SECTION B — PERFORMING OPERATIONS; TRANSPORTING

B60 VEHICLES IN GENERAL

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 [2006.01]

Note(s) [2006.01]

1. Main groups B60W 10/00 and B60W 30/00-B60W 50/00 do 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 50/00 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 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;
   - "drive control system" means an electronic system in a road vehicle for automatically controlling the movement of that vehicle in order to take certain actions;
   - "road vehicle" means a vehicle normally under the control of a human driver for transportation on roads, e.g. an automobile, truck or bus;
   - "sub-unit" means one of the following vehicle systems: 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, energy storage means, fuel cells or auxiliary equipment.

10/00 Conjoint control of vehicle sub-units of different type or different function (for propulsion of purely electrically-propelled vehicles with power supplied within the vehicle B60L 11/00) **[2006.01]**

Note(s) [2006.01]

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

10/02 • including control of driveline clutches **[2006.01]**
10/04 • including control of propulsion units **[2006.01]**
10/06 • • including control of combustion engines **[2006.01]**
10/08 • • including control of electric propulsion units, e.g. motors or generators **[2006.01]**
10/10 • including control of change-speed gearings **[2006.01, 2012.01]**
10/101 • • Infinitely variable gearings **[2012.01]**
10/103 • • • of fluid type **[2012.01]**
10/105 • • • of electric type **[2012.01]**
10/107 • • • with endless flexible members **[2012.01]**
10/108 • • • Friction gearings **[2012.01]**
10/109 • • • • of toroid type **[2012.01]**
10/11 • • Stepped gearings **[2012.01]**
10/111 • • • with separate change-speed gear trains arranged in series **[2012.01]**
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 **[2012.01]**
10/115 • • • with planetary gears **[2012.01]**
10/119 • including control of all-wheel-driveline-means, e.g. transfer gears or clutches for dividing torque between front and rear axles (B60W 10/14 takes precedence) **[2012.01]**
10/12 • including control of differentials **[2006.01, 2012.01]**
10/14 • • Central differentials for dividing torque between front and rear axles **[2012.01]**
10/16 • • Axle differentials, e.g. for dividing torque between the left and right wheels **[2012.01]**
10/18 • including control of braking systems **[2006.01, 2012.01]**
10/184 • • with wheel brakes **[2012.01]**
10/188 • • • hydraulic brakes **[2012.01]**
10/192 • • • electric brakes **[2012.01]**
10/196 • • acting within the driveline, e.g. retarders **[2012.01]**
10/198 • • with exhaust brakes **[2012.01]**
10/20 • including control of steering systems **[2006.01]**
10/22 • including control of suspension systems **[2006.01]**
10/24 • including control of energy storage means **[2006.01]**
10/26 • • for electrical energy, e.g. batteries or capacitors **[2006.01]**
10/28 • including control of fuel cells **[2006.01]**
10/30 • including control of auxiliary equipment, e.g. air-conditioning compressors or oil pumps **[2006.01]**

20/00 Control systems specially adapted for hybrid vehicles, i.e. vehicles having two or more prime movers of more than one type, e.g. electrical and internal combustion motors, all used for propulsion of the vehicle [2006.01]

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 [2006.01]

