

ECLA EUROPEAN CLASSIFICATION

B60T VEHICLE BRAKE CONTROL SYSTEMS OR PARTS THEREOF; BRAKE CONTROL SYSTEMS OR PARTS THEREOF, IN GENERAL (electrodynamic brake systems for vehicle, in general B60L; brakes per se, i.e. devices where braking effect occurs, including ultimate brake actuators, F16D); ARRANGEMENT OF BRAKING ELEMENTS ON VEHICLES IN GENERAL; PORTABLE DEVICES FOR PREVENTING UNWANTED MOVEMENT OF VEHICLES; VEHICLE MODIFICATIONS TO FACILITATE COOLING OF BRAKES

[N: **WARNING**

[C0507] The following IPC groups are not used in the internal ECLA classification scheme. Subject matter covered by these groups is classified in the following ECLA groups:

[B60T8/20](#) covered by [B60T8/18](#)

[B60T8/22](#) covered by [B60T8/18](#)

[B60T8/60-B60T8/70](#) covered by [B60T8/00B](#)

[B60T8/78-B60T8/84](#) covered by [B60T8/00B](#)

[B60T13/122](#) covered by [B60T13/14B3](#), [B60T13/16B3](#)

[B60T13/125](#) covered by [B60T13/14A](#)

[B60T13/128](#) covered by [B60T13/14B2](#), [B60T13/16B2](#)

[B60T13/13](#) covered by [B60T13/14B2A](#), [B60T13/16B2A](#)

[B60T13/132](#) covered by [B60T13/14B1](#), [B60T13/16B1](#)

[B60T13/135](#) covered by [B60T13/14B1A](#), [B60T13/16B1A](#)

[B60T13/138](#) covered by [B60T13/14D](#), [B60T13/16D](#)

[B60T13/60](#) covered by [B60T13/58](#)

[B60T15/06](#) covered by [B60T15/04](#)

[B60T15/08](#) covered by [B60T15/04](#)

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Note

In this subclass, the term "brake control systems" includes brake control systems for vehicles or of general applicability

B60T1/00 Arrangements of braking elements, i.e. of those parts where braking effect occurs
[N: specially for vehicles]

B60T1/00B . [N: by locking of wheel or transmission rotation]

B60T1/02 . acting by retarding wheels

B60T1/04 . . acting directly on tread

B60T1/06 . . acting otherwise than on tread, e.g. employing rim, drum, disc, or transmission [N: or on double wheels] [C9608]

B60T1/06B . . . [N: acting on transmission parts]

B60T1/06C . . . [N: employing disc ([B60T1/06B](#) takes precedence)]

B60T1/06D . . . [N: employing drum ([B60T1/06B](#) takes precedence)]

B60T1/08 . . using fluid or powdered medium

B60T1/087 . . . in hydrodynamic, i.e. non-positive displacement, retarders [N9602]

B60T1/093 . . . in hydrostatic, i.e. positive displacement, retarders [N9602]

- B60T1/10 . . . by utilising wheel movement for accumulating energy, e.g. driving air compressors (using propulsion unit as braking means, see the relevant class)
- B60T1/12 . . . acting otherwise than by retarding wheels, e.g. jet action
- B60T1/14 . . . directly on road ([portable devices, e.g. chocks B60T3/00](#))
- B60T1/16 . . . by increasing air resistance, e.g. flaps

B60T3/00 **Portable devices for preventing unwanted movement of vehicles, e.g. chocks**

B60T5/00 **Vehicle modifications to facilitate cooling of brakes**

Guide heading: **Brake control systems or parts thereof**

B60T7/00 **Brake-action initiating means**

- B60T7/02 . . . for personal initiation
- B60T7/04 foot actuated
- B60T7/04B [N: by electrical means, e.g. using travel or force sensors] [N9703]
- B60T7/04C [N: with locking and release means, e.g. providing parking brake application] [N9804]
- B60T7/04C1 [N: Hand-actuated release means] [N9804] [C9812]
- B60T7/06 Disposition of pedal
- B60T7/06B [N: with means to prevent injuries in case of collision (for vehicle pedals in general by moving them from an operative to an out-of-the way position [B60R21/09](#))] [N9703]
- B60T7/08 . . . hand actuated
- B60T7/08B [N: by electrical means, e.g. travel, force sensors]
- B60T7/10 Disposition of hand control
- B60T7/10A [N: by means of a pull rod] [N9703]
- B60T7/10C [N: by means of a tilting lever] [N9703]
- B60T7/10C1 [N: with a locking mechanism] [N9703]
- B60T7/10C1A [N: the lock being released by means of a push button] [N9703]
- B60T7/10F [N: with electrical power assistance][N9703]
- B60T7/10G [N: with mechanisms to take up slack in the linkage to the brakes][N9703]
- B60T7/12 . . . for automatic initiation; for initiation not subject to will of driver or passenger [N: (limiting speed of vehicles other than rail vehicles [B60K31/00](#))]
- B60T7/12B . . . [N: for locking of reverse movement]
- B60T7/12C . . . [N: Brakes for railway vehicles coming into operation in case of accident, derailment or damage of rolling stock or superstructure (self-acting brakes in general [F16D59/00](#))]
- B60T7/12D . . . [N: Brakes for railway vehicles coming into operation in case of exceeding a predetermined speed (self-acting brakes in general [F16D59/00](#))]
- B60T7/12E . . . [N: Self-acting brakes of different types for railway vehicles ([B60T7/12](#) takes precedence; self-acting brakes in general [F16D59/00](#))]

- B60T7/14 . . . operated upon collapse of driver ([deadman`s devices for electrically propelled vehicles B60L3/02](#))
- B60T7/16 . . . operated by remote control, i.e. initiating means not mounted on vehicle
- B60T7/18 operated by wayside apparatus
- B60T7/20 . . . specially for trailers, e.g. in case of uncoupling of [N: or [overrunning by](#)] trailer ([inertia-actuated over-run brakes B60T13/08](#))
- B60T7/20B [N: with automatic brake release or reduction in case of reverse travel, e.g. by means of mechanisms mounted on the draw bar]
- B60T7/20B1 [N: by means of mechanisms mounted on trailer drum brakes]
- B60T7/22 . . . initiated by contact of vehicle, e.g. bumper, with an external object, e.g. another vehicle [N: , or by means of [contactless obstacle detectors mounted on the vehicle](#)]

