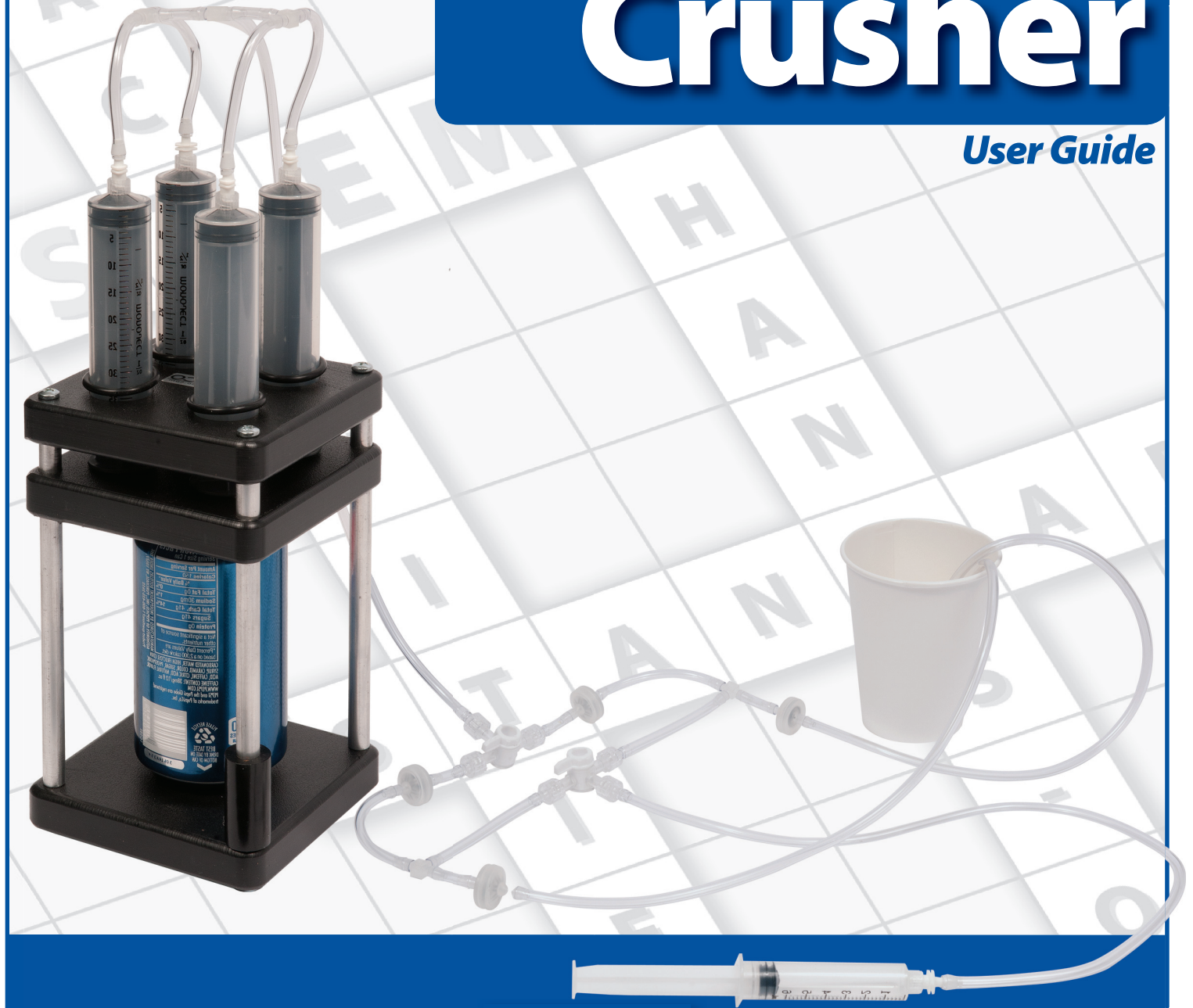


Can Crusher

User Guide



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EDUCATION

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E D U C A T I O N

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Cautionary and Warning Statements

- This kit is designed and intended for educational purposes only.
- Use only under the direct supervision of an adult who has read and understood the instructions provided in this user guide.
- Read warnings on packaging and in manual carefully.
- Always exercise caution when using sharp tools.

