

VADDER DESTROYER Dual Core Heat Exchanger Kit

GEN4 V1.0

Installation instructions

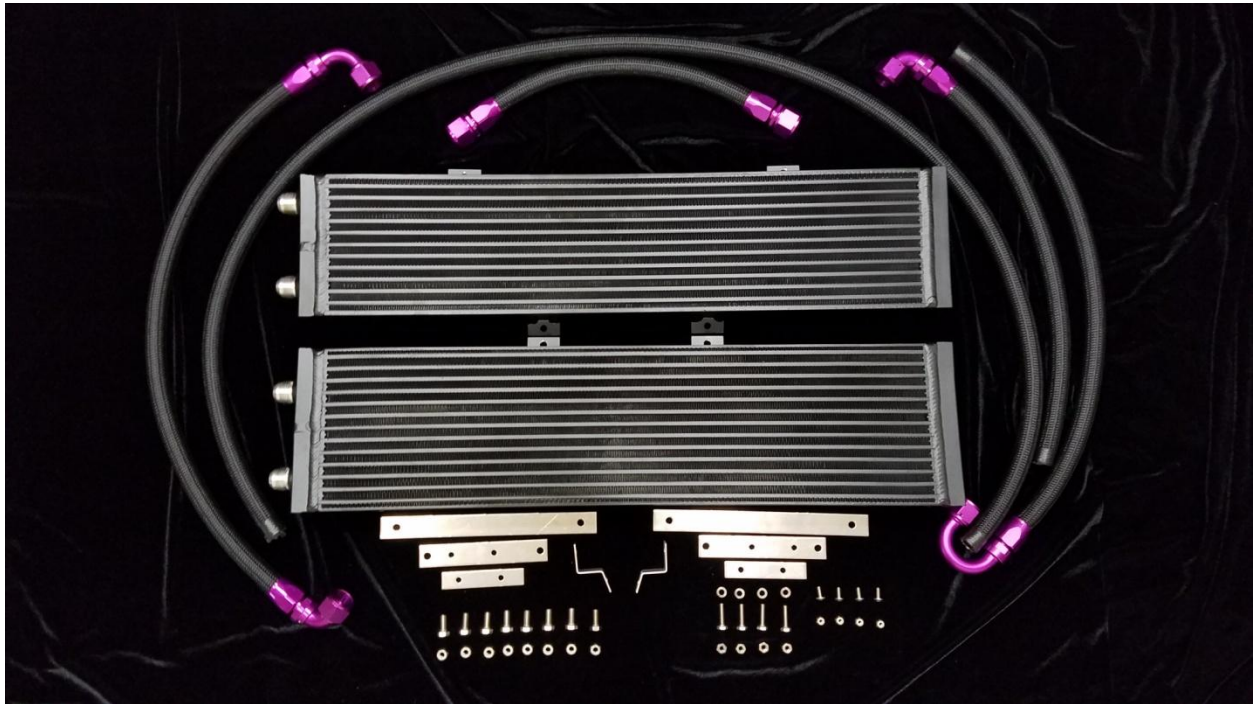


Figure 1

Package contents (unless custom configuration has been requested),
Fig.1

- 1x upper Heat Exchanger core (HX) with angled mounting tabs
- 1x lower HX core with straight and 90 degree mounting tabs
- 1x 30" hose marked "HX to lid lower port", two 90 fittings
- 1x 20" hose marked "lid upper to filler neck", one 90 fitting
- 1x 15" hose marked "HX to HX", two straight fittings
- 1x 79" hose marked "filler neck to pump inlet", no fittings
- 1x 25" hose marked "pump outlet to HX", one 180 fitting

- 2x long 1" wide straight brackets
- 2x short 0.75" wide straight brackets
- 2x 0.75" S shaped upper HX brackets
- 2x 12" long lower HX brackets
- 8x 5/16"-18 0.75" long hex SS bolts
- 8x 5/16"-18 nylock SS nuts
- 4x 1/4"-20 1" long SS hex bolts
- 4x 1/4"-20 SS nuts
- 4x 10-32 button head SS bolts Philips
- 4x 10-32 SS nylock nuts

Tools needed:

- Floor jack and jackstands
- 4" grinder with cutoff and sandpaper wheels
- Sockets: 10mm, 11mm, 13mm,
- 3/16" hex wrench/socket, 10mm, 11mm, 13mm wrenches,
- adjustable wrench
- Plastic push pin tool shown below, adjustable pliers



- 3/16" drill bit and a drill
- Long carving knife, safety knife
- Pry bar
- Long plastic funnel
- Can of black spray paint (optional), RustOleum industrial grade recommended

Consumables needed:

- WD-40
- Power steering fluid (cheap Autozone or Advance Auto brand)
- Dexcool antifreeze (or water + Redline Water Wetter)

Note: use plenty of WD-40 on all Stainless bolts and all 12AN fittings, this is very important: Stainless and Aluminum threads are prone to galling when installed dry.

Begin with raising the car securely with jack stands on each side. Battery doesn't need to be disconnected. Remove all push pins on the bottom of the bumper (red), the two 10mm bolts on the belly pan, the two exposed Christmas tree push pins and the 4 hidden Christmas tree push pins marked with an arrow. The two bolts on the belly pan are where the lower HX brackets will be installed later on, remember the locations (Fig. 2, 3 & 4).



Figure 2



Figure 3



Figure 4

There are also 4 more push pins (not shown) on each side of the belly pan, connecting it to the under fender panels, take them out as well. The belly pan should come out at this point. Now remove the two push pins on each side and then pry out the inner fender panel out to reach the two hidden 10mm bolts and take them out. Hold the edge of the bumper and pull it out to unsnap each side.



