
Glossary of Terms

Actuator: A device which physically initiates mechanical motion of a brake system component.

Air disc brakes: Air-actuated brakes which, upon application, employ a caliper to clamp two brake pads against a rotor. Air discs, compared to drum-type brakes, have superior ability to resist fade.

Anchor pin: The pin that retains the brake shoes within the brake assembly.

Application time: From depression of the brake pedal to when the linings engage the drums (according to FMVSS 121, when all service chambers reach 60 psi).

Automatic slack adjuster: A mechanism that automatically adjusts the brakes. Every time the brake is applied, a take-up mechanism in the actuating lever compensates for wear on the brake lining, to maintain brake balance at each wheel.

Bell-mouthed drum: When a drum has a larger diameter at the open end than at the flange. This prevents full contact with the lining.

Blue drum: Friction surface is blued from high temperature which, in turn, may be caused by weak return springs or an out-of-balance drum.

Brake balance: Balance is achieved when all brakes on all axles do their fair share of the work.

Brake chamber: A device, inside which a diaphragm converts air pressure to mechanical force, via a push rod, for brake actuation.

Brake drag: Failure of one or more brakes to release immediately and/or completely after a driver removes his foot from the brake pedal.

Brake fade: Reduction or elimination of a vehicle's braking ability. This usually happens when heat is generated by continuous or repeated use of the brakes - on a long downgrade, for example. Sometimes this happens selectively, as with brakes that are misadjusted or defective (scored drums, etc.), and sometimes it happens when the brakes are wet.

Brake lining: The friction material that wears against the inside of the brake drum, to slow and stop the truck. Its effectiveness in doing this depends on brake surface area, surface temperature and the brake lining material itself.

Brake pads: Steel plates with friction material attached.

Brake proportioning valve: Also called "bobtail proportioning valve," it limits the pressure to drive-axle brakes while a tractor is operating without a trailer.

Brake shoe: The part to which the brake lining is riveted.

Brake treadle: Works as the brake pedal; is the mechanical lever attached to the foot brake valve.

Breakaway valve: Automatically prevents air loss from the power unit if the trailer is accidentally separated. Also called the "tractor protection valve".

Burnish: The conditioning or "seasoning" of a brake lining by wear and temperature via a test procedure or in-service operation.

Caliper: In an air disc brake system, the clamping device containing friction material. When actuated, the caliper applies braking force to both sides of the rotor.

Cam brakes: (Also called "S-cam" brakes) A type of brake in which the brake lining is pressed against the drum via cam action. An S-shaped cam is rotated when air pressure in the brake chamber moves the push rod which, in turn, moves the lever that rotates the cam. As the cam rotates, it pushes a pair of rollers that force the brake shoes into contact with the brake drum. The friction created by this contact creates the torque necessary to slow and stop the vehicle.

Clevis pin: Pin connecting the arm of a slack adjuster lever to a brake chamber push rod yoke.

Control line valve: Operates as a relay valve on application and a quick release valve for the signal air on release. Improves air system responsiveness by filling the downstream control line faster on application and exhausting the air from the downstream control faster on release.

Cracked drum: Brake drum cracked all the way through by excessive heat and

build-up and/or resurfacing of a drum beyond the manufacturer's limit.

Dash manifold valve: A push-pull valve that is used in the cab for parking control, trailer air supply and tractor protection.

Drain valve: Provides manual or automatic release of water and contaminants from the air system.

Drum: Component upon which brake lining material is applied to slow or stop a vehicle.

Dual brake system: Primary and secondary air systems designed to provide a backup in case one brake system fails.

Dust shield: A metal or plastic plate mounted behind the brake drum to reduce exposure of the mechanism and friction surfaces to road debris.

Edge codes: Double letter codes, such as EE, FF, GG, FG, printed on the edge of a brake block to designate friction levels. Developed by the Friction Materials Standards Institute.

Foundation brake system: The components that collectively supply the retardation force for vehicle stopping, including brake chambers, slack adjusters, brake drums and brake linings.

Friction material: Material attached to the brake shoe that wears against the inside of the brake drum to slow and stop the vehicle.

Full function valve: A trailer valve that integrates all of the functions of the service relay valve and the spring brake control valve.

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GCW: Gross Combination Weight. Total weight of a loaded combination vehicle (e.g., tractor-trailer).

Gladhand: A mechanical connector used to attach the air lines on the tractor to those on the trailer.