B60T8/00 Arrangements for adjusting wheel-braking force to meet varying vehicular or ground-surface conditions, e.g. limiting or varying distribution of braking force (by changing number of effective brake cylinders in power brake systems [B60T17/10](#))

- B60T8/17 . . . Using electrical or electronic regulation means to control braking [N: ([detecting or indicating faulty operation B60T8/88B](#))] [N0505]
- B60T8/17P . . . [N: [Braking or traction control means specially adapted for particular types of vehicles \(for vehicles having more than one drive axle B60T8/1769\)](#)] [N0505]
- B60T8/17P3 [N: for aircrafts] [N0505]
- B60T8/17P5 [N: for rail vehicles] [N0505]
- B60T8/17P7 [N: for single-track vehicles, e.g. motorcycles] [N0505]
- B60T8/17P9 [N: for lorries or tractor-trailer combinations] [N0505]
- B60T8/171 . . . Detecting parameters used in the regulation; Measuring values used in the regulation [N0505]
- B60T8/172 . . . Determining control parameters used in the regulation, e.g. by calculations involving measured or detected parameters [N: ([B60T8/1755B takes precedence](#))] [N0505] [C1004]
- B60T8/172C [N: [Using tyre sensors, e.g. Sidewall Torsion sensors \(SWT\) \(for tyre pressure and temperature detection B60C23/00\)](#)] [N0505]
- B60T8/173 . . . Eliminating or reducing the effect of unwanted signals, e.g. due to vibrations or electrical noise [N0505]
- B60T8/174 . . . characterised by using special control logic, e.g. fuzzy logic [N: ,[neural computing](#)] [N0505]
- B60T8/175 . . . Brake regulation specially adapted to prevent excessive wheel spin during vehicle acceleration, e.g. for traction control ([safety devices for propulsion unit control responsive to, or preventing, skidding of wheels B60K28/16](#)) [N0505]
- B60T8/1755 . . . Brake regulation specially adapted to control the stability of the vehicle, e.g. taking into account yaw rate or transverse acceleration in a curve (road vehicle drive control systems for control of driving stability otherwise than by controlling a particular sub-unit B60W30/02) [N0505] [C0607]
- B60T8/1755B [N: [determining control parameters related to vehicle stability used in the regulation, e.g. by calculations involving measured or detected parameters](#)] [N1004]
- B60T8/1755D [N: [responsive to the tire sideslip angle or the vehicle body slip angle](#)] [N1004]
- B60T8/1755F [N: [specially adapted for enhancing stability around the vehicles longitudinal axle, i.e. roll-over prevention \(road vehicle drive control systems for roll-over prevention otherwise than by controlling a particular sub-unit B60W30/04\)](#)] [N1004]

- B60T8/1755H . . . [N: specially adapted for enhancing driver or passenger comfort, e.g. soft intervention or pre-actuation strategies] [N1004]
- B60T8/1755K . . . [N: specially adapted for lane departure prevention (road vehicle drive control systems for lane keeping otherwise than by controlling a particular sub-unit [B60W30/12](#))] [N1004]
- B60T8/1755M . . . [N: specially adapted for collision avoidance or collision mitigation (road vehicle drive control systems for collision avoidance otherwise than by controlling a particular sub-unit [B60W30/08D](#))] [N1004]
- B60T8/176 . . . Brake regulation specially adapted to prevent excessive wheel slip during vehicle deceleration, e.g. ABS ([B60T8/1755](#) takes precedence) [N0505]
- B60T8/1761 . . . responsive to wheel or brake dynamics, e.g. wheel slip, wheel acceleration or rate of change of brake fluid pressure [N0505]
- B60T8/1761B [N: based on analogue circuits or digital circuits comprised of discrete electronic elements] [N0505]
- B60T8/1761D [N: Microprocessor-based systems] [N0505]
- B60T8/1763 . . . responsive to the coefficient of friction between the wheels and the ground surface ([B60T8/1764](#) takes precedence) [N0505]
- B60T8/1763B [N: based on analogue circuits or digital circuits comprised of discrete electronic elements] [N0505]
- B60T8/1763D [N: Microprocessor-based systems] [N0505]
- B60T8/1764 . . . Regulation during travel on surface with different coefficients of friction, e.g. between left and right sides, mu-split [N: or between front and rear] [N0505]
- B60T8/1766 . . . Proportioning of brake forces according to vehicle axle loads, e.g. front to rear of vehicle [N0505]
- B60T8/1769 . . . specially adapted for vehicles having more than one driven axle, e.g. four-wheel drive vehicles [N0505]

- B60T8/18 . . . responsive to vehicle weight or load, e.g. load distribution ([N: using electrical circuitry on regulation means [B60T8/17](#);] [B60T8/30](#) takes precedence; responsive to weight and speed condition [B60T8/58](#)) [C0505]

- [N: **Note**
[B60T8/18F](#) and [B60T8/18G](#) take precedence over [B60T8/18A](#) to [B60T8/18D](#)]
- B60T8/18A . . . [N: characterised by the calibration process or the means therefor]
- B60T8/18B . . . [N: characterised by the means for pressure reduction]
- B60T8/18B1 [N: Lever mechanism]
- B60T8/18B2 [N: Means for changing the diaphragm area submitted to pressure]
- B60T8/18B3 [N: pressure reducing or limiting valves]
- B60T8/18C . . . [N: characterised by the load-detecting arrangements]
- B60T8/18C1 [N: Arrangements for detecting air spring pressure]
- B60T8/18C2 [N: Arrangements for detecting vehicle level]
- B60T8/18C3 [N: Arrangements for detecting suspension spring load ([B60T8/18C1](#) takes precedence)]
- B60T8/18C3B [N: comprising sensors of the type providing a fluid output signal representing the load on the vehicle suspension] [M1108]
- B60T8/18C3C [N: comprising sensors of the type providing a mechanical output signal representing the load on the vehicle suspension] [M1108]
- B60T8/18C3D [N: comprising sensors of the type providing an electrical output signal

