

Volvo Blower Motor Replacement

Under-dash work has always required some special skills. In addition to the occasional need to be a contortionist in tight and awkward places, the under-dash repairman has to be able to remember which screws went where, and the correct reassembly sequence for hoses, wires, and plastic ducts. He also needs a lot of patience.

He needs to be careful and conscientious when handling a fragile assortment of plastic switches, vents, and ducts. He doesn't need to turn the snap-in-place fit into the snap-and-break rattle.

This month, to illustrate the importance of these under-dash skills, we're traveling to the heart of deepest dashboard in search of the elusive Volvo blower motor. Hardly an endangered species, it is a recluse, however, and may never before have been filmed in the wild. Before beginning our safari, we feel that certain warnings are in order to assure your safe return. So grab your screwdrivers, flashlight, and canteen, and follow along.

Also understand that the procedure shown is an alternative to the factory approved method. It is offered as a time-saving procedure. The shop that guided us through the dashboard jungle has done this repair on a regular basis with success.

But It Worked Before I Got Here

Just to cover yourself, start the job by making sure what does and doesn't work in the dash *before* disassembly. Check all dash illumination lights, the radio, vents, and all switches for proper operation. In-

form the customer up front about anything that isn't working before the dash is disassembled—or you may be blamed for anything not working afterward.

Disconnect the battery. You'll be moving a lot of wires around—disconnected wires. At certain stages of reassembly, you'll want to reconnect the battery for a moment to check for proper, noise-free blower operation. Do so only after making sure you won't be doing any unwanted arc welding. Then disconnect the battery again during final reassembly.

If you're replacing the factory installed motor, you'll have to change a few things, since the replacement motor is quite different from the original.

- The replacement motor uses an external resistor to control fan speeds. You'll have to include the price of the resistor and replacement fan control switch in your estimate.

- When replacing the original equipment motor, you'll have to do some tool and die work to the plastic motor housing to make the new motor fit properly. You'll need a small air grinder and an L-head grinder or attachment to do the modifications. A carbide burr grinding tip is a real time-saver.

Three cautions here:

- 1) **Wear eye protection.** Those plastic shavings will look like snow, but they'll be plenty hot.

- 2) **Be careful where you poke that grinder.** The heater core is very close to the plastic housing. If you slip with the grinder, you could turn a time-saving procedure into the Manhattan Project.

- 3) **You'll have plastic shavings all over the place by the time you're done grinding.** Run the newly in-

stalled fan to clear away any stray shavings in the blower housing before returning the car to its owner. A blizzard of white plastic shavings won't endear you to the customer. We also spent a few minutes with some regulated air pressure and a shop vacuum cleaner to make sure things were really clean.

- The white plastic housing used on this model is rigid. It takes a little wiggling and twisting to get the side covers clear, but it can be done without damaging anything. This particular car had had surgery on the blower before, apparently by some mad scientist with a claw hammer.

- If the car is equipped with air conditioning, the original fan switch provided power to the air conditioning relay in the console. The replacement fan switch won't have a connector like the OE switch did. You'll have to provide power for the relay. Technicians at our host shop routinely run a power wire back to

a fused output terminal at the main fuse box to handle this problem.

- We've tried to highlight some key points involved with disassembly, but there are quite a few screws and fasteners to keep track of, so pay close attention to where things go.

Finally, we've shown both an OE replacement motor and an aftermarket alternative. We suggest you look into the alternatives available and make your own decision on the replacement motor that best suits your needs and the needs of your customer.

Service and Value Expeditors (SAVE)

Circle No. 201

Volvo Cars of North America

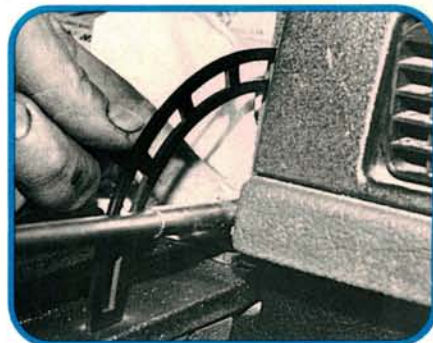
Circle No. 202

—By Ralph Birnbaum



1

Once you've made sure everything works in the dash (lights, radio, and so on), disconnect the battery negative terminal before disassembling the dash. You don't want to add a wiring harness to the parts list! This particular car needed to have battery posts and terminals cleaned anyhow at 116,000 miles.



2

Remove the screws bordering the glove box insert. The glove box has to be removed so you can disconnect the right side defroster ducts from their support brackets beneath the dash and from the blower housing. Remove both the left and right under-dash panels, held by plastic fastener clips.



