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Ford 6.7L BD Scorpion SXE

Installation Instructions

104580X 2011-2016 Ford 6.7L Scorpion SXE

PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION.

NOTE: This kit will require a race tuner (see page 2 for recommended tuner.)

BD ENGINE BRAKE, INC.

Plant Address: 33541 MacLure Rd, Abbotsford, BC, Canada V2S 7W2

US Shipping Address: 88-446 Harrison St, Sumas, WA 98295 | US Mailing Address: PO Box 231, Sumas, WA 98295

Phone: 1-800-887-5030 | Fax: 604-853-8749 | Internet: www.dieselpowerformance.com

Please be aware that non-wastegated turbochargers are extremely sensitive to over speed failures. Please size the turbo correctly to your fueling level and EGTs. EGTs over 1500° can possibly indicate an undersized turbocharger. High boost pressure can also indicate over speed, do not exceed 50psi of compressor outlet pressure.

Overspeed can result in split compressor wheels, separated turbine wheels, worn journal bearings and damaged thrust surfaces.



Using a wastegate will help you control turbo speed. For the cost there is no better insurance.

Recommended Tuner

- PPEI EZ Lynk
- Spartan custom tuning
- SCT Custom tuned

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Engine:	Ford 6.7	Max compressor outlet pressure: 45psi	**Not intake manifold pressure	
		Tuning Only	Tuning & Upgrade CP4	Tuning & Dual CP3/CP4 & Injectors
Turbocharger				
S363/80	Caution on High Tuning Levels	Wastegate Needed	Wastegate Needed	Wastegate Needed/Larger Turbo Recommended
S364.5/80	No wastegate needed	Caution on High Tuning Levels	Wastegate Needed	Wastegate Needed/Larger Turbo Recommended
S366/80	No wastegate needed	Caution on High Tuning Levels	Wastegate Recommended	Wastegate Needed/Larger Turbo Recommended
S369/80	No wastegate needed	No wastegate needed	Caution on High Tuning Levels	Wastegate Needed/Larger Turbo Recommended

*Note you can always overspeed a turbocharger. Play it safe, there are no warranties for overspeed.

*Factory intercooler can have a 2psi pressure drop across. i.e. 45psi manifold pressure = 47psi compressor outlet pressure.

*All our test is done at the standard RPM range of the engine. If you exceed this RPM, your turbo speed will also increase.

*Extended injection duration will cause turbo overspeed.

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K I T C O N T E N T S :

Please check to make sure that you have all the parts listed in this kit **before** you start the disassembly of your truck.

Foundation Kit							
1403000		1403010		1403016		1403017-1	
							
<i>Manifold; Mchnd Ford 6.7 Pass</i>		<i>Pipe Assy; Ford 6.7 Cross Over</i>		<i>Downpipe; Upper Ford 6.7</i>		<i>Downpipe; Lower Ford 6.7</i>	
Qty: 1		Qty: 1		Qty: 1		Qty: 1	
1403053	1403026	1403031P		1403032	2475042	1403003	
							
<i>Drain; Ford 6.7 S3SXE</i>	<i>Pedestal; Ford 6.7</i>	<i>Tube; Ford CAC Hot Side</i>		<i>Tube; CAC Ford 6.7 Assy</i>	<i>T4 Gasket</i>	<i>Heat Shield; Ford 6.7</i>	
Qty: 1	Qty: 1	Qty: 1		Qty: 1	Qty: 1	Qty: 1	
1403035-P		1403051	1403052	1403040	1453820	1403040-1	
							
<i>Intake; Cast Y Ford 6.7</i>		<i>Horn; Intake Machined DS</i>	<i>Horn; Intake Machined PS</i>	<i>Air-Box; Ford 6.7</i>	<i>Air Intake Seal (in)</i>	<i>Lid; Ford 6.7 Airbox</i>	
Qty: 1		Qty: 1	Qty: 1	Qty: 1	Qty: 17"	Qty: 1	
2924	1403041		1403042P		1302183	1403044	
							
<i>FILTER; HI-FLOW INTAKE VEL 4"</i>	<i>Intake Tube; Ford 6.7 Turbo</i>		<i>Tube; 4" Ford 6.7 Intake PC</i>		<i>SLEEVE BRAIDED</i>	<i>Line; Coolant Ford 6.7</i>	
Qty: 1	Qty: 1		Qty: 1		Qty: 21"	Qty: 1	

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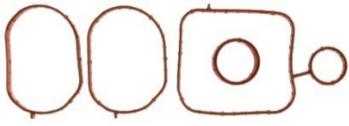
Fastener Kit						
1302198	1900068	MC-7582K71	1453113	1403041-1	1900036	1601521
						
CLAMP; Spring CTB-26mm	Cap; Bullet Rubber 3/16"	Mount; Black Push, 3/16" / .250"	Clamps; 1-1/4 Gear (HS12)	Gasket; Ford 6.7 Intake Tube	13/16" Barbed plug	BOLT; M6-1.0 x 25 SCKT HD
Qty: 2	Qty: 1	Qty: 6	Qty: 2	Qty: 1	Qty: 1	Qty: 3
1300130	1900082	FT-0413694	148062	1300133		
						
Tie Wrap - Long	Bottom EGR Plate	-154 O-Ring	Gasket; Oil Drain Rnd	TIE WRAP 5.6"L		
Qty: 6	Qty: 1	Qty: 1	Qty: 1	Qty: 12		
1403043-2	1403040-2	1900067	1302197	1403027		
						
Adapter; Crankcase Ford 6.7	Bracket; Ford 6.7 Airbox	Barb; Hose Mender 5/16"	CLAMP; Spring CTB-32mm	Insert; Ford 6.7 Pedestal		
Qty: 1	Qty: 1	Qty: 1	Qty: 1	Qty: 1		
1130182	1130183	1456737	1456738	1505022	1405422	1401574
						
Bolt; Hex - M6x16mm	LOCKWASHER; 6MM S/S	UNut; M8-1.25 Long (11630)	Bolt; Body M8-1.25x30 (13614)	BOLT; M6-1.0 x 18mm SCKT HD ZP	Screw; M6 x 12 Truss. Phil S/S	ACORN NUT; M6
Qty: 2	Qty: 2	Qty: 2	Qty: 2	Qty: 1	Qty: 5	Qty: 2

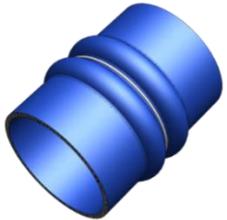
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FT-1116245	1900037	1900056	1302108	1200208	1462431	1462441
						
<i>Bolt;M8x20 10.9 HFBZ</i>	<i>Bolt; M6- 1.0x12 FLHH ZC (8.8)</i>	<i>Bolt;M6x1.0x 25 ZP FT 8.8 Flange</i>	<i>BOLT;HEX FL M10-1.5x25mm</i>	<i>PLUG, 1/8NPT</i>	<i>STUD; M10 x 1.5 x 025</i>	<i>NUT; M10x1.5 Small Flange</i>
Qty: 3	Qty: 4	Qty: 8	Qty: 2	Qty: 4	Qty: 4	Qty: 4
FT-0173590	1462321	1453144	1453143	1462122	1500403	
						
<i>Screw;#8-32 x 9/16 Pan Head SS</i>	<i>1/4MPT x -6 JIC 90°</i>	<i>Fitting;3/8MJIC x 1/4MNPT Long</i>	<i>Fitting; 5/16MJICx1/8 MNPT</i>	<i>PLUG, 3/8" Barb, LLY</i>	<i>Clamp; Spring 11/16" CTL-11</i>	
Qty: 2	Qty: 1	Qty: 1	Qty: 1	Qty: 1	Qty: 4	
1403002	1403004		1900081			
						
<i>Bracket; Ford 6.7 EBP</i>	<i>Harness; Ford 67 EGT Extension</i>		<i>Plate; Coolant EGR Ford 6.7</i>			
Qty: 1	Qty: 1		Qty: 1			
BC3Z-9439C	BC3Z-6N640-A	FC3Z-9448-A	BC3Z-6587-A			
						
<i>Gasket; Intake Manifolds</i>	<i>Gasket; Cross Over Pipe</i>	<i>Gasket, Exhaust Manifold</i>	<i>Gasket; Turbo Pedestal</i>			
Qty: 2	Qty: 2	Qty: 1	Qty: 1			

Boot & Clamp Kit				
1403036	1403043-3	1403033	1405305	1401563
				
<i>Boot; Ford 6.7 Intake 4"-4"</i>	<i>Boot; Intake Ford 6.7 22deg</i>	<i>Boot; CAC Cold Side 90deg</i>	<i>Boot; 3"x3"</i>	<i>Boot; Silicone 3.5"x3.5" 4ply</i>
Qty: 1	Qty: 1	Qty: 1	Qty: 3	Qty: 1
1453701	1407030	1405212	1405211	1453602
				
<i>HOSE CLAMP; 3-36/64 - 4-32/64"</i>	<i>CLAMP; FORD BOOT 3.28-3.63"</i>	<i>Clamp; 3.56-3.91</i>	<i>Clamp; 3.00-3.38</i>	<i>Clamp; V-Band, Down Pipe</i>
Qty: 4	Qty: 1	Qty: 3	Qty: 7	Qty: 1
1405209	1604053	1462120	1403017-2	FT-110120342
				
<i>Clamp; 2.75-3.09"</i>	<i>Hose; Trans Filter 3/8" (/in)</i>	<i>Hose; Silicone Shielded Oil Drain</i>	<i>Clamp; Lower Ford 6.7 DP</i>	<i>M8 x25 Bolt Additional Oil Drain Bolts</i>
Qty: 1	Qty: 1	Qty: 1	Qty: 1	Qty: 2
1100740	1453130-B	1401530	FT-110120342	
				
<i>Clamp; Exhaust Seal 4" S/S</i>	<i>Line; Oil Feed</i>	<i>Boot; 3"x2.75" 5.5" L</i>	<i>Bolt; 3/8"-16x3/4" HCS CZP</i>	
Qty: 1	Qty: 1	Qty: 1	Qty: 2	

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1045805 Application Kit (for 2015-2016 model years only, sold separately)	
BC3Z-18472-E	1403005
	
<i>Line; EGR Cooler Ford 6.7</i>	<i>Bracket; Ford 6.7 EBP 15-16</i>
Qty: 1	Qty: 1

If you believe you are missing any parts that are displayed here, please contact BD Power at 1-(800)-887-5030 for replacements.

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Options

Description	
<p>1027150 BD Exhaust Brake Kit</p> <p>Inline exhaust brake kit. Includes adapter pipe that bolts to the downpipe and adapters for 4 and 5-inch exhaust systems. An excellent add on for a scorpion kit!</p>	
<p>1050470 BD Venom Dual Fuel Kit</p> <p>Adds a CP3 pump in conjunction with the stock CP4 fuel pump. This is needed to get over 600HP.</p>	
<p>BD HD Transmission/Torque Converter</p>	<p>Coming Soon</p>



This kit requires the use of EGR & DPF delete and a RACE tuner. Do not use this kit on pollution control roads. RACE ONLY

Pre-Installation

Installation should occur on a cold vehicle, as turbo and exhaust components become very hot with use.

Also note that a stock transmission will handle a limited amount of power and torque, transmission modifications are recommended. Also note BD is NOT RESPONSIBLE for engine damage.

NOTE: This install is known as a CAB OFF procedure. Cab on installation is also possible with a small amount of modifications to the procedure.

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INSTALLATION

1. Remove Cab.

See the Ford Technical Information or other shop repair manuals (Mitchell, Alldata, etc...) for the Ford 6.7L Cab Removal Instructions before continuing these procedures.

R1.1 Using an 8mm socket remove the front accessories from the EGR cooler along with the bracket attached to the top of the EGR cooler attached to the inlet tube. Remove the EGR cooler bypass solenoid vacuum tube located at the front of the EGR at the solenoid.



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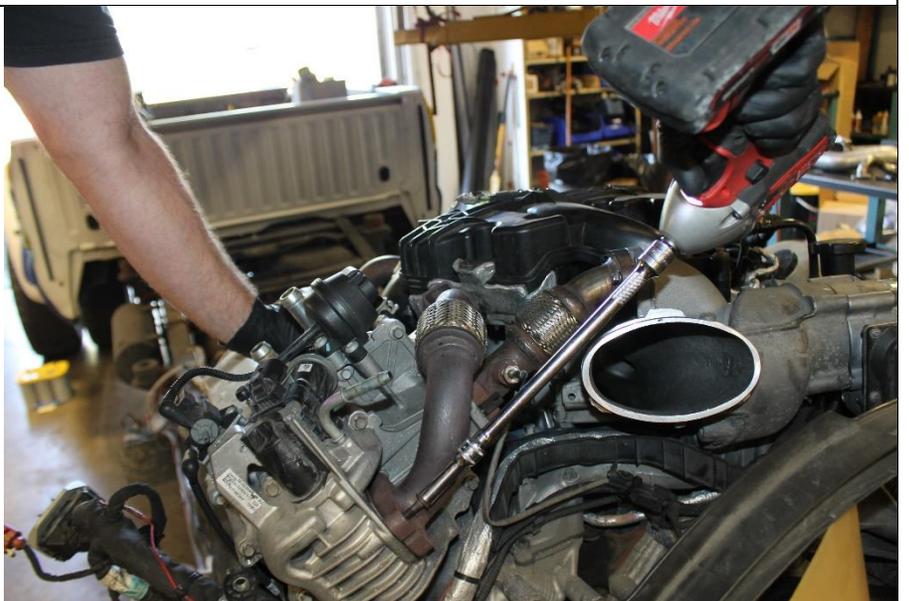
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R1.2 Using a 10mm socket & 16mm wrench remove the EBP sensor and tube at located at the rear of the EGR Cooler. Place the sensor and tube aside this will be reused in the BD Install procedures.



R1.3 Using an 8mm socket remove the exhaust manifold to EGR upper exhaust tube from the cooler.



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R1.4 Unplug the EGR outlet temperature sensor from the harness and using an 8mm socket remove the lower EGR outlet tube.



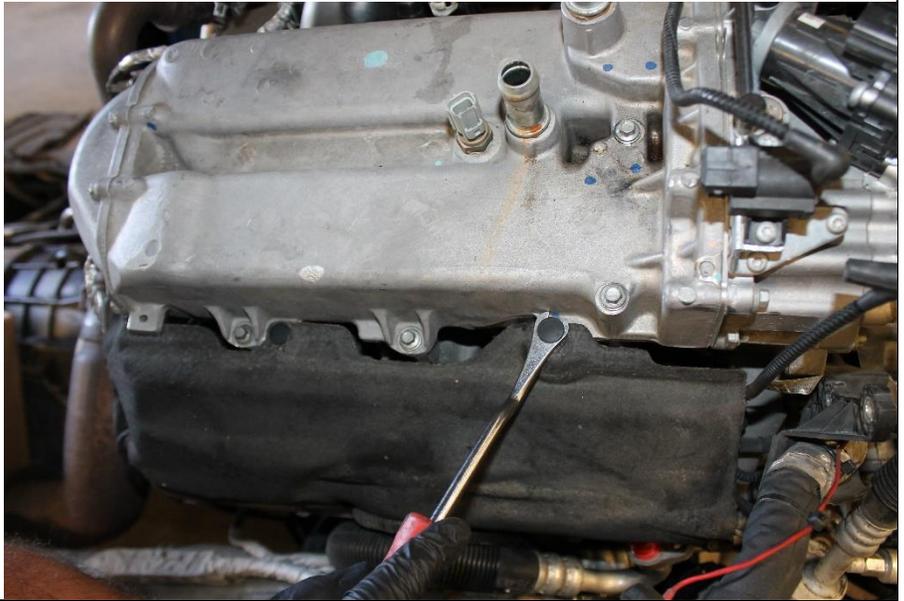
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R1.5 On the passenger side of the engine, remove the upper clips from sound dampening shield. These are mounted to the EGR cooler and will need to be released to remove the cooler.



