



Project: V4™ Vacuum Press Assembly Instructions

PROJECT: V4™

VACUUM PRESS SYSTEM

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The Basic Idea

The Project: V4 vacuum press is a very powerful veneering tool that is capable of producing over 1,400 lbs per square foot of pressure at sea level when used at its normal operating capacity. To put this into perspective, a full-size pick-up truck exerts about this much pressure onto the pavement under each tire. Even more impressive is that the vacuum creates this much pressure on every square foot within the vacuum bag. A simple 2' x 4' panel in a vacuum bag has a total of 11,200 lbs of "pressure" spread across the whole project. It's easy to see why vacuum pressing is considered the ideal method to bond wood veneers to substrates such as plywood, MDF, and particle board.

The vacuum inside the bag presses the veneer onto the substrate and compresses the fibers of the materials being glued. As this happens, some of the air inside of the veneer and substrate material is displaced with the adhesive. This gives the adhesive maximum grip or "bite" on the project pieces. A durable bond between a substrate and a wood veneer can be made in just 45 minutes using [Better Bond X-Press](#)™ veneer glue.



How Does the Project: V4™ System Work?

The V4 kit includes many parts but the most important pieces are the vacuum controller, air valve, venturi and check valve. The vacuum controller provides power to the air valve only as often as needed to maintain the correct level of vacuum in the system and bag. The air valve serves as a gateway which controls the flow of compressed air to the venturi - the part that creates vacuum. When the correct level of vacuum is achieved, the vacuum controller cuts power from the air valve and the flow of compressed air is stopped. The check valve prevents the vacuum in the system from escaping through the venturi when the system cycles off.

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Governing Law

The arbitrator shall be agreed upon by the parties. The arbitration shall take place in Harford County, MD in accordance with Maryland law.

Procedure

If the parties cannot agree on a mutually acceptable arbitrator, the arbitration will be conducted through the American Arbitration Association ("AAA") and in accordance with its rules. The AAA's rules are available to view at <https://www.adr.org>. Both parties agree to equally share the administrative expense of the arbitration, unless the arbitrator finds that the claim was brought in bad faith and orders one party to pay the cost of the proceedings as part of the arbitration award. Both parties are responsible for paying the costs of their own counsel, experts, and witnesses. Judgment on the award rendered by the arbitrator may be entered in any court having jurisdiction thereof. Before commencing an arbitration under this Agreement, the aggrieved party will first present the claim or dispute to the opposing party by (certified mail, regular mail). Our notice address to submit claims or disputes is: JWW Services Inc., 217 E. Jarrettsville Rd., STE 5, Forest Hill, MD 21050. If the claim or dispute is not resolved within 90 days, the aggrieved party can commence arbitration proceedings in accordance with this Agreement.

Class Action Waiver

All arbitrations conducted under this Agreement shall be conducted only on an individual (and not a class-wide) basis; and an arbitrator shall have no authority to award class-wide relief. Your use of this document indicates your acceptance that this Agreement specifically prohibits you from commencing arbitration proceedings as a representative of others or joining in any arbitration proceedings brought by any other person.

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Before You Begin

Conserve Paper

Please try to avoid printing out these instructions in their entirety. Save paper by viewing these instructions in your shop with a laptop, tablet, or PC. Viewing this as a PDF file will allow you to zoom in on the assembly pictures.

Time Estimates for Assembly

Assembly time will vary, but it shouldn't take more than two hours. If these instructions appear excessively long, it is only because of the large number of pictures I've included throughout this document. Don't let the length of these instructions prevent you from assembling your kit. The assembly process does not take as long as it appears.



Vacuum Gauge Inspection – IMPORTANT!

The vacuum gauge is a sensitive measuring instrument containing a fragile sensing spring inside. Handle the gauge with care; do not drop it or allow a hard object such as a wrench to collide with the gauge. Open the vacuum gauge packaging now and make sure the gauge needle is resting at the zero position. If not, cut the rubber tip off the top of the gauge with scissors. That will often allow the gauge needle to drop to the zero mark.

Do not attach the gauge to the assembly if the needle is not at zero. Stop and contact us immediately so we can help with this issue. We cannot help resolve this issue once the gauge has been installed on the vacuum press assembly.

Required Tools and Abilities

The Project: V4 system is offered as a kit which requires assembly. A fair amount of dexterity and physical strength will be needed to adequately assemble and tighten each fitting.

The following list of tools and supplies are required to assemble this kit.

- Locking-Jaw Pliers (also known as Vise Grips)
- Needle-Nose Pliers
- Wrenches: 3/8", 1/2", 9/16", 5/8", 11/16", 12mm, 18mm
- Screwdrivers: Cross-Tip and Flat Style
- Electric Drill and 1/8" Drill Bit
- Tape Measure
- Bench Vise
- Scissors
- Electrical Tape
- Sandpaper (150 or 180 grit)
- Synthetic Abrasive Pad (aka "Scotch-Brite" pad)
- Protective Eyewear

Air Tool Oil

Project: V4 owners likely have a bottle of air tool oil on hand since this kit is used with an air compressor. If you do not have this lubricant, be sure to pick up a bottle at your local hardware store. A drop or two of oil should be added to the pressure port of the air valve before each use.

PVC Cement

A small can of PVC cement is required to complete the assembly of the vacuum reservoirs. Shipping a flammable item is a challenge so the PVC cement is not included with the Project: V4 kit. Most hardware stores offer this cement in a convenient 4 oz. size. Do not purchase CPVC cement; only PVC cement will work on the pipe and caps that are included with this kit.



PVC primer can be applied before cementing, but it is not absolutely necessary. Countless vacuum press reservoirs have been built without primer and are completely free of leaks.

How to Apply Thread Sealing Tape

All metal-to-metal connections must have tape applied to the male threads. Hold the fitting in your right hand and then apply the end of the tape to the threaded portion of the fitting and rotate the fitting clockwise. Rotate the fitting in the same direction as if it were being inserted into another fitting. No more than three layers of tape should be applied.



Tightening Instructions

Throughout these pages, you will find three terms used to describe the amount of effort that must be applied when assembling any two parts.

"Hand-Tighten" - Tighten by hand as far as possible. Do not use tools to further tighten.

"Firmly" - Use tools as required to tighten the fittings with firm but not aggressive force.

"Aggressively" - Use tools to tighten the fittings using as much force as reasonably possible.

Premium versus Non-Premium Kits – VALUABLE INFORMATION HERE!

It is important to know which version of the kit you have. There are a few differences between the non-Premium and Premium versions of the Project: V4 kit so there are some assembly steps and parts specific to the Premium version. The non-Premium kits contain a smaller venturi unit marked with "Mini", "Basic" or "Plus" on the side. The Premium venturi units are marked with "Premium 5" or "Premium 9".

Warnings

Brass Parts Warning

Proposition 65 Warning (Assembly Bill 1953) To California and Applicable States
Brass fittings and other products may contain chemicals known to the state of California to cause cancer, birth defects or other reproductive toxicity. Brass fittings may contain lead and are not for use with potable water. This warning is provided to comply with California's Proposition 65 (Assembly Bill 1953) product labeling law and may apply to other states. Visit www.p65warnings.ca.gov for details.



As with any product of this nature, you should wash your hands after contact with brass parts. We provide this warning based on our knowledge concerning the possible presence of one or more such chemicals, without attempting to evaluate the level of exposure.

Not Suitable for Use Near Flammable or Combustible Materials

The individual components of this kit and the completed assembly of these components should not be considered suitable for use in areas where flammable or combustible gases or dusts are present.



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Parts List

The Project: V4 kit comes with more than 60 parts. The list below will help identify the item for each section of the assembly instructions. If you have printed these instructions, you may find it helpful to separate the parts list from the other pages and keep it nearby as a reference.