Note to Parent or Teacher

This product may require adult supervision and assistance. Child development and skill level vary greatly, and this activity may require modification or additional assistance to fit the needs of the individual child or the class.

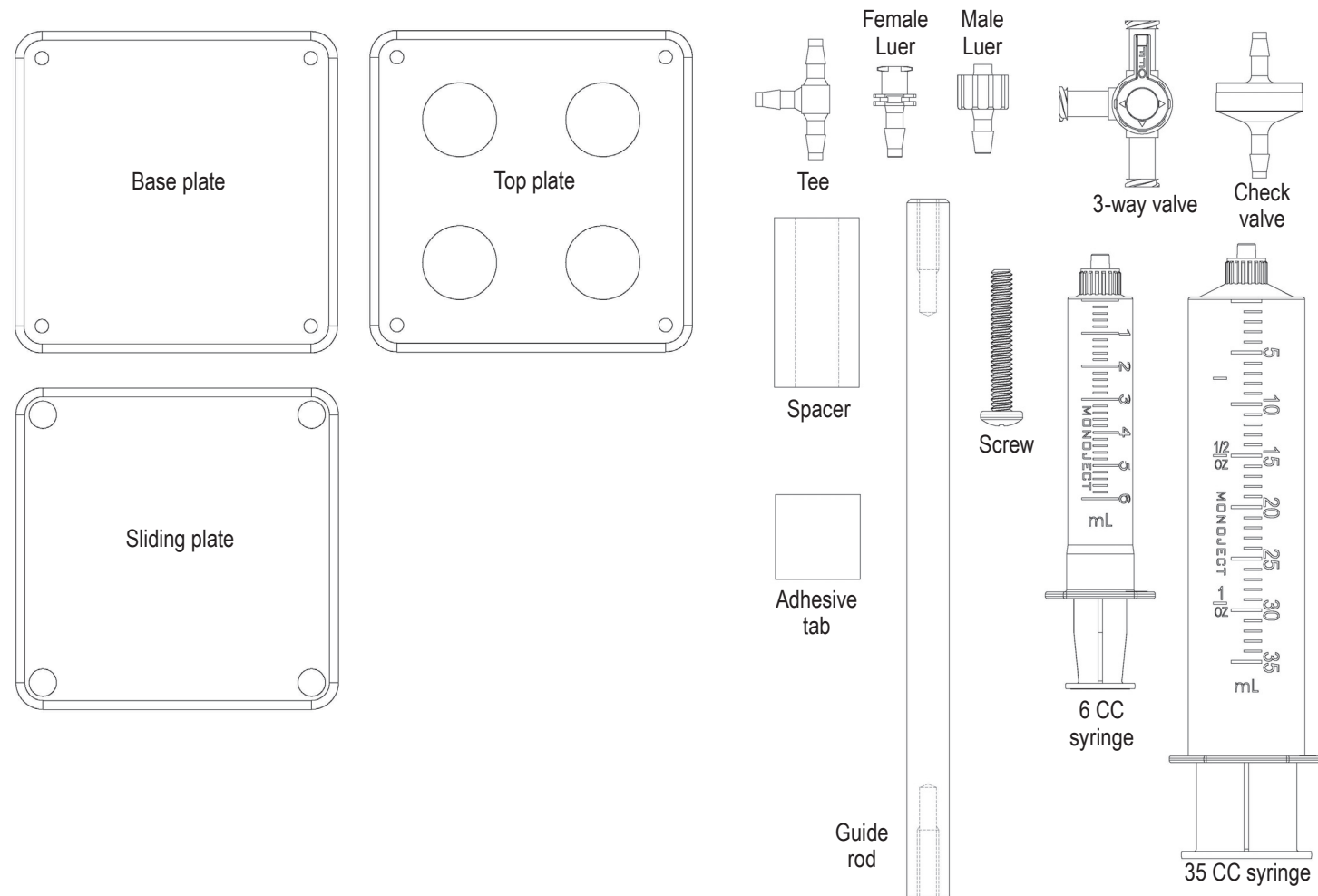
How Hydraulic Pumps Work

A basic hydraulic system is two pistons in fitted cylinders that are connected by a tube filled with a fluid (the fluid is usually oil but we use water in the Can Crusher). The fluid doesn't compress much, so by pushing one cylinder down, the fluid pushes the other cylinder up.

Hydraulic multiplication enables you to multiply the force that you get from a hydraulic system by changing the size of one of the two pistons and cylinders. When a small piston pushes water into a big piston, the small piston pushes farther down than the bigger piston pushes up – so a smaller amount of force applied to the small piston will cause a larger amount of force in the opposite direction on the large piston. In this way, you can create mechanical advantage with the hydraulic pump. For the Can Crusher, this advantage is expressed in the ratio of 14:1.

Materials Included

- 8 screws
- 2 – 1-1/2" spacers
- 5 female Luer fittings
- 6 male Luer fittings
- 4 check valves
- 2 three-way valves
- 3 HDPE plates (top, sliding, and base)
- 4 guide rods
- 5 tees
- 4 double-sided adhesive tabs
- Tubing (not shown below)
- 6 CC syringe
- 4 – 35 CC syringes
- 4 O-rings (not shown below)



Using the Crusher

1. Place the Crusher on a level surface with the cup of water nearby. Place the two loose ends of the tubing into the water.
2. Place the can between the base and sliding plates.

Caution: Be careful when handling crushed cans. Sometimes, they will have sharp metal edges.

