

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

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

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

B60L 2250/10

B60L 2250/12

B60L 2250/14

B60L 2250/16

B60L 2250/18

B60L 2250/20

B60L 2250/22

B60L 2250/24

B60L 2250/26

B60L 2250/28

B60L 2250/30

Driver interactions

- . by alarm
- . by confirmation, e.g. of the input
- . by input of vehicle departure time
- . by display
- . by enquiring driving style
- . by driver identification
- . by presence detection
- . by lever actuation
- . by pedal actuation
- .. Accelerator pedal thresholds
- . by voice

B60L 2260/00

B60L 2260/10

B60L 2260/12

B60L 2260/14

B60L 2260/16

B60L 2260/162

B60L 2260/165

B60L 2260/167

B60L 2260/20

B60L 2260/22

B60L 2260/24

B60L 2260/26

B60L 2260/28

B60L 2260/30

B60L 2260/32

B60L 2260/34

B60L 2260/40

B60L 2260/42

B60L 2260/44

B60L 2260/46

B60L 2260/48

B60L 2260/50

B60L 2260/52

B60L 2260/54

B60L 2260/56

B60L 2260/58

Operating Modes

- . Temporary overload
 - .. of combustion engines
 - .. of transmissions
 - .. of electrical drive trains
 - ... of electrical cells or capacitors
 - ... of converters
 - ... of motors or generators
- . Drive modes; Transition between modes
 - .. Standstill, e.g. zero speed
 - .. Coasting mode
 - .. Transition between different drive modes
 - .. Four wheel or all wheel drive
 - .. Engine braking emulation
 - .. Auto pilot mode
 - .. Stabilising upright position of vehicles, e.g. of single axle vehicles
- . Control modes
 - .. by adaptive correction
 - .. by parameter estimation
 - .. by self learning
 - .. by fuzzy logic
 - .. by future state prediction
 - ... drive range estimation e.g. of estimation of available travel distance
 - ... Energy consumption estimation
 - ... Temperature prediction e.g. for pre-cooling
 - ... 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