R1.6 Using an 8mm socket remove the 7 bolts holding the EGR cooler to the passenger side head. The EGR cooler can now be removed from the engine. Note coolant will still be present in the cooler as you remove it.



2. Intake System Removal

R2.1 Unplug the MAP sensor from the engine harness located on the top of the upper Intake. At this time you can also unplug the turbo VGT actuator from the harness. Move all of this section of the engine harness / wiring out of the way from removal of turbocharger.



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R2.2 Using an 8mm socket remove the two bolts holding the two dipsticks to the intake on the driver's side.



R2.3 Disconnect the turbochargers wastegate actuator tube on the intake side as shown.

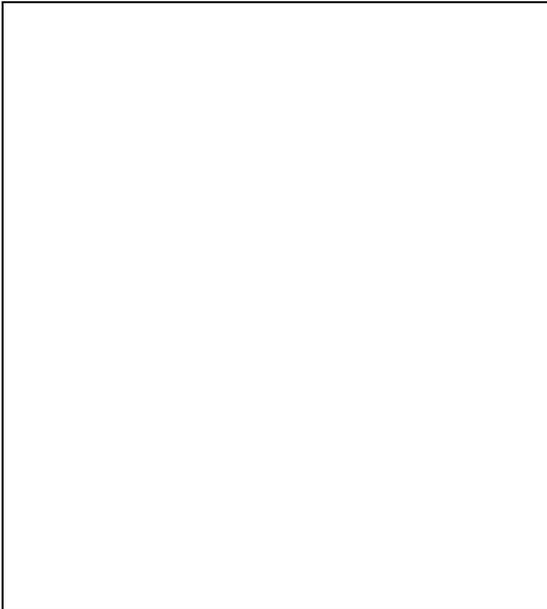


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R2.4 Using an 8mm, socket remove the 15 upper intake bolts. The upper intake can now be removed.



R2.5 Detach the crank case vent tube from the lower intake / aluminum intake casting to the turbo, this joint is twisted to release. Unplug the sensor cable if you wish to remove this tube until reinstall later.

****For 2015-2016 model years, install the 1403005 EBP mounting bracket**



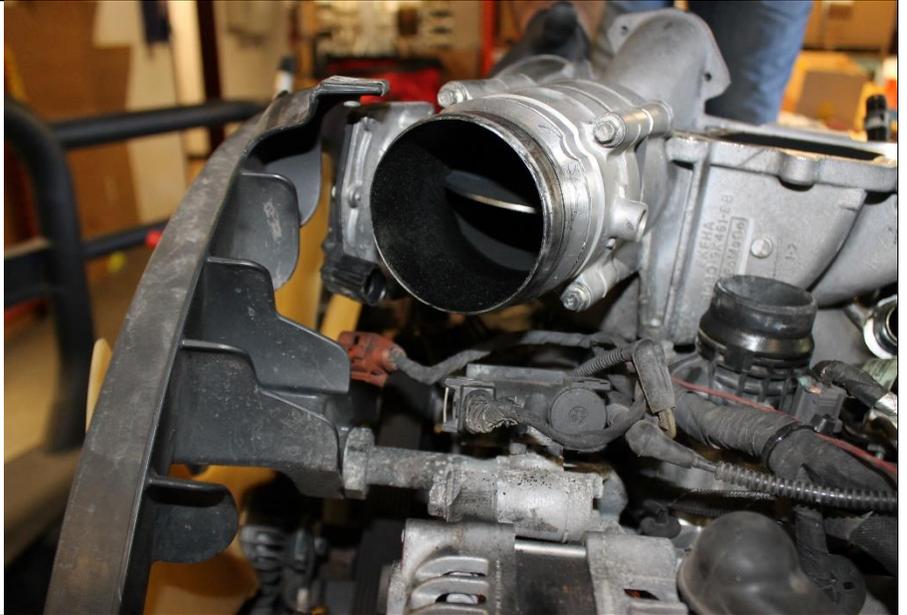
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R2.6 Unplug the intake throttle body plug located at the front of the lower intake.



R2.7 Using an 8mm socket, loosen the front and rear intake boots to the turbo, these boots can be detached when the turbo has been removed.



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R2.8 Using a 10mm socket remove the 3 bolts holding the lower cast aluminum intake. The lower intake can then be removed.



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R2.9 Using an 8mm socket, remove the 2 Coolant tube bolts and remove the tube. This completes the stock intake removal.



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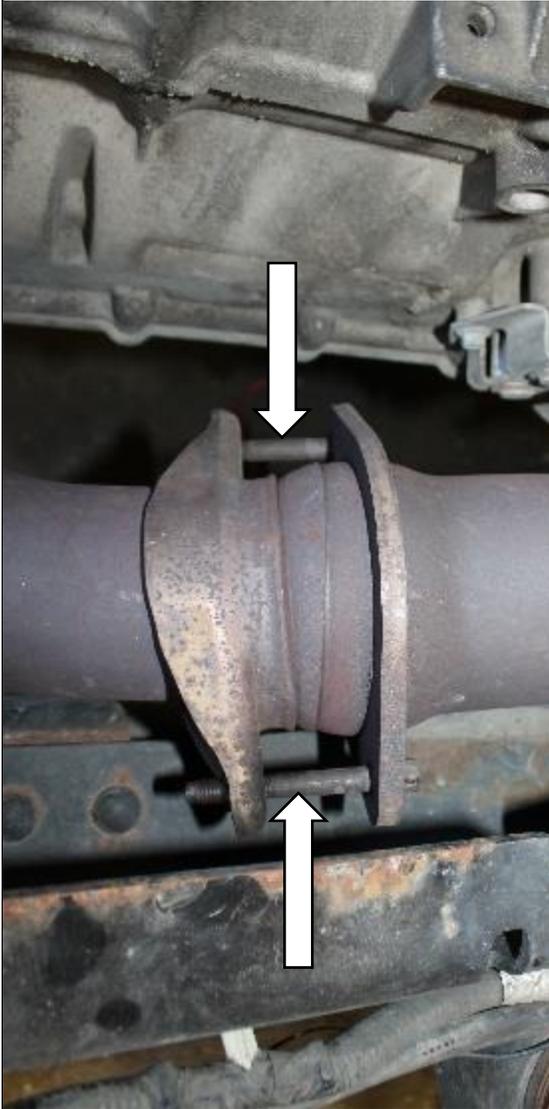
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3.0 Exhaust System Removal

R3.1 using a 13mm socket remove the 2 bolts attaching the ball joint from downpipe to exhaust system.



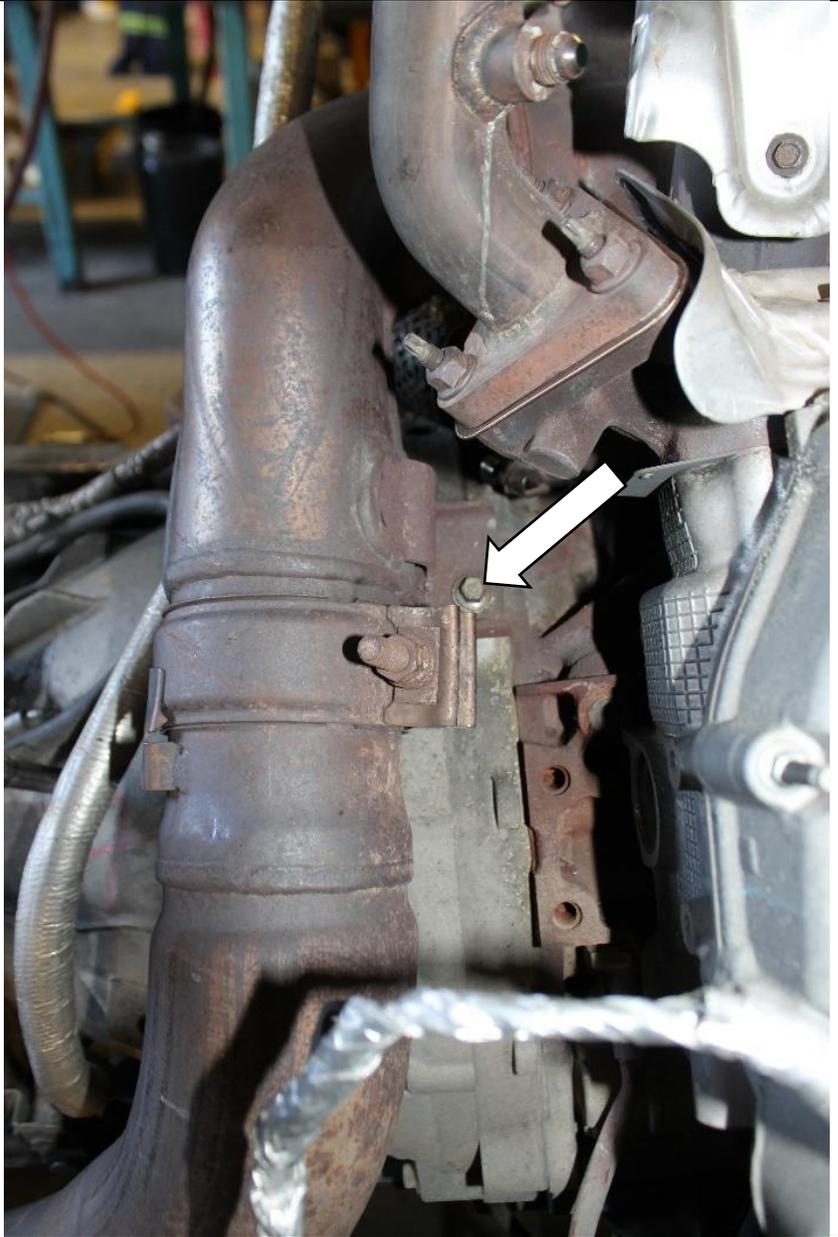
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R3.2 Using a 10mm Socket, remove the bolt holding the OEM cobra downpipe, this is found at between the rear of the engine and the upper down pipe.



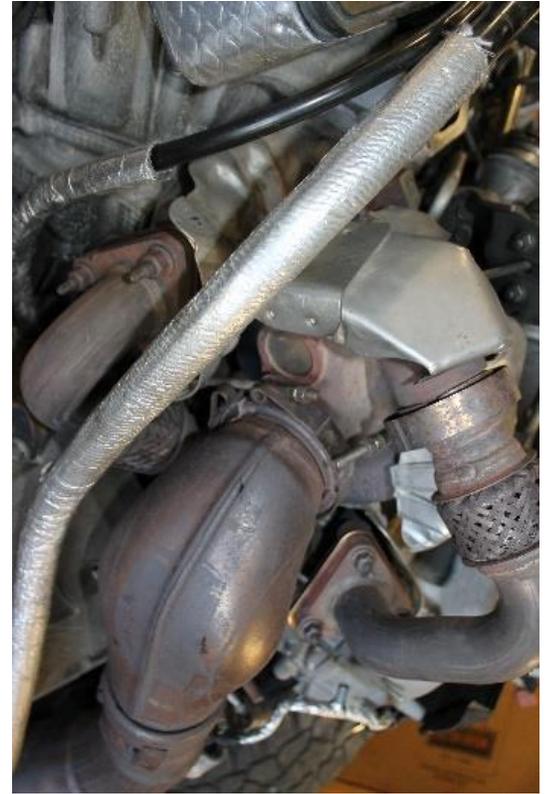
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R3.3 Using an 11mm Socket, loosen the V band clamp from the turbocharger turbine housing outlet to the stock downpipe. At this point the downpipe can be removed.



R3.4 Using an 11mm socket remove the V band clamps from the exhaust manifolds to the up pipe tubes, they can be slid down into the shown position sitting on the tubes, they do not need to be fully removed.



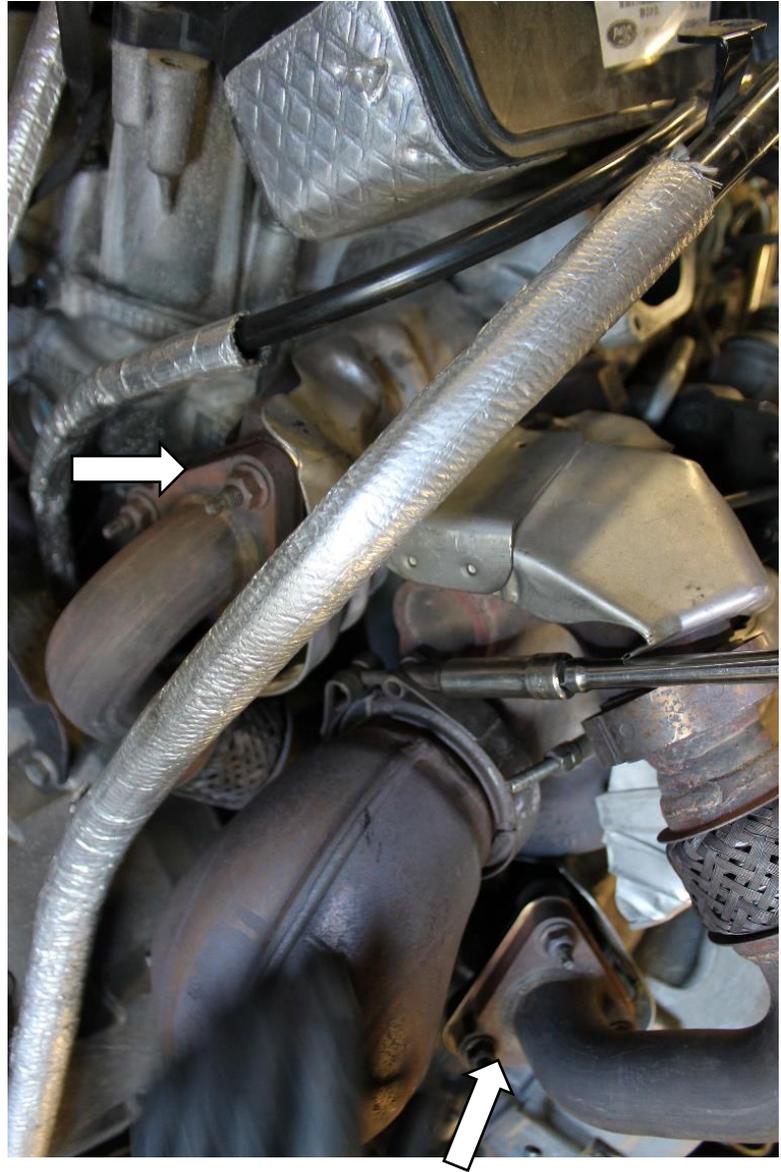
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R3.5 Using a 13mm socket, remove the 6 nuts fastening the up pipes to the stock exhaust manifolds, penetrating oil can be used to aid in the removal of these. This completes removal of the exhaust system except for the passenger side manifold which will be done after the turbo has been removed.



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4.0 Turbocharger Removal

R4.1 Using a 13mm socket and extension, remove the 4 turbocharger pedestal bolts found on the lower turbo / pedestal. (These are accessible 2 from each side of the engine)



R4.2 Remove the turbocharger coolant return line found on the driver's side, this simplified by removing the spring clamp on the front of the tube near the coolant cross over in front of the charger. You may also remove the E Clip to allow this tube to be released, this is not required.