Figure 5

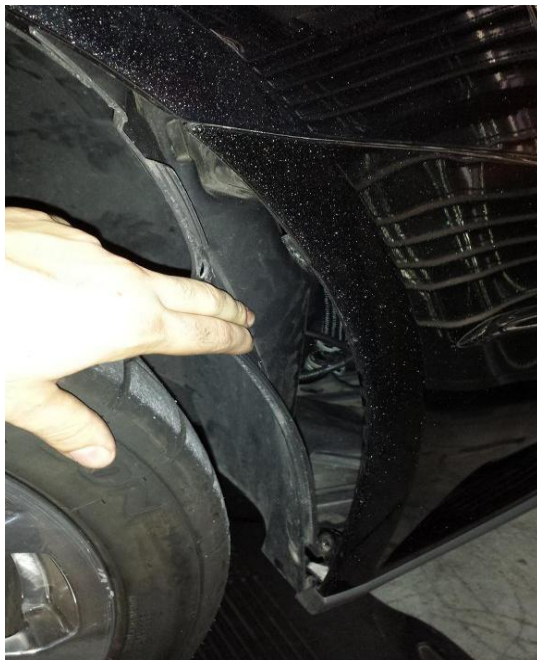


Figure 6



Figure 7



Figure 8

Unscrew the marked in red pins and remove the trim panel (Fig. 9).

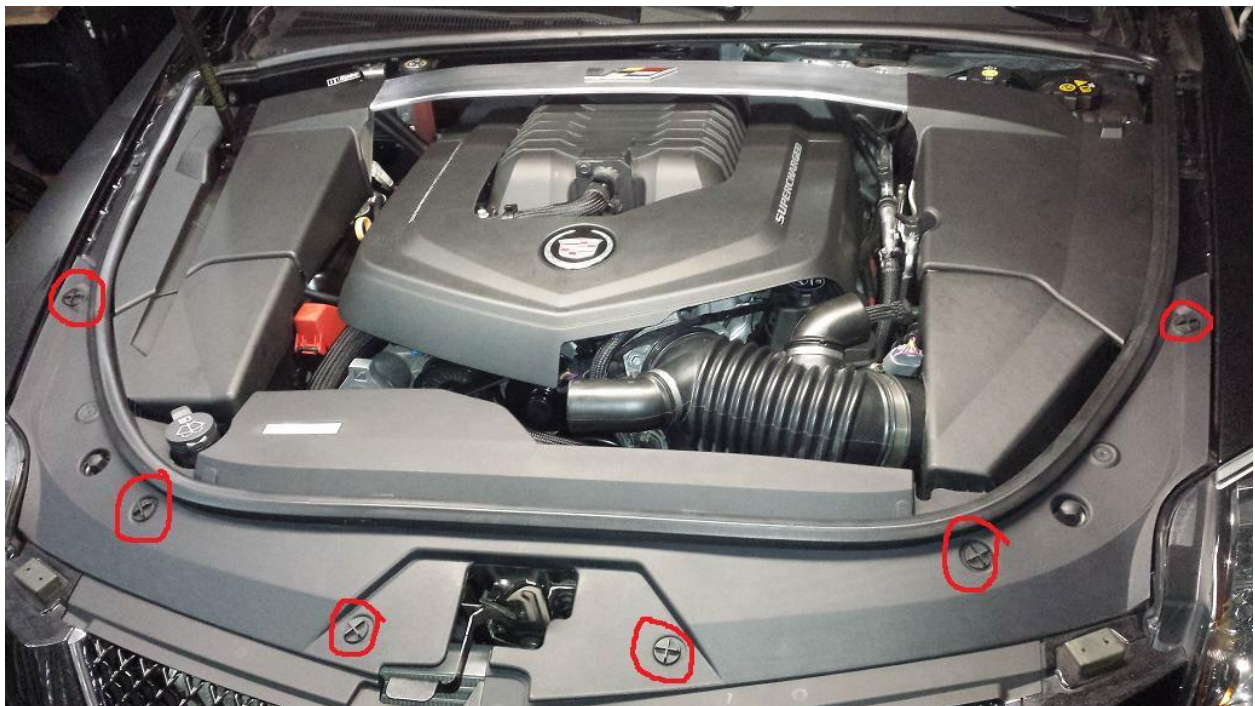


Figure 9

Drill out the 4 rivets (green), and then remove the push pins (red). You might need to oscillate the drill if any of the rivets begin to spin so you don't melt the plastic underneath them. Drill them out at slow speed (Fig. 10).

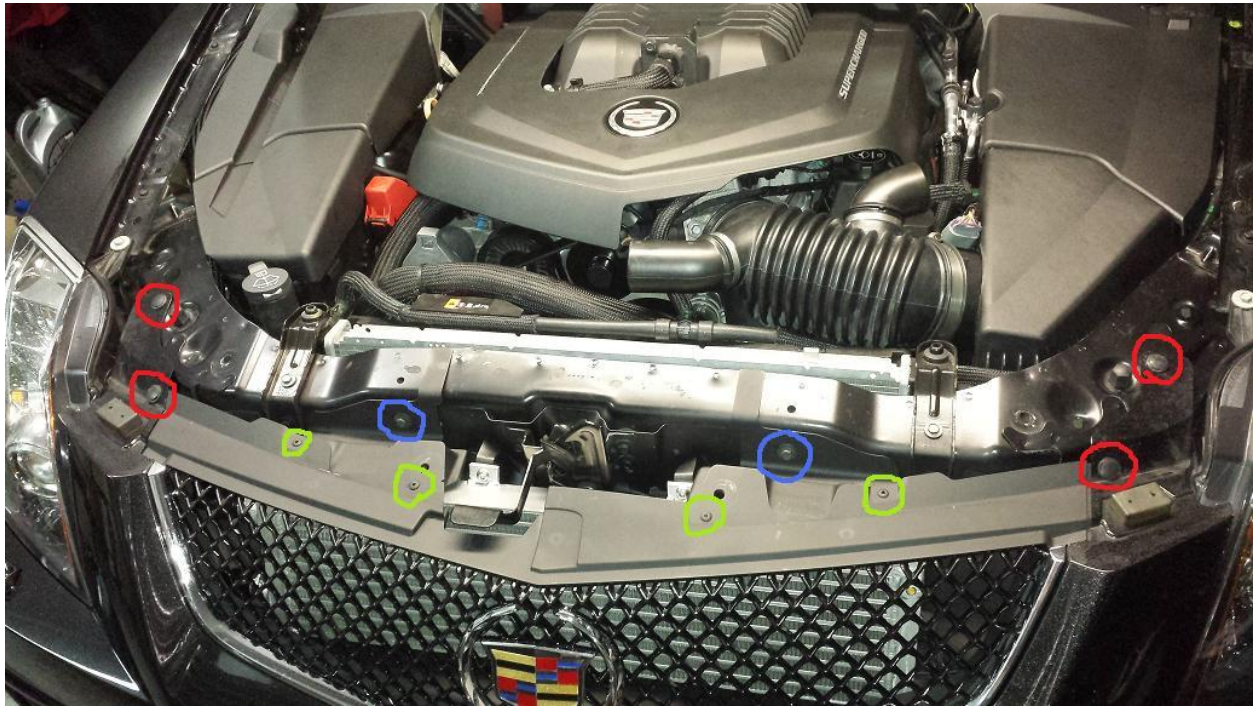


Figure 10

Once you remove the 4 red push pins the bumper will be ready to be removed, slowly pull it away from the car and disconnect the fog lights and headlight washers. There will be two hidden Christmas tree push pins on each side of the lower grill, have your fork tool ready so you can reach down there and pry them out if you haven't done it from the bottom. The headlight washer hoses need to be disconnected from the washers because the one-way valves are installed close to them. The washer fluid will leak out otherwise. Once the bumper is out remove the grill bracket from the car by unscrewing the two bolts shown above (blue).

At this time remove the factory heat exchanger, it is fastened with 4x10mm bolts, disconnect its hoses, drain and collect the intercooler coolant. The removal of the factory heat exchanger involves disconnecting the power steering radiator hoses as well; plug them with spare bolts etc. so little power steering fluid is lost

in the process. After removing the factory heat exchanger, also remove the factory HX hard lines located between the engine and the fuse box, save all the hose clamps as they will be reused with the Vadder kit. The hard pipes are attached in two places, unscrew the nuts and take them out. Remove all factory hoses as well- from the filler neck, supercharger lid and HX pump.

Once the bumper and the factory HX get removed, the power steering cooler needs to be relocated, its bracket gets trimmed and painted. Remove the metal bushing and rubber insulator from the bracket as well. Reattach it as shown, on the back side of the bolt. This is done to provide clearance for the upper HX unit. Cut the bracket as shown with the red line (Fig. 11).



Figure 11

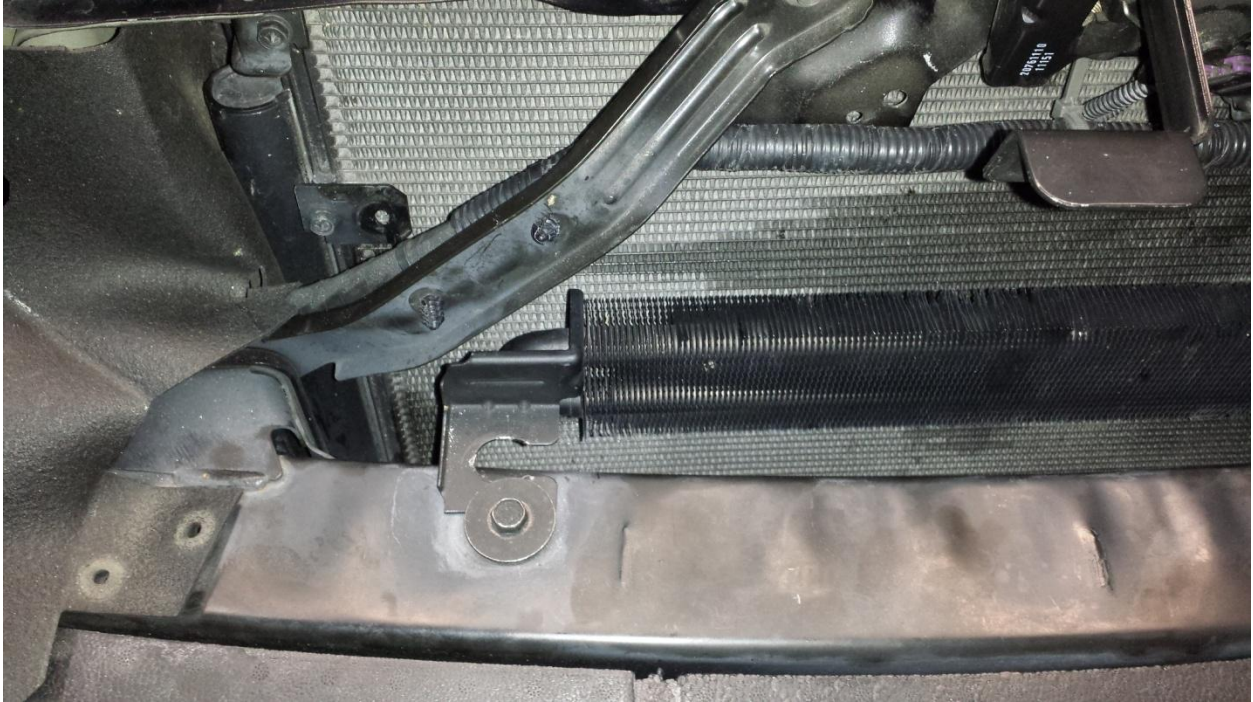


Figure 12

Once the bracket is tightened down (Fig. 12) shave the area of the bracket circled in red, shave the bolt down about half way using the grinder (Fig. 13).



Figure 13

Using the pry bar, gently pry the right power steering cooler bracket (soft aluminum bracket) until the unit sits even on both sides, as shown with the red arrow (Fig.14). The headlight wiring harness gets relocated behind the diagonal brackets and the upper HX brackets get installed at this time. Unplug the ambient air sensor at this time as well; it will be relocated in front of the upper HX unit.

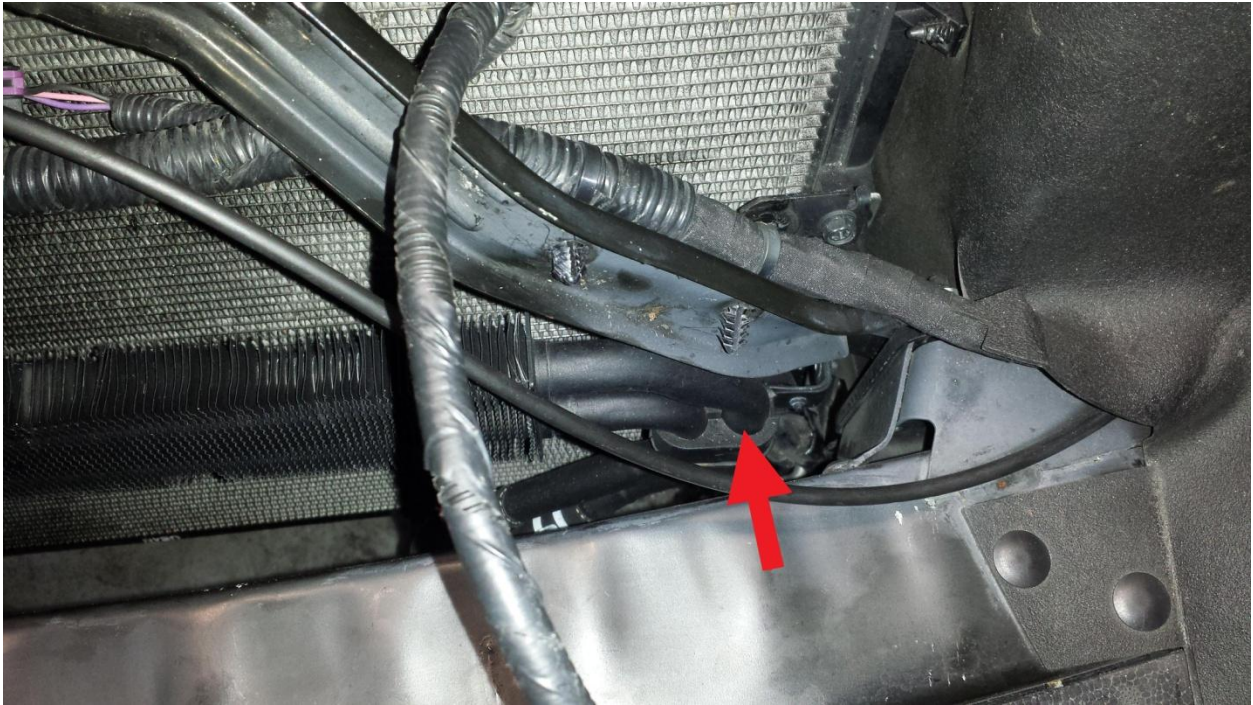


Figure 14

The factory hood latch cover (with printed CTS-V logo) gets removed and will not be used together with the Vadder HX kit (Fig.15).



Figure 15

The top of the crash bar gets painted if desired at this time as well (picture shows wet paint) (Fig.16).



Figure 16

Now it's time to relocate the ambient temperature sensor and relocate the headlight wiring harness behind the two diagonal braces above the power steering cooler. Once you remove the two bolts on the top side of the diagonal braces, undo the Christmas tree pins holding the wiring harness, move the harness behind the braces and insert the pins through the back side of the braces. For now put the ambient temperature sensor out of the way, it will be mounted after the upper HX gets installed.

The little rubber tab gets cut off as well (Fig. 17).



Figure 17

Now it is time to prepare the heat exchangers for installation. Locate the one shorter in height - this is the upper HX unit. The angled tabs are located on the bottom of it. Install the two vertical brackets as shown and having the two smaller holes (1/4") closer to the top.

IMPORTANT: The vertical brackets need to be installed on the back side of the tabs, the HX will not fit properly otherwise. Try to have the brackets as vertical as possible otherwise the lower HX will sit sideways from the front one.



Figure 18

IMPORTANT: Temporarily align the lower HX with the upper one to make sure the brackets align with its mounting holes and tighten the brackets to the upper HX unit (Fig. 18).

The upper HX unit is now ready to be installed. You will need to lift the hood latch while installing it in place, take your time so the brackets don't bend the fins on the power steering cooler. Let the upper HX rest on the crash bar once in place. Install the bolts on the top HX brackets and also temporarily install the grill support bracket bolts in place to help align the brackets, tighten the lower bolts all the way. Leave the grill support bolts in there for now.

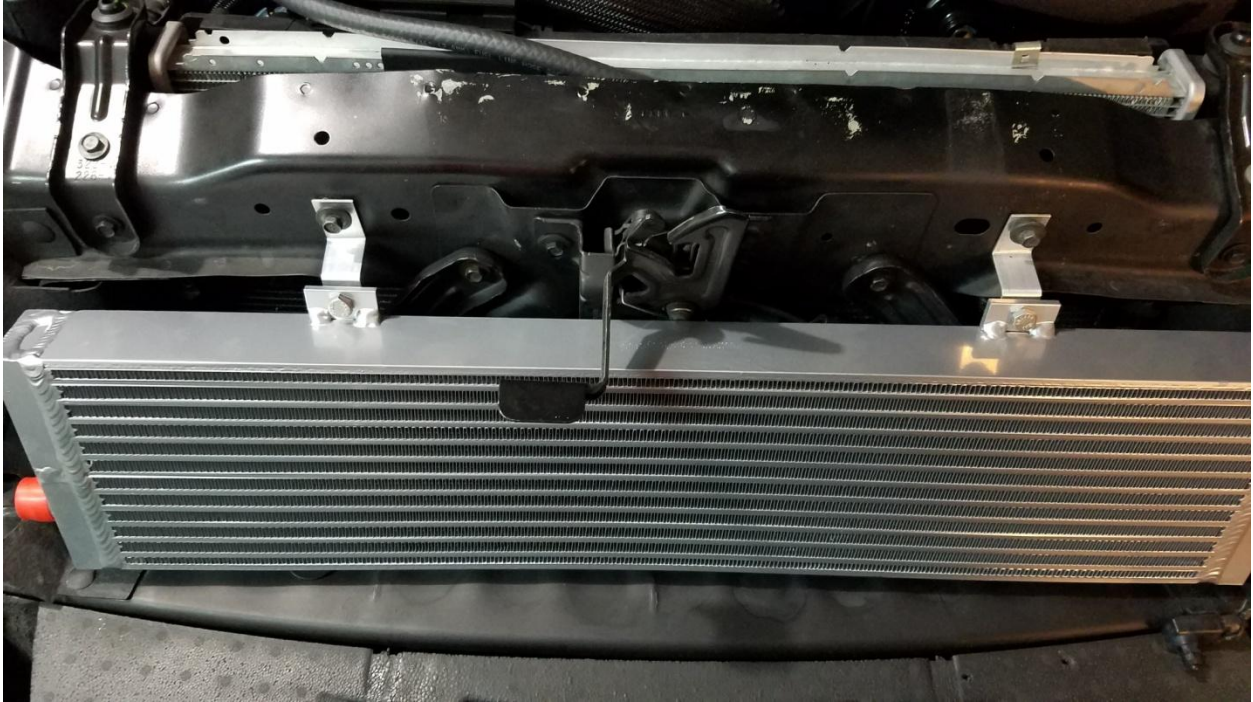


Figure 19

Now get the lower HX and bolts/nuts ready for install. The HX mounting tabs need to be on the front of the bracket, just like the upper HX. Go ahead and tighten them all the way.

Now that the two heat exchangers are in place it is time to install the two flat brackets in place with the $\frac{1}{4}$ -20 hex bolts, lock washers and nuts. These flat brackets get installed from underneath the car using $\frac{7}{16}$ " or 11mm wrenches. It helps if you have a ratcheting wrench as well. Notice that the holes are closer to one side of the bracket. This side faces the bottom; the brackets are marked "UP" to help with install. Insert them inside the crash bar as shown, install the bolts (with lock washers, not shown on the picture) and slowly begin to tighten them in. This action will pinch the crash bar and bring the two heat exchangers forward.

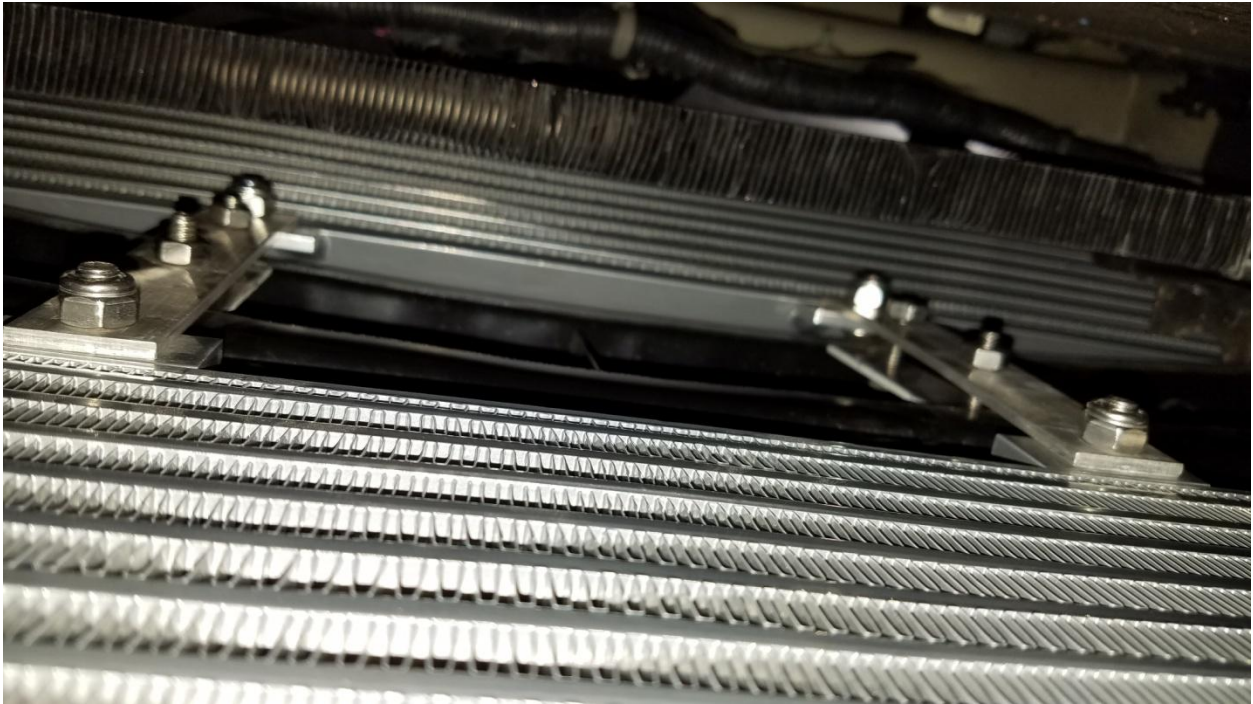


Figure 20

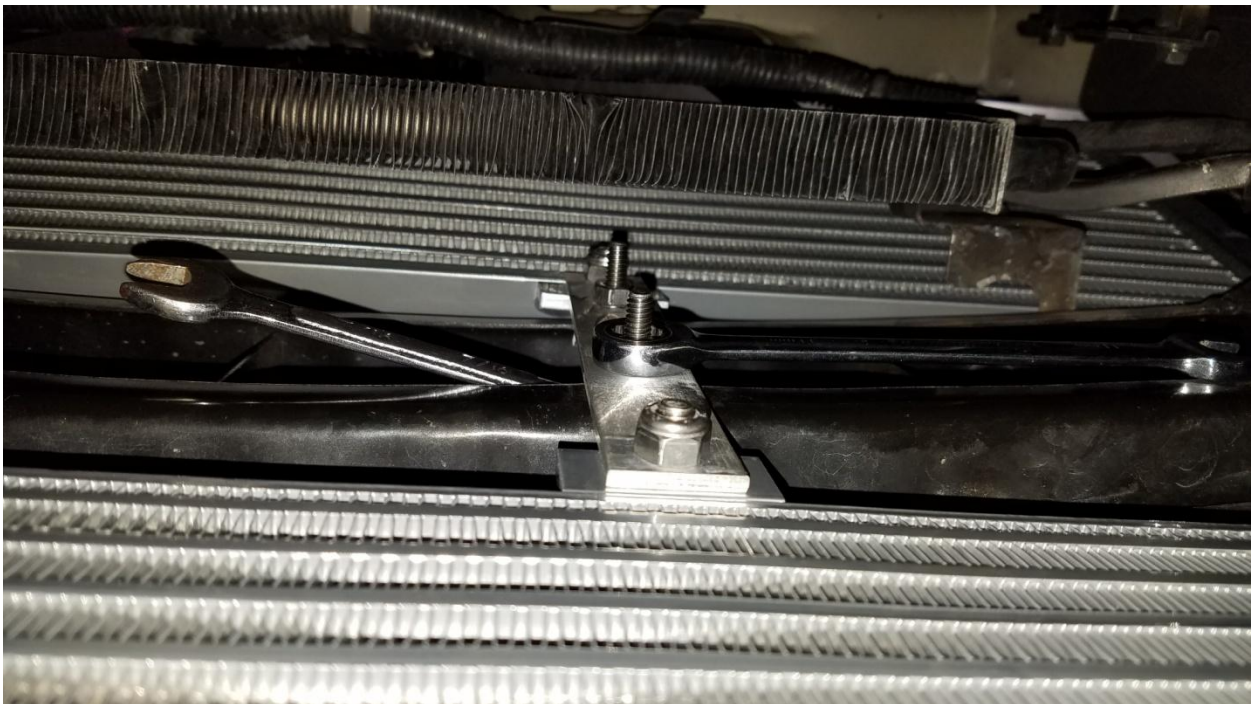


Figure 21

The narrow flat brackets inside the crash bar will bend slightly on the top and bottom, this is normal.



Figure 22

Now install the long bottom HX brackets and temporarily install the belly pan bolts to help align them.



Figure 23

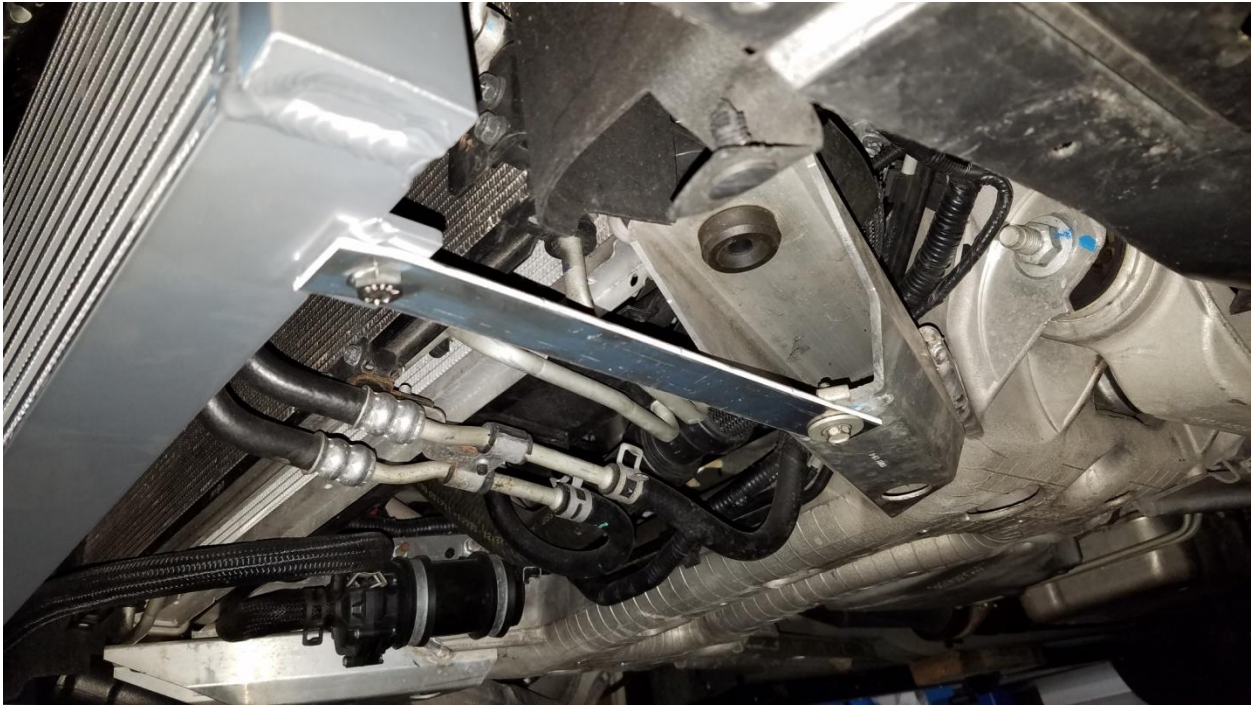


Figure 24

Once tight remove the belly pan bolts making sure they both align with the holes at the same time. Remember, the HX brackets get sandwiched between the subframe and the belly pan so the brackets need to align 100% both at the same time to allow for easy re-install of the belly pan.



Figure 25

Once the HX cores are installed (except the two belly pan bolts in the subframe) it is time to route and connect all the hoses. The HX pump flow is changed- it is now pumping into the HX instead of sucking through it. Loosen, rotate it and position it as shown on the picture below.



Figure 26

The outlet of the pump is pointed the driver's side and the inlet of the pump is pointed towards the front of the car. The next step is bending the factory filler neck's bracket so the filler neck is positioned parallel to the strut tower brace. Remove the filler neck and bend the bracket out of the car, reinstall it. Once the filler neck is installed back in place connect the supplied 79" hose (filler neck to barb) from the kit and run it behind the fuse box as shown.

The return hose from the filler neck to the pump inlet must be run on the outside of the strut tower, not on the inside by the exhaust manifold. Your HX system will run hot otherwise. See Fig. 27 for hose routing.



Figure 27

For the filler neck and the HX pump, reuse the factory spring-type hose clamps. A total of 4 hose clamps will be reused with the new HX- 2 on the filler neck and 2 on the HX pump. The hose needs to end up on the outside of the washer tank, and then run to the HX pump inlet. The pump inlet is the port facing the front of the car. Once the HX pump is connected to the factory filler neck it is time to run the return hoses. Install the 12AN 180 degree fitting with hose onto the lower core and plumb it into the HX pump as shown. WD-40 will help with all barb fittings.

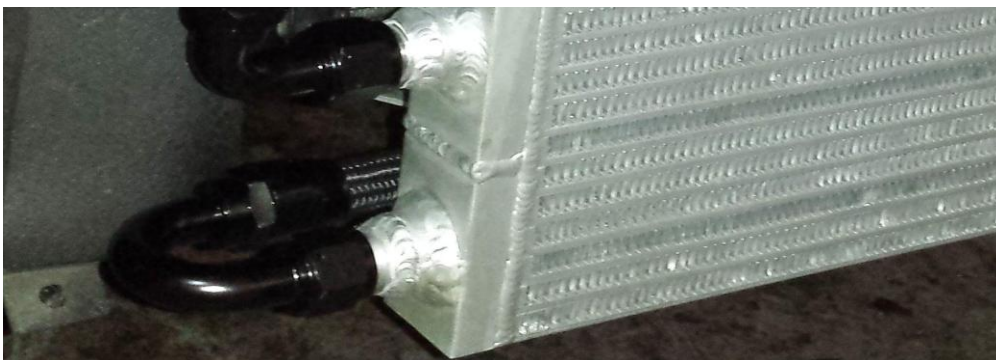


Figure 13

Next is the small 12AN hose connecting the two cores. You will need to cut holes into the heat shields (circled in red). You will also need to carve out a groove through the crash bar foam insert using a steak knife (blue). Install the lower 12AN hose fitting onto the lower core, run the hose in front of the foam insert and mark the location to cut out of the groove. Remove the foam insert using the plastic pin fork tool and carve out a groove on the back side using the long steak knife as shown.



Figure 14



Figure 15

Next locate the 12AN hose with the large radius 90 degree fitting. This hose connects the upper HX to the supercharger lid. In order to run this hose through the opening between the radiator support and the washer tank, unscrew the two 10mm bolts on the washer tank and shift it out of the way.

Upper washer tank bolt, circled in red:



Figure 16

Bottom washer tank bolt, circled in green:



Figure 17

Be careful not to scratch the short radius 90 degree lid fittings (optional); because they will be showing the most. Once you run the short radius fitting by the washer tank, connect it to the bottom lid fitting. The last hose is the one which connects the upper lid port to the filler neck; this hose has one short radius fitting on one side and nothing on the other. Slide one of the leftover factory clamps onto it and connect it to the filler neck. Do not install the short radius fitting on the lid upper port yet, this hose will be used to fill the system properly.

The last installation step is the ambient air temperature sensor, it gets relocated in front of the upper HX so it reads correctly (the factory setup has it behind the power steering cooler). A Philips screwdriver is a good tool to punch a hole in the foam insert, use the location marked with a circle, about in line with the edge of the hole in the front of the insert.

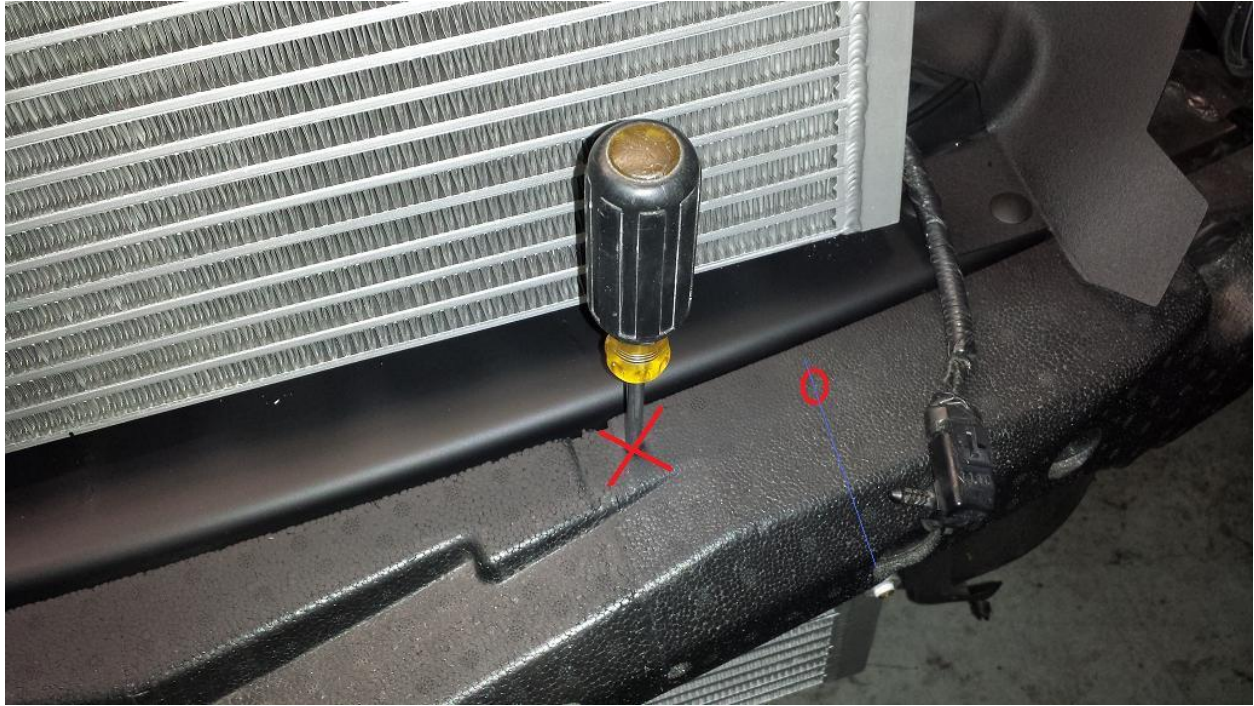


Figure 18

Recovery tank installation (OPTIONAL)

The recovery tank installs on the firewall, next to the HX filler neck. There are two existing bolts on the firewall, remove them. Cut the factory zip tie which secures the small filler neck hose. Locate the small green hose clamp in the hardware bag and slide it onto the small filler neck hose. Install the small filler neck hose onto the bottom recovery tank, secure it with the green hose clamp and install the recovery tank on the firewall with the two bolts. Route the hose coming out of the top recovery tank port on the side of the recovery tank and leave it there or fasten with a hose clamp loosely to the bottom hose.



Figure 19



Figure 20

Fill up procedure

Note: Do not reinstall the bumper cover before the HX system is filled and checked for leaks.

If done properly the fill up will take less than 20min, please follow the instructions carefully.

Prepare your coolant fluid (antifreeze or water), long funnel, 2ft piece of aluminum foil and a small container. Keep the factory filler neck capped for now. Fold the aluminum foil in half lengthwise and make a spout out of it under the upper lid port, draining into the plastic container. This is used to catch the extra fluid and aids in bleeding the system. Stick the funnel into the Redhorse fitting as shown.



Figure 21



Figure 22

The total system capacity is 1.2 gallons, begin filling the funnel until the system refuses to take any more fluid (it should take about 2 quarts before it stops). Once it stops taking fluid use the funnel like a face mask and blow into it, forcing the fluid into the system. It will take about 5-7 funnel fills until fluid begins coming out of the upper lid port. Force another 2 funnel fills through the system to remove some more air. Once this is done install and tighten the upper lid hose,

open the filler neck and stick the funnel in it tight as shown.



Figure 23

Fill the funnel and start the intercooler pump either via an Interceptor gauge or by starting the engine. Check the level of fluid in the filler neck (should begin dropping fast), crack the funnel and let more fluid from the funnel flow into the filler neck until it is filled. Keep adding fluid into the funnel and crack it loose to completely fill the system. Once you notice no more air is coming into the filler neck check the entire HX system for leaks and stop the pump/engine. Fill the recovery tank about half way and top off the filler neck.

Next step is modifying the grill support bracket. Bolt it in place on top of the upper HX and mark the two areas to be cut, use the cutoff wheel make the cuts, deburr and spray paint them to prevent rusting.

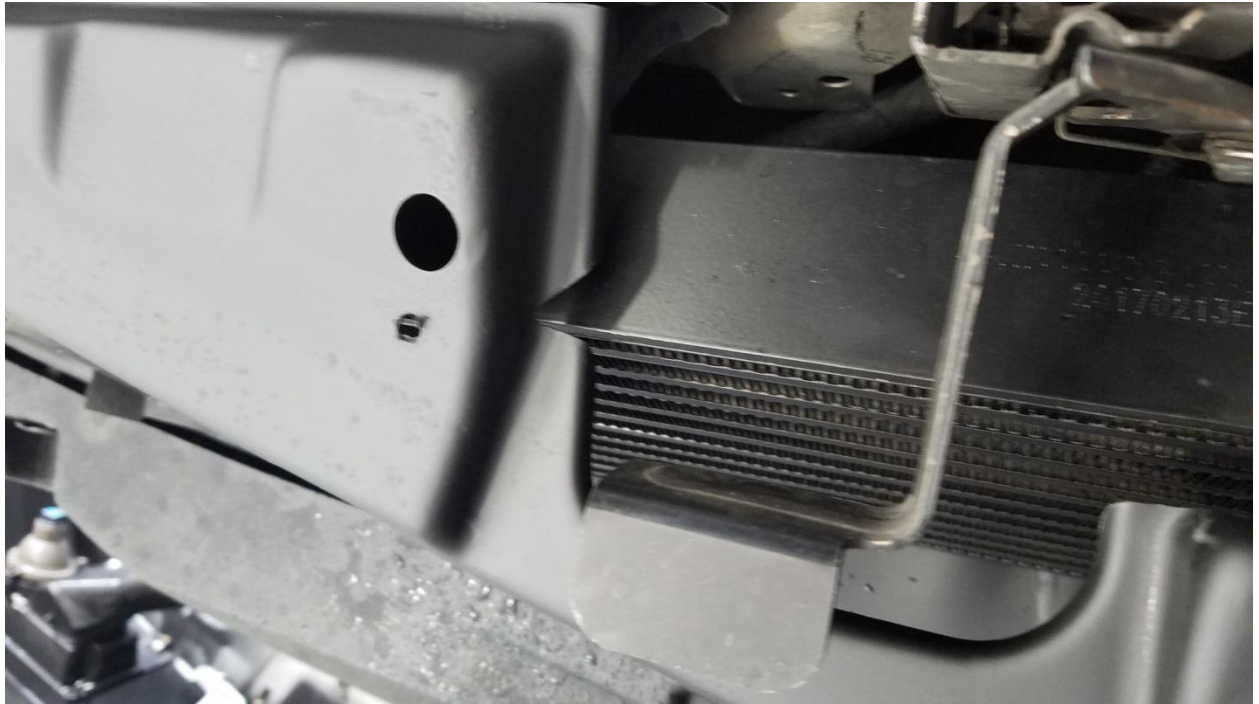


Figure 39



Figure 40

Now it is time to install the modified grille support onto the bumper cover, using the provided four 10-32 button head Philips bolts. At this time the upper grill needs to be modified. Using the sandpaper wheel the grill needs to be shaved to provide extra clearance for the upper core.

Position the sandpaper wheel as shown and slowly shave material off the inside the grill to achieve the following shapes.



Figure 41

Looking at the inside of the bumper cover, its passenger side grille needs to be trimmed to provide clearance for the fittings.



Figure 42

Now moving to the driver's side of the upper grill, the following areas need to be trimmed. The rim of the grill needs to be shaved down as shown in blue.



Figure 43

Once both sides of the grille have been trimmed attach the grill support bracket onto the bumper cover using the provided 10/32 bolts and nuts. Now you can test fit the bumper, making sure the fittings on the upper HX don't touch the grille. Reinstall the belly pan, followed by the bumper cover. Once the bumper and belly pan have been reinstalled, lower the car back on the floor. Purging the system will take a few driving cycles, keep checking the coolant level and add as needed. Add to both the filler neck and the recovery tank to speed up the system purging.

**Thank you for purchasing the VADDER
DESTROYER Dual Core Heat Exchanger kit!
Enjoy the performance!**

