

Installation Instructions: Subaru EJ257 Inlet Manifold

Part Number: 20006438

Applications: 2004-2009 Subaru STI EJ257 with Electronic Throttle Control and Aftermarket FMIC

Disclaimer and Warranty

A vehicle modified with Cosworth competition and or racing performance products will not meet the legal requirements for operation on public roads and highways. It is the purchaser's responsibility to check and comply with all local, state and federal laws prior to operating vehicle. Installation and use of performance products may also affect and void warranty and insurance policies. In general, Cosworth Performance Parts carry no warranty. Cosworth, LLC and Cosworth Ltd. shall not be liable for direct, indirect, incidental or consequential damage or injury to persons or property that might be claimed as a result from the installation, improper installation, and failure of part including claims for delay, loss of profits or labor. There are no warranties expressed or implied.

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Parts List

ITEM #	QTY.	DESCRIPTION	COSWORTH PART #
1	1	Cosworth EJ25 Inlet Manifold Casting	Not Available
2	1	Vacuum Manifold, EJ25 Inlet Manifold	20005840
3	2	1/4" Barb to 1/8" NPT 45° Adapter	20000059
4	1	1/8" Barb to 1/8" NPT Straight Adapter	20008545
5	4	1/8" NPT Taper Plug	PP1120
6	1	3/8" Barb to 1/4" NPT 90° Adapter	ZK0029
7	1	O-Ring, 3.125" ID x 0.070" Cross Section	PP2333
8	4	Screw – M6x1.0x10 BHCS Stainless Steel	20007251
9	12	Screw – M6x1.0x25 SHCS Plated	PR2779
10	4	Screw – M6x1.0x45 SHCS Plated	20008781
11	0.91m	Hose – 3/8" ID EPDM	20008791
12	0.76m	Hose – 1/8" ID Vacuum	20008792
13	4	Spring Clamp – 21/32"	20008782
14	1	Check Valve – 3/8"	20001316
15	2	Cable Tie	PP0589
16	1	Bracket – EJ25 Header Tank Reloc Upper	20008675
17	1	Bracket – EJ25 Header Tank Reloc Lower	20008676
18	3	Screw – M8x1.25x20 Plated	PR6578
19	3	Nut – M8x1.25 Nylock	20006183
20	1	3/8" Barb to 1/8" NPT 90° Adapter	20009161

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General Information

Congratulations, you are the new proud owner of a Cosworth Subaru EJ257 intake manifold. Your plenum features special length and diameter intake runners for power band tuning and radiused runner inlets for increased velocity, all while working with a stock or stock configuration engine. Your plenum is designed to increase horsepower and torque on turbocharged applications.

It is strongly recommended that this plenum is installed by an experienced tuning shop, engine builder, or mechanic. Due to differences in aftermarket turbo, intercooler, coolant header tank, and crankcase ventilation setups, installations will vary. It is essential that the installer have a good understanding of high performance automobile systems and can properly construct any custom air, fuel, oil, or water plumbing as needed. To maximize horsepower and torque gains, we also recommend having your engine professionally tuned by an experienced tuner. Your Cosworth plenum is intended for light duty motorsports such as autocross, club racing, time trials, and track days and is not legal for use on pollution controlled vehicles that will be operated on a US highway. Please check your local laws for your local regulations.

Specific applications (2004-2009 Subaru STI EJ257) – Your Cosworth EJ257 plenum is designed for use with the 2004-2009 STI engines equipped with electronic throttle control. The plenum is not designed for use with any cable-actuated throttle body EJ20/25 applications. Cosworth does NOT provide technical support for any configuration other than intended.

This plenum is designed to replace the factory Subaru plenum in vehicles equipped with an aftermarket front-mounted intercooler (FMIC) kit. Throttle body position remains stock, ensuring fitment with any brand FMIC kit designed for the stock throttle body and intake manifold. For 2008+ Subaru STI's, the Cosworth FMIC kit (**p/n 20005378**) is highly recommended. Disassembly procedures depicted in your Subaru factory service manual must be followed during the removal of the factory plenum. When installing the Cosworth plenum, you must follow the directions in this installation manual very carefully.

Please take a few minutes to inspect and count the parts to ensure there are no signs of damaged or missing parts. Pay special attention to the flat, machined surfaces. If the parts are damaged, please contact the shipping company to make a claim. If you are missing parts and the box was obviously torn or opened, then contact the shipping company to make a claim. If you are missing parts and the box was fully sealed in Cosworth packaging, please contact Cosworth for replacement parts.

