



TECHNICAL GUIDE

Emergency / Park-Release Valve: Faults, Replacement, Care

How the trailer park-release valve locks and releases spring brakes, why it sticks or leaks air, plus diagnosis, replacement steps and torque values.

Every driver who uncouples a trailer and leaves it standing in the yard talks to this valve without realising it: he presses the red button, the air supply is cut, the spring brake actuators take over and the trailer settles onto its own park brake. Later, when the line has to be exhausted for a shunting move, the brake is released through that same valve. In the workshop it goes by names such as "the trailer button", "the park button" or "the release valve"; its technical name is the emergency / park-release valve. It looks small and usually sits somewhere along the chassis rail buried in dust and mud, but when it fails the trailer is either locked solid in the yard or — far more dangerous — fails to hold when it is supposed to be parked. This guide explains, in workshop language, what this valve does on heavy commercial vehicles and trailers, its typical failure patterns, how to diagnose it, how to replace it and how to maintain it.

This document has been prepared by the VADEN technical team, based on field experience with heavy commercial vehicle air brake systems and on OE component behaviour. The values given here are typical reference ranges; for exact torque, pressure and adjustment figures, always refer to the OE service manual of the vehicle, the trailer and the brake system. **Last updated: September 2026.**

What Is an Emergency / Park-Release Valve? Function and Operating Principle

The emergency / park-release valve is a pneumatic control valve that, via manually operated buttons, shuts off and exhausts the air in the supply line of a trailer or vehicle to apply the spring-brake park brake, and that — when required — uses the pressure remaining in the reservoir to release the brake temporarily so the unit can be manoeuvred.

Its operating principle rests on the basic safety logic of an air brake system: spring brake (spring-loaded diaphragm) actuators are released *when* pressure is present and applied *when* pressure is lost. In other words, loss of air is not a fault — it is a brake command. The valve puts exactly this behaviour into the driver's hand. When the control button is pulled out, the valve exhausts the trailer supply line and the spring brake line to atmosphere; the springs extend and the vehicle settles onto its park brake. When the button is pushed in, reservoir pressure is fed back to the actuators, the springs are compressed and the brake is released.

The second function of the valve is the emergency/shunt side. On a trailer that has been uncoupled or whose supply line has been broken, there is no line pressure and the trailer is braked. If some pressure still remains in the trailer reservoir, the "release" (park release / shunt) button routes this reservoir pressure to the actuators, releasing the brake temporarily and allowing the trailer to be pulled or manoeuvred out of position. As reservoir pressure drops, the brake reapplies on its own; this is deliberate safety behaviour of the system, not a fault.

On modern EBS-equipped trailers the picture is somewhat different. On the latest generation of semi-trailers and trailers, the park-release function often does not exist as a stand-alone valve; it is integrated into the trailer air control valve (TrCM / EBS park module). In these modules the park and shunt buttons, the supply check valve, the pressure protection stage and, on some types, the raise-lower control are combined in a single body. The practical consequence is this: although fault-finding remains valve-specific, the repair is usually solved not by replacing a single park

valve but by replacing the complete module. So before you start diagnosing, always confirm from the body label and the port layout whether the trailer uses a stand-alone park valve or an integrated module; otherwise the correct part on the shelf becomes the wrong part.

This product group is known in the market by several names: park-release valve, trailer park valve, red-and-yellow button valve, shunt/release valve, Knorr-Bremse (Bendix) or WABCO type park valve. Although their functions are similar, the number of ports, the button combination and the internal control logic differ from one to another.

- **Valve body and ports:** Supply (reservoir) inlet, trailer/supply line connection, spring brake outlet and exhaust (vent) port. The ports are cast or laser-marked on the body with numbers according to ISO 6786: **1** = supply (reservoir) inlet, **2** = outlet (spring brake / trailer line), **3** = exhaust / vent. On multi-circuit types the supply and outlet pairs are numbered **11/12** and **21/22**; that is, a change in the second digit indicates the second circuit of the same function.
- **Control buttons:** Push-pull buttons, generally red (trailer supply / trailer park) and yellow (vehicle park brake / release; black on some types). In European (ECE) practice the park brake button is yellow and the trailer supply button is red; the black button is specific to the US market and to older applications.
- **Internal piston and spring assembly:** The moving core that opens, closes or vents the air path depending on button position.
- **Sealing elements:** O-rings, valve seat faces and the button stem seal.
- **Automatic pop-out mechanism:** The safety stage that pushes the button out by itself when pressure falls below a defined threshold, thereby applying the brake.
- **Check valve / pressure protection stage:** An internal element on some types that prevents reservoir pressure from bleeding back.

Why is the "brake applies when the air is gone" logic used?

