(I-00300)

BD Engine Brake LIMITED WARRANTY STATEMENT

BD Engine Brake (the "Seller") warrants the following product(s):

All products manufactured or rebuilt by the Seller are to be free from defects in material or workmanship, which includes but is not limited to Turbochargers, Exhaust and Intake manifolds, Exhaust brakes, Intercoolers, Flex Plates, Transmissions, Torque Converters, Oil pans, Fuel pumps and systems, Electronic monitors and control systems. The Seller warrants to the original buyer of the product (the "Buyer") that it will repair or replace, free of charge, any product which has a defect in material or workmanship within the warranty period described below. Copy of original invoice is required to qualify for warranty.

A defect is defined as a condition within the product that would render the product inoperable under normal conditions of use and service. The Seller's responsibility under this Warranty is limited to the repair or replacement, at the Seller's option, of any warrantable product returned prepaid with complete service history and proof of purchase. A valid proof of purchase is a dated bill of sale or receipt.

A Return Material Authorization (RMA) number, obtained in advance from a customer service representative of the Seller and the dated bill of sale or receipt, must accompany any product returned by the Buyer for warranty determination. The Seller will be the final authority on the approval of all warranty claims hereunder. The issuance of a RMA number does not represent an approval of a warranty claim. BD reserves the right to return or replace Warranty Approved items freight Prepaid. While warranty denied or rejected, claims will be returned freight collect. Accepted warranty products, which have been replaced, will become the sole property of BD.

Until the Seller has approved a warranty claim, the Buyer will be responsible for all costs. Replacement parts and the labor costs incurred by the removal and replacement of the product while performing warranty work will be the responsibility of the Buyer. In no case does the obligation of the Seller exceed the original purchase price of the product as indicated on the original bill of sale or receipt. Under no circumstances will the Seller be liable for any travel time incurred in diagnosis for defects, or any other contingent expenses.

Only once the claim is approved, and depending on if the warrantable product is eligible, labor costs will be considered for the removal and replacement if an eligible part at an hourly rate of $100.00 per hour. The end user may be responsible for the difference between the BD warranty labor rate and the authorized service dealer's labor rate. BD recommends the end user negotiate these conditions before the service is performed. As well the end user may be responsible for additional freight charges from FOB Abbotsford, BC / Washington.

To the extent permitted by law, the Buyer hereby waives all rights other than those expressly set out herein and acknowledges that this warranty sets out the Buyer's exclusive remedies with respect to products covered by it. This warranty shall not be extended, amended or varied except by written instrument signed by the Seller and the Buyer. If the buyer replaces the product from the Seller with another from another manufacturer, the Buyer-Seller warranty contract is void and the RMA Claim will be terminated. Any claim for remuneration will be rejected.

The Seller will administer warranty requests on products sold by the Seller and not manufactured by the Seller by forwarding claims made by a Buyer under the manufacturer's warranty to the manufacturer. The final disposition of such claims will be made by the manufacturer and ruled by the laws of British Columbia, Canada.

Customer assumes risk in purchasing product with in 30 days may return the product for exchange of other BD products or services only. No cash refunds are available.

The installation of BD aftermarket parts may void the OE warranty. BD is not responsible for OE warranties or how they are administered. Residents of the U.S.A. can reference the Magnuson-Moss warranty act that protects the consumer on the installation of aftermarket parts, please research this act to base your decisions accordingly.

In the case the warranty is denied, BD at its discretion, may offer to refurbish (where applicable) the product at discounted rate for the end user.

Please refer to Warranty time limitation per product.

NOT COVERED UNDER THIS WARRANTY

This warranty is limited to the original purchaser of the product and is not transferable to subsequent owners. Specifically excluded from this warranty are failures of products caused by misuse, misapplication, negligence of the Buyer, accidents, modification, abuse, improper storage, installation, repair or operation, use of unauthorized parts or other mistreatment of the Buyer or his agent. Any competitive use, sled pulling, drag racing will void warranty on product. A sheared or twisted shaft, broken planetary gear sets, burned clutches, broken drive hubs, sun gear damage, cracked housings are not covered. Damage caused from debris in oil contaminated coolers, improper fluids and filters or damage caused from fuel or air contamination, Biodiesel, low fluid levels are also not covered. This warranty does not cover deterioration of plating, paint or any other coating, linings or parts that are subject to normal wear and tear, such as light bulbs, fuses, bearing wear, seal wear, etc.

In the case of BD transmissions, a BD torque convertor must be installed at the time of installation of the transmission. Use of a 3rd party or OE convertor may invalidate the transmission warranty.

If product is not installed by a trained and authorized BD dealer, installation facility must prove it is properly tooled and has certified training to have installed or to carry out repair of product.

The Seller also disclaims any liability for incidental or consequential damages including but not limited to, repair labor, rental vehicles, hotel cost or any other inconvenience cost. To the extent permitted by law, this warranty is in lieu of all other warranties or guaranties, either expressed or implied, included the implied warranties of merchantability and fitness for a particular purpose and shall not extend to any Buyer or to any person other than the original purchaser residing within the boundaries of the continental U.S. or Canada. As well the seller is not responsible or obligated to update previously manufactured parts that are currently under the above warranty.

NOTE THAT THIS GUARANTEE WILL BE VOID IF THE USER BREACHES THE CONDITIONS IN THE SECTION LABELED "NOT COVERED UNDER THIS WARRANTY" AND IS ONLY APPLICABLE ON THE PRODUCTS THE SELLER MANUFACTURES.

DISCLAIMER OF LIABILITY

Other than as expressly set forth herein, the Seller, together with its distributors, jobbers and dealers shall in no way be responsible for the product's proper use and service. In no event shall the Seller be liable for any special, incidental, indirect or consequential damages of any kind or nature, whether or not the Buyer was advised of the possibility of damage, arising or resulting from the use or performance of the product, and the Buyer hereby waives any and all such claims.

The Buyer acknowledges that he/she/it is not relying on the Seller's skill or judgment to select or furnish goods suitable for any particular purpose and that the Seller has no liability that will extend beyond the scope of the limited warranty contained herein, and the Buyer hereby waives all remedies or liabilities, expressed or implied, arising by operation of law or otherwise, (including, without limitation, any obligations of the Seller with respect to fitness for any particular purpose; merchantability; and special, incidental, indirect or consequential damages) or whether or not occasioned by the Seller's negligence.

The Seller disclaims any warranty and expressly disclaims any liability for personal injury or damages related to the Buyer's use of the product. The Buyer acknowledges and agrees that the disclaimer of any liability for personal injury is a material term for this Agreement and the Buyer agrees to indemnify the Seller and hold the Seller harmless from any claim related to the product and its use or performance. Under no circumstances will the Seller be liable for any damages, liabilities, costs or expenses incurred as a result of by reason of the use, performance or sale of the product, including without limitation, any damages, liabilities, costs or expenses incurred by reason of the Buyer's negligence related to those uses of the product as a result of the removal of the speed limiter.

The Seller assumes no liability regarding the improper installation or misapplication of the product. It is the installer's responsibility to check for proper installation, and, if in doubt, contact the manufacturer.

Limited Warranty Details			
Product Name	Parts (Months/Miles)1	Labor (Months/Miles) 1,2	Notes
Torque Converters	36/ 150,000	12/12,000	No Race abuse covered
Transmissions (TowMaster & TorqueMaster)	36/ 150,000	12/ 24,000	No Race abuse or broken shafts covered. Remote filter required for inspection with a cooler flow rate in GPM at Oil/Air transmission cooler outlet. Freight provision allowed.
Transmissions (RoadMaster)	24/ 100,000	12/ 24,000	
Rebuild/Repair Transmission	12/ 24,000	12/ 24,000	Defined as “Cost of Repair” or repaired units that fall outside of the retail warranty period.
Race Transmissions	12/ 24,000	Not Eligible	
Valve / Accumulators Bodies	12/ 24,000	12/ 24,000	
Transmission Pans	36/ 150,000	Not Eligible	
Flex Plates	36/ 150,000	Not Eligible	
Injectors (Mechanical) & Injection Pumps	12/ 24,000	12/ 24,000	VP44/P7100 Race Pumps 90 days parts/No labor coverage
Performance Injector Nozzles (Common Rail)	Not Eligible	Not Eligible	
Common Rail Injectors	24 Months	Not Eligible	Manufacturing and material defects are only covered. Cracks caused by high fuel pressure are not covered. High Return flow not covered after 12 months on Performance Injectors. For No Hassle Eligibility, see https://us.bddiesel.com/pages/extended-warranty
	24 Months + No Hassle	Not Eligible	
Performance Tuners and Chips	Manufacturer[3]	Not Eligible	
BD Electronic Modules (TSB, VVB, etc)	24/ 48,000	Not Eligible	
Intake / Exhaust Manifolds	36/ 75,000	Not Eligible	
Exhaust Up pipes	12/24,000	Not Eligible	Surface rust not eligible.
Exhaust Kits	Manufacturer[3]	Manufacturer[3]	
Hoses / Clamps	12/ 24,000	Not Eligible	
BD Xtruded Transmission Cooler	12/ 24,000	Not Eligible	
Manual Transmission Clutches	Manufacturer[3]	Manufacturer[3]	
Short Shifters	12/ 24,000	Not Eligible	
Engine / Head Stud kits	Manufacturer[3]	Manufacturer[3]	
Positive Air Shutoff / Electronic Positive Air Shutoff	24/ 24,000	Not Eligible	
Exhaust Brakes	24/ 24,000	12/ 24,000	
Gauges and Mounts	Manufacturer[3]	Manufacturer[3]	
Screamer Turbos	24 Months	Not Eligible	24 Month warranty effective for sales after 11/01/2024
Performance/OEM Turbos	12 Months	Not Eligible	
Remanufactured ISX Turbos	90 Days	Not Eligible	See I-00437 for more details. For 1045880, see OEM Turbos.
Auxiliary Fuel Pumps	12/ 12,000	Not Eligible	
BD FICM	12 Months	Not Eligible	
Fuel Control Plate/Pin (VE & P7100)	24 Months	Not Eligible	
Distributed Product (Not Manufactured by BD)	Manufacturer[3]	Manufacturer[3]	
Replacement Components	12 Months	Not Eligible	
Transmission Rebuild/Build It Kits	12 Months	Not Eligible	Material Defects Only
Steering & Suspension Parts (Track Bar, Caster kit, Steering Stabilizer, Bars and links)	Limited Lifetime (12 months if not registered)	Not Eligible	Must register online within 30 days of purchase to be eligible. See website https://warranty.bddiesel.com/limited-lifetime/ for details. Excludes normal wear & tear (boots, bushings, joints, bearings) and improper use.
Venom/FlowMAX Fuel Lift Pump Kit	Limited Lifetime (12 months if not registered)	Not Eligible	Must register online within 30 days of purchase to be eligible. See website https://warranty.bddiesel.com/limited-lifetime/ for details. Excludes normal wear/service items (hose, filters) and improper use.

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[1] Warranty is based on whichever occurs first (Months or Mileage).

[2] Prior approvals must be given to qualify for labor reimbursement.

[3] As per Manufacturer’s warranty

Updated 10/21/2024

DOWNLOAD COLOUR INSTALL MANUALS AT www.bddiesel.com

Dodge 6.7L Drop-in Turbocharger

1045775	2007-2012 Dodge 6.7L ISBe	Stock Replacement
1045778	2013-2018 Dodge 6.7L ISBe	Stock Replacement
1045770	2007-2012 Dodge 6.7L ISBe	Screamer Turbo*
1045771	2013-2018 Dodge 6.7L ISBe	Screamer Turbo*

***Meets CARB Requirements for the following Models (EO D-553-5):**
2009: 3500
2013-2018: 2500,3500
***Meets SEMA Certified Emissions for the following Models (SC-BDD01-0018):**
2007-2010, 2012 2500

PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION

PRE-INSTALLATION

A new turbocharger will not solve any of the following failures:

- Oil contamination
- Restrictive oil drain and/or oil supply
- Overspeed due to boost leaks
- Exhaust leaks due to faulty seals and/or clamps

Turbo overspeed will lead to premature turbo failure. Boost pressure can be used to estimate turbo speed. The table shows maximum allowable turbo speed at 3200RPM. A restrictive intake or a boost leak will lead to increase in turbo speed and cause an overspeed failure.

Max Turbo Speed	Max Boost (psi)
121,000 RPM	38

Pre-Installation Inspection

When replacing a turbocharger BD recommends the following precautions are taken:

- Replace or clean the air filter.
- Change the engine oil and filter.
- Inspect Intake and CAC passages for debris, and clean if necessary.

In the case of a previous failure also include the following steps:

- Inspect CAC for debris and cleanout if necessary.
- Inspect engine oil for debris. Flush system if debris was present.

Ensuring that these steps are followed will prolong the life of your new turbocharger.

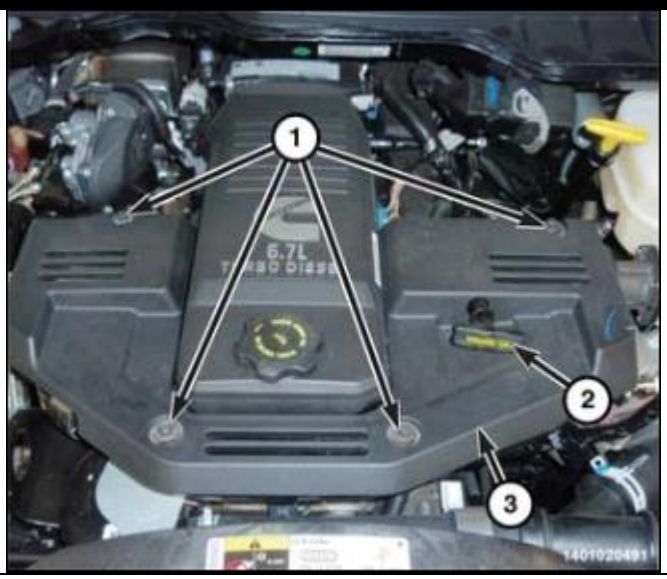
Kit Contents

	4891288	5260648
		
Dodge 6.7L Turbo Screamer/Stock	Oil Drain Gasket	Turbine Housing Gasket
Qty: 1	**Qty: 1**	**Qty: 1**

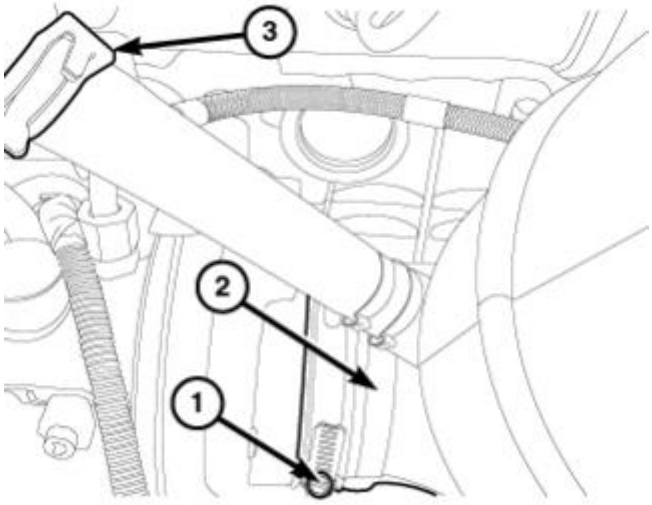
1406853	1462430
	
Seal; Bonded 16.7mm	M10-1.5x30 – M10-1.5x42 Stud
Qty: 4	**Qty: 3**

REMOVAL

1. Disconnect and isolate both of the negative battery cables.
2. Remove the right battery tray.
3. Remove the engine oil dip stick (2).
4. Remove the bolts (1) and the engine cover (3).



5. Remove the air cleaner body.
6. Disconnect the breather hose (3).
7. Loosen the clamp (1) and remove the air tube (2) from the turbocharger.



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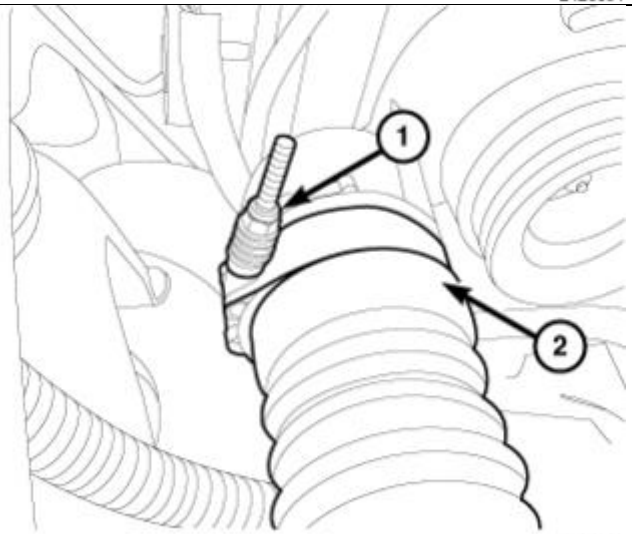
8. Remove the right-side wheelhouse splash shield.
9. Loosen the clamp (1) and remove the right Charge Air Cooler (CAC) tube (2).