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Installation Tips

Fuel Rails

The Cosworth plenum may be used with stock fuel rails with slight modification and bending of the hard lines. Ensure that any modifications to the fuel system are done professionally and pressure tested prior to being put into service. Always secure hard lines to prevent fatigue and cracking due to vibration. It is recommended that a high quality aftermarket fuel rail system and associated plumbing is used with your Cosworth plenum. Route fuel lines away from any hot or moving parts. Secure fuel lines with brackets, p-clips, and/or cable ties to prevent abrasion. Always use high-pressure rated fuel injection hose.

Intake Systems

The Cosworth plenum is compatible for use with the stock turbo inlet tube. Aftermarket silicone tubes for stock location turbos may cause interference and/or abrasion with the body of the plenum. As with any performance part, periodically inspect components for signs of contact or abrasion. Although rotated mount turbo kits usually fit without issue, Cosworth cannot guarantee fitment due to the large number of styles, brands, and sizes of aftermarket turbo kits. Custom fabrication may be required in a few cases.

Tumble Generator Valves

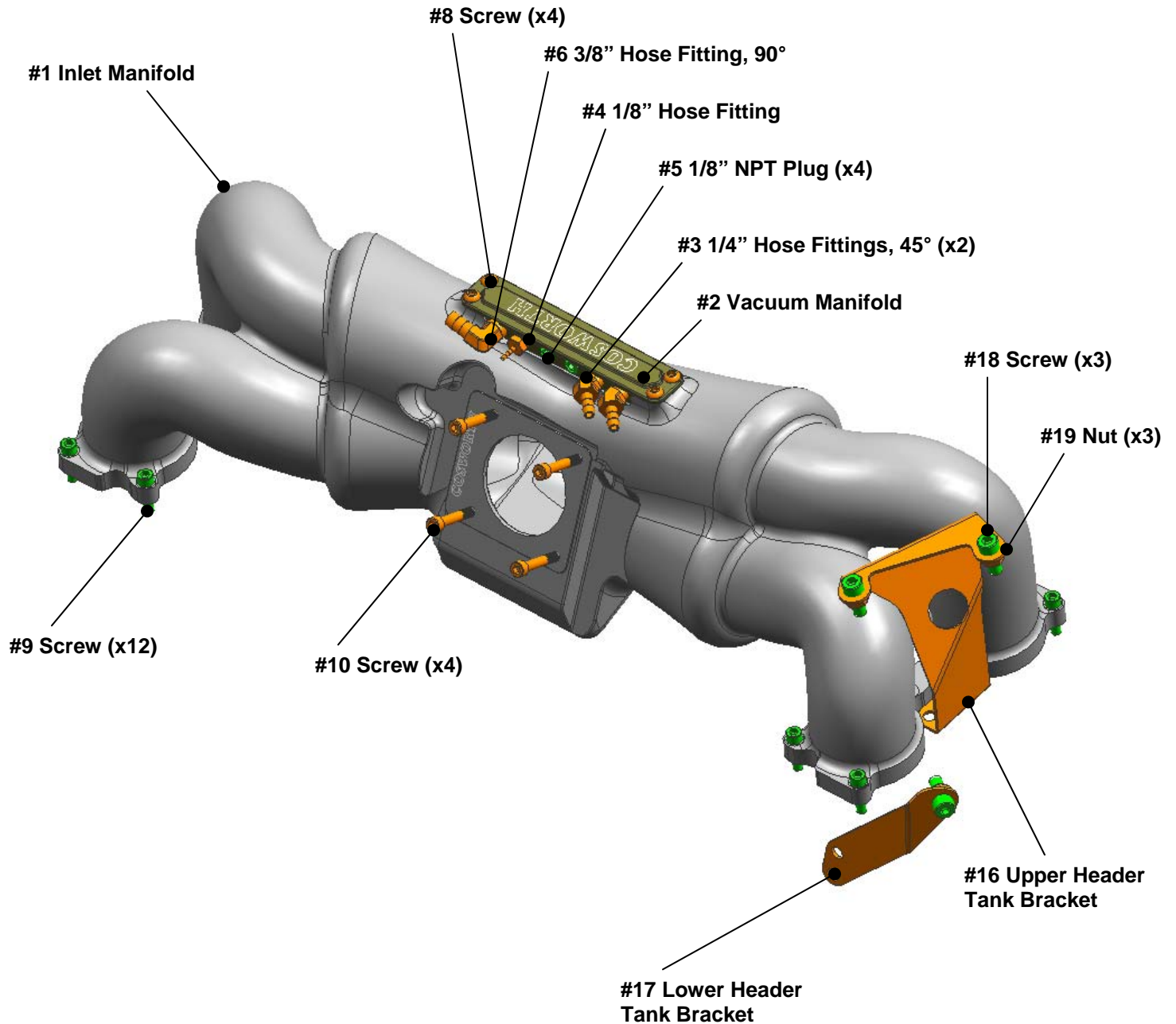
The Cosworth plenum is designed to be compatible with OEM tumble generator valve housings. In general, any direct-fit TGV's or TGV delete housings will fit without issue.

