

CPC**COOPERATIVE PATENT CLASSIFICATION****B60L****ELECTRIC EQUIPMENT OR PROPULSION OF ELECTRICALLY-PROPELLED VEHICLES; MAGNETIC SUSPENSION OR LEVITATION FOR VEHICLES; ELECTRODYNAMIC BRAKE SYSTEMS FOR VEHICLES, IN GENERAL**

(electric coupling devices combined with mechanical couplings of vehicles [B60D 1/62](#); electric heating for vehicles [B60H](#); transmitting drive from electric motors to ultimate propulsive elements in vehicles [B60K](#); disposition of electric propulsion equipment, other than current collectors, in vehicles [B60K](#); auxiliary generator drives on vehicles [B60K](#); lighting for vehicles [B60Q](#); vehicle brake control systems in general [B60T](#); preventing wheel slip by reducing power in rail vehicles [B61C](#); railway track circuits in general [B61L](#); lighting in general [F21](#); [H05B](#); switches in general [H01H](#); coupling devices for electric connections in general [H01R](#); dynamo-electric machines [H02K](#); electric converters [H02M](#); starting, controlling, braking of electric machines or converters in general [H02P](#); electric heating in general [H05B](#))

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.

B60L 1/00

Supplying electric power to auxiliary equipment of vehicles (circuit arrangements for charging batteries [H02J 7/00](#))

B60L 1/003

- {to auxiliary motors, e.g. for pumps, compressors}

B60L 1/006

- {to power outlets}

B60L 1/02

- to electric heating circuits

B60L 1/04

- . . fed by the power supply line

B60L 1/06

- . . . using only one supply

B60L 1/08

- Methods and devices for control or regulation

B60L 1/10

- . . . with provision for using different supplies

B60L 1/12

- Methods and devices for control or regulation

B60L 1/14

- to electric lighting circuits

B60L 1/16

- . . fed by the power supply line

B60L 1/20

- {Energy regeneration from auxiliary equipment}

B60L 3/00

Electric devices on electrically-propelled vehicles for safety purposes; Monitoring operating variables, e.g. speed, deceleration, power consumption (measuring in general [G01](#))

B60L 3/0007

- {Measures or means for preventing or attenuating collisions}

- B60L 3/0015 . . {Prevention of collisions}
- B60L 3/0023 . {Detecting, eliminating, remedying or compensating for drive train abnormalities, e.g. failures within the drive train}
- B60L 3/003 . . {relating to inverters}
- B60L 3/0038 . . {relating to sensors}
- B60L 3/0046 . . {relating to electric energy storage systems, e.g. batteries or capacitors}
- B60L 3/0053 . . {relating to fuel cells}
- B60L 3/0061 . . {relating to electrical machines}
- B60L 3/0069 . . {relating to the isolation, e.g. ground fault or leak current}
- B60L 3/0076 . . {relating to braking}
- B60L 3/0084 . . {relating to control modules}
- B60L 3/0092 . {with use of redundant elements for safety purposes}
- B60L 3/02 . Dead-man's devices
- B60L 3/04 . Cutting off the power supply under fault conditions ([protective devices and circuit arrangements in general H01H; H02H](#))
- B60L 3/06 . Limiting the traction current under mechanical overload conditions
- B60L 3/08 . Means for preventing excessive speed of the vehicle
- B60L 3/10 . Indicating wheel slip; {[Correction of wheel slip](#)}
- B60L 3/102 . . {of individual wheels}
- B60L 3/104 . . {by indirect measurement of vehicle speed}
- B60L 3/106 . . {for maintaining or recovering the adhesion of the drive wheels}
- B60L 3/108 . . . {whilst braking, i.e. ABS}
- B60L 3/12 . Recording operating variables; {[Monitoring of operating variables](#)}

- B60L 5/00** **Current collectors for power supply lines of electrically-propelled vehicles**
([current collectors in general H01R 41/00](#))
- B60L 5/005 . {without mechanical contact between the collector and the power supply line}
- B60L 5/02 . with ice-removing device
- B60L 5/04 . using rollers or sliding shoes in contact with trolley wire ([B60L 5/40 takes precedence](#))
- B60L 5/045 . . {with trolley wire finders}
- B60L 5/06 . . Structure of the rollers or their carrying means
- B60L 5/08 . . Structure of the sliding shoes or their carrying means
- B60L 5/085 . . . {with carbon contact members}
- B60L 5/10 . . Devices preventing the collector from jumping off
- B60L 5/12 . . Structural features of poles or their bases
- B60L 5/14 . . . Devices for automatic lowering of a jumped-off collector
- B60L 5/16 . . . Devices for lifting and resetting the collector ([B60L 5/34 takes precedence](#))
- B60L 5/18 . using bow-type collectors in contact with trolley wire
- B60L 5/19 . . using arrangements for effecting collector movement transverse to the direction of vehicle motion