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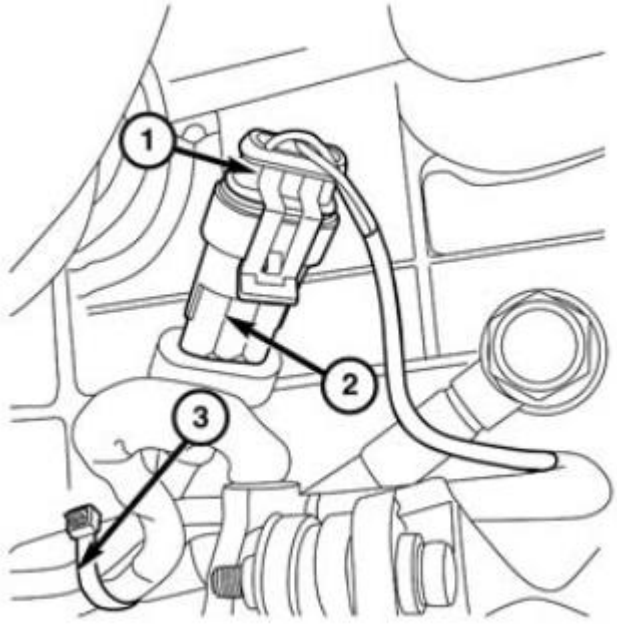
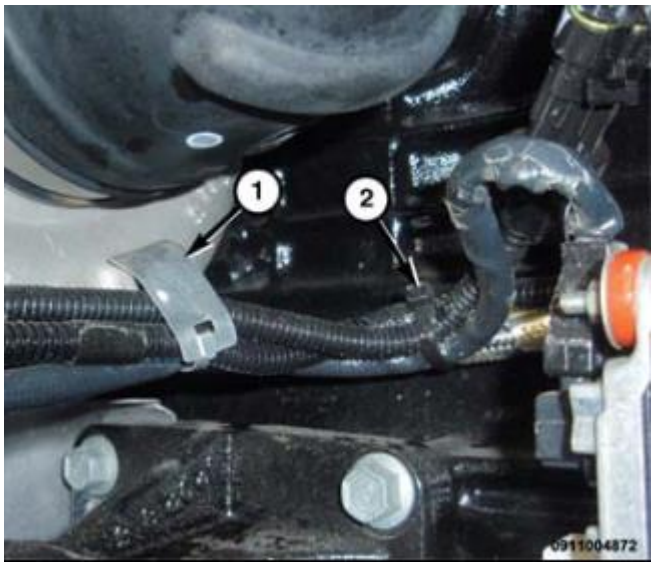
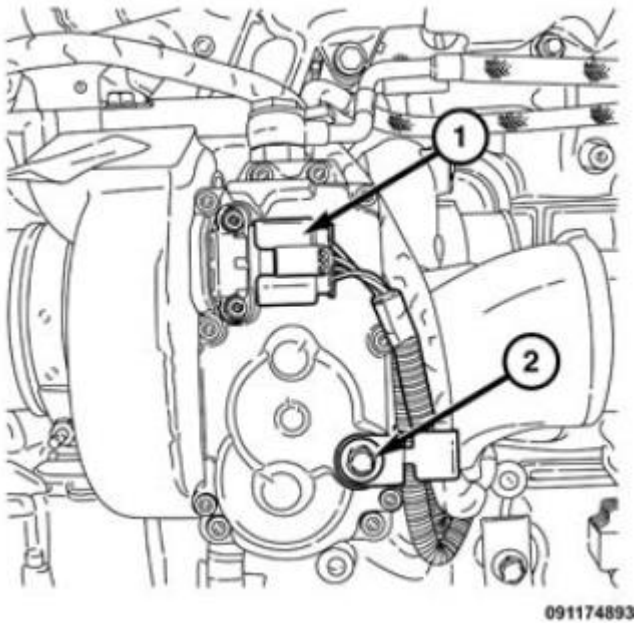
10. Drain the coolant system.
11. Remove the pressurized coolant bottle and position aside.
12. Disconnect the turbocharger speed sensor wire harness connector (1).



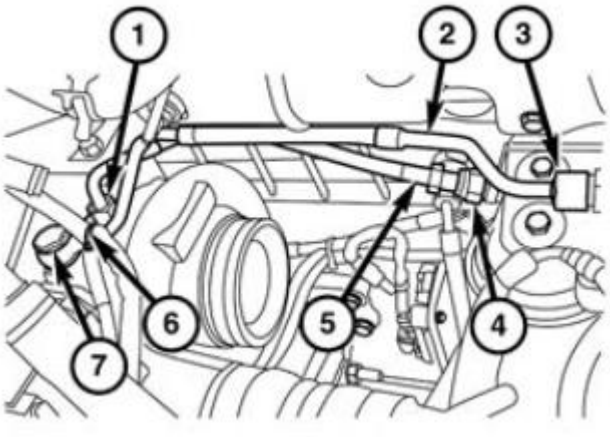
13. Cut the cable tie (2) securing the speed sensor wire harness to the turbocharger speed sensor wire harness.
14. Open clip (1) securing the wire harness and the turbocharger speed sensor wire harness.



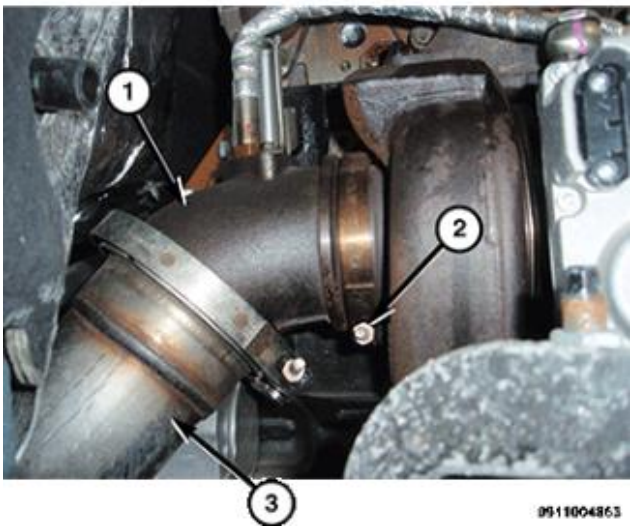
15. Remove bolt (2) and separate the retainer clip securing the wire harness and the turbocharger speed sensor wire harness to the turbocharger actuator.
16. Disconnect turbocharger actuator wire harness connector (1) from the turbocharger by cleaning the connector to remove debris, pulling the light grey release lever away from the locked position with your thumbnail until it clicks into the unlocked position, then holding the light grey release lever down while pulling the connect apart.



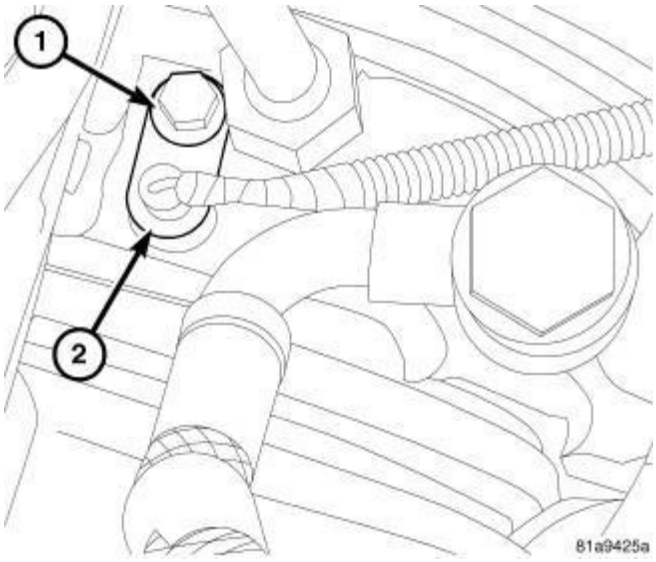
17. Remove the turbocharger oil pressure line (1).
18. Remove banjo bolt (7) and the turbocharger coolant line (2).



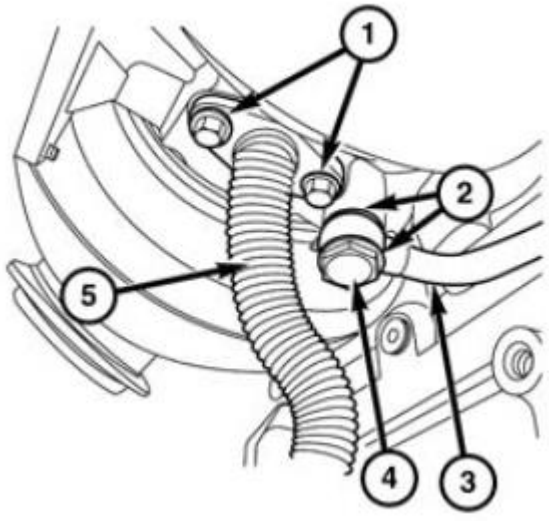
19. Remove the right-side engine mount. (**NOTE**: engine mount does not need to fully removed, just repositioned).
20. Raise and support the vehicle.
21. Remove the exhaust steady bracket from the transmission.
22. Remove the V-band clamp (2) from the turbocharger and position aside the elbow and exhaust pipe (3).



23. Remove the turbocharger speed sensor (2) and set it aside to reuse later.



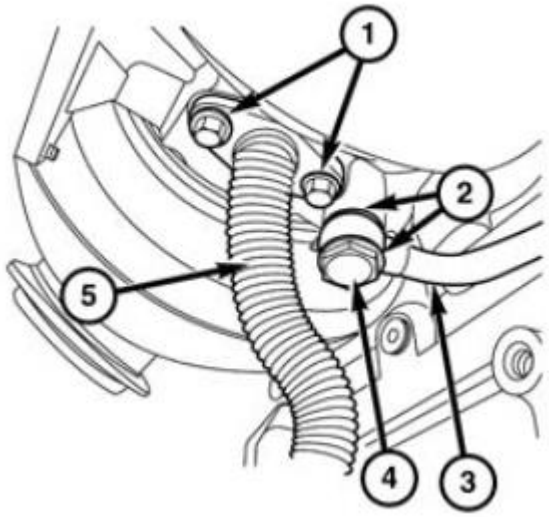
24. Remove the bolts (1) and turbocharger drain tube (5) from the turbocharger.
25. Remove the turbocharger oil drain tube (5) from the cylinder block.
26. Remove the banjo bolt (4) and the coolant tube (3) from the turbocharger.
27. Remove the support and lower the vehicle.
28. Remove the turbocharger to exhaust manifold mounting nuts.
29. Remove the turbocharger from the vehicle coming through the right-side wheel.



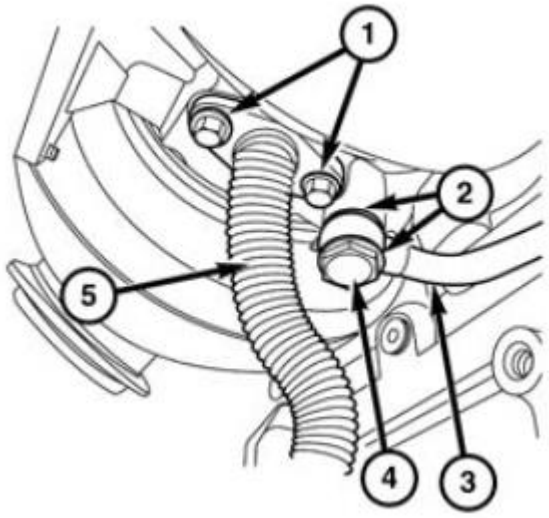
INSTALLATION

Note: Verify that turbocharger and Charger Air Cooler are free of excess oil and debris. Do not allot any water or solvents to enter the turbocharger inlet or outlet. If necessary, clean the turbocharger and the charge air cooler.

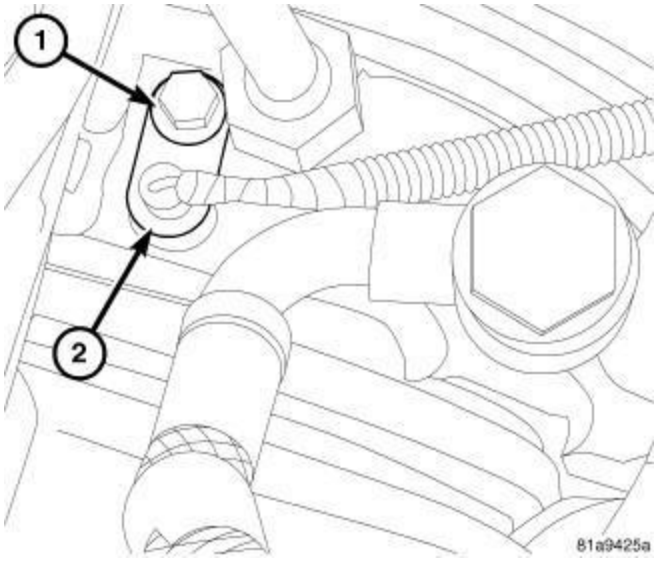
1. Clean the turbocharger mating surfaces.
2. Pre-lube the turbocharger with 29.9-59.4ml (1-2oz) of clean engine oil.
3. Install the three new studs into the turbine inlet that are supplied with the turbo.
4. Using a new gasket, install the turbocharger onto the exhaust manifold stud by coming through the wheel well and tighten the nuts finger tight.
5. Torque the nuts to **43Nm (32ft.lbs)** using a cross pattern.
   Important! Improper flange toque can lead to exhaust leak, Gasket failure and flange damage.
6. Raise and support the vehicle.



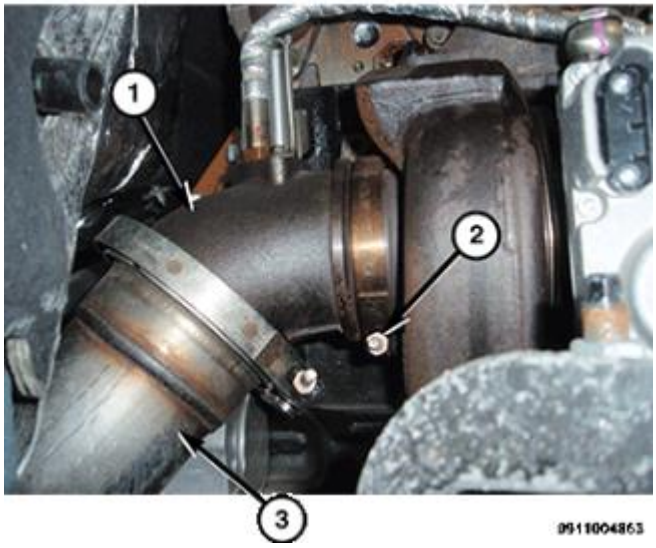
7. Inspect the oil drain tube O-rings for nicks or cuts. Replace if necessary. Lubricate the O-rings seals with clean oil.
8. Install the turbocharger drain tube (5) into engine block.
9. Using a new gasket, install the turbocharger drain tube bolts (1) and tighten to **24Nm (18ft.lbs).**
10. Using new sealing washers (2), install the lower turbocharger coolant line (3) and tighten the banjo bolt (4) to **24Nm (18ft.lbs)**.



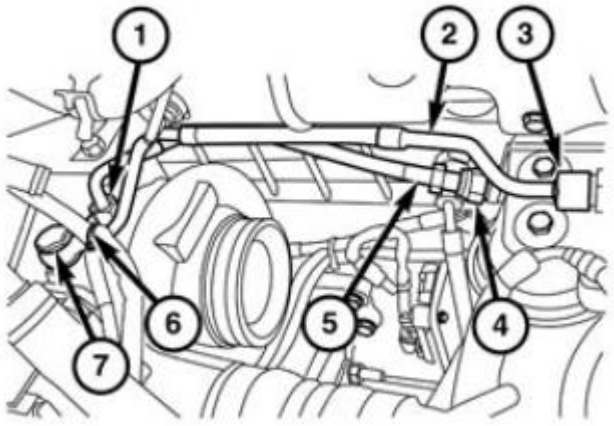
11. Install the old turbocharger speed sensor (2) and tighten bolt (1) to **10Nm (89in.lbs).**



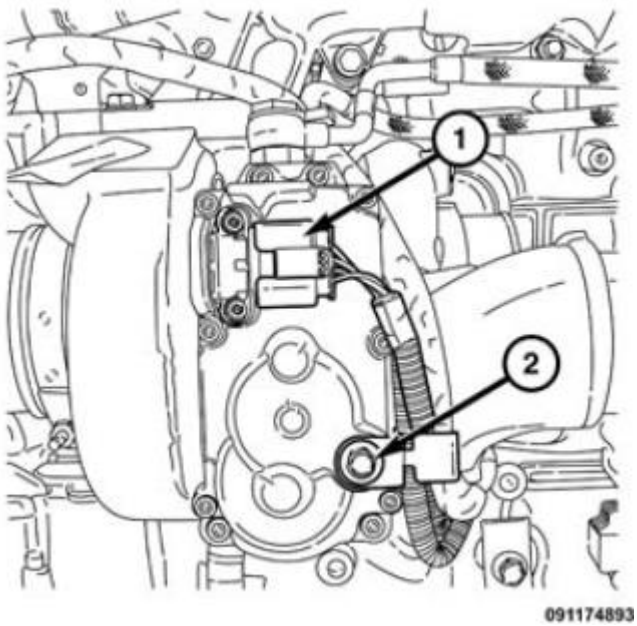
12. Use the V-band clamp (2) to connect the exhaust pipe (3) with the elbow (1) to the turbocharger exhaust outlet with clamp facing as shown. Tighten the clamp (2) to **17Nm (13ft.lbs)**. using a rubber mallet, hit the exhaust pipe to turbocharger clamp three times around the perimeter of the clamp (2) and tighten the clamp (2) to **17Nm (13ft.lbs)**.
13. Install the exhaust steady bracket to the transmission and tighten the bolt **43Nm (32ft.lbs)**.
14. Install the right engine mount.
15. Remove support and lower the vehicle.



