

2017 PERFORMANCE ALPHA A45 SERIES MERCEDES PERFORMANCE PACKAGE / ALPHA



**ALPHA A45 AMG SERIES**

**MB600 BOLT-IN TURBO UPGRADE**

# Introduction

The goal of AMS Performance is to provide the highest quality, best performing products available. By utilizing research and development, and rigorous testing programs AMS Performance will never compromise the quality or performance of our products. In addition, AMS Performance will only provide the finest customer service offering only parts and advice that are in the best interests of the customer. AMS Performance was built on a foundation of integrity. This is who we are; this is what you can count on.

A vehicle modified by the use of performance parts may not meet the legal requirements for use on public roads. Federal and state laws prohibit the removal, modification, or rendering inoperative of any part or element of design affecting emissions or safety on motor vehicles used for transporting persons or property on public streets or highways. Use or installation of performance parts may adversely affect the drivability and reliability of your vehicle, and may also affect or eliminate your insurance coverage, factory warranty, and/or new OEM part warranty. Performance parts are sold as-is without any warranty of any type. There is no warranty stated or implied due to the stresses placed on your vehicle by performance parts and our inability to monitor their use, tuning, or modification.

These instructions are provided as a guide only as there are many variables that cannot be accounted for concerning your particular vehicle, including but not limited to model year differences, model differences, the presence of non-OEM parts, and modifications that may already be or were previously installed. A basic knowledge of automotive parts and systems is helpful but a better understanding of the parts and systems on your particular vehicle may be required.

If you have any questions or issues at any time during the installation of your AMS Performance product(s) please call us for technical assistance. The AMS Performance tech line can be reached during business hours at 847-709-0530 for AMS Performance products only.

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**42** Enjoy!



1) Remove the engine cover and battery cover. Remove the engine cover by pulling upwards while give the cover a wiggle to release the grommets holding it in place. Remove the battery cover by sliding it forwards to the front of the car and then lifting up.



2) Disconnect the negative battery terminal.





### 3) Release ECU Connectors

**Note: Take care releasing the ECU connectors. Carefully release the tab that holds the Grey and Red levers in place. Pull the levers one at a time to unseat the connectors from the ECU. If they are difficult to release, wiggle the connector while pulling the lever. Pull the connectors off to the side.**



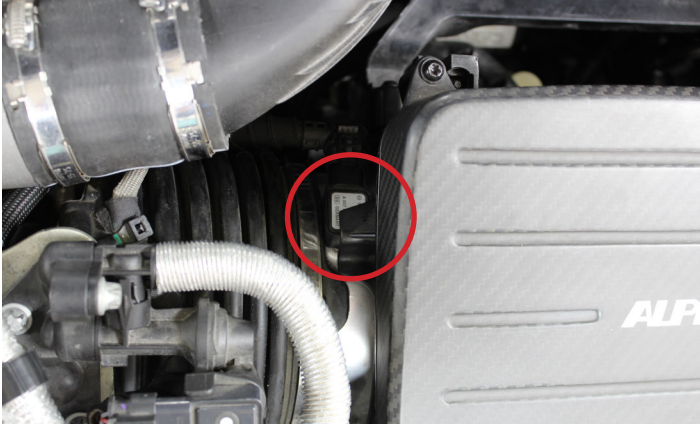
### 4) Remove ECU

**Note: There are two securing clips that hold the ECU to the airbox. Release these, tilt the ECU towards the battery, and then pull up to remove.**





5) Disconnect the MAP sensor on the air box. To do so, use a small screwdriver to pull out the grey tab from the connector. Once released, depress the grey tab down to disconnect.



6) Loosen the hose clamp on the coupler to air box connection using a 7mm socket or flat head screw driver. Remove the airbox and inlet duct from the car.

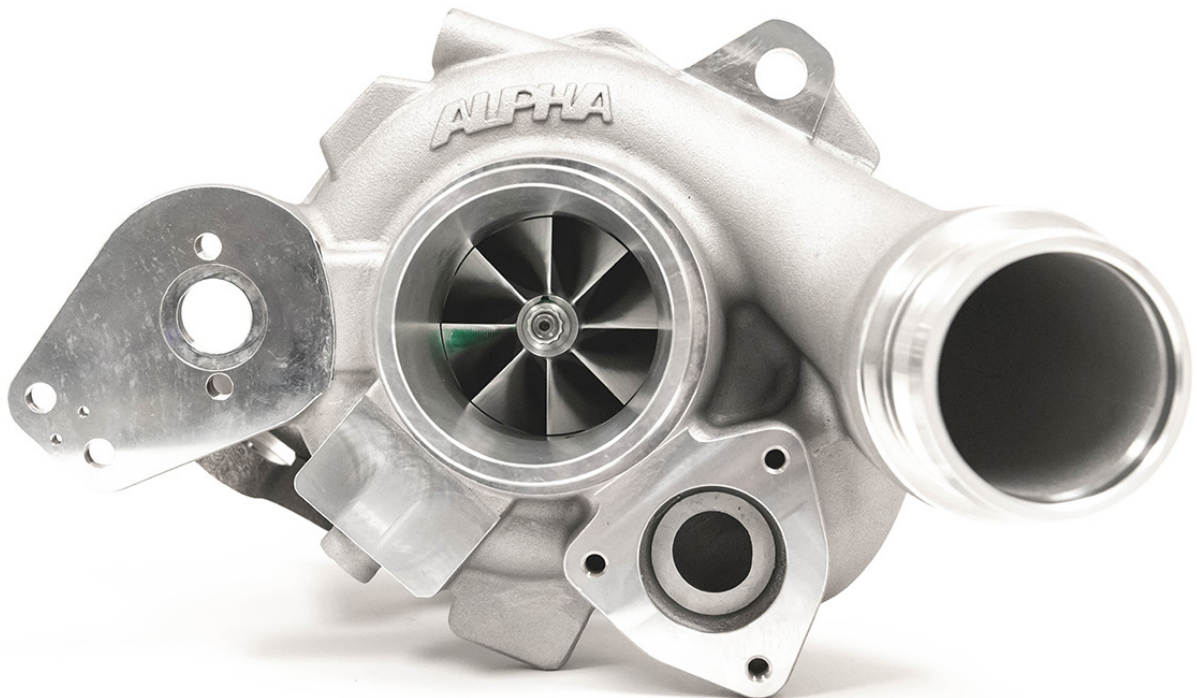
**Note: On cars with the factory inlet duct: Pull the inlet duct towards the front of the car away from the air box. Pull up on the air box assembly to remove it from the car. It is held in place by three rubber grommets under the air box. Then remove the inlet duct.**

**Note: On cars with Alpha inlet duct: Release and pull the inlet duct towards the front of the car away from the airbox. Pull up on the airbox assembly about 3-4 inches while rotating the inlet duct downward. You should be able to remove the inlet duct from the car at this time. Remove the airbox assembly. It is held in place by three rubber grommets under the air box.**



7) Remove the turbo heat shield by removing the three E10 Torx bolts.

8) Remove the primary A/F sensor.





**9)** Remove the radiator fan. The fan will take a bit of time to figure out how to remove it. It will take a little trial and error but will not require force to remove.

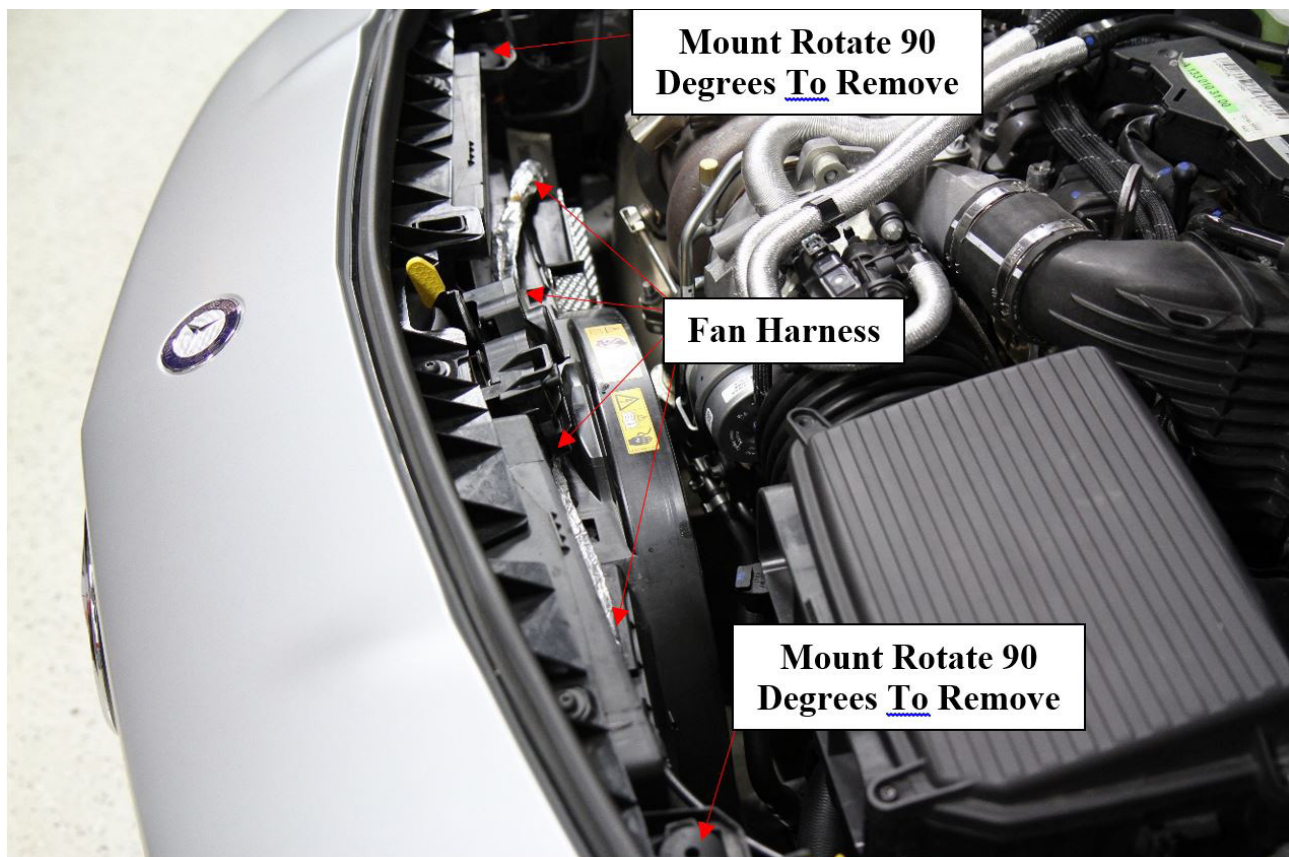
**a.** First start by removing the upper radiator mounts. Do this by turning the upper part of the mount 90 degrees. When turned 90 degree, the tabs will clear the mounting area and can be removed. The easiest way I found to do this is to use needle nose pliers to turn the mounts. You also may have to wiggle the radiator itself to aid in removing the mounts.

**b.** Disconnect the fan control module on the passenger side of the fan. It is a large connector with a harness covered in silver heat wrap. Once disconnected, disconnect the clips holding the harness to the fan and pull the harness over to the driver's side.

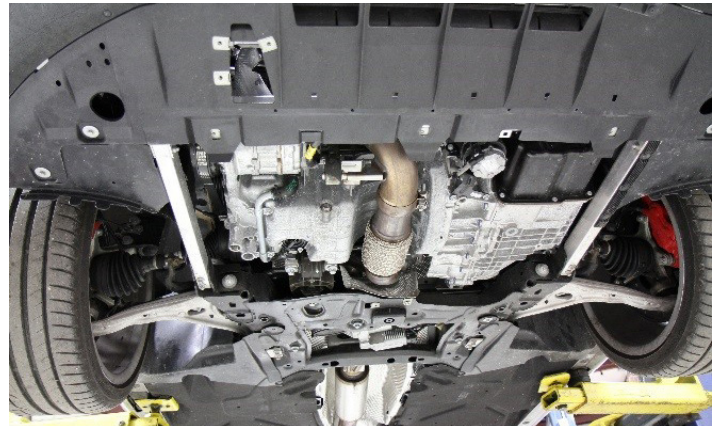
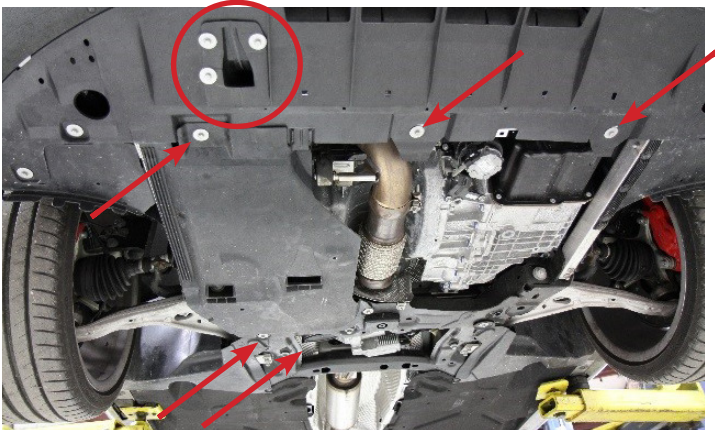
**c.** Release the harnesses connected to the driver's side of the fan. These maybe difficult to get to at first. The harnesses are held in place by fir tree mounts. Carefully pry the mounts off the fan. Complete removal of the air box may aid in reaching the harnesses.

**d.** The fan slides into brackets on the radiator. Push the radiator towards the engine, release the upper tabs of the fan and pull upwards. You will need to push the radiator towards the engine so the fan clears the hood latch.

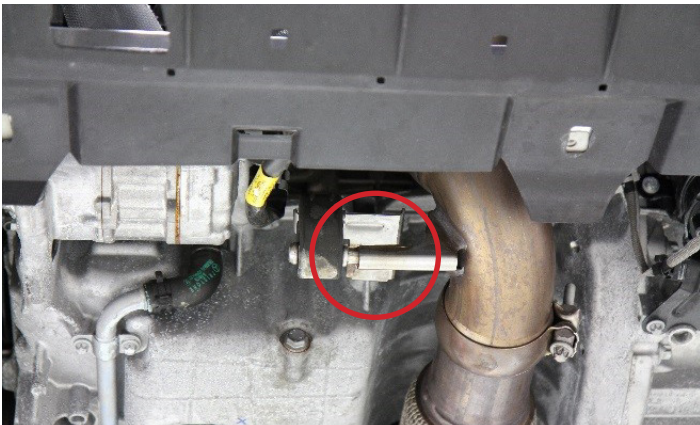
**e.** Take care when removing the fan. It will take a little side to side motion while pulling it upwards to remove it from the car.



**10)** Under the car, remove the small under tray and the downpipe air duct shown in the picture. Also remove the two bolts shown holding the front bumper.