Removal and Installation of Vacuum Manifold

Each time the vacuum manifold is removed, a new o-ring **MUST** be used. The o-ring part number is on page 2 of this instruction booklet. Replacement o-rings can be ordered from your local Cosworth authorized dealer. If you must use generic o-ring cord, then a small dab of silicone is should be used to seal the two o-ring ends to each other. Also make sure to cut the o-ring so that one end of the o-ring overlaps approximately 1/8" with the other end. Then gently butt the two ends of the o-ring together inside the groove.

The vacuum manifold may be installed in either direction. For most installations, the vacuum ports will face the throttle body mounting face. For forward facing throttle body installations, the vacuum block can be mounted in reverse to keep the vacuum ports pointing towards the firewall. Any such installations are completely custom and Cosworth cannot provide technical support.

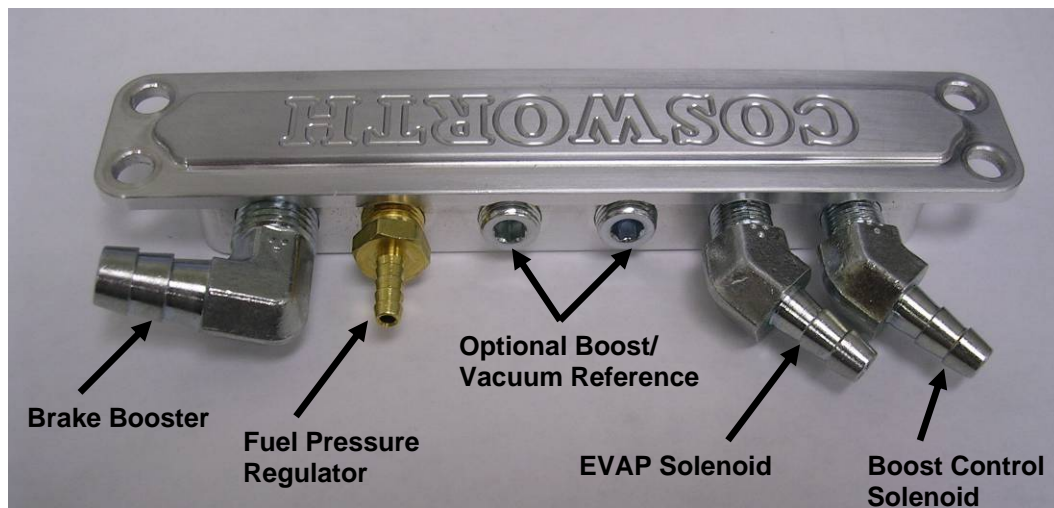
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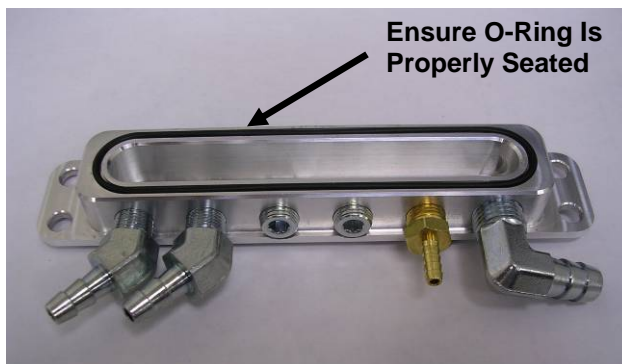
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Installation

1. Prepare the vacuum manifold **#2** for installation by installing fittings **#3, 4, 5, and 6**. Use Teflon tape or pipe sealing paste to ensure a positive seal on all pipe threads. The number and use of the ports can be customized (extra 1/8 NPT plugs are supplied to block unused ports). Generally, the vacuum manifold should be setup up as pictured. The 90° 3/8" nipple is for the brake booster, the 1/8" nipple is for the fuel pressure regulator reference, and the two 45° 1/4" nipples are for the EVAP purge solenoid and boost control solenoid lines.

