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C7 Z06 Elite Engineering E2-X™ and E2™ Air/Oil Separation system installation guide

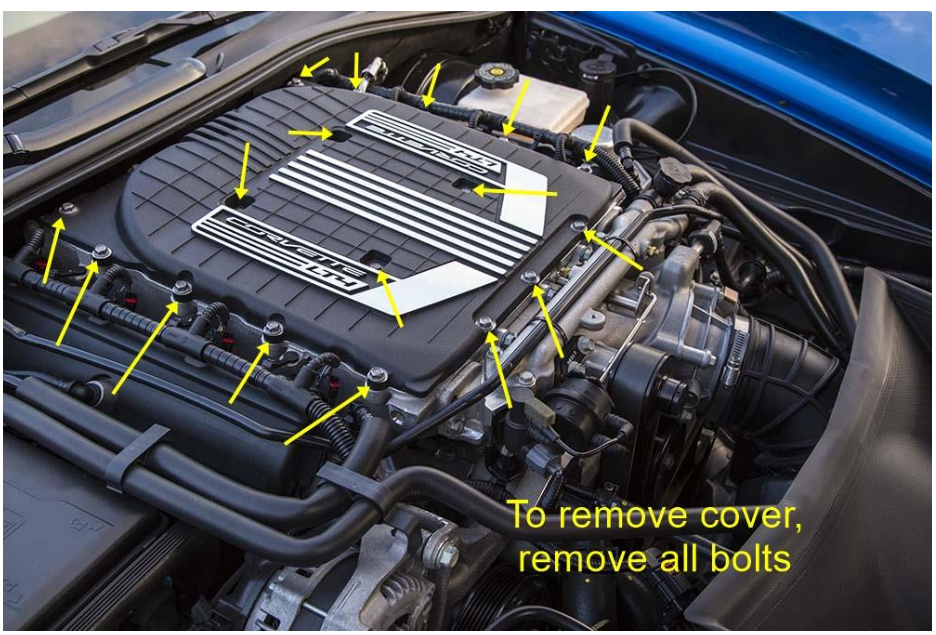
Last updated: 9/16/2017

The issue with the LT4 supercharged engine and the oil ingestion via the PCV system into the intake air charge has made this solution a bit more involved. With the earlier LS9 versions in the ZL1, ZR1, Grand Sport, and CTS-V the foul/dirty side of the PCV system was easily accessible so adding the system to correct this was easier. What GM did for model year 2015 and up is they concealed the foul/dirty side inlet underneath the supercharge plenum, so this installation involves the removal of the top cover of the supercharger housing, which gives an opportunity to see just how severe this issues is, and to also clean the existing oil from the housing. Be VERY careful to NOT damage the rotor leading edge, just clean what is visible.

Note: These instructions are the same for the E2-X and E2 Catch Cans. See pictures of the E2 Catch Can at the bottom of this document.

Also, the LT4 has a newly designed clean side cyclonic oil separator that seems to be doing an excellent job on the clean side, so the Elite clean side unit is NOT needed unless you plan on doing a lot of hard racing, just the E2 or E2-X Dual Exit/Dual Check valve air oil separator system (Catch Can).

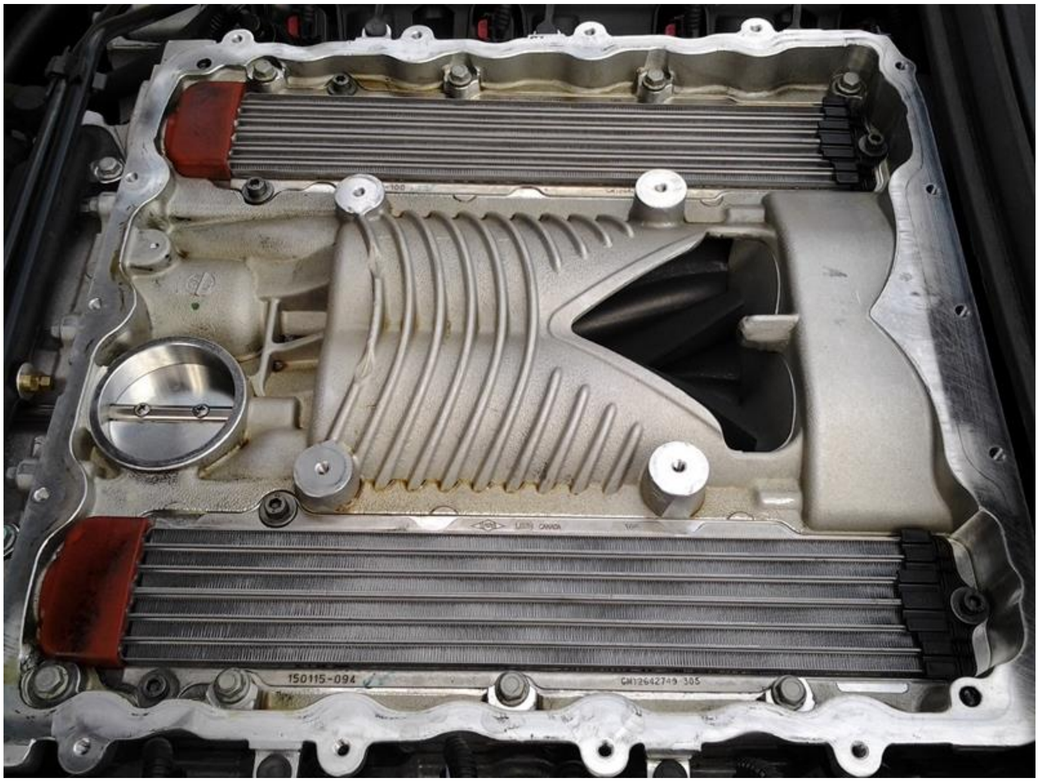
Our first step is to remove the Stock PCV Valve. So, let's start with removing the top cover of the supercharger housing. The rear most bolts are easier to access if you pull the rubber hood-dust seal off of the plastic surround. All bolts are 10mm so a simple socket and combination wrench will work.

