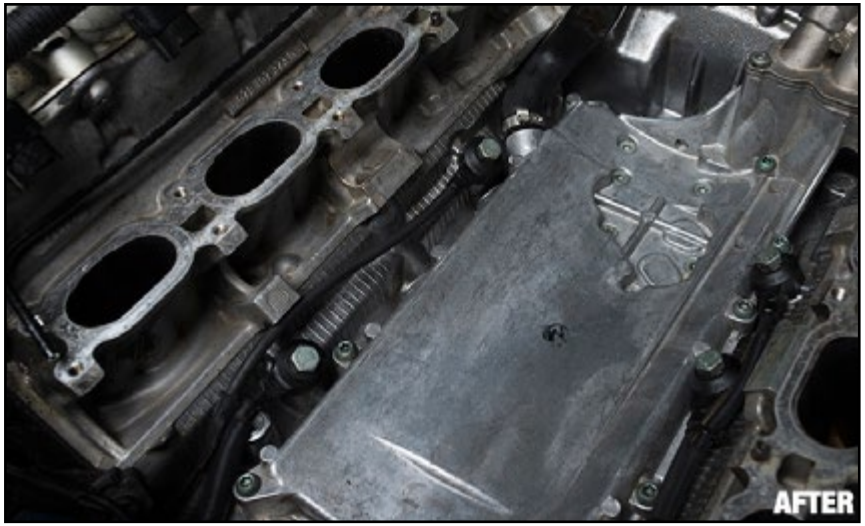
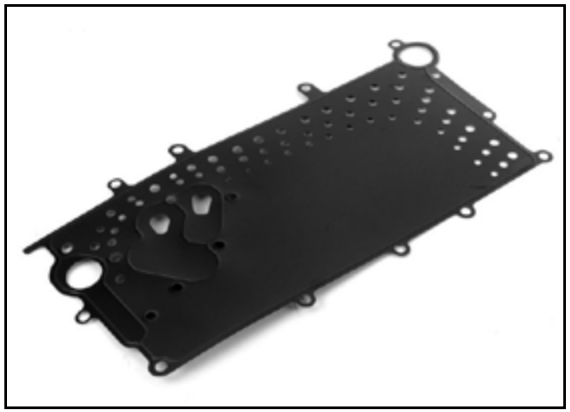
Audi B6/B7 S4 Oil Check Valve Service Kit Installation



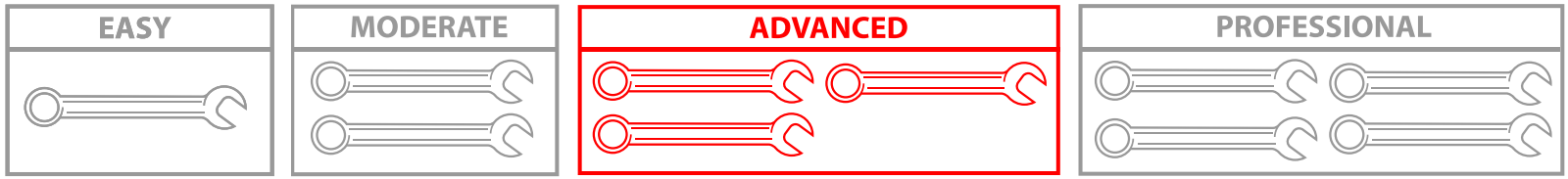


INTRODUCTION

Audi B6/B7 S4 Oil Check Valve Service Kit ES#2765724

When the Oil Check Valves on your V8 powered Audi B6/B7 S4 fail it can cause a loud rattling noise during warm engine starts. Our Oil Check Valve Service kit includes everything you need to fix the problem:

- New Valley Pan Gasket
- New Intake Manifold Gaskets
- New Oil Check Valves
- New Oil Spray Valve
- New Oil Filter Housing Seals



Replacing the Oil Check Valves on your V8 powered Audi B6/B7 S4 is a rewarding project that an experienced technician will be able to complete in a weekend, plan accordingly based on your experience level. We **HIGHLY** recommend that you change the engine oil and filter after you perform this repair, just in case any dirt or contaminants are allowed to enter the engine. The Oil Check Valve Service Kit includes everything you need to perform the complete repair. Don't forget that by performing this repair you will also be fixing any valley pan leaks you may have. Before you begin, read and familiarize yourself with these instructions and make sure you have all the required tools on hand. Thank you for purchasing our Oil Check Valve Service Kit, we appreciate your business!

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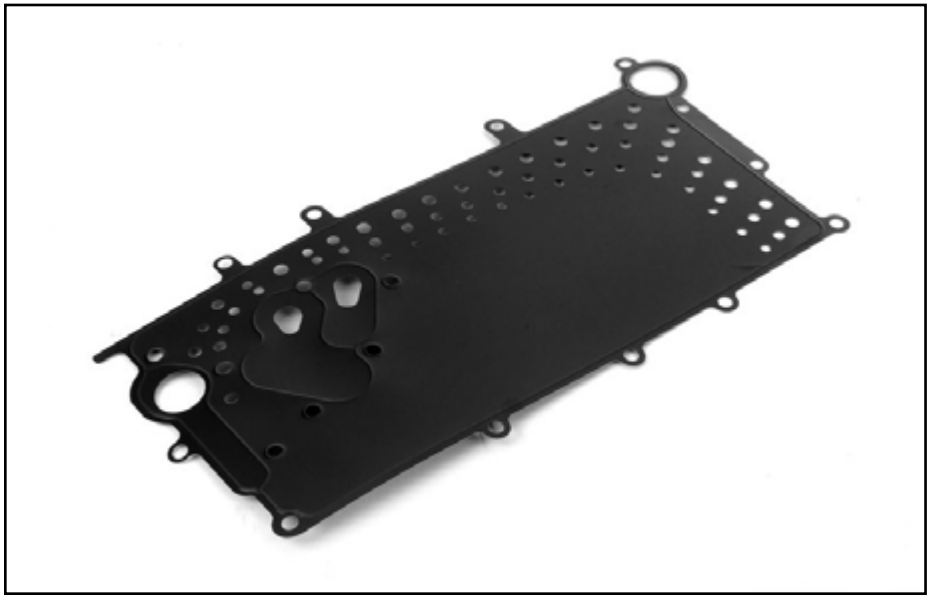
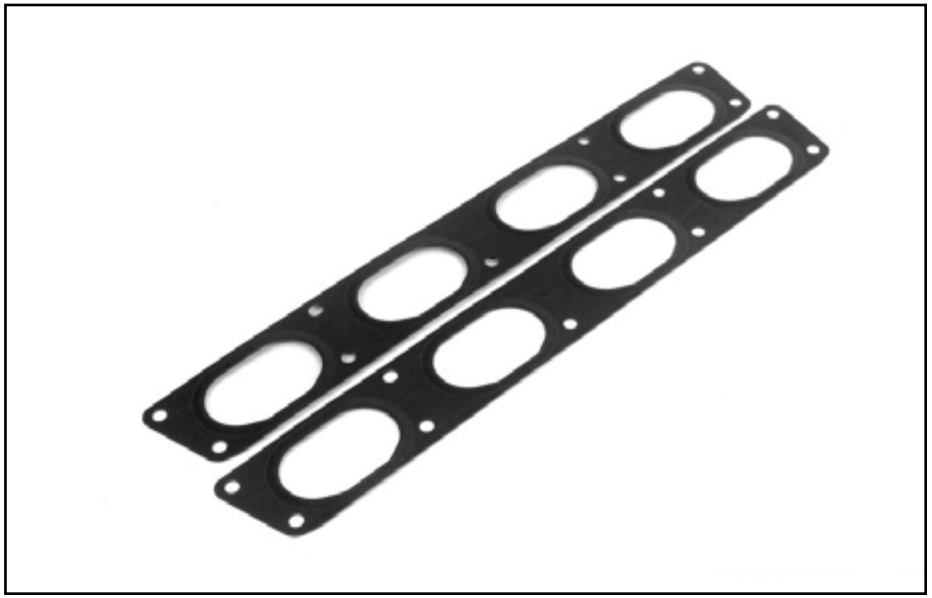
KIT CONTENTS



