

How to Build a Pneumatic Potato Cannon and Pistol

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Introduction to Building Pneumatic Potato Launchers

This manual will help you build two types of pneumatic potato launchers. The two launchers are very similar in design, but differ in size. The potato cannon boasts a 4-foot barrel, while the pistol's barrel measures 16 inches. Both launchers will utilize a PVC-dominant design, including a PVC air tank used to hold air fed by an air compressor. The barrel of the launcher sits on the other side of the air tank. To fire, load a potato into the barrel, fill the air tank with air, and open the valve.

Constructing potato guns is a relatively simple and incredibly fun exercise, but only attempt with guidance from someone with experience building and firing similar devices.

The National Firearms Act of 1936 neglects to recognize potato guns as firearms. However, when designing and building potato guns, you must follow certain guidelines to ensure that you build a device that falls outside of the designation "Class 2 Destructive Device" (a live cannon) which must be registered with the Bureau of Alcohol, Tobacco, Firearms, and Explosives.

The following guideline will ensure that you build an appropriate device:

You must construct the potato gun in such a way as to make it incapable of accepting live, cartridge style ammunition, or any ammunition utilizing smokeless propellants.

Follow the previous guideline and the federal government will neglect to recognize your device as destructive. However, you must still abide by local laws concerning the devices, some of which include:

- Potato guns are illegal for persons under the age of 16 in New York to possess.
- In Illinois, Madison, Wisconsin, Glendale, Arizona and Phoenix, Arizona, authorities fail to recognize combustion potato guns as firearms.
- Authorities in Texas recognize combustion potato guns as firearms.
- Authorities in Winter Springs, FL recognize all potato guns as firearms.

As you can see, the local laws regarding potato guns vary throughout the country. It is abundantly important that you know the laws pertaining to potato guns in your area.

Materials Needed for Building Pneumatic Potato Launchers

Materials Needed for Potato Cannon

- 13' X 2.5" PVC SCH40 Pipe
- 2.5" PVC Elbow x2
- 2.5" PVC Valve
- 2.5" PVC Cap x2
- 2.5" PVC T-Joint
- Schrader Valve
- Pressure Gauge
- PVC Primer and Cement
- PVC Cutting Tool
- Wrench
- Sandpaper
- Flat File

SCH 40 PVC Pipe



PVC 90° Elbow

Materials Needed for Potato Pistol

- 1' X 4" PVC SCH40 Pipe
- 4" PVC Cap
- 4" to 2" PVC Reducer
- 10" X 2" PVC SCH40 Pipe
- 2' X 2.5" PVC SCH40 Pipe
- 2" to 2.5" PVC Reducer
- 2" PVC Elbow x2
- 2" PVC Valve
- Schrader Valve
- Pressure Gauge
- PVC Primer and Cement
- PVC Cutting Tool
- Wrench
- Sandpaper
- Flat File

PVC Cap



Schrader Valve

Steel Hose Clamp



Preparation for Building Pneumatic Potato Launchers

Preparation for Potato Cannon

PVC Plastic pipe sizing

- Cut the 2" Diameter PVC piping to a length of 4'.
- Cut the 4" PVC piping to a length of 1 ½'.
- Cut two .5' sections out of the remaining PVC pipe.
- File off the sharp corners on the inside and outside of the pipe. Break the outside corner to ensure proper solvent welding and to prevent leak paths from forming.
- Drill a small hole equal to the circumference of the Schrader valve on one end of the 4" PVC pipe.
- On one end of the 1 ½" chamfer the inside .020" and file down the outside to meet the inner chamfer.

PVC Fittings

- Check the fittings for any bad weld lines or discolorations.
- After you inspect the fittings, remove all paper tags or labels and use a thin layer of primer to remove any adhesive residue. File down any spurs that might be present on the fittings.
- File off the sharp corners on the inside and outside of the pipe. Break the outside corner to ensure proper solvent welding and to prevent leak paths from forming.

Important information

- Ensure that cut ends are as square as possible so that the pieces will fit together properly.
- File down any sharp edges on the cut piping to prevent any buildup of potato scud.
- Double-check PVC for cracks before gluing.
- Any discolorations or bad weld lines might indicate weak spots and could cause the potato gun to work improperly.



Preparation for Potato Pistol

PVC Plastic pipe sizing

- Cut the 2 ½" PVC pipe to a length of 16"
- Cut a .40" slice off the 1" coupler, making a ring. This will serve as the reinforcing ring inside the pressure chamber.
- Cut two pieces of 1" PVC pipe; make the first cut at 1 ¾" and the second cut at 1 ½".
- Cut the 1.25" PVC pipe to a length of 2.5".
- Cut the 4" diameter PVC pipe to a length of 8".
- File off sharp edges on the outside and inside of the PVC piping.

