

2001 V70 T5 ETM Removal and Cleaning Directions

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Read this before you start

I performed this ETM cleaning because I had gotten 2 reduced performance messages at 50+ mph driving. I also felt faint hesitation at extended period of highway speed driving (over an hour). It felt similar to the driving on highway during windy days.

After the ETM cleaning, my car had more performance and ran really well. I was impressed. It was like having a new car again.

But then I got another reduced performance message and all my performance gains after the ETM cleaning was gone. I decided to reset the computer by disconnecting the ETM and the battery. The improved performance magically came back after.

I realized it is the computer reset from ETM cleaning that gave me the performance increase and not the removal of slight oily film in the throttle body. The butterfly in the throttle body is under a fair amount of spring tension. This tension is much higher than any resistance that the oily film might offer. In my case, I have reduced performance even with a clean throttle body. Of course, I still need to track down the cause of the reduce performance message.

So you might consider doing this before attempting to clean the ETM. My assessment is the oil film removal from throttle body + butterfly won't do anything.

Disconnecting the ETM

See picture 6. Maybe disconnecting the car battery is unnecessary but I haven't yet determined this.

IMPORTANT: If you really want to clean the throttle body or want the directions for ETM removal+replacement. Please continue. Keep in mind if you put in a new ETM, the car won't run because it needs to have the computer programmed at the dealer.

Acknowledgement

Big thanks to flippu10 on Volvospeed. His directions motivated me to not be overwhelmed by all those pipes and wires at first glance on this job.

General Comments

- Most steps of this job looks harder than it really is. Most items and connections you can see removes easily
- The turbo pipe feeding the ETM is the single hardest item to remove and reassemble. Reassembly was harder for me (took me 1.5 hour to figure out the best way). You work blindly under ETM by feel in this step. flippu10 on Volvospeed offered a good tip to grease the pipe fitting to make it a lot easier.
- Took me a total of about 4-5 hours. But I think I spent 3+ hours trying to figure out how to remove and reassemble the turbo pipe from the ETM.

Sequence of main components to be removed

- A1. Air pipe connecting the turbo to the intercooler (see picture 1)
- A2. Air intake to the air filter box (see picture 1)
- A3. electric fan assembly (see picture 2)
- A4. Turbo pipe from intercooler to ETM (see picture 3).
- A5. ETM (see picture 3)

Parts you will need

- B1. ETM to intake manifold gasket ~\$5 (picture 5)
- B2. Hose clamps with screw for tightening/loosing clamp for about 5/8" diameter hose
- B3. 3 tie wraps that can provide about 1 inch loop
- B4. Throttle body cleaner (valvoline synthetic carb+choke+throttle body cleaner worked well for me)
- B5. Old tooth brush to scrub the ETM deposits

Tools you will need

- C1. 1/4 drive + extension + 7mm and 10mm socket
- C2. Screw driver handle attachment to the above sockets (may not be necessary. See "Remove turbo pipe from intercooler to ETM")
- C3. T-25 Torx screw driver + T-25 Torx tip/bit (one screw is oriented with no room for screw driver)

Note

- The directions will indicate some locations with left and right. Left is driver side and right is passenger side in US models.

Disconnect the battery

- I saw a thick red wire that is probably positive below the ETM. Rather than to take a chance and touch ground, I just disconnected the negative terminal on the battery.
- Whenever I disconnect/reconnect the power on my car, sunroof and a few other electrical circuits don't work after. Just use your remote to lock and unlock the doors. This resets all the communications on those circuits properly.

Remove Air pipe connecting the turbo to intercooler (picture 1)

- Loosen clamps at 3 locations (picture 1, hose clamp H1, H2, H3). H2 and H3 are on the rubber pipe connecting the plastic pipe to the plastic piping to the intercooler.
- Take off the 2 T-25 Torx screws (picture 1, T1 and T2). The one near the dip stick don't have enough clearance for a Torx screw driver. So use the Torx tip/bit with a 1/4 drive.

