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Location: NJ

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B6/B7 S4 DIY: Complete Engine Pull Guide

Here is the DIY that you all have been waiting for. I have taken a lot of time to put together this DIY while i removed the engine on my avant. You can use this entire DIY to pull the motor or use sections of it to remove certain parts that are also involved with the engine pull.

Please note this DIY is NOT for the faint of heart. It is a very very detailed, tiring, and time consuming process. I highly recommend that you have a few capable hands working with you. If this is the case you should be able to have it pulled in a day if you work hard. If this is your first time do not be surprised if you cannot fit the engine removal and re-install in a weekend.

This is also a very good time to do maintenance items while you are pulling the motor for whatever reason. We all know the engine bay is cramped and hard to work in sometimes. With the motor out you really have no restrictions or limitations to working. Take advantage and do as much maintenance items as possible. It is also a good time for other modifications.

While the motor is out, you should consider the following:

Maintenance

Timing Chain Service (Tensioners, Tensioner Guides, Timing Chains, Adjusters)
 Valve Cover Gaskets
 Serpentine Belt / Idler Pulley / Belt Tensioner
 Spark Plugs
 Coil Packs
 Air Filter
 Oil Change

Modifications

JHM Headers (Recommend Ceramic Coating or Header Wrap) / Aftermarket Downpipes
 JHM Intake Manifold
 JHM LW Pulley
 Snub Mount
 Upgraded Motor Mounts
 LW Flywheel / Upgraded Clutch
 JHM Shifter Trio
 JHM Tune
 JHM Intake Spacers

What you will need for re-install

2 Jugs of G12 Coolant (1.5 liter)- \$25
 1 Can of Powder Steering Fluid (1 liter)- Recommend CHF- \$20
 AC Recharge- \$100
 Various Hose Clamps (Buy an assorted pack)- \$10

Estimate Total Cost of Necessary Parts: \$155

Equipment / Tools Required

Critical Equipment

Engine Hoist- Must be rated at least 1/2 ton(Harbor Freight)
Lift Chains / Securing Hooks
4 Jack Stands
Jack

Tools Necessary

*Not all of these tools are absolutely necessary. For example you will not use every single socket in the 1/4 set, or you might prefer to use a 3/8 set instead of a 1/4. However, all are good to have and with many options it can make certain tasks easier with the right assortment of tools

1/4, 3/8, 1/2 Ratchets
1/4, 3/8, 1/2 Socket Sets (Shallow and Deep)
1/4, 3/8, 1/2 Breaker Bars (Assorted Lengths for Leverage)
Assortment of Flat Head Screw Drivers
Assortment of Philips Screw Drivers
Angled Pick Set
TORX Socket Set (T25, T30, T45 mostly used)
HEX Socket Set (6mm mostly used)
Ratcheting Wrench Set
Assorted Wrench Set (Metric)
Triple Square Set (110 mostly used)
Hose Clamp Removal Tool (Make things a lot easier)
Assortment of Pliers (Needle Nose, Channel Locks, Pliers)
Hammer
Rubber Mallet
Pry Bars
Can of PB Blaster / Spray Lubricant

Phases / Difficulty / Time Estimates

This DIY will be broken out into phases. Below is an outline of the phases involved for the motor pull process. I have also rated each phase based on difficulty with a scale of 1-10 (ten being extremely difficult). Each section also has an estimated time to complete (note that this estimation is taking into account someone who is familiar with working on this section of the car).

Phase 1: Bumper Removal- Difficulty: 4 / Time: 45 Minutes

Phase 2: Radiator Removal- Difficulty: 5 / Time: 1 Hour

Phase 3: Stock Cat-back Removal- Difficulty: 2 / Time: 20 Minutes

Phase 4: Engine Bay Plumbing and Component Removal- Difficulty: 6 / Time: 1.5 Hours

Phase 5: Engine Electrical Harness Removal- Difficulty: 6 / Time: 2 Hours

Phase 6: Dropping the Shifter Box- Difficulty: 3 / Time: 45 Minutes

Phase 7: Final Components and Engine Pull- Difficulty: 8 / Time: 2-3 Hours

Total Time Estimate: 8-9 Hours

This gives us a realistic time frame of how long it will take to pull the motor first time around, working at a decent pace and taking short breaks. I have done this motor twice now and i can say i would feel comfortable getting it done in about 5-6 hours with capable assistance.

Air Conditioning Discharge / Recharge

The Air Condition lines must be disconnected during this engine pull DIY. It is up to you whether or not you want to have the system discharged professionally. Having it done properly will be better for the environment. However, this is totally up to you. An AC discharge should only run about \$20. You can also buy a kit to do the discharge yourself. If wish to do it the lazy way, locate this AC line in the upper passenger side of the engine bay. Remove this black cap. Stick a pick or a small screw driver down in to vent the freon as shown below.



You will also need a Re-Charge upon completion. Prices vary, but expect to pay around \$100 for it.

Helpful Recommendations

- Be Patient, Don't rush! It is a long process. If you become frustrated take a break. Going too quickly or getting upset will only lead to stuff breaking
- Ask Questions! If you become stuck or if something is not clear, take the time to ask. It is a long DIY and some things may not be crystal clear. Get in touch with me as i am more than happy to help
- Have Fun! Enjoy your passion and really learn about your car. Working on it is half the love for these cars

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Here we go...

Before we start, get the vehicle up on four jack stands. You will want to raise the car high



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enough to comfortably work under neath during the process. Remove both the belly pan and the transmission splash guards before starting Phase 1. Each can be removed with a flat head screw driver.

Phase 1: Bumper Removal

Difficulty: 4

Approximate time: 45 Minutes

Here is a look at the engine bay before we begin the engine removal process.



Remove all of the engine bay covers and the engine bay weather strip

Next step is to remove the airbox intake tube. Grab your philips screw driver and remove the two screws that hold the front of the intake tube to the rad support.



Once the screws are removed, lift up and wiggle the tube out as shown below



Time to remove the headlights. Grab your 3/8 ratchet, extension, and TORX30 socket. There are 4 TORX30 bolts holding each headlight down. The top two can be seen obviously.



The lower two are screwed into the headlight tray. Locate them via the picture below. Do not remove them, just loosen enough to where you can pull the headlight forward.



Once the headlight has been moved forward, disconnect the headlight connector by pushing the connector forward and at the same time pull backward on the clip. This will release the connector and the headlight will come out.



Same procedure on the passenger side. Here are the lower TORX30 bolts.



Next, grab a flat head and head for the fog light grills. Locate the screw on the inside corner as shown below. It should be vertical. Turn it to a horizontal position and it will pop out. Wiggle the fog like grill out of the inner tab and remove. Repeat on passenger side.



Grab a 1/4 ratchet and TORX25 bit and head or the fender liner. Behind the liner you will see this torx25 bolt. Remove it and repeat on the drivers side.



Once those inner fender bolts are removed we can pop the side of the bumper free from the fender. Simply grab from the end and pull toward you. It will pop free with some muscle. Repeat on other side.





Time to get the bolts that hold the bumper to the fender. Grab a 10mm ratcheting wrench and pick a side of the car. Look down where the headlight was and you will see three 10mm nuts on each side fastening the bumper to the fender. Remove all 6 (three on each side).

*The driver side lower most bolt might be hard to see and reach due to the harness and washer fluid connector being in the way. This one might take a bit of patience to get to.





Last step for bumper remove. We must now loosen the two main frame rail bolts. Grab a 3/8 ratchet, short extension, and 6mm HEX and navigate to the fog light grill openings. Peak up and you will see this bolt.



Loosen this bolt, but do not remove it. Once you loosen it enough you will be able to feel the bumper give forward. Repeat on the other side.



