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11-16 LML Duramax CP3 Fuel Pump Conversion

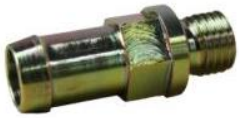
2011-2016 LML Duramax Engine CP4 to CP3

1050496	**CP3 Kit; 11-16 LML Conversion**

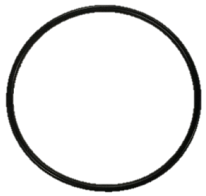
No tuning required for install!

Note: BD Diesel recommends replacing all EGR, intake, and thermostat housing gaskets and o-rings. These are not included in the kit.

1050495 Kit Contents – Conversion Kit

1050115	1500780	1502042	1502040
			
CP3 Pump	CP3 Adapter	3/8” Return Fitting	½” Inlet Fitting
Qty: 1	**Qty: 1**	**Qty: 1**	**Qty: 1**

1500775	1500776	1500779	1500785
			
High-Pressure Line	Low-Pressure Line	Supply Hose	9th Injector Feed Assembly
Qty: 1	**Qty: 1**	**Qty: 1**	**Qty: 1**

1500778	1500738	FT-11116059	1130238
			
Rail Plug	Extension Harness	M8 x 35 Bolt	Adapter O-ring
Qty: 1	**Qty: 1**	**Qty: 3**	**Qty: 1**

1502019	1452827	1302143	1302141	1302142
				
Seal Washer	#6 Gear Clamp	Banjo Seal Washer	Banjo Cap	M8 Banjo Bolt
Qty: 2	**Qty: 2**	**Qty: 2**	**Qty: 1**	**Qty: 1**

Introduction

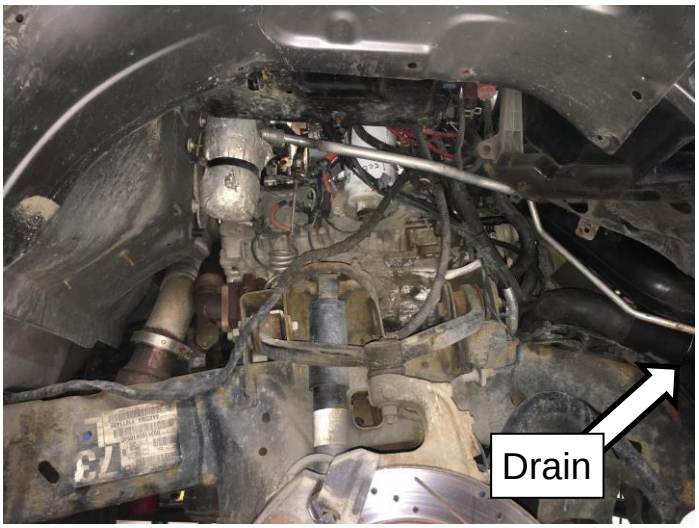
Starting in 2001, Duramax engines have been equipped with the dependable Bosch CP3 injection pump. However, from 2011 to 2016, the LML Duramax engines came equipped with the much less reliable CP4 injection pump. With a catastrophic CP4 failure, metal particles are introduced into the entire fuel system. This results in thousands of dollars spent replacing fuel injectors, rails, lines, etc. Many owners prefer to upgrade their LML engines to use a CP3, whether as a preventative measure, or after a CP4 failure. This kit comes with everything you need to convert a CP4-equipped LML Duramax to use a CP3. It does not require tuning for operation in a stock vehicle.

Installation

Disconnect both vehicle batteries before installation for safety.

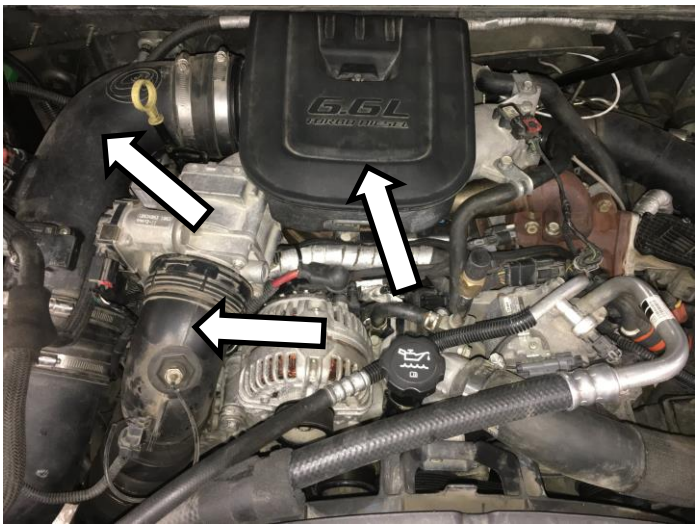
CP4 Pump Removal

Remove RF inner fender and drain engine cooling system at lower rad hose connection.

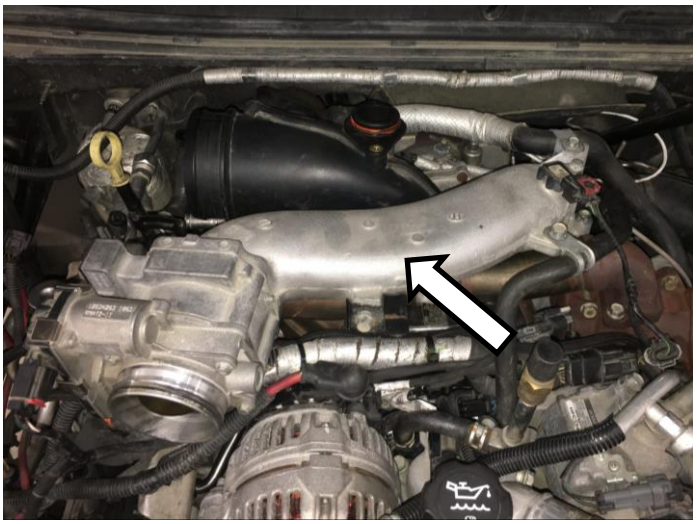


Remove plastic intake manifold cover, air filter tube, and charge air cooler (CAC) pipe between throttle body and CAC.

Note: To disconnect CAC pipe, gently rotate locking rings counter clockwise.

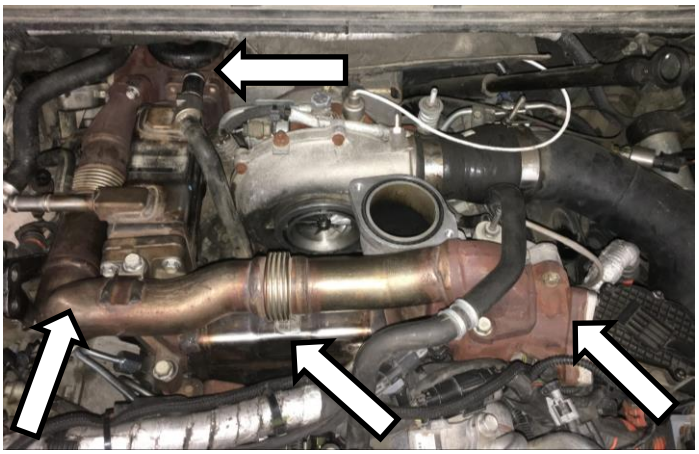


Remove aluminum intake with throttle body and support bracket.

