

ECLA EUROPEAN CLASSIFICATION

B61L	GUIDING RAILWAY TRAFFIC; ENSURING THE SAFETY OF RAILWAY TRAFFIC (power supply lines for electrically-propelled vehicles B60M; vehicle signalling in general B60Q; brakes or auxiliary equipment B61H, B61K; point or crossing construction E01B; insulated rail joints E01B11/54 ; optical devices in general G02; controlling in general G05; electric communication technique H04)
B61L1/00	Devices along the route controlled by interaction with the vehicle or vehicle train, [N: e.g. pedals] (detonators B61L5/20 ; operation of points or signals by passage of the vehicle B61L11/00 , B61L13/00 ; central traffic control systems controlled by train B61L27/04 ; operation of gates, or gates and signals, by approaching vehicle B61L29/18)
B61L1/02	. Electric devices associated with track [N: e.g. rail contacts]
B61L1/02A	. . [N: actuated by variation of resistance or by piezo-electricity]
B61L1/04	. . mechanically actuated by a part of the vehicle
B61L1/04A	. . . [N: actuated by fluid-pressure]
B61L1/06	. . actuated by deformation of rail; actuated by vibration in rail
B61L1/08	. . magnetically actuated; electrostatically actuated
B61L1/10	. . actuated by electromagnetic radiation; actuated by particle radiation
B61L1/12	. Electric devices associated with overhead trolley wires
B61L1/14	. Devices for indicating the passing of the end of the vehicle or vehicle train
B61L1/16	. Devices for counting axles; Devices for counting vehicles (counting moving objects in general G06M)
B61L1/16A	. . [N: characterised by the counting methods] [N0904]
B61L1/16B	. . [N: characterised by the error correction] [N0904]
B61L1/16C	. . [N: Detection devices] [N0904]
B61L1/16C1	. . . [N: Mechanical] [N0904]
B61L1/16C2	. . . [N: Electrical] [N0904]
B61L1/16C3	. . . [N: Optical] [N0904]
B61L1/16D	. . [N: Circuit details] [N0904]
B61L1/16E	. . [N: Specific transmission details] [N0904]
B61L1/16H	. . [N: Diagnosis] [N0904]
B61L1/18	. Railway track circuits (automatically-operated track circuits specially adapted for section blocking for controlling traffic B61L23/00 ; rail joints E01B11/00)
B61L1/18A	. . [N: Details]
B61L1/18A1	. . . [N: Use of current of indifferent sort or a combination of different current types]
B61L1/18A1A [N: Use of means on the vehicle for improving short circuit e.g. in vehicles with rubber bandages]
B61L1/18A1B [N: Use of additional conductors for examining leakages between rails]
B61L1/18A2	. . . [N: Use of direct current]

- B61L1/18A3 . . . [N: Use of rectified alternating current]
- B61L1/18A4 . . . [N: Use of alternating current]
- B61L1/18A5 . . . [N: Use of coded current]

- B61L1/20 . Safety arrangements for preventing or indicating malfunction of the device, e.g. by leakage current, by lightning [N: remote indicating means for abnormal operations conditions [G08B21/00](#), [G08B23/00](#); detectors for indicating the overheating of axle bearings [B61K9/00](#)]

- B61L3/00** **Devices along the route for controlling devices on the vehicle or vehicle train, e.g. to release brake, to operate a warning signal**