Now you will be able to slide the bumper forward. Pull outward and support the passenger side with a bucket or stool while finish disconnecting plugs on the drivers side to pull the bumper

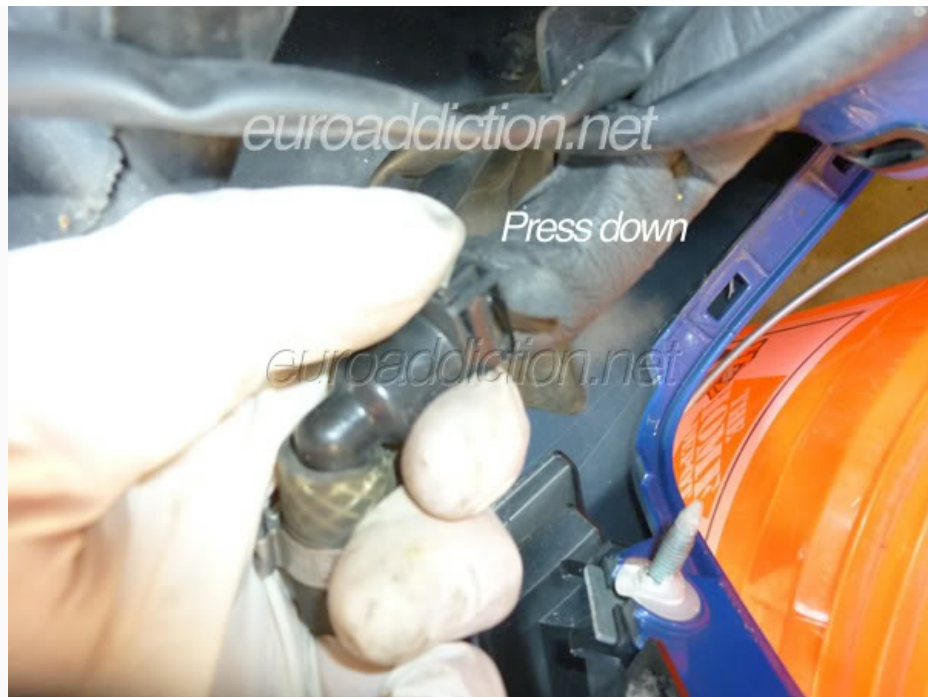
completely free.



There are two wiring harness connectors that must be disconnected and a windshield washer line that must be un-done to remove the bumper. Here is what you need to unplug.



Get a bucket ready before you unplug the washer fluid connector, it will come spilling out.



The bumper should now be off. Please proceed to Phase 2.



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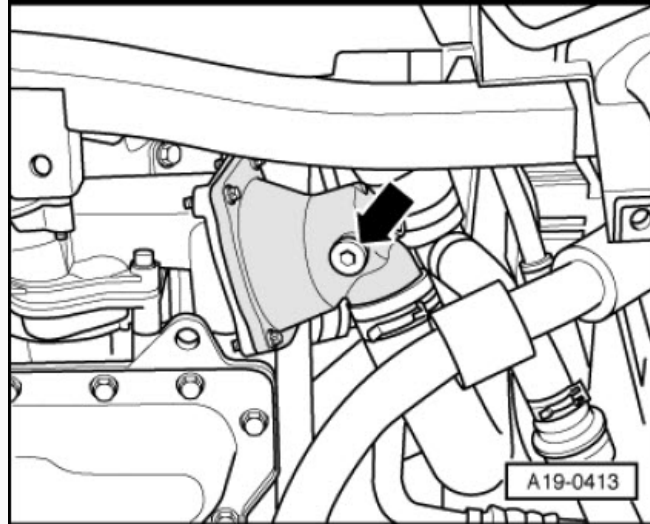


Phase 2: Radiator Removal

Difficulty: 5

Approximate time: 1 Hour

First step is to drain the coolant system. Remove the cap on your coolant reservoir to depressurize the system. Next, grab a 6mm Hex and locate the water pump on the driver side of the car. Remove the drain plug as shown below. Make sure you have a bucket ready to catch all of the coolant. This will help save a mess when we disconnect other coolant lines later on.



Let's start by taking the auxiliary radiator air shrouds out. The passenger side can be removed by taking out these two 10mm bolts as shown below. Grab your 1/4 ratchet and get to work.



Drivers side is a bit more of a pain. There are four 8mm nuts holding the shroud on. Two on the top and two on the bottom. Remove them and pull the shroud out.



On the drivers side you will see two plugs. Here is one going to the condenser. Disconnect it.



The next one is a bit lower, it goes to the fan control module. Disconnect it also.

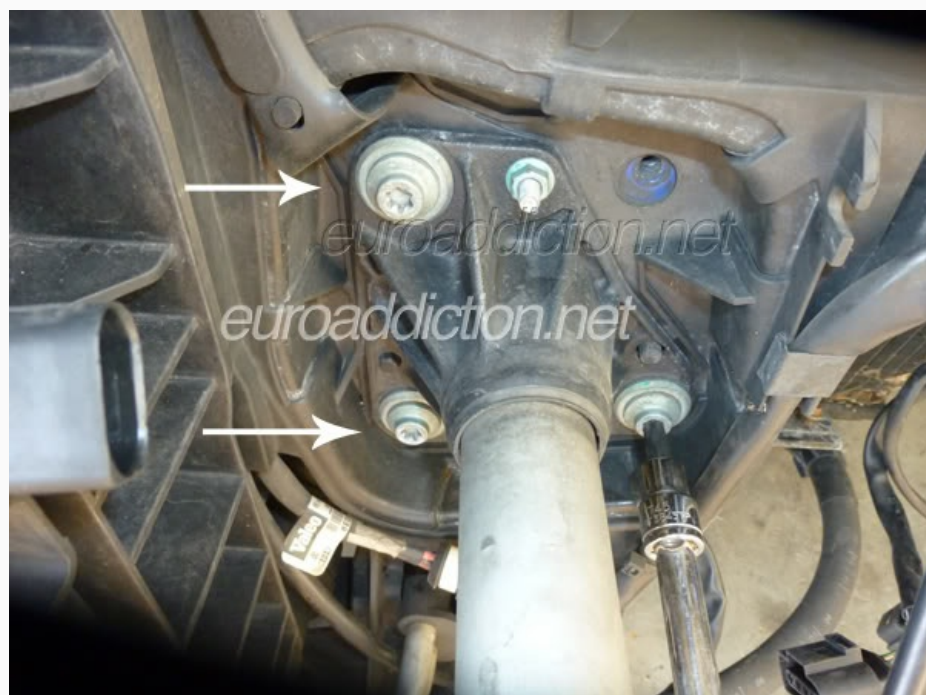


Let's take out the radiator support bolts. There are three on each side. 2 on top of the fender and one on the side. They are TORX30, remove them.





Next we can take out the frame rail core supports. Again, there are three bolts on each side. They are TORX45 screws. Completely remove them from the core supports / frame rail.



We can now take off the hood latch. It is located on the top back side of the radiator support. Remove by pulling it outward.



The airbag sensors can now be unplugged. There are two total; one on each side of the radiator support. They are yellow. Push in on the connector while pulling back on the plug. Remove.

*push in on connector and pull
tab to release connector*



Locate these two plugs by the ABS module. They run to the electrical components on the radiator support. Disconnect both.



Next step is to un-done the two coolant hoses behind the radiator. You can disconnect whichever you want to first. It does not matter. Have a bucket handy because there will still be

some excess coolant in the system. There is one hose located on the upper passenger side and one located on the lower drivers side. Both are shown below.





