

CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

TRANSPORTING

B60 VEHICLES IN GENERAL

(NOTE omitted)

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

NOTES

1. This subclass does not cover the control of a single sub-unit; such control is classified in the relevant place for the sub-unit, e.g. [F02D](#), [F16H](#). Where a single sub-unit is controlled by means of signals or commands from other sub-units, the control of this single sub-unit is classified in the relevant place for this sub-unit. For example, the control of variable-ratio gearing by means of signals from the engine or the accelerator is classified in the subclass for gearing, [F16H](#).
2. Conjoint control of driveline units, e.g. engines, and variable-ratio gearing occurring only transiently during ratio shift and being also characterised by the control of the gearing is also classified in the subclass for gearing, [F16H](#).
3. In groups [B60W 20/00](#) - [B60W 50/00](#), the first place priority rule is applied, i.e. at each hierarchical level, classification is made in the first appropriate place.
4. When classifying in group [B60W 10/00](#), classification must also be made in groups [B60W 20/00](#) - [B60W 50/00](#) in order to identify the purpose or use of the control.
5. In this subclass, the following terms are used with the meanings indicated:
 - "conjoint control" means that a programmed or condition-responsive {main} automatic controller on board the vehicle, embodying control logic for vehicle sub-units of different type or different function, sends control signals to actuators of two or more vehicle sub-units, 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.

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	<ul style="list-style-type: none"> including control of braking systems <p>WARNING</p> <p>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.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p>	10/30	<ul style="list-style-type: none"> including control of auxiliary equipment, e.g. air-conditioning compressors or oil pumps <p>WARNING</p> <p>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.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p>
10/182	<ul style="list-style-type: none"> . . {including control of parking brakes} 	20/00	<p>Control systems specially adapted for hybrid vehicles {(hybrid vehicle design, B60K 6/00; electric vehicles B60L)}</p> <p>WARNING</p> <p>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.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p>
10/184	<ul style="list-style-type: none"> . . with wheel brakes 	20/10	<ul style="list-style-type: none"> Controlling the power contribution of each of the prime movers to meet required power demand
10/188	<ul style="list-style-type: none"> . . . hydraulic brakes 	20/11	<ul style="list-style-type: none"> . . 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)}
10/192	<ul style="list-style-type: none"> . . . electric brakes 	20/12	<ul style="list-style-type: none"> . . using control strategies taking into account route information {(estimation or calculation of non-directly measurable driving parameters B60W 40/00)}
10/196	<ul style="list-style-type: none"> . . acting within the driveline, e.g. retarders 	20/13	<ul style="list-style-type: none"> . . in order to stay within battery power input or output limits; in order to prevent overcharging or battery depletion
10/198	<ul style="list-style-type: none"> . . with exhaust brakes 	20/14	<ul style="list-style-type: none"> . . . in conjunction with braking regeneration
10/20	<ul style="list-style-type: none"> including control of steering systems <p>WARNING</p> <p>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.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p>	20/15	<ul style="list-style-type: none"> . . Control strategies specially adapted for achieving a particular effect
10/22	<ul style="list-style-type: none"> including control of suspension systems <p>WARNING</p> <p>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.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p>	20/16	<ul style="list-style-type: none"> . . . for reducing engine exhaust emissions
10/24	<ul style="list-style-type: none"> including control of energy storage means <p>WARNING</p> <p>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.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p>	20/17	<ul style="list-style-type: none"> . . . for noise reduction
10/26	<ul style="list-style-type: none"> . . for electrical energy, e.g. batteries or capacitors 	20/18	<ul style="list-style-type: none"> . . . for avoiding ageing of fuel
10/28	<ul style="list-style-type: none"> including control of fuel cells <p>WARNING</p> <p>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.</p> <p>All groups listed in this Warning should be considered in order to perform a complete search.</p>	20/19	<ul style="list-style-type: none"> . . . for achieving enhanced acceleration
		20/20	<ul style="list-style-type: none"> Control strategies involving selection of hybrid configuration, e.g. selection between series or parallel configuration
		20/30	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Control strategies for responding to system failures, e.g. for fault diagnosis, failsafe operation or limp mode