- B61L3/00A . [N: Recorders on the vehicle]
- B61L3/00B . [N: Memory means reproducing during the running of the vehicle or vehicle train, e.g. smart cards] [C0902]
- B61L3/00C . [N: On-board optimisation of vehicle or vehicle train operation (**track-side optimisation of operation** [B61L27/00B3](#))] [N0902]
- B61L3/00D . [N: On-board target speed calculation or supervision (**track-side control of safe travel** [B61L27/00C](#); **speed control circuitry** [B60L3/08](#); **speed control of electric drives** [B60L15/20](#))] [N0902]
- B61L3/02 . at selected places along the route, e.g. intermittent control [N: **simultaneous mechanical and electrical control**]
- B61L3/04 . . controlling mechanically [N: arrangements of making elements acting directly on tread [B60T1/04](#)]
- B61L3/06 . . controlling by electromagnetic or particle radiation, e.g. by light beam (**using radio waves** [B61L3/12](#))
- B61L3/06A . . . [N: controlling optically]
- B61L3/08 . . controlling electrically
- B61L3/10 . . . using current passing between devices along the route and devices on the vehicle train
- B61L3/10A [N: Details of current transmitting conductors or contact brushes]
- B61L3/10B [N: with mechanically controlled electrical switch on the vehicle]
- B61L3/12 . . . using magnetic or electrostatic induction; using radio waves
- B61L3/12A [N: using magnetic induction]
- B61L3/12B [N: using short-range radio transmission (**long-range radio transmission** [B61L15/00B1](#), [B61L27/00A](#))] [N0902]
- B61L3/12C [N: Constructional details] [N0902]
- B61L3/12D [N: for remote control of locomotives (**remote control of locomotives within a train consist** [B61C17/12](#))] [N0902]
- B61L3/12E [N: for control of tilting trains by external control devices, e.g. by Eurobalise (**tilting details** [B61F5/22](#))] [N0902]
- B61L3/14 . . to cut-off the power supply to traction motors of electrically-propelled vehicles
- B61L3/16 . Continuous control along the route
- B61L3/18 . . using electric current passing between devices along the route and devices on the

- vehicle or vehicle train
- B61L3/18A . . . [N: using separate conductors]
- B61L3/20 . . . employing different frequencies or coded pulse groups [N: e.g. using currents carried by traction current (operating and signalling systems using network power supply [H02J13/00](#))]
- B61L3/22 . . . using magnetic or electrostatic induction; using electromagnetic radiation
- B61L3/22A [N: using track circuits]
- B61L3/22A1 [N: Arrangements on the track only] [C9609]
- B61L3/22B [N: using separate conductors along the route]
- B61L3/22C [N: using electromagnetic radiation]
- B61L3/24 employing different frequencies or coded pulse groups [N: e.g. in combination with track circuits]
- B61L3/24A [N: using alternating current]
- B61L3/24B [N: using coded current]

- B61L5/00** **Local operating mechanisms for points or track-mounted scotch-blocks** (track-mounted scotch-blocks per se [B61K](#)); **Visible or audible signals; Local operating mechanisms for visible or audible signals** ([B61L11/00](#) takes precedence)

- B61L5/02 . . . Mechanical devices for operating points or scotch-blocks [N: e.g. local manual control]
- B61L5/02A [N: using funicular driving means]
- B61L5/02B [N: fixing switch-rails to the driving means]

- B61L5/04 . . . Fluid-pressure devices for operating points or scotch-blocks
- B61L5/04A [N: using electrically controlled fluid-pressure operated driving means]

- B61L5/06 . . . Electric devices for operating points or scotch-blocks [N: e.g. using electromotive driving means]
- B61L5/06A [N: Wiring diagrams]
- B61L5/06B [N: Construction of driving mechanism]
- B61L5/06C [N: using electromagnetic driving means]

- B61L5/08 . . . Underground actuating arrangements, e.g. for tramways

- B61L5/10 . . . Locking mechanisms for points; Means for indicating the setting of points
- B61L5/10A [N: Controlling electrically]
- B61L5/10B [N: Controlling funicularly]
- B61L5/10C [N: electrical control of points position]

- B61L5/12 . . . Visible signals [N: (signalling means on the vehicle [B61L15/00](#); signalling means for classification yards, or the like, with multiple indicating means [B61L17/02A](#); signalling means for road crossings [B61L29/24](#); lighting in general [F21](#); visible signalling arrangements in general [G08B5/00](#))]
- B61L5/12A [N: Fixed signals, beacons, or the like]
- B61L5/14 Form signals, e.g. semaphore arms [N: (illumination for points, form signals [B61L9/00](#))]
- B61L5/16 Local operating mechanisms for form signals