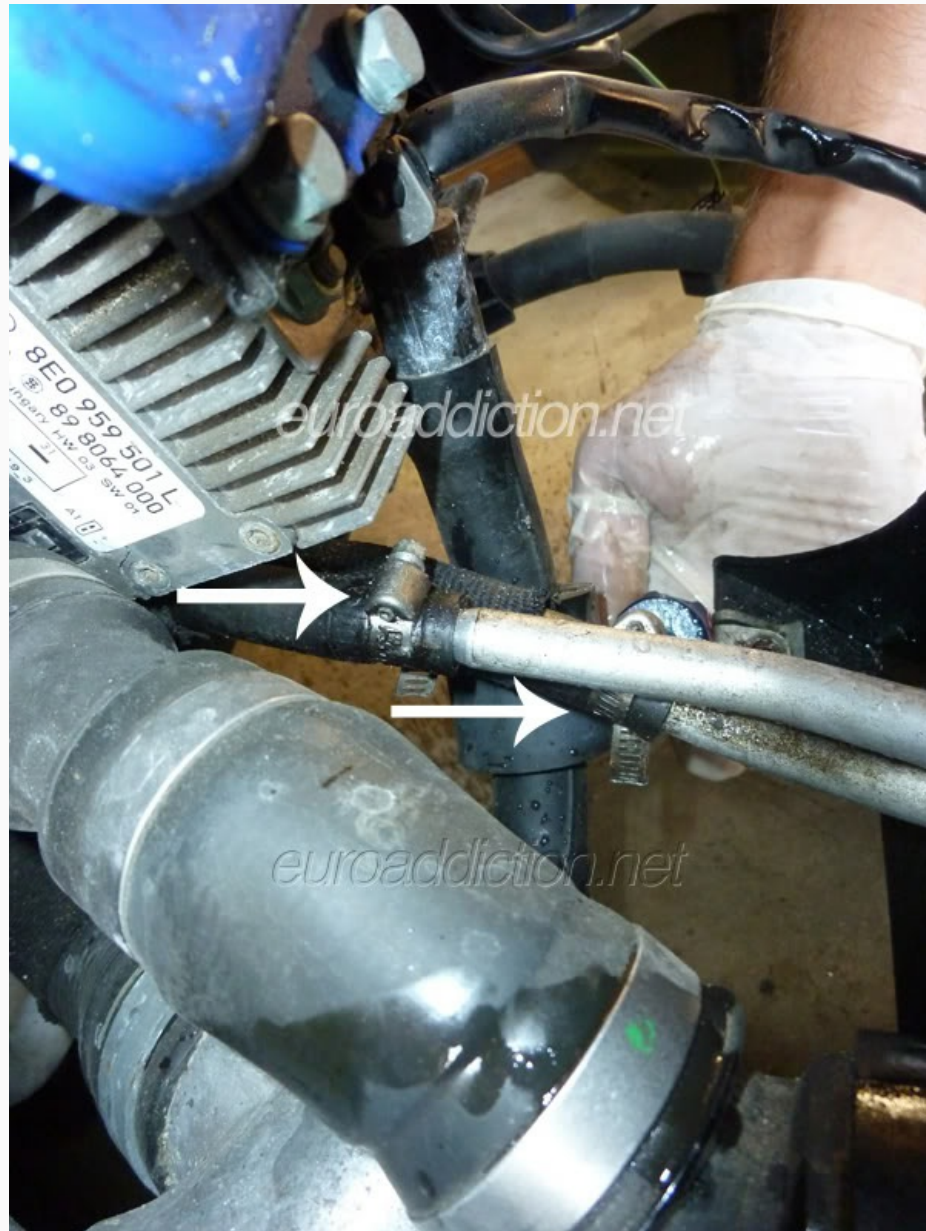
To disconnect the hoses, grab a small flat head and release the clip as shown above. With the clip removed you can wiggle the hose off the radiator. You may have to use a pick or small flat head to work the seal loose.

Let the excess coolant, if any, drain.



Next we can take off the two power steering lines located under the driver side lower radiator coolant line. You can see the both below. They will be held on by 1 use clamps if you have never taken them off before. You will most likely mangle them by taking the off. Don't worry as you will replace those clamp with new ones during the re-install.

Again, have a bucket ready to catch the PS fluid.



The only thing holding the radiator on now are the two lower AC hard lines. Grab a 10mm socket and un-done both bolts and pull the hard lines off. One is located on the passenger side, the other on the drivers side. Both shown below.

Passenger Side



Driver Side



The radiator is now free and can be pulled away from the car. Be careful as there will still be coolant in the system. Don't be surprised if a lot of it falls out of the radiator. You are now finished with phase 2.





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Phase 3: Stock Cat-back Removal

Difficulty: 2

Approximate time: 20 Minutes

Next step is to get the stock exhaust off. Grab some lubricant and a pry bar and slide under the back of the car. I find the easiest way to get the catback off is to first un-do the hangers on the mid-section. If you do them with the mufflers hanging free it will make it much more difficult since all of the weight will be on the mid-section hangers.

Below is what the hangers look like in the mid section. Lube the hangers up and wedge a pry-bar between the drive-shift and exhaust to pop these hangers out. It might require some muscling of the exhaust back and fourth but they should come off rather easier



Once the mid-section hangers are off, grab a ratchet and a 17mm deep socket to loosen the four bolts (two on each side as shown) to un-do the sleeve clamps connecting the downpipes to the catback. I recommend spraying some PB-Blaster on these bolts before attempting to take them off. They are prone to rusting especially if you are in a winter state. Don't worry if some of the bolts snap, i have had this happen many times. They are cheap and easy to replace if need be.



Last step to get the cat-back off is the rear muffler hangers. There are two ways to go about this. You can either pop off the mufflers from the rubber hangers or take the rubber hangers out completely. I have done both and find that leaving the hangers in the car make it easier later on for re-install and tip alignment. If you want to leave the hangers in, grab some lube and a pry bar and simply pop off the mufflers. It might be a good idea to have a friend hold up the mufflers or a jack as they are heavy and will fall downward.



If you want to take the hangers out completely them get a 13mm socket and extension and undo the four 13mm bolts (2 on each side) that bolt the hanger into the body



The exhaust is ready to come off now. Grab the mufflers and gently tug outward. The cat-back should easily slide out from the downpipe sleeve and become free from the car.

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Phase 4: Engine Bay Plumbing and Component Removal

Difficulty: 6

Approximate time: 1.5 Hours

In this section we will finalize removing all necessary components and plumbing to get the engine out of the car.

Here is a shot to give you a feel where we are in the dis-assembly



Lets first get the air components out of the way. Grab a flat head and start loosening the two clamps on the MAF tube. As you can see below there is one clamp connecting the tube to the MAF and another connecting the tube to the Throttle Body. Loosen both and remove the tube from the components.



With it off



To completely remove the tube you must disconnect it from the plastic elbow seated in the tube. Be careful as it is very very brittle and will easily snap. Soak the elbow down with lubricant and get a right angle pick to pull the lip back and wiggle the elbow out.



Lets get the airbox out. First remove the front tubing by pushing inward on the connector, pinching the ribber tabs in, and pulling outward on the connector.



Pop the wire running on top of the airbox by pulling upward. It is held on by two tabs



Grab a philips screw driver and remove the two screws on top of the airbox as shown below



Pull the fuel line tab up from the MAF



Remove this wire from its holder from the front face of the airbox



Next, disconnect the MAF sensor connector (located on the back of the MAF) by pushing in and pulling back on the release tab.



The airbox lid is free, pull it behind the fuel line and pull it out of the car.



We might as well just take the entire airbox out of the car. There is a push pin holding the top of the box into the passenger fender. Grab a flat head and pop the push pin out. You will then be able to pull the entire airbox out as it is only secured to the bottom with two rubber grommets.

Let's now disconnect the fuel line and get it out of the way. Grab a 17mm wrench and a 14mm wrench. Place them on the nuts as shown below. To crack this line loose, push the 17mm wrench toward the center of the car while pulling the 14mm toward you. Once loose, unscrew it but keep a cloth under it just in case excess fuel drips out.



To prevent any debris from getting in the lines i recommend you wrapping the ends up and taping them off



With that stuff out of the way we can now focus on the plumbing behind the intake manifold. Pop this air line out from its mount on the firewall



Next you can pop off the smaller coolant line and the larger brake booster line from the back of the manifold. If this is the first time removing these tubes they will be held on by one time use clamps. Use a flat head to take them off. You will replace these during re-install with fresh ones



Grab a pair of needle nose pliers and remove this air line by pinching the clip and pulling upward



Take the needle nose pliers and remove the coolant line running to the top of the coolant overflow reservoir in the same fashion



We want to get the reservoir out of the way to grab a philips screw driver and remove this screw



To remove the reservoir from its rear tabs you must push downward on the rear tabs and pull up. With the reservoir loose remove the sensor from the bottom of the tank in the same fashion you remove all of the audi connectors. Move the coolant reservoir to the side



That is mostly it for the top components. Lets move to the sides of the motor. Now, as a general rule of thumb, any tubing or plumbing that crosses over or under the frame rails must be disconnected in order to pull the motor. Let's start with the passenger side. There are three main tubes that must be disconnected.



Most of these tubes are held on by pinch clips. A good pair of channel locks or pliers will be required. Let's start with the line in the picture about with the "EA" writing on it. Pinch the clip in and move it down the tube so we can remove it from the pipe it is connected to.

A lot of these tubes have never come off before and might be stuck on the piping. To make getting them off easier, grab a right angle pick and simply break the seal by running the pick between the rubber tube and the pipe it is connected to as shown below



Here is a shot of all three tubes that must be disconnected



Note the spots where i disconnected the tubes. The third tube is a little harder to see from the picture so here it is at another angle. It connects to a hard line that runs below the valve cover



That's it for the passenger side. Push the piping that runs over the frame rail to the side to get it out of the way. Now lets go to the drivers side where there are 4 pieces of tubing that must be un-done. I have pointed out three in this picture (two up top next to each other and one on the bottom by the water pump).