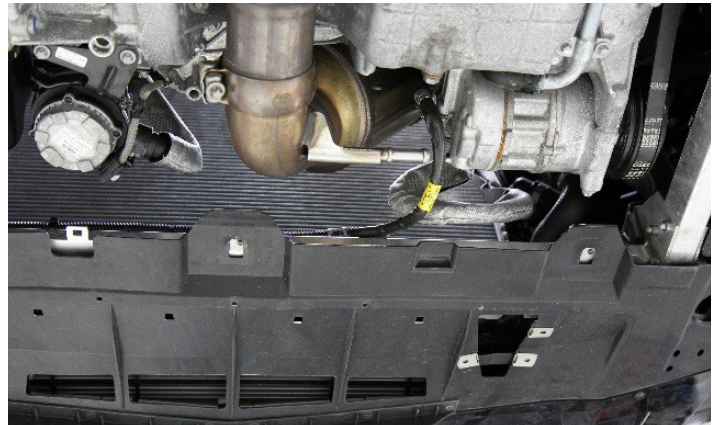
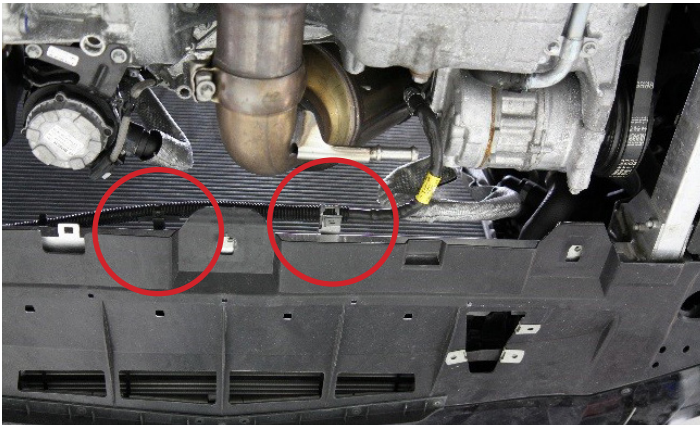


**11)** Remove the downpipe hanger mount by removing the two E12 Torx bolts.





**12)** Remove the T25 Torx screw holding the harness in place shown in the picture below. Also remove the Fir clip just to the left. The harness will need to be pushed back slightly towards the radiator when removing the stock downpipe.



**13)** Remove the lower downpipe section with the flex. Remove the two exhaust clamps with E12 Torx bolts. Remove the lower downpipe section out towards the front of the car.





**14)** Disconnect the secondary O2 sensor. The sensor can remain in the downpipe for removal. The connector is accessible from under the vehicle. The connector is located just above the outlet ball flange of the downpipe and is clipped into a bracket on the engine.

**15) This step is important! Locate a thick or multiple pieces of cardboard. Place the cardboard in front of the radiator. When dropping the factory downpipe out the bottom of the car, the turbo flange will touch the radiator. Without something there to protect the radiator, the chances of damaging it will be very high.**

**16)** Remove the two E12 Torx bolts of the V-band clamp holding the downpipe in place. Use some type of rust penetrant on the bolts prior to removal. Without it, the bolts can gall and seize in the clamp. The clamp will need to be pried off the flange. Take care when doing this so not to damage any surrounding components or allowing the downpipe to fall.

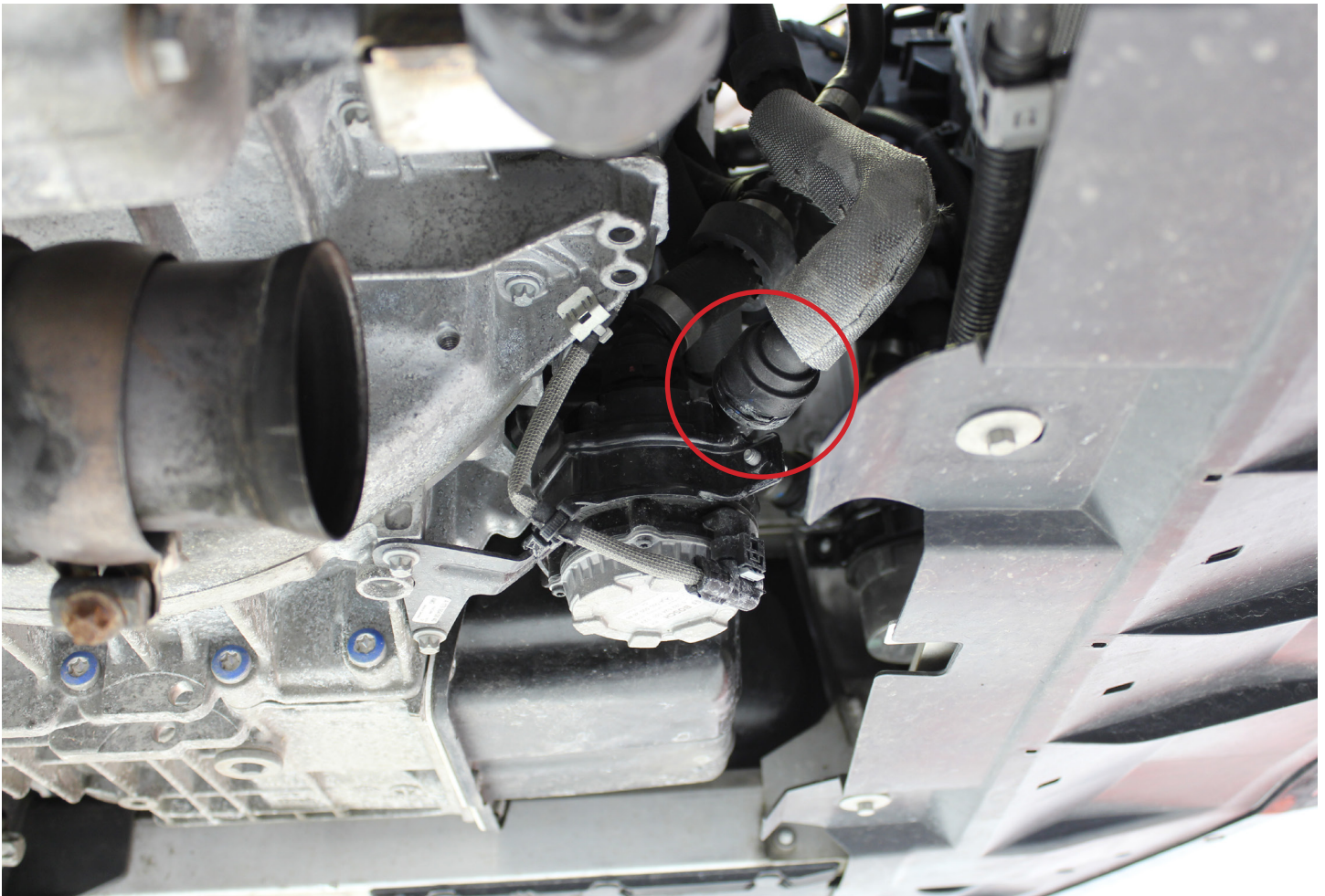


**17)** To remove the downpipe, move the down pipe forward to the radiator. Then slide the downpipe over to the drive's side so the turbo flange is just past the turbine housing. Once past the turbine housing, start to guide the downpipe down out the bottom of the car.



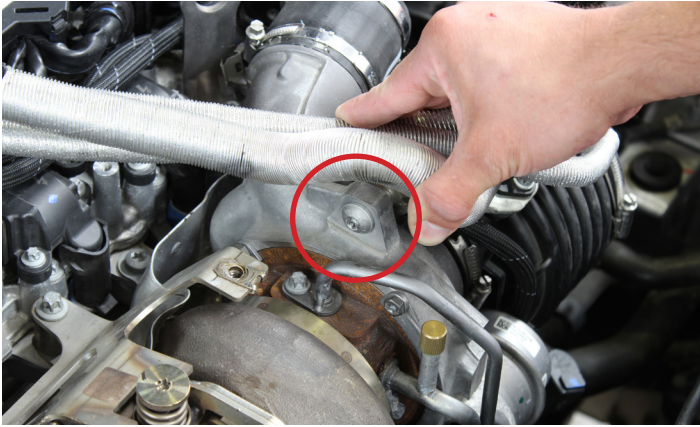
### 18) Drain Engine Coolant/Anti-freeze.

**Note:** On the 2014 model year CLA45 AMG in which these instructions are based off of, there is no known coolant drain. To drain the coolant, remove the hose on the outlet side of the auxiliary coolant pump located in front of the transmission. This is a low enough point to provide adequate draining of coolant from the engine and turbocharger. Remove the engine coolant reservoir cap for faster draining.

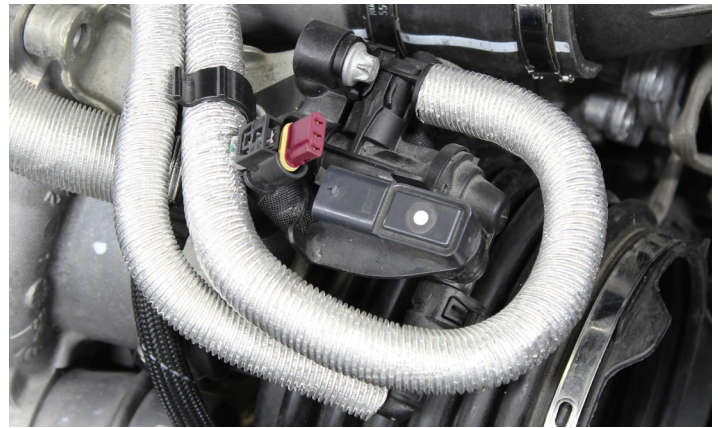
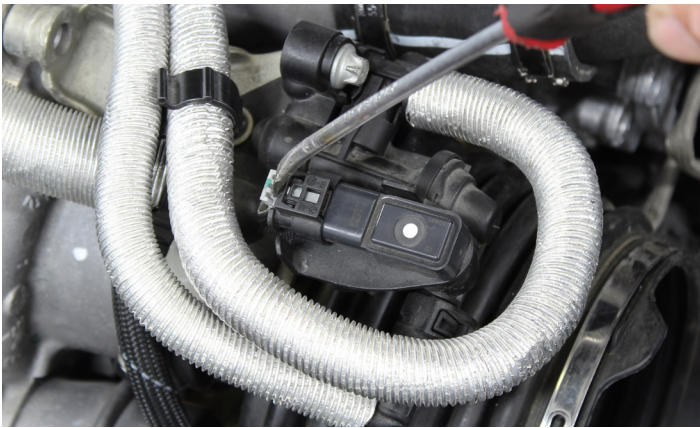




**19)** Remove T45 Torx bolt securing the evap bracket.

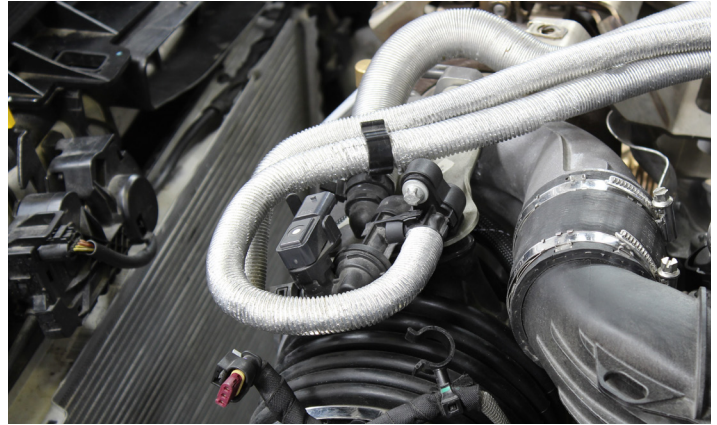
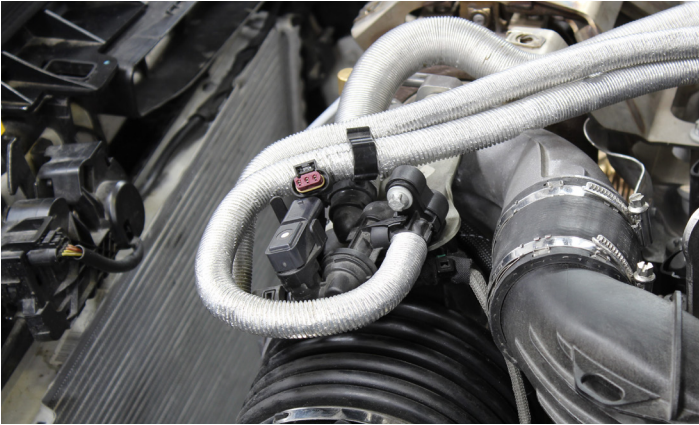


**20)** Unclip the electrical connection on the evap monitoring sensor. To do so, use a small screwdriver to pull out the grey tab from the connector. Once released, depress the grey tab down to disconnect.

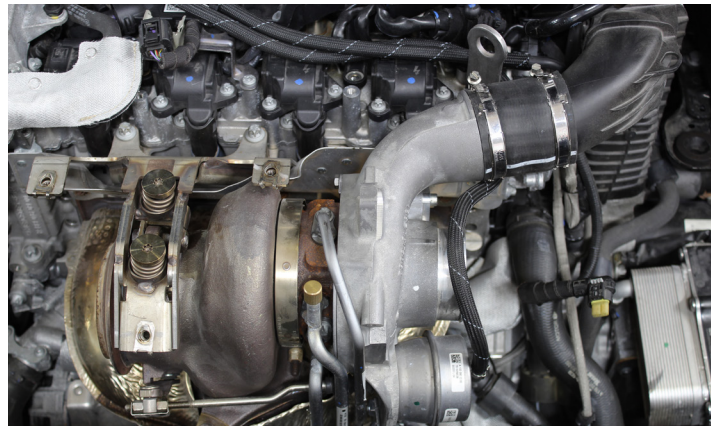
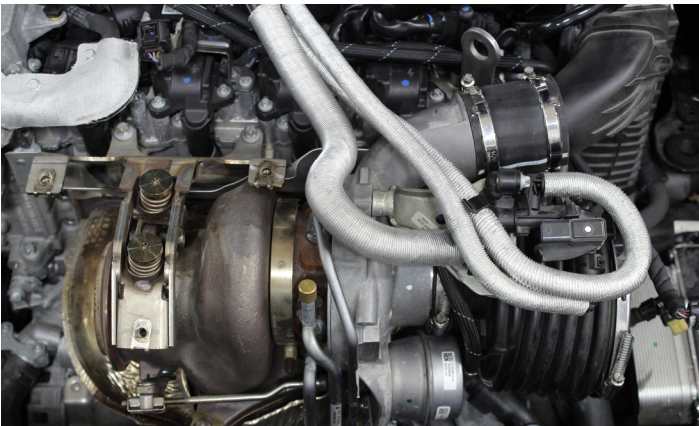




**21)** Remove the evap sensor wire harness and secure to the side.



**22)** Loosen the hose clamp on the coupler to turbocharger inlet connection using a 7mm socket or flat head screwdriver. Remove the inlet coupler and evap lines all together as a unit, and secure to the side.



