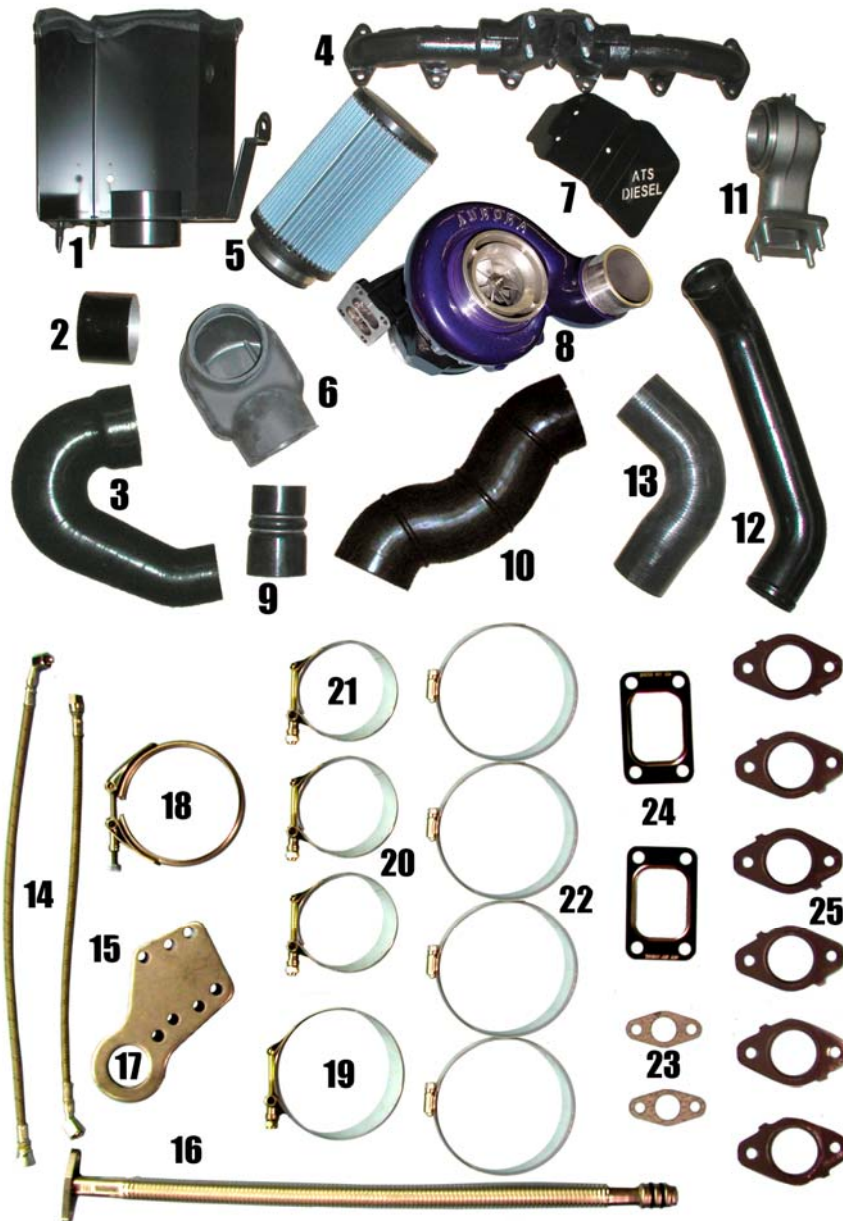




**Installation Manual v1.0:  
Aurora Plus - 4000 Turbo Kit  
(2003-2007) 5.9L Dodge**

**Please read all instructions before installation.**



**Figure 1: Aurora Plus - 4000 Kit Contents**



**Figure 2: Aurora Plus Hardware Kit**

Please make sure all of the components are in the Aurora Plus – 4000 Turbo kit before beginning installation. A complete corresponding list of parts and part numbers can be found on pages 17-19.

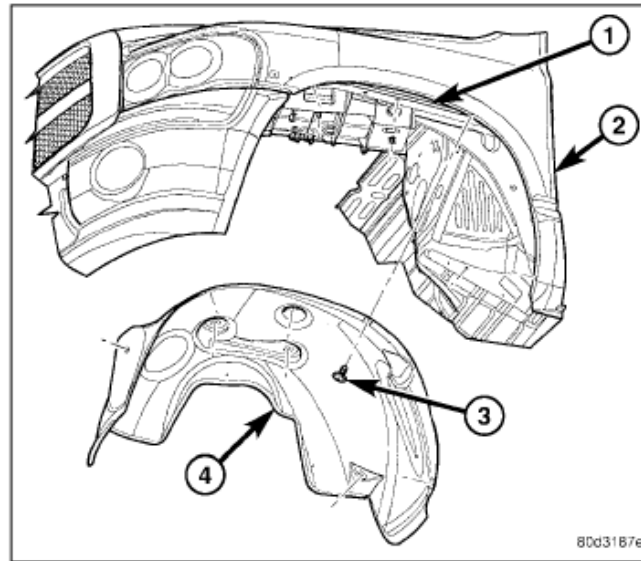
**Tools Required:**

- |                                       |                              |
|---------------------------------------|------------------------------|
| 1. Large set of I.D. snap-ring pliers | 10. 13mm deep socket         |
| 2. 7/16" drill bit                    | 11. 11/16" wrench            |
| 3. 3/32" drill bit                    | 12. Vise-grip pliers         |
| 4. Electric drill                     | 13. Needle nose pliers       |
| 5. 17mm wrench                        | 14. Square nose pliers       |
| 6. 15mm wrench                        | 15. 8mm nut driver           |
| 7. 13mm wrench                        | 16. Dikes or side cutters    |
| 8. 11mm deep socket                   | 17. (03-04 Installation) Die |
| 9. 10mm deep socket                   | Grinder w/ Round Tip         |
|                                       | Carbide Burr (shown below)   |

