

# CPC COOPERATIVE PATENT CLASSIFICATION

## B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

### TRANSPORTING

#### B60 VEHICLES IN GENERAL

(NOTE omitted)

#### B60L **PROPULSION OF ELECTRICALLY-PROPELLED VEHICLES** (arrangements or mounting of electrical propulsion units or of plural diverse prime-movers for mutual or common propulsion in vehicles [B60K 1/00](#), [B60K 6/20](#); arrangements or mounting of electrical gearing in vehicles [B60K 17/12](#), [B60K 17/14](#); preventing wheel slip by reducing power in rail vehicles [B61C 15/08](#); dynamo-electric machines [H02K](#); control or regulation of electric motors [H02P](#)); **SUPPLYING ELECTRIC POWER FOR AUXILIARY EQUIPMENT OF ELECTRICALLY-PROPELLED VEHICLES** (electric coupling devices combined with mechanical couplings of vehicles [B60D 1/64](#); electric heating for vehicles [B60H 1/00](#)); **ELECTRODYNAMIC BRAKE SYSTEMS FOR VEHICLES IN GENERAL** (control or regulation of electric motors [H02P](#)); **MAGNETIC SUSPENSION OR LEVITATION FOR VEHICLES; MONITORING OPERATING VARIABLES OF ELECTRICALLY-PROPELLED VEHICLES; ELECTRIC SAFETY DEVICES FOR ELECTRICALLY-PROPELLED VEHICLES**

#### NOTES

1. This subclass, subject to the above references, covers:
  - feeding of power to auxiliary circuits;
  - current collectors; arrangements thereof on rail or road vehicles or on vehicles in general
  - electrodynamic brake systems;
  - electric propulsion of vehicles; control and regulation therefor
2. In this subclass it is desirable to classify any "additional information" which is of interest for search.

#### 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.

<p><b>1/00</b>    <b>Supplying electric power to auxiliary equipment of vehicles</b> (<a href="#">circuit arrangements for charging batteries H02J 7/00</a>)</p> <p>1/003    . {to auxiliary motors, e.g. for pumps, compressors}</p> <p>1/006    . {to power outlets}</p> <p>1/02     . to electric heating circuits</p> <p>1/04     . . fed by the power supply line</p> <p>1/06     . . . using only one supply</p> <p>1/08     . . . . Methods and devices for control or regulation</p> <p>1/10     . . . with provision for using different supplies</p> <p>1/12     . . . . Methods and devices for control or regulation</p> <p>1/14     . to electric lighting circuits</p> <p>1/16     . . fed by the power supply line</p> <p>1/20     . {Energy regeneration from auxiliary equipment}</p>	<p><b>3/00</b>    <b>Electric devices on electrically-propelled vehicles for safety purposes; Monitoring operating variables, e.g. speed, deceleration or energy consumption</b> (<a href="#">methods or circuit arrangements for monitoring or controlling batteries or fuel cells B60L 58/00</a>)</p> <p>3/0007    . {Measures or means for preventing or attenuating collisions}</p> <p>3/0015    . . {Prevention of collisions}</p> <p>3/0023    . {Detecting, eliminating, remedying or compensating for drive train abnormalities, e.g. failures within the drive train}</p> <p>3/003     . . {relating to inverters}</p> <p>3/0038    . . {relating to sensors}</p> <p>3/0046    . . {relating to electric energy storage systems, e.g. batteries or capacitors}</p> <p>3/0053    . . {relating to fuel cells}</p> <p>3/0061    . . {relating to electrical machines}</p> <p>3/0069    . . {relating to the isolation, e.g. ground fault or leak current}</p> <p>3/0076    . . {relating to braking}</p>
--	---

