Heater Core Replacement (also Cabin Filter Replacement)– Late E36

Steps required to remove and replace the heater core from a ’97 BMW 318i sedan, with automatic transmission, basic multi-display and standard radio. Other E36 models will hopefully be very similar, though the earlier rotary-knob heater/AC controller will be substantially different in that area.

To replace the cabin air filter located behind the heater box, skip directly to “Remove Glove Box”, then “Cabin Filter.”

Symptoms of a heater core leak (as far as I know.)
In my case, when you turned on the heater on a cool morning, the windshield would fog up, especially the drivers side. Running the defogger really didn’t help very much. Even if it did not fog up, you could smell the semi-sweet smell of anti-freeze. I never lost very much antifreeze – only added about a gallon of de-ionized water over a period of one year, so obviously the leak was very small. The sign of a major failure I would think would be antifreeze draining out the bottom of the heater, which would cause a puddle under the transmission.

Note: Taking this car apart is like solving one mechanical puzzle after another! It has been suggested that at the factory they hold up the heater core and build the car around it. Almost every step required research from Berkley, the forums, or just plain trying to figure it out. Hardware mostly snaps together, even the ones held together with screws. Easy to put together at the factory, but difficult to take apart when you don’t know the secrets. Hopefully this will help you find the secrets and not break anything (like I have.) I wrote 20 pages of notes and took 68 pictures to describe this. I hope I never have to do it again. Expect to take a LOT of time to do this. I spent a week on and off working on it, but the total time was in excess of 20 hours. With this information, I hope you can cut that in half.

Follow the steps in the order given, for in a lot of cases, one step will require completion of a previous step.

Remove Center Console

Disconnect ground side of battery.

Block the car so it will not roll with the tranny in N and the emergency brake off.

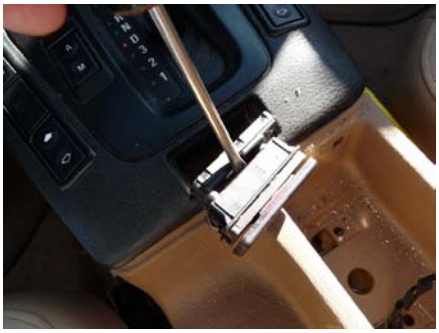
Remove shift knob. Mine was the leather shift knob with no set screw or clip ring. Check to see if you have either. My method is to put the key in the ignition, move shift to D and just pull HARD straight up off the shaft.

Remove the rear ashtray in the center console (two plastic screws, with inserts.) Remove the screw found beneath the ashtray.
To avoid problems, may I suggest putting hardware in little bags and leaving them with the components removed?

Remove Multi-Information Display in the center console. Push up through the hole in the bottom of the storage tray and pull out. It doesn't seem to come out easy, but eventually the display will come out. I'm still not sure how I got it out, just wiggled it around. It snaps on each side.

Remove the tray, unplug the connectors. Disconnect the Multi-display. Press detent lock down (thumb) and move lever over the detent to release the connector.

Carefully ply up the Hazard Warning Switch behind the shift lever using a small screwdriver.



Carefully pry the connector off of the back of the switch.

Remove the screw beneath the hazard switch. Leave the boot around emergency brake handle but unclip it from console. Pull the rear portion of the center console back to remove. Snake the emergency brake boot through the hole and remove the console.

In the front half of the console, remove two screws at the top front of the console (they are vertical, below the Heater/AC controller.

Remove the nut at the rear of the front console.

Reach under the black center of the console and pop up the switch groups. Grip the body of the connector and wiggle to unplug switches,

- except the middle bottom on left – that one you have to push the yellow switch out of the way, then slide the latch of the center switch towards the yellow switch to release the connector.

Lift (unsnap) the center shift console (with the "PRN321") and disconnect the Auto/Manual switch, then the small connector to the shift LEDs (Caution: the little circuilt board breaks off easy and the connector is hard to unplug.)

Insert the key into the ignition, turn to the first detent, set the shift lever to the back ("1") to make room and remove the front half of the shift console (Black and tan portions combined) as one unit.

Remove Glove Box

Remove 8 screws – two at the top inside the vents above the glove box, two just under the lip of the glove box door (covered by small covers – pry up with small screw driver), two above the hinge, and two underneath. The last two have larger washers, so keep separate.

Remove the vent panel above the glove box door.

Remove the light inside glove box – pry behind the lens at the rear of the glove box to pop it downward. It and the built-in switch will fall downwards. Carefully unplug the connector (use a small screw driver to help release the little tab in the middle.)

Remove the bolt (10mm socket needed) behind the light (if present.)

Unclip the flashlight holder with a small screw driver on both sides.

The whole glove box should be free to remove.

Remove Drivers Panel below the Steering Wheel

Remove three screws – two black ones left and right at the top, one silver colored at the lower right that hold the panel below the steering wheel. The whole panel pulls out, working portions from under the pedals and left front console panel.

