

# 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. When classifying in group [B60W 10/00](#), classification must also be made in groups [B60W 20/00](#) - [B60W 60/00](#) in order to identify the purpose or use of the control.
4. 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, 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 on board 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 vehicle for transportation on roads, e.g. an automobile, truck or bus;
  - "autonomous road vehicle" means a road vehicle capable of controlling all dynamic driving tasks without human intervention during {a plurality of} driving scenarios by using on-board computer hardware and software to execute decision making processes in real-time.
  - "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.

### WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

**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 50/00](#) - [B60L 58/00](#))

### NOTE

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

### WARNING

Group [B60W 10/00](#) is incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 10/02 . including control of driveline clutches

**WARNING**

Group [B60W 10/02](#) is incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 10/023 . . {Fluid clutches}

**WARNING**

Group [B60W 10/023](#) is incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#). Group [B60W 10/023](#) is also impacted by reclassification into groups [B60W 10/024](#) and [B60W 10/026](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 10/0235 . . . {of bridging or lock-up clutches}

**WARNING**

Group [B60W 10/0235](#) is incomplete pending reclassification of documents from groups [B60W 10/026](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 10/024 . . {including control of torque converters}

**WARNING**

Group [B60W 10/024](#) is incomplete pending reclassification of documents from groups [B60W 10/023](#), [B60W 10/026](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 10/026 . . . {of lock-up clutches}

**WARNING**

Group [B60W 10/026](#) is incomplete pending reclassification of documents from groups [B60W 10/023](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#). Group [B60W 10/026](#) is also impacted by reclassification into groups [B60W 10/0235](#) and [B60W 10/024](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 10/04 . including control of propulsion units

**WARNING**

Groups [B60W 10/04](#) - [B60W 10/08](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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

**WARNING**

Groups [B60W 10/10](#) - [B60W 10/115](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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)

**WARNING**

Group [B60W 10/119](#) is incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 10/12 . including control of differentials

**WARNING**

Groups [B60W 10/12](#) - [B60W 10/16](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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

**WARNING**

Groups [B60W 10/18](#) - [B60W 10/198](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 10/182 . . {including control of parking brakes}
- 10/184 . . with wheel brakes
- 10/188 . . . hydraulic brakes
- 10/192 . . . electric brakes
- 10/196 . . acting within the driveline, e.g. retarders
- 10/198 . . with exhaust brakes
- 10/20 . including control of steering systems

**WARNING**

Group [B60W 10/20](#) is incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 10/22 . including control of suspension systems

**WARNING**

Group [B60W 10/22](#) is incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 10/24 . including control of energy storage means

**WARNING**

Groups [B60W 10/24](#) - [B60W 10/26](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 10/26 . . for electrical energy, e.g. batteries or capacitors

- 10/28 . including control of fuel cells

**WARNING**

Group [B60W 10/28](#) is incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 10/30 . including control of auxiliary equipment, e.g. air-conditioning compressors or oil pumps

**WARNING**

Group [B60W 10/30](#) is incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 20/00 **Control systems specially adapted for hybrid vehicles** {(hybrid vehicle design, [B60K 6/00](#); electric vehicles [B60L](#))}

**WARNING**

Groups [B60W 20/00](#) - [B60W 20/50](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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 {(utilising navigation and traffic information in the control strategy [B60W 20/12](#))}
- 20/12 . . using control strategies taking into account route information {(estimation or calculation of non-directly measurable driving parameters [B60W 40/00](#))}
- 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 {(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](#))}