- B60L 5/20
 - . . Details of contact bow
- B60L 5/205
 - . . . {with carbon contact members}
- B60L 5/22
 - . . Supporting means for the contact bow
- B60L 5/24
 - . . . Pantographs
- B60L 5/26
 - . . . Half pantographs, e.g. using counter rocking beams
- B60L 5/28
 - . . . Devices for lifting and resetting the collector
- B60L 5/30
 - using springs
- B60L 5/32
 - using fluid pressure
- B60L 5/34
 - . with devices to enable one vehicle to pass another one using the same power supply line
- B60L 5/36
 - . with means for collecting current simultaneously from more than one conductor, e.g. from more than one phase
- B60L 5/38
 - . for collecting current from conductor rails ([B60L 5/40 takes precedence](#))
- B60L 5/39
 - . . from third rail
- B60L 5/40
 - . for collecting current from lines in slotted conduits
- B60L 5/42
 - . for collecting current from individual contact pieces connected to the power supply line

B60L 7/00

Electrodynamic brake systems for vehicles in general

- B60L 7/003
 - . {Dynamic electric braking by short circuiting the motor}
- B60L 7/006
 - . {Dynamic electric braking by reversing current, i.e. plugging}
- B60L 7/02
 - . Dynamic electric resistor braking ([B60L 7/22 takes precedence](#))
- B60L 7/04
 - . . for vehicles propelled by dc motors
- B60L 7/06
 - . . for vehicles propelled by ac motors
- B60L 7/08
 - . . Controlling the braking effect ([B60L 7/04](#), [B60L 7/06 take precedence](#))
- B60L 7/10
 - . Dynamic electric regenerative braking ([B60L 7/22 takes precedence](#))
- B60L 7/12
 - . . for vehicles propelled by dc motors
- B60L 7/14
 - . . for vehicles propelled by ac motors
- B60L 7/16
 - . . for vehicles comprising converters between the power source and the motor
- B60L 7/18
 - . . Controlling the braking effect ([B60L 7/12](#), [B60L 7/14](#), [B60L 7/16 take precedence](#))
- B60L 7/20
 - . Braking by supplying regenerated power to the prime mover of vehicles comprising engine-driven generators
- B60L 7/22
 - . Dynamic electric resistor braking, combined with dynamic electric regenerative braking
- B60L 7/24
 - . with additional mechanical or electromagnetic braking
- B60L 7/26
 - . . Controlling the braking effect
- B60L 7/28
 - . Eddy-current braking

B60L 8/00

Electric propulsion with power supply from force of nature, e.g. sun, wind

- B60L 8/003
 - . {Converting light into electric energy, e.g. by using photo-voltaic systems}
- B60L 8/006
 - . {Converting flow of air into electric energy, e.g. by using wind turbines}

B60L 9/00

Electric propulsion with power supply external to vehicle ([B60L 8/00](#),
[B60L 13/00](#) take precedence)

- B60L 9/005 . {Interference suppression}
- B60L 9/02 . using dc motors
- B60L 9/04 . . fed from dc supply lines
- B60L 9/06 . . . with conversion by metadyne
- B60L 9/08 . . fed from ac supply lines
- B60L 9/10 . . . with rotary converters
- B60L 9/12 . . . with static converters
- B60L 9/14 . . fed from different kinds of power-supply lines
- B60L 9/16 . using ac induction motors
- B60L 9/18 . . fed from dc supply lines
- B60L 9/20 . . . single-phase motors
- B60L 9/22 . . . polyphase motors
- B60L 9/24 . . fed from ac supply lines
- B60L 9/26 . . . single-phase motors
- B60L 9/28 . . . polyphase motors
- B60L 9/30 . . fed from different kinds of power-supply lines
- B60L 9/32 . using ac brush displacement motors

B60L 11/00

Electric propulsion with power supplied within the vehicle

([B60L 8/00](#),[B60L 13/00](#) take precedence; arrangements or mounting of plural diverse prime-movers for mutual or common propulsion [B60K 6/20](#); control systems specially adapted for hybrid vehicles [B60W 20/00](#))