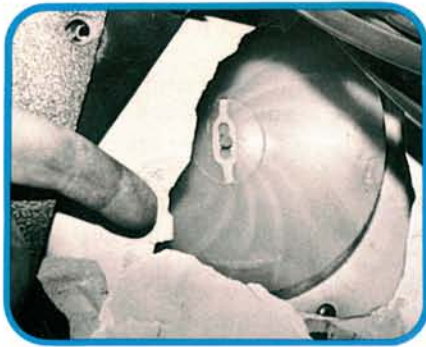
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With the glove box removed, we can see the support brackets for the defroster ducts. Remove this retaining clip at the vacuum pod and the vacuum line. Then push the rubber mounting tabs through the metal bracket to free the duct. Let the vacuum pod hang from the duct, but don't remove it.



4

Remove the side panels from the console. When you remove the screws holding the console trim face from the console support brackets, don't forget the two screws hiding just below the radio. If you forget them, you may crack the plastic. We've also removed the face plate holding the radio in the console.



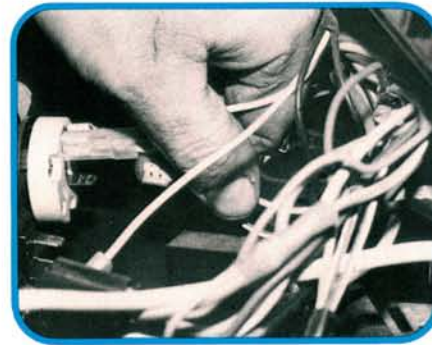
With the right side console panel removed, we saw that Ivan the Terrible had been the last one beneath the dash. This mangled plastic cover was pieced together with duct tape after being attacked by either a claw hammer or a chainsaw. This is a good example of how NOT to do under-dash repairs.



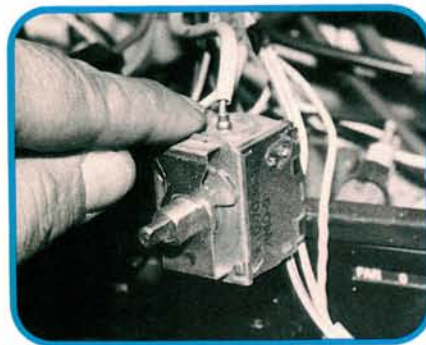
There's a vacuum tank just below the blower housing. Disconnect the large rubber vacuum hose indicated by our arrow. We'll have to remove the tank in a few steps. It will come out the left side, but you might as well disconnect this hose while you're here.



If the car has air conditioning, it will probably be easier to remove the air conditioning control switch from the face panel. That way you can let the switch hang free without disturbing the temperature sensing capillary tube. Just pop the square trim piece and remove the nut beneath it.



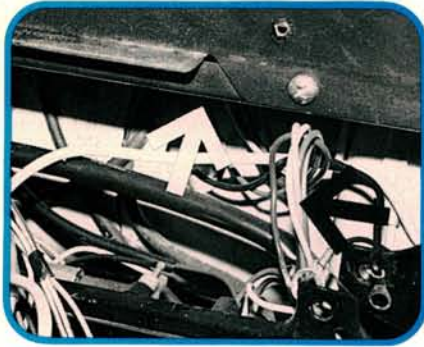
Pull the console center trim forward and begin unplugging connector blocks and illumination bulbs. Be careful with the bulb connectors. Don't just start yanking on the wires. If you're careful, you can remove the wires, holders, and bulbs as an assembly. Unbolt the air conditioning switch.



With the console trim removed, we see the air conditioning switch hanging from its wires and the capillary tube. Don't get physical and break or kink that tube. If you wondered why we disconnected the battery before, you should be starting to get the idea now.



Remove these screws. Pull the center vent section forward far enough so you can unplug the clock and remove the dash illumination lights. Remove the short plastic bellows connecting the blower housing outlets to the vents and lay them aside.



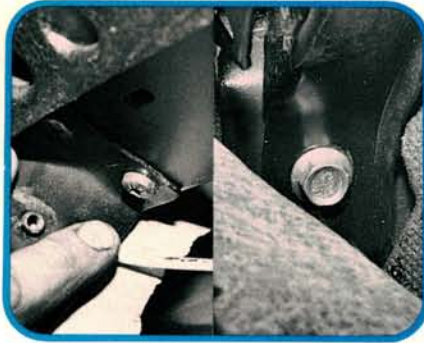
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Follow this bundle of wires from the fan control switch. It runs to the motor through a hole with a rubber grommet in the top center of the blower housing. Since we're replacing the switch as well as the motor, remove the main power feed from the connector. Cut the remaining wires. Remove the old switch.



