

## 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

<b>1/00</b>	<b>Supplying electric power to auxiliary equipment of electrically-propelled vehicles</b> (arrangement of signalling or lighting devices, the mounting or supporting thereof or circuits therefor, for vehicles in general B60Q) [6]	5/08	• • Structure of the sliding shoes or their carrying means
1/02	• to electric heating circuits	5/10	• • Devices preventing the collector from jumping off
1/04	• • fed by the power supply line	5/12	• • Structural features of poles or their bases
1/06	• • • using only one supply	5/14	• • • Devices for automatic lowering of a jumped-off collector
1/08	• • • • Methods or devices for control or regulation	5/16	• • • Devices for lifting and resetting the collector (B60L 5/34 takes precedence)
1/10	• • • with provision for using different supplies	5/18	• using bow-type collectors in contact with trolley wire
1/12	• • • • Methods or devices for control or regulation	5/19	• • using arrangements for effecting collector movement transverse to the direction of vehicle motion [3]
1/14	• to electric lighting circuits	5/20	• • Details of contact bow
1/16	• • fed by the power supply line	5/22	• • Supporting means for the contact bow
<b>3/00</b>	<b>Electric devices on electrically-propelled vehicles for safety purposes; Monitoring operating variables, e.g. speed, deceleration, power consumption</b>	5/24	• • • Pantographs
3/02	• Dead-man's devices	5/26	• • • Half-pantographs, e.g. using counter-rocking beams
3/04	• Cutting-off the power supply under fault conditions	5/28	• • • Devices for lifting and resetting the collector
3/06	• Limiting the traction current under mechanical-overload conditions	5/30	• • • • using springs
3/08	• Means for preventing excessive speed of the vehicle	5/32	• • • • using fluid pressure
3/10	• Indicating wheel slip	5/34	• with devices to enable one vehicle to pass another one using the same power supply line
3/12	• Recording operating variables	5/36	• with means for collecting current simultaneously from more than one conductor, e.g. from more than one phase
<b>5/00</b>	<b>Current-collectors for power supply lines of electrically-propelled vehicles</b>	5/38	• for collecting current from conductor rails (B60L 5/40 takes precedence)
5/02	• with ice-removing device	5/39	• • from third rail [3]
5/04	• using rollers or sliding shoes in contact with trolley wire (B60L 5/40 takes precedence)	5/40	• for collecting current from lines in slotted conduits
5/06	• • Structure of the rollers or their carrying means	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)