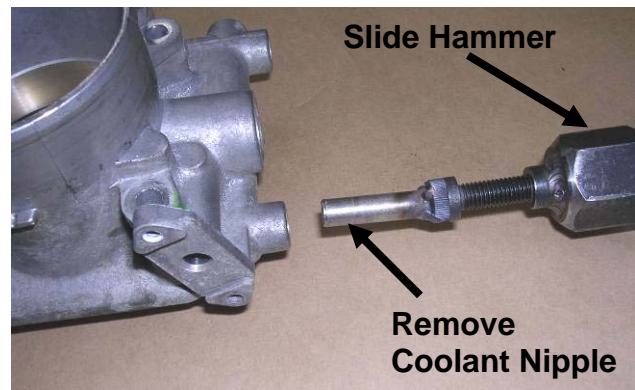
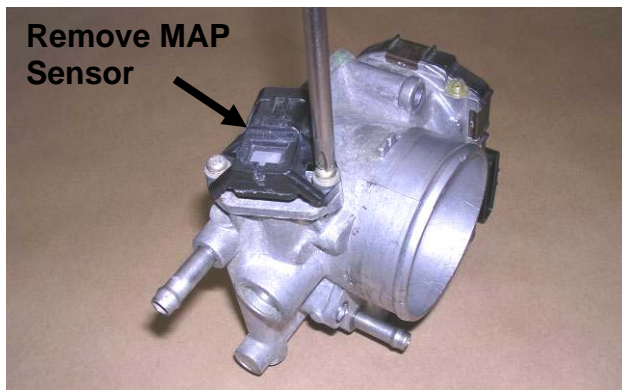


2. Inspect the inside of the plenum **#1** to ensure it is clean of debris, dirt, or other foreign matter.
3. Install the vacuum manifold to the plenum, being sure to install the supplied o-ring **#7**. It may be helpful to secure the o-ring in a few spots with silicone grease to hold it in place during installation. The vacuum fittings should face the throttle body mounting flange for most installations. Apply a small amount of blue Loctite and secure the manifold with the four M6 screws **#8**. Torque screws to **75 in-lb (6.25 ft-lb)**.

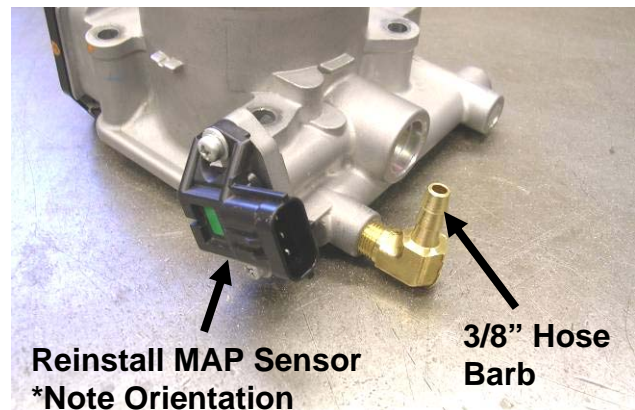
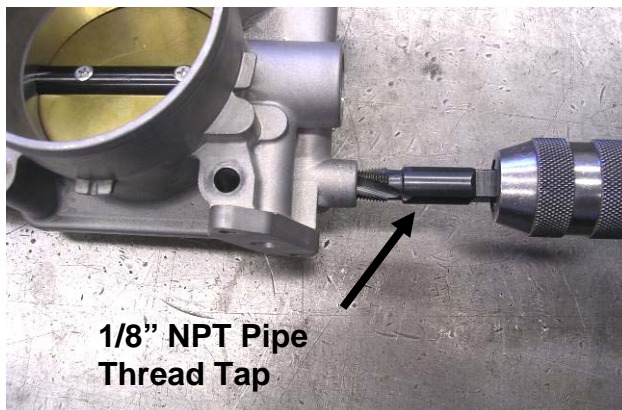


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- The throttle body will need modification to work with the Cosworth intake plenum. As per the factory service manual, remove the throttle body. Cover the exposed inlet manifold to prevent debris from entering.
- Remove the MAP sensor located on the top of the throttle body. Prepare the throttle body by removing the upper coolant bypass nipple located just below the MAP sensor. The easiest way to do this is by tack-welding a screw to the nipple and removing it with a slide hammer. The nipple may also be removed with a pair of vise grips, but use caution to avoid damaging the hole in the throttle body casting.