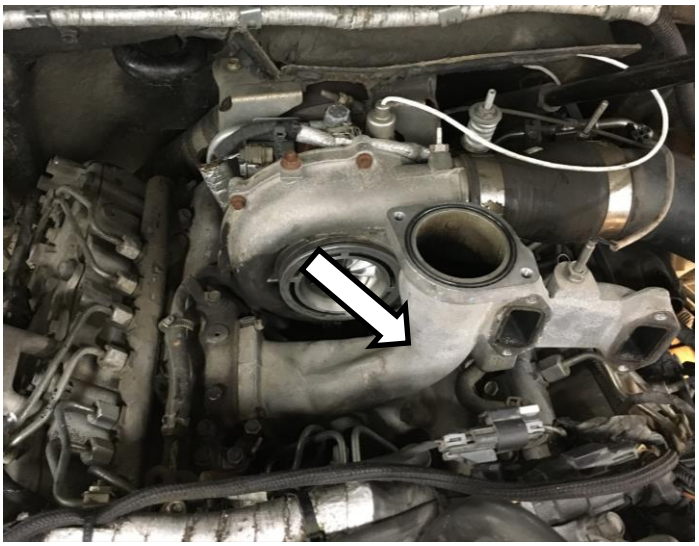


Remove plastic intake elbow from turbo inlet.

Remove EGR system including coolers, bypass pipe, valves, and coolant hoses.

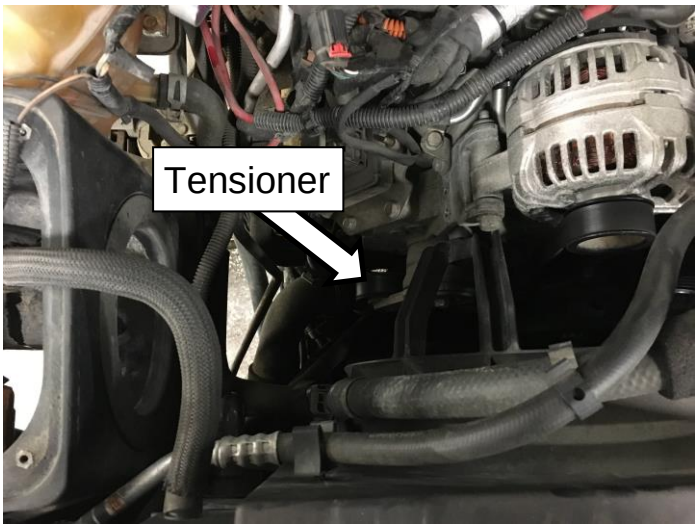


Remove intake manifold “Y” bridge.



Remove upper rad hose, serpentine belt, and alternator.

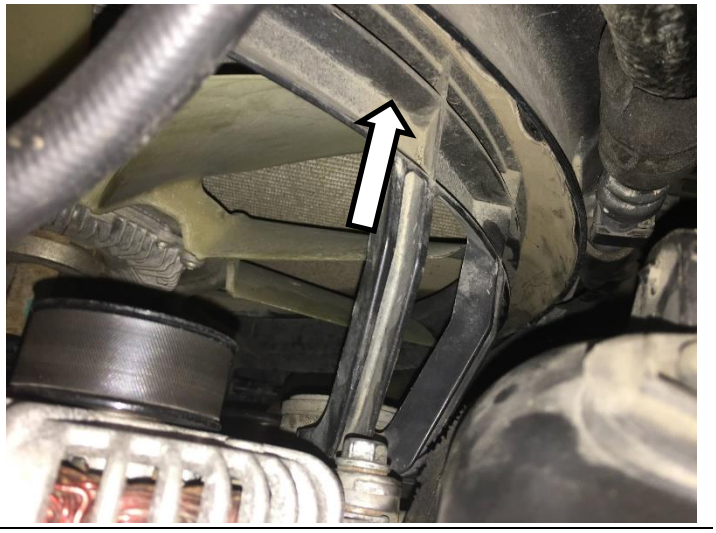
Note: Release belt tensioner with a ½” ratchet below alternator.



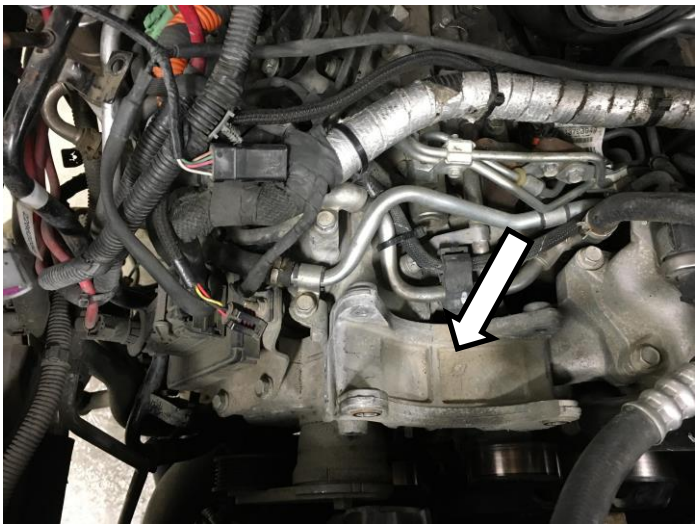
Unbolt A/C compressor and carefully position aside.

Note: Refrigerant does not need to be recovered.

Unbolt cooling fan inner shroud and slide forward toward rad. Fan should not need to be removed or repositioned.



Remove alternator mounting bracket. Belt tensioner and idler pulleys can stay mounted to bracket.

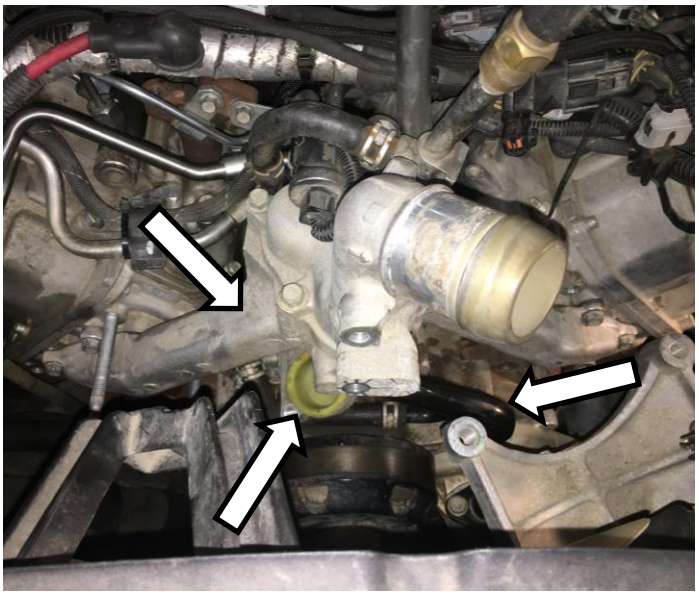


Position A/C compressor / power steering pump mounting bracket aside.

