

42 Draft Designs

Vacuum Manifold Kit – Installation Instructions

Kit Contents:

Vacuum Manifold (5 ports)

Input Fittings (all fittings 1/4" NPT threads)

1 Straight Barb: 3/8" Tubing

1 90° Barb: 3/8" Tubing

1 T-fitting: 3/8" Tubing x 3/8" Tubing x 3/8" Tubing

1 T-fitting: 3/8" Tubing x 1/2" Tubing x 1/2" Tubing

Output Fittings (all fittings 1/8" NPT threads)

1 Straight Barb: 1/8" Tubing

3 Straight Barbs: 3/16" Tubing

1 Straight Barb: 1/4" Tubing

Tubing

3' 3/8" ID Tubing

4' 1/8" ID Tubing

12' 3/16" ID Tubing

4' 1/4" ID Tubing

2 1/8" NPT Output Plugs

2 1/4"-20 x 3/4" Button-Head Screws (SS)

2 1/4"-20 Nylon Lock Nuts (SS)

2 1/4" Flat Washers (SS)

2 1/4" Flat Washers (Rubber)

10 4" Zip-Ties

Tools Recommended:

tubing cutters, sharp knife, Teflon tape, 7/16" deep socket, 7/16" open end wrench, 9/16" deep socket, 9/16" open end wrench, 5/32" Allan wrench, 1/4" drill bit.

Before You Begin:

This kit is designed for universal installation. We have included an assortment of tubing and fittings which should allow for installation on *most* vehicles with *most* accessories. Because every engine differs, not every combination of tubing and fittings can be provided. Before you begin installation check the tubing sizes on your accessories to be sure the tubing sizes and lengths included will fit properly. Additionally, be sure the included input fittings will fit your factory tubing. In some cases alternative methods of installation may be necessary. If additional tubing and fittings are necessary please visit our website. We offer the tubing and fittings included in this kit individually, as well as additional sizes and configurations.

1. Locate the largest vacuum line in your engine bay. Typically, the largest vacuum line on an engine runs from the intake manifold to the brake booster. Remove one end of this line and determine the correct T-fitting to use. We have included T-fittings for 3/8" and 1/2" tubing which should accommodate metric & sizes in-between. Locate an area on this vacuum line to install the T-fitting. The area should be between the intake manifold and any vacuum accessories such as check valves or emissions equipment.
2. Based on the proposed location of the T-fitting, choose a location in the engine bay to mount the vacuum manifold. This location should be a flat surface, easily accessible, and within reach of your vacuum accessories. In order to mount the vacuum manifold two 1/4" holes must be drilled through the mounting surface, so choose a location which will allow through drilling such as the firewall, battery box, engine cover, etc. Don't forget the space required by the output fittings and tubing.