- 3/0084 . . {relating to control modules}
- 3/0092 . {with use of redundant elements for safety purposes}
- 3/02 . Dead-man's devices
- 3/04 . Cutting off the power supply under fault conditions (protective devices and circuit arrangements in general [H01H](#); [H02H](#))
- 3/06 . Limiting the traction current under mechanical overload conditions
- 3/08 . Means for preventing excessive speed of the vehicle
- 3/10 . Indicating wheel slip {; [Correction of wheel slip](#)}
- 3/102 . . {of individual wheels}
- 3/104 . . {by indirect measurement of vehicle speed}
- 3/106 . . {for maintaining or recovering the adhesion of the drive wheels}
- 3/108 . . . {whilst braking, i.e. ABS}
- 3/12 . Recording operating variables {; [Monitoring of operating variables](#)}
- 5/00** **Current collectors for power supply lines of electrically-propelled vehicles (current collectors in general [H01R 41/00](#))**
- 5/005 . {without mechanical contact between the collector and the power supply line}
- 5/02 . with ice-removing device
- 5/04 . using rollers or sliding shoes in contact with trolley wire ([B60L 5/40](#) takes precedence)
- 5/045 . . {with trolley wire finders}
- 5/06 . . Structure of the rollers or their carrying means
- 5/08 . . Structure of the sliding shoes or their carrying means
- 5/085 . . . {with carbon contact members}
- 5/10 . . Devices preventing the collector from jumping off
- 5/12 . . Structural features of poles or their bases
- 5/14 . . . Devices for automatic lowering of a jumped-off collector
- 5/16 . . . Devices for lifting and resetting the collector ([B60L 5/34](#) takes precedence)
- 5/18 . using bow-type collectors in contact with trolley wire
- 5/19 . . using arrangements for effecting collector movement transverse to the direction of vehicle motion
- 5/20 . . Details of contact bow
- 5/205 . . . {with carbon contact members}
- 5/22 . . Supporting means for the contact bow
- 5/24 . . . Pantographs
- 5/26 . . . Half pantographs, e.g. using counter rocking beams
- 5/28 . . . Devices for lifting and resetting the collector
- 5/30 . . . . using springs
- 5/32 . . . . using fluid pressure
- 5/34 . with devices to enable one vehicle to pass another one using the same power supply line
- 5/36 . with means for collecting current simultaneously from more than one conductor, e.g. from more than one phase
- 5/38 . for collecting current from conductor rails ([B60L 5/40](#) takes precedence)
- 5/39 . . from third rail
- 5/40 . for collecting current from lines in slotted conduits
- 5/42 . for collecting current from individual contact pieces connected to the power supply line
- 7/00** **Electrodynamic brake systems for vehicles in general**
- 7/003 . {Dynamic electric braking by short circuiting the motor}
- 7/006 . {Dynamic electric braking by reversing current, i.e. plugging}
- 7/02 . Dynamic electric resistor braking ([B60L 7/22](#) takes precedence)
- 7/04 . . for vehicles propelled by DC motors
- 7/06 . . for vehicles propelled by AC motors
- 7/08 . . Controlling the braking effect ([B60L 7/04](#), [B60L 7/06](#) take precedence)
- 7/10 . Dynamic electric regenerative braking ([B60L 7/22](#) takes precedence)
- 7/12 . . for vehicles propelled by DC motors
- 7/14 . . for vehicles propelled by AC motors
- 7/16 . . for vehicles comprising converters between the power source and the motor
- 7/18 . . Controlling the braking effect ([B60L 7/12](#), [B60L 7/14](#), [B60L 7/16](#) take precedence)
- 7/20 . Braking by supplying regenerated power to the prime mover of vehicles comprising engine-driven generators
- 7/22 . Dynamic electric resistor braking, combined with dynamic electric regenerative braking
- 7/24 . with additional mechanical or electromagnetic braking
- 7/26 . . Controlling the braking effect
- 7/28 . Eddy-current braking
- 8/00** **Electric propulsion with power supply from forces of nature, e.g. sun or wind**
- 8/003 . {Converting light into electric energy, e.g. by using photo-voltaic systems}
- 8/006 . {Converting flow of air into electric energy, e.g. by using wind turbines}
- 9/00** **Electric propulsion with power supply external to the vehicle (electric propulsion for monorail vehicles, suspension vehicles or rack railways [B60L 13/00](#); in combination with batteries or fuel cells within the vehicle [B60L 50/53](#))**
- 9/005 . {Interference suppression}
- 9/02 . using DC motors
- 9/04 . . fed from DC supply lines
- 9/06 . . . with conversion by metadyne
- 9/08 . . fed from AC supply lines
- 9/10 . . . with rotary converters
- 9/12 . . . with static converters
- 9/14 . . fed from different kinds of power-supply lines
- 9/16 . using AC induction motors
- 9/18 . . fed from DC supply lines
- 9/20 . . . single-phase motors
- 9/22 . . . polyphase motors
- 9/24 . . fed from AC supply lines
- 9/26 . . . single-phase motors
- 9/28 . . . polyphase motors
- 9/30 . . fed from different kinds of power-supply lines
- 9/32 . using AC brush displacement motors