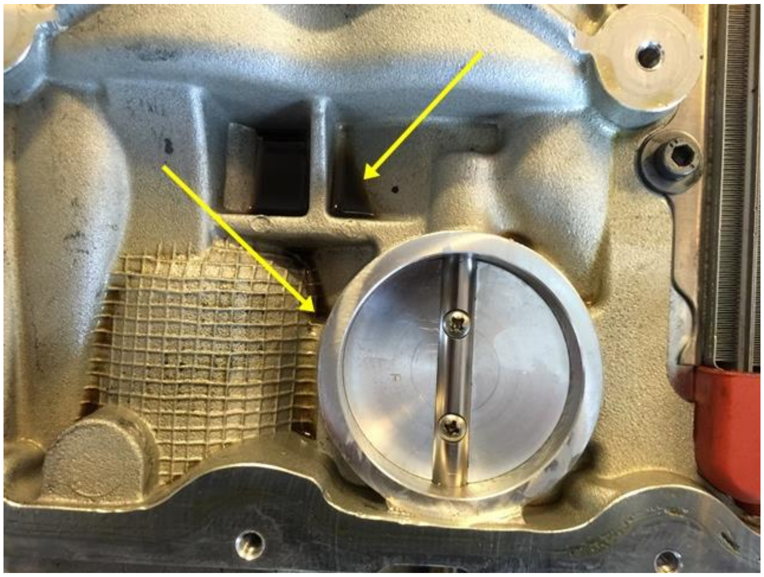


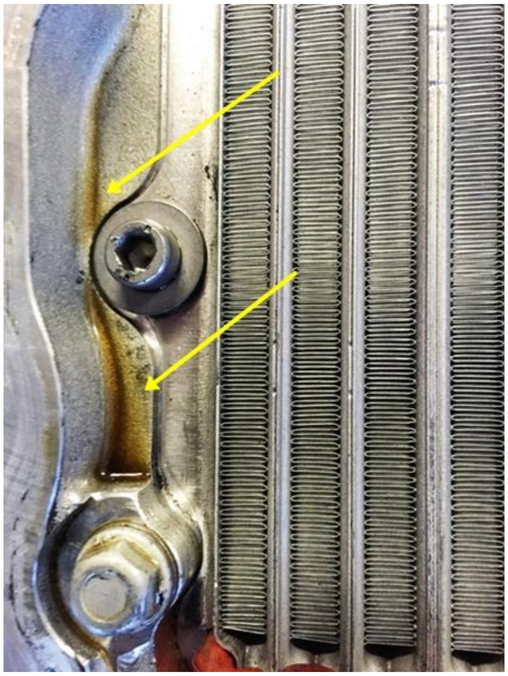
Set gasket and cover aside and clean all visible oil.

Here's a good picture of the cover being removed.

You can already see some visible oil puddling



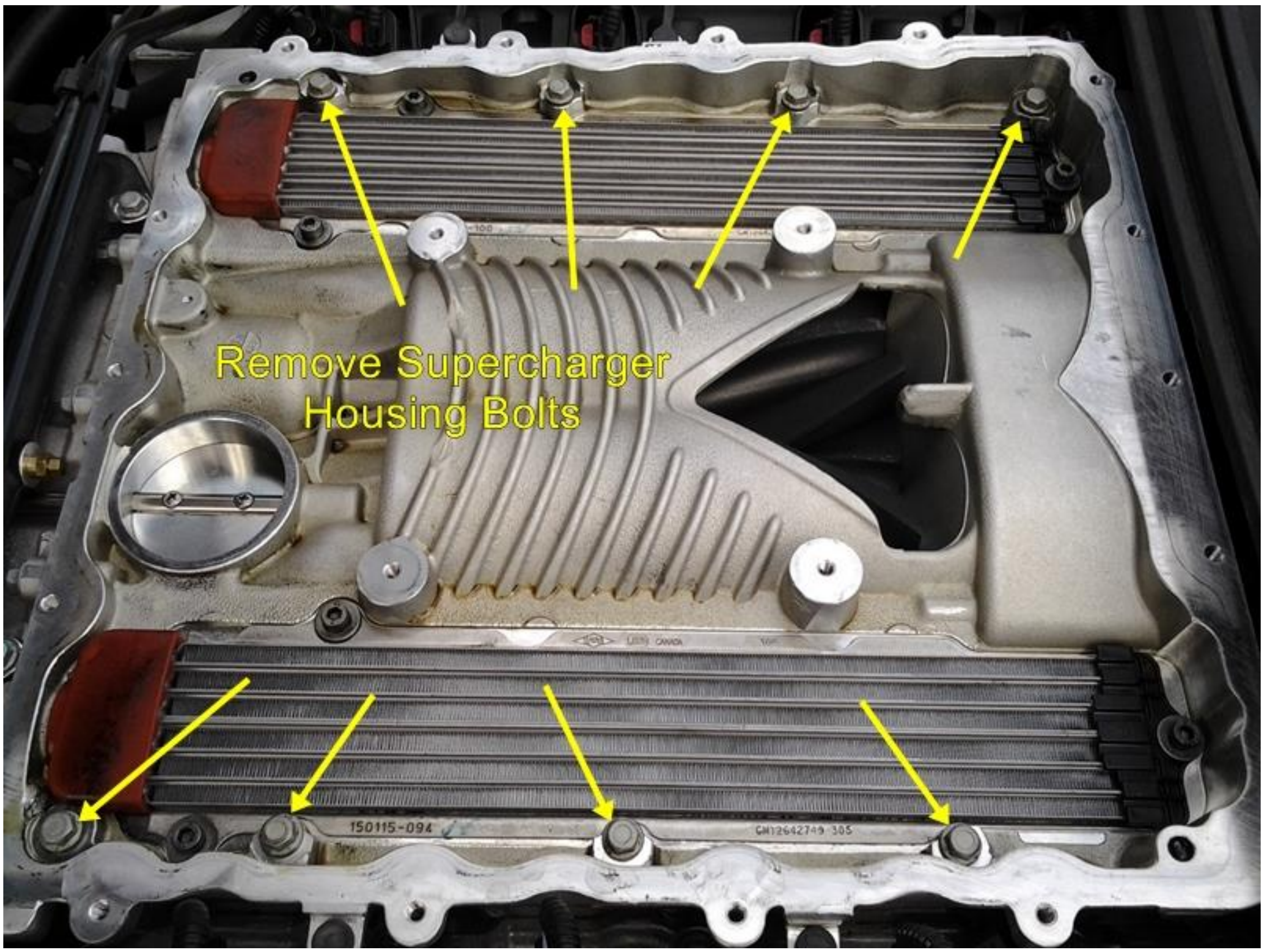




Then looking at the boost bypass valve you will see it can be opened and kept this way with anything handy to prop it in the open position. Now is also a good time to remove and clean the internal surface of the throttle body of any existing residue. Brake cleaner will work fine with a clean rag. Don't miss the cast-in sump depression just inside the snout as oil collects there.