20/40	• Controlling the engagement or disengagement of prime movers, e.g. for transition between prime movers {( <a href="#">power-up or power-down of the driveline B60W 30/192</a> )}	30/18027	• • • {Drive off, accelerating from standstill}
20/50	• Control strategies for responding to system failures, e.g. for fault diagnosis, failsafe operation or limp mode	30/18036	• • • {Reversing}
30/00	<b>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] <a href="#">B60T 8/00</a>)}</b> <b>WARNING</b> Groups <a href="#">B60W 30/00</a> - <a href="#">B60W 2030/206</a> are incomplete pending reclassification of documents from groups <a href="#">G05D 1/0061</a> , <a href="#">G05D 1/0088</a> , <a href="#">G05D 1/021</a> , <a href="#">G05D 1/0214</a> , <a href="#">G05D 1/0221</a> , and <a href="#">G05D 1/0223</a> . All groups listed in this Warning should be considered in order to perform a complete search.	30/18045	• • • {Rocking, i.e. fast change between forward and reverse}
30/02	• Control of vehicle driving stability	30/18054	• • • {at stand still, e.g. engine in idling state ( <a href="#">hill holding B60W 30/18118</a> )}
30/025	• • {related to comfort of drivers or passengers}	30/18063	• • • {Creeping}
30/04	• • related to roll-over prevention	30/18072	• • • {Coasting}
2030/041	• • • {about the pitch axis}	2030/18081	• • • {With torque flow from driveshaft to engine, i.e. engine being driven by vehicle}
2030/043	• • • {about the roll axis}	2030/1809	• • • {Without torque flow between driveshaft and engine, e.g. with clutch disengaged or transmission in neutral}
30/045	• • Improving turning performance	30/181	• • • {Preparing for stopping}
30/06	• Automatic manoeuvring for parking ( <a href="#">controlling only the steering B62D 15/0285</a> )	30/18109	• • • {Braking}
30/08	• {Active safety systems} predicting or avoiding probable or impending collision {or attempting to minimise its consequences}	30/18118	• • • {Hill holding}
2030/082	• • {Vehicle operation after collision}	30/18127	• • • {Regenerative braking}
30/085	• • Taking automatic action to adjust vehicle attitude in preparation for collision, e.g. braking for nose dropping	30/18136	• • • {Engine braking}
30/09	• • Taking automatic action to avoid collision, e.g. braking and steering	30/18145	• • • {Cornering}
30/095	• • Predicting travel path or likelihood of collision	30/18154	• • • {Approaching an intersection}
30/0953	• • • {the prediction being responsive to vehicle dynamic parameters}	30/18159	• • • {Traversing an intersection}
30/0956	• • • {the prediction being responsive to traffic or environmental parameters}	<b>WARNING</b> Group <a href="#">B60W 30/18159</a> is incomplete pending reclassification of documents from groups <a href="#">B60W 30/12</a> , <a href="#">B60W 30/16</a> , <a href="#">B60W 30/162</a> , <a href="#">B60W 30/165</a> , <a href="#">B60W 30/17</a> , <a href="#">B60W 30/182</a> , <a href="#">B60W 50/082</a> , <a href="#">G05D 1/0061</a> , <a href="#">G05D 1/0088</a> , <a href="#">G05D 1/021</a> , <a href="#">G05D 1/0214</a> , <a href="#">G05D 1/0221</a> , and <a href="#">G05D 1/0223</a> . All groups listed in this Warning should be considered in order to perform a complete search.	
30/10	• Path keeping {(cruise control for automatically following a preceding vehicle <a href="#">B60W 30/165</a> )}	30/18163	• • • {Lane change; Overtaking manoeuvres}
30/12	• • Lane keeping	30/18172	• • {Preventing, or responsive to skidding of wheels}
30/14	• {Adaptive} cruise control	30/18181	• • {Propulsion control with common controlling member for different functions}
30/143	• • {Speed control ( <a href="#">B60W 30/16</a> takes precedence)}	30/1819	• • {Propulsion control with control means using analogue circuits, relays or mechanical links}
30/146	• • • {Speed limiting}	30/182	• • Selecting between different operative modes, e.g. comfort and performance modes
30/16	• • Control of distance between vehicles, e.g. keeping a distance to preceding vehicle	30/184	• • Preventing damage resulting from overload or excessive wear of the driveline
30/162	• • • {Speed limiting therefor}	30/1843	• • • {Overheating of driveline components ( <a href="#">B60W 30/186</a> takes precedence)}
30/165	• • • Automatically following the path of a preceding lead vehicle, e.g. "electronic tow-bar"	30/1846	• • • {Preventing of breakage of drive line components, e.g. parts of the gearing}
30/17	• • • with provision for special action when the preceding vehicle comes to a halt, e.g. stop and go	30/186	• • • excessive wear or burn out of friction elements, e.g. clutches
30/18	• Propelling the vehicle	30/188	• • Controlling power parameters of the driveline, e.g. determining the required power
30/18009	• • {related to particular drive situations}	30/1882	• • • {characterised by the working point of the engine, e.g. by using engine output chart}
30/18018	• • • {Start-stop drive, e.g. in a traffic jam}	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}

