Revised intake system

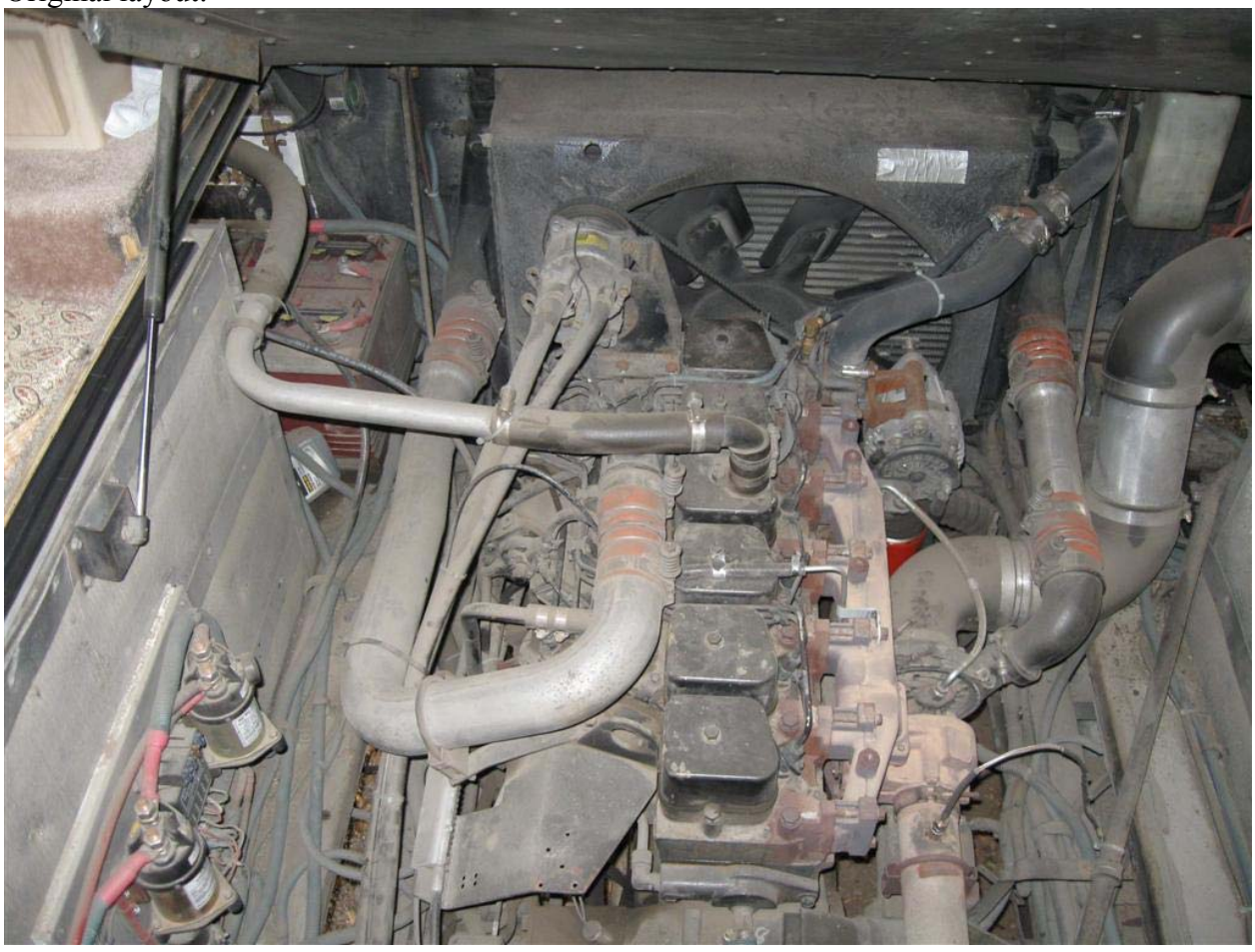
Dec 12, 2008

While discussing what could be done with my turbo Cummins to increase the response of the turbo I saw a part addition to a Dodge Cummins turbo diesel that showed promise. The Dodge was put on a dyno and measured stock torque and HP, then a modified intake inlet was put on and dyno test was run again to confirm any increase.

Although the net HP gain didn't changed much, the torque curve between 1500 and 2000 RPM increased by 75 lb/ft! That seemed to be the real "sweet-spot" for torque. I drive in that range and thought that I might be able to gain MPG or response as a result of this change. The part that was added was an intake inlet that removed a real bottle neck in the air flow path from the intercooler. The thing I didn't like about the part was as it was made for a Dodge, the inlet opening was sized for a much smaller hose then I had in the Barth from the intercooler. All aftermarket parts like these had the same size inlet. I decided to make my own inlet.