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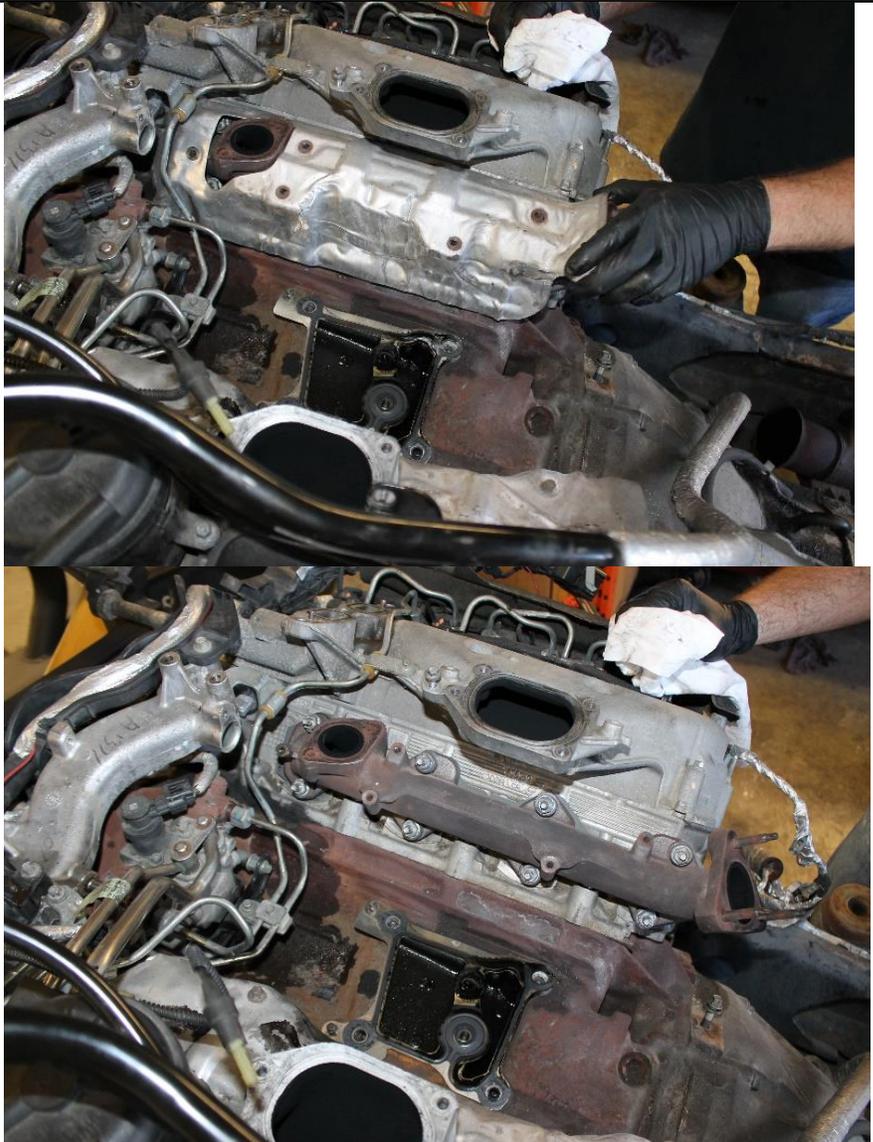
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R4.3 Pull the turbocharger off at this time. Lift up and towards the rear of the engine.



5.0 Passenger Side Manifold Removal

R5.1 Remove the bolts holding the heat shield over the passenger side manifold using a 8mm socket. Then remove the heat shield / cover.



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R.2 Using a 13mm socket, remove the 8 main manifold nuts. Some studs may come with these and will need to be reinstalled after manifold removal. The manifold can now be removed from the passenger side head. If any studs were removed reinstall these and torque to 115 lb-in.

Clean gasket mating surfaces.



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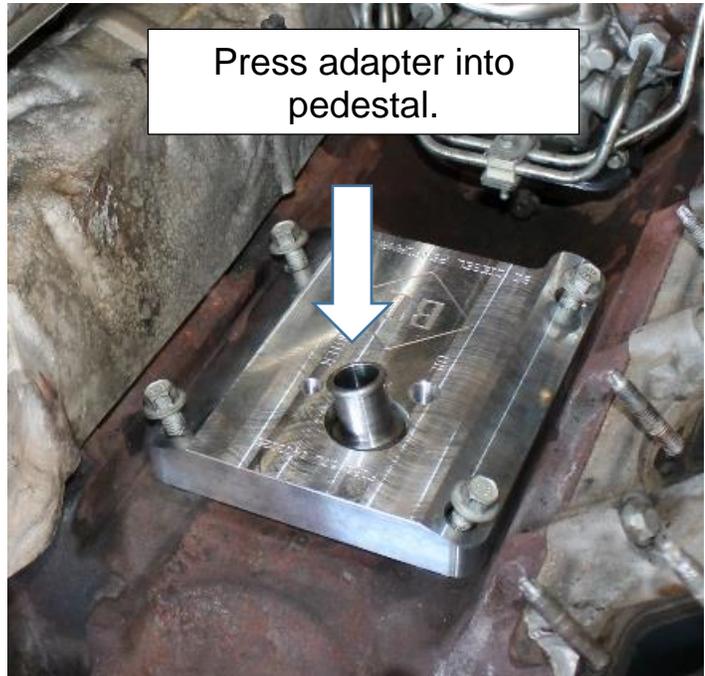
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BD Turbo Kit Install Procedures

1. BD Pedestal Install

NOTE: It is recommended that sealant is applied to the oil drain before installing into the adapter.

1.1 Press the 1403027, oil drain insert into the 1403026 pedestal. Align the insert with the drain bore on the pedestal as shown. This install can be done with a large dead blow hammer. Assure there is no damage to the bottom face which mates to the engine & gasket. This can be done with the pedestal placed on a rubber mat or clean wooden bench.



1.2 Place a new OEM Ford turbocharger pedestal gasket BC3Z-6587-A in place. Place the BD billet aluminum block off pedestal into place and assure it seats correctly on the dowel pins.



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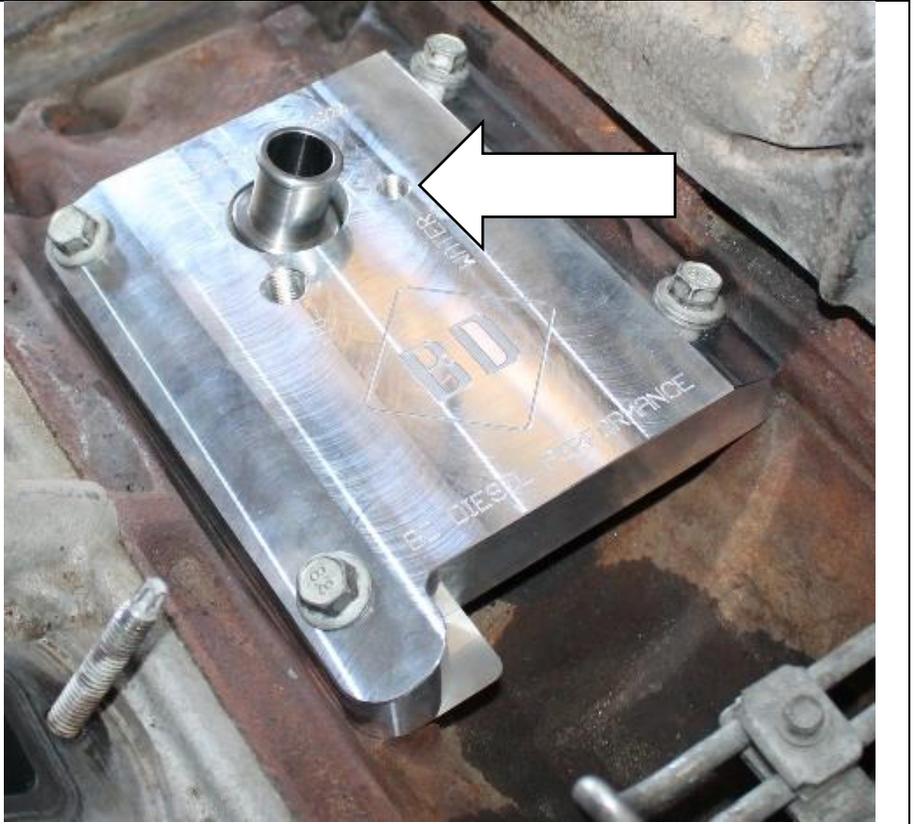
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1.3 Torque down the 4 pedestal block off plate bolts using a 13mm socket to 41 ft. lbs.



1.4 Install a 1/8" NPT plug in the water feed location unless you are installing an aftermarket water-cooled wastegate or non-standard watercooler CHRA turbocharger. Use a thread sealant such as Permatex or teflon tape. Insure the NPT is well seated.



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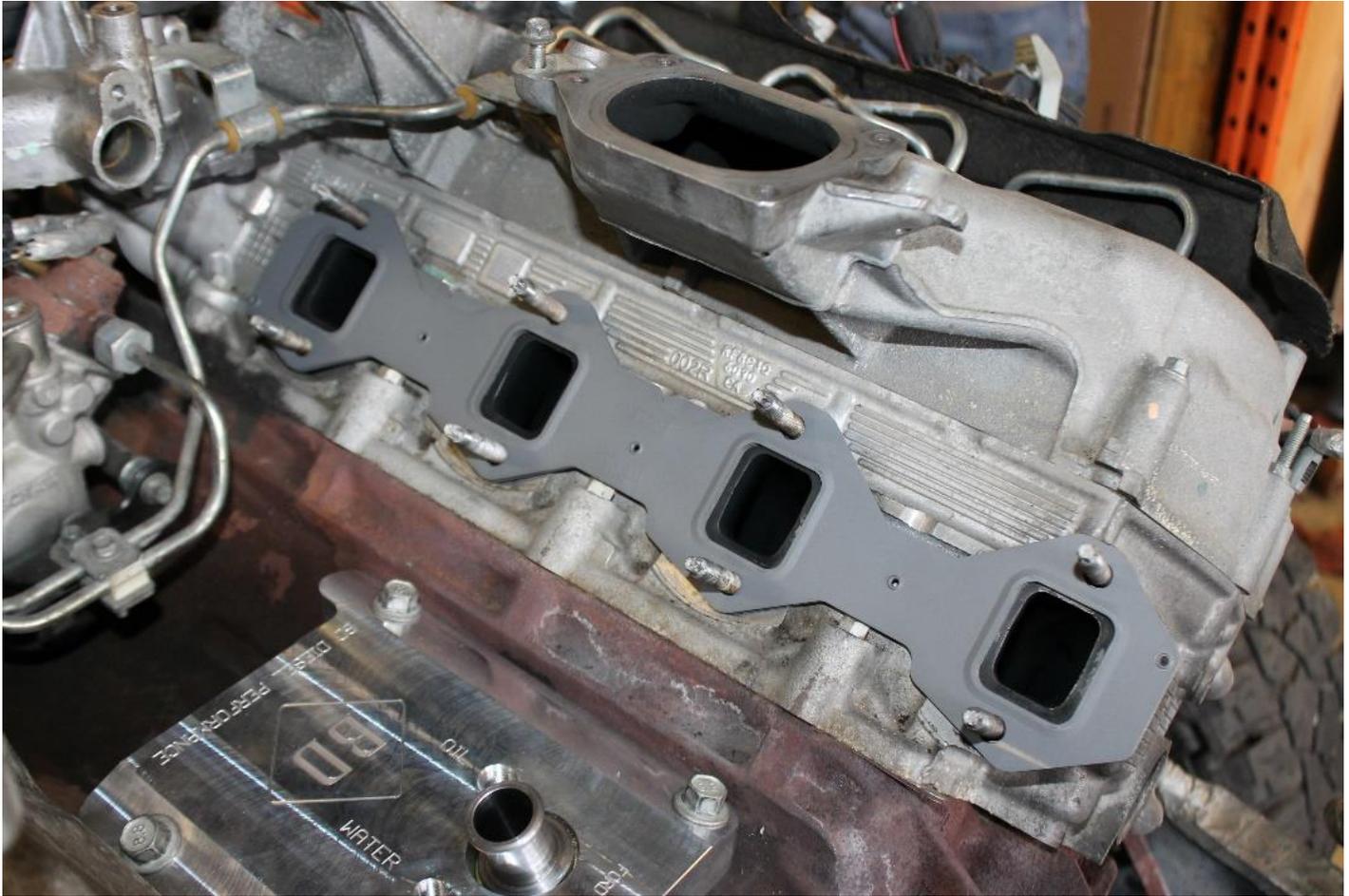
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2. Manifold Install

2.1 Place the OEM Ford exhaust manifold gasket FC3Z-9448-A in place on the passenger side head. (Assure the studs were all installed correctly and properly seated before this step. Ford recommends using thread locker)



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2.2 Place the T4 flange 1403000 BD manifold into place on the passenger side head. Install the OEM Ford spacers onto the studs after the manifold has been positioned.



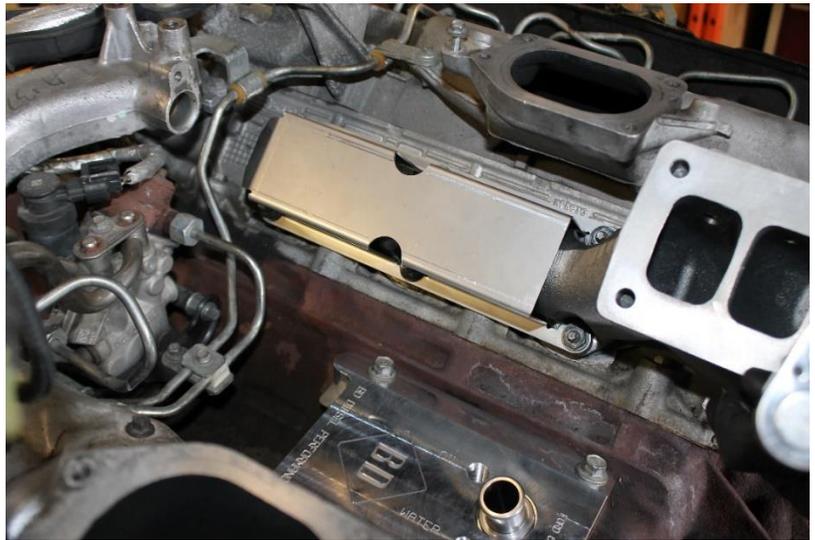
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2.3 Place the 1403002 BD heatshield into place on top of the front of the BD manifold.

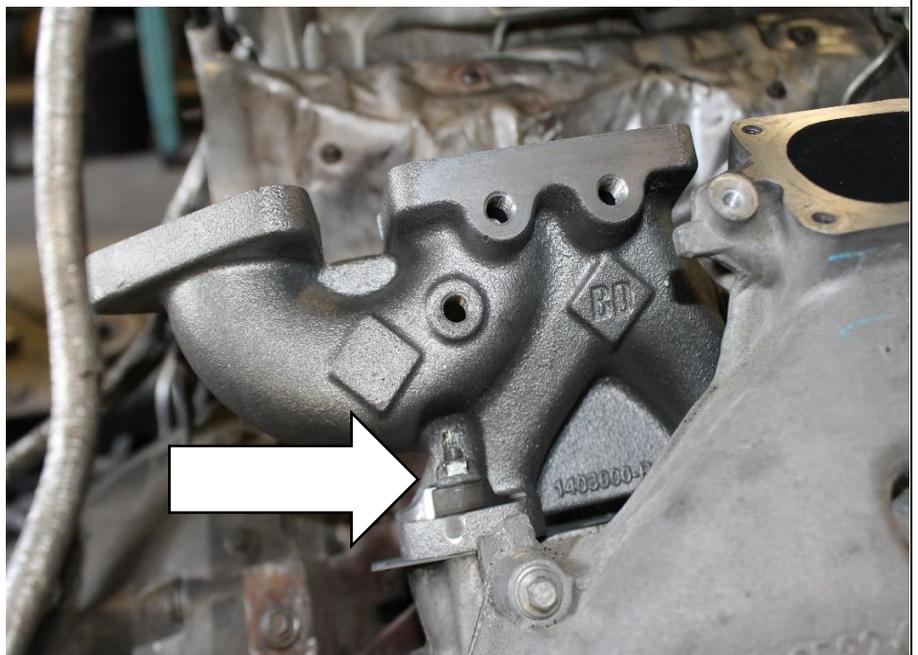
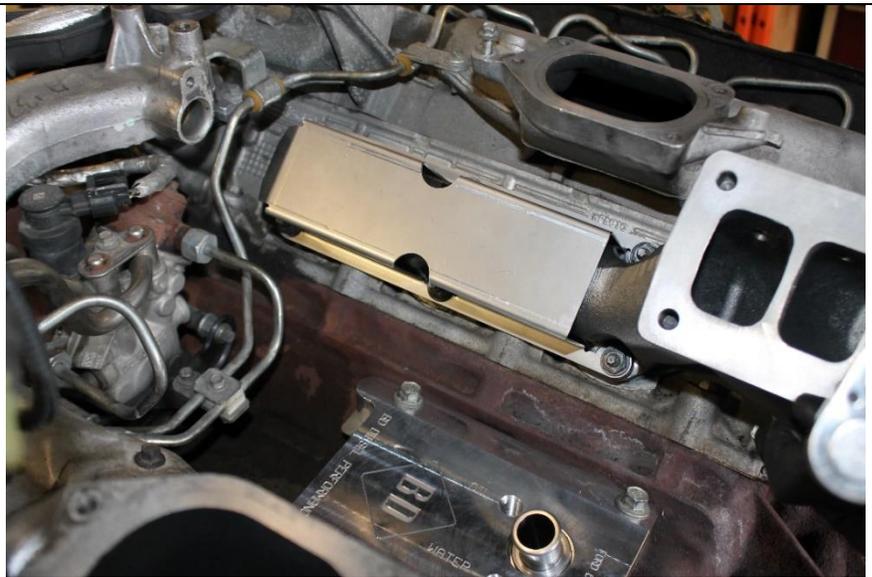


2.4 Install the OEM manifold nuts and torque to first pass at 15ftlbs.

Note the rear upper stud will require a crows foot (13mm) to torque down to specification. Don't forget to re-calculate your torque setting with the crows foot.