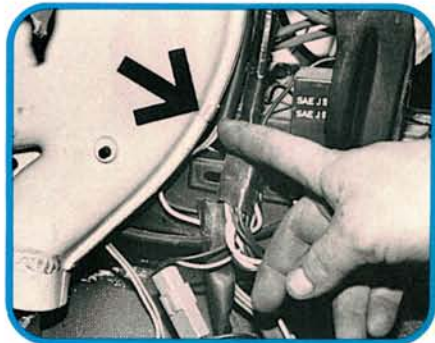
12

This wire connected the original fan switch to the air conditioning relay (arrow). The wiring on the new switch doesn't have this connector, so don't just pitch the old switch and harness and forget to provide an alternate power source for the relay. You'll need a fused, ignition "on" source.



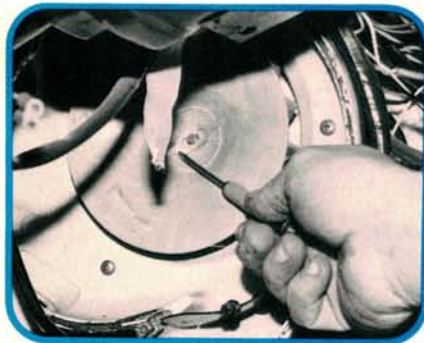
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Unfasten the upright console supports. This will give you enough room to remove the left and right fan covers from the main body of the blower housing. The photo at the left shows the screws holding one support to the dash. The photo at right shows the bolt that holds the support to the tunnel.



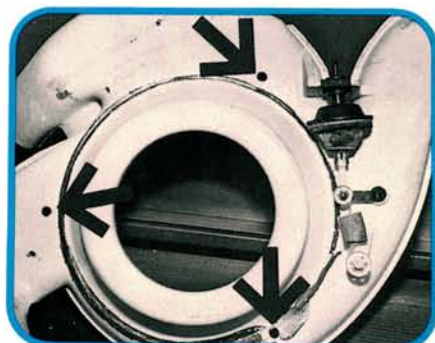
14

Disconnect all the ducts from the blower housing. Then pop off these clips that hold the fan covers to the main housing. The clips at the top front can be tough, but be patient and don't force things. Remove the covers from both sides. They may take a little coaxing, but will come off in one piece.



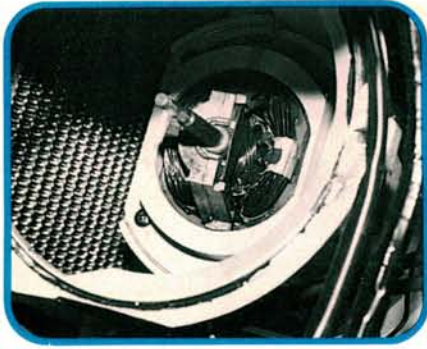
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We've removed the left side cover. You can see the left side fan and the clip that holds it to the motor. Remove the clip and pull the fan, squarely and evenly. Repeat this process for the other side. If either clip seems damaged, throw it away now and get a new one. Bad clips mean loose fans and noise.



16

Remove the three screws holding the inner fan housing to the left side of the main blower housing. There's a vacuum pod on the backside of the inner housing. Disconnect the vacuum line as you pull the housing away. Don't forget to reinstall it on the pod during reassembly.



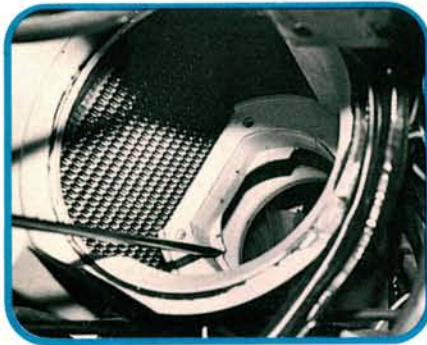
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Finally! There's the old motor. Only three screws remain in a plastic retaining collar that holds the motor in place. Remove the screws and the collar. Keep the screws. Pitch the collar. You won't use it with the new motor. Pull the switch wires through the grommet and remove the motor.



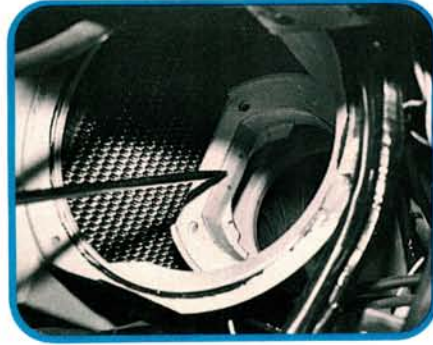
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If we stop here and compare the old motor at the left with a replacement motor, we see quite a difference. The new motor at the right has a mounting flange on the motor housing with three holes in it. The screws we removed in the previous step will hold the new motor in the main housing.



