## COOPERATIVE PATENT CLASSIFICATION

### B PERFORMING OPERATIONS; TRANSPORTING

#### (NOTES omitted)

### TRANSPORTING

#### B60 VEHICLES IN GENERAL

#### (NOTE omitted)

| B60L | Propulsion of Electrically-Propelled Vehicles (arrangements or mounting of electrical propulsion units or of plural diverse prime-movers for mutual or common propulsion in vehicles B60K 1/00, B60K 6/20; arrangements or mounting of electrical gearing in vehicles B60K 17/12, B60K 17/14; preventing wheel slip by reducing power in rail vehicles B61C 15/08; dynamo-electric machines H02K; control or regulation of electric motors H02P); Supplying Electric Power for Auxiliary Equipment of Electrically-Propelled Vehicles (electric coupling devices combined with mechanical couplings of vehicles B60D 1/64; electric heating for vehicles B60H 1/00); Electrodynamic Brake Systems for Vehicles in General (control or regulation of electric motors H02P); Magnetic Suspension or Levitation for Vehicles; Monitoring Operating Variables of Electrically-Propelled Vehicles; Electric Safety Devices for Electrically-Propelled Vehicles |
| --- |

#### NOTES

1. This subclass, subject to the above references, covers:
   - feeding of power to auxiliary circuits;
   - current collectors; arrangements thereof on rail or road vehicles or on vehicles in general
   - electrodynamic brake systems;
   - electric propulsion of vehicles; control and regulation therefor

2. In this subclass it is desirable to classify any "additional information" which is of interest for search.

#### WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

### 1/00 Supplying Electric Power to Auxiliary Equipment of Vehicles (Circuit Arrangements for Charging Batteries H02J 7/00)

<table>
<thead>
<tr>
<th>1/00</th>
<th>Supplying electric power to auxiliary equipment of vehicles (circuit arrangements for charging batteries H02J 7/00)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/003</td>
<td>[to auxiliary motors, e.g. for pumps, compressors]</td>
</tr>
<tr>
<td>1/006</td>
<td>[to power outlets]</td>
</tr>
<tr>
<td>1/02</td>
<td>to electric heating circuits</td>
</tr>
<tr>
<td>1/04</td>
<td>fed by the power supply line</td>
</tr>
<tr>
<td>1/06</td>
<td>using only one supply</td>
</tr>
<tr>
<td>1/08</td>
<td>Methods and devices for control or regulation</td>
</tr>
<tr>
<td>1/10</td>
<td>with provision for using different supplies</td>
</tr>
<tr>
<td>1/12</td>
<td>Methods and devices for control or regulation</td>
</tr>
<tr>
<td>1/14</td>
<td>to electric lighting circuits</td>
</tr>
<tr>
<td>1/16</td>
<td>fed by the power supply line</td>
</tr>
<tr>
<td>1/20</td>
<td>[Energy regeneration from auxiliary equipment]</td>
</tr>
</tbody>
</table>

#### Electric Devices on Electrically-Propelled Vehicles for Safety Purposes; Monitoring Operating Variables, E.g., Speed, Deceleration or Energy Consumption (Methods or Circuit Arrangements for Monitoring or Controlling Batteries or Fuel Cells B60L 58/00)

#### WARNING

Group B60L 3/00 is impacted by reclassification into groups B60L 58/00, B60L 58/10, B60L 58/12, B60L 58/13, B60L 58/14, B60L 58/15, B60L 58/16, B60L 58/18, B60L 58/19, B60L 58/20, B60L 58/21, B60L 58/22, B60L 58/24, B60L 58/25, B60L 58/26, B60L 58/27, B60L 58/30, B60L 58/31, B60L 58/32, B60L 58/33, B60L 58/34, and B60L 58/40.

