

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 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
 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	30/06	• Automatic manoeuvring for parking (controlling only the steering B62D 15/0285)
10/20	• including control of steering systems		WARNING
10/22	• including control of suspension systems		B60W 30/06 and subgroups are not complete pending a reorganisation; see provisionally also group B62D 15/0285
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	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	2030/082	• • {Vehicle operation after collision}
NOTE	Classification is also made in B60K 6/42 for the different types of hybrid electric vehicles	30/085	• • Taking automatic action to adjust vehicle attitude in preparation for collision, e.g. braking for nose dropping
20/10	• Controlling the power contribution of each of the prime movers to meet required power demand	30/09	• • Taking automatic action to avoid collision, e.g. braking and steering
20/11	• • using model predictive control [MPC] strategies, i.e. control methods based on models predicting performance	30/095	• • Predicting travel path or likelihood of collision
20/12	• • using control strategies taking into account route information	30/0953	• • • {the prediction being responsive to vehicle dynamic parameters}
20/13	• • in order to stay within battery power input or output limits; in order to prevent overcharging or battery depletion	30/0956	• • • {the prediction being responsive to traffic or environmental parameters}
20/14	• • • in conjunction with braking regeneration	30/10	• Path keeping {(cruise control for automatically following a preceding vehicle B60W 30/165)}
20/15	• • Control strategies specially adapted for achieving a particular effect	30/12	• • Lane keeping
20/16	• • • for reducing engine exhaust emissions	30/14	• {Adaptive} cruise control
20/17	• • • for noise reduction	30/143	• • {Speed control (B60W 30/16 takes precedence)}
20/18	• • • for avoiding ageing of fuel	30/146	• • • {Speed limiting}
20/19	• • • for achieving enhanced acceleration	30/16	• • Control of distance between vehicles, e.g. keeping a distance to preceding vehicle
20/20	• Control strategies involving selection of hybrid configuration, e.g. selection between series or parallel configuration	30/162	• • • {Speed limiting therefor}
20/30	• Control strategies involving selection of transmission gear ratio	30/165	• • • Automatically following the path of a preceding lead vehicle, e.g. "electronic tow-bar"
20/40	• Controlling the engagement or disengagement of prime movers, e.g. for transition between prime movers	30/17	• • • with provision for special action when the preceding vehicle comes to a halt, e.g. stop and go
20/50	• Control strategies for responding to system failures, e.g. for fault diagnosis, failsafe operation or limp mode	30/18	• Propelling the vehicle
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)}		WARNING
30/02	• Control of vehicle driving stability		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
30/025	• • {related to comfort of drivers or passengers}	30/18009	• • {related to particular drive situations}
30/04	• • related to roll-over prevention	30/18018	• • • {Start-stop drive, e.g. in a traffic jam}
2030/041	• • • {about the pitch axis}	30/18027	• • • {Drive off, accelerating from standstill}
2030/043	• • • {about the roll axis}	30/18036	• • • {Reversing}
30/045	• • Improving turning performance	30/18045	• • • • {Rocking, i.e. fast change between forward and reverse}
	WARNING	30/18054	• • • {at stand still, e.g. engine in idling state (hill holding B60W 30/18118)}
	This group is not complete pending a reorganisation, see also B60W 30/02	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}	40/10	. related to vehicle motion
30/18154	. . . {Approaching an intersection}	40/1005	. . {Driving resistance}
30/18163	. . . {Lane change; Overtaking manoeuvres}	40/101	. . Side slip angle of tyre
30/18172	. . {Preventing, or responsive to skidding of wheels}	40/103	. . Side slip angle of vehicle body
30/18181	. . {Propulsion control with common controlling member for different functions}	40/105	. . Speed
30/1819	. . {Propulsion control with control means using analogue circuits, relays or mechanical links}	40/107	. . Longitudinal acceleration