- B61L5/16A [N: using electromotive driving means]
- B61L5/16A1 [N: Wiring diagrams]
- B61L5/16A2 [N: Driving mechanisms]
- B61L5/16B [N: using electromagnetic driving means]
- B61L5/16C [N: using electrically controlled gravity operated driving means]
- B61L5/16D [N: using electrically controlled fluid-pressure operated driving means]
- B61L5/16G [N: using funicular driving means]
- B61L5/18 . . Light signals; Mechanisms associated therewith, e.g. blinders
- B61L5/18A [N: Daylight signals]
- B61L5/18A1 [N: using mobile coloured screen]
- B61L5/18A2 [N: using light sources of different colours and a common optical system]
- B61L5/18A3 [N: using light sources of different colours and separate optical systems]
- B61L5/18A4 [N: Optical systems, lenses]
- B61L5/18A5 [N: Mounting and focussing of the light source in a lamp, fixing means
(focussing of the light source in reflecting mirrors [F21M3/02](#))]
- B61L5/18A6 [N: Lamp mountings on a mast]
- B61L5/18A7 [N: Mobile mounting arrangements on a mast; Arrangements for hoisting of
the lamp along the mast]
- B61L5/18A8 [N: Wiring diagrams for power supply, control or testing]
- B61L5/18C [N: using flashing light sources (visible signalling in general using flashing light
sources [G08B5/38](#); thermal switches operating intermittently [H01H61/06](#),
[H01H61/08](#))]

- B61L5/20 . . Audible signals, e.g. detonator [N: audible signalling]
- B61L5/20A . . . [N: Detonators; Track mounting means; Composition of the detonative product]
- B61L5/20B . . . [N: Signalling means for special purposes]
- B61L5/22 . . Devices for initiating the release of detonators in a certain position of a signal
- B61L5/24 . . Replacement of detonators

- B61L7/00** **Remote control of local operating means for points, signals, or trackmounted
scotch-blocks** ([B61L11/00](#) takes precedence; interlocking arrangements [B61L19/00](#);
transmission per se, see the relevant classes)

- B61L7/02 . . using mechanical transmission; e.g. wire, lever
- B61L7/02A . . . [N: Driving wheels or supports for traction wires]
- B61L7/02B . . . [N: Guiding means or supporting foundations in beton]
- B61L7/02C . . . [N: Coupling for wires or traction bars]
- B61L7/02D . . . [N: Bracing or compensating arrangements]
- B61L7/02E . . . [N: Control levers]
- B61L7/02H . . . [N: Indicating or fixing arrangements in the event of breaking or tension difference
of transmission wires for points, signals or similar]

- B61L7/04 . . using fluid-pressure transmitting

- B61L7/06 . . using electrical transmission

- B61L7/06A . . [N: using electromotive driving means]
- B61L7/06A1 . . . [N: Wiring diagrams]
- B61L7/06A2 . . . [N: Construction of driving mechanism]
- B61L7/06B . . [N: using electromagnetic driving means]
- B61L7/06D . . [N: using electrically controlled fluid-pressure operated driving means]
- B61L7/06P . . [N: Supply for electric safety arrangements]
- B61L7/06Q . . [N: Protection against eddy-currents, short-circuits, or the like, for electric safety arrangements]
- B61L7/08 . . Circuitry
- B61L7/08A . . . [N: Direct line wire control]
- B61L7/08B . . . [N: Common line wire control using currents of different amplitudes, polarities, frequencies, or the like]
- B61L7/08C . . . [N: Common line wire control using synchronous distributors]
- B61L7/08D . . . [N: Common line wire control using relay distributors]
- B61L7/08F . . . [N: Common line wire control using series of coded pulses]
- B61L7/10 . . . for light signals, e.g. for supervision, back-signalling
- B61L7/10A [N: Electric control of the setting of signals]
- B61L7/10A1 [N: for form signals]

B61L9/00 **Illumination specially adapted for points, form signals, or gates** ([lighting in general F21](#))

- B61L9/02 . non-electric
- B61L9/04 . electric

B61L11/00 **Operation of points from the vehicle or by the passage of the vehicle**