All groups listed in this Warning should be considered in order to perform a complete search.

| 3/007 | [Measures or means for preventing or attenuating collisions] |
B60L

3/0015 . . . (Prevention of collisions)
3/0023 . . . (Detecting, eliminating, remedying or compensating for drive train abnormalities, e.g. failures within the drive train)
3/003 . . . (relating to inverters)
3/0038 . . . (relating to sensors)
3/0046 . . . (relating to electric energy storage systems, e.g. batteries or capacitors)

**WARNING**

Group B60L 3/0046 is impacted by reclassification into groups B60L 58/00, B60L 58/10, B60L 58/12, B60L 58/13, B60L 58/14, B60L 58/15, B60L 58/16, B60L 58/18, B60L 58/19, B60L 58/20, B60L 58/21, B60L 58/22, B60L 58/24, B60L 58/25, B60L 58/26, B60L 58/27, and B60L 58/40.

All groups listed in this Warning should be considered in order to perform a complete search.

3/0053 . . . (relating to fuel cells)

**WARNING**

Group B60L 3/0053 is impacted by reclassification into groups B60L 58/00, B60L 58/30, B60L 58/31, B60L 58/32, B60L 58/33, B60L 58/34, and B60L 58/40.

All groups listed in this Warning should be considered in order to perform a complete search.

3/0061 . . . (relating to electrical machines)
3/0069 . . . (relating to the isolation, e.g. ground fault or leak current)
3/0076 . . . (relating to braking)
3/0084 . . . (relating to control modules)
3/0092 . . . (with use of redundant elements for safety purposes)
3/02 . . Dead-man's devices
3/04 . Cutting off the power supply under fault conditions (protective devices and circuit arrangements in general H01H: H02H)
3/06 . Limiting the traction current under mechanical overload conditions
3/08 . Means for preventing excessive speed of the vehicle
3/10 . Indicating wheel slip ; Correction of wheel slip
3/102 . . (of individual wheels)
3/104 . . (by indirect measurement of vehicle speed)
3/106 . . . (for maintaining or recovering the adhesion of the drive wheels)
3/108 . . . . (whilst braking, i.e. ABS)
3/12 . Recording operating variables ; Monitoring of operating variables

**5/00** Current collectors for power supply lines of electrically-propelled vehicles (current collectors in general H01R 41/00)

5/005 . . . (without mechanical contact between the collector and the power supply line)
5/02 . . with ice-removing device
5/04 . using rollers or sliding shoes in contact with trolley wire (B60L 5/40 takes precedence)
5/045 . . . (with trolley wire finders)

5/06 . . . Structure of the rollers or their carrying means
5/08 . . . Structure of the sliding shoes or their carrying means
5/085 . . . (with carbon contact members)
5/10 . . Devices preventing the collector from jumping off
5/12 . . . Structural features of poles or their bases
5/14 . . . Devices for automatic lowering of a jumped-off collector
5/16 . . . Devices for lifting and resetting the collector (B60L 5/34 takes precedence)
5/18 . . using bow-type collectors in contact with trolley wire
5/19 . . using arrangements for effecting collector movement transverse to the direction of vehicle motion
5/20 . . . Details of contact bow
5/205 . . . (with carbon contact members)
5/22 . . Supporting means for the contact bow
5/24 . . . Pantographs
5/26 . . . Half pantographs, e.g. using counter rocking beams
5/28 . . . Devices for lifting and resetting the collector
5/30 . . . . using springs
5/32 . . . . using fluid pressure
5/34 . . . with devices to enable one vehicle to pass another one using the same power supply line
5/36 . . . with means for collecting current simultaneously from more than one conductor, e.g. from more than one phase
5/38 . . for collecting current from conductor rails (B60L 5/40 takes precedence)
5/39 . . from third rail
5/40 . . for collecting current from lines in slotted conduits
5/42 . . for collecting current from individual contact pieces connected to the power supply line

**7/00** Electrodynamic brake systems for vehicles in general

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

8/00 Electric propulsion with power supply from forces of nature, e.g. sun or wind
8/003 . [Converting light into electric energy, e.g. by using photo-voltaic systems]
8/006 . [Converting flow of air into electric energy, e.g. by using wind turbines]

9/00 Electric propulsion with power supply external to the vehicle (electric propulsion for monorail vehicles, suspension vehicles or rack railways; B60L 13/00; in combination with batteries or fuel cells within the vehicle: B60L 50/53)

WARNING
Group B60L 9/00 is impacted by recategorisation into group B60L 50/53.
Groups B60L 9/00 and B60L 50/53 should be considered in order to perform a complete search.