Brass Parts



Vacuum Parts



Electrical and Miscellaneous Parts



12v DC
Adapter



DC Jack
w/ Wires



12v Press-Fit
Rocker Switch



Blue Electrical
Box



Electric Box
Cover & Screws



Bungee Cord
12"



Thread-Sealing
Tape



Handle with
4 screws



#8 x 1-3/4"
Screws (8)



#6 x 1/2"
Screws (4)



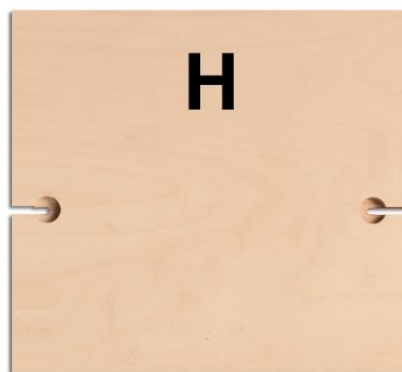
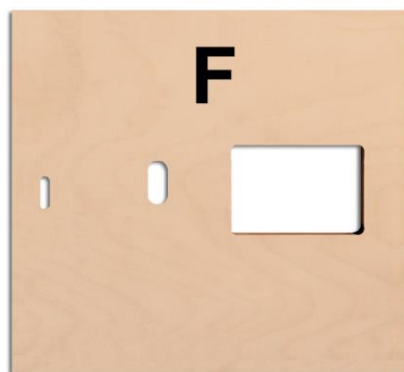
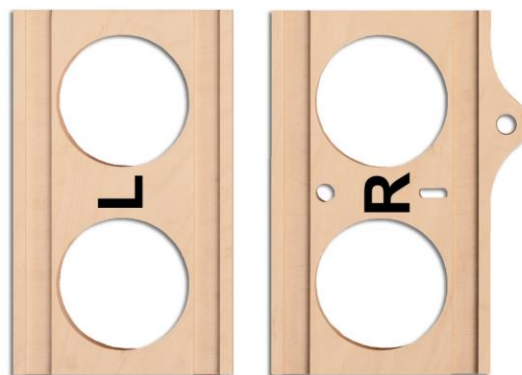
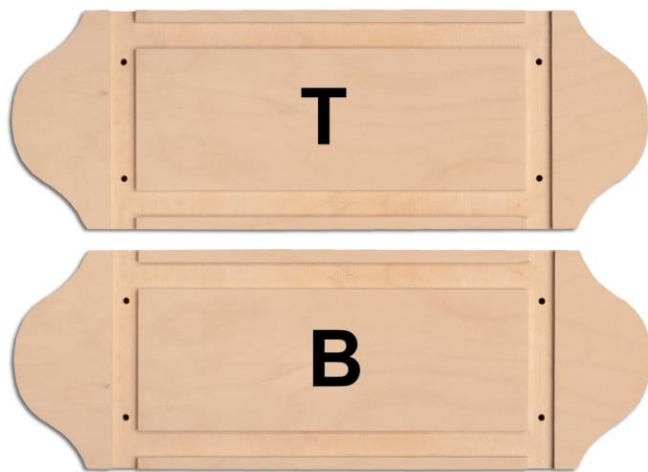
#10 x 1-3/4"
Screws (2 or 4*)



Plastic Spacers
(2 or 4*)

* For Project: V4 Premium kits only

Vacuum Press Carrier Parts



T - Top
B - Bottom
F - Front

L - Left
R - Right
H - Hind

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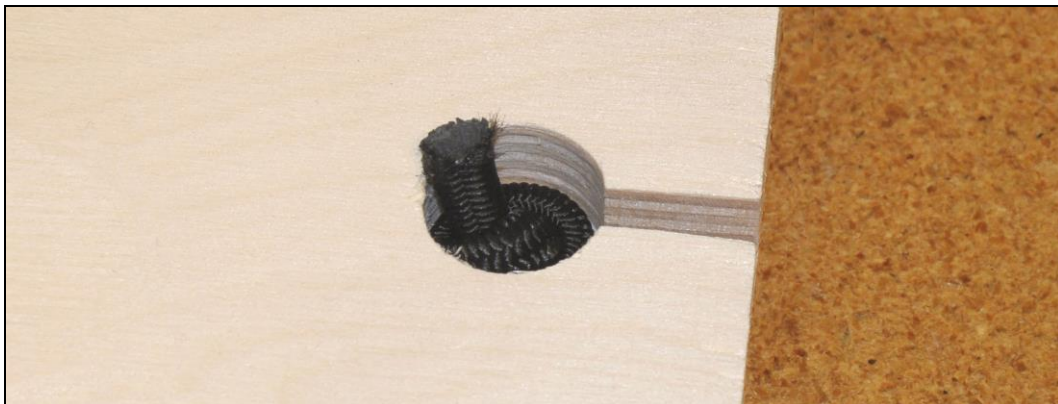
Part A: Partial Carrier Assembly

The carrier keeps the whole system together in one simple and portable package. Unlike the Project: V2 kit, I include the carrier parts in the V4 kit for your convenience. The carrier material is a high-grade birch plywood which can be painted, stained, or left unfinished.

Assembly Time: 9 to 12 minutes

Required Parts: #8 x 1-3/4" Flat Head Screws (x4) Bungee Cord (12")
Metal Handle (with 4 mounting screws)
Carrier Sections "B", "L", "R", and "F"

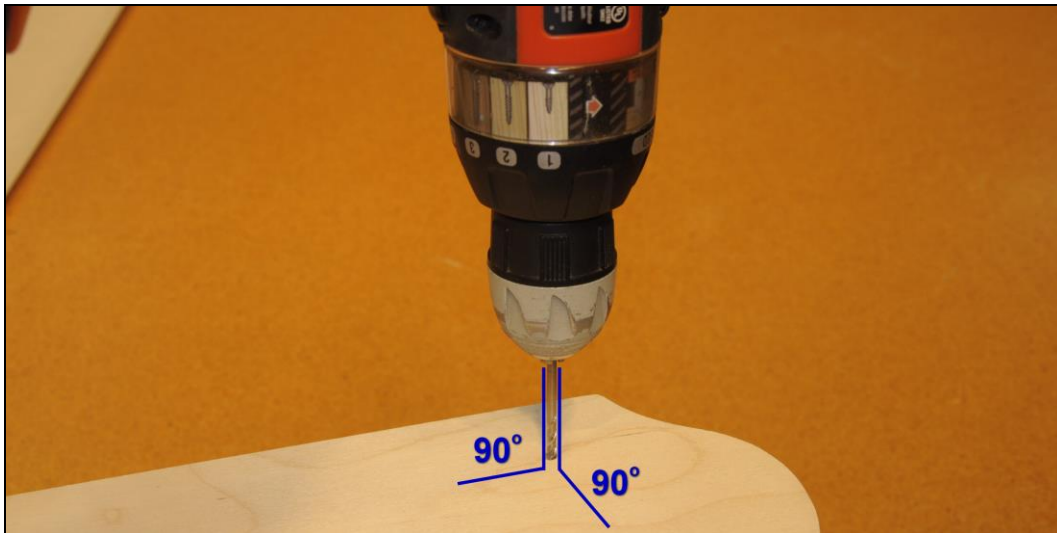
1. The carrier parts will need light sanding. Use 150 to 180 grit sandpaper to smooth any rough spots and ease any sharp or loose edges.
2. A piece of bungee cord is included with the V4 kit. Tie both ends in a simple knot leaving 7 to 8" of space in between.
3. Trim the ends of the bungee cord with scissors and then attach the bungee cord to the outside of the carrier panel (marked with a "H") by sliding the knotted ends around the slotted holes and setting the knots inside the recesses as shown below.



4. Assemble the carrier bottom "B" and sides "L" and "R" as shown below.

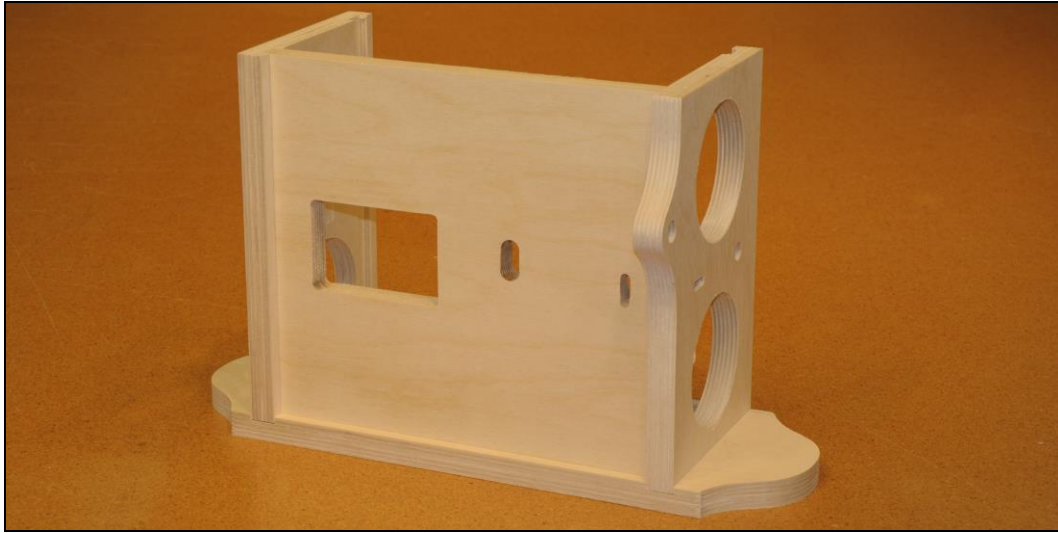


5. Screws will be used to attach the "B" panel to the "L" and "R" panels, but pilot holes have to be drilled first. Turn the carrier assembly over so that the "B" part is on top. Make sure the sides of the two side panels are flush at the edge with the bottom panel.
6. Drill pilot holes in the "L" and "R" panels for the attachment screws using a 1/8" drill bit. The pilot holes should be at least 1-1/2" deep. Use the pre-drilled holes on the "B" part as a guide. Drill straight into the carrier at 90 degrees.