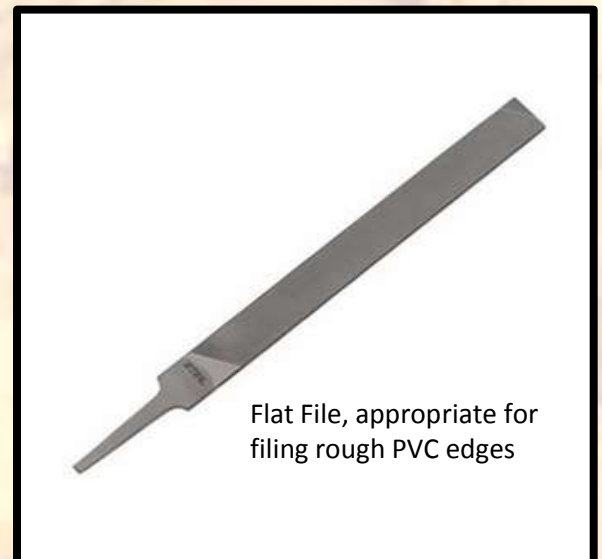


PVC Fittings

- Check the fittings for any bad weld lines or discolorations.
- Remove any tags or labels and use a thin layer of primer to remove any adhesive residue.

Important information

- As with the larger potato gun, ensure the cuts for the potato pistol are as square as possible.
- File down any sharp edges on the cut piping to prevent any buildup of potato scud.
- Double-check PVC for cracks before gluing.
- Make sure that you do not crack or fracture the PVC piping when you are cutting it.
- Be sure to inspect the PVC piping for any discoloration or bad welds.



Instructions for Building Pneumatic Potato Launchers

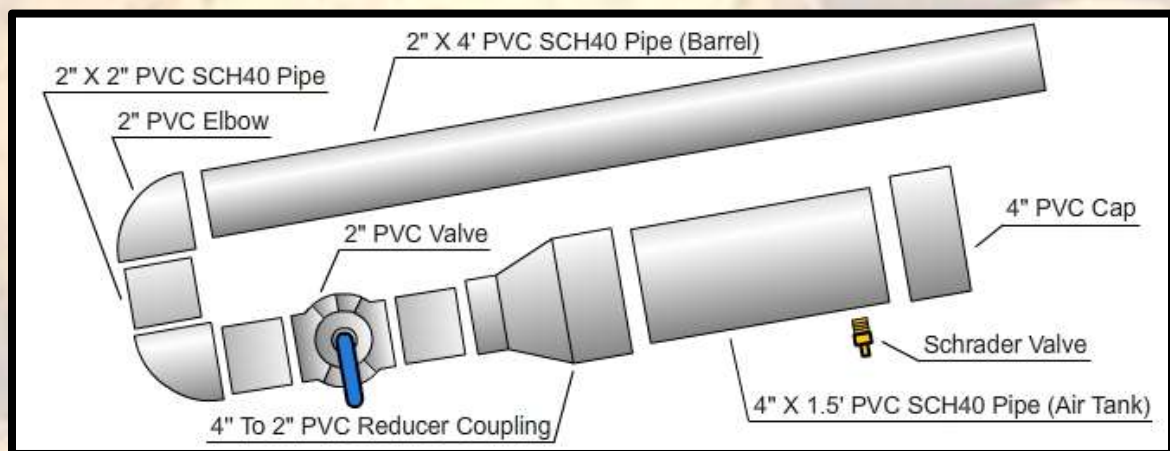
Instructions for Potato Cannon

Constructing the barrel of the cannon

1. Retrieve your 4' length of 2" PVC pipe.
2. Sand and clean the outside of one end of your barrel and inside of both ends of the valve piece with your sandpaper.
3. Apply the plumbers' glue to the rough portions of the PVC that you sanded.
4. Let the barrel sit while the glue dries.