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

13/00 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 70/06; linear motors per se H02K 41/00)

13/003 . . [Crossings; Points]
13/006 . . (Electric propulsion adapted for monorail vehicles, suspension vehicles or rack railways (B60L 13/03 takes precedence))

13/03 . . Electric propulsion by linear motors
13/035 . . [Suspension of the vehicle-borne motorparts]
13/04 . . Magnetic suspension or levitation for vehicles
13/06 . . Means to sense or control vehicle position or attitude with respect to railway
13/08 . . for the lateral position
13/10 . . Combination of electric propulsion and magnetic suspension or levitation

15/00 Methods, circuits, or devices for controlling the traction-motor speed of electrically-propelled vehicles
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]
Electric propulsion with power supplied within the vehicle (with power supply from force of nature, e.g. sun or wind, B60L 8/00; for monorail vehicles, suspension vehicles or rack railways B60L 13/00)

using propulsion power supplied by engine-driven generators, e.g. generators driven by combustion engines

using DC generators and DC motors

using AC generators and DC motors

using AC generators and AC motors

with additional electric power supply (with capacitors charged by engine-driven generators B60L 50/40; with batteries charged by engine-driven generators B60L 50/61)

with provision for separate direct mechanical propulsion

using propulsion power generated by humans or animals

using propulsion power stored mechanically, e.g. in fly-wheels

using propulsion power supplied by capacitors

using propulsion power supplied by batteries or fuel cells

WARNING
Group B60L 50/50 is impacted by reclassification into groups B60L 50/60, B60L 50/64, B60L 50/70, and B60L 50/75.

All groups listed in this Warning should be considered in order to perform a complete search.

characterised by AC-motors

characterised by DC-motors

in combination with an external power supply, e.g. from overhead contact lines

WARNING
Group B60L 50/53 is incomplete pending reclassification of documents from group B60L 9/00.

Groups B60L 9/00 and B60L 50/53 should be considered in order to perform a complete search.

using power supplied by batteries (in combination with fuel cells B60L 50/75)

WARNING
Group B60L 50/60 is incomplete pending reclassification from group B60L 50/50.

All groups listed in this Warning should be considered in order to perform a complete search.

using power supplied by batteries (in combination with fuel cells B60L 50/75)

by batteries charged by engine-driven generators, e.g. series hybrid electric vehicles

charged by low-power generators primarily intended to support the batteries, e.g. range extenders

Constructional details of batteries specially adapted for electric vehicles

NOTE
This group covers adaptation of battery structures of electric vehicles, e.g. integration into control or safety systems, crash-resistant casings or vibration-damping means.

WARNING
Group B60L 50/64 is incomplete pending reclassification of documents from group B60L 50/50.

Groups B60L 50/50 and B60L 50/64 should be considered in order to perform a complete search.

Arrangements of batteries

using power supplied by fuel cells (in combination with batteries B60L 50/75)

WARNING
Group B60L 50/70 is incomplete pending reclassification from group B60L 50/50.

All groups listed in this Warning should be considered in order to perform a complete search.

Arrangement of fuel cells within vehicles specially adapted for electric vehicles

Constructional details of fuel cells specially adapted for electric vehicles

NOTE
This group covers adaptation of fuel cell structures of electric vehicles, e.g. integration into control or safety systems, crash-resistant casings or vibration-damping means.

using propulsion power supplied by both fuel cells and batteries

WARNING
Group B60L 50/75 is incomplete pending reclassification from group B60L 50/50.