13/00	<b>Electric propulsion for monorail vehicles, suspension vehicles or rack railways; Magnetic suspension or levitation for vehicles</b> ( <a href="#">tracks for Maglev-type trains E01B 25/30</a> ;} <a href="#">electromagnets per se H01F 7/06</a> ; <a href="#">linear motors per se H02K 41/00</a> )	15/24	. . with main controller driven by a servomotor ( <a href="#">B60L 15/28 takes precedence</a> )
13/003	. {Crossings; Points}	15/26	. . with main controller driven through a ratchet mechanism ( <a href="#">B60L 15/28 takes precedence</a> )
13/006	. {Electric propulsion adapted for monorail vehicles, suspension vehicles or rack railways ( <a href="#">B60L 13/03 takes precedence</a> )}	15/28	. . without contact making and breaking, e.g. using a transductor
13/03	. Electric propulsion by linear motors	15/30	. . with means to change over to human control
13/035	. . {Suspension of the vehicle-borne motorparts}	15/32	. Control or regulation of multiple-unit electrically-propelled vehicles
13/04	. Magnetic suspension or levitation for vehicles	15/34	. . with human control of a setting device
13/06	. . Means to sense or control vehicle position or attitude with respect to railway	15/36	. . . with automatic control superimposed, e.g. to prevent excessive motor current
13/08	. . . for the lateral position	15/38	. . with automatic control
13/10	. Combination of electric propulsion and magnetic suspension or levitation	15/40	. Adaptation of control equipment on vehicle for remote actuation from a stationary place ( <a href="#">devices along the route for controlling devices on rail vehicles B61L 3/00</a> ; <a href="#">central rail-traffic control systems B61L 27/00</a> )
15/00	<b>Methods, circuits, or devices for controlling the traction-motor speed of electrically-propelled vehicles</b>	15/42	. Adaptation of control equipment on vehicle for actuation from alternative parts of the vehicle or from alternative vehicles of the same vehicle train ( <a href="#">B60L 15/32 takes precedence</a> )
15/002	. {for control of propulsion for monorail vehicles, suspension vehicles or rack railways; for control of magnetic suspension or levitation for vehicles for propulsion purposes}	<b>50/00</b>	<b>Electric propulsion with power supplied within the vehicle</b> ( <a href="#">with power supply from force of nature, e.g. sun or wind, B60L 8/00</a> ; <a href="#">for monorail vehicles, suspension vehicles or rack railways B60L 13/00</a> )
15/005	. . {for control of propulsion for vehicles propelled by linear motors}	50/10	. using propulsion power supplied by engine-driven generators, e.g. generators driven by combustion engines
15/007	. {Physical arrangements or structures of drive train converters specially adapted for the propulsion motors of electric vehicles}	50/11	. . using DC generators and DC motors
15/02	. characterised by the form of the current used in the control circuit	50/12	. . using AC generators and DC motors
15/025	. . {using field orientation; Vector control; Direct Torque Control [DTC]}	50/13	. . using AC generators and AC motors
15/04	. . using DC	50/14	. . using DC generators and AC motors
15/06	. . using substantially sinusoidal AC	50/15	. . with additional electric power supply ( <a href="#">with capacitors charged by engine-driven generators B60L 50/40</a> ; <a href="#">with batteries charged by engine-driven generators B60L 50/61</a> )
15/08	. . using pulses	50/16	. . with provision for separate direct mechanical propulsion
15/10	. for automatic control superimposed on human control to limit the acceleration of the vehicle, e.g. to prevent excessive motor current ( <a href="#">electric devices for safety purposes B60L 3/00</a> )	50/20	. using propulsion power generated by humans or animals
15/12	. . with circuits controlled by relays or contactors	50/30	. using propulsion power stored mechanically, e.g. in fly-wheels
15/14	. . with main controller driven by a servomotor ( <a href="#">B60L 15/18 takes precedence</a> )	50/40	. using propulsion power supplied by capacitors
15/16	. . with main controller driven through a ratchet mechanism ( <a href="#">B60L 15/18 takes precedence</a> )	50/50	. using propulsion power supplied by batteries or fuel cells
15/18	. . without contact making and breaking, e.g. using a transductor	50/51	. . characterised by AC-motors
15/20	. for control of the vehicle or its driving motor to achieve a desired performance, e.g. speed, torque, programmed variation of speed	50/52	. . characterised by DC-motors
15/2009	. . {for braking}	50/53	. . in combination with an external power supply, e.g. from overhead contact lines
15/2018	. . . {for braking on a slope}	50/60	. . using power supplied by batteries ( <a href="#">in combination with fuel cells B60L 50/75</a> )
15/2027	. . . . {whilst maintaining constant speed}	50/61	. . . by batteries charged by engine-driven generators, e.g. series hybrid electric vehicles
15/2036	. . {Electric differentials, e.g. for supporting steering vehicles}	50/62	. . . . charged by low-power generators primarily intended to support the batteries, e.g. range extenders
15/2045	. . {for optimising the use of energy}	50/64	. . . Constructional details of batteries specially adapted for electric vehicles
15/2054	. . {by controlling transmissions or clutches}		<b>NOTE</b>
15/2063	. . {for creeping}		This group <u>covers</u> adaptation of battery structures of electric vehicles, e.g. integration into control or safety systems,
15/2072	. . {for drive off}		
15/2081	. . . {for drive off on a slope}		
15/209	. . {for overtaking}		
15/22	. . with sequential operation of interdependent switches, e.g. relays, contactors, programme drum		

