

Z1 Q50 / Q60 VRX70 BOLT-ON TURBOCHARGERS INSTALLATION MANUAL



This Installation Manual is intended for the following models:	
2016+	Infiniti Q50 (VR30)
2017+	Infiniti Q60 (VR30)
2023+	Nissan Z

PROLOGUE:

Study these instructions completely before proceeding to assembly. The installer must have a thorough knowledge of automotive systems operation. If unfamiliar with any of the concepts outlined in this instruction, we recommend the installation be completed by a qualified professional.

WARNING!

Extreme caution should be taken when performing maintenance or performance upgrades to your vehicle. Please observe and abide by any Warning or Caution labels placed on the various components and tools used when servicing your vehicle. If you have any questions regarding installation or the various components included with the Z1 Motorsports Q50 / Q60 VRX70 Bolt-On Turbochargers, consult with a Professional Mechanic or contact Z1 Motorsports for more information.

PARTS INCLUDED:

Item	Quantity	Description
1	1	Z1 Upgraded VR30 Turbochargers - Left
2	1	Z1 Upgraded VR30 Turbochargers - Right
3	1	Left Coolant Supply Line w/ Hardware
4	1	Left Coolant Return Line w/ Hardware
5	1	Left Oil Supply Line w/ Hardware
6	1	Left Oil Drain Line
7	1	Left Silicone Oil Drain Hose
8	1	Right Coolant Supply Line w/ Hardware
9	1	Right Coolant Return Line w/ Hardware
10	1	Right Oil Supply Line w/ Hardware
11	1	Right Oil Drain Line
12	1	Right Oil Drain Block Flange
13	1	Right Silicone Oil Drain Hose
14	2	Oil Drain Gasket
15	12	M6x 12mm Flange Bolt (Bracket On Oil/Coolant Lines)
16	4	M8 x 16mm Socket Head Bolt (Oil Drain)
17	1	OEM VR30 Turbo Oil Return Line To Engine Gasket - Passenger
18	2	Turbo Outlet Gasket
19	2	Turbo Inlet Gasket
20	1	M10-1.5 x 35mm Button Head Bolt (Motor Mount Bolt To Engine)
21	1	M10-1.25 x 30mm Flange Bolt (Motor Mount Bolt To Mount)
22	2	M12 Drain Plug W/ Copper Washer (EGT Plug)
23	2	Turbo Speed Sensor Plug and small O-ring
24	2	M4 x 12mm Socket Head Bolt (Speed Sensor)
25	1	M6 x 8mm Hex Head Bolt (Passenger Coolant Feed Line)
26	4	M6 Flat Washer (Speed Sensor Bracket Spacer)
27	7	OEM Heat Shield Bolts, M6 x 10mm Flange Bolts
28	8	OEM Turbo Mounting Flange Nuts
29	1	AWD Extras: Z1 VR30 Q50 AWD, Motor Mount Bracket Set
30	8	AWD Extras: M10 x 25mm Flange Bolt

TOOLS REQUIRED:

- Hydraulic Jack
- (2) 2-Ton+ Jack Stands
- Engine Hoist or Two-Post Lift
- AC Refrigerant Machine
- High Torque Impact
- Ratchet & Extension(s)
- Assorted Metric Sockets/Wrenches
- Torque Wrench (ft-lbs & in-lbs)
- Pliers
- 6mm Allen/Hex Driver Bit
- T20 Torx Driver
- E8 Torx Socket
- Metal Snips
- C-Clip/Snap Ring Pliers

SAFETY REQUIREMENTS:

- Always wear safety glasses and any necessary protective garments. If using any fluids, chemicals, or solvents, a respirator is recommended.
- Always turn the ignition to the OFF position and disconnect the NEGATIVE battery terminal.
- Always use properly rated jack stands when working under your vehicle.
- Always keep limbs and parts away from moving drivetrain parts.
- Only operate drivetrain in safe space and well-ventilated areas.

BEFORE YOU BEGIN:

Remove contents from the Z1 Motorsports Q50 / Q60 VRX70 Bolt-On Turbochargers and verify that ALL necessary hardware is present.

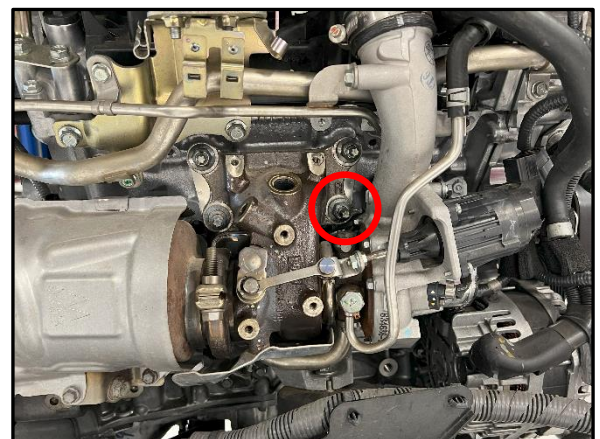
Turbo upgrade/replacement on VR30 engines is not a simple task. It is highly recommended to perform this upgrade with the engine removed from the vehicle. This is best done when using a two-post lift and an engine/transmission stand or table. Removing the engine will also require you to discharge the refrigerant from the A/C circuit. If you do not have the proper tools and equipment to perform this task, we recommend taking your vehicle to a shop to perform this step.

