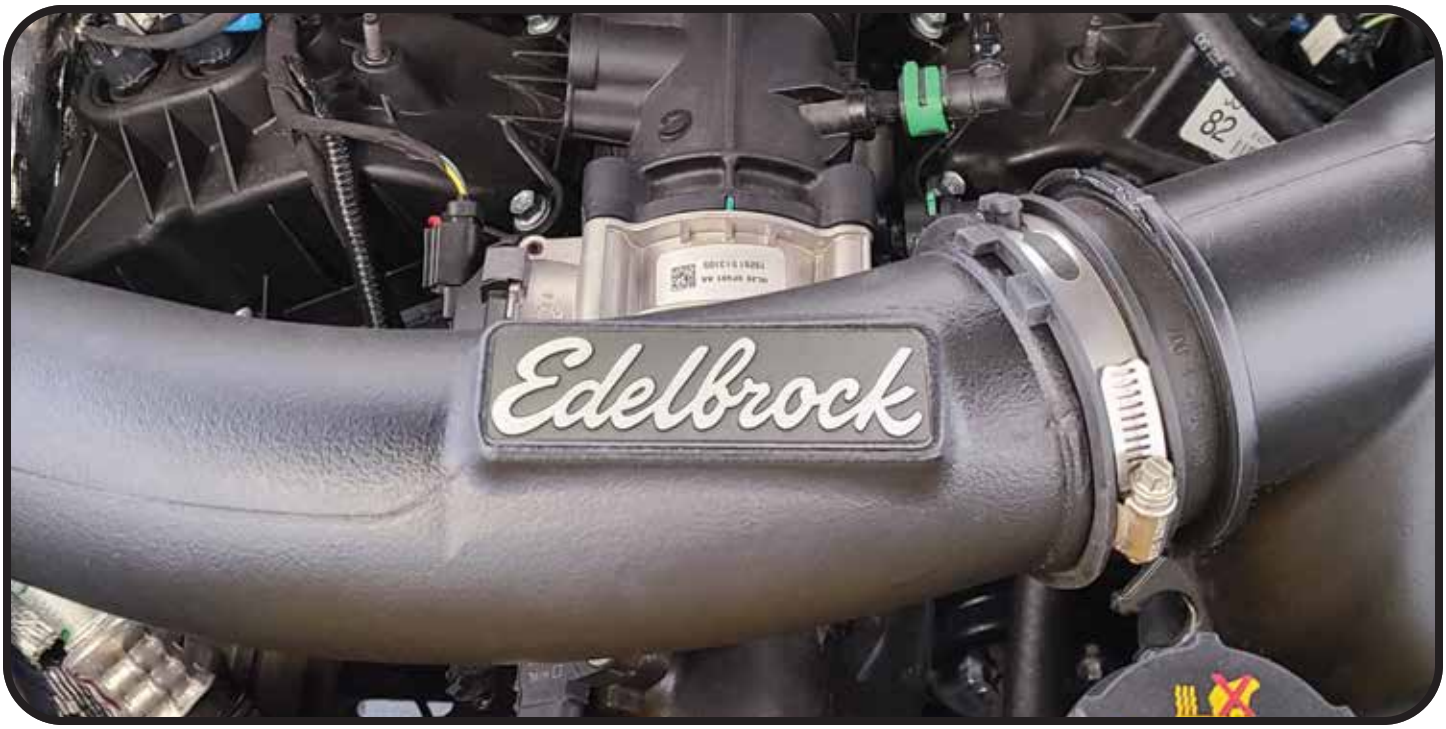
Edelbrock®

TURBOCHARGERS



EDELBROCK® TWIN-FORCE™ TURBOCHARGERS

2017-20 FORD F150, FORD F150 RAPTOR 3.5L V6

3.5L ECOBOOST STAGE 1 TURBO SYSTEM

PART # 158331

STAGE 1-2 UPGRADE

PART # 158337

3.5L ECOBOOST STAGE 2 TURBO SYSTEM

PART # 158332, 158330

STAGE 2-3 UPGRADE

PART # 158338

3.5L ECOBOOST STAGE 3 TURBO SYSTEM

PART # 158333

FOR ALL STAGE 2 AND STAGE 3 TWIN-FORCE TURBO KITS!
PLEASE READ BEFORE ATTACHING ANY OIL OR COOLANT LINES TO YOUR NEW TURBOS!

Figure A: Torx head Bolt with a longer unthreaded tip

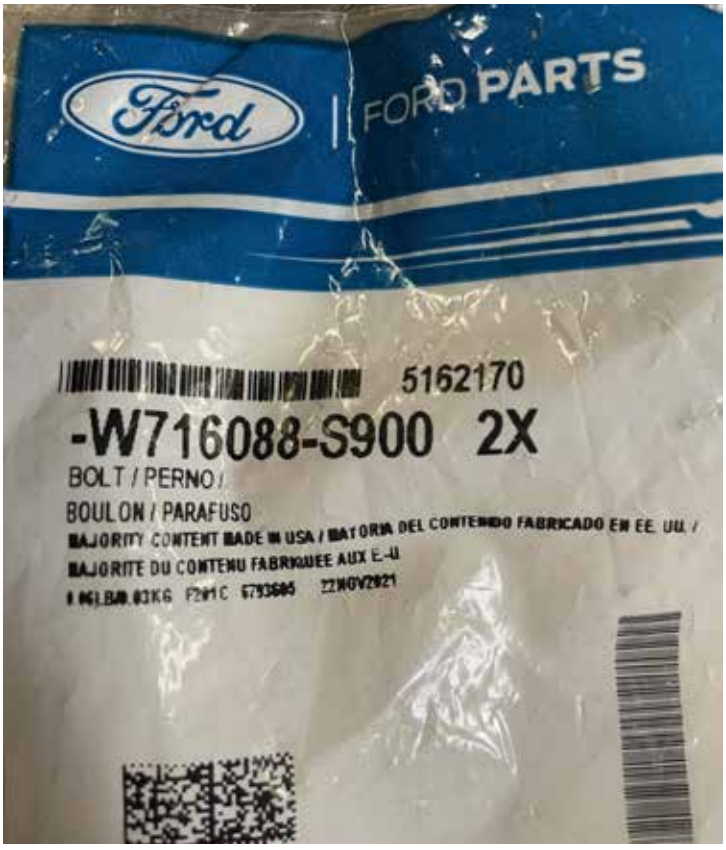
Figure B: Modified bolt after removing 1/16" from the tip

Notice that there are three identical Torx head bolts on each turbo that are used to secure the coolant and oil lines to the turbo main body. One of the three bolts is used to secure both the Coolant Supply and Return lines to the turbo, the other two are used to secure the Oil Supply line and the Oil Return line to the turbo. These bolts will be reused to attach the referenced lines to your new turbos.

In some cases when using aftermarket turbos, the bolts may bottom out in the holes before properly clamping the flange to the turbo causing a potential oil or coolant leak.

As shown in the pictures, these bolts feature an unthreaded pilot portion on their tip (Figure A). In order to ensure proper clamping, carefully remove approximately 1/16" from the tip (Figure B) of all 6 bolts (3 per turbo). This will eliminate most of the pilot portion but should not affect the threads at all. **DO NOT** remove any of the threads of the bolt when making this modification. Carefully de-burr the tip of the bolt before attempting to thread them into the turbo housing.

Should you need to replace these bolts for any reason, the Ford part number for these bolts is (insert or reference image of F150 Turbo Bolt Part Number).



IMPORTANT WARNINGS

Before beginning the installation, use the enclosed checklist to verify that all components are present in the box then inspect each component for damage that may have occurred in transit. If any parts are missing or damaged, contact Edelbrock® Technical Support (800-416-8628), not your parts distributor.

Due to the complexity of the Edelbrock® Turbocharger system, it is recommended that this system only be installed by a qualified professional with access to a service lift, pneumatic tools, and a strong familiarity with automotive service procedures. To qualify for the Powertrain Warranty, the turbocharger system must be installed by a Certified ASE Technician at a licensed business, Ford Dealership, or an Authorized Edelbrock® installer. Failure to do so will void and/or disqualify any and all warranties offered with this system. Please contact the Edelbrock® Technical Support department if you have any questions regarding this system and/or how your installer of choice will affect any warranty coverage for which your vehicle may qualify.

Proper installation is the responsibility of the installer. Improper installation will void all manufacture's standard warranties and may result in poor performance and engine or vehicle damage.