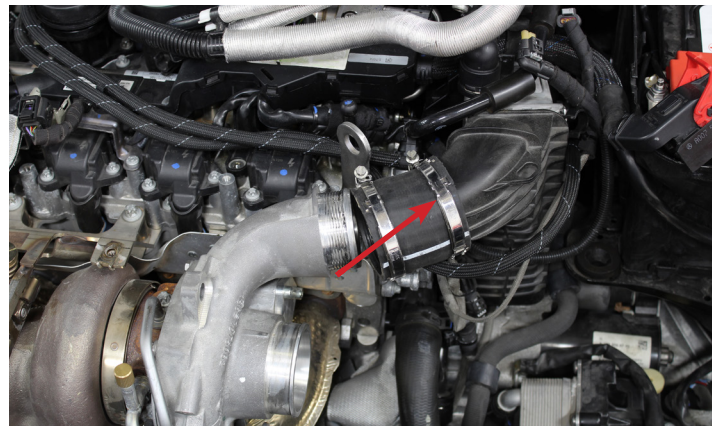


**23)** Remove the wastegate vacuum hose from the wastegate actuator fitting and secure to the side.

**Note:** This is not a permanent connection and should be able to be removed and reinstalled without releasing the clamp.

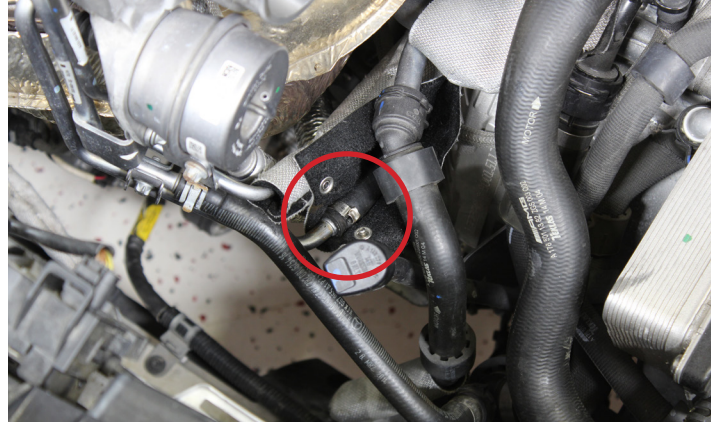


**24)** Loosen the hose clamps on the turbocharger outlet to intercooler connection using a 7mm socket or flat head screwdriver. Slide the coupler away from the turbocharger onto the intercooler as far as possible.

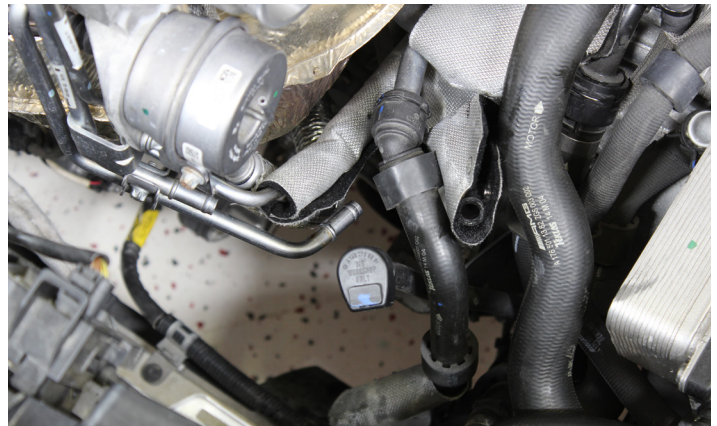
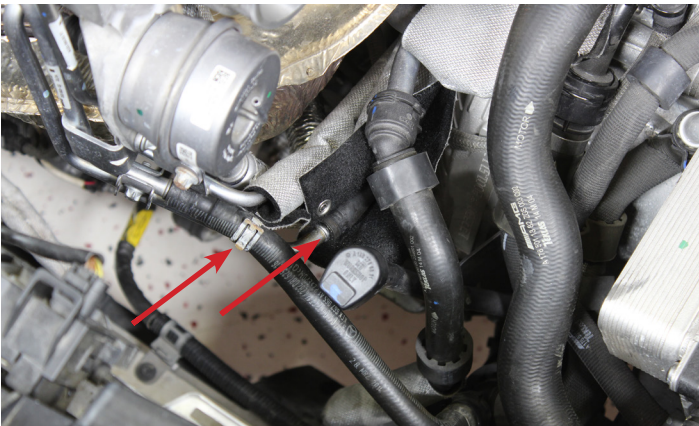




**25)** Remove the protective sleeving from the turbocharger coolant feed line to reveal the clamp.



**26)** Remove the clamps from both turbocharger coolant lines. Disconnect and secure the lines to the side.





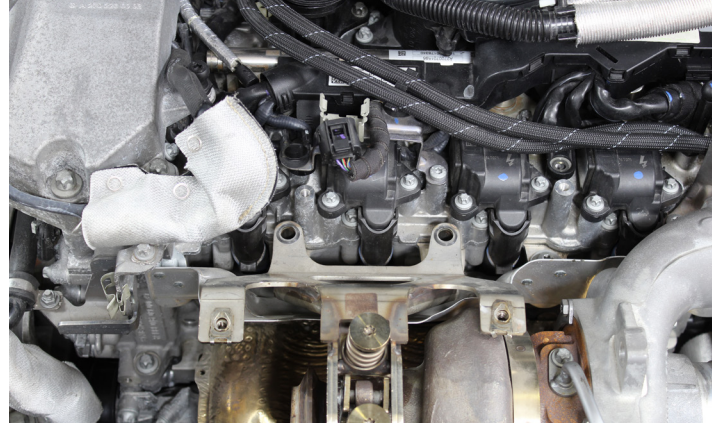
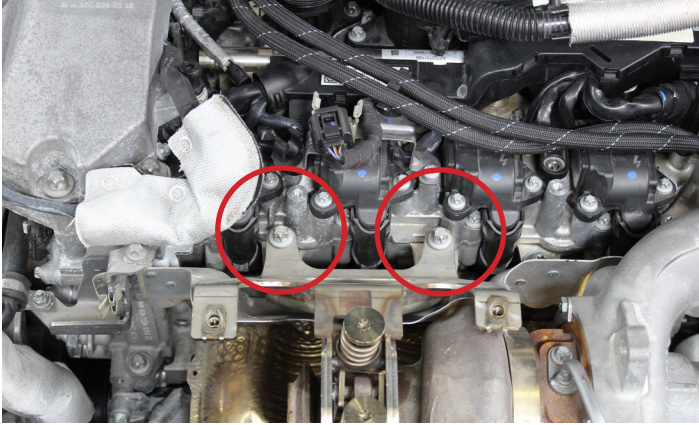
**27)** From the underside of the vehicle, disconnect the oil drain tube from the engine block.



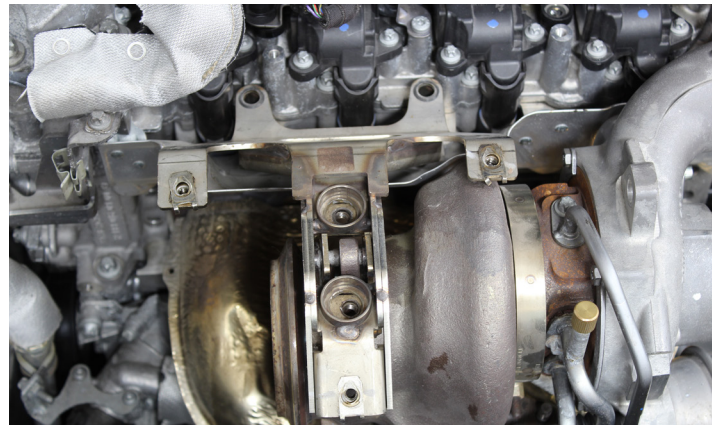
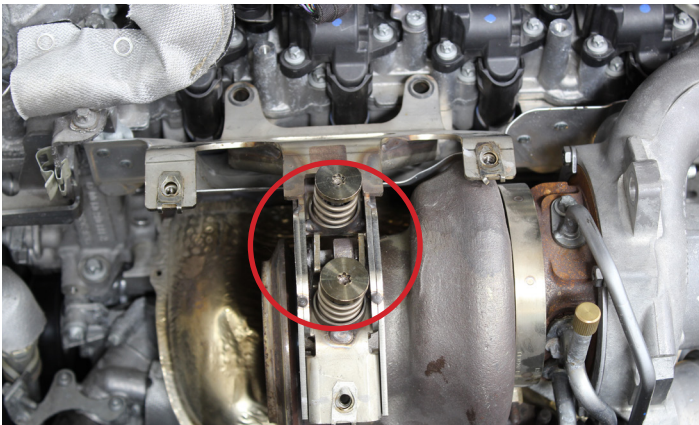
**28)** From the underside of the vehicle, disconnect the oil feed line from the engine block.



**29)** Remove the 2 E8 Torx bolts from the turbocharger upper support bracket to the cylinder head.

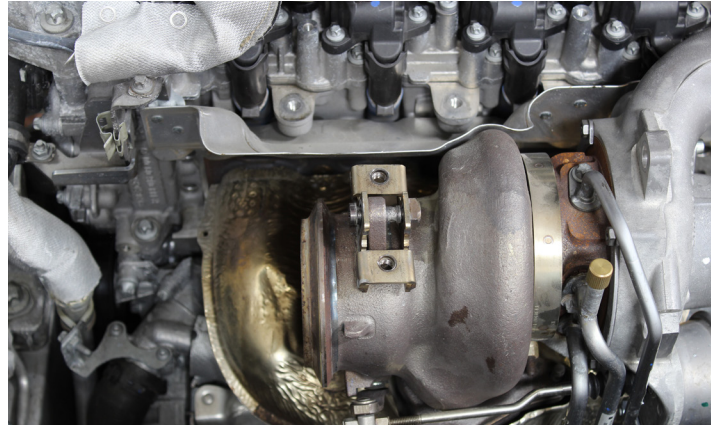
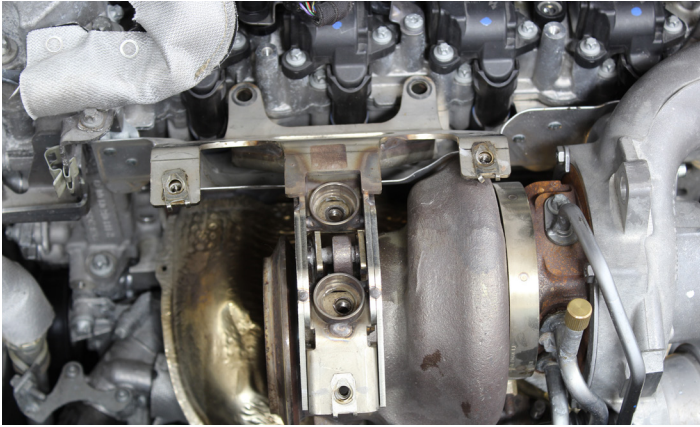


**30)** Remove the 2 T40 Torx bolts from the turbocharger upper support bracket.

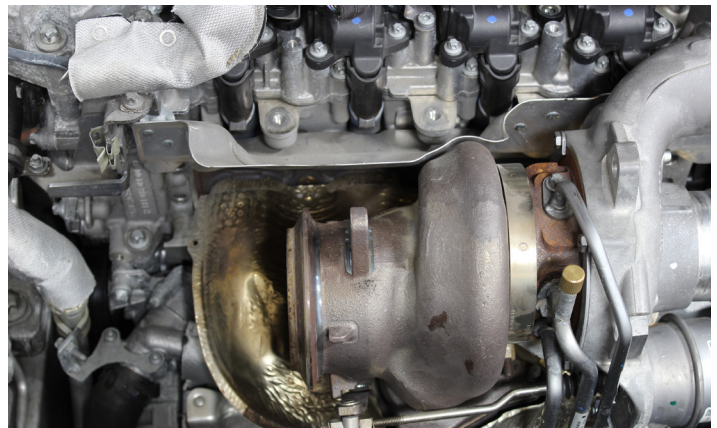




**31)** Remove the turbocharger upper support bracket.



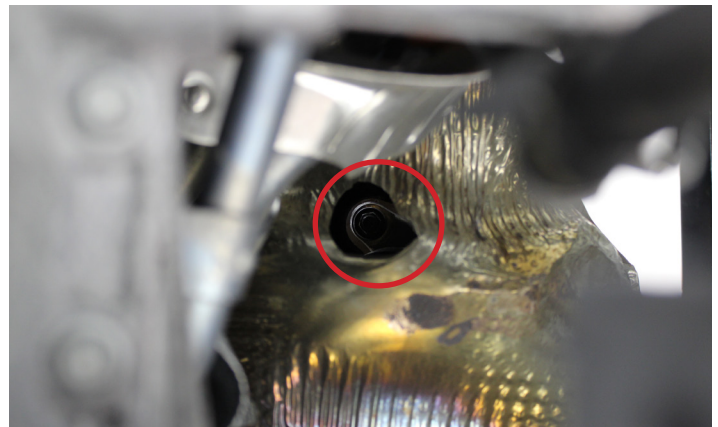
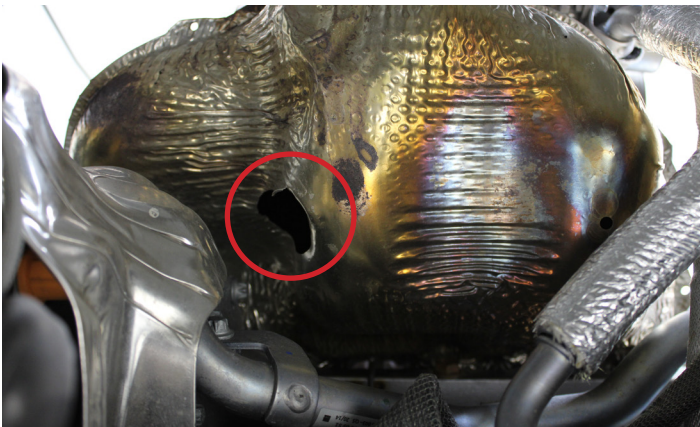
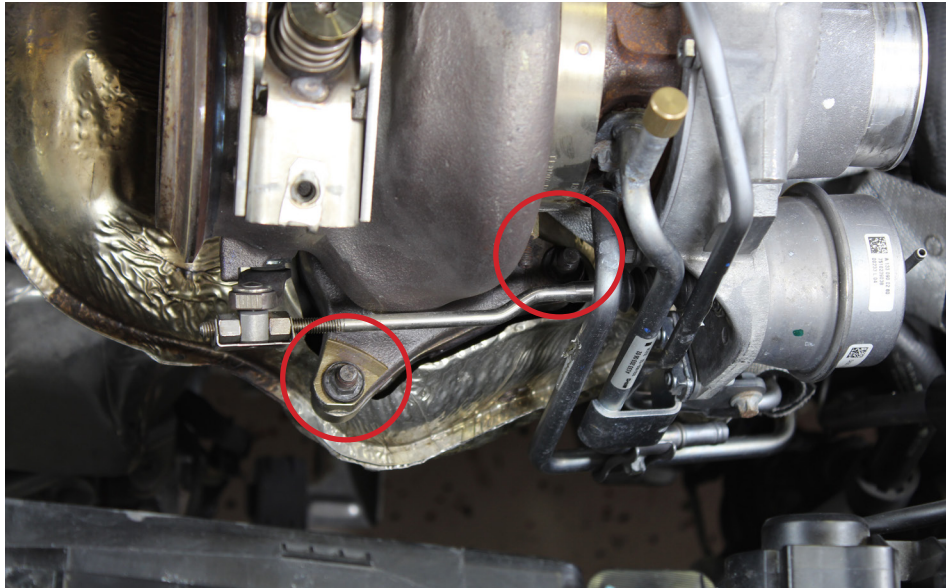
**32)** Remove the last T40 Torx bolt from the lower support bracket and remove from the turbocharger.



