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# **Chevy Compound Turbo Kit**

**Add-a-turbo LML Duramax 2011-2016**

**1046603**

**Install Kit with Turbo**

**1046604**

**Install Kit Only (no turbo) \***

\*Install kit requires Borg Warner turbo PN 171702

Tuning is required.

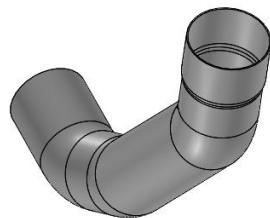
Aftermarket charge air cooler tubes are not required with this kit.

BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295    U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295  
Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: [www.bd-power.com](http://www.bd-power.com)

**Kit Contents**

171702	1406623	1406610
		
Turbo; S475	Air Box	Bracket; Primary Support
<b>Qty: 1</b>	<b>Qty: 1</b>	<b>Qty: 1</b>
1403802	1406611	1406614
		
UpPipe; Passenger Side	3" Tube; Hot Pipe	Tube; 3" Primary Outlet
<b>Qty: 1</b>	<b>Qty: 1</b>	<b>Qty: 1</b>
1406620	1406612	1406616
		
Battery Box	Down pipe; 4" (1 of 2)	Down pipe; 4" (2 of 2)
<b>Qty: 1</b>	<b>Qty: 1</b>	<b>Qty: 1</b>
1406622	1406615	1406613
		
Tank; Coolant w/ Sensor	Tube; 5" Primary Intake	3" Tube; Secondary Intake
<b>Qty: 1</b>	<b>Qty: 1</b>	<b>Qty: 1</b>

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1406625	1406624	2925
		
Coolant Line; Front	Coolant Line; Rear	5" Intake Filter
Qty: 1	Qty: 1	Qty: 1

1462329	1462330	1462410	1462420
			
-6 Oil Line; 36" Long	-8 Oil Line; 32" Long	Gasket; Turbo Feed Pipe	Gasket; Lower Feed Pipe
Qty: 1	Qty: 1	Qty: 1	Qty: 1

2495146	6239-5-BP	LMG53-E-1-001	1453514
			
Gasket; T6 Turbine	Cable; 36" Long	Fuse Holder	2" Header Wrap
Qty: 1	Qty: 1	Qty: 1	Qty: 6

1300180	1406627	DOR54259	1900074
			
Loom; 3/8" Nylon	Radiator Cap	Radiator Cap Cover	Plate; Intake
Qty: 72"	Qty: 1	Qty: 1	Qty: 2

FT-0480803	1407155	FT-69989	SBHP1579-00
			
O-Ring; #031	Coolant Hose; 5/16"	Hose Mender; 1/2"	Adapter Kit
Qty: 1	Qty: 2.5", 4", 12", 24"	Qty: 1	Qty: 1
1462121	1462123	1604054	1900022
			
Plug; 5/16" Barb	Plug; 1/2" Barb	Hose; 1/2"	Heater Hose; 5/8" Silicone
Qty: 1	Qty: 1	Qty: 3"	Qty: 38"

### ***Hardware***

FT-11116243	1456737	1462441	1601715
			
Bolts; M8-1.25 Flange	U-Nut; M8-1.25	Nut; M10-1.5 Flange	Bolt; M8 SHCS
Qty: 4	Qty: 1	Qty: 4	Qty: 4

FT-35574	FT-423015-131280	1462323	1403106
			
Bolt; M10-1.5x50mm	Fitting; -8 JICM x 1/2 NPTM	Fitting; 14x1.5 ORB x -6 JIC	Bolt; M8x20 Flange
Qty: 4	Qty: 1	Qty: 1	Qty: 1

1453504	FT-0413922	FT-0480826	1453820
			
Stainless Steel Zip-Tie	-152 O-ring	-242 O-ring	Air Intake Seal
Qty: 12	Qty: 1	Qty: 1	Qty: 41", 23", 5", & 6"

1453162	FT-421680	VIB2898
		
Fitting; -6 JIC-M x -4 NPT-M	Fitting; -8 JIC x 3/8 NPTM 45d	Oil Drain Flange
Qty: 1	Qty: 1	Qty: 1

### ***Boots and Clamps***

1406626	1453113	99502-0588	1407153	1100740
				
Boot; 5"x2.125" Silicon	Screw Clamp; 1/2"-1-1/4" Dia	Clamp; 5.88" V-Band	Clamp; Spring 1/2"	Lap Clamp; 4"
Qty: 1	Qty: 11	Qty: 1	Qty: 2	Qty: 1

1405211	99800-0450	HS-96	1405305
			
Clamp; 3.00"-3.38"	Clamp; 4.50" V-Band	5"-7" Clamp	3"x3" Boot
Qty: 2	Qty: 1	Qty: 2	Qty: 1

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## Introduction

BD's Compound Add-A-Turbo Kit for the Chevy Duramax LML is a great upgrade for drivers wanting to push past 500hp but still keep stock turbo spool, the ability to tow heavy loads, and maintain safe EGT's. The factory Variable Geometry Turbo (VGT) retains the use of the stock exhaust brake and rapid turbo spool while the addition of the BorgWarner S475 turbo supplies the extra air needed for high performance.

