



TURBOCHARGER UPGRADE; N20 INSTALLATION INSTRUCTIONS

PART NUMBER D310-0120

APPLICATION:	2014-16	F22 228i & xDrive coupe
	2015-16	F23 228i & xDrive convertible
	2012-16	F30 328i & xDrive sedan
	2014-16	F31 328i xDrive wagon
	2014-16	F34 328i xDrive Gran Turismo
	2014-16	F32 428i & xDrive coupe
	2015-16	F36 428i & xDrive Gran Coupe

Congratulations for being selective enough to use a Dinan Turbocharger Upgrade. We have spent many hours developing this kit to assure that you will receive maximum performance and durability with minimum difficulty in installation. Please take the time to read these instructions and call us if you have any difficulties during the installation.

PARTS LIST

Qty	Part #	Description
1	D313-0120	Dinan Turbocharger; N20
1	D313-0126	N20 Turbo Hardware Kit

IMPORTANT NOTES:

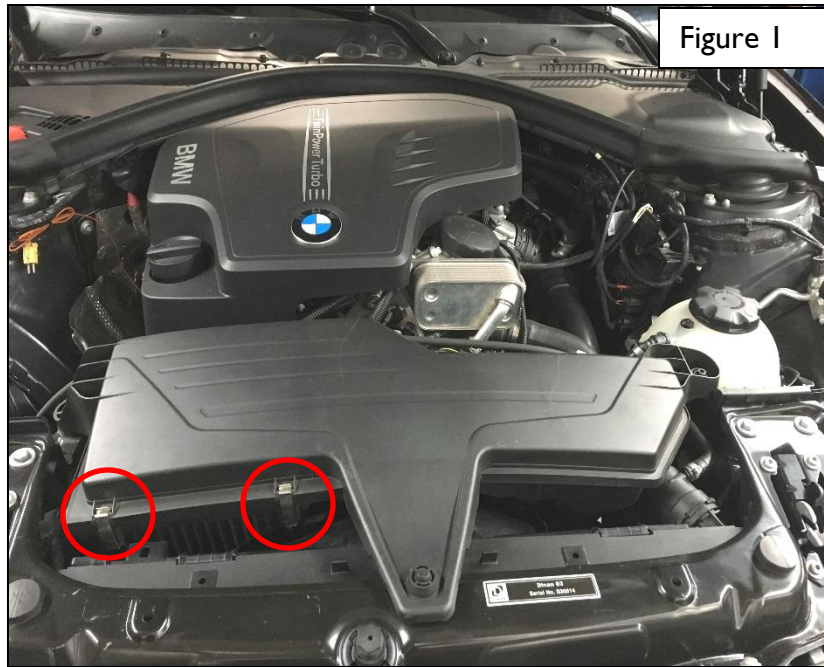
- Turbocharger replacement requires a high level of automotive mechanical skill, experience and tools. There is a risk of damage to both the turbocharger being removed, as well as the new turbocharger, if adequate care is not taken. Installation of the Dinan turbocharger assumes the user has a sufficient level of skill, experience, and tools, to complete this task successfully.
- For rear wheel drive vehicles: These instructions discuss turbocharger replacement on an N20 engine without removal of the exhaust manifold. This is a much quicker process than the standard BMW turbocharger replacement procedure. The hardware included in this kit is designed for Dinan's shorter procedure.
- For xDrive vehicles: Due to limited access, turbocharger replacement on xDrive vehicles must follow recommended BMW procedure. Because the exhaust manifold is removed to access the turbocharger, additional hardware will be required for installation. Please have these components on hand before beginning installation, or contact your sales representative for Dinan hardware kit D313-0127.
- For xDrive vehicles with vacuum-controlled wastegate turbochargers: The wastegate linkage must be adjusted for proper operation. This adjustment is not documented in the standard BMW turbocharger replacement procedure. The best opportunity to perform the adjustment is when the Dinan turbocharger has been installed onto the manifold, but before this assembly is reinstalled in the car. While the assembly is on the workbench, follow the wastegate adjustment procedure at the end of these instructions.
- For all vehicles with electronic wastegates: The wastegate must be adjusted per BMW procedure for proper operation. Wastegate adjustment requires factory-level tools such as BMW ISTA (or equivalent). Please ensure that these tools are available prior to beginning installation.

DO NOT WORK ON VEHICLES SUPPORTED BY A JACK ONLY. USE SECURE JACK STANDS!

INSTALLATION:

I. Remove the upper intake airbox.

- Unsnap the clips holding the upper box to the lower box. There are clips on the front and rear (see Figure 1).



- Unclip the hose on the rear of the airbox (see Figure 2).