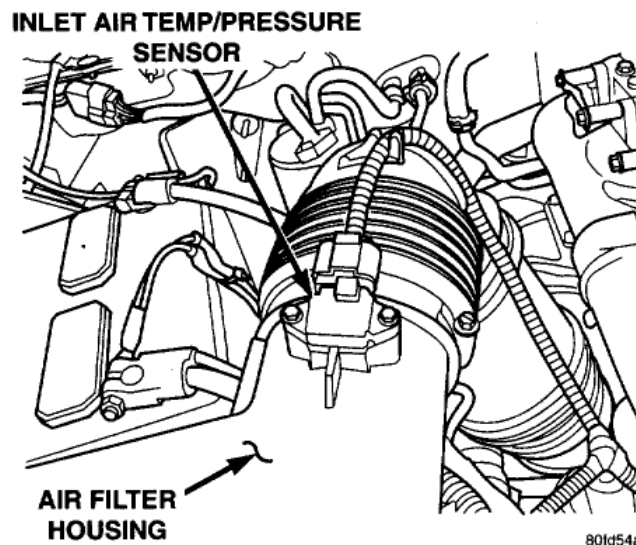


### Preparing the vehicle:

1. Set parking brake and block the wheels.
2. Disconnect batteries by removing both negative (-) terminals. Secure the negative (-) terminals away from batteries.
3. Remove the passenger side inner fender to make it easier to access the side of the engine (driver side shown).



4. Disconnect the IAT (Intake Air Temperature) sensor and remove it from the intake tube. Remove the air filter housing and intake tube.



5. (04.5-07 Trucks only) On the front of the stock turbo is a round black colored component, which is connected to the engine harness. This component is the wastegate control solenoid. Disconnect the wastegate

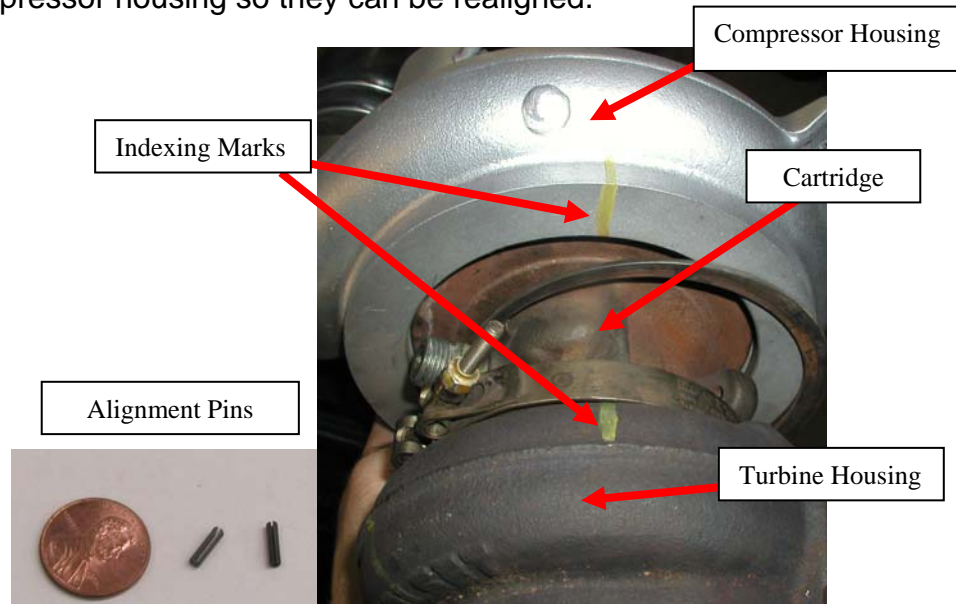
control solenoid from the engine harness and remove it from the stock turbo. Install the harness jumper provided in the kit to prevent the computer from setting the check engine light.



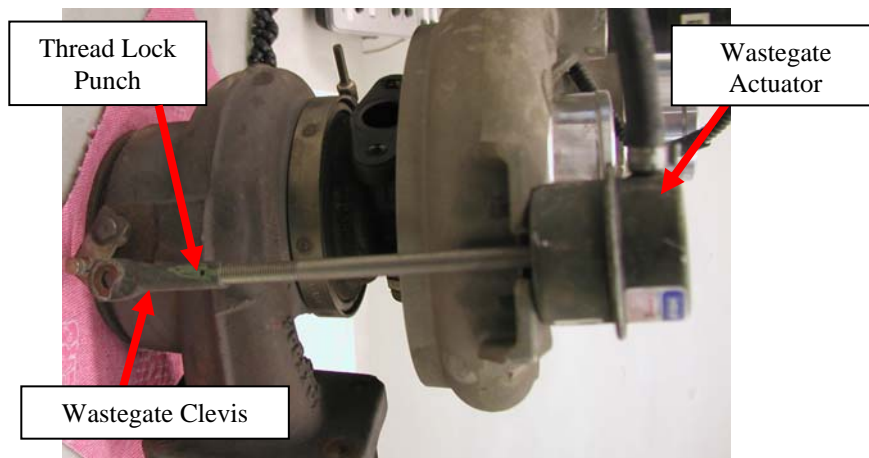
6. Remove the rubber grommet from the factory front air box and install it into the ATS air box mounting bracket. If the grommet cannot be found, a large flat washer will work.
7. Remove the factory turbo-to-intercooler charge pipe.
8. Remove the rubber hump boot on the intercooler inlet.
9. Disconnect the factory oil feed line from the top of the factory turbo and disconnect the oil drain from the bottom of the factory turbo. Retain the bolts.
10. Disconnect the exhaust by removing the v-band clamp that holds the exhaust elbow to the turbine housing. There are two locating pins that will either be stuck in the exhaust elbow or turbo outlet flange; remove and discard both pins.
11. Remove the four nuts securing the heat shield to the manifold.
12. Cut and remove the bracket securing heater hose to the manifold stud. Be sure not to cut the heater hose.
13. Using a pair of side cutters, remove the safety straps from the back four manifold bolts.
14. With the factory turbo still in place, remove the 12 manifold bolts to remove the stock turbo and manifold as one piece. Place the assembly on a workbench or equivalent sturdy work surface.
15. With the turbo/manifold assembly on the workbench, remove the four nuts securing manifold to turbo flange and separate the turbo and manifold. The four nuts can be very difficult to loosen. Use penetrating oil on stud threads before attempting to loosen nuts.