Remove air intake to the air filter box (picture 1)

- 2 pieces of loosely connected plastic parts

Remove fan assembly (picture 2)

- Remove the T-25 Torx screw (T3) holding the bracket
- Disconnect the electrical connector (E1 and E2)
- Cut the 3 tie wraps (W1, W1 and W3)
- Remove 2 bolts (B1 and B2)
- Un-guide the radiator fluid hose on top of the fan
- Take the wiring harness out of the guides on the right side of the fan assembly.
- Move the wires aside, take out the dip stick to have more room and pull out the fan. Have to wiggle a little to get the tabs on the bottom of the fan assembly to clear radiator hoses on both sides of the radiator.

Remove turbo pipe from intercooler to ETM (picture 3, picture 4)

I really wished I took a picture of this pipe after removal so you can see it clearly. I simply forgot. If anyone performs this procedure, please take a picture and forward to me so I can include it. Thanks.

- Loosen the clamp on intercooler side (about half way down the lower left of the radiator)
- Take off the hose after removing hose clamp (H4). I squeezed the crimped part (edge wise along the length of the clamp) on top with a pair of plier and the clamp just popped open.
- Take off the 2 electrical connectors (E3 and E4)
- Here is one of the hard steps. Feel and find the screw on the clamp (at the end of the U turn on the turbo pipe) holding the turbo pipe to the ETM. Use the proper tool depending on orientation. Mine was located in the very back (toward the firewall) with the screw head facing left. I had to use a 7mm socket fitted to a screw driver handle + extension (to make about 10 inches total) to reach in under the intake manifold (picture 3)
- This pipe was really hard to pull off as you couldn't get much leverage on it. I finally put a screw driver over the U turn on the pipe and pushed down with one hand in front of the ETM and the other under the intake manifold. It came out right away.

Remove ETM

- Trace the ETM wire to connector and disconnect it.
- Take out 4 ~3 inch long 10mm bolts arranged rectangular pattern around the throttle body opening hold the ETM to the intake manifold. Need to feel for it and operate in blind. Remember, counter clock wise to loosen (Remember that the ratchet is upside down so it looks like clock wise if you look down from top of the engine compartment)
- Pop off the ETM. Use slight force to loosen the hold by the gasket

Clean the ETM

- Spray and clean the inside round walls of the throttle body + butterfly. Use the tooth brush to get off the more gummed up areas. I wouldn't get the rest of the ETM wet, there is electronics in there.
- Use a razor blade and scrap off the remaining sticky gasket material on the ETM. Clean this surface with throttle body cleaner.

Reinstalling the ETM

IMPORTANT: Before reinstalling the ETM, look at the instructions on the next step (**Installing the turbo pipe to ETM**) You will be doing that installation blind as you can't see the area you are working in. So take a good look and try to memorize what you will feel.

- Put the new gasket on (I put the raised ring on gasket facing ETM, but I heard it doesn't matter) and work the 2 front bolts into the intake manifold. Don't tighten with ratchet yet.
- Work the 2 back bolts into the intake manifold through the gasket bolt holes. Since you are blind, you'll have to trust the back bolts are going through the gasket bolt holes with the front bolts aligning everything properly. The 2 front bolt should hold everything in place if you hand tighten the bolt.
- Tight these 2 screws. I don't know the torque spec. The gasket has a bumped ring surface. I felt this surface compress as the screws got tight.
- Connect the ETM electrical connector

