

Stage Fabrication and Performance – BMW N51/N52 Air-To-Water Intake Manifold Kit Installation Guide



Warning! This product has not received approval from the California Air Resources Board (CARB). We are actively engaged in the necessary processes and evaluations required for CARB certification. It's important to note that this product is not intended for use on California roads until CARB approval has been obtained. We remain committed to compliance with all regulatory standards and are diligently working toward obtaining CARB approval to ensure our product meets the stringent environmental requirements set forth by the state of California.

Installation Kit Content

Part #	Part Description	Quantity Required
1	Air to Water Intake Manifold	1
2	Heat Exchanger	1
3	Thermal Spacer	1
4	Thermal Spacer Gaskets	12
5	Intercooler Pump	1
6	Intake Air Temp Connector + Wiring	1
7	Intake Air Temp Sensor	1
8	Coolant Tank	1
9	¾" Hose	1
10	Intercooler Pump Relay + Wiring Harness	1
11	Hose Clamp #10	6
12	Hose Clamp #12	2
13	Intake Manifold Stud M7-1.00	7
14	Intake Manifold Nut M7-1.00	7
15	Pump + Tank Bracket Bolt M8-1.25	2
16	Pump + Tank Bracket Nut M8-1.25	2
17	Pump + Tank Bracket Washer M8	4
18	Power Steering Bracket Bolt M6-1.00 x 35mm	2
19	Heat Exchanger Bracket Bolt M6-1.00 x 12mm	2
20	Heat Exchanger Power Steering Bracket Nut M6-1.00	4
21	Heat Exchanger Bracket Screw	2
22	Coolant Tank Hose Clamp	1
23	MAP Sensor Hardware M6-1.00	2
24	Intake Manifold AUX Port Plug	1
25	Intake ¾" Barb Fitting	2
26	Intake Air Temp Sensor Crush Washer	1
27	Heat Exchanger Bracket	2
28	Intercooler Pump Bracket	1
29	Coolant Tank Bracket	1
30	Power Steering Reservoir Bracket	1

Installation Instructions

Before beginning, please note that this intake manifold kit was fitted on a 2006 E90 sedan. There are minor differences on the E92. If you need any help with installation or have any questions, please email tune@stagefp.com. If you do not feel confident installing this kit, please take it to a professional performance shop. The estimated time for installation is 8 hours.

Before Removing the Factory Intake

Make sure the vehicle is in park or in gear with the parking brake applied. Disconnect the positive battery terminal in the rear trunk.

Removing the Factory Intake

Please follow the guide below for the step-by-step removal of the intake: [Pelican Parts - Intake Manifold Replacement](#)

Disconnecting the Fuel Feed Line

You need to relieve pressure from the fuel rail before disconnecting the fuel line. At the end of the fuel rail, you will see a cap. Remove the cap and, with a small pocket screwdriver, press in the Schrader valve. Make sure that you capture the fuel with a rag and dispose of the fuel and rag properly. At the fuel line connecting to the fuel rail, push forward on the fuel line and press in the tab on the fuel line to release it from the rail.

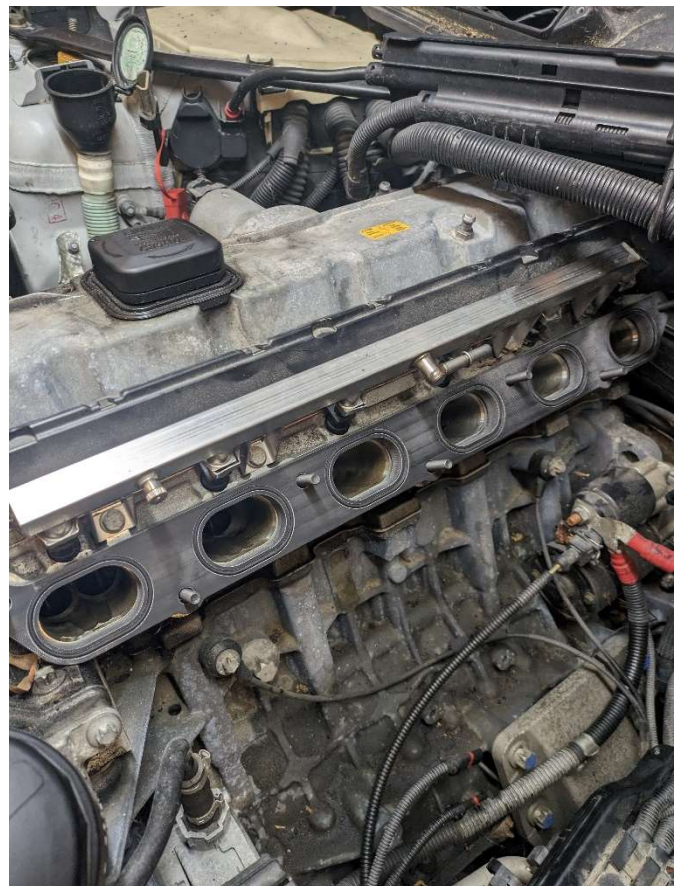
Before Installing the StageFP ATW Intake