## Modifying the Factory Turbo:

1. The factory turbo cartridge must be clocked (rotated) in order to correctly mount the assembly in the new location. The oil drain must be at the bottom of the cartridge when the turbo is installed on the ATS manifold. To do this, the alignment pins inside on the cartridge flanges must be removed. To access the pins, the turbine and compressor housings must be removed from the turbo cartridge. Before disassembling the stock turbo, make two indexing marks on the turbine housing and the compressor housing so they can be realigned.

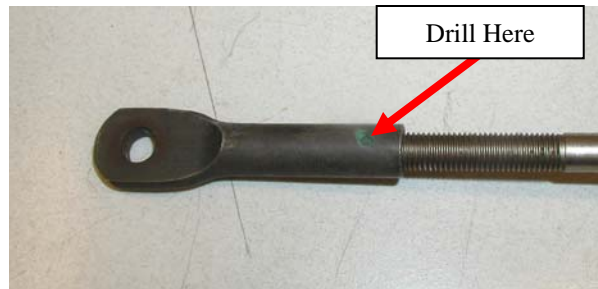


2. Remove the wastegate valve actuator by removing the e-clip that retains the rod on the lever and the two nuts that hold the actuator on the compressor housing. Disconnect and discard the rubber hose.

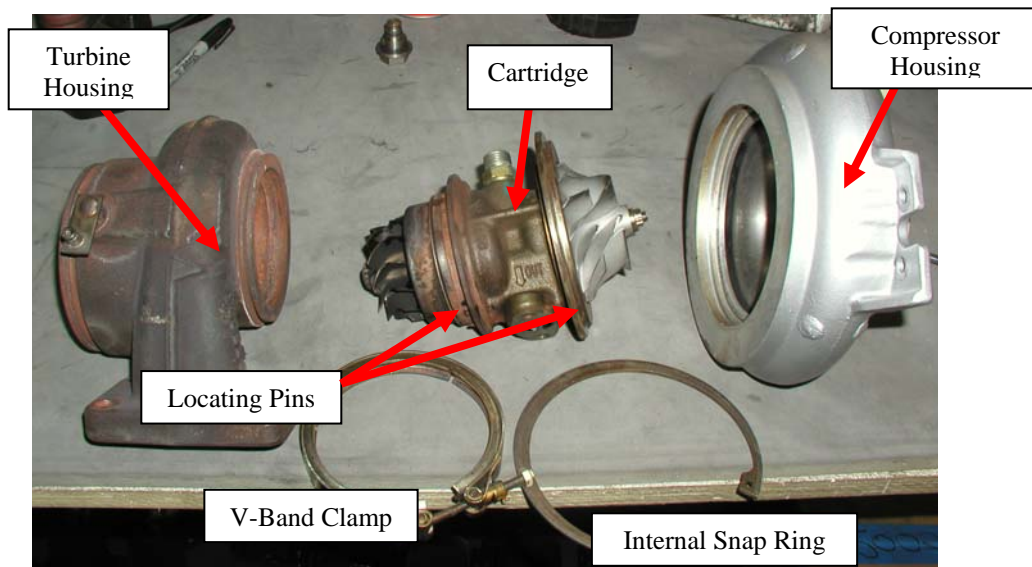


3. (04.5-07 Trucks only) The factory preload on the Wastegate adjustment rod is set to .25". The Aurora Plus system operates best at .063" (1/16") of preload. To allow for adjustment of the preload, drill out the small notch on the wastegate clevis to remove the thread lock punch. Do not use a

drill bit larger than .125". Drill deep enough to allow the clevis to break the lock on the threaded rod. Do not drill completely through the rod.



4. (04.5-07 Trucks only) After the thread lock punch is drilled out. Remove the clevis and thread on the 5/16-24 lock nut supplied with the kit. Thread on the clevis, but leave the lock nut loose to allow for adjustment later.
5. Remove the turbine housing by loosening the v-band clamp on the cartridge. While wearing safety glasses, remove the compressor housing using a large set of snap-ring pliers to release the internal snap-ring in the housing rim. Adequate snap-ring pliers are available through ATS.



6. Remove the alignment pins from both sides of the cartridge. Discard the alignment pins.

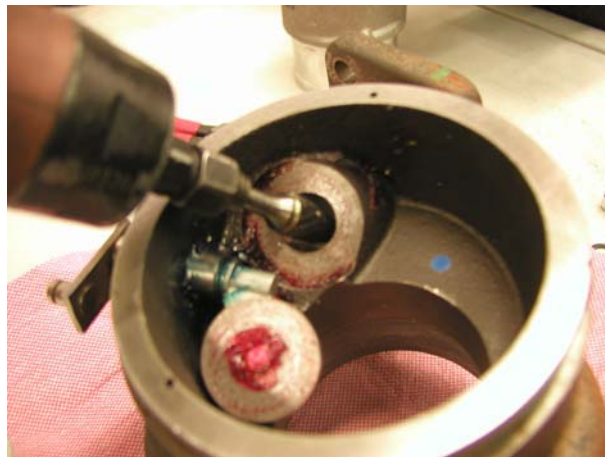
7. Remove the two 10mm studs using a set of vise-grip pliers.