## Removal

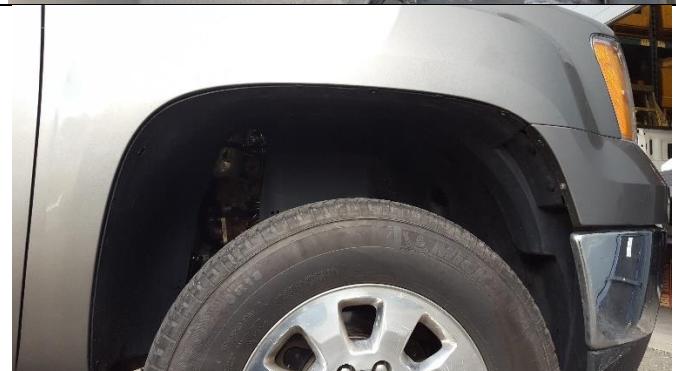


**VEHICLE SHOULD BE SAFELY SECURED BEFORE INSTALLATION.**

1. Disconnect both batteries.



2. Remove passenger side wheel and fender liner.

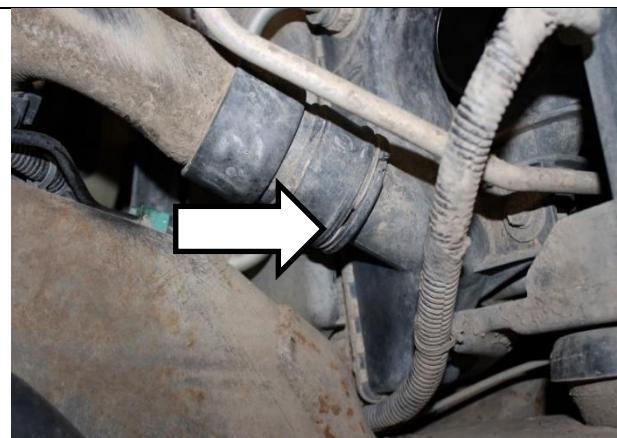


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3. Drain coolant by removing the retaining clip and removing the hose from the passenger side of the radiator. Reconnect the radiator hose once the coolant has drained.



4. Remove engine bay corner bracket.

2015-2016 trucks will have a bar.



5. Disconnect MAF and humidity sensors from the intake.



6. Undo the Philips head screws and gear clamps on the intake. Remove the stock air box and filter.





7. Remove the top two bolts with a 10mm socket and the front bracket with a 13mm socket. Remove the intake resonator.



8. Remove the stock turbo intake tube. Completely loosen off the inlet gear clamp. Remove the PCV tube and attached P-clamp.

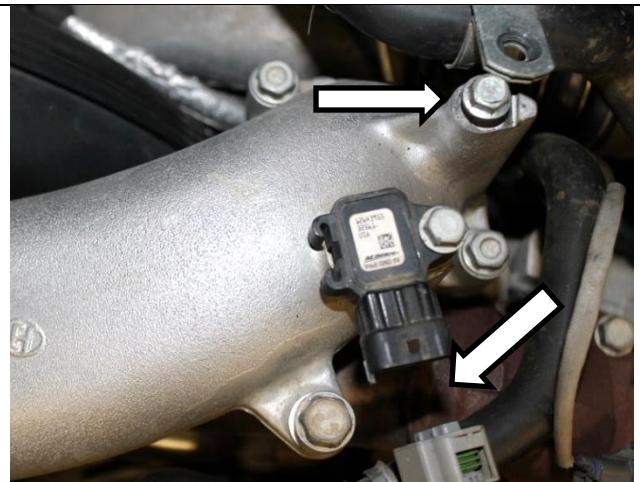


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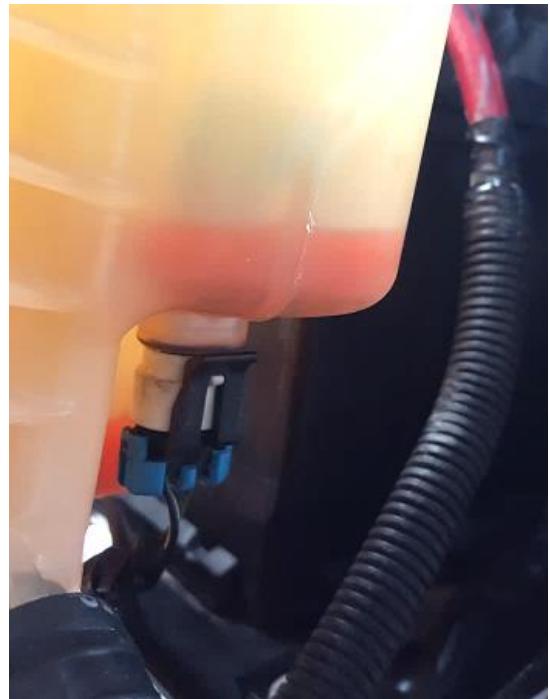
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9. Disconnect the MAP sensor and PCV clamp bolt.



10. Disconnect the coolant lines from the stock coolant bottle.

Disconnect the coolant sensor from the bottom of the bottle. Then remove the one bolt and one nut with a 10mm socket and remove the bottle.



11. Remove the bolt on the grid heater bracket on the passenger side.

Remove the bolts underneath the throttle valve that secure the assembly.



12. Unplug the orange connector on the recirculation valve.

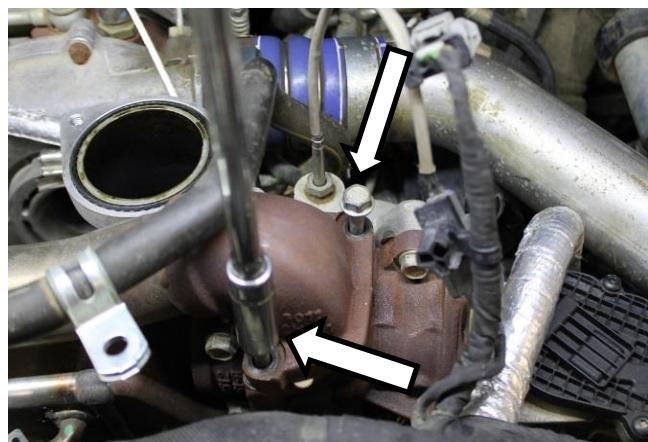


13. Unplug the control valve connector and remove all coolant lines connected to the recirculation (only 4 shown there are 5 in total to disconnect).