- Unplug airflow meter (see Figure 3)

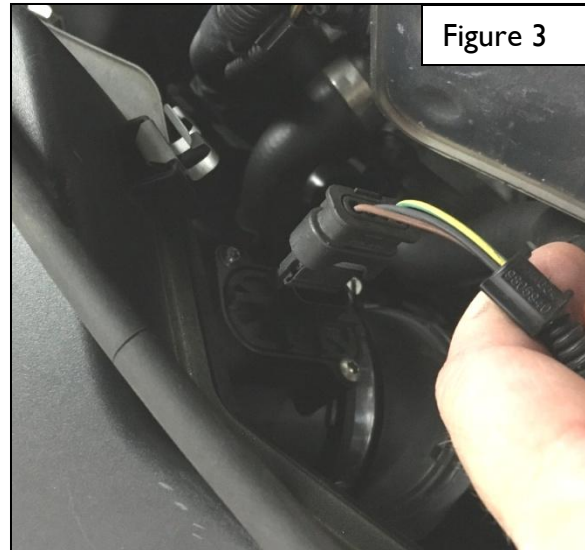


Figure 3

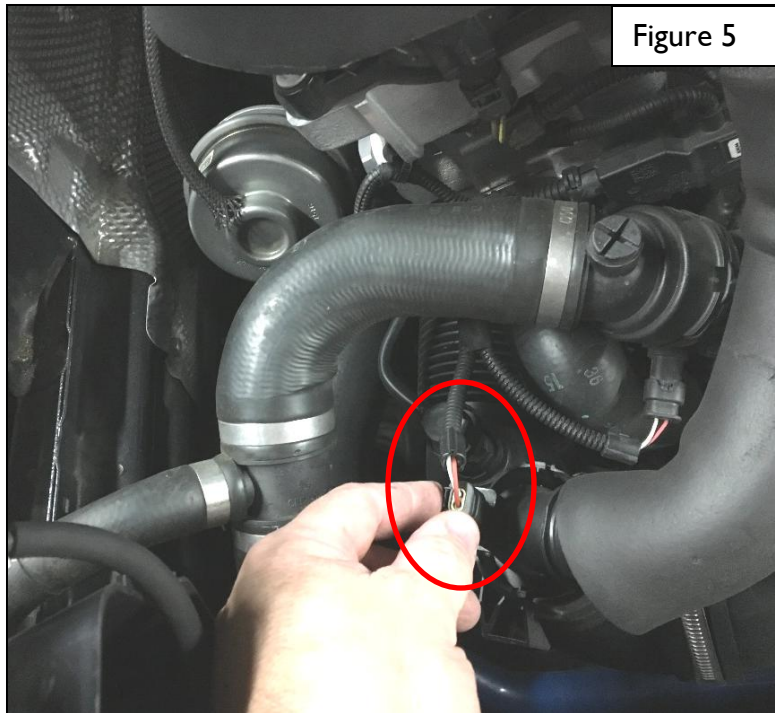
- Loosen hose clamp and remove upper airbox (see Figure 4).
- Lift out lower airbox.



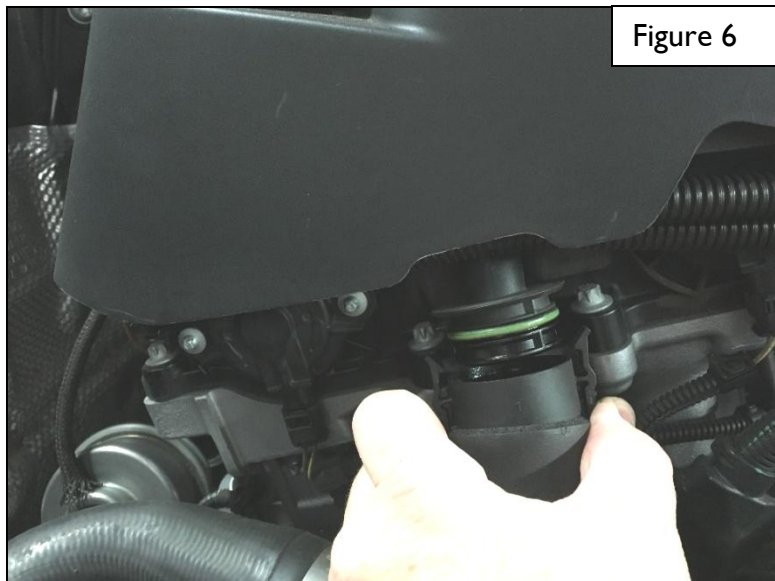
Figure 4

2. Unhook the breather tube.

- Disconnect the vent line attached to the air intake tube, seen just behind the sensor plug in Figure 5.
- Unplug the sensor wire from the intake tube



- Unclip and pull down the breather tube from the valve cover (see Figure 6).



- For vacuum-controlled wastegate turbochargers:
Unplug the vacuum hose from the turbo wastegate vacuum pot (see Figure 7a).

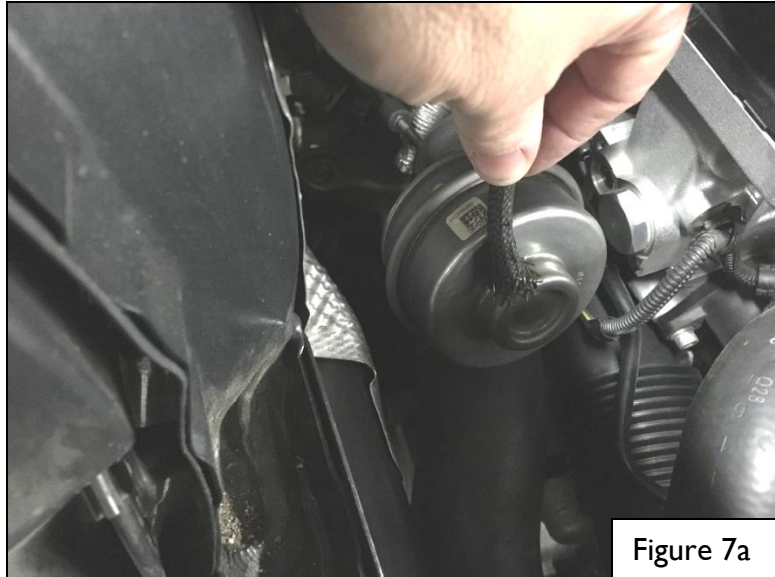


Figure 7a

- For electronic wastegate turbochargers:
Unplug the wire harness from the turbo wastegate servo (see Figure 7b)

