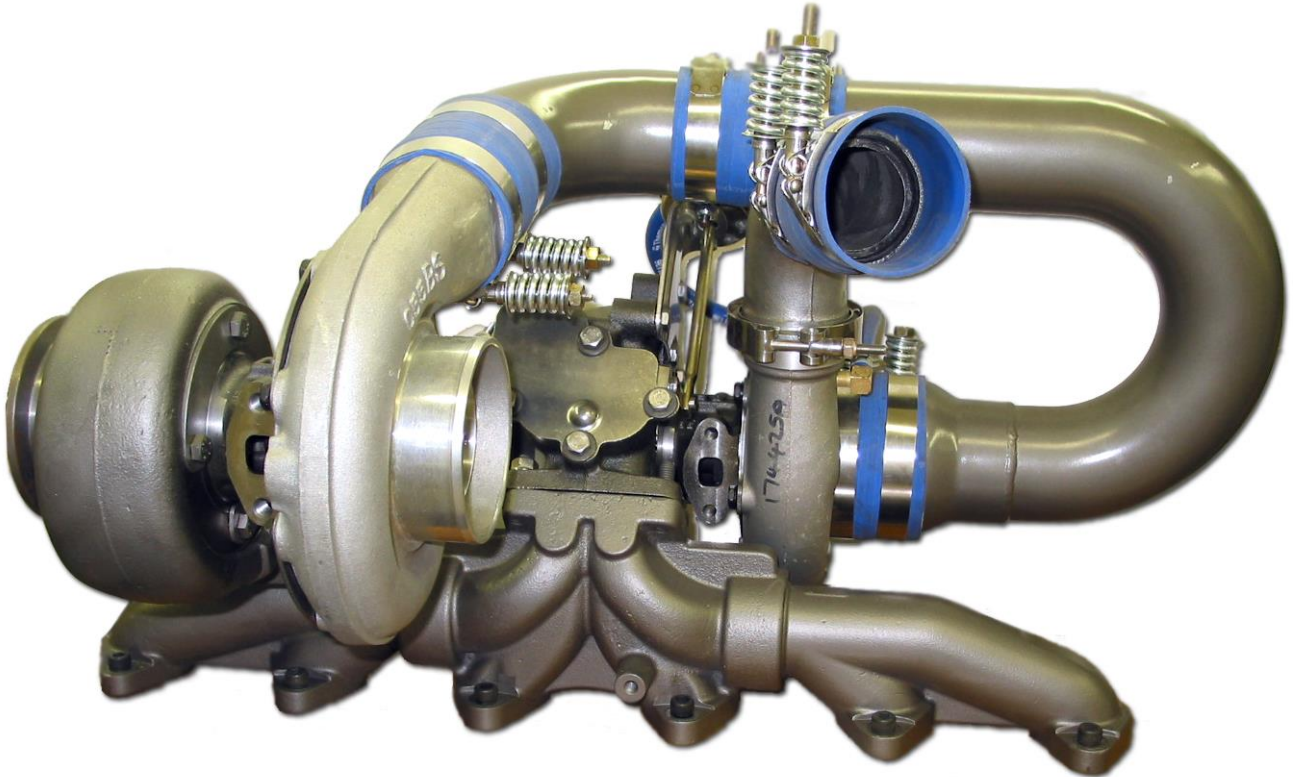




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BD Twin Turbo Kit

1998 ½ - 2002 Dodge 24v ISB

Part# 1045320

PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION.

** Picture as shown features recommended optional 3-piece HD Exhaust Manifold
(BD P/N# 1045985)*

UNLESS AN EO# IS LISTED, THIS PRODUCT IS LEGAL IN CALIFORNIA FOR RACING VEHICLES ONLY, WHICH MAY NEVER BE USED UPON A HIGHWAY.

KIT CONTENTS :

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










DODGE 24V TWIN TURBO KIT (BD# 1045320)			
1405230	1405219	1453105	1453106
Primary Turbo (Un-wastegated)	Secondary Turbo (Wastegated)	11' Oil Drain	23'' Oil Drain
Qty: 1	Qty: 1	Qty: 1	Qty: 1
1453120	1453405P	1453600	1453521
Primary Turbo Support Bracket	Primary Air Outlet Pipe	Primary Exhaust Outlet Pipe	Turbine Housing Blanket
Qty: 1	Qty: 1	Qty: 1	Qty: 1
1453602	1100740	1453700P	1453305P
Exhaust Down Pipe V-Band Clamp	4'' Stainless Steel Down Pipe Clamp	Air Filter to Primary Turbo Pipe	Secondary Air Inlet Pipe
Qty: 1	Qty: 1	Qty: 1	Qty: 1
1459122P	1453502	1045986	
Intercooler Extension Pipe	Primary to Secondary Exhaust Pipe	Exh. Manifold Gasket Set	
Qty: 1	Qty: 1	Qty: 1	

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PRIMARY TURBO HARDWARE KIT (BD# 1453192)				
1453111	1120031	1453121	1453122	1453115
				
Upper Oil Drain Bolt (3/8NC x1.25)	Oil Drain Washer (3/8)	Pri. Support Bolt (M12x1.75x25)	Pri. Support Washer (M12)	Oil Feed Adapter (1/8MPT x -6JIC)
Qty: 2	Qty: 2	Qty: 1	Qty: 1	ty: 1
1453503	1453504	1462430	1462441	1405926 (0406)
				
Heat Shield	Zip Tie	Stud (M10x1.5)	Nut (M10x1.5)	Secondary Cast Elbow Down Pipe Clamp
Qty: 1	Qty: 3	Qty: 4	Qty: 4	Qty: 1