Inspect all components for damage that may have occurred in transit before beginning installation.
If any parts are missing or damaged, contact Edelbrock® Technical Support, not your parts distributor.

Any previously installed aftermarket tuning equipment must be removed and the vehicle returned to an as stock condition before installing the Turbochargers.

Any equipment that directly modifies the fuel mixture or ignition timing of the engine can cause severe engine damage if used in conjunction with the Edelbrock® Turbocharger System. This includes, but is not limited to: OBDII programmers, MAF sensors, adapters and any other device that modifies signals to and/or from the ECU. Aftermarket bolt-on equipment such as underdrive pulleys or air intake kits will also conflict with the operation of the turbochargers and must be removed prior to installation. Use of any of these products with the turbochargers could result in severe engine damage, make the vehicle emissions non-compliant, and void warranty.

WARNING: Installation of this turbocharger will result in a significant change to the performance characteristics of your vehicle. It is highly recommended that you take some time to familiarize yourself with the added power, and how it is delivered. This must be done in a controlled environment. Take extra care on wet and slippery roads as the rear tires will be more likely to lose traction with the added power. It is never recommended to turn off your vehicles traction control system.

It is recommended that you check the Edelbrock® Tech Center Website for any updates to this installation manual. Please refer to the lower right hand corner to verify that you have the latest revision of this installation manual before beginning the installation.

TechCenter: https://www.edelbrock.com/automotive_new/misc/tech_center/install/index.php

Do not use a wideband oxygen sensor in place of the rear O2 sensor when dyno testing this system. The voltage signal will cause the fuel system to run lean and possibly cause engine damage.

IMPORTANT WARNINGS (CONTINUED)

91 octane or higher gasoline is required at all times.
If your vehicle has been filled with anything less, it must be run until dry and refilled with 91 or higher octane gasoline twice prior to installation.

Failure to use the required 91 octane gasoline or higher could permanently damage your engine. Any failures associated with not using premium 91 octane gasoline or higher, will be ineligible for warranty repairs.

WARNING: Installation of this turbocharger and charge air cooler may require removal and replacement of front grille, front bumpers, or other pieces which may be equipped with Advanced Driver Assistance Systems (ADAS). ADAS Systems include, without limitation:

- Forward Collision Warning
- Auto braking
- Lane Departure Warning
- Lane Keeping Assist
- Blind Spot Warning
- Rear Cross Traffic
- Rearview Camera
- And various other OEM ADAS Equipment

It is the responsibility of the installer to ensure that all necessary ADAS systems that require post-repair calibrations/targeting/aiming is performed by qualified repair facilities. Edelbrock® assumes no liability whatsoever with respect to any damages or losses with respect to any ADAS systems.

EDELBROCK® AUTHORIZED INSTALLER DISCLAIMER

Authorized installers of Edelbrock® products are independent companies over which Edelbrock® has no right of control. Edelbrock LLC makes no claims regarding the abilities, expertise or competency of individual employees of any authorized installer. Each authorized installer is an independent company and makes its own independent judgments. Edelbrock LLC specifically disclaims any responsibility to any party including third parties for the actions, or the failure to act, of individuals, agents or a company authorized in the installation of Edelbrock LLC products.

EDELBROCK® TWIN-FORCE™ TURBOCHARGER SYSTEM 2017-20 FORD F150 / RAPTOR 3.5L V6 INSTALLATION INSTRUCTIONS

INTRODUCTION

Thank you for purchasing the Edelbrock® Twin-Force™ Turbocharger System for the 2017-20 Ford F-150 with 3.5L Turbo EcoBoost V6. The Stage 1 kit features an upgraded Intercooler and larger intake tubes to feed the turbochargers plus the matching ECU calibration. The Stage 2 kit adds a pair of Garrett Turbochargers for the next power level. The Stage 3 kits also feature a fuel pump voltage booster to unlock up to 500 Horsepower at the rear wheels!

EPA LEGAL: This product meets the EPA Anti-Tampering Policy reasonable basis for emissions criteria, and can be sold in U.S. states which don't require a California Air Resources Board (C.A.R.B) Executive Order (E.O.) for aftermarket, performance and add-on parts.

TOOLS AND SUPPLIES REQUIRED

- Jack and Jack Stands or Service Lift
- Ratchet and Socket Set including but not limited to: 1/4" Drive: 7mm, 8mm, 10mm
- 3/8" Drive: 8mm, 10mm, 12mm, 13mm, 15mm, 16mm, 24mm,
- Deep: 9mm, 19mm
- 1/2" Drive: 24mm
- Torx: T15, T30
- Wrench Set including but not limited to: 8mm, 10mm, 17mm
- Breaker Bar: 1/2"
- Utility Knife
- Radiator Cooling System Vacuum Purge and Refill Kit or Spill-Free Funnel
- Panel Puller
- Flat Blade & Phillips Screwdrivers
- 50/50 Coolant Mixture
- Side Cutters
- Fuel Line Removal Tools
- Torque Wrench
- Pliers OR Hose Clamp Removal Tool
- Blue Thread Retaining Compound
- High Temp Nickel Anti-seize
- O-ring Lube
- Masking Tape
- Shop Rags
- Wire Ties
- Dremel or Grinding Tool

INSTALLATION HARDWARE IDENTIFICATION GUIDE

(Parts Are Not To Scale)

51-3988
Ford Turbo Exhaust
Flange Adapter
BL3Z-9N496-A

36-1507
Bolt, Hex Flange,
M6 X 1.0 X 16MM,
Full Thread

51-1591
Fitting, Bypass
F-150 Turbo

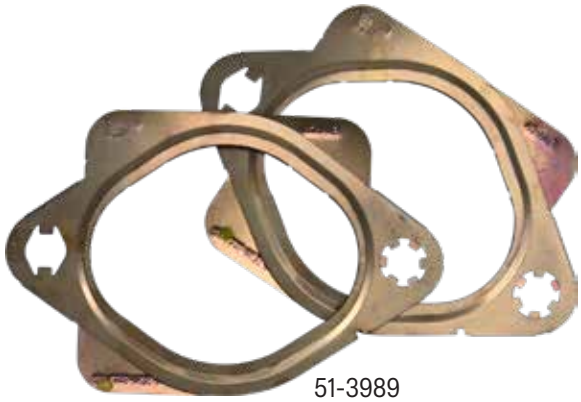
51-4130
Push-In Flexible
Rubber Grommet

51-1592
Fitting, Tee
F-150 Turbo

51-3990
Ford Turbo To
Exhaust Manifold
Gasket
JL3Z-9450-A

51-4293
Push-In Flexible
Rubber Grommet 1" Id, 1-3/4"