#### **WARNING**

Groups [B60W 40/00](#) - [B60W 2040/1392](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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**

Groups [B60W 50/00](#) - [B60W 50/16](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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 }	2050/0095	. . . .	{ Automatic control mode change }
2050/004	. . . . .	{ of the clutch }	2050/0096	. . . .	{ Control during transition between modes }
2050/0041	. . . . .	{ of the drive line }	50/0097	. . . .	{ Predicting future conditions }
2050/0042	. . . .	{ Transfer function lag; delays }	50/0098	. . . .	{ Details of control systems ensuring comfort, safety or stability not otherwise provided for }
2050/0043	. . . .	{ Signal treatments, identification of variables or parameters, parameter estimation or state estimation }	50/02	. . . .	{ Ensuring safety in case of control system failures, e.g. by diagnosing, circumventing or fixing failures }
2050/0044	. . . .	{ In digital systems }	50/0205	. . . .	{ Diagnosing or detecting failures; Failure detection models }
2050/0045	. . . .	{ using databus protocols }	2050/021	. . . .	{ Means for detecting failure or malfunction }
2050/0047	. . . .	{ Digital-analogue (D/A) or analogue-digital (A/D) conversion }	2050/0215	. . . .	{ Sensor drifts or sensor failures }
2050/0048	. . . .	{ Addition or subtraction of signals }	2050/022	. . . .	{ Actuator failures }
2050/0049	. . . .	{ Signal offset }	50/0225	. . . .	{ Failure correction strategy }
2050/005	. . . .	{ Sampling }	50/023	. . . .	{ Avoiding failures by using redundant parts }
2050/0051	. . . .	{ combined with averaging }	50/029	. . . .	{ Adapting to failures or work around with other constraints, e.g. circumvention by avoiding use of failed parts }
2050/0052	. . . .	{ Filtering, filters }	2050/0292	. . . .	{ Fail-safe or redundant systems, e.g. limp-home or backup systems }
2050/0054	. . . .	{ Cut-off filters, retarders, delaying means, dead zones, threshold values or cut-off frequency }	2050/0295	. . . .	{ Inhibiting action of specific actuators or systems }
2050/0055	. . . .	{ High-pass filters }	2050/0297	. . . .	{ Control Giving priority to different actuators or systems }
2050/0056	. . . .	{ Low-pass filters }	50/032	. . . .	{ Fixing failures by repairing failed parts, e.g. loosening a sticking valve }
2050/0057	. . . .	{ Frequency analysis, spectral techniques or transforms }	50/035	. . . .	{ Bringing the control units into a predefined state, e.g. giving priority to particular actuators }
2050/0058	. . . .	{ Signal modulation for data transmission }	50/038	. . . .	{ Limiting the input power, torque or speed }
2050/0059	. . . .	{ Signal noise suppression }	50/04	. . . .	{ Monitoring the functioning of the control system }
2050/006	. . . .	{ Interpolation; Extrapolation }	2050/041	. . . .	{ Built in Test Equipment [BITE] }
2050/0062	. . . .	{ Adapting control system settings }	2050/043	. . . .	{ Testing equipment at KEY-ON }
2050/0063	. . . .	{ Manual parameter input, manual setting means, manual initialising or calibrating means (for vehicle control input means, control panels see B60K 37/00) }	50/045	. . . .	{ Monitoring control system parameters }
2050/0064	. . . .	{ using a remote, e.g. cordless, transmitter or receiver unit, e.g. remote keypad or mobile phone }	2050/046	. . . .	{ involving external transmission of data to or from the vehicle, e.g. via telemetry, satellite, Global Positioning System [GPS] }
2050/0065	. . . .	{ using a personalised data carrier, e.g. magnetic card, memory card or electronic ignition key }	2050/048	. . . .	{ displaying data transmitted between vehicles, e.g. for platooning, control of inter-vehicle distance }
2050/0066	. . . .	{ using buttons or a keyboard connected to the on-board processor }	50/06	. . . .	{ Improving the dynamic response of the control system, e.g. improving the speed of regulation or avoiding hunting or overshoot }
2050/0067	. . . .	{ Confirmation by the driver }	2050/065	. . . .	{ by reducing the computational load on the digital processor of the control computer }
2050/0068	. . . .	{ Giving intention of direction, e.g. by indicator lights, steering input }	50/08	. . . .	{ Interaction between the driver and the control system }
2050/007	. . . .	{ Switching between manual and automatic parameter input, and vice versa }	50/082	. . . .	{ Selecting or switching between different modes of propelling }
2050/0071	. . . .	{ Controller overrides driver automatically }	50/085	. . . .	{ Changing the parameters of the control units, e.g. changing limit values, working points by control input }
2050/0072	. . . .	{ Controller asks driver to take over }	50/087	. . . .	{ where the control system corrects or modifies a request from the driver }
2050/0073	. . . .	{ Driver overrides controller }	50/10	. . . .	{ Interpretation of driver requests or demands }
2050/0074	. . . .	{ Driver shifts control to the controller, e.g. by pressing a button }	50/12	. . . .	{ Limiting control by the driver depending on vehicle state, e.g. interlocking means for the control input for preventing unsafe operation }
2050/0075	. . . .	{ Automatic parameter input, automatic initialising or calibrating means }	50/14	. . . .	{ Means for informing the driver, warning the driver or prompting a driver intervention }
2050/0082	. . . .	{ for initialising the control system }	2050/143	. . . .	{ Alarm means (B60W 50/16 takes precedence) }
2050/0083	. . . .	{ Setting, resetting, calibration }	2050/146	. . . .	{ Display means }
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 }			
2050/009	. . . .	{ Priority selection }			
2050/0091	. . . .	{ of control inputs }			
2050/0093	. . . .	{ of the engine }			
2050/0094	. . . .	{ of control units }			