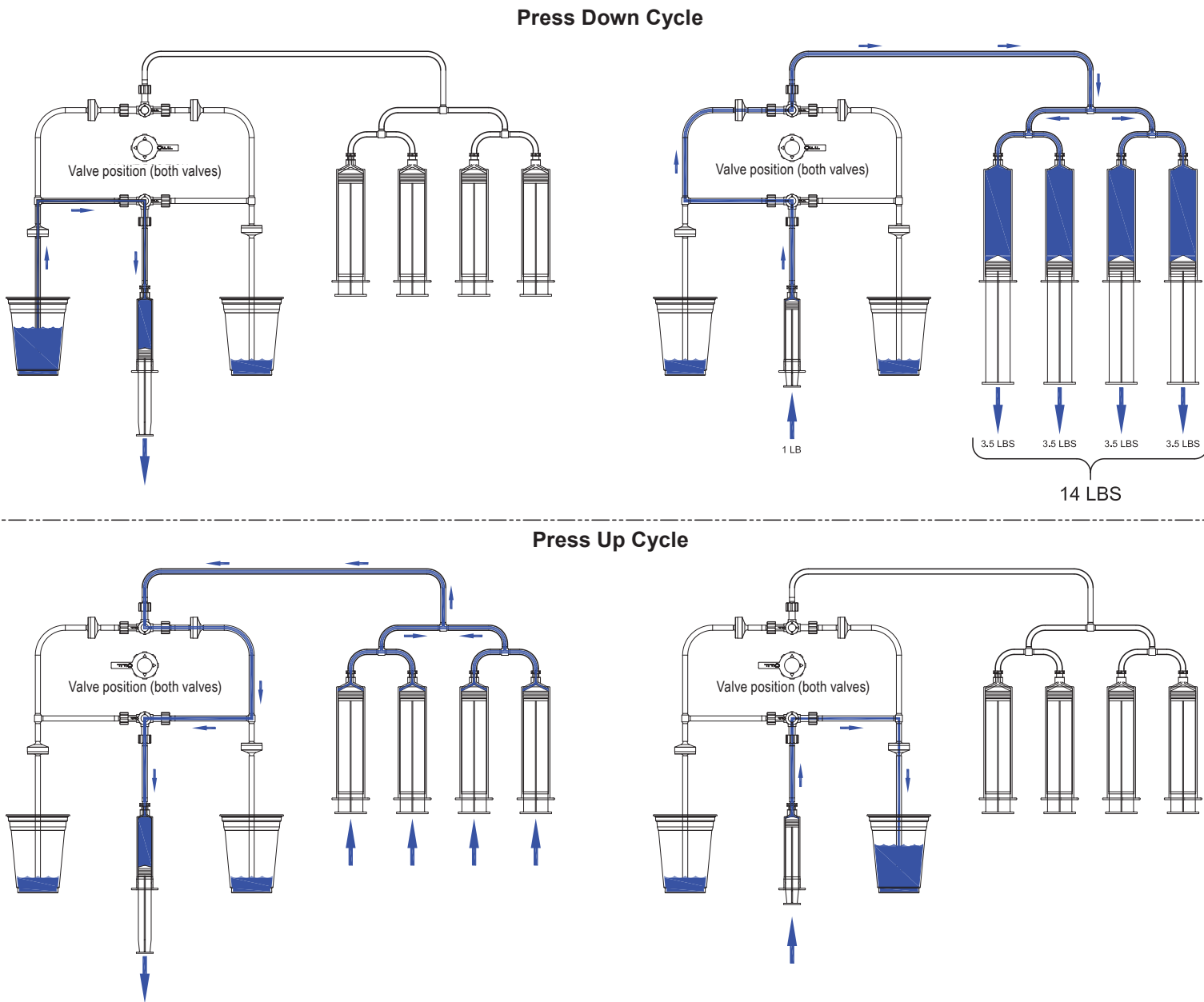
3. With the three-way valves turned to the right, pump the small syringe several times. You should notice that the water is moving into the tubing and through the valves to slowly make the sliding plate move down. Keep pumping the syringe until the can is crushed.
4. When finished crushing, flip the switches of the three-way valves to the left. Pump the small syringe to lift the sliding plate to release the crushed can and so you can place another can in the press.
5. When finished using the Crusher, remove the tubing from the cup of water and pump to remove as much water from the tubing as possible. **Note:** You will not be able to get all of the water out – just get as much out as you can.



Understanding the Water Flow

Before crushing cans, take a few minutes to understand how the pump works. The three-way valves should be switched to the same direction. With the valves positioned to the right, the water will run through the pump so that it pushes down the sliding plate. When the valves are switched to the left, the sliding plate is pulled up when you pump the water using the small syringe.

Look at the graphic below and experiment with the pump. Then, continue to the next page for crushing instructions.



Items Required (not included)