Complete a second pass at 22 ft. lbs.

Assure the manifold is seated correctly.



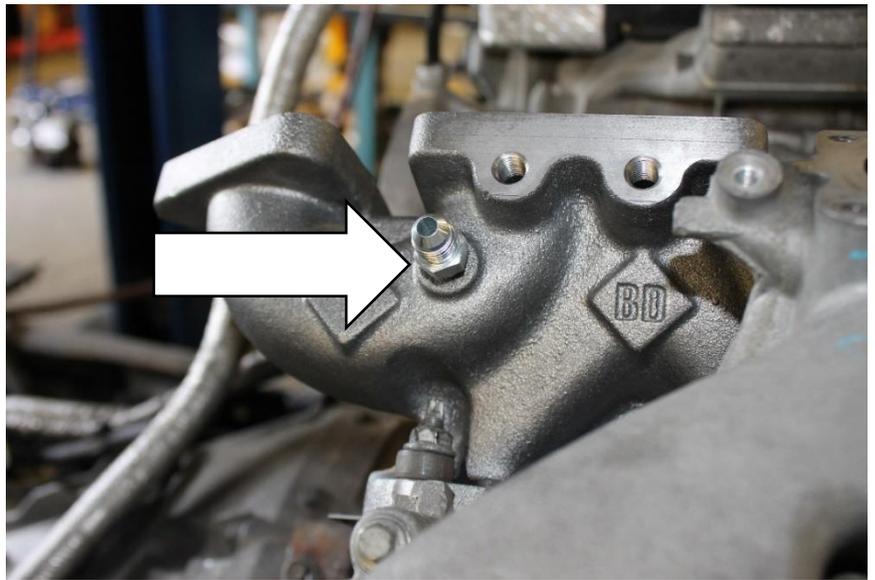
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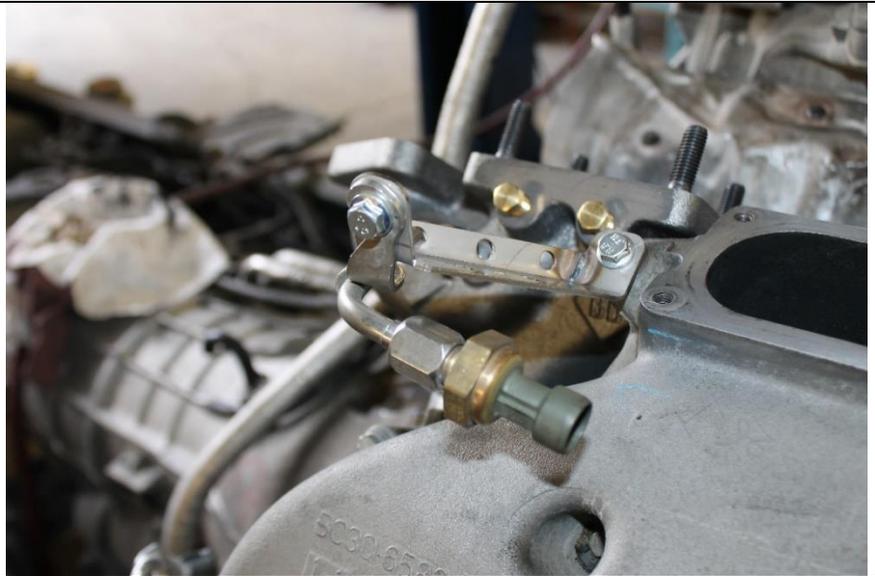
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2.5 Install the (EBP) exhaust back pressure JIC fitting into the manifold (5/16" X -8 JICM).

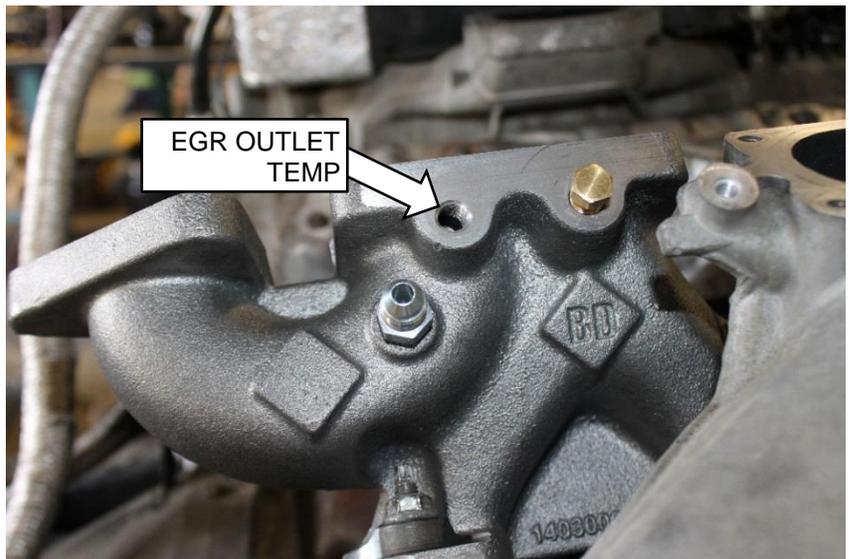


2.6 Using the 1403002 EBP mounting bracket, install the OEM EBP sensor and OEM tube as shown. This requires an 8mm & 10mm socket.



2.7 Install the OEM EGR outlet temperature sensor removed earlier into the rear EGT port, use the 1403004 EGT extension harness and plug into the EGR outlet temp plug located at the front of the engine.

At this time install a 1/8" NPT fitting 1200208 into the manifold pyro front location, an aftermarket pyro can be installed in this location now or later in the install



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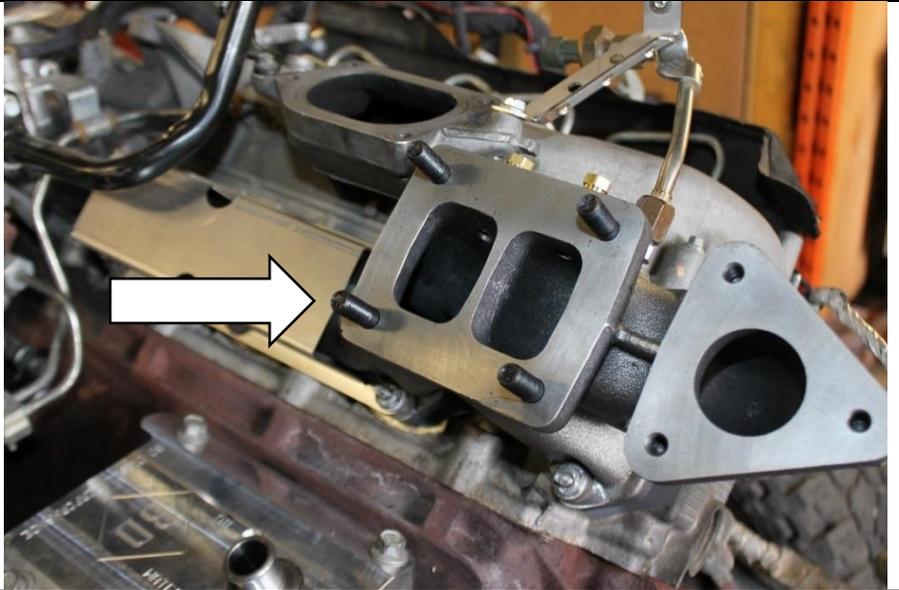
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process.

2.8 Install the M10x25mm 1462431 flange studs into the manifolds T4 Flange. The shorter thread ends goes into the manifold.



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2.9 Reinstall the coolant tube at this time using a 8mm socket.



3. S400 Turbocharger Install

Note: All work with the turbocharger turbine housing separated must be done with care as to not damage the turbine blades, even a small bend on the blades will cause an imbalance and premature turbocharger failure. This is not covered under warranty.

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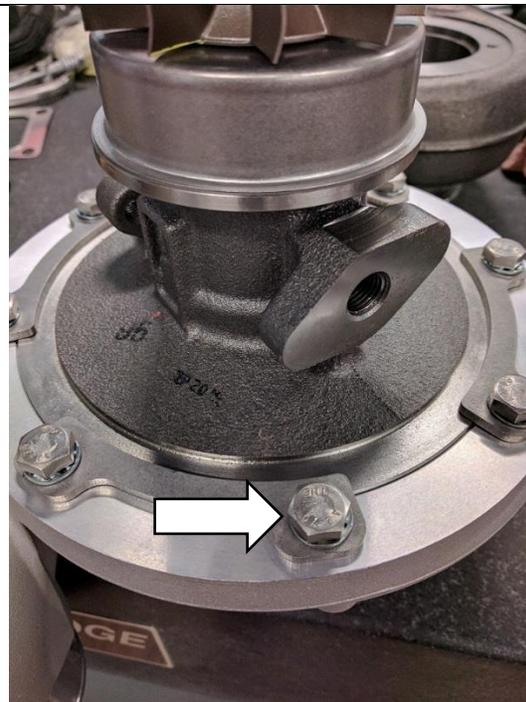
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3.1 Place the turbocharger on a bench with the turbine housing side down and carefully remove the Turbine Housing from the turbocharger super core / CHRA. Assure not to hit the turbine blades causing any damage.



3.2 The compressor cover bolts can be slightly loosened to allow it to be clocked into position once installed. Only loosen until the compressor cover can be rotated with some force and is still held in position.



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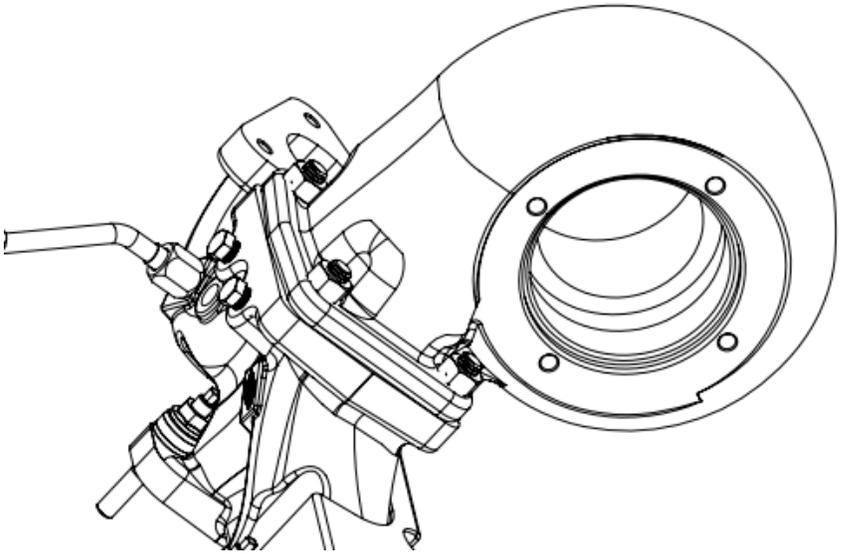
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3.3 Place the 2475042 T4 gasket onto the manifold.



3.4 Install the turbine housing using 4x 1462441 nuts. Tighten the M10 nuts with a 14mm socket/wrench. Torque to 32 ftlbs in a cross pattern.



3.5 Install the 1453144 90° oil feed fitting in the orientation shown. Use pipe sealant or teflon tape. Do not use excessive amounts of sealant, as this could cause oil contamination.

At the same time you can insert the silicone oil drain hose 1462120, loosen the 1453113 gear clamps and install over the oil drain barb.



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3.6 Install the oil feed tube 1453130-B into position with the 90° section installed on the lower section as seen in the photo.



3.7 Tighten the 1453113 gear clamp to secure oil drain hose.



3.8 Place a second 1453113 gear clamp onto the drain tube hose loose as shown.

3.9 Place the 1403020 turbocharger welded oil drain tube assembly into the 7/8" oil drain tube as shown.



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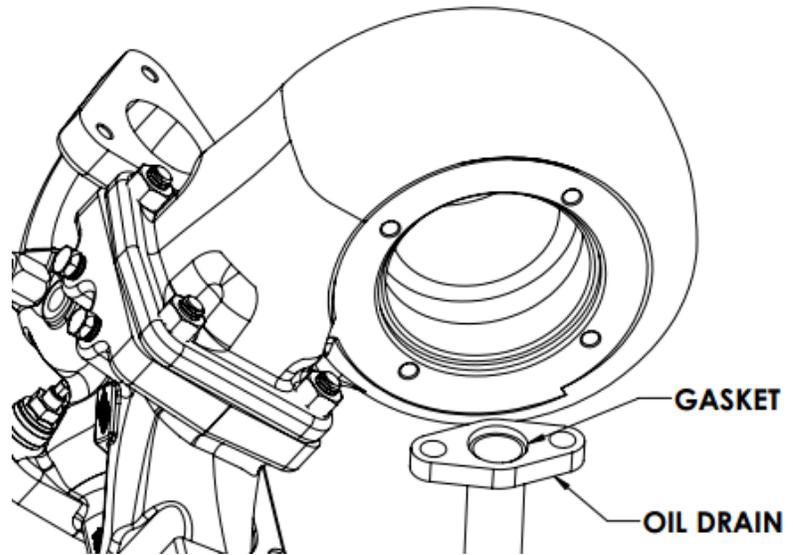
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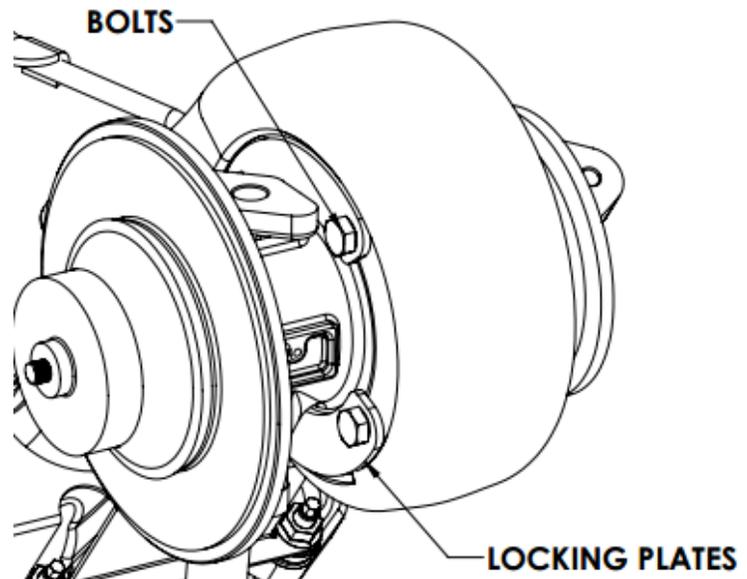
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3.10 The 148062 oil drain gasket can be placed in position now for when the CHRA is installed, or it can be slid into position after the CHRA is installed.