- representing the load on the vehicle suspension] [N1108]
- B60T8/18D . . [N: characterised by failure-responsive means]
 - B60T8/18F . . [N: especially adapted for tractor-trailer combinations]
 - B60T8/18G . . [N: especially adapted for railway vehicles]

 - B60T8/24 . responsive to vehicle inclination or change of direction, e.g. negotiating bends [N: (using electrical circuitry or regulation means [B60T8/17](#))] [C0505]
 - B60T8/24B . . [N: Lateral vehicle inclination] [N1108]
 - B60T8/24B2 . . . [N: for roll-over protection] [N1108]
 - B60T8/24D . . [N: Longitudinal vehicle inclination] [N1108]
 - B60T8/24F . . [N: Change of direction] [N1108]
 - B60T8/24G . . [N: Trailer sway, e.g. for preventing jackknifing] [N1108]

 - B60T8/26 . characterised by producing differential braking between front and rear wheels [N: (using electrical circuitry or regulation means [B60T8/17](#))] [C0505]
 - B60T8/26B . . [N: specially adapted for use in motorcycles]
 - B60T8/26C . . [N: using valves with stepped characteristics ([B60T8/26B](#), [B60T8/26D](#) take precedence)]
 - B60T8/26C1 . . . [N: for pneumatic brake systems]
 - B60T8/26C2 . . . [N: for hydraulic brake systems]
 - B60T8/26D . . [N: using valves or actuators with external control means ([B60T8/26B](#) takes precedence)] [C1108]
 - B60T8/26D2 . . . [N: for hybrid systems with different kind of brakes on different axles] [N1108]
 - B60T8/26D4 . . . [N: using the valves of an ABS, ASR or ESP system] [N1108]
 - B60T8/28 . . responsive to deceleration [N: ([B60T8/26B](#), [B60T8/26C](#), [B60T8/26D](#) take precedence)]
 - B60T8/28B . . . [N: using ball and ramp]
 - B60T8/28C . . . [N: using horizontal moving mass]
 - B60T8/28D . . . [N: using pendulums]
 - B60T8/30 . . responsive to load [N: ([B60T8/26B](#), [B60T8/26C](#), [B60T8/26D](#) take precedence)]
 - B60T8/30B . . . [N: using pneumatic valves]
 - B60T8/30C . . . [N: using hydraulic valves]

 - B60T8/32 . responsive to a speed condition, e.g. acceleration or deceleration ([N: using electrical circuitry or regulation means [B60T8/17](#)]; [B60T8/28](#) takes precedence; electric devices on electrically propelled vehicles indicating the wheel slip [B60L3/10](#); measuring linear or angular speed per se [G01P3/00](#)) [C0505]
 - B60T8/32A . . [N: acceleration ([B60T8/34](#), [B60T8/52](#), [B60T8/54](#), [B60T8/56](#), [B60T8/58](#), [B60T8/72](#), [B60T8/86](#), [B60T8/88](#) take precedence)]
 - B60T8/32D . . [N: deceleration ([B60T8/34](#), [B60T8/52](#), [B60T8/54](#), [B60T8/56](#), [B60T8/58](#), [B60T8/72](#), [B60T8/86](#), [B60T8/88](#) take precedence)]
 - B60T8/32D2 . . . [N: Systems characterised by having means acting on components of the drive line, e.g. retarder, clutch or differential gear ([B60T8/32D4](#) takes precedence)]
 - B60T8/32D4 . . . [N: Systems specially adapted for vehicles driven by more than one axle, e.g. Four Wheel-Drive vehicles]
 - B60T8/32D6 . . . [N: Systems specially adapted for single-track vehicles, e.g. motorcycles ([B60T8/32D10](#) takes precedence)]

B60T8/32D8	. . .	[N: Systems specially adapted for tractor-trailer combinations]
B60T8/32D10	. . .	[N: Systems specially adapted for rail vehicles]
B60T8/32D10B	. . . .	[N: Speed measurement by means of centrifugal governors or the like] [N9709]
B60T8/32D10D	. . . .	[N: responsive to the speed difference between wheels and rail, or between two wheels or two axles] [N9709]
B60T8/32D12	. . .	[N: Systems specially adapted for aircraft]
B60T8/32D14	. . .	[N: Systems in which the braking action is dependent on brake pedal data]
B60T8/32D14A	. . . .	[N: Hydraulic systems] [N1108]
B60T8/32D14A2	. . . .	[N: with control of the booster (B60T8/32D14D takes precedence)] [N1108] [C1207]
B60T8/32D14B	. . . .	[N: Pneumatic systems]
B60T8/32D14D	. . . .	[N: Systems with a braking assistant function, i.e. automatic full braking initiation in dependence of brake pedal velocity] [N9712] [M1207]
B60T8/32D16	. . .	[N: Systems sharing components with other fluid systems onboard the vehicle]
B60T8/32D16B	. . . .	[N: the other fluid systems being suspension elements]
B60T8/32D18	. . .	[N: Systems characterised by their speed sensor arrangements]
B60T8/32D20	. . .	[N: Systems in which there is a pulsating signal superposed on the command signal]
B60T8/34	. .	having a fluid pressure regulator responsive to a speed condition
B60T8/34B	. . .	[N: Systems characterised by their valves (B60T8/36 , B60T8/38 take precedence)]
B60T8/34B2	. . . .	[N: Pneumatic systems]
B60T8/34D	. . .	[N: Systems characterised by their lay-out (B60T8/34F takes precedence)]
B60T8/34D2	. . . .	[N: Hydraulic systems]
B60T8/34D2B	. . . .	[N: having more than one brake circuit per wheel]
B60T8/34D2D	. . . .	[N: 2 Channel systems (B60T8/34D2B takes precedence)]
B60T8/34D2F	. . . .	[N: 3 Channel systems (B60T8/34D2B takes precedence)]
B60T8/34D2H	. . . .	[N: 4 Channel systems (B60T8/34D2B takes precedence)]
B60T8/34F	. . .	[N: Systems adapted to control a set of axles, e.g. tandem axles]
B60T8/36	. . .	including a pilot valve responding to an electromagnetic force
B60T8/36B	. . . .	[N: wherein the pilot valve is mounted in a circuit controlling the working fluid system]
B60T8/36D	. . . .	[N: wherein the pilot valve is mounted in a circuit controlling an auxiliary fluid system]
B60T8/36F	. . . .	[N: Electromagnetic valves specially adapted for anti-lock brake and traction control systems (electromagnetic valves in general F16K31/06)]
B60T8/36F2	. . . .	[N: in pneumatic systems (B60T8/36F6 , B60T8/36F8 and B60T8/36F10 take precedence)]
B60T8/36F2B	. . . .	[N: having at least one vacuum connection]
B60T8/36F4	. . . .	[N: in hydraulic systems (B60T8/36F6 , B60T8/36F8 and B60T8/36F10 take precedence)]
B60T8/36F4B	. . . .	[N: switching between more than two connections, e.g. 3/2-valves (B60T8/36F4D , B60T8/36F4F and B60T8/36F4H take precedence)]
B60T8/36F4D	. . . .	[N: switching between a number of discrete positions as a function of the applied signal, e.g. 3/3-valves (B60T8/36F4F takes precedence)]