- Tap the exposed hole with a 1/8" NPT pipe thread tap. Be sure to remove all chips and debris by blowing compressed air through the lower coolant bypass nipple. Install the supplied #20 3/8" barb to 1/8" NPT 90° fitting. Use Teflon tape or pipe sealing paste to ensure a positive seal on all pipe threads. Clock the fitting so that the hose barb points away from the mounting face. Reinstall the MAP sensor so that the wire connection faces outwards.

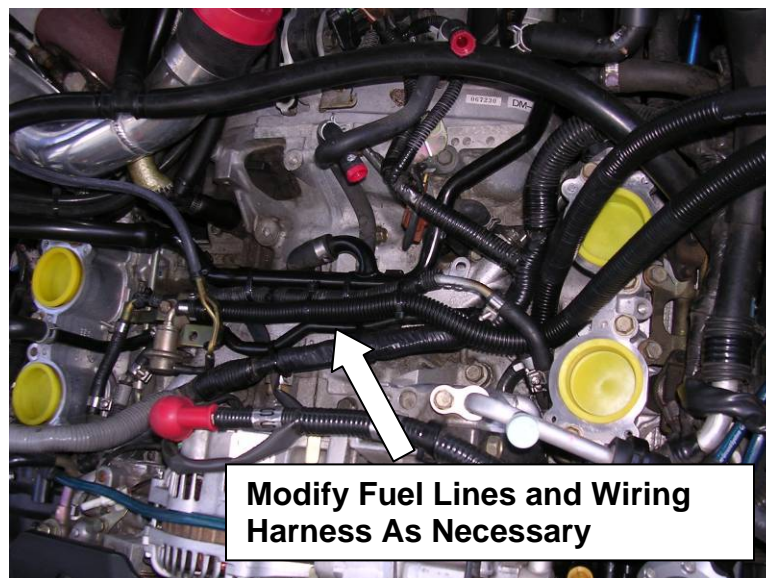


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7. Install the throttle body to the Cosworth inlet plenum using the supplied **#10** M6x1.0x45 screws and a new OEM throttle body gasket. Torque screws to **75 in-lb (6.25 ft-lb)**.

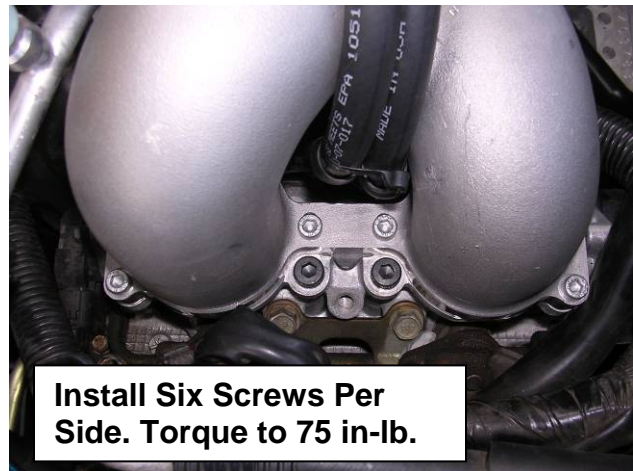
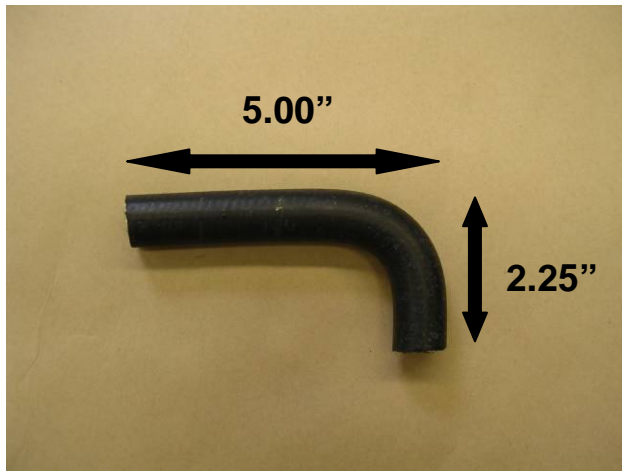