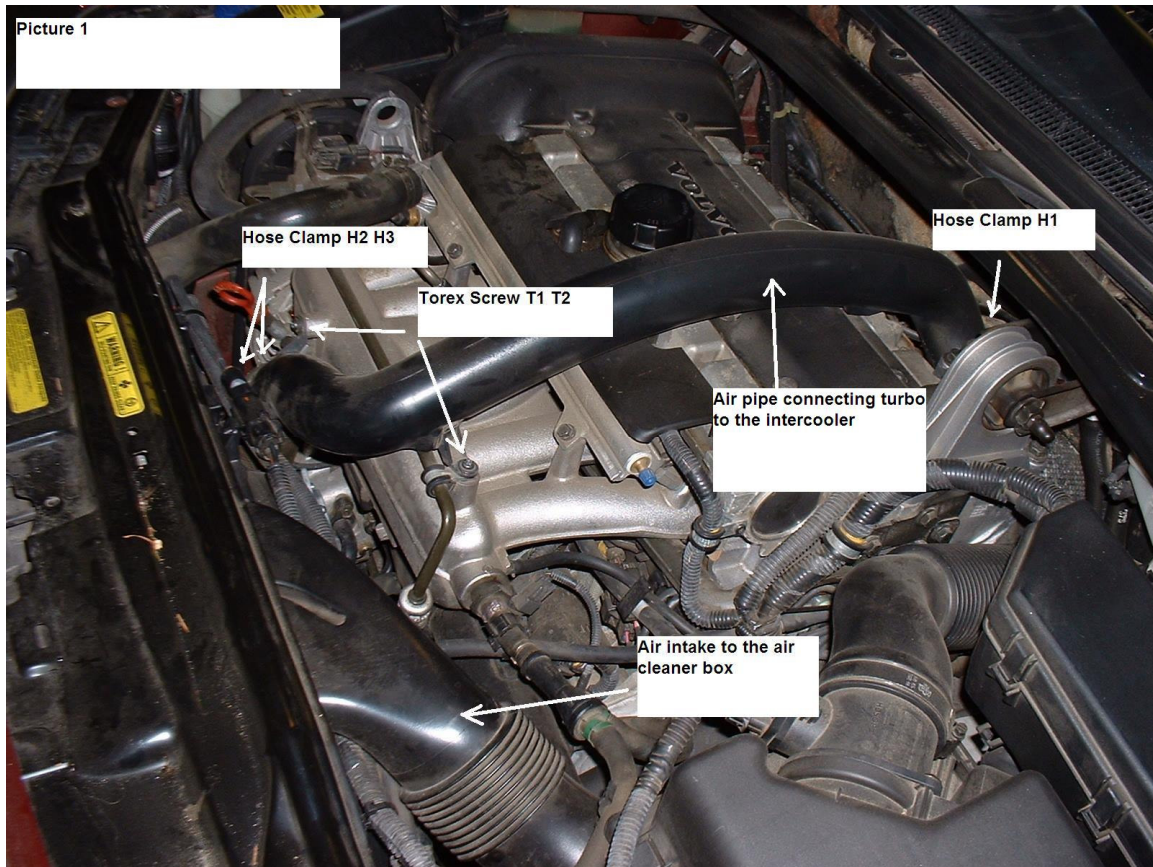
Installing the turbo pipe to ETM

- This was really hard and took me a long time. The pipe's opening to the throttle body barely fits so you need really good alignment and even force while working blindly upside down without good leverage.
- The trick I did was to loosen the clamp and drop it to the bottom of the U part of the hose. Now you can get a good feel whether the lip of the opening is evenly over the throttle body opening (without feeling the hose clamp). Then push up and get it in there. I had to wiggle and rotate a little while providing upward force.
- flippu10 on Volvospeed provided a tip that greasing the pipe fittings makes this a lot easier. He said greasing all of the pipe fittings helps during installation.
- Since you will be doing everything by feel, you should remember there were ribs on the outer circular walls of the throttle body for the turbo hose attachment. If you can feel these, then the hose isn't on correct or fully.
- After the hose is on, put back and tighten the hose clamp. I put the screw facing front of the car so I don't have to work behind the ETM and under the intake manifold next time.