B60T8/36F4F	. . . . .	[N: having more than one electromagnetic coil inside a common housing]
B60T8/36F4H	. . . . .	[N: combining a plurality of functions in one unit, e.g. pressure relief]
B60T8/36F6	. . . . .	[N: Continuously controlled electromagnetic valves]
B60T8/36F6B	. . . . .	[N: Valve details] [N1108]
B60T8/36F6B2	. . . . .	{7 dots} [N: Sliding valves] [N1108]
B60T8/36F6B4	. . . . .	{7 dots} [N: Seat valves, e.g. poppet valves] [N1108]
B60T8/36F8	. . . . .	[N: integrated in modulator units]
B60T8/36F8B	. . . . .	[N: combined with other mechanical components, e.g. pump units, master cylinders]
B60T8/36F8B2	. . . . .	{7 dots} [N: characterised by the mounting of the modulator unit onto the vehicle]
B60T8/36F10	. . . . .	[N: Valves using piezo-electric elements (in general F16K31/00E)]
B60T8/36H	. . . . .	[N: wherein the pilot valve is mounted separately from its power section (B60T8/36B , B60T8/36D and B60T8/36F take precedence)]
B60T8/38	. . . . .	including valve means of the relay or driver controlled type
B60T8/40	. . . . .	comprising an additional fluid circuit including fluid pressurising means for modifying the pressure of the braking fluid, e.g. including wheel driven pumps for detecting a speed condition, or pumps which are controlled by means independent of the braking system
B60T8/40A	. . . . .	[N: Repositioning the piston(s) of the brake control means by means of a fluid pressurising means in order to reduce the brake pressure]
B60T8/40A1	. . . . .	[N: the brake control means being the wheel cylinders]
B60T8/40B	. . . . .	[N: Fluid pressurising means for more than one fluid circuit, e.g. separate pump units used for hydraulic booster and anti-lock braking]
B60T8/40C	. . . . .	[N: Pump units characterised by their drive mechanisms (B60T8/40P takes precedence)]
B60T8/40C1	. . . . .	[N: Pump units driven by an individual electric motor (B60T8/40C2 takes precedence)]
B60T8/40C2	. . . . .	[N: Pump units driven by (parts of) the vehicle propulsion unit]
B60T8/40D	. . . . .	[N: Pump units characterised by their construction or mounting (pump units in combination with valve blocks B60T8/36)]
B60T8/40F	. . . . .	[N: Pump units characterised by their failure-responsive means (B60T8/88 takes precedence)]
B60T8/40G	. . . . .	[N: Control of the pump unit]
B60T8/40G1	. . . . .	[N: involving ON/OFF switching]
B60T8/40G2	. . . . .	[N: involving the start-up phase]
B60T8/40G3	. . . . .	[N: involving the delivery pressure control (B60T8/40J takes precedence)]
B60T8/40G4	. . . . .	[N: involving the rate of delivery]
B60T8/40G5	. . . . .	[N: involving the direction of fluid flow]
B60T8/40H	. . . . .	[N: the additional fluid circuit comprising means for attenuating pressure pulsations]
B60T8/40J	. . . . .	[N: Systems in which a driver input signal is used as a control signal for the additional fluid circuit which is normally used for braking]
B60T8/40J2	. . . . .	[N: Systems in which the booster is used as an auxiliary pressure source] [N1108]
B60T8/40J4	. . . . .	[N: Systems with stroke simulating devices for driver input (B60T8/40J2