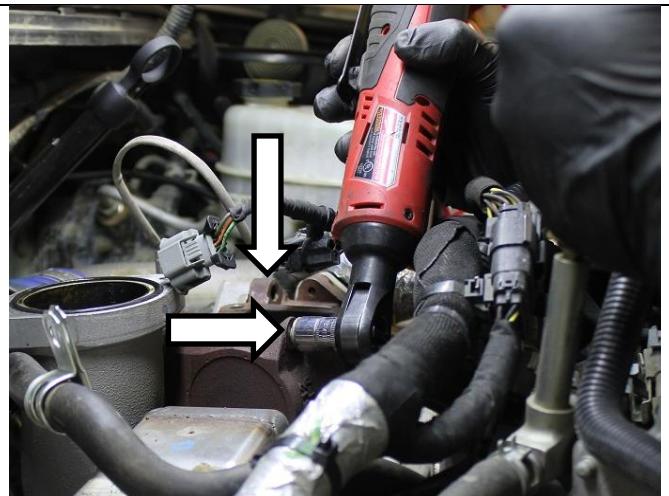


14. Remove the two bolts on the crossover tube on the passenger (by control valve) and driver (by recirculation valve) side.

Lift and remove the cross over tube.



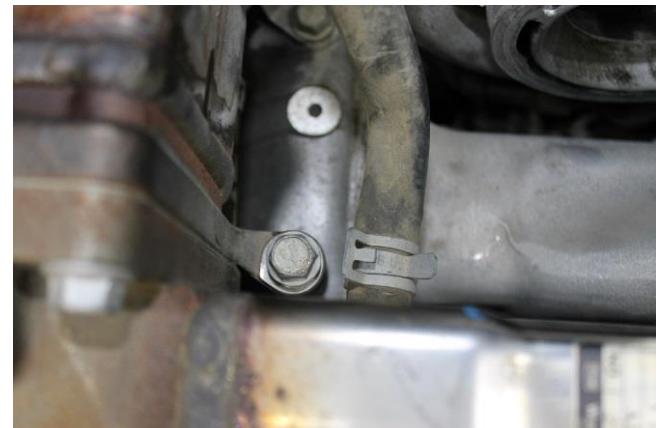
15. Remove the two bolts securing the recirculation valve to the intake manifold.



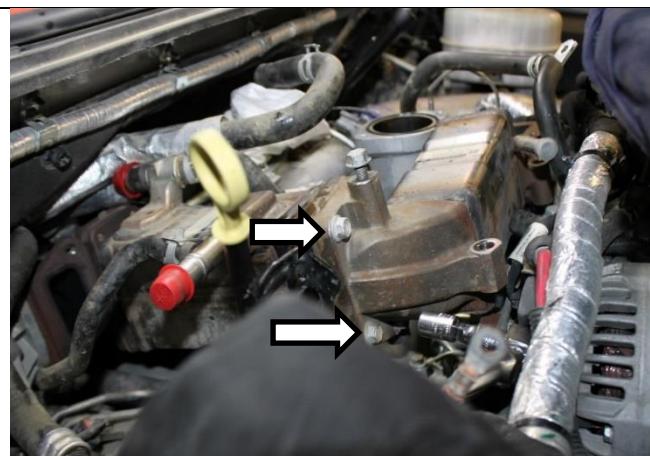
16. Remove the two bolts securing the front and rear recirculation cooler to the motor.



17. Remove the heat shield on the exhaust up-pipe. Remove the bolt holding the large coolant line next to the up-pipe and the two vertical bolts on the control valve (pictured).



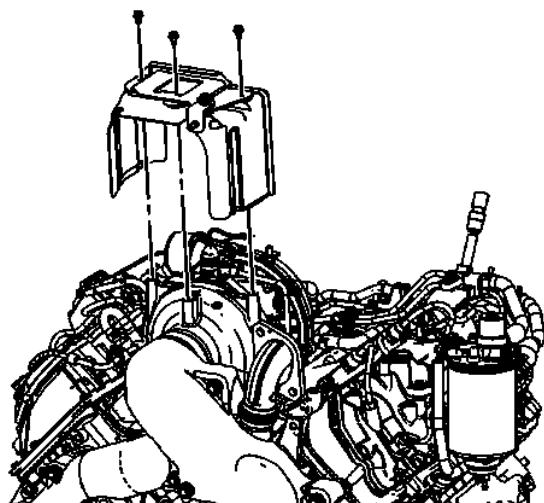
18. Lift the cooler assembly to access and remove four bolts securing the front cooler to the rear cooler.



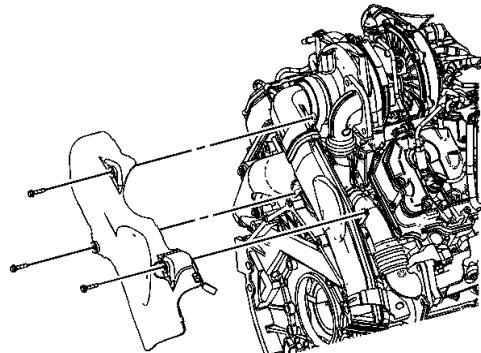
19. Remove the exhaust gas recirculation cooler.

You may need to remove the glow plug controller.

