

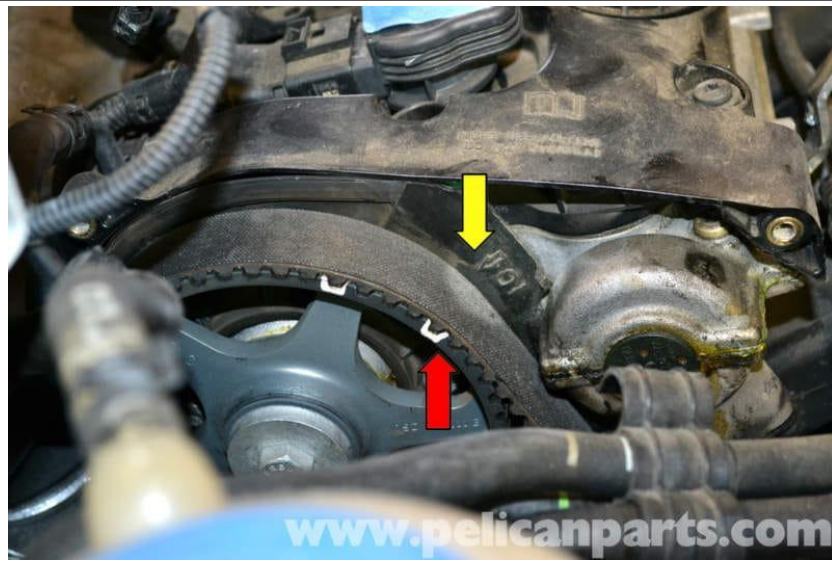
Depressurize fuel system and disconnect HPFP, but don't remove it (remove proper fuse and start car, then loosen hpfp Schrader valve).

Part 1. Upper Timing Cover Removal and TDC

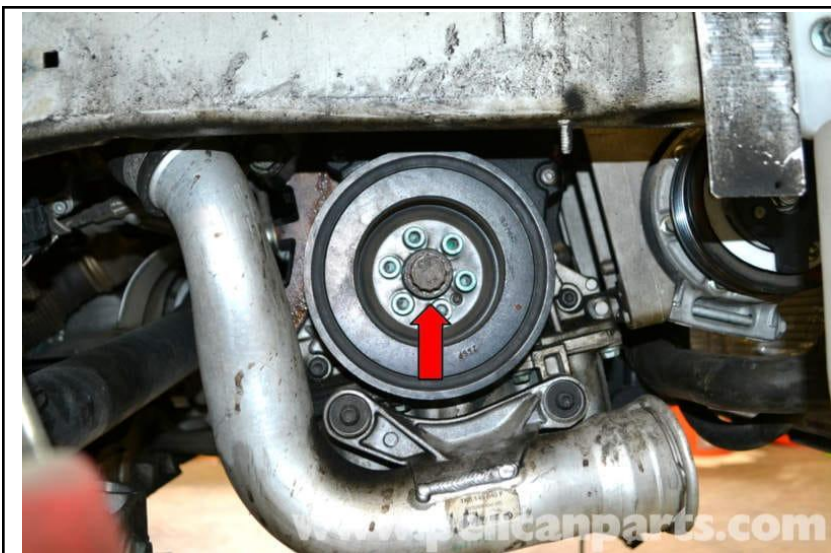
19mm 12 pt, T30 Torx, Ratchet, Fuse Puller, 13 mm wrench, 17mm wrench, 14mm wrench



Begin by removing the two T30 Torx screws on the top of the guard on the opposite end of the cylinder head from the pump (red arrows).



You need to turn the engine until the notch in the sprocket (red arrow) is even with the mark on the head (yellow arrow). Note; someone had marked our sprocket in two places with white but you will be able to see the notch in the sprocket (red arrow).



You can turn the engine over in a clockwise direction by using a 19mm twelve point socket on the nut on the crankshaft (red arrow).