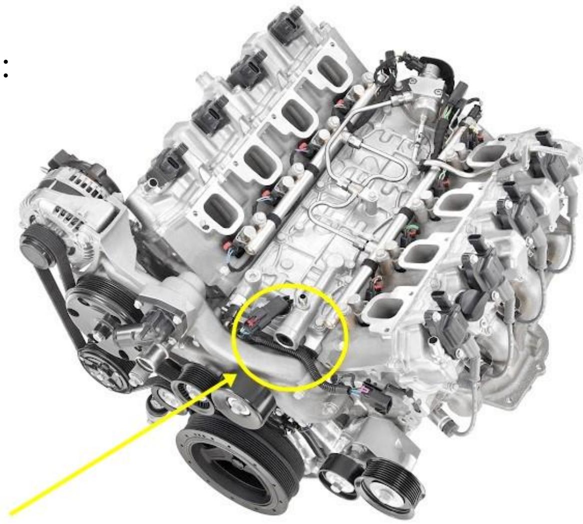
Remove the strain reliefs (3 per side), and any electrical connectors

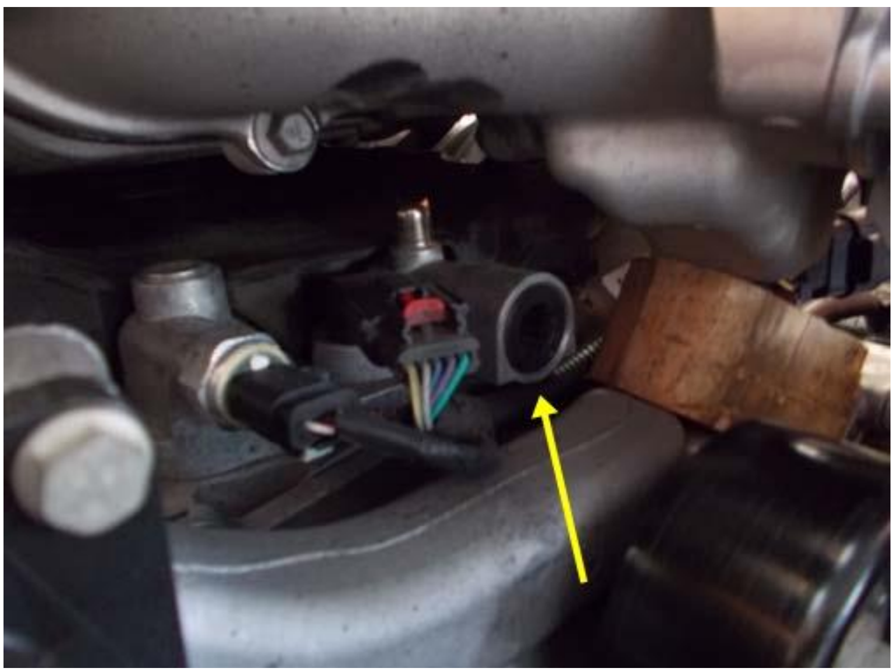
Now we want to remove the Supercharger housing bolts so we can tip the aluminum housing up from the front slightly to gain access from the Passenger’s side.



Once the bolts are removed, loosen belt from the tensioner, you can now prop up the front of the supercharger. You can use something to slide under the supercharger to hold it up, so you can get access to the PCV Port to remove the Stock Black PCV Valve.

This is the area you're trying to get access too:





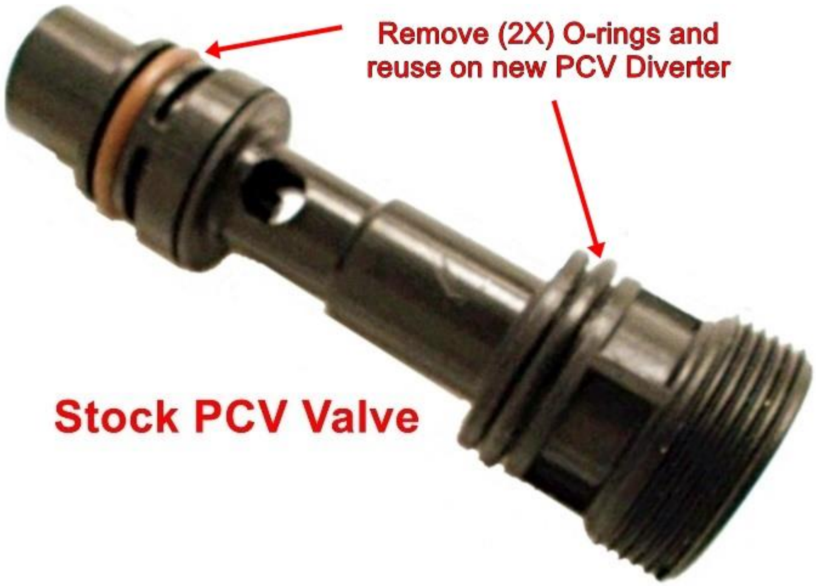
New PCV Diverter

Stock PCV Valve

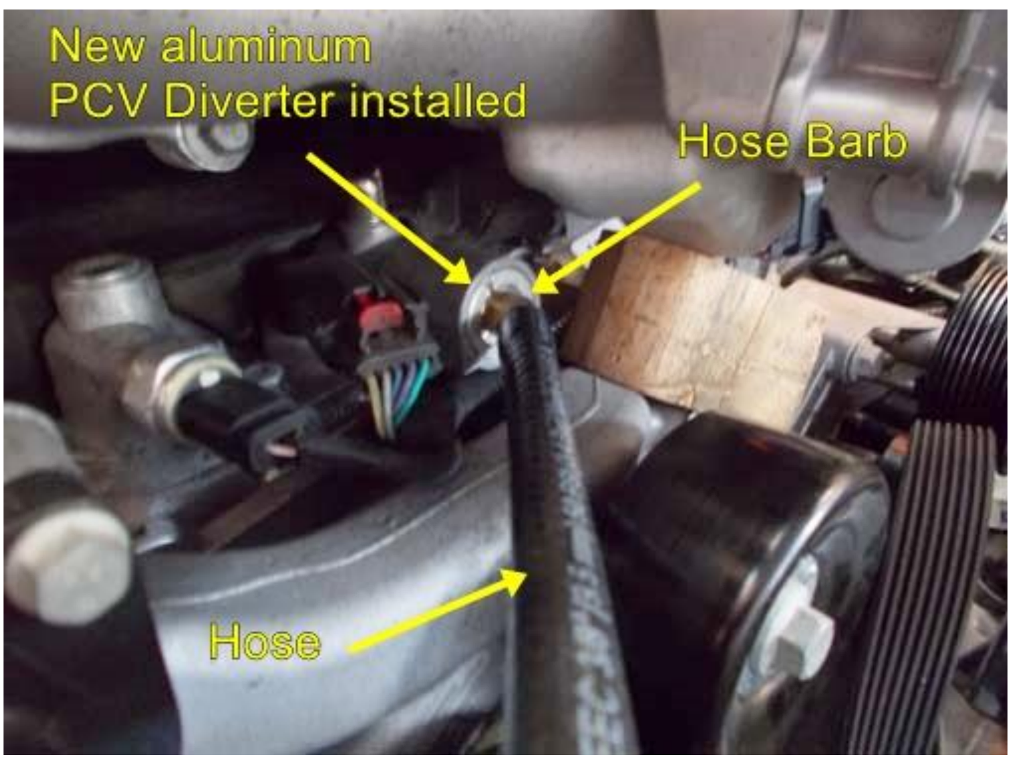
Using a 14mm Allen with 3" extension, we want to remove the <u>Stock PCV valve</u>

Stock Black PCV Valve Removed:

We recommend reusing the two stock O-rings that were on the original black PCV valve (see below):



Once the stock Black Plastic PCV Valve is removed, it is now time to install the new aluminum PCV Diverter in your kit. Coat the threads with Teflon tape or paste and screw it into the PCV Port. Tighten until it points towards the passenger side of the engine compartment. As shown below, attach a piece of rubber hose to the hose barb fitting. Tuck the hose so it will NOT rub on the belt once installed. This hose will not run and connect to the Center (Inlet) of Port on your Catch Can (see below)



Note: This replaces our earlier installation with the Delrin plug so no need to plug the PCV tube from the top.

