

**CPC****COOPERATIVE PATENT 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**

**NOTE**

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

**WARNING**

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

[B60T 8/20](#) covered by [B60T 8/18](#)  
[B60T 8/22](#) covered by [B60T 8/18](#)  
[B60T 8/60 - B60T 8/70](#) covered by [B60T 8/17](#)  
[B60T 8/78 - B60T 8/84](#) covered by [B60T 8/17](#)  
[B60T 13/122](#) covered by [B60T 13/147](#), [B60T 13/167](#)  
[B60T 13/125](#) covered by [B60T 13/141](#)  
[B60T 13/128](#) covered by [B60T 13/145](#), [B60T 13/165](#)  
[B60T 13/13](#) covered by [B60T 13/146](#), [B60T 13/166](#)  
[B60T 13/132](#) covered by [B60T 13/143](#), [B60T 13/162](#)  
[B60T 13/135](#) covered by [B60T 13/144](#), [B60T 13/163](#)  
[B60T 13/138](#) covered by [B60T 13/148](#), [B60T 13/168](#)  
[B60T 13/60](#) covered by [B60T 13/58](#)  
[B60T 15/06](#) covered by [B60T 15/04](#)  
[B60T 15/08](#) covered by [B60T 15/04](#)

**B60T 1/00**

**Arrangements of braking elements, i.e. of those parts where braking effect occurs {specially for vehicles}**

**B60T 1/005**

- . {by locking of wheel or transmission rotation}

**B60T 1/02**

- . acting by retarding wheels

**B60T 1/04**

- . . acting directly on tread

**B60T 1/06**

- . . acting otherwise than on tread, e.g. employing rim, drum, disc, or transmission {or on double wheels}

**B60T 1/062**

- . . . {acting on transmission parts}

**B60T 1/065**

- . . . {employing disc ([B60T 1/062](#) takes precedence)}

**B60T 1/067**

- . . . {employing drum ([B60T 1/062](#) takes precedence)}

**B60T 1/08**

- . . using fluid or powdered medium

- B60T 1/087 . . . in hydrodynamic, i.e. non-positive displacement, retarders
- B60T 1/093 . . . in hydrostatic, i.e. positive displacement, retarders
- B60T 1/10 . . by utilising wheel movement for accumulating energy, e.g. driving air compressors (using propulsion unit as braking means, see the relevant class)
- B60T 1/12 . acting otherwise than by retarding wheels, e.g. jet action
- B60T 1/14 . . directly on road (portable devices, e.g. chocks [B60T 3/00](#))
- B60T 1/16 . . by increasing air resistance, e.g. flaps
- B60T 3/00** **Portable devices for preventing unwanted movement of vehicles, e.g. chocks**
- B60T 5/00** **Vehicle modifications to facilitate cooling of brakes**

### Brake control systems or parts thereof

- B60T 7/00** **Brake-action initiating means**
- B60T 7/02 . for personal initiation
- B60T 7/04 . . foot actuated
- B60T 7/042 . . . {by electrical means, e.g. using travel or force sensors}
- B60T 7/045 . . . {with locking and release means, e.g. providing parking brake application}
- B60T 7/047 . . . . {Hand-actuated release means}
- B60T 7/06 . . . Disposition of pedal
- B60T 7/065 . . . . {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 [B60R 21/09](#))}
- B60T 7/08 . . hand actuated
- B60T 7/085 . . . {by electrical means, e.g. travel, force sensors}
- B60T 7/10 . . . Disposition of hand control
- B60T 7/101 . . . . {by means of a pull rod}
- B60T 7/102 . . . . {by means of a tilting lever}
- B60T 7/104 . . . . . {with a locking mechanism}
- B60T 7/105 . . . . . {the lock being released by means of a push button}
- B60T 7/107 . . . . {with electrical power assistance}
- B60T 7/108 . . . . {with mechanisms to take up slack in the linkage to the brakes}
- B60T 7/12 . for automatic initiation; for initiation not subject to will of driver or passenger {(limiting speed of vehicles other than rail vehicles [B60K 31/00](#))}
- B60T 7/122 . . {for locking of reverse movement}
- B60T 7/124 . . {Brakes for railway vehicles coming into operation in case of accident, derailment or damage of rolling stock or superstructure (self-acting brakes in general [F16D 59/00](#))}
- B60T 7/126 . . {Brakes for railway vehicles coming into operation in case of exceeding a predetermined speed (self-acting brakes in general [F16D 59/00](#))}
- B60T 7/128 . . {Self-acting brakes of different types for railway vehicles ([B60T 7/12](#) takes precedence; self-acting brakes in general [F16D 59/00](#))}

- B60T 7/14
  - . . operated upon collapse of driver (deadman's devices for electrically propelled vehicles [B60L 3/02](#))
- B60T 7/16
  - . . operated by remote control, i.e. initiating means not mounted on vehicle
- B60T 7/18
  - . . . operated by wayside apparatus
- B60T 7/20
  - . . specially for trailers, e.g. in case of uncoupling of {or overrunning by} trailer (inertia-actuated over-run brakes [B60T 13/08](#))
- B60T 7/203
  - . . . {with automatic brake release or reduction in case of reverse travel, e.g. by means of mechanisms mounted on the draw bar}
- B60T 7/206
  - . . . . {by means of mechanisms mounted on trailer drum brakes}
- B60T 7/22
  - . . initiated by contact of vehicle, e.g. bumper, with an external object, e.g. another vehicle {, or by means of contactless obstacle detectors mounted on the vehicle}
  
- B60T 8/00**

**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 [B60T 17/10](#))**
- B60T 8/17
  - Using electrical or electronic regulation means to control braking {(detecting or indicating faulty operation [B60T 8/885](#))}
- B60T 8/1701
  - . . {Braking or traction control means specially adapted for particular types of vehicles (for vehicles having more than one drive axle [B60T 8/1769](#))}
- B60T 8/1703
  - . . . {for aircrafts}
- B60T 8/1705
  - . . . {for rail vehicles}
- B60T 8/1706
  - . . . {for single-track vehicles, e.g. motorcycles}
- B60T 8/1708
  - . . . {for lorries or tractor-trailer combinations}
- B60T 8/171
  - . . Detecting parameters used in the regulation; Measuring values used in the regulation
- B60T 8/172
  - . . Determining control parameters used in the regulation, e.g. by calculations involving measured or detected parameters {([B60T 8/17551](#) takes precedence)}
- B60T 8/1725
  - . . . {Using tyre sensors, e.g. Sidewall Torsion sensors [SWT] (for tyre pressure and temperature detection [B60C 23/00](#))}
- B60T 8/173
  - . . Eliminating or reducing the effect of unwanted signals, e.g. due to vibrations or electrical noise
- B60T 8/174
  - . . characterised by using special control logic, e.g. fuzzy logic {,neural computing}
- B60T 8/175
  - . . 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 [B60K 28/16](#))
- B60T 8/1755
  - . . 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 [B60W 30/02](#))
- B60T 8/17551
  - . . . {determining control parameters related to vehicle stability used in the regulation, e.g. by calculations involving measured or detected parameters}
- B60T 8/17552
  - . . . {responsive to the tire sideslip angle or the vehicle body slip angle}