NOTE: Depending on how your turbo or supercharger manufacturer has set up the crankcase vent and EVAP, the factory vent and EVAP do not connect to the StageFP intake manifold; they need to be routed to the front of the inlet of the supercharger or turbocharger.

Remove the 5 factory studs from the cylinder head. Clean the surface of the cylinder head, removing any dirt or debris. Install the 7 supplied intake manifold M7-1.0 studs. The shorter side of the stud threads into the cylinder head.

WARNING! Threads in the aluminum cylinder head will not withstand abuse. Care must be taken to ensure proper thread alignment and engagement and to tighten the fasteners to the proper specifications!

Next, install the intake manifold thermal spacer. You need to pre-install the gaskets into the spacer on both sides. Add a dip of oil or grease to help with installation. Slide the spacer over the studs, ensuring you match the orientation of the cylinder intake ports.



Installing the New Intake Air Temp Wiring

Note: Depending on your tuner or type of power adder kit, some might still use the MAF (Mass Air Flow) sensor. This kit removes the intake air temp from this sensor connector and moves it to a more ideal location behind the intercooler for a more accurate reading. Please consult your tuner for their recommendations.

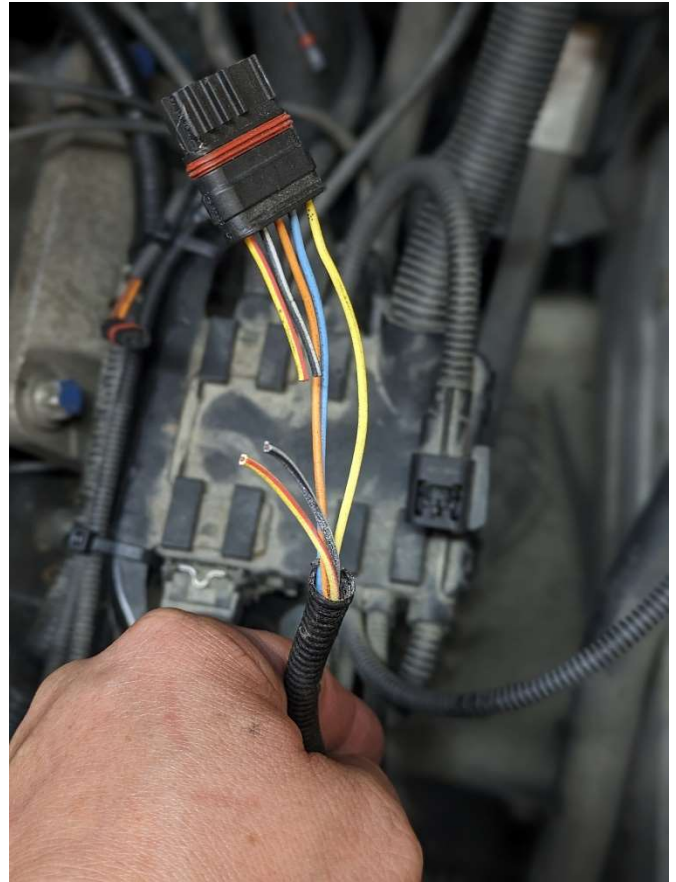
Locate the Mass Air Flow sensor connector and strip back 5-6 inches of the sheathing.