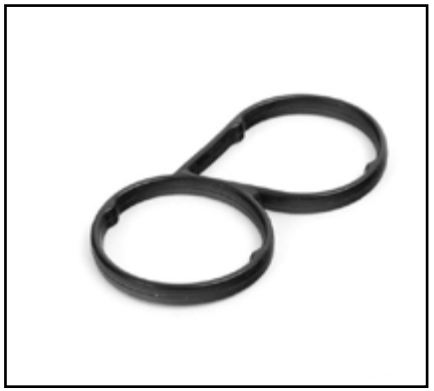
Valley Pan Gasket



Intake Manifold Gaskets

Oil Check Valves

Oil Filter Housing To Timing Cover Seal



Oil Filter Housing To Valley Pan Seal

Oil Spray Valve

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REQUIRED TOOLS

Note: The tools required for each step will be listed by the step number throughout these instructions.

We recommend that you have a complete selection of tools and equipment necessary for automotive repair. Below is a list of the tools we used to install the Audi Oil Check Valve Service Kit. Additional tools may be required for any issues that arise during installation such as rust, corrosion, or broken and stripped fasteners.

- 1/4" Drive Ratchet ..... Available at ecstuning.com ..... ES#2093757
- 3/8" Drive Ratchet ..... Available at ecstuning.com ..... ES#2765902
- 3/8" Drive Torque Wrench ..... Available at ecstuning.com ..... ES#2221245
- 3/8" Drive Sockets: 10mm, 13mm ..... Available at ecstuning.com ..... ES#2763772
- 1/2" Drive Breaker Bar ..... Available at ecstuning.com ..... ES#2776653
- 1/2" Drive Torque Wrench ..... Available at ecstuning.com ..... ES#2221244
- Flat and Phillips Blade Screwdriver(s) ..... Available at ecstuning.com ..... ES#2225921
- Torx Bit Sockets: T20, T25, T30 ..... Available at ecstuning.com ..... ES#11418
- Allen Bit Sockets: 5mm, 6mm ..... Available at ecstuning.com ..... ES#11420
- M10 Triple Square Socket ..... Available at ecstuning.com ..... ES#1910125
- Drain Pan ..... Available at ecstuning.com ..... ES#2748892
- Hose/O-Ring Picks ..... Available at ecstuning.com ..... ES#2778980
- Lock Carrier Tool Set ..... Available at ecstuning.com ..... ES#2710836
- Telescoping Hood Prop ..... Available at ecstuning.com ..... ES#2748795
- VAG Connector Removal Tool ..... Available at ecstuning.com ..... ES#2628676
- Needle Nose Pliers, Cutting Pliers
- 3/8" Drive Extensions
- 1/2" Drive Extensions
- 1/2" Drive Socket: 13mm

SHOP SUPPLIES AND MATERIALS

- Hand Cleaner/Degreaser ..... Available at ecstuning.com ..... ES#2167336
- Aerosol Brake Cleaner ..... Available at your local auto parts store
- Shop Rags ..... Available at your local auto parts store
- Aerosol Spray Lubricant/Penetrating Oil ..... Available at your local auto parts store

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INSTALLATION NOTES

- **RH** refers to the passenger side of the vehicle.
- **LH** refers to the driver side of the vehicle.
- Always use the proper torque specifications.
- If applicable to this installation, torque specifications will be listed throughout the document and at the end as well.
- Please read all of these instructions and familiarize yourself with the complete process **BEFORE** you begin.

GENERAL PREPARATION AND SAFETY INFORMATION

ECS Tuning cares about your health and safety. Please read the following safety information. This information pertains to automotive service in general, and while it may not pertain to every job you do, please remember and share these important safety tips.

- Park your car in a safe, well lit, level area.
- Shut the engine off and remove the key from the ignition switch.
- Make sure any remote start devices are properly disabled.
- **ALWAYS** wear safety glasses.
- Make sure the parking brake is applied until the vehicle is safely lifted and supported.
- If using an automotive lift, be sure and utilize the factory specified lift points. Lifting a vehicle in an incorrect location can cause damage to the suspension/running gear.
- When lifting a vehicle using a jack, always utilize the factory specified lift points. Lifting a vehicle in an incorrect location can cause damage to the suspension/running gear. **ALWAYS** support the vehicle with jack stands.
- Always read and follow all safety information and warnings for the equipment you are using.

Never get underneath a vehicle that is supported only by a jack. Always make sure that the vehicle is securely supported on jack stands.

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REMOVING THE OLD CHECK VALVES

Step 1:

For this installation we chose to place the front lock carrier into “service position”. This is a design feature of the vehicle and is extremely beneficial for several reasons:

1. It is a very simple process to perform.
2. It makes it significantly easier to access all of the necessary components, connectors, and hoses.
3. It makes it significantly easier to clean any oil residue or spills from the engine.
4. It prevents any damage by providing the necessary clearance for component removal.

This process is detailed on Page 30.

Step 2: Telescoping Hood Prop

Prepare for the job by placing fender covers over the fenders and front core support.

TECH TIP

If your hood strut is worn and won’t securely support the hood, use a telescoping hood prop for safety.