- B61L11/02 . Using mechanical interaction between vehicle and track
- B61L11/04 . . Trailable point locks
- B61L11/06 . . with fluid-pressure transmission
- B61L11/08 . using electrical or magnetic interaction between vehicle and track
- B61L11/08A . . [N: Magnetic control]

B61L13/00 **Operation of signals from the vehicle or by the passage of the vehicle**

- B61L13/00A . [N: actuated by the passage of the vehicle]
- B61L13/00B . [N: optically actuated]
- B61L13/00C . [N: acoustically actuated]
- B61L13/02 . using mechanical interaction between vehicle and track [N: (pedals [B61L1/00](#))]
- B61L13/04 . using electrical or magnetic interaction between vehicle and track [N: e.g. by conductor circuits using special means or special conductors]

- B61L13/04A . . [N: using isolated rail sections]
- B61L13/04B . . [N: using separated rail contacts, pedals or similar ([B61L1/02](#) takes precedence)] [C9609]
- B61L13/04C . . [N: controlling inductively or magnetically]

- B61L15/00** **Indicators provided on the vehicle or vehicle train for signalling purposes; [N: On-board control or communication systems] [C0902]**
- B61L15/00A . [N: wiring diagrams for start- or stop-signals on vehicles having one or more carriages and having electrical communication lines between the carriages]
- B61L15/00B . [N: Communication with or on the vehicle or vehicle train ([line transmission systems H04B3/00](#))] [C0902]
- B61L15/00B1 . . [N: Radio-based, e.g. using GSM-R] [N0902]
- B61L15/00B2 . . [N: Conductor-based, e.g. using CAN-Bus, train-line or optical fibres] [N0902]
- B61L15/00C . [N: Destination indicators, identification panels or distinguishing signs on the vehicles (displaying in general G09F)] [C0902]
- B61L15/00D . [N: Train integrity supervision, e.g. end-of-train (EOT) devices] [N0902]
- B61L15/00E . [N: Multiple on-board control systems, e.g. "2 out of 3"-systems ([trackside multiple control systems B61L27/00E](#))] [N0902]
- B61L15/00G . [N: On-board train data handling ([trackside train data handling B61L27/00G](#))] [N0902]
- B61L15/00H . [N: On-board diagnosis or maintenance ([trackside diagnosis or maintenance B61L27/00H](#))] [N0902]
- B61L15/00K . [N: On-board display devices] [N0902]
- B61L15/02 . Head or tail indicators, e.g. light

- B61L17/00** **Switching systems for classification yards ([rail brakes B61K](#))**
- B61L17/02 . Details, e.g. indicating degree of track filling
- B61L17/02A . . [N: Signalling; Signals with multiple indicating means]
- B61L17/02B . . [N: Brake devices]

- B61L19/00** **Arrangements for interlocking between points and signals by means of a single interlocking device, [N: e.g. central control ([remote control B61L7/00](#); [station block arrangements B61L21/00](#))]**
- B61L19/02 . Interlocking devices having mechanical or fluid-pressure operation
- B61L19/02A . . [N: purely mechanical ([control levers B61L7/02E](#))]
- B61L19/02B . . [N: using fluid-pressure operated points or signals]
- B61L19/04 . . Detail- e.g. hand lever, back-signalling device
- B61L19/06 . Interlocking devices having electrical operation

- B61L19/08 . . Special arrangements for power supply for interlocking devices
- B61L19/10 . . with mechanical locks
- B61L19/12 . . . Details
- B61L19/14 . . with electrical locks
- B61L19/16 . . . Details

- B61L21/00** **Station blocking between signal boxes in one yard** (interlocking between points and signals by means of a single interlocking device [B61L19/00](#))

- B61L21/02 . Mechanical locking and release of the route; Repeat locks; Coupling of semaphores
- B61L21/04 . Electrical locking and release of the route; Electrical repeat locks [N: (central interlocking [B61L19/00](#))]
- B61L21/06 . Vehicle-on-line indication; Monitoring locking and release of the route
- B61L21/06A . . [N: for signals, including signals actuated by the vehicle]
- B61L21/08 . Order transmission and reception arrangements for giving or withholding permission
- B61L21/10 . Arrangements for trains which are closely following one another (automatic central traffic control systems [B61L27/04](#))