- 50/16 . . . Tactile feedback to the driver, e.g. vibration or force feedback to the driver on the steering wheel or the accelerator pedal

**60/00 Drive control systems specially adapted for autonomous road vehicles**

**WARNING**

Groups [B60W 60/00](#) - [B60W 60/007](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [B60W 30/12](#), [B60W 30/16](#), [B60W 30/162](#), [B60W 30/165](#), [B60W 30/17](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 60/001 . {Planning or execution of driving tasks}
- 60/0011 . . {involving control alternatives for a single driving scenario, e.g. planning several paths to avoid obstacles}
- 60/0013 . . {specially adapted for occupant comfort}
- 60/00133 . . . {for resting}
- 60/00136 . . . {for intellectual activities, e.g. reading, gaming or working}
- 60/00139 . . . {for sight-seeing}
- 60/0015 . . {specially adapted for safety}
- 60/0016 . . . {of the vehicle or its occupants}
- 60/0017 . . . {of other traffic participants}
- 60/0018 . . . {by employing degraded modes, e.g. reducing speed, in response to suboptimal conditions}
- 60/00182 . . . . {in response to weather conditions}
- 60/00184 . . . . {related to infrastructure}
- 60/00186 . . . . {related to the vehicle}
- 60/00188 . . . . {related to detected security violation of control systems, e.g. hacking of moving vehicle}
- 60/0021 . . {specially adapted for travel time}
- 60/0023 . . {in response to energy consumption}
- 60/0024 . . {with mediation between passenger and vehicle requirements, e.g. decision between dropping off a passenger or urgent vehicle service}
- 60/0025 . . {specially adapted for specific operations}
- 60/00253 . . . {Taxi operations}
- 60/00256 . . . {Delivery operations}
- 60/00259 . . . {Surveillance operations}
- 60/0027 . . {using trajectory prediction for other traffic participants}
- 60/00272 . . . {relying on extrapolation of current movement}
- 60/00274 . . . {considering possible movement changes}
- 60/00276 . . . {for two or more other traffic participants}
- 60/005 . {Handover processes (between vehicles and remote control entities [G05D 1/0011](#))}
- 60/0051 . . {from occupants to vehicle}
- 60/0053 . . {from vehicle to occupant}
- 60/0054 . . . {Selection of occupant to assume driving tasks}
- 60/0055 . . . {only part of driving tasks shifted to occupants}
- 60/0057 . . {Estimation of the time available or required for the handover}