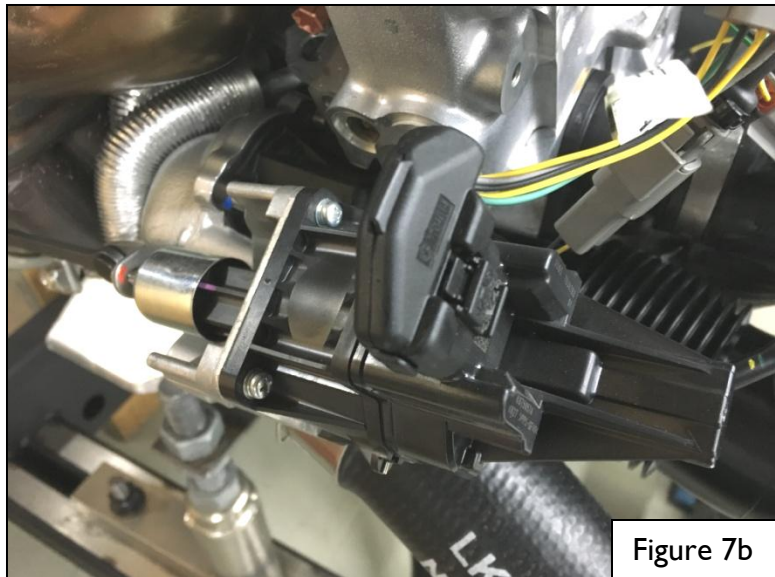
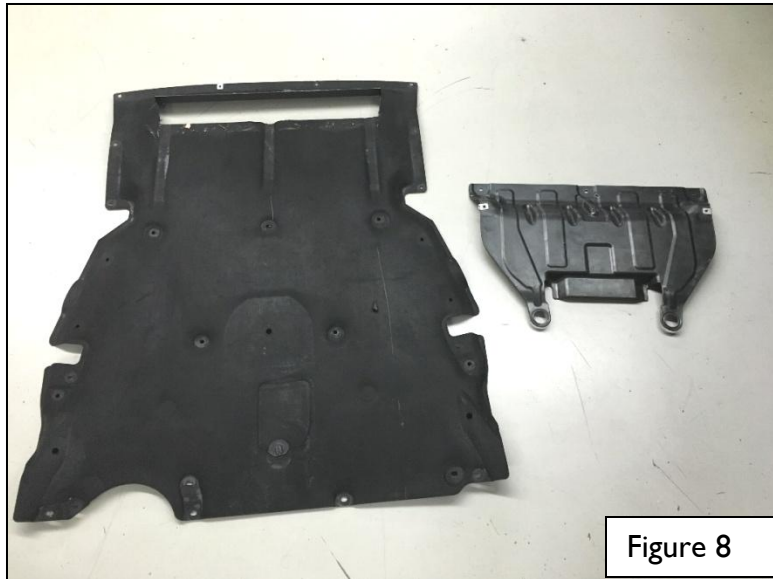