30/182	. . Selecting between different operative modes, e.g. comfort and performance modes	40/109	. . Lateral acceleration
30/184	. . Preventing damage resulting from overload or excessive wear of the driveline	40/11	. . Pitch movement
30/1843	. . . {Overheating of driveline components (B60W 30/186 takes precedence)}	40/112	. . Roll movement
30/1846	. . . {Preventing of breakage of drive line components, e.g. parts of the gearing}	40/114	. . Yaw movement
30/186	. . . excessive wear or burn out of friction elements, e.g. clutches	40/12	. related to parameters of the vehicle itself, {e.g. tyre models}
30/188	. . Controlling power parameters of the driveline, e.g. determining the required power	40/13	. . Load or weight
30/1882	. . . {characterised by the working point of the engine, e.g. by using engine output chart}	2040/1307	. . . {Load distribution on each wheel suspension}
30/1884	. . . {Avoiding stall or overspeed of the engine}	2040/1315	. . . {Location of the centre of gravity}
30/1886	. . . {Controlling power supply to auxiliary devices}	2040/1323	. . . {Moment of inertia of the vehicle body}
30/1888	. . . . {Control of power take off [PTO]}	2040/133	. . . . {about the roll axis}
30/19	. . Improvement of gear change, e.g. by synchronisation or smoothing gear shift	2040/1338	. . . . {about the pitch axis}
30/192	. . Mitigating problems related to power-up or power-down of the driveline, e.g. start-up of a cold engine	2040/1346	. . . . {about the yaw axis}
30/194	. . . related to low temperature conditions, e.g. high viscosity of hydraulic fluid	2040/1353	. . . {Moment of inertia of a sub-unit}
30/20	. . Reducing vibrations in the driveline	2040/1361	. . . . {the component being the engine}
2030/203	. . . {related or induced by the clutch}	2040/1369	. . . . {the component being the clutch}
2030/206	. . . {related or induced by the engine}	2040/1376	. . . . {the component being the transmission}
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}	2040/1384	. . . . {the component being the wheel}
40/02	. related to ambient conditions	2040/1392	. . . {Natural frequency of components}
40/04	. . Traffic conditions	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}
40/06	. . Road conditions		WARNING
40/064	. . . Degree of grip		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
40/068	. . . Road friction coefficient		
40/072	. . . Curvature of the road	2050/0001	. {Details of the control system}
40/076	. . . Slope angle of the road	2050/0002	. . {Automatic control, details of type of controller or control system architecture}
40/08	. related to drivers or passengers	2050/0003	. . . {In analogue systems, e.g. continuous systems}
2040/0809	. . {Driver authorisation; Driver identical check}	2050/0004	. . . {In digital systems, e.g. discrete-time systems involving sampling}
2040/0818	. . {Inactivity or incapacity of driver}	2050/0005	. . . . {Processor details or data handling, e.g. memory registers or chip architecture}
2040/0827	. . . {due to sleepiness}	2050/0006	. . . . {Digital architecture hierarchy}
2040/0836	. . . {due to alcohol}	2050/0008	. . . {Feedback, closed loop systems or details of feedback error signal}
2040/0845	. . . {due to drugs}	2050/0009	. . . . {Proportional differential [PD] controller}
2040/0854	. . . {due to driver cheating, e.g. to circumvent driver tests}	2050/001	. . . . {Proportional integral [PI] controller}
2040/0863	. . . {due to erroneous selection or response of the driver}	2050/0011	. . . . {Proportional Integral Differential [PID] controller}
2040/0872	. . {Driver physiology}	2050/0012	. . . {Feedforward or open loop systems}
2040/0881	. . {Seat occupation; Driver or passenger presence}	2050/0013	. . . {Optimal controllers}
2040/089	. . {Driver voice}	2050/0014	. . . {Adaptive controllers}
40/09	. . Driving style or behaviour	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}	2050/0071	. . . {Controller overrides driver automatically}
2050/0025	. . . . {Transfer function weighting factor}	2050/0072	. . . {Controller asks driver to take over}
2050/0026	. . . {Lookup tables or parameter maps}	2050/0073	. . . {Driver overrides controller}
2050/0027	. . . {Minimum/maximum value selectors}	2050/0074	. . . {Driver shifts control to the controller, e.g. by pressing a button}
2050/0028	. . . {Mathematical models, e.g. for simulation}	2050/0075	. . {Automatic parameter input, automatic initialising or calibrating means}