- B61L23/00** **Control, warning, or like safety means along the route or between vehicles or vehicle trains**

- B61L23/00A . [N: Control or safety means for heart-points and crossings of aerial railways, funicular rack-railway (points or safety systems for model railways [A63H](#); points, crossings or hearts for aerial railway, funicular rack railway [E01B25/12](#))]
- B61L23/00A1 . . [N: Automatic control or safety means for points for operator-less railway, e.g. transportation systems]
- B61L23/00B . [N: Safety arrangements on railway crossings]
- B61L23/02 . for indicating along the route the failure of brakes
- B61L23/04 . for monitoring the mechanical state of the route
- B61L23/04A . . [N: Obstacle detection] [N0902]
- B61L23/04B . . [N: Track changes detection] [N0902]
- B61L23/04B1 . . . [N: Broken rails] [N0902]
- B61L23/04B2 . . . [N: Rail wear] [N0902]
- B61L23/04B3 . . . [N: Track or rail movements] [N0902]
- B61L23/04B4 . . . [N: Road bed changes, e.g. road bed erosion] [N0902]
- B61L23/06 . for warning men working on the route
- B61L23/08 . for controlling traffic in one direction only (station blocking between signal boxes in one yard [B61L21/00](#))
- B61L23/10 . . manually operated [N: e.g. block arrangements]

- B61L23/12 . . partly operated by train
- B61L23/14 . . automatically operated
- B61L23/16 . . . Track circuits specially adapted for section blocking
- B61L23/16A [N: using current of indifferent sorte or a combination of different current types]
- B61L23/16B [N: using direct current]
- B61L23/16C [N: using rectified alternating current]
- B61L23/16D [N: using alternating current]
- B61L23/16F [N: using coded current]
- B61L23/18 . . . specially adapted for changing lengths of track sections in dependence upon speed and traffic density
- B61L23/20 . . . with transmission of instructions to stations along the route

- B61L23/22 . for controlling traffic in two directions over the same pair of rails (station blocking between signal boxes in one yard [B61L21/00](#))
- B61L23/24 . . using token systems, e.g. train staffs, tablets
- B61L23/26 . . with means for actuating signals from the vehicle or by passage of the vehicle
- B61L23/28 . . using non-automatic blocking from a place along the route
- B61L23/30 . . using automatic section blocking
- B61L23/32 . . . with provision for the blocking or passing sidings

- B61L23/34 . Control, warnings or like safety means indicating the distance between vehicles or vehicle trains by the transmission of signals therebetween

B61L25/00 Recording or indicating positions or identities of vehicles or vehicle trains or setting of track apparatus

- B61L25/02 . . Indicating or recording positions or identities of vehicles or vehicle trains
- B61L25/02A . . . [N: Measuring and recording of train speed]
- B61L25/02B . . . [N: Determination of driving direction of vehicle or vehicle train] [N0902]
- B61L25/02C . . . [N: Absolute localisation, e.g. providing geodetic coordinates] [N0902]
- B61L25/02D . . . [N: Relative localisation, e.g. using odometer] [N0902]
- B61L25/02E . . . [N: Determination of vehicle position and orientation within a train consist, e.g. serialisation] [N0902]

- B61L25/04 . . Indicating or recording train identities
- B61L25/04A [N: using reflecting tags]
- B61L25/04B [N: using inductive tags]
- B61L25/04C [N: using reradiating tags]
- B61L25/04D [N: using magnetic tags]
- B61L25/04E [N: using programmable tags]

- B61L25/06 . . Indicating or recording the setting of track apparatus, e.g. of points, of signals
- B61L25/06A . . . [N: for signalling systems on the vehicle using current conduction]
- B61L25/08 . . Diagrammatic displays

B61L27/00 Central traffic control systems; [N: Track-side control or specific communication

systems] [C0904]