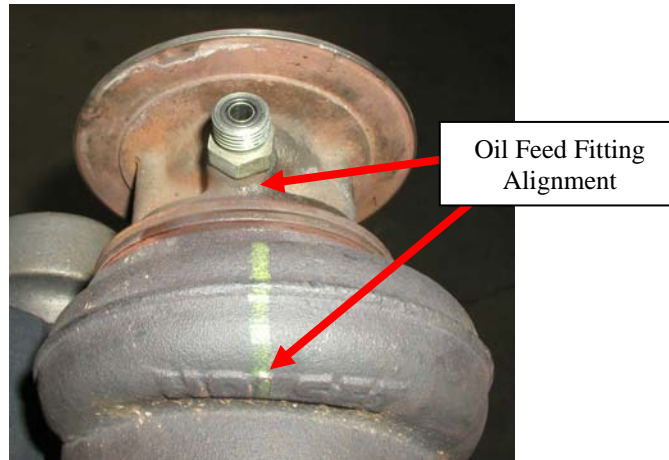
8. Drill out the two threaded holes using a 7/16" drill bit. Remove all burrs after drilling.



9. (03-04 Trucks only) The factory Wastegate hole measures .710" on the HX35 turbine housing. To maintain safe drive pressures (exhaust manifold pressure) this hole must be bored out to .840", which is just over 13/16". Use a die grinder with the carbide burr to enlarge this hole. Keep the hole as round as possible and centered. Drilling or milling the hole will provide the best finish, but a die grinder will work.



10. Reinstall the turbine housing and locate the oil feed fitting as shown in the picture below. Align the oil feed fitting with the letter "L" in the "Holset" name on the turbine housing.



11. Reinstall the compressor housing. Use the indexing marks applied in step 1 to correctly align the compressor housing with the turbine housing.



12. (04.5-07 Trucks only) Install the Wastegate solenoid plug-cap (Figure 2, #7) into the compressor housing. Make sure there are three o-rings on the plug.





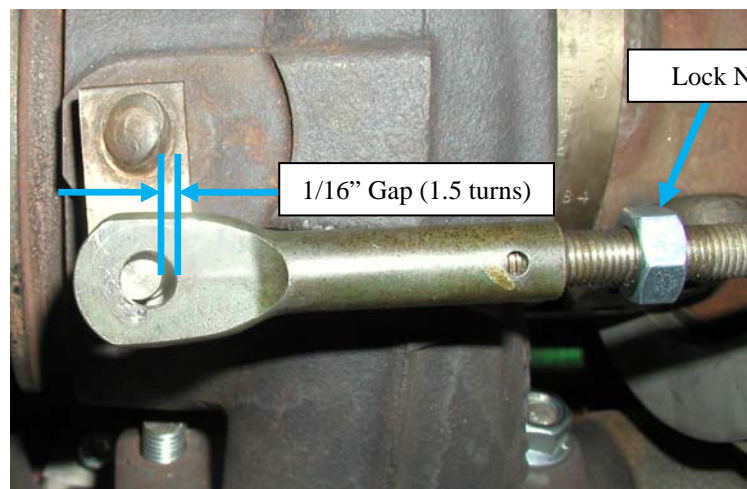
13. (03-04 Trucks only) Remove the brass 90° fitting from the front of the compressor housing. Install the 1/8NPT plug (Figure 2, #16) supplied in the kit.



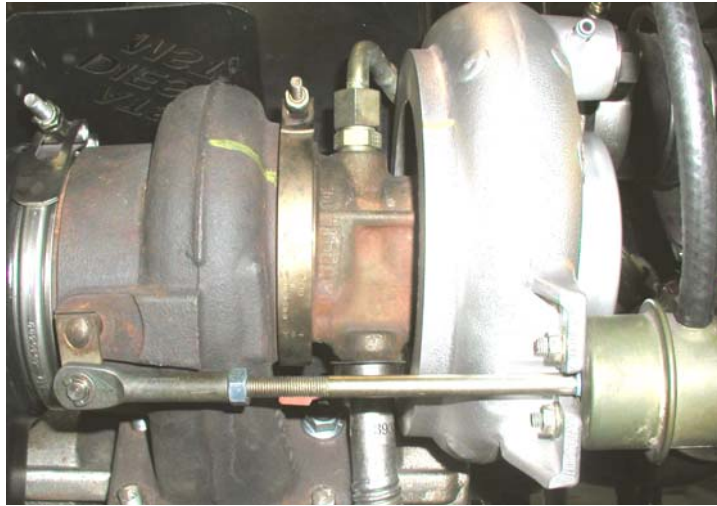
14. Remove the oil feed fitting located on the top of the cartridge. Install the provided 12mm to JIC-4 fitting with one 12mm o-ring (Figure 2, #10).



15. (04.5-07 Trucks Only) For optimal performance, set the Wastegate preload to .063" (1/16"); exactly 1.5 turns of the clevis. Thread the clevis out until it slides on the pin easily, then turn the clevis back 1.5 turns to set the preload. Too much preload will cause high EGT's and too little will cause slow throttle response. Once the preload is correctly set pull the clevis onto the lever pin. Tighten the lock nut. Secure the clevis on the lever using the original e-clip.