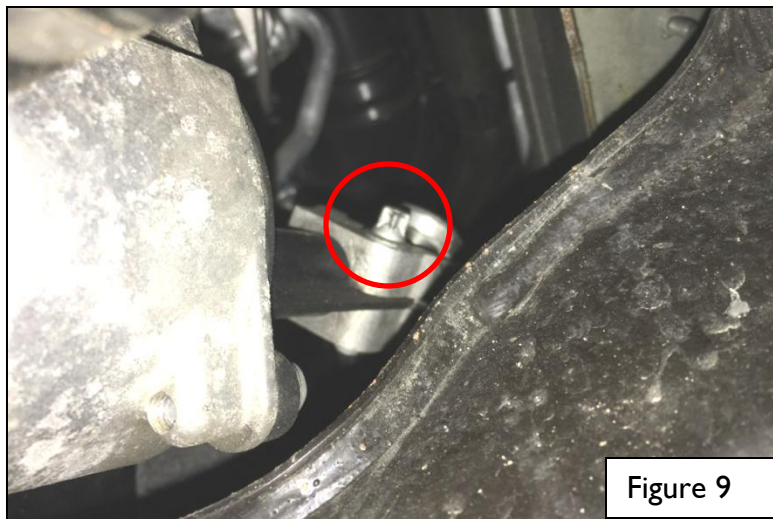
Figure 7b

3. Remove steering rack.

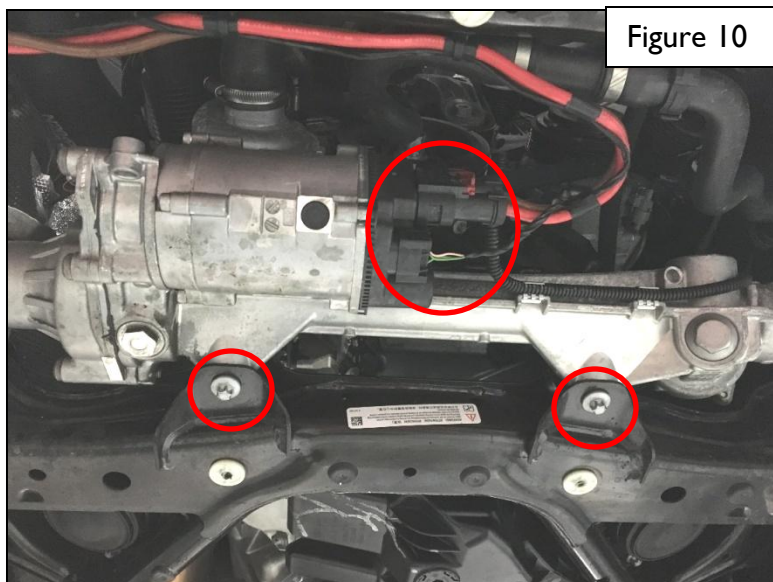
- Raise car on a lift and remove the splash guards from under the engine (see Figure 8).



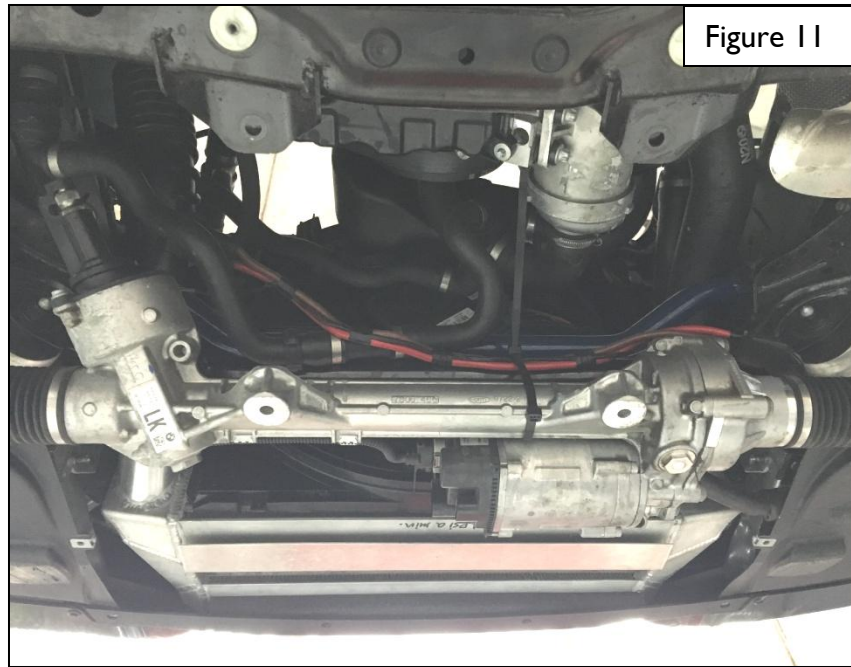
- Remove the bolt that clamps the steering column to the steering rack, then lightly tap up on the column to move it up and almost off of the rack splines.
- When the rack is removed later, the splines will come all the way off (see Figure 9).



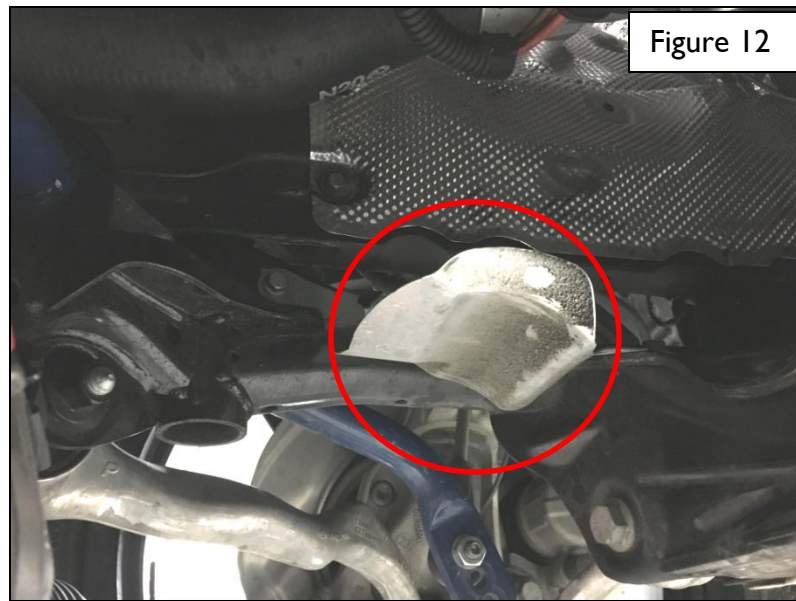
- Disconnect the two electrical plugs from the rack (see Figure 10).
- Remove the two bolts and nuts on top that attach the rack to the subframe (see Figure 10).



- Slide the rack forward off of the mounting ears, and let the column slip off of the splines.
- Push the rack fully forward and tie it to the cross member under the sway bar (see Figure 11).
- This gives enough room to remove the turbo out the bottom of the car.



- Remove the small heat shield that was over the right-front steering rack boot. It is secured with two bolts (see Figure 12).



4. Remove water pump.

- Disconnect the electrical connection to the water pump.
- Remove the clamp from the lower hose on the pump.
- Detach the hose and drain the coolant from the system (see Figure 13).