PROCEDURE:

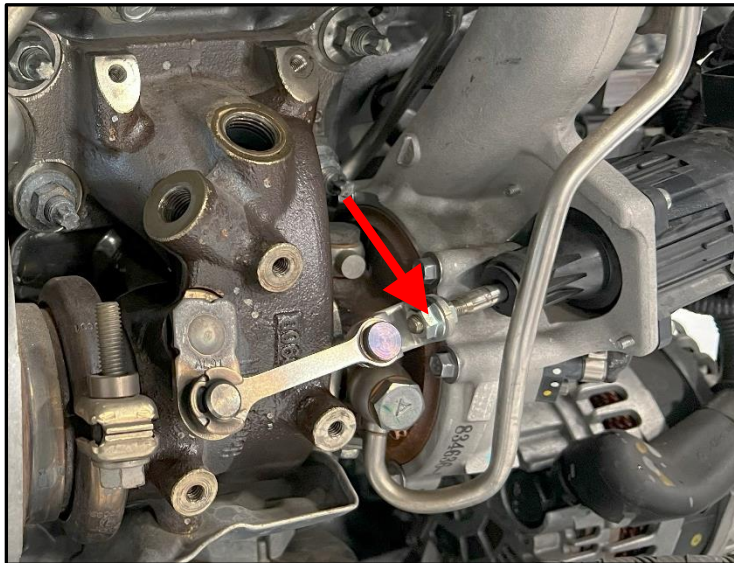
1. Place the transmission in Park position (or in Reverse gear if equipped with a manual transmission). Apply the parking brake.
2. Locate proper jacking points on vehicle's chassis (refer to vehicle's Owner Manual). Raise and support vehicle using jack & jack stands.
3. Refer to the [Factory Service Manual \(FSM\)](#) to remove the engine and transmission assembly.
4. Once the engine is removed from the vehicle it is time to start disassembling the factory turbo oil and coolant lines, and then remove the factory turbos.

Use the diagrams located at the end of this manual as reference for the following steps:

5. Starting on either side of the vehicle, remove the air fuel ratio sensor located on the top of the exhaust inlet on the turbine housing.
6. If equipped, remove the exhaust temperature sensor located just below the air fuel ratio sensor.
7. Remove the upper heat shields.
8. Remove the catalytic converter.
9. Remove the (2) water/coolant lines (lines are highlights in diagrams at the end) from the rubber hoses they are attached to and remove any bolt on the coolant line's brackets if they attach to the engine.
10. Remove the bottom forward (closest to front of engine) stud from the head using an E8 Torx socket (circled at right).
11. Remove the banjo bolt on the oil feed line (lines are highlights in diagrams at the end) from the top of the turbo charger CHRA.

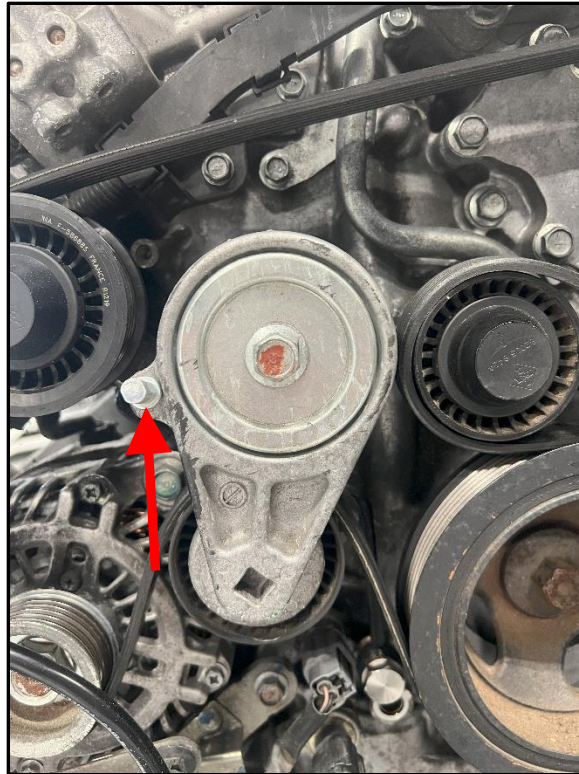


12. Remove the rubber hose attached to the oil drain hard line on the bottom of the OE turbos.
13. For Redsport owners: Remove the turbocharger speed sensor located on the front of the compressor housing. The bolt for the speed sensor uses a small Torx drive bit, when we removed them inhouse it would typically break or damage the Torx bit. We found it best to use hex jaw (Knipex) pliers, vice grips, or channels locks to break the bolt loose, then remove with the Torx bit.
14. Loosen the turbocharger mounting nuts in the order shown below:
 - a. Top Left
 - b. Bottom Right
 - c. Top Right
 - d. Bottom Left
15. Fully remove turbocharger mounting nuts and remove OE turbocharger assembly.
16. Remove OE turbocharger exhaust inlet gasket.
17. Remove the end nut securing the bracket to the wastegate actuator shaft (shown below). Retain these nuts.

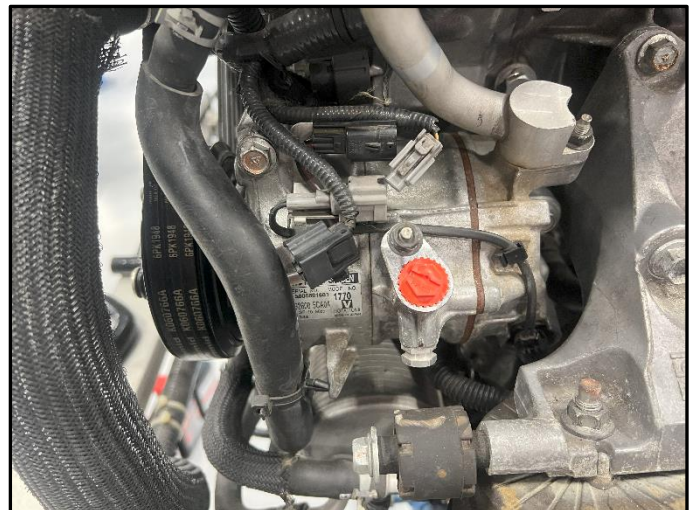
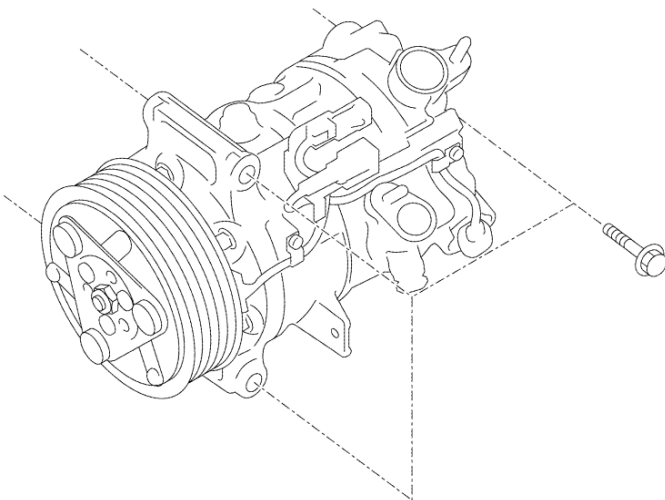


18. Remove the (4) T20 screws securing the wastegate actuator to the turbo and then remove the actuator. Set the actuator and (4) screws to the side as they will be reused.
19. Repeat steps #5-18 on the opposite side of the vehicle. Make sure to keep all driver and passenger components separate for reinstallation into Z1 turbos.