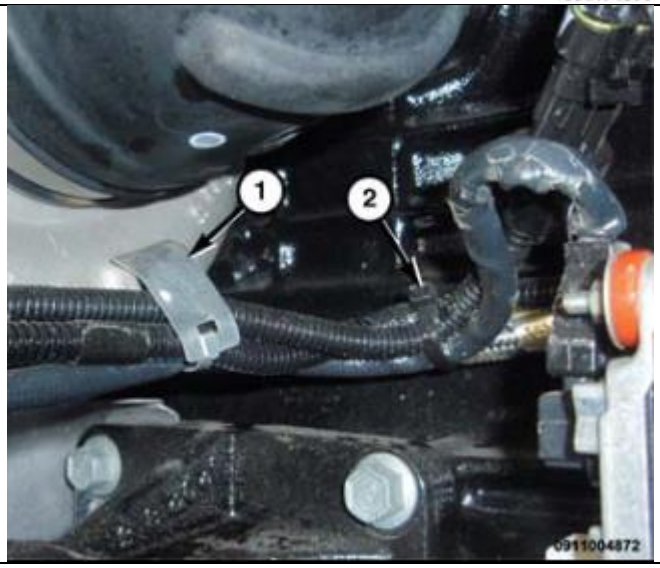
16. Using new sealing washer, install the coolant line (2) to the turbocharger and tighten the banjo bolt (7) and fitting (3) to **24Nm (18ft.lbs).**
17. Install the turbocharger oil pressure line (5) and tighten the fitting (1,4) to **24Nm (18ft.lbs).**



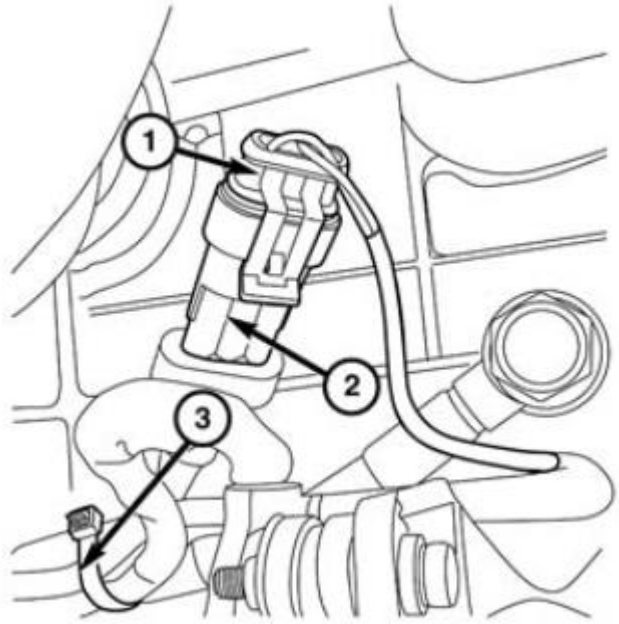
18. Connect the turbocharger actuator wire harness connector (1).
19. Position the wire harness and the turbocharger speed sensor wire into the harness retainer clip.
20. Install the bolt (2) to the turbocharger actuator and tighten to **11Nm (8ft.lbs).**



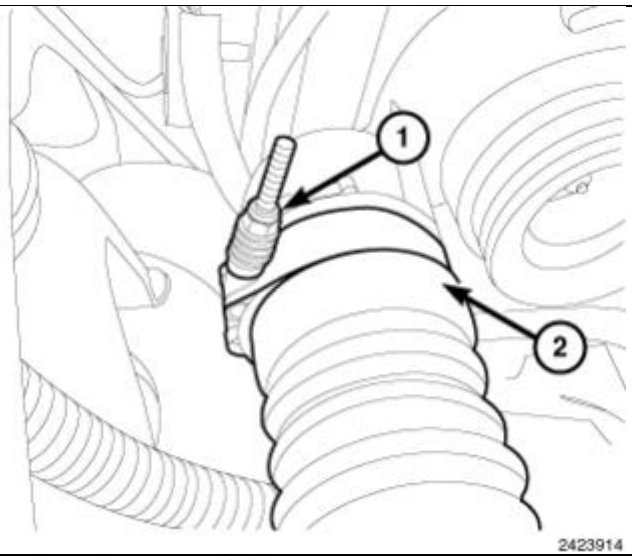
21. Position the wire harness and the turbocharger speed sensor wire harness into the retainer and close the retainer clip (1).
22. Using a cable tie (2), tie the wire harness and turbocharger speed sensor wire harness together.



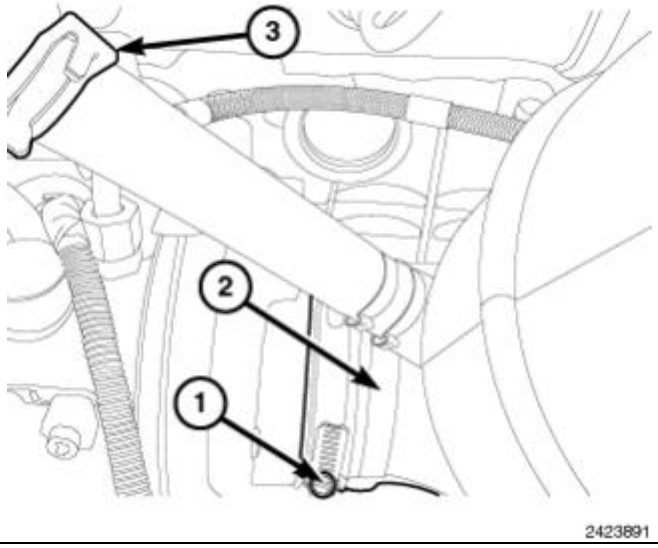
23. Connect the turbocharger speed sensor wire harness connector (1).



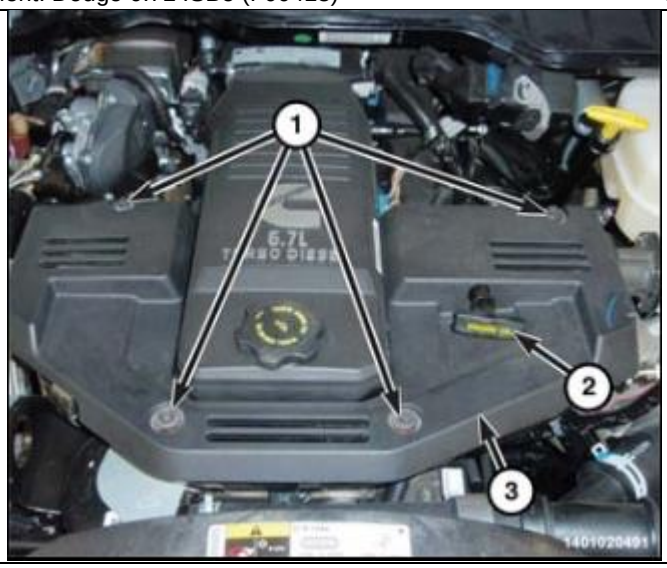
24. Install the pressurized coolant bottle.
25. Install the right CAC tube (2) to the turbocharger and tighten the clamp (2) to **11Nm (8ft.lbs).**
26. Install the right-side wheelhouse splash shield.



27. Install the inlet tube (2) to the turbocharger and tighten the clamp (1) to **11Nm (8ft.lbs).**
28. Connect the breather hose (3).
29. Install the air cleaner body.
30. Fill the cooling system.



31. Install the engine cover (3). Tighten bolts (1) to **10Nm (89in.lbs).**
32. Install the engine oil dip stick (2).
33. Install the right battery tray.
34. Connect both of the negative battery cables.
35. Start the engine and check for any cooling or exhaust leaks and confirm the turbocharger is operating properly.



36. For vehicles models meeting the CARB requirements, affix the sticker onto the truck, close to the airbox as shown.

CHECKLIST FOR INSTALLING TURBOCHARGERS

1. Inspect the intake and exhaust systems leading to and from the turbocharger to ensure absence of foreign material, including burrs and loose lining fragments.
    a. Be thorough – even small particles can cause sever rotor damage if inducted during high speed operation.
2. Use new and approved gaskets at the various air, oil and exhaust connections to the turbocharger
    a. Avoid the use of sealing or jointing compounds at all flanged connections.
3. Use a high temperature anti-seize compound (such as Fel-Pro C5A) on all threaded fasteners connected to the turbocharger.
4. Limit the drain port tilt to 20° from bottom center in either direction.
    a. Tilting in excess of this amount can create a low-idle leakage tendency at both the turbine and compressor seals.
5. Fill the oil inlet port to overflowing with clean engine oil before connecting the oil feed hose to the turbocharger.
6. If the clamp tabs or V-band are loosened for angular orientation of the compressor cover or turbine housing, be certain that the mating flanges are tightly reseated, and that the fasteners are retightened to the torque levels specified in the appropriate manual.
    a. Complete the orientation of the cover and housing before making any rigid connections to the compressor inlet and outlet, or to the turbine outlet; this will make certain that all ducting aligns closely with the turbocharger; this will minimize the external stresses acting on the unit.
7. Before connecting the oil drain hose, crank the engine without firing until a steady stream of oil flows from the drain port.
8. Operate the engine at low idle for at least three minutes after completing the installation of any turbocharger. This will prevent oil starvation damage to the bearing system, and will tend to purge any residual contaminants from the bearing housing prior to the unit acceleration.
9. Always change the engine oil and filter when replacing a turbocharger.
10. Replace or clean the air filter.
11. In case of previous failure, inspect CAC for debris. Clean if necessary.

NOTE: Warranty will be denied if the turbocharger is installed on any application not previously approved by BD Diesel Performance.

General Factors Affecting Turbocharger Service Life

An analysis of turbochargers removed from service indicates that approximately 40% of the troubles are due to foreign material going through either the turbine or the compressor. An additional 40% are due to lubrication failures. The remaining 20% are of a miscellaneous nature.

Come of the foreign material damage is the result of pieces of burned or broken valves and combustion cups going through the exhaust system into the turbine. Other turbine damage is due to casting fins that may break out of the manifolds and ports. Occasionally improperly installed gaskets will permit pieces of gasket to overhang a port and break off into the exhaust system. Damage due to the nuts and washers that are dropped into the exhaust system is also altogether too frequent. Occasionally engine suffer from scuffed and broken pistons. Pieces of these pistons will damage turbine wheels.

Compressor wheel breakage also occurs due to foreign material although not as frequently as turbine wheel damage. Sometimes pieces of the air cleaner will break loose and go through the compressor. There have also been instances where hose connections fail and pieces of rubber or wire reinforcing from the hose gets into the compressor wheel.

Again, carelessness in allowing nuts, bolts and washers to get into the intake system sometimes causes compressor wheel failures.

Lubrication failure may be any one of a number of types. Undersized or plugged oil lines are quite common. It is essential to have an adequate supply of oil at full engine oil pressure for turbocharger bearings. The turbocharger runs at very high speeds and will very quickly overheat with even a momentary failure of oil supply.

The oil supplied to the turbocharger should first pass through a good filter of adequate size so that there is always fill oil pressure at the turbocharger bearing. With an adequate supply of clean oil, turbocharger bearing will run for thousands of hours with no measurable wear.

Failure may occur due to extreme exhaust temperatures encountered in excessive altitude operation. Any engine that is operating close to its limits on exhaust temperatures at sea level will have excessive exhaust temperatures when operated at altitudes above 5000 feet.

Altitude operation will cause the turbocharger speed to increase and may cause failures due to over speeding as well as high temperatures unless the engines fuel system is derated according to the manufacturer's recommendations.

Inlet restrictions due to plugged air cleaners, collapsing hose connections, or undersized air pipes have the effect of reducing the air supply to the engine and result in excessive exhaust temperatures. Both inlet restriction and the excessive altitude operation can cause turbine wheel failures due to excess temperatures.

With any turbocharger, it is possible to accumulate enough dirt in compressor housing and diffuser to reduce the airflow capacity and the efficiency of the compressor if air cleaning system is not maintained. Reduced air flow will cause the engine to run hotter and may result in burned valves and pistons which in turn will cause turbocharger failure.

Leaking gaskets or connections on either the intake or exhaust system of the engine will cause a reduction in the air supply to the engine and will result in high exhaust temperatures.

Sometimes air connections and exhaust connections are made in such a manner that thermal expansion of the exhaust manifold and other parts connected to the turbocharger will produce very high loads on the turbocharger. These high loads result in housing distortions that cause the compressor and turbine wheels to rub.

Excessively heaving piping that is supported only by the turbocharger may also cause distortion.

Turbocharger mounting that are not sufficiently rigid to prevent excessive vibrations in the turbocharger can also cause distortions and failures.

In conclusion it can be stated that every few turbocharger failures would occur if no foreign material were permitted to enter either the turbine or the compressor; if precautions were taken to prevent excessive exhaust temperatures, and if the turbocharger were always supplied with an adequate amount of clean oil.

IMPORTANT SAFEGUARDS

WARNING:

Misuse or modification of the turbocharger can result in serious injury and property damage. Basic safety precautions including the following should always be followed.

1. Read and comply with all instructions including “Checklist for Installing Turbochargers” before installing or using turbochargers. Read “General Factor Affecting Turbocharger Service Life”. (Contact BD Diesel Performance for any additional copies).
2. Install turbocharger only on an engine which has been approved for such application (check BD Diesel Performance Catalog). The turbocharger is a precision built product which has been matched and test for the intended application.
3. Do not modify or substitute any parts of turbocharger. Do not remove metal from any part of the turbocharger.
4. Disassembly and reassembly should done only in accordance with the appropriate set of the instructions provided with the turbocharger.
5. Do not modify or substitute any parts of the engine except in accordance with the engine owner’s manual. Do not modify engine fuel control system or restrict exhaust system or inlet excessively.
6. Do not operate at excessive altitudes (consult engine owner’s manual for altitude restrictions).
7. Be sure that oil supply and drain line are adequate (see “Check List for Installing Turbochargers”).
8. Always warm up engine for 2-5 minutes to allow oil to reach the turbocharger before operating under load.
9. Performance all maintenance specified by the engine manufacturer each time or at intervals maintenance is recommended by the engine manufacturer. Concurrently inspect turbocharger for any deficiencies described in the “General Factors Affecting Turbocharger Service Life”, and correct all observed or suspected deficiencies before operating the engine and/or turbocharger.
10. SAVE THIS LIST OF IMPORANT SAFEGUARDS, THE ENGINE OWNER’S MANUAL, “CHECKLIST FOR INSTALLING TURBOCHARGER”, AND “GENERAL FACTORS AFFECTING TURBOCHARGER SERVICE LIFE”.

General Policy
All core returns must be,

- like for like, no mixed models
- drained of all fluids ($50 Charge)
- be returned in the original packaging
- Part Disassembled
- No junkyard cores (core must have been removed from vehicle)
- No fire damage
- Free of excessive Rust or Water Damage

Returned cores that fail to follow the above conditions will be disallowed and scrapped or returned at the customer's expense. Freight and removal damage are not covered. BD Diesel reserves the right to adjudicate cores as it sees fit and may deviate from its policy.