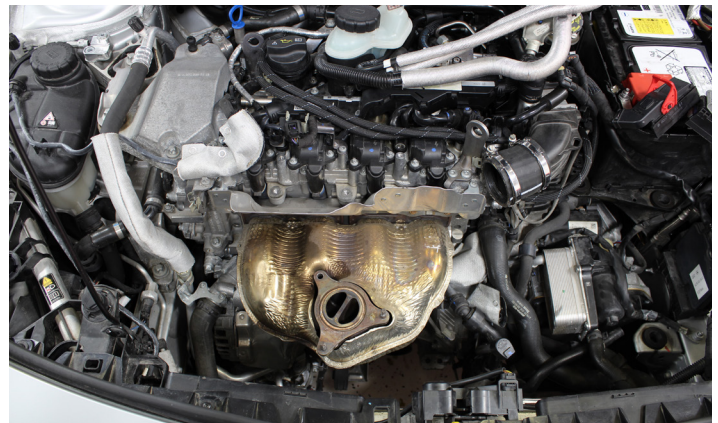
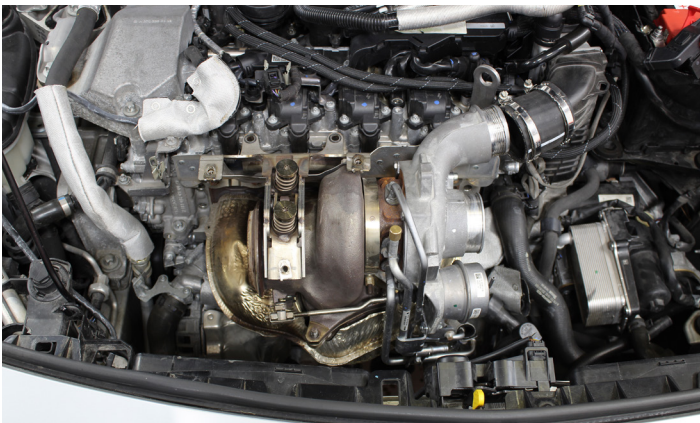


**33)** Remove the 3 10mm hex nuts securing the turbocharger to the exhaust manifold. The two front nuts are accessible from the turbo side on top. The rear nut is accessible from underneath with an extension.

(View from above)

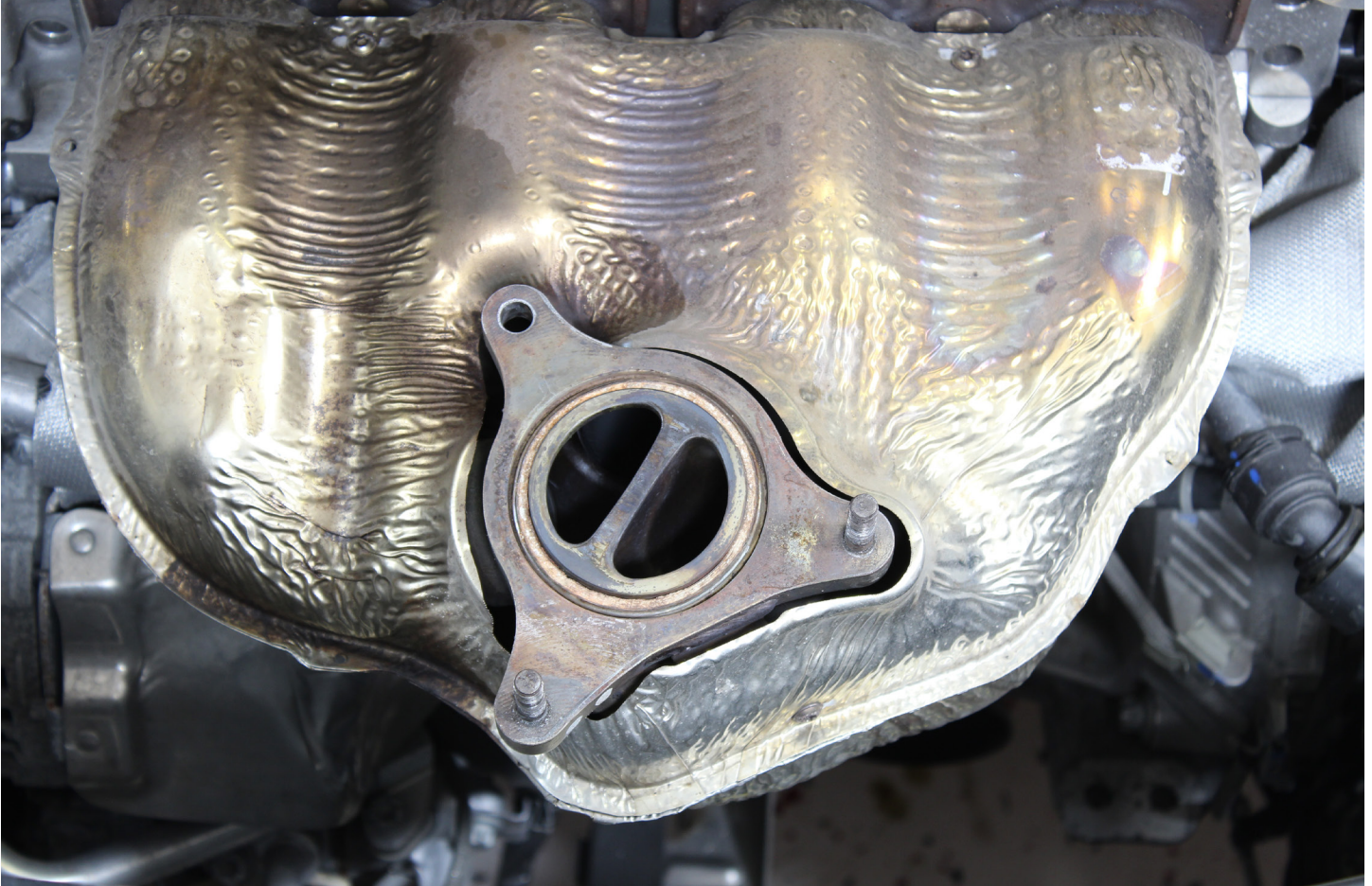


**34)** Remove turbocharger assembly from vehicle.





**35)** Inspect the manifold to turbine housing gasket / sealing ring for irregularities or wear. Replace if necessary. (OEM Part # A1331440180)



**36)** Remove the Alpha turbocharger upgrade kit from the packaging. Place the turbocharger on the bench next to the stock turbocharger and confirm that the orientation of the compressor housing and turbine housing visually matches up to the orientation of the factory turbocharger. The orientation/clocking of the turbocharger compressor housing and the turbine housing are set in house, however minor adjustments may have to be made before final installation.

**37)** Temporarily remove the rubber coupler on the inlet of the intercooler and set to the side.



**38)** Loosen but don't remove the 4 – 10mm hex bolts securing the compressor cover and the 6 – 12mm hex bolts securing the turbine housing to the CHRA. Only loosen enough so rotation of the compressor cover and or CHRA can be achieved.

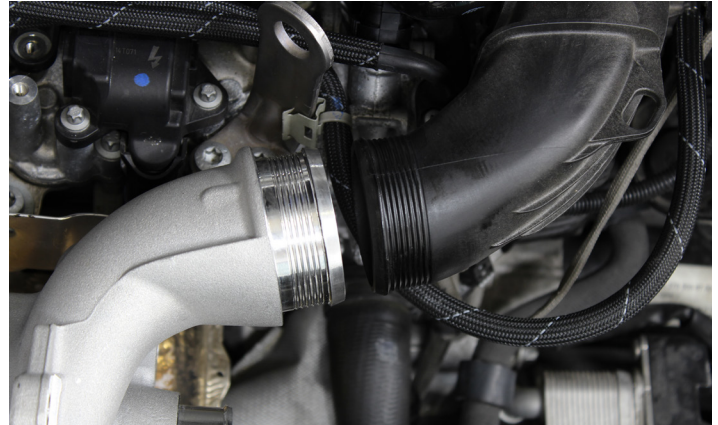
**39)** Install the turbocharger assembly on to the exhaust manifold and loosely tighten the turbine housing to exhaust manifold nuts.

**40)** Check the orientation of the Oil inlet fitting. This should be nearly vertical or very slightly angled towards the rear of the car when looking at the turbocharger assembly from the side. If adjustment is necessary, rotate the CHRA to the desired position and then tighten the accessible bolts which secure the CHRA to turbine housing. Do not rotate the CHRA forward to far, as this will cause issues with clearance of the oil drain line.

**41)** Once the Turbine Housing to CHRA bolts are tightened, the alignment/clocking of the compressor outlet to the intercooler inlet needs to be checked.

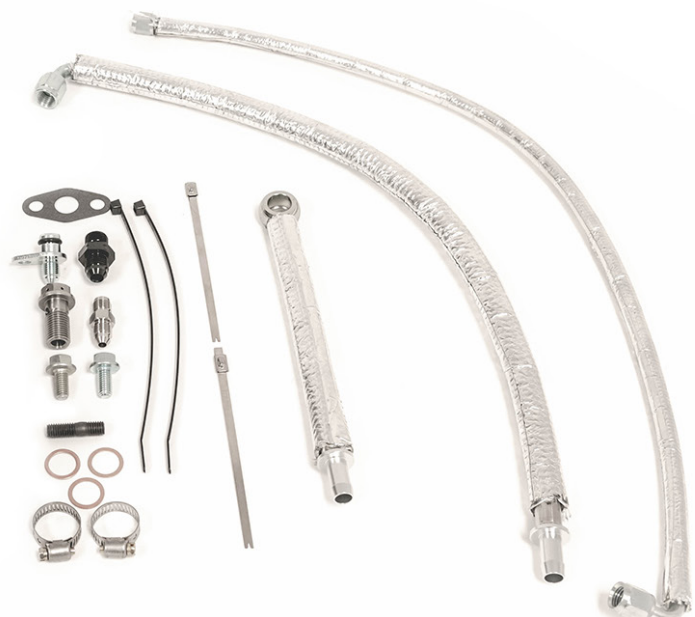


**42)** Rotate the compressor cover until the compressor outlet lines up with the intercooler inlet as shown in the following photos. Tighten the accessible compressor cover bolts to lock the compressor cover into place.



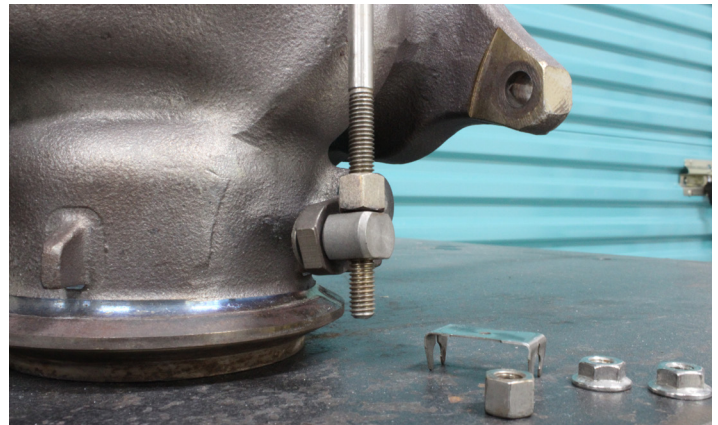
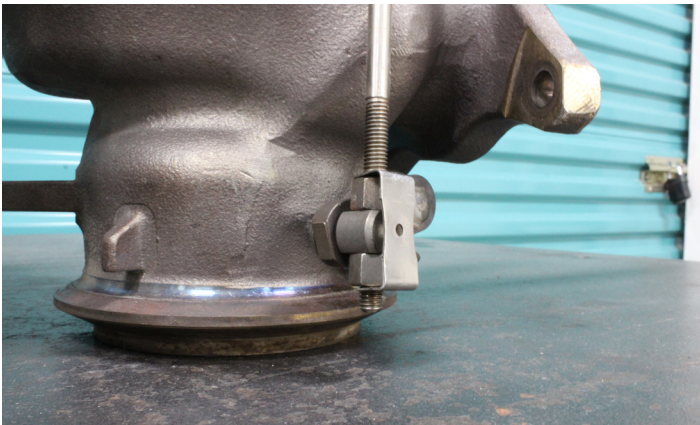
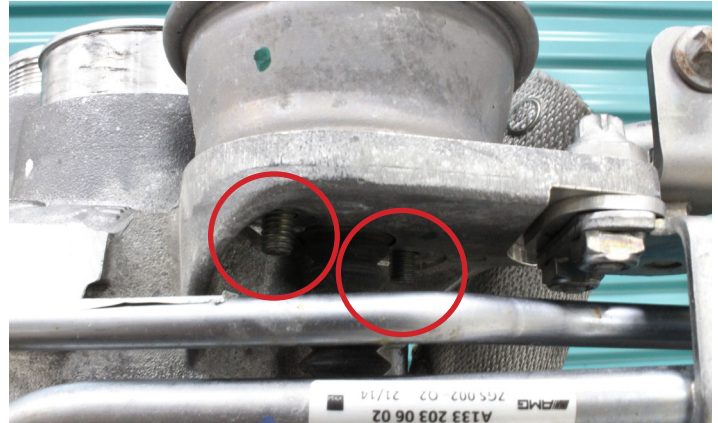
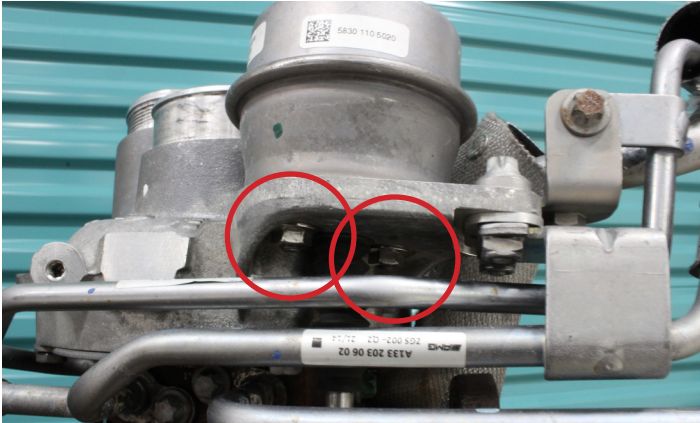
**43)** Remove the turbocharger and tighten the CHRA to turbine housing and compressor cover bolts that were inaccessible while on the car.