Note: you can use a heavy grease to secure the gasket to the drain face.

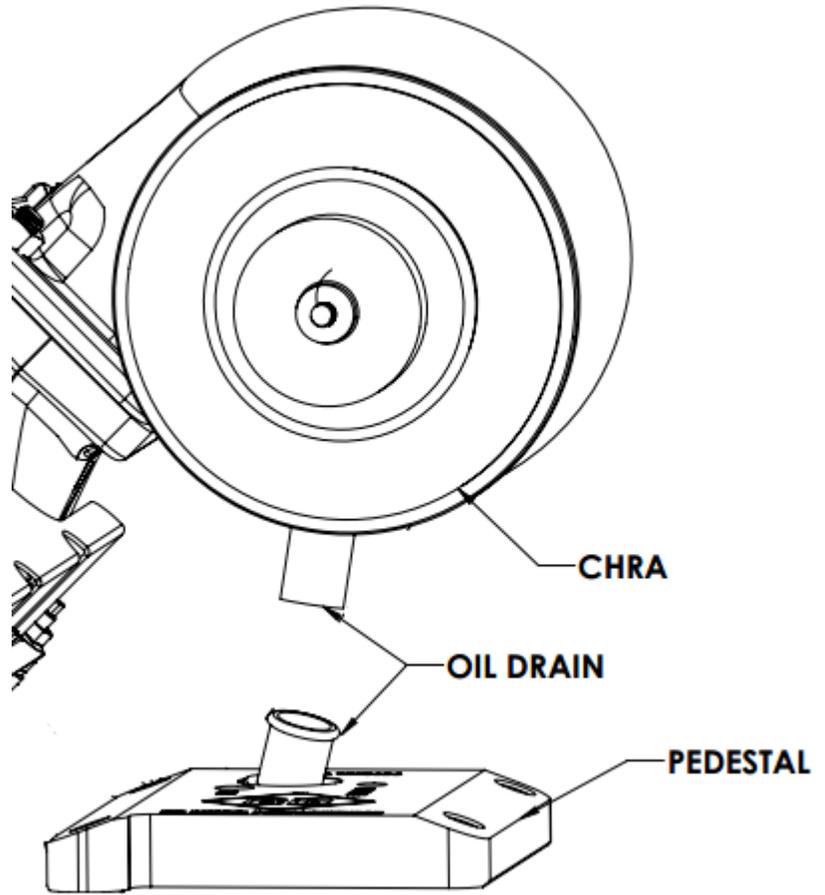


3.11 Carefully place the Turbocharger CHRA Super core into turbine housing place assuring not to make contact with the turbine blades. Secure the CHRA to the turbine using the locking plates and bolts.



3.12 Slide the oil drain gasket in place if it is not already. Assure the turbocharger is sitting horizontal and flush with the oil drain flange. Tighten the bolts to secure the CHRA to the turbine housing to 15ftlbs (186 in-lbs).

Secure the compressor cover in place. Do not tighten until later in the build when it is clocked into the correct position.



3.13 Install the 2 oil drains bolts (FT-110120342) using a 9/16 socket and torque to 32 ft.lbs securing it to the CHRA.

Note: Picture shows S400 Turbo. Installation is very similar.

Borgwarner uses multiple sizes of oil drain bolts. For S300 SXE they use 3/8. While for S400 they will use a mixture of M10 and M8. These bolts have provided.

Extra Bolts: 1302108 & FT-110120342



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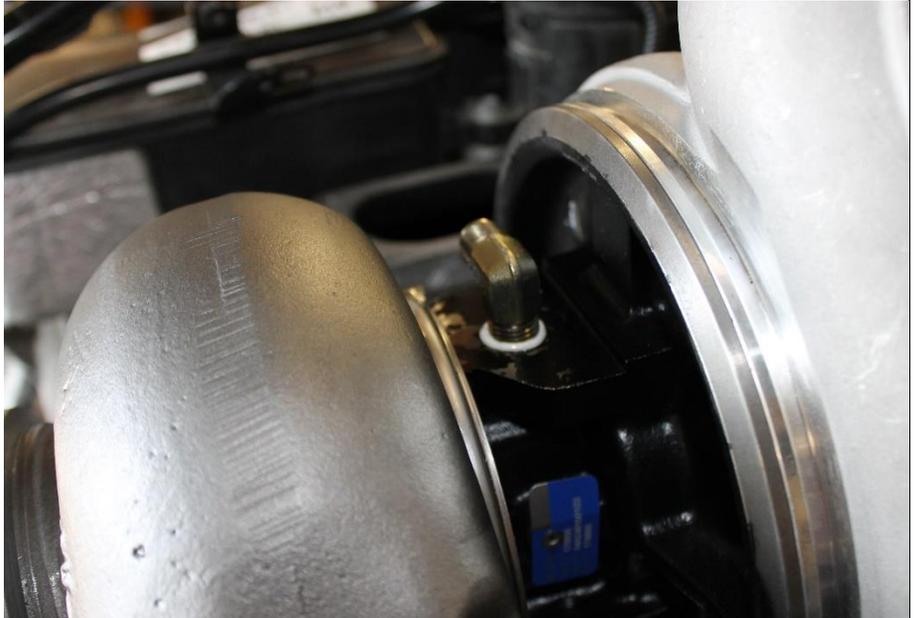
3.14 Tighten the oil drain hose gear clamps at this time.



3.15 Use a small amount of pipe sealant or teflon tape on the threads and install the Oil Feed 90° fitting 1462321 into the CHRA Oil inlet. Do not use excessive amounts of sealant, as this could cause oil contamination.

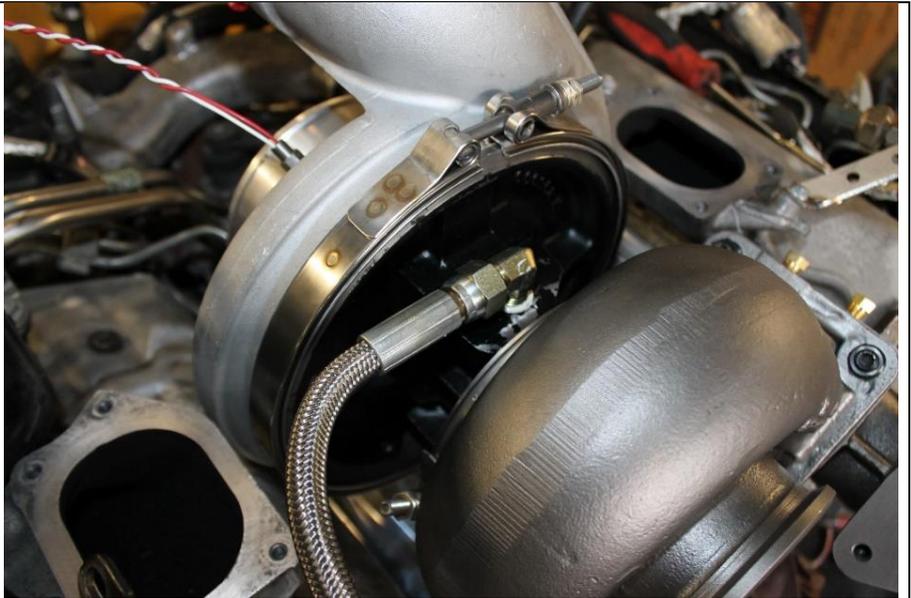
Do not use Teflon tape.

Note: Picture shows S400 Turbo. Installation is very similar.

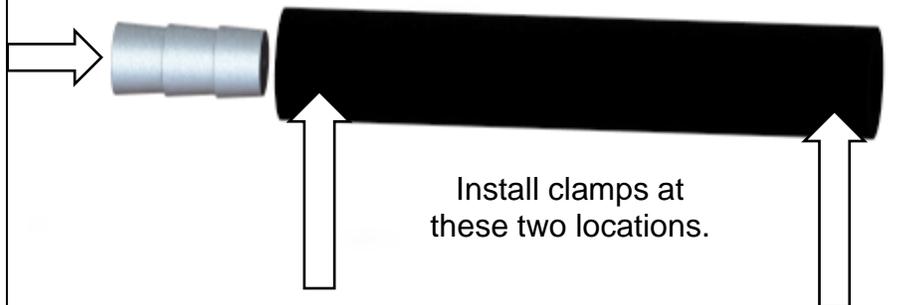
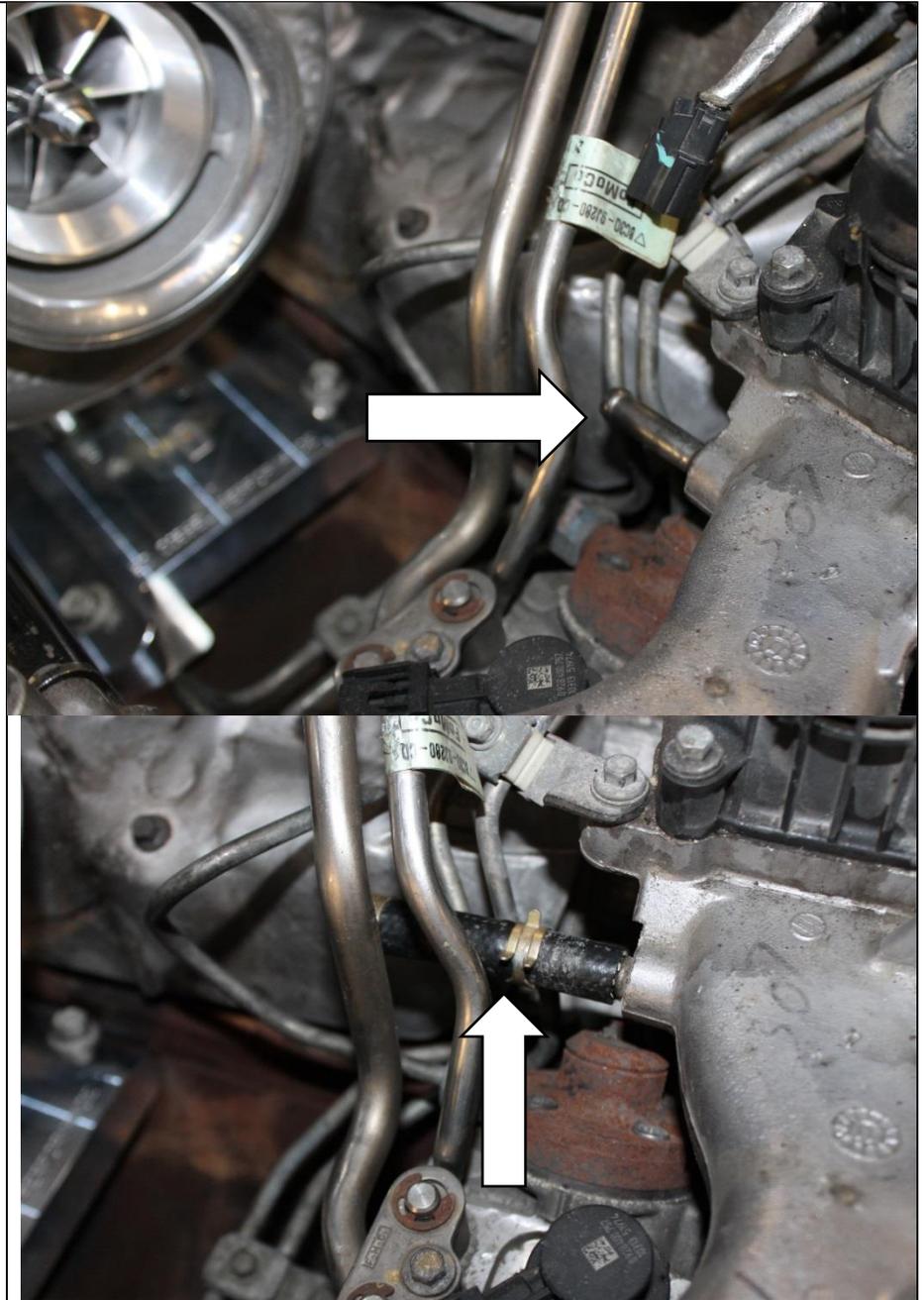


3.16 Install the oil feed line, take care to assure this line is clear of the driver side manifold, turbine housing and other sources of heat or any edges on which this line could wear on. When tightened in final position the oil feed line should be free from rubbing all other items by 1/2 Inch.

Note: Picture shows S400 Turbo. Installation is very similar.



3.17 Install the turbocharger coolant port block off plug (1462122) in the OE tube located near the CP4. Use the supplied spring clamps (CTL-11), along with the section of 3/8" diameter X 3" L hose provided. This completes this section of the install.



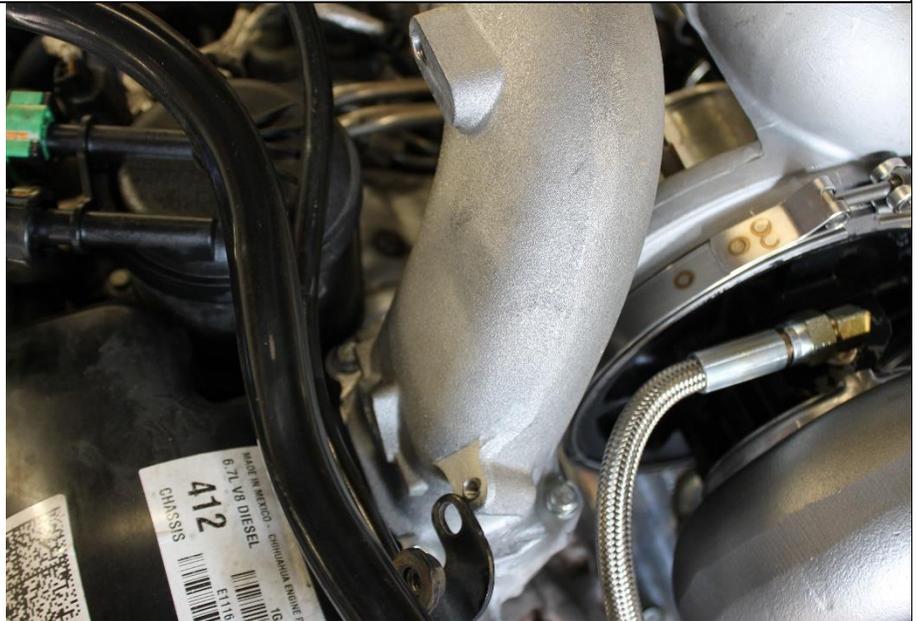
4. Intake Horns Install

4.1 Place in the new set of Ford OEM seals (P/N 9439A) into the intake horns.



4.2 Install the driver's side intake into place first using the 4 M6 bolts 1900056 and a 10mm socket.

Assure the seal stays seated in place during install and is not pinched. Torque the 4 bolts to 89 inch lbs.