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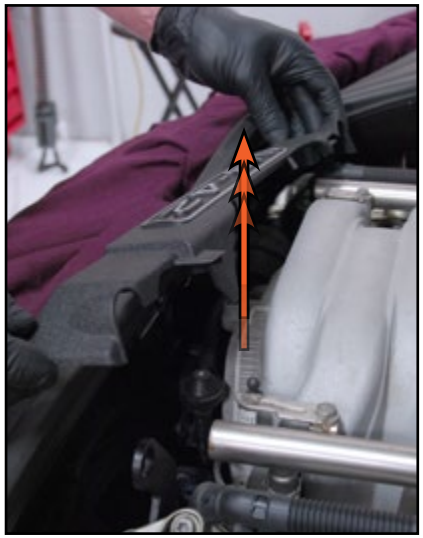
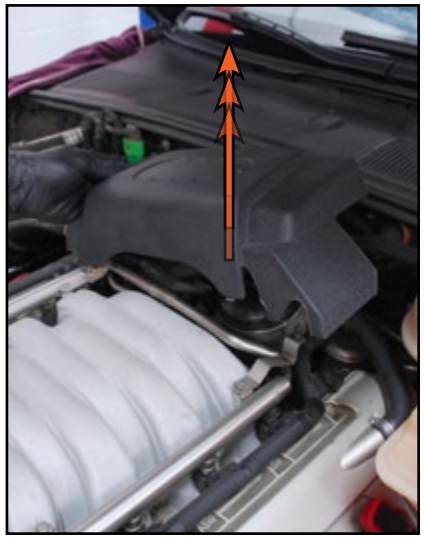
REMOVING THE OLD CHECK VALVES

Step 3:

Remove the front and rear engine beauty covers by pulling upwards to release them from their mounts.





Step 4: 3/8" Drive Ratchet, 19mm Socket

Unthread the oil filter housing cap to allow the oil to drain through the engine, then reinstall and torque the cap to 18 Ft-lbs after the oil has drained from the housing.

CAUTION

These steps should only be performed after the engine has been allowed to cool, DO NOT perform steps 4 & 5 while the engine is still warm.

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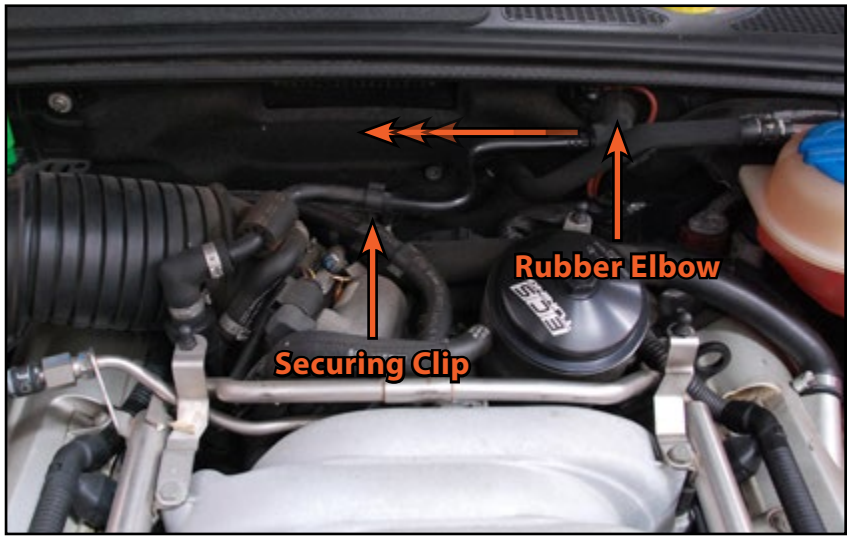
REMOVING THE OLD CHECK VALVES

Step 5:

Loosen the coolant reservoir cap to allow any system pressure to be released, this will help to lessen coolant spills during later steps. Reinstall the cap once the pressure has been released.

Step 6:

Unclip the vacuum pipe from the securing clip, then carefully pull the pipe out of the rubber elbow on the firewall.



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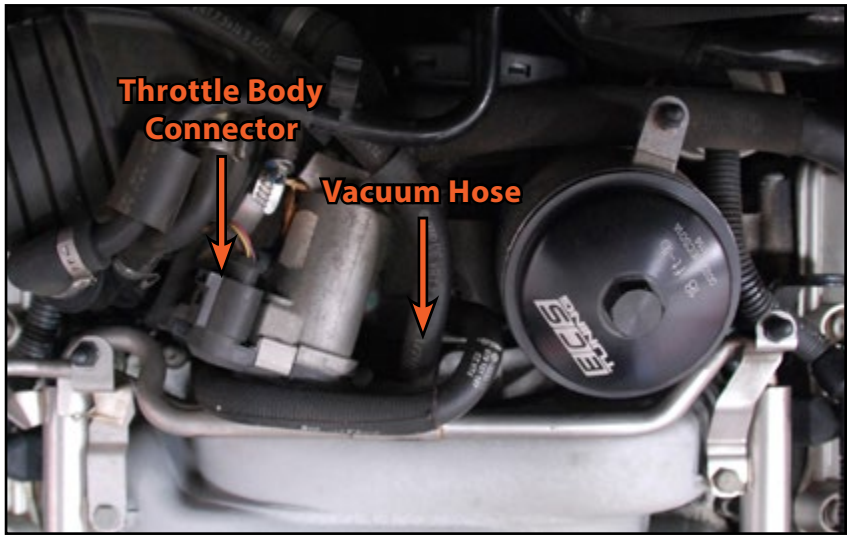
REMOVING THE OLD CHECK VALVES

Step 7: Needle Nose Pliers

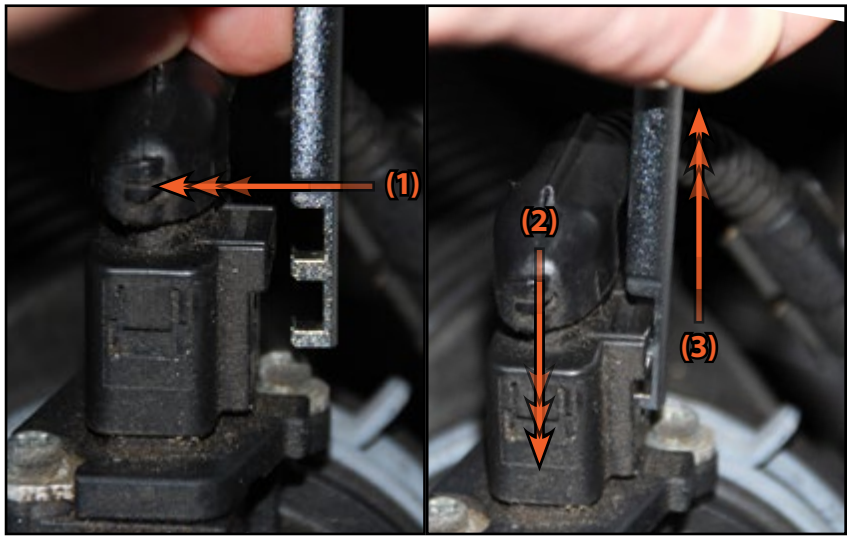
Remove the vacuum hose shown in the photo from the throttle body by squeezing the spring clip and pulling the hose upwards. Locate the throttle body connector, then proceed to the next step.