Groups B60L 50/50 and B60L 50/75 should be considered in order to perform a complete search.

using propulsion power supplied by specific means not covered by groups B60L 50/10 - B60L 50/50, e.g. by direct conversion of thermal nuclear energy into electricity
Methods of charging batteries, specially adapted for electric vehicles; Charging stations or on-board charging equipment therefor; Exchange of energy storage elements in electric vehicles

**WARNING**

Group B60L 53/00 is impacted by reclassification into groups B60L 53/50, B60L 53/51, B60L 53/52, B60L 53/53, B60L 53/54, B60L 53/55, B60L 53/56, B60L 53/57, B60L 53/58, and B60L 53/59. All groups listed in this Warning should be considered in order to perform a complete search.

53/10 characterised by the energy transfer between the charging station and the vehicle

**WARNING**

Group B60L 53/10 is incomplete pending reclassification of documents from group B60L 53/60. Groups B60L 53/60 and B60L 53/10 should be considered in order to perform a complete search.

53/11 DC charging controlled by the charging station, e.g. mode 4

53/12 Inductive energy transfer

**WARNING**

Group B60L 53/12 is impacted by reclassification into groups B60L 53/122, B60L 53/124, and B60L 53/126. All groups listed in this Warning should be considered in order to perform a complete search.

53/122 Circuits or methods for driving the primary coil, e.g. supplying electric power to the coil

**WARNING**

Group B60L 53/122 is incomplete pending reclassification of documents from group B60L 53/12. Groups B60L 53/12 and B60L 53/122 should be considered in order to perform a complete search.

53/124 Detection or removal of foreign bodies

**WARNING**

Group B60L 53/124 is incomplete pending reclassification of documents from group B60L 53/12. Groups B60L 53/12 and B60L 53/124 should be considered in order to perform a complete search.

53/126 Methods for pairing a vehicle and a charging station, e.g. establishing a one-to-one relation between a wireless power transmitter and a wireless power receiver

**WARNING**

Group B60L 53/126 is incomplete pending reclassification of documents from group B60L 53/12. Groups B60L 53/12 and B60L 53/126 should be considered in order to perform a complete search.

53/14 Conductive energy transfer

**WARNING**

Group B60L 53/14 is impacted by reclassification into group B60L 53/18. Groups B60L 53/14 and B60L 53/18 should be considered in order to perform a complete search.

53/16 Connectors, e.g. plugs or sockets, specially adapted for charging electric vehicles

53/18 Cables specially adapted for charging electric vehicles

**WARNING**

Group B60L 53/18 is incomplete pending reclassification of documents from group B60L 53/14. Groups B60L 53/14 and B60L 53/18 should be considered in order to perform a complete search.

53/20 characterised by converters located in the vehicle

53/22 Constructional details or arrangements of charging converters specially adapted for charging electric vehicles

53/24 Using the vehicle's propulsion converter for charging

53/30 Constructional details of charging stations

**WARNING**

Group B60L 53/30 is impacted by reclassification into groups B60L 53/302, B60L 53/305, B60L 53/34, B60L 53/67, and B60L 53/68. Groups B60L 53/30, B60L 53/302, B60L 53/305, B60L 53/34, B60L 53/67, and B60L 53/68 should be considered in order to perform a complete search.

53/32 Cooling of charging equipment

**WARNING**

Group B60L 53/32 is incomplete pending reclassification of documents from group B60L 53/30. Groups B60L 53/30 and B60L 53/32 should be considered in order to perform a complete search.
53/305. . . {Communication interfaces}

**WARNING**

Group **B60L 53/305** is incomplete pending reclassification of documents from group **B60L 53/30**. 

Groups **B60L 53/30** and **B60L 53/305** should be considered in order to perform a complete search.

53/31. . . Charging columns specially adapted for electric vehicles

53/32. . . {by charging in short intervals along the itinerary, e.g. during short stops}

53/34. . . Plug-like or socket-like devices specially adapted for contactless inductive charging of electric vehicles (positioning means for charging devices using inductive energy transfer **B60L 53/38**)

**WARNING**

Group **B60L 53/34** is incomplete pending reclassification of documents from group **B60L 53/30**. 

Groups **B60L 53/30** and **B60L 53/34** should be considered in order to perform a complete search.