51-3987
Ford Exhaust Stud
W716667-S900



51-3989
Ford Turbo Exhaust Flange
Adapter Gasket

51-3986
Ford Exhaust Nut
W520514-S440

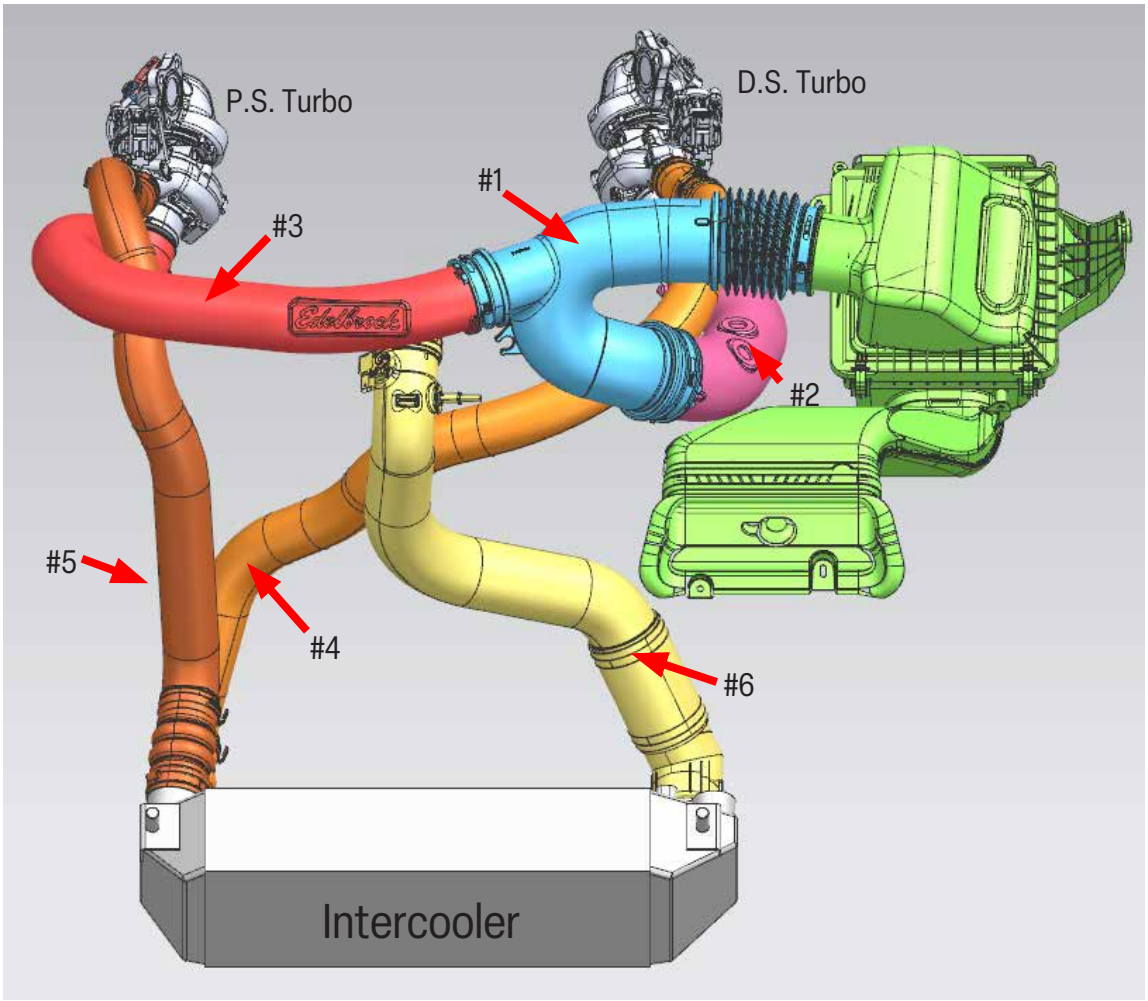
88-0620
Fitting Intake Tube
5/8 Barb To 5/8
Quick Connect
Male Clear

INTAKE PARTS

(Parts Are Not To Scale)

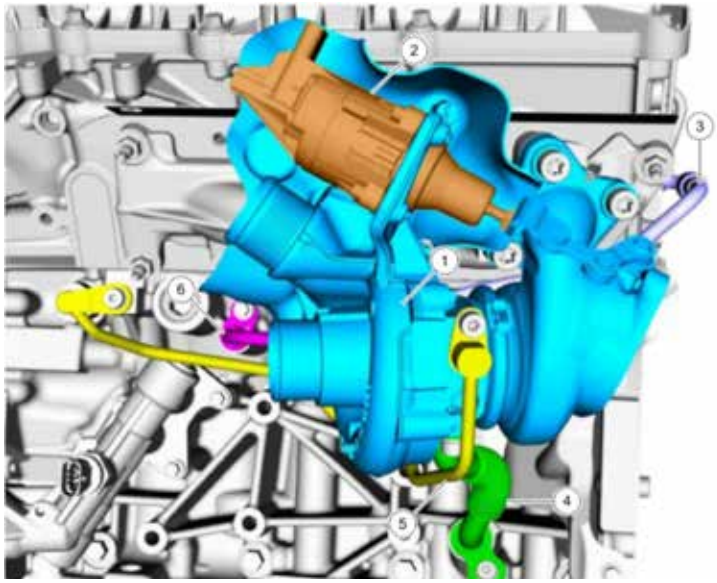
INTAKE TUBE IDENTIFICATION GUIDE

1. Airbox Outlet Tube (Factory)
2. D.S. Turbo Inlet Tube
3. P.S. Turbo Inlet Tube
4. D.S. Turbo Outlet/Intercooler Inlet Tube (Factory)
5. P.S. Turbo Outlet/Intercooler Inlet Tube (Factory)
6. Intercooler Outlet Tube (Factory)



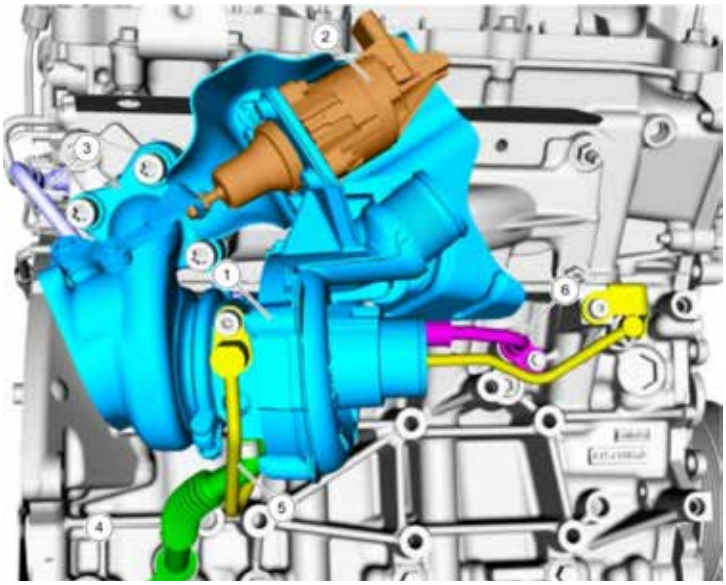
TURBOCHARGER COMPONENT IDENTIFICATION GUIDE

LH TURBO



1. LH Turbocharger
2. LH Wastegate actuator
3. LH Coolant return tube
4. LH Oil return tube
5. LH Oil supply tube
6. LH Coolant supply tube

RH TURBO

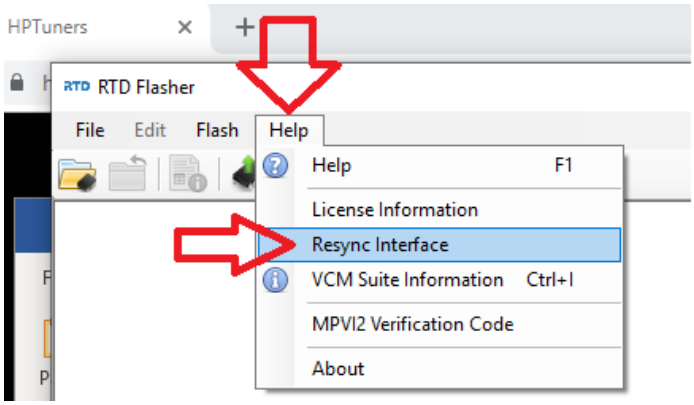


1. RH Turbocharger
2. RH Wastegate actuator
3. RH Coolant return tube
4. RH Oil return tube
5. RH Oil supply tube
6. RH Coolant supply tube

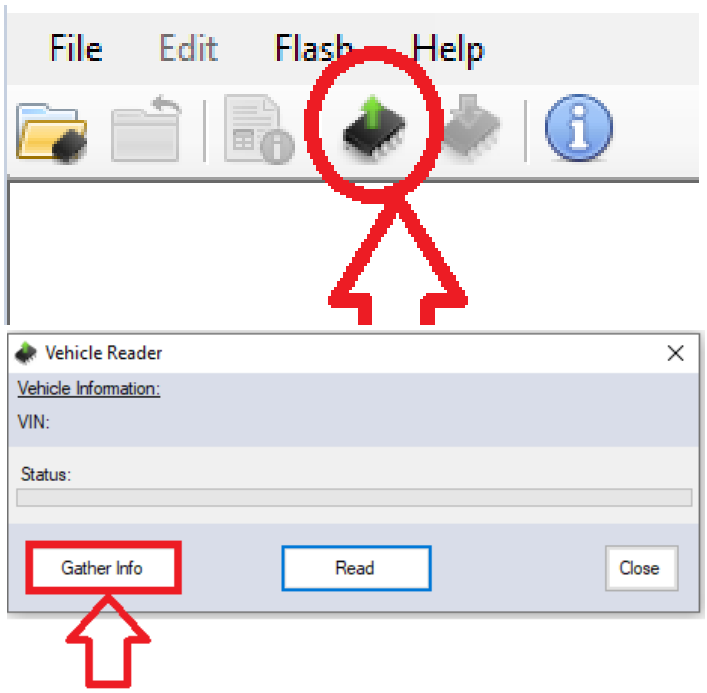
FLASHING INSTRUCTIONS

WARNING: Battery must be sufficiently charged before starting the PCM flashing procedure and ensure a strong WIFI connection is established throughout the entire calibration process