BD FUEL INJECTION CORE ACCEPTANCE POLICY

Model	Deduction	No Credit
P7100 Injection Pump	• AFC Housing Damaged (25% Deduction) • Governor Housing Damaged Front or Back (25% Deduction)	• Contaminated/Bio Diesel • Damaged Camshaft on 911/913 pumps. • Main Body Damaged
Bosch VE Pump	• AFC Housing Damaged (25% Deduction) • Cold Advanced Housing Damaged (50% Deduction) • Governor housing damaged front or back (25% deduction) • Main Body Damaged (50% Deduction)	• Contaminated/Bio Diesel • Seized Head (Does not turn)
CP3		• Contaminated/Bio Diesel • Seized (Does not turn) • Catastrophic Shaft Failure (Frost Plugs Damaged or Missing) • Front Cover Damaged
VP44	• Damaged Electronics (50% Deduction)	• Contaminated/Bio Diesel • Seized Head (Does not turn)
Common Rail Injectors	• Solenoid melted or destroyed, stretched terminals (25% Deduction) • 5.9/6.7 Broken Solenoid Terminal Divider (No Deduction)	• Contaminated/Bio Diesel • Damaged Body
Mechanical Injectors		• Contaminated/Bio Diesel • Damaged Body

BD TURBOCHARGER CORE ACCEPTANCE POLICY

Turbo Model/ Application	Deduction	No Credit
Cummins ISX VGT Air or Electronic Actuated	• Damaged Electronics (50% Deduction) • Missing Clamps (25% Deduction) • Missing Parts or Actuators (50% Deduction) • Turbine Wheel Separation (50% Deduction)	• Knock Off Models (Not Genuine) • Part Disassembled
Caterpillar (Ball Bearing) Models		• Knock Off Models (Not Genuine) • Wheel Separation
Caterpillar (Standard Turbocharger) 704604-9007, 704604-9011		• Knock Off Models (Not Genuine) • Turbo with 3 support Webs

Detroit Diesel VGT	• Damaged Electronics (50% Deduction)	• Knock Off Models (Not Genuine) • Wheel Separation
Ford 6.4 Powerstroke	• Missing Parts or Actuators (50% Deduction)	• Knock Off Models (Not Genuine) • Part disassembled • Wheel Separation
Ford 6.7 Powerstroke	• Missing Parts or Actuators (50% Deduction)	• Wheel Separation
GM 6.6 L5P	• L5D Version (due to incorrect compressor cover) (25% Deduction) • Missing Parts or Actuators (50% Deduction)	• Knock Off Models (Not Genuine) • Wheel Separation
Dodge Cummins 6.7 HE351VG/HE300VG	• Missing Parts or Actuators (50% Deduction)	• Knock Off Models (Not Genuine)
Standard Turbochargers (All Models, Non VGT)	• Damaged Electronics (50% Deduction) • Missing Clamps (25% Deduction) • Missing Parts or Actuators (50% Deduction)	• Knock Off Models (Not Genuine) • Wheel Separation

The above criteria apply to customer core returns. The following criteria will apply for core purchases.

Deduction	No Credit
• Cracked or Damaged due to freight • Damaged Electronics • Missing Parts or Actuators • Heavily Damaged Wheels and/or Shaft • Missing Clamps • Turbine Wheel Separation • Heavily Modified Turbochargers	• Knock Off Models (Not Genuine)

BD TRANSMISSION/TORQUE CONVERTOR CORE ACCEPTANCE POLICY

Model	Deduction	No Credit
Transmissions	• Cracked Overdrive housings ($100 Deduction) • 68rfe Cracked Case (25% Deduction) • Part disassembled (50% Deduction) • Missing Transmission Shipping Crate ($200 Deduction) • Missing TC/Transmission bracket ($50 Deduction)	• Cracked Case (Except 68rfe)
Torque Convertors	• Hub and Impeller damaged. (50% Deduction)	• Excessive corrosion • Part disassembled
Valve Bodies	• Missing electronics (25% Deduction)	• Excessive corrosion • Part disassembled

GENERAL CORE ACCEPTANCE POLICY

Model	Deduction	No Credit
EGR Cooler		• Brackets broken

Please note that all cores have a time eligibility restriction. Please see BD Terms & Conditions for further details. https://cdn.bddiesel.com/downloads/bd_terms_general.pdf

DOWNLOAD COLOUR INSTALL MANUALS AT

www.bddiesel.com

5.9 CUMMINS VGT KIT

Converts a Common Rail 5.9 to use a VGT Turbocharger
2003-2007 Auto & Manual

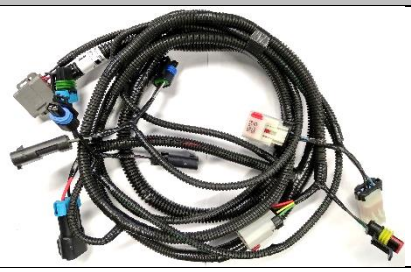
1047135	**Controller Kit** Includes all electrical parts only
1047136	**Install Kit with Controller** Includes everything but the turbo
1047139	**Stock HE351 VGT Turbo Kit** Complete kit with 60mm VGT
1047140	**Screamer VGT Turbo Kit** Complete kit with 64.5mm VGT

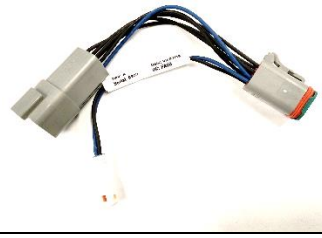
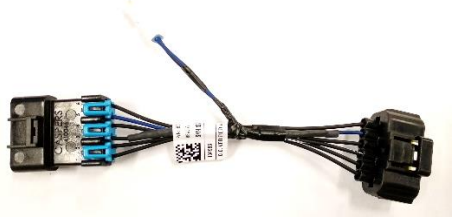
2003-2004 trucks require a 2004.5-2007 style downpipe such as FLOPRO #20811 and OEM V-band # 52121285AA

*2003-2005 automatic transmission models may require Supplement Kit 1047137 to reroute the coolant tube above the exhaust manifold. (Not required with coolant bypass kits)

BD Engine Brake Inc.
1-800-887-5030 | https://www.bddiesel.com

Controller Kit Contents 1047135 (included in all kits)

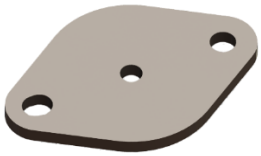
1407036	1407037	1407038
		
VGT Control Module	VGT Control Harness	Exhaust Brake Switch Kit
Qty: 1	**Qty: 1**	**Qty: 1**

1407130	1407131	1407132
		
03-04 APPS Adapter	05-06 APPS Adapter	07 APPS Adapter
Qty: 1	**Qty: 1**	**Qty: 1**

1300348	1453240	1300131
		
Posi-Tap	Wastegate “fooler”	Tie Wraps
Qty: 4	**Qty: 1**	**Qty: 12**

Install Kit Contents (included in 1047136/7139/7140)

1045966	1045993	1405100
		
5.9 VGT Manifold Kit	Manifold Gasket Set	Turbo Exhaust Clamp
Qty: 1	**Qty: 1**	**Qty: 1**

1900033	1453104	1407034	1405101
			
Rear Manifold Plate	Oil Drain Tube	Bracket; Coolant Tube	Exh Elbow
Qty: 1	**Qty: 1**	**Qty: 1**	**Qty: 1**

1200208	FT-11115722	1505001	1405976	FT-0424606
				
1/8” NPT Plug	M8-1.25x12 Bolt	Clamp; Gear	M10 Spacer	O-ring; 2mmx16mm
Qty: 1	**Qty: 1**	**Qty: 2**	**Qty: 2**	**Qty: 1**

1900075	1302196	1407024	1407033
			
5/8” Heater Hose Adapter	Clamp; CTB 24	Fitting; -6JIC to M18	3/8” Barb to 1/4” NPT
Qty: 1	**Qty: 2**	**Qty: 1**	**Qty: 1**

1604053	1407032	1407029
		
3/8” Hose	-6JIC to 3/8” Barb 90deg	-6JIC to M16 Banjo
Qty: 18”	**Qty: 1**	**Qty:**

1407028	1900014	1407023
		
Bolt; Banjo M16	Nut; M8	Drain; Coolant -6JIC
Qty: 2	**Qty: 1**	**Qty: 1**

VGT Turbo (included in 1047139/7140)

VGT Turbo	1407043
	
VGT Turbo	Speed Sensor
Qty: 1	**Qty: 1**

Optional Items (Sold Separately)
Adapter wire to convert HE300VG to HE351VE turbocharger plug PN: 1407046
Only needed when using 2013+ style turbo with this controller kit.

TorqLoc lockup controller
2003-2005 vehicles do not maintain torque converter lockup on deceleration. A Torqloc kit will provide lockup control to improve exhaust braking performance. PN: 1030395
Not needed for 2006-2007 trucks.

Table of Contents

Introduction

Newer 6.7L Dodge pickups have VGT turbos from factory which allow for quick spool up and built-in exhaust braking capability. BD has created kits that enable you to install and control this newer style turbocharger on a 2003-2007 Dodge 5.9L engine.

The complete turbo kit (1047139/7140) includes a VGT turbo and all the parts needed to install it including a controller. This turbo spools faster than a conventional turbocharger of this size and provides large performance potential.

The install kit (1047136) comes with all of the parts you need except the turbocharger. This kit is ideal for those who already have a turbo or want to use a stock sized turbocharger for faster spool with mild performance upgrades.

The controller kit (1047136) comes with only the electrical parts needed to run this type of turbocharger. This kit is intended for someone who wishes to source the installation parts elsewhere but still needs a controller for the turbocharger.

Pre-Installation Inspection

When replacing a turbocharger BD recommends the following precautions are taken:

- Replace or clean the air filter.
- Change the engine oil and filter.
- Inspect Intake and CAC passages for debris, and clean if necessary.

In the case of a previous failure also include the following steps:

- Inspect CAC for debris and cleanout if necessary.
- Inspect engine oil for debris. Flush system if debris was present.

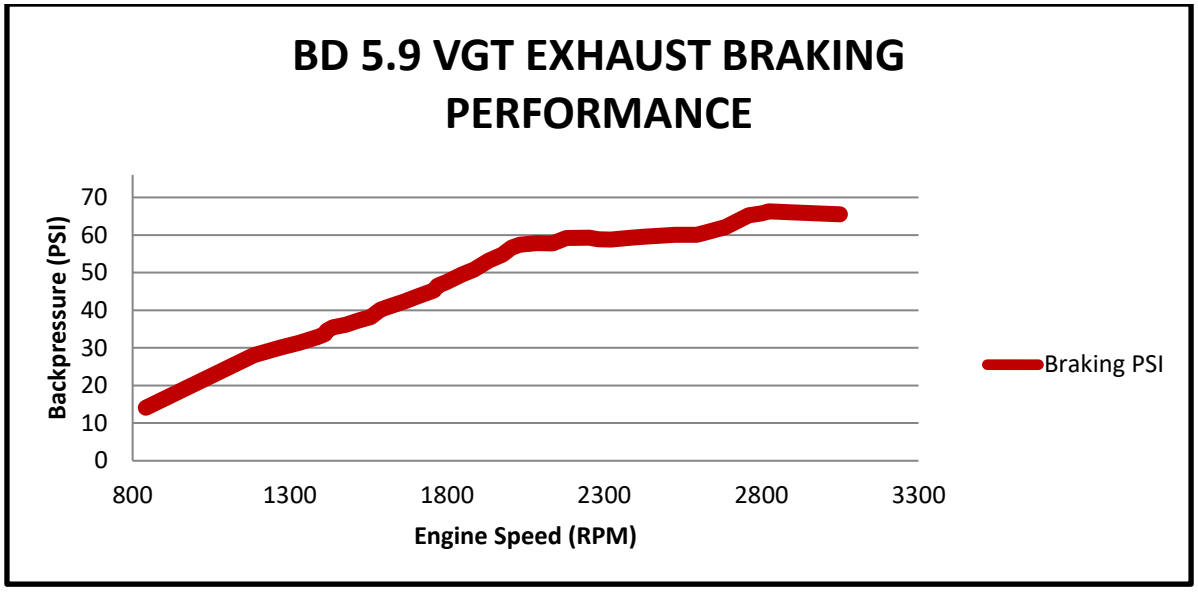
Ensuring that these steps are followed will prolong the life of your new turbocharger.

Operation

The VGT control operation is all automatic. The control module has built in look up tables and uses the various inputs (apps, boost, rpm, turbo speed) to operate the turbocharger effectively.

The VGT turbo can also function as an exhaust brake. An exhaust brake toggle switch has been included with this kit and uses the turbocharger vanes to create exhaust backpressure which will slow the vehicle down.

If the exhaust brake is turned on when the engine is cold it will close the vanes at idle to warm up the engine faster. This will operate until 180F on 2003 and 160F on 2004-2007 trucks.



Removal of Old Turbo

Disconnect batteries
Disconnect the IAT sensor from the air intake

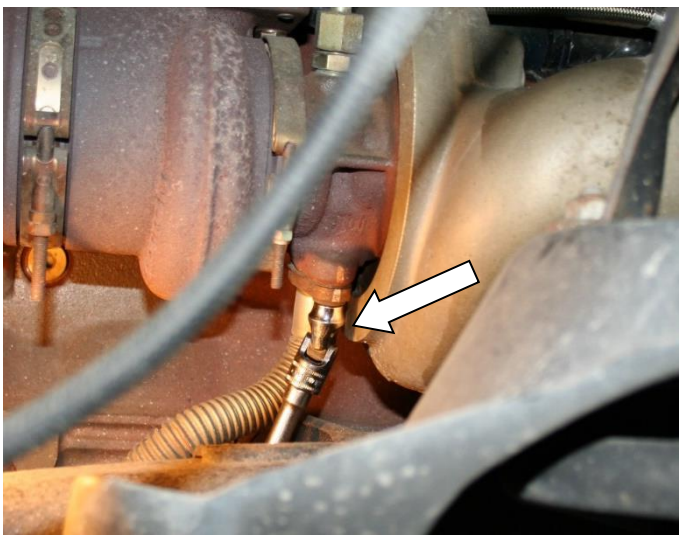
Remove the intake hose

Remove the passenger side inner fender well with a 5/16” socket.

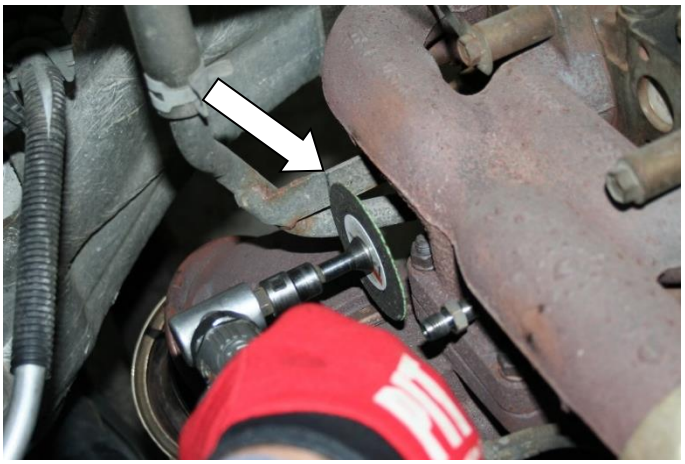
Remove the v-band clamp from the exhaust pipe with a 7/16” socket (save this clamp - it will be reused)

Remove the turbo oil drain with a 10mm socket and pull the line out of the engine block

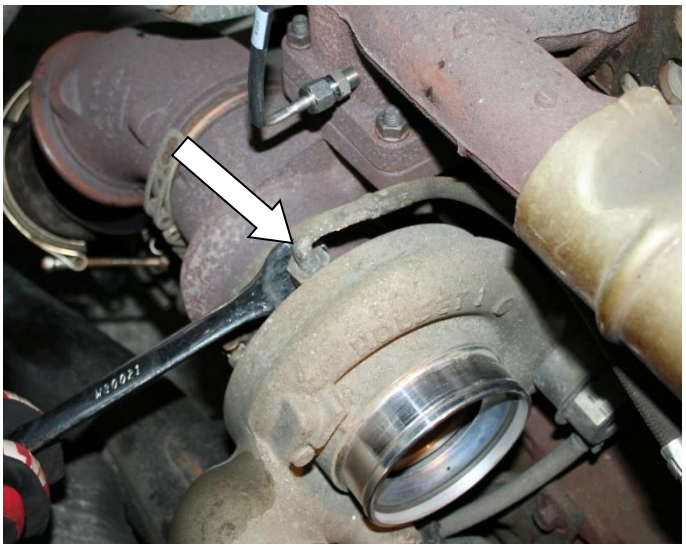
**Note: Some models require you to loosen gear clamps to remove the oil drain hose.