Part 2: Charge Pipe

T30 Torx, 8mm wrench, flathead screwdriver



Begin by using a flathead screwdriver and lifting the quick release fitting (red arrow). You will not be able to pull the fitting out until you release the other hardware.



Use a T30 Torx and remove the mounting screw located by the alternator.



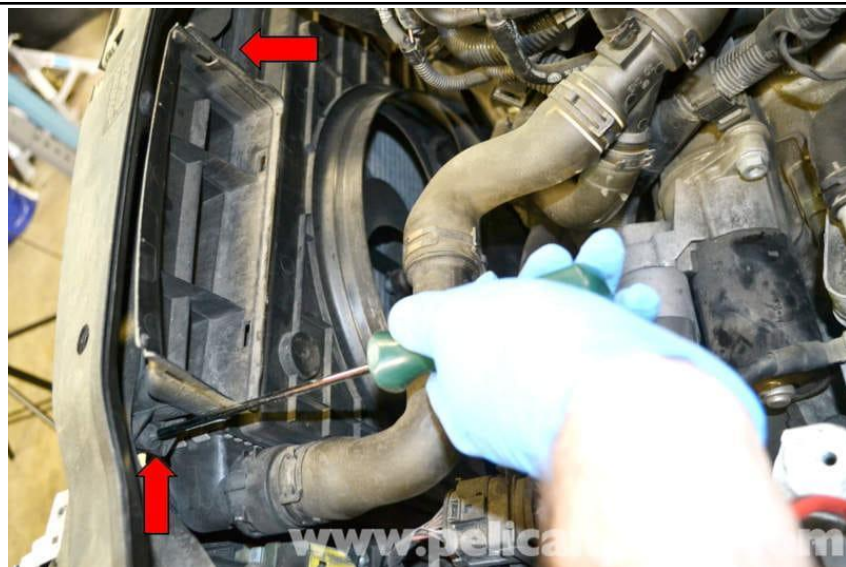
Remove the 8mm bolt (red arrow) from the top of the shroud.



Use a flathead screwdriver and release the quick release connection (red arrow) from the hose (yellow arrow). You can now wiggle both of the connections loose and remove the pipe from the vehicle. Installation is the reverse of removal.

Part 3: Fan and Shroud

T30, T27, T20 Torx, 10mm, 8mm wrench



Remove the two T27 Torx screws from the air diverter (red arrows). Note: You do not need to remove the engine cover to perform this job, just get the intake hose to lock carrier out of the way. Remove the air diverter (red arrow) from the lock carrier.



Remove the T27 Torx screw (red arrow) from the shroud to radiator bracket on the upper left side.



Remove the T27 Torx screw (red arrow) from the shroud to radiator bracket on the upper right side.



Unclip the wiring connection for the fans on the lower left corner (red arrow).



Remove the T27 Torx screw (red arrow) from the shroud to radiator bracket on the lower left side.



