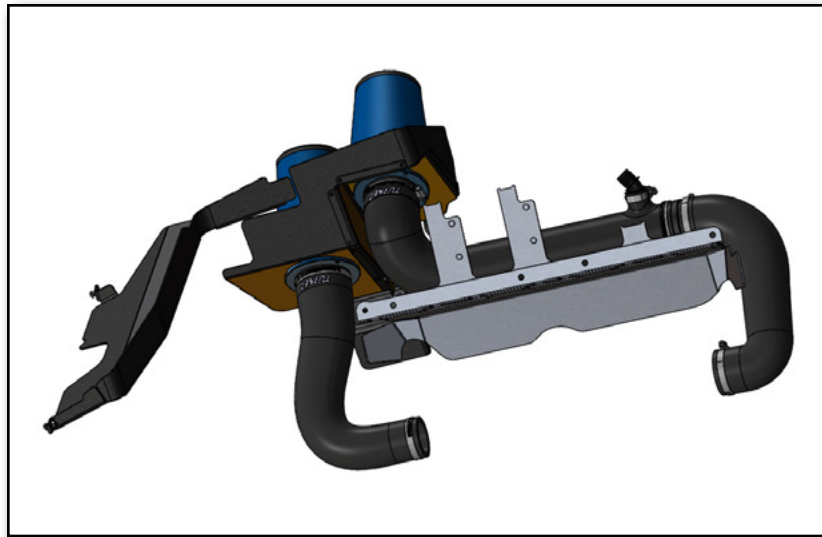




BMW E8x/E9x N54 Turbo Side Intake Installation Guide



Proper service and repair procedures are vital to the safe, reliable operation of all motor vehicles as well as the personal safety of those performing the repairs. Standard safety procedures and precautions (including use of safety goggles and proper tools and equipment) should be followed at all times to eliminate the possibility of personal injury or improper service which could damage the vehicle or compromise its safety.

INTRODUCTION

Turner Motorsport BMW E8x/E9x N54 Turbo Side Intake System

The new Turner Motorsport N54 turbo side intake kit is the ultimate upgrade for your N54 powered 135i or 335i! This kit replaces the small, restrictive OEM turbo inlets with much larger diameter silicone hoses. These new silicone turbo inlets boast significantly better air flow, and they will completely transform the look of your engine bay! Real world gains of 50hp are possible thanks to this innovative system.

This is not an install for the faint of heart, there are a lot of steps and you should expect it to take you at least a full day to complete. An experienced tech with all of the proper tools and access to a lift might be able to complete this job in 6-10 hours. Someone with less experience, who is doing this job on jack stands in the driveway might find they need 12 hours or more to get it done. The install itself is rather straight forward, but it's all of the little details which end up taking so long.

The photo on the right shows the two turbo inlet hoses and their orientation on the RH side of the engine. As you can see, the rear turbo inlet hose is split into two pieces for ease of installation, and has a breather elbow incorporated into it which can be connected to the stock PCV system or an oil catch can system. The two turbo inlet hoses then connect to the bottom side of the main heat shield assembly which houses the two air filters.

Feel free to refer back to this photo at any point during your install if needed.

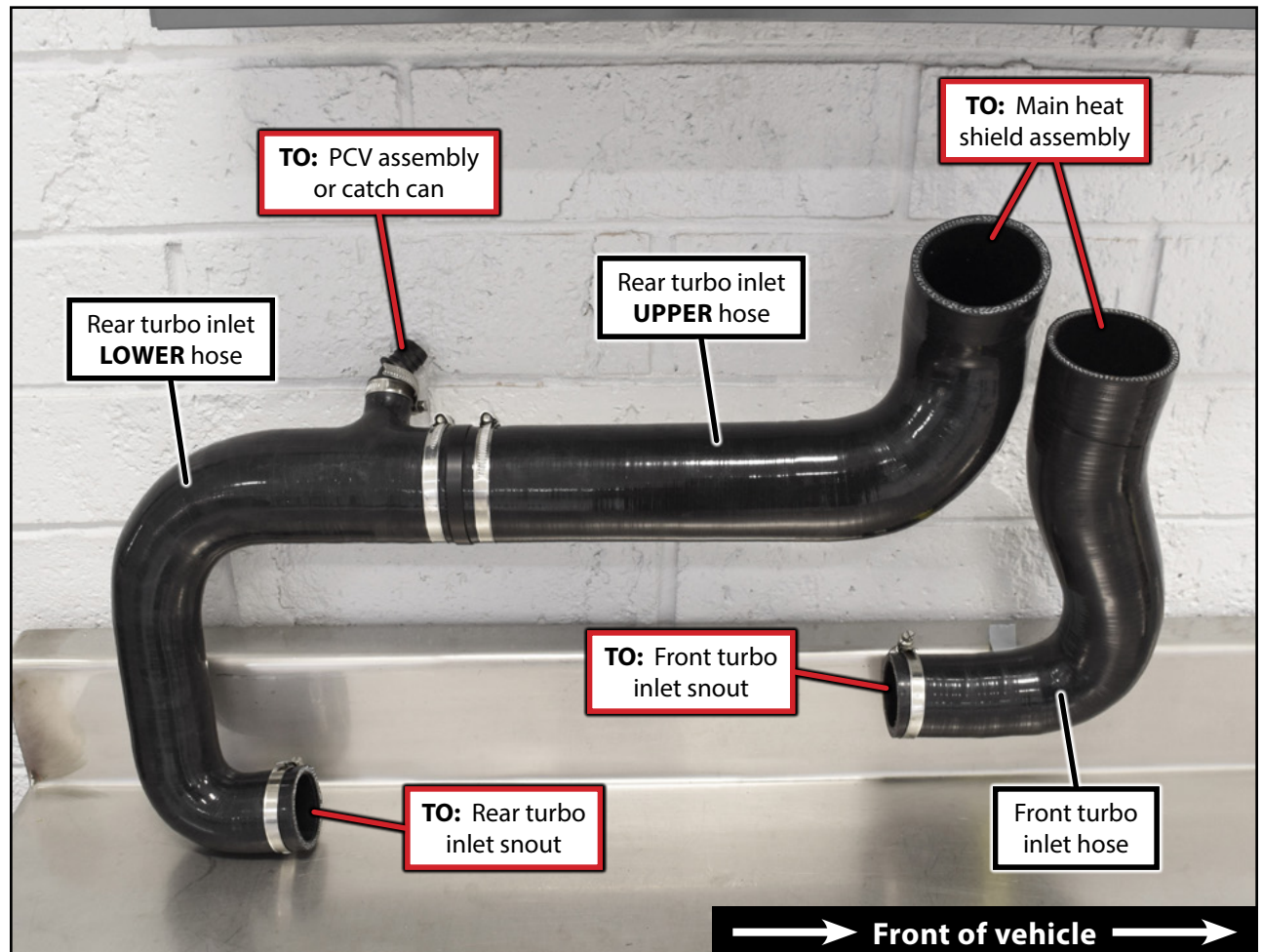


TABLE OF CONTENTS

Installation and Safety Information	pg.6
Removing the Original Front Turbo Inlet.....	pg.7
Removing the Original Rear Turbo Inlet.....	pg.15
Relocating the Vacuum Reservoirs.....	pg.23
Relocating the Coolant Expansion Tank.....	pg.33
Installing the New Turbo Inlet Hoses & Intake System	pg.42
Adjusting the Intake System for Proper Fitment.....	pg.52
Reassembly Procedure	pg.55
Bleeding the Cooling System.....	pg.57

KIT CONTENTS



Front Turbo Inlet Hose & Clamps
(Available in 44mm & 50mm ID)

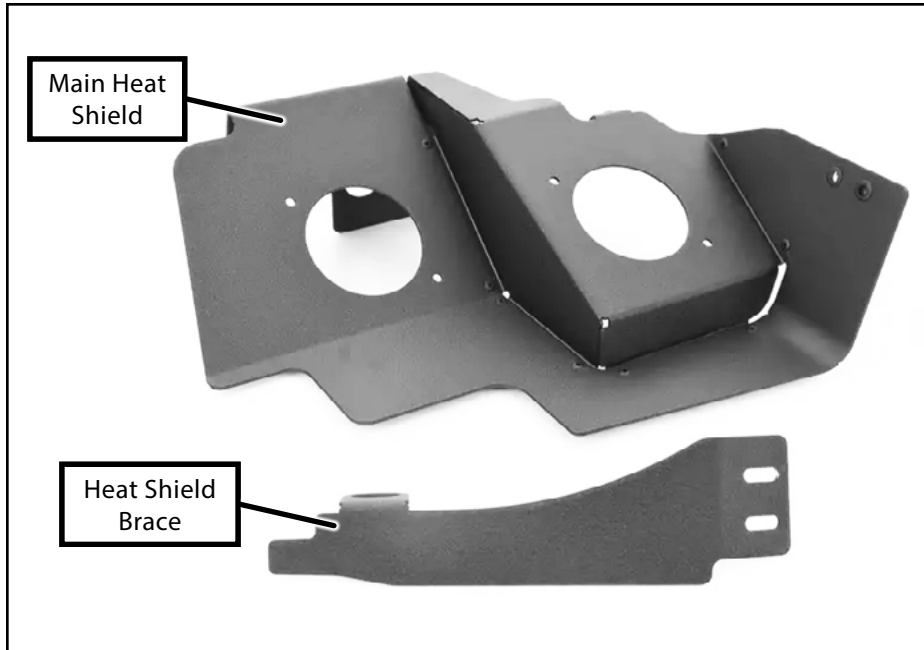


Rear Turbo Inlet Lower Hose & Clamps
(Available in 44mm & 50mm ID)



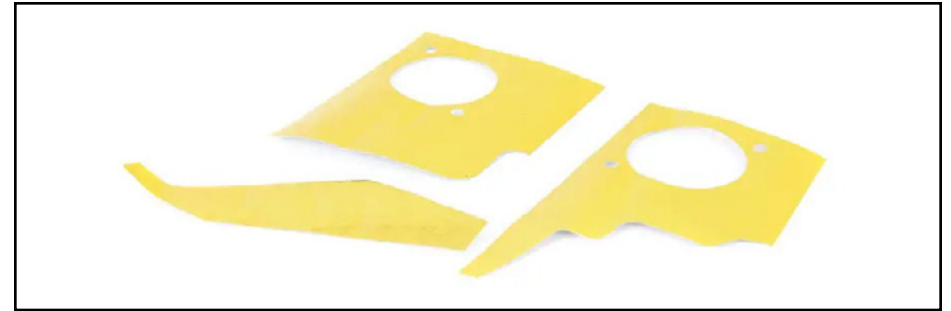
Rear Turbo Inlet Upper Hose & Clamps

KIT CONTENTS (CONTINUED)



Main Heat Shield - QTY 1
(Protects filters from hot engine bay)

Heat Shield Brace - QTY 1
(Connects heat shield to RH strut tower)



Heat Shield Tape Kit - QTY 1
(Reflects engine heat away)



Air Filter Adapter - QTY 2
(Mounts air filters to heat shield)



Hose Coupler - QTY 1
(Connects upper & lower rear inlets)



335i Air Duct - QTY 1
(135i air duct differs slightly in appearance)



Air Filter w/Clamp - QTY 2
(Protects engine from micro-particulates)



Heat Shield Standoff - QTY 2
(Supports the heat shield from below)

KIT CONTENTS (CONTINUED)



Expansion Tank Relocation Kit - **QTY 1**
(**OPTIONAL**, relocates expansion tank to LH corner of engine bay)



Silicone Catch Can Hose - **QTY 1**
(For vehicles w/oil catch can only)



Silicone PCV Hose - **QTY 1**
(For vehicles w/stock PCV only)



Breather Hose Elbow - **QTY 1**
(Connects upper inlet hose to PCV)



Installation Hardware Kit - **QTY 1**
(All required mounting hardware)



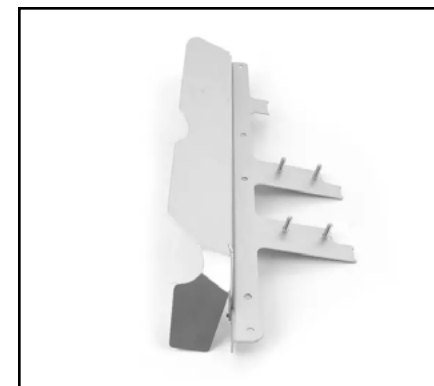
Vacuum Reservoir Bracket - **QTY 1**
(Mounts the relocated reservoirs)



Vacuum Hose: 1m length - **QTY 3**
(Connects relocated vacuum reservoirs)



5/8" Bulb Seal - **QTY 1**
(Main heat shield, brace & air duct)



Manifold Heat Shield - **QTY 1**
(Protects hoses from hot engine bay)

INSTALLATION NOTES

- **RH** refers to the *passenger side* of the vehicle.
- **LH** refers to the *driver side* of the vehicle.
- Always use the proper torque specifications.
- If applicable to this installation, torque specifications will be listed throughout the document and at the end as well.
- Please read all of these instructions and familiarize yourself with the complete process **BEFORE** you begin.

GENERAL PREPARATION AND SAFETY INFORMATION

Turner Motorsport cares about your health and safety, please read the following safety information. This information pertains to automotive service in general, and while it may not pertain to every job you do, please remember and share these important safety tips.

- Park your car in a safe, well lit, level area.
- Shut the engine off and remove the key from the ignition switch.
- Make sure any remote start devices are properly disabled.
- **ALWAYS** wear safety glasses.
- Make sure the parking brake is applied until the vehicle is safely lifted and supported.
- Whether lifting a vehicle using an automotive lift or a hydraulic jack, be sure and utilize the factory specified lift points.
- Lifting a vehicle in an incorrect location can cause damage to the suspension/running gear.
- **ALWAYS** support the vehicle with jack stands.
- **ALWAYS** read and follow all safety information and warnings for the equipment you are using.



NEVER get underneath a vehicle that is supported only by a jack, and **ALWAYS** make sure that the vehicle is securely supported on jack stands.

REMOVING THE ORIGINAL FRONT TURBO INLET

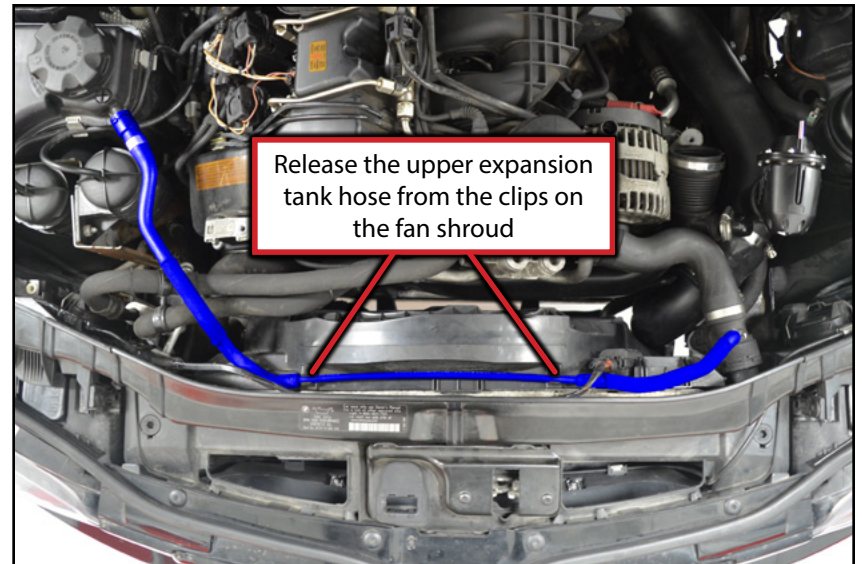
Step 1:

Remove the intake system, air box, rain tray, engine cover (all highlighted in **GREEN** in the photo), and catch can (if equipped).



Step 2: Flat Blade Screwdriver

Release the upper expansion tank hose (highlighted in **BLUE**) from the clips along the top of the fan shroud.



REMOVING THE ORIGINAL FRONT TURBO INLET

Step 3: Flat Head Screwdriver

Disconnect the fan shroud electrical connector (LH photo), then release the wiring harness clips from the core support (RH photo).



Step 4: T25 Torx

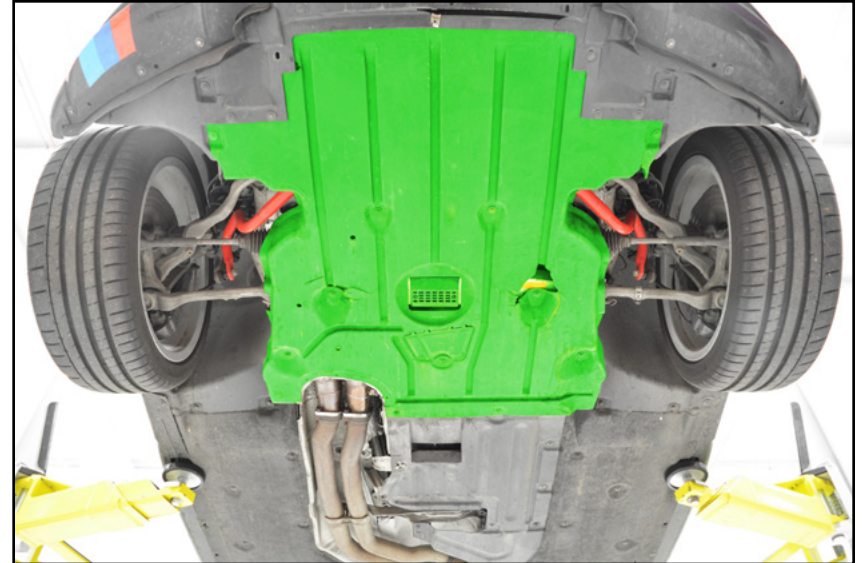
Remove the screw from the upper RH corner of the fan shroud.



REMOVING THE ORIGINAL FRONT TURBO INLET

Step 5: 8mm Socket & Ratchet

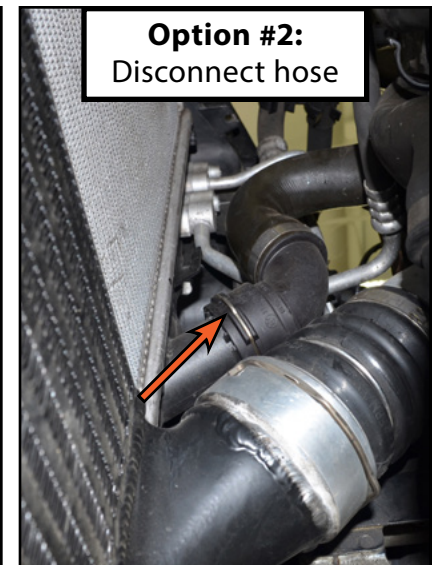
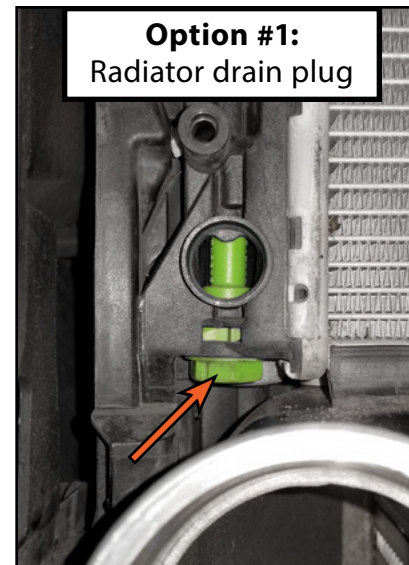
Remove the belly pan from the vehicle (highlighted in **GREEN**).



