EGR Delete

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The 6.7L Cummins diesel is equipped with an Exhaust Gas Recirculation (EGR) system. The sole purpose of this system is to recycle exhaust gas from the exhaust manifold into the intake horn to reduce emissions. I'm sure you're familiar with how much soot is produced by a diesel engine. Well, all that soot is now cycled back into the intake. How good could this possibly be for the engine? I know what some of you are thinking; the exhaust on a new engine is clean and doesn't produce any soot. Well, you're wrong. It produces a lot of soot; it's just caught by the Diesel Particulate Filter (DPF) under the cab before it gets out the tail pipe.

The EGR system has been known to cause more harm than good in these engines. A primary example is with the MAF sensor and the turbo. They both clog up with excess soot causing the sensor to read out of range and the sliding vein system in the turbo to stick. What does all this equate to? More maintenance costs/warranty work and downtime. That's why I chose to delete the EGR system off of my truck. If I have to take my truck in for warranty work, all I have to do is bolt all of the stuff back on. Disabling the system without a programmer will throw a code and the Check Engine Light, but it will not de-rate your trucks power or send it into any sort of a "limp mode." It will, however, increase the reliability of the engine and increase your fuel mileage because you're no longer trying to burn spent exhaust gasses.

Stage 1

The first and easiest phase is to simply unplug the EGR intake valve. The valve is located on the driver's side of the engine in top of the intake horn. Pull the plug off and let it hang loose. This won't stop 100% of the EGR flow, but it will reduce it significantly.

Stage 2

This is a little more involved but it works better than the first one. Here we are actually removing the EGR intake valve and the cross over manifold and physically blocking it off with aluminum plates. The entire process should take approximately 20 minutes. You will have to either purchase or fabricate some block off plates to perform this action.

I first performed this mode with some plates I purchased off of eBay. They worked OK, but never fit quite right. I later replaced these eBay plates with some high quality plates that I got from Sinister Mfg for my Stage 3 mod. The Sinister plates are much better than the eBay plates and I recommend you purchase the Sinister Mfg kit right from the start. The pictures in this phase are with the eBay plates, but installation for the Sinister kit is nearly identical.

Step 1

Remove the four 8mm bolts and the plastic cover that hides the EGR intake valve and cross over manifold. You'll need to pull out the dip stick to remove the cover and reinstall it once the cover is off.

Step 2

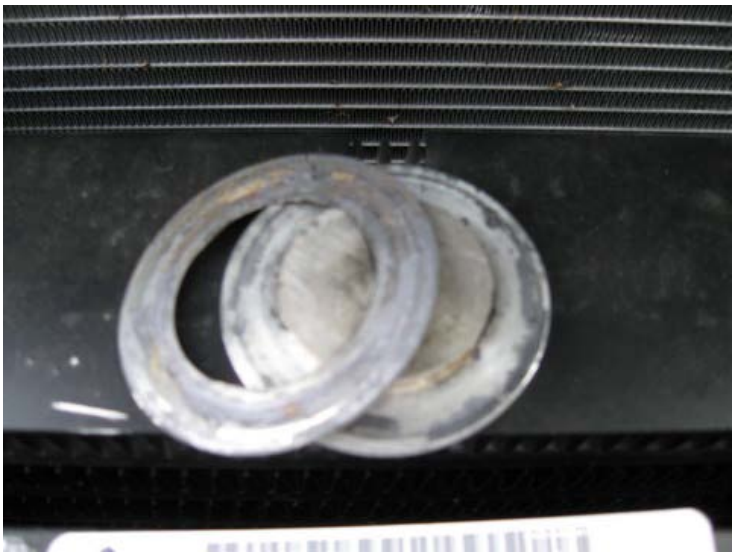
Loosen the two clamps (11mm) and center bolt (8mm) holding the cross over manifold in place. The center bolt is located on the bottom of the cross over manifold. This is where that extension and swivel combo will come in handy. You have to push down on the radiator hose to get the socket on it.

Step 3

Remove the cross over manifold. Be extremely careful not to drop the 2 gaskets on the manifold (one on each end) or the center bolt. Reinstall the center bolt back in the position it came out from so you don't lose it.