- B60T 8/17554 . . . {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 [B60W 30/04](#))}
- B60T 8/17555 . . . {specially adapted for enhancing driver or passenger comfort, e.g. soft intervention or pre-actuation strategies}
- B60T 8/17557 . . . {specially adapted for lane departure prevention (road vehicle drive control systems for lane keeping otherwise than by controlling a particular sub-unit [B60W 30/12](#))}
- B60T 8/17558 . . . {specially adapted for collision avoidance or collision mitigation (road vehicle drive control systems for collision avoidance otherwise than by controlling a particular sub-unit [B60W 30/09](#))}
- B60T 8/176 . . Brake regulation specially adapted to prevent excessive wheel slip during vehicle deceleration, e.g. ABS ([B60T 8/1755](#) takes precedence)
- B60T 8/1761 . . . responsive to wheel or brake dynamics, e.g. wheel slip, wheel acceleration or rate of change of brake fluid pressure
- B60T 8/17613 . . . . {based on analogue circuits or digital circuits comprised of discrete electronic elements}
- B60T 8/17616 . . . . {Microprocessor-based systems}
- B60T 8/1763 . . . responsive to the coefficient of friction between the wheels and the ground surface ([B60T 8/1764](#) takes precedence)
- B60T 8/17633 . . . . {based on analogue circuits or digital circuits comprised of discrete electronic elements}
- B60T 8/17636 . . . . {Microprocessor-based systems}
- B60T 8/1764 . . . Regulation during travel on surface with different coefficients of friction, e.g. between left and right sides, mu-split {or between front and rear}
- B60T 8/1766 . . . Proportioning of brake forces according to vehicle axle loads, e.g. front to rear of vehicle
- B60T 8/1769 . . . specially adapted for vehicles having more than one driven axle, e.g. four-wheel drive vehicles
- B60T 8/18 . . responsive to vehicle weight or load, e.g. load distribution ({using electrical circuitry on regulation means [B60T 8/17](#); } [B60T 8/30](#) takes precedence; responsive to weight and speed condition [B60T 8/58](#))

**NOTE**

[B60T 8/1887](#) and [B60T 8/1893](#) take precedence over [B60T 8/1806](#) to [B60T 8/1881](#)

- B60T 8/1806 . . {characterised by the calibration process or the means therefor}
- B60T 8/1812 . . {characterised by the means for pressure reduction}
- B60T 8/1818 . . . {Lever mechanism}
- B60T 8/1825 . . . {Means for changing the diaphragm area submitted to pressure}
- B60T 8/1831 . . . {pressure reducing or limiting valves}
- B60T 8/1837 . . {characterised by the load-detecting arrangements}
- B60T 8/1843 . . . {Arrangements for detecting air spring pressure}
- B60T 8/185 . . . {Arrangements for detecting vehicle level}

- B60T 8/1856 . . . {Arrangements for detecting suspension spring load ([B60T 8/1843](#) takes precedence)}
- B60T 8/1862 . . . . {comprising sensors of the type providing a fluid output signal representing the load on the vehicle suspension}
- B60T 8/1868 . . . . {comprising sensors of the type providing a mechanical output signal representing the load on the vehicle suspension}
- B60T 8/1875 . . . . {comprising sensors of the type providing an electrical output signal representing the load on the vehicle suspension}
- B60T 8/1881 . . {characterised by failure-responsive means}
- B60T 8/1887 . . {especially adapted for tractor-trailer combinations}
- B60T 8/1893 . . {especially adapted for railway vehicles}
- B60T 8/24 . responsive to vehicle inclination or change of direction, e.g. negotiating bends {(using electrical circuitry or regulation means [B60T 8/17](#))}
- B60T 8/241 . . {Lateral vehicle inclination}
- B60T 8/243 . . . {for roll-over protection}
- B60T 8/245 . . {Longitudinal vehicle inclination}
- B60T 8/246 . . {Change of direction}
- B60T 8/248 . . {Trailer sway, e.g. for preventing jackknifing}
- B60T 8/26 . characterised by producing differential braking between front and rear wheels {(using electrical circuitry or regulation means [B60T 8/17](#))}
- B60T 8/261 . . {specially adapted for use in motorcycles}
- B60T 8/262 . . {using valves with stepped characteristics ([B60T 8/261](#), [B60T 8/266](#) take precedence)}
- B60T 8/263 . . . {for pneumatic brake systems}
- B60T 8/265 . . . {for hydraulic brake systems}
- B60T 8/266 . . {using valves or actuators with external control means ([B60T 8/261](#) takes precedence)}
- B60T 8/267 . . . {for hybrid systems with different kind of brakes on different axles}
- B60T 8/268 . . . {using the valves of an ABS, ASR or ESP system}
- B60T 8/28 . . responsive to deceleration {([B60T 8/261](#), [B60T 8/262](#), [B60T 8/266](#) take precedence)}
- B60T 8/282 . . . {using ball and ramp}
- B60T 8/285 . . . {using horizontal moving mass}
- B60T 8/287 . . . {using pendulums}
- B60T 8/30 . . responsive to load {([B60T 8/261](#), [B60T 8/262](#), [B60T 8/266](#) take precedence)}
- B60T 8/303 . . . {using pneumatic valves}
- B60T 8/306 . . . {using hydraulic valves}
- B60T 8/32 . responsive to a speed condition, e.g. acceleration or deceleration {(using electrical circuitry or regulation means [B60T 8/17](#)) ; [B60T 8/28](#) takes precedence; electric devices on electrically propelled vehicles indicating the wheel slip [B60L 3/10](#); measuring linear or angular speed per se [G01P 3/00](#)}
- B60T 8/3205 . . {acceleration ([B60T 8/34](#), [B60T 8/52](#), [B60T 8/54](#), [B60T 8/56](#), [B60T 8/58](#), [B60T 8/72](#), [B60T 8/86](#), [B60T 8/88](#) take precedence)}