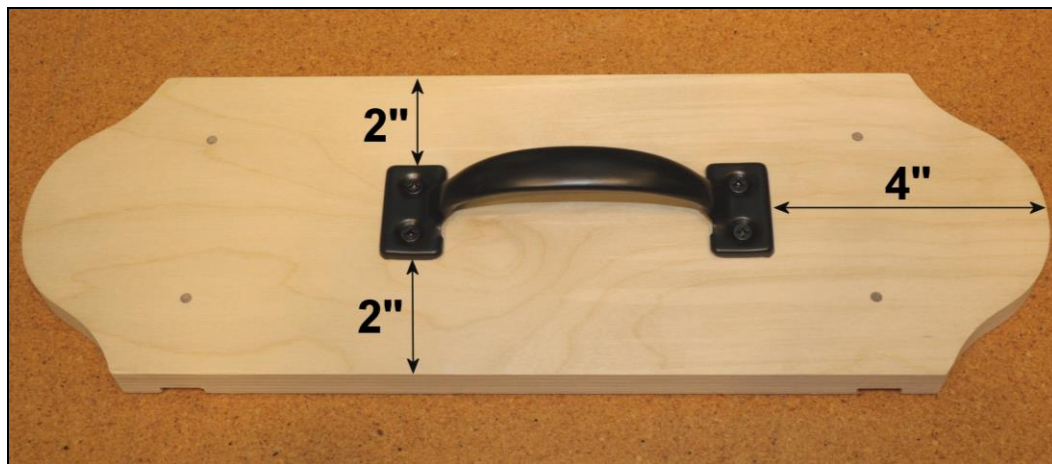


7. Attach the bottom panel to the "L" and "R" sides using four of the #8 x 1-3/4" flat-head screws provided with the kit. The screws will countersink into the plywood if you press hard enough on them as they are driven in.

8. Slide the front "F" panel into the assembly so that it rests inside the channels cut into the "L", "R", and "B" panels. The "F" marking on the panel should be at the top and on the inside. Note that the "F" and "H" panels intentionally fit loose in the carrier slots.



9. Do not attach the "H" or "T" sections to the carrier assembly yet.
10. Find the metal handle and four small black screws that are included with your kit. Set the handle on the top carrier panel as shown below and mark the hole locations with a pencil. Drill pilot holes for the mounting screws using a 1/8" drill bit. You will notice that the handle is off-center from left to right. The handle is positioned this way to better balance the system when being carried.
11. Attach the handle to the carrier using a cross-tip screwdriver. Be aware that the handle screws are longer than needed and will protrude from the bottom of the carrier part.



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Part B: Air Valve and Venturi Assembly

The air valve is the gateway that opens and closes to allow compressed air to the venturi unit. We're going to start off with an easy bit of assembly work on the heart of the system but please pay close attention to the assembly information and picture below.

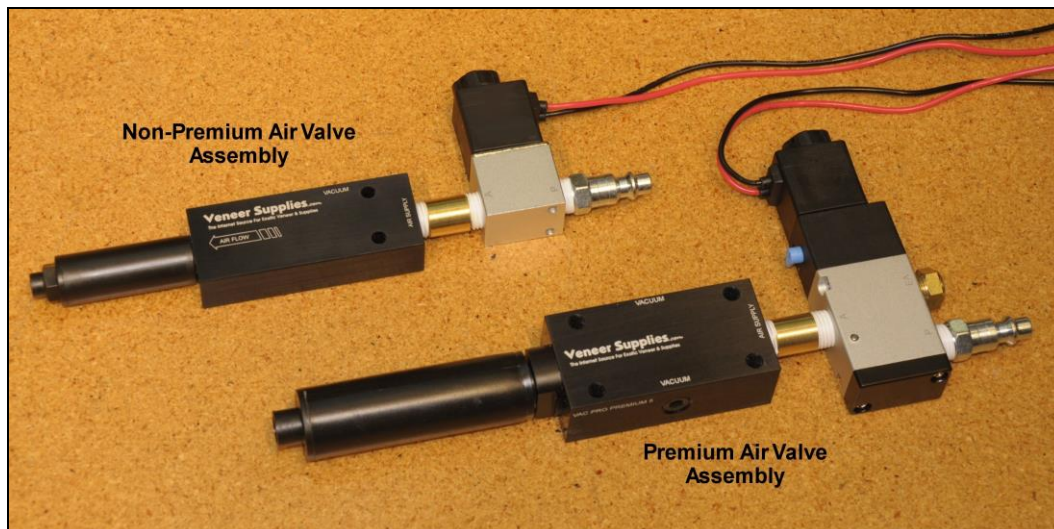
Assembly Time: 6 to 8 minutes

Required Parts:	Compressed Air Fitting*	Air Valve
	Breather Fitting (for Premium kits only)	1-1/2" Brass Pipe

1. Apply thread sealing tape to the compressed air fitting and both sides of the brass pipe. Remember that all metal-to-metal threaded connections require thread sealing tape.
2. **Give careful attention to this step. Proper direction of the air valve is critical.**
The ports on the air valve may not be clearly marked so it is important to look carefully at the picture below. On the non-Premium version, the silver compressed air fitting is attached to the side of the air valve with the power wires. The Premium version shows the compressed air fitting attached on the side opposite the wires.

Clamp the metal body of the air valve into a bench vise and use a 9/16" wrench to aggressively tighten this fitting. "Industrial Interchange" the common name for this class of air connection fittings. The mating fitting for your compressed air line can be found at most hardware stores.

3. If you have a Premium version of the V4 kit, install the breather fitting to the "EA" port and firmly tighten it with a 9/16" wrench. Not sure which kit version you have? See page 5 of these instructions.
4. Loosely attach the 1-1/2" brass pipe to the "A" port on the air valve.
5. Attach the air valve assembly to the air supply port on the venturi. Hand-tighten assembly and stop turning when the venturi and the air valve are aligned as shown in the next picture. Do not aggressively tighten these parts.



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Part C: Manifold Assembly

The manifold assembly is the core of the system. It distributes vacuum to all of the critical system areas for measuring, monitoring, and storage. Each part below must be assembled correctly and 100% airtight. This section is a bit of a "knuckle buster" if you are not careful so take your time and work safely within your abilities. I'll try to make this as easy as possible.

Assembly Time: 25 to 30 minutes

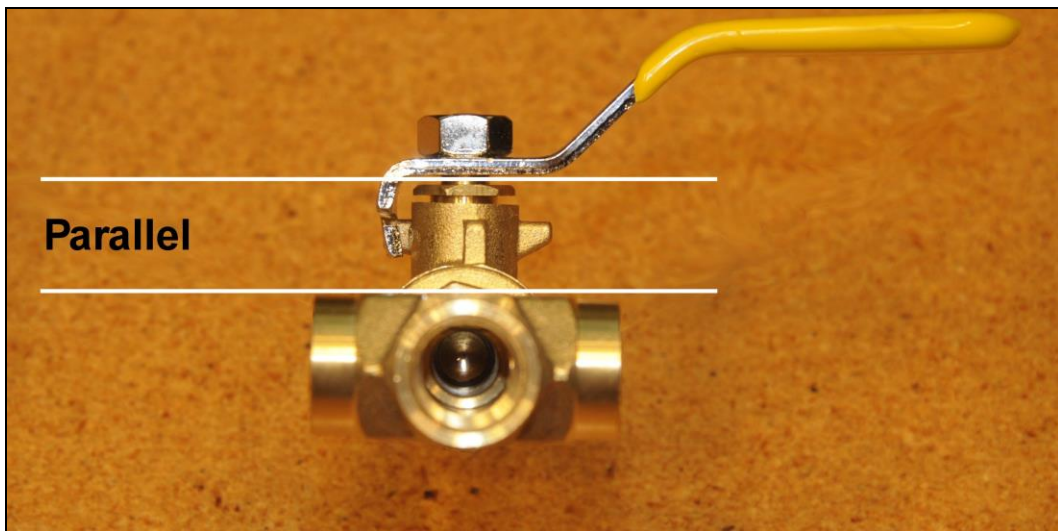
Required Parts:	Vacuum Gauge	Vacuum Valve
	2" Brass Pipe	Check Valve
	3" Brass Pipe	Venturi
	Brass Barb Elbow	Brass Cross
	Brass Adapter Fitting (for Premium 5 and 9 kits only)	

1. Apply thread sealing tape to the male threads of each brass part used in this section. Also apply thread sealing tape to the threads on the vacuum gauge.
2. Attach the 2" brass pipe to the vacuum valve. This part is a bit tricky because the brass pipe doesn't have a hex shape that can be held with a wrench. Use "vise grip" pliers to clamp down on the smooth area of the pipe. You will want the pliers to have a good grip but not so tight that the fitting deforms. Use an 18mm wrench on the vacuum valve and aggressively tighten the brass pipe to the vacuum valve.