Greased linings: One possible cause of poor brake performance. This happens when the cam head seal is in need of replacement - grease leaks past it and gets onto the linings where it reduces brake friction.

GVW: Gross Vehicle Weight. Total weight of a single loaded vehicle (e.g., tractor alone).

Heat-damaged drums: Brake drums that are heat-cracked (with hairline cracks from thermal cycling) or hot-spotted (raised spots on the friction surface).

Hydraulic disc brakes: Hydraulically-actuated brakes which, upon application, employ a caliper to clamp two brake pads against a rotor.

Hydraulic drum brakes: A type of brake in which the brake lining is pressed against the drum via hydraulic action.

Hysteresis: Difference between the amount of pressure needed to open a valve and the pressure drop needed to close it.

Inversion valve: Normally open, an air control valve often used in interlocking applications where components must operate in a specific sequence.

One-way check valve: Protects the air in the spring portion of the spring brake chamber in the event of a loss of service brake air pressure.

Out-of-round drum: Dimensionally inaccurate brake drum – could be oval or bumpy – which reduces braking effectiveness.

Pressure protection valve: Delays the filling of the auxiliary reservoir until a pre-set pressure is achieved in the primary braking reservoir.

Push rod: A rod, protruding from a brake chamber, which is connected to the arm of a slack adjuster via a clevis pin.

Quick release valve: To reduce the chance of brake drag, it speeds the reduction of air pressure when the driver releases the brake treadle.

Relay Valve: Applies, holds or releases brake chamber pressure in proportion to the driver's demand as indicated by the signal pressure.

Release time: Time between release of brake treadle and total disengagement of brake linings (per FMVSS-121, time to reduce service chamber pressures from 95 to 5 psi).

Retarder: Auxiliary braking device such as engine brake, exhaust brake, hydraulic retarder or electric retarder.

Return springs: The springs that retract the brake shoes when the treadle is released. Weak springs can cause the brakes to drag.

Rotor: Component that turns about its own axis to create friction in conjunction with friction pads.

Service brakes: The part of the brake system that is used on the road - as opposed to parking or emergency brakes.

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Service relay valve: Performs the normal service braking function on the trailer; delivers a supply of air to the brake cartridges in proportion to the applied signal pressure.

Slack adjuster: A lever, connecting the brake chamber push rod with the foundation brake camshaft, which transmits torque to rotate the brake camshaft when the brake treadle is depressed. It also provides a means of adjusting the clearance between brake shoes and the drum to compensate for lining wear.

Spring brake: A parking or emergency brake that does not require air pressure to apply the brakes, but does require air pressure to release the brakes. It works automatically if there is a sudden loss of air pressure, and it can be activated manually by a dash-mounted parking brake control. It is only released when air pressure comes back into the system. Some of these units are parking and emergency brakes only, and some have a tandem chamber that incorporates a service brake chamber as well as a spring actuator.

Spring brake control valve: A combination of quick release valve, pressure protection valve and one-way check valve, this valve is operated by the trailer push-pull valve on the tractor dash. Its functions are: charge the trailer reservoir(s) with air, apply and release the parking brakes in response to the drivers signal, apply the emergency spring brakes if a complete loss of supply line pressure occurs.

Stopping distance: The distance traveled by a vehicle on a road between the initial brake application and a full stop.

Stroke: Refers to total distance traveled by a brake chamber push rod or slack adjuster arm during brake application.

Torque balance: A condition achieved when individual brakes exert an equal amount of braking force. The brakes are considered to be proportionally appropriate, but not necessarily equal.

Tractor protection valve: Safeguards the tractor air brake system should a breakaway occur and/or a severe air leak develop in the trailer.

Trailer hand control valve: Provides graduated control of the trailer's service (signal) air to enable independent control of the trailer's service brakes on a tractor-trailer combination.

Truck inversion valve: Provides an anti-compounding function to protect the brakes from being overloaded by simultaneous application of the spring brakes and the service brakes.

Wedge brakes: A design alternative to cam brakes. With this system, air pressure is delivered to one end of the wedge assembly by an air chamber. As the wedge moves forward, rollers spread two plungers. This action causes the brake shoes to spread and, as with the cam brake, the friction created between the lining and the drum creates the torque necessary to slow the vehicle. This type of brake is self-adjusting and, as such, does not utilize a slack adjuster.

Worm gear: Part of the slack adjuster. The worm and worm gear provide for adjusting lining-to-drum clearance.