Note: Remove two mounting studs after removing nuts and bolts to allow bracket to be repositioned.

Remove oil fill tube, then thermostat housing with crossover and bypass pipe.

Important! Plug oil fill tube bore to prevent debris from entering.

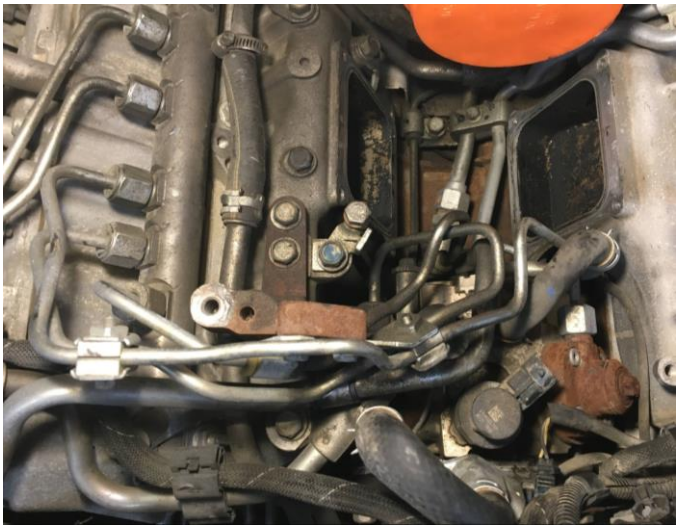


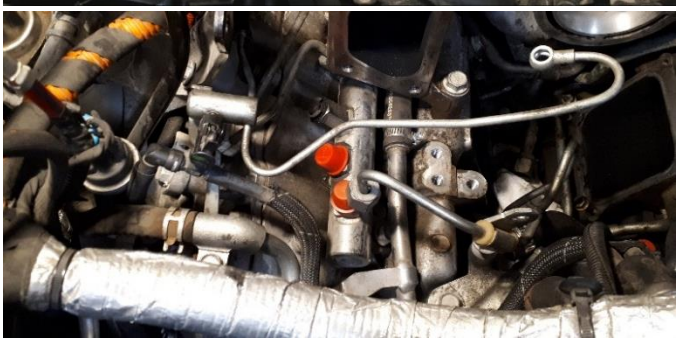
Remove all fuel lines and hoses to and from injection pump.

Place Rubber lines aside, as some will be re-used during install.

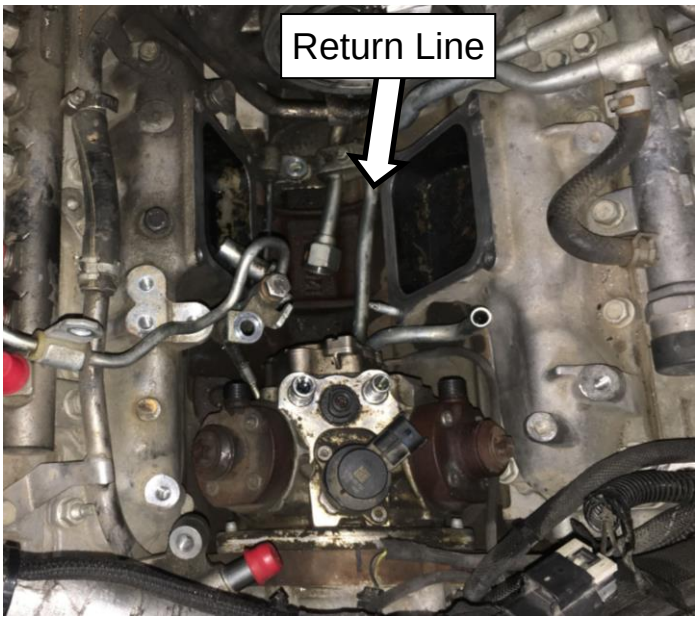
Note: 9th Injector feed line can be loosened and folded up out of the way as shown.

Important! Cap ports on fuel rail to prevent debris from entering!

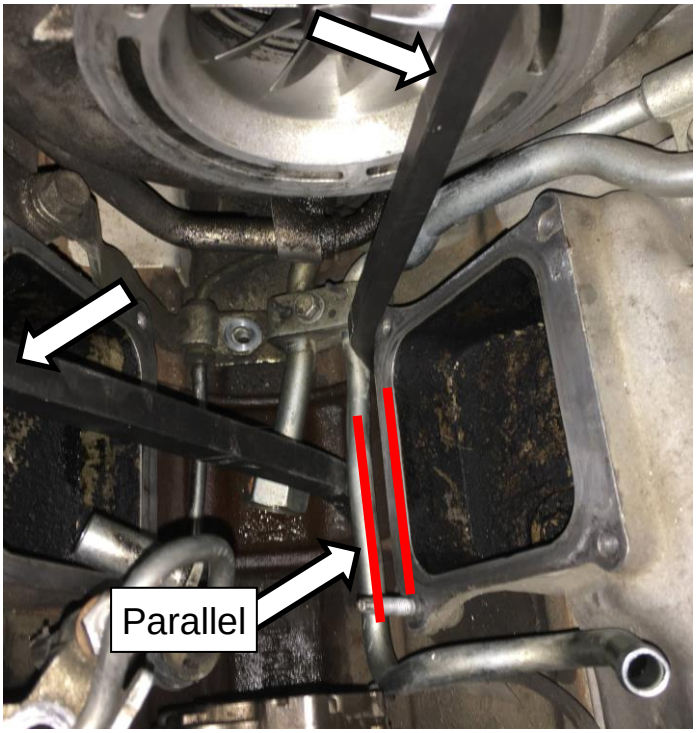


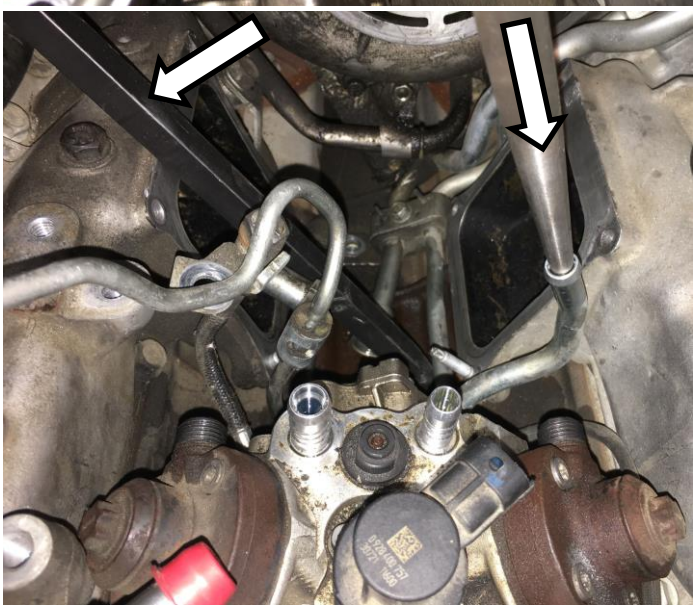


Carefully bend return line in valley to be parallel to machined surface of L/H intake manifold. This may need further adjusting later once new pump is installed.

