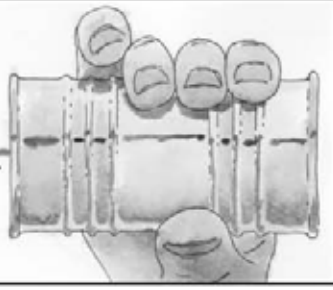
MEMBER 2 MEMBER



I think you will agree with me when I categorize Turbo Diesel owners as independent people who are not afraid to try something new. You are an ingenious membership who reinvents and improves a product to make it better serve your needs. You show a strong willingness to share your "Shadetree Solutions." With your input each quarter, we publish the "Member2Member" exchange to give you a forum to tell other members how you solved a problem.

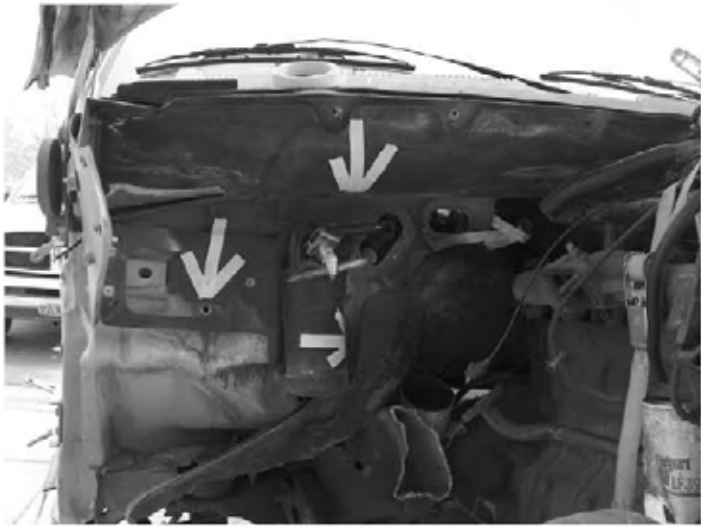
HEATER CORE REPLACEMENT
By Joe Donnelly

This job has to be one of the worst tasks I've ever encountered. My daughter has children's books like the Miserable Mill and the Hostile Hospital. In that vein, this task has to be The Horrible Miserable Heater Core. The misery starts with the factory service manual, which tells us to remove the entire dash and instrument panel, and then to remove the heating-ventilating-air conditioning (HVAC) system from the firewall. Various sharp edges await the unsuspecting technician who attempts the job. Discharging the air conditioning freon and draining the cooling system add to the difficulty. With the amount of wiring increasing exponentially year by year, a large number of confusing connectors have to be found and disconnected so the dashboard and instrument cluster can be removed. Anyone experienced at such tasks knows that nothing fits when it is time to reinstall the HVAC box and the dashboard. Wiring connectors and screws seem to mutate into alien parts that will not fit back together. Positioning the HVAC system and the dash so the screws and studs go back into place seems impossible.

There's Hope?

But wait! Maybe, just maybe, I can help you reduce the misery. In this article, I can recount a partial triumph. The heater core can actually be replaced without discharging the air conditioning freon and without disconnecting wiring harnesses. The job is not fun, and reaching around the partially removed dashboard is a hassle. It really helped me in developing the procedures to have a junked truck to disassemble first. The owner had gleefully chopped the wiring harnesses and had already removed the fenders and front suspension, so access under the hood was facilitated. Once the evil nuts were found, taking things apart became much easier. It is incredible how the factory hides the bolts and nuts so you have to conduct a search mission to do what is, in principle, a simple job.