SECONDARY TURBO HARDWARE KIT (BD# 1453292)					
1452813	1453982	1453983	1604102	1604103	1453316
					
Turbo Mnt. Bolt (3/8NFx1.25)	Turbo Mnt. Nut (3/8NF Gold)	Turbo Mnt. Washer (3/8 Gold)	Lock Washer (8mm)	Bolt (M8x1x25)	Spacer Plate
Qty: 2	Qty: 2	Qty: 4	Qty: 2	Qty: 2	Qty: 1

AIR BOX KIT (BD# 1453892)				
1453805T	2924	1453803	1453802	1453801
				
Powder Coated Air Box	Air Box Filter	Nut (1/4)	Washer (1/4)	Spacer
Qty: 1	Qty: 1	Qty: 3	Qty: 3	Qty: 1

HOSE & CLAMP KIT (BD# 1453492)				
1405222	1405221	1405213	1405211	1453701
				
<i>4"i.d. Hose (4" each)</i>	<i>3"i.d. Hose (4"/each)</i>	<i>Clamp (4.11")</i>	<i>Clamp (3.25")</i>	<i>Clamp (4")</i>
Qty: 2	Qty: 2	Qty: 2	Qty: 4	Qty: 2
1453130-B		1453161		1453162
				
<i>Oil Feed Hose</i>		<i>Primary Oil Inlet Adapter (-6JICMx-6JICF 90°)</i>		<i>Primary Oil Inlet Fitting (1/4MPTx- 6JICM)</i>
Qty: 1		Qty: 1		Qty:1

HEATER TUBE RETRO-FIT KIT (BD# 1453922)		
1459130	1459140	1300131
		
<i>Heater Tube Coupler</i>	<i>Heater Tube Clamp</i>	<i>Zap Strap</i>
Qty: 1	Qty: 1	Qty: 2

Pre-Installation

For the purpose of the instruction manual, the term “primary turbo” refers to the larger non-wastegated turbo and the term “secondary turbo” refers to the smaller wastegated turbo.

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

The BD twin turbo system is recommended for trucks with 375-525 RWHP. We do have other kits available for higher horsepower. Please call us to discuss your options.

Also note that a stock transmission will not handle this power and torque, transmission modifications are a must.

Options

Description	Part #
BD 'X' Torque Converter	1070215X
BD Transmission	CALL
BD High Flow Injectors	CALL
BD Auxiliary Lift Pump Kit	1050226
BD High Flow Banjo Bolts	CALL
Heavy Duty Exhaust Manifold	1045985
Head Studs	247-4202
BD High Pressure Intercooler Boots	1405220

When either upgrading or installing the twin turbo kit the wastegate will need to be adjusted. This wastegate is adjustable by turning the actuator rod. To adjust the wastegate you will need to unscrew the rod counter clockwise roughly 3 complete turns. You can then take the vehicle for a test drive to customize the boost pressure to the vehicle. BD recommends no more than 52psi of boost pressure on the 1994-2002 vehicles. 2003-2006 vehicles can handle 60psi of boost pressure on a well maintained engine.

YOU SHOULD EFFECTIVELY RUN AS MUCH BOOST AS POSSIBLE TO KEEP YOUR EGTS IN CONTROL, BUT DO NOT EXCEED THE MAXIMUM BOOST PRESSURE.

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Battery Disconnect

Disconnect the negative terminals on both of the vehicle's batteries, and then disconnect the positive terminals.

Installation

1. Record radio settings and disconnect both battery terminals on both batteries.

2. If your vehicle heater feed tube runs below your exhaust manifold, you will need to drain the engine coolant into a clean container to be re-used later.

3. Lay a protective cover over the passenger side fender to eliminate any scratches.

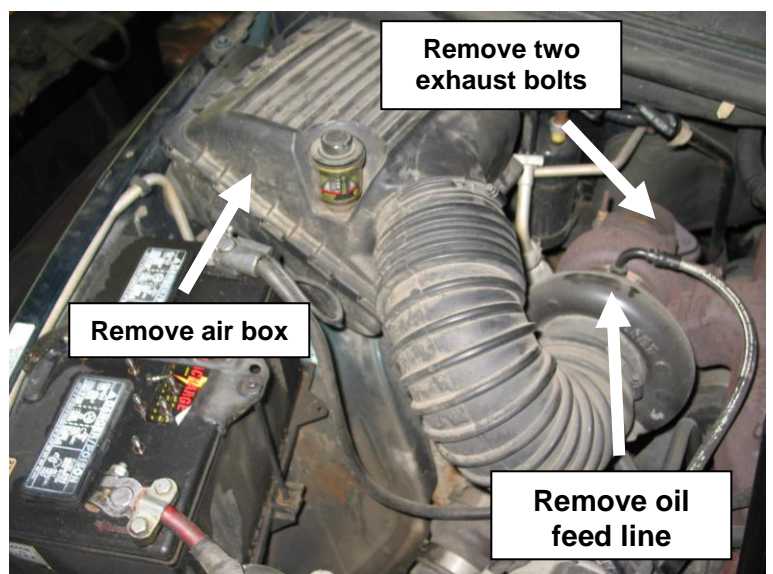
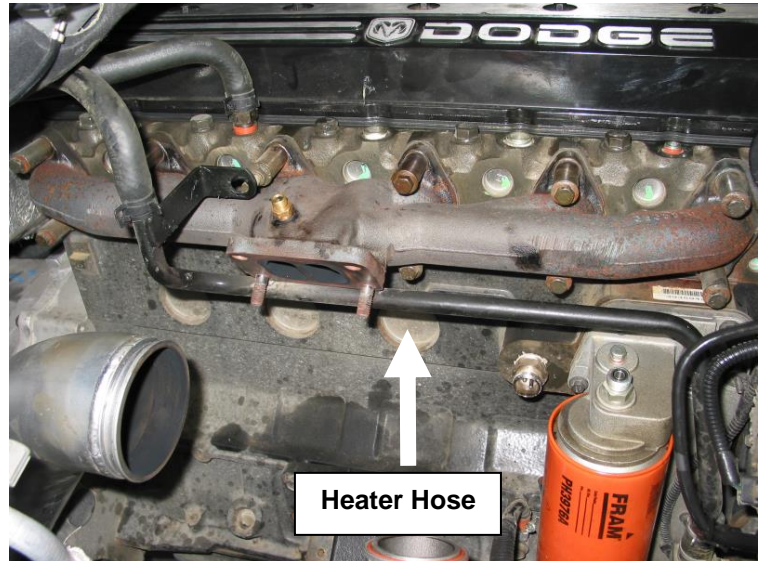
4. Remove the air box assembly and intake tube from the inlet of the turbocharger.