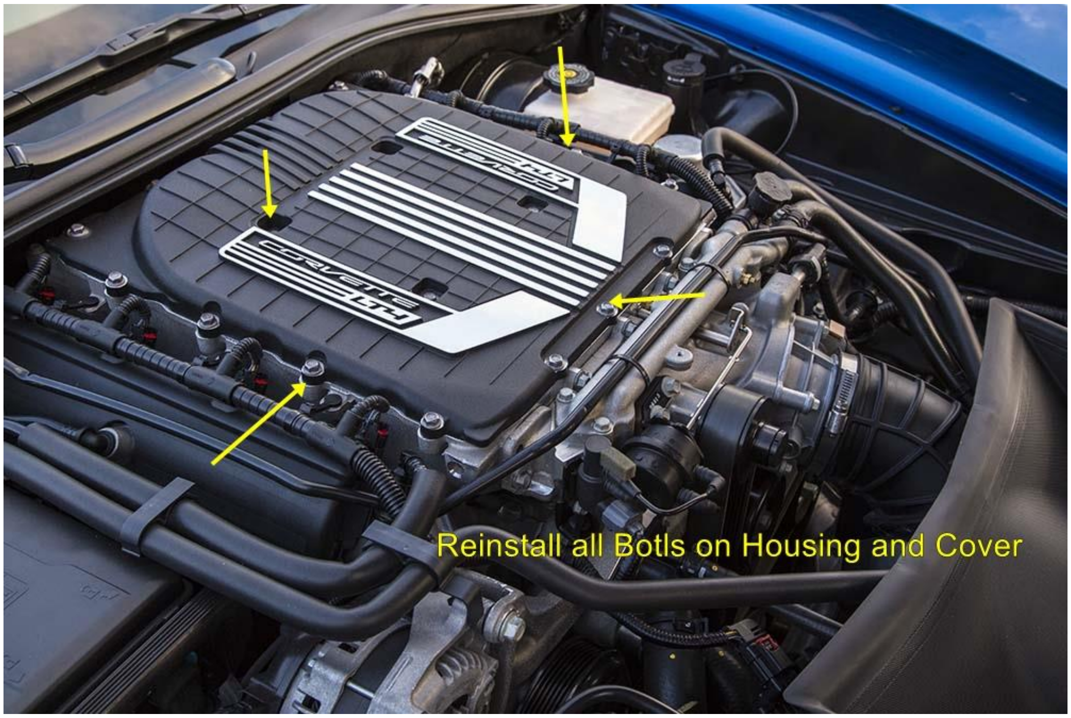
This is easy to put back to stock if desired. The new PCV Diverter goes in with a small crescent wrench that should be threaded all the way in until it bottoms, and is fully seated, taking care to avoid cutting any o-rings.

Install barb facing to passenger side of engine for blower clearance and for mounting barb fitting. Make sure to save the factory PCV valve

Before setting the supercharger housing back down, install a length of rubber hose on this brass hose barb. This newly installed rubber hose will then run to the Center (Inlet) of the Catch Can, Port #1

Now set the supercharger housing back down, taking care to not pinch, kink, or compress the newly installed rubber hose.

Reinstall the supercharger belt and slide the belt over the pully. Remount the housing, checking that this fitting is not binding against the blower.



Once this has been completed re-install the upper plenum and we will now move to the easy part of the install!

Mount the Catch Can: Using the brackets and hardware supplied, you will now mount the E2-X$_{TM}$ Catch Can as shown below, make sure to tighten all bolts well, don't over tighten (Fig. 2 & 3). Use a screwdriver to separate the "C" clamp bracket so you don't scratch the outside of the Catch Can.