- B61L27/00A . [N: Details of track-side communication] [N0904]
- B61L27/00B . [N: Regulation, e.g. scheduling, time tables] [N0904]
- B61L27/00B1 . . [N: Preparing schedules] [N0904]
- B61L27/00B2 . . [N: Following schedules] [N0904]
- B61L27/00B3 . . [N: Track-side optimisation of vehicle or vehicle train operation (on-board optimisation [B61L3/00C](#))] [N0904]
- B61L27/00B4 . . [N: Crew rosters and itineraries] [N0904]
- B61L27/00C . [N: Track-side control of safe travel of vehicle or vehicle train, e.g. braking curve calculation (on-board target speed calculation and supervision [B61L3/00D](#))] [N0904]
- B61L27/00D . [N: Testing or simulation] [N0904]
- B61L27/00E . [N: Track-side multiple control systems, e.g. switch-over between different systems, "2 out of 3"-systems (on-board multiple control systems [B61L15/00E](#))] [N0902]
- B61L27/00E1 . . [N: Backup systems, e.g. switching when failures occur] [N0902]
- B61L27/00E2 . . [N: Migration, e.g. parallel installations running simultaneously] [N0902]
- B61L27/00G . [N: Track-side train data handling, e.g. vehicle or vehicle train data, position reports (on-board train data handling [B61L15/00G](#))] [N0902]
- B61L27/00H . [N: Track-side diagnosis or maintenance, e.g. software upgrades (on-board diagnosis or maintenance [B61L15/00H](#))] [N0902]
- B61L27/00H1 . . [N: for track-side elements or systems, e.g. trackside supervision of trackside control system conditions] [N0902]
- B61L27/00H2 . . [N: for vehicles or vehicle trains, e.g. trackside supervision of train conditions] [N0902]
- B61L27/02 . Manual systems
- B61L27/04 . Automatic systems, e.g. controlled by train; Change-over to manual control
- B61L29/00 Safety means for rail/road crossing traffic**
- B61L29/02 . Guards or obstacles for preventing access to the route ([cattle guards connected to the permanent way E01B17/00](#))
- B61L29/02A . . [N: Special gates]
- B61L29/02A1 . . . [N: Preventing access by means of obstacles raising across the route]
- B61L29/04 . Gates for level crossings
- B61L29/06 . . yielding to vehicles in one direction but operated in a different direction
- B61L29/08 . Operation of gates; Combined operation of gates and signals
- B61L29/10 . . Means for securing gates in their desired position
- B61L29/12 . . Manual operation

- B61L29/14 . . . mechanically
- B61L29/16 . . . electrically
- B61L29/18 . . . Operation by approaching rail vehicle or rail vehicle train
- B61L29/20 . . . mechanically
- B61L29/22 . . . electrically
- B61L29/22B [N: using conductor circuits with separate contacts or conductors]
- B61L29/22B2 [N: using rail contacts] [C9609]
- B61L29/22C [N: using track-circuits, closed or short-circuited by train or using isolated rail-sections] [C9609]
- B61L29/22F [N: using optical means]

- B61L29/24 . . . Means for warning road traffic that a gate is closed or closing, or that rail traffic is approaching, e.g. for visible or audible warning
- B61L29/24A . . . [N: Transmission mechanism or acoustical signals for gates]
- B61L29/24B . . . [N: Signals or brake- or lighting devices mounted on the road vehicle and controlled from the vehicle train]

- B61L29/26 . . . mechanically operated
- B61L29/28 . . . electrically operated
- B61L29/28A [N: magnetic or inductive control by the vehicle]
- B61L29/28B [N: using rail-contacts, rail microphones, or the like, controlled by the vehicle]
- B61L29/28C [N: using conductor circuits controlled by the vehicle]
- B61L29/28D [N: Wiring diagram of the signal control circuits]
- B61L29/30 Supervision, e.g. monitoring arrangements
- B61L29/32 Timing, e.g. advance warning of approaching train

- B61L99/00** . . . **Subject matter not provided for in other groups of this subclass [N0704]**