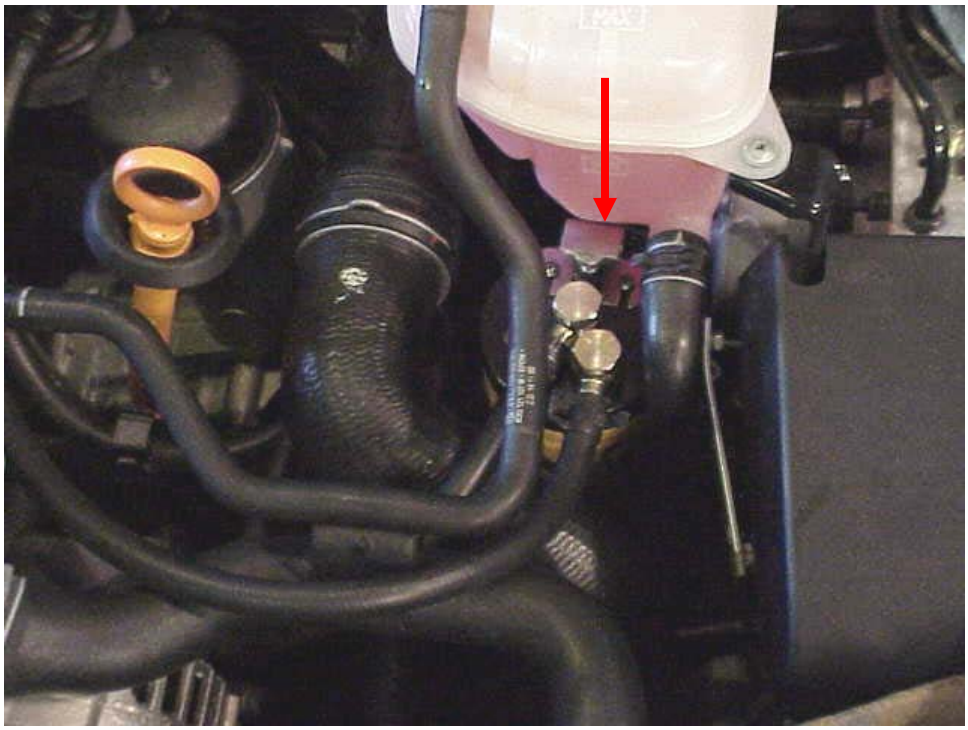
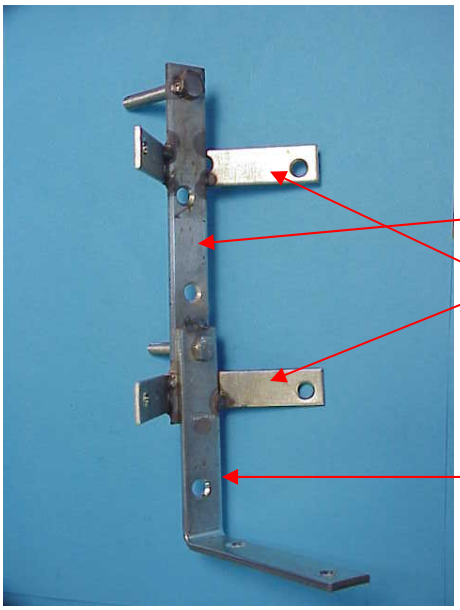
# CAT 2 MICRON FUEL FILTER INSTALL IN 2005 PASSAT TDI

These instructions outline the installation of a CAT 2 micron fuel filter in a 2005 model year Passat TDI. I purchased the fuel filter installation kit for the A4 VW's from Lubrication Specialists (Greg Landuyt). This CAT fuel filter has been installed as a secondary filter to the OEM Bosch -- it does not replace the OEM.

I chose to add the CAT downstream of the OEM filter because the engine mounted filter holder is a tight fit even for the smaller OEM Bosch. Second, this setup lets me keep the water drain feature of the OEM, and third, there is a perfect spot to add the CAT just below and forward of the coolant overflow tank. No drilling or modifications to the vehicle are required. Note the photos below of the completed installation.



The output line connected to the OEM filter is removed and connected to the output banjo fitting on the CAT filter. This line does not need to be cut or lengthened. An additional 5/16" fuel discharge line is run from the output of the OEM filter to the input of the CAT filter. The thermostat "T" fitting is plugged (not used) on the CAT. Heated fuel in the OEM is fed directly to the CAT filter making this connection unnecessary in this 2 filter arrangement.



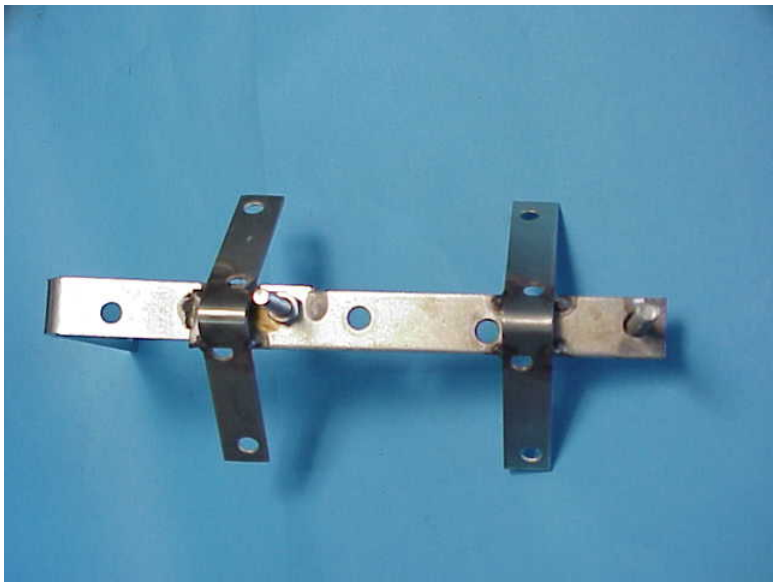
A custom bracket must be made to install the CAT. It can be made from stamped steel strap material available from the local hardware store. Note the photo below of the completed main bracket. It is approximately 8" long and made from 4 individual purchased steel straps that are welded together.

6" X ¾" Zinc plated mending brace (National N220-285)

2 1/2" X ¾" Zinc plated corner braces (National N113-233)

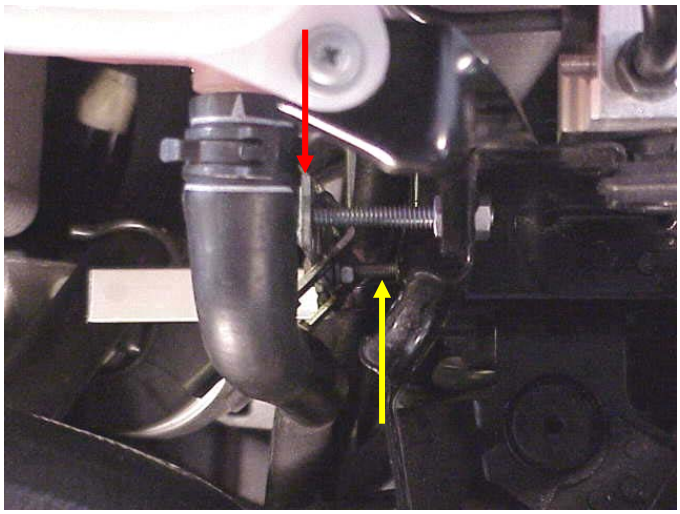
3 1/2" X ¾" Zinc plated corner brace (National N113-399)

A view of the back side of the bracket can be seen below. The only hole that I drilled in the bracket is the lower mounting bolt hole in the 6" mending brace. The hole is a ¼" thru hole for a 40 mm long 6 X 1.0 mm bolt. The bolt must be metric because it threads directly into a pre-existing threaded bracket in the Passat. This bolt is not welded to the bracket.

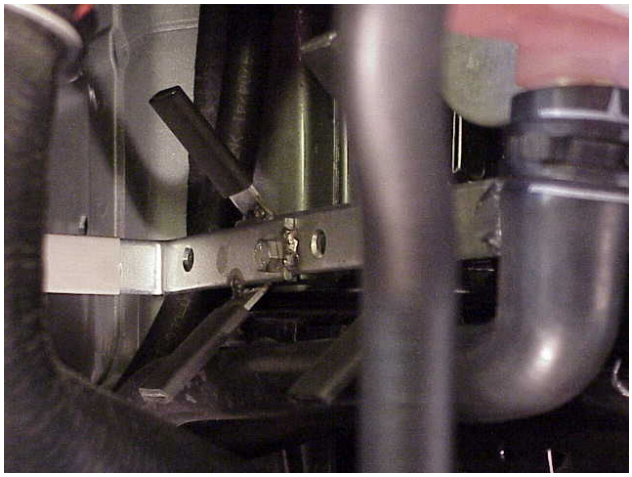


The upper bolt in the bracket is a 2" long ¼ X 20 bolt. The head of the bolt is welded to the bracket strictly for convenience of installation. Each of the 2 corner braces are tack welded to the 6" mending brace prior to welding the bottom leg on the bracket. The bottom leg supports the end of the fuel filter.

In the photo below left, you can see the bracket installed in the vehicle. The bracket that supports the front of the coolant overflow bottle has a hole already stamped in the bracket to accept the upper bracket bolt. The hole is about 4 inches down from the coolant mounting screw. Another 4 inches down from this hole and directly below it is a threaded 6 mm hole to accept the lower bracket bolt. You can just see the lower bolt in the photo (yellow arrow).

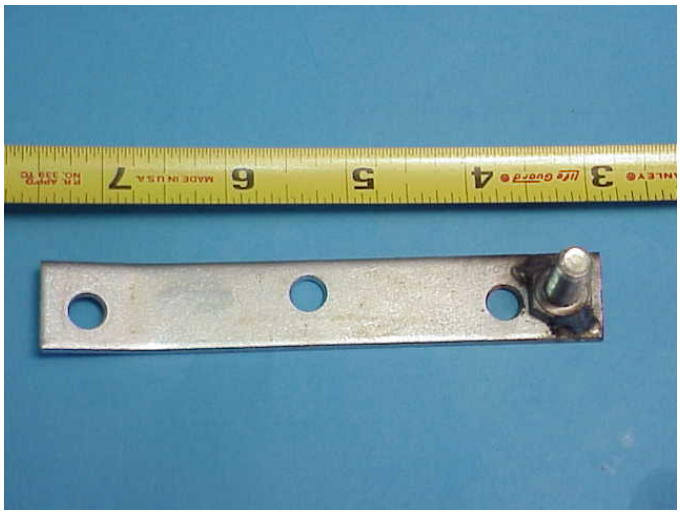


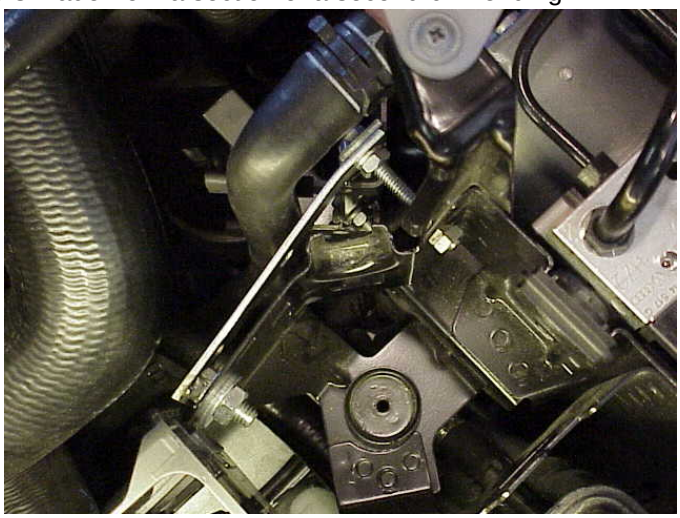
Two jam nuts are required on the back side of the lower bolt. One is on the back side of the bracket and the other against the threaded vehicle bracket. The upper bolt has a nut on either side of the vehicle bracket. The fuel filter bracket is spaced the required distance away from the vehicle bracket when the nuts on the upper bolt are threaded to the end (see photo above). Thread the lower 6 mm bracket bolt into its threaded hole to keep the bracket straight up-and-down. When installed in this manner, the fuel filter will have the proper clearance from the coolant bottle hose and any wiring to the right of the filter.



Another photo left shows the bracket in place on the vehicle. The use of an upper stabilizer brace and the installation of the black "grips" on the corner braces are shown on the next page.

A brace can be added to the upper bolt of the bracket. It is probably not necessary, but I wanted the bracket to be "rock-solid" and this brace does the trick. It is made from a section of a second 6" mending



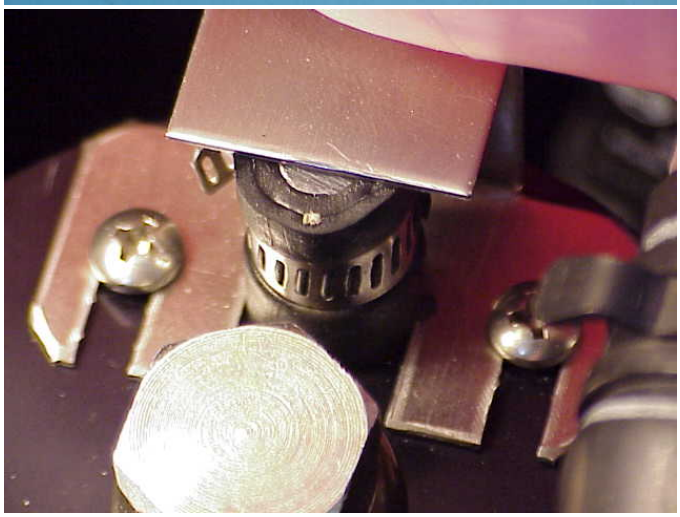


brace. A 5/16" bolt ¾" long is welded to the brace. Note the very shallow bend made in the end of the brace. This end is placed over the upper bolt of the bracket during installation. A hole to receive the bolt is already stamped in the vehicle bracket. The brace is shown installed in the photo above right. I used split washers behind each nut on the bracket to prevent the bracket from coming loose.

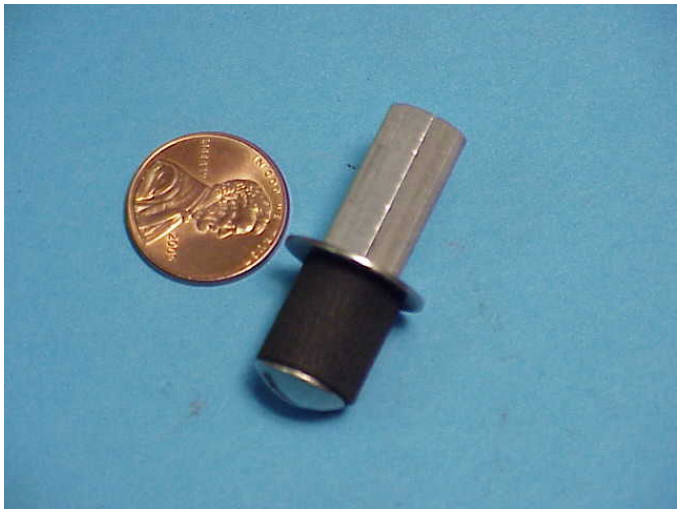
To prevent scratching the paint on the CAT fuel filter I added a rubber sleeve to each of the corner brace arms on the bracket. I used 1 ½" lengths of Santoprene elastomer tubing (1/2" OD X 3/8" ID) available from McMaster-Carr (catalog # 51225K35). This stuff has high surface friction and a high temperature rating. Just stretch and slide the tubing on the arms of the bracket. I put heat shrink tubing on the bottom leg of the bracket.

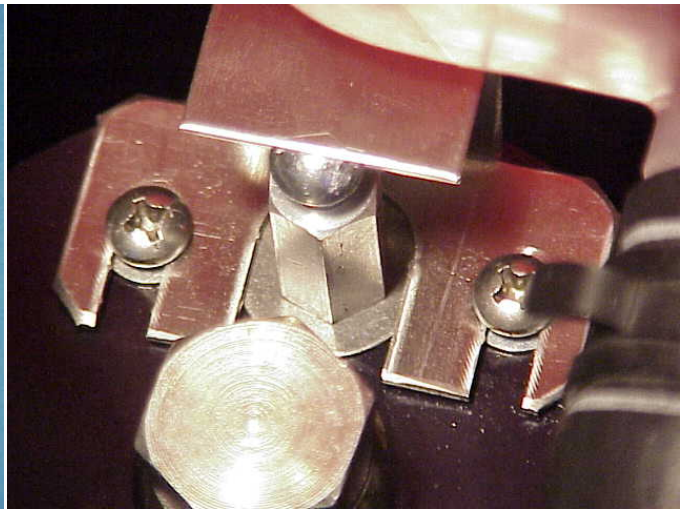
Hold the fuel filter to the bracket using a single stainless steel 3 ½" hose clamp. I put the Santoprene tubing around the hose clamp.

The next challenge is installing a plug in the thermostatic "T" hole in the top of the filter adapter. My first attempt was using a 0.3" diameter steel rod shoved down the ID of a ¼" ID fuel hose (photo below left). This assembly was then forced in the approximate ½" hole and a hose clamp was tightened around the tubing. Unfortunately, diesel fuel would slowly seep thru the string braiding in the walls of the fuel hose. Remember that PD TDI diesels have a fuel tank pump that pressurizes the line and not a mechanical pump on the engine that draws a vacuum thru the fuel filter. This means that you get fuel leaks and not air leaks. On the next page is a photo of the plug that has not leaked after installation.



The photo shows McMaster-Carr part #2599K28 Thumb Nut Stem Test Plug for Pipe ID .47" To .55". It costs $5.56. On the right below you can see it installed in the fuel filter.



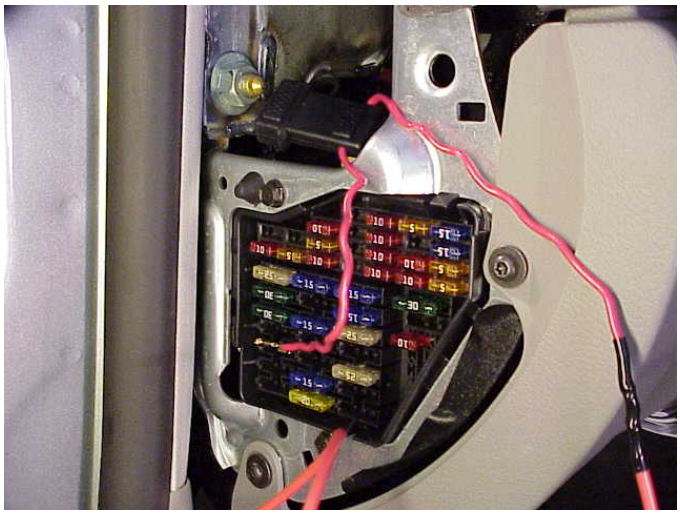


I threaded a 10-32 machine screw in the head of the test plug. I filed off half of the slotted head of the screw so it cannot rotate with the "T" bracket in place. Note that the test plug is rated for 250°F but only 10 PSI pressure. The bracket insures that it won't pop out under fuel pump pressure.

Once the fuel filter has been installed, use Greg's hose clamps on the CAT fuel connections. Plumb the outlet of the OEM fuel filter to the CAT filter. At this time, the CAT filter is full of air. Both filters can be purged of air without the use of a vacuum pump using only the electric fuel pump in the tank on the car.

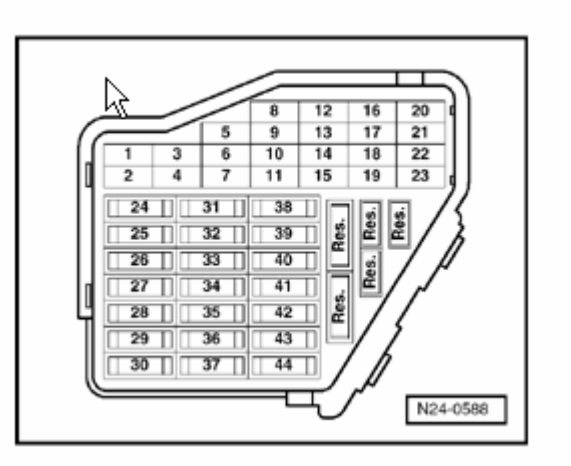
To do this fuel priming the easy way, make a 12 gauge jumper wire that is made from parts obtained from Radio Shack. On one end of the wire connect a small battery clip. An inline fuse holder for a standard size plug-in fuse is soldered on the opposite end of the long wire. A brass tab in this case is soldered to the fuse holder wire so that it can be plugged into the fuse block on the Passat.

In the photo below you can see the fuse panel for the Passat. Remove fuse 28 (20 amps) for the fuel pump from the fuse block (see fuse panel layout on the next page). Place the end of the jumper wire in the right-most blade of the fuse block (position 28).



Attach the battery clip to the positive terminal on the battery. Make absolutely sure that all fuel hoses are connected to the fuel filters. Only then, place the 20 amp fuse that you just removed into the fuse holder of the jumper wire. You will hear the Passat fuel pump begin to run.

About 40 seconds after the pump begins to run, the air from the CAT filter can be heard as it enters the fuel tank. Let the pump run for 1 minute and 15 seconds to clear all the air from the filters. Remove the fuse to stop the fuel pump. Now remove the jumper wire first from the battery and then from the fuse block. Replace the fuel pump fuse and the engine can now be started. If will fire up without extended engine cranking.




On the left is a diagram of the fuse panel for the Passat. Fuse position 28 is in the 3rd row from the bottom.

The fuel priming jumper cable can be used anytime that the fuel filters are replaced in the future or if you run out of diesel fuel. I don't plan to replace the fuel filter for 50 or 60K miles since I have the OEM filter still in the line. The OEM filter should be replaced as recommended in the owner's manual.

As a last note, many thanks go to Greg for designing the CAT fuel filter adapter head including the use of the banjo fittings. This thing is a work of art.