On a heavy commercial vehicle, the park and emergency brake work differently from hydraulic passenger car logic. The braking force is produced by springs; the air only compresses those springs and holds the brake *released*. In situations such as a burst hose, a broken coupling or loss of supply, the system automatically falls to the safe side, that is, to the applied position. The park-release valve is the manual control interface of this behaviour.

Difference between the tractor-side valve and the trailer-side valve

The hand brake valve (park brake valve) on the tractor side is generally inside the cab and is used constantly by the driver. The park-release valve on the trailer, on the other hand, is positioned along the chassis rail so it can be reached from outside; it provides park and manoeuvring control for an uncoupled trailer. Both work on the same logic but have different port layouts and durability requirements.

On the pair of lines that connects these two, the most useful piece of information in the field is the colour code of the coupling heads. Under EN 15807, the pneumatic coupling heads between tractor and trailer are distinguished by colour: **red = supply (emergency) line, yellow = service (control) line**. The red line charges the trailer reservoir and, when interrupted, applies the park/emergency brake; the yellow line carries the driver's brake pedal command. Reading the valve ports together with this colour logic is the most practical safeguard against the port mix-

up described in the warning below – remember that the line coming from the red coupling must go to the supply port (1) of the valve, and the yellow line to the service/control side.

The pop-out (automatic release) function

When system pressure falls below the safety threshold, the button is expected to pop out by itself, so that the vehicle cannot be moved while pressure is insufficient. If the button does not behave this way, the valve has lost its most critical safety function, and that alone is grounds for replacement.

Type / Application	Control	Typical use	Note
Trailer park-release valve (twin button)	Red + yellow (black on some types) button	Semi-trailer, drawbar trailer, tanker trailer	Knorr-Bremse, WABCO and Bendix equivalent types
Single-button park valve	Single push-pull button	Light trailer, agricultural trailer, special equipment	Park function only
In-cab hand brake valve	Lever / button operated	Tractor unit and truck cab	Driver operated, in constant use
Chassis-mounted release (shunt) valve	Push button	Manoeuvring an uncoupled trailer	Temporary release using reservoir pressure
Combined valve with pressure protection	Button + internal protection stage	Multi-circuit trailer systems	Maintains circuit priority
EBS park module (integrated)	Button group on the module	Modern EBS-equipped semi-trailer	No separate valve; complete module replacement

Part number verification: Park-release valves look almost identical from the outside; the difference lies in the number of ports, the distribution of button functions and the internal control logic. A valve of the wrong type can cause the trailer not to settle onto its park brake when uncoupled, or not to release at all. Before fitting, always verify the OE number of the old valve, the port layout (the 1/2/3 or 11-12/21-22 numbers on the body) and the button colour/function assignment.

Failure Symptoms and Diagnosis

Faults on this valve fall into two main groups: *it does not control* (the button fails to perform its function) and *it does not hold / it leaks* (loss of internal sealing). The second group is the more insidious, because it can slowly release the brake of a parked vehicle. The table below is the starting point for field diagnosis.

Symptom	Possible Cause	Check / Verification
Button will not stay pushed in, keeps popping out	Low supply pressure, internal leak, faulty pop-out stage	Measure reservoir pressure with a gauge; repeat the behaviour while above the threshold

Symptom	Possible Cause	Check / Verification
Park brake does not apply although the button is pulled out	Internal piston sticking, exhaust port (3) blocked, spring brake line not exhausting	Verify that spring brake line pressure drops to zero while the button is pulled out
Park brake will not release, trailer stays locked	Supply line blocked/frozen, internal valve blockage, insufficient reservoir pressure	Measure reservoir and supply line pressure separately; check for the possibility of a frozen line
Continuous air blowing from the exhaust port of the valve	Hardened O-rings, wear on the internal piston seat face, fatigued button stem seal	Apply a soapy water test in both button positions
Brake releases by itself over time while parked	Pressure bleeding into the spring brake actuators due to an internal leak	Chock the vehicle for safety; observe spring brake line pressure over a long period
The release (shunt) button does not free the brake for manoeuvring	No pressure left in the trailer reservoir, check valve failure, jammed button mechanism	Read reservoir pressure; if pressure is present the valve is at fault, if not it is a charging problem
Button mechanically stiff / does not return	Dirt, corrosion, ice, broken internal spring	Clean the body and check button movement by hand
Does not work in the cold, recovers once warm	Moisture in the system - internal freezing; inefficient dryer	Check reservoir water draining and the condition of the dryer cartridge

Pressure verification with a gauge

The most reliable diagnosis is to connect a gauge to the reservoir outlet and to the spring brake line and then operate the buttons in turn. When the button is pushed in, the spring brake line must rise rapidly to reservoir level; when it is pulled out, it must fall rapidly to zero. Slow filling points to a supply restriction, slow exhausting to an exhaust/piston problem, and failure to fall to zero at all to an internal blockage.