53/35. . . Means for automatically adjusting the relative position of charging devices and vehicles

53/36. . . by positioning the vehicle

53/37. . . using optical position determination, e.g. using cameras

53/38. . . specially adapted for charging by inductive energy transfer

53/39. . . with position-responsive activation of primary coils

53/50. . . Charging stations characterised by energy-storage or power-generation means

**WARNING**

Groups **B60L 53/50** - **B60L 53/57** are incomplete pending reclassification of documents from group **B60L 53/00**. 

All groups listed in this Warning should be considered in order to perform a complete search.

53/62. . . in response to charging parameters, e.g. current, voltage or electrical charge

**WARNING**

Group **B60L 53/62** is incomplete pending reclassification of documents from groups **B60L 53/60**. 

All groups listed in this Warning should be considered in order to perform a complete search.

53/63. . . in response to network capacity

53/64. . . Optimising energy costs, e.g. responding to electricity rates

53/65. . . involving identification of vehicles

53/66. . . Data transfer between charging stations and vehicles

**WARNING**

Group **B60L 53/66** is incomplete pending reclassification of documents from group **B60L 53/60**. 

Groups **B60L 53/60** and **B60L 53/66** should be considered in order to perform a complete search.

53/68. . . Off-site monitoring or control, e.g. remote control

**WARNING**

Group **B60L 53/68** is incomplete pending reclassification of documents from groups **B60L 53/00**, **B60L 53/30**, and **B60L 53/60**. 

All groups listed in this Warning should be considered in order to perform a complete search.

53/80. . . Exchanging energy storage elements, e.g. removable batteries

**WARNING**

Group **B60L 53/80** is incomplete pending reclassification of documents from groups **B60K 1/04** and **B60S 5/06**. 

Groups **B60K 1/04**, **B60S 5/06**, and **B60L 53/80** should be considered in order to perform a complete search.

55/00 Arrangements for supplying energy stored within a vehicle to a power network, i.e. vehicle-to-grid [V2G] arrangements
Methods or circuit arrangements for monitoring or controlling batteries or fuel cells, specially adapted for electric vehicles

**NOTE**
This group covers the monitoring of the operating state of batteries or fuel cells in combination with controlling the propulsion in response to the detected variables of the state.

**WARNING**
Group B60L 58/00 is incomplete pending reclassification of documents from groups B60L 3/00, B60L 3/0046, B60L 3/0053, B60L 50/60, and B60L 50/70.
All groups listed in this Warning should be considered in order to perform a complete search.

| 58/10 | . . for monitoring or controlling batteries

**WARNING**
Group B60L 58/10 is incomplete pending reclassification of documents from groups B60L 3/00, B60L 3/0046, and B60L 50/60.
All groups listed in this Warning should be considered in order to perform a complete search.

| 58/12 | . . responding to state of charge [SoC]

**WARNING**
Group B60L 58/12 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.
Group B60L 58/12 is also impacted by reclassification into group B60L 58/15.
All groups listed in this Warning should be considered in order to perform a complete search.

| 58/13 | . . Maintaining the SoC within a determined range

**WARNING**
Group B60L 58/13 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.
Group B60L 58/13 is also impacted by reclassification into group B60L 58/15.
All groups listed in this Warning should be considered in order to perform a complete search.

| 58/14 | . . Preventing excessive discharging

**WARNING**
Group B60L 58/14 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.
Group B60L 58/14 is also impacted by reclassification into group B60L 58/15.
All groups listed in this Warning should be considered in order to perform a complete search.

| 58/15 | . . Preventing overcharging

**WARNING**
Group B60L 58/15 is incomplete pending reclassification of documents from groups B60L 3/00, B60L 3/0046, B60L 58/12, B60L 58/13, and B60L 58/14.
All groups listed in this Warning should be considered in order to perform a complete search.

| 58/16 | . . responding to battery ageing, e.g. to the number of charging cycles or the state of health [SoH]