Locate the yellow wire with a red stripe and the black wire with a white stripe; cut the wires 3-4 inches back from the connector.

Route the new connector toward the cylinder head. The sensor will be located on the right rear of the intake manifold on the bottom.

Strip back the wires and solder the black wire with the white stripe to the black wire on the new intake air temp connector wiring pigtail. Do the same for the yellow wire with the red stripe, soldering it to the white wire on the new pigtail.

Make sure to cover the connections with heat shrink or electrical tape.



Relocating the Junction Box for the Intake Manifold

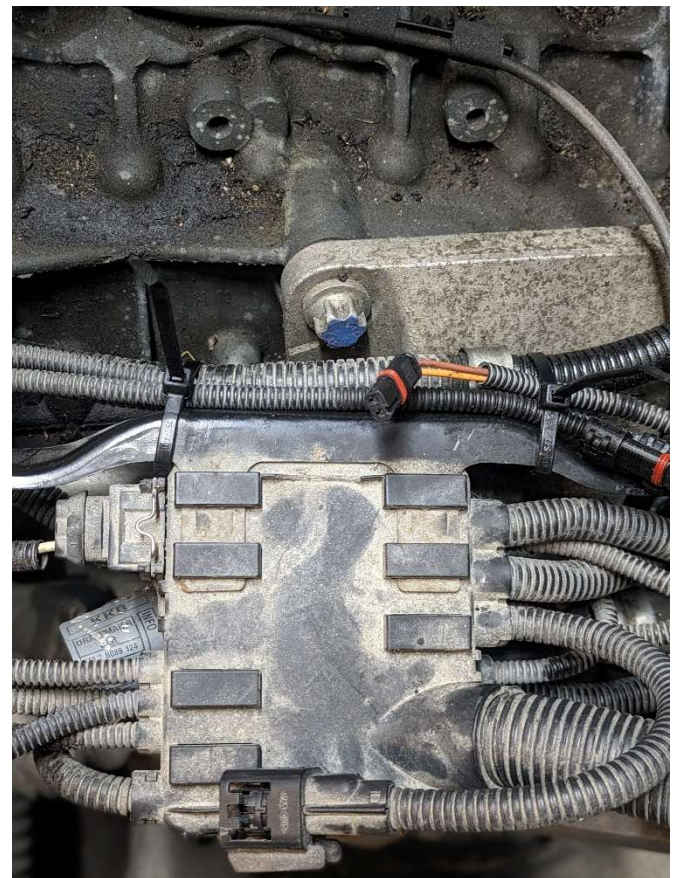
The junction box located under the factory intake needs to be relocated to the K-member frame since it does not connect to the new intake manifold.

Take the junction box and zip-tie it to the frame as shown in the picture below. Make sure not to pinch any of the wires or hoses.

Removing the Factory Power Steering Reservoir Bracket and Installing the Replacement

During the removal of the factory intake, you removed the reservoir. The bracket that it was connected to needs to be removed and replaced with the supplied unit. There should be 3 10mm nuts under the bracket.

At this time, do not reinstall the reservoir.



Preparing the StageFP ATW Intake for Installation

Remove the factory MAP (Manifold Absolute Pressure) sensor from the stock intake manifold. It's located at the top of the intake near the driver's side rear.

Remove the throttle body from the factory intake. Set aside the factory bolts and gasket as they will be reused.

With some Teflon tape, install the intake $\frac{3}{4}$ " barb fitting on each side of the intake manifold. **DO NOT OVERTIGHTEN.**

Install the MAP sensor in the rear of the intake, making sure the connector is facing towards the throttle body. Use the supplied bolts.

With the supplied copper crush washer, install the new intake air temp sensor in the rear of the intake manifold.

Using Teflon tape, install the intake manifold AUX port plug; this port is designed for a boost reference or if you are looking to use meth injection.

Install the throttle body using the factory hardware and gasket, ensuring the throttle body connector is facing the left side of the intake manifold.