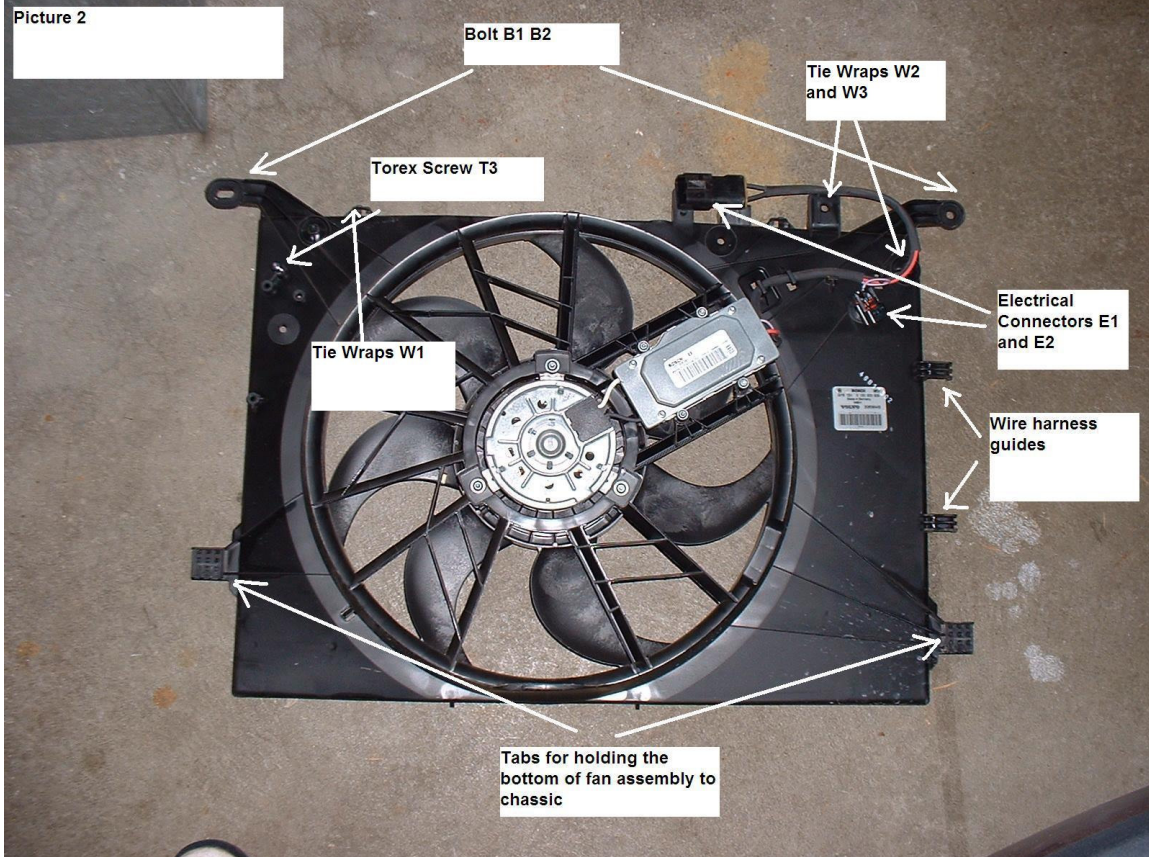
Everything after this is easy. Just reverse the disassembly process with the following additional notes

- When reinstalling the fan assembly. Make sure the tabs on the bottom of the assembly fit into the slots on 2 side of the radiator. This is what holds the bottom of the fan assembly. Also be careful working these tabs pass the hoses on both side on the top of the radiator.