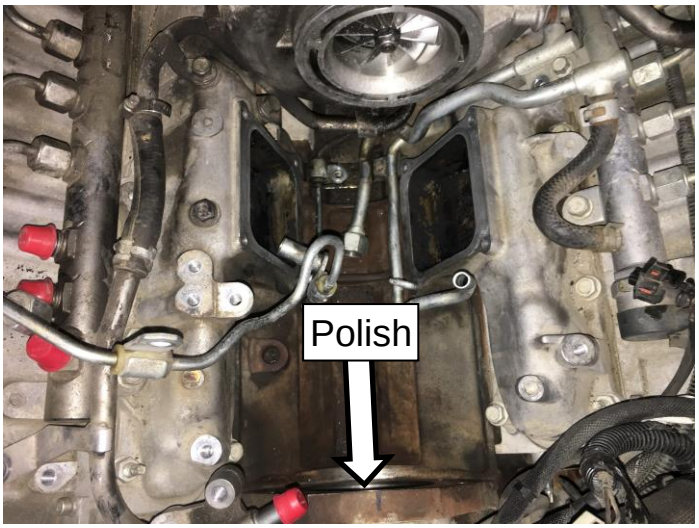


Note: Two prybars and a clean drift punch inserted into line work well to manipulate it.





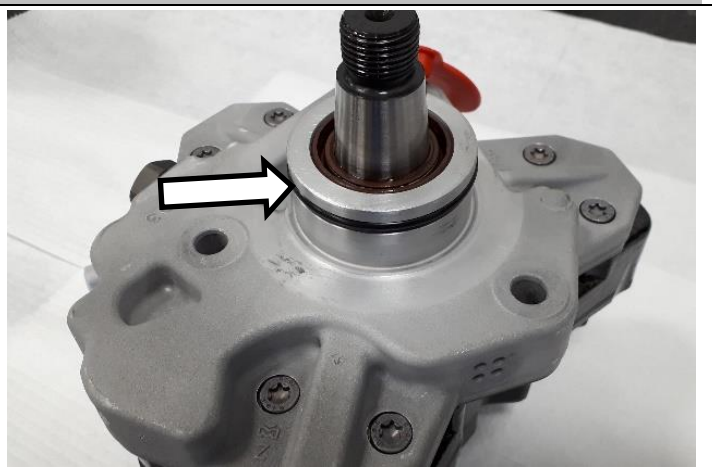
Remove CP4 from cylinder block, and polish mounting bore to aid CP3 installation.



Remove and save drive gear, nut, and temperature sensor to be reused.

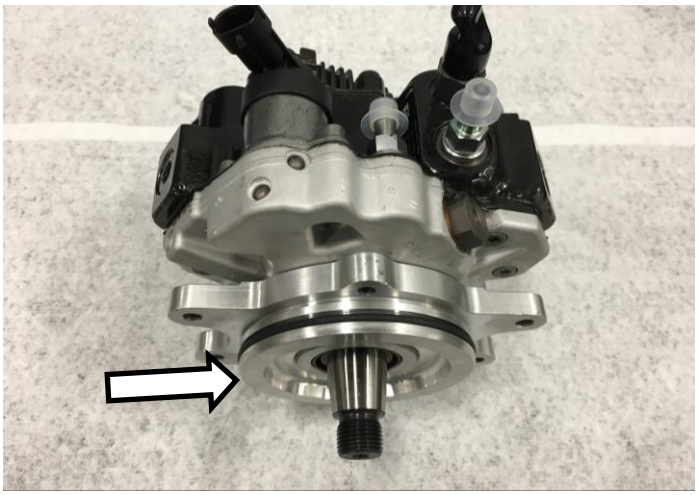
Preparing CP3 Pump for Install

Lubricate o-ring on front of pump.



Install pump mount adapter **1500780** onto pump, and tighten three mounting bolts **FT-11116059** to **18 ft-lbs**.

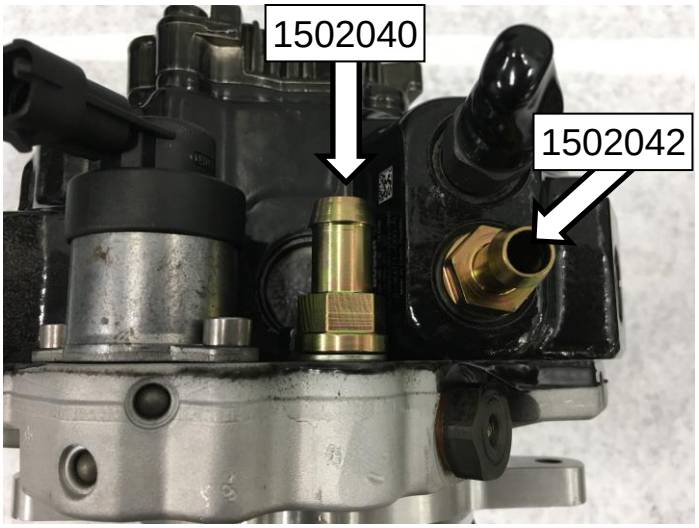
Lubricate and install supplied o-ring **1130238** on pump mount adapter.



Remove barbed supply and return fittings from pump.

Install supplied barbed fittings with lubricated sealing washers **1502019** in locations shown and torque to **20 ft-lbs**.