- B60T 8/321 . . {deceleration ([B60T 8/34](#), [B60T 8/52](#), [B60T 8/54](#), [B60T 8/56](#), [B60T 8/58](#), [B60T 8/72](#), [B60T 8/86](#), [B60T 8/88](#) take precedence)}
- B60T 8/3215 . . . {Systems characterised by having means acting on components of the drive line, e.g. retarder, clutch or differential gear ([B60T 8/322](#) takes precedence)}
- B60T 8/322 . . . {Systems specially adapted for vehicles driven by more than one axle, e.g. Four Wheel-Drive vehicles}
- B60T 8/3225 . . . {Systems specially adapted for single-track vehicles, e.g. motorcycles ([B60T 8/3235](#) takes precedence)}
- B60T 8/323 . . . {Systems specially adapted for tractor-trailer combinations}
- B60T 8/3235 . . . {Systems specially adapted for rail vehicles}
- B60T 8/324 . . . . {Speed measurement by means of centrifugal governors or the like}
- B60T 8/3245 . . . . {responsive to the speed difference between wheels and rail, or between two wheels or two axles}
- B60T 8/325 . . . {Systems specially adapted for aircraft}
- B60T 8/3255 . . . {Systems in which the braking action is dependent on brake pedal data}
- B60T 8/326 . . . . {Hydraulic systems}
- B60T 8/3265 . . . . . {with control of the booster ([B60T 8/3275](#) takes precedence)}
- B60T 8/327 . . . . {Pneumatic systems}
- B60T 8/3275 . . . . {Systems with a braking assistant function, i.e. automatic full braking initiation in dependence of brake pedal velocity}
- B60T 8/328 . . . {Systems sharing components with other fluid systems onboard the vehicle}
- B60T 8/3285 . . . . {the other fluid systems being suspension elements}
- B60T 8/329 . . . {Systems characterised by their speed sensor arrangements}
- B60T 8/3295 . . . {Systems in which there is a pulsating signal superposed on the command signal}
- B60T 8/34 . . having a fluid pressure regulator responsive to a speed condition
- B60T 8/341 . . . {Systems characterised by their valves ([B60T 8/36](#), [B60T 8/38](#) take precedence)}
- B60T 8/342 . . . . {Pneumatic systems}
- B60T 8/343 . . . {Systems characterised by their lay-out ([B60T 8/349](#) takes precedence)}
- B60T 8/344 . . . . {Hydraulic systems}
- B60T 8/345 . . . . . {having more than one brake circuit per wheel}
- B60T 8/346 . . . . . {2 Channel systems ([B60T 8/345](#) takes precedence)}
- B60T 8/347 . . . . . {3 Channel systems ([B60T 8/345](#) takes precedence)}
- B60T 8/348 . . . . . {4 Channel systems ([B60T 8/345](#) takes precedence)}
- B60T 8/349 . . . {Systems adapted to control a set of axles, e.g. tandem axles}
- B60T 8/36 . . . including a pilot valve responding to an electromagnetic force
- B60T 8/3605 . . . . {wherein the pilot valve is mounted in a circuit controlling the working fluid system}
- B60T 8/361 . . . . {wherein the pilot valve is mounted in a circuit controlling an auxiliary fluid system}

B60T 8/3615	. . . .	{Electromagnetic valves specially adapted for anti-lock brake and traction control systems ( <a href="#">electromagnetic valves in general F16K 31/06</a> )}
B60T 8/362	. . . . .	{in pneumatic systems ( <a href="#">B60T 8/3655</a> , <a href="#">B60T 8/3675</a> and <a href="#">B60T 8/369</a> take precedence)}
B60T 8/3625	. . . . .	{having at least one vacuum connection}
B60T 8/363	. . . . .	{in hydraulic systems ( <a href="#">B60T 8/3655</a> , <a href="#">B60T 8/3675</a> and <a href="#">B60T 8/369</a> take precedence)}
B60T 8/3635	. . . . .	{switching between more than two connections, e.g. 3/2-valves ( <a href="#">B60T 8/364</a> , <a href="#">B60T 8/3645</a> and <a href="#">B60T 8/365</a> take precedence)}
B60T 8/364	. . . . .	{switching between a number of discrete positions as a function of the applied signal, e.g. 3/3-valves ( <a href="#">B60T 8/3645</a> takes precedence)}
B60T 8/3645	. . . . .	{having more than one electromagnetic coil inside a common housing}
B60T 8/365	. . . . .	{combining a plurality of functions in one unit, e.g. pressure relief}
B60T 8/3655	. . . . .	{Continuously controlled electromagnetic valves}
B60T 8/366	. . . . .	{Valve details}
B60T 8/3665	. . . . .	{Sliding valves}
B60T 8/367	. . . . .	{Seat valves, e.g. poppet valves}
B60T 8/3675	. . . . .	{integrated in modulator units}
B60T 8/368	. . . . .	{combined with other mechanical components, e.g. pump units, master cylinders}
B60T 8/3685	. . . . .	{characterised by the mounting of the modulator unit onto the vehicle}
B60T 8/369	. . . . .	{Valves using piezo-electric elements ( <a href="#">in general F16K 31/004</a> )}
B60T 8/3695	. . . . .	{wherein the pilot valve is mounted separately from its power section ( <a href="#">B60T 8/3605</a> , <a href="#">B60T 8/361</a> and <a href="#">B60T 8/3615</a> take precedence)}
B60T 8/38	. . .	including valve means of the relay or driver controlled type
B60T 8/40	. . .	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
B60T 8/4004	. . . .	{Repositioning the piston(s) of the brake control means by means of a fluid pressurising means in order to reduce the brake pressure}
B60T 8/4009	. . . . .	{the brake control means being the wheel cylinders}
B60T 8/4013	. . . . .	{Fluid pressurising means for more than one fluid circuit, e.g. separate pump units used for hydraulic booster and anti-lock braking}
B60T 8/4018	. . . . .	{Pump units characterised by their drive mechanisms ( <a href="#">B60T 8/4095</a> takes precedence)}
B60T 8/4022	. . . . .	{Pump units driven by an individual electric motor ( <a href="#">B60T 8/4027</a> takes precedence)}
B60T 8/4027	. . . . .	{Pump units driven by (parts of) the vehicle propulsion unit}
B60T 8/4031	. . . . .	{Pump units characterised by their construction or mounting (pump units in combination with valve blocks <a href="#">B60T 8/36</a> )}



B60T 8/4036	. . . .	{Pump units characterised by their failure-responsive means ( <a href="#">B60T 8/88</a> takes precedence)}
B60T 8/404	. . . .	{Control of the pump unit}
B60T 8/4045	. . . . .	{involving ON/OFF switching}
B60T 8/405	. . . . .	{involving the start-up phase}
B60T 8/4054	. . . . .	{involving the delivery pressure control ( <a href="#">B60T 8/4072</a> takes precedence)}
B60T 8/4059	. . . . .	{involving the rate of delivery}
B60T 8/4063	. . . . .	{involving the direction of fluid flow}
B60T 8/4068	. . . .	{the additional fluid circuit comprising means for attenuating pressure pulsations}
B60T 8/4072	. . . .	{Systems in which a driver input signal is used as a control signal for the additional fluid circuit which is normally used for braking}
B60T 8/4077	. . . . .	{Systems in which the booster is used as an auxiliary pressure source}
B60T 8/4081	. . . . .	{Systems with stroke simulating devices for driver input ( <a href="#">B60T 8/4077</a> takes precedence)}
B60T 8/4086	. . . . .	{the stroke simulating device being connected to, or integrated in the driver input device}
B60T 8/409	. . . . .	{characterised by details of the stroke simulating device}
B60T 8/4095	. . . .	{including wheel driven pumps for detecting a speed condition}
B60T 8/42	. . .	having expanding chambers for controlling pressure {i.e. closed systems}
B60T 8/4208	. . . .	{Debooster systems}
B60T 8/4216	. . . . .	{having a mechanically actuated expansion unit ( <a href="#">B60T 8/4225</a> and <a href="#">B60T 8/4266</a> take precedence)}
B60T 8/4225	. . . . .	{having a fluid actuated expansion unit}
B60T 8/4233	. . . . .	{with brake pressure relief by introducing fluid pressure into the expansion unit ( <a href="#">B60T 8/4241</a> takes precedence)}
B60T 8/4241	. . . . .	{pneumatically}
B60T 8/425	. . . . .	{using a vacuum}
B60T 8/4258	. . . . .	{with brake pressure relief by creating vacuum inside the expansion unit}
B60T 8/4266	. . . . .	{having an electro-mechanically actuated expansion unit, e.g. solenoid, electric motor, piezo stack}
B60T 8/4275	. . . .	{Pump-back systems}
B60T 8/4283	. . . . .	{having a pressure sensitive inlet valve}
B60T 8/4291	. . . . .	{having means to reduce or eliminate pedal kick-back}
B60T 8/44	. . .	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 {i.e. open systems}
B60T 8/441	. . . .	{using hydraulic boosters ( <a href="#">B60T 8/445</a> , <a href="#">B60T 8/446</a> , <a href="#">B60T 8/447</a> take precedence)}
B60T 8/442	. . . . .	{the booster being a fluid return pump, e.g. in combination with a brake pedal force booster}