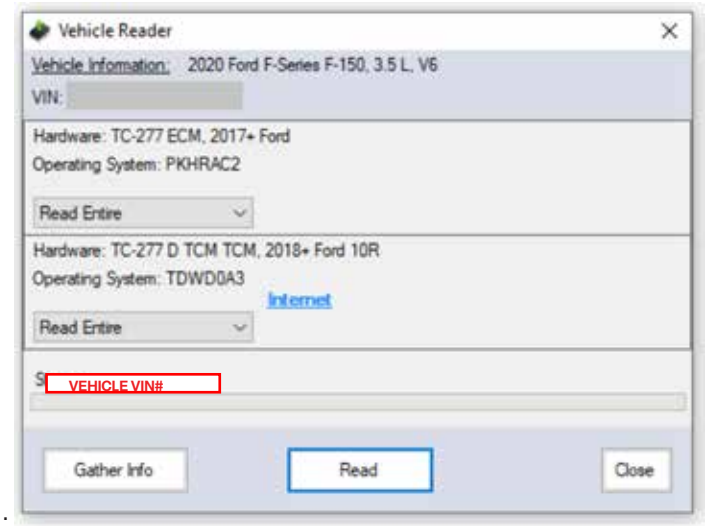
1. Create a new registration, then download and install the latest RTD Flasher from: www.hptuners.com/myaccount/. Connect your RTD device to your PC via the supplied USB cable.
2. Open RTD Flasher, select HELP, and then resync interface.



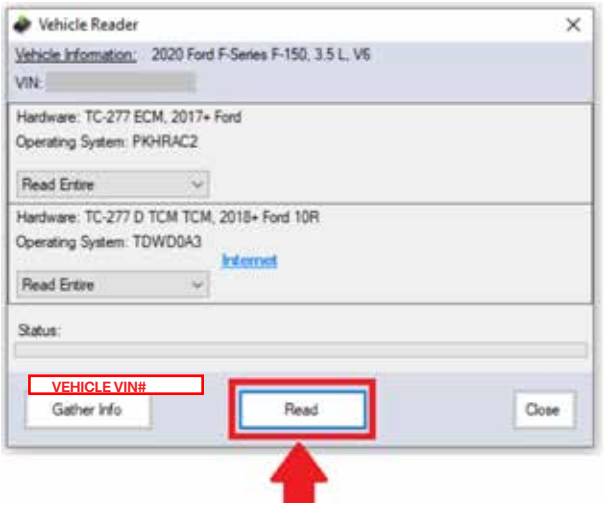
3. With the RTD Flasher program still open, plug the RTD into your vehicles OBDII port and turn the ignition ON without starting the engine. Select the READ VEHICLE icon then click GATHER INFO in the VEHICLE READER box.



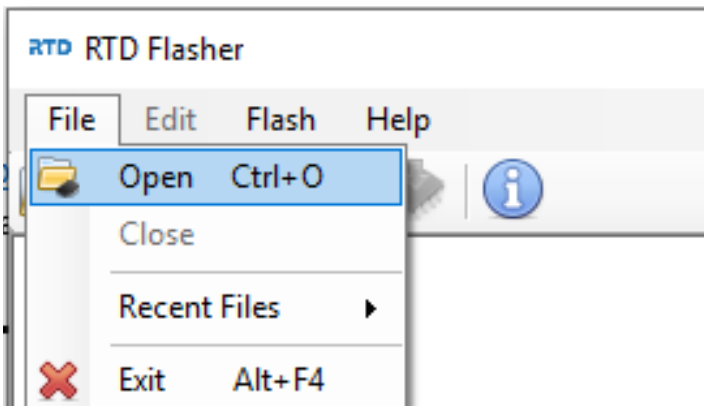
4. Ensure both ECM and TCM are displayed like image below. Please note, actual hardware types may vary depending on model year



5. Select READ to begin uploading your stock ECM/TCM files. Follow the prompts to complete the read



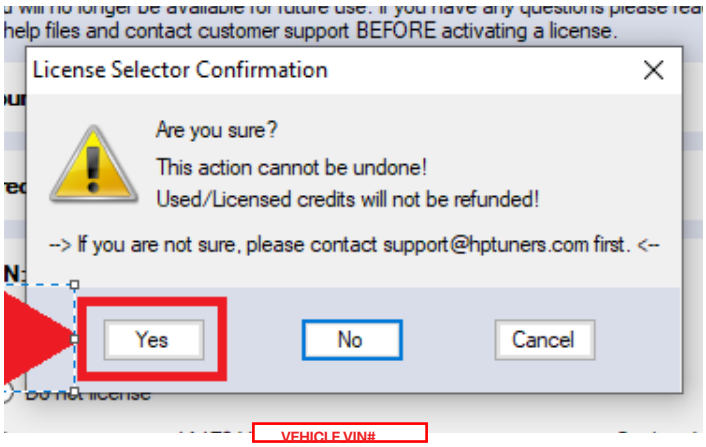
6. Once the stock read is saved to your PC, email the file to calibration@edelbrock.com with the subject line 'Calibration Update Needed, 20xx F150 3.5/Raptor/Limited Turbo Kit'. Please include your RTD serial number which is printed on the tool. The RTD is shipped without credits since the amount required may vary per model year and controller types. Please allow 24-48 hours for the update to be processed.
7. Once you receive the updated EFORCE file via email, save it to your PC. Open RTD Flasher, select FILE, OPEN, locate the updated EFORCE file you just saved to your PC, and double-click it to open.



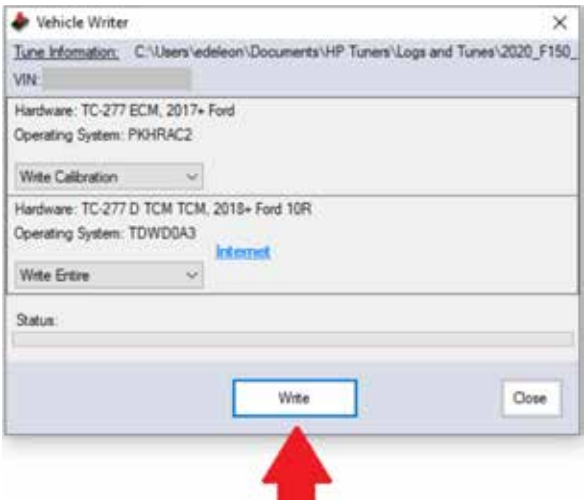
8. Select "SHOW LICENSE OPTIONS" at the bottom of the UNLICENSED FILE window.

9. In the LICENSE SELECTOR window, select OK to apply the available credits for the EFORCE calibration.

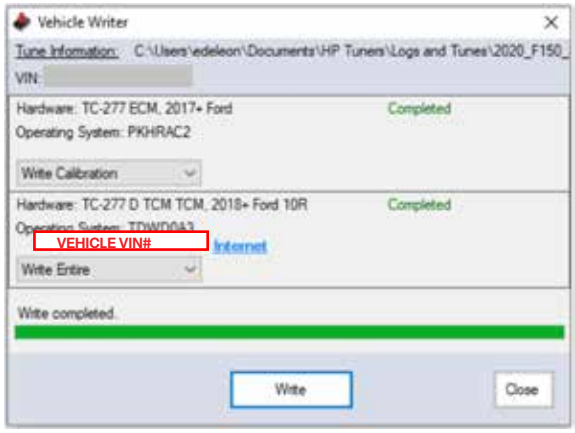
10. In the LICENSE SELECTOR CONFIRMATION window, select YES.



11. In the VEHICLE WRITER window, select WRITE to begin flashing the EFORCE calibration. Follow the prompts to complete the flash.



12. Once the flash is completed, click CLOSE, turn the ignition OFF and disconnect the RTD from your OBDII port. The engine is now ready to start once the supercharger installation is complete!