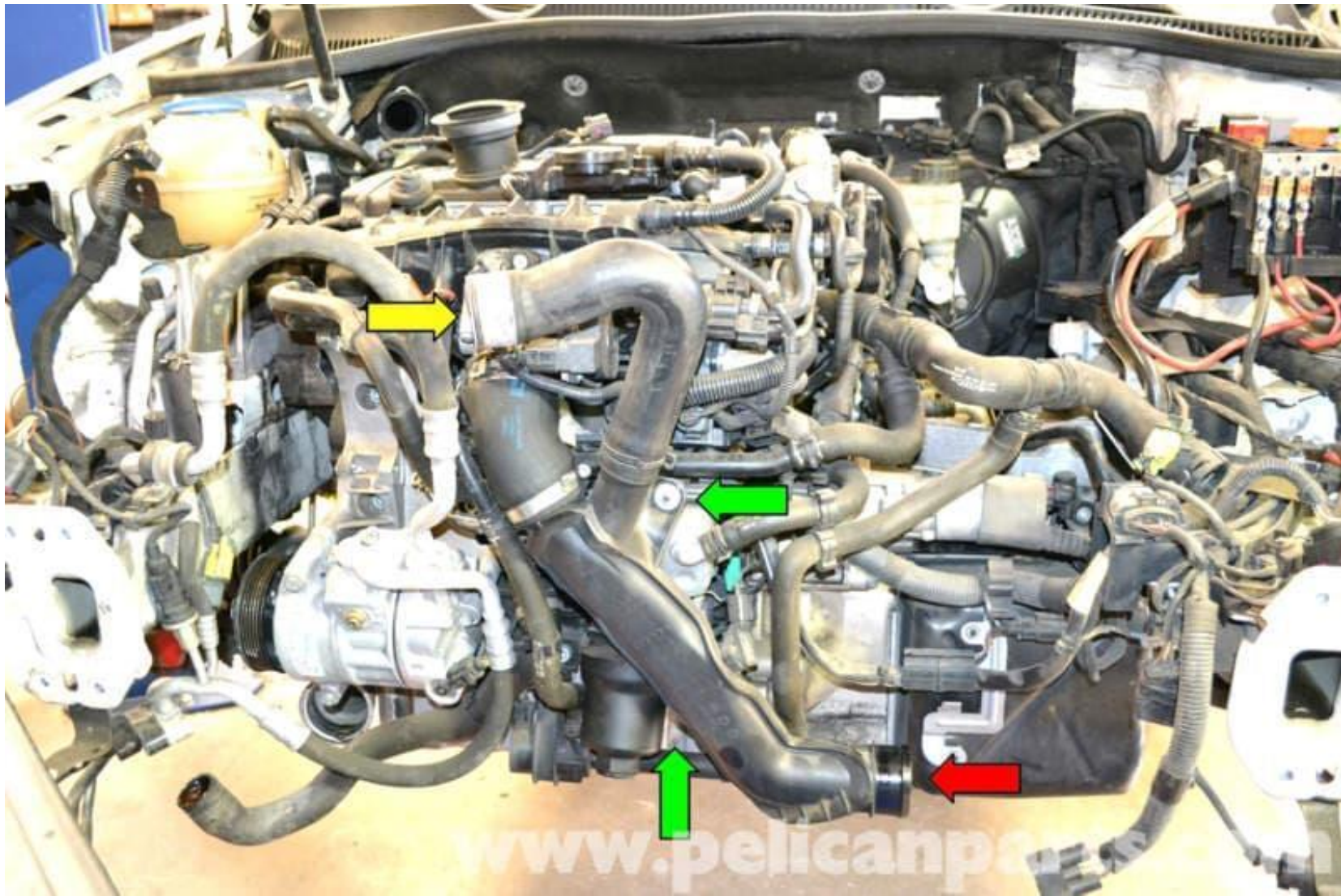
Remove the T27 Torx screw (red arrow) from the shroud to radiator bracket on the lower right side



Drop the shroud and fans slightly and turn it counter clockwise. You will now be able to slide the shroud and fans (red arrow) up out of the engine compartment on the left side.

Part 3: Throttle Body

T30, T25 Torx, 10mm, 8mm wrench, flathead screwdriver





On the lower left side unclip the quick release clip from the lower turbo hose and separate the hose from the intercooler (red arrow). You can leave it attached to the induction pipe and remove it with the pipe or remove it completely now.



Disconnect the wiring connection (red arrow) from the boost sensor (yellow arrow).



Use a flathead screwdriver and loosen the clamp on the throttle body hose (red arrow).



