

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](#))

NOTE

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