5. Remove the two 13 mm bolts connecting the exhaust down pipe to the turbo flange.

6. Remove the cast aluminum elbow attached to the turbo compressor housing outlet. You will need to loosen the 'V' band clamp and the band clamp with a 7/16" deep socket. Be sure not to lose the orange o-ring from the aluminum elbow, as you will re-use the aluminum elbow assembly later.

7. Remove the black steel intercooler tube. You will need to loosen the band clamp on the intercooler using a 7/16" deep socket.

8. Remove the turbo oil feed line



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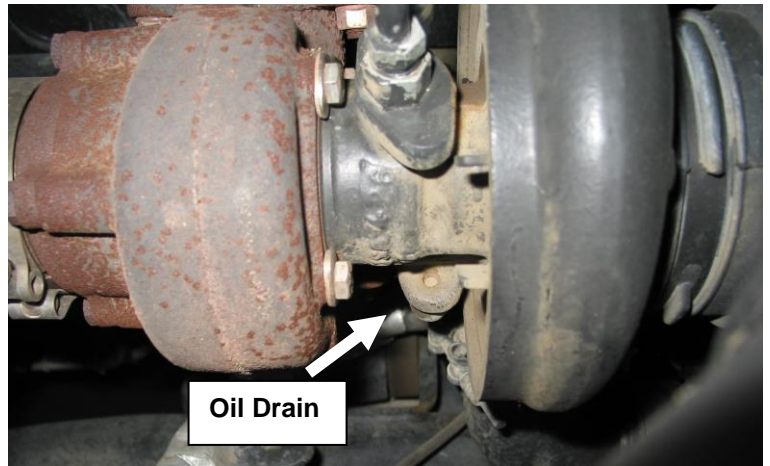
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(top of turbo) from the turbo by holding the 19mm turbo fitting with a wrench and remove the 13/16" line fitting – place line to the side. As well you may now remove the 19mm oil feed fitting.

9. Unbolt the turbo oil drain tube (bottom of turbo) by removing the two 10mm bolts.

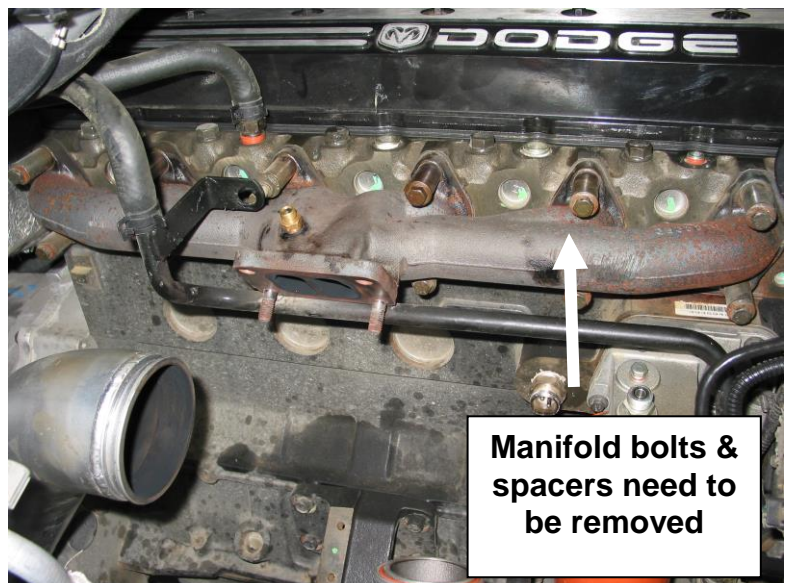
10. Remove the lower hose clamp on the turbo oil drain boot and remove the oil drain tube and hose as an assembly.



11. Remove the four nuts holding the turbo to the exhaust manifold with a 15mm wrench—remove the stock turbo and set it aside.

12. Remove the stock down pipe and intermediate pipe from the exhaust system.

13. Remove the nut holding the heater core line to the exhaust manifold stud using a 15mm socket, remove the spring clamps at each end of the steel line and remove the line.



14. Remove the exhaust manifold bolt retainer straps if equipped, and then remove the bolts with a 13mm socket. Remove the spacers and finally the manifold at this time. Be sure not to lose the spacers.

15. Discard all exhaust manifolds gaskets and clean then engine block and exhaust manifold mating surface.

**** Critical Step ****

16. On the lower right side of engine, 6" from the rear of the engine block (just above the oil pan), there is a frost plug that caps an oil drain port that leads to the engine crankcase. This frost plug needs to be removed to serve as the oil drain for the *primary turbo*.