Step 6:

Now it's time to drain the coolant from the system. While we don't need to drain the entire system, we need to drain enough of it to remove the stock expansion tank and the hoses without making a mess.

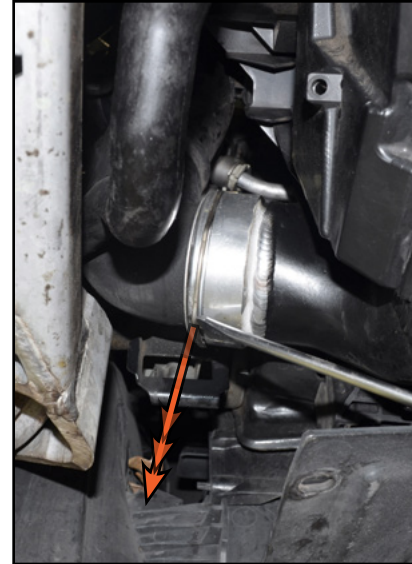
Some models may have a drain plug on the radiator (shown in the LH photo), while others will require you to disconnect the lower radiator hose in order to drain the coolant (shown in the RH photo).



REMOVING THE ORIGINAL FRONT TURBO INLET

Step 7: Flat Blade Screwdriver or Hose Pick

Disconnect the intercooler outlet coupler from the intercooler (LH photo), then slide it out as shown (RH photo).

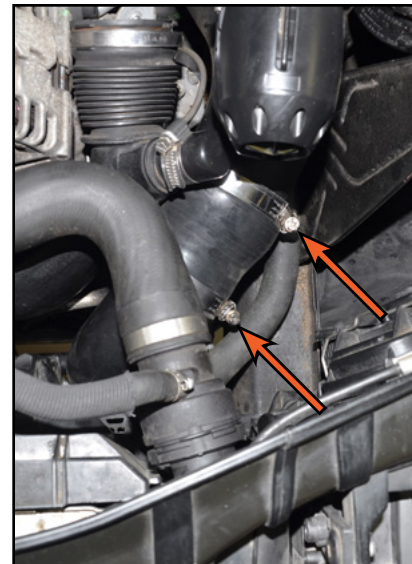


Step 8: Flat Blade Screwdriver or Hose Pick

Loosen the hose clamps on the intercooler outlet pipe (LH photo), then release the clip on throttle body charge pipe. Disconnect the MAP sensor, then remove the throttle body charge pipe from the vehicle (RH photo).



If necessary, you can remove the upper radiator hose in order to gain additional clearance for the next step.



REMOVING THE ORIGINAL FRONT TURBO INLET

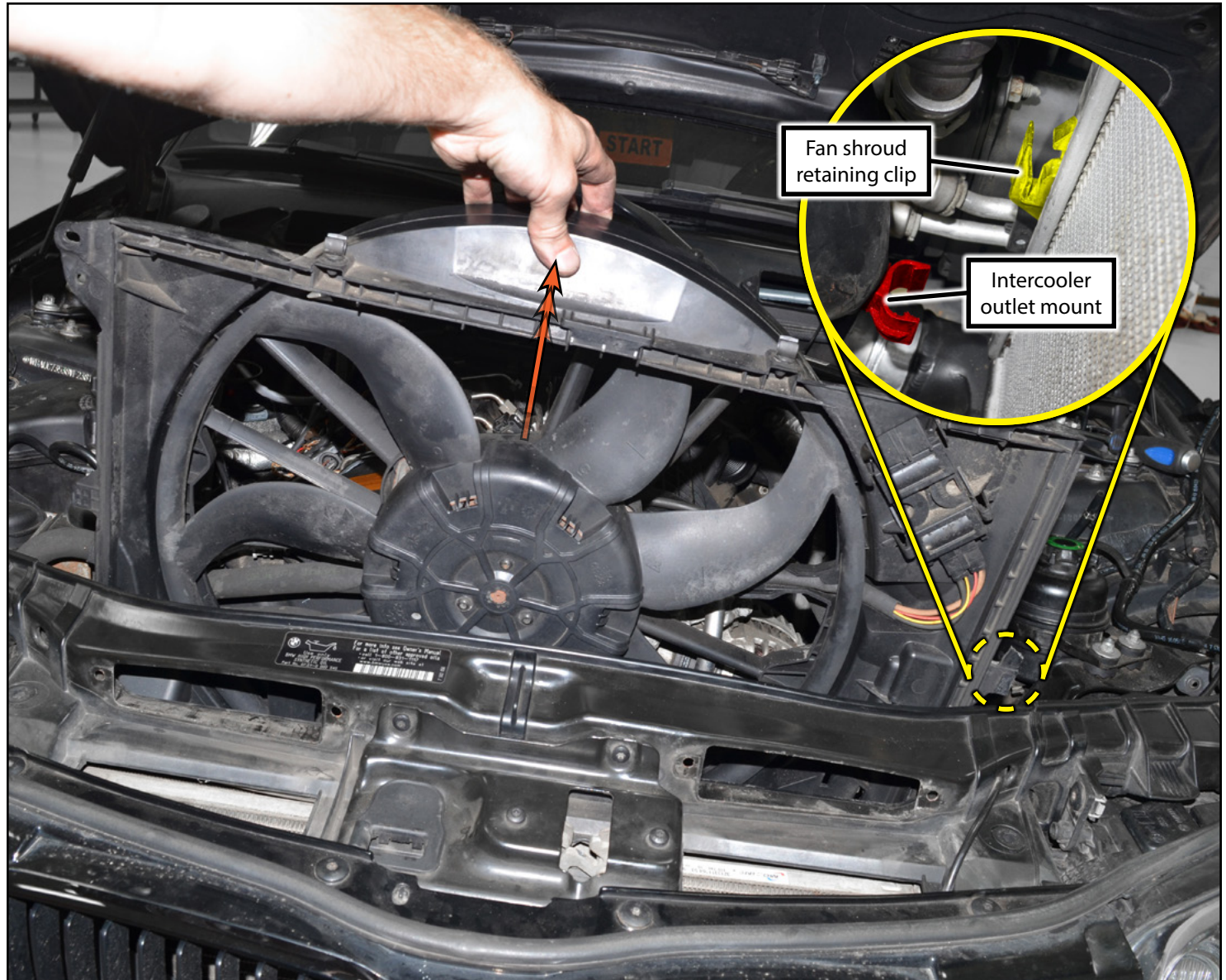
Step 9:

Now it's time to remove the fan shroud, this part takes a bit of patience.

There is a single tab on the LH (driver's) side of the fan shroud which locks into a slot on the radiator (highlighted in **YELLOW** in the inset photo). You want to **CAREFULLY** pry on the tab with a screwdriver while you start to lift the fan shroud upward. This tab can be quite brittle, so be gentle.

There is also a rubber bushing on the fan shroud which slides into the intercooler outlet mount (highlighted in **RED** in the inset photo). Be careful not to break off the mount or the bushing.

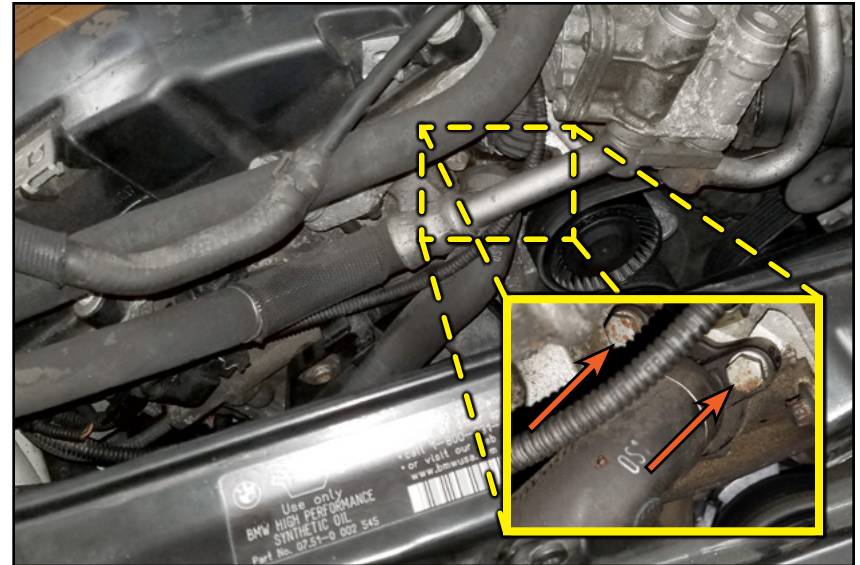
Lift the fan shroud out of the engine bay and set it aside.



REMOVING THE ORIGINAL FRONT TURBO INLET

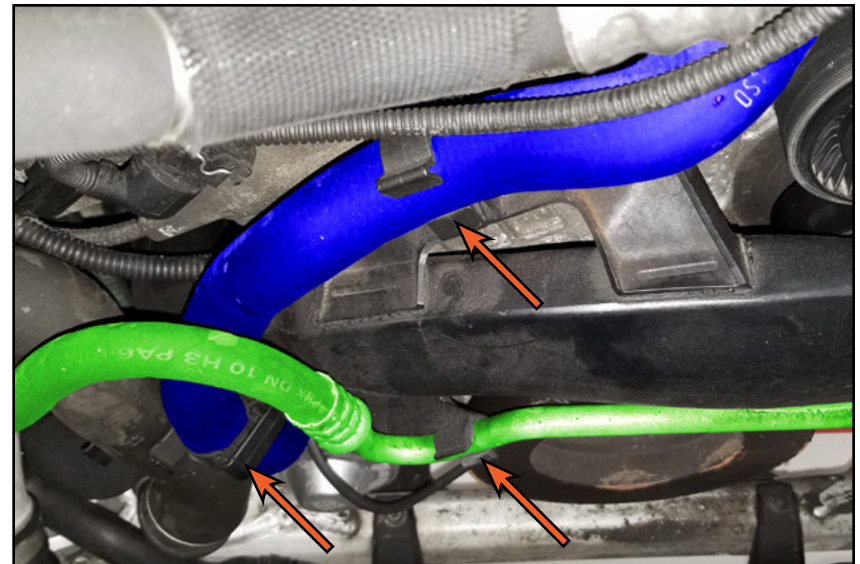
Step 10: 10mm Socket & Ratchet

Remove the bolts from the coolant hose on the front of the engine. This hose can remain connected below, but this flange needs to be pulled out of the engine to remove the front turbo inlet.



Step 11:

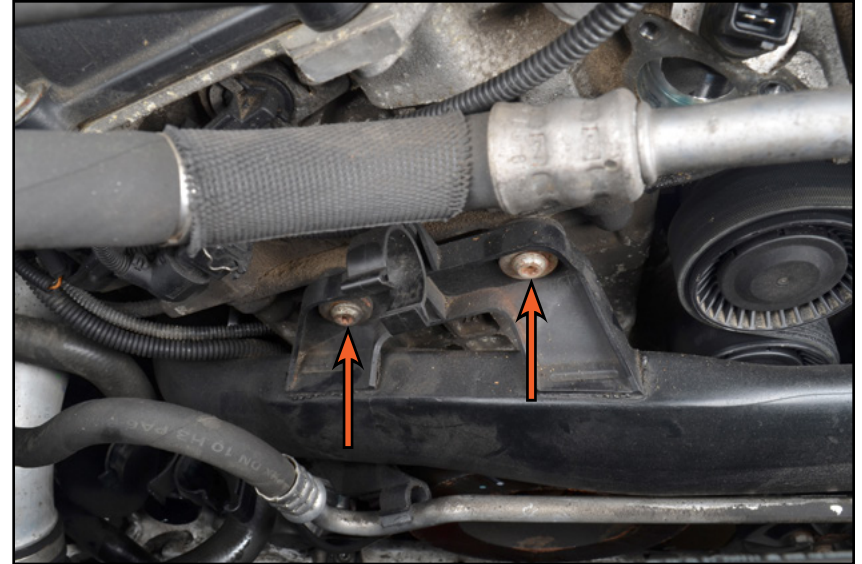
Pull the coolant hose (highlighted in **BLUE**) and the A/C line (highlighted in **GREEN**) out of the clips (arrows) in the front turbo inlet.



REMOVING THE ORIGINAL FRONT TURBO INLET

Step 12: T30 Torx

Remove the two bolts (arrows) which secure the front turbo inlet to the engine.



Step 13: Flat Blade Screwdriver or Hose Pick

Lift on the clip in the upper radiator hose fitting, then pull the hose off of the radiator.



REMOVING THE ORIGINAL FRONT TURBO INLET

Step 14:

Working from below, pull the front turbo inlet off of the turbo.



Step 15:

Working from above, remove the front turbo inlet from the engine. This takes a little patience and twisting, but it will come out as shown in the photo.



REMOVING THE ORIGINAL REAR TURBO INLET

Step 1:

Moving to the back of the engine, remove the crank vent hose between the valve cover and the intake tube (highlighted in **GREEN** in the photo). These are a little tricky at times, due to the self locking fittings on the end. You'll have to use a pick and gently work around the perimeter of each fitting to release it.



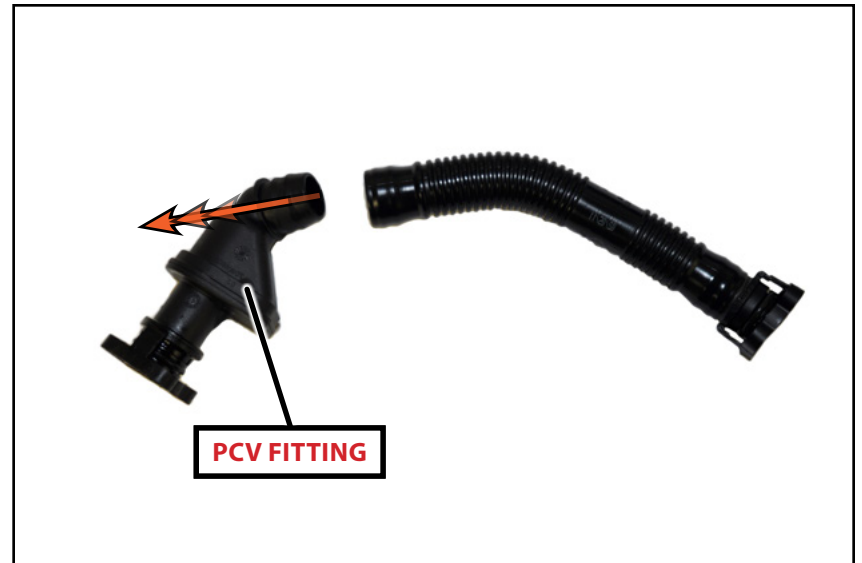
You will need to reuse the end fittings from this vent hose. For more information on this, please reference Pages 8, & 11-13 of our N54 catch can PDF. That PDF can be found by clicking [HERE](#).



Step 2: Heat Gun - or - Razor Blade

Now you'll have to separate the PCV fitting from the crank vent hose, it is needed to connect the breather system. There are two ways you can do this:

1. Heat the end of the hose and pull the fitting out. Use caution with this method since you can easily get the fitting too hot and melt it.
2. Carefully slice the hose at the fitting using a sharp razor blade, then pull the fitting out.

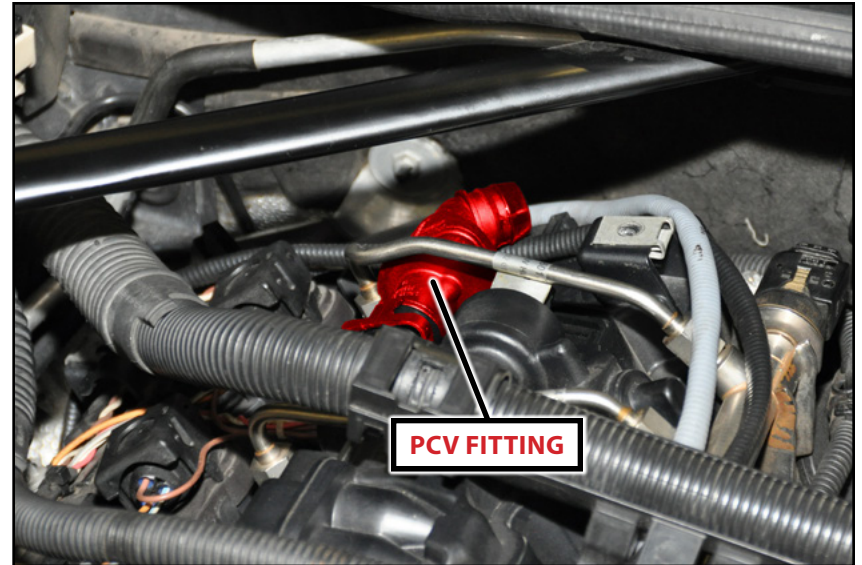


REMOVING THE ORIGINAL REAR TURBO INLET

Step 3:

Reinstall the PCV fitting onto the valve cover. This fitting will be connected to one of the following later on in the install ([Page 48](#)):

1. Catch Can users will connect the catch can **FEED** hose.
2. Stock PCV users will connect the breather hose from the rear turbo inlet hose.



Step 4: Small Angled Pick

Disconnect the electrical connector from PCV heater on the rear turbo inlet.



The PCV heater will not be reused with the new intake system. This harness can be secured out of the way.



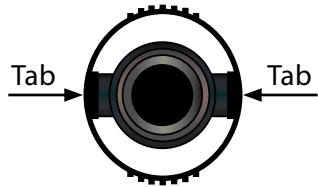
REMOVING THE ORIGINAL REAR TURBO INLET

Step 5:

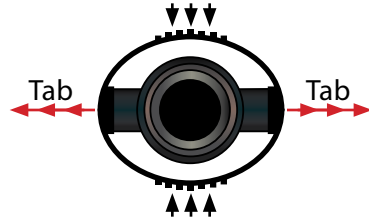
Disconnect the brake booster vacuum line **FRONT** connection by squeezing the two retaining tabs together and pulling up on the line.

NORMAL INSTALLED STATE:

The tabs keep the hose "locked" onto the fitting.



TO REMOVE: Squeeze the knurled sides of the locking ring together and the tabs will expand out and unlock, allowing you to pull the connector off of the air box.