- takes precedence)] [N1108] [C1207]
- B60T8/40J4A [N: the stroke simulating device being connected to, or integrated in the driver input device] [N1204]
 - B60T8/40J4B [N: characterised by details of the stroke simulating device] [N1108]
 - B60T8/40P [N: including wheel driven pumps for detecting a speed condition]
 - B60T8/42 having expanding chambers for controlling pressure [N: i.e. closed systems]
 - B60T8/42A [N: Debooster systems]
 - B60T8/42A2 [N: having a mechanically actuated expansion unit ([B60T8/42A4](#) and [B60T8/42A6](#) take precedence)]
 - B60T8/42A4 [N: having a fluid actuated expansion unit]
 - B60T8/42A4A [N: with brake pressure relief by introducing fluid pressure into the expansion unit ([B60T8/42A4B](#) takes precedence)]
 - B60T8/42A4B [N: pneumatically]
 - B60T8/42A4B1 {7 dots} [N: using a vacuum]
 - B60T8/42A4B1A {8 dots} [N: with brake pressure relief by creating vacuum inside the expansion unit]
 - B60T8/42A6 [N: having an electro-mechanically actuated expansion unit, e.g. solenoid, electric motor, piezo stack]
 - B60T8/42B [N: Pump-back systems]
 - B60T8/42B2 [N: having a pressure sensitive inlet valve]
 - B60T8/42B4 [N: having means to reduce or eliminate pedal kick-back]
 - B60T8/44 co-operating with a power-assist booster means associated with a master cylinder for controlling the release and reapplication of brake pressure through an interaction with the power assist device [N: i.e. open systems]
 - B60T8/44B [N: using hydraulic boosters ([B60T8/44F](#), [B60T8/44H](#), [B60T8/44V](#) take precedence)]
 - B60T8/44B2 [N: the booster being a fluid return pump, e.g. in combination with a brake pedal force booster] [N1108]
 - B60T8/44C [N: using compressed air ([B60T8/44F](#), [B60T8/44H](#), [B60T8/44V1](#) take precedence)]
 - B60T8/44D [N: using vacuum ([B60T8/44F](#), [B60T8/44H](#), [B60T8/44V1](#) take precedence)]
 - B60T8/44F [N: replenishing the released brake fluid volume into the brake piping]
 - B60T8/44H [N: replenishing the released brake fluid volume via the master cylinder]
 - B60T8/44V [N: Reducing the boost of the power-assist booster means to reduce brake pressure]
 - B60T8/44V1 [N: the power-assist booster means being a vacuum or compressed air booster]
 - B60T8/44V1A [N: of the multiple booster type]
 - B60T8/46 the pressure being reduced by exhausting fluid
 - B60T8/48 connecting the brake actuator to an alternative or additional source of fluid pressure [N: e.g. traction control systems]
 - B60T8/48B [N: Traction control, stability control, using both the wheel brakes and other automatic braking systems] [C9712]
 - B60T8/48B2 [N: in pneumatic brake systems]
 - B60T8/48B4 [N: in hydraulic brake systems]
 - B60T8/48B4A [N: wherein a booster output pressure is used for normal or anti lock braking ([B60T8/48B4B](#), [B60T8/48B4D](#), [B60T8/48B4F](#) take

		precedence)]
B60T8/48B4B	. . . . .	[N: using a booster or a master cylinder for traction control]
B60T8/48B4B2	. . . . .	{7 dots} [N: pneumatic boosters]
B60T8/48B4D	. . . . .	[N: closed systems (B60T8/48B4B , B60T8/48B4F take precedence)]
B60T8/48B4D2	. . . . .	{7 dots} [N: pump-back systems]
B60T8/48B4D2B	. . . . .	{8 dots} [N: having priming means] [N9712]
B60T8/48B4F	. . . . .	[N: using separate traction control modulators]
B60T8/50	. . .	having means for controlling the rate at which pressure is reapplied to [N: or released from] the brake
B60T8/50B	. . . . .	[N: Pressure reapplication by pulsing of valves (B60T8/50D , B60T8/50F , B60T8/50H , B60T8/50K take precedence)]
B60T8/50D	. . . . .	[N: Pressure reapplication using a plurality of valves in parallel]
B60T8/50F	. . . . .	[N: Pressure reapplication using restrictions (B60T8/50D , B60T8/50H take precedence)]
B60T8/50F2	. . . . .	[N: in hydraulic brake systems]
B60T8/50F2B	. . . . .	[N: open systems]
B60T8/50F2D	. . . . .	[N: closed systems]
B60T8/50F2D2	. . . . .	{7 dots} [N: deboosters systems]
B60T8/50H	. . . . .	[N: Pressure reapplication in a mu-split situation, i.e. a situation with different coefficients of friction on both sides of the vehicle]
B60T8/50K	. . . . .	[N: Pressure reapplication using memory devices]
B60T8/50K2	. . . . .	[N: using memory chambers]
B60T8/50K2B	. . . . .	[N: having decay means]
B60T8/50M	. . . . .	[N: Pressure release by pulsing of valves (B60T8/50N , B60T8/50P take precedence)]
B60T8/50N	. . . . .	[N: Pressure release using a plurality of valves in parallel]
B60T8/50P	. . . . .	[N: Pressure release using restrictions (B60T8/50N takes precedence)]
B60T8/50P2	. . . . .	[N: in hydraulic brake systems]
B60T8/52	. .	Torque sensing, i.e. wherein the braking action is controlled by forces producing or tending to produce a twisting or rotating motion on a braked rotating member
B60T8/54	. .	by mechanical means
B60T8/56	. .	having means for changing the coefficient of friction
B60T8/58	. .	responsive to speed and another condition or to plural speed conditions

Note

In this group, a single condition which is itself responsive to, or representative of, another single condition is not regarded as plural conditions

B60T8/72	. .	responsive to a difference between a speed condition, e.g. deceleration, and a fixed reference [C9412]
B60T8/74	. . .	sensing a rate of change of velocity
B60T8/76	. . .	two or more sensing means from different wheels indicative of the same type of speed condition
B60T8/86	. .	wherein the brakes are automatically applied in accordance with a speed condition and having means for overriding the automatic braking device when a skid condition occurs
B60T8/88	. .	with failure responsive means, i.e. means for detecting and indicating faulty

- peration of the speed responsive control means
- B60T8/88B . . . [N: using electrical circuitry]
- B60T8/90 . . . using a simulated speed signal to test speed responsive control means
- B60T8/92 . . . automatically taking corrective action
- B60T8/94 on a fluid pressure regulator
- B60T8/96 on speed responsive control means

- B60T10/00** **Control or regulation for continuous braking making use of fluid or powdered medium, e.g. for use when descending a long slope [N9602]**

- B60T10/02 . with hydrodynamic brake [N9602]
- B60T10/04 . with hydrostatic brake [N9602]

- B60T11/00** **Transmitting braking action from initiating means to ultimate brake actuator without power assistance or drive or where such assistance or drive is irrelevant (the power assistance or drive being essential [B60T13/00](#))**

- B60T11/04 . transmitting mechanically
- B60T11/04B . . [N: in case of steerable wheels]
- B60T11/04D . . [N: Using cables ([B60T11/04B](#) takes precedence)]
- B60T11/06 . . Equalising arrangements
- B60T11/08 . . providing variable leverage