- 60/0059 . . {Estimation of the risk associated with autonomous or manual driving, e.g. situation too complex, sensor failure or driver incapacity}
- 60/0061 . . {Aborting handover process}
- 60/007 . {Emergency override (remote control [G05D 1/0011](#))}

**2300/00 Indexing codes relating to the type of vehicle**

**WARNING**

Groups [B60W 2300/00](#) - [B60W 2300/50](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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****WARNING**

Group [B60W 2400/00](#) is incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

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

Groups [B60W 2420/00](#) - [B60W 2420/905](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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****WARNING**

Groups [B60W 2422/00](#) - [B60W 2422/95](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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****WARNING**

Groups [B60W 2510/00](#) - [B60W 2510/305](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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

##### **WARNING**

Groups [B60W 2520/00](#) - [B60W 2520/406](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

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 vehicle conditions or values, not covered by groups [B60W 2510/00](#) or [B60W 2520/00](#)

##### **WARNING**

Group [B60W 2530/00](#) - [B60W 2530/20](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

2530/10	. .	Weight
2530/12	. .	Catalyst or filter state
2530/13	. .	Mileage
2530/16	. .	Driving resistance
2530/18	. .	Distance travelled
2530/20	. .	Tyre data
2530/201	. .	Dimensions of vehicle

##### **WARNING**

Groups [B60W 2530/201](#) - [B60W 2530/213](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [B60W 30/12](#), [B60W 30/16](#), [B60W 30/162](#), [B60W 30/165](#), [B60W 30/17](#), [B60W 30/182](#), [B60W 50/082](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

2530/203	. .	Presence of trailer
2530/205	. .	Dimensions of trailer
2530/207	. .	Towing force
2530/209	. .	Fuel quantity remaining in tank
2530/211	. .	Fuel quality, e.g. water content due to age of fuel
2530/213	. .	Fuel type

#### 2540/00 Input parameters relating to occupants

##### **WARNING**

Group [B60W 2540/00](#) is incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2540/01 . Occupants other than the driver

**WARNING**

Groups [B60W 2540/01](#) - [B60W 2540/049](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [B60W 30/12](#), [B60W 30/16](#), [B60W 30/162](#), [B60W 30/165](#), [B60W 30/17](#), [B60W 30/182](#), [B60W 50/082](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2540/041 . Potential occupants
- 2540/043 . Identity of occupants
- 2540/045 . Occupant permissions
- 2540/047 . Prioritizing desires of multiple occupants, e.g. when setting climate control or driving behaviour
- 2540/049 . Number of occupants
- 2540/06 . Ignition switch

**WARNING**

Groups [B60W 2540/06](#) - [B60W 2540/20](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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
- 2540/21 . Voice

**WARNING**

Groups [B60W 2540/21](#) - [B60W 2540/215](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [B60W 30/12](#), [B60W 30/16](#), [B60W 30/162](#), [B60W 30/165](#), [B60W 30/17](#), [B60W 30/182](#), [B60W 50/082](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2540/215 . Selection or confirmation of options

- 2540/22 . Psychological state; Stress level or workload

**WARNING**

Group [B60W 2540/22](#) is incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2540/221 . Physiology, e.g. weight, heartbeat, health or special needs