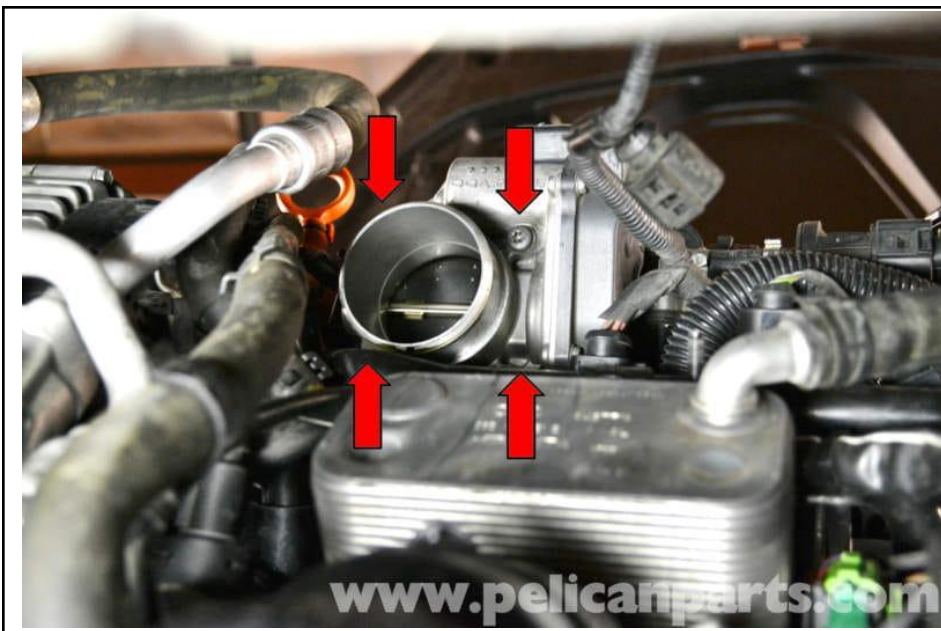
Working from below remove the T30 screw holding the charged air pipe bracket to the engine (red arrow).



Working from the top of the vehicle remove the 10mm nut (red arrow) holding the charged air pipe bracket on and remove the pipe. Use care to wiggle it and the intake hose off the throttle body and out through the bottom of the vehicle.



Disconnect and remove the air intake wiring connector from the sensor (red arrows) and then remove the throttle wiring from the connection on the throttle body (yellow arrows). Both connections are simple push pull connections.



Working from underneath the front of the vehicle you can get easier access to the four T30 Screws (red arrows, only one shown) on the throttle body.



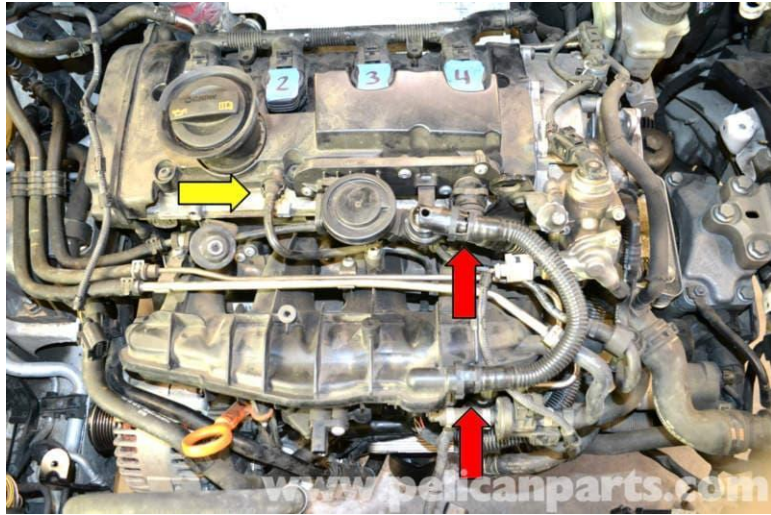
There is a series of hoses and wires that you will need to work around and through. I found that a six inch T30 driver worked best. Take your time and find the best angle to get the driver (red arrow) onto each screw (yellow arrow). You do not want to strip these screws so make sure the Torx is well seated before removing them.