Horizontal: 1/2” barb fitting **1502040**
Vertical: 3/8” barb fitting **1502042**

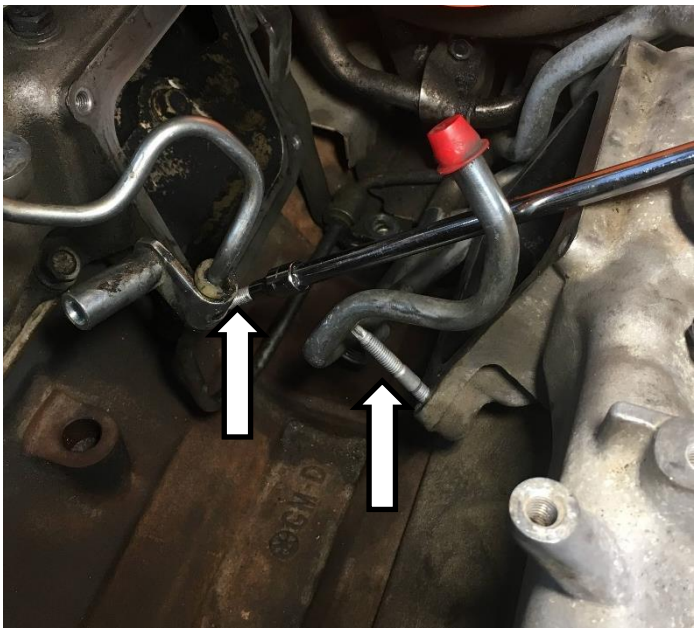


Install drive gear, and torque nut to **75 ft-lbs**.

Note: The CP4 nut does not fully thread onto the pump shaft, this is not a problem. It is taller than a CP3 nut. Thread engagement remains the same.

CP3 Pump Installation

Remove two 6mm studs from intake manifolds.

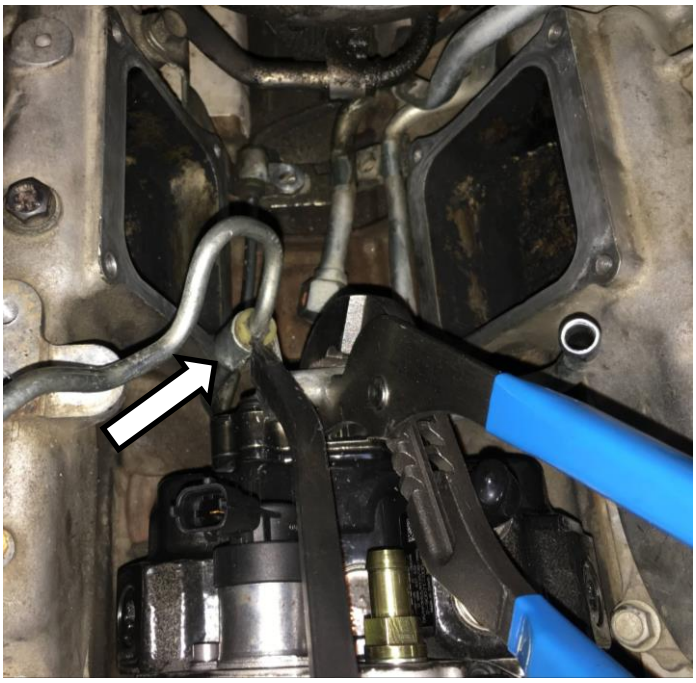


Maneuver CP3 pump into place. Tighten four original CP3 mounting bolts to **20 ft-lbs**.

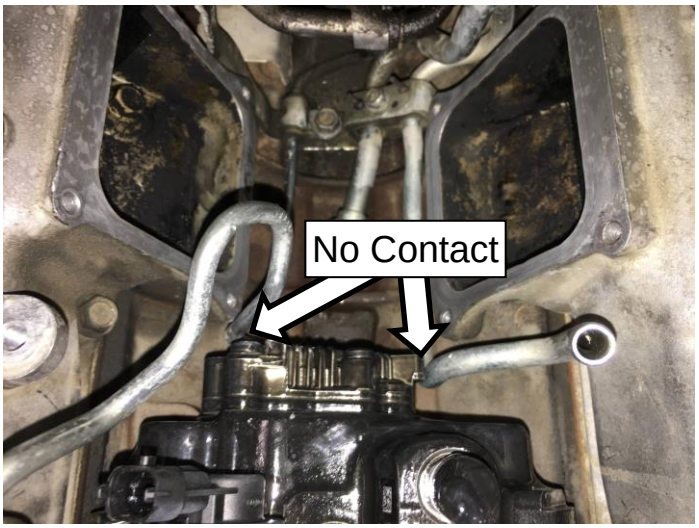
Important! Tighten bolts evenly while working pump into position to prevent damage to pump mount adapter.

Using a prybar and adjustable pliers, remove support bracket on crossover fuel line.

Important! Take care to not bend or damage fuel line.

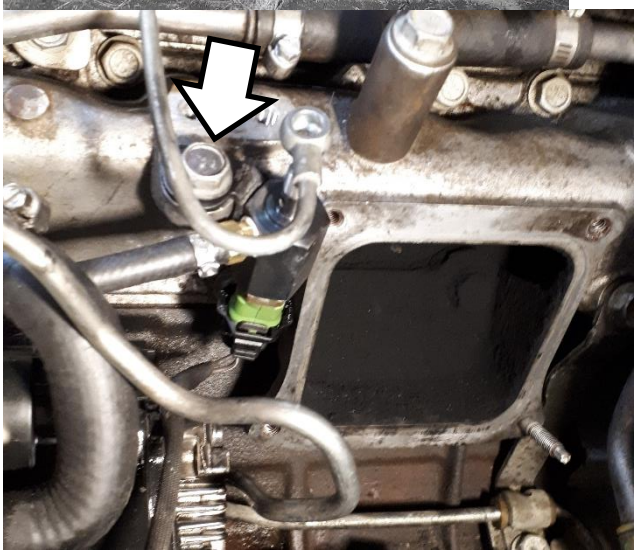


If necessary, adjust crossover and return lines to not contact CP3.



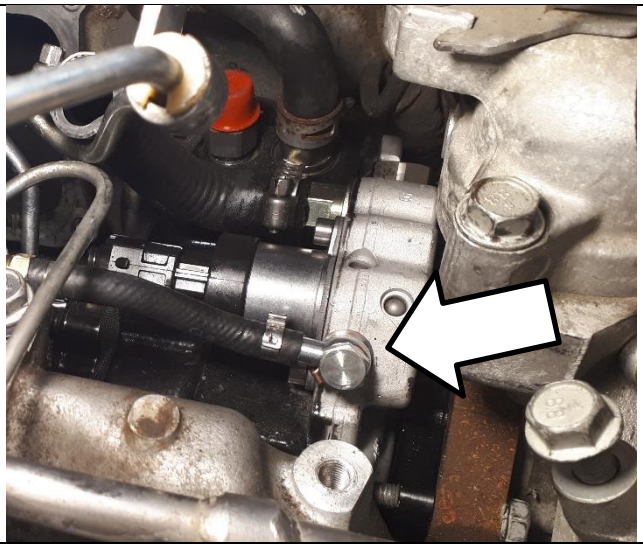
Install factory CP4 temp sensor into adapter **1500785**

Install adapter assembly onto boss that held the original CP4 line.