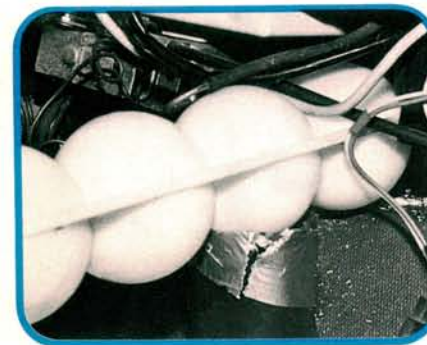
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Before we can install the new motor, we'll have to modify the housing with a grinder. We've highlighted the flange in the housing that has to be removed. The first time you do this, you may want to alternately grind and then try fitting the motor until you know just how much material to remove.



20

Depending on the replacement motor you install, you may also have to remove this locating boss, or the new motor may not sit squarely in the housing. See how close the heater core is? Don't slip with the grinder. You may want to put a piece of cardboard over the coils while you grind for safety's sake.



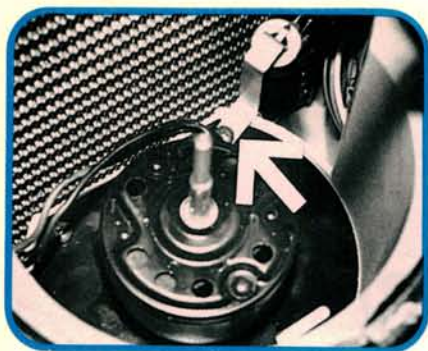
21

Even after you've modified the housing so the motor will fit properly, you'll have to make a hole in the base of the housing for the wires on the motor. Remember disconnecting the vacuum hose to the reservoir tank? Remove the small vacuum hose on the left side of the tank. Remove the tank.



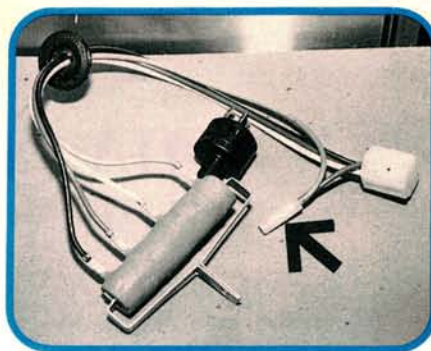
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Now we need that L-head grinder. With the vacuum tank removed, grind a hole big enough to accommodate the grommet on the OE motor, or the two wires on the aftermarket motor. If you use the aftermarket unit, insulate the wires so they don't chafe. Install the motor and replace the vacuum reservoir.



23

Use one of the three mounting screws for the motor to install the resistor as shown. Run the motor leads through the hole in the base of the housing made earlier with the grinder. The wiring from the resistor block goes through the hole at the top of the housing back to the switch.



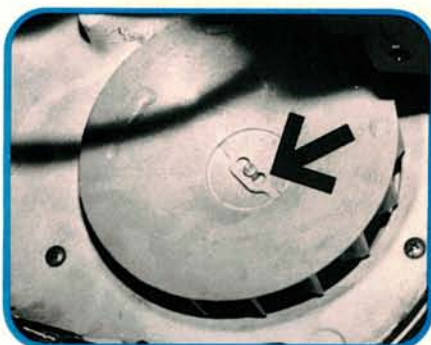
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Here's a little clearer shot of the resistor and wiring. The small bullet connector (arrow) near the plastic multiple connector for the switch connects to the hot side of the motor. Make sure you find a good, clean connection for the ground wire from the motor. Remember, you'll need the new fan switch shown.



25

The plastic molded connector may not want to fit back through the hole in the top of the housing. Either grind away a little plastic or remove the wires, feed them through the hole, and reinstall them in the block. Insert the fused power lead in the block as shown. Make sure it locks in place.



26

Reinstall the vacuum reservoir, left inner fan housing, and the fan. Reconnect that vacuum hose on the pod. Reinstall the right fan. Connect the motor to the switch. Making sure no bare wires touch metal, reconnect the battery. Run the fans and make sure nothing is rubbing.



27

Before you reinstall the left outer cover, make sure you properly position this capillary tube grommet in the reliefs cut in the two halves of the fan housing. If you don't get it properly positioned, it may interfere with the fan. Reinstall the snap clips on the housing covers, both left and right.



28

Reassemble all ductwork, switches, and brackets in reverse of disassembly. Be especially careful to replace these ground wires on the console brackets. Take the time to double check the operation of all lights and switches. Test drive the car and check for a rattle-free dash and quiet blower operation.