting, resetting, calibration}
2050/0041	. . . . . {of the drive line}	2050/0085	. . . . {Setting or resetting initial positions}
2050/0042	. . . {Transfer function lag; delays}	2050/0086	. . . . {Recalibrating datum positions, e.g. by using check cycles}
2050/0043	. . {Signal treatments, identification of variables or parameters, parameter estimation or state estimation}	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}	50/16	. . . Tactile feedback to the driver, e.g. vibration or force feedback to the driver on the steering wheel or the accelerator pedal
2050/0094	. . . . . {of control units}		
2050/0095	. . . {Automatic control mode change}		
2050/0096	. . . . . {Control during transition between modes}	2300/00	Indexing codes relating to the type of vehicle
50/0097	. {Predicting future conditions}	2300/10	. Buses
50/0098	. {Details of control systems ensuring comfort, safety or stability not otherwise provided for}	2300/105	. . Ambulances
50/02	. Ensuring safety in case of control system failures, e.g. by diagnosing, circumventing or fixing failures	2300/12	. Trucks; Load vehicles
50/0205	. . {Diagnosing or detecting failures; Failure detection models}	2300/121	. . Fork lift trucks, Clarks
2050/021	. . . {Means for detecting failure or malfunction}	2300/123	. . Light trucks
2050/0215	. . . {Sensor drifts or sensor failures}	2300/125	. . Heavy duty trucks
2050/022	. . . {Actuator failures}	2300/126	. . . Multi-axes trucks
50/0225	. . {Failure correction strategy}	2300/128	. . . Silo or fluid transporting vehicles
50/023	. . Avoiding failures by using redundant parts	2300/13	. Independent Multi-axe long vehicles
50/029	. . Adapting to failures or work around with other constraints, e.g. circumvention by avoiding use of failed parts	2300/135	. . Vehicles having wheels mounted on a vertical steerable column
2050/0292	. . . {Fail-safe or redundant systems, e.g. limp-home or backup systems}	2300/14	. Trailers, e.g. full trailers, caravans (relation between towing and towed vehicle B60Y 2300/28)
2050/0295	. . . {Inhibiting action of specific actuators or systems}	2300/145	. . Semi-trailers
2050/0297	. . . {Control Giving priority to different actuators or systems}	2300/15	. Agricultural vehicles
50/032	. . Fixing failures by repairing failed parts, e.g. loosening a sticking valve	2300/152	. . Tractors
50/035	. . Bringing the control units into a predefined state, e.g. giving priority to particular actuators	2300/154	. . Boom carrying vehicles, e.g. for crop spraying
50/038	. . Limiting the input power, torque or speed	2300/156	. . Ridable lawn mowers
50/04	. Monitoring the functioning of the control system	2300/158	. . Harvesters
2050/041	. . {Built in Test Equipment [BITE]}	2300/16	. Cranes
2050/043	. . . {Testing equipment at KEY-ON}	2300/17	. Construction vehicles, e.g. graders, excavators
50/045	. . {Monitoring control system parameters}	2300/18	. Four-wheel drive vehicles
2050/046	. . . {involving external transmission of data to or from the vehicle, e.g. via telemetry, satellite, Global Positioning System [GPS]}	2300/185	. . Off-road vehicles
2050/048	. . . . {displaying data transmitted between vehicles, e.g. for platooning, control of inter-vehicle distance}	2300/26	. Military
50/06	. Improving the dynamic response of the control system, e.g. improving the speed of regulation or avoiding hunting or overshoot	2300/28	. Racing vehicles, e.g. Formula one cars
2050/065	. . {by reducing the computational load on the digital processor of the control computer}	2300/285	. . Go-karts
50/08	. Interaction between the driver and the control system	2300/30	. Toys
50/082	. . {Selecting or switching between different modes of propelling}	2300/32	. Amphibious vehicles
50/085	. . {Changing the parameters of the control units, e.g. changing limit values, working points by control input}	2300/34	. Compact city vehicles
50/087	. . {where the control system corrects or modifies a request from the driver}	2300/345	. . Three wheelers not including single track vehicles
50/10	. . Interpretation of driver requests or demands	2300/36	. Cycles; Motorcycles; Scooters
50/12	. . Limiting control by the driver depending on vehicle state, e.g. interlocking means for the control input for preventing unsafe operation	2300/362	. . Buggies; Quads