Step 4

Utilizing the gasket removed from the passenger side of the engine, install the round block off plate in the hold the tube was connected to. It must be the flat gasket from the passenger side because the other one is cupped. Tighten down the clamp to hold it in place and seal.



Step 5

Unplug the EGR intake valve and remove the four 10mm bolts holding it onto the intake horn. Lift to remove it. There are 2 gaskets that seal the intake valve to the intake horn to watch for; mine were stuck to the intake horn. If you have the Sinister Mfg kit, clean all the gasket material off. The block off plate creates a seal with two embedded O-rings which do not need the OEM gaskets.

Step 6

Using the 4 bolts removed from the intake valve and the gaskets, install the block off plate on the intake horn. There is a ridge between the ports of the intake horn that must be taken into consideration if you're going to fabricate your own plates.

Step 7

That's it, you're done. Take all of the parts you removed and store them somewhere safe. If your truck has to go in to the dealer for any reason, you will have to reinstall everything or risk voiding your warranty.

Stage 3

Here's where the good stuff comes in. This is the complete removal of the entire EGR system from the truck. I'm talking about the intake valve, the crossover pipe, the cooler, and all the electrical components. Please note that this phase of modification CAN NOT be performed without a programmer to delete the EGR system from the computer. Disconnection of the electrical connectors on the EGR cooler WILL send the truck into a limp mode without a programmer.

I got the Sinister Mfg EGR cooler delete kit from Rollin Smoke Diesel. The Sinister kit is an absolute work of art. The machine work and attention to detail that has gone into this kit is absolutely top notch. If you're looking for a kit, this is the kit to get. I also recommend getting two new gaskets for the exhaust manifold to put under the delete plates. The Cummins part numbers are 5266801 and 4933225. They claim to be reusable, but I never like to reuse a gasket, plus they are not expensive if you get them directly from Cummins. ($5.14 and $2.17 when I ordered mine)

The kit has three basic parts to it; the plate that goes on top of the intake horn, the two plates that go on the exhaust manifold, and the coolant hose to replace the coolant path through the cooler. The kits for the 2010+ models have a few extra parts that are needed to retain the coolant flow due to a re-design of the hard coolant line coming from the EGR cooler. Since I ordered my kit around Christmas time, the pre-2010 kits were sold out and I got a 2010+ kit instead. All the parts I need are exactly the same; I just have a few extra pieces that I don't need. On the right side in the picture below, the silver bracket, blue coolant fitting, hex stud spacer, and miscellaneous bolts are only used on 2010+ models and will not be used for my 2008.

If you haven't done the "Stage 2" modification yet, you will need to start there. You must have the cross-over tube removed before you can start on the EGR cooler. Since I already had the "Stage 2" modification completed, this step was just simply replacing the old crappy intake horn plate with the new pretty one from the Sinister kit utilizing the 4 hex key bolts. I had to clean off the old gasket material that the old plate needed because the sinister plate seals with O-rings.

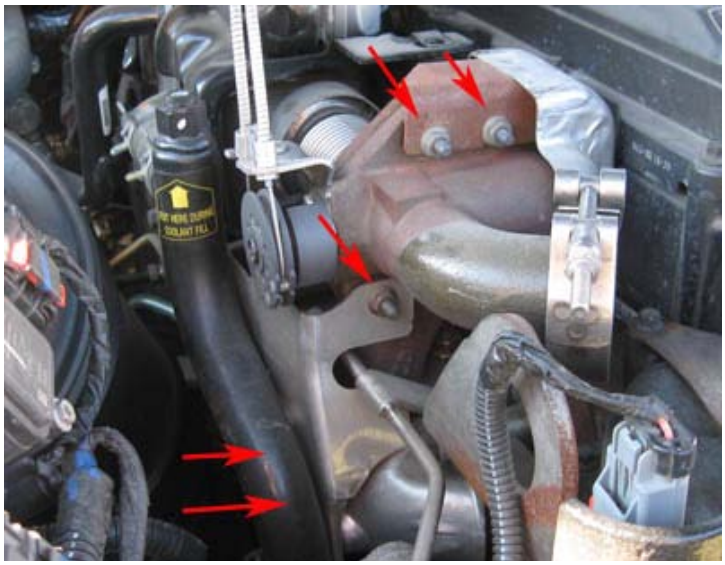
There are several different methods to removing the cooler. Some require complete disassembly of the entire system, some require special tools. The hardest nut to remove is the one on the front inboard side of the EGR cooler that attaches the cooler to the exhaust manifold. The cooler disassembly is simply to gain access to this nut. If you have a good 15mm crow foot you can theoretically remove the entire cooler in one piece without any major disassembly. I didn't have one and couldn't get that nut off, so I have put together a fairly simple way to remove the EGR cooler in 2 main pieces and without any special tools.