Step 6:

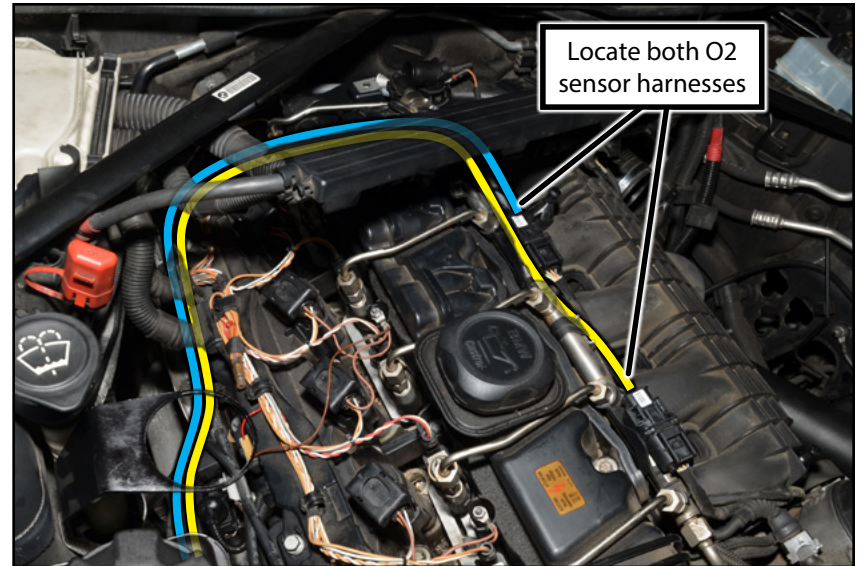
Disconnect the brake booster vacuum line **REAR** connection by depressing the white locking tab inward while pulling it outward.



REMOVING THE ORIGINAL REAR TURBO INLET

Step 7:

Locate the upstream oxygen sensor harnesses and connectors. Familiarize yourself with how they are routed around the back side of the engine, we will want to replicate this routing when we are reassembling later on.



Step 8:

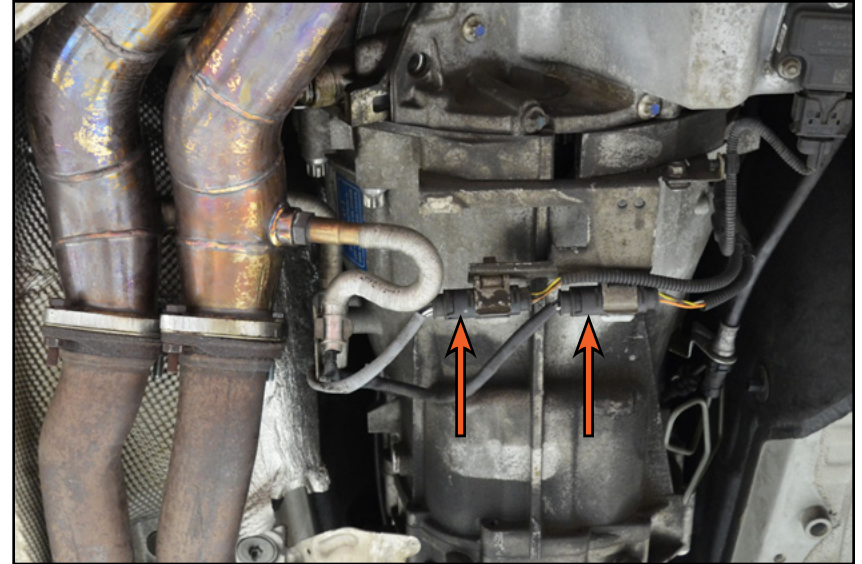
Disconnect both upstream oxygen sensor harness connectors, then release the harnesses from all of the clips which secure them to the engine.



REMOVING THE ORIGINAL REAR TURBO INLET

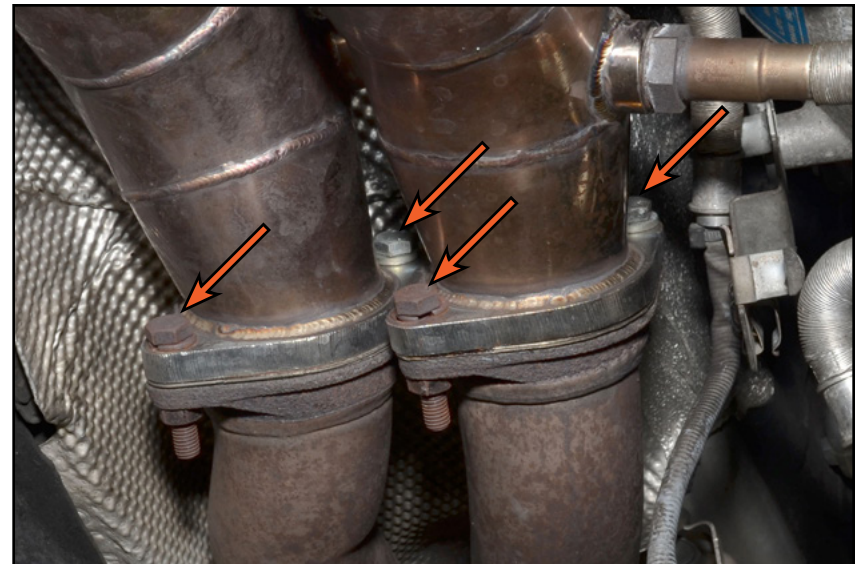
Step 9:

Disconnect both downstream oxygen sensor connectors.



Step 10: 13mm Socket & Ratchet, 13mm Wrench

Disconnect the downpipes from the exhaust system.



REMOVING THE ORIGINAL REAR TURBO INLET

Step 11:

Before we proceed, we would strongly advise you to remove the upstream oxygen sensors from the downpipes. Removing the sensors makes it much easier to remove the downpipes, and it might save you from needing to drop the subframe for clearance.

Once the oxygen sensors have been removed, loosen and remove the two 13mm v-clamp bolts, then remove the downpipes.

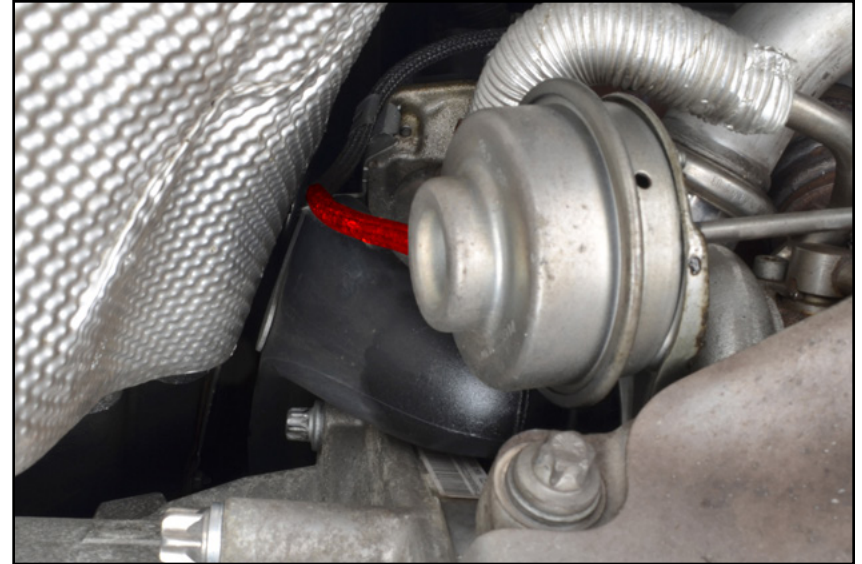


You may need to remove or lower the subframe in order to remove the downpipes. Reference our YouTube video for this procedure by clicking [HERE](#).

REMOVING THE ORIGINAL REAR TURBO INLET

Step 12:

Disconnect the vacuum hose from the rear turbo wastegate (highlighted in **RED**).



Step 13:

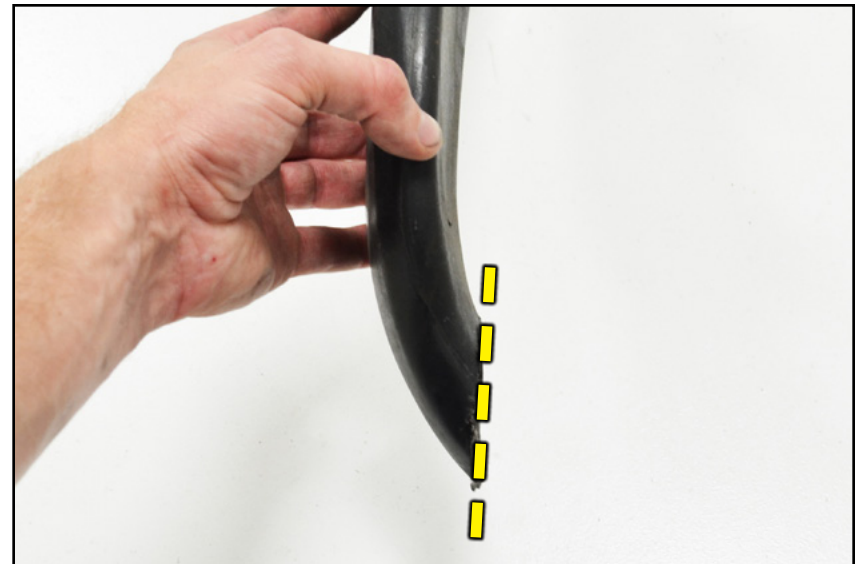


DO NOT make any cuts until you have read all the way through to the end of Page 22.



Now we're almost ready for the worst part of this job; cutting the rear turbo inlet in order to remove it. There is no way to remove this pipe without cutting it, there simply isn't enough clearance around the engine.

The photo on the right shows what we're going to be trying to accomplish, we want to make our cut nice and straight and make the inlet pipe as thin as possible so we can pull it out from above.



REMOVING THE ORIGINAL REAR TURBO INLET

Step 14:

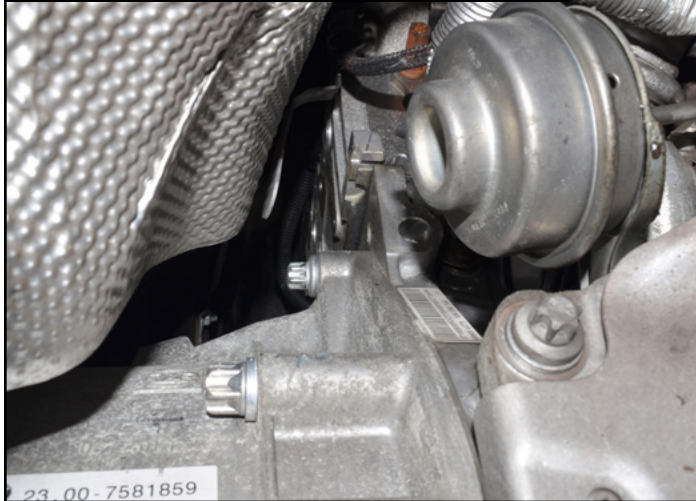
Look closely around the turbo inlet and identify any nearby components which you don't want to cut (**Photo #1**).

Carefully make your cut through the rear turbo inlet, make it by hand if at all possible (**Photo #2**). If you need to use a reciprocating saw or other power tool **BE CAREFUL!**

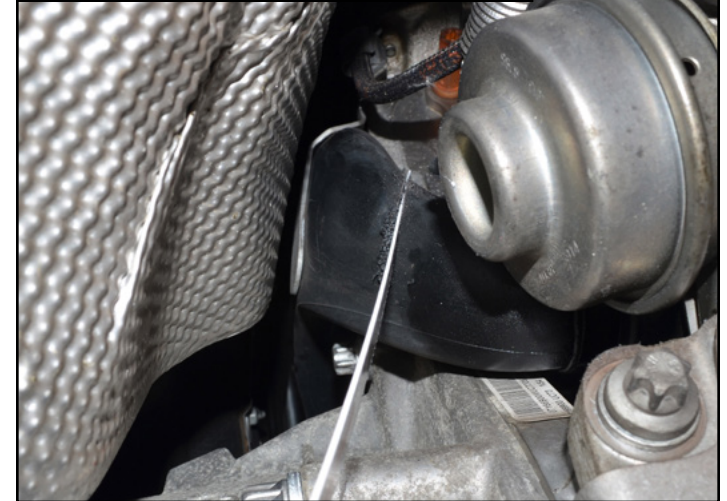
Locate and remove the two T30 screws which secure the rear turbo inlet to the back of the engine (**Photo #3**).

Remove the rear turbo inlet from the vehicle (not shown).

#1: Identify nearby components and risks



#2: Make your cut by hand if possible



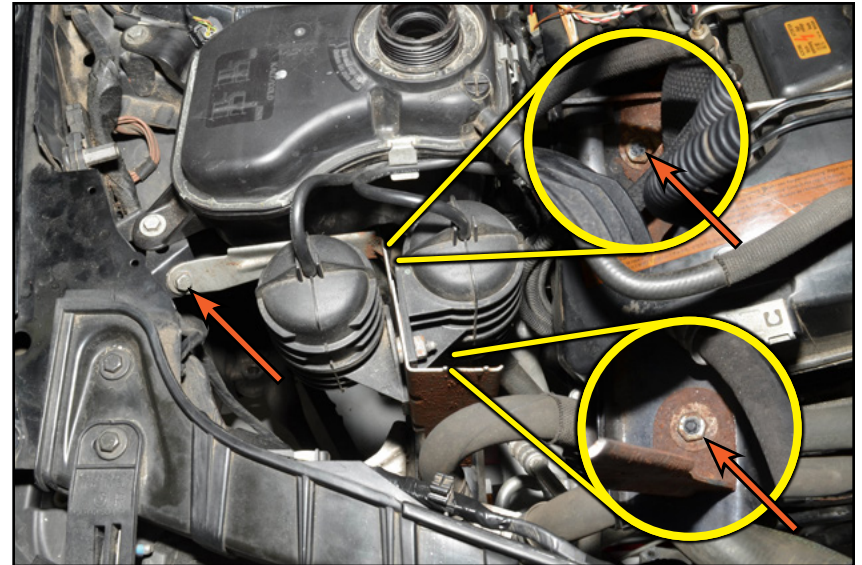
#3: Locate the two T30 rear inlet mounting screws, remove the rear inlet from the engine bay



RELOCATING THE VACUUM RESERVOIRS

Step 1: 10mm Socket, Ratchet & Extension

Locate and remove the three fasteners from the vacuum reservoir mounting bracket. A few of them are rather difficult to see, note the inset photos on the right.



Step 2:

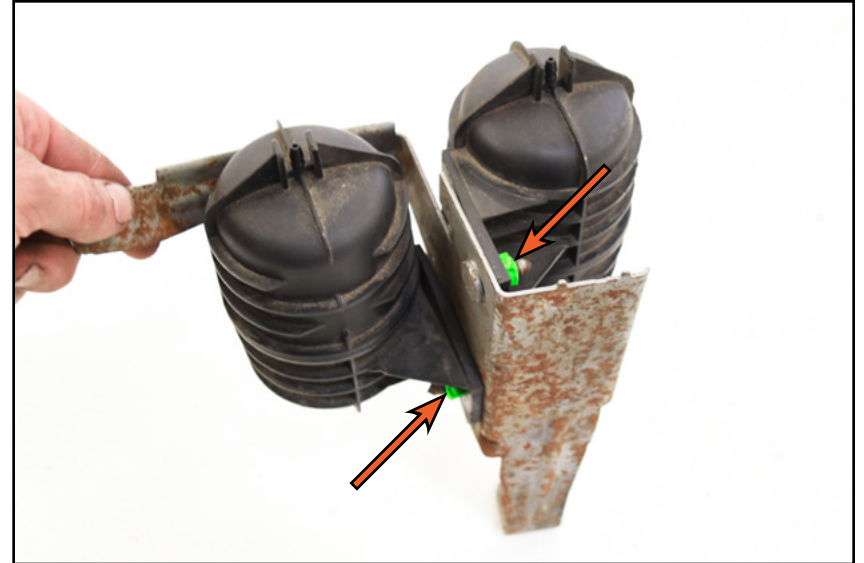
Disconnect the vacuum lines from the reservoirs, then remove them from the vehicle and set them aside.



RELOCATING THE VACUUM RESERVOIRS

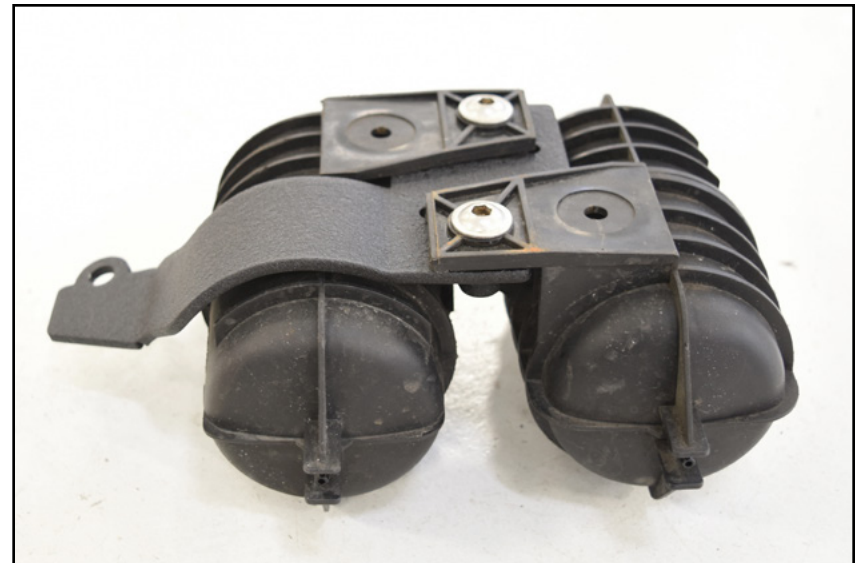
Step 3: 13mm Socket & Ratchet

Remove the nuts (highlighted in **GREEN**) which secure the vacuum reservoirs to the OE mounting bracket.



Step 4: 5mm Hex (Allen)

Install the vacuum reservoirs into the new relocation bracket using the provided M8 bolts.



RELOCATING THE VACUUM RESERVOIRS

Step 5:

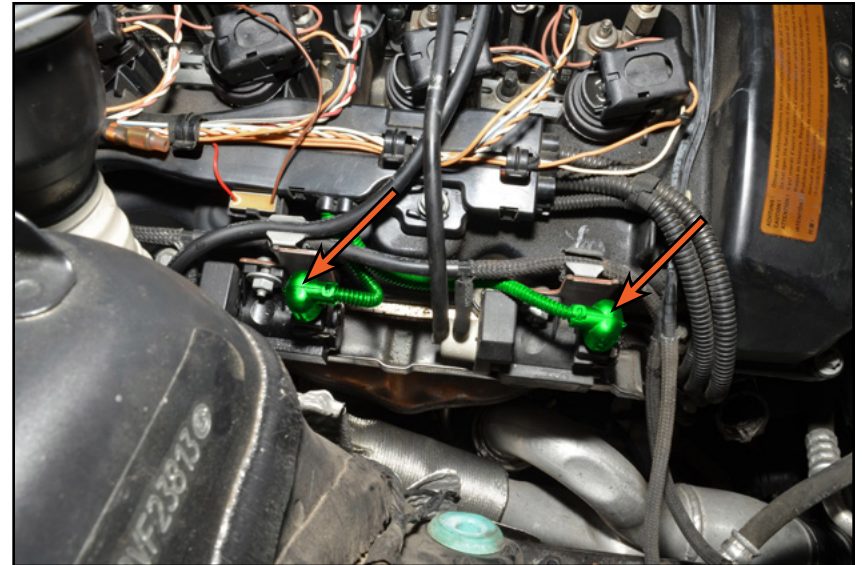
Install the new relocation bracket onto the engine block just below the throttle body as shown.