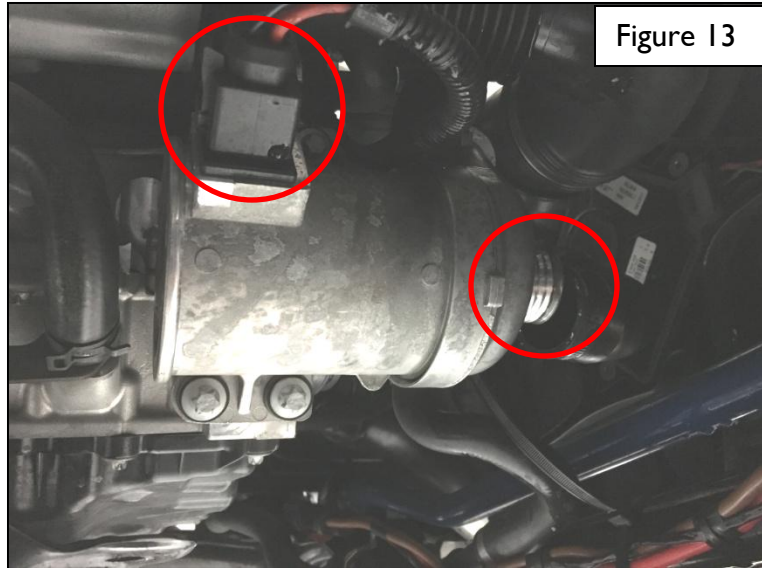


Figure 13

- Remove the upper clamp and detach the upper hose.
- Undo the 3 bolts holding the pump to the block and remove the pump (see Figure 14).

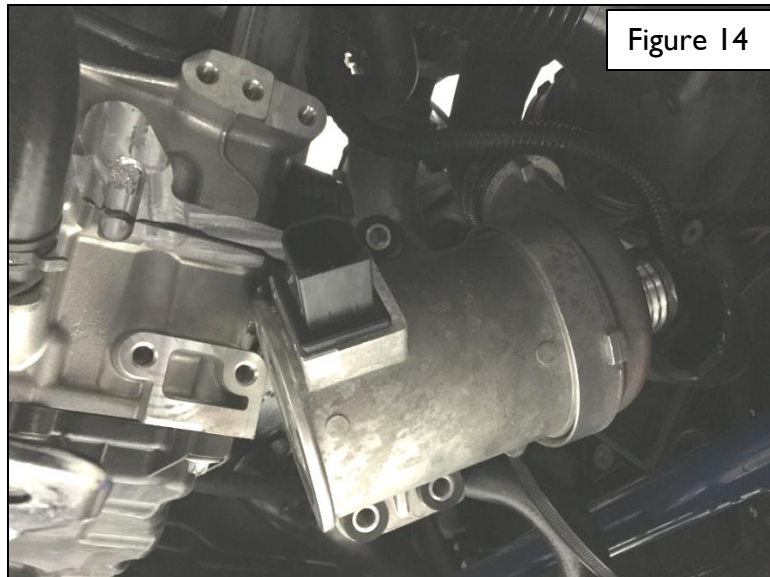
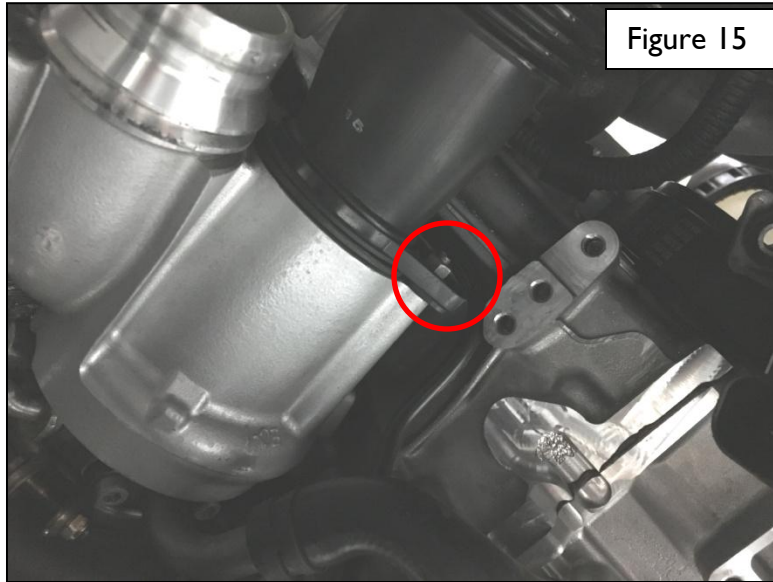


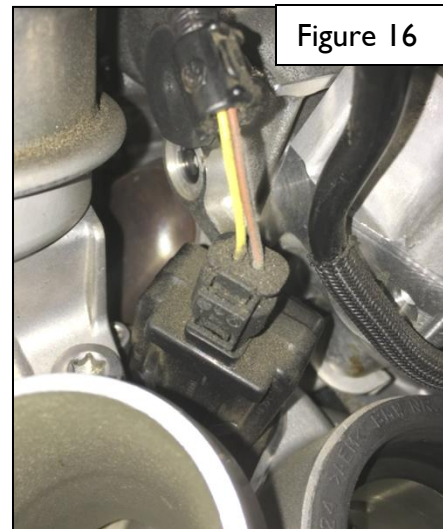
Figure 14

5. Disconnect turbocharger.

- Remove the nut holding the plastic air intake tube to the turbocharger (do not lose the small steel spacer under the nut!).
- Slide the intake tube off of the turbo. Push tube forward and upward to gain clearance (see Figure 15).