3. Use 150 grit sandpaper to remove any rough areas left by the pliers. Exercise caution to avoid getting a brass splinter caught in your finger. The sanding process will scratch the brass pipe but the scratches will be hidden once the assembly is set onto the carrier.

4. Clamp the brass cross fitting into a bench vise and use an 18mm wrench to firmly attach the vacuum valve. After the assembly is firmly tightened, continue tightening until the vacuum valve handle and brass cross are aligned as shown in the pictures below.



5. If the vacuum gauge is not reading zero, use scissors to cut off the tip of the rubber cap found on the top of the vacuum gauge. If the gauge does not then reset to zero, do not attach it to the brass cross. Please contact us immediately and do not continue with these instructions until we have replied.

Provided that your vacuum gauge is reading zero, attach the gauge to the brass cross as shown below. Do not tighten the gauge by applying pressure to the stainless-steel body of the gauge. Use a 9/16" wrench on the brass base of the vacuum gauge and an 11/16" wrench on the brass cross to aggressively tighten these parts. You might find it easier to clamp the brass cross at an angle in a bench vise instead of using the 11/16" wrench.

Make sure the gauge is aggressively tightened but stop turning when the gauge is aligned with the brass cross as shown in the picture below.



6. Attach the brass barb elbow to the brass cross on the port directly across from the vacuum valve. Aggressively tighten the fitting and stop turning when the fitting is aligned as shown in the picture below. Tip: You might find it easier to clamp the brass barb elbow fitting into a bench vise and use an 11/16" wrench to turn the brass cross for tightening.

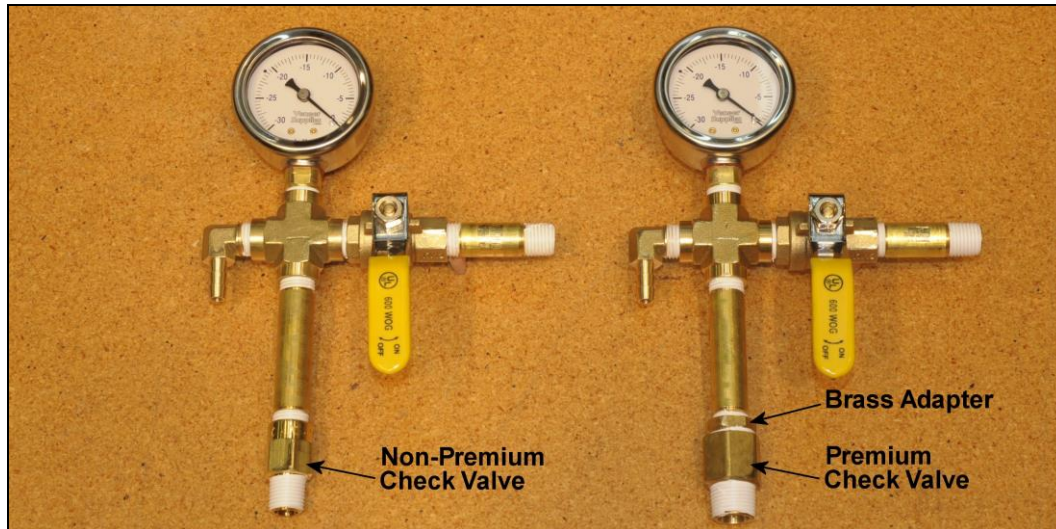


7. Loosely attach the 3" brass pipe to the remaining port in the brass cross.
8. If you have a non-Premium version of the V4 kit, attach the check valve to the end of the 3" brass pipe.

If you have a Premium version of the V4 kit, loosely attach the brass 1/4" NPT to 3/8" NPT adapter fitting to the end of the 3" brass pipe. Then attach the check valve to the adapter fitting.



9. Clamp the check valve into a bench vise and then use an 11/16" wrench on the body of the brass cross to aggressively tighten the brass fittings between the cross and the check valve. This step will tighten the brass cross, brass pipe, and check valve.



10. Attach the check valve on the manifold assembly to the vacuum port on the venturi. This should be slightly more than hand-tight. Do not aggressively tighten these parts. Stop turning when the venturi and the air valve are aligned as shown in the picture below.



11. Hold the assembly so that you can look down the back of the venturi and see the vacuum gauge. Be sure that the venturi, vacuum gauge, and brass cross parts are each parallel as shown in the picture below. Make adjustments as needed to get this right. This assembly will not fit the carrier properly if the alignment is incorrect.



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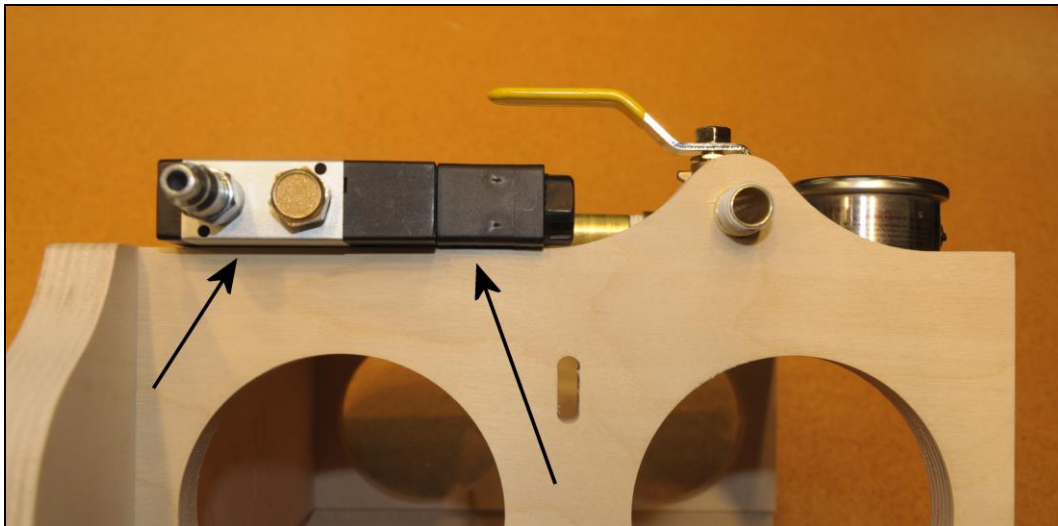
Part D: The Marriage

The strenuous parts of the Project: V4 construction are finished now. Take a breath and keep in mind that the remaining assembly steps will not require nearly as much physical strength. Let's go ahead and get the manifold assembly on the carrier now.

Assembly Time: 6 to 8 minutes

Required Parts: Plastic Spacers (x2 for non-Premium, x4 for Premium)
#10 x 1-3/4" Screws (x2 for non-Premium, x4 for Premium)

1. Attach the completed manifold assembly to the carrier by sliding the brass pipe on the vacuum valve through the protruding hole on the right side of the carrier.
2. Pay attention to how the air valve rests on the carrier. If everything has been assembled correctly and each part was aligned properly, then the air valve will lay flat on the edge of the right side panel as shown in the picture below. If it does not fit well on the carrier, you may need to twist the air valve (holding the venturi steady) to correctly align it.



3. There will be approximately 3/8" of space between the bottom of the venturi and the front panel of the carrier. The venturi should lay parallel to the front panel. If it is not aligned to the front panel you may have to remove it from the carrier and twist the venturi on the manifold to better align it as mentioned in the last step of the previous section.



4. Slide the manifold assembly left or right until the smooth part of the brass pipe is centered under the protruding hole on the "R" panel of the carrier.



5. Use needle nose pliers to place a plastic spacer under each of the holes on the venturi. Then insert the supplied #10 x 1-3/4" screws into the mounting holes on the venturi and through the spacers. Secure the screws to the carrier. No pilot hole is required for these screws.
6. The power wires from the air valve can now be inserted into the carrier. The wires on a non-Premium V4 system should be inserted through the oblong hole on the "R" panel of the carrier. On the Premium version, the wires should be inserted through the small oblong hole on the "F" panel of the carrier.

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Part E: Electrical Connections

The Project: V4 system runs on 12 volts of DC current. This voltage is considered a relatively safe and reliable type of power for many kinds of electrical assemblies. You won't need a background in electrical wiring to get through these steps. I've made this as easy as possible.

Assembly Time: 14 to 18 minutes

Required Parts:	Blue Electrical Box (with four #6 x 1/2" screws)	Vacuum Controller
	Electrical Box Cover Plate (with 2 screws)	DC Jack w/ wires
	Brass Barb Fitting with Female Threads	Rocker Switch

1. Remove the nut and washer from the DC power jack fitting (with wires attached). Handle this part with care. Do not bend the wire tabs on the back of the power jack.
2. Insert the DC jack into the 5/16" diameter hole in the black plastic box cover and reattach the washer and nut on the other side. Use a 3/8" wrench to tighten the nut while holding the back of the fitting with your fingers. Do not use a tool to hold the back side of the DC jack. If a tool is used, the negative-contact arm will bend inward and render the jack useless.
3. Find the rocker switch that is included with the kit and press it through the large hole on the front of the cover plate. This will take a bit of force but the cover plate will not break. Once installed, rotate the switch on the cover plate so that the white dot on the top of the switch is positioned as shown in the picture below.