Optional: To help remove the downpipe heat shield remove the turbocharger upper heat shield bolts and heat shield



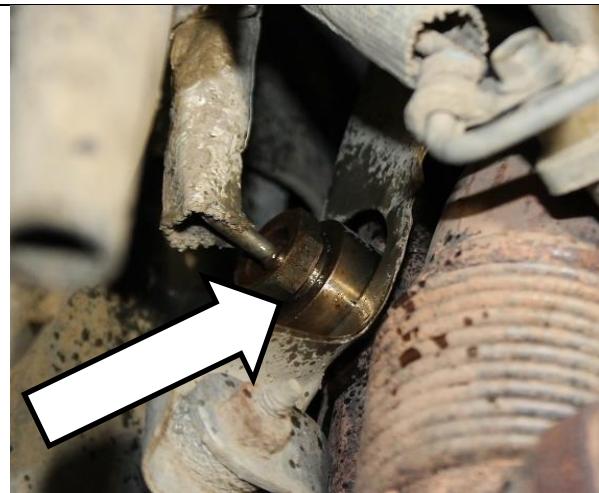
20. Remove the downpipe heat shield and bolts



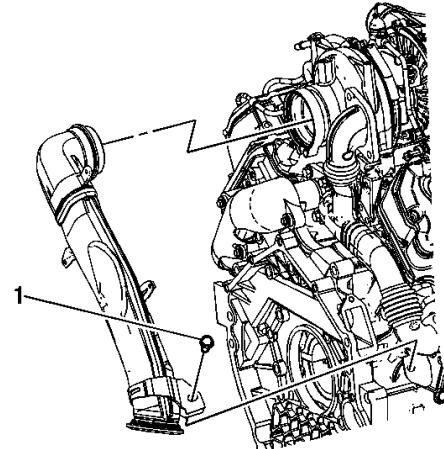
21. Disconnect and remove the EGT sensor. Remove the module from the firewall.



22. Remove the indirect fuel injector in the downpipe.



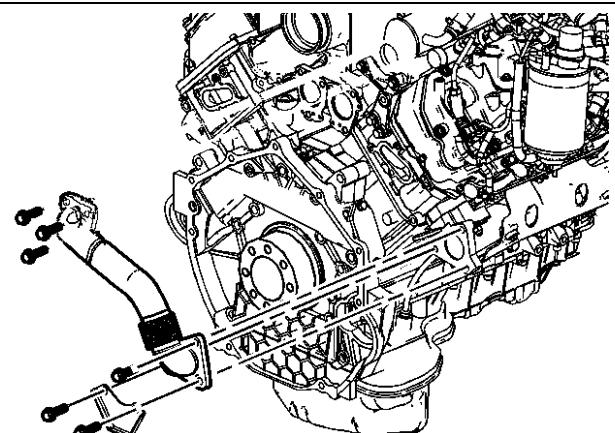
23. Remove the downpipe.



24. Using a 12mm 12 point socket wrench remove the passenger side up pipe bolts.

Remove the up-pipe and discard the gaskets.

**It is highly suggested to use liquid thread loosener and or apply heat to help loosen the up-pipe bolts.**



<p>25. Remove the lower section of the downpipe.</p> <p>The lower exhaust bracket must be removed to get the lower section of downpipe out. There are two 13mm socket bolts.</p>	
<p>26. Remove the stock air filter tray.</p>	
<p>27. Disconnect all the wiring to the stock megafuse holder. A new megafuse holder will be used with the kit.</p>	

28. Remove the passenger side battery. Keep the OEM tie down bolt and plastic bracket.



29. Remove the stock battery tray and brace. Do not lose the two 10mm head nuts on the fender.

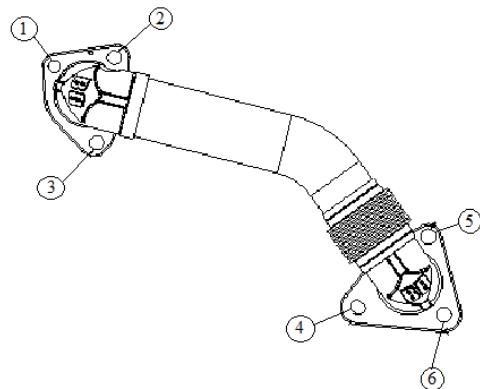


30. Two studs on the firewall will need to be ground off to clear the compound downpipe.



## Installation

1. Install the BD supplied up-pipe (1403802). Tighten the exhaust up-pipe bolts in the sequence shown. 39 lbft.

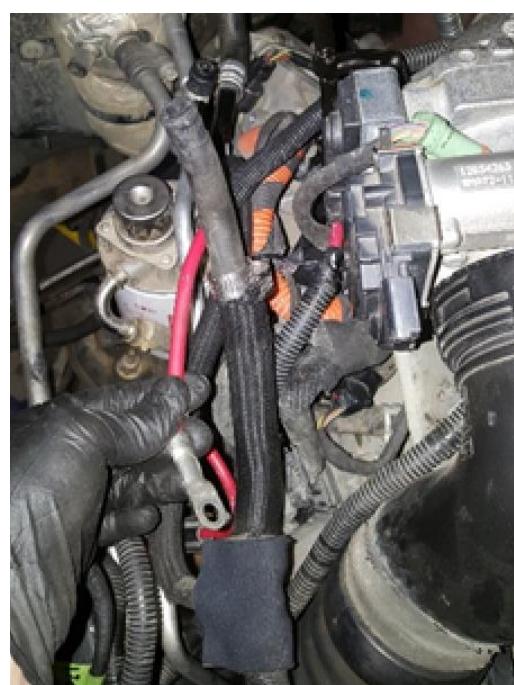


2. On the OEM intake install the intake plates (1900074) and bolts using the supplied O-rings (FT-0480803) and bolts (1601715).



3. Remove the large wire that runs along the top of the firewall. This wire originates from the fuse block on the driver side of the engine bay.

This wire needs to be rerouted to reach diagonal across the motor to reach near the passenger side headlight.



4. The coolant tube running from the heater core to the block (near the stock downpipe) will need to be replaced with the supplied 5/8" to 7/8" silicone tube (1406624). The stock metal coolant tube will need to be used.