20. Release the tension on the drive belt by turning the tensioner with a 3/8 ratchet and placing a bolt or dowel in the locking hole (as shown below).



21. Disconnect the (2) electrical connectors on AC compressor. Remove the clip securing the hose to the AC compressor. Then remove the (3) bolts securing AC compressor to engine and set compressor aside.

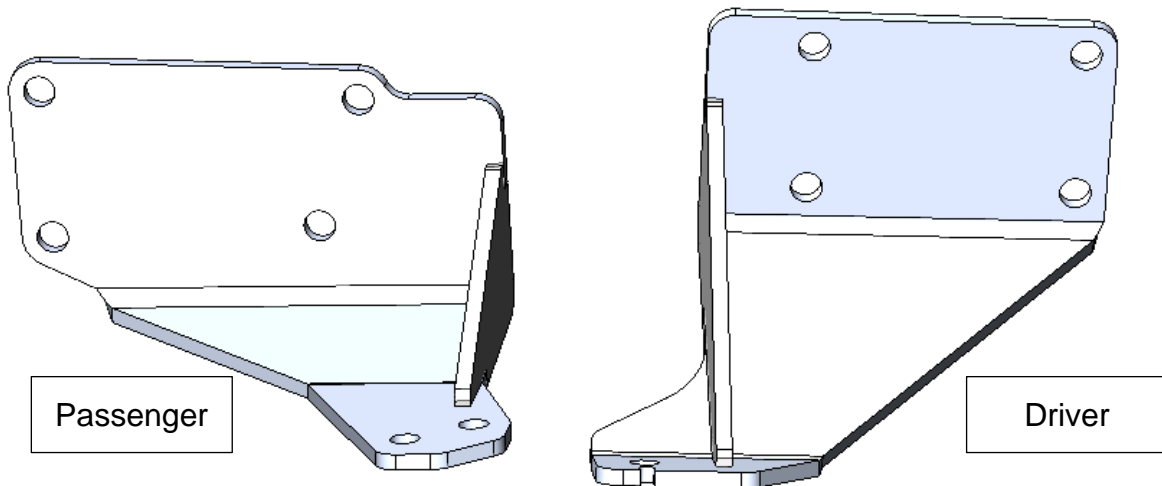


22. If not removed earlier, fully remove the OE oil and coolant hardlines from the engine.

23. RWD customers: Remove the passenger side oil drain flange that bolts to the lower engine block. AWD customers will use the OE oil drain flange.

24. AWD Customers: Fully remove the OE motor mount brackets, retain the hardware used to secure the brackets to the motor mounts on the subframe. Locate the new Z1 AWD motor mount brackets and (8) new M10 x 25mm bolts.

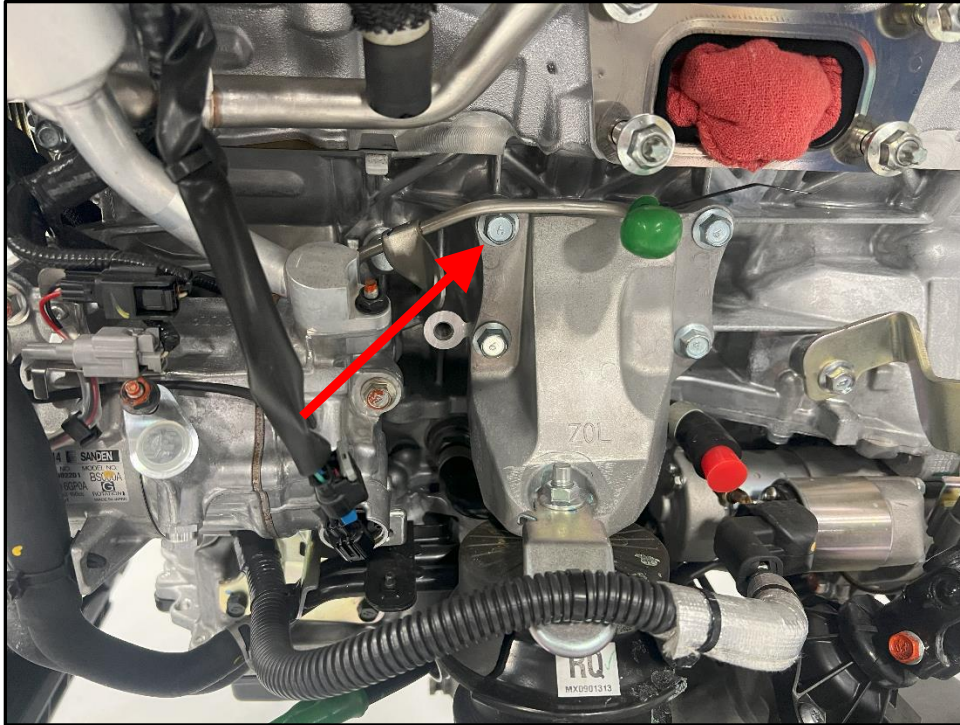
- a. Install the motor mount brackets onto the engine and motor mounts. Use the OE hardware to secure the brackets to the motor mounts. Use the provided (8) M10 x 25mm flange bolts to secure the brackets to the engine. Torque all fasteners to 36ft-lbs.