**44)** Reinstall the rubber coupler onto the inlet of the intercooler.



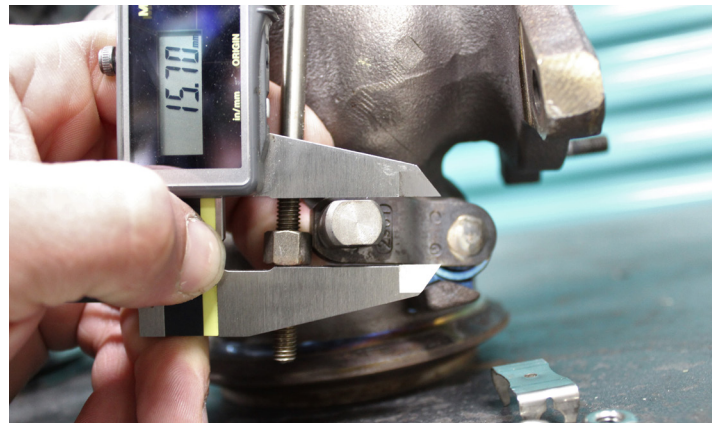
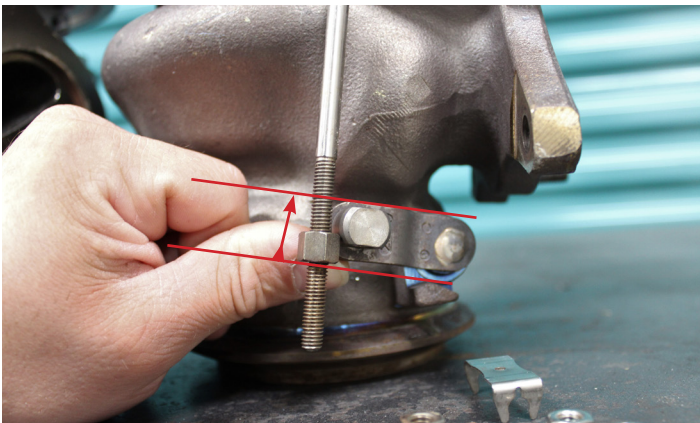


45) Remove the 2 – 10mm hex nuts securing the wastegate actuator body to the compressor housing. Then Remove the retaining clip and the lower/outer 10mm hex nut securing the wastegate actuator rod to the wastegate lever arm. Do not rotate or remove the inner/upper 10mm hex nut on the wastegate lever arm.



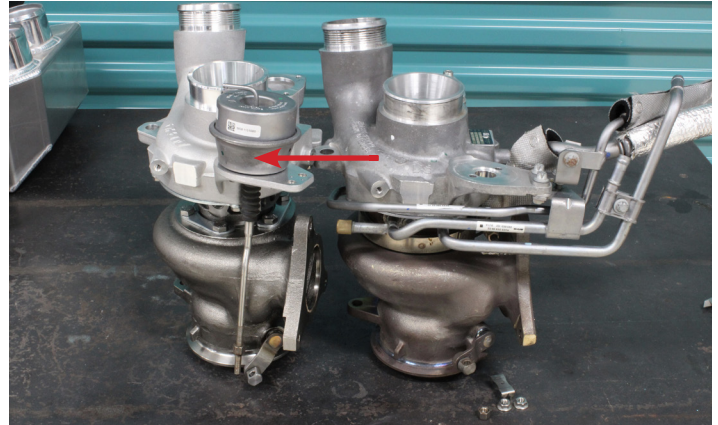
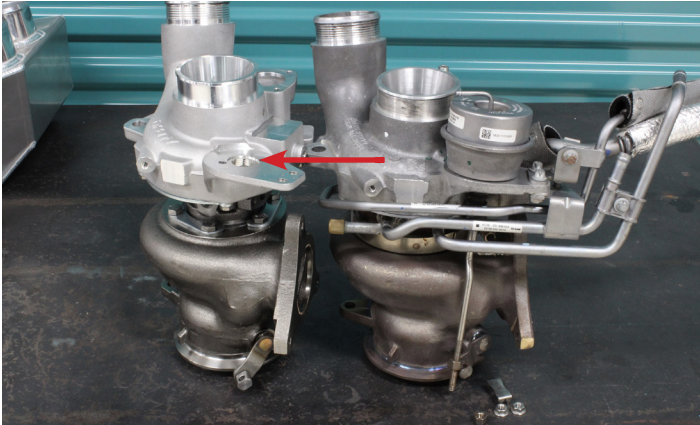
46) Before removing the wastegate actuator from the turbocharger we need to pay close attention to the positioning/preload of the wastegate actuator arm.

- a. Remove the rod from the wastegate lever arm.
- b. Hold the wastegate lever arm shut.
- c. Measure and record the distance between the bottom of the nut on the rod and the top surface of the wastegate lever arm eyelet.

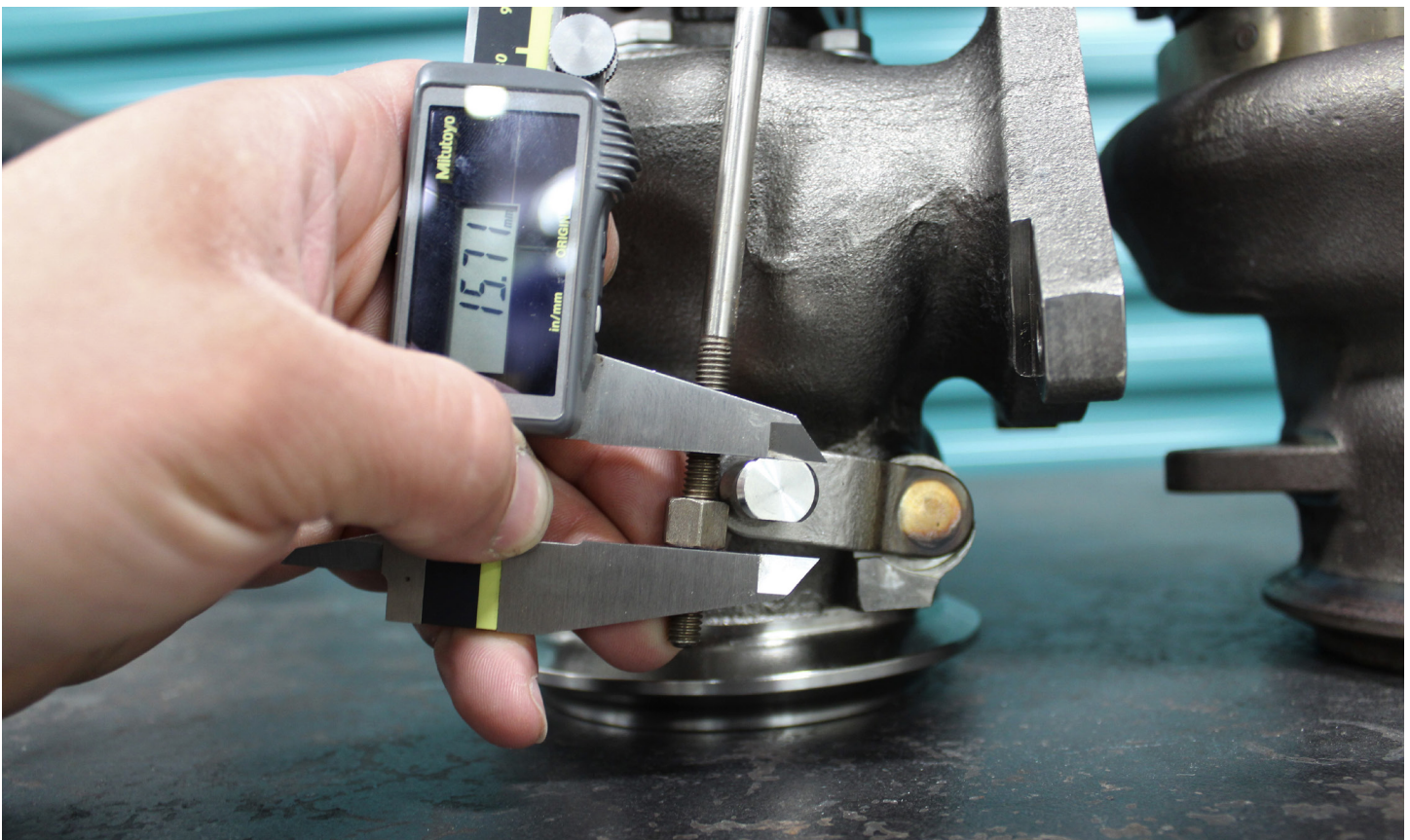




**47)** Remove the wastegate actuator assembly from the factory turbocharger and place onto the Alpha turbocharger.

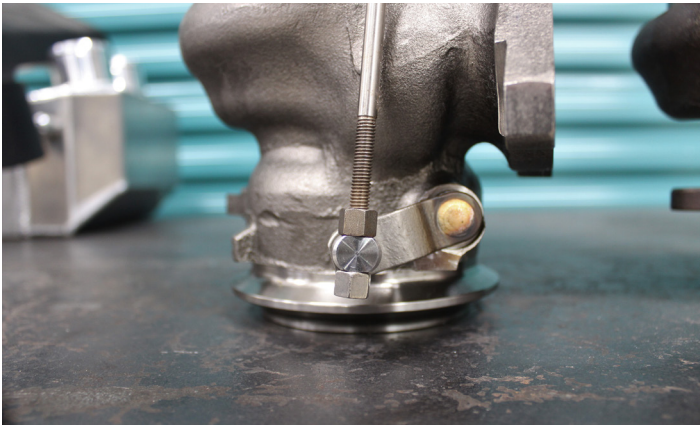


**48)** Repeat the measurement process and adjust the nut on the wastegate actuator rod until it is the same as the measurement as found on the factory turbocharger.

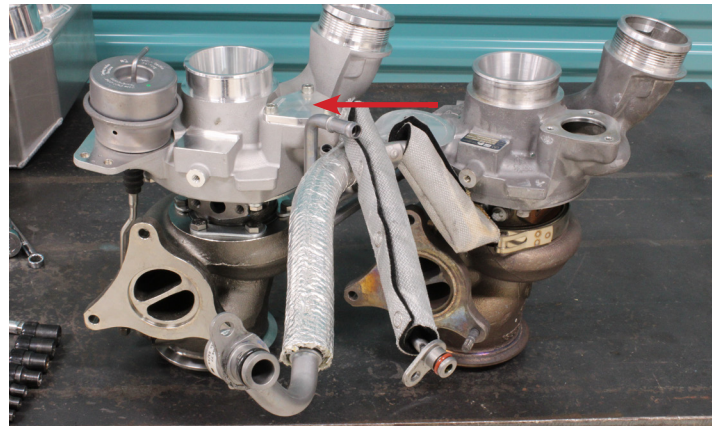




**49)** Slide the rod through the eyelet of the wastegate lever arm. Install and tighten the lower nut on the wastegate actuator rod. Install and tighten the nuts to secure the wastegate actuator body to the compressor housing.

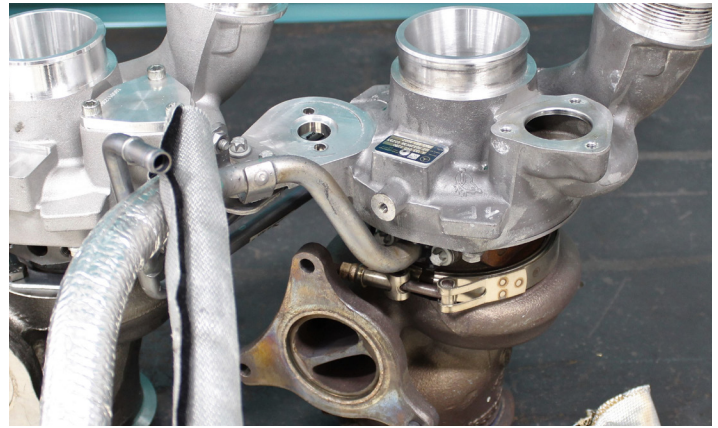
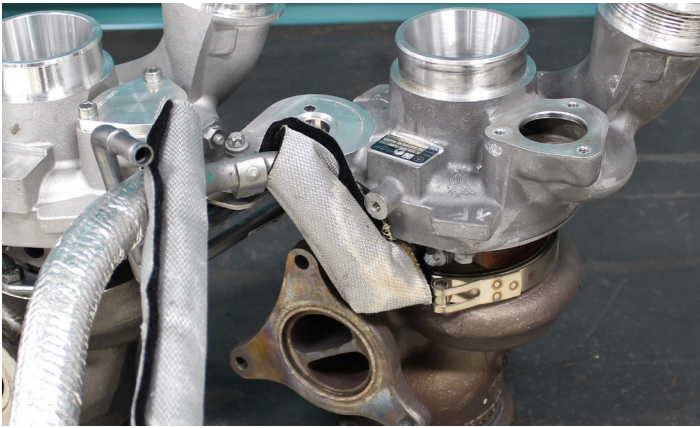


**50)** Remove the BOV/Block-off plate from the factory turbocharger and install onto the Alpha Turbocharger.

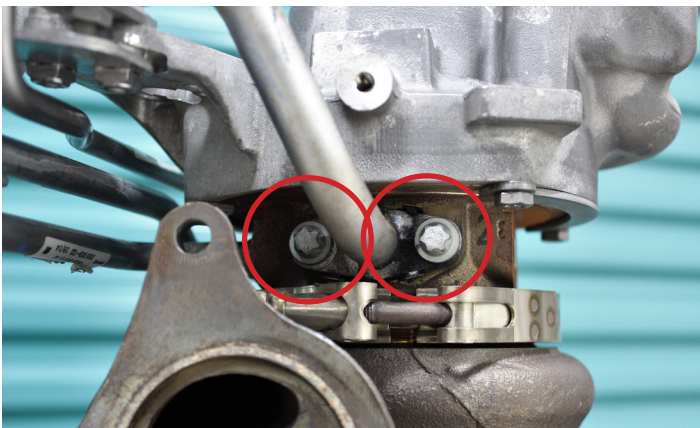




**51)** Remove the protective heat sleeving from the oil drain line by unbuttoning the 3 buttons securing it to the line.