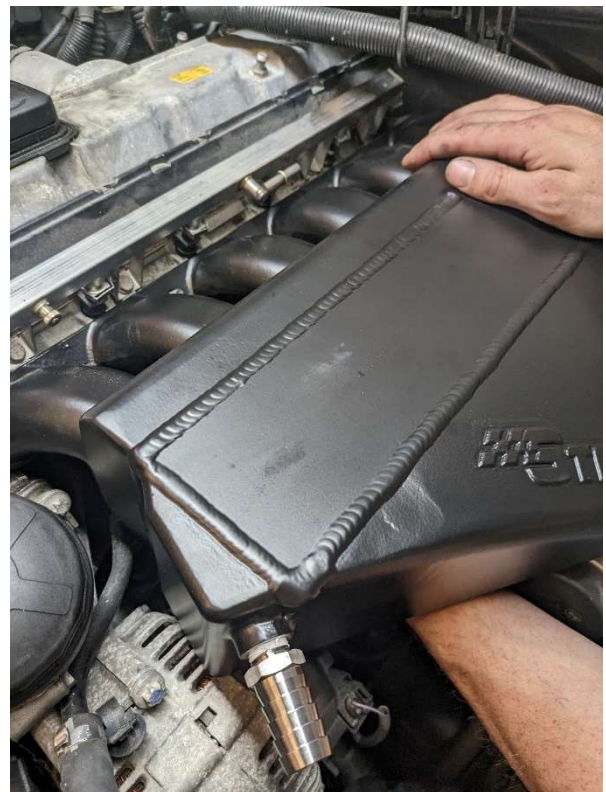
Installation of the Intake Manifold

It's recommended to team lift the intake manifold into place.

Slide the intake over the studs and install two of the supplied M7-1.00 nuts on the first and last studs to hold the intake in place.

Install the other five nuts onto the studs.

Torque the nuts to 100 in-lbs or 8 ft-lbs, working your way from the center to the outer nuts when torquing. You will need to reach under the intake to connect the MAP, IAT, and throttle body.



Installation of the Intercooler Pump

The intercooler pump will be mounted utilizing the M6-1.00 stud on the driver's frame rail and bracket #28. First, attach bracket #28 to the pump using an M8-1.25 nut and bolt before installing the pump onto the vehicle. The inlet of the pump will be facing toward the passenger side, and the outlet of the pump will be pointing straight down.



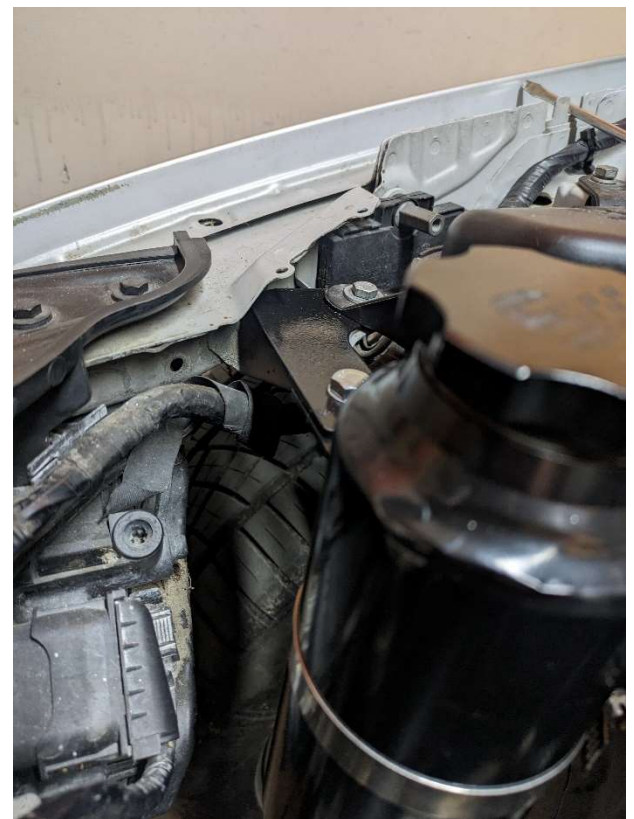
Installation of the Coolant Reservoir

The coolant reservoir will be mounted using bracket #29. The two parts of the bracket will need to be bolted together using an M8-1.25 nut and bolt. Using hose clamp #22, attach the coolant reservoir to bracket #29 by sliding the clamp over the tank and tightening it. Remove the forwardmost OEM coolant reservoir bolt and slide bracket #29 in between the mounting hole and the OEM tank, then reinstall the factory bolt.