25. RWD Customers: On the driver's side of the engine, the larger Z1 turbo will contact the engine mount stud. Before the turbos are installed you must remove the driver's side engine mount nut and stud and replace it with the supplied M10 x 30mm FLANGED HEX head bolt. Torque to 36ft-lbs. Refer to images below.



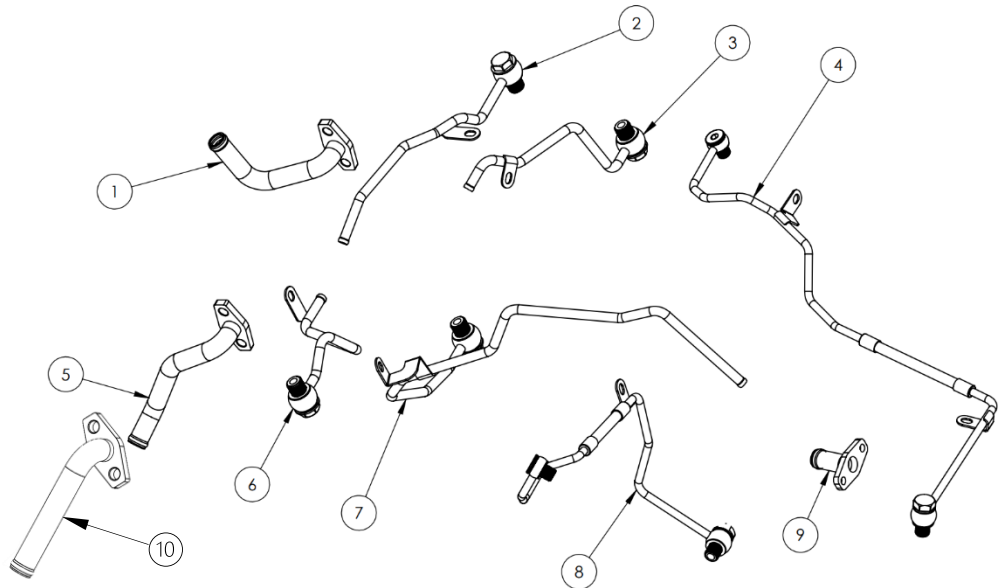
26. RWD Customers: Also on the driver's side of the engine, remove the bolt in the top left of the engine mount bracket. Replace it with the supplied M10 x 35mm BUTTON head bolt.



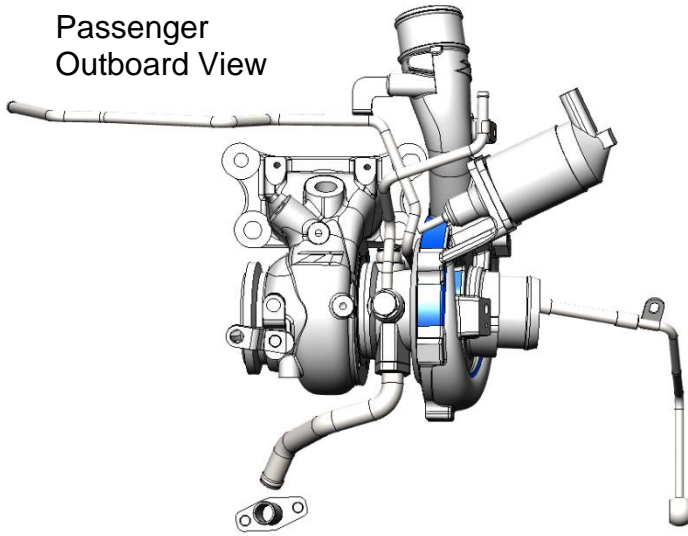
27. Locate the new Z1 VR30 Turbochargers.

28. Locate the new Z1 oil and coolant line kit. Please use the pictures, diagrams, and charts below and on the following page as reference to where each line needs to be installed on each turbo.

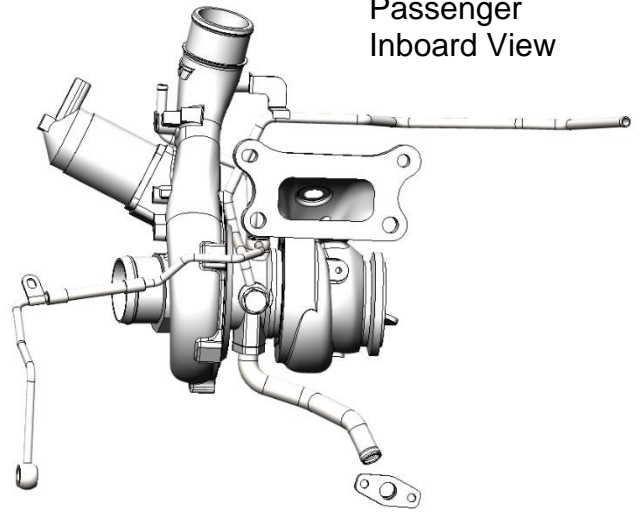
Item No.	Description
1	Driver Oil Drain
2	Driver Coolant Supply Line
3	Driver Coolant Return Line
4	Driver Oil Feed Line
5	Pass. Oil Drain
6	Pass. Coolant Supply Line
7	Pass. Coolant Return Line
8	Pass. Oil Feed Line
9	Pass. Oil Drain Block Flange
10	AWD Pass. Oil Drain