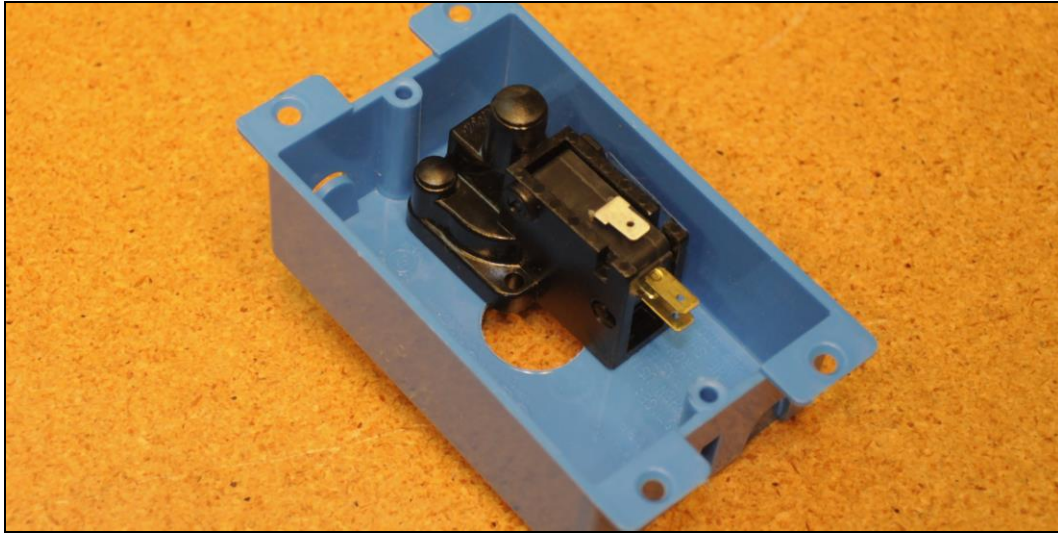


DON'T SKIP THIS STEP

4. Remove the vacuum controller from the factory packaging. Notice that there is a removable plastic cover on the top of the vacuum controller as shown in the picture to the right. This part should be removed and discarded. Also discard the black plastic barb fitting that is included with the vacuum controller.



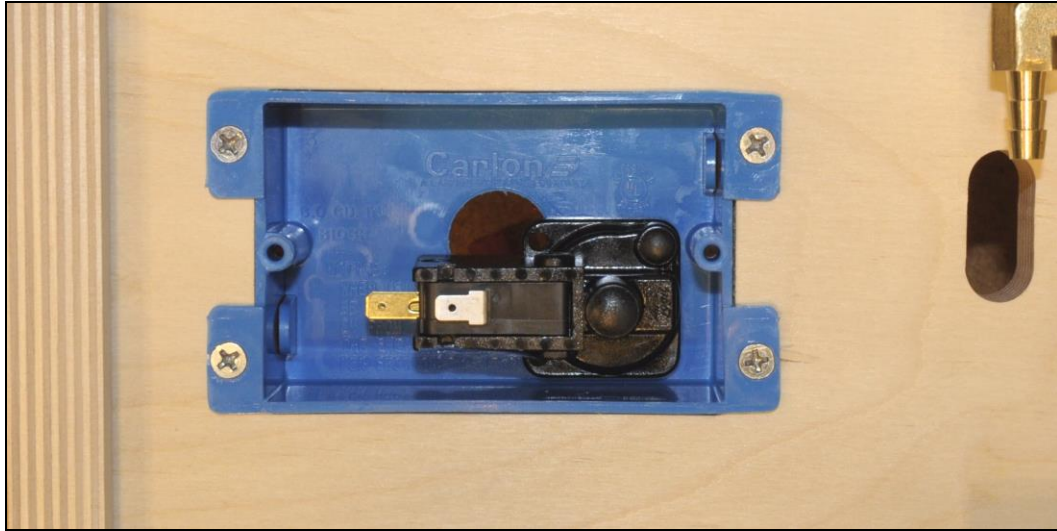
5. Remove the nut and insert the threaded extension on the vacuum controller through the 7/16" hole in the blue electrical box so that the controller is inside the box as shown in the picture below.



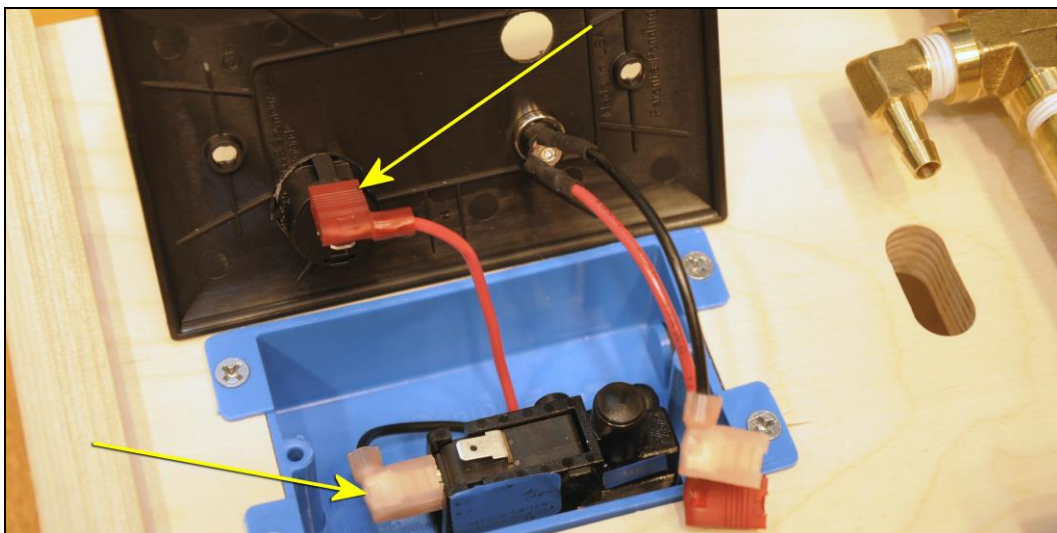
6. Now re-attach the plastic nut and lightly tighten it with a 9/16" wrench. Hand tight plus another 45 degrees of turn is enough. Over-tightening will cause the plastic stem to break off. The nut should be loose enough to still allow the vacuum controller to turn slightly inside the box.
7. Apply thread sealing tape to the threads on the vacuum controller. Use exactly two layers of tape on this part. Do not let the thread sealing tape get into or cover the sensing hole at the top of the threads.
8. Attach the small brass barb fitting to the vacuum controller. Use the *closed end* of a 1/2" wrench to *slowly* tighten the fitting. I can't stress this enough so I will repeat it. Use the closed end of the wrench to slowly tighten the brass fitting. Continue tightening the brass fitting until it is touching the plastic nut. Do not over-tighten this fitting as it will damage the vacuum controller. The maximum amount of torque on this part is just 4 inch-lbs.



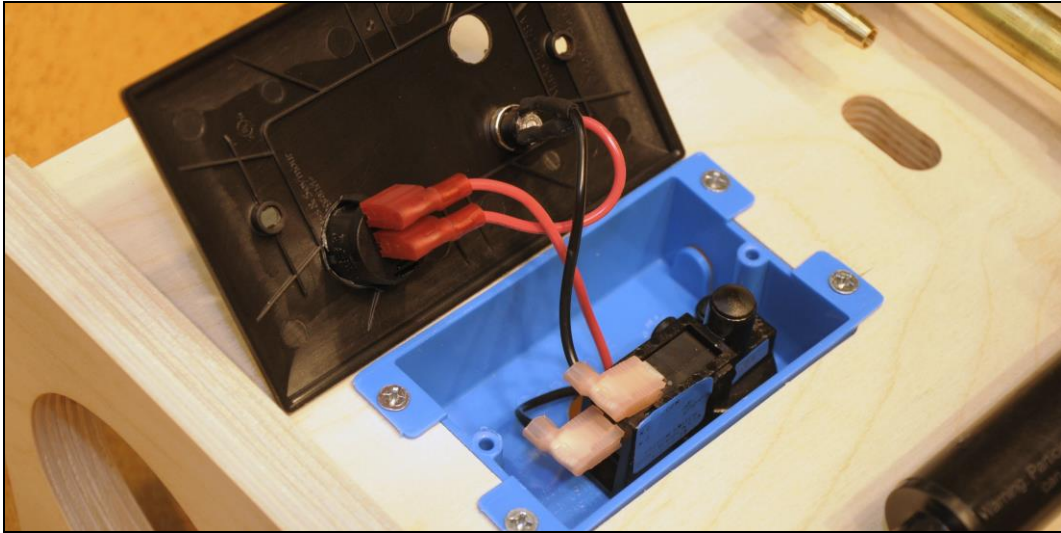
9. Insert the blue box into the front carrier panel so that the vacuum controller is on the right side as shown in the picture below. Secure the blue box to the carrier with four #6 x 1/2" screws. Pre-drilling is not required for these screws.