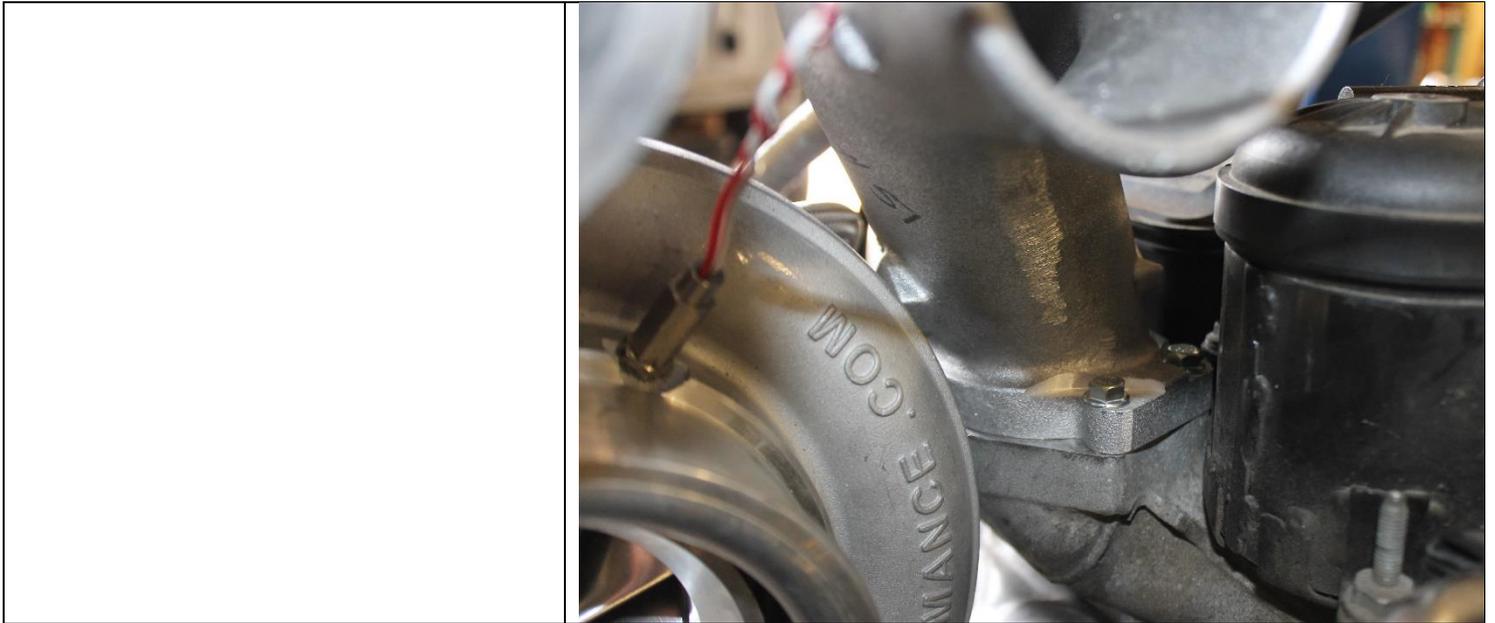


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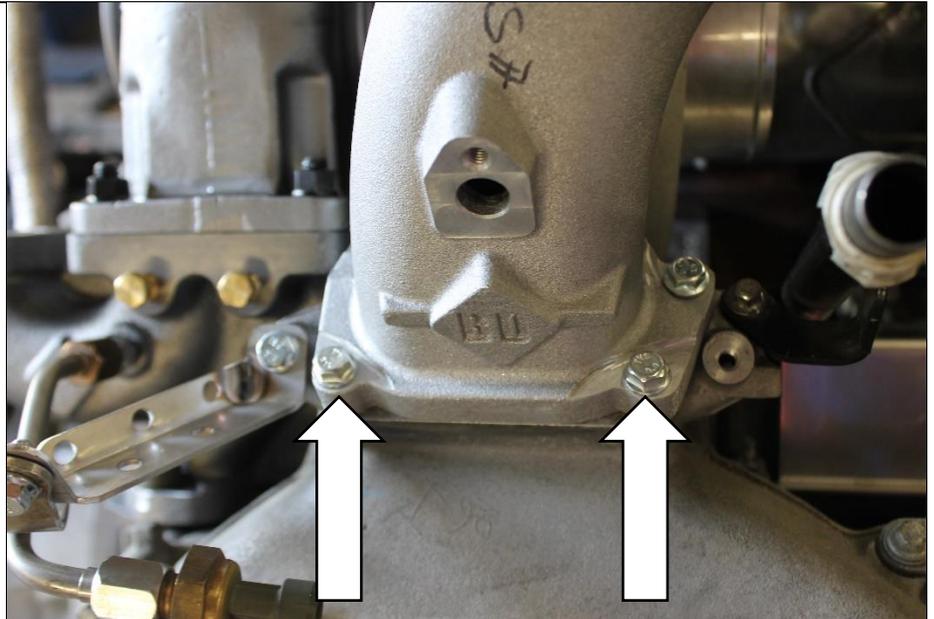
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4.3 Repeat the process for the passenger side intake horn, and torque to 89 inch lbs.



4.4 The 1/8" NPT plugs 1200208 can be installed in each of the intake horns, unless you plan on using aftermarket boost gauges or another injection system or boost pressure accessory.



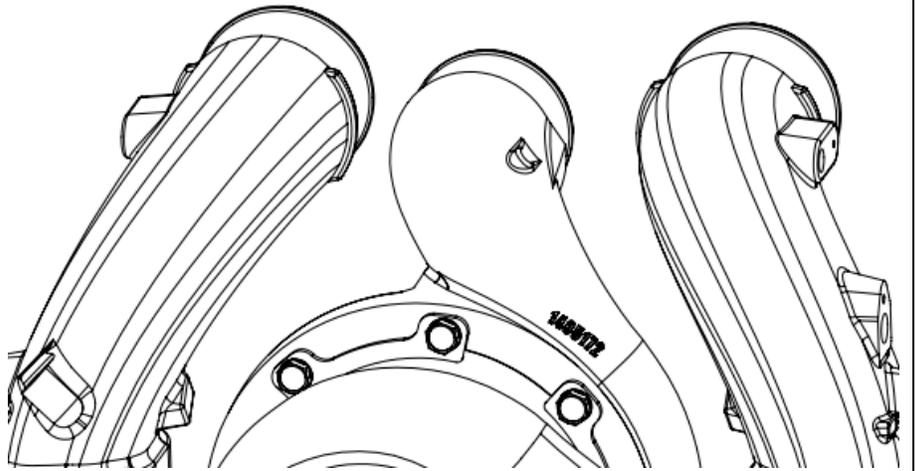
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4.5 The compressor cover can now be clocked in position with the outlet centered between the two intake horns. Tighten the bolts to 120 in-lbs.



5. Cross Over Tube Install

Important! Do not install heat wrap over the flexible bellows portion of the crossover pipe. It can overheat this area and cause it to fail.

5.1 Using a new OEM Ford Part No BC3Z-6N640-A Gasket. Place the gasket into place on the driver's side manifold outlet / studs, while installing BD Part #1403010 cross over tube.



5.2 During this section assure the transmission dipstick is on the inside or front of the cross over tube. It will need to be massaged into shape to clear in the following step.

Put the 1403010 BD cross over tube into place and install the 3 OEM nuts on the driver's side.

Slide the second gasket BC3Z-6N640-A between the crossover tube and the BD manifold into position.

Install the 3 (FT-11116245) M8 bolts on the passenger side manifold using a 10mm socket.



5.3 Torque the cross over tube bolts and nuts to 18 ft. lbs.



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5.4 Carefully bend the transmission dipstick to give 1/2" to 3/4" clearance from the dipstick to the cross over tube as shown. Make small adjustments evenly to avoid kinking the tube. This can be done by hand on the truck. The engine oil dipstick may need a small adjustment as well for best fitment.

(If you will be installing BD Boot Locks the intake horns the dipstick will need to be massaged out of this location, if not the position as installed will have adequate clearance.)



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5.5 Install the 2 1900037 M6 dipstick bolts provided with an 8mm socket and torque to 89 inch lbs.



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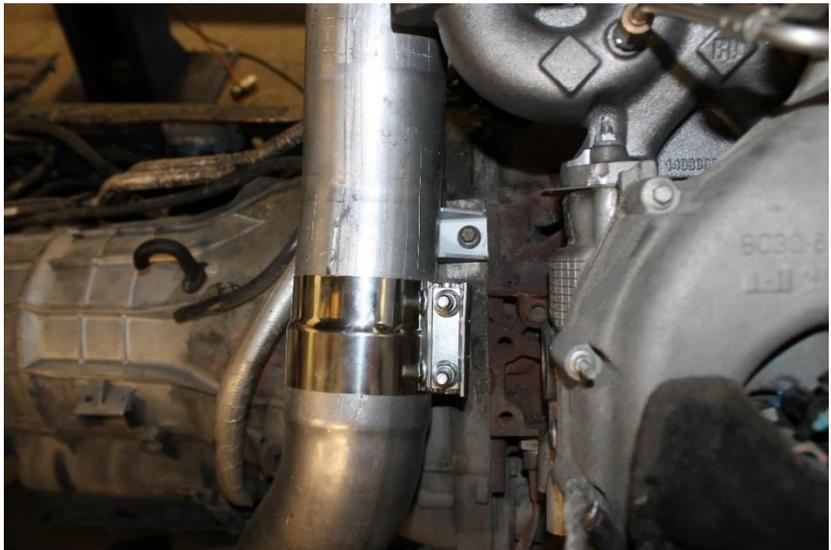
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6. Downpipe install

6.1 At the rear of the turbine housing slide the 1453602 downpipe clamp onto the turbine outlet past the flange and place the upper downpipe 1403016 into position, partially install the OE mounting bolt and align the downpipe to the flange. Tighten the V Band clamp followed by the OE mounting bolt and torque the mounting bolt to 22 ft. lbs.



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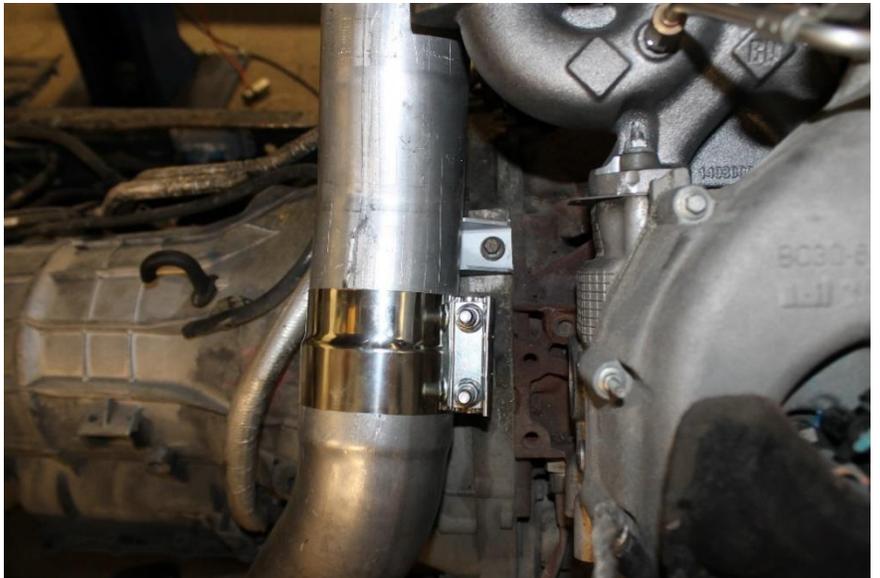
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6.2 Slide the laser cut Lower downpipe flange 1403017-2 onto the lower downpipe 1403017-1.



6.3 With the flange sitting on the tube, install the lower downpipe into position along with the intermediate 4" lap exhaust clamp 1100740.

Do not tighten 4" lap clamp at this point.



6.4 Re-use previously removed fastener hardware to secure exhaust ball joint. Ensure female and male ends are clean.



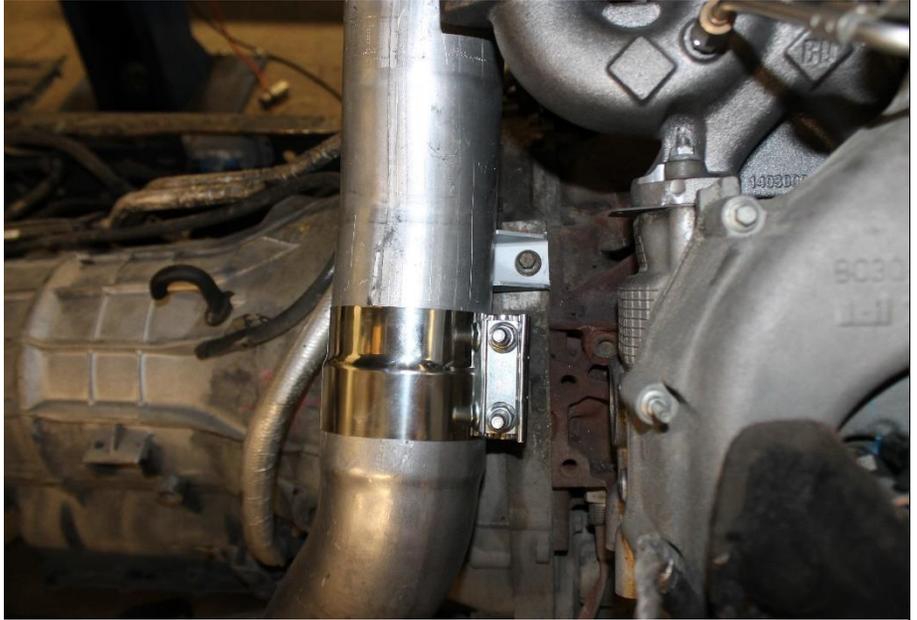
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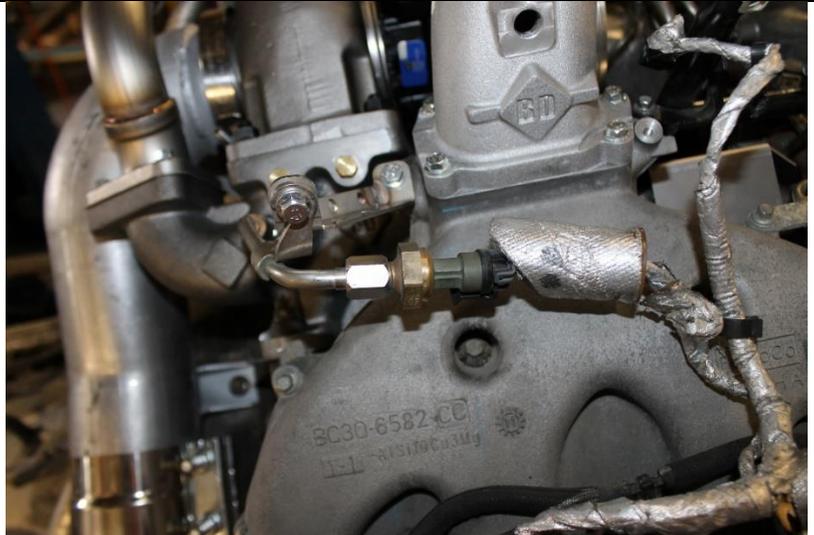
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6.5 Align the 4" lap exhaust clamp as shown and tighten to 45-60 ft. lbs.



7. Sensor Harness Install / Coolant block off plate

7.1 Plug the stock wiring harness into the exhaust back pressure sensor as shown, the OE heat shield can be installed / slid overtop.



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7.2 Install the MAP sensor onto the passenger side intake horn, use the provided M6x18mm 1505022 bolt and torque to 89 in. lbs.



7.3 Plug the harness into the MAP sensor and zip tie the harness as necessary away from heat sources and from wear due to vibration. The VGT actuator plug can be tapped up or capped.



7.4 Place the lower coolant block off plate 1900082 against the factory EGR Cooler surface.

Lubricate and install FT-0413694 O-ring into 1900081 top plate.

Fasten the top plate down, sandwiching the lower plate with the O-ring. Secure the sandwiched assembling using the provided hardware. (1601521).



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7.5 We recommend removing the plastic wire harness support bracket shown, this will clean up the install as it has no mounting locations with the EGR Cooler not in place. Arrange the wire harness as required and assure it's not free to vibrate and wear on sharp edges.