Using channel locks or pliers take these tubes off the piping in the same manner. Here is a shot of the 2nd top tube that must come off, it was hidden in the first picture. It runs to the power steering reservoir and sits right near the oil dip stick.



And another shot for more clarification with the tubes off



Slide under the driver side auxiliary radiator and locate the 4th piece of tubing. Disconnect it here as i have shown below. I find it easier to disconnect here then getting the larger clip by the water pump



With that plumbing out of the way we are left with another hard AC line. Grab a TORX45 socket and un-do this hard line. It will pop right off



I find it a good habit to put bolts back in their respect holes to avoid misplacing or loosing them



Locate the other AC hard line right next to the one you just took off. Grab a TORX45 and take this line off also.

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This line runs along the oil pan to the passenger side of the car. There are two clamps under the car (10mm bolts) that hold this line into place. In order to move it out of the way under the car you need to un-do these two clamps. Follow the line it is easy to locate them

Next up is another power steering connector. Crouch down by the water pump and locate this line underneath. Grab a 19mm wrench and undo this line.



Locate this fat vacuum line that runs in front of the motor and connects to a T elbow by the knock sensor on the front right side of the intake manifold. Pull this line off and get it out of the way



That's it for the components and plumbing section. Next step is to take care of the electrical harness

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Phase 5: Engine Electrical Harness Removal

Difficulty: 6

Approximate time: 2 Hours

This section will deal with all of the electric connections in the engine bay that need to be removed for the engine to come out.

First thing to do it disconnect the battery. Grab a 10mm socket and remove both the positive and negative terminals. We will come back to this to snake the battery wiring out later in this section





Lets remove the weather stripping. Simply peel it off



First step is to pop the rear cowl off to expose the ECU box. Simply lift up on it and remove



To get the ECU box cover off we need to get a few things out of the way to reach the rear most bolts. Grab a flat head and pop the cover off the drivers side windshield wiper



This will expose a 16mm bolt holding the windshield wiper down. Grab a 16mm socket and remove this bolt



With the bolt free we can wiggle the wiper off. If it has never been removed it might be a little difficult to get it off. Try spraying some lubricant in the threads and wiggle it back and fourth. It should eventually come free. Once loose remove the wiper



Remove the metal clip that pinches the rain tray onto the tab. This will allow you to pull up higher on the rain tray



Now we can remove the ECU cover. There are 5 TORX30 bolts holding it on; three in the front and 2 in the rear. The locations are shown below. The front three and the rear left are easy to get to.



Here is a shot of the tricky rear rear bolt location. A little trick is to grab a 1/4 ratchet and extension. Feed the extension through the wiper hole and attach either a TORX30 or TORX27 (TORX30 is hard to find in 1/4"). This should allow easy access to remove this rear bolt.



Pull the cover forward and off



This will expose the ECU. First step is to remove the horizontal metal bar holding the ECU in place. Pop the tabs off each side and remove



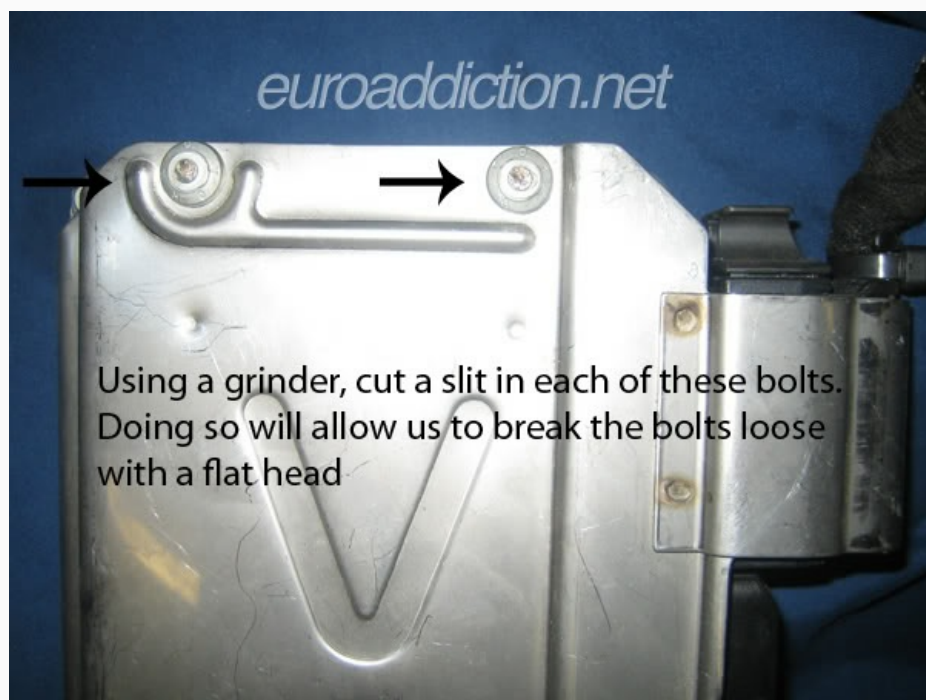
You will now be able to lift the ECU out of the holder. Move it to the side out of the way. If you are not taking your ECU out please proceed to the non-italicized section below

*****Supplemental ECU Removal*****

It is not necessary to take the ECU out of the chastity belt for the engine removal, however, if you plan to have the ECU tuned then you will need to take it off. This supplemental section will show you how to get the ECU out of the factory chastity belt.

You will see the ECU is locked into the chastity belt as shown below. The ECU is held in here by the two flat bolts on the end. Audi uses these bolts so nobody can tamper with the ECU. In order to get the ECU out we need to cut out some slits into these bolts. These slits will allow us to use a flat head screw driver to crack the bolts loose.

Here is something you should use for grind slits in the bolts



With the Chasity belt and ECU holder out we can disconnect the ECU from the electrical harness. To remove the rear connectors simply pull out on each of the side tabs and they will pop off



Let's pop off the upper ECU cradle out of the ECU box. This will allow us to gain access to the relay boxes down below. Toward the rear of the ECU box you will see it held on by a tab. Grab a flat head and release this tab to pull the holder out



With that out of the way we can now pull the relays out. It is convenient that they are all held in on a board so we do not have to remove them individually. Again this piece is held on by a tap on the rear side. With the flat head again, release the tab and the whole board will come free



Now it is time for the fun part. There are a few connectors and a ground located in a lower section behind the ECU box. Here is a shot down below of what we are working with



There are four connectors that need to come out. Below is a picture of what they look like. The easiest way to release the connectors is to get a straight pick and wedge it between the connector and the outside leg. This will release the outside clip. With the Outside clip push out pull up on the connector and it will pop free



Last step is to get the red wired ground. Get a 10mm socket and remove the ground. A swivel might make it easier to take out



On the fire wall we need to take a few things off. First is this brown ground wire on the drivers side. A 10mm socket will remove it



Next step... You will see there is an electric line that runs from the harness down to the drivers side radiator to a connection. This must be disconnected. Remove this connector just like every Audi connector. Here is a shot of where it is located



Time to remove both driver and passenger side connector holders on the firewall. These house the connectors for parts such as the front and rear O2 sensors. Grab a 8mm socket. There are two bolts on each holder. Remove them completely as shown below.



And removed...