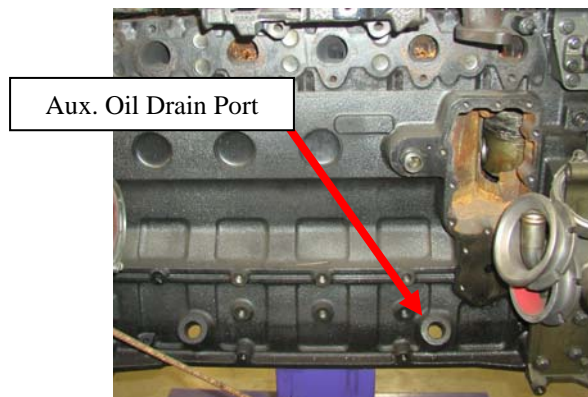


16. Make sure the Wastegate control rod is aligned correctly as shown. The picture below shows the factory turbo ready to be used on the Aurora Plus system.



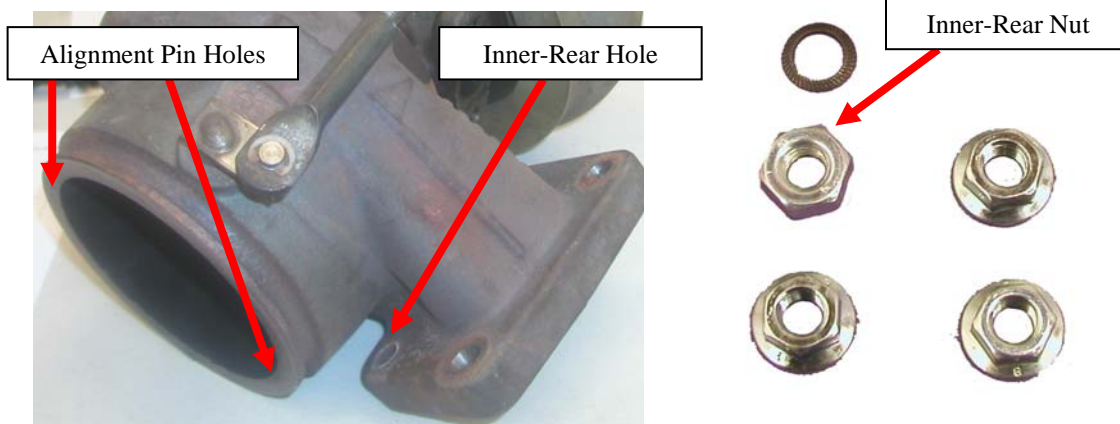
### Installing the Aurora Plus – 4000 Compound System

1. Remove the plug from the auxiliary oil drain port located on the side of the engine block just above the oil pan on the passenger side. Use a hammer and a flat tip punch to turn the plug by tapping it on one side. Do not hit the plug in the center. Once turned, grab the exposed plug edge with a set of vise-grip pliers and remove it from the engine block.

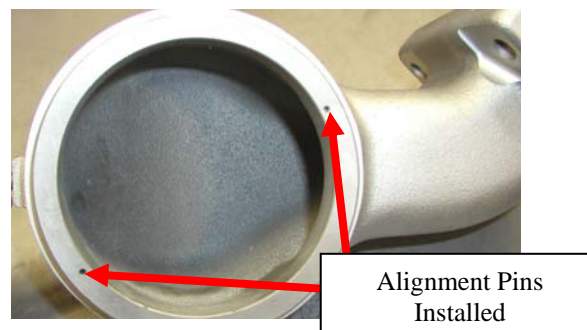


2. Once the factory turbo and ATS manifold are installed, there is not enough room to get the Aurora 4000 installed in the proper location without removing the battery. To avoid removing the battery, set the Aurora 4000 charger into the passenger side of the engine compartment. Rest the turbo on the frame in a secure position.
3. Place the ATS 3-piece manifold onto a work bench. Install the factory turbo on the ATS manifold using the provided turbo flange gasket (Figure 1, #24). The factory turbo does not provide much clearance for the inner-rear nut. A standard nut (Figure 2, #2) with a serrated washer provides

the best clearance for a wrench in this location. Install this nut first by holding the turbo just off and while turning the nut lower the turbo onto the studs. Install the three serrated flange hex nuts and use three more serrated washers. Tighten all four in a crisscross pattern.



4. Modify the factory exhaust-manifold-heat-shield by trimming off the section behind the first two sets of manifold bolts so that it can be reinstalled with the ATS exhaust manifold.
5. Install the ATS manifold and factory turbo assembly onto the engine block using the six gaskets provided (Figure 1, #25) in the kit and the trimmed heat-shield.
6. Install the compound exhaust elbow (Figure 1, #11) onto the factory turbo by aligning the pins and holes. Use the supplied 4" v-band clamp (figure 1, #18) to secure the exhaust elbow in place.

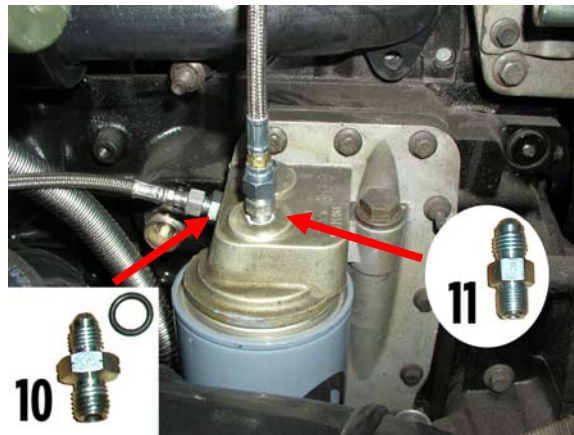


7. Once the exhaust elbow is in place, use (4) flange hex nuts, (4) serrated washers, and the gasket supplied (Figure 1, #24) in the kit to connect the Aurora 4000 turbo to the exhaust elbow. Use a small amount of heavy grease to hold the gasket in place while lifting the Aurora 4000 up to the exhaust elbow.
8. Use the three supplied 8mm hex flange bolts to attach the supplied heat shield (Figure 1, #7) to the rear of the exhaust elbow.