B60T 8/443	. . . .	{using compressed air ( <a href="#">B60T 8/445</a> , <a href="#">B60T 8/446</a> , <a href="#">B60T 8/448</a> take precedence)}
B60T 8/444	. . . .	{using vacuum ( <a href="#">B60T 8/445</a> , <a href="#">B60T 8/446</a> , <a href="#">B60T 8/448</a> take precedence)}
B60T 8/445	. . . .	{replenishing the released brake fluid volume into the brake piping}
B60T 8/446	. . . .	{replenishing the released brake fluid volume via the master cylinder}
B60T 8/447	. . . .	{Reducing the boost of the power-assist booster means to reduce brake pressure}
B60T 8/448	. . . . .	{the power-assist booster means being a vacuum or compressed air booster}
B60T 8/449	. . . . .	{of the multiple booster type}
B60T 8/46	. . .	the pressure being reduced by exhausting fluid
B60T 8/48	. . .	connecting the brake actuator to an alternative or additional source of fluid pressure {e.g. traction control systems}
B60T 8/4809	. . . .	{Traction control, stability control, using both the wheel brakes and other automatic braking systems}
B60T 8/4818	. . . . .	{in pneumatic brake systems}
B60T 8/4827	. . . . .	{in hydraulic brake systems}
B60T 8/4836	. . . . .	{wherein a booster output pressure is used for normal or anti lock braking ( <a href="#">B60T 8/4845</a> , <a href="#">B60T 8/4863</a> , <a href="#">B60T 8/489</a> take precedence)}
B60T 8/4845	. . . . .	{using a booster or a master cylinder for traction control}
B60T 8/4854	. . . . .	{pneumatic boosters}
B60T 8/4863	. . . . .	{closed systems ( <a href="#">B60T 8/4845</a> , <a href="#">B60T 8/489</a> take precedence)}
B60T 8/4872	. . . . .	{pump-back systems}
B60T 8/4881	. . . . .	{having priming means}
B60T 8/489	. . . . .	{using separate traction control modulators}
B60T 8/50	. . .	having means for controlling the rate at which pressure is reapplied to {or released from} the brake
B60T 8/5006	. . . .	{Pressure reapplication by pulsing of valves ( <a href="#">B60T 8/5012</a> , <a href="#">B60T 8/5018</a> , <a href="#">B60T 8/505</a> , <a href="#">B60T 8/5056</a> take precedence)}
B60T 8/5012	. . . .	{Pressure reapplication using a plurality of valves in parallel}
B60T 8/5018	. . . .	{Pressure reapplication using restrictions ( <a href="#">B60T 8/5012</a> , <a href="#">B60T 8/505</a> take precedence)}
B60T 8/5025	. . . . .	{in hydraulic brake systems}
B60T 8/5031	. . . . .	{open systems}
B60T 8/5037	. . . . .	{closed systems}
B60T 8/5043	. . . . .	{debooster systems}
B60T 8/505	. . . .	{Pressure reapplication in a mu-split situation, i.e. a situation with different coefficients of friction on both sides of the vehicle}
B60T 8/5056	. . . .	{Pressure reapplication using memory devices}
B60T 8/5062	. . . . .	{using memory chambers}
B60T 8/5068	. . . . .	{having decay means}

- B60T 8/5075 . . . . {Pressure release by pulsing of valves ([B60T 8/5081](#), [B60T 8/5087](#) take precedence)}
- B60T 8/5081 . . . . {Pressure release using a plurality of valves in parallel}
- B60T 8/5087 . . . . {Pressure release using restrictions ([B60T 8/5081](#) takes precedence)}
- B60T 8/5093 . . . . {in hydraulic brake systems}
- B60T 8/52 . . 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
- B60T 8/54 . . by mechanical means
- B60T 8/56 . . having means for changing the coefficient of friction
- B60T 8/58 . . 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

- B60T 8/72 . . responsive to a difference between a speed condition, e.g. deceleration, and a fixed reference
- B60T 8/74 . . . sensing a rate of change of velocity
- B60T 8/76 . . . two or more sensing means from different wheels indicative of the same type of speed condition
- B60T 8/86 . . 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
- B60T 8/88 . . with failure responsive means, i.e. means for detecting and indicating faulty operation of the speed responsive control means
- B60T 8/885 . . . {using electrical circuitry}
- B60T 8/90 . . . using a simulated speed signal to test speed responsive control means
- B60T 8/92 . . . automatically taking corrective action
- B60T 8/94 . . . . on a fluid pressure regulator
- B60T 8/96 . . . . on speed responsive control means

**B60T 10/00 Control or regulation for continuous braking making use of fluid or powdered medium, e.g. for use when descending a long slope**

- B60T 10/02 . with hydrodynamic brake
- B60T 10/04 . with hydrostatic brake

**B60T 11/00 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 B60T 13/00](#))**

- B60T 11/04 . transmitting mechanically
- B60T 11/043 . . {in case of steerable wheels}
- B60T 11/046 . . {Using cables ([B60T 11/043](#) takes precedence)}
- B60T 11/06 . . Equalising arrangements
- B60T 11/08 . . providing variable leverage