Cut the heater pipe bracket close to the manifold (leave enough of the bracket attached to the pipe to re-affix later)



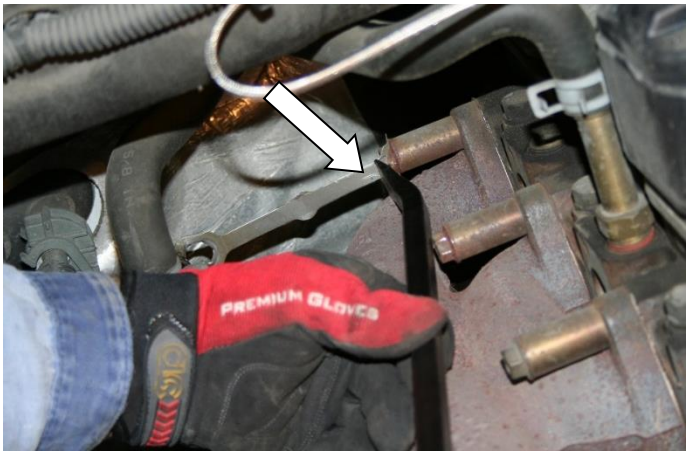
Remove the turbo oil feed from the turbo



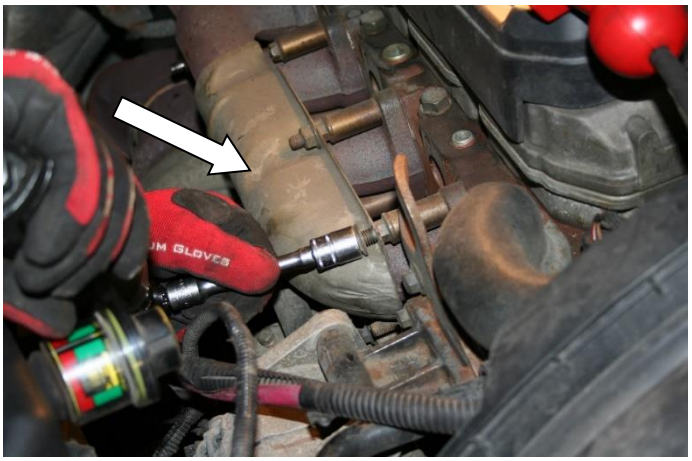
On 2005-2007 trucks, unplug the wastegate solenoid connector

Remove the passenger side intercooler hose band clamp with a 7/16” socket

Pry off the metal lock from the rear manifold bolts. Remove the heater pipe bracket.



Remove the manifold heat shield with a 15mm socket



Remove the remaining manifold bolts using a 13mm socket

Remove the turbo/manifold as an assembly.
CAUTION This assembly is very heavy, you may need help lifting it out.

Special Note: Install Supplement Kit 1047137 which is for 2003-2005 automatic transmission models. This kit relocates the coolant pipes from the heater core/transmission cooler and water inlet connection from below the exhaust manifold to above. (Not required on trucks without a transmission oil cooler or when a coolant bypass kit has been installed)

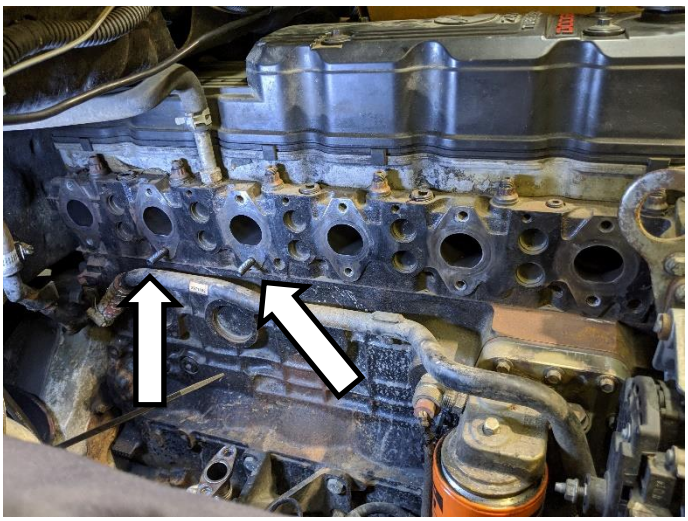
See Appendix A beginning on page 25 of this manual for instructions.

Installation - Turbo and Manifold

Install the plate (1900033) on the rear top manifold port using the supplied gasket (5295446), 2 smaller studs (1462431), spacers (1405976) and nuts (1462441) provided in the kit (as shown).

Install 1 long stud (1462430) into the turbo flange of the manifold.

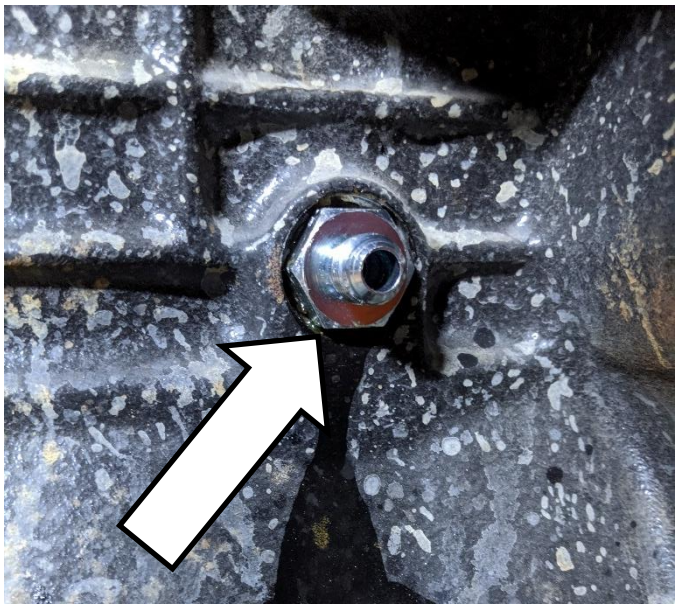
Install 2 of the longer studs in the engine as shown at the bottom of 2nd and 3rd port from the back of the motor.



Remove the coolant port plug, towards the front of the engine on the passenger side.

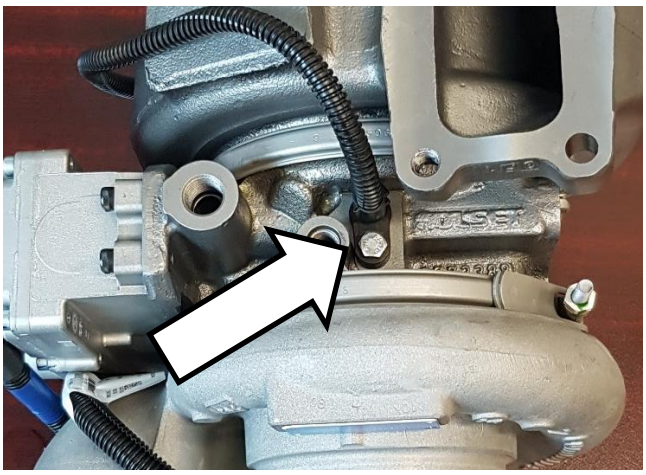
Install the supplied FT-0424606 O-ring onto the 1407024 ORB to JIC fitting.

Install fitting into the engine block as shown

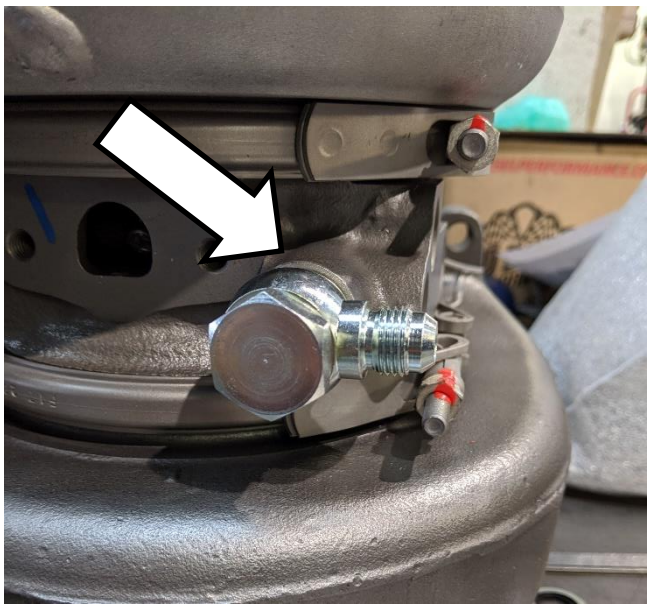


Install the speed sensor (1407043) into the turbocharger.

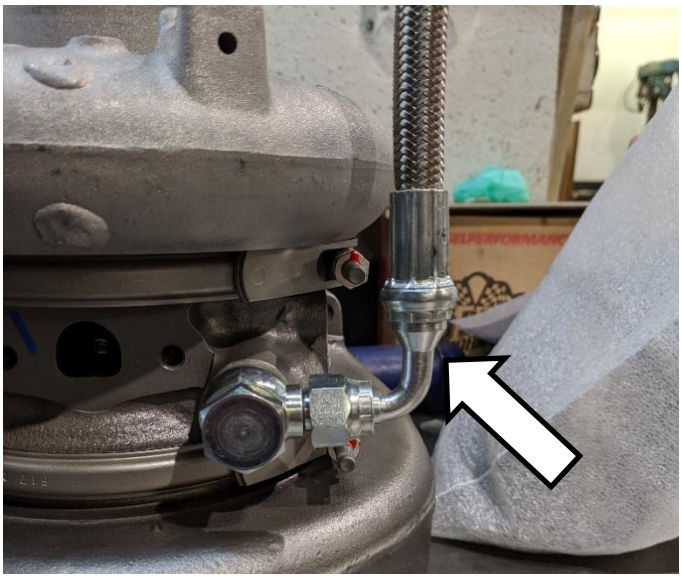
Torque bolt to 89inlbs.



Loosely install the Banjo to JIC fittings in the bottom of the turbocharger.



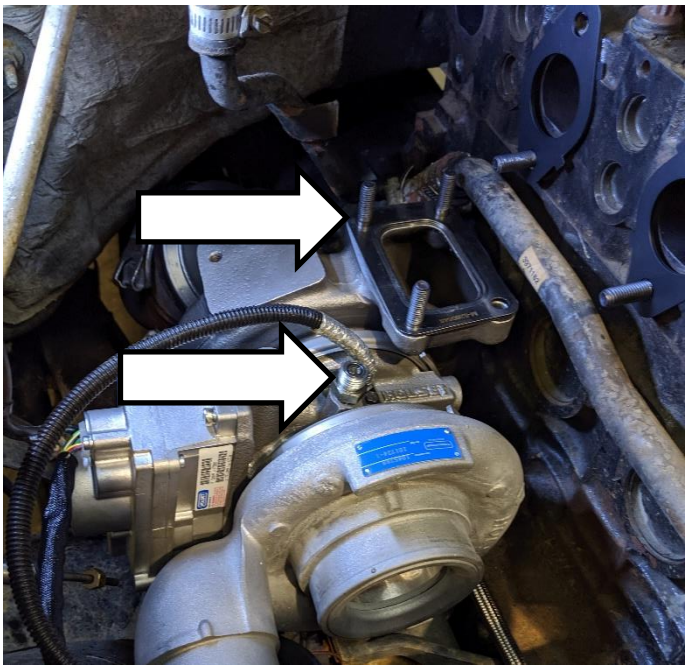
Loosely install the coolant line (1407023) as shown.



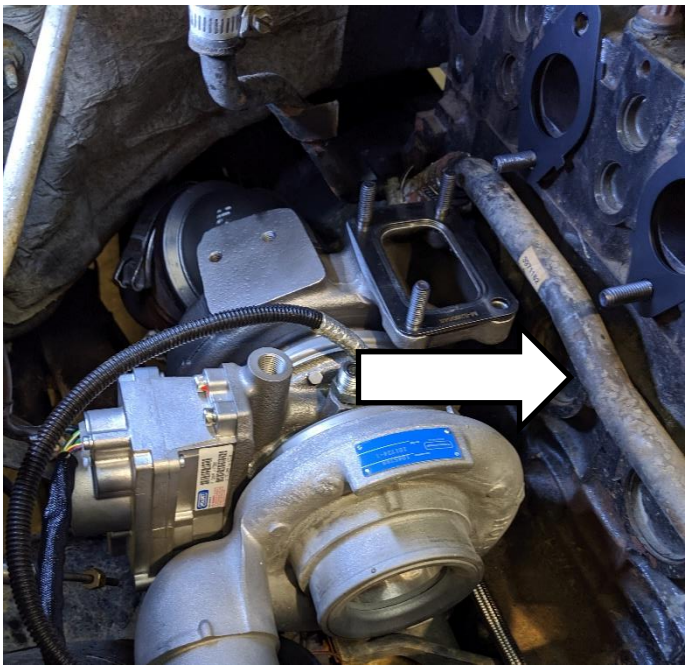
Install the 2 remaining studs onto the turbo.

Transfer and secure the oil feed fitting from your stock turbo onto the VGT.

Drop the turbo into the engine bay.



To help ease the installation of the manifold, it may be useful on 05-07 trucks to loosen the coolant tube and slightly shift out of the way.



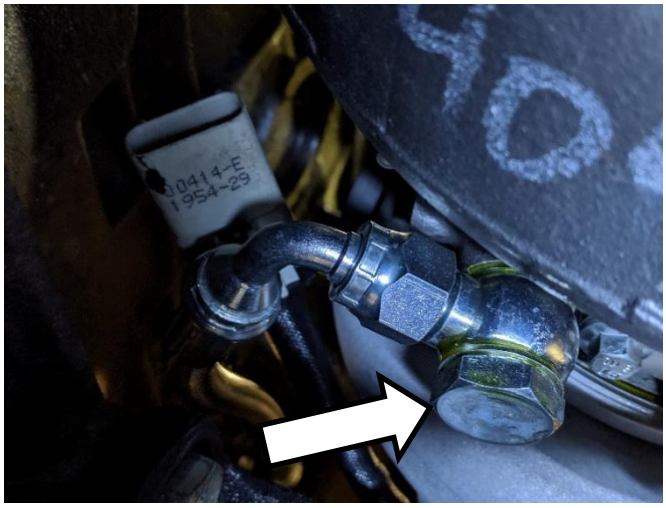
Install the manifold and gaskets onto the engine and turbo. Torque manifold bolts and nuts to **33ft-lbs**.

Secure the turbo to the manifold. Torque the turbo mounting nuts to **32ft-lbs**.

Important! Improper torque of flange can lead to exhaust leak, gasket failure and flange damage.

Secure the coolant line to the JIC fitting in the engine block installed earlier.

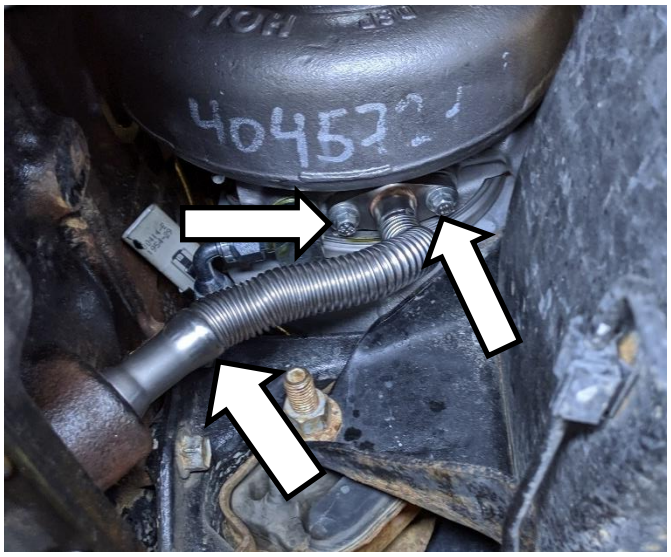
Tighten the banjo and the JIC fittings. Torque the banjo bolt to **18ft-lbs**.



Form the supplied oil drain into shape and install onto the turbo oil drain with provided gasket. Transfer the oil drain bolt from the stock turbo.

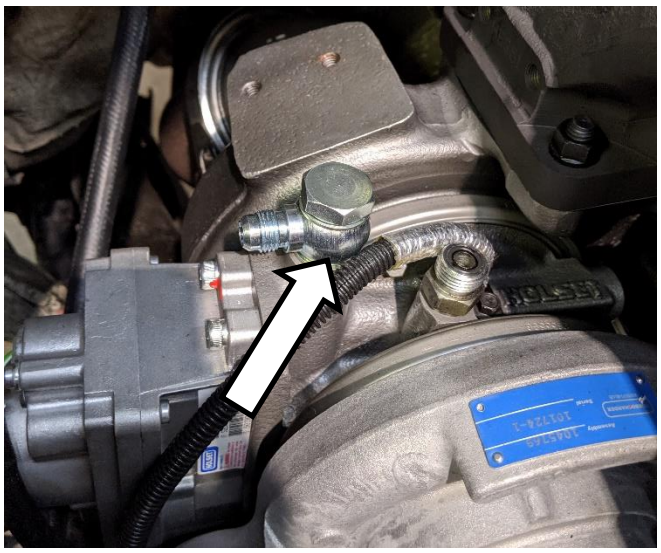
Be sure to avoid any components coming into contact with one-another.

Torque the bolts to **18ft-lbs**.

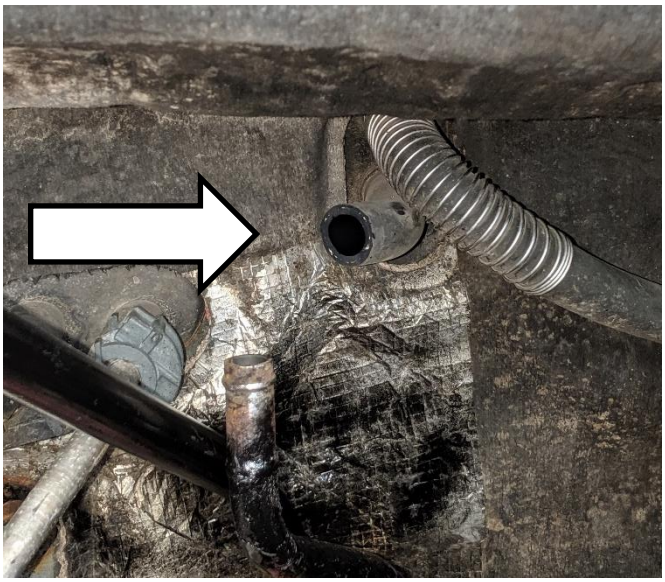


Install the banjo to JIC fitting as shown.