- B60T11/10 . transmitting by fluid means, e.g. hydraulic
- B60T11/10B . . [N: equalising arrangements]
- B60T11/10C . . [N: in combination with mechanical elements]
- B60T11/10D . . [N: in combination with other control devices (conjoint control of brake system and at least another sub-unit [B60K41/00](#))] [C9608]
- B60T11/10D2 . . . [N: with brake locking after actuation, release of the brake by a different control device, e.g. gear lever]
- B60T11/10D2B [N: locking and release of the brake by the clutch]
- B60T11/10F . . [N: overrun brakes with fluid means]
- B60T11/10G . . [N: to a trailer fluid system] [N9604]
- B60T11/12 . . the transmitted force being varied therein ([B60T11/16](#) to [B60T11/26](#) take precedence)
- B60T11/14 . . the transmitted force being substantially unchanged
- B60T11/16 . . Master control, e.g. master cylinders (master cylinders associated with vacuum boosters [B60T13/565](#))
- B60T11/16B . . . [N: Single master cylinders for pressurised systems]
- B60T11/18 . . . Connection thereof to initiating means
- B60T11/20 . . . Tandem, side-by-side, or other multiple master cylinder units
- B60T11/20B [N: Side-by-side configuration] [N9604]
- B60T11/20B1 [N: with control by a force distributing lever] [N9604]
- B60T11/21 with two pedals operating on respective circuits, pressures therein being equalised when both pedals are operated together, e.g. for steering ([steering](#))

non-deflectable wheels or endless tracks by differentially driving ground-engaging elements on opposite vehicle sides using brakes as main steering effecting means [B62D11/08](#))

- B60T11/22 . . . characterised by being integral with reservoir
- B60T11/22A . . . with pressure-varying means, e.g. with two stage operation provided by use of different piston diameters including continuous variation from one diameter to another
- B60T11/22B . . . Pressure-maintaining arrangements, e.g. for replenishing the master cylinder chamber with fluid from a reservoir ([B60T11/232](#) takes precedence)
- B60T11/232 . . . Recuperation valves
- B60T11/236 . . . Piston sealing arrangements
- B60T11/24 . . . Single initiating means operating on more than one circuit e.g. dual circuits ([multiple master cylinder units B60T1/20](#))
- B60T11/26 . . . Reservoirs ([integral with master controls B60T11/22](#))
- B60T11/28 . . . Valves specially adapted therefor ([recuperation valves B60T11/232](#))
- B60T11/30 . . . Bleed valves for hydraulic brake systems
- B60T11/32 . . . Automatic cut-off valves for defective pipes
- B60T11/32B [N: in hydraulic systems]
- B60T11/32C [N: in pneumatic systems]
- B60T11/34 . . . Pressure reducing or limiting valves [N: (for arrangements for adjusting wheel-braking force responsive to vehicle weight or load [B60T8/18B3](#))]

B60T13/00 **Transmitting braking action from initiating means to ultimate brake actuator with power assistance or drive; Brake systems incorporating such transmitting means, e.g. air-pressure brake systems (arrangements for adjusting wheel-braking force to meet varying vehicular or ground-surface conditions [B60T8/00](#); valves incorporated in such systems [B60T15/00](#))**

- B60T13/02 . . with mechanical assistance or drive [N: (combined with fluid pressure [B60T13/58D](#))] [C9409]
- B60T13/04 . . by spring or weight ([fluid released B60T13/10](#))
- B60T13/06 . . by inertia, e.g. flywheel
- B60T13/06B . . . [N: of the propulsion system]
- B60T13/08 . . . Over-run brakes
- B60T13/10 . . with fluid assistance, drive, or release
- B60T13/12 . . the fluid being liquid
- B60T13/14 . . . using accumulators or reservoirs [N: fed by pumps]
- B60T13/14A [N: Systems with distributor valve ([B60T13/14B3](#) takes precedence)]
- B60T13/14B [N: Systems with master cylinder]
- B60T13/14B1 [N: Master cylinder mechanically coupled with booster]
- B60T13/14B1A [N: Pilot valve provided inside booster piston]
- B60T13/14B2 [N: Master cylinder integrated or hydraulically coupled with booster]
- B60T13/14B2A [N: Part of the system directly actuated by booster pressure]
- B60T13/14B3 [N: In combination with distributor valve]
- B60T13/14D [N: Arrangements for pressure supply]

B60T13/16	. . .	using pumps directly, i.e. without interposition of accumulators or reservoirs
B60T13/16B	. . . .	[N: Systems with master cylinder]
B60T13/16B1	. . . . .	[N: Master cylinder mechanically coupled with booster]
B60T13/16B1A	. . . . .	[N: Pilot valve provided inside booster piston]
B60T13/16B2	. . . . .	[N: Master cylinder integrated or hydraulically coupled with booster]
B60T13/16B2A	. . . . .	[N: Part of the system directly actuated by booster pressure]
B60T13/16B3	. . . . .	[N: In combination with distributor valve]
B60T13/16D	. . . . .	[N: Arrangements for pressure supply]
B60T13/18	. . . . .	with control of pump output delivery [N: e.g. by distributor valves (B60T13/16B3 takes precedence)]
B60T13/20	. . . . .	with control of pump driving means
B60T13/22	. . .	Brakes applied by springs or weights and released hydraulically
B60T13/24	. .	the fluid being gaseous
B60T13/24B	. . .	[N: Differential pressure systems]
B60T13/24B2	. . . . .	[N: The control valve is provided as one unit with the servomotor cylinder]
B60T13/24B2B	. . . . .	[N: Mechanical command of the control valve, mechanical transmission to the brakes]
B60T13/24B2C	. . . . .	[N: Mechanical command of the control valve, hydraulic transmission to the brakes]
B60T13/24B2D	. . . . .	[N: Hydraulic command of the control valve, hydraulic transmission to the brake]
B60T13/24B3	. . . . .	[N: The control valve is provided apart from the servomotor cylinder]
B60T13/24B3B	. . . . .	[N: Mechanical command of the control valve, mechanical transmission to the brakes]
B60T13/24B3C	. . . . .	[N: Mechanical command of the control valve, hydraulic transmission to the brakes]
B60T13/24B3D	. . . . .	[N: Hydraulic command of the control valve, hydraulic transmission to the brakes]
B60T13/26	. . .	Compressed-air systems
B60T13/26B	. . . . .	[N: systems with both indirect application and application by springs or weights and released by compressed air]
B60T13/26B2	. . . . .	[N: specially adapted for coupling with dependent systems, e.g. tractor-trailer systems]
B60T13/26B3	. . . . .	[N: dependent systems e.g. trailer systems]
B60T13/26D	. . . . .	[N: Systems with both direct and indirect application, e.g. in railway vehicles] [N9709]
B60T13/26F	. . . . .	[N: using accumulators or reservoirs] [N1204]
B60T13/36	. . . . .	direct, i.e. brakes applied directly by compressed air
B60T13/36D	. . . . .	[N: for railway vehicles] [N9709]
B60T13/38	. . . . .	Brakes applied by springs or weights and released by compressed air [N: (B60T13/26B takes precedence)]
B60T13/38S	. . . . .	[N: Control arrangements therefor]
B60T13/40	. . . . .	indirect i.e. compressed air booster units [N: indirect systems]
B60T13/40B	. . . . .	[N: specially adapted for coupling with dependent systems, e.g. tractor-trailer systems]
B60T13/40B2	. . . . .	[N: specially adapted for transfer of two or more command signals e.g.