- B60T 11/10 . transmitting by fluid means, e.g. hydraulic
- B60T 11/101 . . {equalising arrangements}
- B60T 11/102 . . {in combination with mechanical elements}
- B60T 11/103 . . {in combination with other control devices (conjoint control of brake system and at least another sub-unit [B60K 41/00](#))}
- B60T 11/105 . . . {with brake locking after actuation, release of the brake by a different control device, e.g. gear lever}
- B60T 11/106 . . . . {locking and release of the brake by the clutch}
- B60T 11/107 . . {overrun brakes with fluid means}
- B60T 11/108 . . {to a trailer fluid system}
- B60T 11/12 . . the transmitted force being varied therein ([B60T 11/16](#) to [B60T 11/26](#) take precedence)
- B60T 11/14 . . the transmitted force being substantially unchanged
- B60T 11/16 . . Master control, e.g. master cylinders (master cylinders associated with vacuum boosters [B60T 13/565](#))
- B60T 11/165 . . . {Single master cylinders for pressurised systems}
- B60T 11/18 . . . Connection thereof to initiating means
- B60T 11/20 . . . Tandem, side-by-side, or other multiple master cylinder units
- B60T 11/203 . . . . {Side-by-side configuration}
- B60T 11/206 . . . . . {with control by a force distributing lever}
- B60T 11/21 . . . . 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 [B62D 11/08](#))
- B60T 11/22 . . . characterised by being integral with reservoir
- B60T 11/224 . . . 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
- B60T 11/228 . . . Pressure-maintaining arrangements, e.g. for replenishing the master cylinder chamber with fluid from a reservoir ([B60T 11/232](#) takes precedence)
- B60T 11/232 . . . Recuperation valves
- B60T 11/236 . . . Piston sealing arrangements
- B60T 11/24 . . Single initiating means operating on more than one circuit e.g. dual circuits (multiple master cylinder units [B60T 11/20](#))
- B60T 11/26 . . Reservoirs (integral with master controls [B60T 11/22](#))
- B60T 11/28 . . Valves specially adapted therefor (recuperation valves [B60T 11/232](#))
- B60T 11/30 . . . Bleed valves for hydraulic brake systems
- B60T 11/32 . . . Automatic cut-off valves for defective pipes
- B60T 11/323 . . . . {in hydraulic systems}
- B60T 11/326 . . . . {in pneumatic systems}
- B60T 11/34 . . . Pressure reducing or limiting valves {(for arrangements for adjusting wheel-braking force responsive to vehicle weight or load [B60T 8/1831](#))}

<b>B60T 13/00</b>	<b>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 <a href="#">B60T 8/00</a>; valves incorporated in such systems <a href="#">B60T 15/00</a>)</b>
<a href="#">B60T 13/02</a>	<ul style="list-style-type: none"> <li>with mechanical assistance or drive {(combined with fluid pressure <a href="#">B60T 13/588</a>)}</li> </ul>
<a href="#">B60T 13/04</a>	<ul style="list-style-type: none"> <li>by spring or weight (fluid released <a href="#">B60T 13/10</a>)</li> </ul>
<a href="#">B60T 13/06</a>	<ul style="list-style-type: none"> <li>by inertia, e.g. flywheel</li> </ul>
<a href="#">B60T 13/065</a>	<ul style="list-style-type: none"> <li>{of the propulsion system}</li> </ul>
<a href="#">B60T 13/08</a>	<ul style="list-style-type: none"> <li>Over-run brakes</li> </ul>
<a href="#">B60T 13/10</a>	<ul style="list-style-type: none"> <li>with fluid assistance, drive, or release</li> </ul>
<a href="#">B60T 13/12</a>	<ul style="list-style-type: none"> <li>the fluid being liquid</li> </ul>
<a href="#">B60T 13/14</a>	<ul style="list-style-type: none"> <li>using accumulators or reservoirs {fed by pumps}</li> </ul>
<a href="#">B60T 13/141</a>	<ul style="list-style-type: none"> <li>{Systems with distributor valve (<a href="#">B60T 13/147</a> takes precedence)}</li> </ul>
<a href="#">B60T 13/142</a>	<ul style="list-style-type: none"> <li>{Systems with master cylinder}</li> </ul>
<a href="#">B60T 13/143</a>	<ul style="list-style-type: none"> <li>{Master cylinder mechanically coupled with booster}</li> </ul>
<a href="#">B60T 13/144</a>	<ul style="list-style-type: none"> <li>{Pilot valve provided inside booster piston}</li> </ul>
<a href="#">B60T 13/145</a>	<ul style="list-style-type: none"> <li>{Master cylinder integrated or hydraulically coupled with booster}</li> </ul>
<a href="#">B60T 13/146</a>	<ul style="list-style-type: none"> <li>{Part of the system directly actuated by booster pressure}</li> </ul>
<a href="#">B60T 13/147</a>	<ul style="list-style-type: none"> <li>{In combination with distributor valve}</li> </ul>
<a href="#">B60T 13/148</a>	<ul style="list-style-type: none"> <li>{Arrangements for pressure supply}</li> </ul>
<a href="#">B60T 13/16</a>	<ul style="list-style-type: none"> <li>using pumps directly, i.e. without interposition of accumulators or reservoirs</li> </ul>
<a href="#">B60T 13/161</a>	<ul style="list-style-type: none"> <li>{Systems with master cylinder}</li> </ul>
<a href="#">B60T 13/162</a>	<ul style="list-style-type: none"> <li>{Master cylinder mechanically coupled with booster}</li> </ul>
<a href="#">B60T 13/163</a>	<ul style="list-style-type: none"> <li>{Pilot valve provided inside booster piston}</li> </ul>
<a href="#">B60T 13/165</a>	<ul style="list-style-type: none"> <li>{Master cylinder integrated or hydraulically coupled with booster}</li> </ul>
<a href="#">B60T 13/166</a>	<ul style="list-style-type: none"> <li>{Part of the system directly actuated by booster pressure}</li> </ul>
<a href="#">B60T 13/167</a>	<ul style="list-style-type: none"> <li>{In combination with distributor valve}</li> </ul>
<a href="#">B60T 13/168</a>	<ul style="list-style-type: none"> <li>{Arrangements for pressure supply}</li> </ul>
<a href="#">B60T 13/18</a>	<ul style="list-style-type: none"> <li>with control of pump output delivery {e.g. by distributor valves (<a href="#">B60T 13/167</a> takes precedence)}</li> </ul>
<a href="#">B60T 13/20</a>	<ul style="list-style-type: none"> <li>with control of pump driving means</li> </ul>
<a href="#">B60T 13/22</a>	<ul style="list-style-type: none"> <li>Brakes applied by springs or weights and released hydraulically</li> </ul>
<a href="#">B60T 13/24</a>	<ul style="list-style-type: none"> <li>the fluid being gaseous</li> </ul>
<a href="#">B60T 13/241</a>	<ul style="list-style-type: none"> <li>{Differential pressure systems}</li> </ul>
<a href="#">B60T 13/242</a>	<ul style="list-style-type: none"> <li>{The control valve is provided as one unit with the servomotor cylinder}</li> </ul>
<a href="#">B60T 13/243</a>	<ul style="list-style-type: none"> <li>{Mechanical command of the control valve, mechanical transmission to the brakes}</li> </ul>

