

B60 VEHICLES IN GENERAL

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; arrangements or mounting of electrical propulsion units in vehicles B60K 1/00; arrangements or mounting of electric gearing in vehicles B60K 17/12, B60K 17/14; auxiliary drives on vehicles B60K 25/00; arrangement of signalling or lighting devices, the mounting or supporting thereof or circuits therefor, for vehicles in general 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) **[4]**

This subclass covers, subject to the references following the title of the subclass:

- 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.

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

1/00	Supplying electric power to auxiliary equipment of vehicles (circuit arrangements for charging batteries H02J 7/00) [6]	5/10	. .	Devices preventing the collector from jumping off
1/02	. to electric heating circuits	5/12	. .	Structural features of poles or their bases
1/04	. . fed by the power supply line	5/14	. . .	Devices for automatic lowering of a jumped-off collector
1/06	. . . using only one supply	5/16	. . .	Devices for lifting and resetting the collector (B60L 5/34 takes precedence)
1/08	 Methods or devices for control or regulation	5/18	. using bow-type collectors in contact with trolley wire	
1/10	. . . with provision for using different supplies	5/19	. using arrangements for effecting collector movement transverse to the direction of vehicle motion [3]	
1/12	 Methods or devices for control or regulation	5/20	. . Details of contact bow	
1/14	. to electric lighting circuits	5/22	. . Supporting means for the contact bow	
1/16	. . fed by the power supply line	5/24	. . . Pantographs	
3/00	Electric devices on electrically-propelled vehicles for safety purposes; Monitoring operating variables, e.g. speed, deceleration, power consumption (measuring in general G01)	5/26	. . . Half-pantographs, e.g. using counter-rocking beams	
3/02	. Dead-man's devices	5/28	. . . Devices for lifting and resetting the collector	
3/04	. Cutting-off the power supply under fault conditions (protective devices or circuit arrangements in general H01H, H02H)	5/30	 using springs	
3/06	. Limiting the traction current under mechanical-overload conditions	5/32	 using fluid pressure	
3/08	. Means for preventing excessive speed of the vehicle	5/34	. with devices to enable one vehicle to pass another one using the same power supply line	
3/10	. Indicating wheel slip	5/36	. with means for collecting current simultaneously from more than one conductor, e.g. from more than one phase	
3/12	. Recording operating variables	5/38	. for collecting current from conductor rails (B60L 5/40 takes precedence)	
5/00	Current-collectors for power supply lines of electrically-propelled vehicles (current-collectors in general H01R 41/00)	5/39	. . from third rail [3]	
5/02	. with ice-removing device	5/40	. for collecting current from lines in slotted conduits	
5/04	. using rollers or sliding shoes in contact with trolley wire (B60L 5/40 takes precedence)	5/42	. for collecting current from individual contact pieces connected to the power supply line	
5/06	. . Structure of the rollers or their carrying means	7/00	Electrodynamic brake systems for vehicles in general [4]	
5/08	. . Structure of the sliding shoes or their carrying means	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 (electromagnetic brakes F16D 65/34)
- 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; arrangement or mounting of plural diverse prime-movers for mutual or common propulsion B60K 6/00; control systems specially adapted for hybrid vehicles B60W 20/00) [5,6,8]

- 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 (electromagnetics per se H01F 7/06; linear motors per se H02K 41/00) [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 traction-motor speed of electrically-propelled vehicles

- 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 transducer
- 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 transducer
- 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)