Step 1

During this task, I ended up removing the intake tube between the air box and the turbo. It will give you more room to work with the EGR cooler. It's completely optional and you can work around it, but it does make the job easier. I recommend removing it from the start.

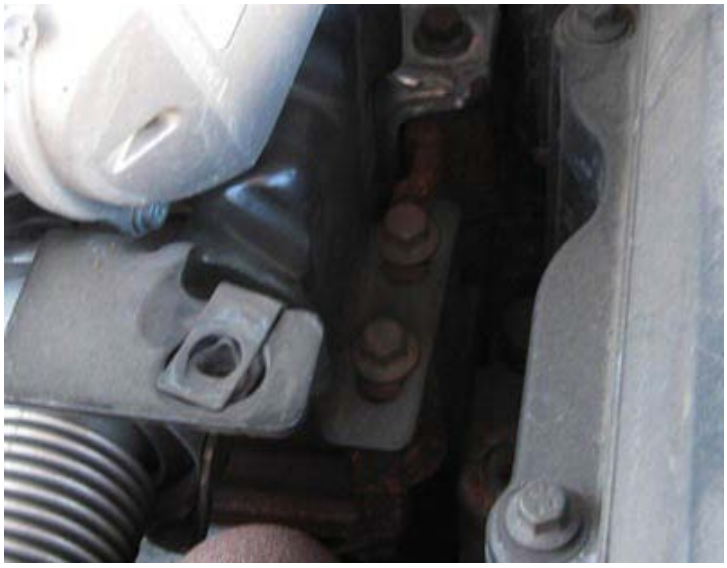
Step 2

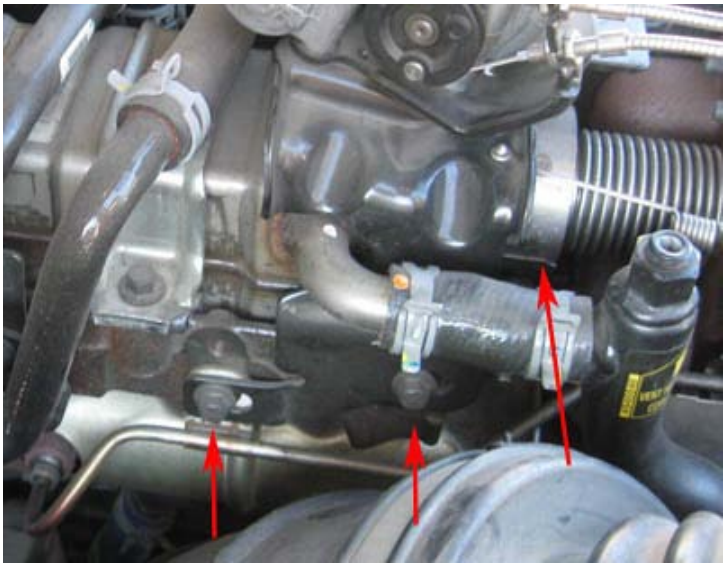
Remove the two heat shields on the front of the EGR cooler. The lower one has one 10mm bolt on the top and two 8mm bolts holding the bottom. The upper heat shield is held on with two 10mm bolts on the front of the EGR cooler. This will gain you access to the two bolts that attach the front part of the cooler to the exhaust manifold.



Step 3

Moving straight back, remove the 4 bolts that hold the servo motor bracket to the EGR cooler. Two bolts are between the cooler and engine, and two bolts are on the outboard side of the cooler. Then remove the V-band clamp that attaches the front half of the EGR cooler assembly to the rear half with a deep 11mm socket.