Make sure that the tank is elevated above the intake when bleeding the system to ensure all air is removed.

Front Bumper Removal

Follow these steps for the removal of the bumper: [Pelican Parts - Front Bumper Replacement](#)



Modifying the Front Air Dam for Fitment of the Heat Exchanger

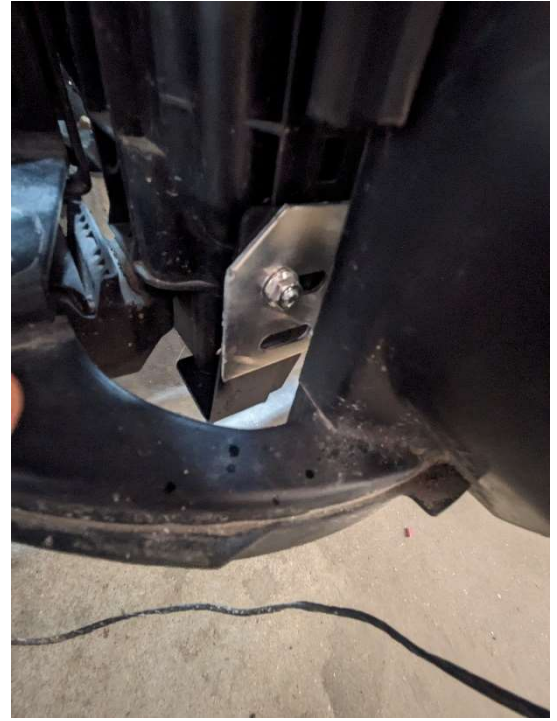
In order to fit the heat exchanger, you will need to cut and modify the front air dam. Please follow the images below on where to trim the air dam.



Installation of the Heat Exchanger

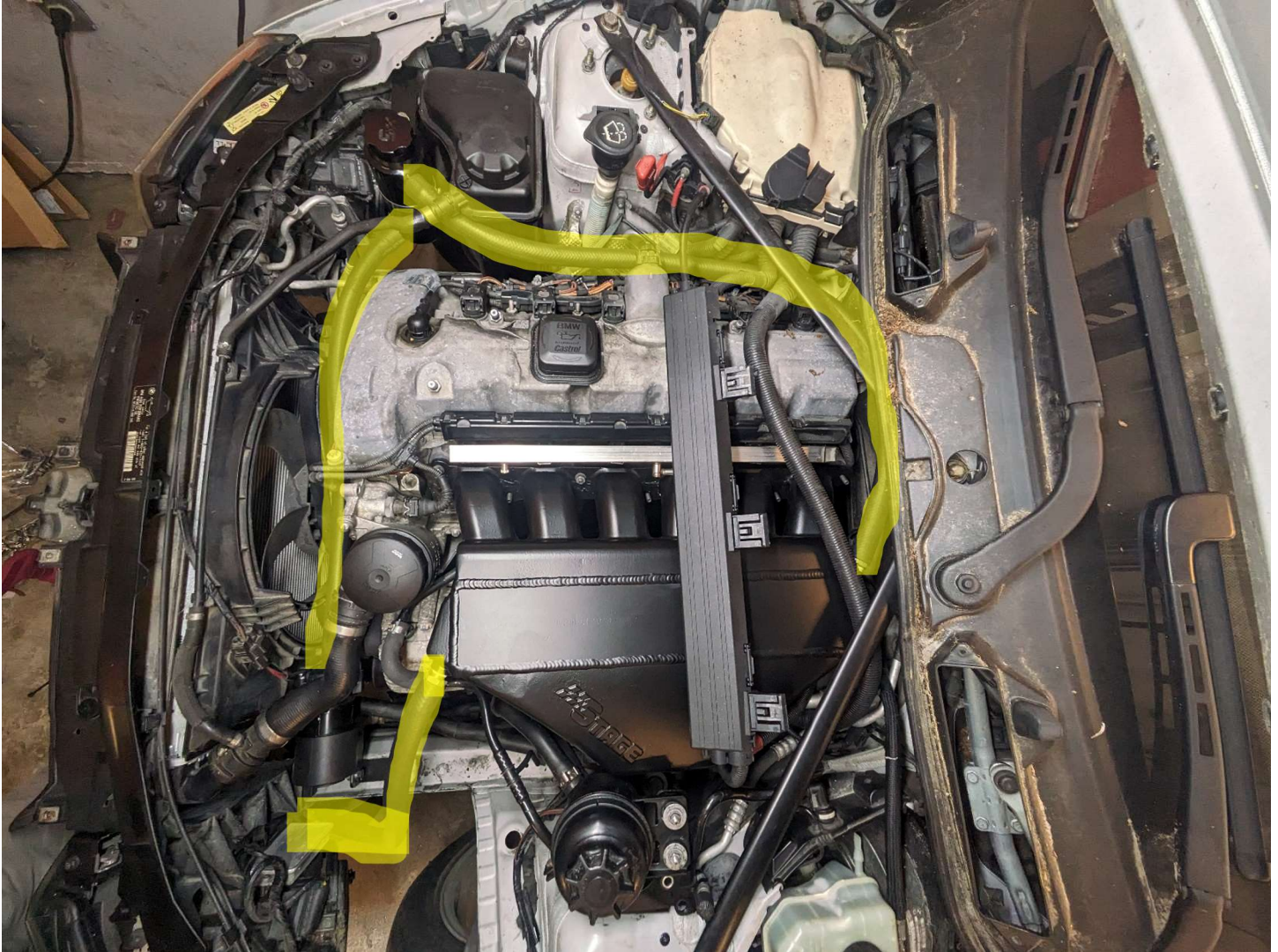
Bolt #27 brackets to the bottom of the air dam using the supplied #21 screws. The screws will thread into the factory location that is not utilized on N52 cars. The holes are the factory mounting location for the intercooler on N54 cars.