Torque the banjo to **18ft-lbs**.

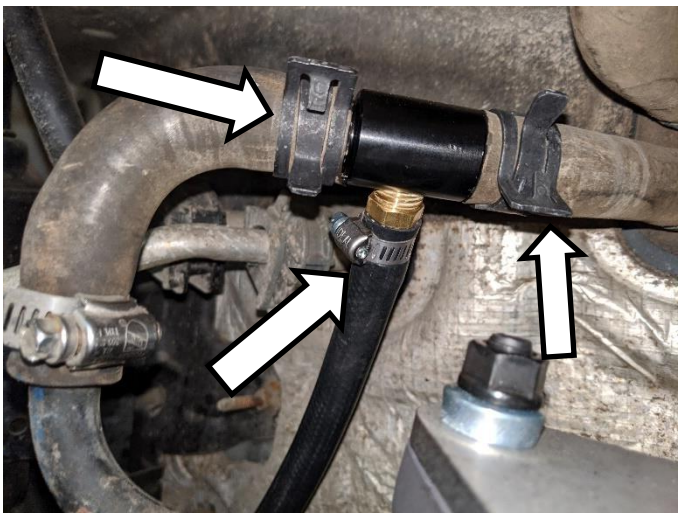


Cut the coolant hose as shown by the firewall. Do not discard the cut hose.



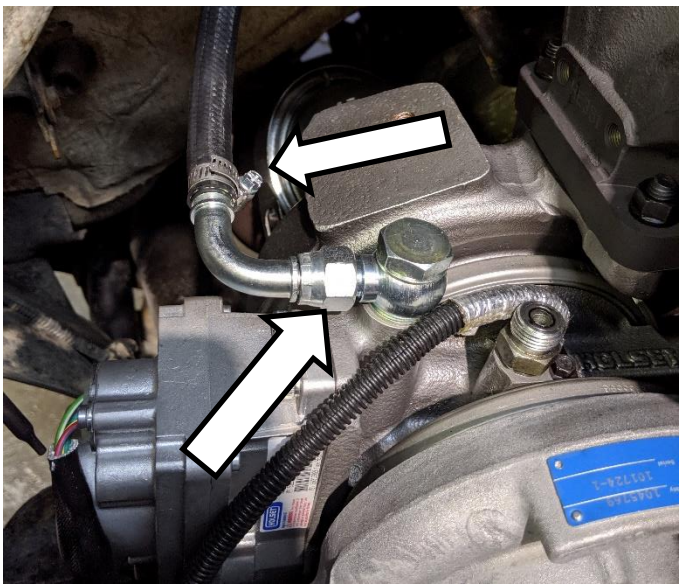
Install the supplied the tee fittings (1900075, 1407033) as shown. Secure both sides with supplied spring clamps.

Install the supplied 3/8” hose to the barb and secure with gear clamp.

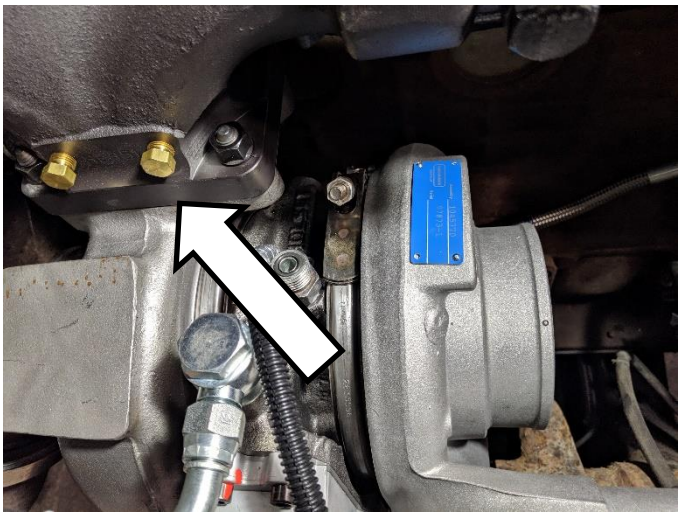


Install the JIC to Barb fitting. Secure the hose onto the fitting.

Tighten the JIC fitting onto the banjo.



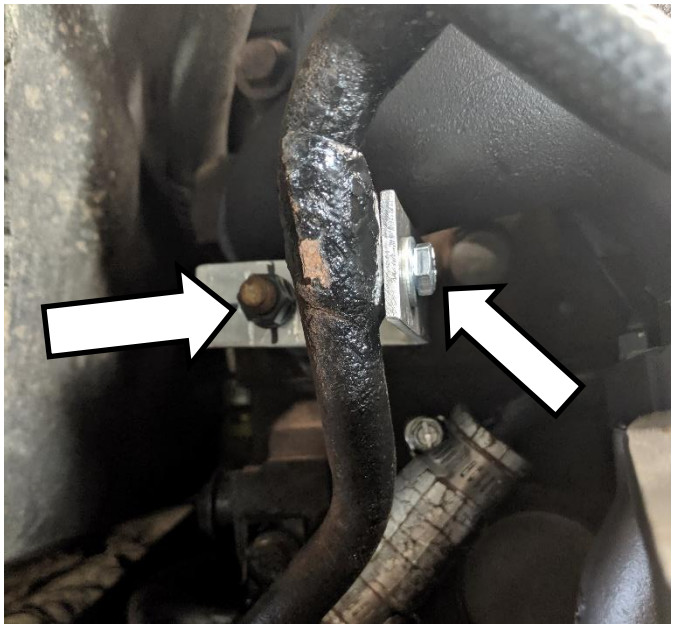
Install the two NPT plugs into the manifold if not using ports.



Secure the coolant tube to the manifold using the provided bracket.

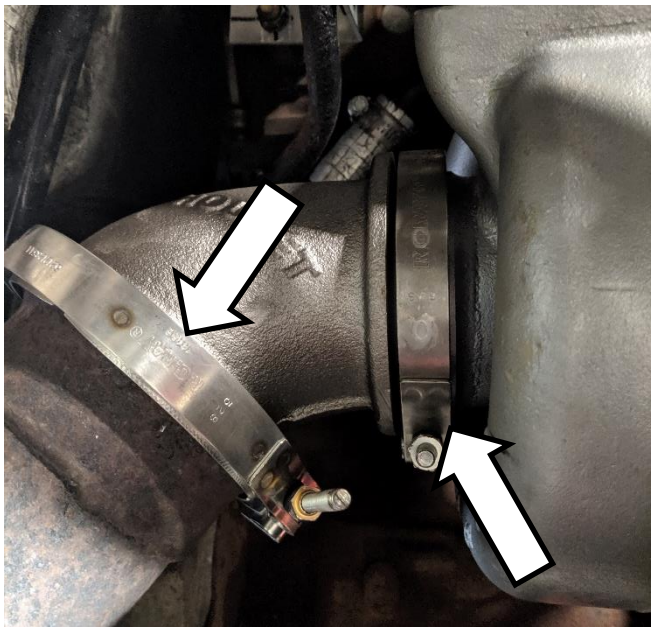
Mockup the bracket to the manifold stud and coolant tube tab and drill 21/64” or M8 bolt clearance hole at the marked location on the coolant tube tab.

Secure the bracket to the manifold with the provided nut and to the coolant tube with the provided nut, bolt and washers.



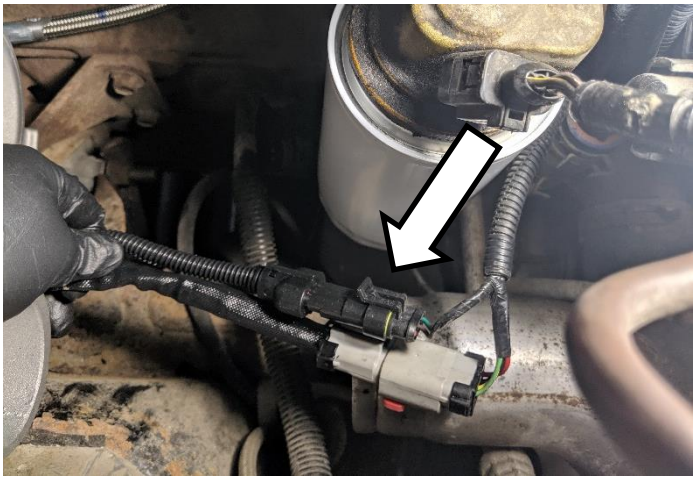
Install the provided exhaust outlet elbow to the turbo and the exhaust downpipe. Reuse your stock downpipe clamp. Turbo to exhaust elbow clamp is provided in the kit.

NOTE 2003-2004 trucks will need a 2005-2007 style downpipe (not included).



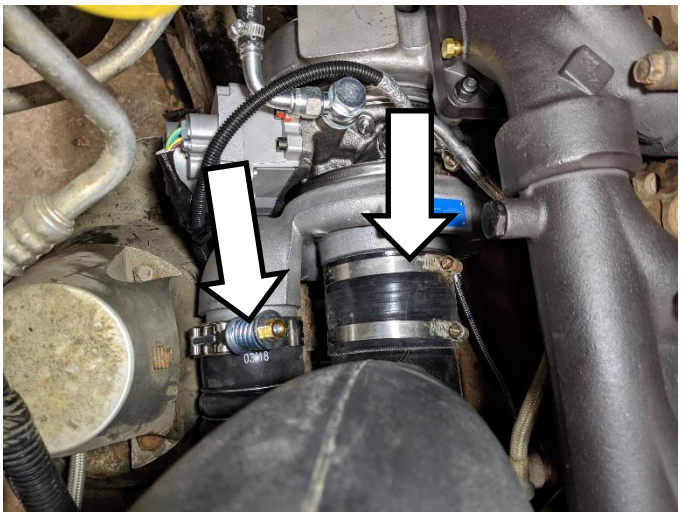
Refer to the Installation – Controller Kit and Wiring section of the manual to successfully connect the turbo to the supplied electronics before proceeding forward.

Turbo actuator and speed sensor should be connected following the wiring instructions.



Install the oil feed line. Tighten at both ends.

Install the boot at the turbo outlet and re-install your intake system and airbox.



Connect the IAT sensor.

Reinstall the inner fender well.

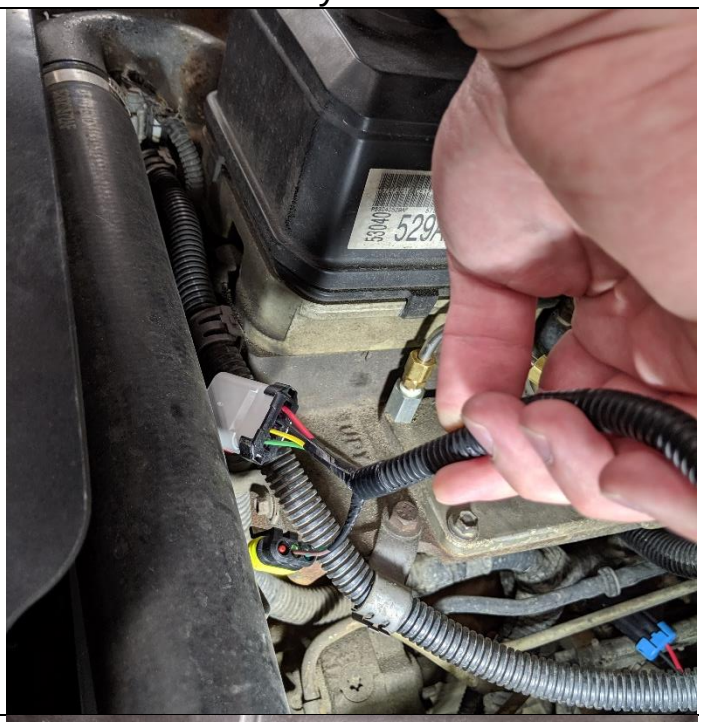
Refill coolant as per factory instructions.

Connect batteries.

Installation - Controller Kit and Wiring

Disconnect both vehicle batteries before installation for safety.

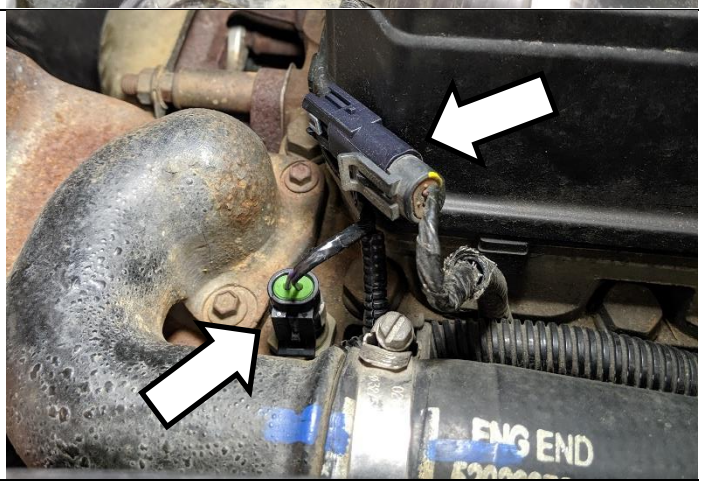
Install the main VGT control harness in the engine bay. Line up the various plug in locations before securing the harness in place. Follow the factory engine wiring harness. This will require fishing the two turbo electrical connectors across the front of the motor and down the passenger side behind the oil filter.



Connect the turbocharger actuator and the turbocharger speed sensor wires to the turbo.

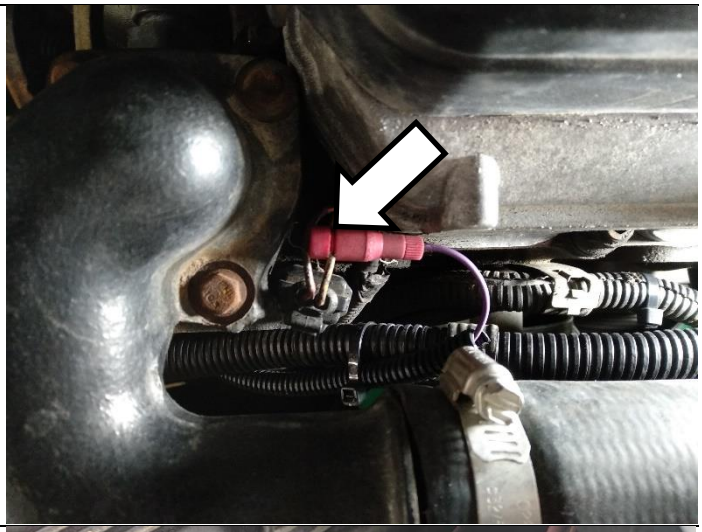
NOTE 2013+ HE300VG turbos require an adapter wire (sold separately)

2004-2007 Models
Connect the main harness to the coolant temperature sensor by plugging it inline.

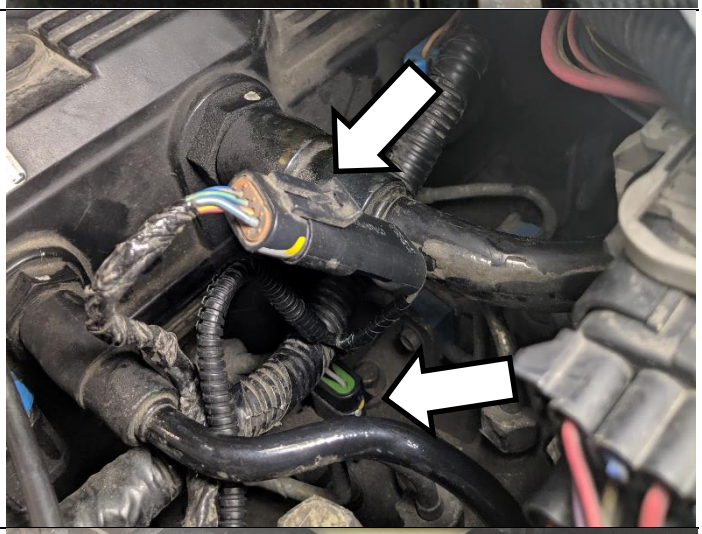


2003 Models
Cut the two-pin coolant temperature sensor connector off of the BD harness and use a posi-tap to connect to your factory coolant temperature sensor signal wire.