VEHICLE VIN#

VEHICLE VIN#

HP TUNER SERIAL#

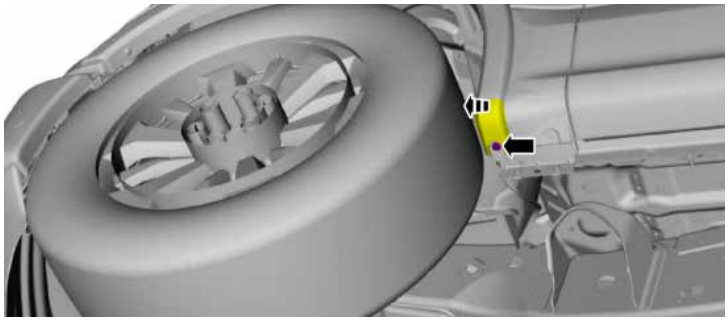
HP TUNER SERIAL#

TURBOCHARGER INSTALLATION

1. Disconnect ground cable from the battery terminal. Isolate the cable so it will not touch the negative post on the battery.

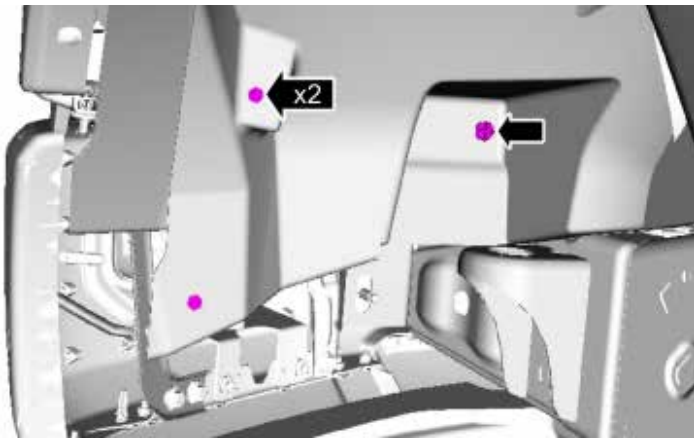
2. Put the vehicle on a lift and remove both front wheels. If a lift is not available, lift the front end and secure with jack stands.

3. Starting with the Driver side of the vehicle, remove the push pin and set aside.

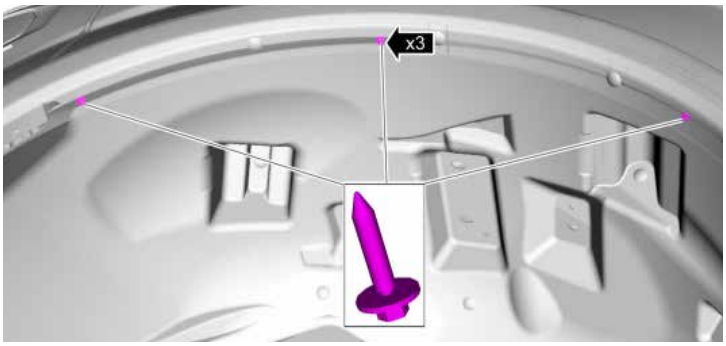


4. If equipped, remove the push pins and pull the front wheel arch molding off and set aside. Raptors must disconnect the fender marker light connector as well.

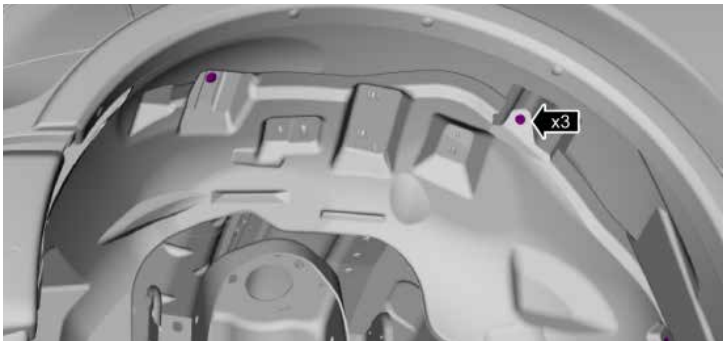
5. Remove the 2 bolts and push pin towards the front of the inner liner.



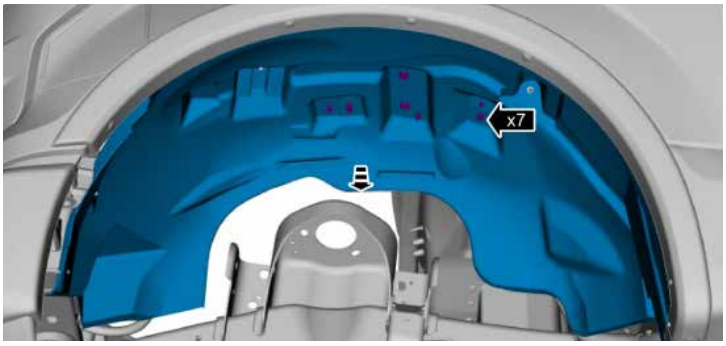
6. Remove the 3 bolts located at the top of the wheel arch.



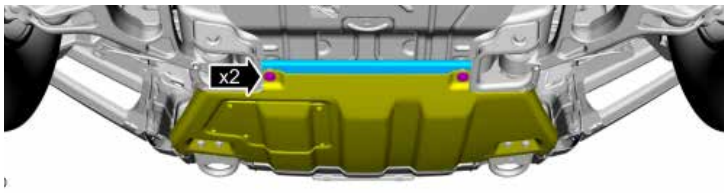
7. Remove the 3 push pins.



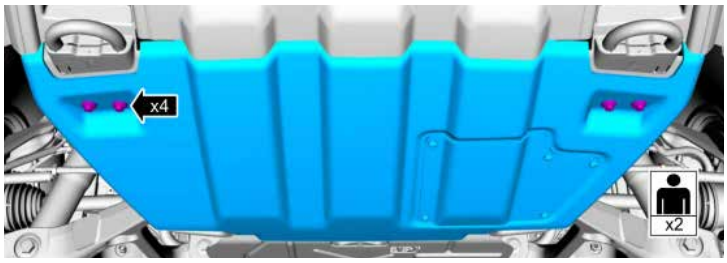
8. Remove the push pins and the fender liner. Repeat Steps 3-8 for the Passenger side.
9. RAPTOR ONLY: Remove the bolts and the spacer from the front underbody skid plate.



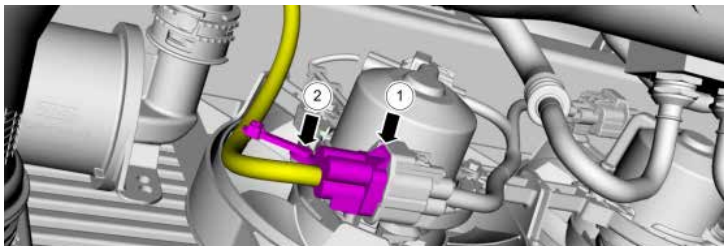
10. RAPTOR ONLY: Remove the bolts and the spacer from the front underbody skid plate.



11. RAPTOR ONLY: Remove the bolts and the front underbody skid plate.

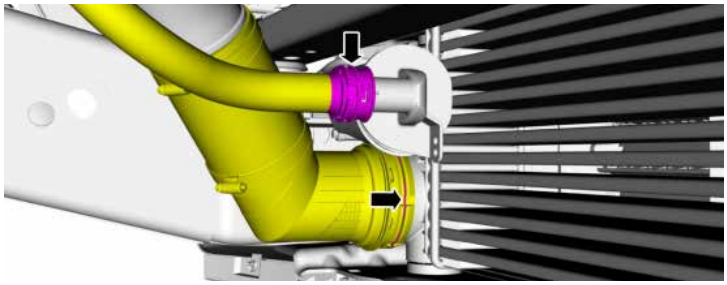


12. RAPTOR ONLY: (a)Disconnect the intercooler cooling fan electrical connector. (b)Detach the retainer and position the wiring harness aside.

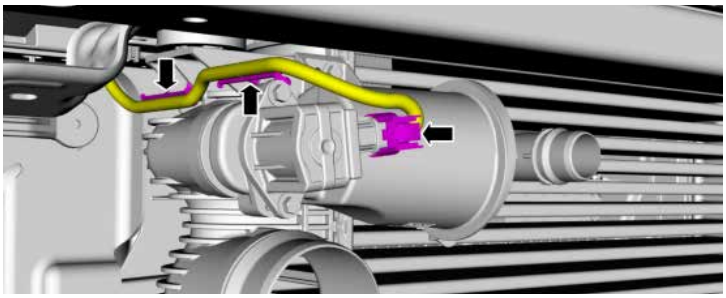


13. Loosen the intercooler intake tube clamps and position the intake pipes aside.

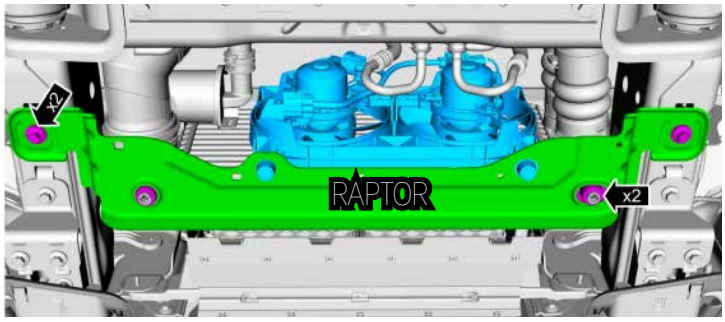
14. Disconnect intercooler outlet pipe and the bypass valve tube.