This is the original layout of the air path from the intercooler to the inlet of the engine. Why this circuitous route was chosen is not understood. First, the inlet of the intercooler is 3 ½ inches as is the outlet, it is immediately necked down at the outlet of the intercooler to 3 inches and run way back to the rear of the engine and then a 90 up and another 90 back toward the front of the engine. Not only does this tube have to fill with air upon boast, but will also pick up engine heat and contribute to warmer air after the intercooler. The tube also makes working on the injection pump, linkage and fuel filter difficult. An example, I had to remove the tube to work on the cruise control changes to get the linkage right.

Original layout:



Original inlet:

First cut:

Final inlet:

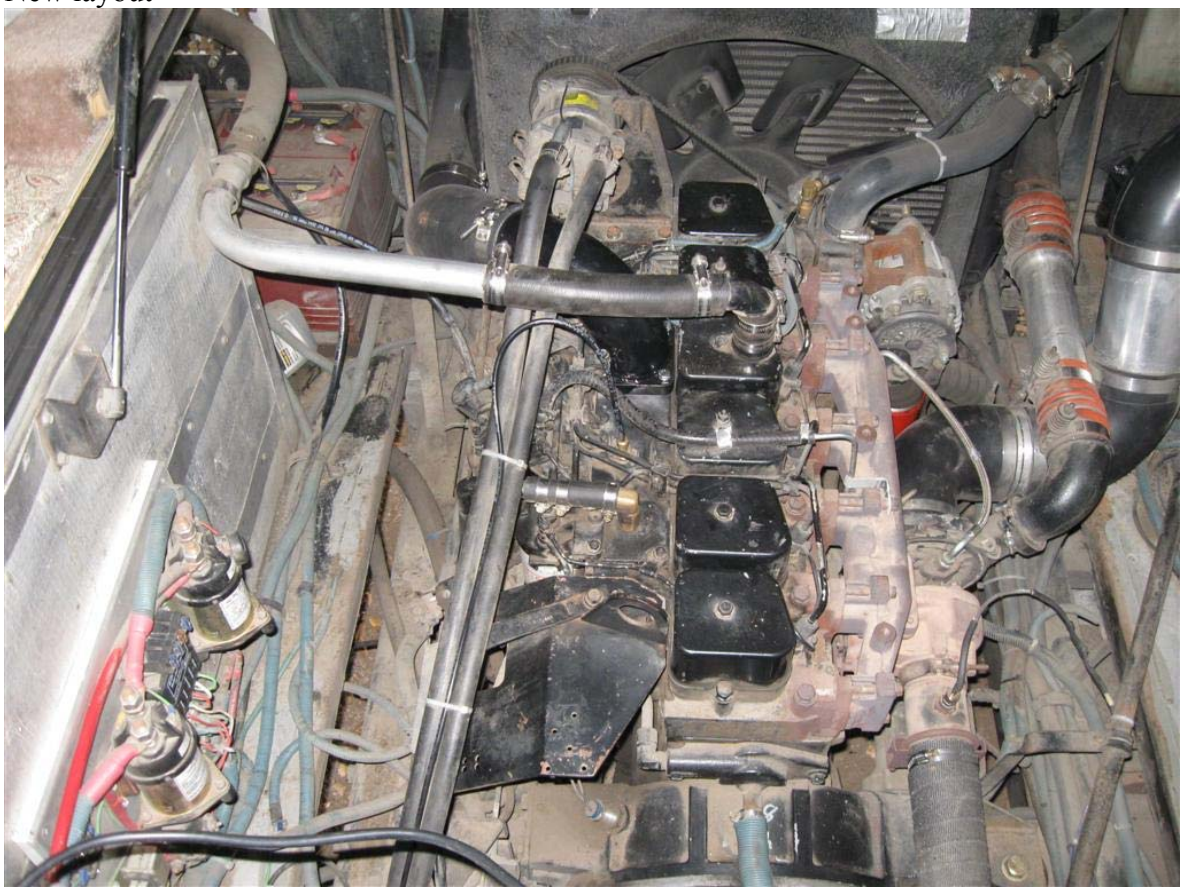
I located two 5 ply 3 ½ inch silicone turbo hoses 45 degree elbows with 6 inch legs and it was virtually a perfect fit. Notice that there is a slight angle induced at the end of the new inlet because the angles weren't quite right. I used a mandrel bent 3 ½ in piece of steel tubing to form the inlet, I was going to use aluminum but could not find locally and quickly so I used steel.