Passenger side for reference



On the passenger side you will notice this black connector does not come out with the wiring harness and must be disconnected



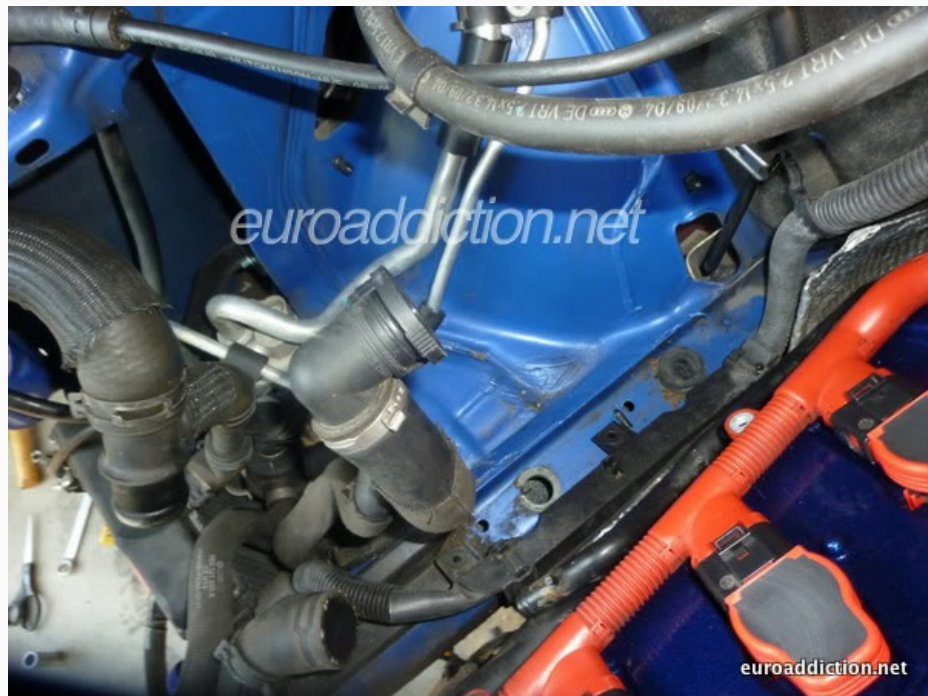
This connector on the vac-line (shown here and the other end connector to the rear of the intake manifold) must also be disconnected



Let's go back to the battery wiring. Grab your positive terminal and snake it through the fire wall hole as shown below



Here is an aerial shot of how the positive wire is run down to the bottom of the motor. Notice how it sits below the airbox and runs behind the passenger aide auxiliary radiator



Also take notice to another black piece of wiring that is running down this side with the battery wire. This must also be removed.



As you can tell the aux radiator leaves little room to snake these wires through so we must unbolt the top of the radiator to make some room. Grab a TORX30 and remove this bolt as shown below



With that bolt removed we can now slide the wires under the bracket and in front of the radiator



Now we can crouch down and look where these wires run under the frame rail. Disconnect the black connector for the black wire that we just snaked in front of the radiator. Also take notice to the large ground wire in the back. Get a 13mm socket and extension and remove this while you are there



Almost done. We can remove the clips holding the positive battery terminal line to the frame. They are shown below. There also might be a few zip ties holding some wires on. Remove them accordingly. Once done you should be able to wrap the battery line up onto the manifold for removal



Now all of the wiring components should be free. Stack all of the wiring as shown below on top of the motor neatly for removal.

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Phase 6: Dropping the Shifter Box

Difficulty: 3

Approximate time: 45 Minutes

Okay let's get in the car and prep the shifter box to be dropped so we can pull it out with the motor and trans

First step is to get inside the car and remove the shift boot from the shifter surround. Pinch inward as shown below on both sides (pinch the boot, not the chrome surround) to free the boot from the surround.



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Pull the boot upward like shown below.



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You will notice the boot is held on by a clip. Below is a picture of what the clip looks like. Undo this one time clip and replace with a new one



[Click here to view the original image of 640x360px.](#)



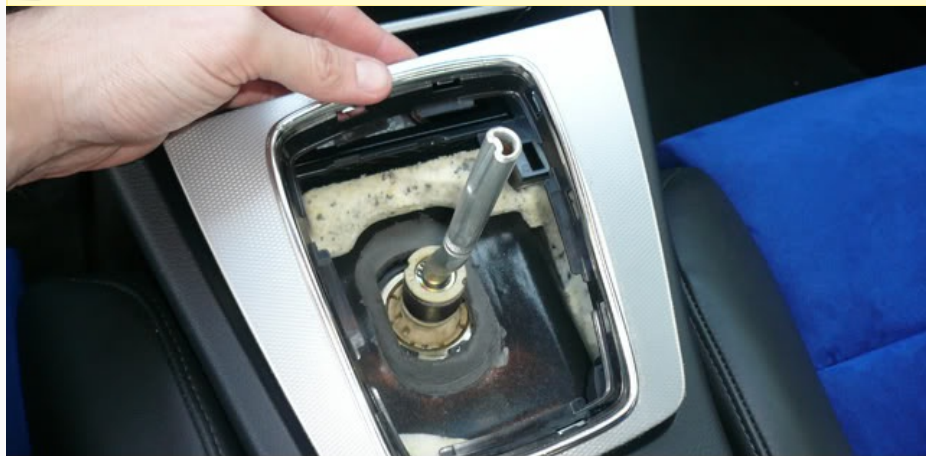
You should now be looking at this.

[Click here to view the original image of 640x360px.](#)



Next step is to pop off the shifter surround trim. It is held on by 4 clips, 1 on each corner. Reach under it and pop it up as shown below.

[Click here to view the original image of 640x360px.](#)



You will notice a 2 foam pieces inside the shifter box. Grab the back piece of foam and pull it out.

[Click here to view the original image of 640x360px.](#)



Now grab the front piece of foam and remove it. Make note of the orientation of the foam piece for reassembly.

[Click here to view the original image of 640x360px.](#)



We are almost to the shifter assembly. Remove the next layer of padding from the shifter box as shown below.

[Click here to view the original image of 640x360px.](#)



After removing this piece of padding you will reveal yet another cover held on by two 10mm bolts. Grab your 1/4" ratchet, 6"+ extension and 10mm socket and remove these two bolts.

[Click here to view the original image of 640x360px.](#)

B6/B7 S4 JHM SS Install

euroaddiction
performance



Once the bolts are out remove the cover.

[Click here to view the original image of 640x360px.](#)



B6/B7 S4 JHM SS Install

euroaddiction
performance

Now you have access to the shifter assembly. To get a little bit more room for the rear bolts we need to loosen up the ashtray. It is not necessary to remove. I did my install without removing the ashtray. It is up to you whether or not you want to remove it or not.

Grab your 1/4" ratchet, 6"+ extension and 8mm socket and remove those two bolts as shown below.

[Click here to view the original image of 640x360px.](#)

B6/B7 S4 JHM SS Install

euroaddiction
performance



Once the ashtray is loose, tilt it upward to give yourself some room to work. If you have the

patience and finesse you can also take the ashtray out, but it is a real pain to do so and not necessary

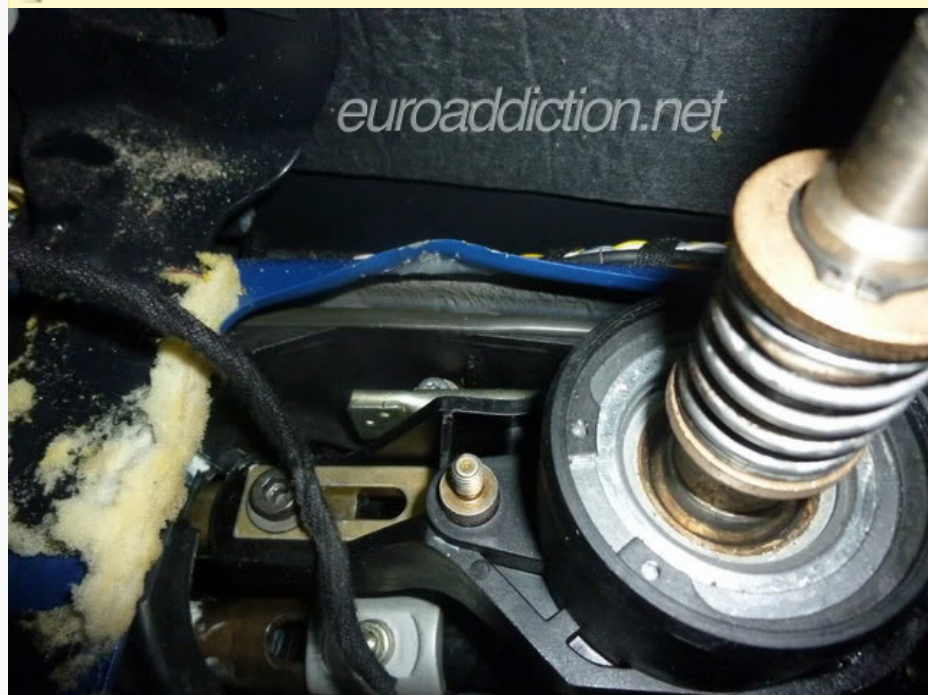
Now we have a view of the whole shifter box from above. Grab your 10 socket and take note to the 4 10mm bolts shown in the picture below. These are holding the shifter box onto the center console. Remove them.