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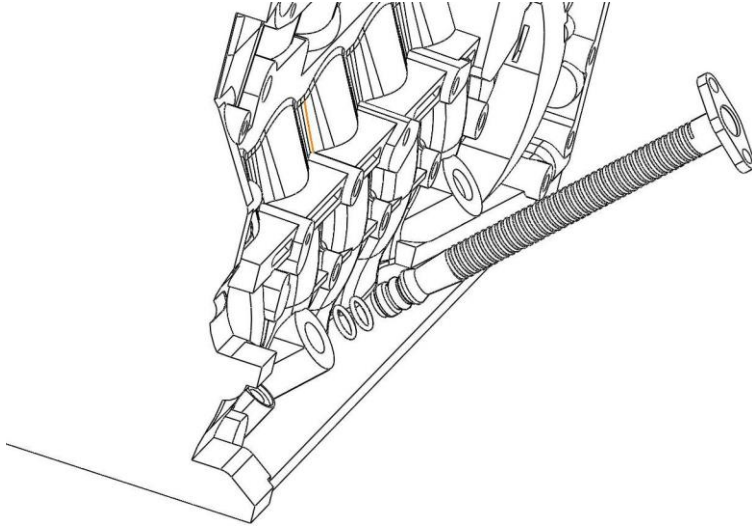
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Great care needs to be taken when removing the frost plug so that it isn't forced into the oil pan.

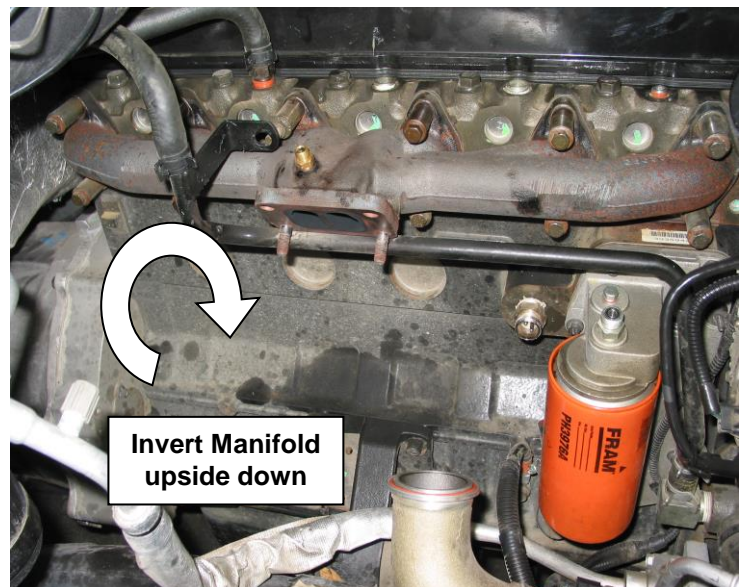
The frost plug can be removed by coating a drill bit with grease (to catch any metal shavings) and by drilling a small hole in the center of the frost plug. Insert a sheet metal screw into the hole and pry the frost plug out with a pair of pliers.



Coat the orings of the supplied oil drain assembly (Shorter 1453105) with oil and gently insert into the block.

17. Reinstall the exhaust manifold in an **inverted manner** so the turbo flange faces upward. Use the provided manifold gaskets and the factory bolts, spacers and retainers and torque to 32 ft lbs with a 13mm socket.

Note: If you have purchased a heavy-duty aftermarket manifold, you will need to install it in the same inverted manner. Please consult the manifold's instructions for the rest of the installation.



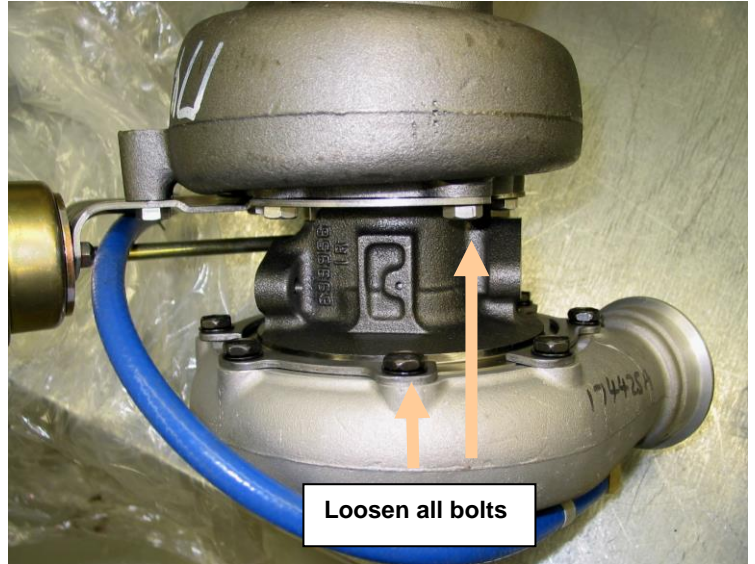
Turbo Preparation & Installation

To alleviate any fit problems, all turbocharger support bolts, housing bolts and clamps must be loose. Once everything has fit together, then tighten all bolts.

18. Remove the primary and secondary turbos from their boxes and remove any paper that may be in the inlets or outlets. It is critical that nothing is left inside of the turbos.

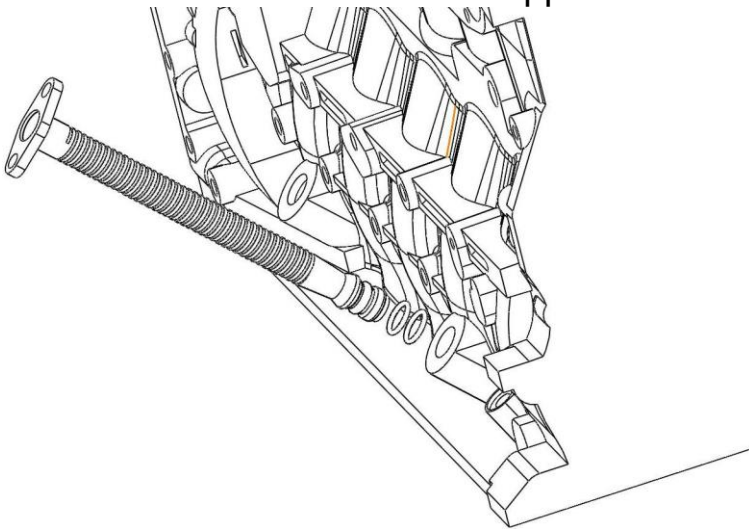
19. On both turbos, loosen the 4 bolts that secure the exhaust turbine housing to the turbo body with a 13mm wrench.