8. As per the factory service manual, remove the factory inlet manifold. Cover the exposed ports to prevent debris from falling in. Remove the top-mount intercooler brackets and fuel pipe protectors.
9. Depending on how your fuel system and wiring harness are configured, some modification may be necessary. Remove the plastic channel from the wire harness, wrap the wire harness in a protective covering, and secure it to the top of the engine.
10. Modify and/or replace the fuel system hard line assembly as necessary. Temporarily install the Cosworth inlet plenum and check clearance to all fuel system components and wiring harness. Pressure test any fuel system modifications to check for leaks. Once routing is finalized, wrap any exposed lines in protective covering and secure to the top of the engine.

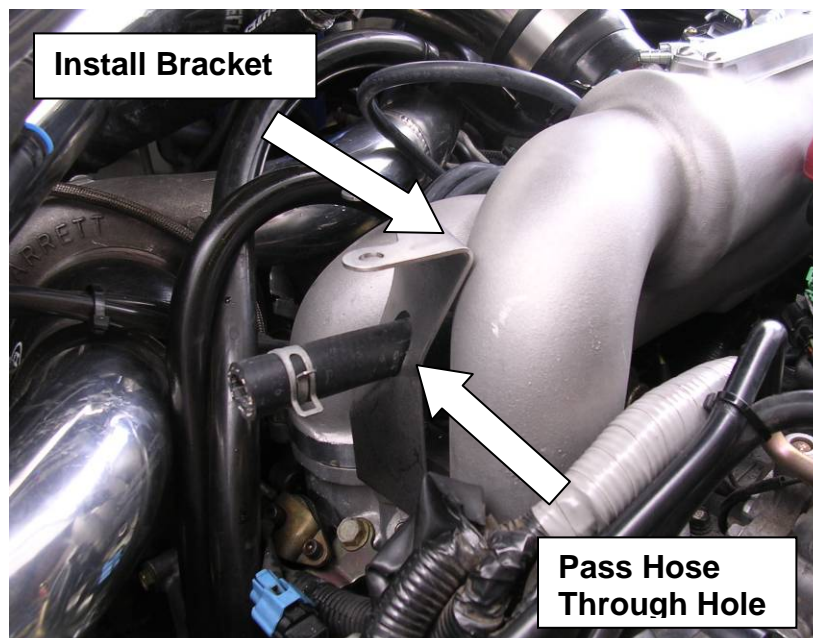


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11. Replace the lower header tank hose with a ½" ID 90° coolant hose elbow as shown below. Gates part number 28460 or Goodyear part number 63706 both work well for this application. Trim the legs to 5.00" and 2.25". Secure the shorter leg to the coolant tube with a factory hose clamp.
12. Install the Cosworth inlet plenum using new OEM TGV housing gaskets and the supplied #9 M6x25 screws (12 places, 6 per side). Torque screws to **75 in-lb (6.25 ft-lb)**.

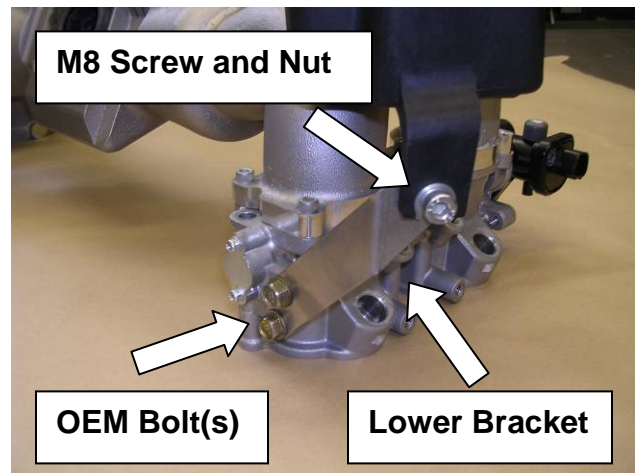
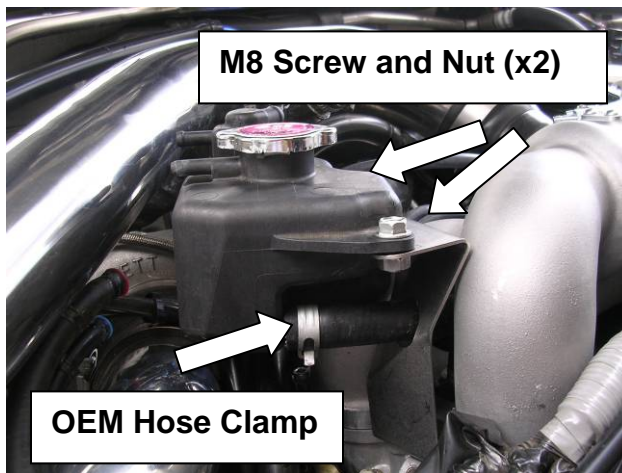


