

# 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.
- 10/024 . . {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 group [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 {(power-up or power-down of the driveline [B60W 30/192](#))}
- 20/50 . Control strategies for responding to system failures, e.g. for fault diagnosis, failsafe operation or limp mode

**30/00 Purposes of road vehicle drive control systems not related to the control of a particular sub-unit, e.g. of systems using conjoint control of vehicle sub-units**

**WARNING**

Groups [B60W 30/00](#) - [B60W 2030/206](#) 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.

- 30/02 . Control of vehicle driving stability
- 30/025 . . {related to comfort of drivers or passengers}
- 30/04 . . related to roll-over prevention
- 2030/041 . . . {about the pitch axis}
- 2030/043 . . . {about the roll axis}
- 30/045 . . Improving turning performance
- 30/06 . Automatic manoeuvring for parking
- 30/08 . {Active safety systems} predicting or avoiding probable or impending collision {or attempting to minimise its consequences}
- 2030/082 . . {Vehicle operation after collision}
- 30/085 . . Taking automatic action to adjust vehicle attitude in preparation for collision, e.g. braking for nose dropping
- 30/09 . . Taking automatic action to avoid collision, e.g. braking and steering
- 30/095 . . Predicting travel path or likelihood of collision
- 30/0953 . . . {the prediction being responsive to vehicle dynamic parameters}
- 30/0956 . . . {the prediction being responsive to traffic or environmental parameters}
- 30/10 . Path keeping {cruise control for automatically following a preceding vehicle [B60W 30/165](#)}
- 30/12 . . Lane keeping
- 30/14 . {Adaptive} cruise control
- 30/143 . . {Speed control ([B60W 30/16](#) takes precedence)}
- 30/146 . . . {Speed limiting}
- 30/16 . . Control of distance between vehicles, e.g. keeping a distance to preceding vehicle
- 30/162 . . . {Speed limiting therefor}
- 30/165 . . . Automatically following the path of a preceding lead vehicle, e.g. "electronic tow-bar"
- 30/17 . . . with provision for special action when the preceding vehicle comes to a halt, e.g. stop and go
- 30/18 . Propelling the vehicle
- 30/18009 . . {related to particular drive situations}
- 30/18018 . . . {Start-stop drive, e.g. in a traffic jam}
- 30/18027 . . . {Drive off, accelerating from standstill}
- 30/18036 . . . {Reversing}
- 30/18045 . . . . {Rocking, i.e. fast change between forward and reverse}
- 30/18054 . . . {at stand still, e.g. engine in idling state ([hill holding \[B60W 30/18118\]\(#\)](#))}
- 30/18063 . . . {Creeping}
- 30/18072 . . . {Coasting}
- 2030/18081 . . . . {With torque flow from driveshaft to engine, i.e. engine being driven by vehicle}

- 2030/1809 . . . . {Without torque flow between driveshaft and engine, e.g. with clutch disengaged or transmission in neutral}
- 30/181 . . . {Preparing for stopping}
- 30/18109 . . . {Braking}
- 30/18118 . . . . {Hill holding}
- 30/18127 . . . . {Regenerative braking}
- 30/18136 . . . . {Engine braking}
- 30/18145 . . . {Cornering}
- 30/18154 . . . {Approaching an intersection}
- 30/18159 . . . {Traversing an intersection}

**WARNING**

Group [B60W 30/18159](#) is incomplete pending reclassification of documents from groups [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.