- B60L 11/002 . {using electric power supply other than engine driven generators, electrical or fuel-cells}
- B60L 11/005 . . {using capacitors}
- B60L 11/007 . . {using auxiliary power supplied by humans}
- B60L 11/02 . using engine-driven generators
- B60L 11/04 . . using dc generators and motors
- B60L 11/06 . . using ac generators and dc motors
- B60L 11/08 . . using ac generators and motors
- B60L 11/10 . . using dc generators and ac motors
- B60L 11/12 . . with additional electric power supply, e.g. accumulator
- B60L 11/123 . . . {using range extenders, e. g. series hybrid vehicles}
- B60L 11/126 {the range extender having low power output with respect to maximum power output of the vehicle}
- B60L 11/14 . . with provision for direct mechanical propulsion
- B60L 11/16 . using power stored mechanically, e.g. in fly-wheel
- B60L 11/18 . using power supply from primary cells, secondary cells, or fuel cells
- B60L 11/1801 . . {combined with an external power supply}

B60L 11/1803	. . {for vehicles propelled by ac-motors}
B60L 11/1805	. . {for vehicles propelled by dc-motors}
B60L 11/1807	. . {for vehicles propelled by position controlled motors}
B60L 11/1809	. . {Charging electric vehicles}
B60L 11/1811	. . . {using converters}
B60L 11/1812	. . . . {Physical arrangements or structures of charging converters specially adapted for charging electric vehicles}
B60L 11/1814	. . . . {the vehicle's propulsion converter is used for charging}
B60L 11/1816	. . . {by conductive energy transfer, e.g. connectors}
B60L 11/1818	. . . . {Adaptations of plugs or sockets for charging electric vehicles}
B60L 11/182	. . . {by inductive energy transfer}
B60L 11/1822	. . . {by exchange of energy storage elements, e.g. removable batteries}
B60L 11/1824	. . . {Details of charging stations, e.g. vehicle recognition or billing (B60L 11/1811 , B60L 11/182 , B60L 11/1822 take precedence)}
B60L 11/1825	. . . . {Charging columns for electric vehicles}
B60L 11/1827	. . . . {Automatic adjustment of relative position between charging device and vehicle}
B60L 11/1829	. . . . . {for inductive energy transfer}
B60L 11/1831	. . . . . {with position related activation of primary coils}
B60L 11/1833	. . . . . {the vehicle being positioned}
B60L 11/1835	. . . . . {with optical position determination, e.g. by a camera}
B60L 11/1837	. . . . . {by charging in short intervals along the itinerary, e.g. during short stops}
B60L 11/1838	. . . . {Methods for the transfer of electrical energy or data between charging station and vehicle}
B60L 11/184	. . . . . {Optimising energy costs, e.g. by charging depending on electricity rates}
B60L 11/1842	. . . . . {Energy stored in the vehicle is provided to the network, i.e. vehicle to grid (V2G) arrangements}
B60L 11/1844	. . . . . {the charging being dependent on network capabilities}
B60L 11/1846	. . . . . {Identification of the vehicle}
B60L 11/1848	. . . . . {Methods related to measuring, billing or payment}
B60L 11/185	. . . . . {Fast charging}
B60L 11/1851	. . {Battery monitoring or controlling; Arrangements of batteries, structures or switching circuits therefore}
B60L 11/1853	. . . {by battery splitting}
B60L 11/1855	. . . . {by series/parallel switching}
B60L 11/1857	. . . {Battery age determination}
B60L 11/1859	. . . {Preventing deep discharging}
B60L 11/1861	. . . {Monitoring or controlling state of charge [SOC]}
B60L 11/1862	. . . . {Target range for state of charge [SOC]}