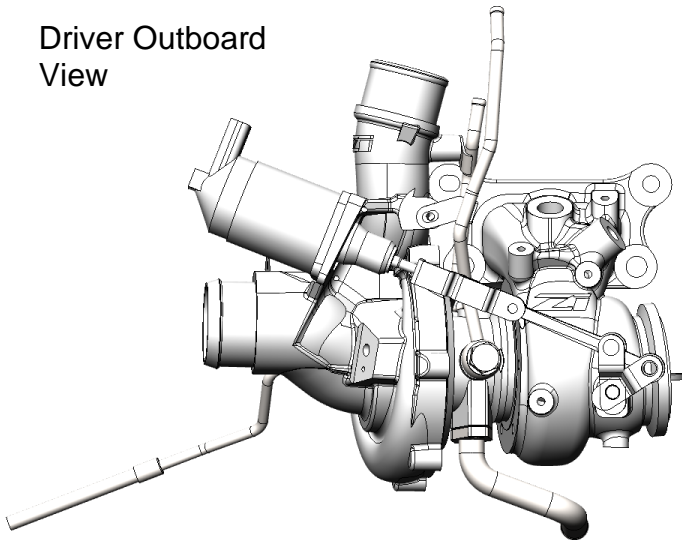
Passenger
Outboard View



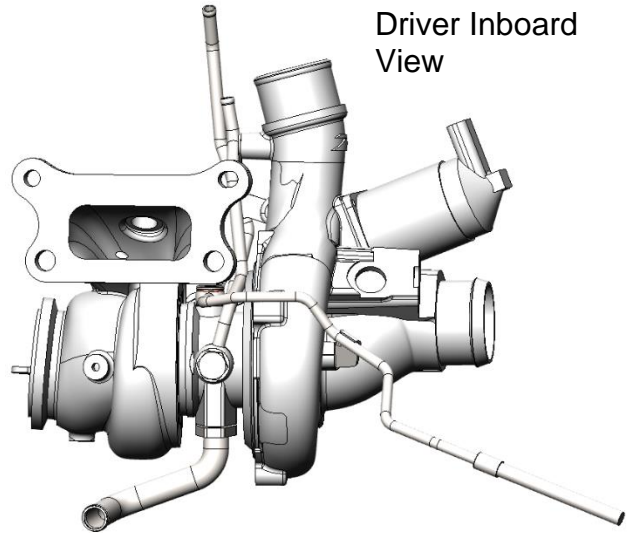
Passenger
Inboard View



Driver Outboard
View

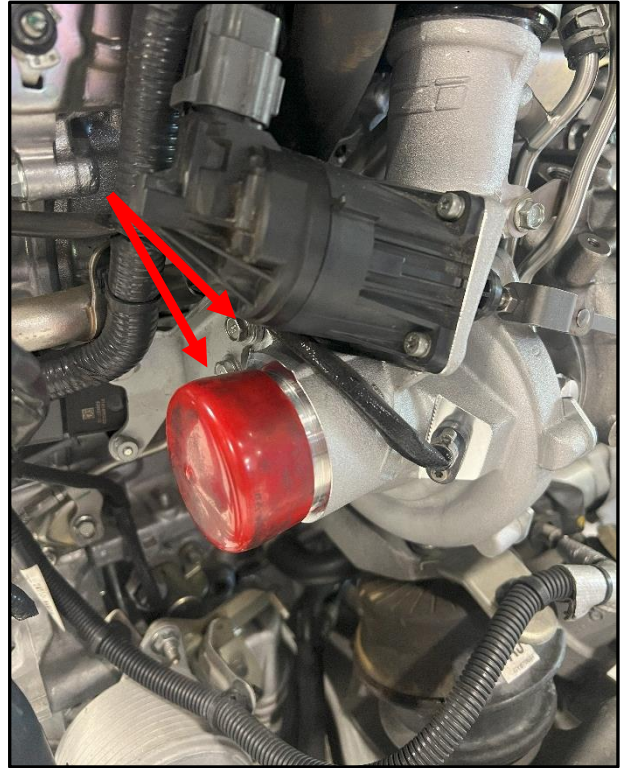
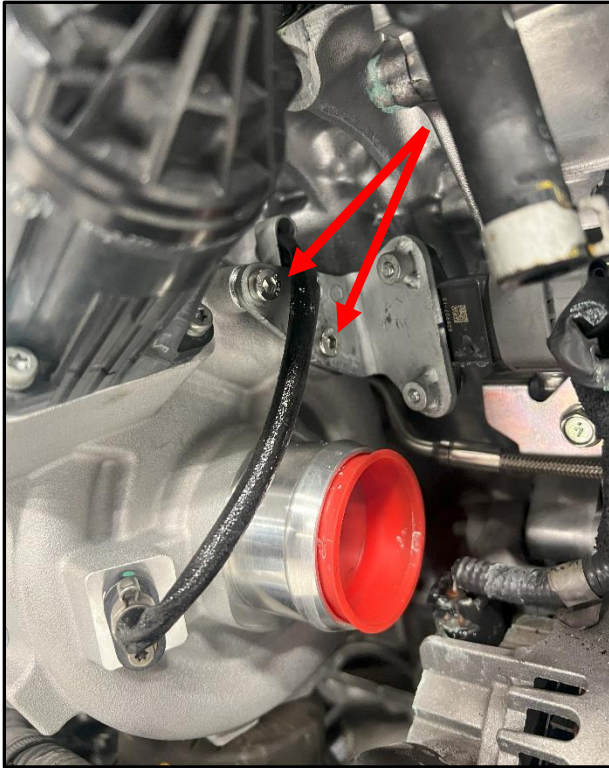


Driver Inboard
View

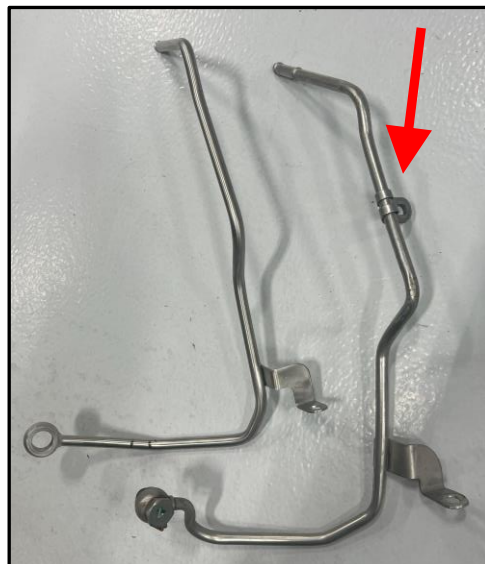


Note: The full driver oil feed line in the images above is not shown. The full driver feed line will look like ④ in the diagram on the previous page. Roughly half the line can be seen in this view.