First, let's cover the underhood steps. Drain the cooling system into a five-gallon bucket. Remove the drain cock and check the sealing o-ring. If it is torn, get a new one and grease with silicone grease. Remove the heater hoses from the heater core at the firewall. The heater core pipes are soft brass and will distort easily. The hoses will be tightly stuck on the pipes, and you will probably have to cut the hoses and peel them off the pipes. Remove the three screws holding the powertrain control module (PCM computer) to its bracket on the firewall. You don't need to disconnect the wiring harness, just move the PCM out of the way. Remove the two AC joint clips by popping them off the connections near the firewall. Remove the AC drier clamp from the bracket, and then remove the 11mm nut that holds the bracket to the PCM mounting plate and the firewall. This stud also mounts the HVAC box—it goes through the firewall and attaches to the HVAC box. There are three more 11mm nuts to remove: one near the valve cover, another near the top of the drier, and the last is accessible through a slot in the PCM mounting bracket toward the outside of the truck. These steps will allow the pipes to pull into the cab of the truck with the HVAC box just enough so the heater core pipes will clear the firewall on the inside of the cab.



View under the hood of a partially disassembled truck. The positions of the four HVAC box mounting nuts are shown by arrows.

Second, we will cover the removal procedures that take place inside the cab of the truck. Remove the kick panels that are integral with the door sills. This will allow you better access to the two 13mm bolts (one left side, one right side) at the bottom corners of the dash that mount it to the sides of the cab. Remove these two bolts. You should remove one screw that mounts the parking brake release for better access to the bolt. There is also a ground strap behind the right kick panel. Remove this screw. Remove the two Phillips screws holding the airbag module plastic cover to the module, and pop the cover off (it has a snap fastener at the top center). Remove the four 10mm bolts that mount the airbag control module to the transmission tunnel of the floor. Factory cuts in the carpet allow it to be folded out of the way for access to the bolts. The bolts have Loctite on them, so they are difficult to turn. The module can now slide out of the way so the HVAC box has more room to move away from the firewall. Remove the screws holding the knee blocker (the

panel under the steering column) and remove it. Some trucks, such as Club Cabs, may have a reinforcement plate that comes close to the steering column. Remove the screws that hold it so that it can move out of the way as the dash is moved when the steering column is dropped. Remove the two 10mm nuts holding the steering column to the dash bracket, allowing the column to drop. The steering wheel will rest on the seat.

Knee blocker is removed.

Air bag module and cover. The snap attachment of the cover and the four mounting bolts are shown.

Now you can remove the five 8mm sheet-metal screws with captured washers that hold the dash assembly to the cab just below the windshield. Now the dash will swing away from the firewall just enough so you can access the HVAC box from the right side of the truck. Remove two 10mm nuts, one on a vertical stud at the far right near the top of the box, and one on a horizontal stud coming out of the firewall, above the box and to the right of the heater core pipes. This second nut also secures a ground strap to the cab firewall stud. The other end of the strap is attached to the bracket holding the heater core pipes to the HVAC box. Remove the two Phillips-headed screws and the bracket and strap. Now remove another 10mm nut from the same firewall stud that the ground strap was attached to. Finally, the HVAC box can be pulled away from the firewall.

You may have to go back under the hood to be sure the AC pipes are feeding through the firewall without binding the pipes elsewhere under the hood. You will be able to pull the HVAC box away just enough to remove the single Phillips-head screw holding a second bracket to the pipes and HVAC box, right near the firewall. You can now slide the heater core upward, just clearing the firewall and cab under the windshield. You may need to cut the black plastic/foam insulating pad on the firewall inside the cab to pull the heater core pipes up. There is not much clearance for the pipes, because you did not disassemble the truck as far as the factory told you! I understand that some aftermarket replacement heater cores have flexible joints in the pipes to facilitate installation, but I was using a Mopar heater core with the rigid brass pipes that are soldered to the top tank of the core.

View of the HVAC box with the dashboard assembly removed. Two mounting nut positions are indicated by arrows.

Another view of the HVAC box with the dashboard assembly removed. Two mounting nut positions are indicated by arrows.

Extent of access to the HVAC box is shown here.

View behind the dash of the HVAC box. Two mounting nut positions are indicated by arrows.