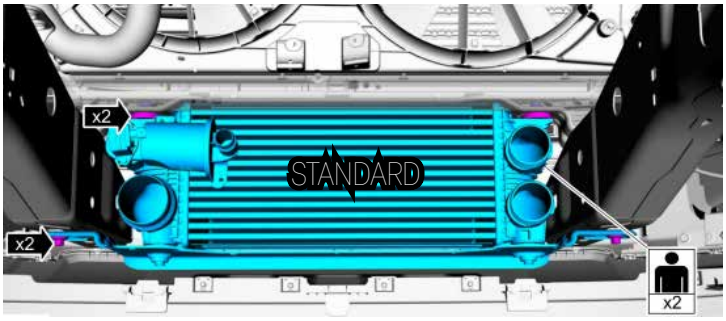


15. Disconnect the turbocharger bypass valve electrical connector and the harness push pins.

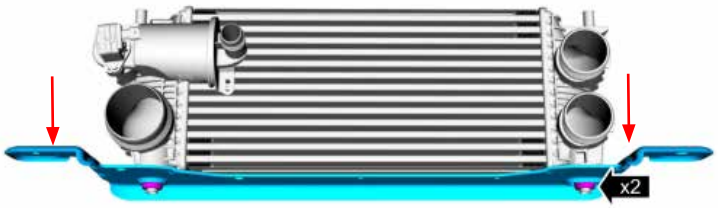


16. Remove the bolts, lower bracket and fans (if equipped). Two people are recommended to lower the assembly safely.

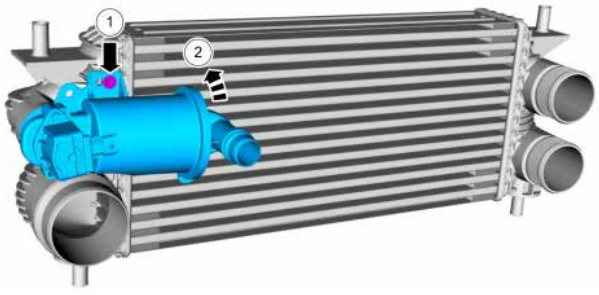




17. Remove the cooling fan (if equipped) from the front of the intercooler. Remove the lower bracket from the intercooler.



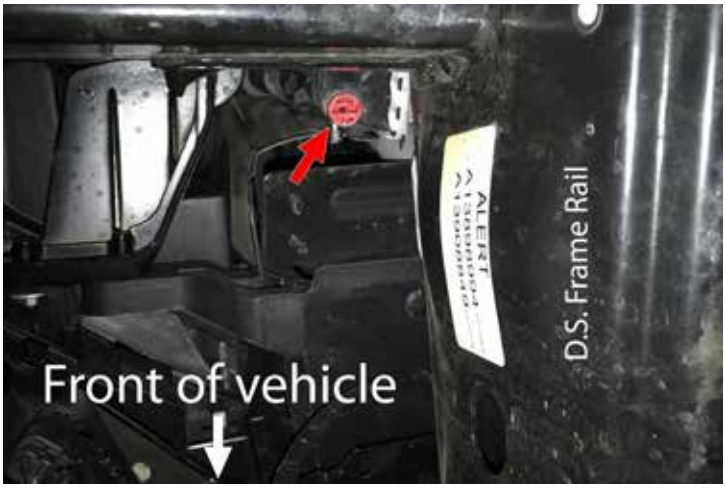
18. (a)Remove and discard the bolt from the turbocharger bypass valve. (b)Rotate the bypass valve counter-clockwise and remove from the CAC .



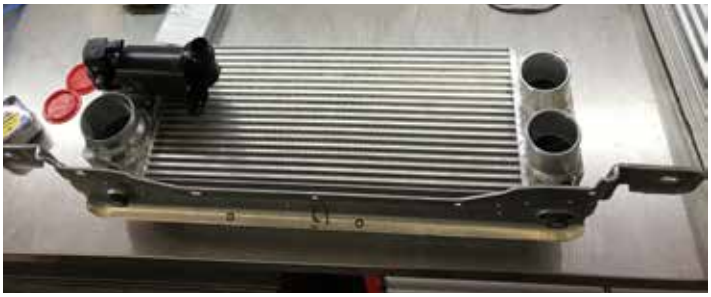
19. Lubricate the bypass valve o-ring, then insert into the intercooler port with the guides aligned. Rotate clockwise until tab is aligned with the bolt bracket. Torque the supplied (1) M6x16mm bolt to 8 ft-lbs. Remove (4) rubber bushings from the stock intercooler and place on corresponding posts of the new intercooler.

20. Remove the intercooler shutter shroud by unfastening the tabs around the perimeter. Only this most rearward piece, located just forward of where the intercooler mounts, must be removed.

21. (NOTE: Stage 2 and above kits only) Ensure that the engine is cool before draining any engine coolant. Drain the coolant from the engine by carefully opening the radiator cap and opening the petcock, located underneath the bottom Driver Side of the radiator, using a flathead screwdriver. Route a hose from the drain port to a bucket so that the coolant can be disposed of safely. Close the petcock once the coolant has been drained.



22. Attach intercooler support bracket to the new intercooler. If equipped, attach the electric fans at this time as well.



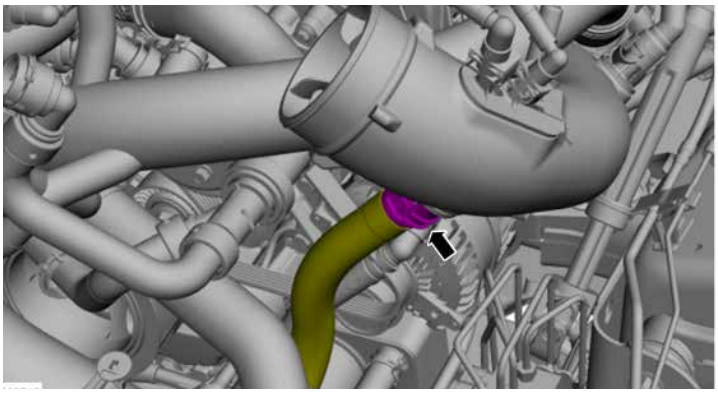
23. Reinstall the intercooler assembly and secure the bolts.

24. Reconnect Intercooler outlet pipe and secure the retaining clip. Leave the 2 Intercooler inlet pipes disconnected for now.

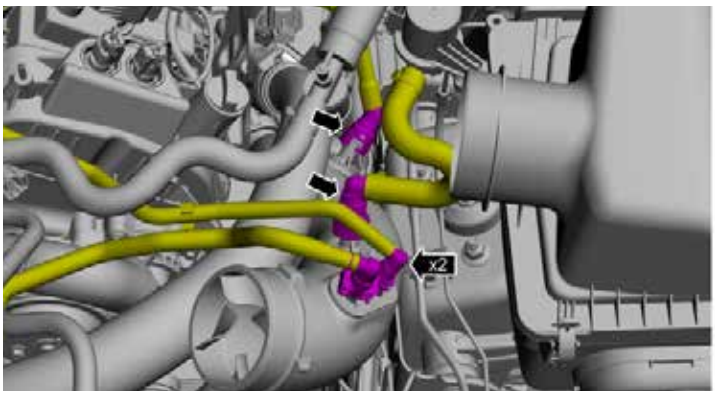
25. Reconnect Bypass Valve tube and electrical connector. If equipped, reconnect the electrical connector for the fan as well.