7.6 Follow Mitchel/Alldata or other shop manual instructions, for all accessories and non-related intake and turbocharger installation and components.



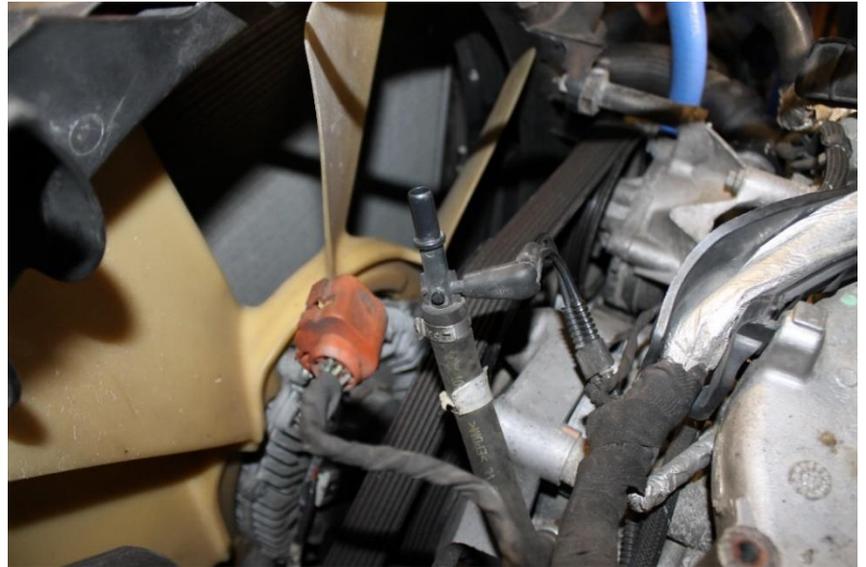
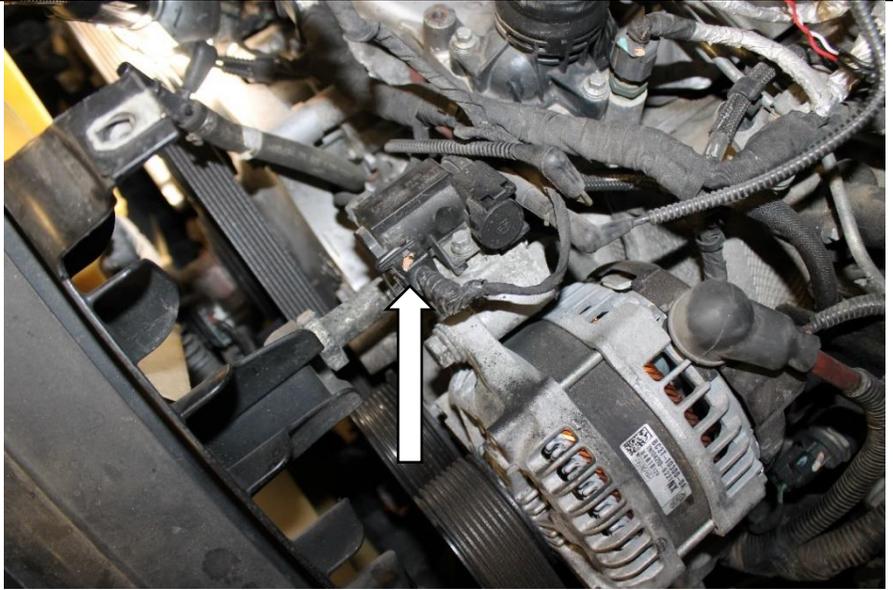
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7.7 Remove the wastegate actuator solenoid and the vacuum tubing lines routed both toward the driver side and passenger Side at this time. Remove the 2 bolts with an 8mm socket. The harness and plugs related to these items can be zip tied and taped up / sealed if wished.

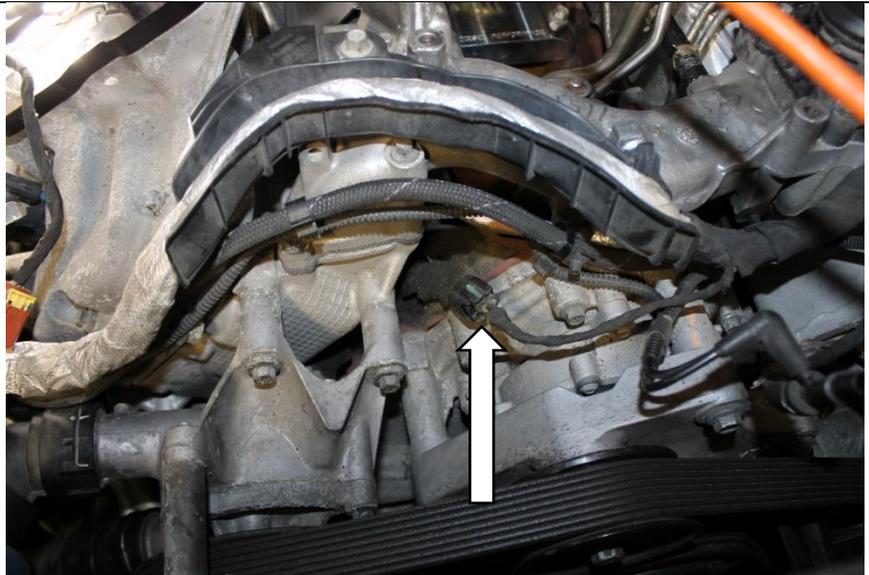


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7.8 Cap the shown location where the wastegate actuator solenoid was fed using the supplied Rubber bullet cap (1900068)



8. Cab Drop

Assure all items are out of the way and clear of the cab being lowered.

Note: You may wish to remove stock DPF related items before lowering the cab depending on if you're installing an aftermarket exhaust system as these are easy to access currently.

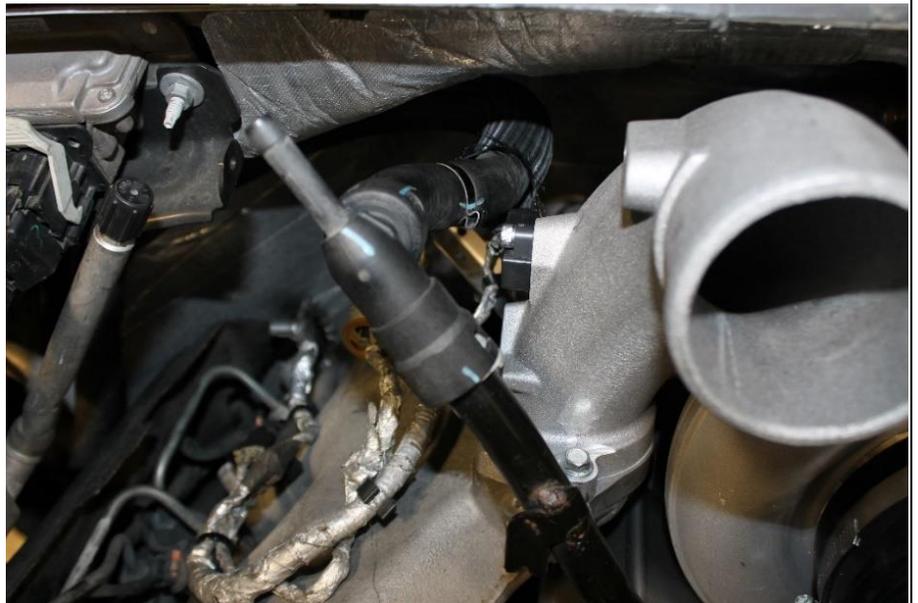
8.1

Critical! Before dropping the Cab, the middle DS Stud on the firewall shown should be trimmed. This will give adequate clearance to the cross over tube.



8.2 At this time the OE Coolant line for the heater can be installed near the Passenger Side intake horn with stock clamps.

**For 2015-2016 models, remove the stock coolant line and replace with the line provided (BC3Z-18472-E) in the 1045805 application kit.



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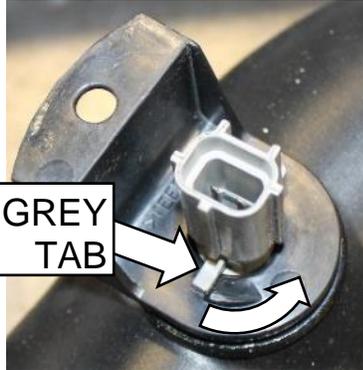
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9. Intake Tube & CAC Tube install

9.1 On the stock CAC tube from intercooler to intake, remove the intake air temperature sensor by lifting the grey tab and rotating.



9.2 Install the OE IAT into the BD CAC Tube 1403032-1. Rotate until the clip locks into place as shown.



9.3 Insert the breather crank case adapter 1403043-2 into the 1403036 boot as shown and secure with a 32mm clamp (1302197).

NOTE: Picture shows 1403043-1 boot.

Install barb plug 1900036 if using aftermarket breather system and disregard step 9.5



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9.4 Install the assembled 1403036 intake boot onto the Turbocharger at the shown angle. We recommend placing the 1453701 Gear Clamp in the shown orientation.



9.5 Reinstall the OE Breather tube as shown.



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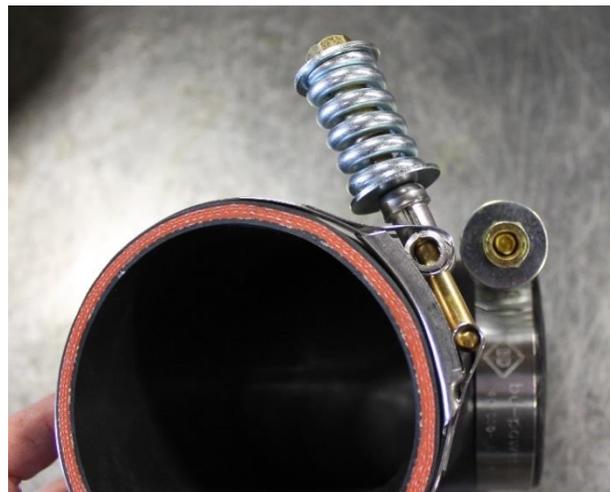
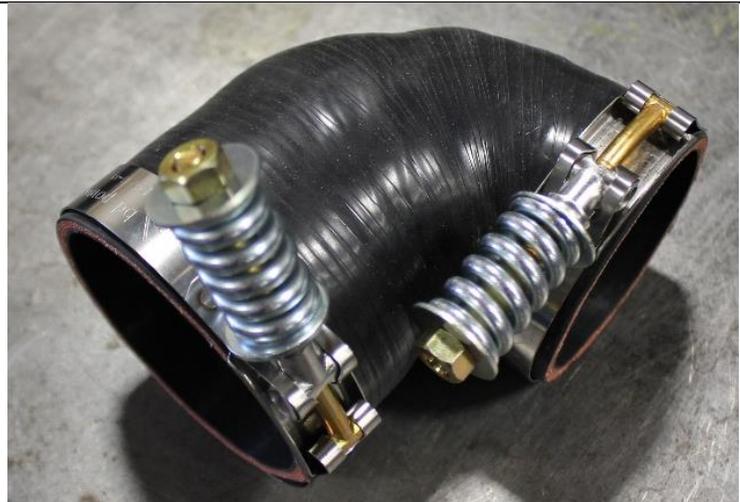
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9.6 Place the 4" Intake Tube Into position as shown, with 1453701 gear clamp installed on the 4-5" intake boot. Do not tighten the gear clamps at this time.



9.7 Install the only 1407030 clamp provided in the kit for the intercooler and 3.5" clamps as shown on to the 3.5" CAC Tube. Adjust so they are held from rotating but are movable.



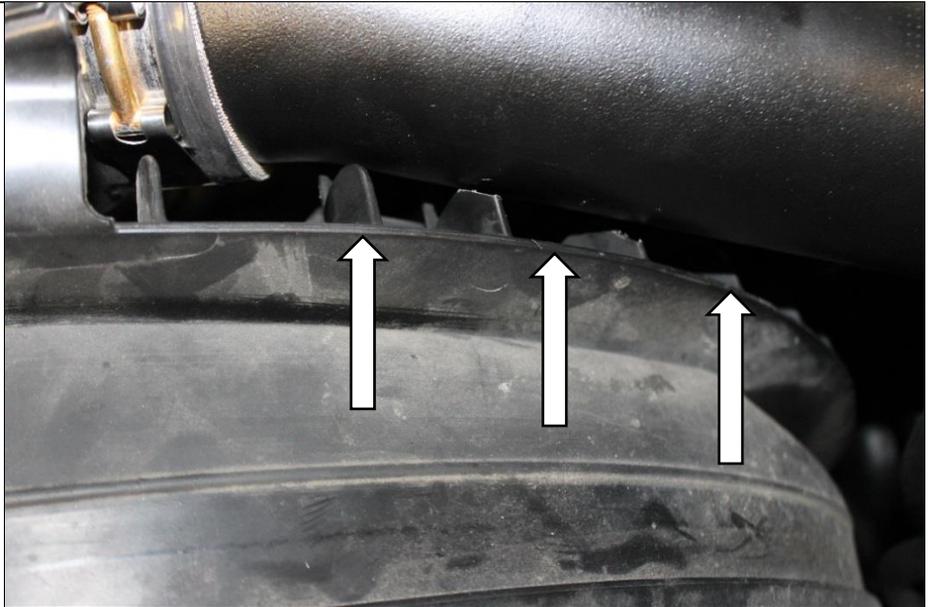
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9.8 On the fan shroud the 3rd & 4th fin down and too the right from the mounting tab will need to be trimmed at a 45° approximately 1/4" to clear the CAC tube. See photo, this can be done before the tube is installed.



9.9 Install the 3.5" lower CAC tube as shown. Assure the 3" intercooler joint snaps into place. Do not tighten the clamps until aligned (see photo). The tube should be aligned compared to the fan shroud. The end of the tube should sit almost flush with the tab when lifted forward. All clamps can be tightened until spring is bound.



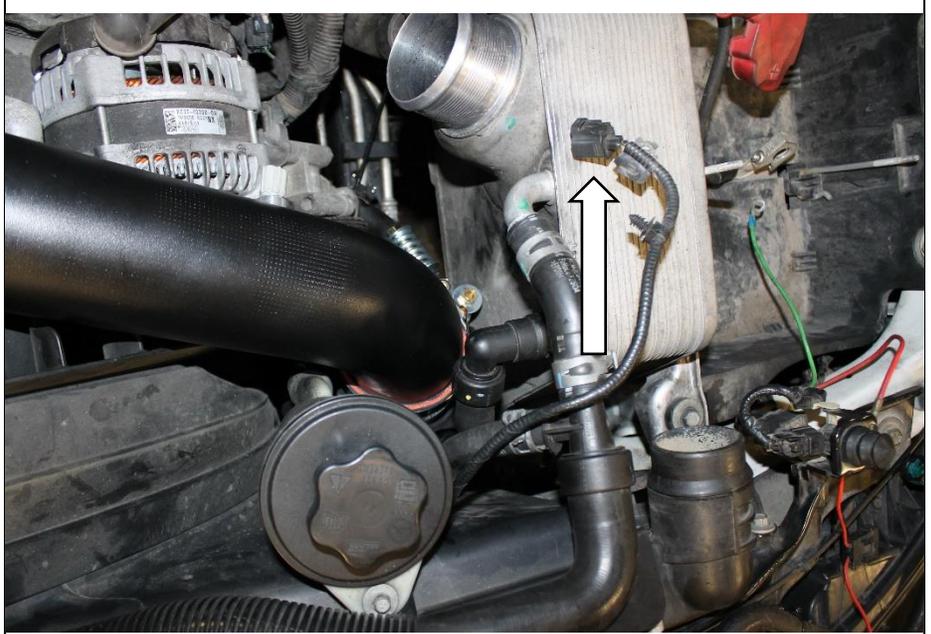
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9.10 Plug in the IAT Harness into the IAT sensor at this time.