50/14	. . Means for informing the driver, warning the driver or prompting a driver intervention	2300/365	. . Scooters
2050/143	. . . {Alarm means (B60W 50/16 takes precedence)}	2300/367	. . Tricycles
2050/146	. . . {Display means}	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	2510/0695	. . Inertia
2420/42	. Image sensing, e.g. optical camera	2510/08	. Electric propulsion units
2420/50	. Magnetic or electromagnetic sensors	2510/081	. . Speed
2420/503	. . Hall effect or magnetoresistive, i.e. active wheel speed sensors	2510/082	. . . Speed change rate
2420/506	. . Inductive sensors, i.e. passive wheel sensors	2510/083	. . Torque
2420/52	. Radar, Lidar	2510/084	. . . Torque change rate
2420/54	. Audio sensitive means, e.g. ultrasound	2510/085	. . Power
2420/60	. Doppler effect	2510/086	. . . Power change rate
2420/62	. Laser	2510/087	. . Temperature
2420/90	. Single sensor for two or more measurements	2510/088	. . Inertia
2420/905	. . the sensor being an xyz axis sensor	2510/09	. Other types of propulsion units, e.g. fluid motors, or type not specified
2422/00	Indexing codes relating to the special location or mounting of sensors	2510/10	. Change speed gearings
2422/10	. on a suspension arm	2510/1005	. . Transmission ratio engaged
2422/20	. on or inside a spring	2510/101	. . . Transmission neutral state
2422/202	. . the spring being a coil spring	2510/1015	. . Input shaft speed, e.g. turbine speed
2422/205	. . the spring being a pneumatic spring	2510/102	. . . Input speed change rate
2422/207	. . the spring being a leaf spring	2510/1025	. . Input torque
2422/40	. on a damper	2510/103	. . . Input torque change rate
2422/50	. on a steering column	2510/1035	. . Input power
2422/70	. on the wheel or the tire	2510/104	. . Output speed
2422/80	. on wheel hub bearing	2510/1045	. . . Output speed change rate
2422/90	. on bumper, e.g. collision sensor	2510/105	. . Output torque
2422/95	. Measuring the same parameter at multiple locations of the vehicle	2510/1055	. . . Output torque change rate
2510/00	Input parameters relating to a particular sub-units	2510/106	. . Output power
2510/02	. Clutches	2510/1065	. . . Transmission of zero torque
2510/0208	. . Clutch engagement state, e.g. engaged or disengaged	2510/107	. . Temperature
2510/0216	. . . Clutch engagement rate	2510/1075	. . fluid pressure, e.g. oil pressure
2510/0225	. . . Clutch actuator position	2510/108	. . . pressure of control fluid
2510/0233	. . . of torque converter lock-up clutch	2510/1085	. . . pressure of working fluid
2510/0241	. . Clutch slip, i.e. difference between input and output speeds	2510/109	. . Direction of power flow
2510/025	. . . Slip change rate	2510/1095	. . Inertia
2510/0258	. . Clutch friction coefficient	2510/12	. Differentials
2510/0266	. . Moment of inertia	2510/125	. . Locking status
2510/0275	. . Clutch torque	2510/18	. Braking system
2510/0283	. . Clutch input shaft speed	2510/182	. . Brake pressure, e.g. of fluid or between pad and disc
2510/0291	. . Clutch temperature	2510/184	. . Brake temperature, e.g. of fluid, pads or discs
2510/06	. Combustion engines, Gas turbines	2510/186	. . Status of parking brakes
2510/0604	. . Throttle position	2510/188	. . Parking lock mechanisms
2510/0609	. . . Throttle change rate	2510/20	. Steering systems
2510/0614	. . Position of fuel or air injector	2510/202	. . Steering torque
2510/0619	. . . Air-fuel ratio	2510/205	. . Steering speed
2510/0623	. . . Fuel flow rate	2510/207	. . Oversteer or understeer
2510/0628	. . . Inlet air flow rate	2510/22	. Suspension systems
2510/0633	. . Turbocharger state	2510/222	. . Stiffness
2510/0638	. . Engine speed	2510/225	. . Damping
2510/0642	. . . Idle condition	2510/227	. . Oscillation frequency
2510/0647	. . . Coasting condition	2510/24	. Energy storage means
2510/0652	. . . Speed change rate	2510/242	. . for electrical energy
2510/0657	. . Engine torque	2510/244	. . . Charge state
2510/0661	. . . Torque change rate	2510/246	. . . Temperature
2510/0666	. . Engine power	2510/248	. . . Age of storage means
2510/0671	. . Engine manifold pressure	2510/28	. Fuel cells
2510/0676	. . Engine temperature	2510/285	. . Temperature
2510/068	. . Engine exhaust temperature	2510/30	. Auxiliary equipments
2510/0685	. . Engine crank angle	2510/305	. . Power absorbed by auxiliaries
2510/069	. . Engine braking signal	2520/00	Input parameters relating to overall vehicle dynamics