RELOCATING THE VACUUM RESERVOIRS

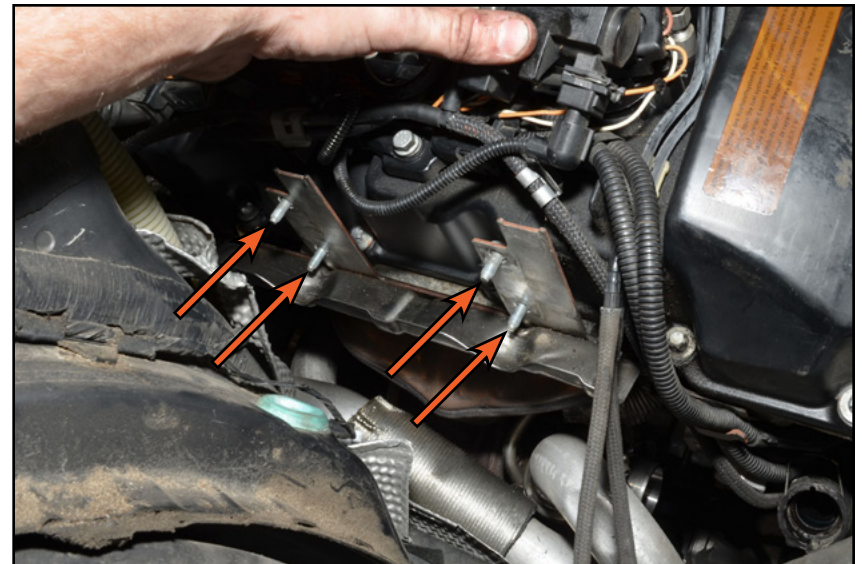
Step 6:

Disconnect the electrical connectors from the wastegate solenoids (highlighted in **GREEN**).



Step 7: 10mm Socket & Ratchet

Locate and remove the four nuts which secure the wastegate solenoids to the heat shield. They are a bit difficult to see, so the photo on the right was taken with them removed for better visibility.



INSTALLING THE NEW TURBO INLETS & INTAKE SYSTEM

Step 8:

Now it's time to remove the turbo outlet pipes. There simply isn't enough room to install the new heat shield with these pipes in place.

We've performed this install on vehicles with stock outlets as well as aftermarket outlets, removal is very similar for both. Remove the clamps which secure the outlet pipes to the turbos, remove the coupler from the intercooler, then remove the pipes from the engine bay.

#1: For vehicles w/stock turbo outlet pipes



#2: For vehicles w/aftermarket turbo outlet pipes

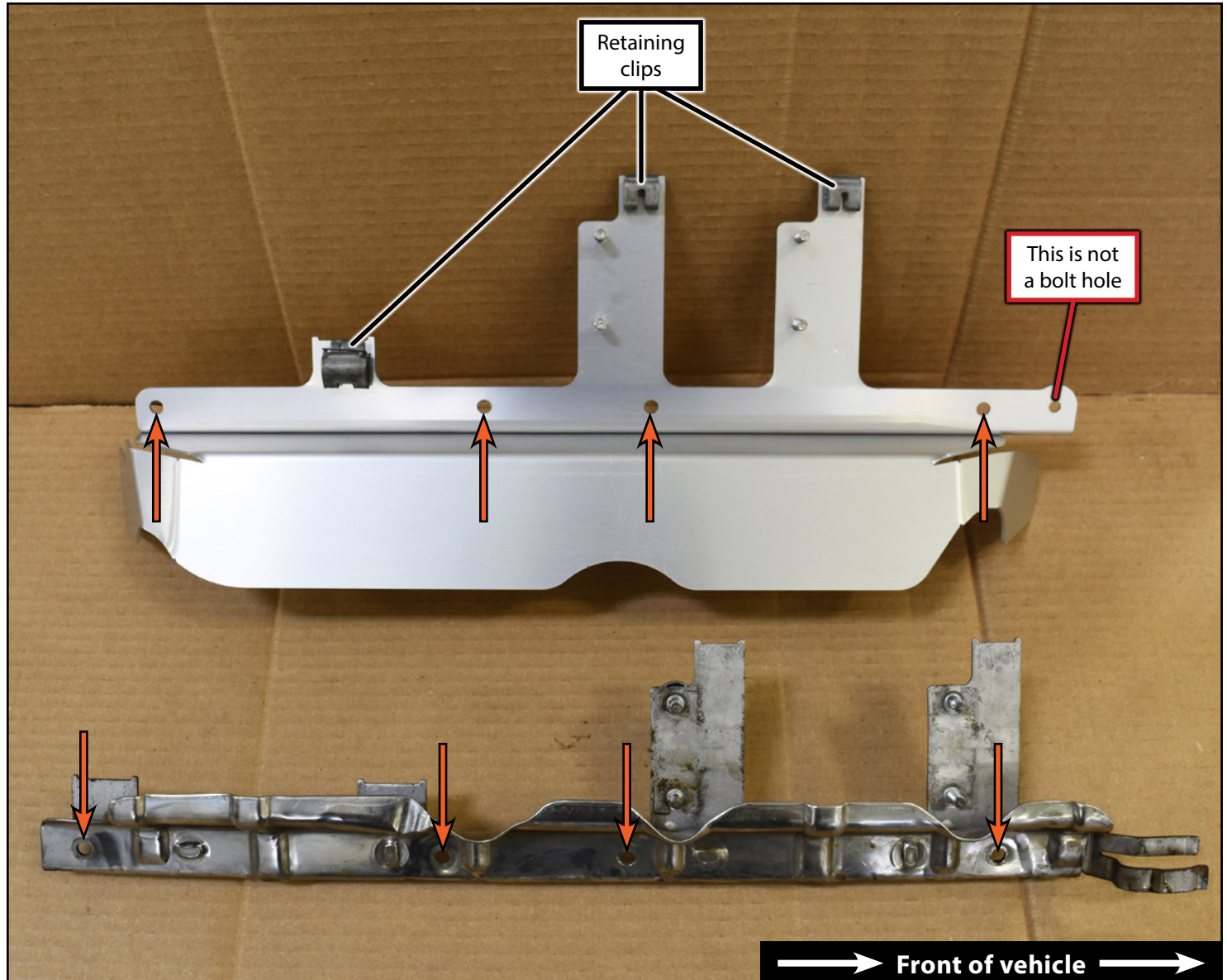


INSTALLING THE NEW TURBO INLETS & INTAKE SYSTEM

Step 9:

Now it's time to remove the heat shield from the RH side of the engine. There is no good way to get a camera into this space to show you where the bolts are located, so we've put this image together for reference (bolt locations are shown with arrows).

Transfer the retaining clips from the stock heat shield over to the new upgraded heat shield.



INSTALLING THE NEW TURBO INLETS & INTAKE SYSTEM

Step 10:

Install the new heat shield onto the engine with the original bolts, then mount the wastegate solenoids.

Connect the vacuum hoses from the solenoids to the plastic lines which run over the valve cover (reference the diagram on the next page for more info).

DO NOT reinstall your turbo outlet pipes at this time. You might notice that they're back on our vehicle in the photo, but you need to leave them off until after you install the rear turbo inlet lower hose.



DO NOT cut any of the vacuum hoses until you read all the way through to the end of Page 32.

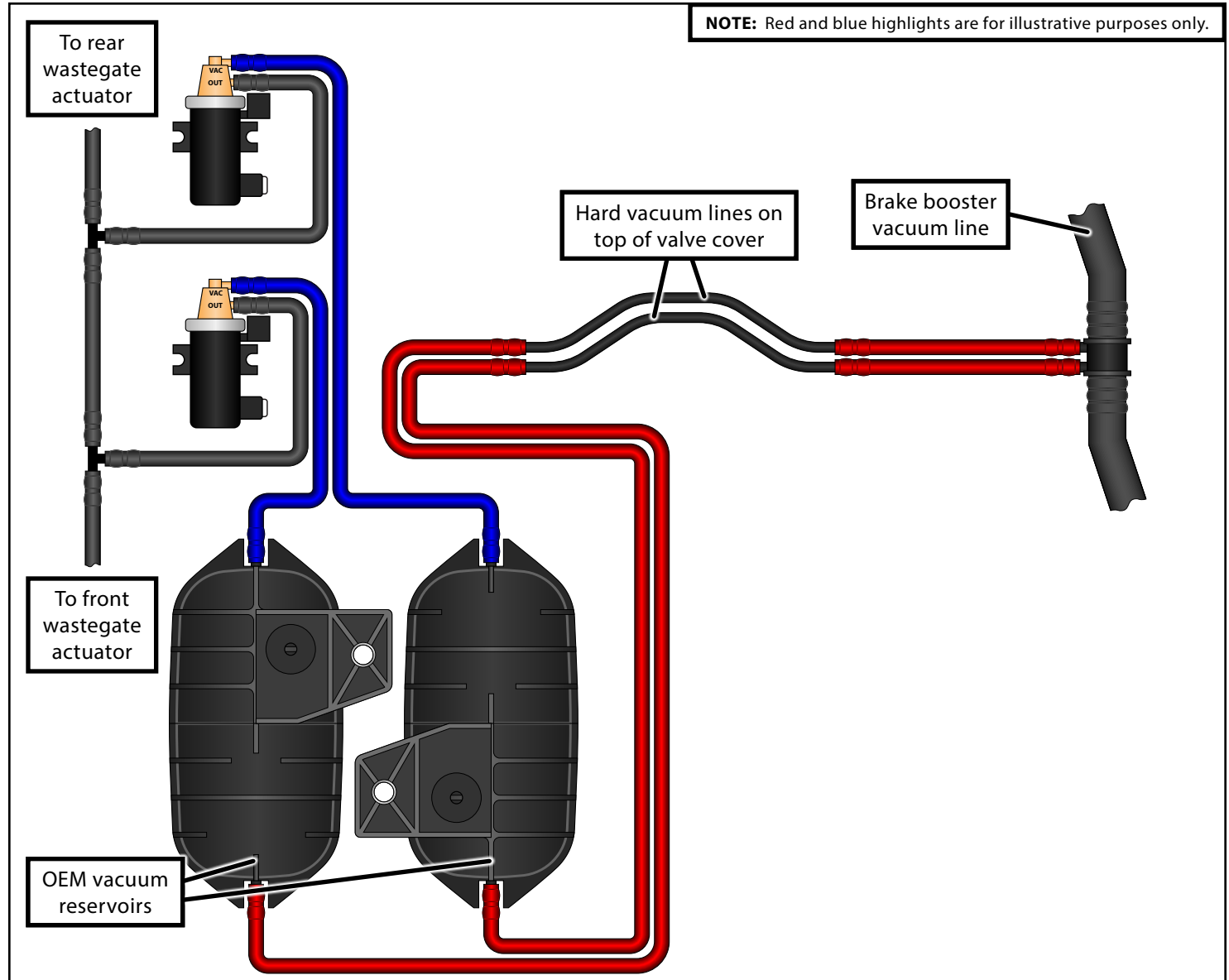


RELOCATING THE VACUUM RESERVOIRS

Step 11:

Here's a diagram of the stock vacuum system on the N54. Hoses with **RED** highlights are used to connect the brake booster vacuum line to the reservoirs. Hoses with **BLUE** highlights are used to connect the vacuum reservoirs to the wastegate solenoids.

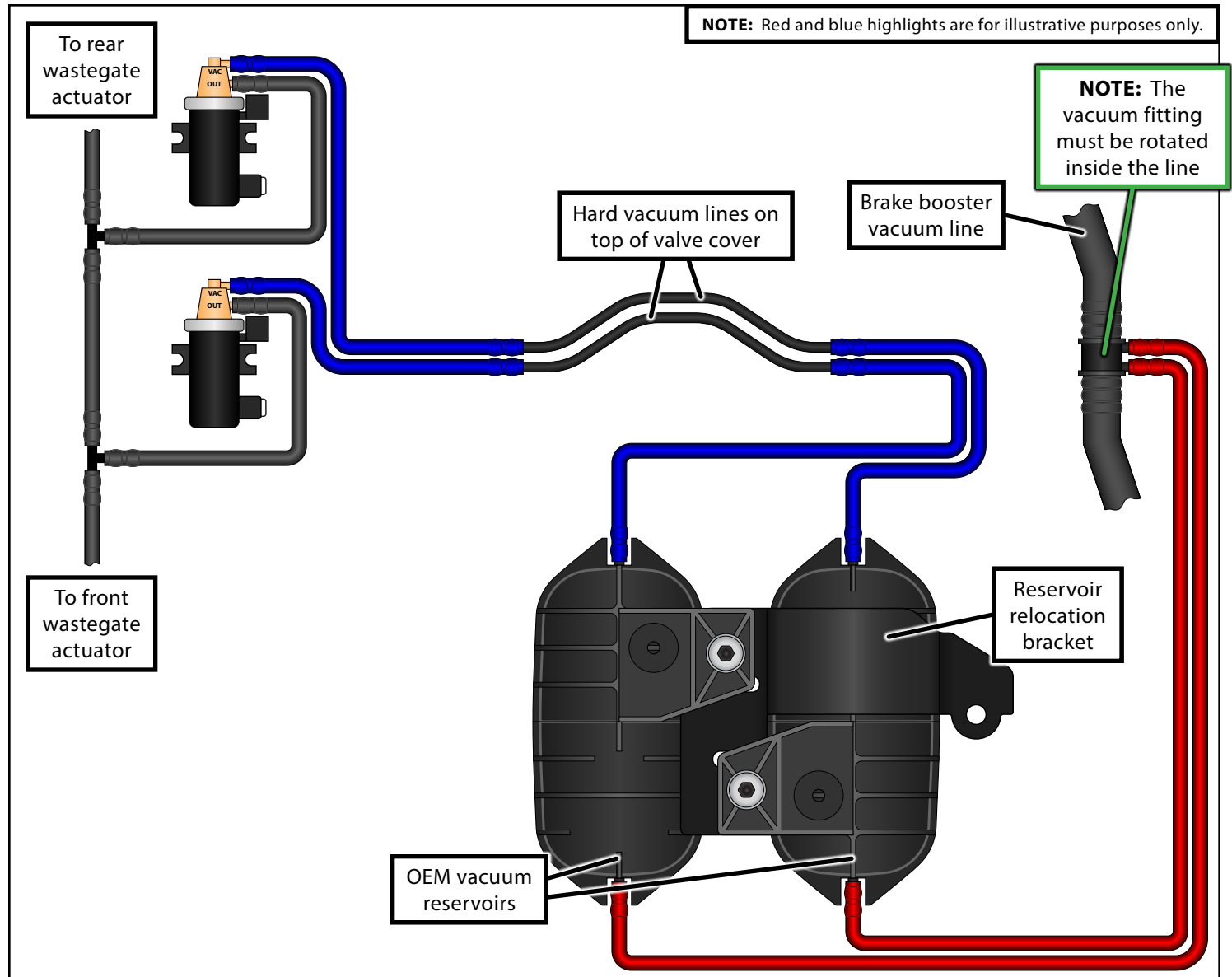
Familiarize yourself with this diagram, then proceed to the next page to see what we will be changing.



RELOCATING THE VACUUM RESERVOIRS

Step 12:

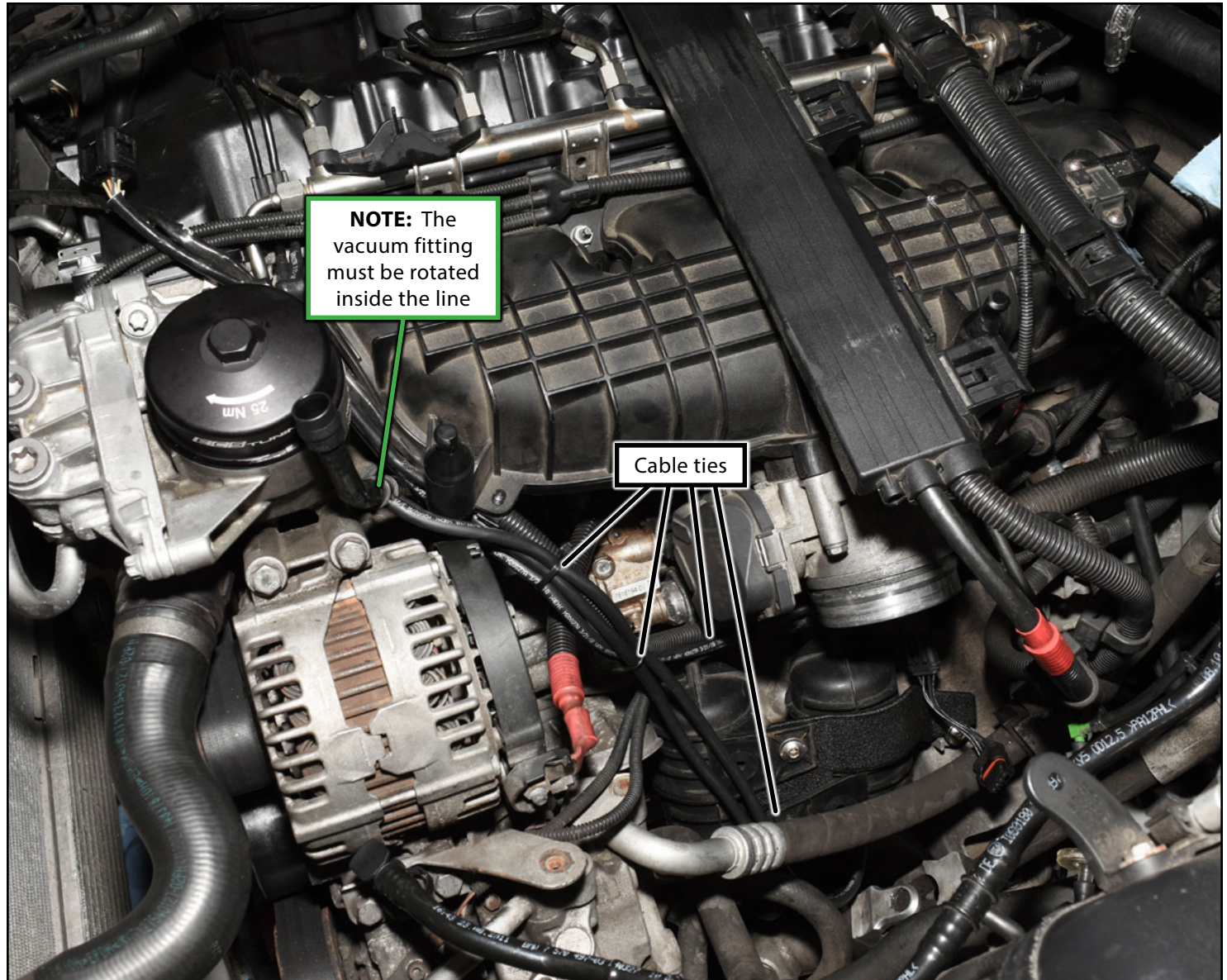
This diagram shows the vacuum system after relocating the vacuum reservoirs. As you can see, we're still connecting the brake booster vacuum line to the bottom of the vacuum reservoirs (hoses with **RED** highlights), but we're doing this all on the LH side of the engine. Then we connect the top of the vacuum reservoirs to the hard vacuum lines on top of the valve cover, then to the wastegate solenoids (hoses with **BLUE** highlights).