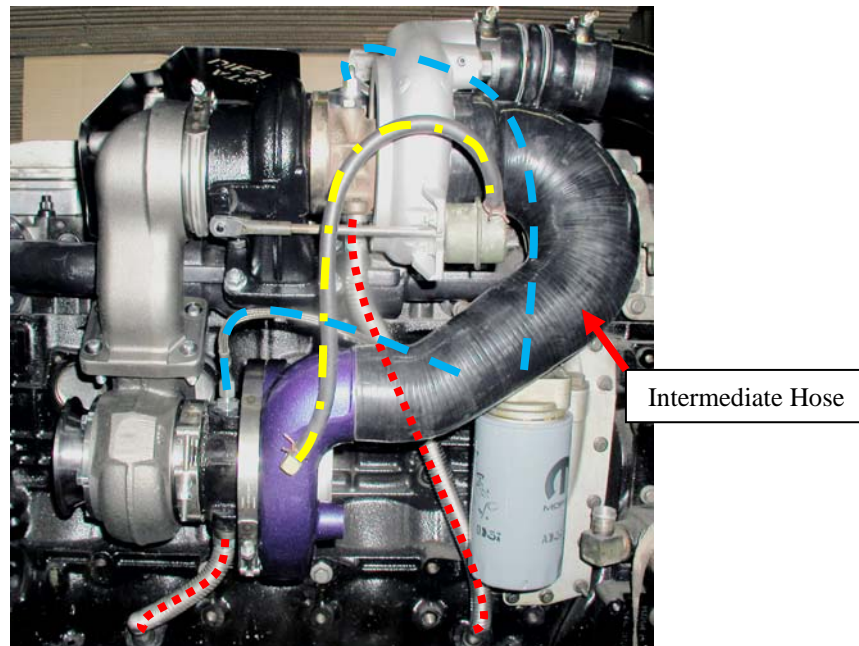
9. Connect the factory oil drain tube to the Aurora 4000 using the gasket provided in the kit (Figure 1, #23) and the two 8mm x 20 bolts (Figure 2, #12).
10. Route the supplied long drain tube (Figure 1, #16) from the front oil drain port up to the factory turbo charger. Try to route the drain tube as close to the engine block as possible to make room for the intake tube.
11. Install the intake tube (Figure 1, #10) using the 4" clamps provided. Use the 4" coupler (Figure 1, #2) provided to connect the compact 90° boot (Figure 1, #6) and the 4" intake tube (Figure 1, #10).



12. Remove the factory oil feed fitting from the side of the oil filter housing and remove one of the plugs from the top of the oil filter housing.



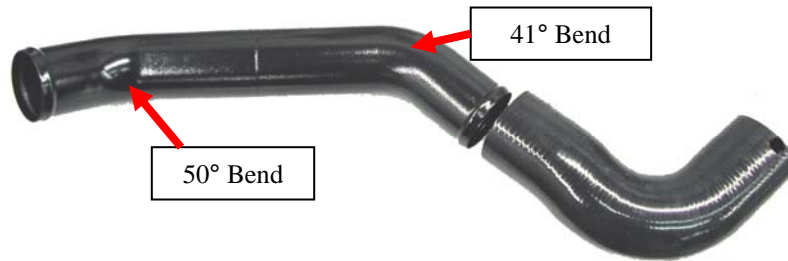
13. Install the supplied 14mm to -4 JIC (Figure 2, #10) oil feed fitting into the side of the filter housing and the 1/8NPT to -4 JIC (Figure 2, #11) oil feed fitting into the top of the filter housing.
14. Install the supplied 14" oil feed line (Figure 1, #15) from the filter housing to the oil feed fitting on the Aurora 4000. Route the oil feed line away from the exhaust manifold. Connect the 45° fitting to the Aurora 4000.
15. Install the supplied 17" oil feed line (Figure 1, #14) from the fitting on top of the filter housing to the oil feed fitting on the factory turbo. Route the oil feed line away from the exhaust manifold and turbine housing. Connect the 90° fitting to the factory turbo.



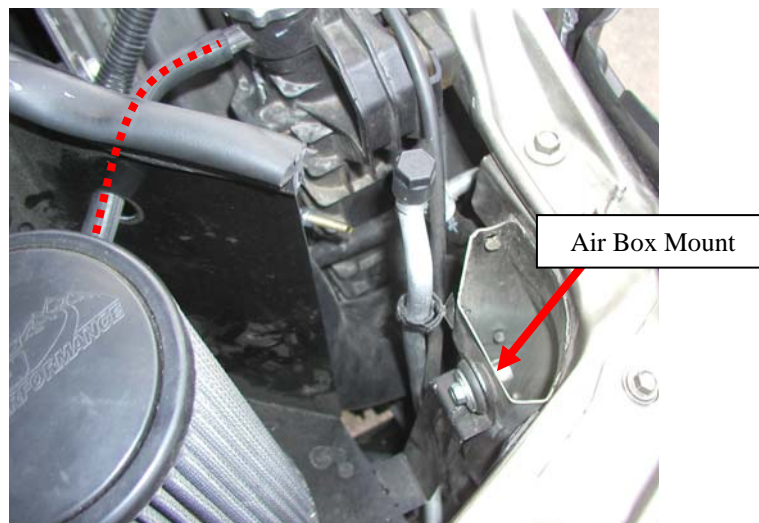
**Figure 3: Line and Drain Tube Routing**