**52)** Remove the 2 E10 Torx bolts securing the oil drain line to the factory CHRA and remove the 1 E10 Torx bolt securing the oil drain line bracket. Remove the oil drain line from the factory turbocharger



**53) Oil Drain Line modification:**

a. With the line removed, you will need to drill the bolt holes in the 2-bolt flange larger to be able to pass through an M8 bolt. Your new Alpha turbocharger upgrade kit is supplied with M8 bolts to re-secure the line to the Alpha CHRA.

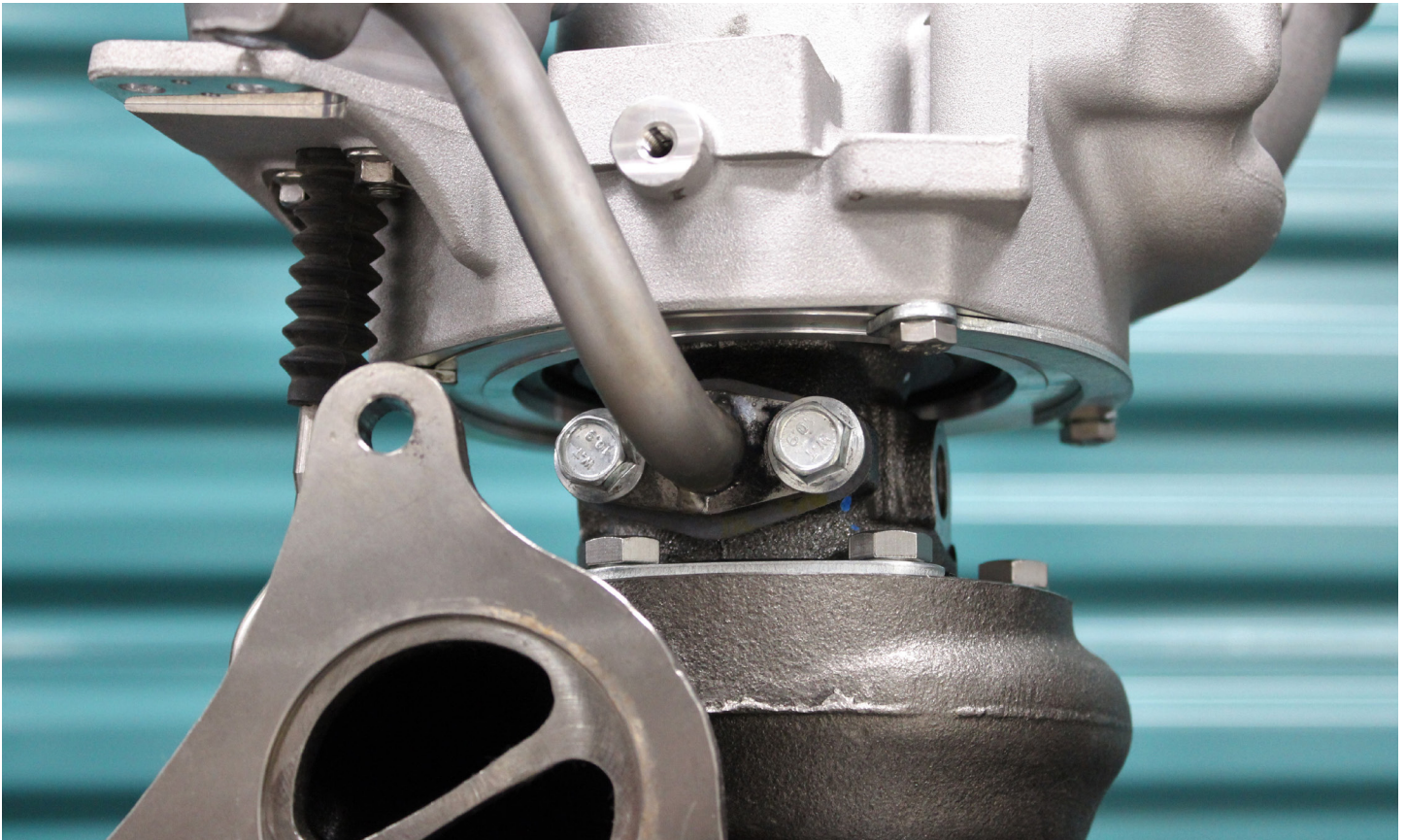


b. For added clearance, bend the bracket on the oil drain line as shown in the pictures below. The bracket will not be used on the Alpha turbocharger upgrade

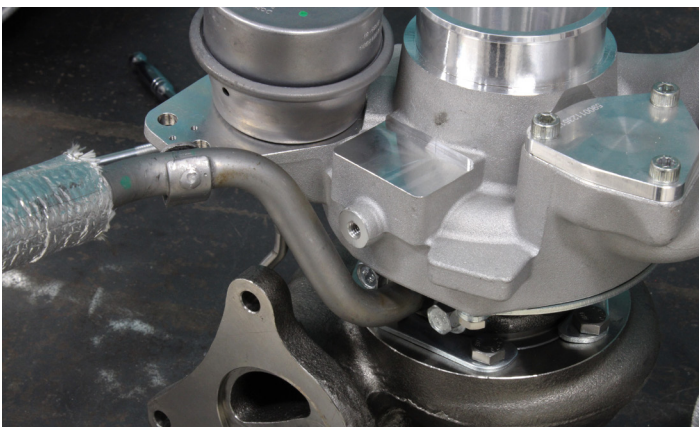




**54)** Install the modified oil drain line onto your Alpha Turbocharger using the M8 bolts supplied in the kit.



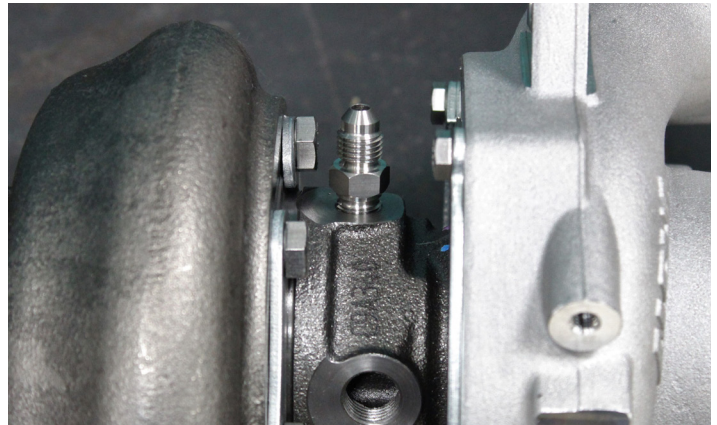
**55)** Reinstall the heat sleeving onto the oil drain line.



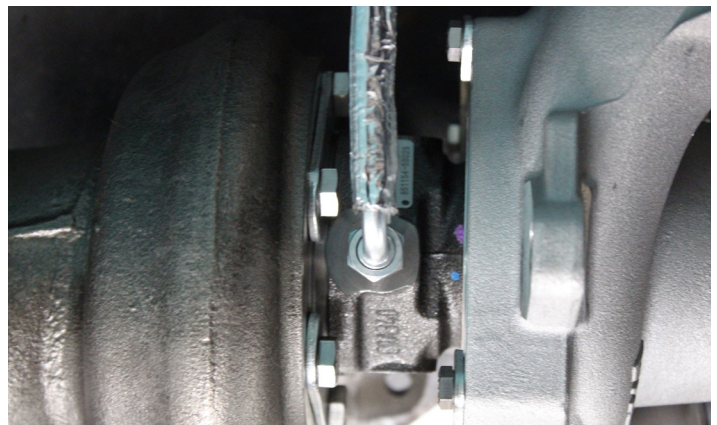
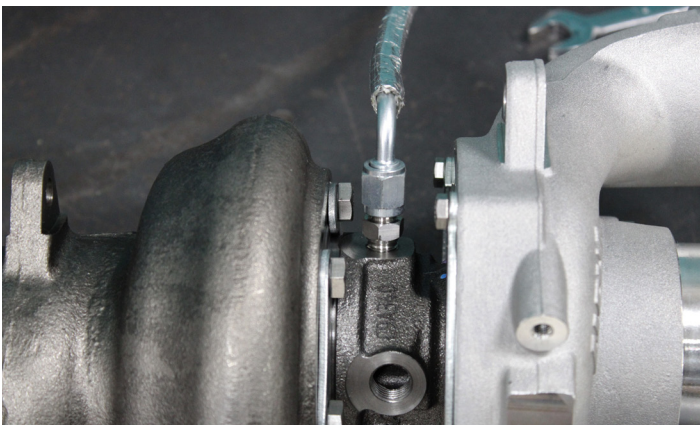


**56) Oil feed and coolant line installation:**

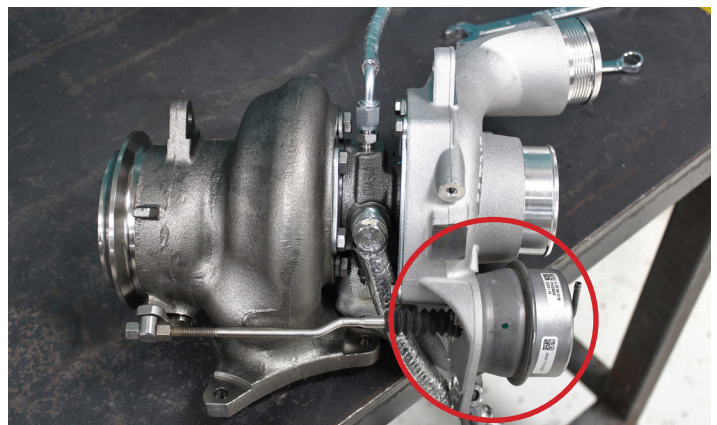
- a. Locate the oil feed fitting restrictor from your kit. Install into the CHRA.



- b. Locate the -04an oil feed line and install in the orientation shown.

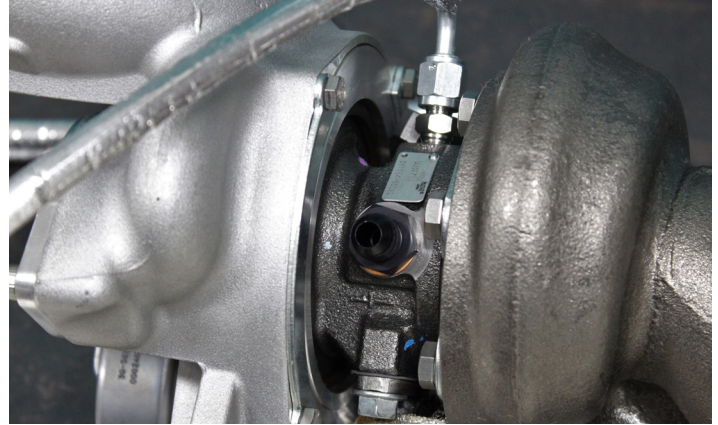


- c. Locate the M14 Banjo to barb coolant line from your kit. Using the alpha banjo bolt and 2-14mm copper crush washers, install onto the CHRA in the orientation shown. This is the "front" coolant line.





d. Locate the M14 to -06an Male adaptor and remaining 14mm copper crush washer. This will be installed onto the “back” side of the CHRA in the orientation shown.

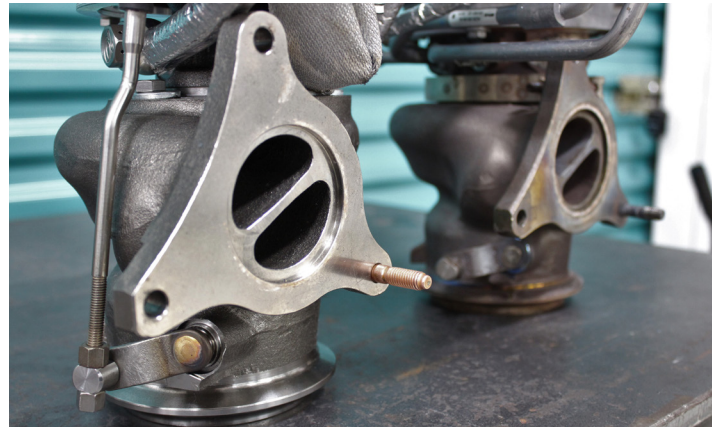
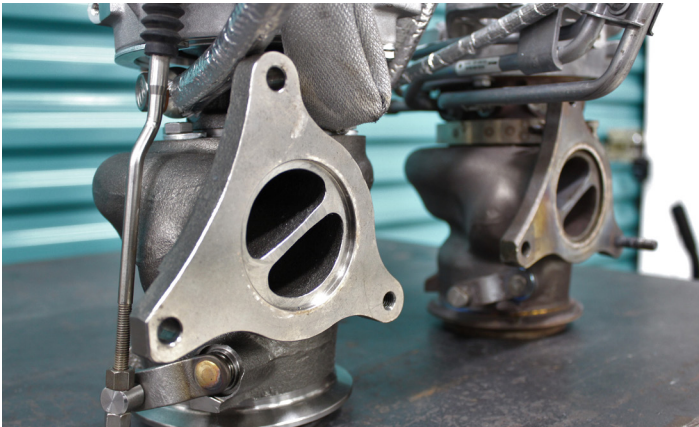


e. Locate the -06an 90degree female to barb coolant line and install in the orientation shown. This is the “rear” coolant line.





**57)** Install the supplied M8 stud into the inlet flange of the turbine housing in the same location that is found on the factory turbocharger.