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

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 (controlling only the steering [B62D 15/0285](#))
- 30/08 . {Active safety systems} predicting or avoiding probable or impending collision {or attempting to minimise its consequences}
- 2030/082 . . {Vehicle operation after collision}
- 30/085 . . Taking automatic action to adjust vehicle attitude in preparation for collision, e.g. braking for nose dropping
- 30/09 . . Taking automatic action to avoid collision, e.g. braking and steering
- 30/095 . . Predicting travel path or likelihood of collision
- 30/0953 . . . {the prediction being responsive to vehicle dynamic parameters}
- 30/0956 . . . {the prediction being responsive to traffic or environmental parameters}
- 30/10 . Path keeping {(cruise control for automatically following a preceding vehicle [B60W 30/165](#))}
- 30/12 . . Lane keeping
- 30/14 . {Adaptive} cruise control
- 30/143 . . {Speed control ([B60W 30/16](#) takes precedence)}
- 30/146 . . . {Speed limiting}
- 30/16 . . Control of distance between vehicles, e.g. keeping a distance to preceding vehicle
- 30/162 . . . {Speed limiting therefor}
- 30/165 . . . Automatically following the path of a preceding lead vehicle, e.g. "electronic tow-bar"
- 30/17 . . . with provision for special action when the preceding vehicle comes to a halt, e.g. stop and go
- 30/18 . Propelling the vehicle
- 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 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}
- 2050/004 {of the clutch}
- 2050/0041 {of the drive line}
- 2050/0042 . . . {Transfer function lag; delays}

- 2050/0043 . . {Signal treatments, identification of variables or parameters, parameter estimation or state estimation}
- 2050/0044 . . . {In digital systems}
- 2050/0045 {using databus protocols}
- 2050/0047 . . . {Digital-analogue (D/A) or analogue-digital (A/D) conversion}
- 2050/0048 . . . {Addition or subtraction of signals}
- 2050/0049 {Signal offset}
- 2050/005 . . . {Sampling}
- 2050/0051 {combined with averaging}
- 2050/0052 . . . {Filtering, filters}
- 2050/0054 {Cut-off filters, retarders, delaying means, dead zones, threshold values or cut-off frequency}
- 2050/0055 {High-pass filters}
- 2050/0056 {Low-pass filters}
- 2050/0057 . . . {Frequency analysis, spectral techniques or transforms}
- 2050/0058 . . . {Signal modulation for data transmission}
- 2050/0059 . . . {Signal noise suppression}
- 2050/006 . . . {Interpolation; Extrapolation}
- 2050/0062 . {Adapting control system settings}
- 2050/0063 . . {Manual parameter input, manual setting means, manual initialising or calibrating means (for vehicle control input means, control panels [see B60K 37/00](#))}
- 2050/0064 . . . {using a remote, e.g. cordless, transmitter or receiver unit, e.g. remote keypad or mobile phone}
- 2050/0065 . . . {using a personalised data carrier, e.g. magnetic card, memory card or electronic ignition key}
- 2050/0066 . . . {using buttons or a keyboard connected to the on-board processor}
- 2050/0067 {Confirmation by the driver}
- 2050/0068 . . . {Giving intention of direction, e.g. by indicator lights, steering input}
- 2050/007 . . {Switching between manual and automatic parameter input, and *vice versa*}
- 2050/0071 . . . {Controller overrides driver automatically}
- 2050/0072 . . . {Controller asks driver to take over}
- 2050/0073 . . . {Driver overrides controller}
- 2050/0074 . . . {Driver shifts control to the controller, e.g. by pressing a button}
- 2050/0075 . . {Automatic parameter input, automatic initialising or calibrating means}
- 2050/0077 . . . {involving external transmission of data to or from the vehicle}
- 2050/0078 {using Global Position System data}
- 2050/0079 {using telemetry}
- 2050/008 {using data transmitted between vehicles, e.g. for platooning, control of inter-vehicle distance}
- 2050/0081 {using satellite communication}
- 2050/0082 . . . {for initialising the control system}
- 2050/0083 . . . {Setting, resetting, calibration}
- 2050/0085 {Setting or resetting initial positions}
- 2050/0086 {Recalibrating datum positions, e.g. by using check cycles}
- 2050/0087 {Resetting start and end points of actuator travel}
- 2050/0088 {Adaptive recalibration}
- 2050/0089 {Historical data record of previous events}
- 2050/009 {Priority selection}
- 2050/0091 {of control inputs}
- 2050/0093 {of the engine}
- 2050/0094 {of control units}
- 2050/0095 . . . {Automatic control mode change}
- 2050/0096 {Control during transition between modes}
- 50/0097 . {Predicting future conditions}
- 50/0098 . {Details of control systems ensuring comfort, safety or stability not otherwise provided for}
- 50/02 . Ensuring safety in case of control system failures, e.g. by diagnosing, circumventing or fixing failures
- 50/0205 . . {Diagnosing or detecting failures; Failure detection models}
- 2050/021 . . . {Means for detecting failure or malfunction}
- 2050/0215 . . . {Sensor drifts or sensor failures}
- 2050/022 . . . {Actuator failures}
- 50/0225 . . {Failure correction strategy}
- 50/023 . . Avoiding failures by using redundant parts
- 50/029 . . Adapting to failures or work around with other constraints, e.g. circumvention by avoiding use of failed parts
- 2050/0292 . . . {Fail-safe or redundant systems, e.g. limp-home or backup systems}
- 2050/0295 . . . {Inhibiting action of specific actuators or systems}
- 2050/0297 . . . {Control Giving priority to different actuators or systems}
- 50/032 . . Fixing failures by repairing failed parts, e.g. loosening a sticking valve
- 50/035 . . Bringing the control units into a predefined state, e.g. giving priority to particular actuators
- 50/038 . . Limiting the input power, torque or speed
- 50/04 . Monitoring the functioning of the control system
- 2050/041 . . {Built in Test Equipment [BITE]}
- 2050/043 . . . {Testing equipment at KEY-ON}
- 50/045 . . {Monitoring control system parameters}
- 2050/046 . . . {involving external transmission of data to or from the vehicle, e.g. via telemetry, satellite, Global Positioning System [GPS]}
- 2050/048 {displaying data transmitted between vehicles, e.g. for platooning, control of inter-vehicle distance}
- 50/06 . Improving the dynamic response of the control system, e.g. improving the speed of regulation or avoiding hunting or overshoot
- 2050/065 . . {by reducing the computational load on the digital processor of the control computer}
- 50/08 . Interaction between the driver and the control system
- 50/082 . . {Selecting or switching between different modes of propelling}
- 50/085 . . {Changing the parameters of the control units, e.g. changing limit values, working points by control input}
- 50/087 . . {where the control system corrects or modifies a request from the driver}
- 50/10 . . Interpretation of driver requests or demands
- 50/12 . . Limiting control by the driver depending on vehicle state, e.g. interlocking means for the control input for preventing unsafe operation
- 50/14 . . Means for informing the driver, warning the driver or prompting a driver intervention