Fig 2

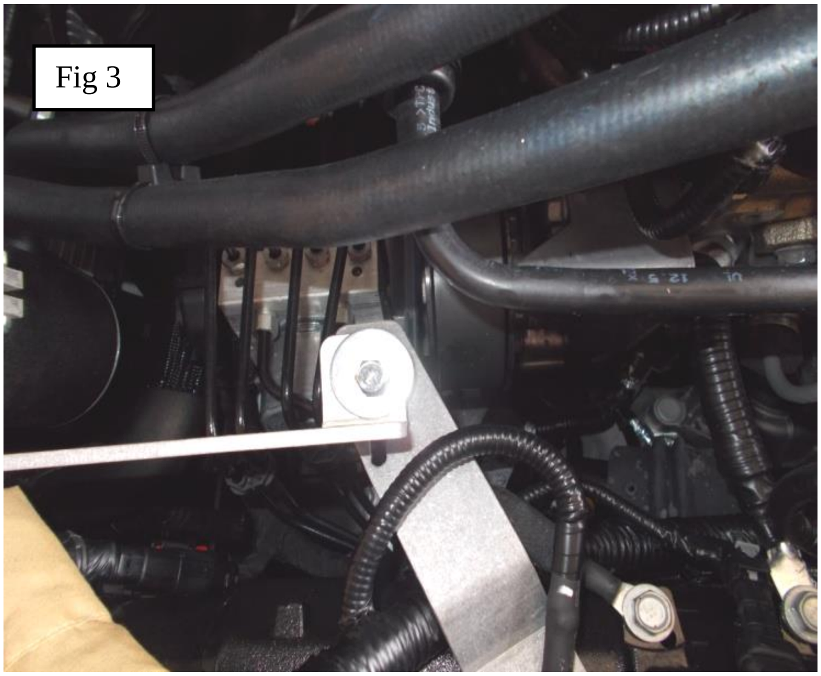


Fig 3

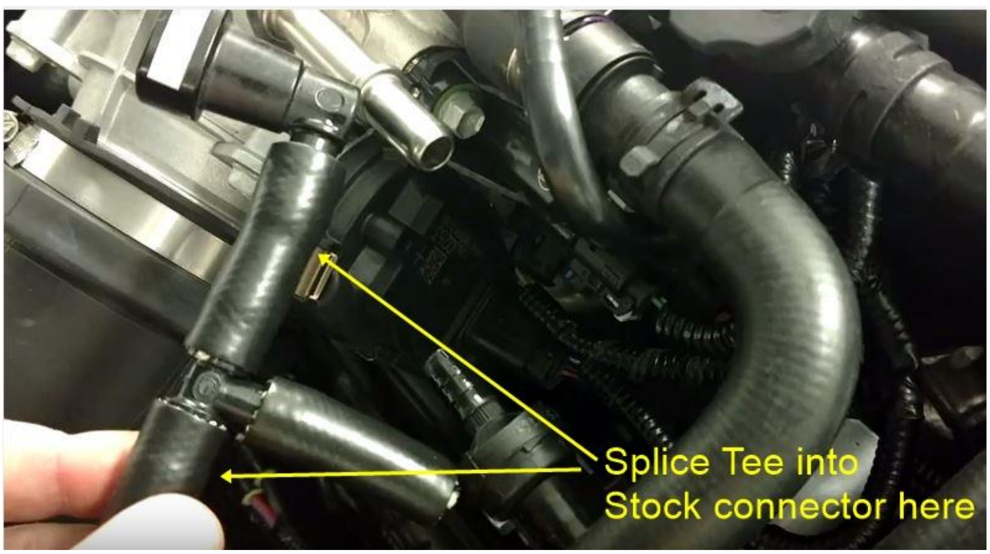
Once the E2-X™ Catch Can is securely mounted, we'll hook-up and attach the (3) hose lines / fittings. (3) for a Dual Catch Can set-up, (2) hoses for a Single Catch Can set-up.

<u>The Inlet Port #1 – Hose from PCV Diverter to Inlet Port of Catch Can</u>

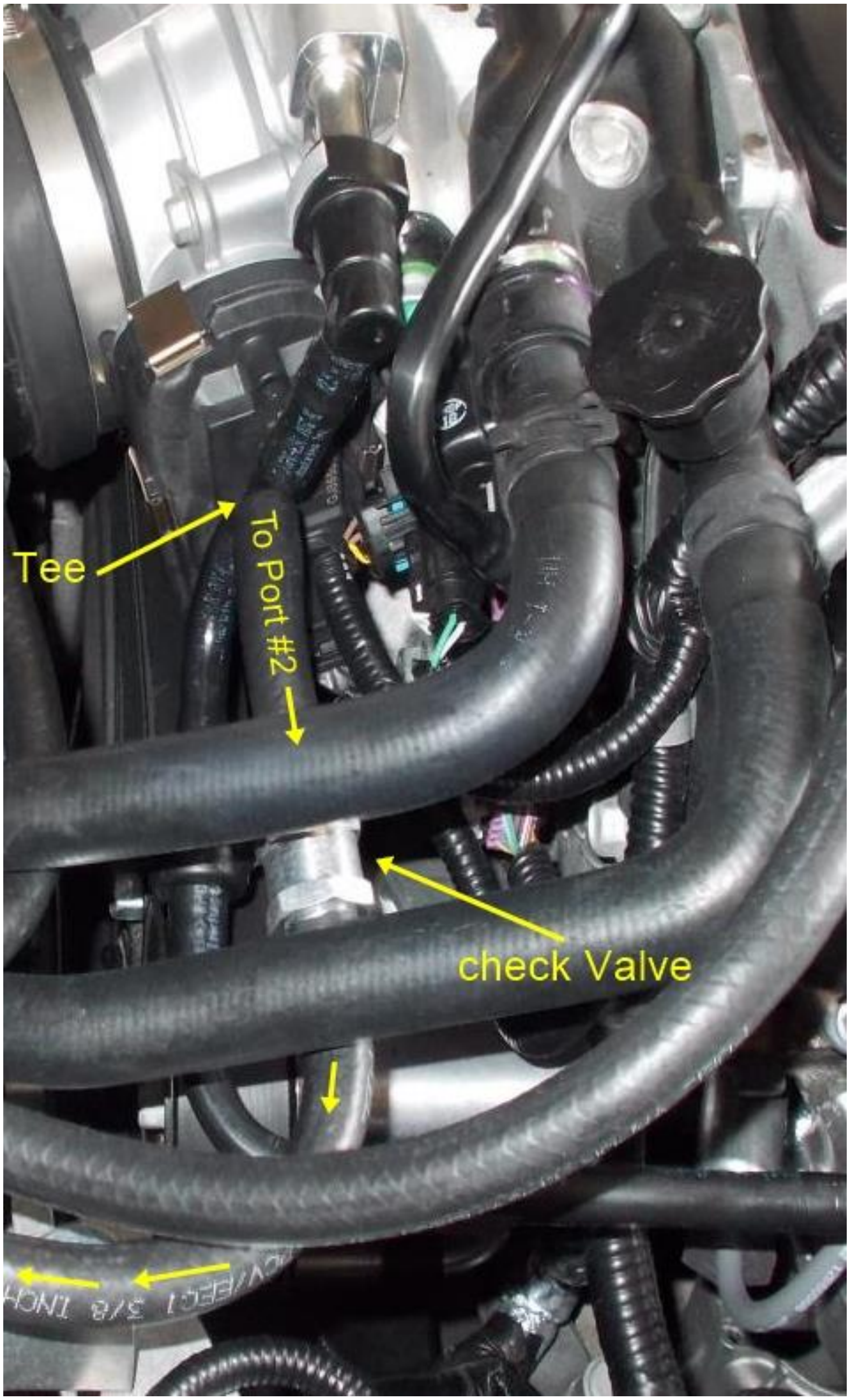
The center of the can (Inlet Port), #1 in the picture above will connect to the newly installed PCV Diverter you added in Figure 1. Run a hose from the brass barb fitting on the newly installed PCV Diverter to this Center port of the Catch Can.

<u>Exit Port #2</u> - Locate and unclip the stock connector here:

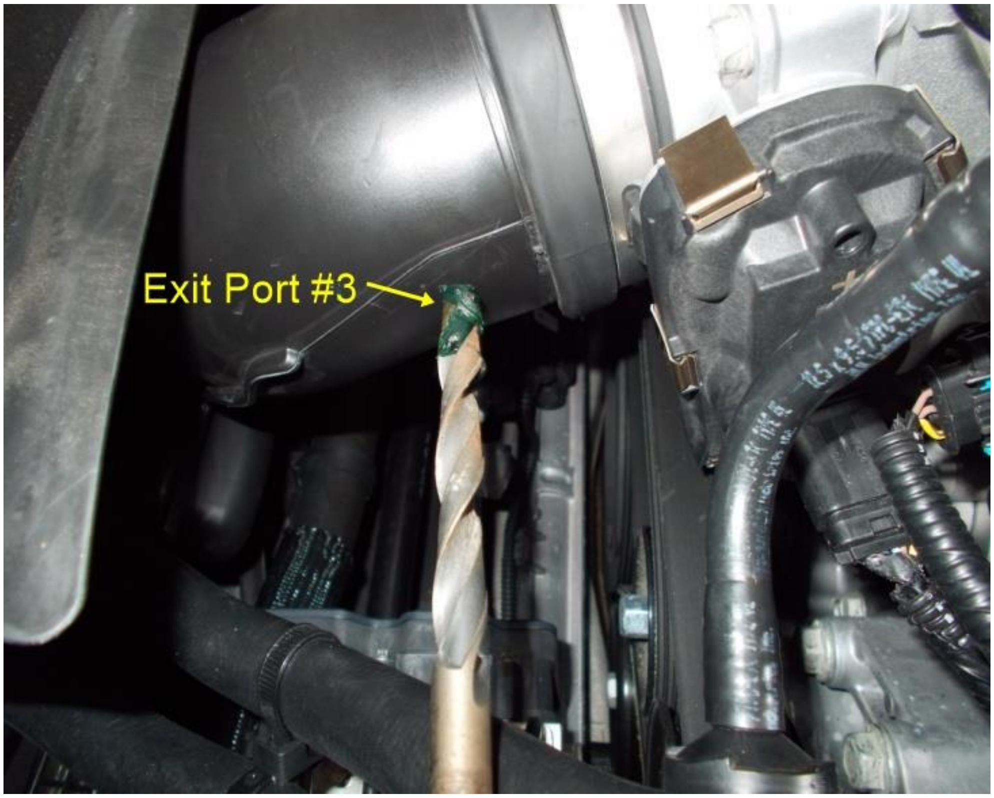
This primary outlet (shown above) will run from this Tee, you will install in the brake booster line, to the Catch Can (Exit Port), #2 in pictures, w/check valve flowing "away" from the Catch Can (check valves have directional arrows). This provides the primary suction needed for evacuation. The provided Tee will fit into the inside of the hard line where you cut it. Warming the tube with a hairdryer or heat gun will soften the hard plastic so it can fit inside more easily.