Step 8: VAG Connector Tool

These connectors are commonly referred to as “Push and Pull” connectors, in reference to the method used to disconnect them. Disconnect the throttle body connector as follows:

1. Engage the connector release tool into the connector housing.
2. Push down gently on the connector.
3. While holding pressure downward on the connector, pull up on the handle of the release tool.
4. Move the harness out of the way.



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REMOVING THE OLD CHECK VALVES

Step 9: Cutting Pliers or Small Flat Blade Screwdriver

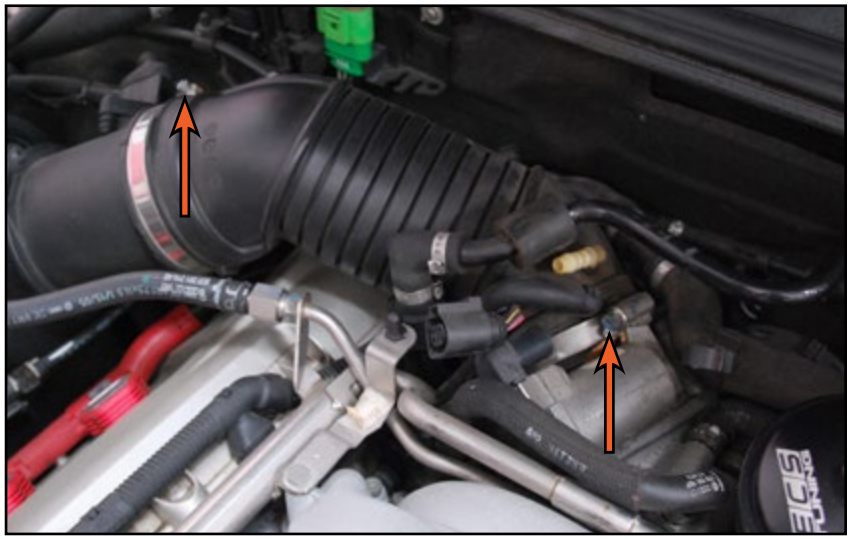
Cut or release the clamp securing the small hose on the intake boot, then pull the hose off of the elbow. Removing the hose in this manner will reduce the risk of breaking the fragile plastic elbow.

TECH TIP

This type of hose clamp must be replaced once it is removed, the replacement part is ES#467785.

Step 10: Flat Blade Screwdriver

Loosen the two clamps on the intake boot and remove the boot from the vehicle.



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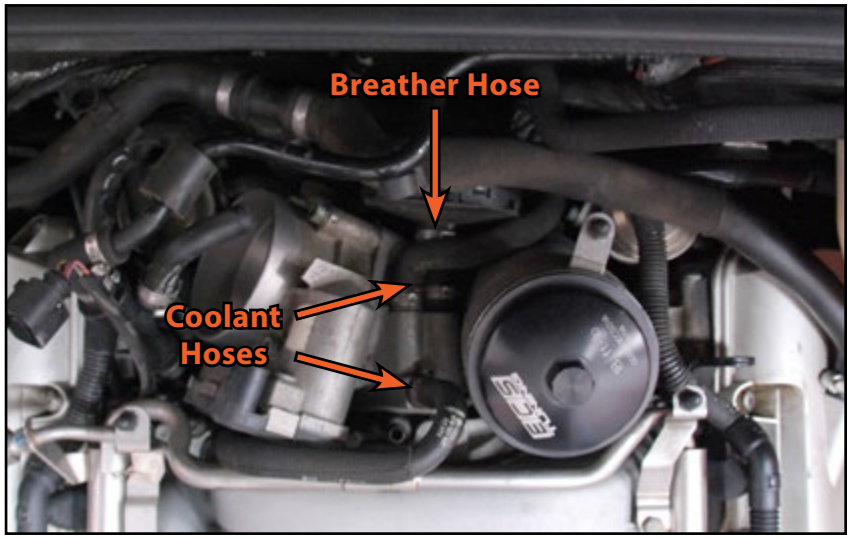
REMOVING THE OLD CHECK VALVES

Step 11: Cutting Pliers or Small Flat Blade Screwdriver

Cut or release the clamps on the three remaining hoses shown in the photo, then remove the hoses and push them out of the way. Some coolant may spill out of the coolant hoses after removal, but it should be a very small amount.



TECH TIP

Replacement clamps for the breather hose: ES#51766, and replacement clamps for the coolant hoses: ES#467401.

Step 12:

Disconnect the vacuum line located at the front LH corner of the engine compartment by squeezing the release tabs and pulling it out of the connector.

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REMOVING THE OLD CHECK VALVES

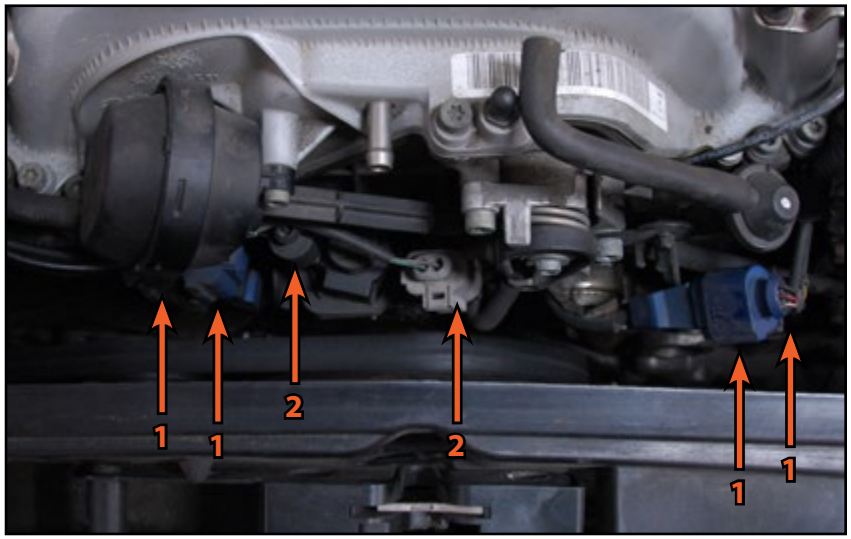
Step 13:

At this point you will need access to the front of the engine. It is extremely beneficial to have the lock carrier in service position as recommended in Step 1. If you have not done this, refer to Page 30, then continue with Step 14.

Step 14: Flat Blade Screwdriver, VAG Connector Tool

There are six electrical connectors on the front of the intake manifold. The blue and black connectors (#1) are for the Knock Sensors, which are located underneath the Intake Manifold. Do not disconnect these connectors, simply push them towards the front of the vehicle to slide them out of their mounting brackets.

Disconnect the two connectors near the center of the manifold (#2).