Unclip light

Squeeze the sides of each On Board Diagnostics connector and unplug.

Remove the big padded bolster under the steering wheel (10 mm socket.)

Remove plastic heater duct above drivers pedals – held by two plastic pins, one on bottom near heater – pry this one out, or just wiggle the whole thing and the duct will come out.

Heater Core

Remove the temperature sensors from the heater box – grip the edges of the connectors and unlatch the connectors from the two sensors.

Pull out the two temp sensors (they snap into place) – caution, they are about 4" long.

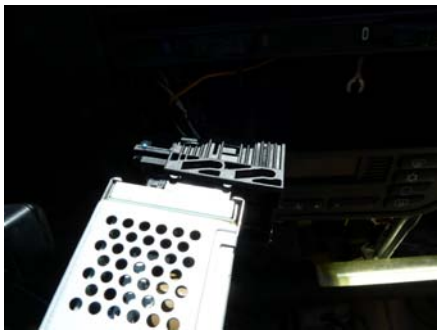
The cover over the heater core is held by seven screws. The bottom ones are easy – see picture at right.

Three of them are almost impossible to reach, so here is how I did it. The top two are behind the heater/AC controller. Reach in behind and push it out. Press the release and unlatch the large blue connector. Pull straight out on the small black connector.

Reach in and remove the two upper screws of the heater core cover.

The last screw is behind the flat steel brace running sideways around to the glove box. I drilled a pilot hole then a larger hole to be able to reach in and remove the screw. Use something behind the brace so the drill won't drill a hole in the cover – believe me, the drill WILL hurt the cover. (I used a putty knife.) I also used a paper towel below to catch debris. Drill the hole a little higher than I did – just below the plastic panel. If you don't have a T-25 torx bit long enough, use a long 7/64 allen wrench.

Pry the clip off the heater controller harness on the front of the heater core cover. I used a small screw driver on the side to release the two sharp teeth that grip the cover.



I also removed the radio, which allows for some flexing of the plastic to help removal of the heater cover. The radio is removed by opening the two little doors on each side of the face, and using the special 5-sided allen type wrench – or you may be able to use a normal allen wrench if you are careful. You also might consider grinding down a nail or something to make a 5-sided wrench. The big connector on the back of the radio is a little challenging. There are four pins (2 each side) visible through the connector latch slots. Pry the connector latch up with a large screw driver where shown on the connector. When the latch is fully extended (see picture) the connector will just fall off the radio.

It is very difficult to work the cover out from under the dash. I found a molded cable bracket not being used, and in the way. I cut it off with a large pair of wire cutters.

If you pull back one side of the heater core cover you will see there is a vent flap inside the cover that is in the way. To make it retract, temporarily hook up the battery, insert the key and turn the ignition on until this flap retracts out of the way (straight up and down.) Move any wiring harnesses out of the way and carefully move the cover to the left and out under the steering column. It is not easy, tabs and pieces of it will hang up on everything, so take your time. It may require a little flexing of the cover also.

Unsnap both ends of the actuating arm (about 4" long, on the right side of the heater core) that operates the flap in front of the heater core. I used a screw driver to force the arm out of the two holes that the tabs go through.

To remove the shaft that holds the flaps, pry the left side of the heater core housing to the left enough for the shaft bearing to come out of the housing. Pull the shaft away from the core and slide it to the left, taking the left flap and the shaft out, but leaving the right flap in place.

Drain the antifreeze. I was successful in just loosening the bleed screw next to the radiator cap and siphoning the antifreeze back into an empty gallon bottle. This seemed to have taken enough water out of the system.

Unbolt the heater pipes from the heater core. This is not an easy job either (getting used to this now?) On the left side of the core are three aluminum pipes going to the core, held by three bolts through a plate. The bolts go into some metal inserts in the plastic core header. Only two of these bolts are visible. I used an 8mm ¼" drive socket; ¼" flex joint swivel and various extensions and handles to get them out. Remove the hidden one first, then put rags under the area to catch any antifreeze and remove the two remaining bolts.

Carefully pull the three pipes away from the heater core. I used a screw driver to lift a portion of the housing next to the pipes to get a peak in to determine if they are back enough.

Remove Heater Core (yea, right – easier said than done.) Wiggle the core toward you and up. I used a screw driver to hook over a ridge on the upper left, as well as a screw drive going into the core where the closest pipe is connected. Be very careful with the actuator arm from the flap drive motor at the upper right corner of the core – it is a force fit to get the core past this arm. Lift the core toward you and up until it is clear of the housing.

Slide the core to the left, holding rags to the inlet tubes – antifreeze WILL spill out as you tilt it down to get it out.