Here's a close-up picture of the "Tee" spliced into the Catch Can Exit, port #2 and hose routing.



Exit Port #3 – If you have a "Dual" Exit Catch Can, and you plan to install the second exit port, port #3, please see below:

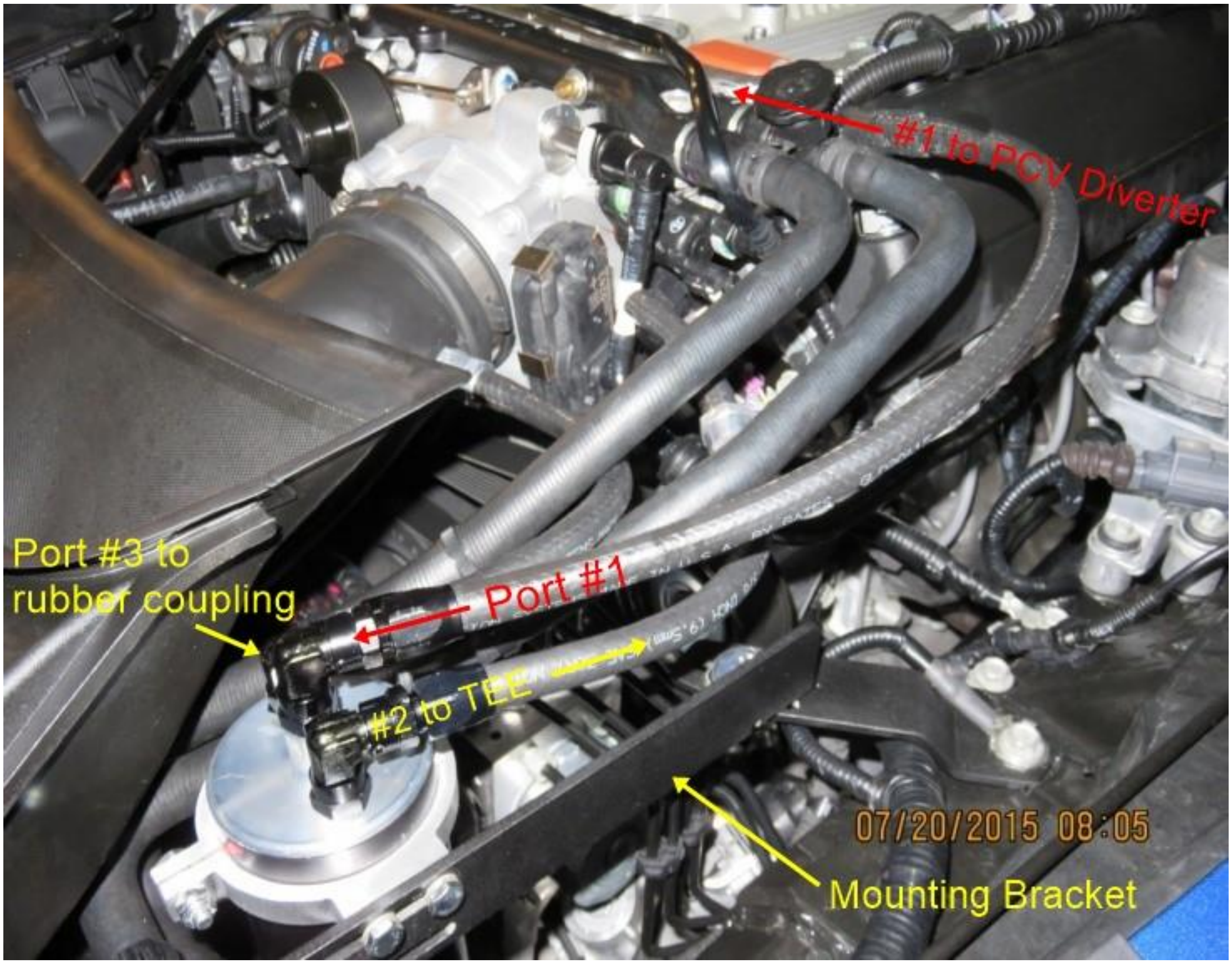


You'll need to drill a hole in the rubber stock intake coupler (shown above), coat the end of a 3/8" drill bit in grease to capture any debris from drilling, and drill a hole where shown.

Then insert (thread) the supplied 1/4 NPT x 3/8" plastic hose barb (shown below) into this drilled hole. And run a piece of rubber hose from this barbed end (insert a check valve) to the Exit Port on the Catch Can, port #3.

If you ordered the "Dual" Exit Catch Can, you will have received two (2) Check Valves with your Catch Can kit (one if you ordered the Single Exit Catch Can). These check valves should be spliced into each Exit rubber hose lines (Ports #2 and Port #3), flowing "away" from the Catch Can. (check valves have a flow directional arrow stamped on the hex).