- 30/18163 . . . {Lane change; Overtaking manoeuvres}
- 30/18172 . . {Preventing, or responsive to skidding of wheels}
- 30/18181 . . {Propulsion control with common controlling member for different functions}
- 30/1819 . . {Propulsion control with control means using analogue circuits, relays or mechanical links}
- 30/182 . . Selecting between different operative modes, e.g. comfort and performance modes
- 30/184 . . Preventing damage resulting from overload or excessive wear of the driveline
- 30/1843 . . . {Overheating of driveline components ([B60W 30/186](#) takes precedence)}
- 30/1846 . . . {Preventing of breakage of drive line components, e.g. parts of the gearing}
- 30/186 . . . excessive wear or burn out of friction elements, e.g. clutches
- 30/188 . . Controlling power parameters of the driveline, e.g. determining the required power
- 30/1882 . . . {characterised by the working point of the engine, e.g. by using engine output chart}
- 30/1884 . . . {Avoiding stall or overspeed of the engine}
- 30/1886 . . . {Controlling power supply to auxiliary devices}
- 30/1888 . . . . {Control of power take off [PTO]}
- 30/19 . . Improvement of gear change, e.g. by synchronisation or smoothing gear shift
- 30/192 . . Mitigating problems related to power-up or power-down of the driveline, e.g. start-up of a cold engine
- 30/194 . . . related to low temperature conditions, e.g. high viscosity of hydraulic fluid
- 30/20 . . Reducing vibrations in the driveline
- 2030/203 . . . {related or induced by the clutch}
- 2030/206 . . . {related or induced by the engine}

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

**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 identity 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}
- 2050/004 . . . . {of the clutch}
- 2050/0041 . . . . {of the drive line}
- 2050/0042 . . . {Transfer function lag; delays}

- 2050/0043 . . . {Signal treatments, identification of variables or parameters, parameter estimation or state estimation}
- 2050/0044 . . . {In digital systems}
- 2050/0045 . . . . {using databus protocols}
- 2050/0047 . . . {Digital-analogue (D/A) or analogue-digital (A/D) conversion}
- 2050/0048 . . . {Addition or subtraction of signals}
- 2050/0049 . . . . {Signal offset}
- 2050/005 . . . {Sampling}
- 2050/0051 . . . . {combined with averaging}
- 2050/0052 . . . {Filtering, filters}
- 2050/0054 . . . . {Cut-off filters, retarders, delaying means, dead zones, threshold values or cut-off frequency}
- 2050/0055 . . . . . {High-pass filters}
- 2050/0056 . . . . . {Low-pass filters}
- 2050/0057 . . . {Frequency analysis, spectral techniques or transforms}
- 2050/0058 . . . {Signal modulation for data transmission}
- 2050/0059 . . . {Signal noise suppression}
- 2050/006 . . . {Interpolation; Extrapolation}
- 2050/0062 . {Adapting control system settings}
- 2050/0063 . . {Manual parameter input, manual setting means, manual initialising or calibrating means}
- 2050/0064 . . . {using a remote, e.g. cordless, transmitter or receiver unit, e.g. remote keypad or mobile phone}
- 2050/0065 . . . {using a personalised data carrier, e.g. magnetic card, memory card or electronic ignition key}
- 2050/0066 . . . {using buttons or a keyboard connected to the on-board processor}
- 2050/0067 . . . . {Confirmation by the driver}
- 2050/0068 . . . {Giving intention of direction, e.g. by indicator lights, steering input}
- 2050/007 . . {Switching between manual and automatic parameter input, and *vice versa*}
- 2050/0071 . . . . {Controller overrides driver automatically}
- 2050/0072 . . . . {Controller asks driver to take over}
- 2050/0073 . . . . {Driver overrides controller}
- 2050/0074 . . . . {Driver shifts control to the controller, e.g. by pressing a button}
- 2050/0075 . . . {Automatic parameter input, automatic initialising or calibrating means}
- 2050/0082 . . . {for initialising the control system}
- 2050/0083 . . . {Setting, resetting, calibration}
- 2050/0085 . . . . {Setting or resetting initial positions}
- 2050/0086 . . . . {Recalibrating datum positions, e.g. by using check cycles}
- 2050/0087 . . . . {Resetting start and end points of actuator travel}
- 2050/0088 . . . . {Adaptive recalibration}
- 2050/009 . . . {Priority selection}
- 2050/0091 . . . . {of control inputs}
- 2050/0093 . . . . . {of the engine}
- 2050/0094 . . . . . {of control units}
- 2050/0095 . . . {Automatic control mode change}
- 2050/0096 . . . . {Control during transition between modes}
- 50/0097 . {Predicting future conditions}
- 50/0098 . {Details of control systems ensuring comfort, safety or stability not otherwise provided for}
- 50/02 . . Ensuring safety in case of control system failures, e.g. by diagnosing, circumventing or fixing failures
- 50/0205 . . . {Diagnosing or detecting failures; Failure detection models}
- 2050/021 . . . . {Means for detecting failure or malfunction}
- 2050/0215 . . . . {Sensor drifts or sensor failures}
- 2050/022 . . . . {Actuator failures}
- 50/0225 . . . {Failure correction strategy}
- 50/023 . . . Avoiding failures by using redundant parts
- 50/029 . . . Adapting to failures or work around with other constraints, e.g. circumvention by avoiding use of failed parts
- 2050/0292 . . . . {Fail-safe or redundant systems, e.g. limp-home or backup systems}
- 2050/0295 . . . . {Inhibiting action of specific actuators or systems}
- 2050/0297 . . . . {Control Giving priority to different actuators or systems}
- 50/032 . . . Fixing failures by repairing failed parts, e.g. loosening a sticking valve
- 50/035 . . . Bringing the control units into a predefined state, e.g. giving priority to particular actuators
- 50/038 . . . Limiting the input power, torque or speed
- 50/04 . . . Monitoring the functioning of the control system
- 2050/041 . . . {Built in Test Equipment [BITE]}
- 2050/043 . . . . {Testing equipment at KEY-ON}
- 50/045 . . . {Monitoring control system parameters}
- 2050/046 . . . . {involving external transmission of data to or from the vehicle, e.g. via telemetry, satellite, Global Positioning System [GPS]}
- 2050/048 . . . . . {displaying data transmitted between vehicles, e.g. for platooning, control of inter-vehicle distance}
- 50/06 . . Improving the dynamic response of the control system, e.g. improving the speed of regulation or avoiding hunting or overshoot
- 2050/065 . . . {by reducing the computational load on the digital processor of the control computer}
- 50/08 . . Interaction between the driver and the control system
- 50/082 . . . {Selecting or switching between different modes of propelling}
- 50/085 . . . {Changing the parameters of the control units, e.g. changing limit values, working points by control input}
- 50/087 . . . {where the control system corrects or modifies a request from the driver}
- 50/10 . . Interpretation of driver requests or demands
- 50/12 . . Limiting control by the driver depending on vehicle state, e.g. interlocking means for the control input for preventing unsafe operation
- 50/14 . . Means for informing the driver, warning the driver or prompting a driver intervention
- 2050/143 . . . . {Alarm means}
- 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