16. Connect the Wastegate actuator to the port on the Aurora 4000 compressor housing using the  $\frac{1}{4}$ " rubber line and two hose clamps (Figure 2, #15) supplied in the kit. The yellow dashed line in Figure 3 shows the correct routing.
17. Use the 4.5" (Figure 1, #19) and the 3.25" (Figure 1, #20) T-bolt clamps provided in the kit to install the intermediate hose (Figure 1, #3). This hose connects the outlet of the Aurora 4000 to the inlet of the factory charger. Make sure both clamps are tight and seated behind the ribs. If the clamp is tightened on top of the inlet or outlet rib, the intermediate hose may blow off during driving.
18. Install the 2.75" to 3" reducer hose (Figure 1, #9) on to the outlet of the factory charger using the original 3.25" T-bolt clamp.
19. (2007 Trucks only) The engine lift mount located on the engine block behind the alternator will have to be replaced with bracket (Figure 1, #17) provided in the kit to make room for the turbo-to-intercooler charge pipe. Install the bracket by removing the alternator and bolts that secure it to the block.
20. Install the 2-bend silicone (Figure 1, #13) elbow onto the intercooler inlet. The A/C line that is connected to the A/C compressor and the condenser must be routed on the driver's side of the 2-bend silicone elbow.
21. Install the charge tube (Figure 1, #12) with the 41° bend connected to the 2-bend elbow and the 50° bend connected to the reducer boot on the factory charger.

Note: The 2-bend elbow supplied with this kit will fit intercoolers with 3" inlets only. If the truck is equipped with an after-market intercooler that has 3.5" inlets please order P/N 2272-202-026 from ATS Diesel.



22. Install the ATS air box (Figure 1, #1) by setting the enclosure into the rubber mounts on the battery tray. To connect the 90° compact boot, reach through the opening in the base of the enclosure and pull the compact 90° boot onto the air box enclosure then tighten the 4" hose clamp to secure it in place.
23. Use the 6mm x 25mm (Figure 2, #8) bolt supplied in kit to secure the air box mount to the fender support through the grommet removed from the factory air box.



24. Route the radiator overflow line through the air box grommet and reconnect it to the radiator fill spout.
25. Install the air filter (Figure 1, #5) provided in the kit and secure it using a 4" clamp.

26. Install the IAT sensor into the side of the ATS air box using the 10- $\frac{3}{4}$ " sheet metal screws provided.



27. Connect the exhaust system to the Aurora 4000 turbine housing using the factory components.
28. Install the Map Sensor Voltage Cap (Boost Fooler) (Figure 2, #14) by following the instructions included in the hardware kit for the 03-07 Dodge. The MAP sensor is located on the driver side of the engine on the intake plenum cover.
29. Double check all T-bolt clamping points to make sure the clamps are secure and properly seated. Reconnect the batteries.

## Troubleshooting

### 1. *The turbo response is slower than my stock setup:*

(04.5-07 Trucks only) Check to make sure the Wastegate actuator preload is set to 1/16" preload.

Make sure the Wastegate actuator line is connected to the compressor housing on the bottom (Aurora) turbocharger as shown in Figure 3.

Check for leaks in both the exhaust system and charge air system.

Drive pressure in the manifold should be 55-60 psi max and the system should make 38-44 psi of boost.

### 2. *EGT's are not lower than the stock turbo:*

Make sure the Wastegate rod preload was correctly set to 1/16".

(03-04 Trucks only) The stock turbo Wastegate hole measures .710 and needs to be bored out to .840. If the hole was not bored out, refer to step 9.

### 3. *A check engine light was set while driving with high boost:*

Make sure the Boost Fooler was correctly installed.

Have Any Questions?

Thank you for purchasing the Aurora Plus – 4000 Turbo kit. Please check our website at <http://www.atsdiesel.com> for technical support and other performance products such as the 5-Star™ torque converter, ATS High Performance Valve Body and ATS High Performance Transmission along with our full line of power enhancers. Please call or e-mail our Technical Service Department, 8:00am to 5:30pm Mountain Standard Time, Monday through Friday.

### **Contact Information**

Toll Free: 800-949-6002

Local: 303-431-7973

Fax: 303-431-0135

Website: [www.ATSDiesel.com](http://www.ATSDiesel.com)

Email: [info@ATSDiesel.com](mailto:info@ATSDiesel.com)

We strive to make our instructions as clear and complete as possible. To achieve this, our instructions are under constant construction. We encourage you to visit our website. If you have any suggestions as to how we can improve this installation manual, let us know at <mailto:Suggestions@ATSDiesel.com>.



**Bill of Materials**

1. Air Box Enclosure 2272-206-030
2. 4" Intake Tube Connector (4in OD X .065 X 4") 1000-206-005
3. Silicone Intermediate Hose 2272-202-004
4. 3-Piece 24V Manifold M59-24
  - a. (1) 1.625" stud installed and (3) 2" studs installed
5. ATS Air Filter w/ 4" Clamp 1000-206-410
6. 4" 90° Compact Rubber Boot 90CB40
7. Heat Shield, (used on Plus Elbow) 2272-202-043
8. Aurora 4000 Turbo Assembly 2272-202-400
9. 2.75" to 3.00" Reducer Boot 2272-202-017
10. 4" Reinforced Silicone Intake Tube 2272-206-027
11. Compound Exhaust Elbow 2272-202-042
  - a. (2) alignment pins 98296A122
  - b. (4) 2" studs installed
12. CR Charge Pipe (turbo to intercooler) 2272-202-006A
13. 3" 2-Bend Elbow 2272-202-025
  - a. 3" to 3.5" 2-Bend Elbow 2272-202-026 (not included unless specified with original order, use with 3.5" intercoolers)
14. 17" Oil Feed Line 2164-202-028
15. 14" Oil Feed Line 2272-202-046
16. 22" Flexible Drain Tube 3934084
17. (2007+ Only) Engine Lift Bracket 5086831AA
18. 4" V-Band Clamp for Plus Elbow 3535399
  - a. ¼-28 Lock Nut
19. 4.5" T-Bolt Clamp 94100-0450