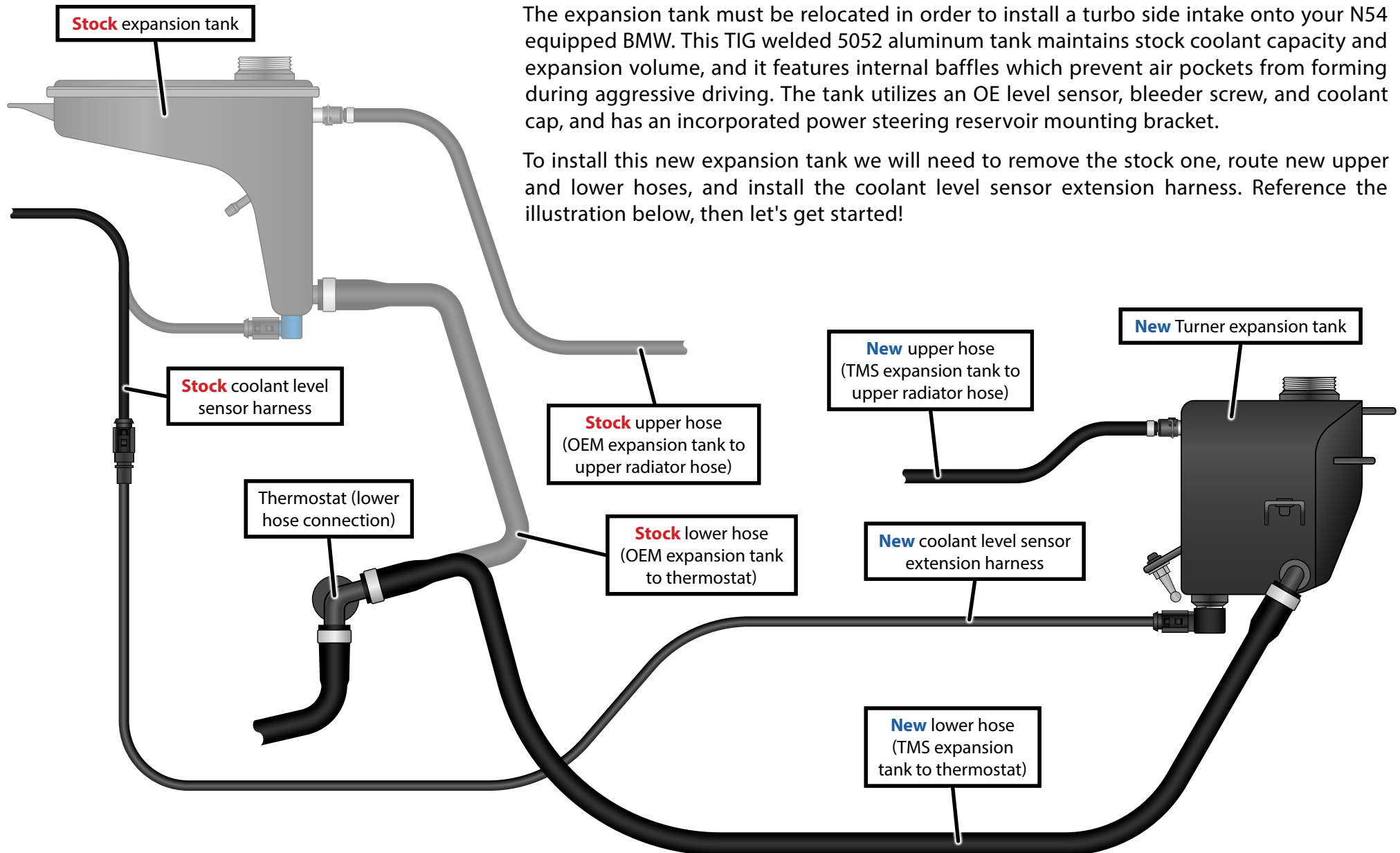
RELOCATING THE VACUUM RESERVOIRS

Step 13:

Here's a picture of the LH side of the engine once all of the vacuum hoses have been connected. Notice how the fitting inside the brake booster vacuum line has been rotated to point toward the LH side, and the vacuum hoses have been secured to nearby wiring harness loom with cable ties.



RELOCATING THE COOLANT EXPANSION TANK



The expansion tank must be relocated in order to install a turbo side intake onto your N54 equipped BMW. This TIG welded 5052 aluminum tank maintains stock coolant capacity and expansion volume, and it features internal baffles which prevent air pockets from forming during aggressive driving. The tank utilizes an OE level sensor, bleeder screw, and coolant cap, and has an incorporated power steering reservoir mounting bracket.

To install this new expansion tank we will need to remove the stock one, route new upper and lower hoses, and install the coolant level sensor extension harness. Reference the illustration below, then let's get started!

RELOCATING THE COOLANT EXPANSION TANK

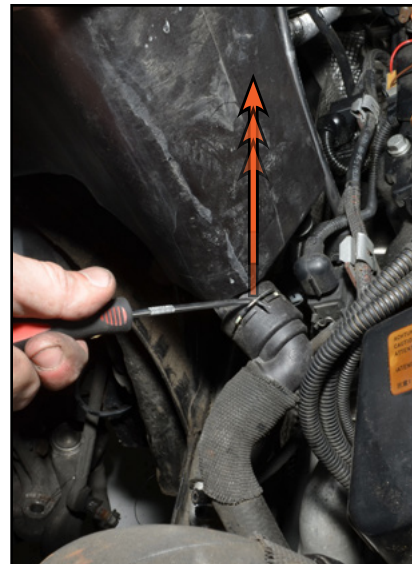
Step 1: 10mm Socket & Ratchet

Disconnect the upper hose from the expansion tank (LH photo).
Remove the two bolts from the expansion tank (RH photo).



Step 2: Small Flat Blade Screwdriver or Hose Pick

Disconnect the lower hose from the expansion tank (LH photo).
Lift the expansion tank up slightly to access the coolant level sensor underneath (RH photo). Disconnect the coolant level sensor and remove the expansion tank from the engine bay.



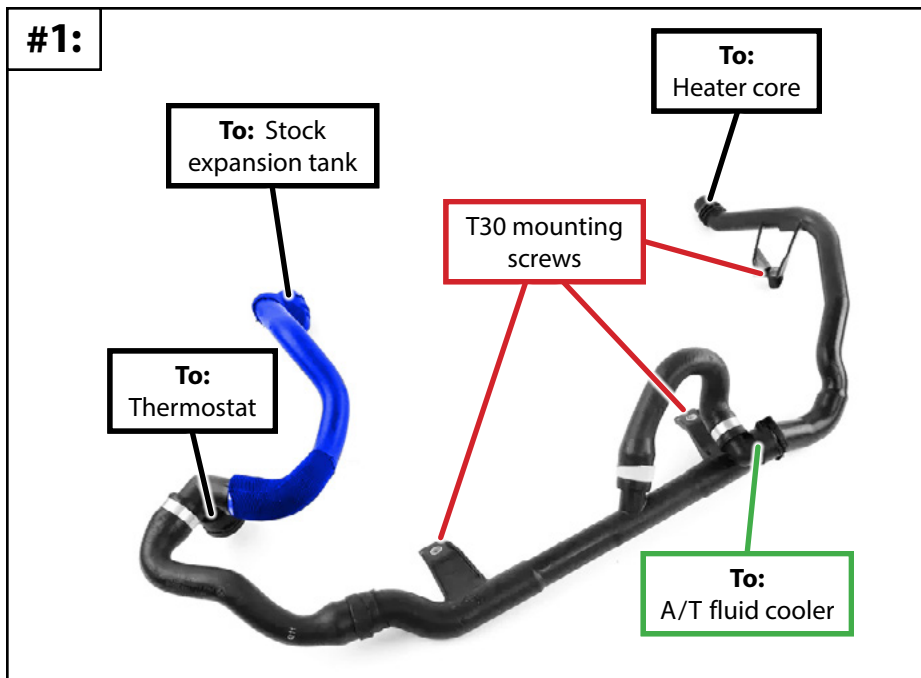
RELOCATING THE COOLANT EXPANSION TANK

Step 3: Cut Off Wheel (to cut the clamp), or Flat Head Screwdriver (to remove the clamp)

Now it's time to remove the original lower expansion tank hose (highlighted in **BLUE** in **Photo #1**). We will be replacing this hose with a new extended length hose which will route across the vehicle to the relocated expansion tank. We will also need to transfer the 90° fitting on the expansion tank side of the original hose over to the new extended length hose.

You will likely find solid band clamps at both of these connections. To remove these clamps you will need to carefully cut them off (being careful to not cut all the way through the hose), then pry the clamps off (**Photo #2 & Photo #3** below). This step can be performed with the hose assembly still in the vehicle, but it is ***much*** easier to do with it removed. The hose assembly is secured to the subframe with three T30 screws (**RED** box in **Photo #1**). If your vehicle has an automatic transmission then you will need to disconnect the additional cooler hose (**GREEN** box in **Photo #1**).

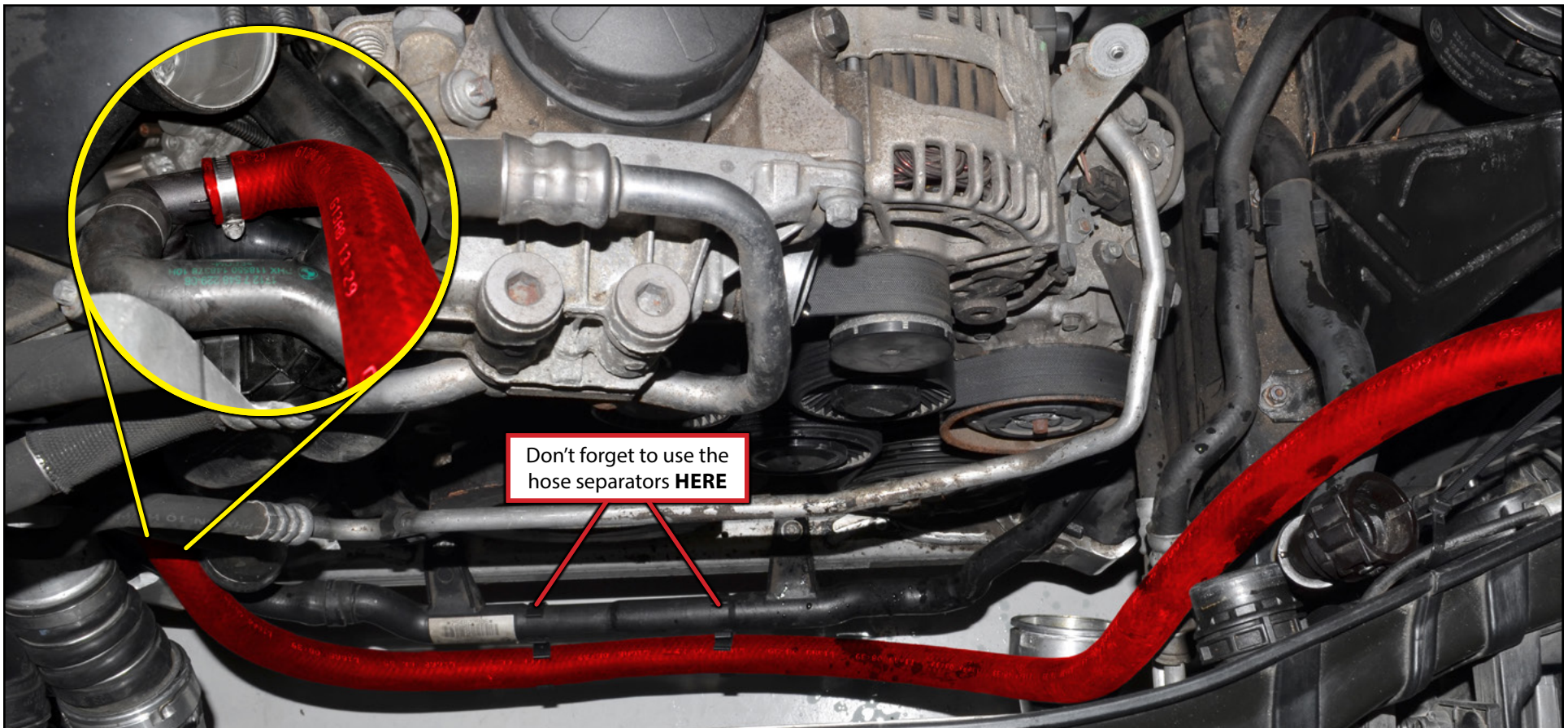
Once the hose clamps has been released, remove the original lower expansion tank hose from the vehicle and set it aside.



RELOCATING THE COOLANT EXPANSION TANK

Step 4: Flat Head Screwdriver

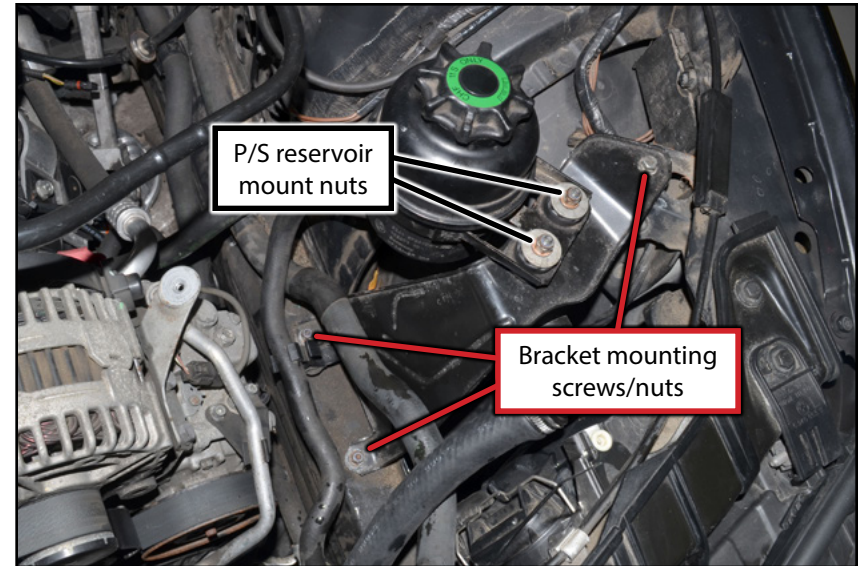
The new lower expansion tank hose has a pre-formed 90° bend in one end, this is the side which will connect to the front of the thermostat using one of the included 17-32mm hose clamps. Fitment is tight, we would suggest using some silicone spray or WD-40 to help the hose slide onto the fitting. We ended up trimming off an inch or two from the new hose to help it clear the other hoses around the thermostat (note the inset photo). Route the new hose along the engine bay as shown below, using the two included hose separators to mount it to the OE coolant pipe assembly. Route the hose over toward the power steering reservoir, but leave it disconnected for now.



RELOCATING THE COOLANT EXPANSION TANK

Step 5: 10mm Socket & Ratchet

Remove the two 10mm nuts which secure the power steering reservoir to the bracket, then swing the reservoir back and out of the way. Remove the single 10mm bolt and the two 10mm nuts from the bracket, then remove the bracket from the engine bay.



Step 6:

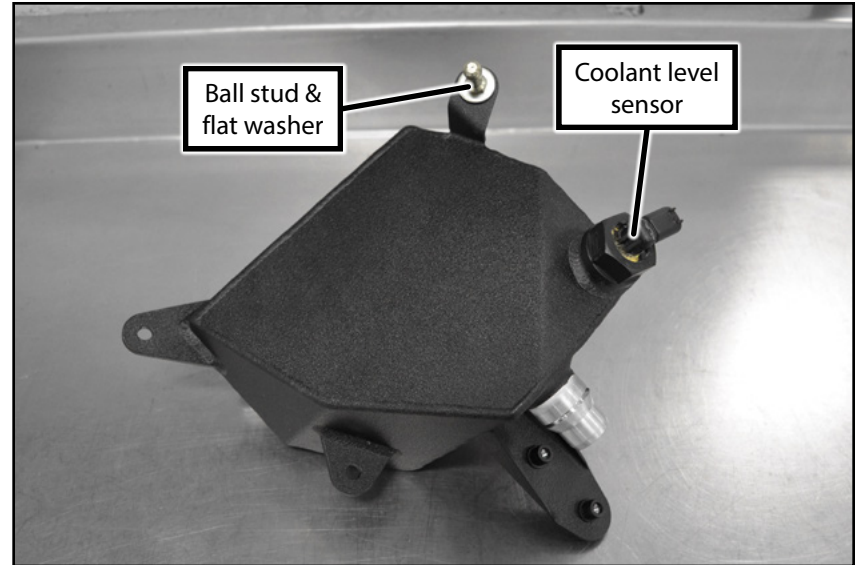
Install the provided mounting grommet into the empty hole in the LH shock tower as shown in the photo.



RELOCATING THE COOLANT EXPANSION TANK

Step 7:

Install the provided ball stud and flat washer into the lower mounting ear on the new expansion tank, then install the provided coolant level sensor. Be mindful of which direction the coolant level sensor will face once it's installed into the engine bay, make sure it will be accessible when you need to plug in the extension harness later on.

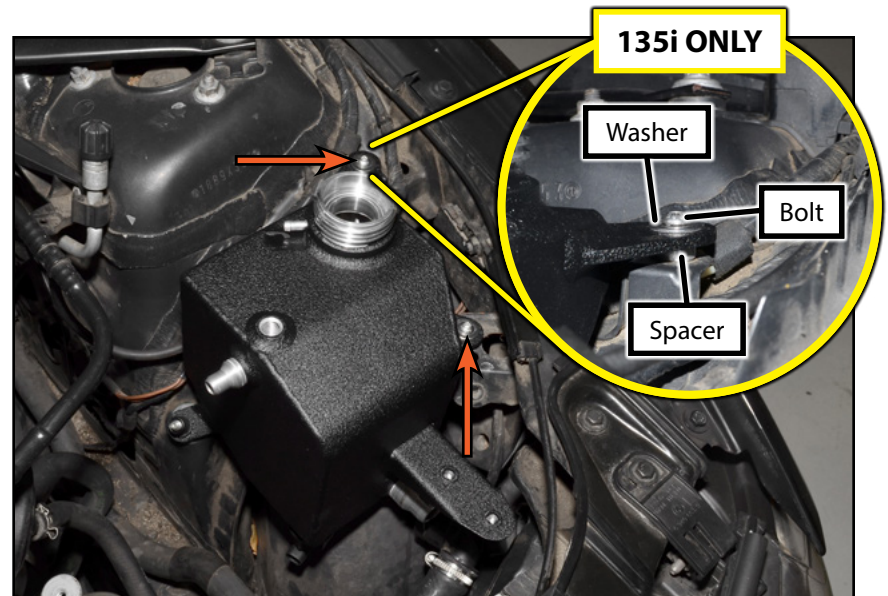


Step 8: 4mm Hex (Allen)

Install the new expansion tank into place. We've found it best to pop the ball stud into the grommet first, then thread in the provided M6x25mm screws and flat washers through the two mounting ears.