**WARNING**
Group B60L 58/16 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.
All groups listed in this Warning should be considered in order to perform a complete search.

| 58/18 | . . of two or more battery modules

**WARNING**
Group B60L 58/18 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.
All groups listed in this Warning should be considered in order to perform a complete search.

| 58/19 | . . Switching between serial connection and parallel connection of battery modules

**WARNING**
Group B60L 58/19 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.
All groups listed in this Warning should be considered in order to perform a complete search.

| 58/20 | . . having different nominal voltages

**WARNING**
Group B60L 58/20 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.
All groups listed in this Warning should be considered in order to perform a complete search.

| 58/21 | . . having the same nominal voltage

**WARNING**
Group B60L 58/21 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.
All groups listed in this Warning should be considered in order to perform a complete search.
58/22 . . . Balancing the charge of battery modules

**WARNING**

Group B60L 58/22 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.

All groups listed in this Warning should be considered in order to perform a complete search.

58/24 . . . for controlling the temperature of batteries

**WARNING**

Group B60L 58/24 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.

All groups listed in this Warning should be considered in order to perform a complete search.

58/25 . . . by controlling the electric load

**WARNING**

Group B60L 58/25 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.

All groups listed in this Warning should be considered in order to perform a complete search.

58/26 . . . by cooling

**WARNING**

Group B60L 58/26 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.

All groups listed in this Warning should be considered in order to perform a complete search.

58/27 . . . by heating

**WARNING**

Group B60L 58/27 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0046.

All groups listed in this Warning should be considered in order to perform a complete search.

58/28 . . . for starting of fuel cells

**WARNING**

Group B60L 58/31 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0053.

All groups listed in this Warning should be considered in order to perform a complete search.

58/32 . . . for controlling the temperature of fuel cells, e.g. by controlling the electric load

**WARNING**

Group B60L 58/32 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0053.

All groups listed in this Warning should be considered in order to perform a complete search.

58/33 . . . by cooling

**WARNING**

Group B60L 58/33 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0053.

All groups listed in this Warning should be considered in order to perform a complete search.

58/34 . . . by heating

**WARNING**

Group B60L 58/34 is incomplete pending reclassification of documents from groups B60L 3/00 and B60L 3/0053.

All groups listed in this Warning should be considered in order to perform a complete search.

58/35 . . . for controlling a combination of batteries and fuel cells

**WARNING**

Group B60L 58/40 is incomplete pending reclassification of documents from groups B60L 3/00, B60L 3/0046, B60L 3/0053, and B60L 50/75.

All groups listed in this Warning should be considered in order to perform a complete search.

---

2200/00 Type of vehicles
2200/10 . Air crafts
2200/12 . Bikes
2200/14 . Vehicles with one wheel only
2200/16 . Single-axle vehicles
2200/18 . Buses
2200/20 . Vehicles specially adapted for children, e.g. toy vehicles
2200/22 . Microcars, e.g. golf cars
2200/24 . Personal mobility vehicles
2200/26 . Rail vehicles
2200/28 . Trailers
2200/30 . Trolleys
2200/32 . Waterborne vessels
2200/34 . Wheel chairs
2200/36 . Vehicles designed to transport cargo, e.g. trucks
2200/40 . Working vehicles
2200/42 . Fork lift trucks
2200/44 . Industrial trucks or floor conveyors
2200/46 . Vehicles with auxiliary ad-on propulsions, e.g. add-on electric motor kits for bicycles

2210/00 Converter types
2210/10 . DC to DC converters
2210/12 . Buck converters
2210/14 . Boost converters
2210/20 . AC to AC converters
2210/22 . without intermediate conversion to DC
2210/30 . AC to DC converters
2210/40 . DC to AC converters
2210/42 . Voltage source inverters
2210/44 . Current source inverters
2210/46 . with more than three phases