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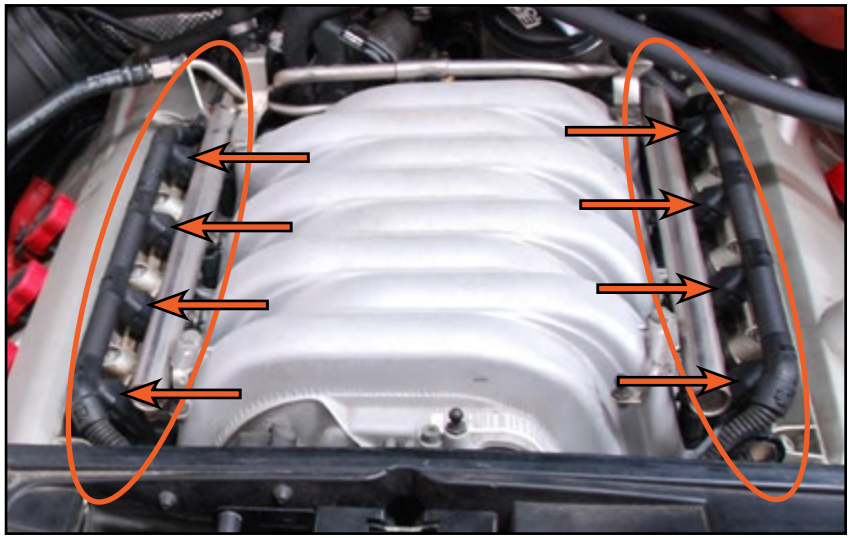
REMOVING THE OLD CHECK VALVES

Step 15:

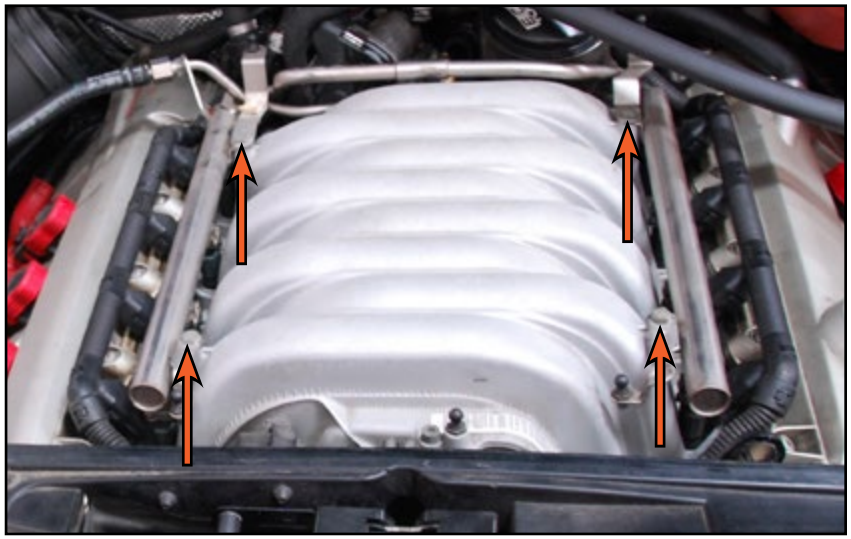
Thoroughly clean the area around the intake manifold and fuel rail (circled in the photo), use spray cleaners, compressed air, vacuums, anything necessary to remove **ALL** contaminants and grit from this area. Any dirt or contaminants left in this area will fall into the combustion chambers when the fuel rail and intake manifold are removed.

Next, release all eight fuel injector electrical connectors from the injectors (arrows in the photo) by pushing each connector down onto the injector, gently squeezing the release tab, and then pulling it off of the injector.



Step 16: 3/8" Ratchet, 10mm Socket

Remove the four bolts which secure the fuel rail to the intake manifold.



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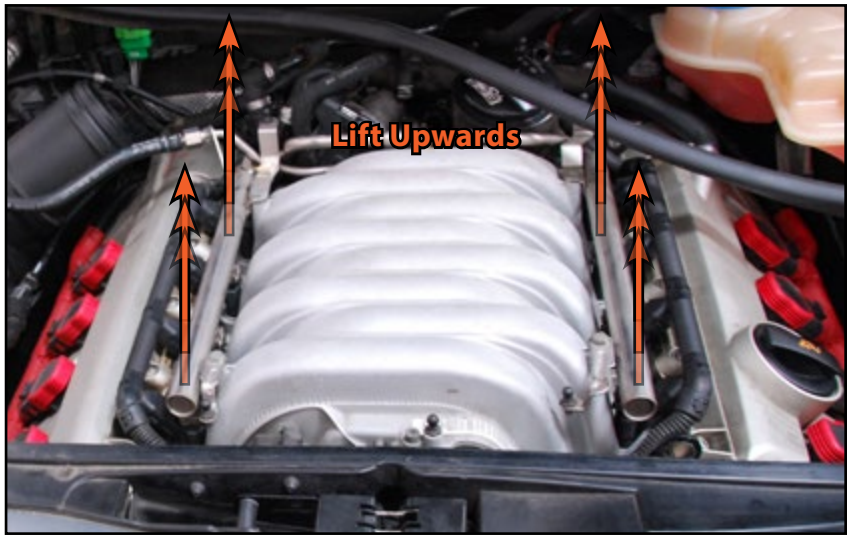
REMOVING THE OLD CHECK VALVES

Step 17:

Gently lift on the fuel rail one corner at a time until all eight injectors pop out of the intake manifold. Take your time with this process to prevent any damage to the injectors or to the fuel rail.



Step 18:

You can now flip the fuel rail upside down and lay it on the wiper cowl as shown in the photo without needing to disconnect the fuel line.

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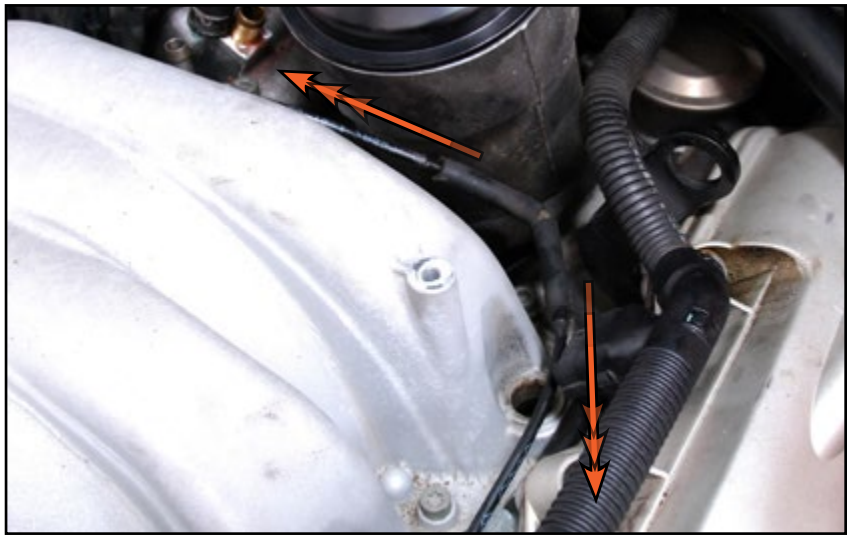
REMOVING THE OLD CHECK VALVES

Step 19:

Remove the vacuum lines from the vacuum “T” located in front of the oil filter housing.