If you have an E8x 135i you will need to install a 5mm thick aluminum spacer in the rearmost mounting location as shown in the inset photo (this is included in 135i kits).



RELOCATING THE COOLANT EXPANSION TANK

Step 9: Flat Head Screwdriver

The new lower expansion tank hose needs to reach the fitting on the front of the expansion tank, once you are satisfied with the way it routes to the tank you can trim it to length. Transfer the 90° plastic fitting from the original expansion tank hose to the straight end of the new hose and secure it with one of the provided 17-32mm clamps.

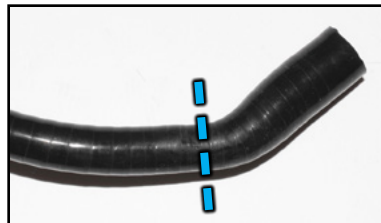
Push the 90° plastic fitting on the new lower hose into place until the locking ring “snaps” into place. Give it a quick tug to ensure that it is properly seated.



Step 10:

You will need to remove one of the flared ends from the silicone overflow hose to connect it to the expansion tank (shown below).

Route the hose (highlighted in **RED**) from the fitting on the expansion tank to your desired location in the engine bay, secure it to the expansion tank with the 11-20mm hose clamp (not shown). You can see we chose to run it into the LH fender-well during our install, this allowed us to zip-tie it to a brake line. The overall length of the hose can also be trimmed if needed.

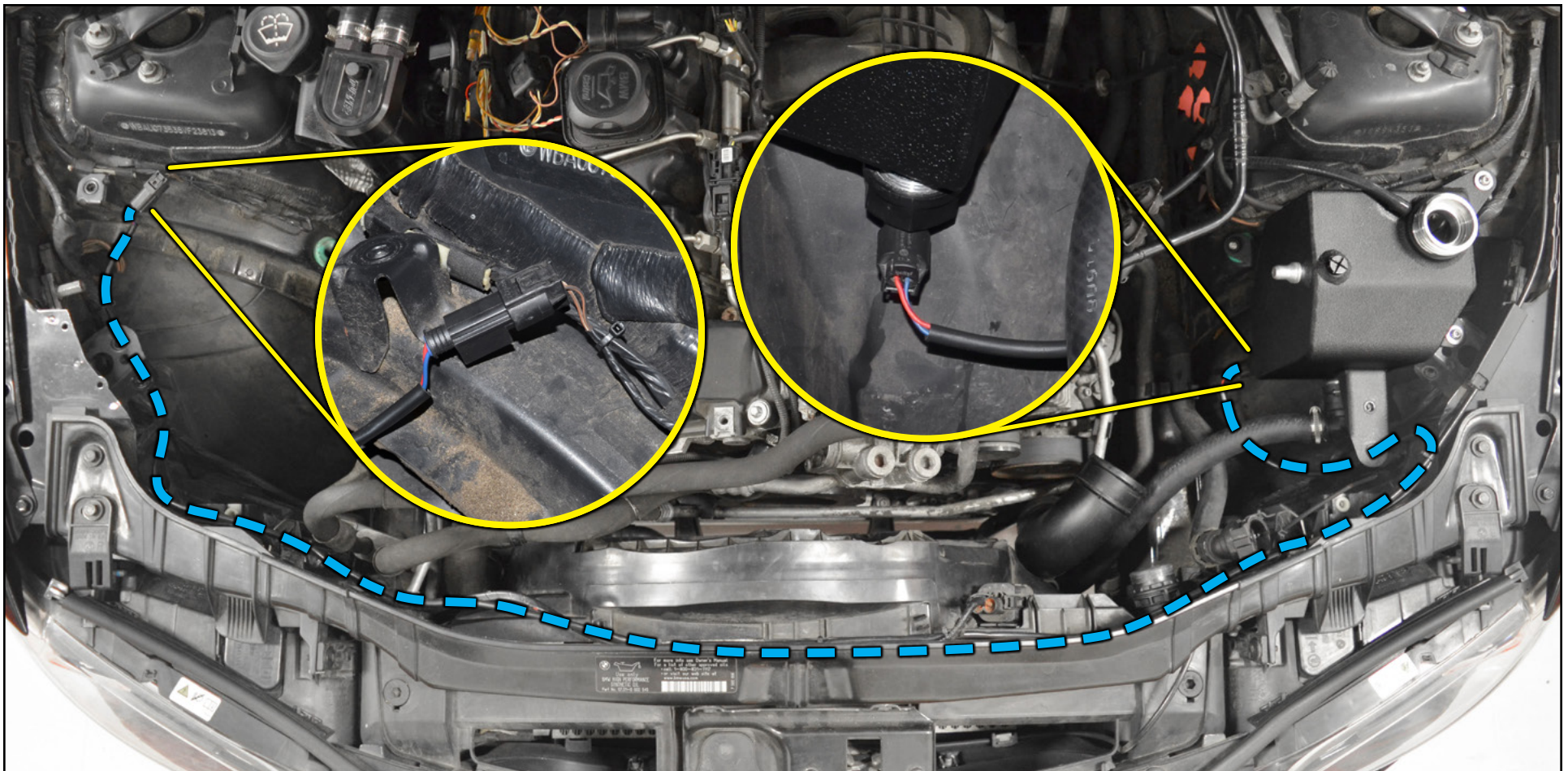


RELOCATING THE COOLANT EXPANSION TANK

Step 11:

Reinstall the fan shroud and the intercooler outlet.

Route the coolant level sensor extension harness from the OE connector on the RH shock tower across the fan shroud and over to the new expansion tank. Connect the harness on both ends, and be sure secure it into place along the way with zip-ties.



RELOCATING THE COOLANT EXPANSION TANK

Step 12:

Carefully cut the clamp off of the upper expansion tank hose where it connects to the upper radiator hose (highlighted in **GREEN** in **Photo #1**), then remove it from the engine bay.

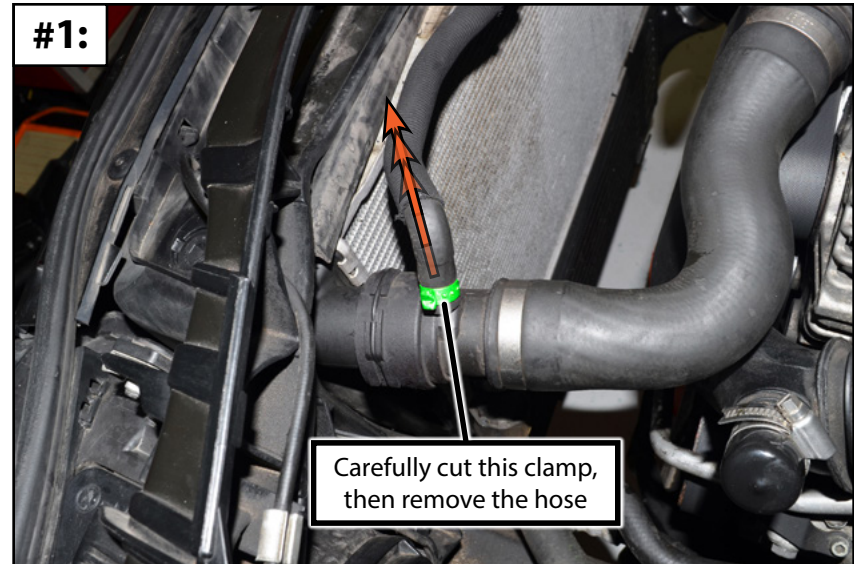
Install the new upper expansion tank hose (highlighted in **BLUE** in **Photo #2**) between the upper radiator hose and the upper hose connection on the new expansion tank (bottom photo).

Now we have a few things to reassemble before we move onto installing the rest of the intake system:

Install the power steering reservoir onto the mounting ear on the relocated expansion tank. You'll need to loosen the clamp around the reservoir to allow you to rotate it for its now mounting position.

Reinstall the throttle body charge pipe.

Reinstall the brake booster vacuum line.



INSTALLING THE NEW TURBO INLET HOSES & INTAKE SYSTEM

Step 1:

We need to install the breather hose elbow (see **Photo #1** below) into the rear turbo inlet lower hose before installing it into the engine bay. This elbow will need to point toward the front or the rear of the vehicle depending on whether you have a stock PCV system or one of our catch cans (reference **Photo #2 & Photo #3** on the right).

#1: Breather hose elbow



#2: For vehicles w/stock PCV system:



#3: For vehicles w/ECS or Turner catch can:



INSTALLING THE NEW TURBO INLET HOSES & INTAKE SYSTEM

Step 2:

Working from above, push the rear turbo lower inlet hose down the side of the engine toward the rear turbo (**Photo #1**) as far as you can.

Next, grab a hold of the hose from below and pull it the rest of the way toward the turbo (**Photo #2**).

Don't install the hose onto the turbo inlet just yet, we need to review a few small details before we're ready to do that.



INSTALLING THE NEW TURBO INLET HOSES & INTAKE SYSTEM

Step 3:

Let's take a moment and look at the inlet snout on the rear turbo. If you have stock turbos (I.E.: turbos with stock housings), the snout is **very** skinny. This isn't a problem when you're running stock turbo inlet pipes (or silicone hoses), but when you're trying to get a hose clamp to secure a silicone turbo inlet hose it becomes a problem. If the hose clamp is just slightly crooked it will pull the hose off of the snout as you go to tighten it down. You need to be 100% sure that the hose is completely bottomed out on the turbo inlet snout, and the hose clamp needs to be 100% parallel as well.

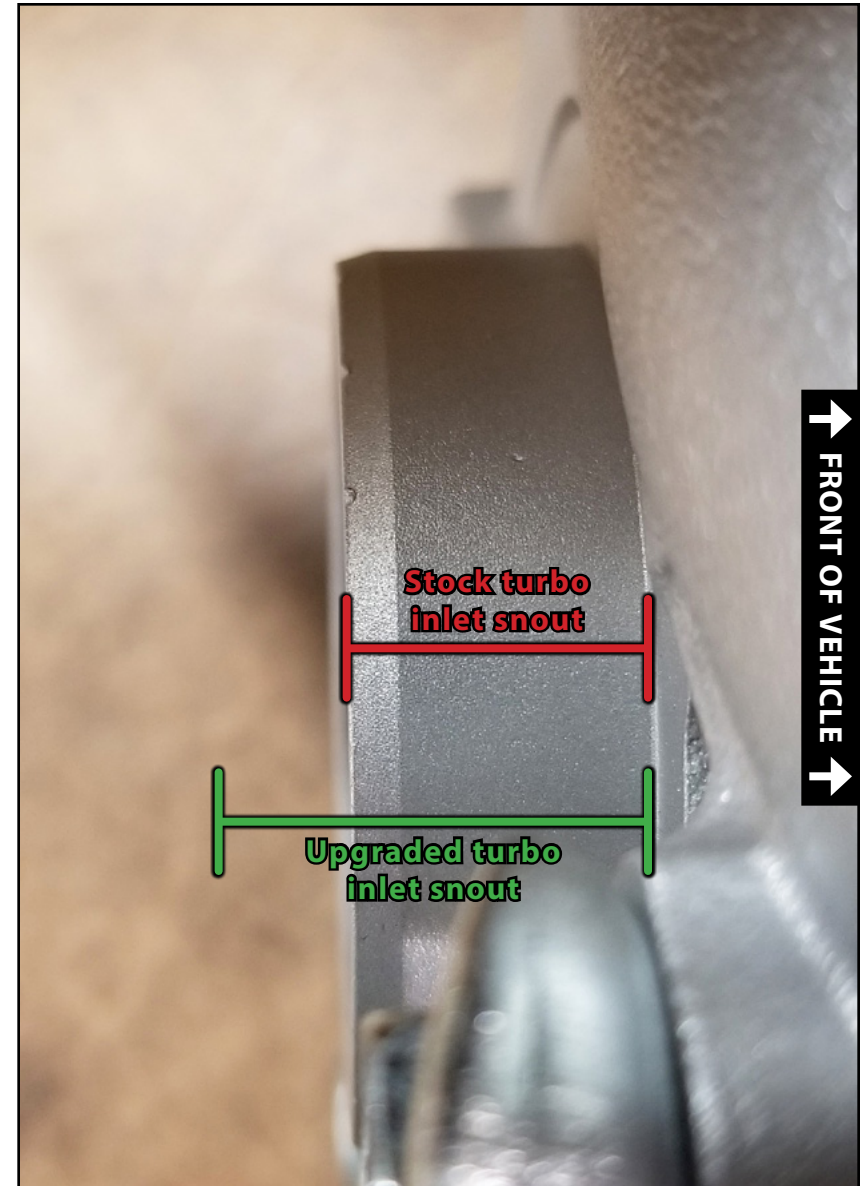
Many aftermarket turbos (or aftermarket turbo housings) use a significantly deeper inlet snout on the rear turbo. These applications are much easier to get the hose clamp to bite onto securely, but there is less clearance between the hose and the bell housing flange.



We've found that removing the wastegate from the rear turbo will really open up a lot of extra space to work, and it makes it much easier to see whether or not the hose clamp is in position.



There's very little room to work and fitment is tight, so it's not easy to get this hose routed and connected. A little bit of silicone spray or WD-40 inside the hose will make it much easier to slide it over the inlet snout.



INSTALLING THE NEW TURBO INLET HOSES & INTAKE SYSTEM

Step 4:

Now we're ready to get back to it!

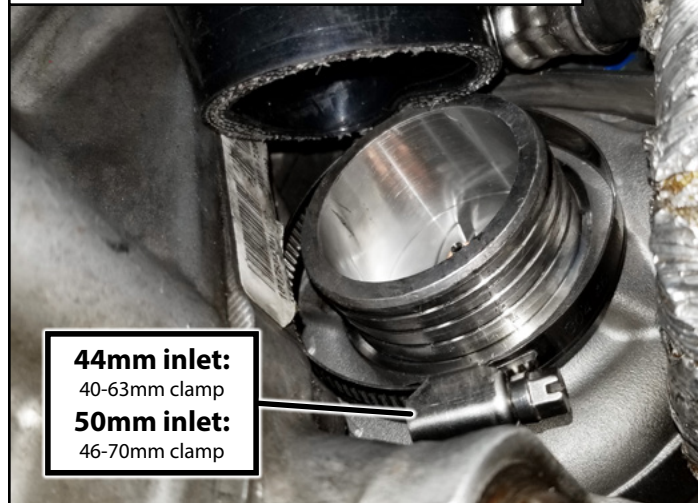
Slide the smaller hose clamp over the turbo inlet snout (reference **Photo #1**), then push the hose into position (**Photo #2**).

As we reviewed on the previous page, a stock rear turbo will have a very skinny inlet snout. You need to be 100% sure that the hose is completely bottomed out on the turbo inlet snout. Removing the rear turbo wastegate really opens a lot of space to work.

Leave the hose clamp on the rear turbo inlet lower hose slightly loose for now, we'll come back and fully tighten it after we adjust the system.

Once the rear turbo inlet lower hose is in place you can reinstall the turbo outlet pipes (**Photo #3**).

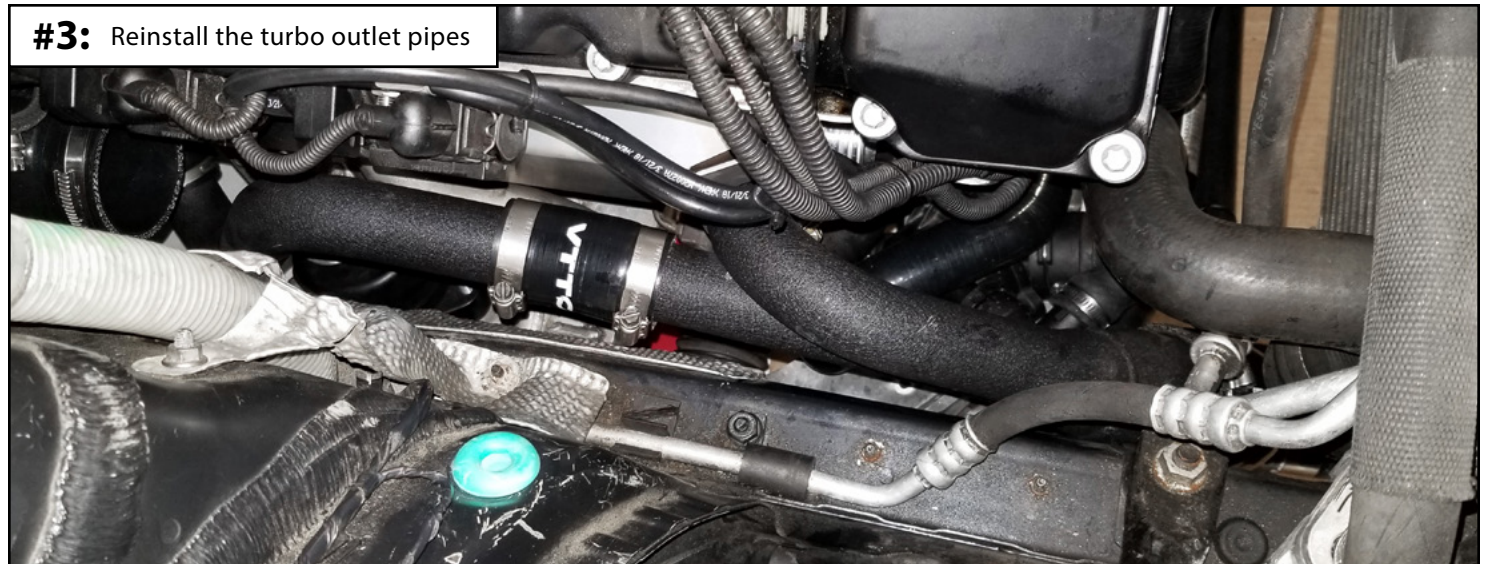
#1: Slide a hose clamp onto the inlet snout



#2: Push the hose onto the turbo inlet snout



#3: Reinstall the turbo outlet pipes

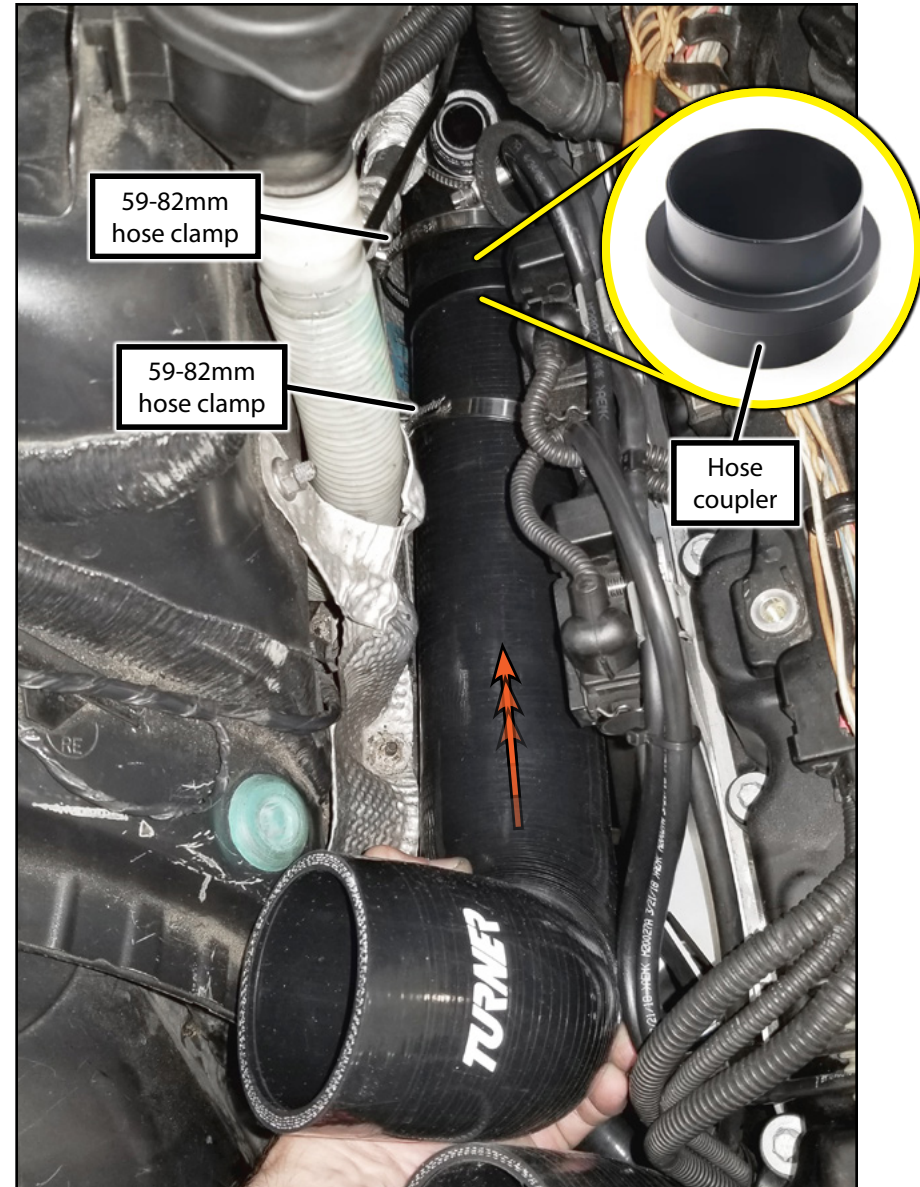


INSTALLING THE NEW TURBO INLET HOSES & INTAKE SYSTEM

Step 5:

Slide one of the 59-82mm hose clamps over end of the lower and upper hoses, then connect the hoses together using the hose coupler (inset photo) as shown.