[Click here to view the original image of 640x480px.](#)



With those bolts removed you can push down on the shifter box to break away the seal that is holding it to the console. It won't drop down completely yet as there is a shield that has to be removed from under the car. We will come to that in the next section

[Click here to view the original image of 640x480px.](#)



We are now done inside the interior. The last few steps in the next section are all that is left before the motor comes out.

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Joey Cuccaro
f t in p You

Arnold Palmer Club Member #1

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07-27-2010 05:36 PM

#8

Joey

THE STIG

Addicted Admin

000000



Join Date: Nov 2009

Location: NJ

Posts: 7,169

Garage



Phase 7: Final Components and Engine Pull

Difficulty: 8

Approximate time: 2-3 Hours

First up is the main drive-shaft. It is easier if you have a friend helping you with this part, or else you will have to repeatedly crawl out from under the car to release and set the e-brake.

There are six 6mm hex bolts holding the drive shaft to the transmission. I find it easy if you position the drive shaft to where you can loosen 2 bolts as once. Once you have the drive shaft in a good position to loosen the bolts pull the e-brake handle up to lock it into place. This will prevent it from spinning while breaking the bolts loose. Once you have 2 out, release the e-brake and spin the shaft till you can work on two more bolts. Follow this procedure until all bolts are out.



Six 6mm Hex
E-Brake to Lock Shaft in place

Once the bolts are out we need to break the seal from the shaft and the transmission. To do so, grab a rubber mallet. Gently tap the outer section of the gold mount. Continue to do so while spinning the drive shaft to break the seal all the way around (leave the e-brake off to allow it to spin freely). This will break the seal. Use some force if gentle taps do not work.



Remember how we dropped the shifter box in the last section? Now we need to remove that shield we were talking about. There are four 10mm bolts holding the section below the shifter box on. Their positions are outlined below. Remove all four screws and take out this section.

[Click here to view the original image of 640x480px.](#)




With the section out we can now see the shifter box from under the car. It can now drop down and come out with the transmission



Now it is time to take off the front drive axles. It is necessary to take these off when pulling the motor out of the front of the car due to clearance issues. Take your front wheels off the car to expose the suspension components

Now, there are several ways to go about this. First i recommend breaking loose but not removing the massive HEX 17 Nut that bolts into the drive shaft. To keep the axle shafts from spinning you can simply insert one of your wheel lugs into the hub. This bolt is very tough to break; I recommend a long pipe to put on the end for extra leverage. When you are ready, spin it counter-clockwise to break it loose. Once loose, keep it in there and do not remove. We want to take the inner shaft triple square bolts out first.

 [Click here to view the original image of 640x480px.](#)



Grab a 110 triple square and move to the inner drive shaft bolts that bolt the shaft to the transmission. There are 6 per side. Remove these and the shaft will come free of the transmission



Now you can remove the large 17MM Hex bolt from the hub. You will notice the shaft is still in the hub. To pop it out you can grab a large deep socket to insert in the hub to sit against the end of the drive shaft. Grab a rubber mallet and give the shaft a few good hits to pop it free. Once it is loose you can remove it from the car. Repeat the process for the other side.

If for any reason you decided to take your rotors during this DIY you can still get the drive shafts loose. You will simply need to hold the hub during the inner and outer bolt remove with a large monkey wrench while a friend loosens the bolts. Again, just another way to prevent the shaft from spinning if you for some reason took the rotors off



[Click here to view the original image of 640x480px.](#)



Next we need to loosen the cross member. It is the cast aluminum piece that runs above the downpipes. Grab a 13mm socket and remove the three bolts holding the upper plate to the transmission.

[Click here to view the original image of 640x480px.](#)



Next, grab a 18mm socket and a larger breaker bar. I recommend the breaker bar because these things are on tight. There are 6 18mm bolts that need to come off (3 per side) as you can see below.



[Click here to view the original image of 640x480px.](#)



You will notice the transmission begin to sag when taking these bolts out. It is okay as it will rest on the sub frame. If you feel un-easy you can prop a jack stand underneath to support the transmission. With the cross member free you can either pull it out if you can wiggle it free or simply left it rest on the downpipes till we remove the motor.

Now it is time to get your engine hoist ready. For this pull i had the boom all the way in to the 1/2 ton setting. This setting is nice if you have clearance issues with a ceiling. I had no problems hoisting the motor out on this notch.

Grab your chain and hooks. There are two engine lift points we will be using. 1 is very simple to spot. It is sticking out on the drivers front side of the manifold. Anchor your hook and attach it to your chain.

[Click here to view the original image of 640x480px.](#)



The next lift point is on the back left side of the manifold. It is kind of buried to the left of the throttle body and the check valve. Locate it and repeat the last step.

[Click here to view the original image of 640x480px.](#)

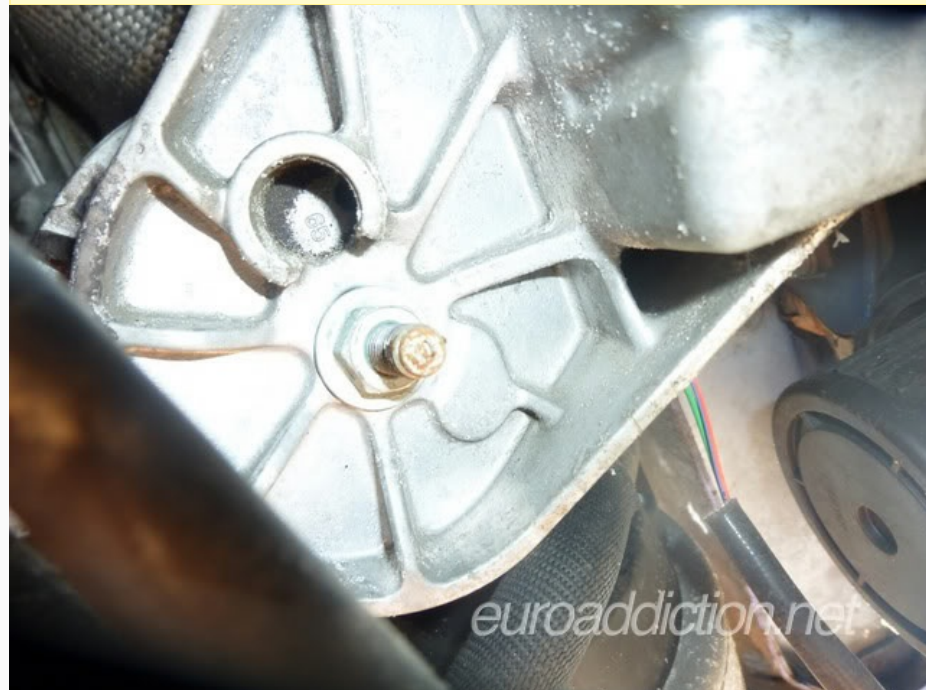


Now, attach the chain to your boom and put on pressure on the motor. Do not lift yet as we still need to un-do the motor mounts.



Grab a 13mm deep socket and get under the motor mounts. The drivers side will only have one 13mm bolt. Remove it

[Click here to view the original image of 640x480px.](#)



The passenger side will have two 13mm bolts (1 under the other as the top is holding on a bracket). Remove the first along with the bracket and then remove the second

<http://i456.photobucket.com/albums/q.../P1000611.jpg>

GET HELP FOR THIS PART!

Now, this is the part where you will need some assistance. I recommend having a friend under

the car guiding the trans and shifter box out. Have another friend guide the top of the motor while you man the hoist. Begin the jack the engine up while having your friends make sure everything is clear. Once you are free of the motor mounts you should be able to pull it forward a bit.

STOP! DON'T PULL IT OUT TOO FAR!

We still have to disconnect the rear coolant line on the back of the motor and the slave cylinder. Make sure the motor is a good 6-8 inches out from the firewall to access these two components. Here is what you should be looking at



Notice the coolant line. It is held onto the connector via a spring clip. Grab a flat head and pop this clip out. This will allow you to pull the coolant line free of the motor (careful as some coolant still might come out). Here we can see the coolant line disconnected



Lastly, we have the slave cylinder. Some people recommend disconnecting the hard line and re-bleeding later. I feel this is more difficult and a longer approach. I recommend simply unbolt it via the 6mm hex bolt shown below and popping it free. When the 6mm HEX is out, you can pull backward on the slave and it will pop free. Make sure the gear is in neutral or 4th to give you more room.



