SECTION B — PERFORMING OPERATIONS; TRANSPORTING

B60 VEHICLES IN GENERAL

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 [4]**

Subclass index

ELECTRIC PROPULSION
With external or internal supply....8/00-11/00
For monorail vehicles, suspension vehicles or rack railways; Magnetic suspension or levitation for vehicles....13/00
Control....15/00
CURRENT-COLLECTORS....5/00
ELECTRIC SUPPLY TO AUXILIARY EQUIPMENT....1/00
SAFETY ARRANGEMENTS....3/00
ELECTRODYNAMIC BRAKING....7/00

1/00 **Supplying electric power to auxiliary equipment of electrically-propelled vehicles** (arrangement of signalling or lighting devices, the mounting or supporting thereof or circuits therefor, for vehicles in general B60Q) **[6]**
1/02 • to electric heating circuits
1/04 • • fed by the power supply line
1/06 • • • using only one supply
1/08 • • • • Methods or devices for control or regulation
1/10 • • • with provision for using different supplies
1/12 • • • • Methods or devices for control or regulation
1/14 • to electric lighting circuits
1/16 • • fed by the power supply line

3/00 **Electric devices on electrically-propelled vehicles for safety purposes; Monitoring operating variables, e.g. speed, deceleration, power consumption**
3/02 • Dead-man's devices
3/04 • Cutting-off the power supply under fault conditions
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
3/12 • Recording operating variables

5/00 **Current-collectors for power supply lines of electrically-propelled vehicles**
5/02 • with ice-removing device
5/04 • using rollers or sliding shoes in contact with trolley wire (B60L 5/40 takes precedence)
5/06 • • Structure of the rollers or their carrying means
5/08 • • Structure of the sliding shoes or their carrying means
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 **[3]**
5/20 • • Details of contact bow
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 **[3]**
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 [4]
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 force of nature, e.g. sun, wind [5]

9/00 Electric propulsion with power supply external to vehicle (B60L 8/00, B60L 13/00 take precedence) **[5, 6]**
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

11/00 Electric propulsion with power supplied within the vehicle (B60L 8/00, B60L 13/00 take precedence; arrangements or mounting of prime-movers consisting of electric motors and internal combustion engines for mutual or common propulsion B60K 6/20) **[5, 6, 2006.01]**
11/02 • using engine-driven generators
11/04 • • using dc generators and motors
11/06 • • using ac generators and dc motors
11/08 • • using ac generators and motors
11/10 • • using dc generators and ac motors
11/12 • • with additional electric power supply, e.g. accumulator
11/14 • • with provision for direct mechanical propulsion
11/16 • using power stored mechanically, e.g. in flywheel
11/18 • using power supplied from primary cells, secondary cells, or fuel cells

13/00 Electric propulsion for monorail vehicles, suspension vehicles or rack railways; Magnetic suspension or levitation for vehicles [4, 6]
13/03 • Electric propulsion by linear motors **[6]**
13/04 • Magnetic suspension or levitation for vehicles **[4]**
13/06 • • Means to sense or control vehicle position or attitude with respect to railway **[4]**
13/08 • • • for the lateral position **[4]**
13/10 • Combination of electric propulsion and magnetic suspension or levitation **[4]**

15/00 Methods, circuits or devices for controlling the propulsion of electrically-propelled vehicles, e.g. their traction-motor speed, to achieve a desired performance; Adaptation of control equipment on electrically-propelled vehicles for remote actuation from a stationary place, from alternative parts of the vehicle or from alternative vehicles of the same vehicle train
15/02 • characterised by the form of the current used in the control circuit
15/04 • • using dc
15/06 • • using substantially-sinusoidal ac
15/08 • • using pulses
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)
15/12 • • with circuits controlled by relays or contactors
15/14 • • with main controller driven by a servomotor (B60L 15/18 takes precedence)
15/16 • • with main controller driven through a ratchet mechanism (B60L 15/18 takes precedence)
15/18 • • without contact-making and breaking, e.g. using a transductor
15/20 • for control of the vehicle or its driving motor to achieve a desired performance, e.g. speed, torque, programmed variation of speed
15/22 • • with sequential operation of interdependent switches, e.g. relays, contactors, programme drum
15/24 • • with main controller driven by a servomotor (B60L 15/28 takes precedence)
15/26 • • with main controller driven through a ratchet mechanism (B60L 15/28 takes precedence)
15/28 • • without contact-making and breaking, e.g. using a transductor
15/30 • • with means to change-over to human control
15/32 • Control or regulation of multiple-unit electrically-propelled vehicles
15/34 • • with human control of a setting device
15/36 • • • with automatic control superimposed, e.g. to prevent excessive motor current
15/38 • • with automatic control
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)
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)