30/02 • Control of vehicle driving stability **[2006.01, 2012.01]**
30/04 • • related to roll-over prevention **[2006.01]**
30/045 • • Improving turning performance **[2012.01]**
30/06 • Automatic manoeuvring for parking **[2006.01]**
30/08 • Predicting or avoiding probable or impending collision **[2006.01, 2012.01]**
30/085 • • Taking automatic action to adjust vehicle attitude in preparation for collision, e.g. braking for nose dropping **[2012.01]**
30/09 • • Taking automatic action to avoid collision, e.g. braking and steering **[2012.01]**
30/095 • • Predicting travel path or likelihood of collision **[2012.01]**
30/10 • Path keeping **[2006.01]**
30/12 • • Lane keeping **[2006.01]**
30/14 • Cruise control **[2006.01]**
30/16 • • Control of distance between vehicles, e.g. keeping a distance to preceding vehicle **[2006.01, 2012.01]**
30/165 • • • Automatically following the path of a preceding lead vehicle, e.g. "electronic tow-bar" **[2012.01]**
30/17 • • • with provision for special action when the preceding vehicle comes to a halt, e.g. stop and go **[2012.01]**
30/18 • Propelling the vehicle **[2006.01, 2012.01]**
30/182 • • Selecting between different operative modes, e.g. comfort and performance modes **[2012.01]**
30/184 • • Preventing damage resulting from overload or excessive wear of the driveline **[2012.01]**
30/186 • • • excessive wear or burn out of friction elements, e.g. clutches **[2012.01]**
30/188 • • Controlling power parameters of the driveline, e.g. determining the required power **[2012.01]**
30/19 • • Improvement of gear change, e.g. by synchronisation or smoothing gear shift **[2012.01]**
30/192 • • Mitigating problems related to power-up or power-down of the driveline, e.g. start-up of a cold engine **[2012.01]**
30/194 • • • related to low temperature conditions, e.g. high viscosity of hydraulic fluid **[2012.01]**
30/20 • • Reducing vibrations in the driveline **[2006.01]**

40/00 Estimation or calculation of driving parameters for road vehicle drive control systems not related to the control of a particular sub-unit [2006.01]

40/02 • related to ambient conditions **[2006.01]**
40/04 • • Traffic conditions **[2006.01]**
40/06 • • Road conditions **[2006.01, 2012.01]**
40/064 • • • Degree of grip **[2012.01]**
40/068 • • • Road friction coefficient **[2012.01]**
40/072 • • • Curvature of the road **[2012.01]**
40/076 • • • Slope angle of the road **[2012.01]**
40/08 • related to drivers or passengers **[2006.01, 2012.01]**
40/09 • • Driving style or behaviour **[2012.01]**
40/10 • related to vehicle motion **[2006.01, 2012.01]**
40/101 • • Side slip angle of tyre **[2012.01]**
40/103 • • Side slip angle of vehicle body **[2012.01]**
40/105 • • Speed **[2012.01]**
40/107 • • Longitudinal acceleration **[2012.01]**
40/109 • • Lateral acceleration **[2012.01]**
40/11 • • Pitch movement **[2012.01]**
40/112 • • Roll movement **[2012.01]**
40/114 • • Yaw movement **[2012.01]**
40/12 • related to parameters of the vehicle itself **[2006.01, 2012.01]**
40/13 • • Load or weight **[2012.01]**

50/00 Details of control systems for road vehicle drive control not related to the control of a particular sub-unit [2006.01]

50/02 • Ensuring safety in case of control system failures, e.g. by diagnosing, circumventing or fixing failures **[2006.01, 2012.01]**
50/023 • • Avoiding failures by using redundant parts **[2012.01]**
50/029 • • Adapting to failures or work around with other constraints, e.g. circumvention by avoiding use of failed parts **[2012.01]**
50/032 • • Fixing failures by repairing failed parts, e.g. loosening a sticking valve **[2012.01]**
50/035 • • Bringing the control units into a predefined state, e.g. giving priority to particular actuators **[2012.01]**
50/038 • • Limiting the input power, torque or speed **[2012.01]**
50/04 • Monitoring the functioning of the control system **[2006.01]**
50/06 • Improving the dynamic response of the control system, e.g. improving the speed of regulation or avoiding hunting or overshoot **[2006.01]**
50/08 • Interaction between the driver and the control system **[2006.01, 2012.01]**
50/10 • • Interpretation of driver requests or demands **[2012.01]**
50/12 • • Limiting control by the driver depending on vehicle state, e.g. interlocking means for the control input for preventing unsafe operation **[2012.01]**
50/14 • • Means for informing the driver, warning the driver or prompting a driver intervention **[2012.01]**
50/16 • • • Tactile feedback to the driver, e.g. vibration or force feedback to the driver on the steering wheel or the accelerator pedal **[2012.01]**