- Disconnect the compressor bypass wiring (see Figure 16).



- Remove the bolt holding the two water lines to the center of the turbo.
- Gently pull these lines out from the turbo (see Figure 17).



- Remove the two bolts holding the oil drain line to the bottom of the turbo (see Figure 18).

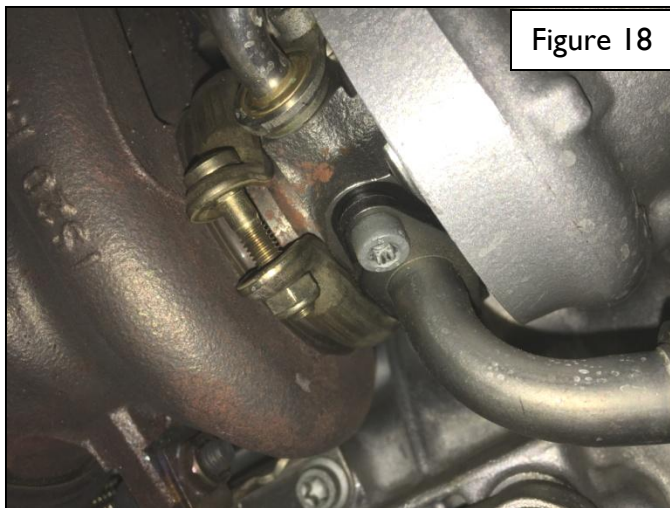


Figure 18

- Remove the clip holding the flat wastegate rod from the turbo to the wastegate arm on the manifold.
- Remove the rod from the arm. This may be difficult while the turbo remains clamped to the manifold, and may be postponed until the turbo is removed.

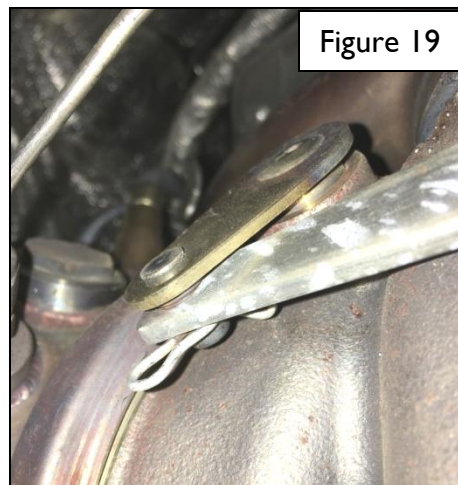


Figure 19

- The oil feed line for the turbocharger is located on the side of the engine block towards the rear, just under the catalytic converter (see Figure 20).
- Remove the single bolt holding this line to the engine block and pull it out of the block. This is some tricky.
- Pull the oil feed line off of the block and out, so it can move freely with the turbo.
- The other end of the oil feed line is bolted to the top of the turbo, and it cannot be accessed until the turbo is removed from the manifold in the next step.



Figure 20

6. Remove turbocharger. Please read thru this entire step before proceeding.

- Undo the clamp that holds the turbo to the manifold (see Figure 21).
- Rotate the clamp around and off of the turbo. Getting the clamp out can be some tricky.

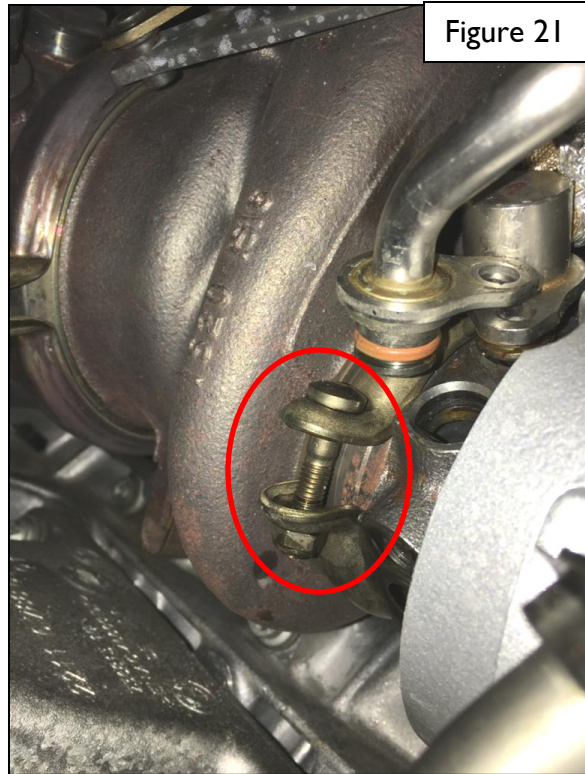


Figure 21

- With the clamp removed, gently pull the turbo forward and off of the manifold about an inch.
- If the turbo does not come forward easily, then the oil line on the side of the block is likely hooked on something.
- Once the turbo moves forward, gently rotate it counter-clockwise slightly.
- The wastegate rod should easily detach from the arm (see Figure 22).