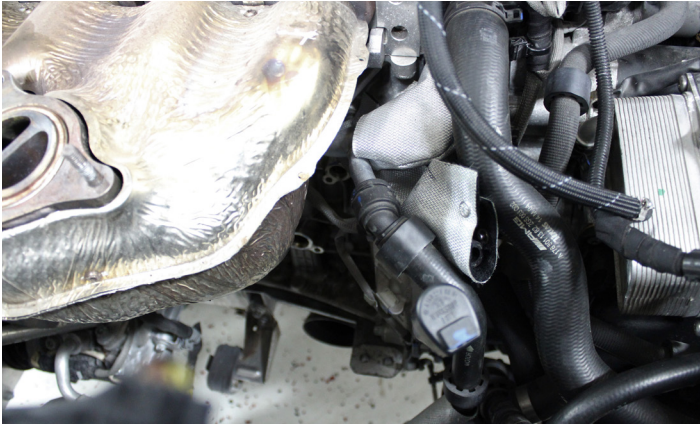


**58)** Locate the oil feed fitting adaptor supplied in your kit and install the O-ring.



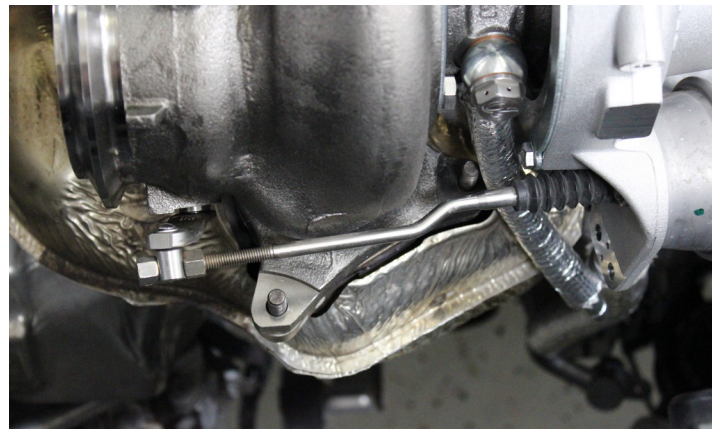
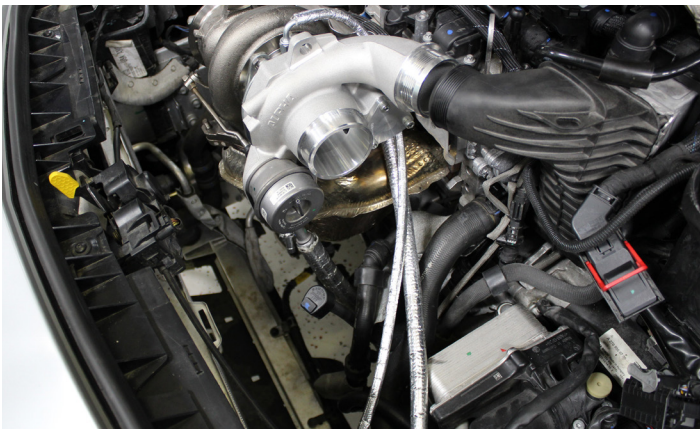


**59)** Using the factory hardware, install the oil feed adaptor fitting into the engine block.



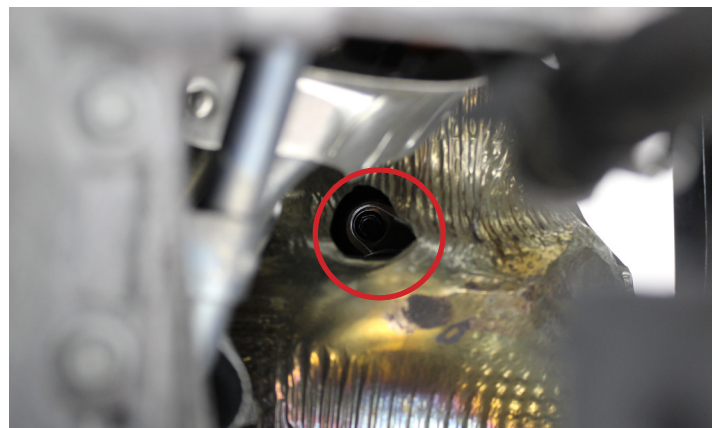
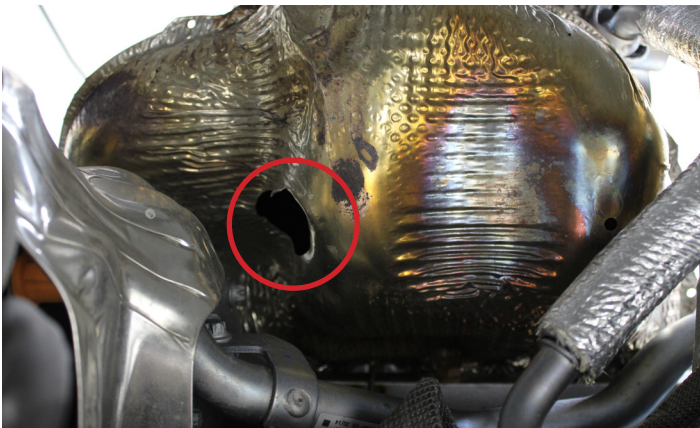
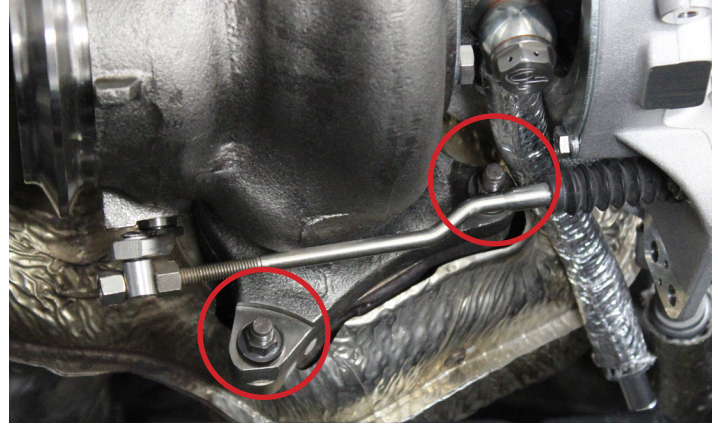
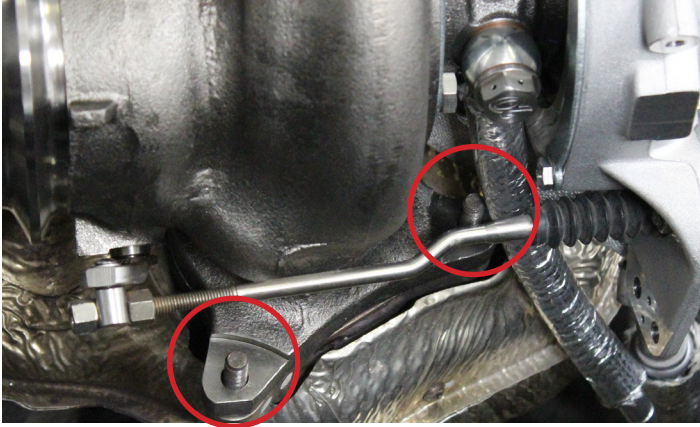
**The Alpha turbocharger is now ready to be installed on your vehicle.**

**60)** Set the Alpha turbocharger assembly into position on the exhaust manifold. Check for clearance between the oil drain line and the exhaust manifold. This should not be touching. Note the orientation of the coolant and oil feed lines.

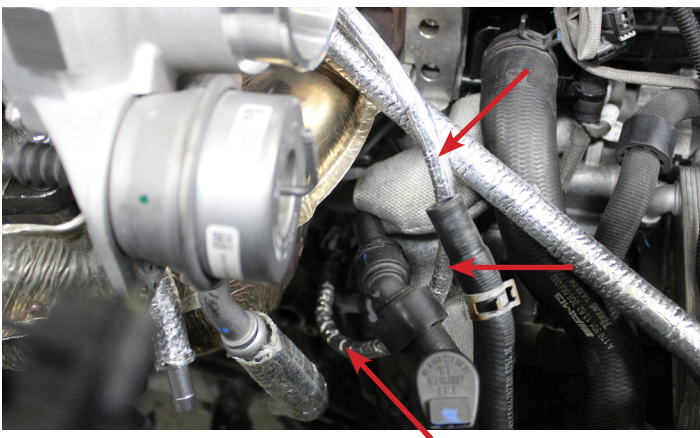




**61)** Tighten all 3 of the manifold-to-turbine housing nuts.  
(View from above)

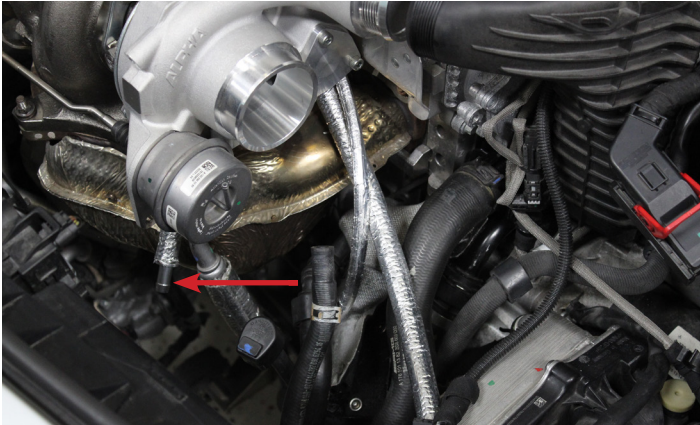


**62)** Route the oil feed line as shown in the following pictures. Connect and tighten the line to the oil feed adaptor fitting on the engine block.

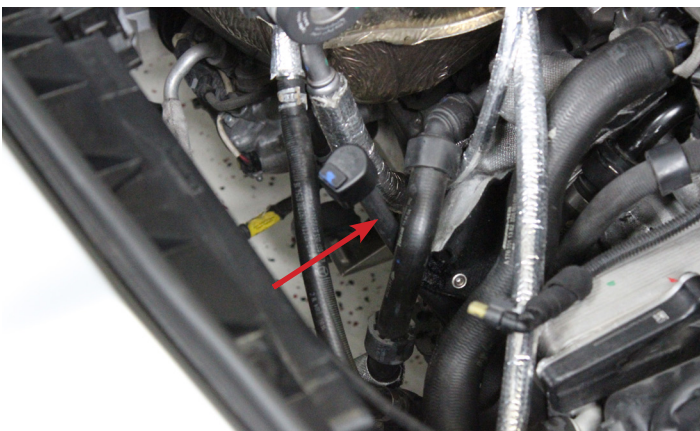




**63)** Connect the front side coolant line as shown in the following pictures

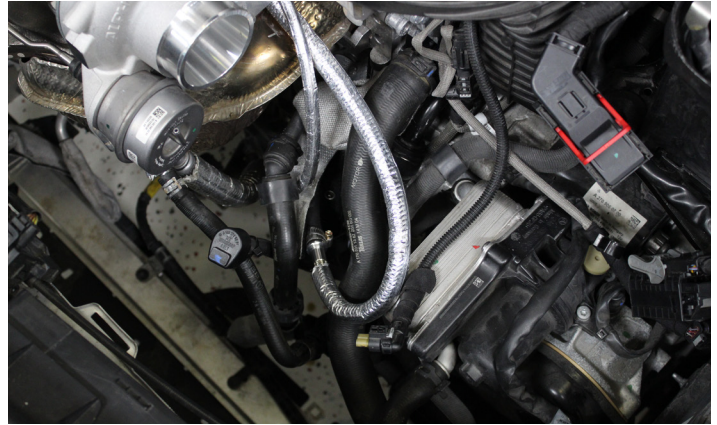
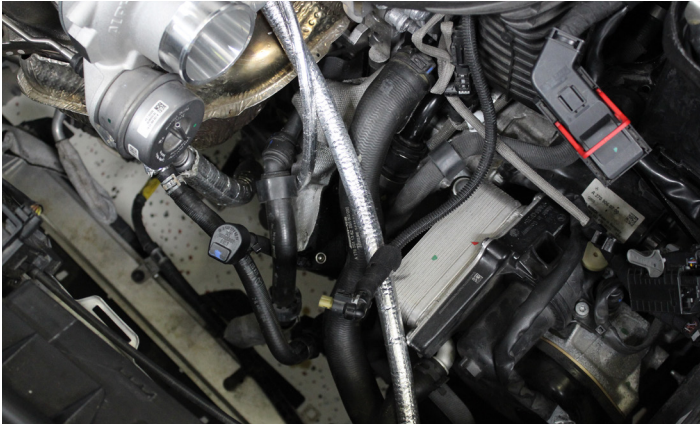


**64)** Using a supplied zip-tie, secure the coolant hose away from the radiator as shown.





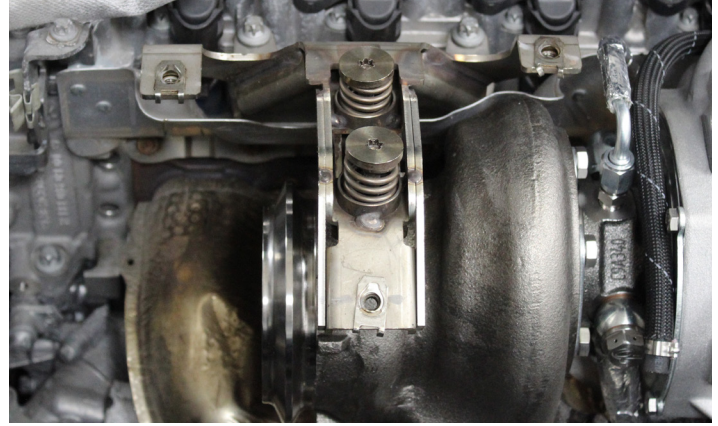
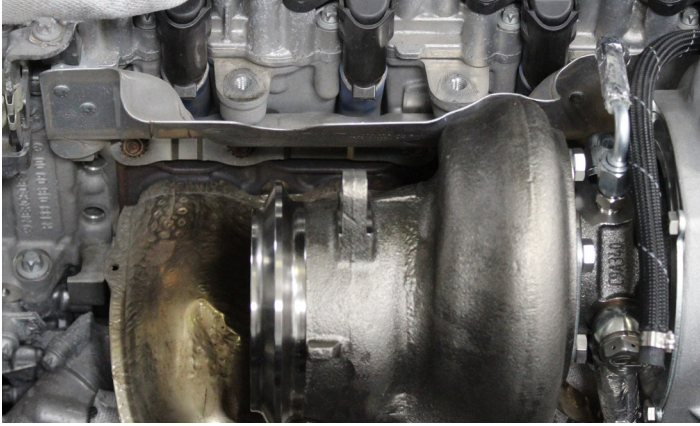
**65)** Connect the rear coolant line as shown in the following pictures. Use the supplied hose clamp if the factory clamp is not reusable.



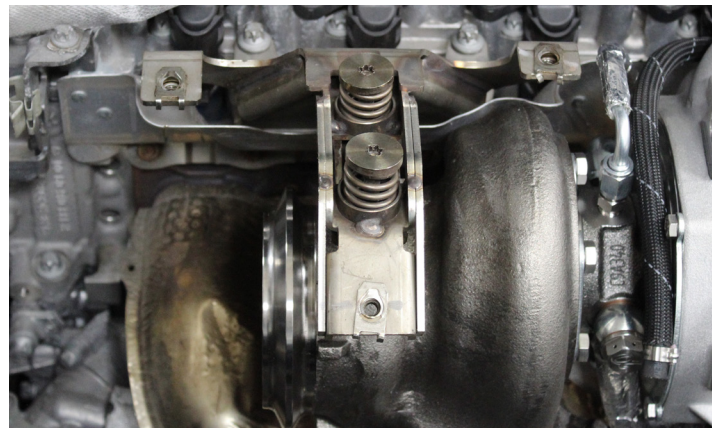
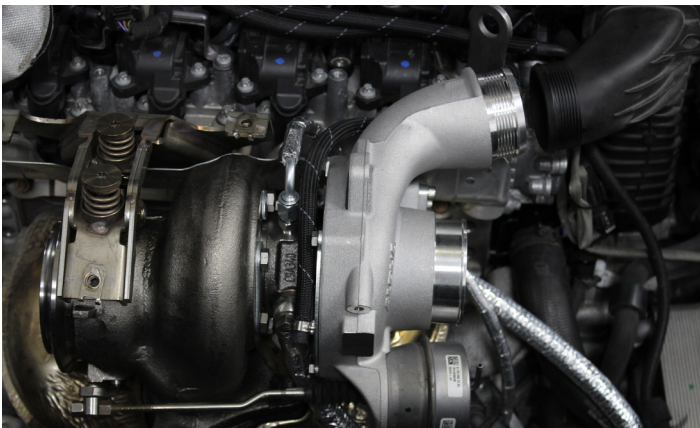
**66)** Reinstall the oil drain line to the engine block.



