King of the Road
By
Dayton Air Control Products, LLC

King of the Road Leveling and Height Control Valves

Control the ride height of the vehicle by automatically inflating or deflating the air bags, or air shocks. Valves are mechanically actuated and available in Delay and Non-delay styles and customized for your OEM applications.

Applications

Valves can be used in all types of air suspension systems where you want to automatically control the height or level of the equipment being supported. Typical applications are Motorcoach, Transit & School Bus, Truck, Trailer, Cab, Rail, RV and Specialty Vehicles. Valves are also used in non-vehicle Industrial Equipment for purposes of liquid level control, HVAC support and pump activation where it is not desirable to use electrically operated valves.

Purpose

It is important to maintain the specified height of the air suspension system as closely as possible to reduce wear on other components in the system and maintain ride quality. Changes in suspension height occur for several reasons. Increasing or decreasing the load on the suspension, non-level road conditions and the natural frequency (bouncing) of the chassis.

Delay Valves

Delay valves are typically used to stop the normal functions of the Valve for a specified amount of time. The delay feature will allow the Valve to ignore intermittent signals such as riding on a rough road or hitting a pothole and only adjust the suspension height for true load adjustments. Long delays can be used to avoid over reaction of the valves such as the extended time a vehicle is tilted when traveling on expressway interchanges. By using less air a delay valve may help to save fuel or even extend the life of the air compressor. Valves are available in short (2-14 sec) and long (20-50 sec.) delays, but can be tailored for a particular application.

Non-Delay Valves

Non-delay or quick response valves begin to flow air as soon as the Control Arm moves outside of the Dead-Band zone. A quick response coupled with a minimum dead-band allows the Valve to act as a switch such as to operate Kneeling Valve systems.

Dead-Band Zone

The dead band is generally considered to be the neutral position of the valve. When the Control Arm is in this position air will not flow through the valve. A narrow dead-band will allow less variation in the ride height of the vehicle but it will increase the amount of air that is being used, since the valve will spend more time outside of the dead band. If air consumption is a concern it is recommended to use a delay style valve. Valves can be furnished with a narrow (1.2 deg.), standard (3.5 deg), or wide (5 deg.) dead band as required.

Control Link Mounting Location

The location of the Control Link mount is important because that is the point that you will be controlling variations in the ride height. Mounting the Link outboard near the tires will see the greatest amount of variation while inboard, near the center of the vehicle will typically see the least amount or an average of the variation in height or travel. Therefore mounting the link further outboard will give the greatest amount of control, but will typically require you to control both sides of the vehicle.

Length of Control Arm or Lever

The control arm is mounted to the side of the Valve and one end is attached to the Control Link. The control arm is typically a flat bar or a round rod. The rod length can be adjusted by loosening a bolt and sliding the rod in or out to the desired length. A flat arm may or may not be adjustable. Some have multiple mounting holes allowing you to choose the length (distance from the center, or pivot point of the valve). Others may have interchangeable parts that allow for different lengths depending on your application.

King of the Road Valves comes standard with a 7.00” flat arm but other lengths are available. There are two important things to keep in mind when choosing or setting an arm length:

1. The total travel of the suspension – The Arm length must be longer than one half of the suspension travel, assuming that the valve is mounted in the center of the travel. If the control arm is too short the valve or the control linkage may be damaged as the suspension extends beyond the vertical travel limit of the arm. Another possible problem would be that when the arm reached a vertical position the suspension could come down on the opposite side allowing the valve to work backwards or not work at all.

2. Changing the Valve performance – The control arm is rotating an internal valve mechanism to make it function, so it has an angular relationship to the vertical travel. Example a 3” Arm length would travel vertically about 0.5” to open the valve 10 degrees. A 10” long arm would have to travel 1.75” to open the valve the same 10 degrees. That also means that a 1” change in vehicle height would only open the Valve 6 degrees when using a 10” arm, but it would open it almost 20 degrees with a 3” arm. Changing the arm length could limit the air flow through the valve as well as the effective dead-band zone and variation in vehicle ride height.

Valve Layout

A typical layout on a transit bus might have one valve on the right rear and one on the left rear of the vehicle each controlling two to four air bags. One valve would also be used at the front of the vehicle to support the air bags on both sides of the vehicle. A trailer may only use one valve per axle mounted near the center.

Number of Valves

One valve can operate a single or a multiple number of air bags.

A single valve may reduce equipment costs and the possible chances of having a leak in the system, but may increase the amount of time it takes to fill or empty the air bag system. The air compressor output, typical load being supported, size of the air line used in the system, volume of each air bag and the number of air bags in the system, flow through the Valve and any other valves in the system as well as any fittings or connectors that might restrict air flow, should all be considered when determining the acceptable amount of time to raise or lower the suspension and how many valves to use.

Valve Height Adjustment

The center position of the King of the Road Valve is preset so alignment pins or golf tees are not required for installation. However the valve arm is adjustable +/- 3.5 degrees and can be used with fixed length linkage or adjustable linkage if needed.

Valve Maintenance

No maintenance of the King of the Road Valve is required. Proper maintenance of the Air Compressor and air system will ensure a long and trouble free life of the valve.

Reduced Hardware

Intake Check Valves can be factory installed on the valve to eliminate the need for mounting an inline valve elsewhere in the system. The Check Valve prevents air from the airbag system to backflow through the valve and lower the vehicle height when the compressor is not running.

Custom mounting brackets and control arms can be designed to avoid adding additional hardware just to mount the Valve.

Valves come preassembled with 7/16”-20 SAE Compression Fitting threads but NPT; DOT and Push Connect Tube fittings are available in various sizes.

Valves can be prepackaged with the necessary mounting hardware, including the Control Linkage.

Fast Installation

Two ¼” or 6mm bolts for mounting to the frame, one airline from the compressor or storage tank into the valve, one airline from the valve to the air bags, and one fastener to the Control Link is all that is required for installation.

Long Life – Backed by a 30 month factory warranty

King of the Road Leveling and Height Control Valve Linkage

Control Linkage is required for each Height Control Valve and is what mechanically actuates the valve. One end is typically mounted to the axle assembly and the other end to the Valve Lever or Control Arm of the Valve.

The Linkage must maintain its set or fixed height during operation to be able to accurately control the vehicle ride height. It must also protect the valve from the shock and twisting motion that is transmitted to the Valve. If the Elastomer bushings dry out and harden or the adjustable linkage is not installed correctly it may shorten the life or damage the valve assembly.

Fixed Length Linkage

No adjustment required, just install.

Available in lengths from 3.50” to 26”.

Links can be supplied in the exact length and special configurations for unusual mounting situations.

All Links are measured from center to center of the two mounting holes.

Made to fit standard ¼” mounting bolts or studs.

Withstands high impact shock and +/- 10 degrees of torsional rotation.

Links come standard with a phosphate coating for corrosion protection but are available with other coatings such as Chromates and Paint.

Link ends are fully supported unlike some rubber only molded ends.

Adjustable Linkage Kits

All of the same great features as our Fixed Length Links but they can be adjusted for any size that you need. Just slide to length and tighten.

Standard in two sizes: 9” to 15” and 15” to 26”, but available in custom length ranges.

Supplied with ¼” mounting hardware, wrench and measuring scale.