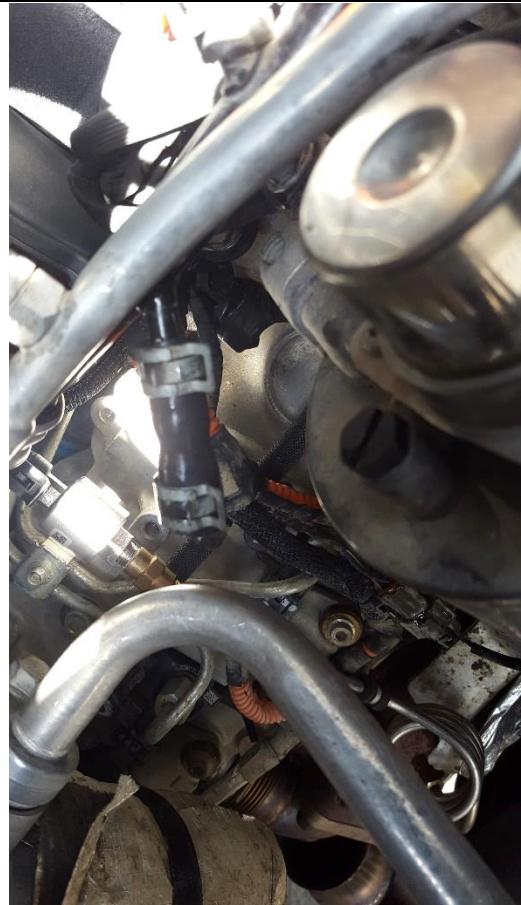
**2011-2014 LML trucks will need to trim 1.25" off the coolant (1406624) line near the firewall to fit.**



5. Plug the 1/2" coolant line near the front of the motor. Use the 1/2" plug (1462123) using 1/2" line (1604054) and two gear clamps (1453113).



6. Plug the coolant hard line near the fuel filter as shown. Use the 5/16" plug (1462121), two spring clamps (1407153) and 2.5" of silicone line (1407155).



7. A turbo oil drain port must be installed.

Drain the engine oil.



8. Remove the oil pan



9. Unbolt the starter and remove from the motor. You will need to make space to drill and tap the new oil drain fitting.



10. Use a 90 degree drill and size 37/64" drill bit to drill through the top of the oil compartment.

Make note of the drill location shown. The 45 degree NPT to JIC fitting must thread in here.



11. Carefully tap the hole using a 3/8" NPT tap. This fitting will be below the oil level.



12. Use thread sealant and seal the 45 degree NPT to JIC fitting (FT-421680). Do not put sealant on the JIC threads.

Orient the JIC threads as shown pointing away from the block.



13. Clean up any metal shavings and install the oil pan.

Use a bead of RTV to seal the oil pan.

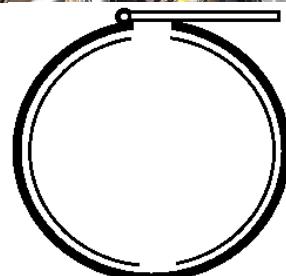


14. Wrap the supplied hot pipe (1406611) with 2" wide header wrap (1453514).



15. Use the stock downpipe v-band clamp and loosely clamp the hot pipe in place (1406612)

The clamp should only have two grooves (as shown) and should not be mixed up with the three groove downpipe clamp.



16. Bolt the primary turbo bracket (1406610) to the fuel filter housing using and intake tube using 4 stock bolts. Use the new M8x20 flange bolt (1403106) on the lower vertical bolt. This bolt is located below the orange cable and connects the coolant hard line. Do not over-torque.

The coolant hard line will sit above the primary turbo bracket.

The hot pipe should be able to line up with the bolt holes in the turbo bracket. If not, double check the turbo outlet flange.

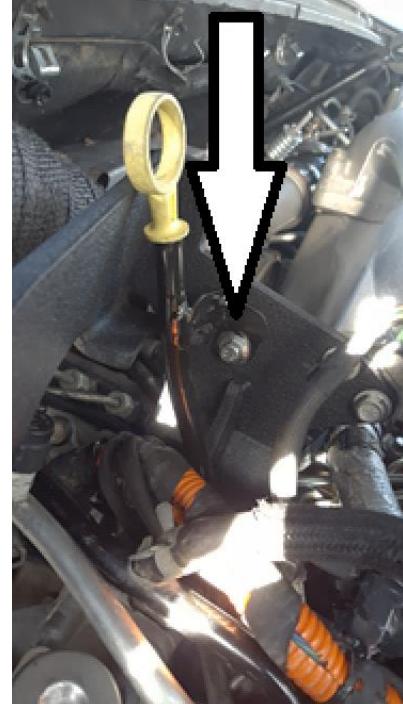


17. Use the supplied T6 gasket (2495146) and sandwich the turbo bracket, hot pipe, and turbine housing together as shown. Use the M10 socket head bolts (FT-35574) with the supplied 10mm nuts (1462441). Make sure the hot pipe sits snugly to the stock turbo and tighten everything into place.



18. Secure the oil dipstick bracket to the primary turbo bracket using the M8 (FT-11116243) bolt.

The oil dipstick tube will need to be slightly pushed into place.



19. Connect the oil drain line (1462330) to both the oil pan and the JIC to turbo drain adapter (PN VIB2898) and install the NPT to JIC fitting (FT-423015-131280).

Make sure the oil drain line does not rub on the exhaust manifold.



20. Install the turbo into the turbine housing. Ensure the turbo compressor wheel spins freely before tightening the turbine housing clamp. **Physical damage is not covered under warranty.**

Bolt the oil drain adapter to the turbo using the oil drain gasket supplied with the turbo.



21. Unbolt the oil plug located in the block with a 17mm wrench. Install the ORB to JIC straight fitting (PN 1462323) and braided oil feed line (PN 1462329).

Route the oil feed line vertically through the wiring to reach the primary turbo.



22. Install the  $\frac{1}{4}$ " NPT to JIC (1453162) fitting into the turbo CHRA. Make sure the oil inlet to the turbo is vertical.

Install the 5" intake boot and supplied clamp onto the compressor cover.



23. Pre-lube the primary turbo and install the oil feed line.

Failure to pre-lube your turbo could damage the bearings on startup.