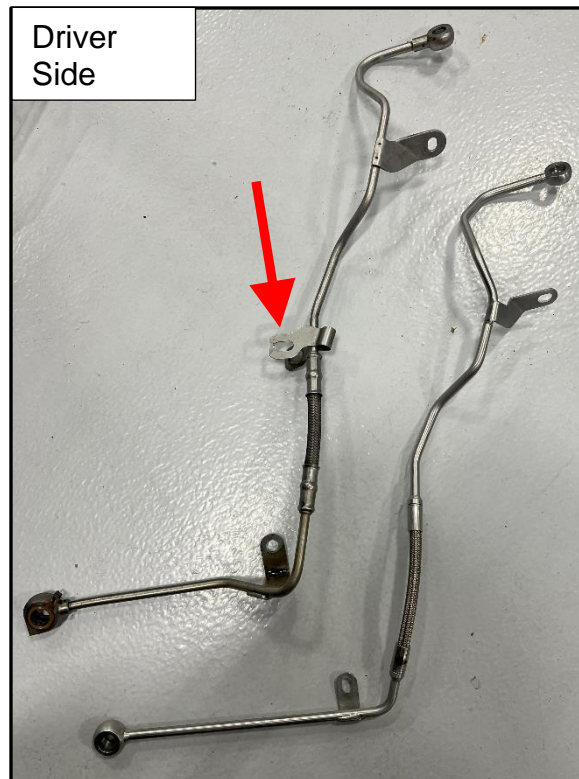
29. For Redsport owners: Install the turbocharger speed sensors and speed sensor brackets that were removed from the OE turbos onto the Z1 turbos. The passenger side speed sensor bracket will need to utilize (2) provided M6 x 12mm bolts with (2) M6 flat washers UNDER the bracket in order to space the bracket out ~3mm from the turbo. If these spacers are not placed behind the bracket, it will contact the top of the compressor housing. The drivers side bracket can use the OE bolts or (2) provided M6 x 12mm bolts. Torque the speed sensor M4 bolts to 19in-lbs and the M6 bracket bolts to 62in-lbs.



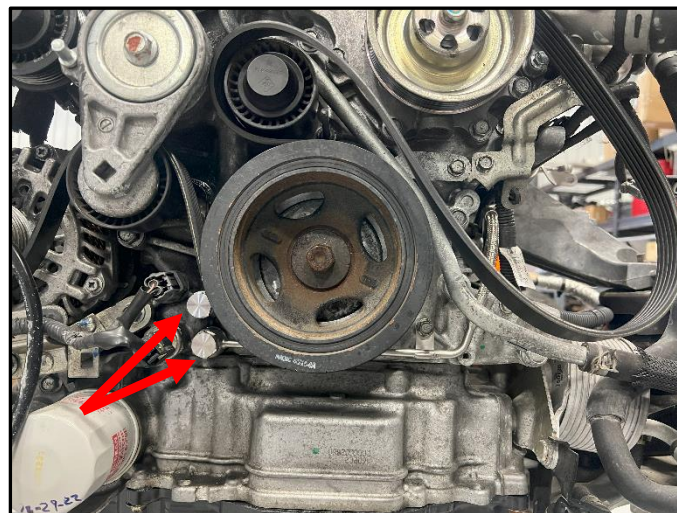
30. For NON-Redsport owners: If the O-ring is not pre-installed onto the speed sensor block off plate, install it at this time, then install the provided speed sensor block off plates onto the Z1 turbos using the supplied M4 x 12mm socket head bolt (3mm) and torque to 19in-lbs.
31. The coolant return lines will need to be installed on the turbos before they can be mounted as they attach from the back/inboard side of the turbos. Using the provided M14 hex head banjo bolts and (4) M14 crush washers, attach each turbo's coolant return lines to the back/inboard side of the Z1 turbos.
32. Transfer the loose mounting bracket from the passenger side OE coolant return line to the passenger side Z1 coolant return line ⑦. Loose bracket is shown with arrow below.



33. Locate the new driver turbo oil feed line ④. Transfer the loose mounting bracket from the OE line onto the Z1 line. To remove the brackets from the OE line you may need to use a flat head screwdriver to separate/open the bracket and then slide it off the line. The bracket is shown on the OE line in the picture below.



34. Using the provided M12 hex head banjo bolts and (4) M12 crush washers, loosely install the oil feed lines onto the front of the engine.



35. You can reuse your OE bolts or use the supplied M6 x 12 flanged bolts to secure the Z1 line's front brackets to the front of the engine. The only line that requires a specific new bolt is the passenger coolant supply line that is installed at a later step.
36. With the provided new OEM oil return line to engine gasket, install the Z1 passenger oil drain block flange ⑨ onto the lower engine block where the OE flange was removed from in step # 24. Torque bolts to 80in-lbs.
37. Using the provided new turbo oil drain gaskets and (2) M8 x 16 socket head bolts, install the Z1 oil drain lines ⑤ & ① onto the bottom drain ports on the Z1 turbos. AWD customers will use ⑩ instead of ⑤.