2050/0029	. . . . {Mathematical model of the driver}	2050/0077	. . . {involving external transmission of data to or from the vehicle}
2050/0031	. . . . {Mathematical model of the vehicle}	2050/0078	. . . . {using Global Position System data}
2050/0032	. . . . . {Quarter vehicle model, i.e. only one vehicle corner}	2050/0079	. . . . {using telemetry}
2050/0033	. . . . . {Single-track, 2D vehicle model, i.e. two-wheel bicycle model}	2050/008	. . . . . {using data transmitted between vehicles, e.g. for platooning, control of inter-vehicle distance}
2050/0034	. . . . . {Multiple-track, 2D vehicle model, e.g. four-wheel model}	2050/0081	. . . . . {using satellite communication}
2050/0035	. . . . . {Multiple-track, 3D vehicle model, e.g. including roll and pitch conditions}	2050/0082	. . . {for initialising the control system}
2050/0036	. . . . . {Multiple-track, 3D multi-body vehicle model, e.g. combination of models for vehicle sub-units}	2050/0083	. . . {Setting, resetting, calibration}
2050/0037	. . . . {Mathematical models of vehicle sub-units}	2050/0085	. . . . {Setting or resetting initial positions}
2050/0039	. . . . . {of the propulsion unit}	2050/0086	. . . . {Recalibrating datum positions, e.g. by using check cycles}
2050/004	. . . . . {of the clutch}	2050/0087	. . . . {Resetting start and end points of actuator travel}
2050/0041	. . . . . {of the drive line}	2050/0088	. . . . {Adaptive recalibration}
2050/0042	. . . {Transfer function lag; delays}	2050/0089	. . . {Historical data record of previous events}
2050/0043	. . {Signal treatments, identification of variables or parameters, parameter estimation or state estimation}	2050/009	. . . {Priority selection}
2050/0044	. . . {In digital systems}	2050/0091	. . . . {of control inputs}
2050/0045	. . . . {using databus protocols}	2050/0093	. . . . . {of the engine}
2050/0047	. . . {Digital-analogue (D/A) or analogue-digital (A/D) conversion}	2050/0094	. . . . {of control units}
2050/0048	. . . {Addition or subtraction of signals}	2050/0095	. . . {Automatic control mode change}
2050/0049	. . . . {Signal offset}	2050/0096	. . . . {Control during transition between modes}
2050/005	. . . {Sampling}	50/0097	. {Predicting future conditions}
2050/0051	. . . . {combined with averaging}	50/0098	. {Details of control systems ensuring comfort, safety or stability not otherwise provided for}
2050/0052	. . . {Filtering, filters}	50/02	. Ensuring safety in case of control system failures, e.g. by diagnosing, circumventing or fixing failures
2050/0054	. . . . {Cut-off filters, retarders, delaying means, dead zones, threshold values or cut-off frequency}	50/0205	. . {Diagnosing or detecting failures; Failure detection models}
2050/0055	. . . . . {High-pass filters}	2050/021	. . . {Means for detecting failure or malfunction}
2050/0056	. . . . . {Low-pass filters}	2050/0215	. . . {Sensor drifts or sensor failures}
2050/0057	. . . {Frequency analysis, spectral techniques or transforms}	2050/022	. . . {Actuator failures}
2050/0058	. . . {Signal modulation for data transmission}	50/0225	. . {Failure correction strategy}
2050/0059	. . . {Signal noise suppression}	50/023	. . Avoiding failures by using redundant parts
2050/006	. . . {Interpolation; Extrapolation}	50/029	. . Adapting to failures or work around with other constraints, e.g. circumvention by avoiding use of failed parts
2050/0062	. {Adapting control system settings}	2050/0292	. . . {Fail-safe or redundant systems, e.g. limp-home or backup systems}
2050/0063	. . {Manual parameter input, manual setting means, manual initialising or calibrating means (for vehicle control input means, control panels see B60K 37/00)}	2050/0295	. . . {Inhibiting action of specific actuators or systems}
2050/0064	. . . {using a remote, e.g. cordless, transmitter or receiver unit, e.g. remote keypad or mobile phone}	2050/0297	. . . {Control Giving priority to different actuators or systems}
2050/0065	. . . {using a personalised data carrier, e.g. magnetic card, memory card or electronic ignition key}	50/032	. . Fixing failures by repairing failed parts, e.g. loosening a sticking valve
2050/0066	. . . {using buttons or a keyboard connected to the on-board processor}	50/035	. . Bringing the control units into a predefined state, e.g. giving priority to particular actuators