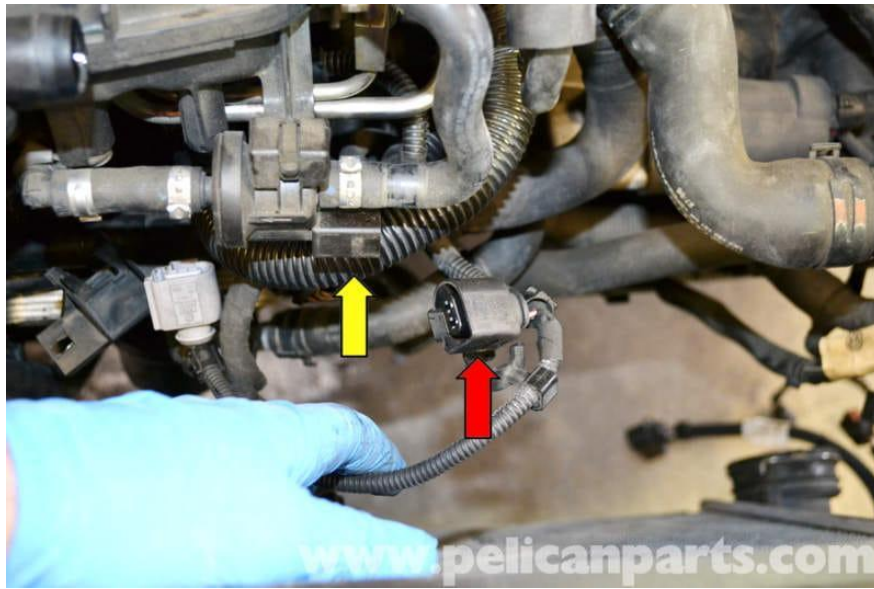
With the screws removed you can remove the throttle body out of the vehicle from the top (red arrow). Watch for the radiator when removing it.

Part 4: Intake Manifold

T30 Torx, 10mm, 13mm, 14mm, 17mm wrench, 10mm triple square, 19mm twelve point socket and driver



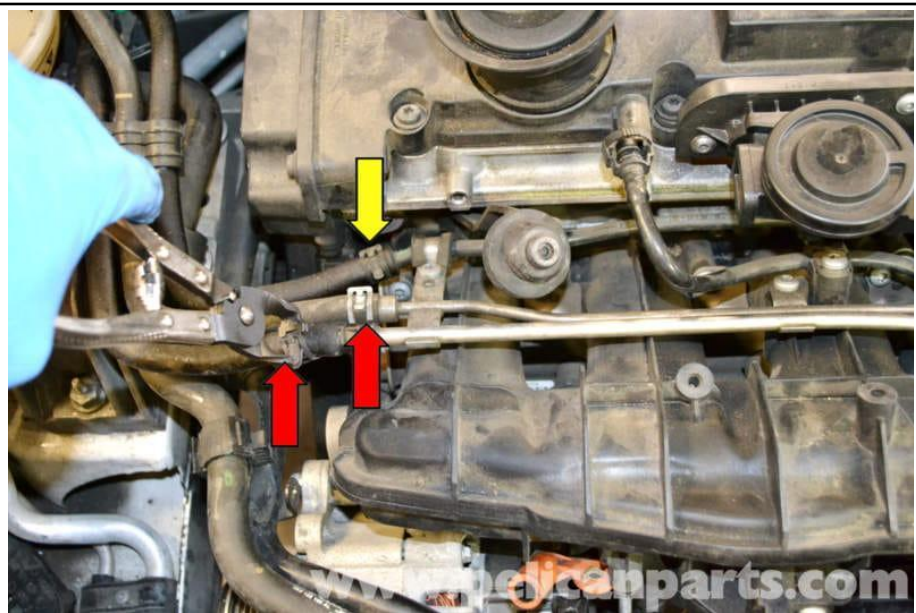
Remove the vacuum line between the manifold and head (red arrows) and separate the vacuum line from the vacuum pump to the head (yellow arrow).