3. When you have chosen your mounting location and vacuum line to tap, mock-up the manifold and loosely route the 3/8" input tubing. Determine which input fitting will be best for your layout and install in the manifold. Use a 9/16" deep socket on the straight barb fitting. On the 90° barb use the closed end of an open end wrench. Use one wrap of Teflon tape on all threads.
4. Hold the assembled manifold in your chosen location and mark the mounting holes using a permanent marker. Next, figure out what's behind those marks. **Take this step seriously.** If you're drilling into your firewall there's a good chance you'll hit something on the other side. If you're drilling into the side of your battery box or engine cover, remove it so that you can drill through in confidence. When you're ready to drill, first use a center punch to mark the absolute center of the hole. Using a 1/4" bit, drill the mounting holes.
5. Mount the manifold, but not permanently. You may need to remove it again to install your output fittings. To mount the manifold, first slide the button head screws through the mounting tab on the manifold. Then, slide a rubber washer on each screw. Push through your mounting holes, and then slide a washer on each screw. Lock everything together with a 5/32" Allan wrench, a 7/16" wrench, and a nut. The nuts included with this kit are nylon lock nuts. They do not need to be aggressively tightened. Simply tighten them down until the manifold is snug against the mounting surface and the rubber washer is slightly compressed.
6. Return to the vacuum line where you will be installing the T-fitting. Using a sharp knife or tubing cutters cut the vacuum line in your chosen location. Clean up your cut and install the T-fitting. Depending on the size of your tubing, small hose clamps may be necessary. In most cases they are not. The barbs on our fittings are aggressive and typically do not require tubing clamps.
7. Slide the 3/8" input tubing onto the T-fitting. This may take some force. Use a drop of water to lubricate the barb if necessary. No zip-ties or hose clamps should be necessary. Route the tubing to the vacuum manifold, cut to length, and slide the tubing onto the barb.
8. Route your chosen output vacuum lines from the manifold to their prospective locations. Install your output fittings in an order which makes sense in your installation. Use a 7/16" deep socket and one wrap of Teflon tape on all fittings. Plug any empty ports. Depending on your mounting location, it may be necessary to loosen or remove the manifold to install the output fittings.
9. Slide your tubing onto the barbs. This may take some force. Use a drop of water to lubricate the barb if necessary. No zip-ties or hose clamps should be necessary. Re-install your manifold if necessary.
10. Finish routing your output tubing. When routing tubing do not bend or kink tubing. Zip-tie tubing where necessary for a clean installation. Cut tubing to length as needed and slide onto the barbs of your vacuum accessories. If you are unable to get a tight fit use a miniature hose clamp or zip tie. Whether hidden, exposed, or stealth your tubing routes should be smooth, flexible, and safe.

A Few Tips:

- You will have extra fittings and tubing. Save it! You will need it later if your engine setup changes.
- To avoid marking the plastic barb fittings use sockets whenever possible. 6 point sockets are better than 12 point.
- When threading the fittings into the manifold use 1 wrap of Teflon tape. Turn the fittings until they are tight. Because plastic is soft, the fittings can be turned (with force) until they bottom out. Our manifold is designed to allow the plastic fitting to thread in 75%. NPT threads are tapered, so once the fitting seems tight it will seal just fine.
- Avoid heat. Our fittings are made of Glass Filled Nylon, which is a plastic polymer protected by glass fibers. Our fittings can withstand blasts of heat, but naturally won't stand up to open flame. Our fittings should not be installed on accessories which are mounted to exhaust components – such as wastegates. They are frequently used for coolant systems, so they can stand up to pretty much anything else. The same goes for our tubing. It can take the heat, but most likely won't stand up to the heat of a wastegate. In this case, use a 6" length of high temperature rubber or silicone tubing and a straight barbed coupler to fit our tubing.
- Never leave a port on our manifold open. Always plug the port to avoid a vacuum leak.

Alternative Installations

Some engines do not have a vacuum line large enough to fit the included T-fittings. If you only have a smaller line to work with, don't panic. Fittings can be purchased which will allow installation. Check our website for fitting options or contact us with your specific needs.

Some engines have hard plastic vacuum lines. In this case, measure the OD of the vacuum line. Using soft tubing (rubber, silicone, or our flexible tubing) create a pair of couplers roughly 2" long. Using these couplers, the appropriate T-fitting, and some hose clamps the manifold can be installed without issue. In many cases, the hard line can be completely replaced by rubber tubing into which the T-fitting can be installed.

Some engines have metal vacuum lines with rubber tubing pressed onto each end. In these cases there may be enough length in the rubber sections to install the T-fitting. If the metal line is large enough it can also be cut-out and the T-fitting installed using couplers as described above.

In some cases, the 3/8" input tubing can be installed directly on the intake manifold. A spare barb on the manifold can be used, or a new hole can be drilled & tapped. If drilling and tapping a new hole you can use the other input fitting included or a fitting of your choice. The hole drilled must be 7/16" and the threads 1/4"-18 NPT. Always remove the intake manifold before modifying.