13. Remove the two center TGV mounting bolts on the passenger side. Install the #16 upper header tank bracket using the factory bolts. Torque screws to **18.4 ft-lb**. Pass the previously installed coolant hose elbow through the hole in the bracket.

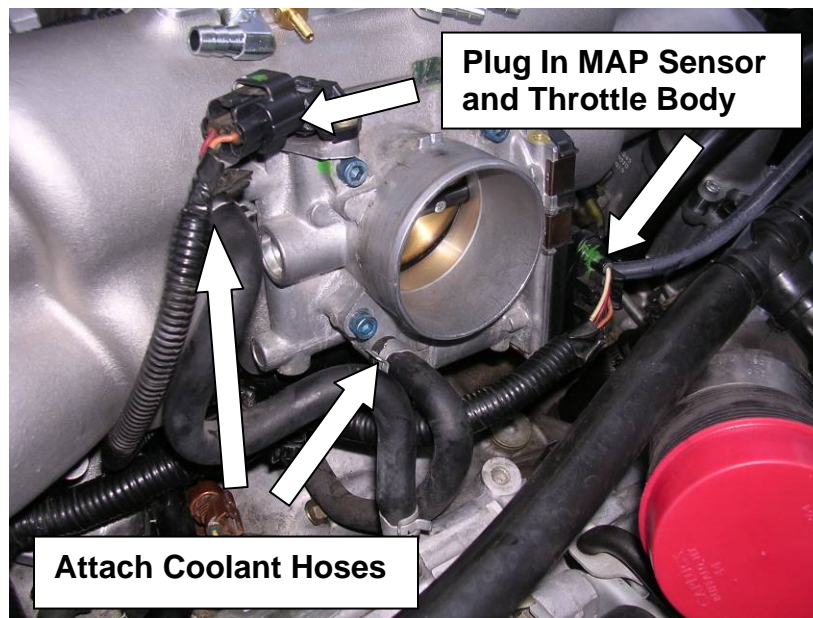


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- Secure the coolant header tank to the bracket using two each of the **#18** M8x20 Screw and **#19** M8 Nut. Attach the lower header tank hose using the factory hose clamp.
- Bolt the **#17** lower header tank bracket to the TGV housing using the factory M8 bolt(s). Attach the lower mounting tab on the header tank to the bracket using one each of the **#18** M8x20 Screw and **#19** M8 Nut. Re-connect all coolant hoses to the header tank.

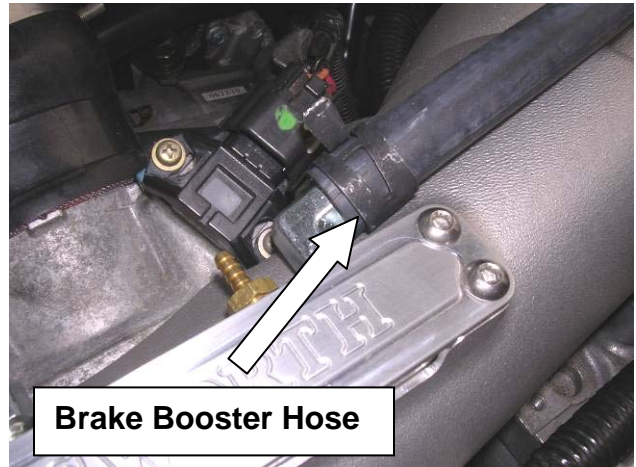
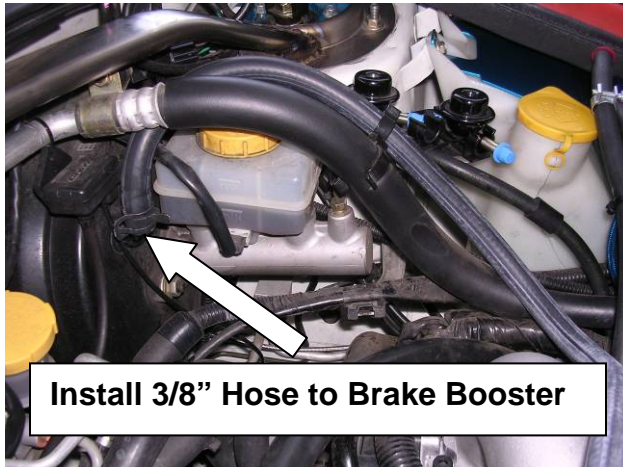