Separate the wiring connection (red arrow) from the purge valve (yellow arrow).



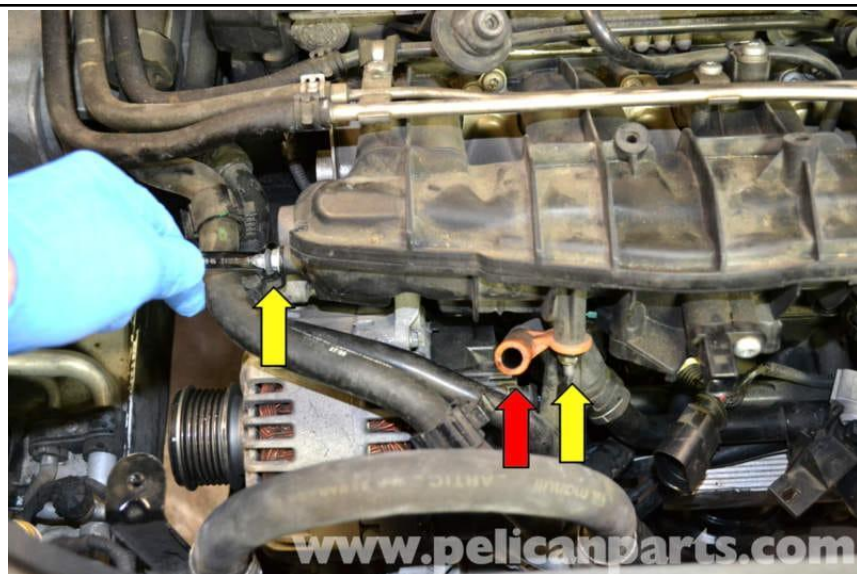
Disconnect the two EVAP lines from that go from the purge valve to the head (red arrows).



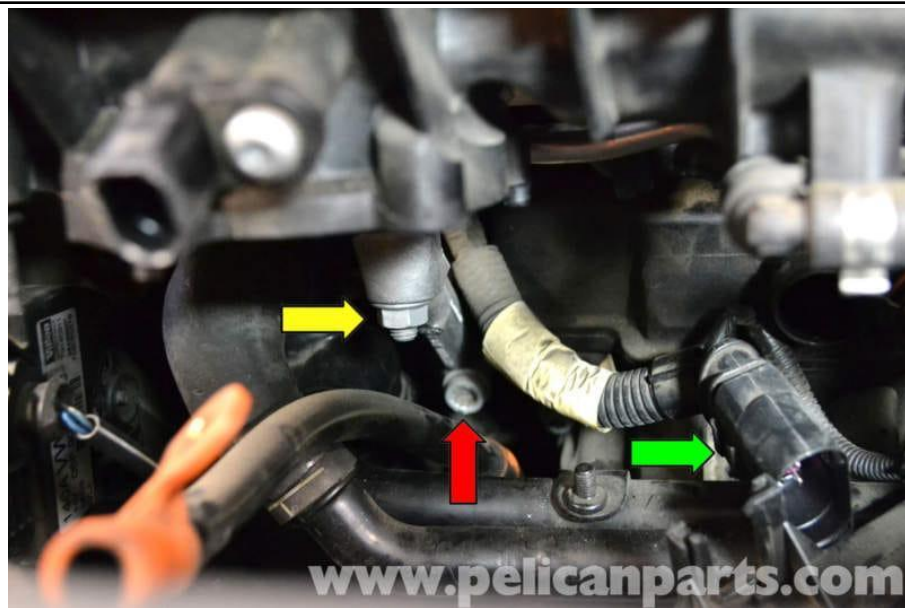
Disconnect the fuel lines (red arrows) and separate the rubber lines from the metal. I found the EVAP line (yellow arrow) was difficult to get at on the manifold so I disconnected it by the reservoir.