## B60L

B60L 50/64

(continued)

- crash-resistant casings or vibration-damping means. 53/37
  - . . . using optical position determination, e.g. using cameras 53/38
  - . . . specially adapted for charging by inductive energy transfer 53/39
  - . . . . with position-responsive activation of primary coils 53/50
  - . Charging stations characterised by energy-storage or power-generation means 53/51
    - . . Photovoltaic means 53/52
    - . . Wind-driven generators 53/53
    - . . Batteries 53/54
    - . . Fuel cells 53/55
    - . . Capacitors 53/56
    - . . Mechanical storage means, e.g. fly wheels 53/57
    - . . Charging stations without connection to power networks 53/60
    - . Monitoring or controlling charging stations 53/62
      - . . in response to charging parameters, e.g. current, voltage or electrical charge 53/63
      - . . in response to network capacity 53/64
      - . . Optimising energy costs, e.g. responding to electricity rates 53/65
      - . . involving identification of vehicles or their battery types 53/66
      - . . Data transfer between charging stations and vehicles 53/665
        - . . . {Methods related to measuring, billing or payment}
      - . . Controlling two or more charging stations 53/67
      - . . Off-site monitoring or control, e.g. remote control 53/68
    - . Exchanging energy storage elements, e.g. removable batteries 53/80
- 50/66 . . . {Arrangements of batteries}
- 50/70 . . using power supplied by fuel cells (in combination with batteries B60L 50/75)
- 50/71 . . . Arrangement of fuel cells within vehicles specially adapted for electric vehicles
- 50/72 . . . Constructional details of fuel cells specially adapted for electric vehicles
- NOTE**

This group covers adaptation of fuel cell structures of electric vehicles, e.g. integration into control or safety systems, crash-resistant casings or vibration-damping means.
- 50/75 . . using propulsion power supplied by both fuel cells and batteries
- 50/90 . using propulsion power supplied by specific means not covered by groups B60L 50/10 - B60L 50/50, e.g. by direct conversion of thermal nuclear energy into electricity
- 53/00 Methods of charging batteries, specially adapted for electric vehicles; Charging stations or on-board charging equipment therefor; Exchange of energy storage elements in electric vehicles**
- 53/10 . characterised by the energy transfer between the charging station and the vehicle
- 53/11 . . {DC charging controlled by the charging station, e.g. mode 4}
- 53/12 . . Inductive energy transfer
- 53/122 . . . Circuits or methods for driving the primary coil, e.g. supplying electric power to the coil
- 53/124 . . . Detection or removal of foreign bodies
- 53/126 . . . Methods for pairing a vehicle and a charging station, e.g. establishing a one-to-one relation between a wireless power transmitter and a wireless power receiver
- 53/14 . . Conductive energy transfer
- 53/16 . . . Connectors, e.g. plugs or sockets, specially adapted for charging electric vehicles
- 53/18 . . . Cables specially adapted for charging electric vehicles
- 53/20 . characterised by converters located in the vehicle
- 53/22 . . Constructional details or arrangements of charging converters specially adapted for charging electric vehicles
- 53/24 . . Using the vehicle's propulsion converter for charging
- 53/30 . Constructional details of charging stations
- 53/302 . . Cooling of charging equipment
- 53/305 . . {Communication interfaces}
- 53/31 . . Charging columns specially adapted for electric vehicles
- 53/32 . . {by charging in short intervals along the itinerary, e.g. during short stops}
- 53/34 . . Plug-like or socket-like devices specially adapted for contactless inductive charging of electric vehicles (positioning means for charging devices using inductive energy transfer B60L 53/38)
- 53/35 . . Means for automatic or assisted adjustment of the relative position of charging devices and vehicles
- 53/36 . . . by positioning the vehicle
- 55/00 Arrangements for supplying energy stored within a vehicle to a power network, i.e. vehicle-to-grid [V2G] arrangements**
- 58/00 Methods or circuit arrangements for monitoring or controlling batteries or fuel cells, specially adapted for electric vehicles**
- NOTE**