Then, loosen the 8 bolts that are securing the turbo compressor housing to the CHRA with a 13mm wrench. This will allow the two housings to rotate freely. Be careful not to loosen the housings off too much as they will fall off and possibly damage the turbo wheels. The clamps should only be loose enough to clock the housings.



20. Thread the previously uninstalled OEM 19mm oil feed adapter into the *secondary turbo*. This is the adapter that you remove from the factory turbo.

21. You will need to remove the factory oil drain elbow adapter that is pressed into the front passenger side of the block. Once removed you can install the longer 1453106 oil drain that is supplied for the secondary turbocharger.



22. Install the long oil drain adapter (1453106) onto the bottom of the *secondary turbo* with the supplied gasket and two 8mm X 25mm bolts and lock washers with a 13 mm socket.

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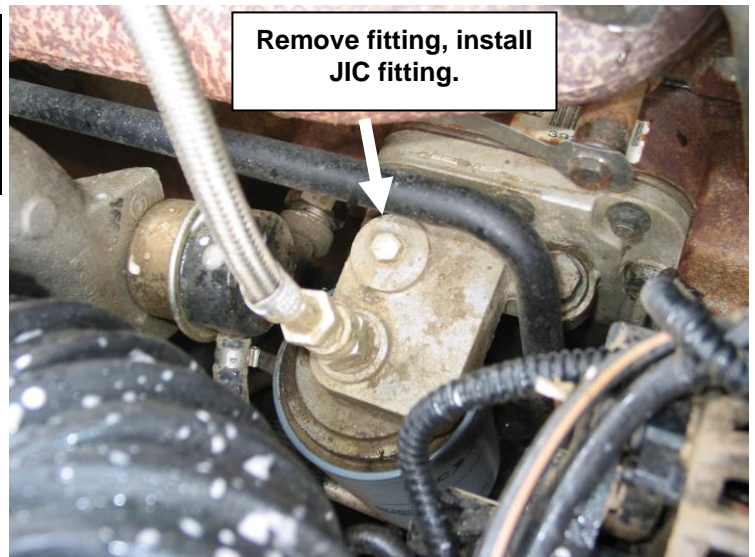
23. On the larger primary turbo non wastegated (#1405230) remove the brass 90° flare fitting from the oil inlet. Locate the supplied 1/4MPT x -6JICM fitting (1453162), apply a very small amount of pipe sealant on the threads (DO NOT USE TEFLON TAPE). Now thread the fitting into the oil inlet, hand tighten then using a wrench turn the fitting ½ turn. DO NOT OVER TIGHTEN.
24. Install the short oil drain adapter (if you have not done already) onto the bottom of the *primary turbo* with the supplied gasket and two 3/8" X 1-1/4" NC bolts and lock washers with a 9/16" wrench.

**** Critical Step ****

25. Squirt fresh oil down the oil feed port of both turbo chargers while slowly rotating the compressor wheel.

26. Remove the 1/8 NPT plug using a 7/16" wrench from the top of the oil filter head and install the supplied oil feed adapter fitting (#1453161).

27. Mount the *secondary turbo* to the exhaust manifold.



Installing with Stock Manifold

Mount the turbo to the manifold using the two factory studs and nuts, the supplied gasket, two 3/8" X 1-1/2 NF bolts, two 3/8" nuts and the four 3/8" flat washers. You will need to use two separate 9/16" wrenches.

Installing with Aftermarket Manifold

Remove the studs from your stock turbo and stock manifold for reinstallation into your aftermarket Heavy Duty Manifold. Install the turbo with the gaskets on either side of the spacer plate and reuse the factory mounting nuts. Note the stainless spacer will only need to be installed between the turbo and manifold if you are using an ATS aftermarket manifold..

28. Locate the cast flanged turbine adapter, and wrap the supplied heat shielding around the adapter. The heat



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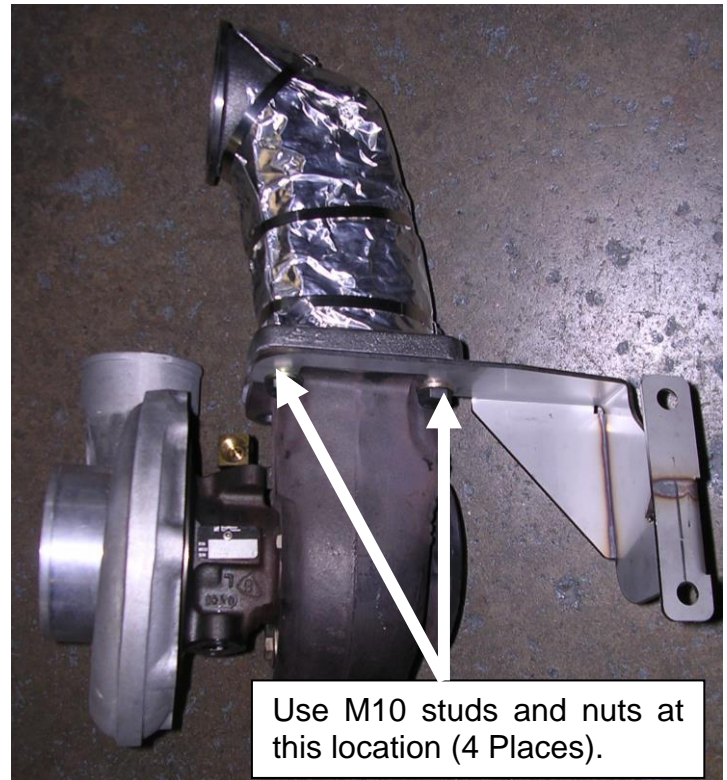
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shield has been formed in a specific pattern to completely wrap around the elbow. Use the 3 supplied stainless steel zip ties to secure the heat shield. One at the bottom, one at the middle and one at the top. Be sure that neither the heat shield or zip tie will interfere with the circular marmon flange when the band clamp is applied.