Squeeze in the clip and disconnect the EVAP line (red arrow).

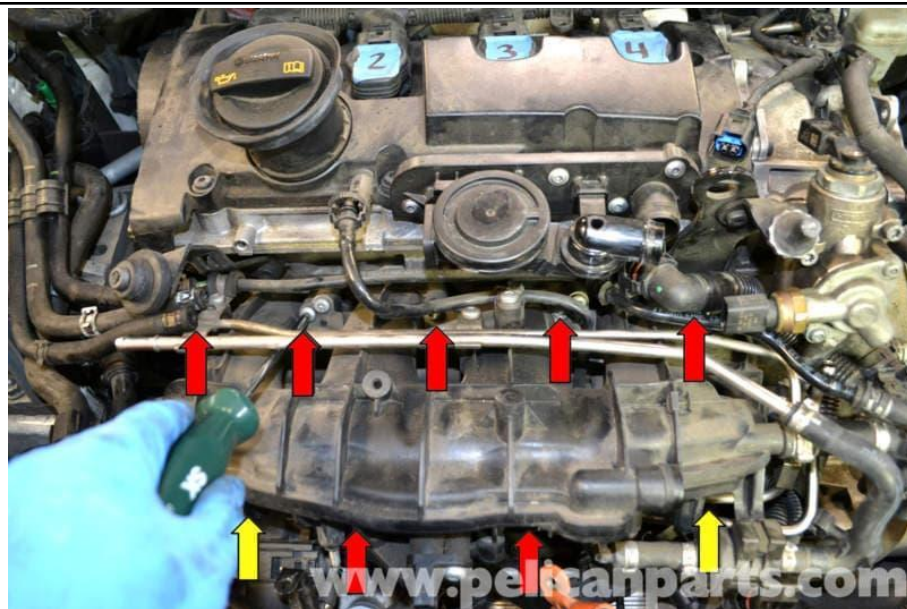


Remove the dip stick from its holder (red arrow) and then remove the two 10mm nuts (yellow arrows) holding the water line bracket in place. Lower the water line bracket off the manifold stud.

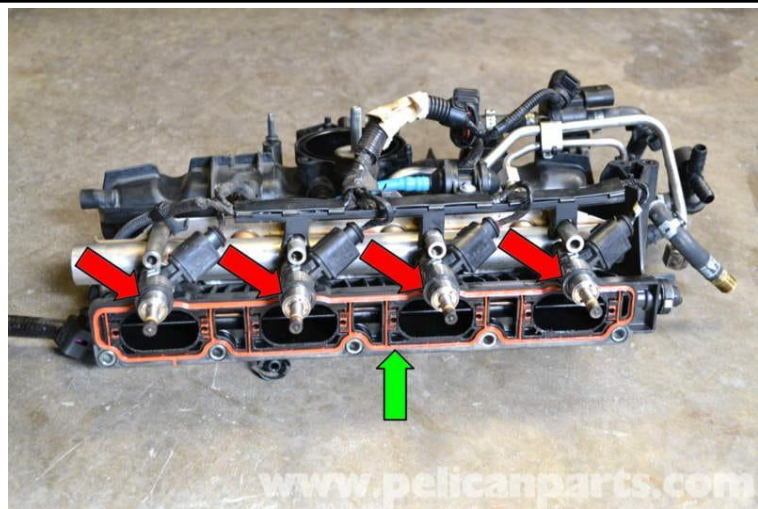


Disconnect the wiring harness for the fuel injectors (green arrow). Now you need to remove what is referred to as the Satan bolt (red arrow). There is a bracket that supports the manifold. Remove the 13mm nut from the top of the bracket (yellow arrow). At the bottom of the bracket is a 10mm triple square bolt securing the bracket to the engine. There is very, very little room to work. Take your time and make sure you get the bit well seated in the socket and remove the bolt. I was able to get my bit through the lines on the end of a 1/4 inch extension and remove the bolt.