B60L 11/1864	. . . {Control of a battery packs, i.e. of a set of batteries with the same voltage}
B60L 11/1866	. . . . {Balancing the charge of multiple batteries or cells}
B60L 11/1868	. . . {Controlling two or more batteries with different voltages}
B60L 11/187	. . . {Battery temperature regulation}
B60L 11/1872	. . . . {by control of electric loads}
B60L 11/1874	. . . . {by cooling}
B60L 11/1875	. . . . {by heating}
B60L 11/1877	. . . {Arrangements of batteries}
B60L 11/1879	. . . {Adaptation of battery structures for electric vehicles}
B60L 11/1881	. . {Fuel cells monitoring or controlling; Arrangements of fuel cells, structures or switching circuits therefore}
B60L 11/1883	. . . {Details of fuel cells}
B60L 11/1885	. . . {Starting of fuel cells}
B60L 11/1887	. . . {combined with battery control}
B60L 11/1888	. . . {Fuel cell temperature regulation}
B60L 11/189	. . . . {by control of electric loads}
B60L 11/1892	. . . . {by cooling}
B60L 11/1894	. . . . {by heating}
B60L 11/1896	. . . {Arrangements of the fuel cells}
B60L 11/1898	. . . {Adaptation of fuel cell structures for electric vehicles}
B60L 13/00	Electric propulsion for monorail vehicles, suspension vehicles or rack railways; Magnetic suspension or levitation for vehicles ({tracks for Maglev-type trains E01B 25/30;} electromagnets per se H01F 7/06; linear motors per se H02K 41/00)
B60L 13/003	. {Crossings; Points}
B60L 13/006	. {Electric propulsion adapted for monorail vehicles, suspension vehicles or rack railways (B60L 13/03 takes precedence)}
B60L 13/03	. Electric propulsion by linear motors
B60L 13/035	. . {Suspension of the vehicle-borne motorparts}
B60L 13/04	. Magnetic suspension or levitation for vehicles
B60L 13/06	. . Means to sense or control vehicle position or attitude with respect to railway
B60L 13/08	. . . for the lateral position
B60L 13/10	. Combination of electric propulsion and magnetic suspension or levitation
B60L 15/00	Methods, circuits, or devices for controlling the traction-motor speed of electrically-propelled vehicles
B60L 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}
B60L 15/005	. . {for control of propulsion for vehicles propelled by linear motors}
B60L 15/007	. {Physical arrangements or structures of drive train converters specially adapted for the propulsion motors of electric vehicles}

- B60L 15/02
 - characterised by the form of the current used in the control circuit
- B60L 15/025
 - • {using field orientation; Vector control; Direct Torque Control [DTC]}
- B60L 15/04
 - • using dc
- B60L 15/06
 - • using substantially sinusoidal ac
- B60L 15/08
 - • using pulses
- B60L 15/10
 - for automatic control superimposed on human control to limit the acceleration of the vehicle, e.g. to prevent excessive motor current (electric devices for safety purposes B60L 3/00)
- B60L 15/12
 - • with circuits controlled by relays or contactors
- B60L 15/14
 - • with main controller driven by a servomotor (B60L 15/18 takes precedence)
- B60L 15/16
 - • with main controller driven through a ratchet mechanism (B60L 15/18 takes precedence)
- B60L 15/18
 - • without contact making and breaking, e.g. using a transducer
- B60L 15/20
 - for control of the vehicle or its driving motor to achieve a desired performance, e.g. speed, torque, programmed variation of speed
- B60L 15/2009
 - • {for braking}
- B60L 15/2018
 - • • {for braking on a slope}
- B60L 15/2027
 - • • • {whilst maintaining constant speed}
- B60L 15/2036
 - • {Electric differentials, e.g. for supporting steering of vehicles (arrangement of control devices for differential gearing B60K 23/02)}
- B60L 15/2045
 - • {for optimising the use of energy}
- B60L 15/2054
 - • {by controlling transmissions or clutches}
- B60L 15/2063
 - • {for creeping}
- B60L 15/2072
 - • {for drive off}
- B60L 15/2081
 - • • {for drive off on a slope}
- B60L 15/209
 - • {for overtaking}
- B60L 15/22
 - • with sequential operation of interdependent switches, e.g. relays, contactors, programme drum
- B60L 15/24
 - • with main controller driven by a servomotor (B60L 15/28 takes precedence)
- B60L 15/26
 - • with main controller driven through a ratchet mechanism (B60L 15/28 takes precedence)
- B60L 15/28
 - • without contact making and breaking, e.g. using a transducer
- B60L 15/30
 - • with means to change over to human control
- B60L 15/32
 - Control or regulation of multiple-unit electrically-propelled vehicles
- B60L 15/34
 - • with human control of a setting device
- B60L 15/36
 - • • with automatic control superimposed, e.g. to prevent excessive motor current
- B60L 15/38
 - • with automatic control
- B60L 15/40
 - Adaptation of control equipment on vehicle for remote actuation from a stationary place (devices along the route for controlling devices on rail vehicles B61L 3/00; central rail-traffic control systems B61L 27/00)

B60L 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 ([B60L 15/32 takes precedence](#))