29. You can now bolt the flanged turbine adapter to the primary turbo. Use the four M10x1.5 studs and serrated nuts to secure the adapter pipe to the turbo. At the same time mount the SS primary turbo support bracket to the assembly.

Note that the support bracket bolts on the bottom side of the turbine housing.



30. Place the turbo and turbine adapter assembly onto the frame rail in a location close to the final install point. Be sure that it does not fall.



31. With the secondary turbo, bolt it loosely to the manifold and align the oil inlet straight up and the compressor outlet towards the bottom of the passenger battery.

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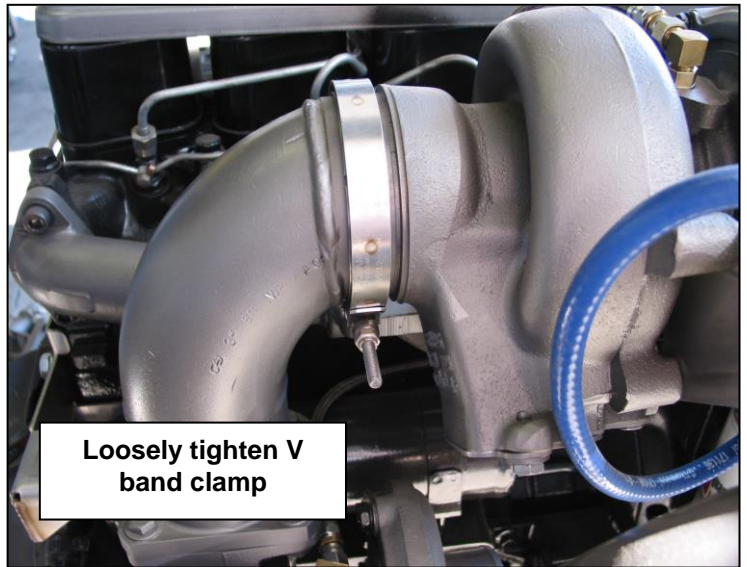
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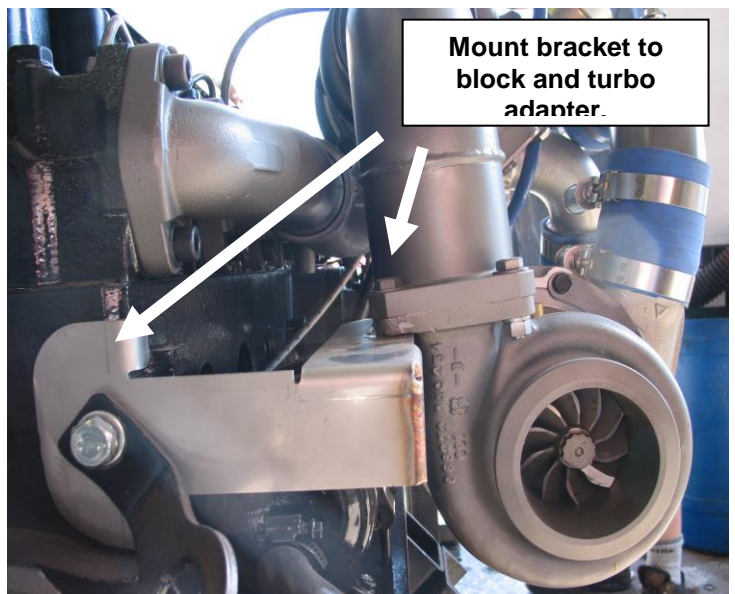
32. Using the supplied v-band clamp (clamp will be labeled 995L2-0406) tighten the secondary exhaust housing to the primary turbo-turbine adapter assembly.

Make sure that heat shield or stainless zip tie does not interfere with the band clamp. Tighten the v-band clamp just enough so that you can still rotate the exhaust elbow.



33. Install the *primary turbo* support bracket to the engine block with the supplied bolt (12mm x 1.75 x 25) and lock washer. Now tighten the bolts and V band clamp.

34. Now that the exhaust housings are in their proper locations, the turbo center sections can be twisted so that the turbo oil feeds are pointing up (+/- 12°) and drains are pointed at the block adapters. Tighten the exhaust housing bolts. Note that you may adjust the factory block oil drain adapter to help align the system.



35. If your heater feed tube runs below your exhaust manifold, remove it and cut off the support bracket in half as shown. Clean off the powder coat and loosely install the brass coupler and reinstall the line with original hose clamps. This will allow you to position the rearward end between the turbo and manifold and hook it back up to the factory rubber hoses. Once positioned,



Once positioned,

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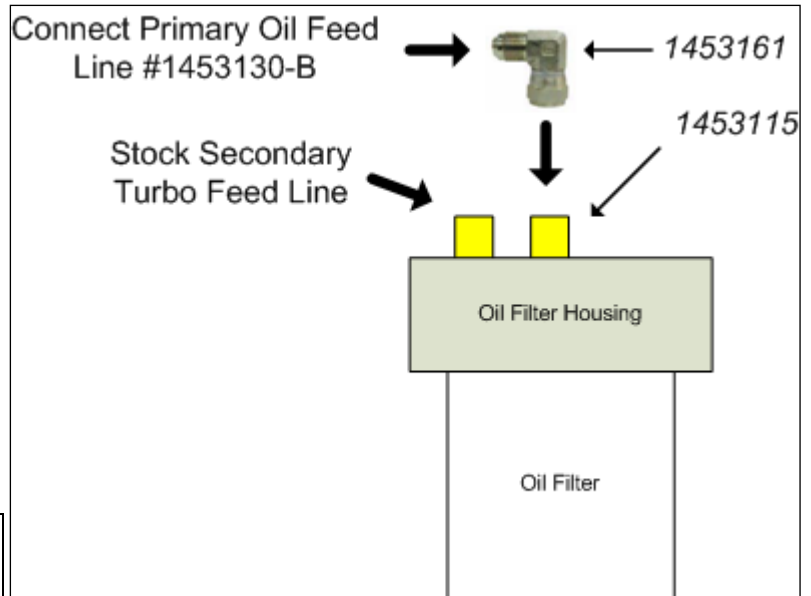
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tighten the brass coupler and install the new support clamp to the oil filter housing bolt. Zap strap the two rubber heater hoses to secure them together.