10. Route the wires from the air valve through the large hole in the bottom of the blue electrical box.
11. Attach the wire from the air valve that has the red connector to either of the terminals on the rocker switch. A bit of force will be required to get it to snap on. Do not pull on the wire as it may break off the connector.
12. Attach the wire from the air valve that has the pink connector to the gold tab closest to the top of the vacuum controller. You may find it helpful to use needle nose pliers to attach the connector but be careful that the tab on the vacuum controller does not bend. Note that the lower gold tab is not used.



13. There are two wires soldered onto the DC jack fitting. Attach the wire with the red connector to the remaining terminal on the rocker switch.
14. Attach the wire with the pink connector to the silver tab on the top of the vacuum controller.



15. Attach the cover plate to the blue box with the two black screws that are included with the V4 kit. Tighten the screws until the black cover plate is fully seated but not so tight that the screws cause the plate to bend inward.

Part F: Testing the Manifold Assembly

Now is the best time to test for vacuum leaks in the manifold assembly so let's get to it. Protective eyewear will be required for some parts of the instructions below. You'll also need an assistant for part of the testing process.

Average Time to Complete: 6 to 8 minutes

1. Set your air compressor to deliver approximately 95 PSI to the air line. Higher pressure does not increase the performance of the venturi unit. Do not exceed 120 PSI.
2. Make sure the rocker switch is in the off position; the white dot should not be depressed.
3. Attach your compressed air line to the quick connector fitting on the air valve. No air should come from the air valve when the connection is made.
4. Insert the round plug end of the DC power cord into the jack on the black cover plate and then attach the other end of the power cord to an appropriate power source.
5. Cut two squares of electrical tape. Place one over the opening on the brass barb elbow fitting on the manifold assembly. Place the other piece of electrical tape over the end of the 2" brass pipe.



6. Close the vacuum valve by turning the handle to the "off" position.
7. You should be wearing suitable protective eye equipment for this testing. Place your thumb or index finger firmly over the electrical tape on the brass barb elbow on the manifold assembly. While maintaining pressure over the fitting, turn on the rocker switch for one second and then turn it off. Air will go through the venturi and it will almost instantly draw a full vacuum which will be indicated on the vacuum gauge as the needle spikes well over the 21" mark. Of course, the noise could startle you and anyone nearby so be prepared.

No Air Flow?

If no air passes through the venturi when you turn the system on, make sure the DC adapter is attached to the DC jack on the electric box cover and the other end to a suitable wall outlet. Still no air flow? Pop the cap off the vacuum controller (see the picture in section L of these instructions) and turn the adjustment screw counter-clockwise three full turns.

8. Keep firm finger pressure on the brass fitting while watching the needle on the vacuum gauge for 20 seconds. The needle on the gauge should not move. Vacuum escaping from the manifold is an indicator that you will need to remove the manifold assembly from the carrier and further tighten each of the brass fittings, and then test it again. Do not continue with the instructions below until the manifold is free of leaks.
9. The next step is to test the brass pipe on the vacuum valve for leaks. The test for this is similar to the testing you just completed, but you will need a helper to lend a hand. You and your helper should be wearing protective eyewear for this testing.
10. Open the vacuum valve, then press and hold your thumb or index finger firmly over the taped area of the barb elbow fitting and then firmly press and hold your other index finger over the 2" brass pipe opening.
11. Now ask your helper to turn on the rocker switch for one second and then turn it off. Once again, air will go through the venturi and it will almost instantly draw a full vacuum which will be indicated on the vacuum gauge as the needle spikes well over the 21" mark. Watch the vacuum gauge needle for movement over a span of 20 seconds. If there is vacuum loss, it is very likely that the brass pipe needs additional tightening to the vacuum valve.
12. If vacuum is maintained, ask your helper give you a pat on the back for a job well-done. Then disconnect the power cord and compressed air line from the system and move on to the next section of instructions.

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VACUUM PRESS SYSTEM

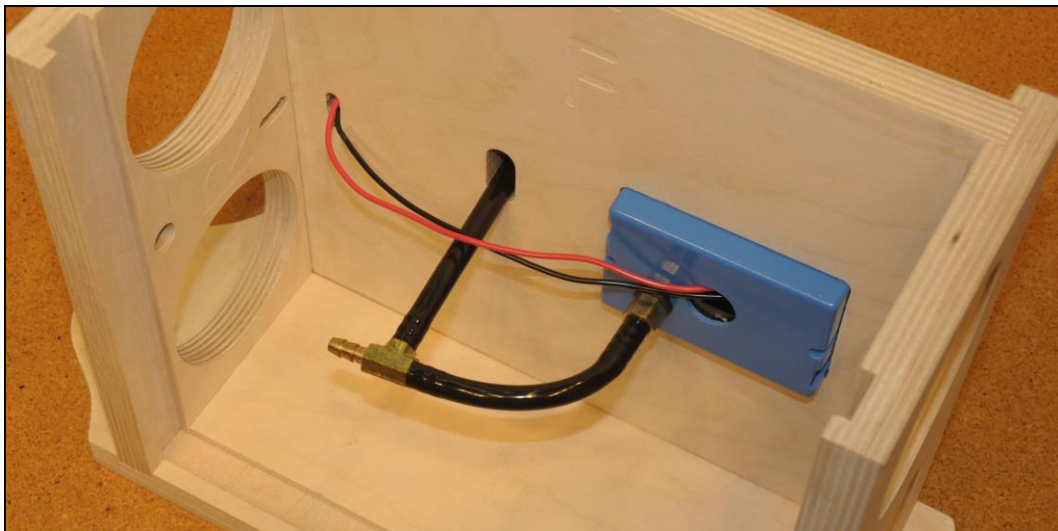
Part G: Pneumatic Tubing Connections

The next set of steps is very easy. In this section you will be setting up some of the "soft" connections in the system. There are many ways to use various types of tubing to connect one fitting to another but the V4 kit uses the easiest and most affordable method.

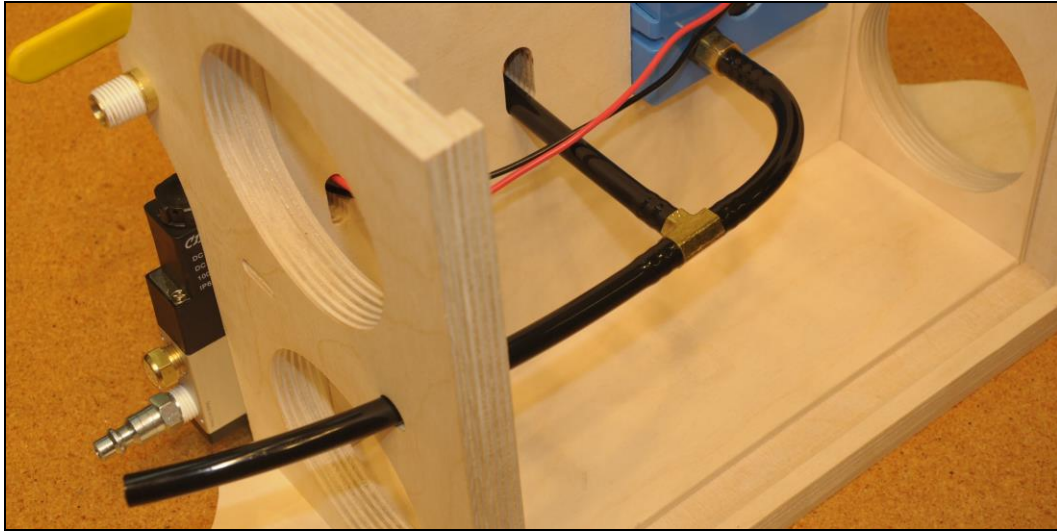
Assembly Time: 4 to 6 minutes

Required Parts: Black Tubing Brass Barb Tee

1. Cut one piece of black tubing exactly 4" in length and attach it to the barb fitting on the back of the blue box.
2. Attach the other end of the black tubing to a barb tee fitting. Be sure to connect it to one of the barbs on the top of the tee. In other words, don't attached it to the stem of the tee.
3. Cut a piece of black tubing exactly 5-1/2" in length. Slide one end fully onto the brass barb fitting on the manifold assembly. Then push the other end of the tubing through the large oblong hole on the "F" carrier panel.
4. Attach the other end of the tubing to the "stem" part of the tee fitting inside the carrier.