**WARNING**

Groups [B60W 2540/221](#) - [B60W 2540/229](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [B60W 30/12](#), [B60W 30/16](#), [B60W 30/162](#), [B60W 30/165](#), [B60W 30/17](#), [B60W 30/182](#), [B60W 50/082](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2540/223 . Posture, e.g. hand, foot, or seat position, turned or inclined
- 2540/225 . Direction of gaze
- 2540/227 . Position in the vehicle
- 2540/229 . Attention level, e.g. attentive to driving, reading or sleeping
- 2540/24 . Drug level, e.g. alcohol

**WARNING**

Groups [B60W 2540/24](#) - [B60W 2540/30](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2540/26 . Incapacity
- 2540/30 . Driving style

**2552/00 Input parameters relating to infrastructure****WARNING**

Group [B60W 2552/00](#) is incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#). Group [B60W 2552/00](#) is also impacted by reclassification into groups [B60W 2552/00](#) - [B60W 2552/53](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2552/05 . Type of road

#### **WARNING**

Group [B60W 2552/05](#) is incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#). Group [B60W 2552/05](#) is also impacted by reclassification into groups [B60W 2552/05](#) and [B60W 2552/10](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2552/10 . Number of lanes

#### **WARNING**

Groups [B60W 2552/10](#) – [B60W 2552/53](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [B60W 2552/00](#), [B60W 2552/05](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2552/15 . Road slope  
2552/20 . Road profile  
2552/25 . Road altitude  
2552/30 . Road curve radius  
2552/35 . Road bumpiness, e.g. pavement or potholes  
2552/40 . Coefficient of friction  
2552/45 . Pedestrian sidewalk  
2552/50 . Barriers  
2552/53 . Road markings, e.g. lane marker or crosswalk

#### **2554/00 Input parameters relating to objects**

#### **WARNING**

Group [B60W 2554/00](#) is incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

Group [B60W 2554/00](#) is also impacted by reclassification into groups [B60W 2554/20](#), [B60W 2554/40](#), [B60W 2554/402](#), [B60W 2554/4023](#), [B60W 2554/4026](#), [B60W 2554/4029](#), [B60W 2554/404](#), [B60W 2554/4041](#), [B60W 2554/4042](#), [B60W 2554/4043](#), [B60W 2554/4044](#), [B60W 2554/4045](#), [B60W 2554/4046](#), [B60W 2554/4047](#), [B60W 2554/4048](#), [B60W 2554/4049](#), [B60W 2554/406](#), [B60W 2554/408](#), [B60W 2554/60](#), [B60W 2554/80](#), [B60W 2554/801](#), [B60W 2554/802](#), [B60W 2554/803](#), [B60W 2554/804](#), [B60W 2554/805](#), and [B60W 2554/806](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2554/20 . Static objects

#### **WARNING**

Groups [B60W 2554/20](#) - [B60W 2554/60](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#), [B60K 2028/003](#), [B60K 2028/006](#), [B60K 28/02](#), [B60K 28/04](#), [B60K 28/06](#), [B60K 28/063](#), [B60K 28/066](#), [B60K 28/08](#), [B60K 28/10](#), [B60K 28/12](#), [B60K 28/14](#), [B60K 28/16](#), [B60K 28/165](#), [B60W 2554/00](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2554/40 . Dynamic objects, e.g. animals, windblown objects  
2554/402 . . Type  
2554/4023 . . . large-size vehicles, e.g. trucks  
2554/4026 . . . Cycles  
2554/4029 . . . Pedestrians  
2554/404 . . Characteristics  
2554/4041 . . . Position  
2554/4042 . . . Longitudinal speed  
2554/4043 . . . Lateral speed  
2554/4044 . . . Direction of movement, e.g. backwards  
2554/4045 . . . Intention, e.g. lane change or imminent movement  
2554/4046 . . . Behavior, e.g. aggressive or erratic  
2554/4047 . . . Attentiveness, e.g. distracted by mobile phone  
2554/4048 . . . Field of view, e.g. obstructed view or direction of gaze  
2554/4049 . . . Relationship among other objects, e.g. converging dynamic objects  
2554/406 . . Traffic density  
2554/408 . . Traffic behavior, e.g. swarm  
2554/60 . Traversable objects, e.g. speed bumps or curbs  
2554/80 . Spatial relation or speed relative to objects