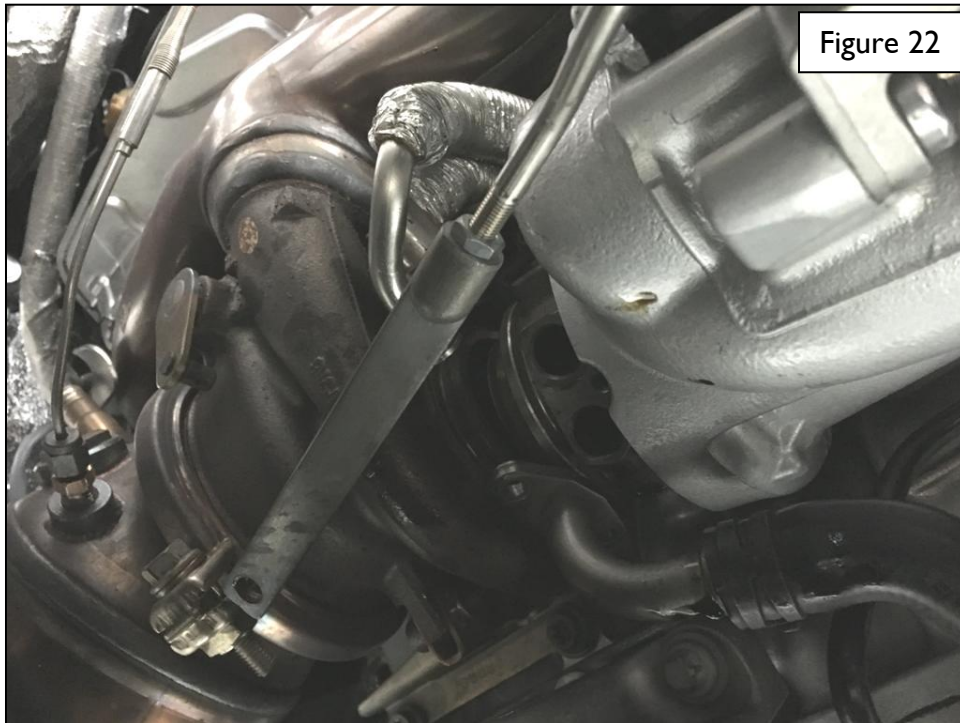


Figure 22

- With the turbo pulled forward and rotated, you can access the oil line on top of the turbo.
- Remove the single bolt and pull the line up out of the turbo. Leave the line in the car.
- Take care to prevent damage to the turbine wheel! You must support the turbo while you remove the bolt so you don't bend the fins on the turbine.
- With the oil line detached, pull the turbo forward and rotate it out the bottom of the car (see Figure 23).