B60T 13/244	. . . . .	{Mechanical command of the control valve, hydraulic transmission to the brakes}
B60T 13/245	. . . . .	{Hydraulic command of the control valve, hydraulic transmission to the brake}
B60T 13/246	. . . . .	{The control valve is provided apart from the servomotor cylinder}
B60T 13/247	. . . . .	{Mechanical command of the control valve, mechanical transmission to the brakes}
B60T 13/248	. . . . .	{Mechanical command of the control valve, hydraulic transmission to the brakes}
B60T 13/249	. . . . .	{Hydraulic command of the control valve, hydraulic transmission to the brakes}
B60T 13/26	. . . . .	Compressed-air systems
B60T 13/261	. . . . .	{systems with both indirect application and application by springs or weights and released by compressed air}
B60T 13/263	. . . . .	{specially adapted for coupling with dependent systems, e.g. tractor-trailer systems}
B60T 13/265	. . . . .	{dependent systems e.g. trailer systems}
B60T 13/266	. . . . .	{Systems with both direct and indirect application, e.g. in railway vehicles}
B60T 13/268	. . . . .	{using accumulators or reservoirs}
B60T 13/36	. . . . .	direct, i.e. brakes applied directly by compressed air
B60T 13/365	. . . . .	{for railway vehicles}
B60T 13/38	. . . . .	Brakes applied by springs or weights and released by compressed air {(B60T 13/261 takes precedence)}
B60T 13/385	. . . . .	{Control arrangements therefor}
B60T 13/40	. . . . .	indirect i.e. compressed air booster units {indirect systems}
B60T 13/403	. . . . .	{specially adapted for coupling with dependent systems, e.g. tractor-trailer systems}
B60T 13/406	. . . . .	{specially adapted for transfer of two or more command signals e.g. railway systems (with electrical control B60T 13/665)}
B60T 13/44	. . . . .	with two-chamber booster units
B60T 13/45	. . . . .	with multiple booster units, e.g. tandem booster units
B60T 13/46	. . . . .	Vacuum systems
B60T 13/465	. . . . .	{for railway vehicles}
B60T 13/48	. . . . .	direct, i.e. brakes applied directly by vacuum
B60T 13/50	. . . . .	Brakes applied by springs or weights and released by vacuum
B60T 13/52	. . . . .	indirect, i.e. vacuum booster units
B60T 13/56	. . . . .	with two-chamber booster units
B60T 13/563	. . . . .	with multiple booster units, e.g. tandem booster units
B60T 13/565	. . . . .	characterised by being associated with master cylinders, e.g. integrally formed
B60T 13/567	. . . . .	characterised by constructional features of the casing or by its strengthening or mounting arrangements
B60T 13/5675	. . . . .	{Supportstruts}

- B60T 13/569 . . . . . characterised by piston details, e.g. construction, mounting of diaphragm
- B60T 13/57 . . . . . characterised by constructional features of control valves
- B60T 13/573 . . . . . characterised by reaction devices
- B60T 13/575 . . . . . using resilient discs or pads
- B60T 13/577 . . . . . using levers
- B60T 13/58 . . Combined or convertible systems
- B60T 13/581 . . . {both hydraulic and pneumatic}
- B60T 13/583 . . . . {using converters}
- B60T 13/585 . . . {comprising friction brakes and retarders}
- B60T 13/586 . . . . {the retarders being of the electric type}
- B60T 13/588 . . . {both fluid and mechanical assistance or drive}
- B60T 13/62 . . . both straight and automatic
- B60T 13/64 . . . both single and multiple, e.g. single and tandem
- B60T 13/66 . . Electrical control in fluid-pressure brake systems
- B60T 13/662 . . . {characterised by specified functions of the control system components}
- B60T 13/665 . . . {the systems being specially adapted for transferring two or more command signals, e.g. railway systems ([B60T 13/662](#) takes precedence)}
- B60T 13/667 . . . . {and combined with electro-magnetic brakes}
- B60T 13/68 . . . by electrically-controlled valves {([B60T 13/662](#) and [B60T 13/665](#) take precedence)}
- B60T 13/683 . . . . {in pneumatic systems or parts thereof (in vacuum systems [B60T 13/72](#))}
- B60T 13/686 . . . . {in hydraulic systems or parts thereof}
- B60T 13/70 . . . by fluid-controlled switches
- B60T 13/72 . . . in vacuum systems {or vacuum booster units}
- B60T 13/74 . . with electrical assistance or drive
- B60T 13/741 . . . {acting on an ultimate actuator}
- B60T 13/743 . . . . {with a spring accumulator}
- B60T 13/745 . . . {acting on a hydraulic system, e.g. a master cylinder}
- B60T 13/746 . . . {and mechanical transmission of the braking action}
- B60T 13/748 . . . {acting on electro-magnetic brakes (combined with fluid-pressure brake systems [B60T 13/667](#))}
  
- B60T 15/00** **Construction arrangement, or operation of valves incorporated in power brake systems and not covered by groups [B60T 11/00](#) or [B60T 13/00](#) (valve structures responsive to a speed condition [B60T 8/34](#); valves in general [F16K](#))**
- B60T 15/02 . . Application and release valves
- B60T 15/021 . . . {Railway control or brake valves}
- B60T 15/022 . . . . {with one slide valve, e.g. an emergency slide valve}
- B60T 15/024 . . . . . {with quick braking action and evacuation of air to a reservoir, to the atmosphere or to the brake cylinder}
- B60T 15/025 . . . {Electrically controlled valves}



B60T 15/027	. . . {in pneumatic systems}
B60T 15/028	. . . {in hydraulic systems}
B60T 15/04	. . Driver's valves
B60T 15/041	. . . {controlling auxiliary pressure brakes, e.g. parking or emergency brakes (B60T 15/048 takes precedence)}
B60T 15/043	. . . {controlling service pressure brakes (B60T 15/048 takes precedence)}
B60T 15/045	. . . . {in multiple circuit systems, e.g. dual circuit systems}
B60T 15/046	. . . . . {with valves mounted in tandem}
B60T 15/048	. . . {Controlling pressure brakes of railway vehicles}
B60T 15/10	. . . for vacuum brakes
B60T 15/12	. . . combined with relay valves or the like
B60T 15/14	. . . influencing electric control means
B60T 15/16	. . . Arrangements enabling systems to be controlled from two or more positions
B60T 15/18	. . 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
B60T 15/181	. . . {Trailer control valves (B60T 15/20 and B60T 15/243 take precedence)}
B60T 15/182	. . . {Trailer brake valves (B60T 15/20 and B60T 15/246 take precedence)}
B60T 15/184	. . . {Railway control or brake valves}
B60T 15/185	. . . . {with one slide valve}
B60T 15/187	. . . . . {with a slide valve for initiation and a second slide valve for control of the braking}
B60T 15/188	. . . . . {with a slide valve for initiation and annular valves for control of the braking}
B60T 15/20	. . . controlled by two fluid pressures
B60T 15/203	. . . . {Trailer control valves (B60T 15/223 takes precedence)}
B60T 15/206	. . . . {Trailer brake valves (B60T 15/226 takes precedence)}
B60T 15/22	. . . . with one or more auxiliary valves, for braking, releasing, filling reservoirs
B60T 15/223	. . . . . {Trailer control valves}
B60T 15/226	. . . . . {Trailer brake valves}
B60T 15/24	. . . controlled by three fluid pressures
B60T 15/243	. . . . {Trailer control valves}
B60T 15/246	. . . . {Trailer brake valves}
B60T 15/26	. . . . without a quick braking action
B60T 15/28	. . . . . and having auxiliary valves
B60T 15/30	. . . . with a quick braking action
B60T 15/302	. . . . . {Railway control or brake valves with evacuation of air to a reservoir, to the atmosphere or to the brake cylinder}
B60T 15/304	. . . . . . {with one slide valve}