B60L 2200/00**Type of vehicles**

B60L 2200/10

- Air crafts

B60L 2200/12

- Bikes

B60L 2200/14

- Vehicles with one wheel only

B60L 2200/16

- Single-axle vehicles

B60L 2200/18

- Buses

B60L 2200/20

- Vehicles specially adapted for children, e.g. toy vehicles

B60L 2200/22

- Micro-cars, e.g. golf cars

B60L 2200/24

- Personal mobility vehicles

B60L 2200/26

- Rail vehicles

B60L 2200/28

- Trailers

B60L 2200/30

- Trolleys

B60L 2200/32

- Waterborne vessels

B60L 2200/34

- Wheel chairs

B60L 2200/36

- Vehicles designed to transport cargo, e.g. trucks

B60L 2200/40

- Working vehicles

B60L 2200/42

- . Fork lift trucks

B60L 2200/44

- . Industrial trucks or floor conveyers

B60L 2200/46

- Vehicles with auxiliary ad-on propulsions, e.g. add-on electric motor kits for bicycles

B60L 2210/00**Converter types**

B60L 2210/10

- DC to DC converters

B60L 2210/12

- . Buck converters

B60L 2210/14

- . Boost converters

B60L 2210/20

- AC to AC converters

B60L 2210/22

- . without intermediate conversion to DC

B60L 2210/30

- AC to DC converters

B60L 2210/40

- DC to AC converters

B60L 2210/42

- . Voltage source inverters

B60L 2210/44

- . Current source inverters

B60L 2210/46

- . with more than three phases

B60L 2220/00**Electrical machine types; Structures or applications thereof**

B60L 2220/10

- Electrical machine types

B60L 2220/12

- . Induction machines

B60L 2220/14

- . Synchronous machines

B60L 2220/16

- . DC brushless machines

- B60L 2220/18 . . Reluctance machines
- B60L 2220/20 . . DC electrical machines
- B60L 2220/30 . . Universal machines
- B60L 2220/40 . Electrical machine applications
- B60L 2220/42 . . with use of more than one motor
- B60L 2220/44 . . Wheel Hub motors, i.e. integrated in the wheel hub
- B60L 2220/46 . . Wheel motors, i.e. motor connected to only one wheel
- B60L 2220/50 . Structural details of electrical machines
- B60L 2220/52 . . Clutch motors
- B60L 2220/54 . . Windings for different functions
- B60L 2220/56 . . with switched windings
- B60L 2220/58 . . with more than three phases

B60L 2230/00**Charging station details**

- B60L 2230/10 . Parts thereof
- B60L 2230/12 . . Connection cables
- B60L 2230/14 . . Contact less plugs
- B60L 2230/16 . . Communication interfaces
- B60L 2230/20 . Power generation within charging stations
- B60L 2230/22 . . by solar panels
- B60L 2230/24 . . by wind generators
- B60L 2230/26 . . by power stored mechanically, e.g. by fly wheel
- B60L 2230/28 . . by fuel cells
- B60L 2230/30 . . by batteries
- B60L 2230/32 . . by capacitors
- B60L 2230/34 . . Charging station being an island
- B60L 2230/40 . Remote controls for charging stations

B60L 2240/00**Control parameters of input or output; Target parameters**

- B60L 2240/10 . Vehicle control parameters
- B60L 2240/12 . . Speed
- B60L 2240/14 . . Acceleration
- B60L 2240/16 . . . longitudinal
- B60L 2240/18 . . . lateral
- B60L 2240/20 . . . angular
- B60L 2240/22 . . Yaw angle
- B60L 2240/24 . . Steering angle
- B60L 2240/26 . . Vehicle weight
- B60L 2240/28 . . Door position
- B60L 2240/30 . . Parking brake position
- B60L 2240/32 . . Driving direction