2220/00 Electrical machine types; Structures or applications thereof
2220/10 . Electrical machine types
2220/12 . Induction machines
2220/14 . Synchronous machines
2220/16 . DC brushless machines
2220/18 . Reluctance machines
2220/20 . DC electrical machines
2220/30 . Universal machines
2220/40 . Electrical machine applications
2220/42 . Wheel Hub motors, i.e. integrated in the wheel hub
2220/44 . Wheel motors, i.e. motor connected to only one wheel
2220/50 . Structural details of electrical machines
2220/52 . Clutch motors
2220/54 . Windings for different functions
2220/56 . with switched windings
2220/58 . with more than three phases

2240/00 Control parameters of input or output; Target parameters
2240/10 . Vehicle control parameters
2240/12 . Speed
2240/14 . Acceleration
2240/16 . longitudinal
2240/18 . lateral
2240/20 . angular
2240/22 . Yaw angle
2240/24 . Steering angle
2240/26 . Vehicle weight
2240/28 . Door position
2240/30 . Parking brake position
2240/32 . Driving direction
2240/34 . Cabin temperature
2240/36 . Temperature of vehicle components or parts
2240/40 . Drive Train control parameters
2240/42 . related to electric machines
2240/421 . Speed
2240/423 . Torque
2240/425 . Temperature

2240/427 . Voltage
2240/429 . Current
2240/44 . related to combustion engines
2240/441 . Speed
2240/443 . Torque
2240/445 . Temperature
2240/46 . related to wheels
2240/461 . Speed
2240/463 . Torque
2240/465 . Slip
2240/48 . related to transmissions
2240/485 . Temperature
2240/486 . Operating parameters
2240/50 . related to clutches
2240/507 . Operating parameters
2240/52 . related to converters
2240/525 . Temperature of converter or components thereof
2240/526 . Operating parameters
2240/527 . Voltage
2240/529 . Current
2240/54 . related to batteries
2240/545 . Temperature
2240/547 . Voltage
2240/549 . Current
2240/60 . Navigation input
2240/62 . Vehicle position
2240/622 . by satellite navigation
2240/625 . by GSM
2240/627 . by WLAN
2240/64 . Road conditions
2240/642 . Slope of road
2240/645 . Type of road
2240/647 . Surface situation of road, e.g. type of paving
2240/66 . Ambient conditions
2240/662 . Temperature
2240/665 . Light intensity
2240/667 . Precipitation
2240/68 . Traffic data
2240/70 . Interactions with external data bases, e.g. traffic centres
2240/72 . Charging station selection relying on external data
2240/80 . Time limits

2250/00 Driver interactions
2250/10 . by alarm
2250/12 . by confirmation, e.g. of the input
2250/14 . by input of vehicle departure time
2250/16 . by display
2250/18 . by enquiring driving style
2250/20 . by driver identification
2250/22 . by presence detection
2250/24 . by lever actuation
2250/26 . by pedal actuation
2250/28 . Accelerator pedal thresholds
2250/30 . by voice

2260/00 Operating Modes
2260/10 . Temporary overload
2260/12 . of combustion engines
2260/14 . of transmissions
| 2260/16 | . . . of electrical drive trains |
| 2260/162 | . . . of electrical cells or capacitors |
| 2260/165 | . . . of converters |
| 2260/167 | . . . of motors or generators |
| 2260/20 | Drive modes; Transition between modes |
| 2260/22 | Standstill, e.g. zero speed |
| 2260/24 | Coasting mode |
| 2260/26 | Transition between different drive modes |
| 2260/28 | Four wheel or all wheel drive |
| 2260/30 | Engine braking emulation |
| 2260/32 | Auto pilot mode |
| 2260/34 | Stabilising upright position of vehicles, e.g. of single axle vehicles |
| 2260/40 | Control modes |
| 2260/42 | by adaptive correction |
| 2260/44 | by parameter estimation |
| 2260/46 | by self learning |
| 2260/48 | by fuzzy logic |
| 2260/50 | by future state prediction |
| 2260/52 | Drive range estimation, e.g. of estimation of available travel distance |
| 2260/54 | Energy consumption estimation |
| 2260/56 | Temperature prediction, e.g. for pre-cooling |
| 2260/58 | Departure time prediction |

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

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