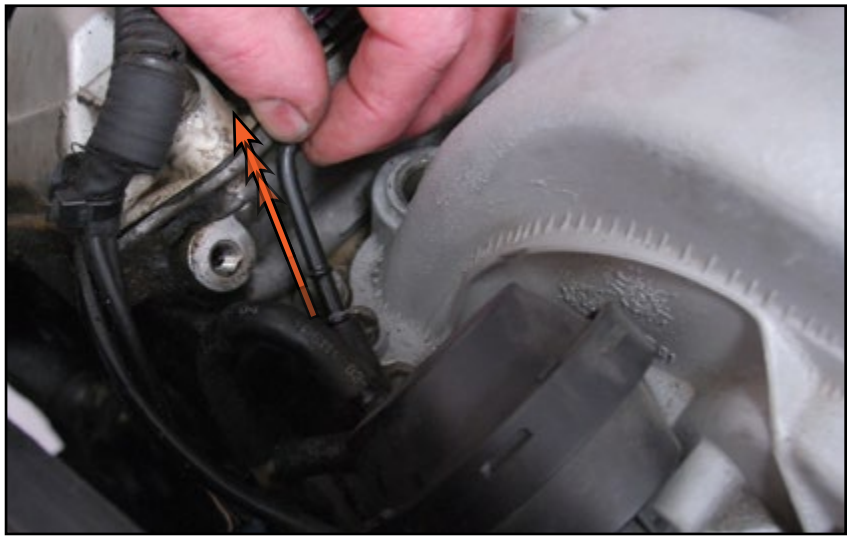


CAUTION

These plastic vacuum lines tend to become EXTREMELY brittle and fragile with age, use extreme caution to prevent breaking them during removal. If a line is broken during this repair, splice the line together with a small length of ES#2593473.

Step 20:

Remove the vacuum line from the vacuum hose located on the front RH of the intake manifold.



CAUTION

These plastic vacuum lines tend to become EXTREMELY brittle and fragile with age, use extreme caution to prevent breaking them during removal. If a line is broken during this repair, splice the line together with a small length of ES#2593473.

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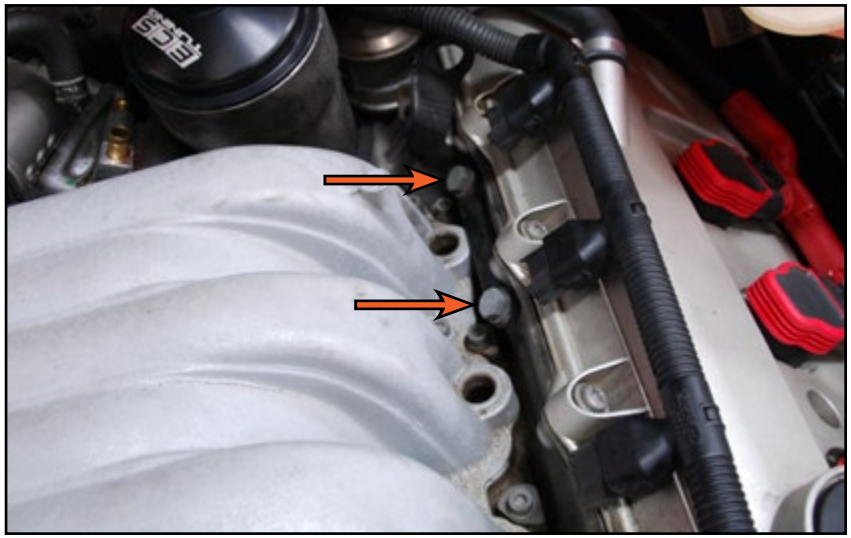
REMOVING THE OLD CHECK VALVES

Step 21: 3/8" Ratchet, 13mm Socket

Remove the two bolts securing the engine lift hook near the oil filter housing, then remove the hook and set it aside.

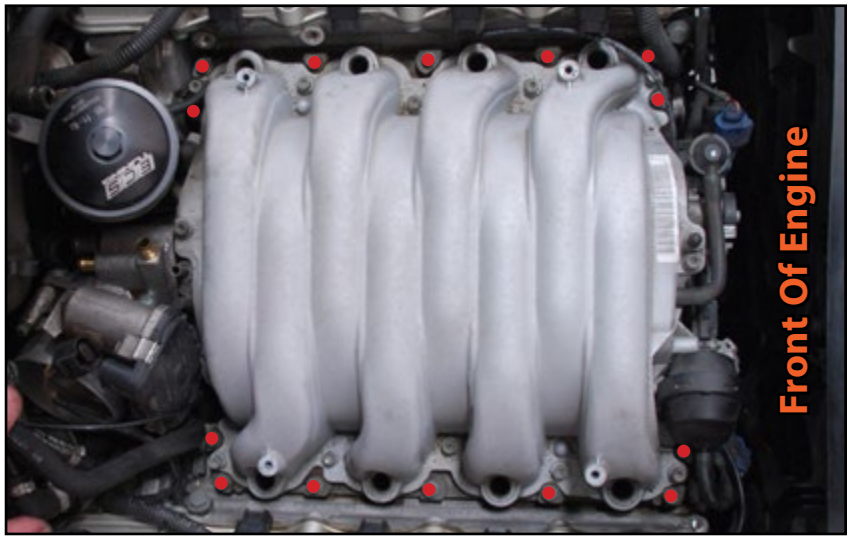


Step 22: 1/4" Ratchet, 5mm Allen Socket

Loosen and remove the fourteen intake manifold bolts (highlighted in **RED** in the photo), then lift the intake manifold out of the engine compartment making sure that everything is disconnected, and then set the manifold aside.

CAUTION

Pay close attention to the bolts which are highlighted in the photo, the Torx bolts on the intake manifold are used to secure the upper and lower halves of the manifold together, do not remove these bolts.