Leave the hose clamps slightly loose for now, we'll come back and fully tighten them after we adjust the system fitment.



INSTALLING THE NEW TURBO INLET HOSES & INTAKE SYSTEM

Step 6:

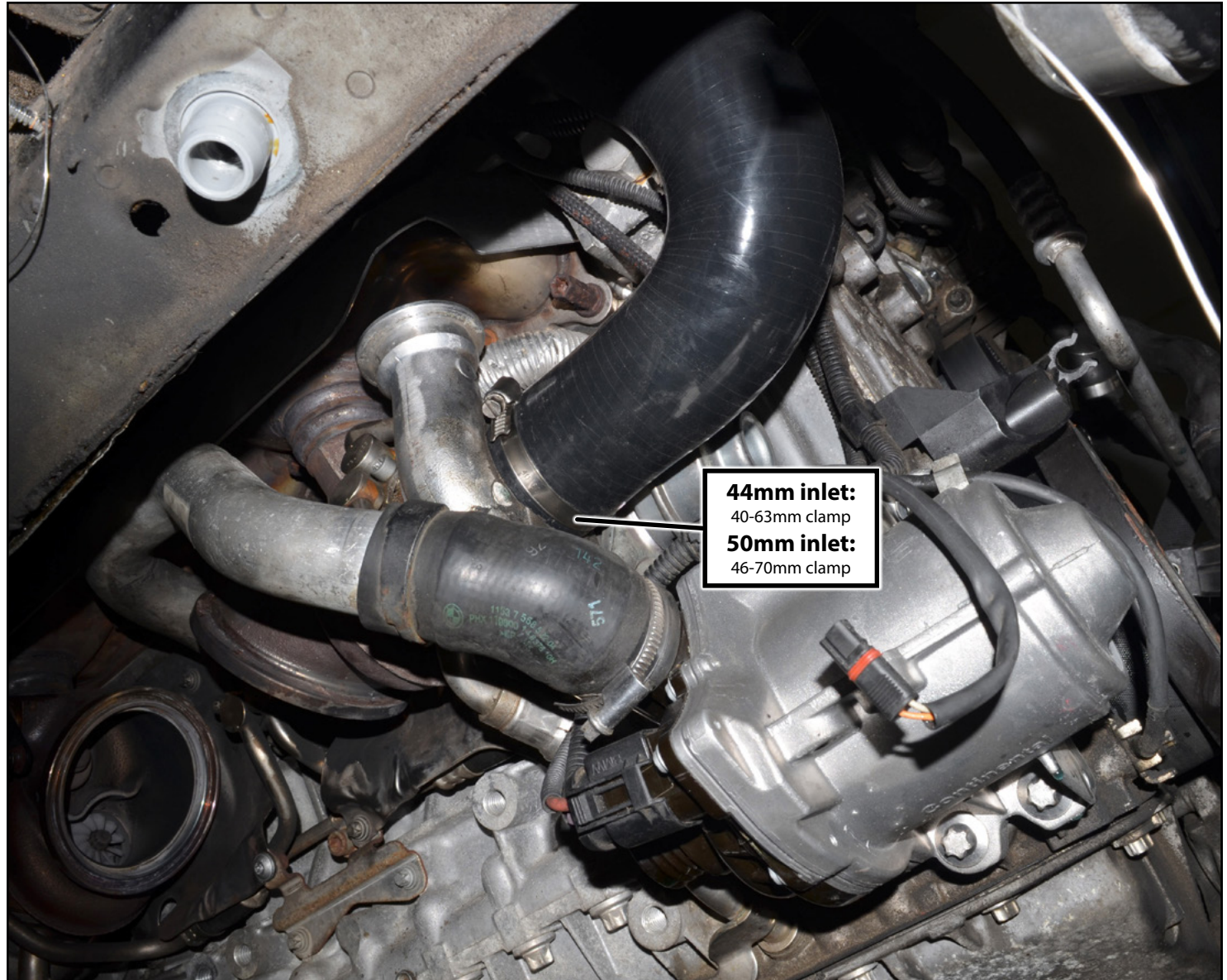
Install the front turbo inlet hose in the same manner as we did the rear lower hose.

Remember to slide the small hose clamps over the turbo inlet snout before you push the hose into position.

This inlet snout is much deeper than the one found on the rear turbo, so it will be much easier to get this hose to line up, and the clamp won't be as difficult to align and tighten properly.

Leave the hose clamp on the front turbo inlet hose slightly loose for now, we'll come back and fully tighten it after we adjust the system.

Once the front turbo inlet hose is in place you can proceed to the next page.



INSTALLING THE NEW TURBO INLET HOSES & INTAKE SYSTEM

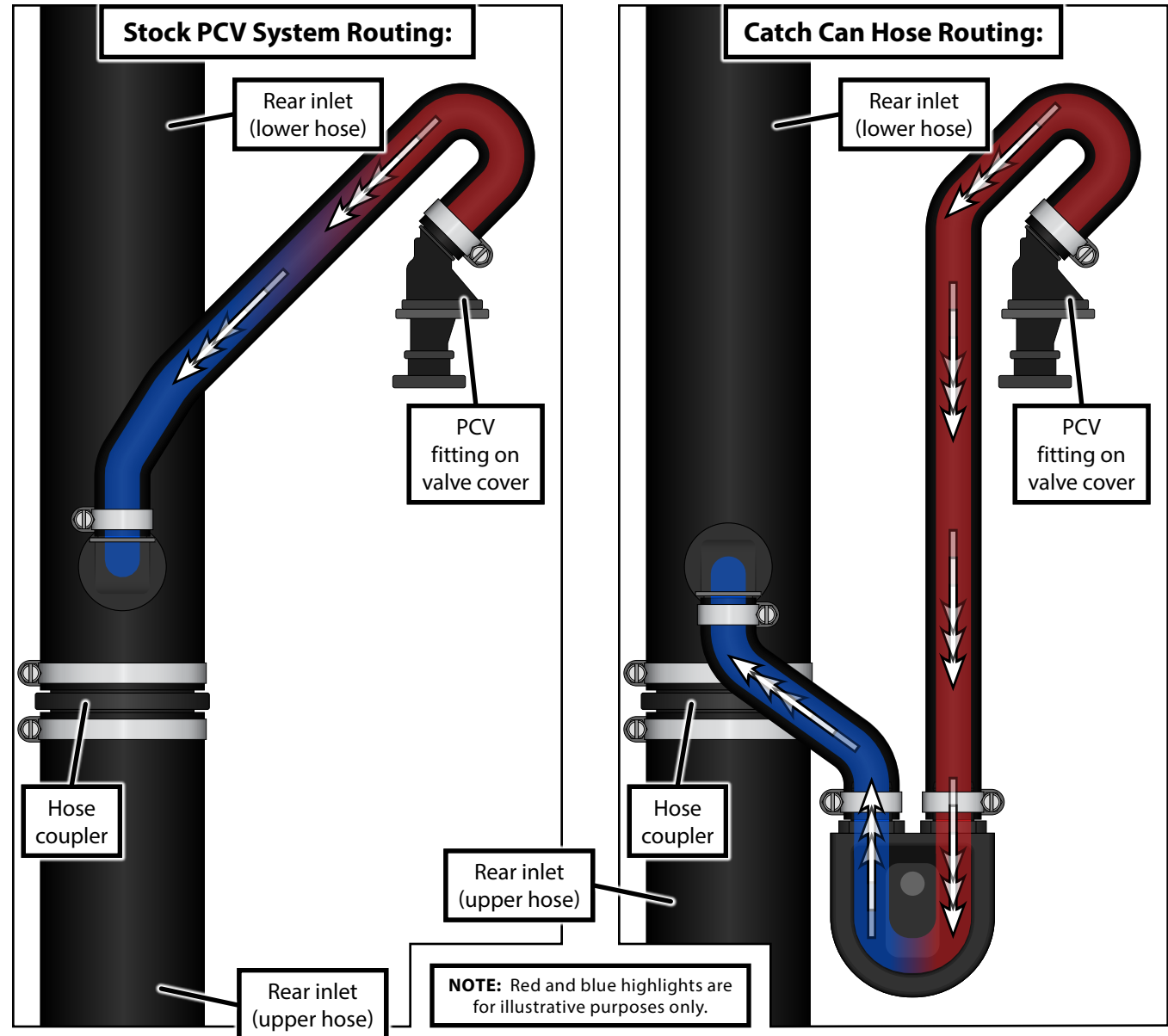
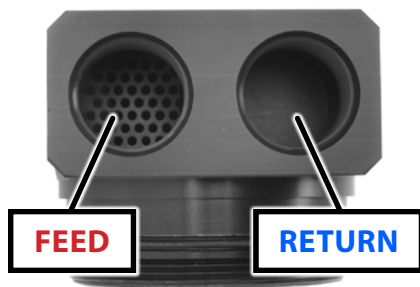
Step 7:

Next we need to connect the PCV system. The illustrations on the right show how to connect a stock PCV system as well as a catch can.

Stock PCV systems will use a hose with a 180° bend in it to connect the PCV fitting on the valve cover to the breather hose elbow in the rear turbo inlet hose.

Catch can systems will use the feed hose which comes with that kit to connect the **FEED** hose to the catch can, then the new **RETURN** hose which is supplied with the intake kit will connect the catch can to the breather hose elbow in the rear turbo inlet lower hose.

Standard Flow Shown Below:



INSTALLING THE NEW TURBO INLET HOSES & INTAKE SYSTEM

Step 8:

With both of the turbo inlet hoses installed, we can get started on mounting the main heat shield assembly.

Locate the two studs on the RH chassis rail (arrows in **Photo #1**). Thread the new billet standoffs (highlighted in green in **Photo #2**) onto those two studs by hand, then tighten them until they make contact + 1/8 turn.

#1: Locate the heat shield mounting studs



#2: Install the new heat shield standoffs



INSTALLING THE NEW TURBO INLET HOSES & INTAKE SYSTEM

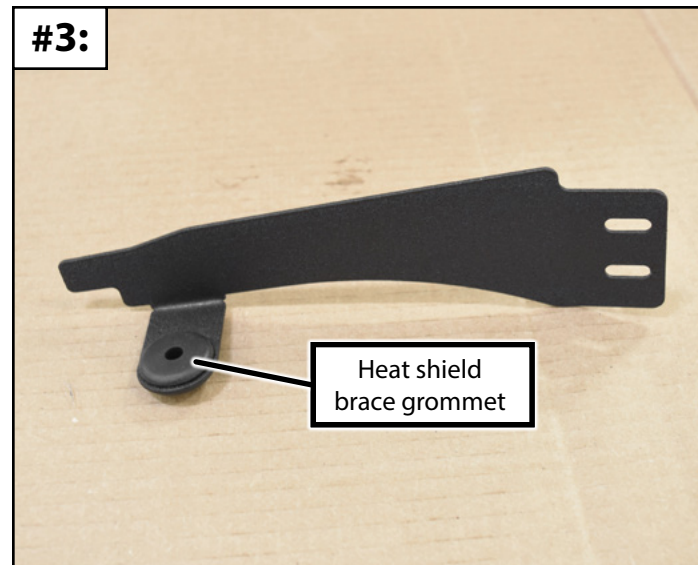
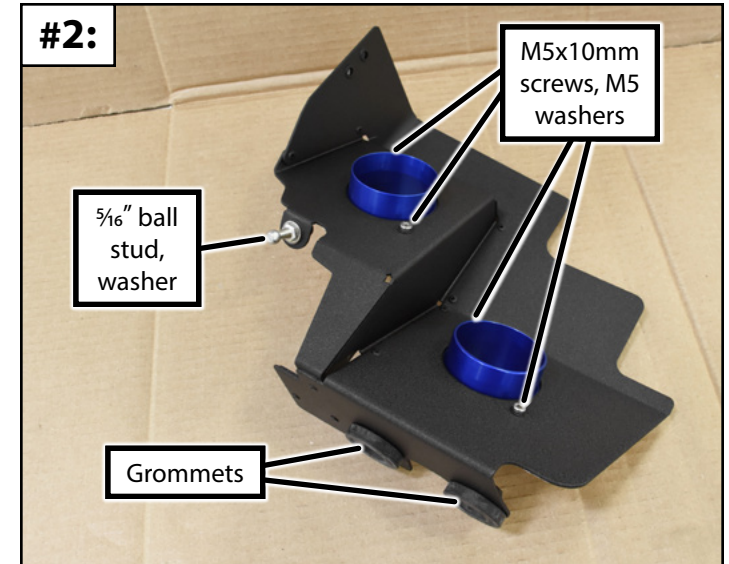
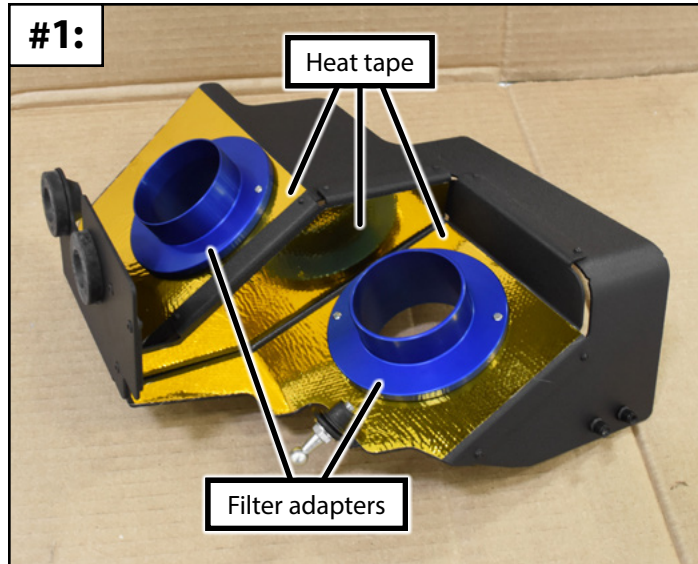
Step 9:

Now it's time to assemble the heat shield, brace, and air duct.

First, apply the heat tape to the back side of the main heat shield (**Photo #1**). The heat tape pieces are side specific, they will only line up one way.

Next, install the filter adapters, $\frac{5}{16}$ " ball stud w/ washer, and the grommets (**Photo #1 & Photo #2**).

Install the grommet into the heat shield brace (**Photo #3**).



INSTALLING THE NEW TURBO INLET HOSES & INTAKE SYSTEM

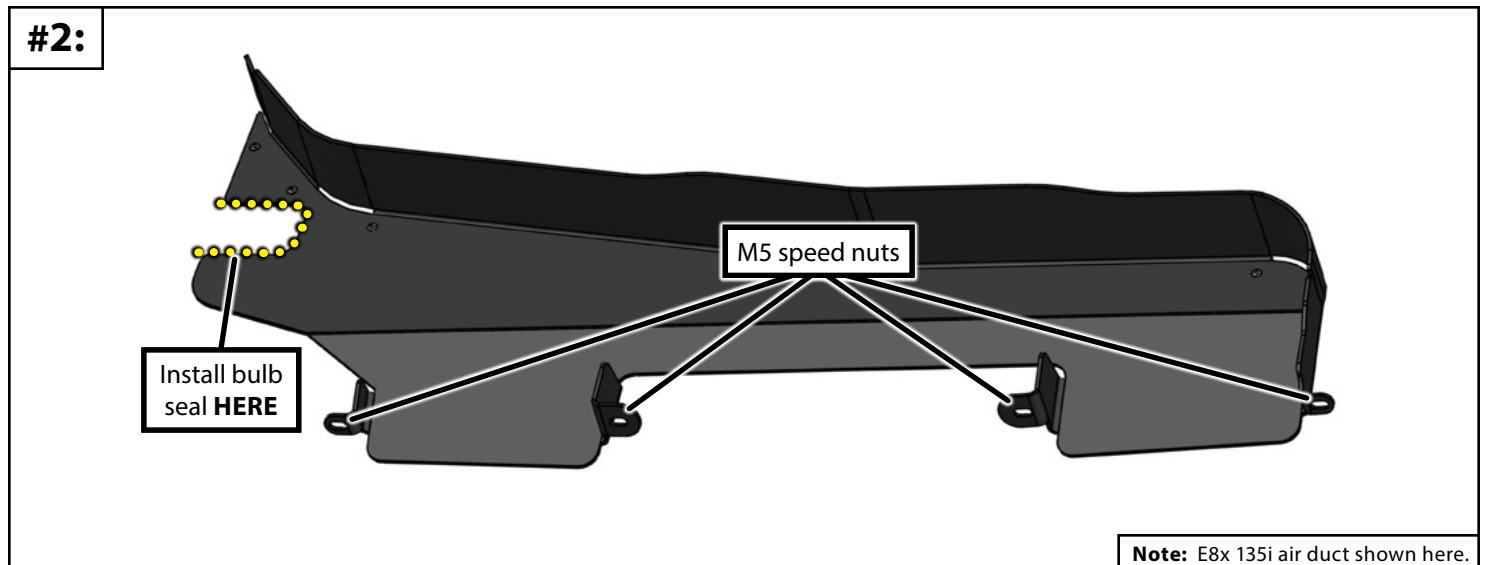
Step 10:

E9x 335i only:

Install the two M5 speed nuts onto the air duct mounting ears (**Photo #1**).