Pin 2 – TAN/BLACK

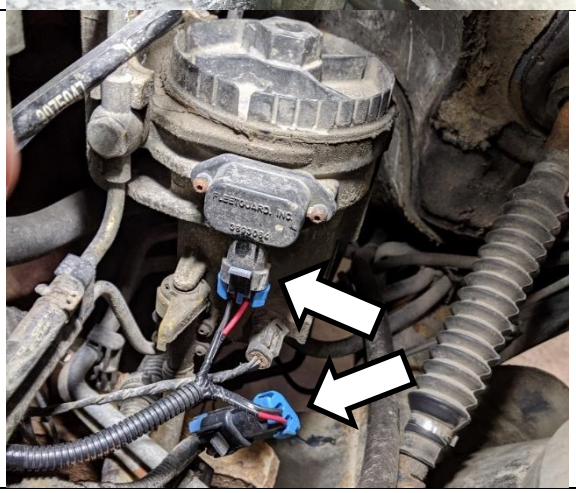


Connect the main harness to the engine MAP sensor located on the intake manifold plate by plugging it inline.
IMPORTANT If the vehicle has a “boost fooler” device, connect the VGT kit directly to the MAP sensor side so it still gets the correct reading.



Connect the main harness to the vehicles crankshaft position sensor by plugging it inline.
NOTE do not mix this up with the camshaft position sensor

Connect the main harness to the fuel bowl heater by plugging it inline.
This provides power to the kit



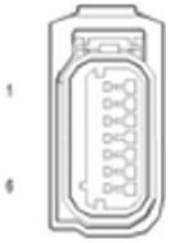
Choose the appropriate accelerator pedal position sensor adapter harness (1407130/31/32) for your model. Install this in line with the sensor.

(2003 shown)

2003-2004 Manual Transmission
The accelerator pedal position sensor is located under the driver's battery tray and the supplied posi-taps must be used. Posi-tap the 2 pin connector in the 1047130 harness to pin 5 and 6 in the APSS connector. The Blue wire to pin 5 BR/WT and the Black wire to pin 6 BR/YL
(Some 2003s can use the 1407130 pigtail shown in the previous step)

2004 Pinout

CAV	CIRCUIT	FUNCTION
1	K29 20WT/BR	APPS NO. 2 SIGNAL
2	K854 20VT/BR	5 VOLT SUPPLY
3	K852 20BR/LB	5 VOLT SUPPLY
4	K400 20BR/VT	APPS NO. 2 RETURN
5	K23 20BR/WT	APPS NO. 1 SIGNAL
6	K167 20BR/YL	APPS NO. 1 RETURN

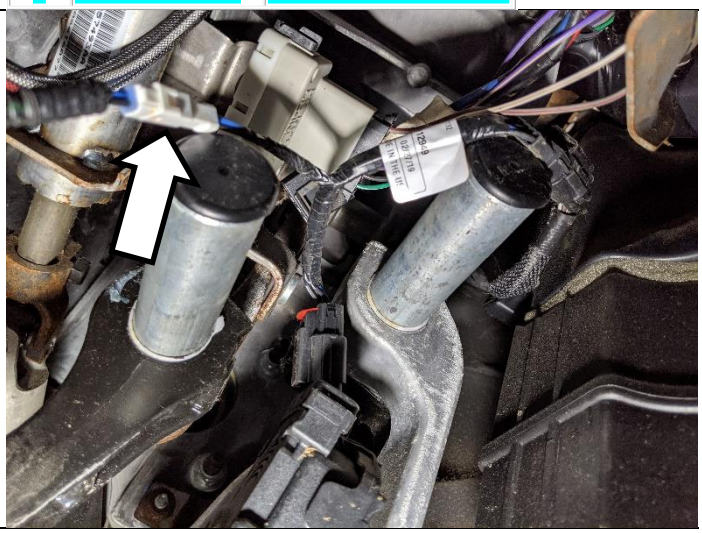


Late Build 2003 Pinout

CAV	CIRCUIT	FUNCTION
1	K81 20DB/DG	APPS NO. 2 SIGNAL
2	K854 20DVT/BR	5-VOLT SUPPLY
3	K852 20BR/VT	5-VOLT SUPPLY
4	K981 20BR/DG	APPS NO. 2 RETURN
5	K255 20WT/DG	APPS NO. 1 SIGNAL
6	K223 20PK/DB	APPS NO. 1 RETURN

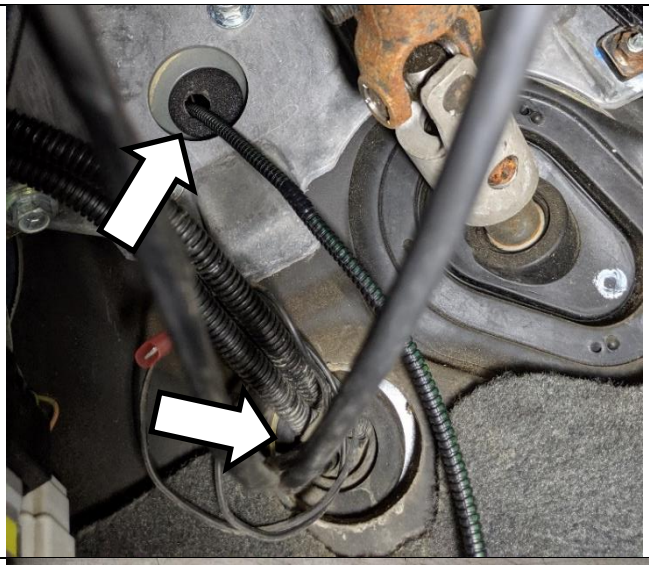
Connect the main harness to the accelerator pedal position sensor adapter installed in the last step. If this is inside the vehicle cabin (2005+) route this wire through the firewall.

(2007 shown)



Route the RED and PINK wires from the toggle switch kit (1407038) from inside the cab to under the hood near the VGT control module.

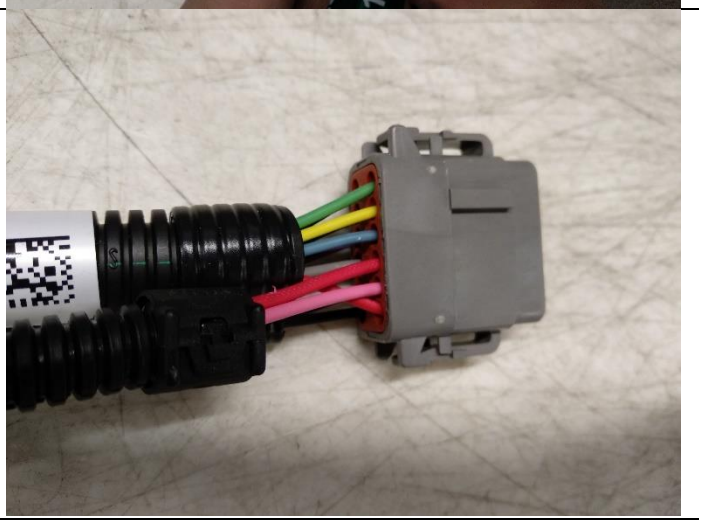
Wires can pass through either the main wiring harness bulkhead or through the clutch cylinder block off plug.



Locate the gray 12 pin module plug from the VGT control kit. Remove the orange wedge using needle nose pliers.

Remove the two seal pins in pins 10 and 11 by pulling them out the back with a pick or small screwdriver.

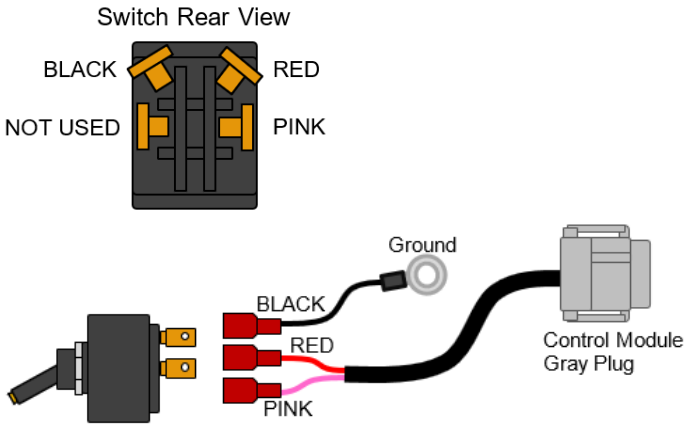
Insert the RED wire into pin 10 and the PINK wire into pin 11. Ensure the pins latch into position.
Reinstall the wedge lock by pushing it back into the connector.



2003-2004 Automatic Trans Models

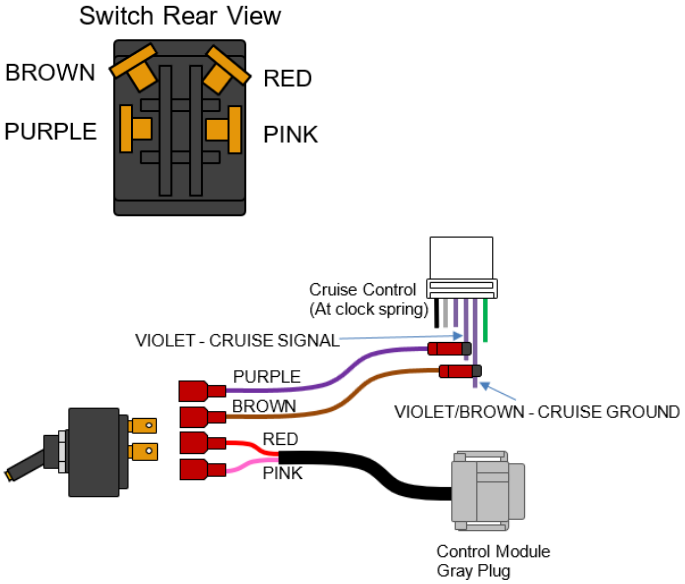
Verify the switch wire pinout matches the configuration for these models. The violet and brown wires will not be used and no cruise control connection will be needed.

Connect the ground wire (black) to a ground under the dash by removing and reinstalling a screw.

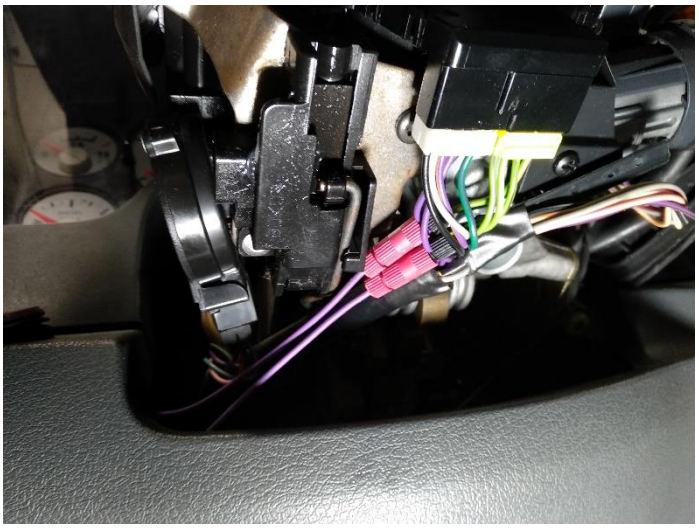


2005-2007 Auto Trans & 2003-2004 Manual Trans Models

Verify the switch wire pinout matches the configuration for these models, you may need to remove the black wire from the switch to install the violet and brown wires. (The black wire is not used for these vehicles). The violet and brown wires are the cruise disable wires. It is necessary to disable the cruise control when the exhaust brake is operational on these years as the cruise control function is internal to the ECM and does not move the accelerator pedal with a servo.

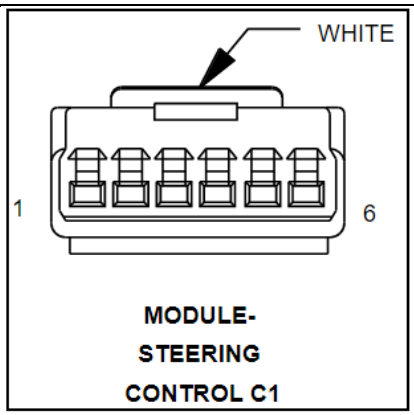


Remove the steering column lower cover by removing the T20 Torx screws securing the tilt lever and the column covers. Locate the 6-pin white connector behind the clock spring, this has the cruise control wires we will attach to.



WARNING Do not tap into the YELLOW connector wires; these are for the airbag.

Locate the VIOLET wire (PIN 4) and install a positap. Then connect this to the VIOLET wire from the toggle switch. Locate the VIOLET/BROWN wire (PIN 5) and install a positap. Connect to the BROWN wire from the toggle switch. Reinstall column covers.



Clock spring connector C1 (WHITE)

Pinout (2004-2007)		(2003)
1	BLACK	BLACK/LIGHT BLUE
2	GRAY/WHITE	GRAY/WHITE
3	VIOLET/ORANGE	VIOLET/ORANGE
4	**VIOLET (Cruise Control Signal)**	**RED/LIGHT GREEN (Cruise Signal)**
5	**VIOLET/BROWN (Cruise Control Ground)**	**BLACK/LIGHT BLUE (Cruise Ground)**
6	DARKGREEN/VIOLET	BLACK/RED

Install the switch in the preferred location. It can be mounted by drilling a hole in the dash or by using the supplied switch bracket. Install the supplied “Exhaust Brake” sticker, then install the black plastic switch mounting nut.

Connect the main harness to the control module and install the control module on the driver’s side of the engine bay using wire ties.

On 2004.5-2007 trucks, install the “wastegate fooler” to cap off the unused connector for the wastegate solenoid from the stock turbocharger.

Installation is now complete. Double check all connections and start the vehicle. Check for oil leaks, coolant leaks.

Operational checks:
-Turn on the exhaust brake switch while the engine is still cold to test the warmup function – you should clearly hear this working. This will confirm turbo actuator operation, coolant temp sensor connection, accelerator pedal voltage and engine RPM.

-Once warmed up, accelerate at full throttle and ensure the turbo reaches normal boost levels (30-40psi depending on fueling/tuning). This will confirm the MAP sensor reading and turbo speed sensor output are working correctly.

If either of the above tests fail, check the troubleshooting section to determine what sensor input is not functional and to diagnose further.

-Confirm cruise control cutout operation on 2005-2007 (and 2004 manual) models only. Turn on the cruise control and ensure it is operational. Now turn on the exhaust brake switch. The cruise control should immediately cancel and begin to coast. If this does not happen turn the brake back off immediately and, check the posi-tap connection on the cruise control wires.

Appendix A

Supplement Kit 1047137 for 2003-2005 automatic models

Install Kit Contents

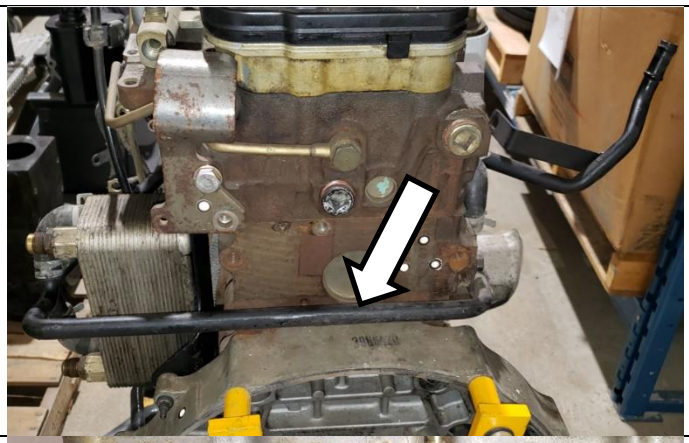
1405446	1405434
	
Coolant Line; TCC	Coolant Tube – 5/8”
Qty: 1	**Qty: 1**

1405441	FT-69884	1453723-3	FT-62012
			
Coolant Line	Fitting; ¾” NPT 90	Fitting; 3/4NPT x 1-1/8 Barb	(#16) 1.5”
Qty: 1	**Qty: 1**	**Qty: 1**	**Qty: 1**

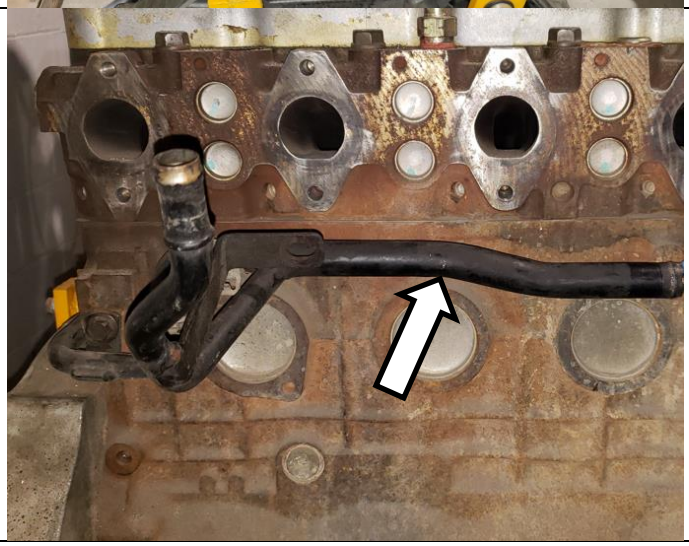
1302198	1120125	1120124	1401553
			
Clamp; Spring 26mm	Clamp; 1” Insulated	Bolt; M8x20	Nut; Manifold M8
Qty: 4	**Qty: 2**	**Qty: 3**	**Qty: 1**

Installation – Supplement Kit 1047137

Begin by removing the existing coolant tubes and hoses from the engine. This includes from the transmission heat exhanger around the back of the block.