This group covers the monitoring of the operating state of batteries or fuel cells in combination with controlling the propulsion in response to the detected variables of the state.
- . . . for monitoring or controlling batteries 58/10
- . . . responding to state of charge [SoC] 58/12
- . . . Maintaining the SoC within a determined range 58/13
- . . . Preventing excessive discharging 58/14
- . . . Preventing overcharging 58/15
- . . . responding to battery ageing, e.g. to the number of charging cycles or the state of health [SoH] 58/16
- . . of two or more battery modules 58/18
- . . . Switching between serial connection and parallel connection of battery modules 58/19
- . . . having different nominal voltages 58/20
- . . . having the same nominal voltage 58/21
- . . . Balancing the charge of battery modules 58/22
- . . for controlling the temperature of batteries 58/24
- . . . by controlling the electric load 58/25
- . . . by cooling 58/26
- . . . by heating 58/27
- . . for monitoring or controlling fuel cells 58/30

58/31	. . for starting of fuel cells	<b>2240/00</b>	<b>Control parameters of input or output; Target parameters</b>
58/32	. . for controlling the temperature of fuel cells, e.g. by controlling the electric load	2240/10	. Vehicle control parameters
58/33	. . . by cooling	2240/12	. . Speed
58/34	. . . by heating	2240/14	. . Acceleration
58/40	. for controlling a combination of batteries and fuel cells	2240/16	. . . longitudinal
		2240/18	. . . lateral
		2240/20	. . . angular
		2240/22	. . Yaw angle
		2240/24	. . Steering angle
		2240/26	. . Vehicle weight
		2240/28	. . Door position
		2240/30	. . Parking brake position
		2240/32	. . Driving direction
		2240/34	. . Cabin temperature
		2240/36	. . Temperature of vehicle components or parts
		2240/40	. Drive Train control parameters
		2240/42	. . related to electric machines
		2240/421	. . . Speed
		2240/423	. . . Torque
		2240/425	. . . Temperature
		2240/427	. . . Voltage
		2240/429	. . . Current
		2240/44	. . related to combustion engines
		2240/441	. . . Speed
		2240/443	. . . Torque
		2240/445	. . . Temperature
		2240/46	. . related to wheels
		2240/461	. . . Speed
		2240/463	. . . Torque
		2240/465	. . . Slip
		2240/48	. . related to transmissions
		2240/485	. . . Temperature
		2240/486	. . . Operating parameters
		2240/50	. . related to clutches
		2240/507	. . . Operating parameters
		2240/52	. . related to converters
		2240/525	. . . Temperature of converter or components thereof
		2240/526	. . . Operating parameters
		2240/527	. . . Voltage
		2240/529	. . . Current
		2240/54	. . related to batteries
		2240/545	. . . Temperature
		2240/547	. . . Voltage
		2240/549	. . . Current
		2240/60	. Navigation input
		2240/62	. . Vehicle position
		2240/622	. . . by satellite navigation
		2240/625	. . . by GSM
		2240/627	. . . by WLAN
		2240/64	. . Road conditions
		2240/642	. . . Slope of road
		2240/645	. . . Type of road
		2240/647	. . . Surface situation of road, e.g. type of paving
		2240/66	. . Ambient conditions
		2240/662	. . . Temperature
		2240/665	. . . Light intensity
		2240/667	. . . Precipitation
		2240/68	. . Traffic data
<b>2200/00</b>	<b>Type of vehicles</b>		
2200/10	. Air crafts		
2200/12	. Bikes		
2200/14	. Vehicles with one wheel only		
2200/16	. Single-axle vehicles		
2200/18	. Buses		
2200/20	. Vehicles specially adapted for children, e.g. toy vehicles		
2200/22	. Microcars, e.g. golf cars		
2200/24	. Personal mobility vehicles		
2200/26	. Rail vehicles		
2200/28	. Trailers		
2200/30	. Trolleys		
2200/32	. Waterborne vessels		
2200/34	. Wheel chairs		
2200/36	. Vehicles designed to transport cargo, e.g. trucks		
2200/40	. Working vehicles		
2200/42	. . Fork lift trucks		
2200/44	. . Industrial trucks or floor conveyors		
2200/46	. Vehicles with auxiliary ad-on propulsions, e.g. add-on electric motor kits for bicycles		
<b>2210/00</b>	<b>Converter types</b>		
2210/10	. DC to DC converters		
2210/12	. . Buck converters		
2210/14	. . Boost converters		
2210/20	. AC to AC converters		
2210/22	. . without intermediate conversion to DC		
2210/30	. AC to DC converters		
2210/40	. DC to AC converters		
2210/42	. . Voltage source inverters		
2210/44	. . Current source inverters		
2210/46	. . with more than three phases		
<b>2220/00</b>	<b>Electrical machine types; Structures or applications thereof</b>		
2220/10	. Electrical machine types		
2220/12	. . Induction machines		
2220/14	. . Synchronous machines		
2220/16	. . DC brushless machines		
2220/18	. . Reluctance machines		
2220/20	. . DC electrical machines		
2220/30	. . Universal machines		
2220/40	. Electrical machine applications		
2220/42	. . with use of more than one motor		
2220/44	. . Wheel Hub motors, i.e. integrated in the wheel hub		
2220/46	. . Wheel motors, i.e. motor connected to only one wheel		
2220/50	. Structural details of electrical machines		
2220/52	. . Clutch motors		
2220/54	. . Windings for different functions		
2220/56	. . with switched windings		
2220/58	. . with more than three phases		