- 2050/143 . . . {Alarm means ([B60W 50/16](#) takes precedence)}
- 2050/146 . . . {Display means}
- 50/16 . . . Tactile feedback to the driver, e.g. vibration or force feedback to the driver on the steering wheel or the accelerator pedal

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
2530/14	. Historical data
2530/145	. . 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	2710/242	. . for electrical energy
2710/0611	. . . Throttle change rate	2710/244	. . . Charge state
2710/0616	. . Position of fuel or air injector	2710/246	. . . Temperature
2710/0622	. . . Air-fuel ratio	2710/248	. . . Current for loading or unloading
2710/0627	. . . Fuel flow rate	2710/28	. Fuel cells
2710/0633	. . . Inlet air flow rate	2710/285	. . Temperature
2710/0638	. . Turbocharger state	2710/30	. Auxiliary equipments
2710/0644	. . Engine speed	2710/305	. . target power to auxiliaries
2710/065	. . . Idle condition		
2710/0655	. . . Coasting condition	2720/00	Output or target parameters relating to overall vehicle dynamics
2710/0661	. . . Speed change rate		WARNING
2710/0666	. . Engine torque		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 .
2710/0672	. . . Torque change rate		All groups listed in this Warning should be considered in order to perform a complete search.
2710/0677	. . Engine power		
2710/0683	. . Engine manifold pressure	2720/10	. Longitudinal speed
2710/0688	. . Engine temperature	2720/103	. . Speed profile
2710/0694	. . Engine exhaust temperature	2720/106	. . Longitudinal acceleration
2710/08	. Electric propulsion units	2720/12	. Lateral speed
2710/081	. . Speed	2720/125	. . Lateral acceleration
2710/082	. . . Speed change rate	2720/14	. Yaw
2710/083	. . Torque	2720/16	. Pitch
2710/085	. . . Torque change rate	2720/18	. Roll
2710/086	. . Power	2720/20	. Sideslip angle
2710/087	. . . Power change rate	2720/22	. Articulation angle, e.g. between tractor and trailer
2710/088	. . Temperature	2720/24	. Direction of travel
2710/09	. Other types of propulsion units, e.g. fluid motors, or type not specified	2720/26	. Wheel slip
2710/10	. Change speed gearings	2720/263	. . Slip values between front and rear axle
2710/1005	. . Transmission ratio engaged	2720/266	. . Slip values between left and right wheel
2710/1011	. . Input shaft speed, e.g. turbine speed	2720/28	. Wheel speed
2710/1016	. . . Input speed change rate	2720/30	. Wheel torque
2710/1022	. . Input torque	2720/40	. Torque distribution
2710/1027	. . . Input torque change rate	2720/403	. . between front and rear axle
2710/1033	. . Input power	2720/406	. . between left and right wheel
2710/1038	. . Output speed		
2710/1044	. . . Output speed change rate	2754/00	Output or target parameters relating to objects
2710/105	. . Output torque		WARNING
2710/1055	. . . Output torque change rate		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 .
2710/1061	. . Output power		All groups listed in this Warning should be considered in order to perform a complete search.
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		

B60W

- 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.