Constructing the receiver of the cannon

1. Cut your remaining PVC pipe into three 1.5' sections and two .5' sections.
2. Drill a hole for your Schrader valve into one the end of one of your PVC caps. Insert the Schrader valve as to make sure to use the plumbers' glue to prevent any leaks.
3. Sand and clean the outside of the ends of the PVC sections.
4. Sand and clean inside of the PVC caps.
5. Glue a PVC cap to one end of each 1.5' section of PVC pipe.
6. Sand and clean the inside of the PVC elbows.
7. Glue the elbows to the end opposite of the cap of the 1.5' section of PVC, let dry.
8. Sand and clean the inside of the T-joint and glue the two 1.5'-elbowed sections to the top of the T-joint. Angle the bottom of the T-joint such that it makes a 45° angle with the two 1.5' sections. Let dry.
9. Glue the remaining 1.5' PVC section to the top of the T-joint and the bottom of the valve piece, let dry.
10. Drill a hole into an elbow and insert the pressure gauge. Make sure there are no air leaks.



Instructions for Potato Pistol

Constructing the air tank

1. Cut an 8" section out of your 4" PVC pipe. Clean and sand both ends of this section.
2. Clean and sand the inside of the 4" PVC cap, and the inside of the 2" to 4" reducer.
3. Glue the cap to one end and glue the reducer to the opposite end of the PVC pipe.
4. Clean and sand one the 2" piece sections of 2" PVC and glue it to the reducer and the PVC valve.
5. Drill a hole for the Schrader valve in the cap. Insert it securely and make sure there are no air leaks.
6. Drill a hole for the pressure gauge in the PVC pipe. Insert it securely and make sure there are no air leaks.

Constructing the barrel

1. Cut a 15" section out of the 2.5" PVC pipe. Clean and sand one end of this section.
2. Clean and sand the inside 2" to 2.5" reducer and glue it to the end of the 15" section.
3. Sand and clean a 2" section of the 2" PVC pipe and glue it to the short end of the reducer.
4. Sand and clean the inside of a 2" elbow and glue one to this 2" section.
5. Sand and clean a 2" section of 2" PVC and glue it to the other end of the elbow.
6. Sand and clean the inside of a 2" PVC elbow. Glue this elbow to the 2" section of PVC.
7. Sand and clean a 2" section of 2" PVC. Glue this piece to the elbow and into the valve.

How to Properly Glue PVC

1. Square pipe ends and remove all burrs and dirt.
2. Check fit of pipe and fitting without glue. Pipe should easily go 1/3 of the way into the fitting.
3. Use a suitable applicator at least 1/2 the size of the diameter. For larger size pipe systems, use a natural bristle brush or roller.
4. Clean pipe and fitting with a listed primer
5. Apply a liberal amount of cement to the pipe to the depth of the socket. Leave no uncoated surface.
6. Apply a thin coat of cement to the inside of the fitting. Apply a second coat of cement to the pipe.
7. Assemble parts quickly. Cement must be fluid. If cement surface has dried, recoat both parts.
8. Push pipe fully into fitting using a 1/4 turning motion until pipe bottoms.
9. Hold pipe and fitting together for 30 seconds to prevent pipe push-out. Wipe off excess.
10. Allow 15 minutes for good handling strength
11. Allow 2 hours of cure time at temperatures above 60°F before pressure testing to 180 psi. The seal may require longer cure times if the temperature is below 60°F.



Clean-up

- Discard any trash in a trash receptacle.
- Collect the PVC dust in a dust pan and discard in a trash receptacle.
- Recycle or store the remaining PVC piping.
- Clean the tools and put them away in their proper storage place.
- Wash hands. Ensure you wash all primer and glue off thoroughly, utilizing a pumice scrub if necessary.

Troubleshooting Guide for Pneumatic Potato Launchers

If your potato gun fails to fire:

Check for a Leaky Air Tank

Fill your tank with air. Monitor pressure gauge for five minutes. If pressure drops significantly in that time, your air tank may have a leak. This is difficult to repair properly. Replace air tank.

Check for a Faulty Air Compressor

If your pressure gauge fails to indicate increasing pressure, first replace the gauge and try again. If the gauge continues to show stagnant pressure, check your compressor. Place the air nozzle 6" from the palm of your hand. If you are unable to fill a steady, strong flow of air, your air compressor is likely faulty.

Ensure Barrel is Loaded Properly

Check your potato. If the potato is not snug in the barrel, too much air may escape during the firing process, disabling a successful launch.

Legal Notices

Special notice for California

Due to the extremely fluid and incredibly complicated legal climate of the state of California relating to firearms, the state may or may not consider producing any type of potato gun a crime. The authors recommend that no resident of California attempt anything stated in this manual.

Release of Liability

The authors in no way condone attempting to assault anything with potatoes. The authors assume no liability for any actions carried out by anyone following these instructions.

References for How to Build a Pneumatic Potato Cannon and Pistol

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