E8x 135i only:

Install the four M5 speed nuts onto the air duct mounting ears (**Photo #2**).
Install the small bulb seal around the cut-out (**YELLOW** dotted line).



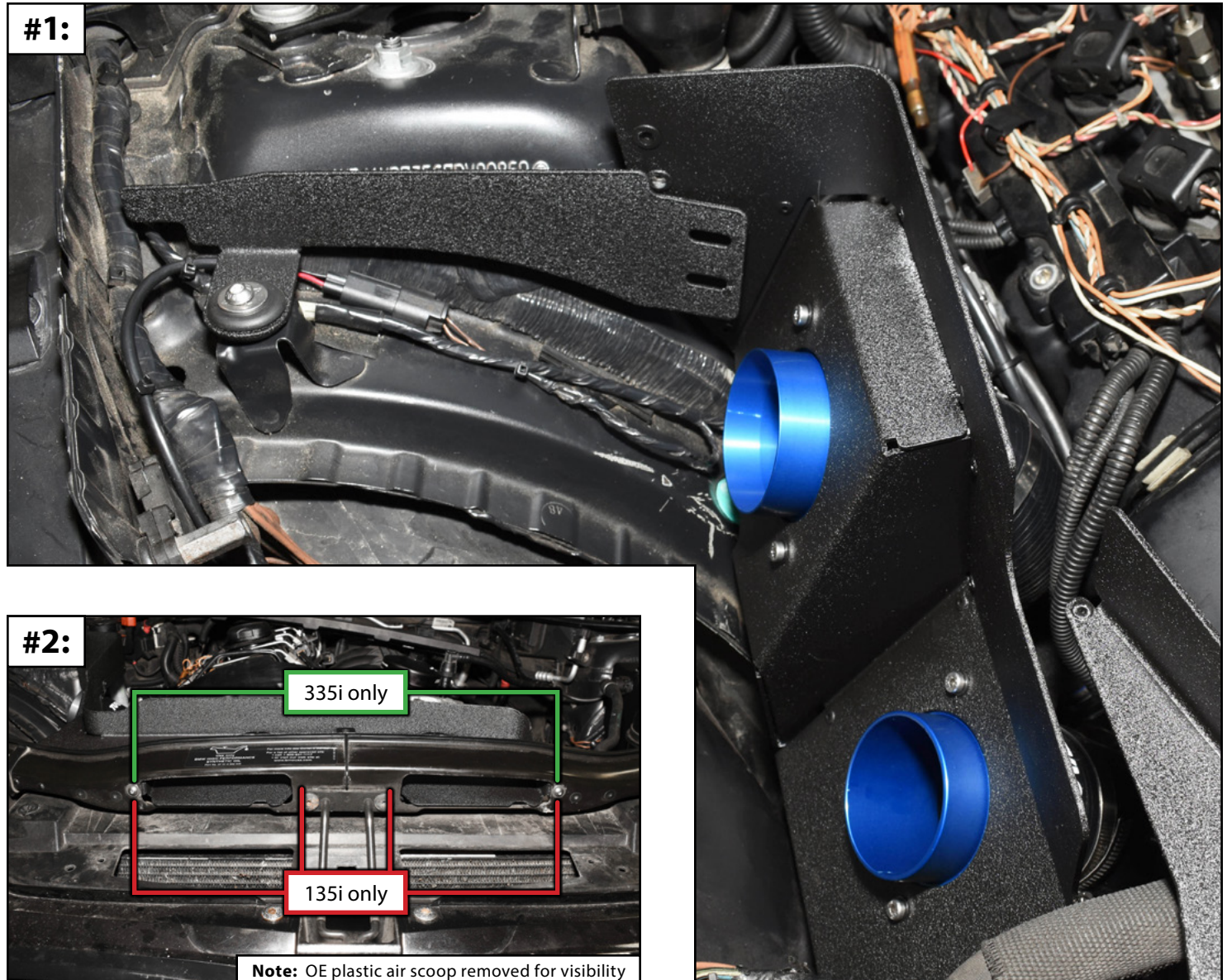
INSTALLING THE NEW TURBO INLET HOSES & INTAKE SYSTEM

Step 11:

Loosely install the main heat shield assembly, heat shield brace and air duct into place (**Photo #1**). Leave all of the clamps loose for now, we need to determine whether the system needs any adjustment.

It's worth noting that the air ducts on the 135i and the 335i are similar, but they have different mounting screw locations (shown in **Photo #2**).

Once these components have been loosely installed you can proceed to the next page for system adjustment.



ADJUSTING THE INTAKE SYSTEM FOR PROPER FITMENT

Step 1:

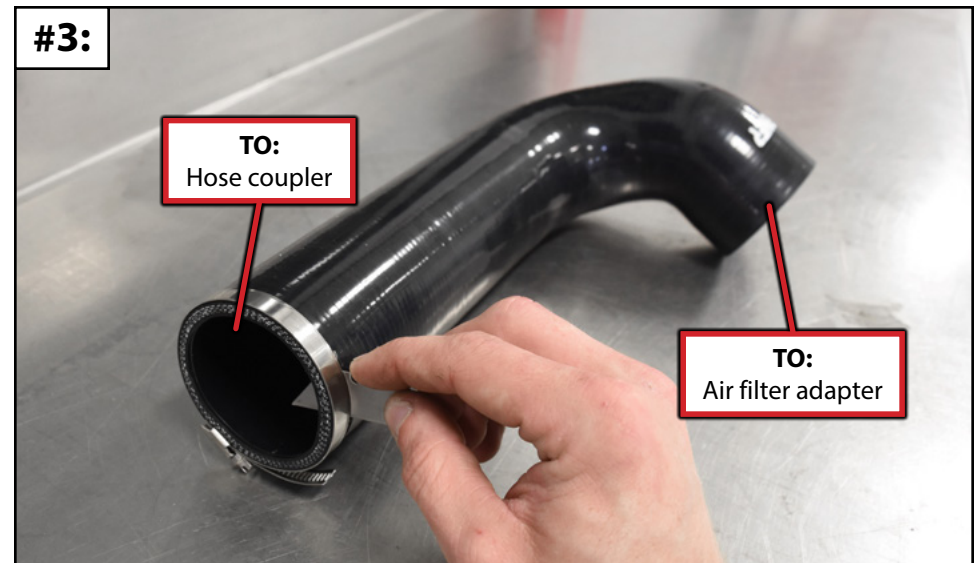
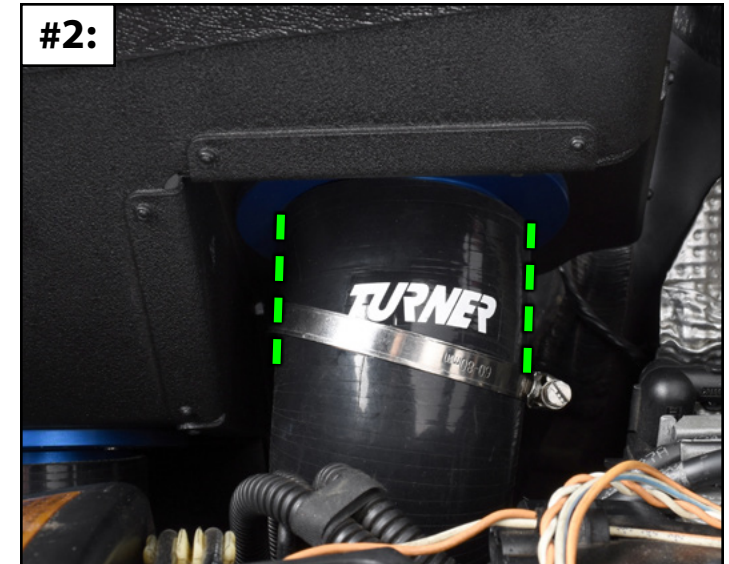
DO NOT make any cuts until you have read all the way the next two pages. This process takes patience and cannot be undone:

We've purposely left two hoses (rear inlet upper & front inlet) slightly longer than they need to be, this allows you to fine-tune system fitment.

You may find that the rear inlet upper hose doesn't want to straighten up against the air filter adapter in the main heat shield (**Photo #1**). This is because the hose length needs to be trimmed slightly, which will pull it rearward and align it with the air filter adapter (**Photo #2**). **To clarify**, we are removing material from the **hose coupler** side of this hose, **not** the side which connects to the air filter adapter on the main heat shield.

We loosely installed a hose clamp onto the inlet hose and used it as a guide to ensure we made the cut as straight as possible (**Photo #3**). We would strongly recommend cutting away small amounts of silicone at a time, then checking fitment after each cut. The last thing you want is to cut away too much, only to realize that the hose is now too short and won't fit!

We still have one more adjustment to make, please continue reading through the end of the next page before you start cutting.



ADJUSTING THE INTAKE SYSTEM FOR PROPER FITMENT

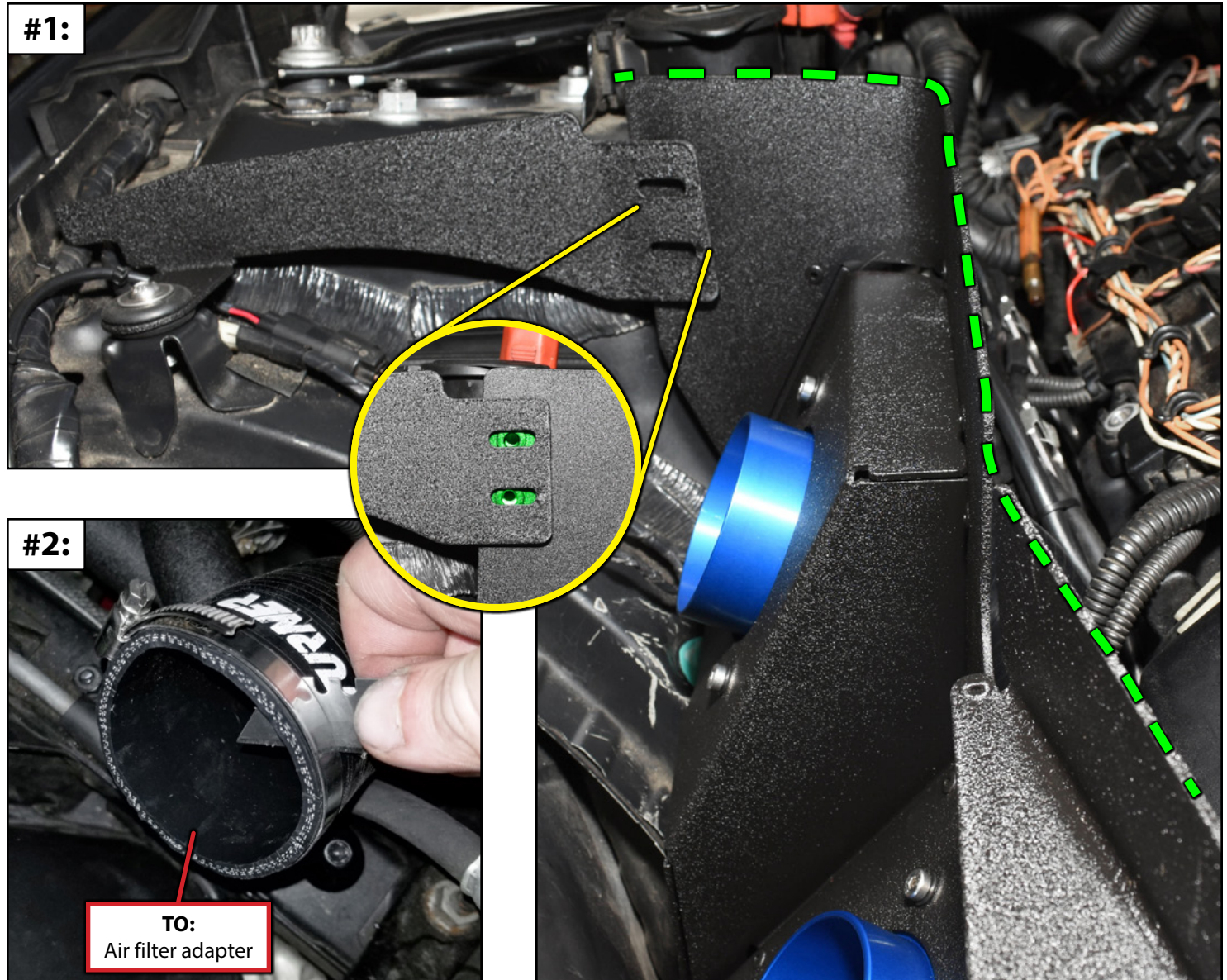
Step 2:

Next we can adjust the heat shield, brace, and air duct fitment.

Our goal is to get all of the heat shield pieces into alignment so that the bulb seal can be installed in the next step (shown w/a **GREEN** dashed line in **Photo #1**). We also want the adjustment slots in the brace to line up with the threads in the main heat shield (see the **YELLOW** inset photo).

Removing material from the **air filter side** of either inlet hose will cause that end of the heat shield to be pulled slightly toward the engine.

Again, we used a hose clamp as a guide for the straightest possible cut (**Photo #2**).



REASSEMBLY PROCEDURE

Step 1:

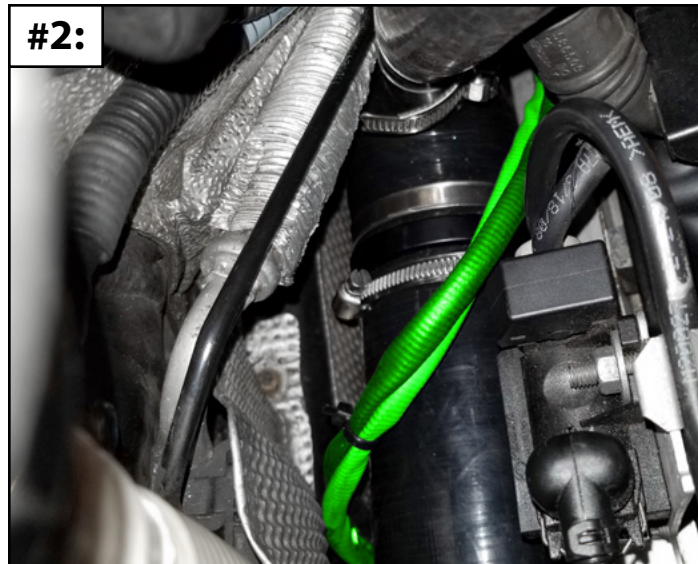
Reinstall the downpipes and the upstream oxygen sensors (**Photo #1**).

Route the upstream oxygen sensor wiring harnesses up and around the rear inlet hose (highlighted in **GREEN** in **Photo #2**). We would suggest using cable ties to secure the harnesses together, and use the rearmost clip on the manifold heat shield to hold the harnesses in place (not shown).

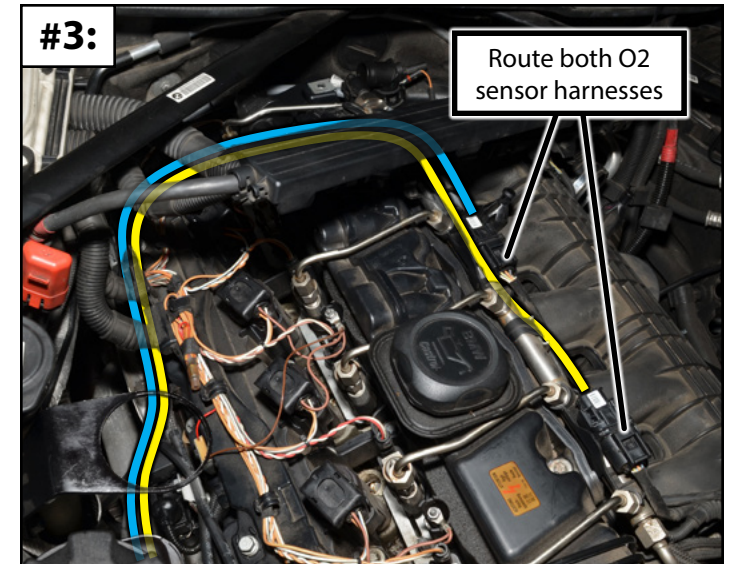
Route the upstream oxygen sensor wiring harnesses around the back side of the engine and reconnect them to the engine wiring harness (**Photo #3**).



#1:



#2:



#3:

Route both O2
sensor harnesses

REASSEMBLY PROCEDURE

Step 2:

Tighten down all of the hose clamps, don't forget about the clamps on the turbo snouts.

Install the air filters (arrows).

Install the bulb seal onto the heat shield and air scoop (highlighted in **GREEN**). Trim as needed.

Reinstall the OE air inlet scoop (highlighted in **RED**).

Reinstall the rain tray, engine cover, belly pans and any other components in the reverse order of removal.

Proceed to [Page 57](#) for instructions on bleeding the cooling system.



BLEEDING THE COOLING SYSTEM

Step 1:

Bleeding procedure:

1. Ensure that the expansion tank bleeder screw and the cap are both tightened down.
2. Connect a battery charger.
3. Switch the ignition to ON (**engine OFF**).
4. Set the temperature controls to the highest setting (~84° F).
5. Set the blower speed to the lowest setting.
6. Press and hold the accelerator pedal to the floor for 10-12 seconds. This will activate the electric coolant pump.
7. The coolant pump will cycle on and off for 12 minutes, **this is normal**.
8. After 12 minutes have passed the coolant pump you can turn the ignition to OFF.
9. Disconnect the battery charger.
10. Return the climate controls to their previous settings.
11. Check and top up the coolant level.
 - The Turner logo inside the tank serves as the fill gauge. Once the coolant rises up to the logo plate it is full.
 - Coolant level is only to be adjusted when the engine is **COLD**, and when the vehicle is sitting on a level surface.

Your installation is complete!



Your N54 Turbo Side Intake System installation is complete!



These instructions are provided as a courtesy by Turner Motorsport

Proper service and repair procedures are vital to the safe, reliable operation of all motor vehicles as well as the personal safety of those performing the repairs. Standard safety procedures and precautions (including use of safety goggles and proper tools and equipment) should be followed at all times to eliminate the possibility of personal injury or improper service which could damage the vehicle or compromise its safety.

Although this material has been prepared with the intent to provide reliable information, no warranty (express or implied) is made as to its accuracy or completeness. Neither is any liability assumed for loss or damage resulting from reliance on this material. SPECIFICALLY, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY IS MADE OR TO BE IMPLIED WITH RESPECT TO THIS MATERIAL. In no event will Turner Motorsport, Incorporated or its affiliates be liable for any damages, direct or indirect, consequential or compensatory, arising out of the use of this material.