- Plug in wire harnesses for MAP sensor and throttle body. Attach throttle body coolant lines, the upper line will attach to the new fitting installed in step 6.

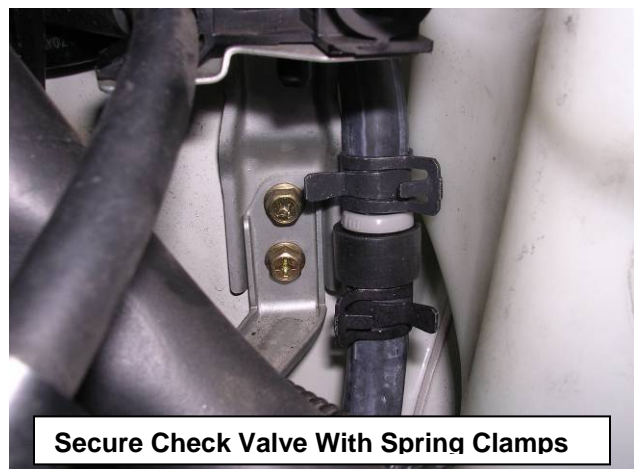
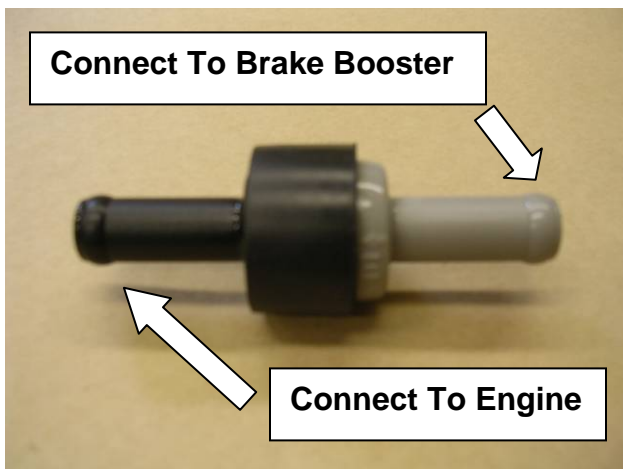


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17. Remove the stock hose from the vacuum brake booster. Install the **#11** 3/8" ID hose and secure with the **#13** spring clamp. Route the hose to the **#6** 3/8" hose barb fitting installed in step 1. Make sure to route the hose away from any hot or moving objects. Secure at the inlet plenum with another **#13** spring clamp.



18. Find a suitable section of straight brake booster hose to install the **#14** check valve. Cut the 3/8" hose and install the check valve using two **#13** spring clamps. The check valve is directional, take note of the color of the housing. The black side of the housing should connect to the hose going to the engine. The gray side will connect to the hose going to the brake booster.



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19. Reattach all vacuum lines to the Cosworth inlet plenum. The vacuum fittings may be customized to accommodate any combination of boost gauge, boost controller, remote mounted MAP sensor, fuel pressure regulator, etc. The Cosworth vacuum block has five 1/8" NPT holes that may be used for hose adapters or plugged if not used.



20. Find a suitable location for any wiring harness grounds that were removed from the stock inlet manifold. Depending on model year, there may be threaded bosses on the TGV housings that can be used. Ensure all grounds are securely mounted and make good electrical contact. Remove any paint or coating from the mounting points to ensure good contact if necessary.



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21. Reinstall the intercooler plumbing and anything else that was removed during installation. Double check all fuel, coolant, and electrical connections before starting engine. Fill and bleed cooling system, following the procedure in the factory service manual.

Warranty

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