26. Disconnect the airbox outlet tube from the airbox and both Turbocharger inlet tubes.

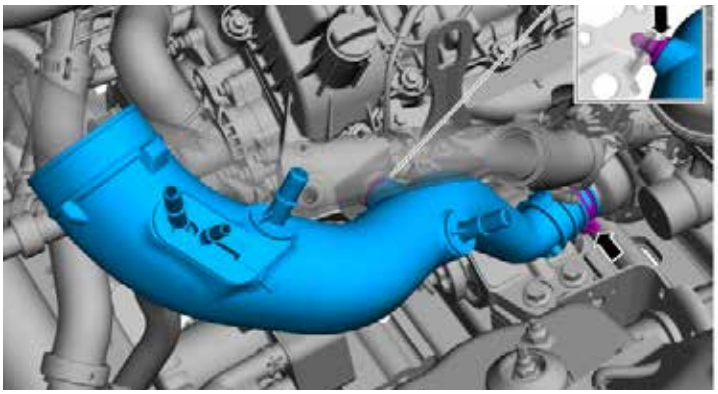
27. Disconnect the bypass valve tube from the D.S. Turbo inlet tube.



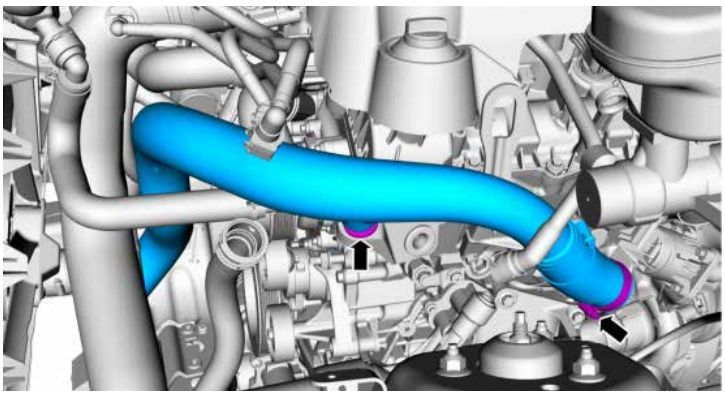
28. Disconnect all the quick connect fittings from the D.S. Turbo inlet tube. Earlier model years will vary slightly from what is shown below.



29. Remove the D.S. Turbo inlet tube by removing the lower hose clamp, which can be accessed through the wheel well.

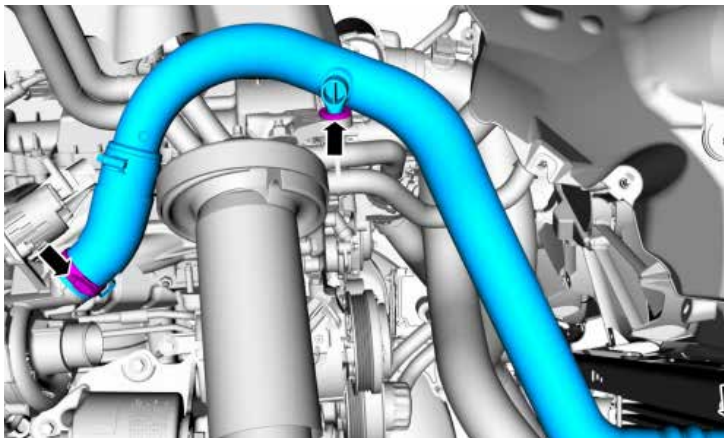


30. Loosen the clamp and disconnect the D.S. Turbo outlet tube from the D.S. turbocharger.



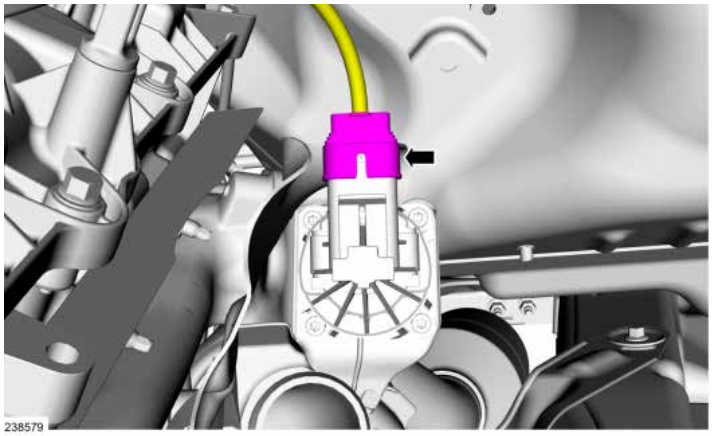
31. Remove the Passenger Side turbo inlet tube by removing the lower hose clamp, which can be accessed through the wheel well.

32. Loosen the clamp and disconnect the P.S. Turbo outlet tube from the P.S. turbocharger.

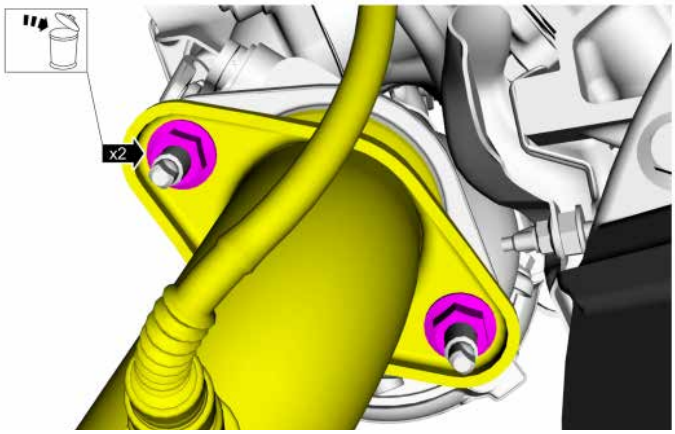


Note: Steps 32-54 are for Stage 2 and Stage 3 only; Stage 1 skip to step 55

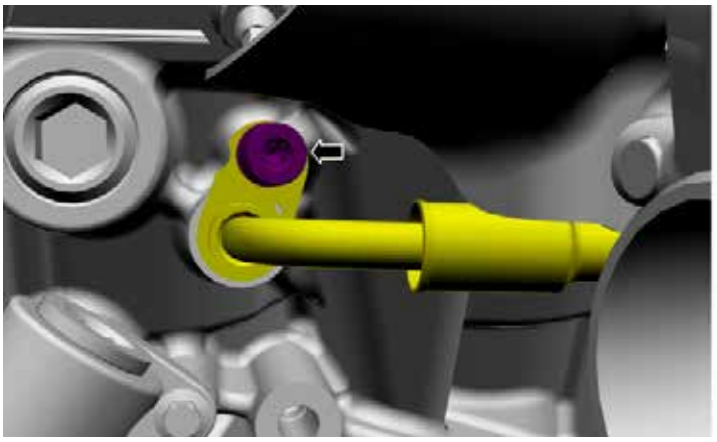
33. Disconnect the Driver Side turbocharger wastegate electrical connector.



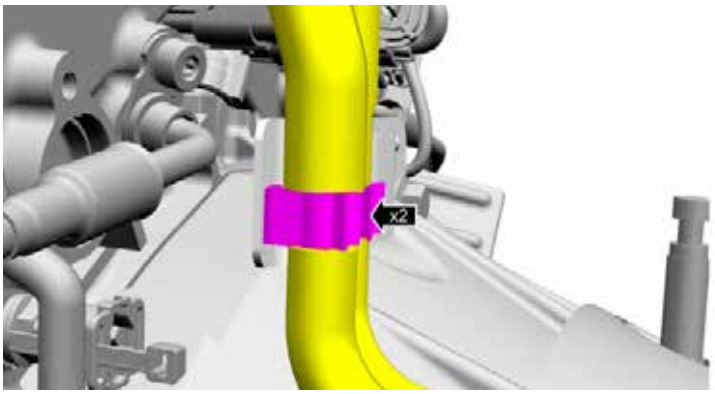
34. Remove and discard the D.S. turbocharger exhaust flange nuts.



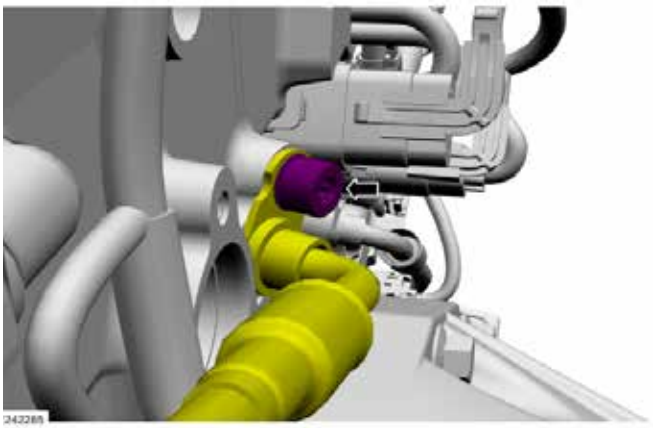
35. Unbolt the D.S. turbo coolant supply tube, and disconnect it from the engine block.