2050/0067	. . . . {Confirmation by the driver}	50/038	. . Limiting the input power, torque or speed
2050/0068	. . . {Giving intention of direction, e.g. by indicator lights, steering input}	50/04	. Monitoring the functioning of the control system
2050/007	. . {Switching between manual and automatic parameter input, and <i>vice versa</i> }	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-axes trucks
2300/128	. . . Silo or fluid transporting vehicles
2300/13	. Independent Multi-axe 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	2510/182	. . Brake pressure, e.g. of fluid or between pad and disc
2510/0266	. . Moment of inertia	2510/184	. . Brake temperature, e.g. of fluid, pads or discs
2510/0275	. . Clutch torque	2510/186	. . Status of parking brakes
2510/0283	. . Clutch input shaft speed	2510/188	. . Parking lock mechanisms
2510/0291	. . Clutch temperature	2510/20	. Steering systems
2510/06	. Combustion engines, Gas turbines	2510/202	. . Steering torque
2510/0604	. . Throttle position	2510/205	. . Steering speed
2510/0609	. . . Throttle change rate	2510/207	. . Oversteer or understeer
2510/0614	. . Position of fuel or air injector	2510/22	. Suspension systems
2510/0619	. . . Air-fuel ratio	2510/222	. . Stiffness
2510/0623	. . . Fuel flow rate	2510/225	. . Damping
2510/0628	. . . Inlet air flow rate	2510/227	. . Oscillation frequency
2510/0633	. . Turbocharger state	2510/24	. Energy storage means
2510/0638	. . Engine speed	2510/242	. . for electrical energy
2510/0642	. . . Idle condition	2510/244	. . . Charge state
2510/0647	. . . Coasting condition	2510/246	. . . Temperature
2510/0652	. . . Speed change rate	2510/248	. . . Age of storage means
2510/0657	. . Engine torque	2510/28	. Fuel cells
2510/0661	. . . Torque change rate	2510/285	. . Temperature
2510/0666	. . Engine power	2510/30	. Auxiliary equipments
2510/0671	. . Engine manifold pressure	2510/305	. . Power absorbed by auxiliaries
2510/0676	. . Engine temperature	2520/00	Input parameters relating to overall vehicle dynamics
2510/068	. . Engine exhaust temperature	2520/04	. Vehicle stop
2510/0685	. . Engine crank angle	2520/06	. Direction of travel
2510/069	. . Engine braking signal	2520/10	. Longitudinal speed
2510/0695	. . Inertia	2520/105	. . Longitudinal acceleration
2510/08	. Electric propulsion units	2520/12	. Lateral speed
2510/081	. . Speed	2520/125	. . Lateral acceleration
2510/082	. . . Speed change rate	2520/14	. Yaw
2510/083	. . Torque	2520/16	. Pitch
2510/084	. . . Torque change rate	2520/18	. Roll
2510/085	. . Power	2520/20	. Sideslip angle
2510/086	. . . Power change rate	2520/22	. Articulation angle, e.g. between tractor and trailer
2510/087	. . Temperature	2520/26	. Wheel slip
2510/088	. . Inertia	2520/263	. . Slip values between front and rear axle
2510/09	. Other types of propulsion units, e.g. fluid motors, or type not specified	2520/266	. . Slip values between left and right wheel
2510/10	. Change speed gearings	2520/28	. Wheel speed
2510/1005	. . Transmission ratio engaged	2520/30	. Wheel torque
2510/101	. . . Transmission neutral state	2520/40	. Torque distribution
2510/1015	. . Input shaft speed, e.g. turbine speed	2520/403	. . between front and rear axle
2510/102	. . . Input speed change rate	2520/406	. . between left and right wheel
2510/1025	. . Input torque	2530/00	Input parameters relating to other vehicle conditions or values
2510/103	. . . Input torque change rate	2530/10	. Weight
2510/1035	. . Input power	2530/12	. Catalyst or filter state
2510/104	. . Output speed	2530/14	. Historical data
2510/1045	. . . Output speed change rate	2530/145	. . Mileage
2510/105	. . Output torque	2530/16	. Driving resistance
2510/1055	. . . Output torque change rate	2530/18	. Distance travelled
2510/106	. . Output power	2530/20	. Tyre data
2510/1065	. . . Transmission of zero torque	2530/22	. Towing force
2510/107	. . Temperature	2540/00	Input parameters relating to the driver
2510/1075	. . fluid pressure, e.g. oil pressure	2540/02	. Driver's voice
2510/108	. . . pressure of control fluid	2540/04	. Driver selection, e.g. driver confirmation
2510/1085	. . . pressure of working fluid	2540/06	. Ignition switch
2510/109	. . Direction of power flow	2540/10	. Accelerator pedal position
2510/1095	. . Inertia	2540/103	. . Accelerator thresholds, e.g. kickdown
2510/12	. Differentials	2540/106	. . Rate of change
2510/125	. . Locking status		
2510/18	. Braking system		