Check Valve >>>>

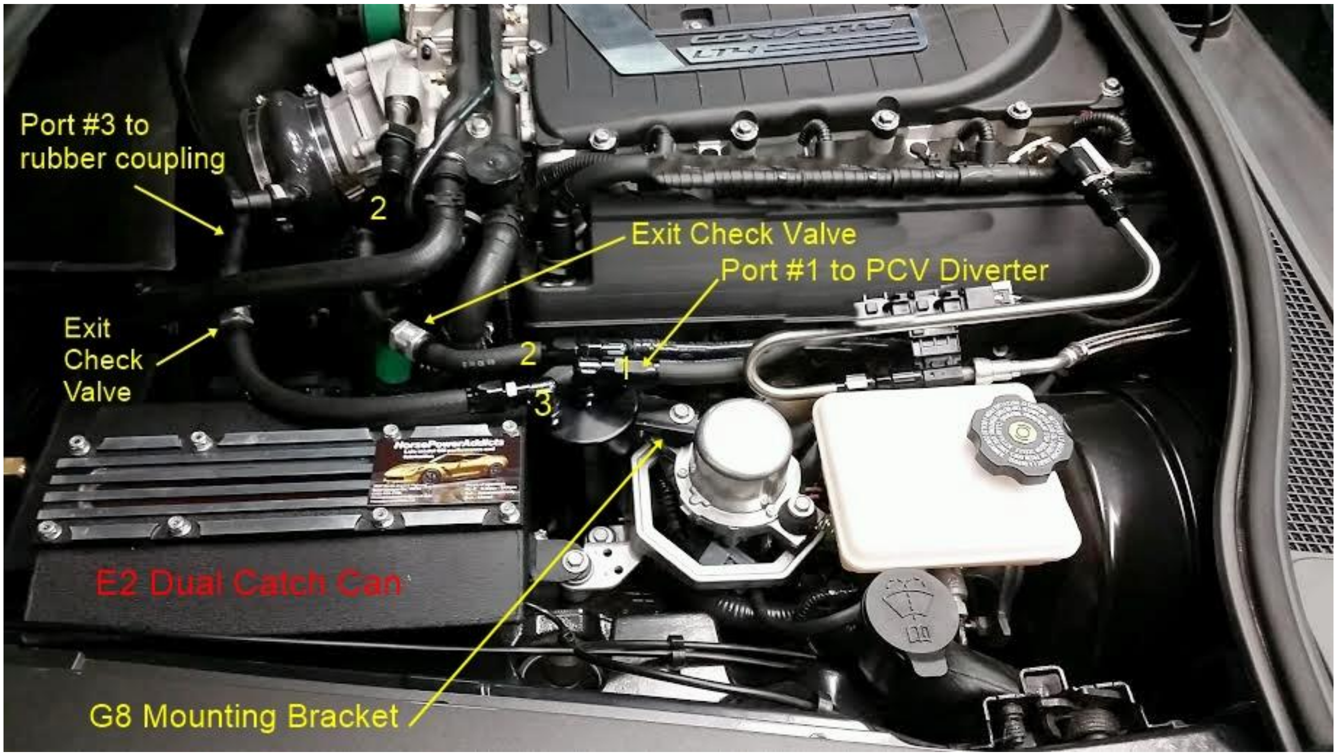


Finally, you can use the supplied clear plastic tubing and hose barb fitting inserted into the bottom of the catch can to run a drain hose. You can also run the drain valve downstream of the catch can to make it easier to access.

This gives a very complete cross-flow evacuation of all damaging compounds now, eliminates any crankcase pressure build up, eliminates the overheating caused by detonation and knock retard, eliminates most all of the intake valve coking, and prolongs engine life while retaining a closed emission compliant PCV system.

Make sure the drain valve is closed before starting (lever horizontal to the drain). Check the Catch Can at approximately 1000 miles to get an idea on your cars usage and then you can judge how often to empty. At the very longest, every oil change and dispose of properly. Do not reuse the drained oil.

Very Important: it is recommended to NOT overfill the oil reservoir tank. GM has released bulletins on the full mark on the dipstick. It's actually 1/2 qt plus over full and should only be filled to app 1/2 qt low on the stick
Picture of the E2 Dual Exit Catch Can installation below:



If you also purchase our Billet Clean Side Separator – This is how it's installed:

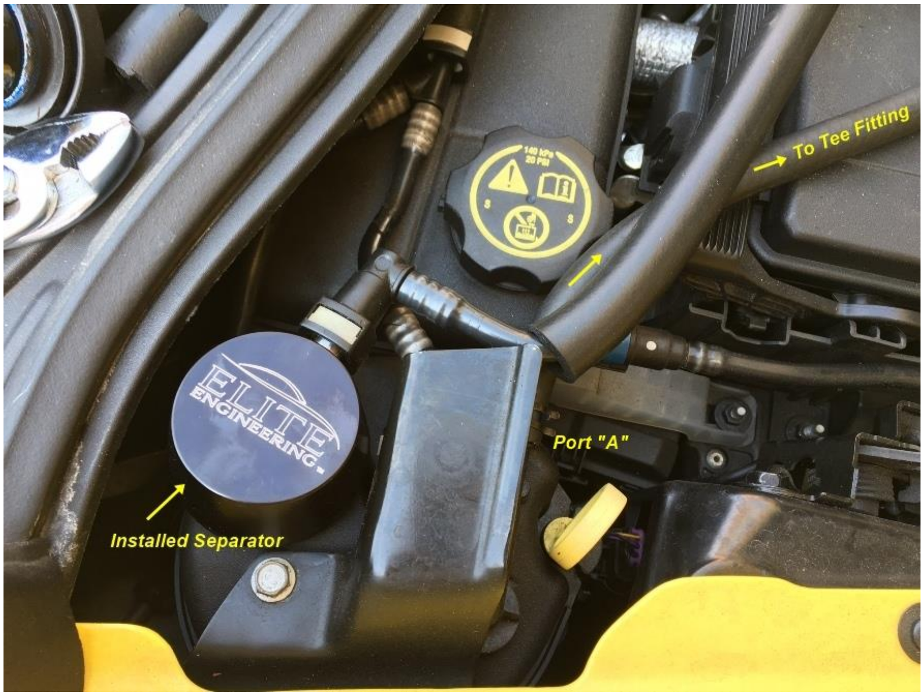
** ELITE ENGINEERING'S CLEAN SIDE SEPARATOR (CSS2) ****

Part number CSS2

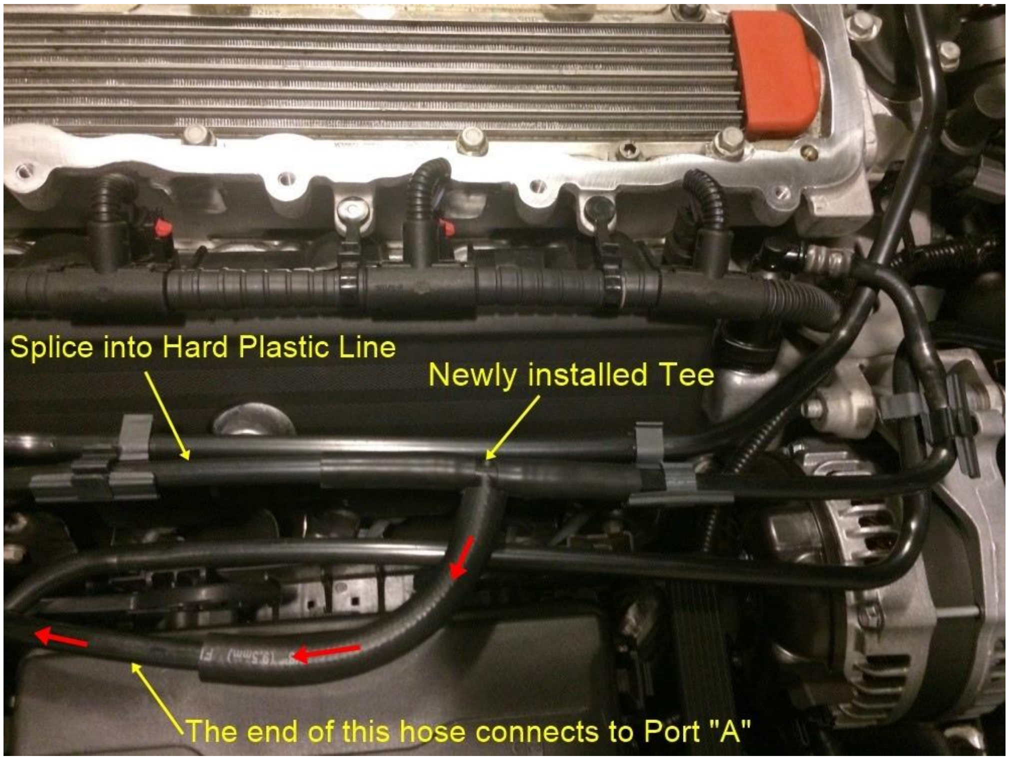
If you purchased the "optional" Clean-Side Separator, this is how it will be installed.

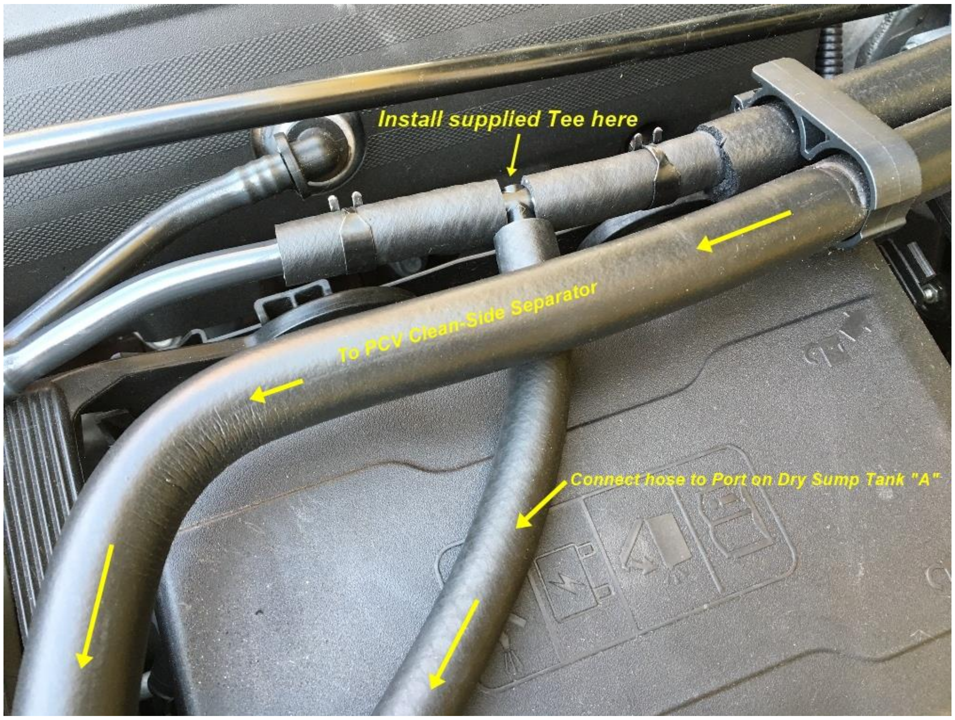
Disconnect (unsnap) front most line from oil tank. This will snap on to the barb of the newly installed Clean Side Separator (CSS) - See Picture "A"

Picture "A"

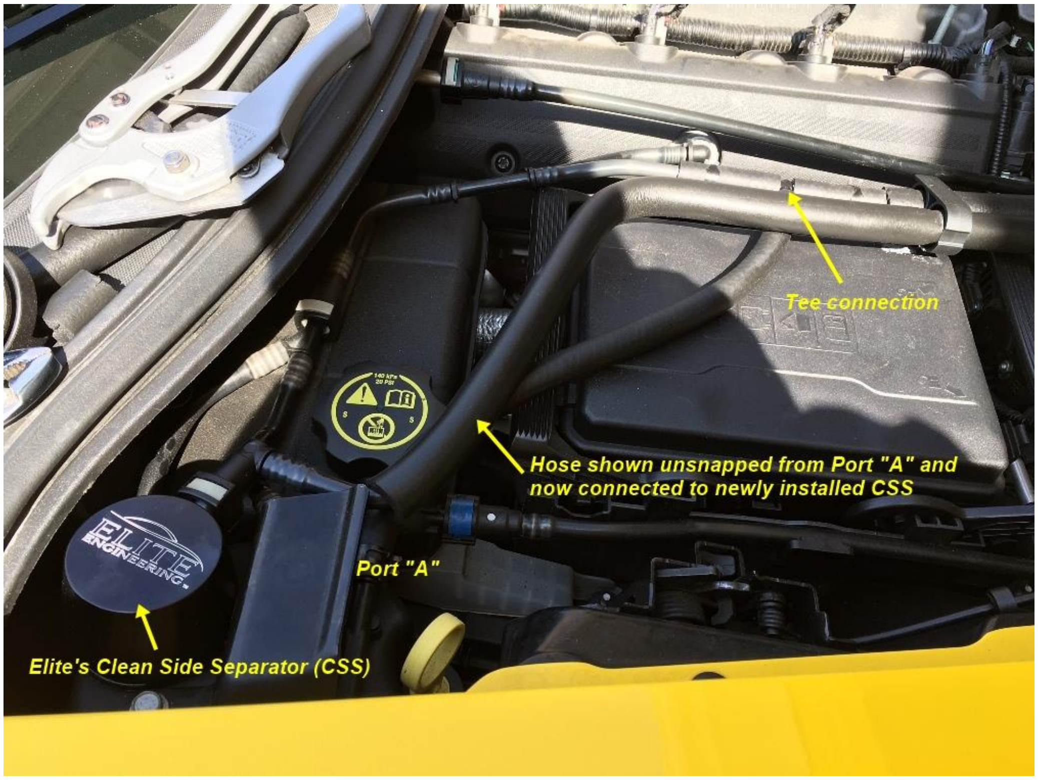


Now you will need to install a Tee (supplied 3/8" hose barb tee) into one of the hard lines that connects to the passenger side valve cover as shown in the picture below. Use some short lengths of 3/8" hose and clamps to slide over the factory hard tubing.





Here's a picture of the completed installation:



To add oil, simply pulled out Clean-Side Separator Cap, replace to seal.