20. (2) 3.5" T-Bolt Clamp 94100-0350
21. 3.25" T-Bolt Clamp 94100-0325
22. (4) 4.5" Worm Drive Hose Clamp ET-72
23. (2) Gasket, Oil Drain Flange 3937706
24. (2) Gasket, Exhaust Flange (open) 3919369 or 196570
25. (6) Gasket, Exhaust Manifold Flange 3946275

Aurora Plus Hardware Kit

1. (7) M10-1.5 Serrated Flange Hex Nut
2. (1) M10-1.5 Standard Hex Nut
3. (2) #10 x 3/4" Sheet Metal Screws 90054A245
4. Extra 7/32" e-clip 98407A122
5. (8) 10mm Serrated Belleville Washer 93501A031
6. (3) M8-1.25 x 12 Flange Bolts
7. Wastegate Solenoid Plug-Cap 2272-202-003
  - a. 10mm O-ring 9263K143
  - b. 11mm O-ring 9263K623
  - c. 20mm O-ring 9263K305
8. 6mm-1.0 x 25mm Hex Head Flange Bolt 98093A445
9. 5/16-24 Hex Nut
10. (2) Oil Feed Fitting (12mm to JIC-4) 30J041215R
  - a. (2) O-ring 9262K671
11. Oil Feed Fitting (1/8NPT to JIC-4) 4FTX-S
12. (2) M8-1.25 x 20 Flange Bolts
13. Wastegate Solenoid Harness Jumper 2272-202-010
14. Map Sensor Voltage Cap (Boost Fooler)
  - a. (3) section of heat shrink

- b. (3) non-insulated butt connector
  - c. ring terminal
15. 16" Section of 1/4" rubber line
- a. (2) spring clamp for 1/2" OD hose 5324K12
16. 1/8NPT Pipe Plug 50785K918

Not Pictured:

- 1. Optional: Internal Snap Ring Pliers 5449A98
- 2. Instruction Manual: 2272-202-942-INST
- 3. ATS Warranty [www.atsdiesel.com/warranty](http://www.atsdiesel.com/warranty)



**Pick List v1.0:  
Aurora Plus – 4000 Kit  
(2003-2007) 5.9L Dodge**

Quantity	Description	P/N	Check
1	Air Box, Dodge Compounds	2272-206-030	
1	4" Intake Tube Connector	1000-206-005	
1	Silicone Intermediate Hose (elephant trunk)	2272-202-004	
1	3-Piece Manifold (studs installed, 1 short stud)	M59-24	
1	ATS Air Filter	1000-206-410	
1	4" Compact Rubber Boot (cobra head)	90CB40	
1	Heat Shield (for exhaust elbow)	2272-202-043	
1	Aurora 4000 Turbo (assembled for plus kit)	2272-202-400	
1	2.75" to 300" Reducer Boot	2272-202-017	
1	4" Reinforced Silicone Intake Tube	2272-206-027	
1	Plus Compound Exh Elbow (4 studs, 2 pins)	2272-202-042	
1	CR Charge Pipe (turbo to intercooler)	2272-202-006	
1	3" 2-bend Elbow	2272-202-025	
If Noted	3" to 3.5" 2-bend Elbow (if on invoice)	2272-202-026	
1	17" Oil Feed Line	2164-202-028	
1	14" Oil Feed Line	2272-202-046	
1	22" Flexible Oil Drain Tube	3934084	
1	Engine Lift Bracket (2007 only)	5086831AA	
1	4" V-Band Clamp (with ¼-28 lock nut)	3535399	
1	4.5" T-Bolt Clamp	94100-0450	
2	3.5" T-Bolt Clamp	94100-0350	
4	4.5" Worm Drive Hose Clamp	ET-72	
2	Gasket, Oil Drain Flange	3937706	
2	Gasket, Exhaust Flange (undivided, T3)	3919369	
6	Gasket, Exhaust Manifold Flange	3946275	

Assembled By: \_\_\_\_\_

Date: \_\_\_\_\_

### Plus Hardware Kit

Quantity	Description	P/N	Check
7	M10-1.5 Serrated Flange Nut	M10WHIZ	
1	M10-1.5 Hex Nut	M10NUTB	
3	M8-1.25 x 12 Hex Flange Bolt	4280	
2	#10 x 3/4" Sheet Metal Screw	84931D	
2	M8-1.25 x 20 Hex Flange Bolt	4282	
1	M6-1.0 x 25 Hex Flange Bolt	4268	
1	5/16-24 Hex Nut	A111	
1	7/32" E-Clip	98407A122	
8	10mm Serrated Belleville Washer	93501A031	
1	Map Sensor Voltage Cap (Boost Fooler)	VBA	
1	Wastegate Solenoid Plug Cap (with 3 o-rings)	2272-202-003	
1	5/16-24 Hex Nut	A111	
2	Oil Feed Fitting 12mm to JIC -4 (ea with o-rings)	30J041215R	
1	Oil Feed Fitting 1/8NPT to JIC -4	4FTX-S	
16"	1/4" High-Temp Silicone Hose (w/ 2 clamps)	6722-0250050	
1	1/8NPT Pipe Plug	4534K41	

Assembled By: \_\_\_\_\_

Date: \_\_\_\_\_