9.11 Install the OEM upper coolant line, if your heat wrap has been damaged we recommend a new coolant tube or wrapping with a header wrap or similar high temperature insulator. Assure the OE clips snap into place.

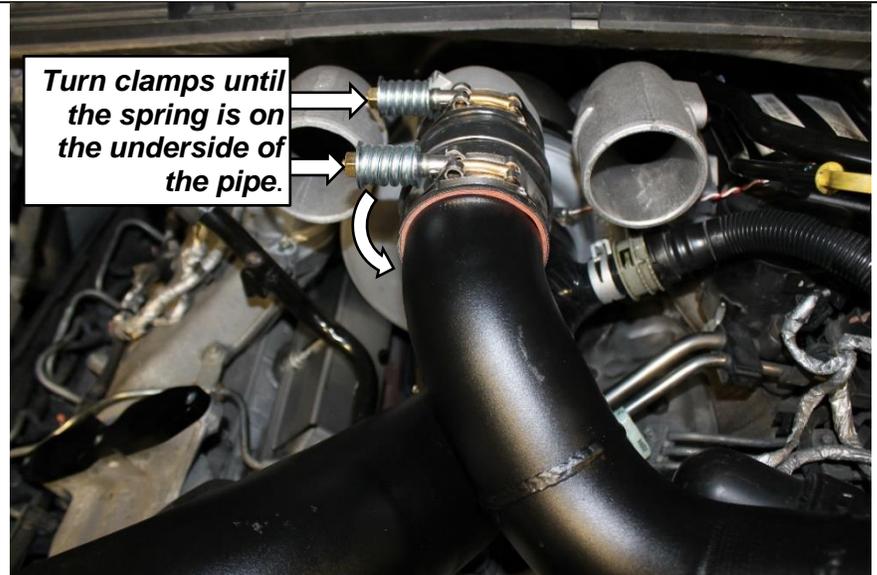


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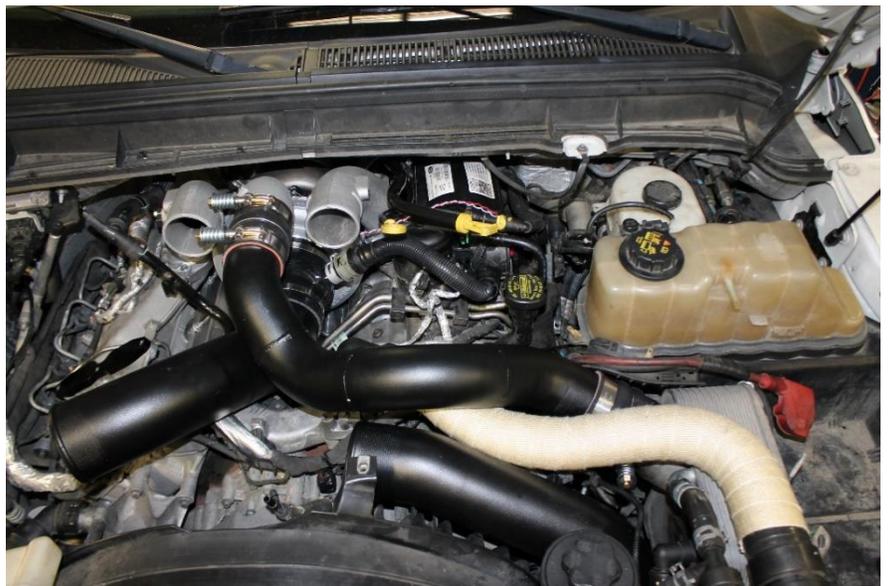
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9.12 Install the 3" Hot side CAC Tube 1403031 with 1401530 boot on turbo with 1405209 and 1405211 clamps. Use 1 3" 1405305 boot and 2 3" 1405211 clamps on the CAC. Place the T Bolts on the bottom side and pointing towards the passenger side. All clamps can be tightened down until spring bound.



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9.13 Place 2 3" Boots 1405305 onto the intake horns and slide the 1401563 3.5" boot onto the Y pipe end. Install the Y pipe into position as shown. All clamps can be tightened down until spring bound.



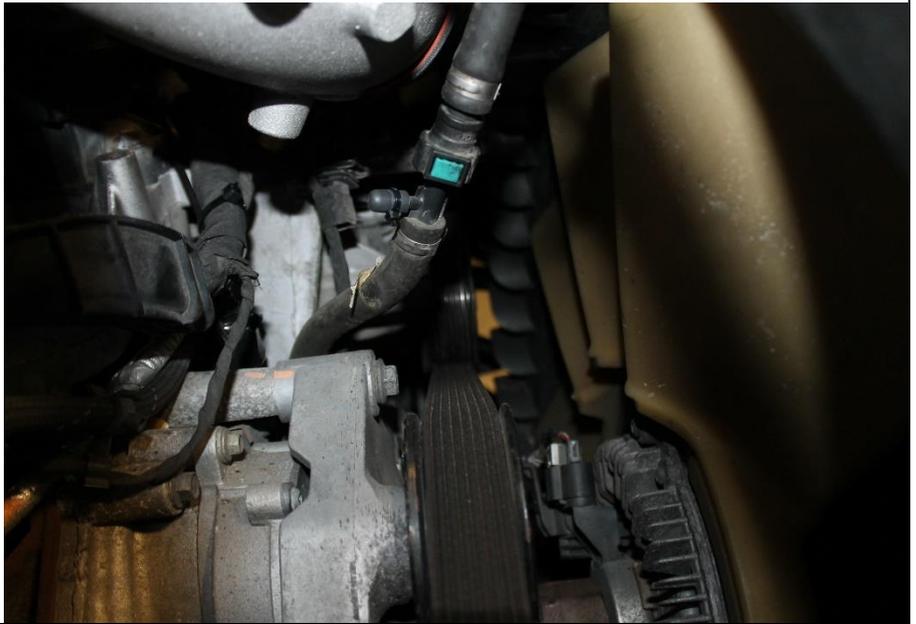
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9.14 Re-install the vacuum and coolant overflow lines into place on the driver's side and the heater line attachment.



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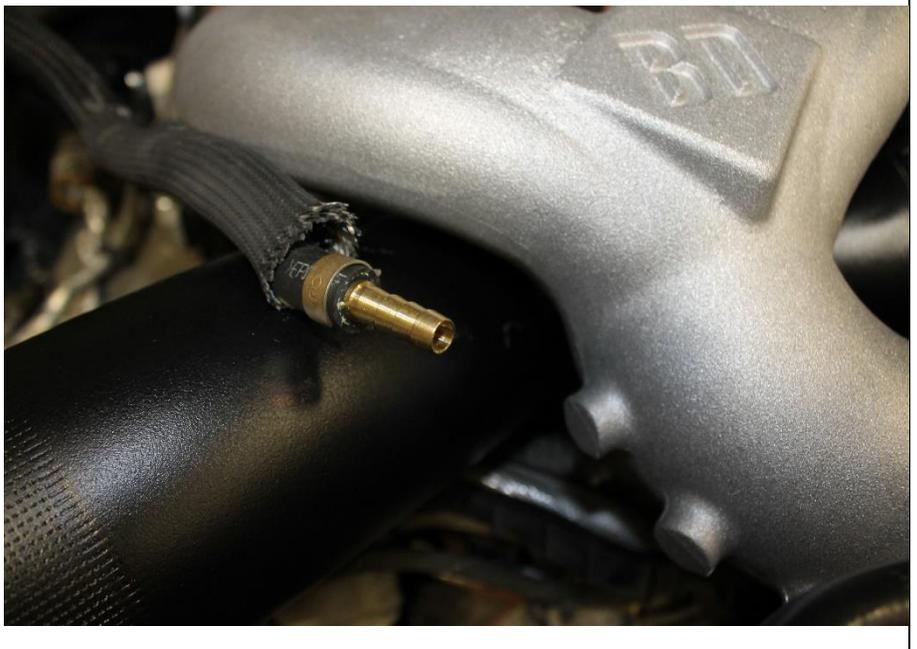
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9.15 Cut the passenger side stock T Junction out on the 5/16" coolant line.



9.16 Install 1900067 5/16" barb using the supplied CTL-8.5 as shown.



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9.17 Join the sections and clamp with a CTL-8.5 clamp. Slide the stock hose covering overtop of the clamps and place the hose as shown. Reinstall the clamp at the heater coolant fitting near the passenger side intake horn.



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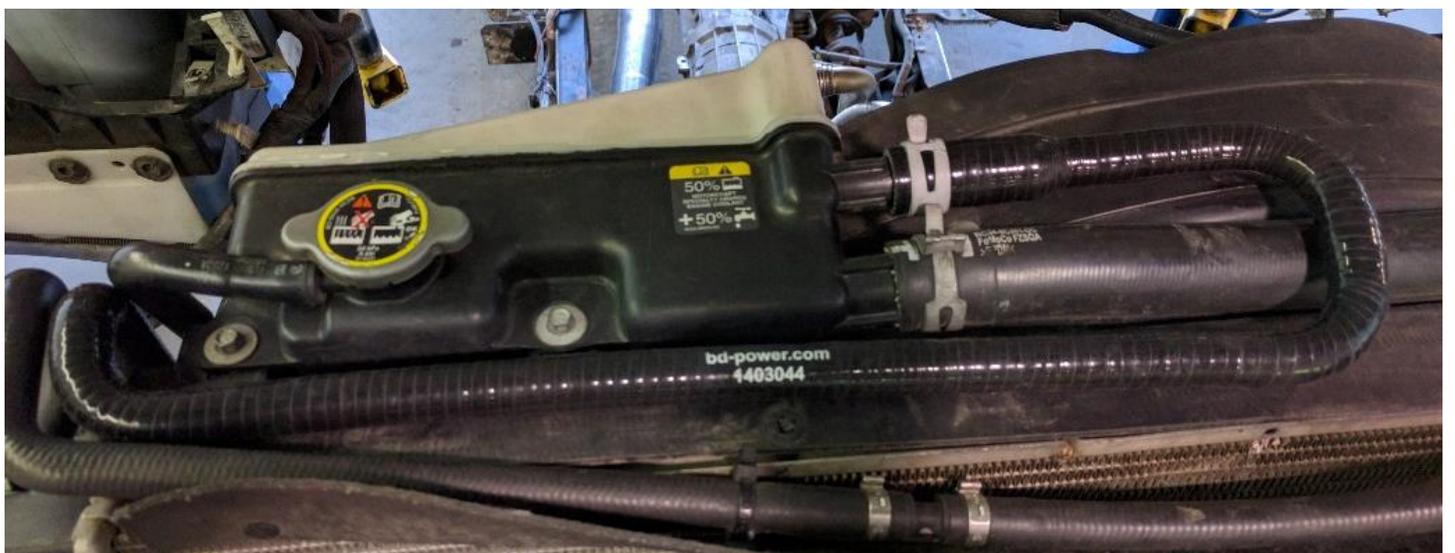
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10. AIR BOX INSTALL

10.1 Slide the braided sleeve over the coolant bypass hose and secure with friction tape (preferred) or electrical tape (Tapes are not supplied). Install the 1403044 Coolant bypass hose. Secure the hose using push mounts (MC-75821K71) supplied in the kit. Drill $\frac{1}{4}$ " holes on top of the shroud and insert push mounts. Use provided zip ties, insert through push mounts and around the coolant line to secure. Use the Spring Clamp (1302198) to secure the coolant line to the Degas Bottle.



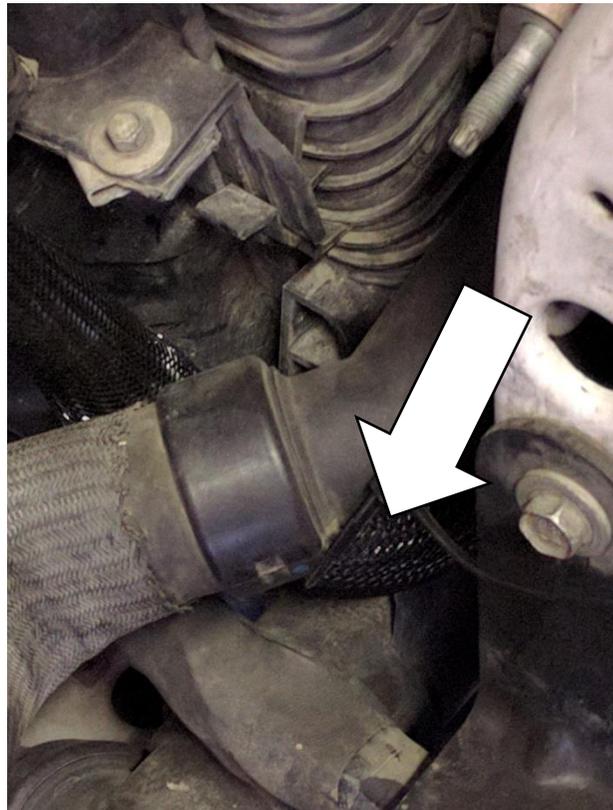
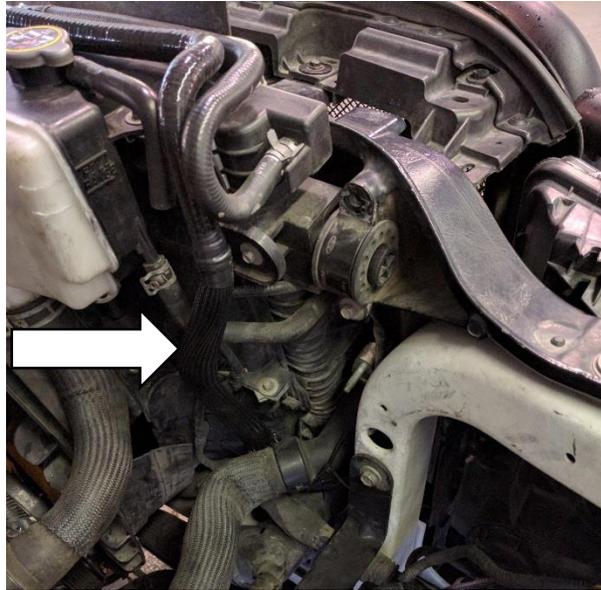
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10.2 Route the coolant line around the radiator and other factory lines and connect to the radiator. Secure with the spring clamp (1302198).



10.3 On the 1403040 BD air box, drill the 2 indented marks shown through with a 1/4" drill bit.



10.4 Using the provided 2x 1401574, 1130182, 1130183 Hardware install the air box bracket 1403040-2 as shown onto the box.



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10.5 Loosen and remove the Rad mount screw using a 10mm wrench.



10.6 If equipped remove the second alternator hook up plug seen on the front of the battery tray and secure out of the way of the new air box attached to the harness below.



Remove OE airbox intake scoop if equipped.



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10.7 Remove the OEM rubber air box mounts and install the 2 1456737 M8 U nuts as shown onto the air box mount.



10.8 Place the air box in position and install the 1456738 M8 bolts.



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10.9 Reinstall the radiator screw and air box bracket as shown.



10.10 Install the 1453820 seal onto the air box outlet hole if it has not been installed already.



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10.11 Install the 1403043-3 22° boot onto the steel 4" tube with 2x 1453701 clamps slide the clamps into place to be tightened later.



10.12 Place the 2924 air filter into the air box before installing the 1403041 rotary molded intake tube. Slide the tube on an offset just behind the 22° boot. Seat the tube into the air filter as you slide it into place. The 22° boot outlet end can then be seated. Align the tube and boot into position and tighten all clamps.



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10.13 Tighten the air filter clamp to the intake tube at this time.



10.14 Install the OEM MAF sensor into the intake tube as shown, use the provided 2 x 8-32 FT-0173590 and 1403041-1 gasket.



10.14 Install the air box lid with the 1405422 M6 Stainless Screws. This Completes the intake section install.

10.15 Reconnect battery terminals. Top up fluids.
Start vehicle and idle to check for leaks.
Road test & recheck fluids.

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