36. Install the factory oil feed line into the 19mm oil feed adapter that should be installed in the *secondary turbo* (hold the fitting with a 19mm wrench and tighten the line with a 13/16" wrench), this line should run on the engine side of the turbo.

37. Install the *primary turbo* oil feed line (#1453130-B) to the primary turbo oil inlet fitting. Then connect the other end of the oil feed line to the 1456161 90° JIC adapter. This adapter should be connected to the 1453115 fitting that you installed into the oil filter block earlier.

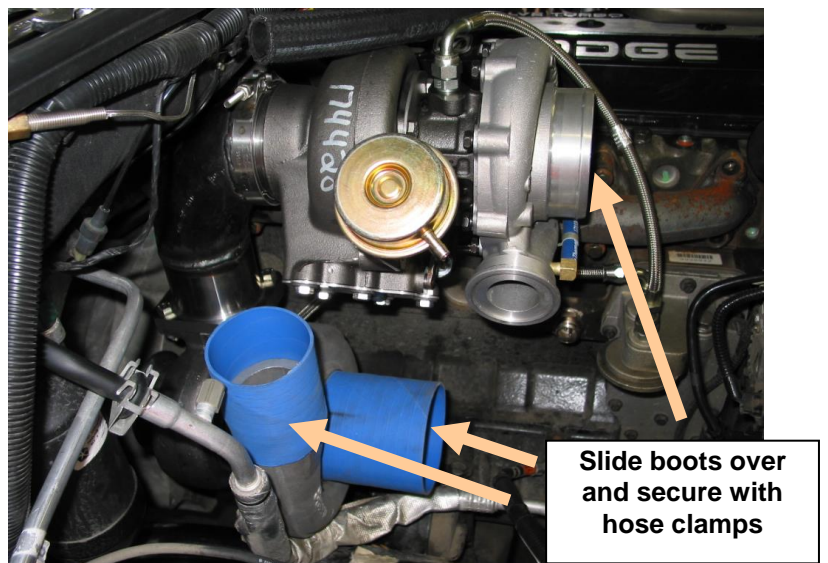


NOTE: All oil drains and feeds should be vertical (+/- 12°).

38. Remove the factory turbo 90 degree adapter and boot from the factory intercooler pipe and place them on the new intercooler pipe provided.
39. Install the cast aluminum elbow and intercooler tube assembly to the compressor outlet of the *secondary turbo* and the lower intercooler boot. Secure with the factory v-band clamp and the two boot band clamps (use a 7/16" deep socket to tighten all clamps)

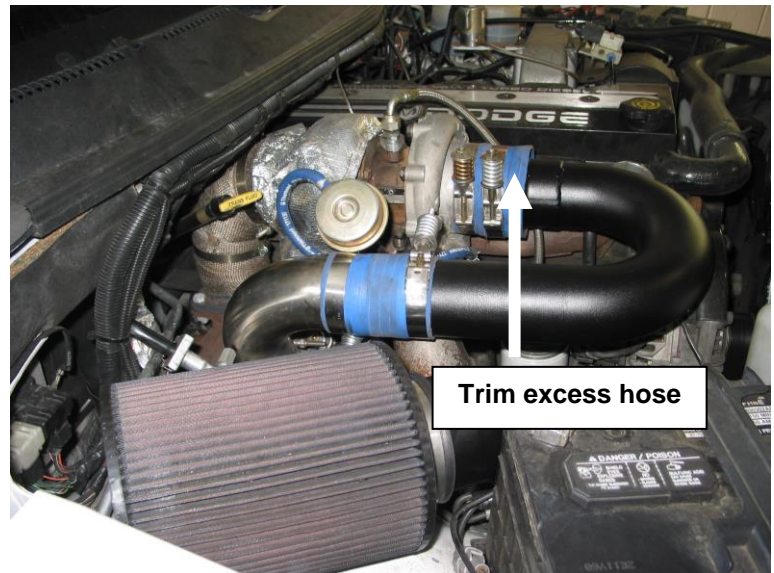
Be sure not to forget the orange factory o-ring in the elbow joint from the compressor housing to the intercooler horn and tighten the compressor housing bolts.

40. The compressor housing of the *primary turbo* should still be loose and so adjustments can be made as required. Move the compressor housing around so that the fit is secure and the tubes will not hit anything when the engine torques over.



41. Install a 4 inch silicone boot on both the *primary turbo* and *secondary turbo* compressor housing inlets – also slide two Heavy Duty 4” band clamps on to each boot for easier installation later.

42. Install a 3” silicone boot on the compressor outlet of the *primary turbo* and slide two Heavy Duty 3” band clamps onto the boot.



43. Slide the 90-degree steel pipe into the compressor outlet boot on the *primary turbo* and point the pipe outlet towards the front of the vehicle.

