Table of Contents

How the inside step slide and outside step operate

Outside step and inside step slide cover are moved with dual-action pneumatic cylinders. Cylinders are controlled with 3-way pneumatic 12-volt valves located on the outside back of the bottom step. There are separate valves for inside slide and outside step. Each valve has an input air line and output adjustable exhaust port.

Two other air lines on the valve go to either ends of cylinder to either extend or collapse cylinder. 12-volts move inside of valve to force air to one end of cylinder. Removing 12-volts allows inside of valve to spring return to force air to other end of cylinder. When one air line is pressurized, the other air line is exhausted to the exhaust port. Exhaust port is adjustable to slow return of cylinder to prevent slamming in either direction. Removing and cleaning exhaust port can improve actions.

You could put your own 12-volts to a valve to see if parts move. Valve is easily disassembled to clean and get a sticking valve to move freely.

Some have a step switch to the right of driver's knee on center console. Switches are usually under a cover to prevent accidental movement. I don't think there are step lights, so your step switch could operate the step slide pneumatic valve.

If you have two switches to operate step slide, each switch is 3-wire single-pole double-throw. One switch has 12-volts to center pole. Other switch has center wired to pneumatic valve. The top & bottom poles are wired to each other, so either switch will close or open 12-volts to valve.

Outside step is powered by ignition through door magnetic reed switch. When ignition is on and door closed, 12-volts is supplied to step pneumatic valve. Opening door or turning off ignition allows valve to spring return. Some have modified circuit to allow step to also close when ignition is off and door closed.

The following is how the two pneumatic air valves that control the step cover and outside step work on our 1997 coach:

Both valves are the same part number, but work independently.Some coach owners have repaired a leaking valve by successfully taken apart their valve, cleaned it and put it back together.Later coaches used a different valve than we originally had on our coach, so I purchased & installed the new valve: https://www.norgren.com Part# V12R517AB312B, description = Valve, solenoid operated, spring return, 12 volt DC.

Nathan Cutsforth the Norgren Express Sales Representative 720-283-5549 says that V61R517AA312JB is the replacement valve $124.30/each

New style valve had to mounted slightly different than original valve because it was physically longer than original.Air from front air tank is plumbed to the two valves mounted on the back outside of the step.Air pressure is reduced with a small adjustable regulator. One for each valve. An air pressure gauge shows set PSI.Our regulator's adjustment would not turn because regulator adjustment shaft had corroded, so I left it at the set pressure.

Valve has four ports:

1. input from regulated air supply.
2. output with a filtered adjustable air flow screwed on.
3. connected to one end of air cylinder.
4. connected to the other end of air cylinder.

Valve has two positions:

- A) solenoid is energized with 12 volts.Air flows from port #1 (air supply) TO port #3 (cylinder end). Air flows

from port #4 (other end of cylinder) TO port #2 (slowly dump air to atmosphere).Close step cover / raise step.

- B) solenoid is returned to relaxed position by an internal spring when 12 volts is turned off.Air flows from port #1 (air supply) TO port #4 (other end of cylinder).Air flows from port #3 (cylinder end) TO port #2 (slowly dump air to atmosphere).Open step cover / lower step.

To prevent the step cover slamming open or slamming closed, a screwed-in adjustable exhaust port is partly closed down to restrict how fast air can leave the cylinder.This restriction in effect, controls how fast new air can come into the other end of the cylinder and how fast cylinder can move from open to close or close to open.This exhaust port can be removed from valve and cleaned. It has a brass filter to keep debris from entering the valve.When ever the coach has air pressure, the step or step slide is continuously being held open or closed by air pressure, so we cannot manually move them.

This is true if ignition is on or off.When all system air pressure is depleted, the step and step slide can be manually opened or closed.Our step slide has one air cylinder. Step has two air cylinders working together.Hope this paints a picture for the mind on how these things work.

by Barry and Cindy

Additional discussion on the pneumatic step cover:

Step air control valves - how they work
2002 Step hardware question
GV Entry Step Actuating Cylinder