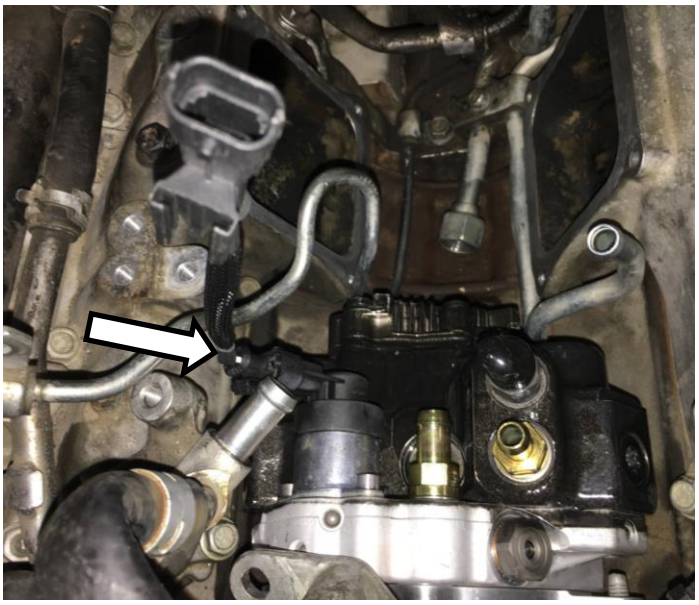


Attach adapter **1500785** hose end to CP3 pump using supplied banjo bolt and seal washer.

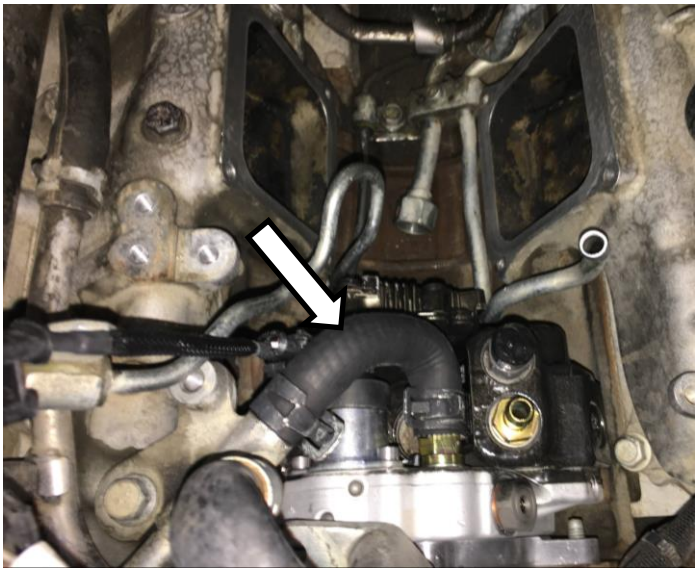
Torque Spec: 89 in-lbs (10 Nm)



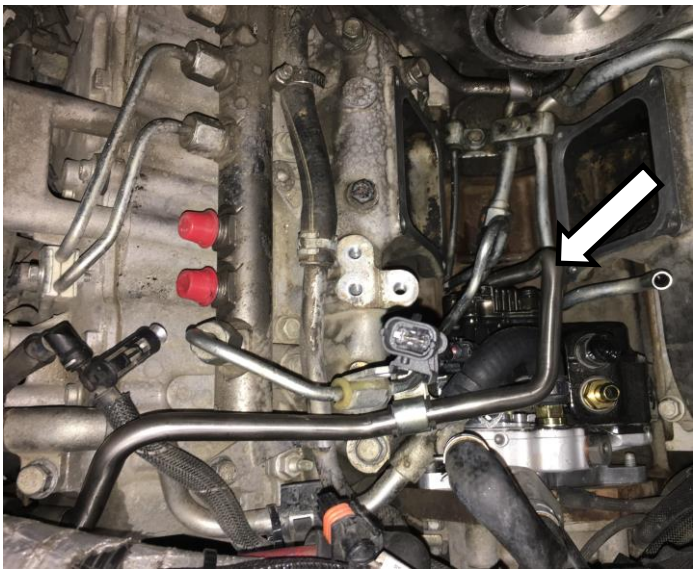
Install FCA extension harness **1500738**.



Install new molded rubber hose **1500779** with #6 hose clamps **1452827**.



Move the two mounting clamps from the original low-pressure line to the same locations on the new line **1500776**.



Maneuver low-pressure line into position.

Important! The connection in the valley is known to be problematic. Ensure mating surfaces are clean, and **do not start mounting bolts yet!**

Start line nut by hand, then **snug** with 22mm and 24mm wrenches.

Connection will pull line into its natural position, allowing it to fully seat. Line can then be slightly adjusted if necessary, so mounting bolts can be installed.

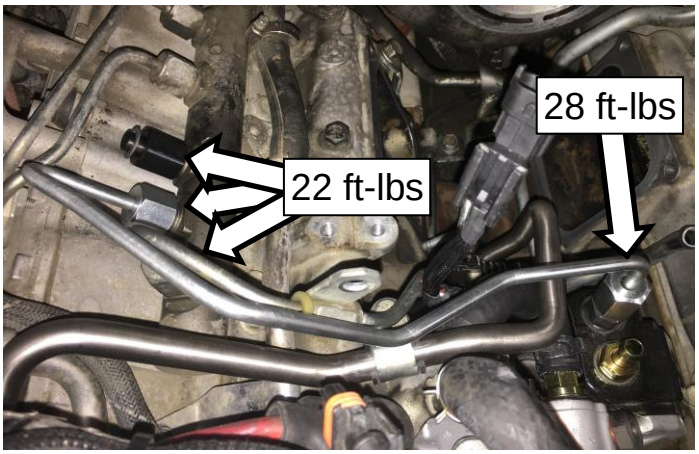
Torque line nut to **50 ft-lbs**.

Important! Ensure line does not contact pump!

Install high-pressure line **1500775** from CP3 to R/H fuel rail, and install fuel rail plug **1500778** as shown.

Torque crossover line nut, high pressure line nuts, and rail plug:

Rail connections: **22 ft-lbs**
Pump connection: **28 ft-lbs**



Install original rubber return hose between pump and return line.

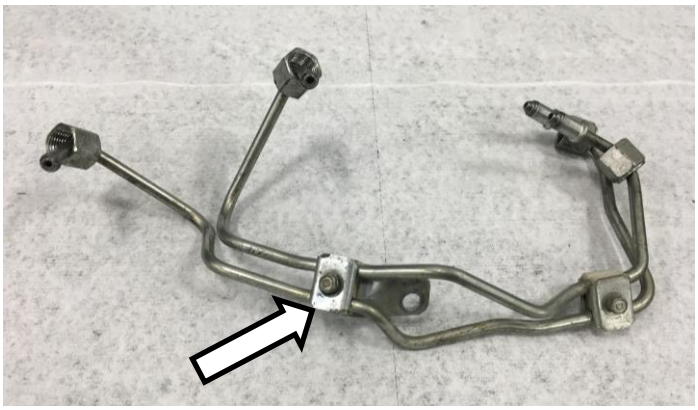
Steel line may need adjusting to line up exactly with hose, and to prevent hose from contacting high-pressure line.

