

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 transductor
- 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 transductor
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