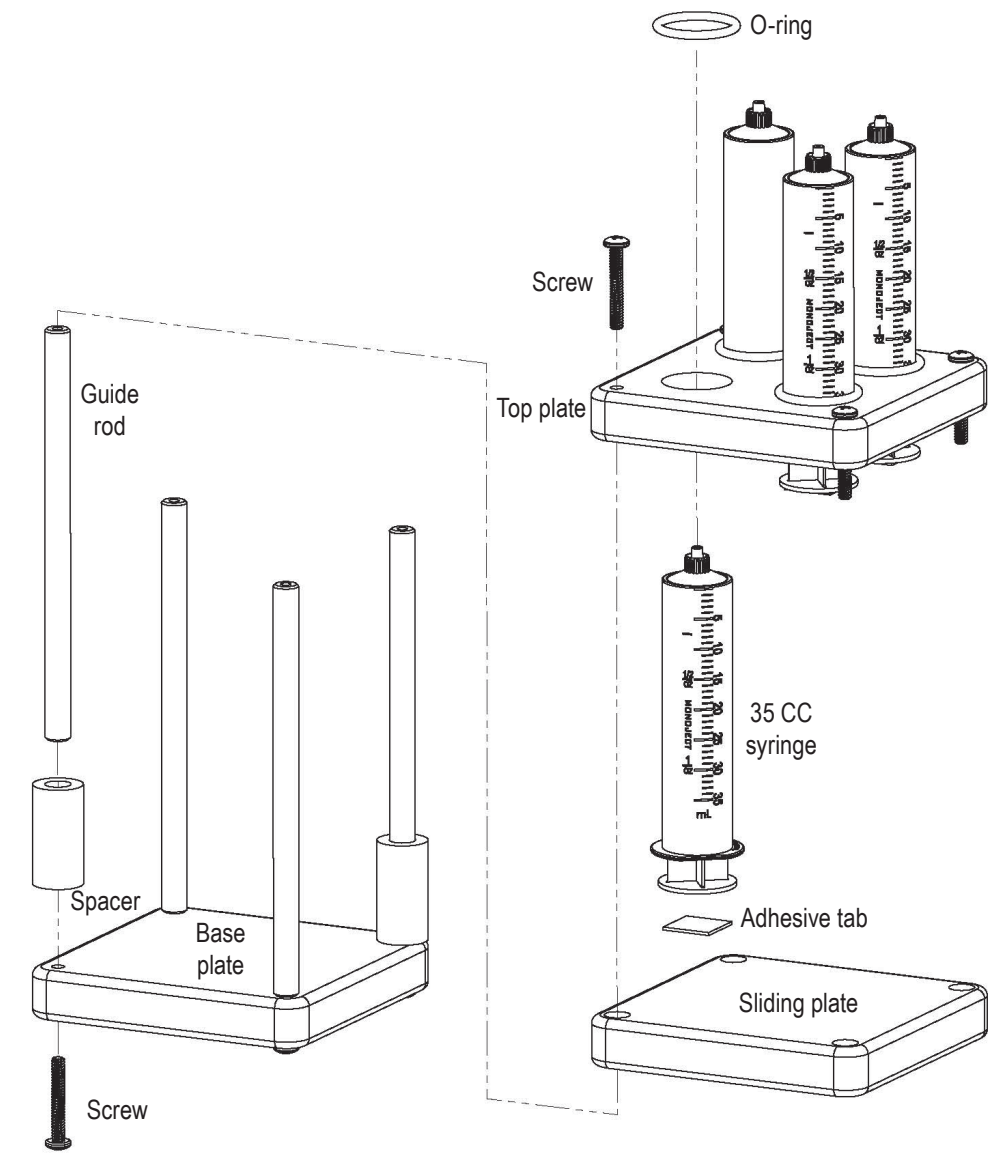
- Ruler
- Scissors
- Phillips screwdriver
- Cup of water
- Standard-size aluminum can(s)

Preparing the Parts

1. Cut the tubing into six 1" pieces, eight 3" pieces, and four 16" pieces.
2. Remove the syringes from their casings.
3. Group the parts and place them on your work surface.

Assembling the Crusher

1. One at a time, push four screws into the base plate holes and thread a guide rod over each screw end. Make sure each rod is tightened.
2. Place the two spacers over two diagonal rods as shown.
3. Place the sliding plate over the rod ends.
4. Mount the four large syringes into the top plate with the Pitsco logo facing up. Slide an O-ring over the pointed end of each syringe. This prevents the syringe from sliding out.
5. Remove the backing from one side of an adhesive tab and press it firmly onto the wide end of a large syringe. Repeat with the other three tabs and large syringes.
6. Remove the backing on the other side of the tabs. Place the top plate tab-side down over the rods. Place the top plate over the rods and use the remaining screws to secure them in place. Push the sliding plate up to securely press the tabs against the plate.



Exploded view of construction

7. Connect the tubing pieces, female Luer fittings, male Luer fittings, check valves, and tees as shown in the illustrations below and on the opposite page. Consider these tips:
- Be sure to put the Luer fittings into the syringe ends so the pointed ends stick out – twist them on so they are just finger snug.
 - Note also that the check valves have an arrow shape, and this indicates the direction of the water flow.
 - Some check valves will require good pressure to attach.