And removed



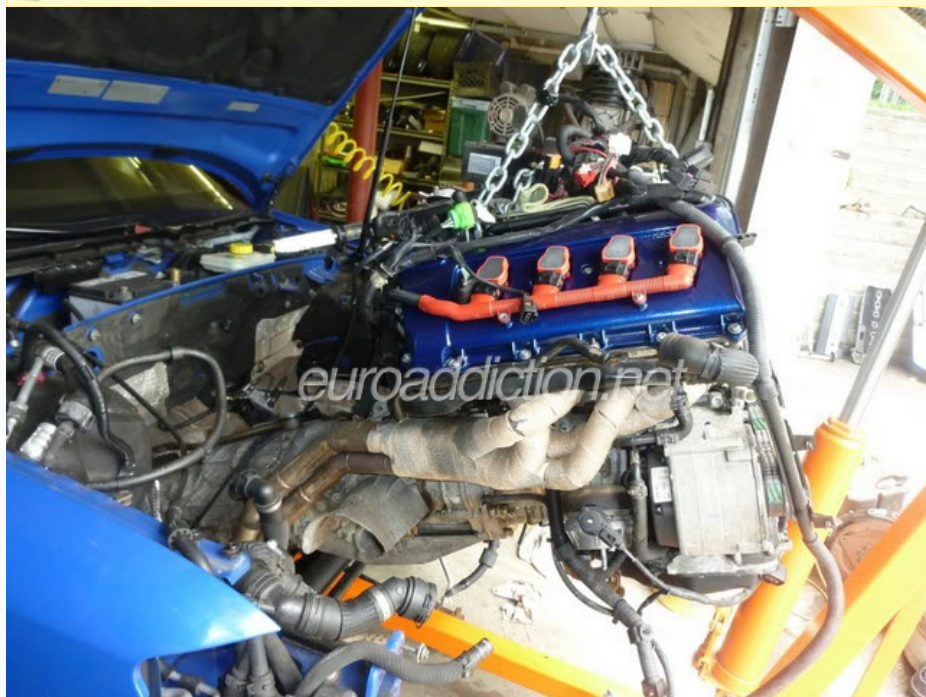
Now every component is free and the motor is able to come out. This part will take some finesse

and patience. You will be able to wiggle and guide the motor out, it just take a little bit of time and team work. Here are some shots of the motor coming out

[Click here to view the original image of 640x480px.](#)



[Click here to view the original image of 640x480px.](#)



And out of the car!

[Click here to view the original image of 640x480px.](#)




[Click here to view the original image of 640x480px.](#)



And there you have it ladies and gentlemen. The longest and most comprehensive DIY i have put together to date. It was surely time consuming and challenging to document all of this, but it was worth it for the benefit of the community. I hope all of you can take this article and put it to some use. Make a fun day or weekend out of it and have some fun, learn about your car, and save some money. I hope you enjoy it as much as i have.

Joey Cuccaro

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 stegura likes this.



Joey Cuccaro
f t in p You

Arnold Palmer Club Member #1

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07-27-2010 05:36 PM

#9

Joey

THE STIG

Addicted Admin

000000



Join Date: Nov 2009

Location: NJ

Posts: 7,169

Garage



Supplemental Pictures

JHM Headers

Click here to view the original image of 640x480px.



Click here to view the original image of 640x480px.



Drivers Side: To install the headers on the drivers side you will need to remove the main coolant line. Some of the bolts are tricky and will require finesse, patience and special tools like crows feet. All header bolts are 10mm

[Click here to view the original image of 640x480px.](#)



[Click here to view the original image of 640x480px.](#)



Passenger side: Again, main coolant line must be removed. Belt, belt tensioners, and alternator must all be removed to install the header on this side.

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[Click here to view the original image of 640x480px.](#)



Stock Manifold vs JHM Headers

The headers are a true piece of art that everyone should appreciate

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[Click here to view the original image of 640x480px.](#)



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Last edited by sakimano; 07-29-2010 at 10:03 AM.

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Joey Cuccaro
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Arnold Palmer Club Member #1

07-27-2010 05:37 PM

#10

Joey

THE STIG

Addicted Admin

000000



Join Date: Nov 2009
Location: NJ
Posts: 7,169
Garage



Reserved

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Joey Cuccaro



Arnold Palmer Club Member #1

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07-29-2010 09:28 AM

#11

staticuxo

Enthusiast



Join Date: Jan 2010
Posts: 260



wow, incredible writeup. this is huge for the B6/7 S4 community



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stegura likes this.

Dolphin Grey B7 S4
Gutted 2.5" Downpipes / Fast Intentions Exhaust / JHM Tune / KW V3 / OEM RS 4 wheels / JHM Solid Short Shifter / Cupra Lip / RNS-E / RS 4 Carbon Fiber / RS 4 Shifter & E-Brake / Clear Bra / LED Plate & City Lights

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07-29-2010 09:36 AM

#12

boravr6

IMOLA - THE FASTEST COLOR

Contributor Addict

000



Join Date: Jan 2010
Location: Barrie
Posts: 983



supplemental pics arent watermarked!!! DO IT!!!

Awesome writeup Joey! Thanks for taking the time!!!

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~ 2006 Imola B7 S4 sedan 6MT
~ 2004 Silver B6 S4 sedan 6MT *SOLD*

Arnold Palmer Club Member #8

07-29-2010 09:59 AM

#13

DaveD

euro addict

Addicted Admin

0000



Join Date: Nov 2009

Location: NJ

Posts: 3,853

Garage



Awesome work bro!

Share



Previous rides:

E53 X5 6 speed - E36 M3 - E350 Coupe - E63 M6 - E46 ZHP - E60 M5 - E46 M3 Vert
E90 335i - E30 Mtech1 S50 -2005 **Nogaro** S4 - Lotus Elise - E90 335i - B6 S4 Cab - E46 ///M3
2005 PES S/C S4 - 2004 **Nogaro** S4 - 2000 **S4** Stage II - 2007 A4 2.0T K04 - 2004 A4 1.8T USP

Royal Flush Rallies

N.E.R.D

Arnold Palmer Club Member #3

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07-29-2010 10:04 AM

#14

sakimano

Vernichtungsgedanke

Contributor Addict

000000



Join Date: Nov 2009

Location: Oakville, ON

Posts: 7,773



Wow.

Wow.

Share

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07-29-2010 10:08 AM

#15

akaEsCo01

EA Member

0



Join Date: Mar 2010

Posts: 33



do work bro, I'm pulling one pretty soon too

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07-29-2010 11:25 AM

#16

angep18t

Euro Addict

000000



Join Date: Apr 2010

Location: 973, New Jersey.

Posts: 3,034



Awesome job Joey.

Share

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07-29-2010 11:35 AM

#17

enigma1406 ▾

Venture Capitalist

Contributor AddictJoin Date: Jan 2010
Posts: 190

Pretty insane. Thanks man.

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07-29-2010 11:53 AM

#18

BUD ▾

Enthusiast

Join Date: Jan 2010
Location: Hollywood, California
Posts: 262

holly shit. enough said.

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stegura likes this.

[Reply With Quote](#)

07-29-2010 12:26 PM

#19

drew ▾

Euro Addict

Join Date: Nov 2009
Location: so cal
Posts: 1,698

epic. joey you are the freaking man! thanks for everything

[Share](#)

05 S4 6MT Light Silver/Black-Silver Alcantara

[Reply With Quote](#)

07-29-2010 02:33 PM

#20

jdmnomore ▾

Enthusiast

Join Date: Jan 2010
Location: NJ
Posts: 480

So easy a caveman could do it lol nice joey

[Share](#)**Car:** 04 S4**Mods:** 034 Adjustable Upper Control Arms / FI Non Res Exhaust / Milltek 2.5in Catless DPs / JHM93 Tune / JHM Intake Spacers / H&R Sport Springs / JHM Short shifter / Adams Slotted+Dimpled Rotors / Goodrich SS Brake Lines / Hawk HPS pads / Apikol Snub Mount / evo THOR skidplate[Reply With Quote](#)

07-29-2010 05:16 PM

#21

richib86 ▾

Nino Brown

Contributor Addict

pretty epic. sick work brohan

Addicted Mod



Join Date: Jan 2010
Posts: 573

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2011 S4, 6 speed, phantom black, black and silver nappa leather, carbon atlas inlays, prestige, B&O, sport diff, titanium package, S4 alu-optics package, re-VAGed car, JHM short throw, AWE boost gauge, KW V3 coilovers, APR 93 octane flash, Miltek full res exhaust, tunerdomes LED's throughout entire car, VNSmedia tv simulator, Eurocode headers, BBS CH-R 19x8.5, E-code's, TT-RS steering wheel, RS4 pedals/dead pedal
2007 RS4 Mugello Blue HIGHLY MODDED- gone but not forgotten



2004 S4 dolphin gray highly modded- gone

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07-29-2010 06:39 PM

#22

ahhhudi

EA Member



Join Date: Dec 2009
Location: North Chicago area
Posts: 83



WOW

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Current Audi: 05 S4 B6. Eclipse AVN726e Navigation system.Eclipse iPod audio/video interface.Eclipse rear view/back-up camera setup.RS pedals(RS6 brake pedal, RS4 throttle & dead pedal).Audi Sport rubber floor mats. V8 insignia. 35% front/20% rear tint.
Previous Audi: 01 S4 B5. Bone Stock.