5. Now cut a piece of black tubing exactly 7-1/2" in length and insert it through the 1/2" diameter hole on the "R" carrier panel. Attach the end of the tubing to the remaining open side of the brass barb tee.



6. Keep the remaining black tubing since some of it will be used to complete the system.

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Part H: Carrier Assembly Completion

It's time to finish the carrier assembly for the V4 vacuum press system. You're more than half way through the entire assembly process at this point. Stay focused and you'll be finished before you know it. Let's get the carrier finished now.

Assembly Time: 4 to 6 minutes

Required Parts: Carrier Sections "H" and "T"
#8 x 1-3/4" Flat Head Screws (x4)

1. Slide the back "H" panel into the carrier assembly so that it rests inside the channels cut into the "L", "R", and "B" panels. The "H" marking on the panel should be at the top and on the inside.
2. Set the "T" panel into the carrier assembly so that the handle, which is offset, is on the right. The grooves cut into the top panel should fit over the top ends of the "F", "H", "L", and "R" panels.
3. Use a 1/8" drill bit to drill 1-1/2" deep pilot holes into the "L" and "R" panels. Use the pre-drilled holes on the "T" carrier part as a guide. Be sure to drill straight in at 90 degrees.
4. Use four of the #8 x 1-3/4" flat-head screws provided with the kit to secure the top panel in place. The screws will countersink into the plywood if you press hard enough on them as they set.
5. Carefully check each of the 3" diameter holes in the "L" and "R" carrier panels to be certain that the screws from the "T" panel are not protruding into these holes.

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VACUUM PRESS SYSTEM

Part I: Partial Vacuum Reservoir Assembly

The vacuum reservoirs are made from solid core schedule 40 PVC that is designed for pressure and works well for vacuum. Only a portion of the reservoirs are assembled in this section. The rest of the reservoir assembly will be completed later.

Assembly Time: 10 to 14 minutes

Required Parts: 3" PVC Pipe (2 pieces, 15" long) 3" PVC Caps (2 pieces, tapped)
Brass Barb Elbow (2 pieces) 3" PVC Caps (2 pieces, not tapped)

1. Apply thread sealing tape to both of the barb elbow fittings. Attach each of these fittings to the pre-tapped caps using a 12mm wrench. As an alternative, I've also found it easy to loosely attach the brass fitting to the cap and then place the head of the fitting in a bench vise. Then I turn the cap by hand until the fitting is snug.



2. For this part of the assembly, you will need the two PVC pipes and the two PVC caps with the brass fittings installed. Inspect the PVC pipe for defects. There should be no chips, cracks, or surface issues.
3. Clean the inside of the 3" PVC caps and the outside mating area of the PVC pipe with a dry paper towel. If the mating area on the PVC pipe is rough, clean it with a synthetic abrasive pad such as a "Scotch-Brite" cleaning pad. Then inspect the parts to make sure there is no debris left behind.
4. Follow the application instructions and safety guidelines on the PVC cement container. Complete this step in a well-ventilated area and proceed carefully.

Apply the cement as directed and immediately attach a pre-tapped cap to the PVC pipe making sure it is fully seated on the pipe - typically having 1-1/2" of pipe inside the cap. Be sure to move quickly with this step. Then hold the cap in place on the pipe for 30 seconds since it will have a tendency to push off due to the chemical reaction that takes place.

5. Repeat the steps above on the second PVC pipe. When finished, you should have two pipes that have only the pre-tapped caps attached.



6. Insert one of the PVC pipes into the bottom right hole on the carrier and push it through the hole on the left side. The brass barb elbow fitting should be on the same side of the carrier as the air valve.
7. Repeat the above step with the remaining PVC pipe by inserting it into the top right hole on the carrier.



8. As with the prior cementing of the first set of caps, follow the instructions on the PVC cement label. Do this in a well-ventilated area and proceed carefully since you will not get a second chance to do this correctly.

Apply the PVC cement as directed on the label and slide the cap fully onto the PVC pipe while holding the cap on the opposite end so that the pipe does not slide out of the carrier.

Be sure to move quickly with this step. Then hold the cap in place on the pipe for 30 seconds since it will have a tendency to push off due to the chemical reaction that takes place. Repeat this step for the second PVC pipe.

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VACUUM PRESS SYSTEM

Part J: Final System Connections

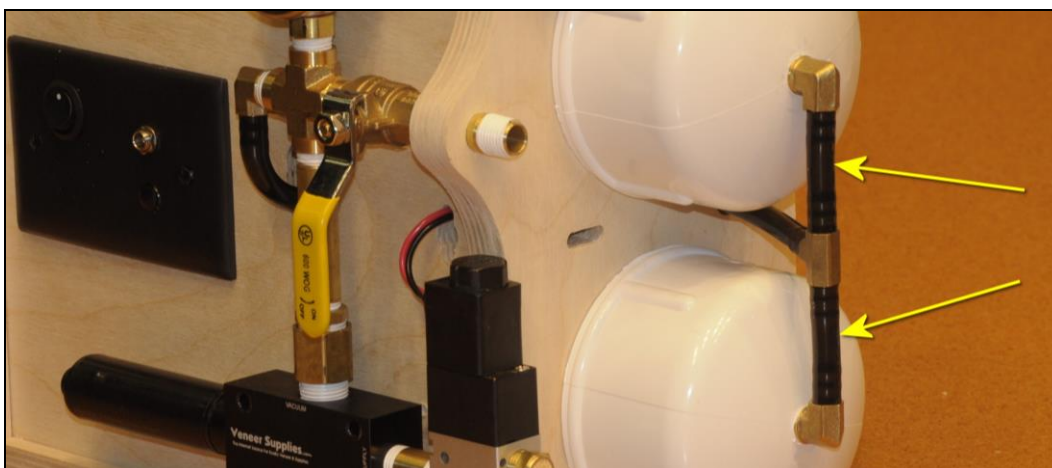
The V4 kit is just a few quick steps away from being completed. You're going to love this system when you see it quickly pull down a vacuum bag and clamp a veneer in place. The best part is knowing that you built the system that makes this happen.

Assembly Time: 4 to 8 minutes

Required Parts:

Brass Tee Fitting	Black Tubing
Brass Quick Fitting	Vacuum Filter

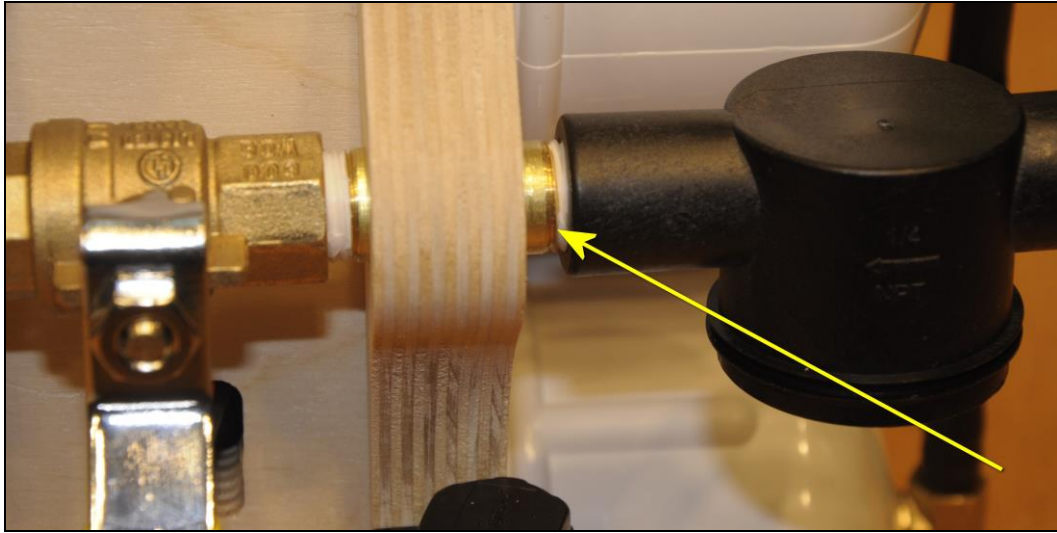
1. Find the remaining brass barb tee fitting that is included with the V4 kit. Attach the stem of the tee fitting to the black tubing that is protruding from the right side of the carrier.
2. Rotate the PVC pipes in the carrier so that the barb elbow fittings on the ends of the PVC caps are facing toward each other. Then cut two pieces of black tube 1-3/4" each. Attach both tubes to the barb tee fitting on the side of the carrier. Attach the other end of each tube to the fittings on the PVC caps.



3. Unscrew and remove the clear plastic bowl and filter cartridge from the vacuum filter. Then attach the filter head to the brass pipe on the manifold. The pipe end should have thread sealing tape applied. Note that the arrow embossed on the side of the filter head must point toward the brass pipe.



4. Attach the filter head by hand. If you consider yourself an exceptionally strong person, then you probably have it tight enough. "Gently snug" is adequate. Tighten the filter head until it is seated on the brass pipe as shown below. There should be only 1 to 2 rows of the brass pipe thread visible when this is complete.