- B60T 15/306 . . . . . {with a slide valve for initiation and a second slide valve for control of the braking}
- B60T 15/308 . . . . . {with a slide valve for initiation and annular valves for control of the braking}
- B60T 15/32 . . . . . and having auxiliary valves
- B60T 15/34 . . . . . controlled alternatively by two or three fluid pressures
- B60T 15/36 . . . . . Other control devices or valves characterised by definite functions  
{(electrically controlled valves in fluid-pressure brake systems [B60T 15/027](#), [B60T 15/028](#))}
- B60T 15/38 . . . . . for quick take-up and heavy braking, e.g. with auxiliary reservoir for taking-up slack
- B60T 15/40 . . . . . with separate take-up and applying cylinders
- B60T 15/42 . . . . . with a quick braking action, i.e. with accelerating valves actuated by brake-pipe pressure variation
- B60T 15/44 . . . . . and operating independently of the main control device
- B60T 15/46 . . . . . for retarding braking action to prevent rear vehicles of a vehicle train overtaking the forward ones
- B60T 15/48 . . . . . for filling reservoirs
- B60T 15/50 . . . . . with means for limiting or relieving pressure in reservoirs
- B60T 15/52 . . . . . 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
- B60T 15/54 . . . . . for controlling exhaust from triple valve or from brake cylinder
- B60T 15/56 . . . . . for filling reservoirs by means of a secondary supply pipe
- B60T 15/58 . . . . . for supplying control impulses through a secondary air pipe
- B60T 15/60 . . . . . for releasing or applying brakes when vehicles of a vehicle train are uncoupled
  
- B60T 17/00** **Component parts, details, or accessories of power brake systems not covered by groups [B60T 8/00](#), [B60T 13/00](#) or [B60T 15/00](#), or presenting other characteristic features (air compressors per se [F04](#))**
  - B60T 17/002 . . . {Air treatment devices}
  - B60T 17/004 . . . {Draining and drying devices}
  - B60T 17/006 . . . {Anti-frost devices}
  - B60T 17/008 . . . {Silencer devices}
  - B60T 17/02 . . . Arrangements of pumps or compressors, or control devices therefor
  - B60T 17/04 . . . 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 [B60D 1/62](#); couplings peculiar to railway vehicles for, or combined with, couplings or connectors for fluid conduits or electric cables [B61G 5/06](#); pipes, cut-off valves, couplings, air hoses per se [F16C](#), [F16K](#), [F16L](#))
  - B60T 17/043 . . . {Brake line couplings, air hoses and stopcocks}
  - B60T 17/046 . . . {Devices for pipe guiding and fixing}
  - B60T 17/06 . . . Applications or arrangements of reservoirs
  - B60T 17/08 . . . Brake cylinders other than ultimate actuators (with built-in wear-compensating mechanisms, ultimate actuators [F16D](#))

B60T 17/081	. . {Single service brake actuators}
B60T 17/083	. . {Combination of service brake actuators with spring loaded brake actuators}
B60T 17/085	. . {Spring loaded brake actuators}
B60T 17/086	. . . {Spring loaded brake actuators with emergency release device}
B60T 17/088	. . {Mounting arrangements}
B60T 17/10	. . 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
B60T 17/12	. . . according to vehicle weight
B60T 17/14	. . . according to vehicle speed
B60T 17/16	. . Locking of brake cylinders
B60T 17/18	. Safety devices; Monitoring
B60T 17/20	. . Safety devices operable by passengers other than the driver, {e.g. for railway vehicles}
B60T 17/22	. . Devices for monitoring or checking brake systems; Signal devices
B60T 17/221	. . . {Procedure or apparatus for checking or keeping in a correct functioning condition of brake systems (hydraulic pressure systems in general <a href="#">F15B 19/00</a> , <a href="#">F15B 21/04</a> ; testing structures or apparatus <a href="#">G01M</a> )}
B60T 17/222	. . . . {by filling or bleeding of hydraulic systems}
B60T 17/223	. . . . . {Devices for pressurising brake systems acting on pedal}
B60T 17/225	. . . {brake fluid level indicators (level indication in general <a href="#">G01F</a> ; <a href="#">H01H</a> )}
B60T 17/226	. . . {using devices being responsive to the difference between the fluid pressures in conduits of multiple braking systems}
B60T 17/227	. . . . {With additional functions, e.g. by-pass}
B60T 17/228	. . . {for railway vehicles}

<b>B60T 2201/00</b>	<b>Particular use of vehicle brake systems; Special systems using also the brakes; Special software modules within the brake system controller</b>
B60T 2201/02	. Active or adaptive cruise control system; Distance control
B60T 2201/022	. . Collision avoidance systems
B60T 2201/024	. . Collision mitigation systems
B60T 2201/03	. Brake assistants
B60T 2201/04	. Hill descent control
B60T 2201/06	. Hill holder; Start aid systems on inclined road
B60T 2201/08	. Lane monitoring; Lane Keeping Systems
B60T 2201/081	. . using distance control
B60T 2201/082	. . using alarm actuation
B60T 2201/083	. . using active brake actuation
B60T 2201/084	. . using suspension control
B60T 2201/085	. . using several actuators; Coordination of the lane keeping system with other control systems
B60T 2201/086	. . using driver related features
B60T 2201/087	. . using active steering actuation