Next remove the section from the rear of the block to the connection near the #3 exhaust port. This includes the heater core connection.



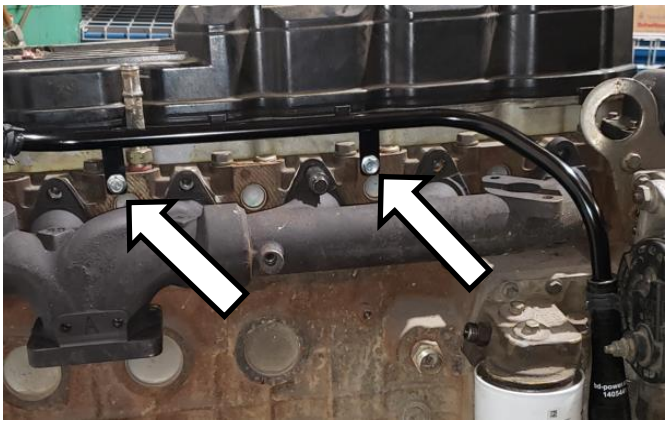
Finally remove the front section which connects to the water outlet fitting and then remove the water outlet fitting.

Install the 90deg fitting (FT-69884) into the water inlet housing port and orientate to face upward.

Next install the barb fitting (1453723-3) and then the (1405441) hose section with the (#16) 1.5” gear clamp (FT-62012) and tighten.

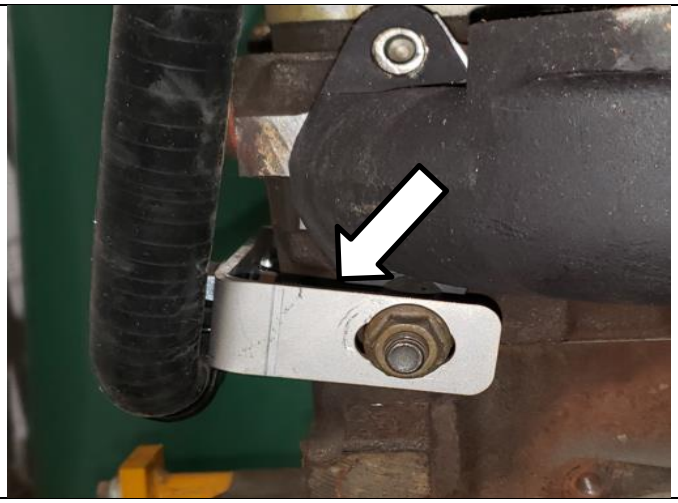
Now Insert the coolant tube (1405434) into the (1405441) hose section with 1 of the (1302198) spring clamps. Mount the coolant tube with 2 of the M8 x 20 bolts (1120124) securing to the cylinder head utilizing existing threaded holes.

(Threads may need to be cleaned out with a tap or chaser)



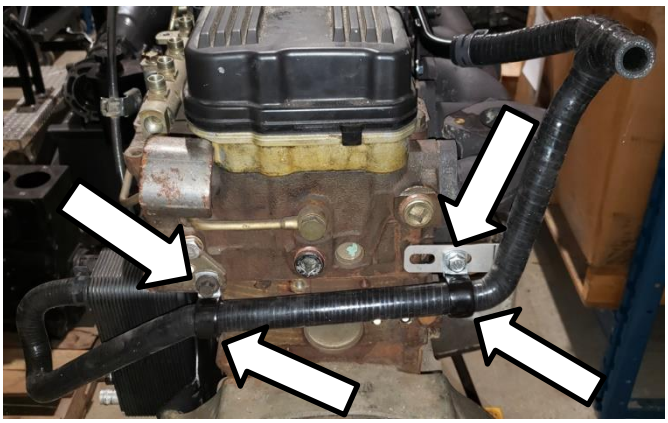
Install the (1405446) hose section onto the new coolant tube, heater core outlet and the transmission heat exchanger secting with 3 of the (1302198) spring clamps.

Mount the (1407034) coolant tube bracket (supplied from the Howler Install Kit) to the lower exhaust stud of the #6 cylinder reusing the OE M10 flange nut.

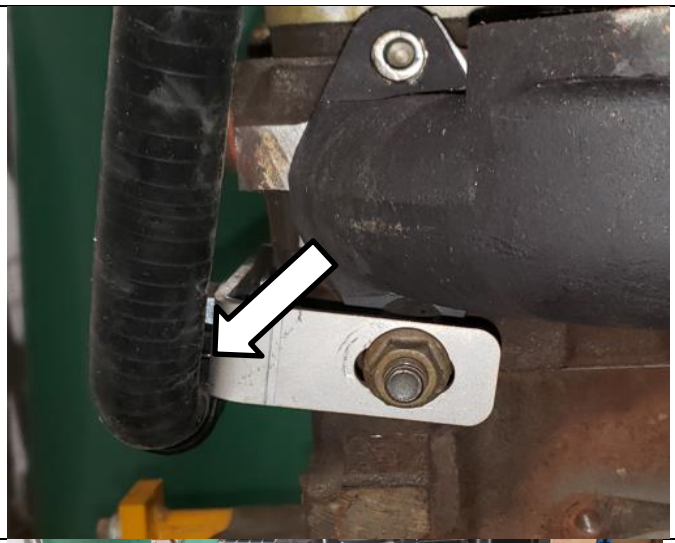


Install the 2 insulated clamps (1120125) around the coolant hose section that goes behind the engibe block. Secure passenger side clamp by mounting to the coolant tube bracket with 1 of the

(1120124) M8 bolts and the (1401553) M8 flange nut. Secure the driver side clamp by removing the lower bolt from the injection line protection bracket and reinstalling through the insulated clamp.



Note: Ensure that the coolant hose does not rub on the coolant tube bracket. The bracket can be angled slightly and insulated clamp can manipulated to gain clearance.

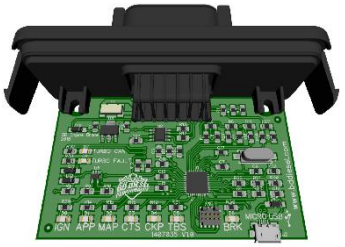


The Supplement Kit installation is now complete and the Howler installation can begin. Refer to page 11.

Troubleshooting

General troubleshooting

Poor turbo performance	- Oversized turbo for application/fueling - Check module inputs, may be operating in fail-safe mode - Boost leak
No exhaust brake function	Module must see BRK input from the toggle switch as well as throttle and engine speed (APP, CKP) operating normally otherwise the exhaust brake will be disabled.



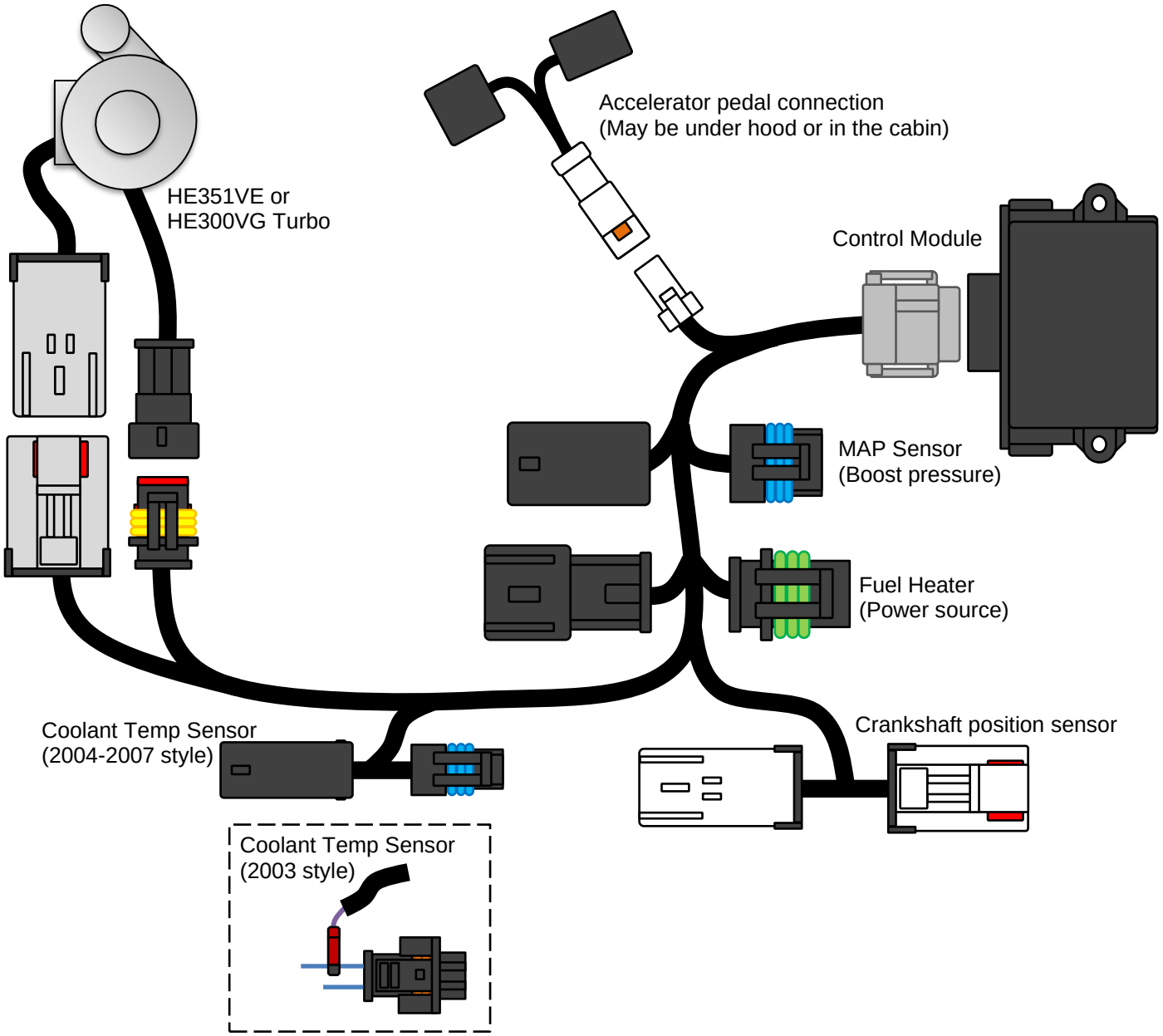
The module has built in LEDs for troubleshooting. Each input to the module has a dedicated LED for diagnostics as well as fault monitoring for the turbocharger actuator.

IGN	Power light. The control module is powered from the fuel heater plug and grounded through the accelerator pedal sensor wiring.
APP	Accelerator pedal sensor input. Off under 0.1v, on over 4.9v. Flashing with changing intensity between 0.1-4.9v. If this input is over 4.8v the module will command minimum boost. If this input is under 0.1v the exhaust brake will be disabled.
MAP	MAP (boost) sensor input. Off under 0.1v, on over 4.9v. Flashing with changing intensity between 0.1-4.9v.
CTS	Coolant temperature sensor input. Off under 0.1v, on over 4.9v. Flashing with changing intensity between 0.1-4.9v. If over 4.9v the exhaust brake warmup feature will be disabled.
CKP	Crankshaft position sensor input. Flashes with varying speed based on the crankshaft position sensor output. If no RPM is detected the exhaust brake will be disabled.
TBS	Turbocharger wheel speed input. Flashes with varying speed based on the turbocharger wheel speed sensor output. If no turbo speed is detected, the module will command minimum boost.
BRK	Exhaust brake switch input. Off if the exhaust brake switch is off or not connected. Flashing if the brake is enabled but not currently active. Solid when the module is commanding the exhaust brake.
TURBO CAN	Indicates communication with the turbo when flashing. If there is no turbo communication check the wiring. The turbo is powered and grounded through the fuel heater wiring.
TURBO FAULT	Indicates a fault with the turbocharger. Either due to no communication (TURBO CAN) or the commanded position of the turbo is not matching the desired position. This could be due to a defective or improperly calibrated turbocharger or actuator.

Howler Control Strategy Reference Tables

APPS Range	Model Year	APPS Voltage	Desired Boost	Engine RPM	Max Boost
0.7V - 3.7V	2003 - 2004	0.0V	6 psi	1200	7 psi
0.5V - 4.5V	2005 - 2007	0.55V	6 psi	1400	9 psi
		0.7V*	0 psi	1500	11 psi
		1.2V	12 psi	1600	15 psi
		3.2V	40 psi	1700	20 psi
		5.0V	40 psi	1800	27 psi
		*This is programmed for cruise control		1900	29 psi
				2000	40 psi

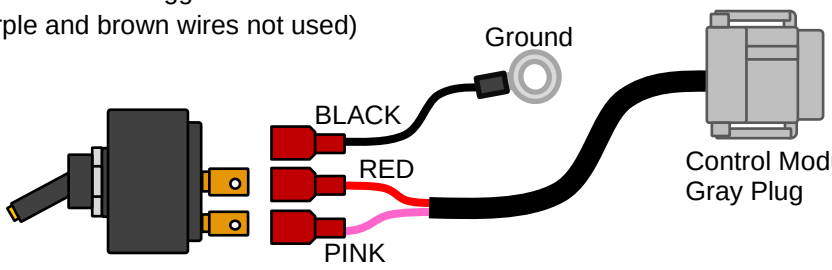
Wiring Diagrams

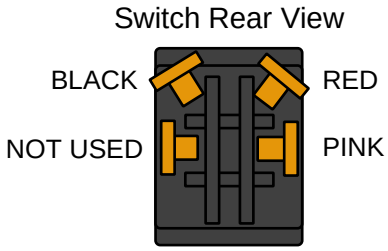


Toggle Switch Wiring

2003-2004 Automatic Transmission

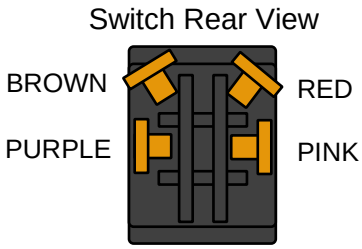
Exhaust Brake Toggle Switch
(Purple and brown wires not used)

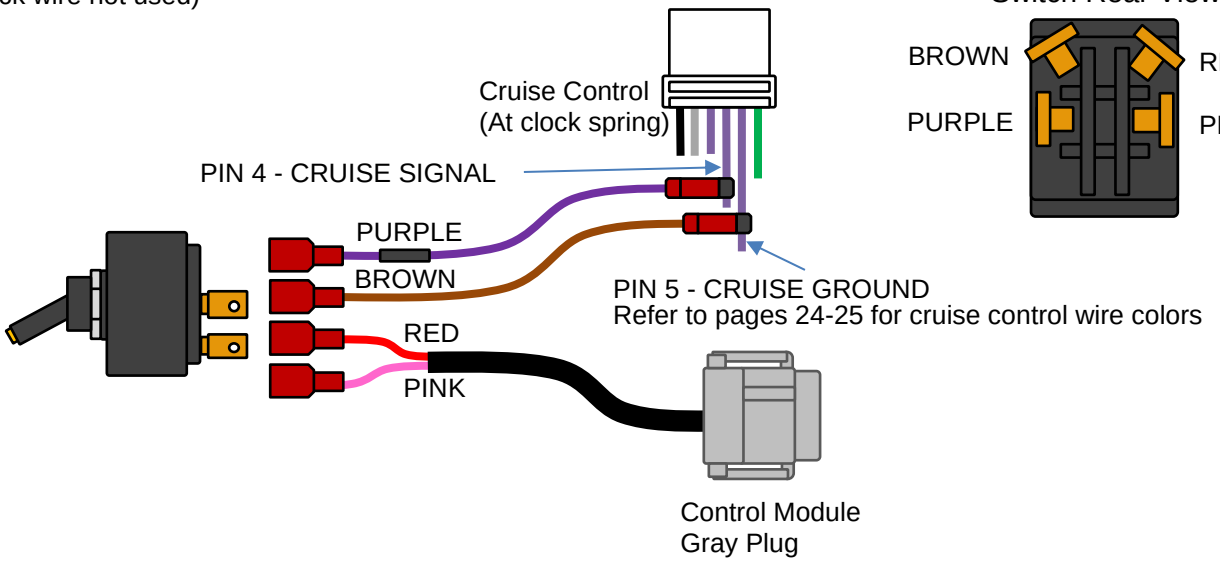




2005-2007 Automatic / 2003-2007 Manual Transmission

Exhaust Brake Toggle Switch with Cruise Cutout
(Black wire not used)





NOTE The light in the toggle switch will be on whenever the ignition is on. If you prefer the light to be on only when the brake is turned on, then reverse the RED and PINK wires at the toggle switch.

Control Module Gray Plug
Pin 10 - Red wire (12V Output to Switch)
Pin 11 - Pink wire (Exhaust Brake Input)