5. The clear plastic filter bowl and filter cartridge inside can now be re-attached. Align the assembly so that it rests vertically on the V4 system as shown in the picture below.



6. If you have not already done so, apply two layers of thread sealing tape to the lock-on plug fitting. Attach the fitting to the vacuum filter with a 9/16" wrench and slowly tighten it until the hex part of the fitting is 1.5 mm from the plastic filter head. This measurement is critical as it prevents the plastic head from splitting. "Gently snug" is adequate.



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VACUUM PRESS SYSTEM

Part K: Vacuum Tube Assembly

Now let's assemble the link between the vacuum press system and the vacuum bag. The V4 kit includes one lock-on connector to attach the vacuum tube the system and another lock-on connector that attaches the vacuum tube to the vacuum bag.

Assembly Time: 5 to 7 minutes

Required Parts: Lock-On Connector (2 pieces) Quick Coupler
Brass Barb Fitting with Fine Threads (2 pieces) Braided Tubing

1. Apply thread sealing tape to the remaining barb fittings that are included with the V4 kit.
2. Use 5/8" and 9/16" wrenches to attach the small barb fittings to each of the lock-on connectors with aggressive force. You might find it easier to clamp the barb fitting into a bench vise and tighten the quick connector with a 5/8" wrench. **Alternate Assembly Option:** You can clamp the barb fitting into a bench vise and tighten the lock-on connector with a 5/8" wrench.



3. Attach each of the above assemblies to the vacuum tube. A high-grade braided tube is included with the V4 kit so the barb fittings should slide in without much force. The tubing can be softened in hot water to make this process easier.

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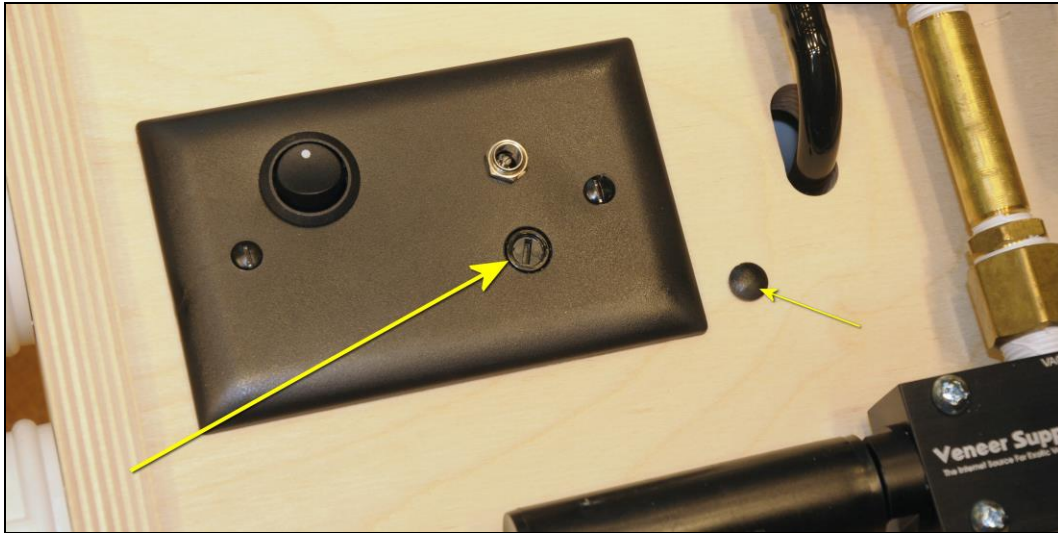
VACUUM PRESS SYSTEM

Part L: Final Testing and Adjustment

The assembly of the V4 system is now complete. You did it! Within the next few minutes, you'll be ready to run the vacuum press for the first time. All that is left is to adjust the shut-off point on the vacuum controller. Let's go!

Average Time to Complete: 6 minutes

1. Make sure the power cord is attached to the V4 system then plug the wall adapter into a live power outlet. Then connect your compressed air line to the fitting on the V4 air valve and make sure your compressor is set to deliver 95 PSI. Higher pressure does not increase the performance of the venturi unit. Do not exceed 120 PSI.
2. Use a small flat screwdriver to pop off the small plastic cap on the top of the vacuum controller. This will expose a small slotted screw inside the vacuum controller that is used to adjust the set point at which flow is shut off from your air compressor.



3. Be aware that particles in the air stream from the venturi exhaust can cause eye damage. Wear appropriate eye protection while adjusting the unit.
4. Make sure the vacuum valve is in the closed position.
5. Turn the system on by depressing the white dot on the power switch. The system may (or may not) cycle on very briefly.

6. Use a small flat screw driver to slowly turn the adjustment counter-clockwise. The air valve should open and allow compressed air to generate vacuum inside the V4 system. The system will likely cycle off before the vacuum controller is set correctly but keep turning the adjustment screw until the system cycles off at 21" Hg. You may need to open the vacuum valve temporarily to allow vacuum to escape which will cause the system to cycle on again.

Remember that counterclockwise turns of the screw will *increase* the amount of vacuum required before the vacuum controller will turn off the air valve. I've found that most systems cycle off at 21" Hg when there is about 1/16" of space between the top of the adjustment screw and the top of the vacuum controller. Do not completely remove the adjustment screw as this may cause damage.

7. The V4 system will automatically cycle on again when the vacuum has decreased. The manufacturer of the vacuum controller claims that the controller will cycle back to the "on" mode within 2 to 5" of Hg decrease. This amount of differential is not adjustable. You can test this by slightly opening the vacuum valve and slowly releasing a bit of vacuum from the system.
8. Reinstall the plastic cap on the top of the vacuum controller. It will snap back into place with gentle pressure.

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VACUUM PRESS SYSTEM

Notes and Reminders

You did it! Your system is now ready for use. There are just a few notes and reminders below. Check them out and get started on your first vacuum pressing project.

- The system is set to turn off at 21" of Hg. This is the ideal vacuum level for most veneer projects. The system will turn on again when the vacuum level drops by 2" to 5" of Hg.
- The on/off cycling of the Project: V4 system is harmless. It is not uncommon for it to cycle on and off every 10 to 20 minutes for 5 to 8 seconds with a vacuum bag connected. Project: V4 systems that are assembled exceptionally well may hold vacuum for many hours without cycling on.
- The odor of PVC cement may be present during the first few uses of your system.
- The individual components of this kit and the completed assembly of these components should not be considered suitable for use in areas where flammable or combustible gases or dusts are present.
- This system is not designed for unattended use.
- Always disconnect power from the system when not in use.
- The vacuum gauge is a sensitive instrument and will be rendered inaccurate if dropped or struck with a hard object.
- You can disconnect the vacuum tube assembly from the V4 system, roll it up, and then place it behind the bungee cord on the back of the V4 carrier. The DC adapter will roll up and fit inside the center of the vacuum tube coil.



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VACUUM PRESS SYSTEM

Using Your Project: V4 System

The V4 system is very easy to set up and put to use.

1. Connect the DC plug end to the power jack on the V4 system.
2. Attach the power adapter to a 120-volt AC outlet.
3. Set the vacuum valve handle to the "off" position.
4. Add a two or three drops of air tool oil to the compressed air fitting on the air valve.
5. Connect your compressed air hose to the air valve.
6. Turn on the rocker switch to pre-charge the system with vacuum.
7. Attach the vacuum tube to the fitting on the vacuum filter.
8. Set up the vacuum bag with a bottom platen inside.
9. Apply glue to project substrate and set the veneer in place.
10. Put the project in the vacuum bag, place breather mesh on top of the project, and close the vacuum bag.
11. Pull back the sleeve on the lock-on connector and slide it onto the brass stem on the vacuum bag. Release the sleeve while gently pushing the downward to snap the lock-on connector into position.
12. Open the vacuum valve in the V4 system.

Check out the veneering and vacuum pressing articles on the JoeWoodworker.com website to learn more about vacuum bags, platens, breather mesh, and veneer adhesives.

Vacuum Clamping Add-On Kit

The Project: V4™ vacuum press can be used for much more than just veneering. With the [optional vacuum clamping add-on](#), you can use the massive power of vacuum to instantly hold work pieces to your bench top for sanding, routing, carving and more. The kit includes a pneumatic latching foot pedal to instantly apply and release vacuum to clamping jigs on the work bench.



Vacuum clamping jigs are required to complete this clamping system. We offer everything needed to make custom jigs or simply order our affordable and versatile [Podz™ jigs](#).

Thank you

Buying a tool without seeing it in person can be a stressful process, but in this age of Internet shopping it's something that many of us woodworkers have come to accept. I thank you for ordering on my website. Your support is genuinely appreciated.

I look forward to seeing what you build with your V4 system and I wish you the best with all of the many vacuum pressing projects in your future.