		railway systems (with electrical control B60T13/66C)]
B60T13/44	. . . . .	with two-chamber booster units
B60T13/45	. . . . .	with multiple booster units, e.g. tandem booster units
B60T13/46	. . . . .	Vacuum systems
B60T13/46D	. . . . .	[N: for railway vehicles] [N9709]
B60T13/48	. . . . .	direct, i.e. brakes applied directly by vacuum
B60T13/50	. . . . .	Brakes applied by springs or weights and released by vacuum
B60T13/52	. . . . .	indirect, i.e. vacuum booster units
B60T13/56	. . . . .	with two-chamber booster units
B60T13/563	. . . . .	with multiple booster units, e.g. tandem booster units
B60T13/565	. . . . .	characterised by being associated with master cylinders, e.g. integrally formed
B60T13/567	. . . . .	characterised by constructional features of the casing or by its strengthening or mounting arrangements
B60T13/567S	. . . . .	[N: Supportstruts]
B60T13/569	. . . . .	characterised by piston details, e.g. construction, mounting of diaphragm
B60T13/57	. . . . .	characterised by constructional features of control valves
B60T13/573	. . . . .	characterised by reaction devices
B60T13/575	. . . . .	using resilient discs or pads
B60T13/577	. . . . .	using levers
B60T13/58	. . . . .	Combined or convertible systems
B60T13/58B	. . . . .	[N: both hydraulic and pneumatic] [N9409]
B60T13/58B1	. . . . .	[N: using converters] [N9409]
B60T13/58C	. . . . .	[N: comprising friction brakes and retarders] [N9409]
B60T13/58C1	. . . . .	[N: the retarders being of the electric type] [N9409]
B60T13/58D	. . . . .	[N: both fluid and mechanical assistance or drive] [N9409]
B60T13/62	. . . . .	both straight and automatic
B60T13/64	. . . . .	both single and multiple, e.g. single and tandem
B60T13/66	. . . . .	Electrical control in fluid-pressure brake systems
B60T13/66B	. . . . .	[N: characterised by specified functions of the control system components]
B60T13/66C	. . . . .	[N: the systems being specially adapted for transferring two or more command signals, e.g. railway systems (B60T13/66B takes precedence)]
B60T13/66C1	. . . . .	[N: and combined with electro-magnetic brakes] [N9409]
B60T13/68	. . . . .	by electrically-controlled valves [N: (B60T13/66B and B60T13/66C take precedence)]
B60T13/68B	. . . . .	[N: in pneumatic systems or parts thereof (in vacuum systems B60T13/72)] [N9409]
B60T13/68C	. . . . .	[N: in hydraulic systems or parts thereof] [N9409]
B60T13/70	. . . . .	by fluid-controlled switches
B60T13/72	. . . . .	in vacuum systems [N: or vacuum booster units]
B60T13/74	. . . . .	with electrical assistance or drive
B60T13/74A	. . . . .	[N: acting on an ultimate actuator]
B60T13/74A1	. . . . .	[N: with a spring accumulator]

- B60T13/74B . . [N: acting on a hydraulic system, e.g. a master cylinder]
- B60T13/74C . . [N: and mechanical transmission of the braking action]
- B60T13/74D . . [N: acting on electro-magnetic brakes (combined with fluid-pressure brake systems [B60T13/66C1](#))] [N9409]

B60T15/00 **Construction arrangement, or operation of valves incorporated in power brake systems and not covered by groups [B60T11/00](#) or [B60T13/00](#) (valve structures responsive to a speed condition [B60T8/34](#); valves in general [F16K](#))**

- B60T15/02 . Application and release valves
- B60T15/02D . . [N: Railway control or brake valves] [N9709]
- B60T15/02D1 . . . [N: with one slide valve, e.g. an emergency slide valve] [N9709]
- B60T15/02D1A [N: with quick braking action and evacuation of air to a reservoir, to the atmosphere or to the brake cylinder] [N9709]
- B60T15/02E . . [N: Electrically controlled valves] [N0301]
- B60T15/02E1 . . . [N: in pneumatic systems] [N0301]
- B60T15/02E2 . . . [N: in hydraulic systems] [N0301]
- B60T15/04 . . Driver`s valves
- B60T15/04B . . . [N: controlling auxiliary pressure brakes, e.g. parking or emergency brakes ([B60T15/04D](#) takes precedence)]
- B60T15/04C . . . [N: controlling service pressure brakes ([B60T15/04D](#) takes precedence)]
- B60T15/04C1 [N: in multiple circuit systems, e.g. dual circuit systems]
- B60T15/04C1A [N: with valves mounted in tandem]
- B60T15/04D . . . [N: Controlling pressure brakes of railway vehicles]
- B60T15/10 . . . for vacuum brakes
- B60T15/12 . . . combined with relay valves or the like
- B60T15/14 . . . influencing electric control means
- B60T15/16 . . . Arrangements enabling systems to be controlled from two or more positions
- B60T15/18 . . Triple or other relay valves which allow step-wise application or release and which are actuated by brake-pipe pressure variation to connect brake cylinders or equivalent to compressed air or vacuum source or atmosphere
- B60T15/18A . . . [N: Trailer control valves ([B60T15/20](#) and [B60T15/24A](#) take precedence)]
- B60T15/18B . . . [N: Trailer brake valves ([B60T15/20](#) and [B60T15/24B](#) take precedence)]
- B60T15/18D . . . [N: Railway control or brake valves] [N9709]
- B60T15/18D1 [N: with one slide valve] [N9709]
- B60T15/18D1A [N: with a slide valve for initiation and a second slide valve for control of the braking] [N9709]
- B60T15/18D1B [N: with a slide valve for initiation and annular valves for control of the braking] [N9709]
- B60T15/20 . . . controlled by two fluid pressures
- B60T15/20A [N: Trailer control valves ([B60T15/22A](#) takes precedence)]
- B60T15/20B [N: Trailer brake valves ([B60T15/22B](#) takes precedence)]
- B60T15/22 with one or more auxiliary valves, for braking, releasing, filling reservoirs
- B60T15/22A [N: Trailer control valves]
- B60T15/22B [N: Trailer brake valves]