Once the brackets are secured, slide the heat exchanger in and line up the holes in the brackets with the slots on the heat exchanger. Use the provided M6-1.00 nuts and bolts to attach them.

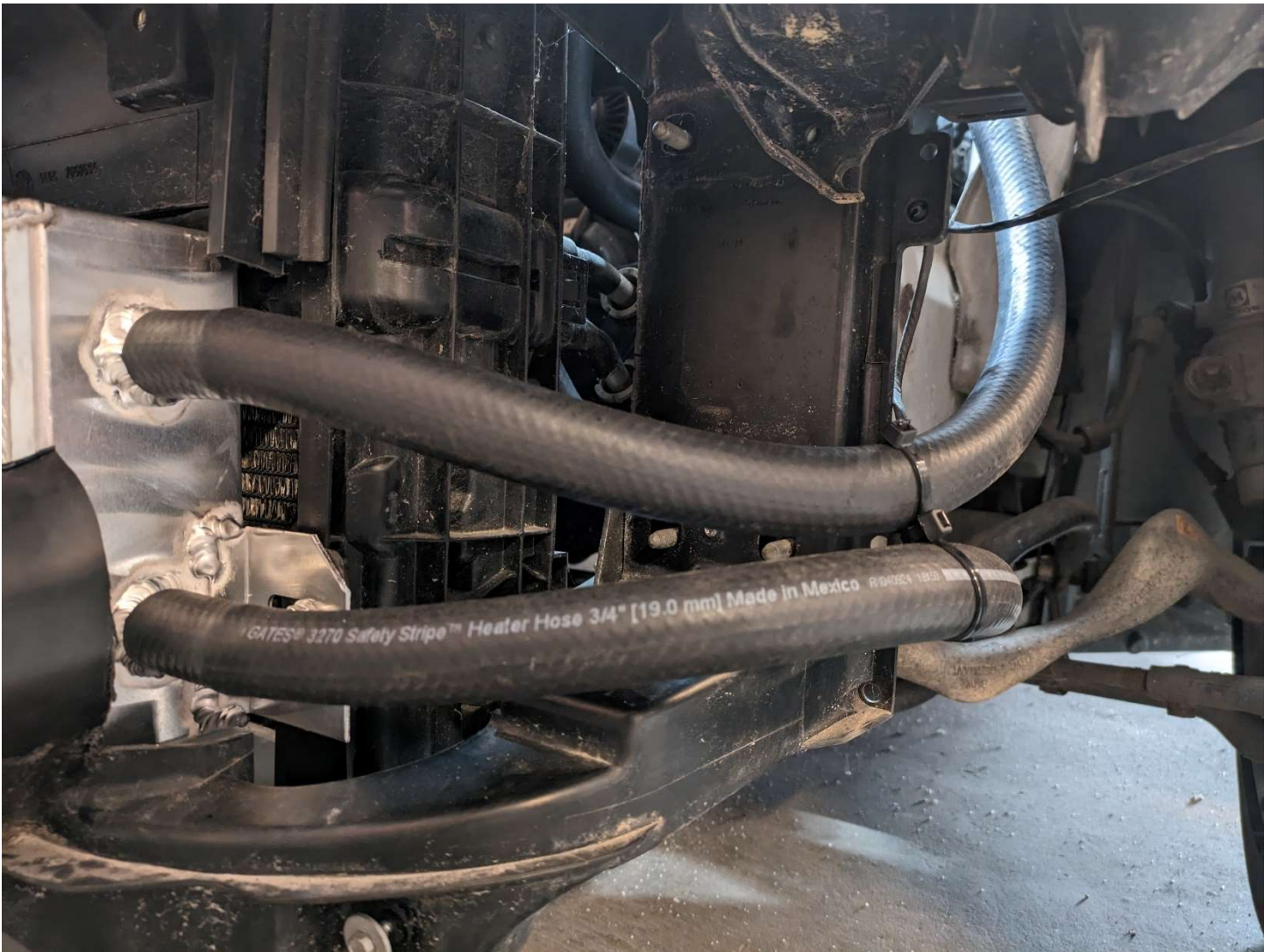


Routing of the Intercooler Hoses

$\frac{3}{4}$ " heater hose is included, which will need to be cut to length. From the bottom outlet of the coolant reservoir, a hose needs to run to the inlet of the intercooler pump. Next, route a hose from the pump outlet to the lower neck on the heat exchanger by running the hose underneath the frame rail as shown. The upper neck on the heat exchanger will run to the barb fitting on the front of the intake, and lastly, the rear barb fitting on the intake will need to be connected to the top port on the coolant reservoir.







Installation of the Intercooler Pump Wiring

The pump harness will first be plugged into the pump. Run the harness across the top of the radiator support toward the passenger side of the vehicle. Mount the relay by using the unused bolt hole next to where the OEM coolant reservoir is secured using an M6-1.00 bolt as shown. The rest of the harness will be routed along the A/C line on top of the passenger frame rail and up toward the DME box. Connect the red wire to the positive jump point as shown and the purple wire to the factory ground location that is a few inches away. The white wire will need to be connected to a switched 12-volt source that will activate the pump when the vehicle is on.

Filling of the Intercooler System

Remove the overflow vent tube from the engine coolant tank.

Remove the intercooler reservoir and raise it above the intake manifold as shown in the image below. Fill it with a 50/50 mix of BMW blue coolant and water.

Once the system has been gravity-filled, reinstall the intercooler reservoir. **NOTE:** Some coolant may come out; this is okay. Just make sure the level is at the top of the upper inlet pipe of the reservoir.

Reinstall the engine coolant overflow vent tube.

It is recommended to have another person assist. Have someone power on the ignition of the car (**DO NOT START THE ENGINE**).

Allow the pump to cycle, watching and filling the reservoir as needed, making sure the level is not past the upper inlet tube.

If there are no leaks, reinstall the reservoir tank cap and the front bumper.

Last Steps Before Starting the Engine

This kit is a universal fitment, meaning it does not include a charge tube. Since there are many different styles of superchargers and turbo kits available for the N51/N52, we are unable to make a plug-in intake tube.

It is recommended to have the car retuned for the intake manifold to take advantage of the cooler air charge coming in, as well as the higher air mass coming in, which may change the fueling of the engine.