2540/12	. Brake pedal position	2710/0616	. . Position of fuel or air injector
2540/14	. Clutch pedal position	2710/0622	. . . Air-fuel ratio
2540/16	. Ratio selector position	2710/0627	. . . Fuel flow rate
2540/165	. . Rate of change	2710/0633	. . . Inlet air flow rate
2540/18	. Steering angle	2710/0638	. . Turbocharger state
2540/20	. Direction indicator values	2710/0644	. . Engine speed
2540/22	. Psychological state; Stress level or workload	2710/065	. . . Idle condition
2540/24	. Drug level, e.g. alcohol	2710/0655	. . . Coasting condition
2540/26	. Incapacity of driver	2710/0661	. . . Speed change rate
2540/28	. Identity of driver	2710/0666	. . Engine torque
2540/30	. Driving style	2710/0672	. . . Torque change rate
2550/00	Input parameters relating to exterior conditions	2710/0677	. . Engine power
2550/10	. from obstacle detection	2710/0683	. . Engine manifold pressure
2550/12	. Ambient conditions, e.g. wind or rain	2710/0688	. . Engine temperature
2550/13	. Altitude	2710/0694	. . Engine exhaust temperature
2550/14	. Road conditions, road types or road features	2710/08	. Electric propulsion units
2550/141	. . Type of road	2710/081	. . Speed
2550/142	. . Road slope	2710/082	. . . Speed change rate
2550/143	. . Road profile	2710/083	. . Torque
2550/145	. . Road altitude	2710/085	. . . Torque change rate
2550/146	. . Road curve radius	2710/086	. . Power
2550/147	. . Road bumpiness, e.g. pavement or potholes	2710/087	. . . Power change rate
2550/148	. . Coefficient of friction	2710/088	. . Temperature
2550/16	. Country codes	2710/09	. Other types of propulsion units, e.g. fluid motors, or type not specified
2550/20	. Traffic related input parameters	2710/10	. Change speed gearings
2550/22	. . Traffic rules, e.g. traffic signs	2710/1005	. . Transmission ratio engaged
2550/30	. . Distance or speed relative to other vehicles	2710/1011	. . Input shaft speed, e.g. turbine speed
2550/302	. . . the longitudinal speed of preceding vehicle	2710/1016	. . . Input speed change rate
2550/304	. . . the lateral speed of preceding vehicle	2710/1022	. . Input torque
2550/306	. . . the position of preceding vehicle	2710/1027	. . . Input torque change rate
2550/308	. . . Distance between vehicles	2710/1033	. . Input power
2550/40	. Involving external transmission of data to or from the vehicle	2710/1038	. . Output speed
2550/402	. . for navigation systems	2710/1044	. . . Output speed change rate
2550/404	. . using telemetry	2710/105	. . Output torque
2550/406	. . using satellite communication	2710/1055	. . . Output torque change rate
2550/408	. . Data transmitted between vehicles	2710/1061	. . Output power
2560/00	Other vehicle related input parameters not covered by groups B60W 2510/00 - B60W 2550/00	2710/1066	. . . Transmission of zero torque
2560/02	. Remaining fuel quantity in tank	2710/1072	. . Temperature
2560/04	. Fuel quality, e.g. water content due to age of fuel	2710/1077	. . fluid pressure, e.g. oil pressure
2560/06	. Fuel type	2710/1083	. . . pressure of control fluid
		2710/1088	. . . pressure of working fluid
		2710/1094	. . Direction of power flow
2600/00	Indexing codes relating to automatic control systems or control processes	2710/12	. Differentials
		2710/125	. . Locking status
		2710/18	. Braking system
2710/00	Output or target parameters relating to a particular sub-units	2710/182	. . Brake pressure, e.g. of fluid or between pad and disc
2710/02	. Clutches	2710/184	. . Brake temperature, e.g. of fluid, pads or discs
2710/021	. . Clutch engagement state	2710/186	. . Status of parking brakes
2710/022	. . . Clutch actuator position	2710/188	. . Parking lock mechanisms
2710/023	. . . Clutch engagement rate	2710/20	. Steering systems
2710/024	. . . of torque converter lock-up clutch	2710/202	. . Steering torque
2710/025	. . Clutch slip, i.e. difference between input and output speeds	2710/205	. . Steering speed
2710/026	. . . Slip change rate	2710/207	. . Steering angle of wheels
2710/027	. . Clutch torque	2710/22	. Suspension systems
2710/028	. . Clutch input shaft speed	2710/223	. . Stiffness
2710/029	. . Clutch temperature	2710/226	. . Damping
2710/06	. Combustion engines, Gas turbines	2710/24	. Energy storage means
2710/0605	. . Throttle position	2710/242	. . for electrical energy
2710/0611	. . . Throttle change rate	2710/244	. . . Charge state

B60W

- 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](#)