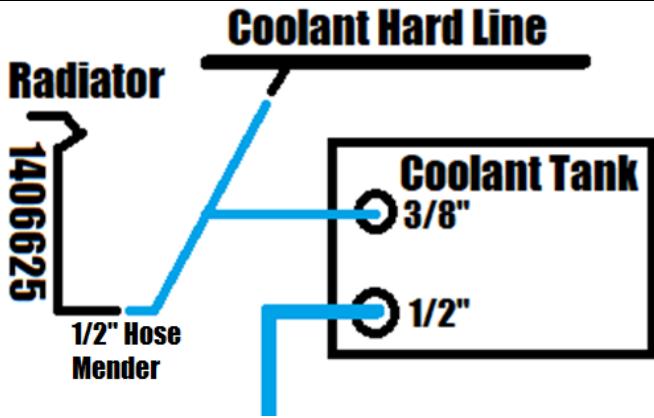


24. The secondary turbo inlet and primary turbo outlet need to be installed at the same time. Be sure to install the supplied #242 O-ring (FT-0480826) into the inlet flange. You may need to fully undo the OEM gear v-band clamp on the stock turbo to install the tube.

Start with the stock turbo inlet and make sure it is centered on the inlet V-band. Tighten the OEM gear clamp until the inlet tube rotates smoothly.



	
<p><b>25.</b> Install the #152 O-ring (FT-0413922) into the turbo outlet tube. Place both spring clamps (1405211) on the 3" boot (1405305) and slip onto both tubes boot before securing the turbo outlet V-band (99800-0450).</p> <p>Make sure the turbo outlet tube clears the grid heater connector. Rotate the compressor cover to line up.</p> <p>Make sure both tubes line up before tightening all clamps and compressor cover.</p>	 
<p><b>26.</b> Install the battery tray using the four factory M6 bolts. Make sure the negative battery cable has been routed underneath and will reach the negative terminal of the battery.</p> <p><b>The negative terminal will be nearest the headlight.</b></p> <p><b>Protect all battery wiring from chaffing against all edges. Use the supplied 3/8" loom (1300180)</b></p>	

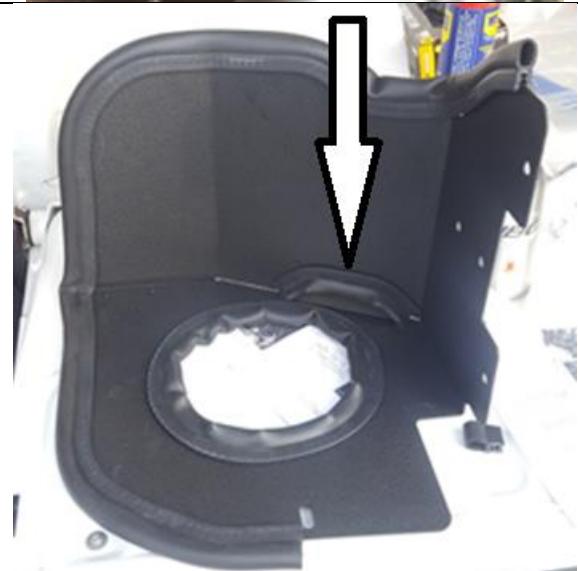
<p>27. Install the coolant bottle (1406621) using the two OEM 10mm head nuts previously used for the battery tray.</p> <p><b>Insert 4" of silicone tube (1407155) onto the overflow coolant bottle cap pointing downwards into the expansion tank.</b></p> <p>Route the coolant caps (1406627 &amp; DOR54259) as shown with an overflow line (1407155) routed down into the fender.</p>	
<p>28. Connect the coolant float sensor.</p>	
<p>29. Disconnect the coolant line from the radiator and insert the supplied formed silicone tube extension (1406625).  Use the <math>\frac{1}{2}</math>" hose mender (FT-69989) and two gear clamps.</p>	
<p>30. Connect the coolant lines to the coolant tank as shown.</p>	 <p><b>Coolant Hard Line</b></p> <p><b>Radiator</b></p> <p><b>1406625</b></p> <p><b>3/8"</b></p> <p><b>1/2"</b></p>

31. On the positive battery terminal, attach the extension wire (6239-5-BP) that will lead to the new megafuse (LMG53-E-1-001) holder.

**Protect all battery wiring from chaffing against all edges. Use 3/8" loom (1300180).**



32. Install the weather stripping (1453820) on the air box as shown. Be sure to install weather stripping to protect the battery cables.



33. Orient and group all the wiring cables prior to installing the air box. Install the supplied wiring loom (1300180) to prevent chaffing.

Some of the factory loom may need to be removed to route accordingly.  
See step 35.