#### **WARNING**

Group [B60W 2554/80](#) is incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [B60W 2554/00](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

Group [B60W 2554/80](#) is also impacted by reclassification into groups [B60W 2554/801](#), [B60W 2554/802](#), [B60W 2554/803](#), [B60W 2554/804](#), [B60W 2554/805](#), and [B60W 2554/806](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2554/801 . . Lateral distance

#### **WARNING**

Groups [B60W 2554/801](#) - [B60W 2554/806](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#), [B60K 2028/003](#), [B60K 2028/006](#), [B60K 28/02](#), [B60K 28/04](#), [B60K 28/06](#), [B60K 28/063](#), [B60K 28/066](#), [B60K 28/08](#), [B60K 28/10](#), [B60K 28/12](#), [B60K 28/14](#), [B60K 28/16](#), [B60K 28/165](#), [B60W 2554/00](#), [B60W 2554/80](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2554/802 . . Longitudinal distance  
 2554/803 . . Relative lateral speed  
 2554/804 . . Relative longitudinal speed  
 2554/805 . . Azimuth angle  
 2554/806 . . Relative heading

- 2555/00** **Input parameters relating to exterior conditions, not covered by groups [B60W 2552/00](#), [B60W 2554/00](#)**

#### **WARNING**

Groups [B60W 2555/00](#) - [B60W 2555/80](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2555/20 . Ambient conditions, e.g. wind or rain  
 2555/40 . Altitude  
 2555/60 . Traffic rules, e.g. speed limits or right of way  
 2555/80 . . Country specific, e.g. driver age limits or right hand drive

- 2556/00** **Input parameters relating to data**

#### **WARNING**

Groups [B60W 2556/00](#) - [B60W 2556/40](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [B60W 30/12](#), [B60W 30/16](#), [B60W 30/162](#), [B60W 30/165](#), [B60W 30/17](#), [B60W 30/182](#), [B60W 50/082](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2556/05 . Big data  
 2556/10 . Historical data  
 2556/15 . Data age  
 2556/20 . Data confidence level  
 2556/25 . Data precision  
 2556/30 . Data update rate  
 2556/35 . Data fusion  
 2556/40 . High definition maps

- 2556/45 . External transmission of data to or from the vehicle

#### **WARNING**

Groups [B60W 2556/45](#) - [B60W 2556/65](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [B60W 30/12](#), [B60W 30/16](#), [B60W 30/162](#), [B60W 30/165](#), [B60W 30/17](#), [B60W 30/182](#), [B60W 50/082](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2556/50 . . for navigation systems  
 2556/55 . . using telemetry  
 2556/60 . . using satellite communication  
 2556/65 . . Data transmitted between vehicles