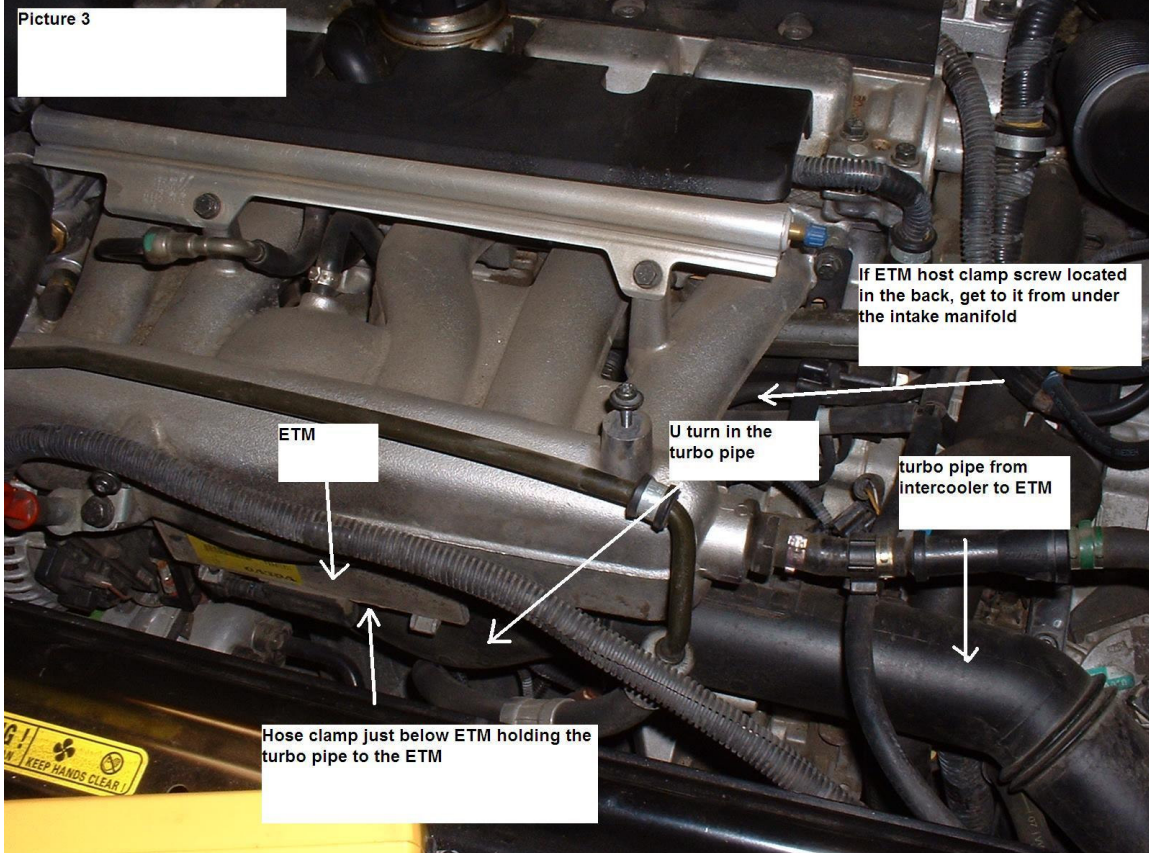
Pictures



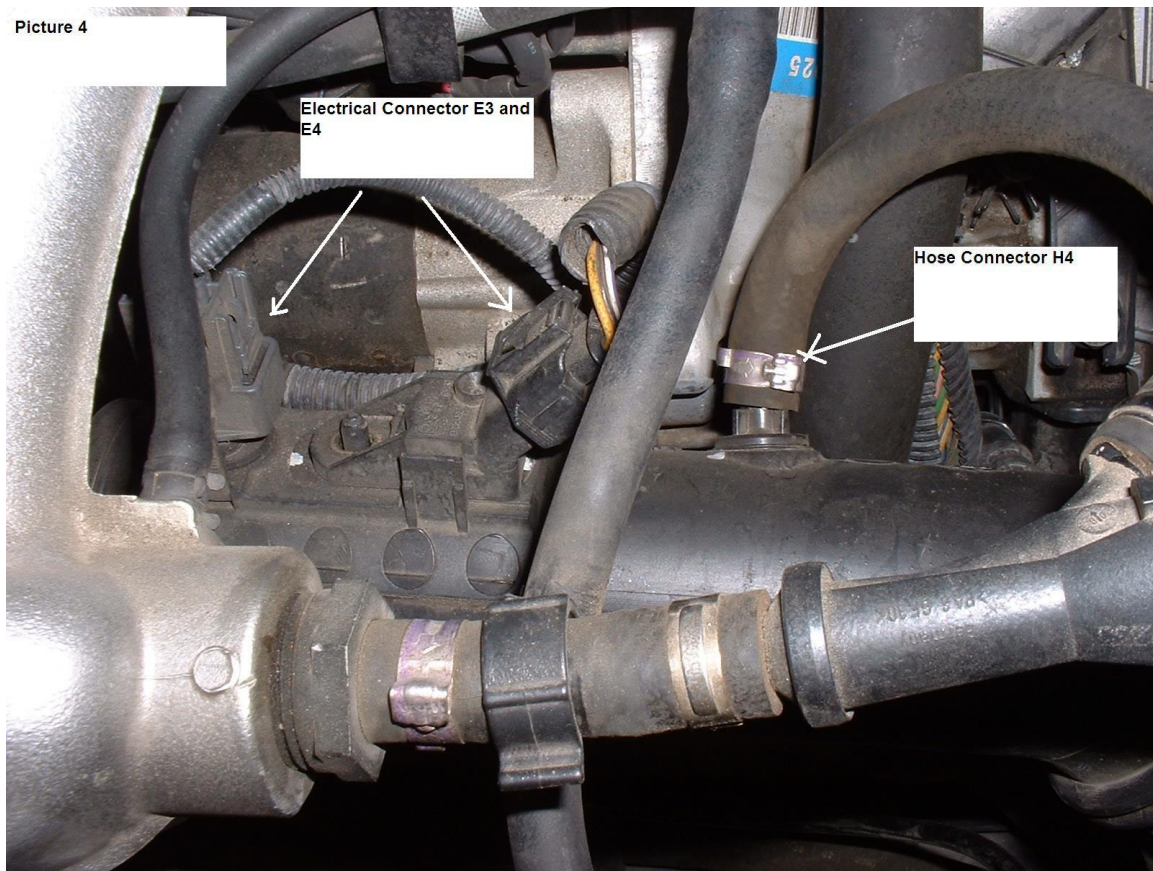
Picture 2



Picture 3



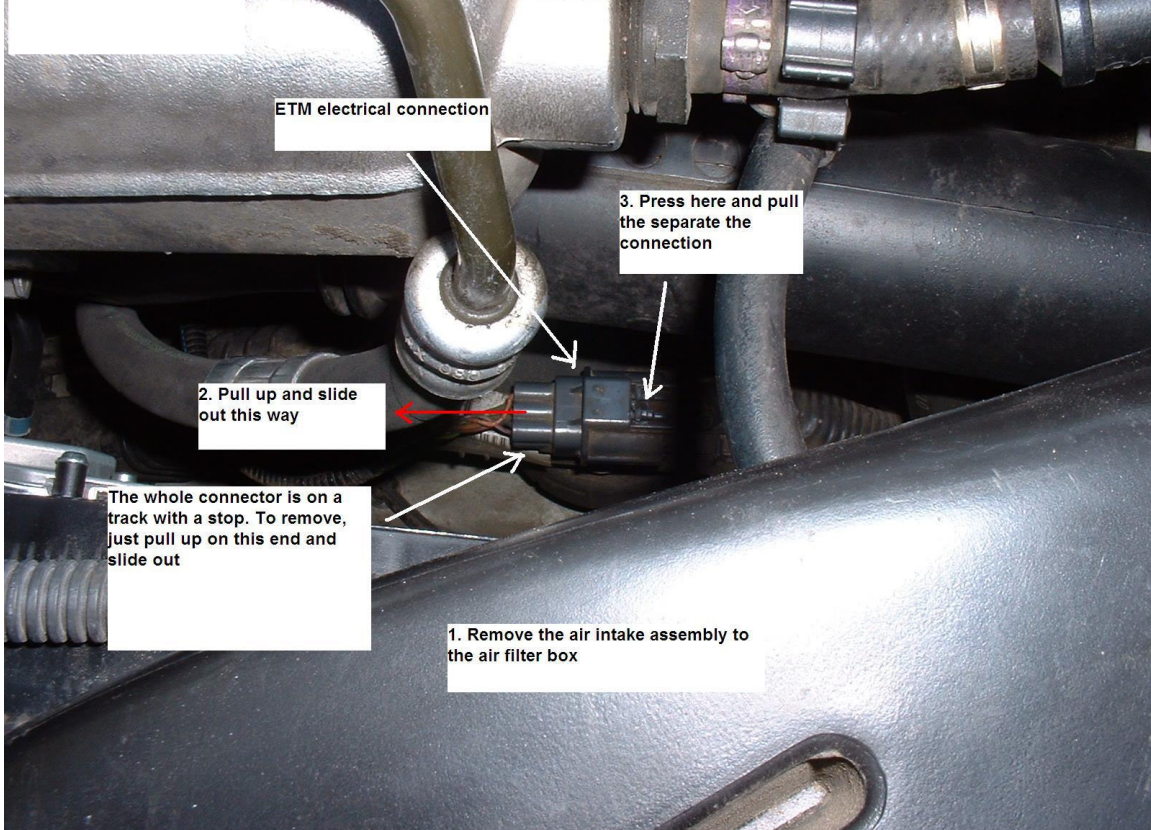
Picture 4



Picture 5
ETM to intake manifold
gasket



Picture 6



ETM electrical connection

3. Press here and pull
the separate the
connection

2. Pull up and slide
out this way

The whole connector is on a
track with a stop. To remove,
just pull up on this end and
slide out

1. Remove the air intake assembly to
the air filter box