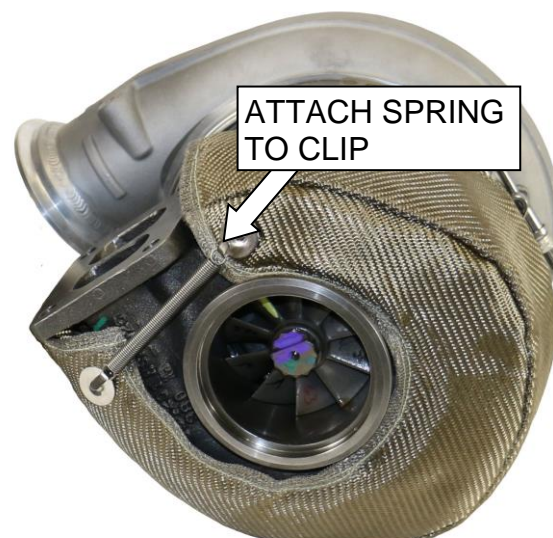
44. Install a 3” silicone boot on the 3” ‘U’ 180° pipe and slide two Heavy Duty 3” band clamps onto the boot and install it between the short 90° on the primary to the secondary turbo 4” inlet.

45. Once all intermediate pipes are lined up, the heavy-duty hose clamps can be tightened as well as the bolts on the *primary turbo* compressor housing.

46. Loosely secure the new down pipe to the *primary turbo* using the supplied V-band clamp.

Be sure to align all exhaust pipes, and then tighten the V band clamp on the back of the turbo. Once this is done you can finally clamp and weld the appropriate exhaust components.

47. Wrap the turbo heat shield blanket as shown over the top of the secondary turbo exhaust housing and secure with the springs.



Note: Spring may need to be trimmed to ensure a snug fit.

48. Install the air box spacer on the stud at the front closest to the engine. This stud is lower than the other two.

49. Insert the 4" intake tube into the air box and then into the silicone boot in the compressor-housing inlet of the *primary turbo*. Install air box onto the factory studs using the three supplied 1/4" NF nuts and the three supplied 1/4" flat washers.



50. Using a 7/16 deep socket tighten the two band clamps on the silicone boots – ensure all pipes have good contact with the boots and at least 1/8" of boot sticks out past each clamp.

51. Install the supplied air filter by inserting it onto the pipe after it has passed through the air box and secure it with the supplied 4" hose clamp.



52. Re-connect the battery terminals and refill engine coolant. Double check all connections to make sure that they are all secure and free from any damage. You now may start the vehicle, once the vehicle has start and is up to temperature re-check for leaks and ensure that all the air is out of the coolant system.

Note: The exhaust housings of the turbos may smoke slightly when new, as manufacturing residue on housing must burn off.

Periodically retighten all clamps and check for any oil or boost leaks.

IMPORTANT When idled for any length of time some oil may leak from the turbo. If the performance/boost is satisfactory and the wheel is not touching the housing (There will be some small movement), the excess oil is not a concern. Simply wipe with a clean cotton cloth and continue use.

Adjusting the Secondary Turbocharger Wastegate

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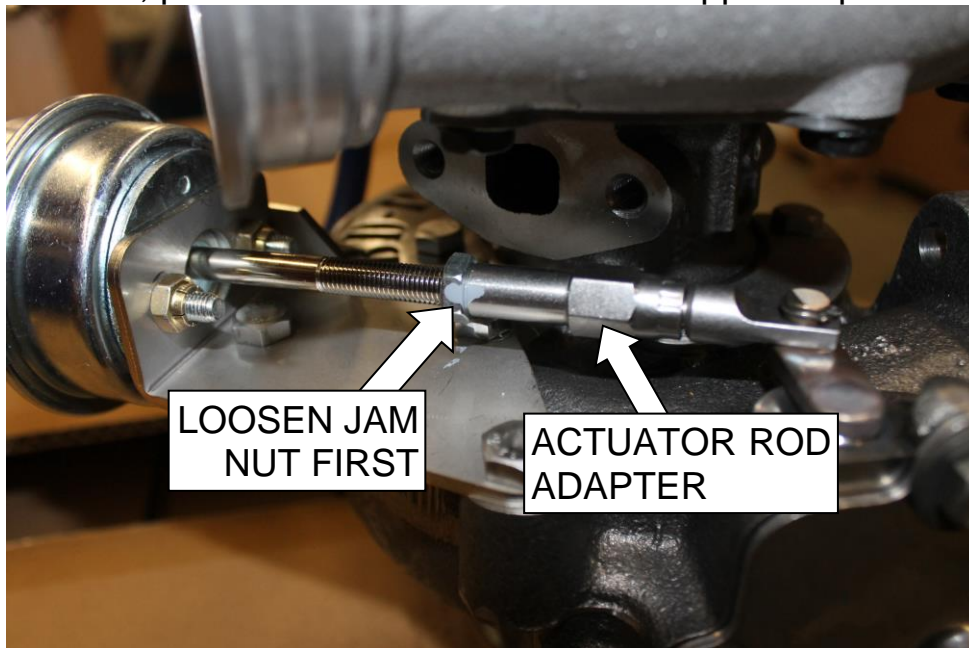
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This turbocharger may be used in both single and twin applications, and as such will need its default wastegate setting raised. BD recommends adjusting this wastegate to achieve maximum boost pressures possible, and lowering engine fueling to control boost pressure. This may be done electronically with a tuner or plug in module, or mechanically. Setting the wastegate too low will overwork the primary turbocharger and will reduce engine efficiency, raising EGTs and lowering fuel economy.

This wastegate should be set to at least 55psi for stock engines, 65psi for modified engines with head studs.

To adjust the wastegate, loosen the jam nut on the actuator rod, and turn the actuator rod adapter. Once the new setting is made, tighten the jam nut to keep the rod adapter from moving. To increase boost pressure, turn the rod adapter clockwise to shorten the distance from the actuator. To lower boost pressure, turn the actuator rod adapter counter-clockwise to lengthen the distance from the actuator. If you have questions, please contact BD's technical support department.



BD WILL NOT BE RESPONSIBLE FOR ANY FAILURES OF THE VEHICLE'S HEAD GASKET.

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