Leak (sealing) test

With the system fully charged, the engine off and the vehicle chocked, soapy water is applied to the valve body, the port connections and the exhaust outlet. The test must be carried out separately in both button positions; many valves leak in one position only, and a single-position test will miss that fault.

Pop-out threshold and function check

By bleeding the system down in a controlled manner, you observe whether the button pops out by itself at the safety threshold. This test must always be carried out with the vehicle chocked, on level ground and with the surrounding area made safe. If the button does not pop out, the valve is allowing the vehicle to move even when pressure is insufficient; this is an unacceptable safety defect.

Standards and further reading

This subject is governed by the equipment rules for air-braked commercial vehicles. In the United States the federal air brake standard, **FMVSS 121 (49 CFR 571.121)** defines the reservoirs, protection and timing a compliant system must provide, and Europe applies the equivalent limits of UNECE Regulation No. 13. For further detail, see the illustrated reference guide at airbrakecompressor.com. Always confirm specific figures against the current regulation and the vehicle manufacturer service data.

Outside the United States the equivalent duties sit in national law. In the United Kingdom, **regulation 18 of the Road Vehicles (Construction and Use) Regulations 1986** requires every part of the braking system to be maintained in good working order. In Canada, air brake systems fall under the **Motor Vehicle Safety Regulations, which contain CMVSS 121**.

Replacement / Installation Steps

Personal protective equipment (PPE) and safety: Wear work gloves and safety glasses. Before starting work, move the vehicle onto level ground, **always chock the wheels** and exhaust all pressure from the brake system. Because this valve controls the park brake, the vehicle may be left without braking during removal — the mechanical chocks must be your only safeguard. A port or line loosened under pressure can cause serious injury from a flying component. The engine and the ignition must be switched off.

- 1 Make the vehicle safe:** Park on level ground, chock the wheels, secure the combination if a tractor unit is coupled, and mark off the working area.
- 2 Exhaust the pressure completely:** Drain all circuits through the reservoir drain valves; verify with a gauge that the system is at zero pressure.
- 3 Mark the lines and ports:** Label or photograph every line before removal. Write the labels not by guesswork but **by reading the ISO 6786 port numbers on the body**: 1 = supply (reservoir) inlet, 2 = outlet (spring brake / trailer line), 3 = exhaust / vent; on multi-circuit types 11/12 are the supply pair and 21/22 the outlet pair. If the cast numbers are hidden under mud or paint, clean the body until they are legible. Also note the coupling colour code (red = supply, yellow = service). Mixing up the ports is the most common mistake in this job.
- 4 Disconnect the air lines:** Carefully separate the fittings or quick connectors and cap or protect the line ends against contamination.
- 5 Remove the old valve:** Undo the bracket/panel bolts and separate the valve from its mounting face; on in-cab types, take care not to damage the console panel.
- 6 Verify the new valve by comparison:** Check the OE number, the port count and layout and their number markings, the thread sizes and the button colour/function assignment of the new VADEN valve side by side against the old part.

- 7 Clean the surface and the lines:** Clean the mounting face, the fitting ends and the insides of the lines; no swarf, rust or old gasket residue must enter the system.
- 8 Fit the new valve:** Tighten the bracket bolts progressively and to the OE torque without distorting the body; access to the valve buttons must remain free.
- 9 Connect the lines to the correct ports:** Fit the supply, spring brake and trailer lines according to your labels and the port numbers; tighten the fittings to the OE torque and do not overtighten.
- 10 Charge the system and carry out a leak test:** Start the engine and bring the system up to full pressure; check for leaks with soapy water at all ports and at the exhaust outlet, in both button positions.
- 11 Perform the function and pop-out test:** Operate the buttons in turn to confirm that the brake applies and releases and that the button pops out by itself when pressure drops; then complete the job with a controlled low-speed brake test.

Points to Watch (Common Mistakes)

The most critical mistake — working without chocks: This valve controls the park brake. Even if the spring brake line has been exhausted during removal, the brake may release unexpectedly during fitting or testing. Wheel chocks are not optional; they are the first and the last step of the job.

Mixing up ports and button functions: Swapping the line connections of the red and yellow (black on some types) buttons can cause the trailer not to settle onto its park brake when uncoupled — that is, the most dangerous type of failure. Mark the port numbers and the coupling colours together before removal, and test each function separately after fitting.