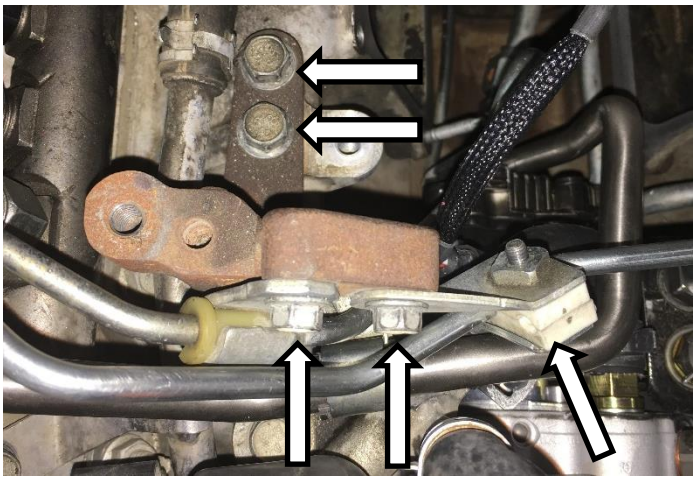
Remove indicated high-pressure line mount and clamp from original lines.

Install EGR / fuel line pedestal and high-pressure line mounts in their original positions.

Note: The mount removed from the original lines now secures only a single line.

Important! Confirm there is no contact between any steel lines, rubber hoses, and other components.

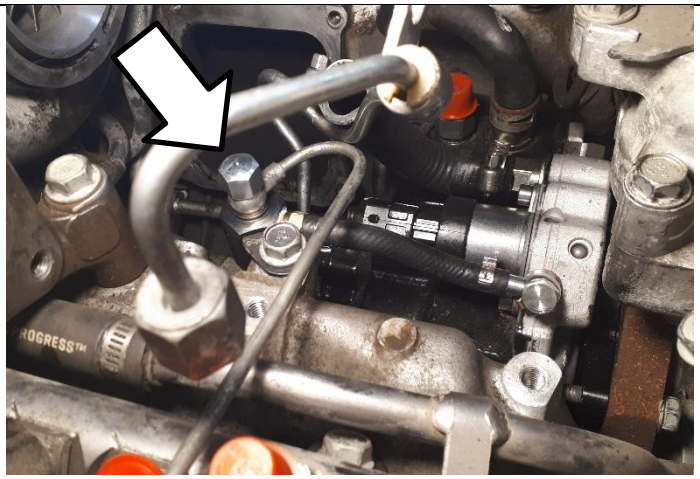




Install factory 9th injector hardline assembly onto adapter, using supplied seal washer and nut.

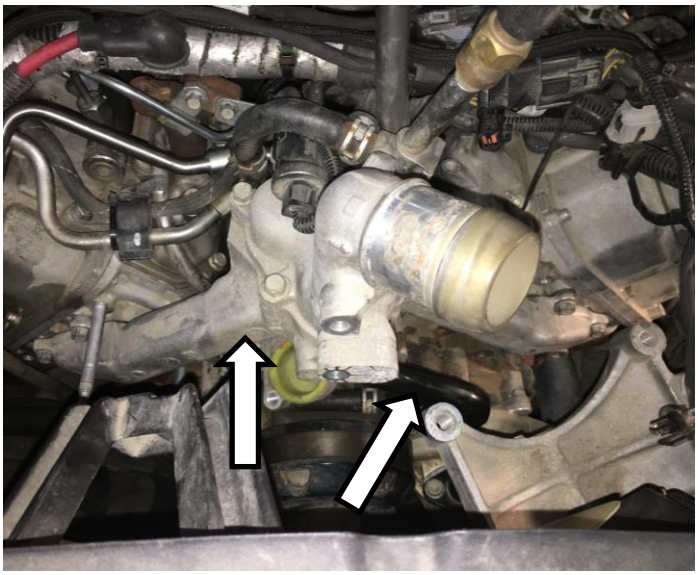
Torque Spec: 89 in-lbs (10 Nm)

Note: Ensure position of adapter does not impede installation of the intake manifold. (Some other components have been removed from image for clarity).

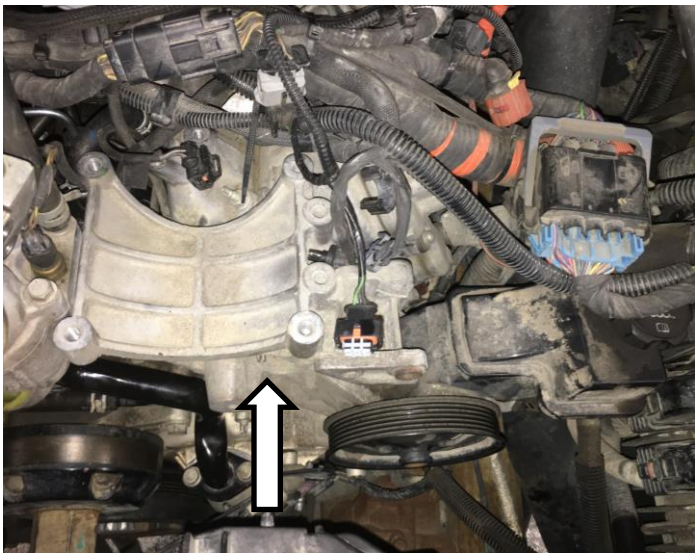


Install thermostat housing with crossover and bypass pipe.

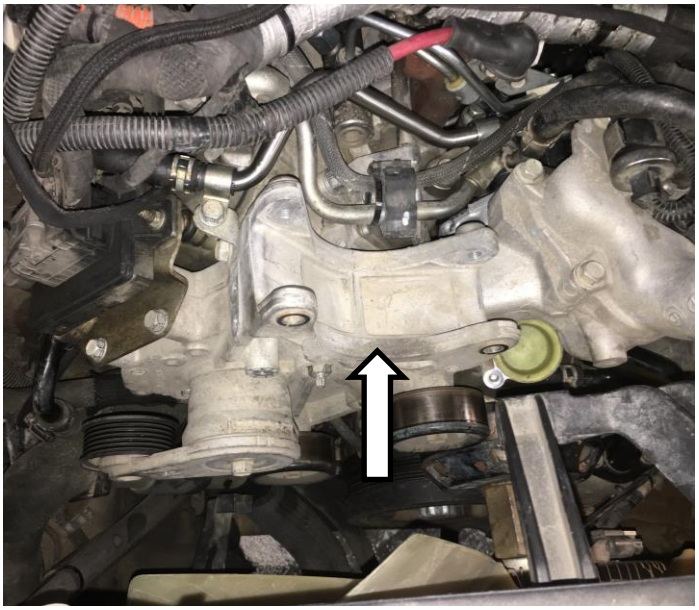
Torque nuts and bolts to **18 ft-lbs**.