The length of the air path was reduced from over 4 feet to just under 2 feet, no 90 degrees turns and the biggie- it is 3 ½ inch all the way from the intercooler outlet to the head of the engine. Being that virtually the entire length after the inter cooler is silicone rubber coated, there will be little heat picked up by this run.

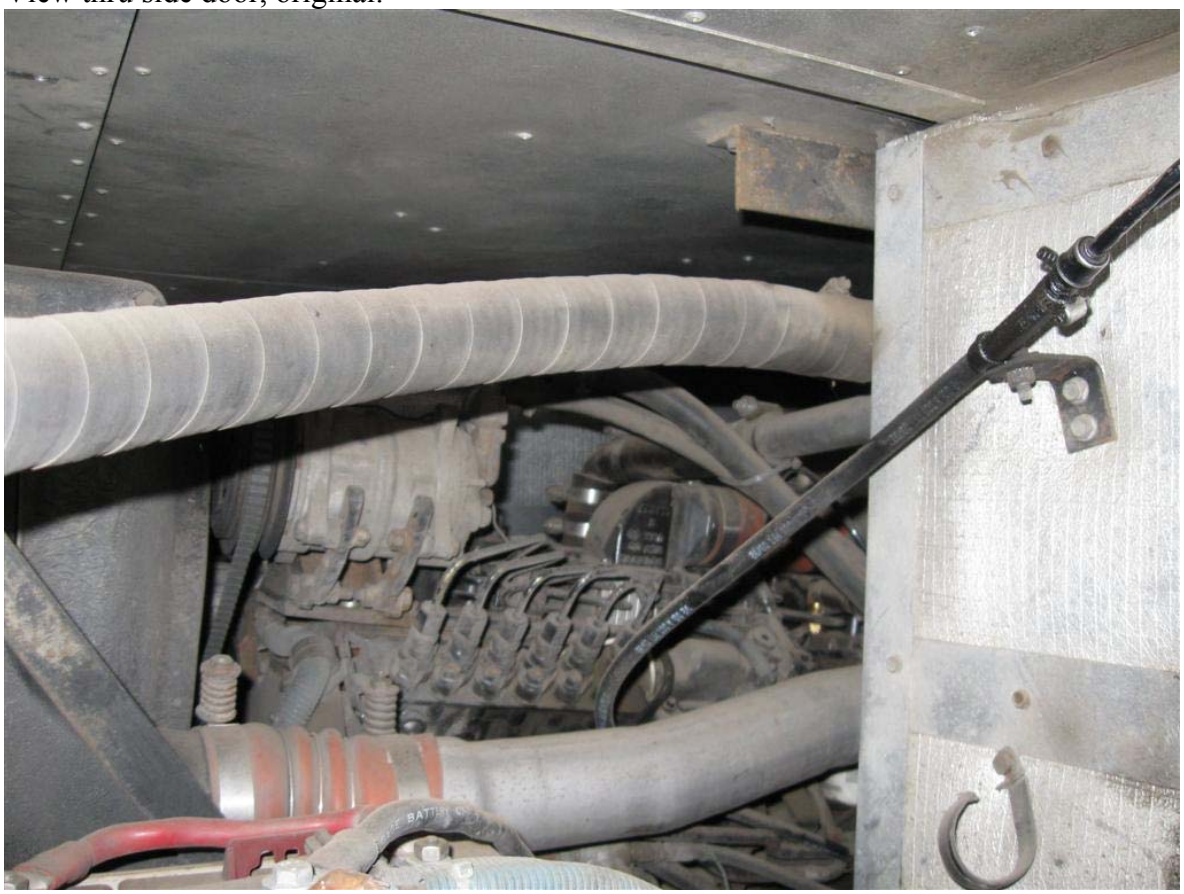
The side of the engine is now more accessible however getting to the top of the injection pump will be a challenge if needed. Will report any noticeable differences/gains when going out later this month. While I don't expect any real differences in initial spool-up of the turbo, I am expecting better performances when pulling hard between 1500-2000 RPM.

Original layout:

New layout



View thru side door, original:



View thru side door new layout:

Final layout, changed oil filler hose routing:

Finished: