

986: Heater Box Repair



Since taking ownership of my 986 there was little to no heat. Symptoms were rather confusing as Durametric software showed a full range of motion for the temperature mix valve, a physical exam of the servo and arm proved the Durametric was correct. Additionally the temperature gauge seemed within specs as were "real time" values again with the Durametric Software in regards to temp. Although temp data didn't support a need for a new thermostat I chose to do it, which of course did not solve the issue. For a day I thought a higher temp thermostat might fix my lack of heat, but I abandoned that theory...as the temps seemed high enough. So what else could it be?



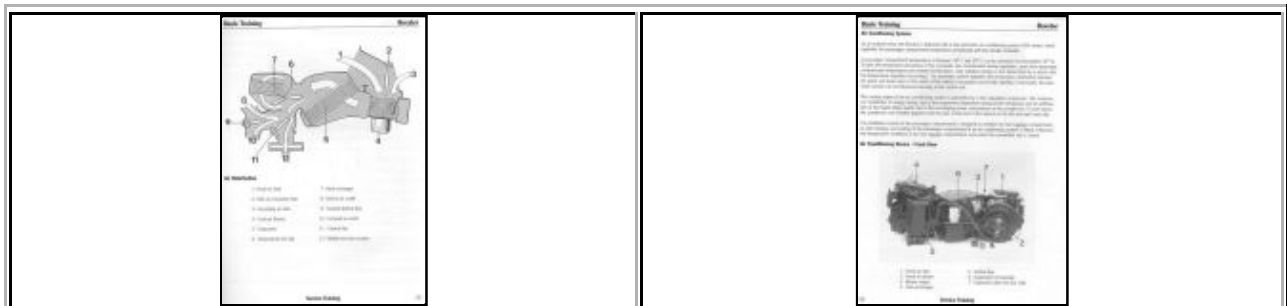
NOTE: Click on any image for a larger view.

The next step was to pull the heater core and check for blockage or air lock plus I wanted to get a view of the temperature mix valve, maybe something was "off" inside. Since so much foam had come out of the air vents I was concerned there could be some blockage too. Was I surprised at what I found!

Many on the different bulletin boards will tell you to remove the remaining foam around the intake cabin air filter as this is the source for the foam shooting out of your vents. I disagreed with this as logic would dictate that the foam coming out of the vent would not be so far upstream. If you study the internal view of the AC/heater housing you would see the evaporator and heater core would block such large pieces of foam from the air intake. So where is the foam coming from? We'll pulling the heat core provided that answer.

A PDF of the following two excerpts from a Porsche tech manual can be found here:

[Porsche 986: Air Box \(3.31 MB\)](#)



The flap/door that controls the regulation of air between the AC evaporator and heater core is a piece of galvanized metal with large holes in it. Then it is covered in foam...but I had no idea why. (someone suggested to save weight, not buying it but a

good theory none the less!) Once the heater core was pulled out it was obvious that all the foam coming out of the air ducts in fact comes from the flap/door for the temperature mix. Mine was 90% gone. Therefore the door was a piece of swiss cheese with large holes and useless for controlling air flow between the hot and cold sides. Turning on the AC or heat allowed air to travel right through the door and the door was basically ineffective. Why I didn't have AC issues this summer is unknown but I'm sure my fix will have me impressed next summer! If you are losing foam in large quantities I bet you have lost your heating or cooling efficiency...or you may not know it yet due to current ambient temps!

Although I thought I could get tape over the holes of the heat side door with the door still installed through the heater core access the AC side was going to prove difficult. I determined a way to remove the flap/door w/o having to remove the dash and entire AC housing. It required only a dremel which may make a few of you queasy but it really wasn't not that difficult. Since I knew the servo for the temperature mix flap was easily accessed under the passenger side foot well, I figured I would start there in my search for a removal technique. The only other option is pulling the dash, and evap-housing and cracking that open. No thanks. Dashes never go back the same way...

Photos can be clicked on for a detail view. Regrettably I had my camera phone which leaves a bit to be desired for dark photo quality. I have omitted the process for getting the heater core out. It's very straight forward and documented clearly in Bentley. If you don't have a Bentley manual, you most likely should not be doing DIY on your Porsche!

This whole procedure was 4 hours and this included inventing my solution. I think I could do it in 3 hours next time. It included:

- Removing cowl to access heater core access area.
- Removing windshield wipers, wiper arms and motor assembly.
- Removing braces and brackets blocking heater core.
- Removing heater core hoses and pulling unit straight up.
- Taking servo arm off and removing bottom plug.
- Dremel crown of door axis off for access to top plug
- Removing door/flap and all left over foam
- Sealing holes in door
- Reinstall was opposite of removal.

This is easily the best design I have ever seen for pulling a heater core. Hat's off to Porsche for using common sense for an item that will eventually fail and need replaced. The blower fan looks easy too!