38. Locate the turbo inlet gaskets. With a gasket on each turbo, install the Z1 turbos onto the engine using the OE nuts removed in step # 15.
39. Using the provided socket head banjo bolts (6mm) and (2) crush washers, install the oil feed lines ④ & ⑧ onto the top of the Z1 turbo's CHRA. Torque to 13ft-lbs.
40. Reinstall the bottom forward (closest to front of engine) turbo mounting studs using an E8 Torx socket. Torque to 11ft-lbs.
41. Tighten turbo mounting nuts in the order shown below:
 - a. Top Left
 - b. Bottom Right
 - c. Top Right
 - d. Bottom Left
 - e. Top Left (2nd time)
 - f. Bottom Right (2nd time)
42. Using the OE bolts or provided M6 x 12mm flange bolts secure the driver side oil feed line's brackets to the engine and to the Z1 turbos. There are (2) additional bracket bolts on the driver side line, (1) onto the bracket behind where the AC compressor was and (1) on the Z1 turbo compressor cover. Torque bracket bolts to 80in-lbs.
43. Go back to the front of the engine and torque the oil feel line hex bolts to 12ft-lbs.
44. Using the provided M14 banjo bolts and (2) M14 crush washers, install the coolant feed lines ② & ⑥ onto the front/outboard side of the turbos.
 - a. For the driver side turbo, use the OE bolt or a supplied M6 x 12mm flange bolt to secure the line's bracket to the Z1 turbo.
 - b. For the passenger side turbo, use the supplied M6 x 8mm hex head bolt to secure the line's bracket to the Z1 turbo.
45. Torque the coolant feed line banjo bolts to 18ft-lbs. Torque the bracket bolts to 80in-lbs.
46. Attach the new silicone drain hoses to the oil drain hand lines on the lower engine block and Z1 turbos secure with the OE clamps.



47. Before attaching the wastegate actuator arms, the threaded shaft on the actuators need to be adjusted. You can move the actuator's position by pushing or pulling on the threaded shaft at the end. Set the shaft to where there is ~25.5mm from the end of the plastic housing then thread the jam nut all way down.

Thread jam nut all the way down, towards the plastic.

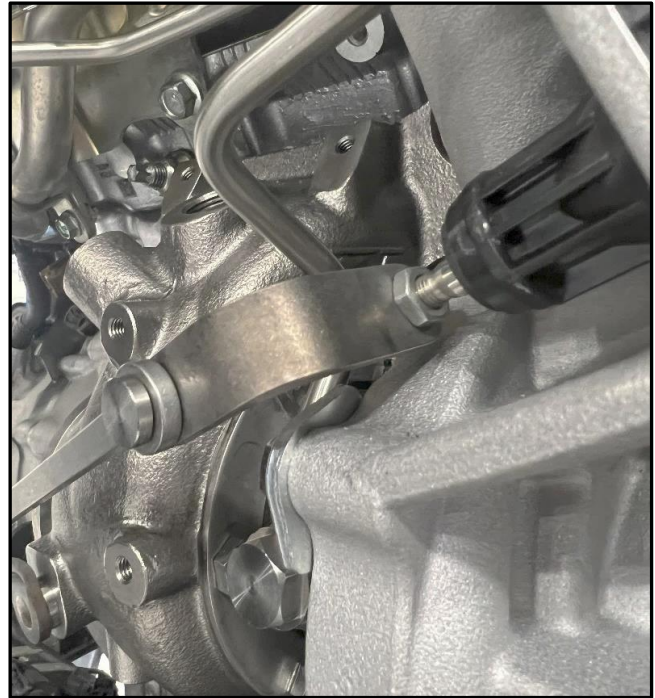
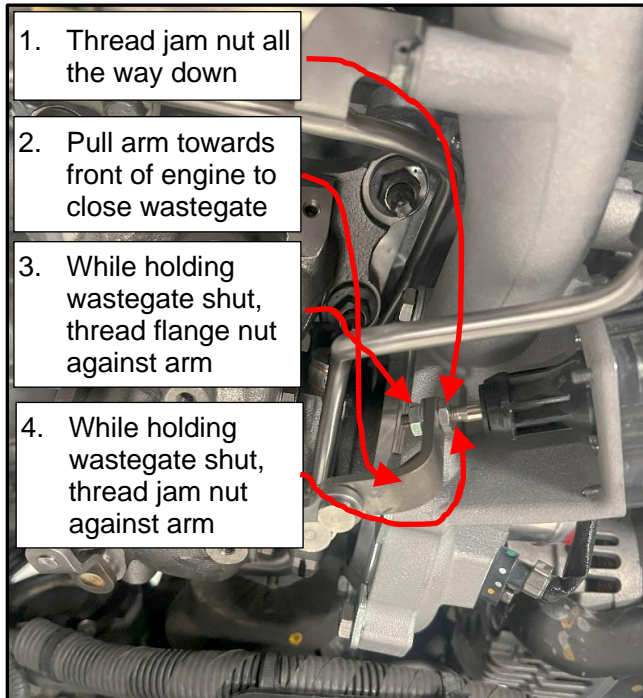


48. Install the wastegate actuators onto the Z1 turbos with the (4) OE T20 screws.
49. Attach the Z1 turbos wastegate arm/bracket onto the stud on the bracket on the turbine housing (shown below with an arrow). The bracket attached to the turbine housing is connected to the "flapper" which opens or shuts the wastegate. Secure the arm with the provided C-clip.



50. Position the L-brackets on the wastegate actuator arms onto the threaded shafts of the wastegate actuators. Pull the arm towards the front of the engine so it fully closes the wastegate in the turbine housing. You can check if the wastegate is shut by visually checking and trying to wiggle the flapper on the inside of the turbine housing. If there is a gap between the flapper and the housing, and you can wiggle the flapper, then the wastegate is not shut. If there is no gap and no movement of the flapper, the wastegate is shut.

While holding the wastegate shut, install the flange nut that was removed in step # 17 against the arm until it is snug. DO NOT tighten the nut enough to pull the threaded shaft further out of the housing, you just want a little bit of pre-load on the arm. Lastly, thread the jam nut on the backside of the L-bracket up, jamming the L-bracket between the two nuts.



51. On both sides, the actuator arm gets close to touching the compressor housing (shown above at right). Run the actuator arm through its full range of motion by pulling and pushing on the arm to fully open and fully close the wastegate. While moving the arm, check for clearance between the arm and compressor housing. If the arm contacts, slightly loosen the jam nut on the backside, then rotate the arm up and ensure there is clearance from the housing. Then, tighten the jam nut until it is snug. DO NOT tighten the nut enough to pull the threaded shaft further out of the housing.