36. Release the fuel tubes from their retainers, located on the back of the D.S. cylinder head and move them out of the way in order to access the turbo coolant return tube bolt.



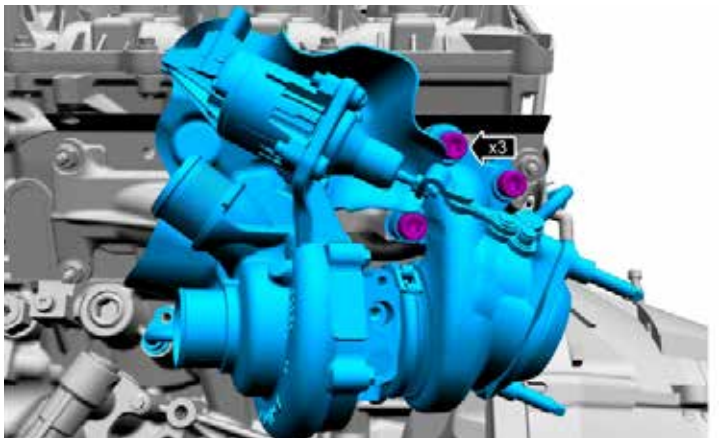
37. Unbolt the D.S. turbo coolant return tube, and disconnect it from the back of the D.S. cylinder head.



38. Unbolt the Oil supply and return line connections from both the turbo end and engine block side of each tube. Some residual oil may leak out. Be sure to cover all oil openings with masking tape to ensure that no debris can enter the engine.

39. Remove the 3 turbocharger to exhaust manifold bolts, then remove the turbocharger, and connected coolant lines, being careful not to damage any of the lines. Each of the coolant lines are 2 piece lines, do not separate the 2 pieces from each other, otherwise you will

have to replace the rubber gaskets between each of the 2 pieces. Ford part number (HL3Z-6N652-A).



40. Cover the remaining oil and coolant openings with masking tape so that no debris can enter.

41. Install exhaust flange gasket onto new turbocharger

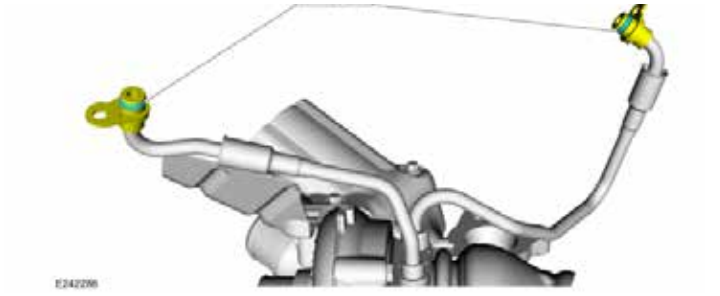
42. Apply high temp nickel anti seize to the turbo exhaust flange stud bolts.

43. Install the turbo exhaust flange adapter and then stud bolts onto the turbocharger and torque both to 30 ft-lbs.

44. Install the new turbocharger to exhaust manifold gasket by pressing it straight into the flange on the turbocharger.

45. Unbolt the coolant lines from the factory turbocharger that was just removed so that they can be swapped onto the new turbo.

46. Inspect the used O-rings on the ends of the coolant supply lines. If torn or damaged replace with Ford part number (FT4Z-6N652-D).



47. Install the turbo coolant lines onto the new turbocharger, using o-ring lube on the seals and tightening the bolt to 89 in lb + 30°.

48. Swap the turbo heat shield onto the new turbocharger. It may have to be bent slightly for it to fit around the larger turbocharger. Be sure it clears the wastegate actuator as well.

49. Remove the masking tape from the coolant openings that were covered earlier.

50. Install the new turbocharger by reusing the factory turbocharger bolts. Torque the bolts to 24 ft-lbs in the sequence shown below.

51. Reconnect the turbo coolant supply and return lines to the engine and torque both bolts to 89 in lb + 30°.

52. Reconnect the exhaust using the supplied nuts and torque both to 30 ft-lbs.

53. Remove the remaining masking tape and reconnect both oil lines to the new turbo and engine. Torque all four bolts to 89 in lb + 30°.

54. Reconnect the electrical connector to the wastegate actuator.

55. Repeat Steps 35-53 for the Passenger side turbo.

56. Assemble the Driver Side turbo intake tube by first inserting the supplied grommets into the holes in the tube and then inserting the fittings in the grommets using the hardware from the air intake hardware bag, as shown below.

57. Install a silicone coupler onto the D.S. turbocharger inlet tube as far as it will go over the tube. Tighten the hose clamp and slide another clamp over the end as shown below.

NOTE: Stage 1 uses reducer couplers. All other kits use the straight couplers as pictured.

58. Install the tube and coupler onto the D.S. turbocharger and tighten the hose clamp.

59. Install the Driver Side turbo outlet tube onto the turbo, ensuring it is resting in the isolator grommet, and tighten the hose clamp.

60. Connect the bypass return tube and all quick connect fittings to the D.S. turbo inlet tube.

61. Install a silicone coupler onto the P.S. turbocharger inlet tube as far as it will go over the tube. Tighten the hose clamp and slide another clamp over the end as shown below.

NOTE: Stage 1 uses reducer couplers. All other kits use the straight couplers as pictured.

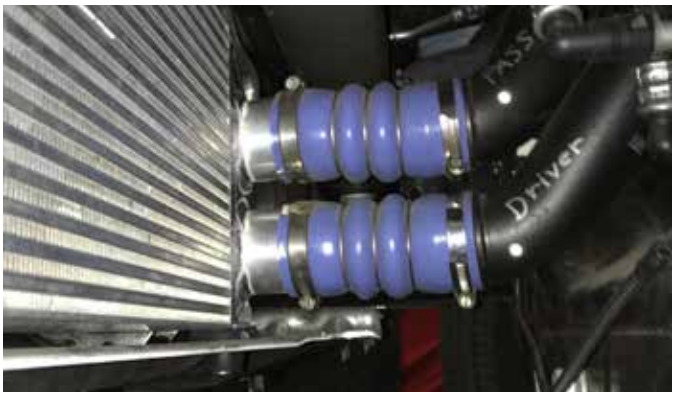
62. Install the tube and coupler onto the P.S. turbocharger and tighten the hose clamp. TIP: The turbo outlet tube should still be disconnected from the intercooler inlet and the turbo. Move that tube out of the way as necessary to install the turbo inlet tube.

63. Install the Passenger Side turbo outlet tube onto the turbo end of the tube, ensuring it is resting in the isolator grommet, and tighten the hose clamp.

64. Remove the airbox lid and replace the air filter with the high performance filter included in the kit.

65. Reinstall the airbox lid and install the airbox outlet tube, tightening all hose clamps.

66. Reconnect the intercooler inlet pipes the to the intercooler, tightening all hose clamps.



67. Check the engine oil level and add any necessary oil that may have been lost while installing the new turbochargers.

Note: Steps 68-72 are for Stage 3 Kits Only:

68. Disconnect the fuel pump driver connector located above the gas tank under the bed of the truck and connect the harness between the two factory connectors.

69. Mount the voltage booster unit using the included self tapping screws.

70. Connect the ground wire to the chassis.

71. Plug in the connector coming from the fuel pump harness tee to the connector coming from the voltage booster.

72. Secure wires in safe location away from any moving parts and ensuring no wires are taut.

73. Reinstall wheel wells and fender arches and skid plate and wheels and safely lower vehicle.

74. Reconnect the negative battery terminal.

75. Refill and bleed the engine coolant according to the factory procedure. Ensure the petcock on the radiator is closed before filling.

91 OCTANE LABEL INSTALLATION INSTRUCTIONS

1. Prep surface that the label will be affixed to with isopropyl alcohol. Peel the label off the sheet and place it on the inside of the fuel door.

Congratulations on the installation of your new Edelbrock® Turbocharger System. If you have any questions, please call our Technical Support hotline at 800-416-8628 and one of our technicians will be happy to assist you.

CAUTION: Check ADAS sensors as described under the "Important Warning" section in the front of this document.