Step 4

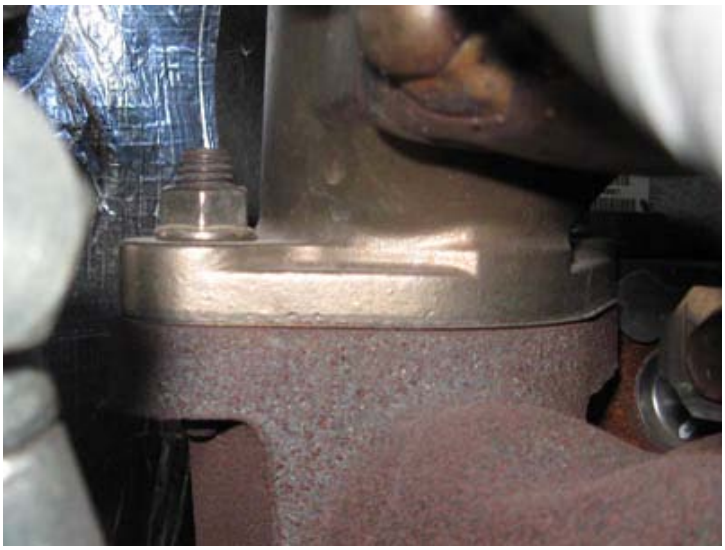
Remove the bolt on the side of the EGR cooler that holds the metal part of the CCV tube and disconnect the CCV tube from the CCV filter. Either remove the tube completely from the truck, or simply prop it back out of the way for now. You'll have to reinstall it later.

Step 5

There is a cast iron "basket" on the bottom of the EGR cooler that holds everything to the engine. On the bottom side of this basket there are two 13mm bolts that are nearly impossible to see while the cooler is on the truck which hold it to the head. Remove these two bolts.

Step 6

Remove the two nuts that attach the back part of the EGR cooler to the exhaust manifold. I used a 15mm shallow socket, 3 inch extension, and a 3/8 ratchet. It's tight, but can be done.



By this point, the only thing you have holding the back part of the EGR cooler to the truck are the two coolant lines. I chose to leave these lines connected until the last part because you will spill some coolant when disconnecting them. It's not very much coolant (you don't even need to worry about a catch jug) but it still gets all over everything and I don't like working in coolant.

Step 7

Remove the front clamp from the hose that connects the EGR cooler to the metal stand pipe. Just slide the clamp straight back over the hose to clear the barb, you don't have to remove the hose right now. Then remove the clamp on the rear coolant line that connects the EGR cooler to the head. Slide this hose off of the connector.

Step 8

The rear half of the cooler is now completely disconnected from the truck and is simply sitting in place. Grab the cooler and lift the rear straight up to clear the manifold studs, then slide it straight back to disconnect the front coolant hose. Finally, wiggle the cooler assembly out of the truck. In the last picture, you can see the mounting holes from the two bolts you had to remove in step 5.

Step 9

Now that the rear half of the cooler is removed, you can get a standard wrench on the front inboard nut that holds the front half of the cooler to the exhaust manifold. Remove the two nuts and pull the front piece off of the manifold.

Step 10

Install the two block-off plates on the exhaust manifold utilizing the nuts you just removed from those studs. The gaskets are supposedly reusable, but I just don't trust a reused exhaust manifold gasket so I installed new ones that I purchased directly from Cummins. Part numbers 5266801 and 4933225. The service manual said those nuts should be torqued to 18 ft lbs, I went to 20 instead. The rear plate has a 1/8" NPT threaded plug so you can install a thermocouple, drive pressure sensor, or any other device you find necessary to screw into the exhaust manifold.

Step 11

Install the new coolant line that connects the port in the head to the metal stand pipe. If you have a 2010+ model, you will need to install the bracket, hex stud spacer, and blue coolant fitting before you can attach the hose. I didn't have to use that stuff on my 2008. Then re-install the CCV hose you removed earlier. The bolt you removed from it won't be re-used because there is nothing there to bolt it to anymore.

Step 13

Double check all your fittings and hose connections to ensure you didn't miss anything. Then start your truck and check for leaks. I suggest letting it idle until it gets to operating temperature to make sure nothing starts leaking. My coolant bypass hose started to leak once the truck got warm so I had to re-tighten the clamp to stop the leak. Drive the truck around a little and then re-check everything.

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