52. Locate the OE upper heat shields that were removed in step # 7. Trim the shielding as shown below:
- a. Passenger's side:
 - i. The passenger side needs a lot of trimming. Roughly position the heat shield onto the turbo to see what areas contact. Use the image below and to the left as a guide to what we cut first.
 - ii. Then once cut, reposition the shield back onto the turbo to mark the area to cut for the coolant feed line. Use the image below and to the right as reference.
 - iii. Once trimmed, install the heat shield onto the turbo with the new provided OEM heat shield bolts (PN 14069-JD00A).



- b. Driver's side:
 - i. The driver's side needs much less trimming than the passenger side but will need to be bent out after cutting. Roughly position the heat shield onto the turbo and mark where the left edge needs to be cut for clearance on the actuator arm. Use the images below as reference to what we cut.



- ii. Install the trimmed heat shield onto the turbo with the new provided OEM heat shield bolts (PN 14069-JD00A).
- iii. From the backside, look behind the heat shield at the actuator arm.
- iv. If the arm is contacting the heat shield, grab the bottom right corner of the heat shield and bent it out slightly.
- v. Recheck after bending to make sure there is clearance. The image below to the left is before bending, the image at the right is after.



53. Once the heat shields are trimmed to fit, using pliers, bend the cut edge inside and flat to prevent the insulation from falling out with vibrations of the engine. Use the pictures below as reference.



54. If your vehicle was equipped with exhaust temperature sensors, reinstall them into the Z1 turbos. Torque to 22ft-lbs. Make sure to install the OE passenger sensors onto the Z1 passenger turbo, and OE driver sensors onto the Z1 driver turbo.

55. If your vehicle was not equipped with exhaust temperature sensors, installed the provided M12 x 12mm plug with the provided M12 copper washer/gasket (as shown at right).

56. Install the air fuel ratio sensors that were removed from the OE turbos onto the Z1 turbos. Torque to 37ft-lbs. Make sure to install the OE passenger sensors onto the Z1 passenger turbo, and OE driver sensors onto the Z1 driver turbo.

57. Reinstall the catalytic converters.

58. Reconnect all electrical connectors that were removed prior to removal of the OE turbos.

59. Ensure all bolts and electrical connectors are securely fastened. Inspect vehicle for loose components or issues.

60. Refer to the [Factory Service Manual \(FSM\)](#) to reinstall the engine and transmission assembly.

61. Check vehicle for loose tools/items.

62. Using consult or the [Z1 Elite Diagnostic Scan Tool](#). Run the “Turbocharger Wastegate Control Solenoid Valve Data Initialization” procedure and the “Idle Air Volume Learning” procedure.

63. Get your car tuned.

64. Perform a final test drive of vehicle.

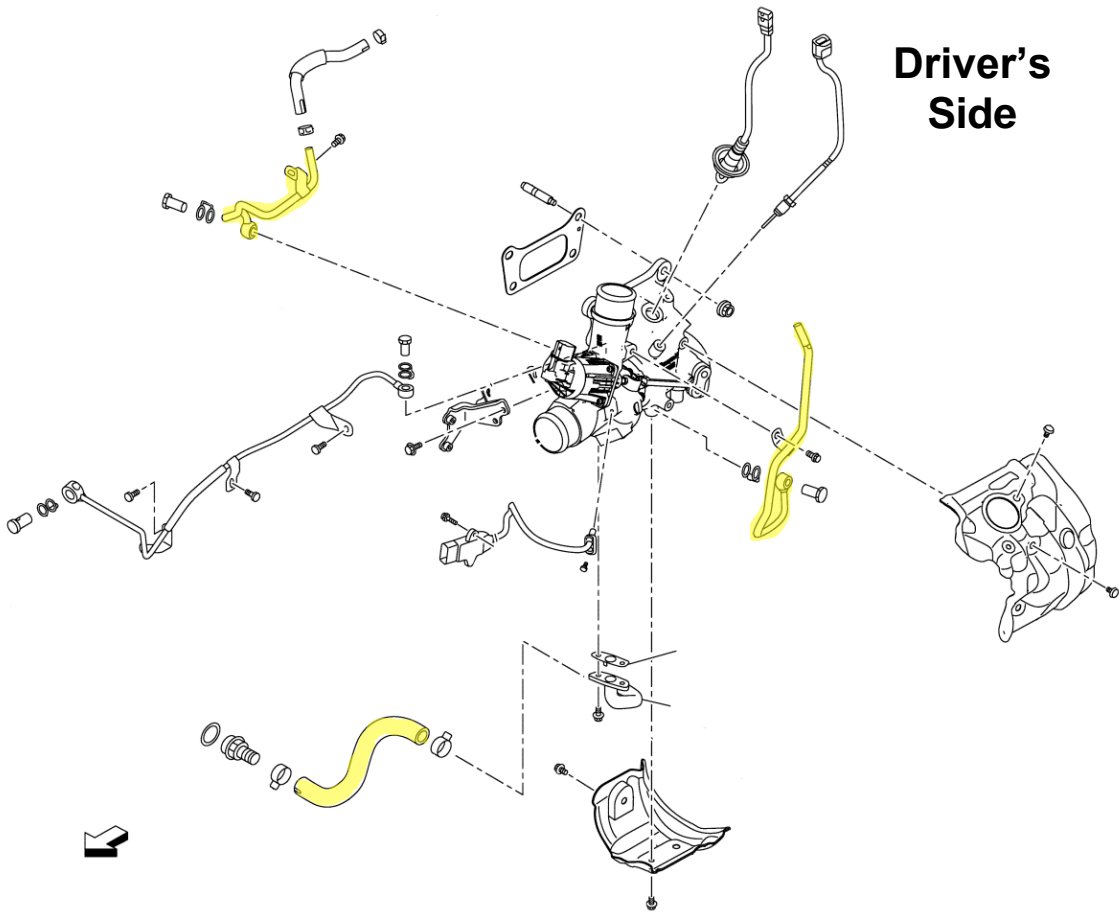


Turbo Charger Diagrams are shown on the next page

END

Additional Technical Support:
Contact Z1 Motorsports at info@z1motorsports.com
Or call 770-838-7777 between 9am and 6pm ET

Driver's Side



Passenger's Side