Install A/C compressor / power steering pump mounting bracket.

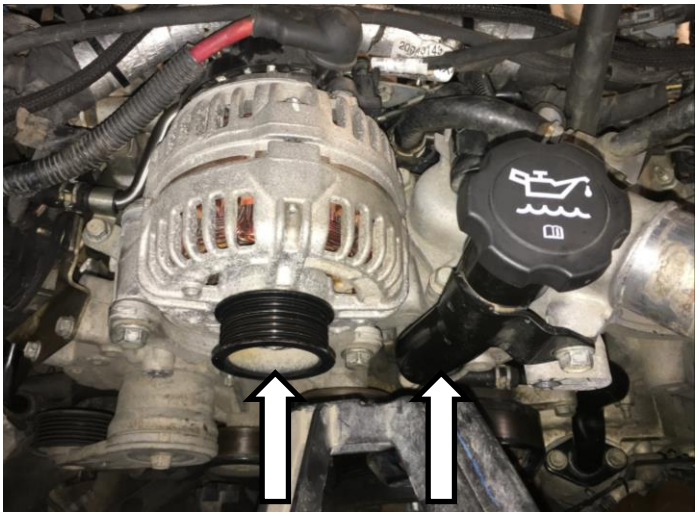


Install alternator mounting bracket.

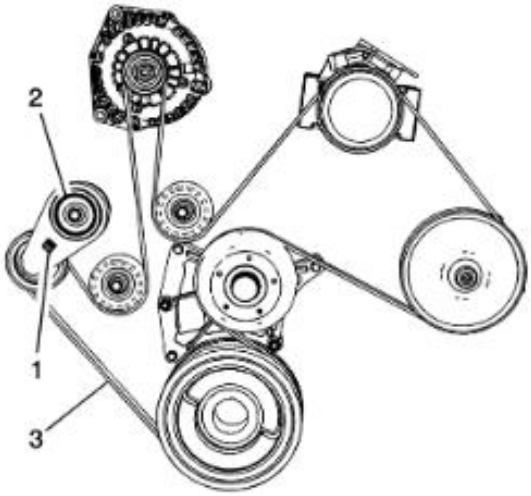


Install oil fill tube and alternator.

Important! Double check there is clearance between the fuel lines and back of alternator.



Remount A/C compressor and install serpentine belt.



Move inner fan shroud forward and remount.

A 90-degree pick may be needed to reposition the rubber seal around the shroud.

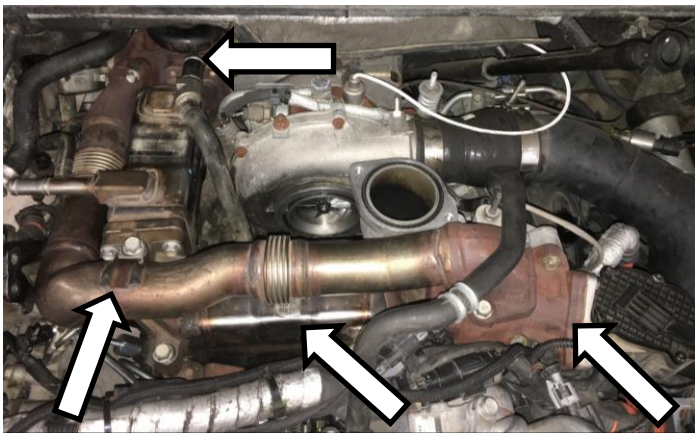
Important! Do not damage the radiator if using a pick!

Install upper rad hose.

Reinstall two intake manifold studs removed earlier.

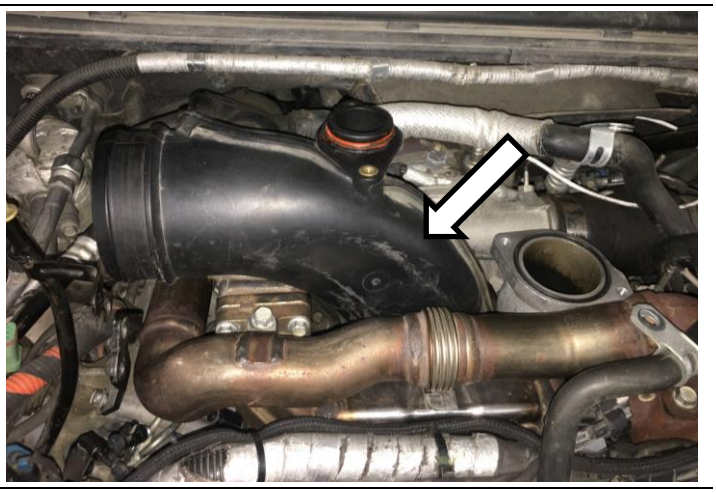
Install intake manifold “Y” bridge and torque nuts and bolts to **89 in-lbs**.

Install EGR system, including coolers, bypass pipe, valves, and coolant hoses.



Important! Ensure there is clearance between the front cooler and the new high pressure line, just above the connection to the CP3.

Install the plastic intake elbow on the turbo inlet.

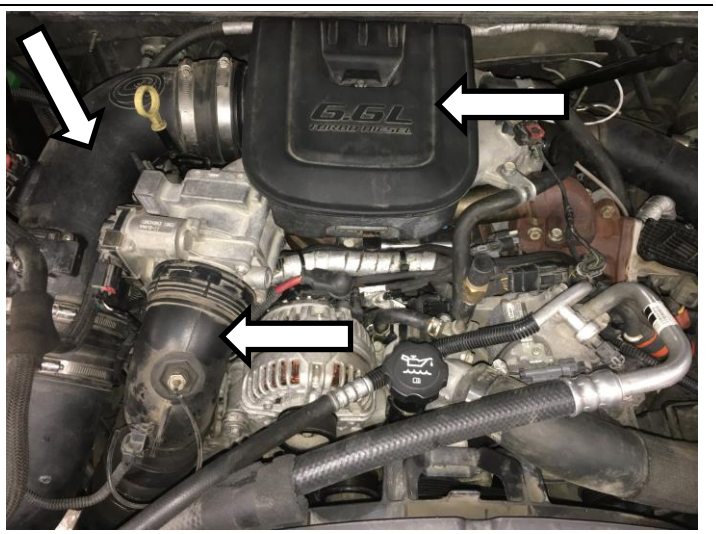


Install aluminum intake with throttle body and support bracket.

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

Install CAC pipe between throttle body and CAC, air filter tube, and plastic intake manifold cover.

Important! CAC pipe connections should audibly latch.



Install the inner fender and refill the cooling system.

Road test vehicle and confirm there are no leaks, no Check Engine Light and no drivability issues.