- B60T15/24 . . . controlled by three fluid pressures
- B60T15/24A [N: Trailer control valves]
- B60T15/24B [N: Trailer brake valves]
- B60T15/26 without a quick braking action
- B60T15/28 and having auxiliary valves
- B60T15/30 with a quick braking action
- B60T15/30D [N: Railway control or brake valves with evacuation of air to a reservoir, to the atmosphere or to the brake cylinder] [N9709]
- B60T15/30D1 [N: with one slide valve] [N9709]
- B60T15/30D1A {7 dots} [N: with a slide valve for initiation and a second slide valve for control of the braking] [N9709]
- B60T15/30D1B {7 dots} [N: with a slide valve for initiation and annular valves for control of the braking] [N9709]
- B60T15/32 and having auxiliary valves
- B60T15/34 . . . controlled alternatively by two or three fluid pressures
- B60T15/36 . . Other control devices or valves characterised by definite functions [N: (electrically controlled valves in fluid-pressure brake systems [B60T13/68B1](#), [B60T13/68C1](#))] [C9409]
- B60T15/38 . . . for quick take-up and heavy braking, e.g. with auxiliary reservoir for taking-up slack
- B60T15/40 with separate take-up and applying cylinders
- B60T15/42 . . . with a quick braking action, i.e. with accelerating valves actuated by brake-pipe pressure variation
- B60T15/44 and operating independently of the main control device
- B60T15/46 . . . for retarding braking action to prevent rear vehicles of a vehicle train overtaking the forward ones
- B60T15/48 . . . for filling reservoirs
- B60T15/50 with means for limiting or relieving pressure in reservoirs
- B60T15/52 . . . for quick release of brakes, e.g. for influencing counter- pressure in triple valve or recirculating air from reservoir or brake cylinder to brake pipe
- B60T15/54 . . . for controlling exhaust from triple valve or from brake cylinder
- B60T15/56 . . . for filling reservoirs by means of a secondary supply pipe
- B60T15/58 . . . for supplying control impulses through a secondary air pipe
- B60T15/60 . . . for releasing or applying brakes when vehicles of a vehicle train are uncoupled

- B60T17/00** **Component parts, details, or accessories of power brake systems not covered by groups [B60T8/00](#), [B60T13/00](#) or [B60T15/00](#), or presenting other characteristic features (air compressors per se [F04](#))**

- B60T17/00A . . [N: Air treatment devices]
- B60T17/00A1 . . [N: Draining and drying devices]
- B60T17/00A2 . . [N: Anti-frost devices]
- B60T17/00A4 . . [N: Silencer devices]

- B60T17/02 . Arrangements of pumps or compressors, or control devices therefor
- B60T17/04 . Arrangements of piping, valves in the piping, e.g. cut-off valves, couplings or air hoses

- (traction couplings involving joints for supply lines, electric circuits, or the like [B60D1/62](#); couplings peculiar to railway vehicles for, or combined with, couplings or connectors for fluid conduits or electric cables [B61G5/06](#); pipes, cut-off valves, couplings, air hoses *per se* [F16C](#), [F16K](#), [F16L](#)) [[C9412](#)]
- B60T17/04B . . [N: Brake line couplings, air hoses and stopcocks]
 - B60T17/04D . . [N: Devices for pipe guiding and fixing]
 - B60T17/06 . Applications or arrangements of reservoirs
 - B60T17/08 . Brake cylinders other than ultimate actuators (with built-in wear-compensating mechanisms, ultimate actuators [F16D](#))
 - B60T17/08B . . [N: Single service brake actuators]
 - B60T17/08C . . [N: Combination of service brake actuators with spring loaded brake actuators]
 - B60T17/08D . . [N: Spring loaded brake actuators]
 - B60T17/08D2 . . . [N: Spring loaded brake actuators with emergency release device]
 - B60T17/08F . . [N: Mounting arrangements]
 - B60T17/10 . . Two or more cylinders acting on the same brake with means for rendering them effective selectively or successively, the number of effective cylinders being variable
 - B60T17/12 . . . according to vehicle weight
 - B60T17/14 . . . according to vehicle speed
 - B60T17/16 . . Locking of brake cylinders
 - B60T17/18 . Safety devices; Monitoring
 - B60T17/20 . . Safety devices operable by passengers other than the driver, [N: e.g. for railway vehicles] [[C9709](#)]
 - B60T17/22 . . Devices for monitoring or checking brake systems; Signal devices
 - B60T17/22B . . . [N: Procedure or apparatus for checking or keeping in a correct functioning condition of brake systems (hydraulic pressure systems in general [F15B19/00](#), [F15B21/04](#); testing structures or apparatus [G01M](#))]
 - B60T17/22B1 [N: by filling or bleeding of hydraulic systems]
 - B60T17/22B1A [N: Devices for pressurising brake systems acting on pedal]
 - B60T17/22D . . . [N: brake fluid level indicators (level indication in general [G01F](#); [H01H](#))]
 - B60T17/22F . . . [N: using devices being responsive to the difference between the fluid pressures in conduits of multiple braking systems]
 - B60T17/22F1 [N: With additional functions, e.g. by-pass]
 - B60T17/22H . . . [N: for railway vehicles]