B60L 2240/34	. . Cabin temperature
B60L 2240/36	. . Temperature of vehicle components or parts
B60L 2240/40	. Drive Train control parameters
B60L 2240/42	. . related to electric machines
B60L 2240/421	. . . Speed
B60L 2240/423	. . . Torque
B60L 2240/425	. . . Temperature
B60L 2240/427	. . . Voltage
B60L 2240/429	. . . Current
B60L 2240/44	. . related to combustion engines
B60L 2240/441	. . . Speed
B60L 2240/443	. . . Torque
B60L 2240/445	. . . Temperature
B60L 2240/46	. . related to wheels
B60L 2240/461	. . . Speed
B60L 2240/463	. . . Torque
B60L 2240/465	. . . Slip
B60L 2240/48	. . related to transmissions
B60L 2240/485	. . . Temperature
B60L 2240/486	. . . Operating parameters
B60L 2240/50	. . related to clutches
B60L 2240/507	. . . Operating parameters
B60L 2240/52	. . related to converters
B60L 2240/525	. . . Temperature of converter or components thereof
B60L 2240/526	. . . Operating parameters
B60L 2240/527	. . . Voltage
B60L 2240/529	. . . Current
B60L 2240/54	. . related to batteries
B60L 2240/545	. . . Temperature
B60L 2240/547	. . . Voltage
B60L 2240/549	. . . Current
B60L 2240/60	. Navigation input
B60L 2240/62	. . Vehicle position
B60L 2240/622	. . . by satellite navigation
B60L 2240/625	. . . by GSM
B60L 2240/627	. . . by WLAN
B60L 2240/64	. . Road conditions
B60L 2240/642	. . . Slope of road
B60L 2240/645	. . . Type of road
B60L 2240/647	. . . Surface situation of road, e.g. type of paving

- B60L 2240/66 . . Ambient conditions
- B60L 2240/662 . . . Temperature
- B60L 2240/665 . . . Light intensity
- B60L 2240/667 . . . Precipitation
- B60L 2240/68 . . Traffic data
- B60L 2240/70 . Interactions with external data bases e.g. traffic centres
- B60L 2240/72 . . Charging station selection relying on external data
- B60L 2240/80 . Time limits

B60L 2250/00**Driver interactions**

- B60L 2250/10 . by alarm
- B60L 2250/12 . by confirmation, e.g. of the input
- B60L 2250/14 . by input of vehicle departure time
- B60L 2250/16 . by display
- B60L 2250/18 . by enquiring driving style
- B60L 2250/20 . by driver identification
- B60L 2250/22 . by presence detection
- B60L 2250/24 . by lever actuation
- B60L 2250/26 . by pedal actuation
- B60L 2250/28 . . Accelerator pedal thresholds
- B60L 2250/30 . by voice

B60L 2260/00**Operating Modes**

- B60L 2260/10 . Temporary overload
- B60L 2260/12 . . of combustion engines
- B60L 2260/14 . . of transmissions
- B60L 2260/16 . . of electrical drive trains
- B60L 2260/162 . . . of electrical cells or capacitors
- B60L 2260/165 . . . of converters
- B60L 2260/167 . . . of motors or generators
- B60L 2260/20 . Drive modes; Transition between modes
- B60L 2260/22 . . Standstill, e.g. zero speed
- B60L 2260/24 . . Coasting mode
- B60L 2260/26 . . Transition between different drive modes
- B60L 2260/28 . . Four wheel or all wheel drive
- B60L 2260/30 . . Engine braking emulation
- B60L 2260/32 . . Auto pilot mode
- B60L 2260/34 . . Stabilising upright position of vehicles, e.g. of single axle vehicles
- B60L 2260/40 . Control modes
- B60L 2260/42 . . by adaptive correction
- B60L 2260/44 . . by parameter estimation

- B60L 2260/46 . . by self learning
- B60L 2260/48 . . by fuzzy logic
- B60L 2260/50 . . by future state prediction
- B60L 2260/52 . . . drive range estimation e.g. of estimation of available travel distance
- B60L 2260/54 . . . Energy consumption estimation
- B60L 2260/56 . . . Temperature prediction e.g. for pre-cooling
- B60L 2260/58 . . . Departure time prediction

B60L 2270/00**Problem solutions or means not otherwise provided for**

- B60L 2270/10 . Emission reduction
- B60L 2270/12 . . of exhaust
- B60L 2270/14 . . of noise
- B60L 2270/142 . . . acoustic
- B60L 2270/145 . . . Structure borne vibrations
- B60L 2270/147 . . . electro magnetic [EMI]
- B60L 2270/20 . Inrush current reduction, i.e. avoiding high currents when connecting the battery
- B60L 2270/30 . Preventing theft during charging
- B60L 2270/32 . . of electricity
- B60L 2270/34 . . of parts
- B60L 2270/36 . . of vehicles
- B60L 2270/38 . . of data
- B60L 2270/40 . related to technical updates when adding new parts or software
- B60L 2270/42 . Means to improve acoustic vehicle detection by humans
- B60L 2270/44 . Heat storages, e.g. for cabin heating
- B60L 2270/46 . Heat pumps, e.g. for cabin heating