Reply With Quote

07-29-2010 07:52 PM

#23

1badg35

EA Member



Join Date: Apr 2010
Posts: 10



damn that is great. thanks Joey

Share

2005 Audi S4 Moro blue- Milltek Catless DP's, Milltek non res exhaust, JHM tune, JHM intake manifold spacers, Hsport f/r sways
1990 Nissan 300zx show car
2002 Audi TT225 (sold)

Reply With Quote

07-29-2010 08:13 PM

#24

bzurke

EA Member



Join Date: Jan 2010
Location: NC
Posts: 33

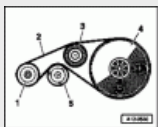


Great writeup Joey.

Now, um, how do I get it back in?

Your alt. belt is routed goofy. This is what I've seen:

Attached Thumbnails



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07-29-2010 08:18 PM

#25

Silver B6 S4

O.T.S.S.!

Contributor **Addict**



Join Date: Nov 2009
Location: Novato, California
Posts: 763



WOW!

Amazing work Joey!

This is going to make pulling mine so much easier when I need to do it.

Alex

Share

Reply With Quote

07-29-2010 08:52 PM

#26

tyler

Enthusiast



Join Date: Nov 2009
Location: nw
Posts: 348



best diy ever

Share

Reply With Quote

07-30-2010 06:44 AM

#27

algee007

Enthusiast



Join Date: Feb 2010
Location: Denver "The Sunshine State"
Posts: 232
Garage ▼



dannnnnnng Joey, awesome stuff!

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07-30-2010 07:22 AM

#28

Joey

THE STIG

Addicted **Admin**



Join Date: Nov 2009
Location: NJ
Posts: 7,169
Garage ▼



Originally Posted by **bzurke**

Great writeup Joey.

Now, um, how do I get it back in?

Your alt. belt is routed goofy. This is what I've seen:

Good eye! I noticed that as soon as the nose came off. It was routed wrong by the previous owner. I slapped it on the correct way when i put the tensioner back on. Interesting how it worked being routed that way.

As for getting it back in, basically follow the DIY in reverse. Everything is pretty much the same.

Share



Joey Cuccaro
f t in p You Tube

Arnold Palmer Club Member #1

Reply With Quote

07-30-2010 05:56 PM

#29

Old Baldy

Enthusiast



Join Date: Dec 2009
Location: South Lyon, MI, USA
Posts: 490
Garage



You, sir, are a f#cking STAR!!!

thanks Joey!

Share

Old Baldy
Audi S4 B6 6-speed
Ducati 996 with hot 999 motor
KLR650 '06
KLR650 '02
OB's Blog
OB's Audi S4 Fuelly data

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08-06-2010 04:42 PM

#30

tyler

Enthusiast



Join Date: Nov 2009
Location: nw
Posts: 348



thanks again for this. i'm going to pull the front axels this time which should make this a ton easier

Share

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09-09-2010 09:54 AM

#31

Joey

THE STIG

Addicted Admin



Join Date: Nov 2009
Location: NJ
Posts: 7,169
Garage



Curios as to if anyone has used this article to assist them with a motor pull yet?

Share



Joey Cuccaro

09-09-2010 01:51 PM

#32

tyler

Enthusiast
 00



Join Date: Nov 2009
 Location: nw
 Posts: 348



yarr i referenced it a good few times putting it back together.

one thing: getting the axels back in are a bit of a bitch (i had to drop the control arms), and the collar bolts are one time use bolts.

Share

09-09-2010 01:54 PM

#33

Joey

THE STIG

Addicted Admin
 000000



Join Date: Nov 2009
 Location: NJ
 Posts: 7,169
 Garage



Originally Posted by tyler

yarr i referenced it a good few times putting it back together.

one thing: getting the axels back in are a bit of a bitch (i had to drop the control arms), and the collar bolts are one time use bolts.

Yes good point. You can remove the axles without dropping the suspension, but its nearly impossible to get them back in.

You need to un-do the top pinch bolt and pop out the two control arms. Then undo the tie-rod. This will allow you to drop the steering knuckle down to give you enough clearance.

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Joey Cuccaro

09-09-2010 08:39 PM

#34

tyler

Enthusiast
 00



Join Date: Nov 2009
 Location: nw
 Posts: 348



any idea what i should torque the bolts holding the half shafts to the transmission? the good ol bentley had another "refer to" and no information 🙄

Share

01-03-2012 05:26 PM

#35

Joey

THE STIG

Addicted Admin

000000



Join Date: Nov 2009

Location: NJ

Posts: 7,169

Garage



Made a few slight changes in Phase 2 concerning coolant drainage.

Share



Joey Cuccaro



Arnold Palmer Club Member #1

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01-04-2012 04:17 PM

#36

norcal

El Duderino

Contributor Addict

000



Join Date: Dec 2009

Location: ATX

Posts: 1,469

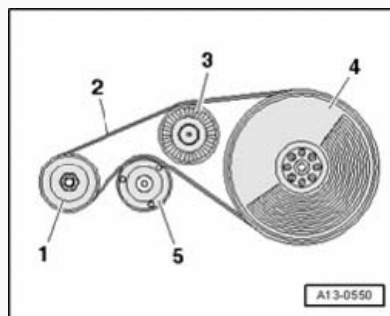
Garage



hey joey, the serp is installed incorrectly in this photo



this is correct (from serp diy)



I ran my serp like that (incorrectly) for about 8k miles before it grenaded on me. Started with a subtle noise at idle but grew to quite a racket within a few thousand miles.

-justin

B6 S4 MT Avant and a '61 15-window

Reply With Quote

01-04-2012 08:13 PM

#37

Joey

THE STIG

Addicted Admin

000000



Join Date: Nov 2009

Location: NJ

Posts: 7,169

Garage



^Agreed. That is how it was routed when i pulled the car apart. When i re-installed the motor i put it on with the correct orientation

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Joey Cuccaro
f t in You

Arnold Palmer Club Member #1

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05-15-2012 02:56 PM

#38

G-Rat

New Member



Join Date: Apr 2012

Posts: 3



Is it absolutely necessary to remove the transmission when pulling the engine? Seems like many steps could be saved by leaving it in the car. Not to mention, it would be much easier to pull the engine out of the car without 4 feet of transmission/shifter hanging off the back of the motor.

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11-11-2012 05:19 PM

#39

G60ING

New Member



Join Date: Nov 2012

Posts: 1



Thanks for a great DIY.

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12-04-2012 11:59 AM

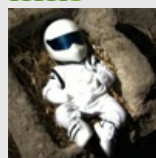
#40

Joey

THE STIG

Addicted Admin

000000



Join Date: Nov 2009

Location: NJ

Posts: 7,169



Originally Posted by **G-Rat**

Is it absolutely necessary to remove the transmission when pulling the engine? Seems like many steps could be saved by leaving it in the car. Not to mention, it would be much easier to pull the engine out of the car without 4 feet of transmission/shifter hanging off the back of the motor.

Up to you, but i prefer to just remove the whole thing

Originally Posted by **G60ING**

Thanks for a great DIY.



Thanks. Did you use it?

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Joey Cuccaro

Arnold Palmer Club Member #1

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DIY motor pull?
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01-26-2013, 02:00 PM

Header Install ** Is an engine "drop" necessary or is it possible to lift out engine?
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07-24-2011, 11:21 AM

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