**67) Re-install the turbocharger lower support bracket.**

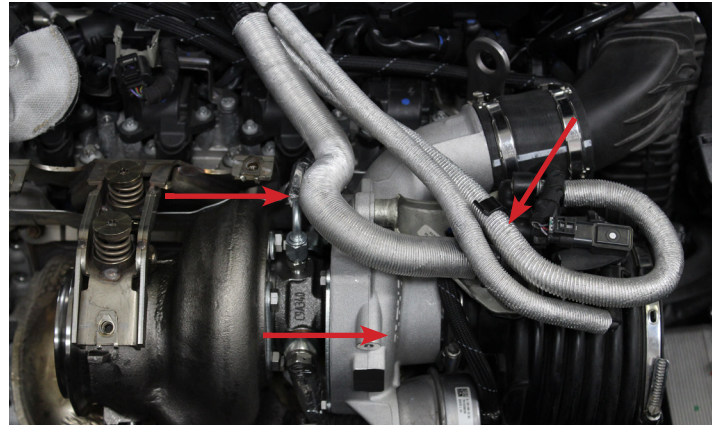
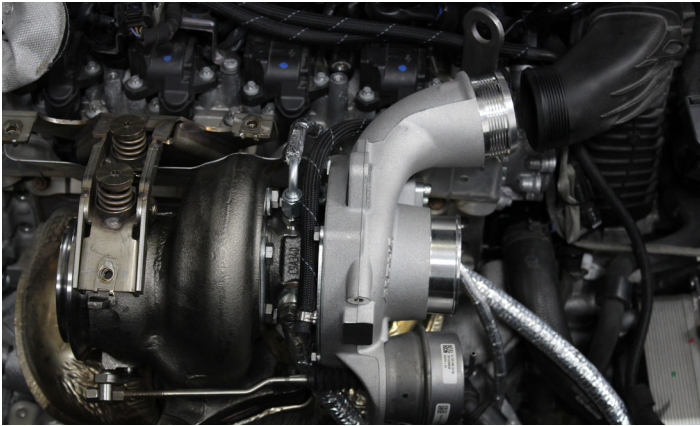


**68) Re-install the turbocharger upper support bracket.**





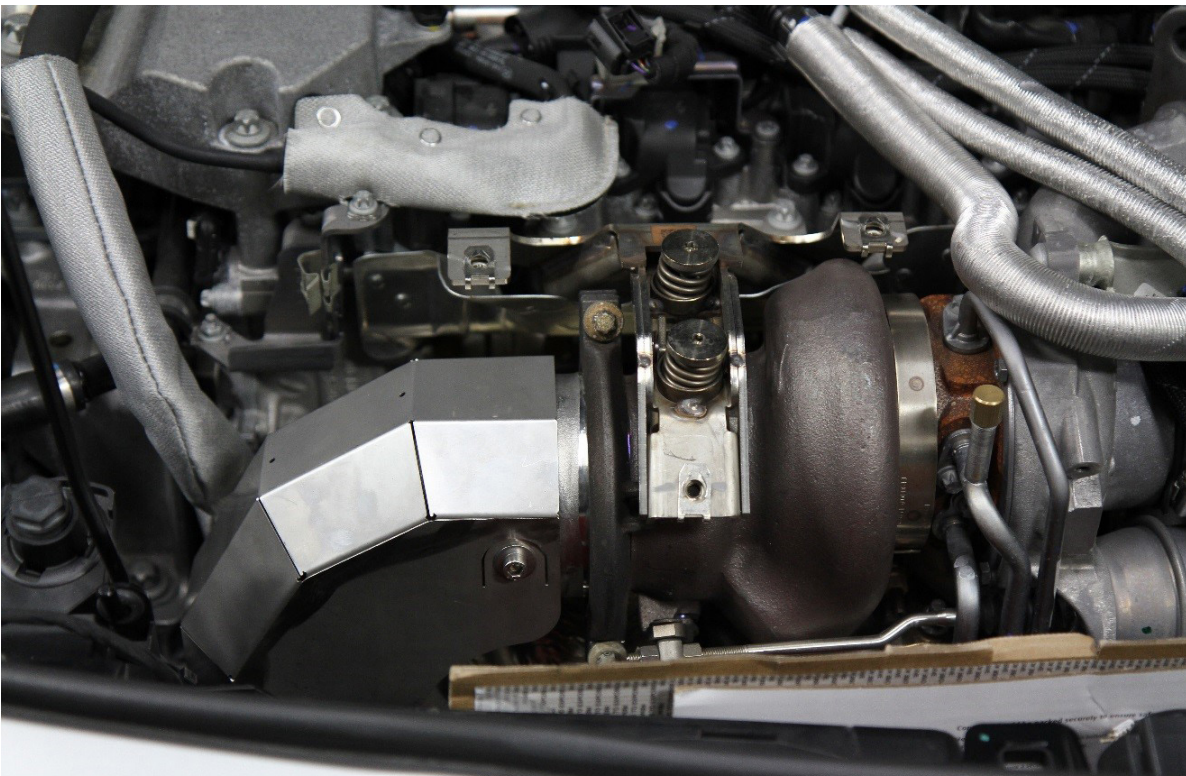
**69)** Re-install the turbocharger inlet coupler and evap lines. Tighten the T45 Torx bolt securing the evap bracket. Then tighten the 7mm hex hose clamp in the inlet of the turbocharger. Reconnect the evap sensor wire harness disconnected in step 21.



**Downpipe Re-Installation:**

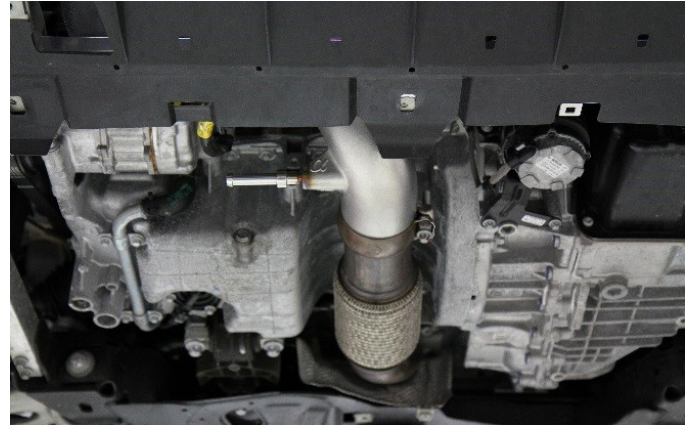
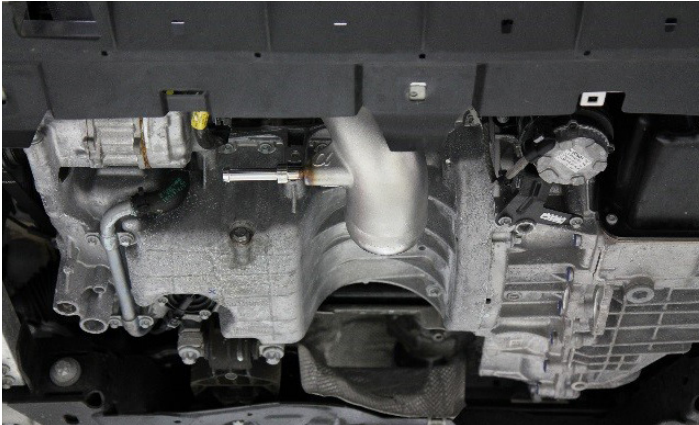
Downpipe Installation is the reverse procedure of removal. If upgrading to an Alpha downpipe, please review the following reinstallation procedure.

**70)** The Alpha downpipe can be installed from the top. Carefully install the downpipe and loosely install the factory V-band clamp. Add a little bit of anti-seize or rust penetrant to the bolts of the V-band prior to installation. Make sure the downpipe flange can rotate for adjustment at the bottom. Do not completely tighten the V-band yet.

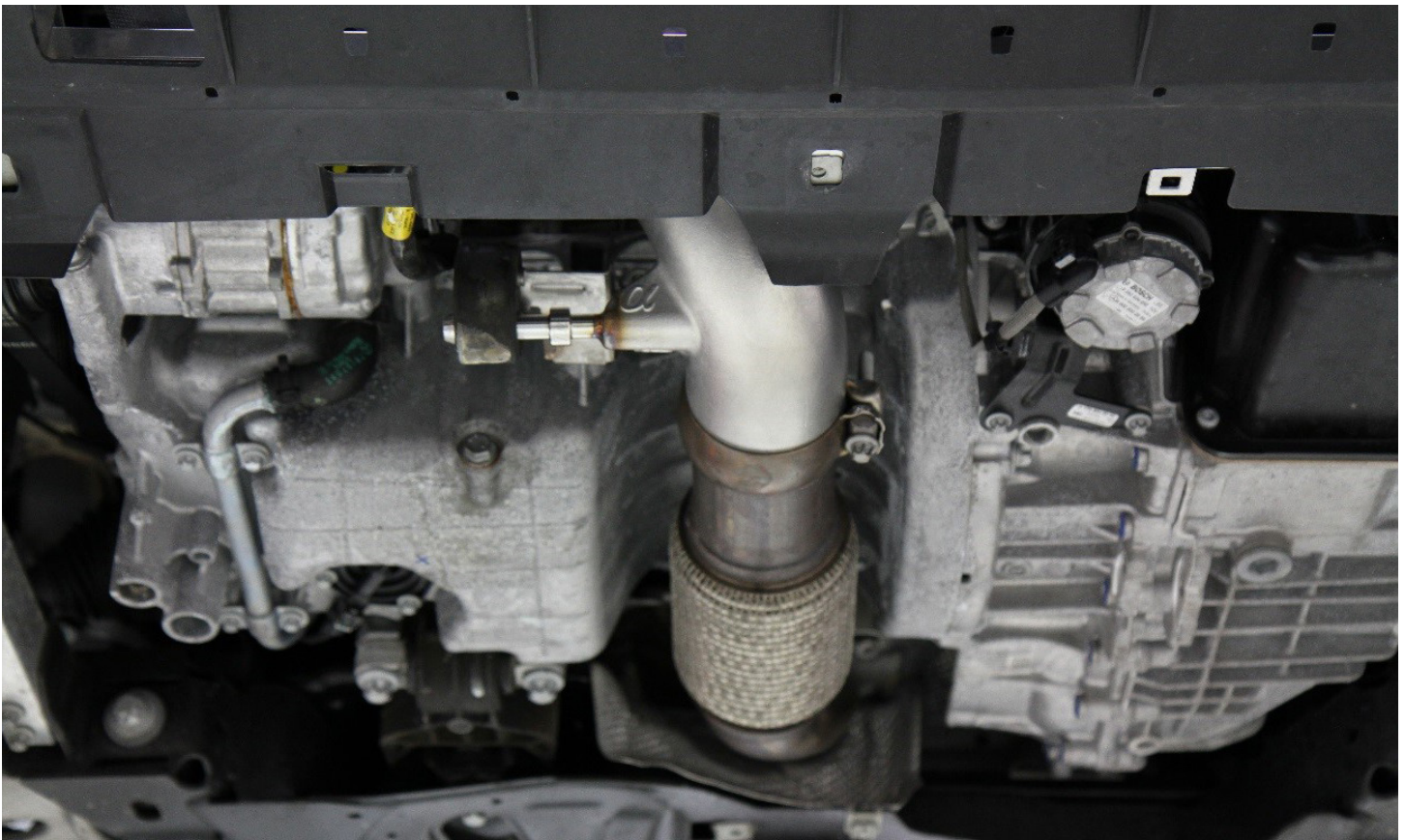




**71)** Reinstall the factory lower downpipe section. Before completely tightening the ball clamps, make sure the clocking and alignment of the pipe is correct. During tightening of the ball clamps, make sure to apply pressure to join the flanges together, otherwise the ball clamp may not apply tension to the connection and flanges could leak.



**72)** Once the factory lower downpipe is installed and tight, reinstall the hanger.





- 73) Completely tighten the factory V-band clamp when the lower connections and mount are installed.
- 74) Reconnect the secondary O2 sensor.
- 75) Reinstall the primary A/F sensor.
- 76) Reinstall all the components in the reverse order of steps # 7-10. Take care when reinstalling the radiator fan making sure the fan is completely seated and the harnesses removed are in the correct locations.

### **Airbox Re-Installation:**

Airbox Installation is the reverse procedure of removal.

- 77) Reinstall all the components in the reverse order of steps # 1-6.



### **Cooling System Refilling:**

#### **Engine Cooling system refilling using Air-Lift Type System:**

**78)** The recommended and proper way to refill and bleed the cooling system is to use an air-lift coolant fill system. These are available from any major tool manufacturer.

**79)** Use the air lift system on the coolant reservoir with the proper adaptor to fill the system with coolant according to the tool's instructions. Once filled, remove the air lift tool.

**80)** While leaving the coolant reservoir cap off, start the vehicle.

**81)** Make sure coolant doesn't rise in the reservoir to the point of overflowing. This may indicate air still in the system. Normal operation would be indicated by the coolant level dropping slightly when running and rising slightly when the engine is stopped.

**82)** This is a good time to check for any noise of exhaust leaks or and fluid leaks that may be present around any connection points that we made during the turbocharger installation.

**83)** Continue to run the car for about 10 minutes until the coolant temperature begins to rise.

**84)** Turn off engine and check coolant level in the reservoir. You may have to add a little and or repeat the process for a couple of heat cycles.

### **Final Installation Checklist:**

**85)** Recheck and tighten the factory turbo to downpipe V-band after some driving. It is possible for the clamp to loosen up slightly until the exhaust flange connections settle in.

**86)** Check coolant level.

**87)** Check engine oil level

**88)** Check to make sure there are no foreign objects or wiring laying on or near the exhaust.

### **Tuning:**

**89)** Once the Alpha turbocharger installation is complete. Tuning/engine calibration is required to take benefit of the upgrade. Your car may run and drive, but you will experience no increase in power and/or unstable boost conditions, which may lead to component or engine failure. Tuning is required for safe engine operation

**90)** Please contact an Alpha sales representative for your tuning/engine calibration needs.

**91)** Enjoy!