- 2710/00** **Output or target parameters relating to a particular sub-units**

#### **WARNING**

Groups [B60W 2710/00](#) - [B60W 2710/305](#) are incomplete pending reclassification of documents from groups [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 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	2720/103	. . Speed profile
2710/085	. . . Torque change rate	2720/106	. . Longitudinal acceleration
2710/086	. . Power	2720/12	. Lateral speed
2710/087	. . . Power change rate	2720/125	. . Lateral acceleration
2710/088	. . Temperature	2720/14	. Yaw
2710/09	. Other types of propulsion units, e.g. fluid motors, or type not specified	2720/16	. Pitch
2710/10	. Change speed gearings	2720/18	. Roll
2710/1005	. . Transmission ratio engaged	2720/20	. Sideslip angle
2710/1011	. . Input shaft speed, e.g. turbine speed	2720/22	. Articulation angle, e.g. between tractor and trailer
2710/1016	. . . Input speed change rate	2720/24	. Direction of travel
2710/1022	. . Input torque	2720/26	. Wheel slip
2710/1027	. . . Input torque change rate	2720/263	. . Slip values between front and rear axle
2710/1033	. . Input power	2720/266	. . Slip values between left and right wheel
2710/1038	. . Output speed	2720/28	. Wheel speed
2710/1044	. . . Output speed change rate	2720/30	. Wheel torque
2710/105	. . Output torque	2720/40	. Torque distribution
2710/1055	. . . Output torque change rate	2720/403	. . between front and rear axle
2710/1061	. . Output power	2720/406	. . between left and right wheel
2710/1066	. . . Transmission of zero torque		
2710/1072	. . Temperature	<b>2754/00</b>	<b>Output or target parameters relating to objects</b>
2710/1077	. . fluid pressure, e.g. oil pressure		<b>WARNING</b>
2710/1083	. . . pressure of control fluid		Group <a href="#">B60W 2754/00</a> is incomplete pending reclassification of documents from groups <a href="#">B60K 28/00</a> - <a href="#">B60K 28/165</a> , <a href="#">G05D 1/0061</a> , <a href="#">G05D 1/0088</a> , <a href="#">G05D 1/021</a> , <a href="#">G05D 1/0214</a> , <a href="#">G05D 1/0221</a> , and <a href="#">G05D 1/0223</a> .
2710/1088	. . . pressure of working fluid		All groups listed in this Warning should be considered in order to perform a complete search.
2710/1094	. . Direction of power flow		
2710/12	. Differentials	2754/10	. Spatial relation or speed relative to objects
2710/125	. . Locking status		<b>WARNING</b>
2710/18	. Braking system		Groups <a href="#">B60W 2754/10</a> is incomplete pending reclassification of documents from groups <a href="#">B60K 28/00</a> , <a href="#">B60K 2028/003</a> , <a href="#">B60K 2028/006</a> , <a href="#">B60K 28/02</a> , <a href="#">B60K 28/04</a> , <a href="#">B60K 28/06</a> , <a href="#">B60K 28/063</a> , <a href="#">B60K 28/066</a> , <a href="#">B60K 28/08</a> , <a href="#">B60K 28/10</a> , <a href="#">B60K 28/12</a> , <a href="#">B60K 28/14</a> , <a href="#">B60K 28/16</a> , <a href="#">B60K 28/165</a> , <a href="#">G05D 1/0061</a> , <a href="#">G05D 1/0088</a> , <a href="#">G05D 1/021</a> , <a href="#">G05D 1/0214</a> , <a href="#">G05D 1/0221</a> , and <a href="#">G05D 1/0223</a> .
2710/182	. . Brake pressure, e.g. of fluid or between pad and disc		Group <a href="#">B60W 2754/10</a> is also impacted by reclassification into groups <a href="#">B60W 2754/20</a> , <a href="#">B60W 2754/30</a> , <a href="#">B60W 2754/40</a> , <a href="#">B60W 2754/50</a> , <a href="#">B60W 2754/60</a> , and <a href="#">B60W 2754/70</a> .
2710/184	. . Brake temperature, e.g. of fluid, pads or discs		All groups listed in this Warning should be considered in order to perform a complete search.
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		
<b>2720/00</b>	<b>Output or target parameters relating to overall vehicle dynamics</b>		
	<b>WARNING</b>		
	Groups <a href="#">B60W 2720/00</a> - <a href="#">B60W 2720/406</a> are incomplete pending reclassification of documents from groups <a href="#">G05D 1/0061</a> , <a href="#">G05D 1/0088</a> , <a href="#">G05D 1/021</a> , <a href="#">G05D 1/0214</a> , <a href="#">G05D 1/0221</a> , and <a href="#">G05D 1/0223</a> .		
	All groups listed in this Warning should be considered in order to perform a complete search.		
2720/10	. Longitudinal speed	2754/30	. . Longitudinal distance
		2754/40	. . Relative lateral speed

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- 2754/50 . . Relative longitudinal speed
- 2754/60 . . Azimuth angle
- 2754/70 . . Relative heading

### 2756/00 Output or target parameters relating to data

#### WARNING

Group [B60W 2756/00](#) - [B60W 2756/10](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2756/10 . 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](#)

#### WARNING

Group [B60W 2900/00](#) is incomplete pending reclassification of documents from groups [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).

All groups listed in this Warning should be considered in order to perform a complete search.