The replacement process is basically the reverse of the above. Be sure the heater core pipes lie against the supports molded into the HVAC box without strain, or the solder holding the pipes to the heater core end tank will give up and they will leak later. You don't want to do this job again, do you? Reinstall the mounting brackets and ground strap. Note that the HVAC box may give you a struggle to get it back through the firewall. It can help to have another M6 x 1.0 threaded nut that has threads all the way through it, so you can secure one stud after you get it a little way through the firewall. The stock nuts have the threads recessed beyond the integral coned washer, so you need a lot of stud protrusion to use it. Once you finally have all four studs through the firewall, you can secure the HVAC box, making sure the tongue of the box is over the stud that holds the ground strap; and you can put a nut on the vertical stud inside the cab near the right door frame. Replace the three nuts that hold the HVAC box from behind the dash.

HVAC box removed from the truck. Heater core and attached pipes are approximately in the center.

The dashboard assembly is heavy and awkward. First replace the two 13mm bolts at the bottom corners, but do not tighten them. From the driver's side, hold the dash up with your knees while lifting the steering column. Loosely install the two 10mm nuts so the steering column will help support the dash assembly. The outer four screws holding the dash to the cab go into nylon inserts in the cab. The center one does not have an insert, but it has a steel strap (part of the dash assembly reinforcement bracketry) that the screw goes through. It is easier to position the dash for installation of this screw if the two right hand screws are not yet installed. This center position is difficult to get into place. You might find it easier if you carefully grind a point on the end of that screw (they come from the factory with blunt ends). Once the dashboard and instrument cluster assembly are in place, go back and tighten the fasteners that you left loose. Then put the truck back together. Amazingly, I have disconnected only two wires in the process; one ground wire behind the right kick panel, and one ground strap for the heater core to cab. There was enough flex everywhere else, albeit only just enough. We drained coolant, but that was an obvious thing to do when replacing the heater core. I did not have to discharge the air conditioning freon. If you are lucky and/or skillful, you did not get cut on sharp edges, or suffer too much while wrestling the HVAC box and the dash back into position. I suggest that you study the

photographs closely, because the job is daunting if you don't know where the mounting attachments are hidden. This job will never get on my list of "Favorite Things To Do on a Saturday." Below is a list of sizes of sockets, etc., you will need for various positions.

Joe Donnelly
TDR Writer

Editor's notes: I think Joe's conclusion, "This job will never get on my list of 'Favorite Things To Do on a Saturday'" sums it up. As the Second Generation trucks continue to age, owners will want to remember this article. Finally, you've read this far into the article and, unless you've had or have the misfortune of a leaking heater core, you're reading the information because you enjoy Joe's no-nonsense writing style. Thanks Joe! I'm prepared for a potential problem.

I think Joe's conclusion, "This job will never get on my list of 'Favorite Things To Do on a Saturday'" sums it up.

Position	Purpose	Number	Size (mm)
Firewall, under hood	PCM computer mounting	3	8
	AC drier mount	1	8
	AC drier bracket/HVAC stud and nut	1	11
	HVAC studs and nuts	3 more	11
Airbag module	Attach plastic cover to module	2	#2 Phillips
Floor tunnel near shifter (if manual transmission)	Airbag module mounting to floor	4	10
Door sills		4 left, 4 right	#2 Phillips
Under steering column	Knee blocker attachment	2-5 depending on year	#2 Phillips
Kick panels	Integral with above	1 left, 1 right	#2 Phillips
Under steering column	Dash reinforcement for club cab Rams	6	#2 Phillips
	Steering column mounting nuts	2	10
Top of dash	Mounts dash to truck body under windshield	5	10
Bottom corners of dash	Mounts dash to truck body at sides	2	13
Bottom corner of dash, left side	Mount screw for parking brake release	1	#2 Phillips
Top center of HVAC behind dash	Mounts ground strap	1	10
Top center of HVAC, under above nut	Mounts HVAC to firewall	1	10
Top right of HVAC, behind dash	Mounts HVAC to firewall	1	10
Top center of HVAC	Mounts heater core pipes and ground strap to HVAC box	2	#2 Phillips
	Mounts heater core pipes to HVAC box near firewall	1	#2 Phillips