**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 ([Handing over between remote control and on-board control or handing over between remote control arrangements G05D 1/227](#))}
- 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 \(Handing over between remote control and on-board control or handing over between remote control arrangements G05D 1/227\)](#)}

**Indexing scheme relating to vehicle control covered by groups B60W 10/00 – B60W 60/007.**

**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 . Emergency vehicles, e.g. ambulances
- 2300/12 . Trucks; Load vehicles
- 2300/121 . . Fork lift trucks, Clarks
- 2300/123 . . Light trucks
- 2300/125 . . Heavy duty trucks
- 2300/128 . . . Silo or fluid transporting vehicles
- 2300/13 . Independent Multi-axle long vehicles
- 2300/135 . . Vehicles having wheels mounted on a vertical steerable column
- 2300/14 . Tractor-trailers, i.e. combinations of a towing vehicle and one or more towed vehicles, e.g. caravans; Road trains
- 2300/145 . . Semi-trailers
- 2300/147 . . Road trains
- 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
- 2300/17 . Construction vehicles, e.g. graders, excavators
- 2300/175 . . Skid-steer loaders
- 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
- 2300/34 . Compact city vehicles, e.g., microcars or kei cars
- 2300/345 . . Three wheelers not including single track vehicles
- 2300/36 . Cycles; Motorcycles; Scooters
- 2300/362 . . Buggies; Quads
- 2300/365 . . Scooters
- 2300/367 . . Tricycles
- 2300/40 . Carts, e.g. trolleys
- 2300/405 . . Golf carts
- 2300/44 . Tracked vehicles
- 2300/46 . Variable track or wheelbase 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, light or radio wave sensitive means, e.g. infrared sensors
- 2420/403 . . Image sensing, e.g. optical camera
- 2420/406 . . Fiber optic sensor
- 2420/408 . . Radar; Laser, e.g. lidar
- 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
- 2420/54 . Audio sensitive means, e.g. ultrasound
- 2420/60 . Doppler effect
- 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 tyre
- 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, e.g. motorways, local streets, paved or unpaved roads