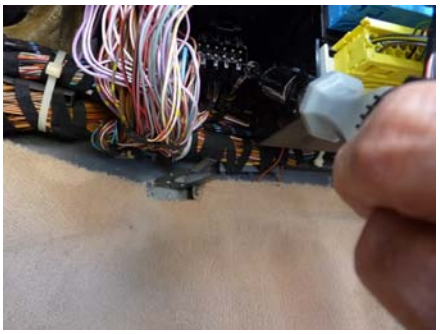
Replacing the Cabin Filter

While you have the glove box out, you might as well replace the cabin air filter. I found mine really packed with dirt and bits of leaves (probably had never been changed in 120,000 miles……)

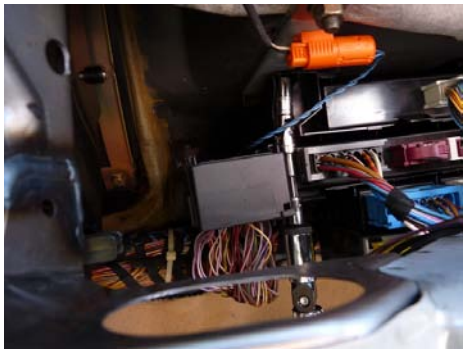
If the panel under the glove box hasn't been removed, remove it. You will need to unclip the light from the top side then pull it back through the hole.

Pull out the air vent plumbing. It is a piece of plastic with two arms. Push down on it in the large round hole in the horizontal sheet metal brace to the right of the heater.

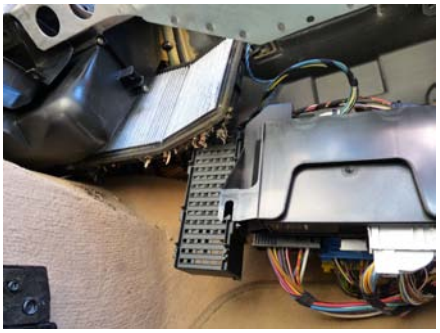
Reach in behind the heater housing and find the knob of the cabin air filter cover – it is barely visible. Turn it counter-clock-wise about 90 degrees and remove the cover. It may not unlatch or come out easily, be careful not to pull too hard as it will break the latch (ask me how I know, though it seems to still work properly.)



Unbolt the computer bench behind the glove box to allow room to remove the filter. This is done with an 8mm socket and long extensions. Remove one screw in the back (see picture left) and two screws in front which hold the tray to the top frame. Let computer the tray hang down on its wires.



I might suggest taking a mirror and visually seeing where the filter is located when it is seated, as it will be hard to tell if the new one is properly seated without some visual aid.



The picture is taken looking somewhat up at the heater on the left and the computers on the right. The filter comes out in two pieces with a hinge in the middle. Reach in and wiggle out the filter by its tab (yuck!)

Reinstalling the Heater Core

Very carefully remove the three O-rings from the aluminum pipes. Caution: use ridged plastic or some other non-hard tool to remove the O-rings, otherwise you may scratch the soft aluminum and you WILL have another heater core leak!

Apply supplied foam tape to new core, using the old one as a pattern.

Replace O-rings onto aluminum tubes. (I added a little not-hardening gasket maker to each O-ring before installing, just to be sure.)

Carefully work the core back into place, being careful of the flap actuator arm (upper right corner) and the foam insulation.

Work each aluminum tube back into place in the heater core so each O-ring is seated and the plate can be positioned. This is not easy to do, but work at it. When the plate is close, insert all three screws and then carefully tighten. Bentley says 27 in/lbs, or about 2 ft/lbs (remember, that is 2 pounds of force on a 12” (1 foot) wrench handle.) I tightened more than that.

To test for leaks

Put antifreeze back into the car (fill to the top of radiator tank with the bleed screw open.) When no more air comes out of the bleed screw, close it. (On M3 models, the bleed screw is on thermostat housing.)

Hook up the two cables to the Heater/AC controller.

I also plugged in the window control switches temporarily.

Temporarily hook up the battery.

Start the engine, turn on the heater and set it for high temperature. Check for leaks (you can actually see antifreeze flowing in the core – there will be a big air bubble in the top tank.)

Check the bleed screw for air and add antifreeze/water if the tank is too low. Rev the engine to help push air out of the heater pipes.

Check antifreeze level again, put on the radiator cap, temporarily install the shift knob and go for a drive until the temperature is up to normal and pressure has built up in the cooling system. This is the critical test for leaks. Let the car sit until it cools off to make sure there are no seeps in the system.

Reinstall the flap and shaft that goes in front of the heater core. Pry the left side of the heater box to install shaft, then install the actuating flap link to the actuator. Test by turning on the ignition to see if it closes properly.

With the flap closed, carefully work the heater core cover back onto the heater box.

The remainder of the reassembly is the reverse of the dismantling process. Take your time and it will all work out.

It is soooooo nice not to have foggy windshields and the smell of antifreeze in the car!