34. Re-use the OEM megafuses and install them in the supplied megafuse holder.

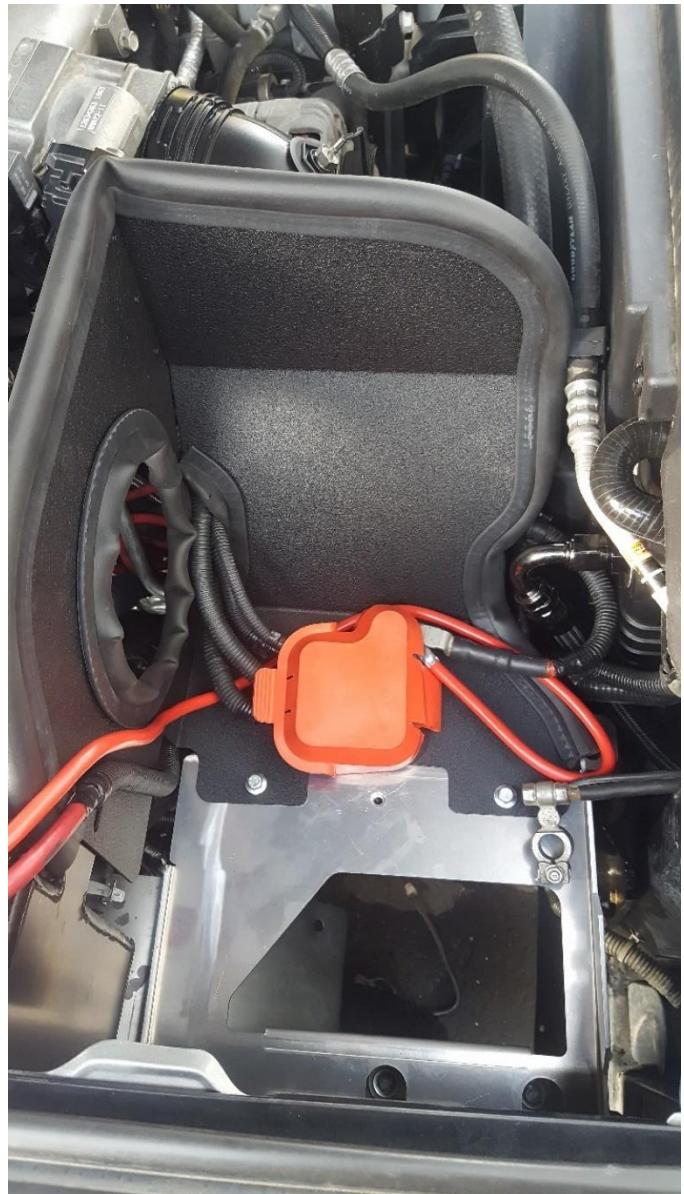


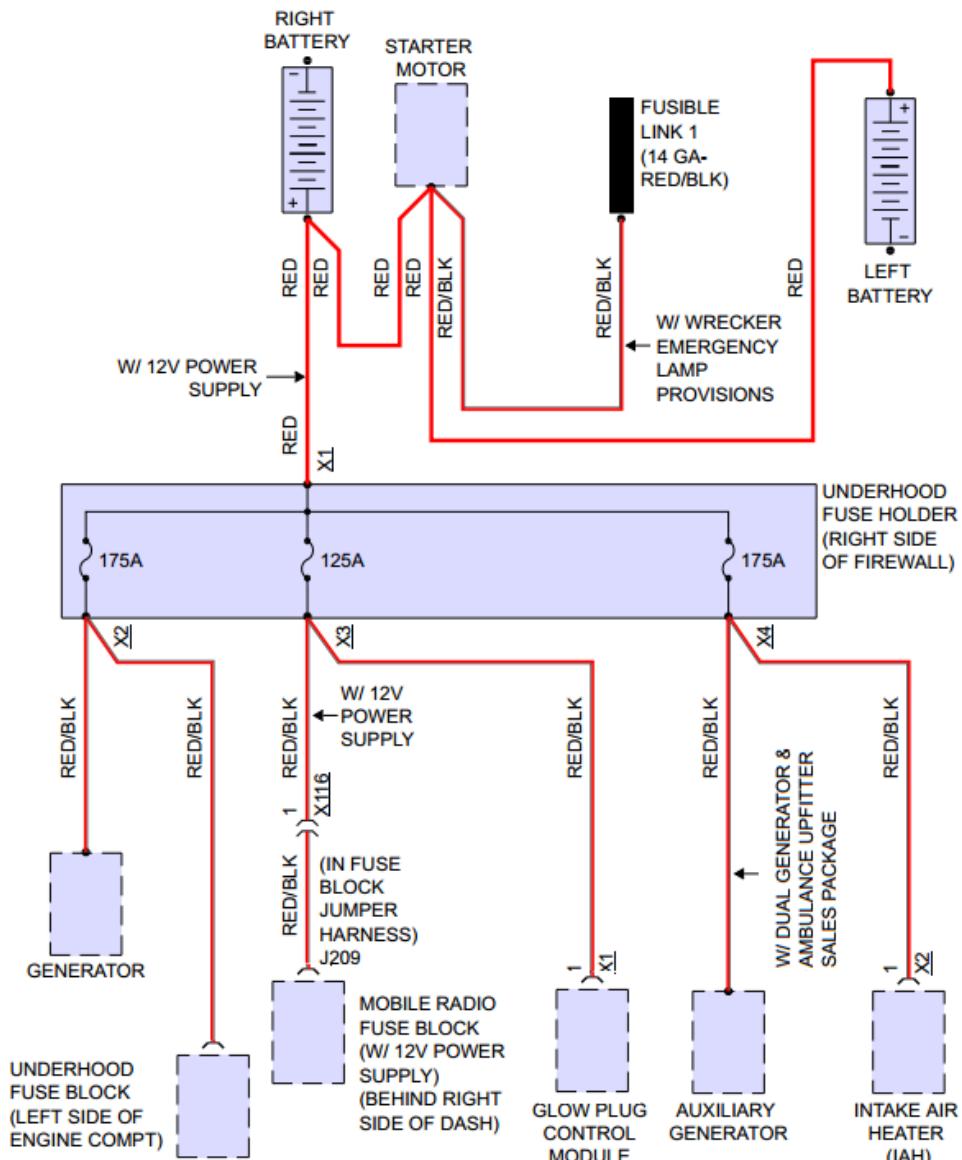
35. Pull the wires through the air box and connect the wires as per the diagram below. Make sure the fuse holder cover is secured in place after attaching all wiring.

Bolt the air box in place using the provided three M8 bolts (FT-11116243). The air box will need to be bolted to the coolant bottle to ensure the intake tube does not rattle against the air box.