## B60L

- 2240/70 . Interactions with external data bases, e.g. traffic centres
- 2240/72 . . Charging station selection relying on external data
- 2240/80 . Time limits
- 2250/00 Driver interactions**
- 2250/10 . by alarm
- 2250/12 . by confirmation, e.g. of the input
- 2250/14 . by input of vehicle departure time
- 2250/16 . by display
- 2250/18 . by enquiring driving style
- 2250/20 . by driver identification
- 2250/22 . by presence detection
- 2250/24 . by lever actuation
- 2250/26 . by pedal actuation
- 2250/28 . . Accelerator pedal thresholds
- 2250/30 . by voice
- 2260/00 Operating Modes**
- 2260/10 . Temporary overload
- 2260/12 . . of combustion engines
- 2260/14 . . of transmissions
- 2260/16 . . of electrical drive trains
- 2260/162 . . . of electrical cells or capacitors
- 2260/165 . . . of converters
- 2260/167 . . . of motors or generators
- 2260/20 . Drive modes; Transition between modes
- 2260/22 . . Standstill, e.g. zero speed
- 2260/24 . . Coasting mode
- 2260/26 . . Transition between different drive modes
- 2260/28 . . Four wheel or all wheel drive
- 2260/30 . . Engine braking emulation
- 2260/32 . . Auto pilot mode
- 2260/34 . . Stabilising upright position of vehicles, e.g. of single axle vehicles
- 2260/40 . Control modes
- 2260/42 . . by adaptive correction
- 2260/44 . . by parameter estimation
- 2260/46 . . by self learning
- 2260/48 . . by fuzzy logic
- 2260/50 . . by future state prediction
- 2260/52 . . . drive range estimation, e.g. of estimation of available travel distance
- 2260/54 . . . Energy consumption estimation
- 2260/56 . . . Temperature prediction, e.g. for pre-cooling
- 2260/58 . . . Departure time prediction
- 2270/00 Problem solutions or means not otherwise provided for**
- 2270/10 . Emission reduction
- 2270/12 . . of exhaust
- 2270/14 . . of noise
- 2270/142 . . . acoustic
- 2270/145 . . . Structure borne vibrations
- 2270/147 . . . electro magnetic [EMI]
- 2270/20 . Inrush current reduction, i.e. avoiding high currents when connecting the battery
- 2270/30 . Preventing theft during charging
- 2270/32 . . of electricity
- 2270/34 . . of parts
- 2270/36 . . of vehicles
- 2270/38 . . of data
- 2270/40 . related to technical updates when adding new parts or software
- 2270/42 . Means to improve acoustic vehicle detection by humans
- 2270/44 . Heat storages, e.g. for cabin heating
- 2270/46 . Heat pumps, e.g. for cabin heating