**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, i.e. the inclination of a road segment in the longitudinal direction
- 2552/20 . Road profile, i.e. the change in elevation or curvature of a plurality of continuous road segments
- 2552/25 . Road altitude
- 2552/30 . Road curve radius
- 2552/35 . Road bumpiness, e.g. 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 . . of positioning data, e.g. GPS [Global Positioning System] data
- 2556/55 . . using telemetry
- 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
- 2710/085 . . . Torque change rate
- 2710/086 . . Power
- 2710/087 . . . Power change rate
- 2710/088 . . Temperature
- 2710/09 . Other types of propulsion units, e.g. fluid motors, or type not specified
- 2710/10 . Change speed gearings
- 2710/1005 . . Transmission ratio engaged
- 2710/1011 . . Input shaft speed, e.g. turbine speed
- 2710/1016 . . . Input speed change rate
- 2710/1022 . . Input torque
- 2710/1027 . . . Input torque change rate
- 2710/1033 . . Input power
- 2710/1038 . . Output speed
- 2710/1044 . . . Output speed change rate
- 2710/105 . . Output torque
- 2710/1055 . . . Output torque change rate
- 2710/1061 . . Output power
- 2710/1066 . . . Transmission of zero torque
- 2710/1072 . . Temperature
- 2710/1077 . . fluid pressure, e.g. oil pressure
- 2710/1083 . . . pressure of control fluid
- 2710/1088 . . . pressure of working fluid
- 2710/1094 . . Direction of power flow
- 2710/12 . Differentials
- 2710/125 . . Locking status
- 2710/18 . Braking system
- 2710/182 . . Brake pressure, e.g. of fluid or between pad and disc
- 2710/184 . . Brake temperature, e.g. of fluid, pads or discs
- 2710/186 . . Status of parking brakes
- 2710/188 . . Parking lock mechanisms
- 2710/20 . Steering systems
- 2710/202 . . Steering torque
- 2710/205 . . Steering speed
- 2710/207 . . Steering angle of wheels
- 2710/22 . Suspension systems
- 2710/223 . . Stiffness
- 2710/226 . . Damping
- 2710/24 . Energy storage means
- 2710/242 . . for electrical energy
- 2710/244 . . . Charge state
- 2710/246 . . . Temperature
- 2710/248 . . . Current for loading or unloading
- 2710/28 . Fuel cells
- 2710/285 . . Temperature
- 2710/30 . Auxiliary equipments
- 2710/305 . . target power to auxiliaries
- 2720/00 Output or target parameters relating to overall vehicle dynamics**
- WARNING**
- Groups [B60W 2720/00](#) - [B60W 2720/406](#) 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.
- 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
- 2754/00 Output or target parameters relating to objects**
- WARNING**
- Group [B60W 2754/00](#) 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.
- 2754/10 . Spatial relation or speed relative to objects
- WARNING**
- Groups [B60W 2754/10](#) is 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](#), [G05D 1/0061](#), [G05D 1/0088](#), [G05D 1/021](#), [G05D 1/0214](#), [G05D 1/0221](#), and [G05D 1/0223](#).
- Group [B60W 2754/10](#) is also impacted by reclassification into groups [B60W 2754/20](#), [B60W 2754/30](#), [B60W 2754/40](#), [B60W 2754/50](#), [B60W 2754/60](#), and [B60W 2754/70](#).
- All groups listed in this Warning should be considered in order to perform a complete search.
- 2754/20 . . Lateral distance
- WARNING**
- Groups [B60W 2754/20](#) - [B60W 2754/70](#) are incomplete pending reclassification of documents from groups [B60K 28/00](#) - [B60K 28/165](#), [B60W 2754/10](#), [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.
- 2754/30 . . Longitudinal distance
- 2754/40 . . Relative lateral speed

- 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.