		2520/04	. Vehicle stop
		2520/06	. Direction of travel

2520/10	. Longitudinal speed	2550/30	. . Distance or speed relative to other vehicles
2520/105	. . Longitudinal acceleration	2550/302	. . . the longitudinal speed of preceding vehicle
2520/12	. Lateral speed	2550/304	. . . the lateral speed of preceding vehicle
2520/125	. . Lateral acceleration	2550/306	. . . the position of preceding vehicle
2520/14	. Yaw	2550/308	. . . Distance between vehicles
2520/16	. Pitch	2550/40	. Involving external transmission of data to or from the vehicle
2520/18	. Roll	2550/402	. . for navigation systems
2520/20	. Sideslip angle	2550/404	. . using telemetry
2520/22	. Articulation angle, e.g. between tractor and trailer	2550/406	. . using satellite communication
2520/26	. Wheel slip	2550/408	. . Data transmitted between vehicles
2520/263	. . Slip values between front and rear axle	2560/00	Other vehicle related input parameters not covered by groups B60W 2510/00 - B60W 2550/00
2520/266	. . Slip values between left and right wheel	2560/02	. Remaining fuel quantity in tank
2520/28	. Wheel speed	2560/04	. Fuel quality, e.g. water content due to age of fuel
2520/30	. Wheel torque	2560/06	. Fuel type
2520/40	. Torque distribution	2600/00	Indexing codes relating to automatic control systems or control processes
2520/403	. . between front and rear axle	2710/00	Output or target parameters relating to a particular sub-units
2520/406	. . between left and right wheel	2710/02	. Clutches
2530/00	Input parameters relating to other vehicle conditions or values	2710/021	. . Clutch engagement state
2530/10	. Weight	2710/022	. . . Clutch actuator position
2530/12	. Catalyst or filter state	2710/023	. . . Clutch engagement rate
2530/14	. Historical data	2710/024	. . . of torque converter lock-up clutch
2530/145	. . Mileage	2710/025	. . Clutch slip, i.e. difference between input and output speeds
2530/16	. Driving resistance	2710/026	. . . Slip change rate
2530/18	. Distance travelled	2710/027	. . Clutch torque
2530/20	. Tyre data	2710/028	. . Clutch input shaft speed
2530/22	. Towing force	2710/029	. . Clutch temperature
2540/00	Input parameters relating to the driver	2710/06	. Combustion engines, Gas turbines
2540/02	. Driver's voice	2710/0605	. . Throttle position
2540/04	. Driver selection, e.g. driver confirmation	2710/0611	. . . Throttle change rate
2540/06	. Ignition switch	2710/0616	. . Position of fuel or air injector
2540/10	. Accelerator pedal position	2710/0622	. . . Air-fuel ratio
2540/103	. . Accelerator thresholds, e.g. kickdown	2710/0627	. . . Fuel flow rate
2540/106	. . Rate of change	2710/0633	. . . Inlet air flow rate
2540/12	. Brake pedal position	2710/0638	. . Turbocharger state
2540/14	. Clutch pedal position	2710/0644	. . Engine speed
2540/16	. Ratio selector position	2710/065	. . . Idle condition
2540/165	. . Rate of change	2710/0655	. . . Coasting condition
2540/18	. Steering angle	2710/0661	. . . Speed change rate
2540/20	. Direction indicator values	2710/0666	. . Engine torque
2540/22	. Psychological state; Stress level or workload	2710/0672	. . . Torque change rate
2540/24	. Drug level, e.g. alcohol	2710/0677	. . Engine power
2540/26	. Incapacity of driver	2710/0683	. . Engine manifold pressure
2540/28	. Identity of driver	2710/0688	. . Engine temperature
2540/30	. Driving style	2710/0694	. . Engine exhaust temperature
2550/00	Input parameters relating to exterior conditions	2710/08	. Electric propulsion units
2550/10	. from obstacle detection	2710/081	. . Speed
2550/12	. Ambient conditions, e.g. wind or rain	2710/082	. . . Speed change rate
2550/13	. Altitude	2710/083	. . Torque
2550/14	. Road conditions, road types or road features	2710/085	. . . Torque change rate
2550/141	. . Type of road	2710/086	. . Power
2550/142	. . Road slope	2710/087	. . . Power change rate
2550/143	. . Road profile	2710/088	. . Temperature
2550/145	. . Road altitude	2710/09	. Other types of propulsion units, e.g. fluid motors, or type not specified
2550/146	. . Road curve radius	2710/10	. Change speed gearings
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		

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
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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](#)**