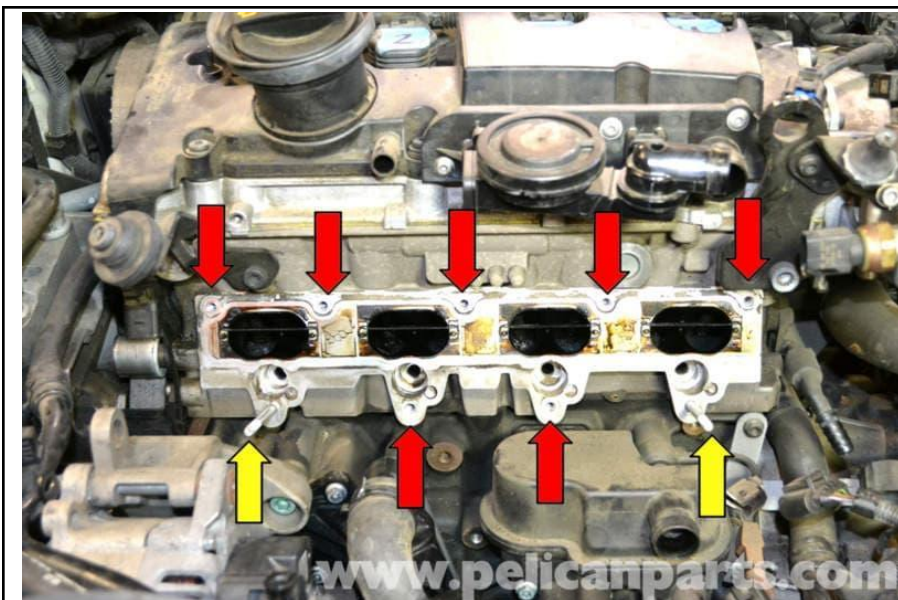
The Satan bolt is not hard to deal with if you remove the upper dipstick tube first. There is a small stud that holds the top of the dipstick tube. Once that stud is out, the tube can be pulled straight up and out pressure fit with o-ring at the bottom. Don't worry, no oil will spill out.



Remove the six T30 Torx bolts holding the manifold and fuel rail on (red arrows). There are four on the top of the manifold and two underneath in the center. Next remove the two 10mm nuts securing the manifold and fuel rail to the engine (yellow arrows). With this done everything should be free that connects the manifold to the vehicle; take a minute and double check. The only thing that is holding everything in place now is the seals in the injectors. There are seals that hold the injectors in the head and seals that hold the injectors in the fuel rail. Wiggle and pull straight back until the injectors give up their hold at either the head or fuel rail. With everything free double check that you have not missed a line or electrical connection.



Our manifold came off with all of the injectors (red arrows) still attached to the fuel rails, yours may leave all of them in the engine or any combination there of. The green arrow shows the intake gasket which needs to be replaced every time the manifold is removed.



This photo illustrates the head with the manifold and injector off. You can see the openings for the T30 Torx bolts (red arrows) as well as the two studs where the 10mm nuts go (yellow arrows). Even with blowing out the engine before working you can still see all of the dirt that ended up in the injector ports; use caution cleaning this out so it does NOT get into the engine. Installation is the reverse of removal. Make sure you clean everything really well. Use a new gasket on the manifold, seals on the injectors and washers (where applicable) on the fuel fittings

When reinstalling, pull the injectors from the fuel rail and put them back into the head. I could not get the assembly in any other way. Make sure all o-rings are on the injectors - NOT in the fuel rail - or it will leak and you'll get to do it all over again. If replacing the injector seals/o-rings recommended, make sure there aren't any old o-rings that stayed with the fuel rail.