B60T 2201/088	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>using transmission control</li> </ul> </li> </ul>
B60T 2201/089	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>using optical detection</li> </ul> </li> </ul>
B60T 2201/09	<ul style="list-style-type: none"> <li>Engine drag compensation</li> </ul>
B60T 2201/10	<ul style="list-style-type: none"> <li>Automatic or semi-automatic parking aid systems</li> </ul>
B60T 2201/12	<ul style="list-style-type: none"> <li>Pre-actuation of braking systems without significant braking effect; Optimizing brake performance by reduction of play between brake pads and brake disc</li> </ul>
B60T 2201/122	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Pre-actuation in case of ESP control</li> </ul> </li> </ul>
B60T 2201/124	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Rain brake support [RBS]; Cleaning or drying brake discs, e.g. removing water or dirt</li> </ul> </li> </ul>
B60T 2201/14	<ul style="list-style-type: none"> <li>Electronic locking-differential</li> </ul>
B60T 2201/16	<ul style="list-style-type: none"> <li>Curve braking control, e.g. turn control within ABS control algorithm</li> </ul>
<b>B60T 2210/00</b>	<b>Detection or estimation of road or environment conditions; Detection or estimation of road shapes</b>
B60T 2210/10	<ul style="list-style-type: none"> <li>Detection or estimation of road conditions</li> </ul>
B60T 2210/12	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Friction</li> </ul> </li> </ul>
B60T 2210/122	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>using fuzzy logic, neural computing</li> </ul> </li> </ul> </li> </ul>
B60T 2210/124	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Roads with different friction levels</li> </ul> </li> </ul> </li> </ul>
B60T 2210/13	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Aquaplaning, hydroplaning</li> </ul> </li> </ul>
B60T 2210/14	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Rough roads, bad roads, gravel roads</li> </ul> </li> </ul>
B60T 2210/16	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Off-road driving conditions</li> </ul> </li> </ul>
B60T 2210/20	<ul style="list-style-type: none"> <li>Road shapes</li> </ul>
B60T 2210/22	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Banked curves</li> </ul> </li> </ul>
B60T 2210/24	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Curve radius</li> </ul> </li> </ul>
B60T 2210/30	<ul style="list-style-type: none"> <li>Environment conditions or position therewithin</li> </ul>
B60T 2210/32	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Vehicle surroundings</li> </ul> </li> </ul>
B60T 2210/34	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Blind spots</li> </ul> </li> </ul>
B60T 2210/36	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Global Positioning System [GPS]</li> </ul> </li> </ul>
<b>B60T 2220/00</b>	<b>Monitoring, detecting driver behaviour; Signalling thereof; Counteracting thereof</b>
B60T 2220/02	<ul style="list-style-type: none"> <li>Driver type; Driving style; Driver adaptive features</li> </ul>
B60T 2220/03	<ul style="list-style-type: none"> <li>Driver counter-steering; Avoidance of conflicts with ESP control</li> </ul>
B60T 2220/04	<ul style="list-style-type: none"> <li>Pedal travel sensor, stroke sensor; Sensing brake request</li> </ul>
B60T 2220/06	<ul style="list-style-type: none"> <li>Adjustment of accelerator pedal reaction forces</li> </ul>
<b>B60T 2230/00</b>	<b>Monitoring, detecting special vehicle behaviour; Counteracting thereof</b>
B60T 2230/02	<ul style="list-style-type: none"> <li>Side slip angle, attitude angle, floating angle, drift angle</li> </ul>
B60T 2230/03	<ul style="list-style-type: none"> <li>Overturn, rollover</li> </ul>
B60T 2230/04	<ul style="list-style-type: none"> <li>Jerk, soft-stop; Anti-jerk, reduction of pitch or nose-dive when braking</li> </ul>
B60T 2230/06	<ul style="list-style-type: none"> <li>Tractor-trailer swaying</li> </ul>
B60T 2230/08	<ul style="list-style-type: none"> <li>Driving in reverse</li> </ul>

**B60T 2240/00****Monitoring, detecting wheel/tire behaviour; counteracting thereof**

B60T 2240/02

- Longitudinal grip ([detection of road friction B60T 2210/10](#))

B60T 2240/03

- Tire sensors

B60T 2240/04

- Tire deformation

B60T 2240/06

- Wheel load; Wheel lift

B60T 2240/07

- Tire tolerance compensation

B60T 2240/08

- Spare wheel detection; Adjusting brake control in case of spare wheel use

**B60T 2250/00****Monitoring, detecting, estimating vehicle conditions**

B60T 2250/02

- Vehicle mass

B60T 2250/03

- Vehicle yaw rate

B60T 2250/04

- Vehicle reference speed; Vehicle body speed

B60T 2250/042

- . Reference speed calculation in ASR or under wheel spinning condition

B60T 2250/06

- Sensor zero-point adjustment; Offset compensation

B60T 2250/062

- . losing zero-point calibration of yaw rate sensors when travelling on banked roads or in case of temperature variations

**B60T 2260/00****Interaction of vehicle brake system with other systems**

B60T 2260/02

- Active Steering, Steer-by-Wire

B60T 2260/022

- . Rear-wheel steering; Four-wheel steering

B60T 2260/024

- . Yawing moment compensation during mu-split braking

B60T 2260/04

- Automatic transmission

B60T 2260/06

- Active Suspension System

B60T 2260/08

- Coordination of integrated systems

B60T 2260/09

- Complex systems; Conjoint control of two or more vehicle active control systems

**B60T 2270/00****Further aspects of brake control systems not otherwise provided for**

B60T 2270/10

- ABS control systems

B60T 2270/12

- . for all-wheel drive vehicles

B60T 2270/14

- . hydraulic model

B60T 2270/20

- ASR control systems

B60T 2270/202

- . for all-wheel drive vehicles

B60T 2270/203

- . hydraulic system components

B60T 2270/204

- . hydraulic model

B60T 2270/206

- . Monitoring, e.g. parameter monitoring, plausibility check

B60T 2270/208

- . adapted to friction condition

B60T 2270/211

- . Setting or adjusting start-control threshold

B60T 2270/213

- . Driving off under Mu-split conditions

B60T 2270/30

- ESP control system

B60T 2270/302

- . for all-wheel drive vehicles

B60T 2270/303	. . Stability control with active acceleration
B60T 2270/304	. . during driver brake actuation
B60T 2270/306	. . hydraulic system components
B60T 2270/308	. . hydraulic model
B60T 2270/311	. . Predefined control maps, lookup tables
B60T 2270/313	. . with less than three sensors (yaw rate, steering angle, lateral acceleration)
B60T 2270/40	. Failsafe aspects of brake control systems
B60T 2270/402	. . Back-up
B60T 2270/403	. . Brake circuit failure
B60T 2270/404	. . Brake-by-wire or X-by-wire failsafe
B60T 2270/406	. . Test-mode; Self-diagnosis
B60T 2270/408	. . Hierarchical failure detection
B60T 2270/411	. . Offset failure
B60T 2270/413	. . Plausibility monitoring, cross check, redundancy
B60T 2270/414	. . Power supply failure
B60T 2270/415	. . Short-circuit, open circuit failure
B60T 2270/416	. . Wheel speed sensor failure
B60T 2270/60	. Regenerative braking
B60T 2270/602	. . ABS features related thereto
B60T 2270/603	. . ASR features related thereto
B60T 2270/604	. . Merging friction therewith; Adjusting their repartition
B60T 2270/606	. . Axle differential or center differential features related thereto
B60T 2270/608	. . Electronic brake distribution (EBV/EBD) features related thereto
B60T 2270/611	. . Engine braking features related thereto
B60T 2270/613	. . ESP features related thereto
B60T 2270/82	. Brake-by-Wire, EHB
B60T 2270/83	. Control features of electronic wedge brake [EWB]
B60T 2270/84	. Driver circuits for actuating motor, valve and the like
B60T 2270/86	. Optimizing braking by using ESP vehicle or tire model
B60T 2270/88	. Pressure measurement in brake systems
B60T 2270/89	. Criteria for brake release