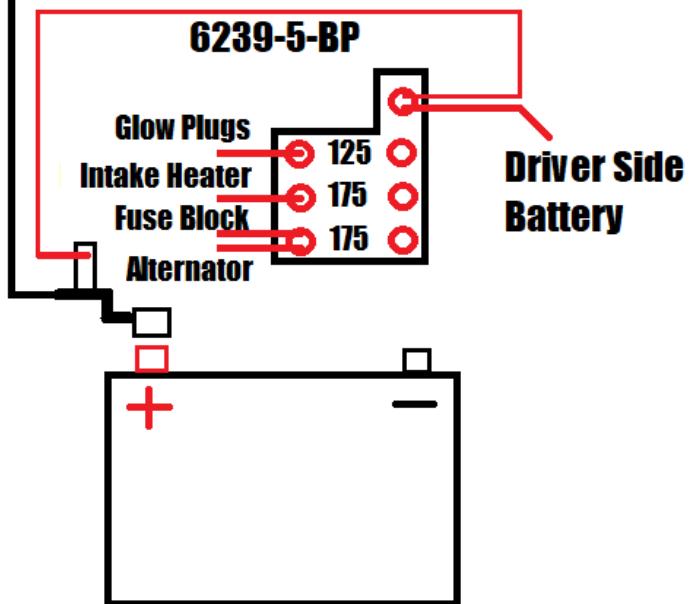
Insert the provided M8 U-nut (1456737) onto the coolant bottle.

Zap strap wires together to prevent any unnecessary chaffing.





## Starter



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36. Install the battery using the OEM battery tie down bracket.



37. Move the MAF and humidity sensor over to the new intake tube (1406615) using the supplied Philips screws and mounting hardware.

Early trucks will use the humidity sensor block off plate.



38. Route the supplied PCV tube across the engine bay. Clamp the tube to the PCV outlet. The tube will need to be cut to length to fit the intake tube.



39. Connect the PCV tube and humidity sensors to the intake tube before pushing through the air box. Cut the PCV tube to length.



40. Push the intake tube through the air box aligning it with the 5" intake boot.

Then connect the MAF/ humidity sensor connectors.



41. Install the air filter and secure in place with the provided gear clamp.



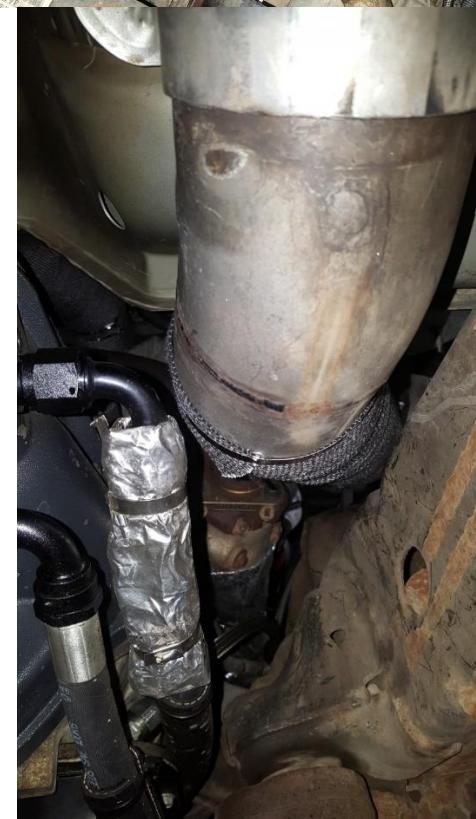
42. Wrap both sections of the downpipe using the provided 2" header wrap.



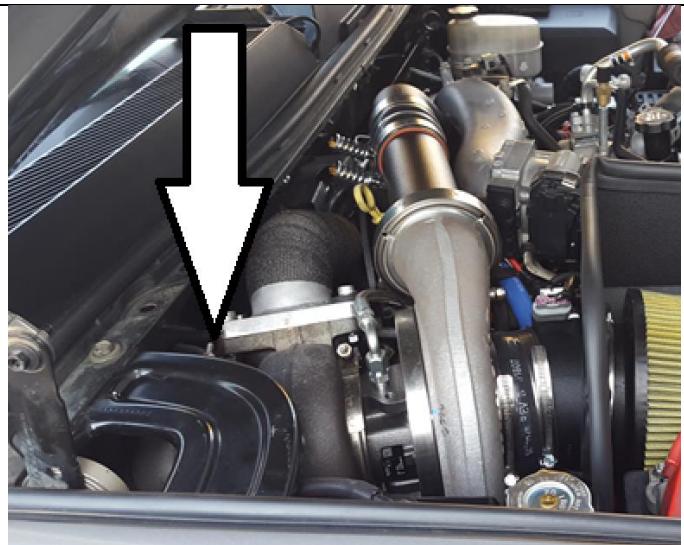
43. Twist the downpipe into place through the bottom. You should not need to force anything.

Loosely clamp the upper V-band in place to align with the rest of your exhaust. Make sure the downpipe is not touching the frame.

Use the included 4" lap clamp (1100740) to then mate up to your preferred 4" exhaust.



44. Re-bolt the engine bay bracket after tightening down all exhaust clamps and re-install the stock fender liner.



45. Refill the engine oil.

Refill the coolant only in the pressurized tank. Do not fill the overflow tank.

Reconnect the IAT on the stock CAC tube and the MAP sensor.

Connect both batteries after making sure all positive wires are not in contact with any grounds or parts.



## Troubleshooting

Low Coolant Light	<ol style="list-style-type: none"> <li>1) Check coolant level.</li> <li>2) Ensure the sensor is plugged in.</li> <li>3) Check the sensor, when the coolant tank is full, the sensor will have low resistance, when empty it will be an open circuit.</li> </ol>
Vibration in cab	<ol style="list-style-type: none"> <li>1) Make sure the intake tube is centred inside the air box. Loosen the clamps and centre the intake filter. The M8 bolt attached to the coolant tank will adjust the air box location.</li> <li>2) Check for adequate exhaust clearance near the firewall and frame.</li> </ol>
Low boost/ high EGT's	<ol style="list-style-type: none"> <li>1) Check the stock turbo inlet tube (1406613) is centred on the turbo inlet and the O-ring</li> </ol>
Hot pipe is loose on the stock turbo/ exhaust leak	<ol style="list-style-type: none"> <li>1) Make sure the correct V-band clamp is installed. See install step 15.</li> </ol>