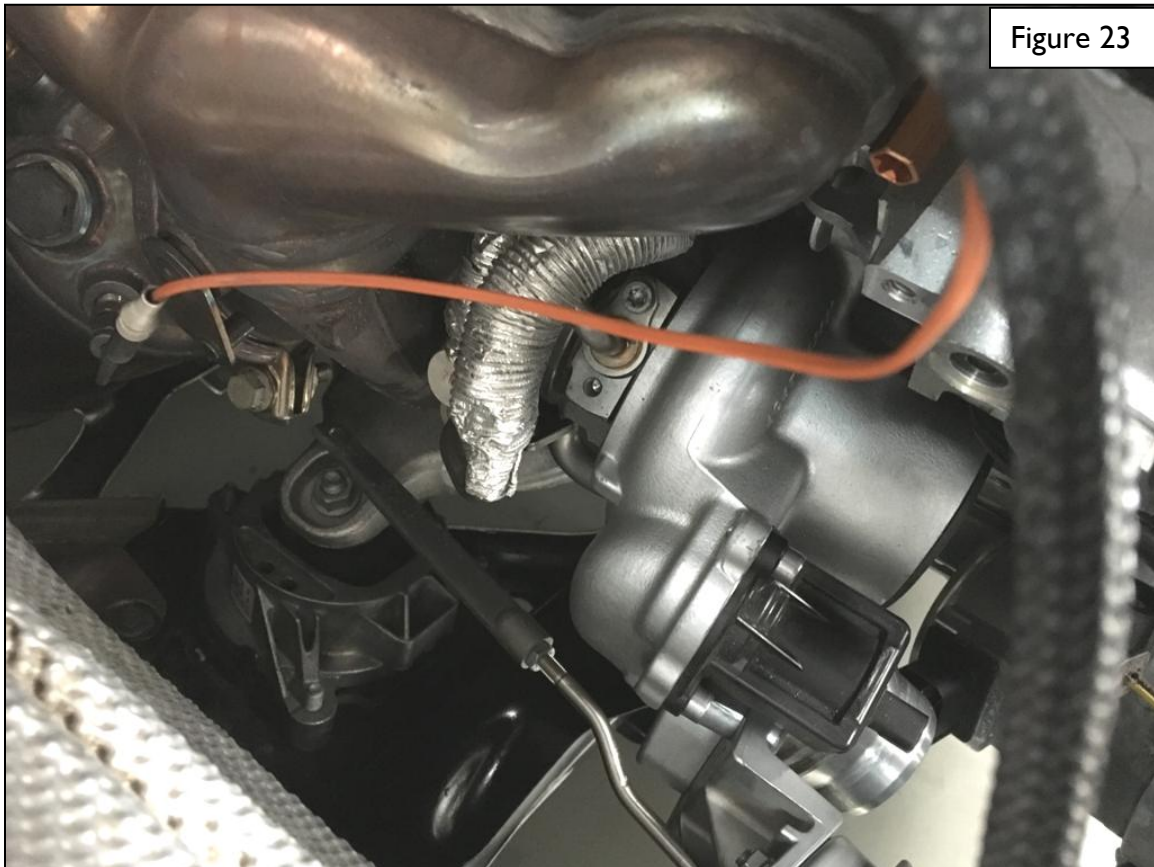
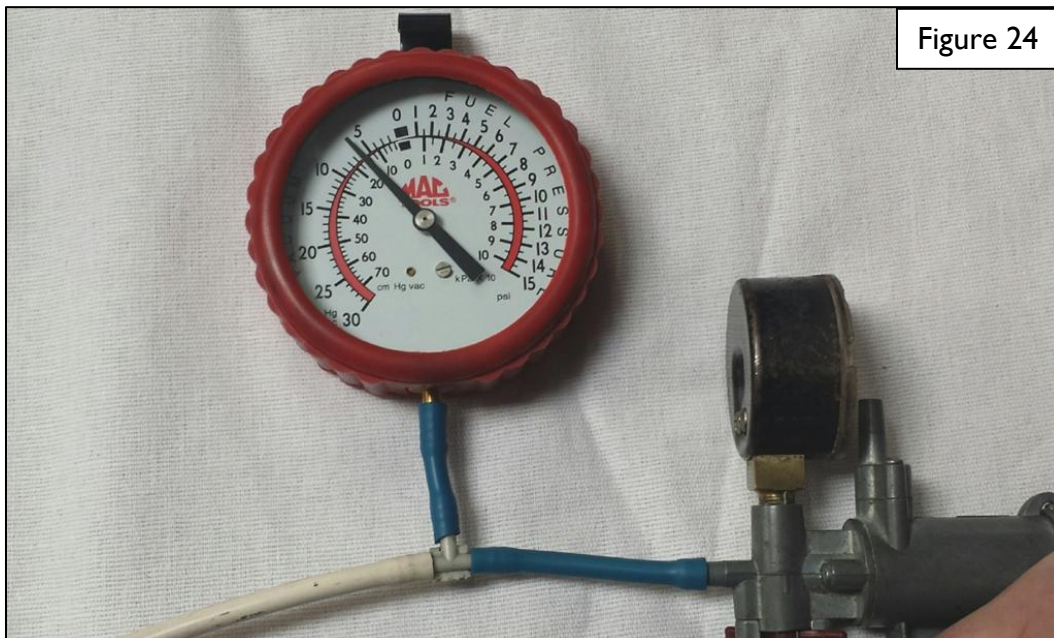


Figure 23

7. Installing the new turbo is basically a reverse of these instructions.
 - Transfer the compressor bypass from the old turbocharger to the new one.
 - Transfer the wastegate control (either the vacuum pot or the electronic servo) from the old turbocharger to the new one.
 - Replace all the o-rings on the oil & water lines, and the gasket on the oil drain line. These items are included in this kit.
 - When installing the turbocharger onto the manifold be very careful not to damage the turbine wheel.
 - You must attach the top oil line to the turbocharger in the same way you removed it -- with the turbo just slightly forward of the manifold and rotated counter-clockwise.
 - After you slide the turbo all the way onto the manifold, and before you tighten the clamp, be sure the small alignment pin is engaged between the manifold and the turbo -- this sets the correct clocking of the turbo in the car. If this pin is not aligned, the turbo will not seal to the manifold.

- For electronic wastegate turbochargers: use the supplied bracket to attach the turbo to the engine block at the plastic air intake tube (see area shown in Figure 15).
8. For vacuum-controlled wastegate turbochargers: The wastegate must be adjusted before the car is fully reassembled. The adjustment procedure is similar to SI B I 04 10.
- If you were able to replace the turbocharger without removing the manifold:
 - a. Install Dinan turbocharger to the manifold in the car and secure in place.
 - b. Reattach the wastegate linkage.
 - c. Attach an accurate vacuum gauge and pump to the wastegate actuator.
 - d. Apply **5.9 in-Hg (15 cm Hg)** to the actuator (see Figure 24).
 - e. Adjust linkage so that the wastegate is just closed with this vacuum setting.
 - If you removed the manifold to install the Dinan turbocharger:
 - a. Install Dinan turbocharger onto the manifold and secure in place.
 - b. Reattach the wastegate linkage.
 - c. While assembly is on the workbench, you will have access to the inside of the turbine.
 - d. Attach an accurate vacuum gauge and pump to the wastegate actuator.
 - e. Apply **5.9 in-Hg (15 cm Hg)** to the actuator (see Figure 24).
 - f. Adjust linkage so that the wastegate is just closed, and as you rotate the wastegate sealing disc, there should be light drag between the disc and the sealing surface.



9. For electronic wastegate turbochargers: Use BMW ISTA (or equivalent) to perform the wastegate adjustment procedure after the car has been reassembled.
10. For best performance, please also install the appropriate DINANTronics ECU with Stage 4 software. Note that Stage 4 also requires the installation of the Dinan Intercooler.

11. Using a scan tool or equivalent, clear fault memory after installation is complete.

12. Happy Motoring!