- **Treating a leak as "normal":** Continuous blowing from the exhaust port is not normal; it is the first sign of a loss of internal sealing.
- **Skipping the pop-out test:** The valve may apply and release correctly while the pop-out stage is faulty; it must be tested separately.
- **Forcing a frozen valve:** Forcing a button that has seized in winter with a screwdriver breaks the mechanism permanently; the ice must first be allowed to thaw and the source of moisture eliminated.
- **Dirty line ends:** Swarf and rust entering the system permanently damage the valve seat face and will finish off the new part in a short time.
- **Wrong torque:** Overtightening damages the body and the threads, undertightening creates leaks; follow the OE values.
- **Mistaking an integrated module for a single valve:** If the park function on an EBS trailer is inside the trailer air control valve (TrCM), looking for a stand-alone park valve is a waste of time; start the parts search from the body label.
- **Ignoring the root cause:** If the valve has failed because of moisture, a replacement carried out without addressing the dryer and reservoir draining is only a temporary fix.

Technical Values and Check Points

The values below are **typical/general reference** ranges for heavy commercial vehicle air brake systems. Exact values vary with the vehicle, the trailer, the valve type and the axle configuration; **the OE service manual is always definitive.**

Parameter	Typical / General Reference	Note
System operating pressure	~8–10 bar (approx. 116–145 psi)	Reservoir/circuit pressure; varies according to OE
Trailer supply line pressure	~6.5–8.5 bar	Red coupling (supply), permanent line
Full release pressure of the spring brake	General reference above ~5.5–6.5 bar	Below this the brake remains partially applied
Pop-out (automatic release) threshold	General reference range ~3–5 bar	Specific to the valve type; the OE value is definitive
Operating temperature range	Approximately -40 °C to +80 °C	Ambient and component temperature
Permissible leakage	Very low / negligible according to the OE limit	Assessed by the rate of reservoir pressure drop
Exhaust behaviour of the spring brake line	Time for line pressure to fall to zero after the button is pulled out	An extended time indicates a restriction at the exhaust port (3) or an undersized line bore; measure comparatively against a sound valve on the same chassis

General torque references for the fasteners are given below. These are starting values; the OE manual must be used for the final torque.

Connection	Typical Torque Range	Note
Bracket / mounting bolts (M6)	~8–12 Nm	Tighten carefully on panel-type installations
Bracket / mounting bolts (M8)	~20–25 Nm	Tighten progressively and evenly
Bracket / mounting bolts (M10)	~40–50 Nm	Varies according to OE
Air line fittings	According to manufacturer specification	Overtightening damages threads and ports

Take pressure measurements with a calibrated gauge and with the system fully charged. When testing the pop-out threshold, reduce the pressure in a controlled, gradual manner; a sudden exhaust both distorts the measurement and causes the vehicle to go onto the brake unexpectedly. Make sure the chocks stay in place throughout the test.

- Verify the supply and spring brake line pressures separately.
- Observe that the spring brake line drops rapidly to zero when the button is pulled out.

- Repeat the soapy water test in both button positions.
- Confirm that the button pops out by itself at the pop-out threshold.
- Look for cracks, broken tabs and excessive free play on the button surfaces.
- Clean and inspect the body area for corrosion and mud build-up.
- Confirm that the port numbers and the button function labels remain legible.

Maintenance and Service Life

The emergency / park-release valve is not a scheduled replacement item; its life depends largely on the quality of the air fed into the system and on the external conditions it is exposed to. Because it sits under the chassis, road salt, mud and moisture reach the body directly. The threat from inside is moisture and oil: in a system with a worn-out dryer the valve's O-rings harden, the seat faces wear and internal leakage begins.

- **Air quality:** Replace the dryer cartridge on time; moisture is the number one enemy of the sealing elements inside the valve.
- **Reservoir draining:** Drain the water drain valves regularly; accumulated water freezes inside the valve in winter and locks the button.
- **Periodic function check:** At every brake service, test the park and release functions separately, together with the pop-out behaviour.
- **External cleaning:** Clean mud and salt deposits from around the body; corrosion seizes the button stem.
- **Mounting and vibration check:** Inspect the bracket bolts for looseness and the lines for chafing or wear.
- **Leak monitoring:** Monitor the rate of pressure drop on a vehicle left parked for a long period; an accelerating drop is an early warning.

A quality park-release valve will work trouble-free for years in a system supplied with clean, dry air. In a damp, dirty and neglected system, on the other hand, even the best valve will fail early. For this reason, regular maintenance of the air preparation chain (compressor, dryer, reservoir draining) determines valve life just as much as the valve replacement itself. You can review the VADEN product families at the two ends of this chain: the **air brake compressors** and **dryer purge valve (air dryer)** groups cover the components that directly determine the pressure and moisture quality of the air reaching the valve.

A correctly selected emergency / park-release valve, supplied with clean air and fitted properly, is the basic condition for a trailer to be left safely in the yard and manoeuvred without trouble when required. The VADEN ORIGINAL **park and release valve** product family is manufactured with port layouts suited to heavy commercial vehicle and trailer systems, OE-equivalent control logic and a body construction that withstands field conditions; used together with correct part number matching and the OE service manual, it provides reliable, long-lasting park brake control.