You can see the servo (motor) for the air temperature mix flap from up under the footwell. Just remove the foam kick bulkhead, I believe there were two plastic trim screws. The servo is almost in the center with a pink arm on it. Take your pliers and simply squeeze together the connector from the motor to the flap housing and pull off. Then you can take a 7mm wrench and take the nut off that attaches the mix arm to the bottom of the air mix flap. Once the arm is off you can pull out what I'll call a "plug" that attaches to the flap. This is the arm and bottom plug that connects to the flap/door at the bottom.



Now this photo is looking down into the heater core hole. What you can see with the silver vertical silver piece is the galvanized flap/door assembly. This photo shows the modified door back in so you cannot see the large holes in the door at this time. More on that later. Since the bottom "plug" has been removed I stuck my hand down in and grabbed the door. It was NOT going to come out and I risked the chance of doing damage that would most likely require the dash and air box to come out. Since I knew how the bottom plug was attached it made sense the top was similar in how it attached to the flap. The problem is there was no hole to access the top plug. Therefore I would have to dremel off the top of the assembly.



Here you can see the top of the axis for the door/flap. I have dremeled off the very crown of the assembly. I didn't have a perfect shot so I used a grinding tool on my dremel to do the surgery making sure not to do in too deep. Damaging the plug inside would most likely create friction and noise in the future when the door moved between hot and cold.



I then pulled up on the door slightly (it shifted up down about 3-5mm on its axis) and this exposed the plug at the top of the door/flap. It simply pulled out. This then allowed the door to come out freely from the heat core access. See the swiss cheese door? How the hell is this going to keep air from mixing?



The first photo to the right shows the "plug" that sits on top of the door/flap. This allows it to rotate on it's axis as well as keep it in place. After dremeling off the top of it's housing the plug pulled up easily releasing itself from the door. The 2nd photo is obviously the galvanized steel door sans foam and useless for air blocking. The larger side is on the AC evaporate side while the single row of holes is on the drivers side and controls the blockage of the heater core.



I was 30 minutes from home at work doing this after hours. I had to have this back together to drive home so I was really wondering how to solve this issue. I initially decided to wrap the entire door in electrical tape. It was the only tape solution around our shop that I trusted to take the temp and stay there for a few years to come. upon reassembly and doing air tests I noted that the door isn't perfect fit in the housing. It allowed for air to blow by around the edges. Maybe the ONLY use I see for the door to be covered in foam, to help seal the edges and minor flow. Therefore I went on a goose chase around our shop for foam to try to "do the right thing"...



Decided on foam again for the solution. I took home quality door/window foam adhesive air block. This is the grey stuff you buy to keep the air leaks around you doors in the winter under control. this stuff was approx. 1 inch wide. I wrapped it around the door overlapping oh so slightly to help wedge and make the door/flap tight when closed in the housing. Since it didn't really stick to the electrical tape very well I decided to wrap the foam with more electrical tape. This served two purposes. Not only to keep it attached to the door but in the case it dry rotted like the old foam it would not come off and shoot out my vents. The door was placed back into the housing and fit like a glove...no air leaks from hot to cold side nor cold to hot.



Reinstalling was a simple reversal of process. The only item need now was to seal the hole created at the top of the door axis. I simply took more electrical tape and sealed this shut. Possibly in the long run this tape will lose it's adhesive qualities and air may come from this hole into the dash but I'm not to worried. Pulling the heater

core will only take an hour the next time around.

EDIT (11.29.09):

The following photos came from Emmett Peter who was lucky enough to have this problem and appeared to have a positive experience from correcting the flap failure. He took up the task of getting us some better photos of the procedure since my camera at the time was piss poor.

I didn't know where to substitute the photos in my write up so I am just going to include them below with some basic comments.



Looks like his foam was actually in better shape than mine! Haha! He called it a swiss cheese air flap...

Emmett also had more patience (and better tape selection) on rebuilding a better flap trap...

Here is the "scary" whacking the top off the bushing carrier of the flap. I didn't have such a good angle with my dremmel and did more of a "grinding". Emmett stated that he cut down a bit to far and nicked the bushing. I suggest you start at the very top and only take about 2mm off and then grind anything that doesn't leave a large enough hole to pull out the bushing to release the flap.

This is the entry point to the trouble spot...





The good stuff...someone should call Porsche and tell them about 3M and their wonderful products...



Here is the bushing coming out of the dremmeled hole created in the top of the bushing housing.



This is under the center console and can be reached very easily. You have to get the screw/nut off of the arm so the fl ap's bottom bushing can be released inside.



Emmett's nifty little solution to creating a new "top" to the shaft so the bushing doesn't ever come out. I just covered the hole with tape! Good job on "doing the right thing".

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