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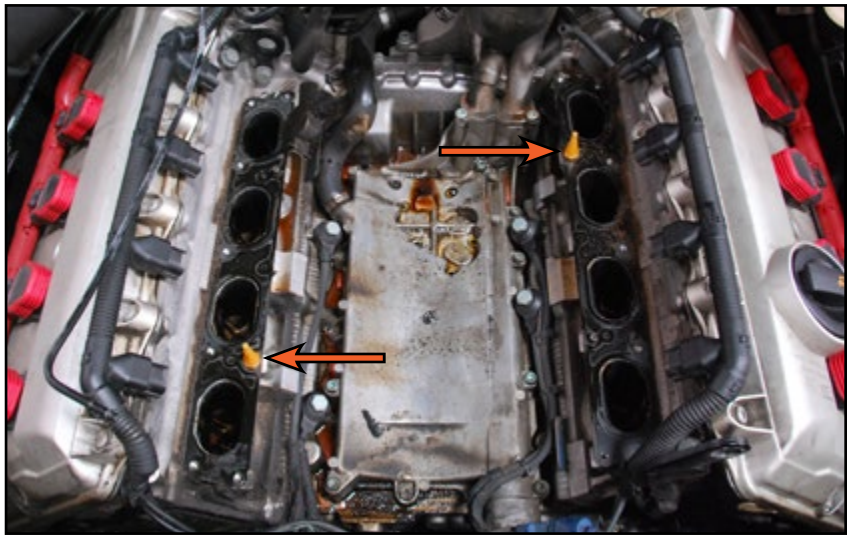
REMOVING THE OLD CHECK VALVES

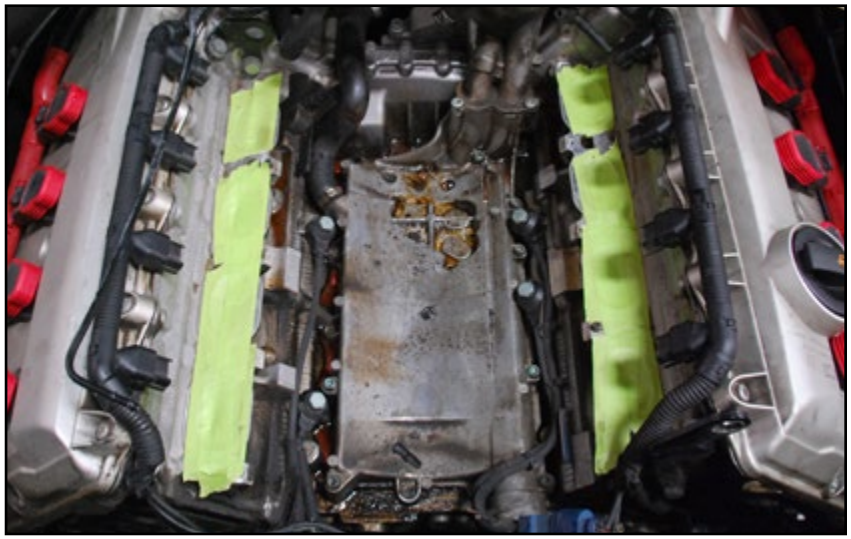
Step 23:

Locate the two orange plastic pieces which are pointed out in the photo, these are used to guide the intake manifold into place during assembly, it is possible they may fall into the ports in the cylinder heads while removing the intake manifold. If this does happen they are easy to reach with a pair of needle nose pliers and remove. If these guides are still in their proper place, simply unscrew them and set them aside.



Step 24:

Use masking tape or rags to cover and protect the cylinder head ports during the next few steps.



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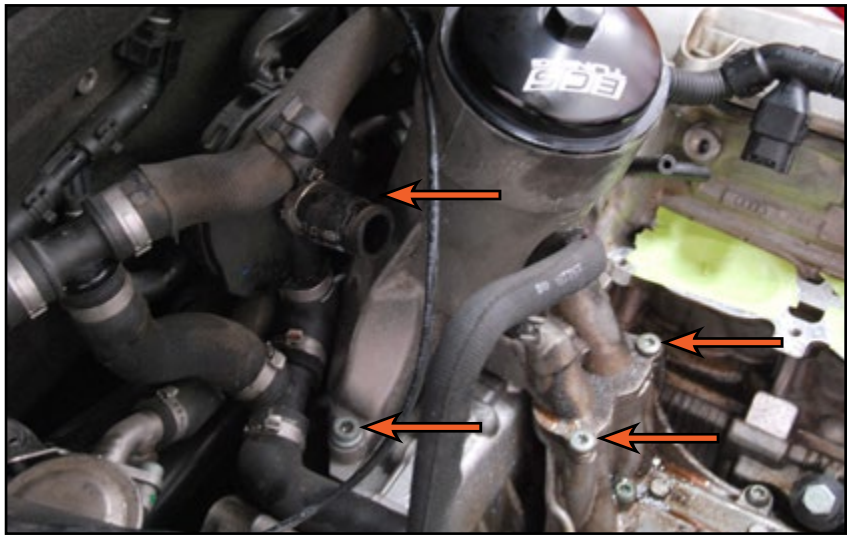
REMOVING THE OLD CHECK VALVES

Step 25: 1/4" Ratchet, 6mm Allen Socket, 3/8" Ratchet, T30 Torx Socket

Remove the four bolts securing the oil filter housing to the valley pan and the timing chain cover.



NOTE

You will very likely see a small amount of oil spill into the valley when removing the front two bolts, but it will all be cleaned in later steps.

Step 26: VAG Connector Tool

Swing the oil filter housing over as shown in the photo, remove the electrical connector located on the back, then lift the housing from the vehicle and set it aside.

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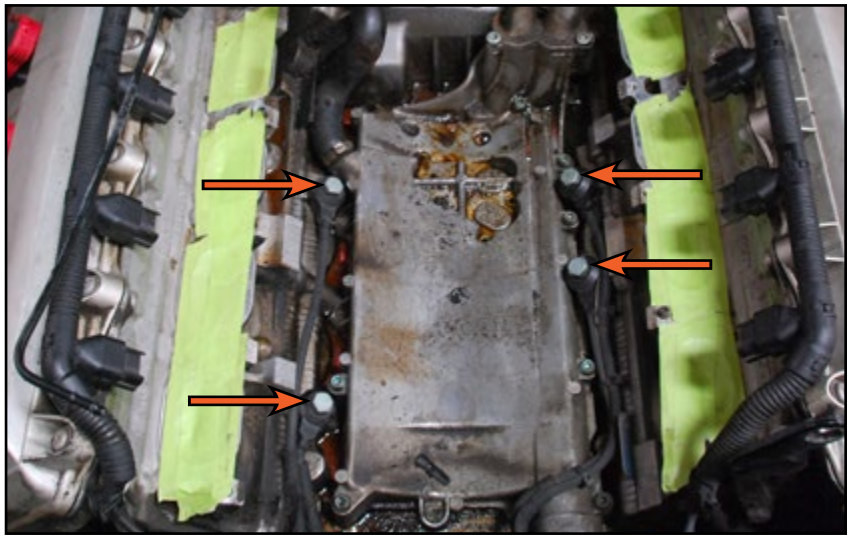
REMOVING THE OLD CHECK VALVES

Step 27:

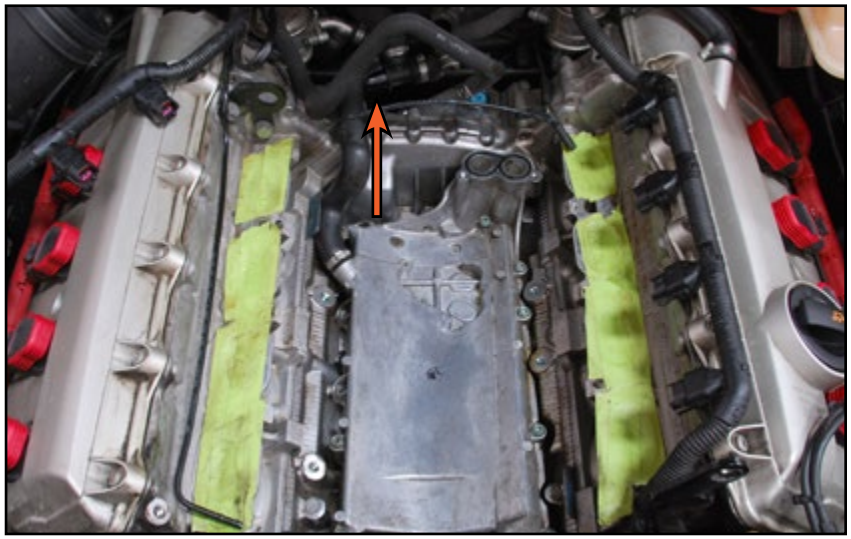
Remove all four knock sensors from the engine block. There is no need to disconnect them from the wiring harness, simply lift them out of the way and rest them on top of the valve covers.



Step 28:

Just as you did in Step 15, thoroughly clean the area around the valley pan, use spray cleaners, compressed air, vacuums, anything necessary to remove **ALL** contaminants and grit from this area. It is also a good idea to remove any grit or dirt from the heads of the bolts which secure the valley pan to the engine block. These bolts have very shallow tool recesses and doing this will reduce the risk of stripping those bolts during removal and assembly.

Cut or release the clamp on the breather hose which is shown in the photo, then disconnect the hose from the "T" fitting.



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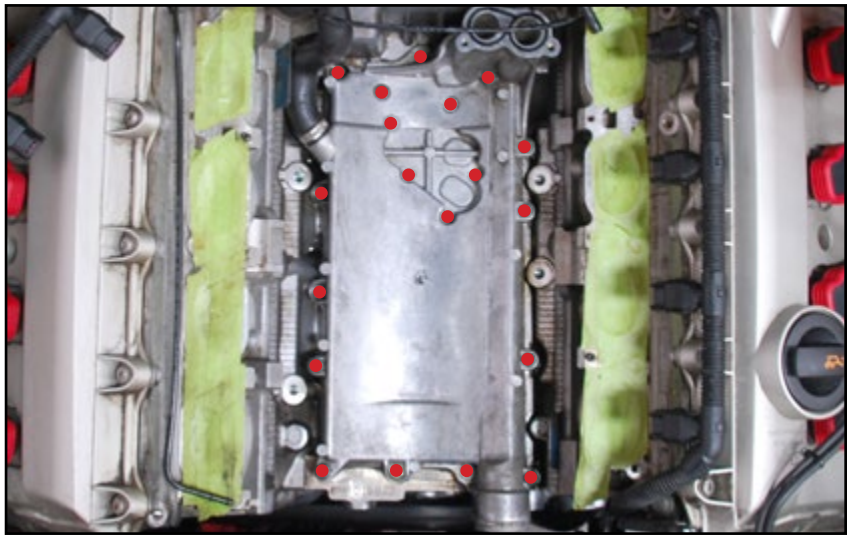
REMOVING THE OLD CHECK VALVES

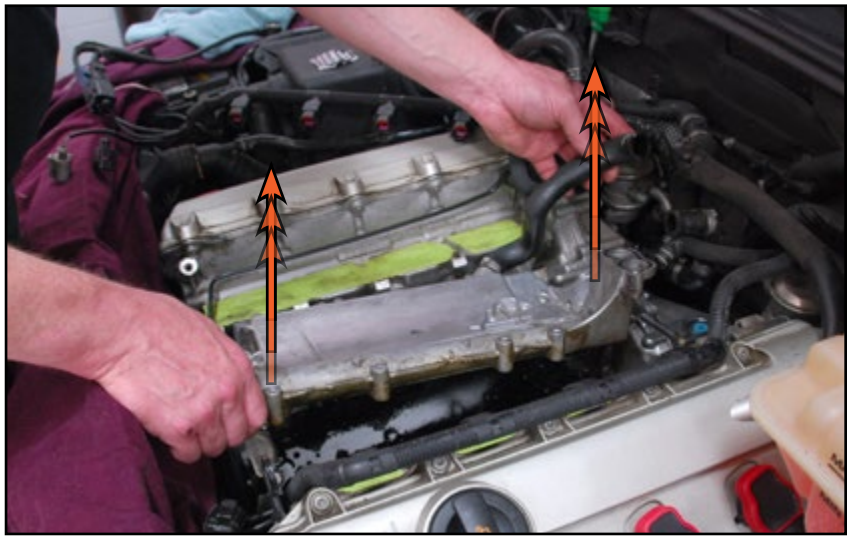
Step 29: 3/8" Ratchet, T30 Torx Socket

Remove all of the bolts from the valley pan, please note where each bolt was located as there are two different length bolts used.



Step 30:

Lift the valley pan off of the engine and set it aside.



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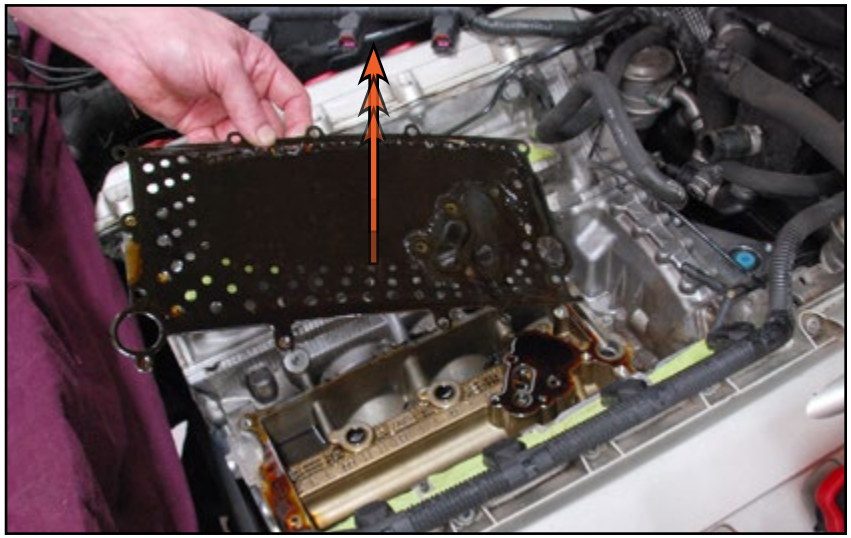
REMOVING THE OLD CHECK VALVES

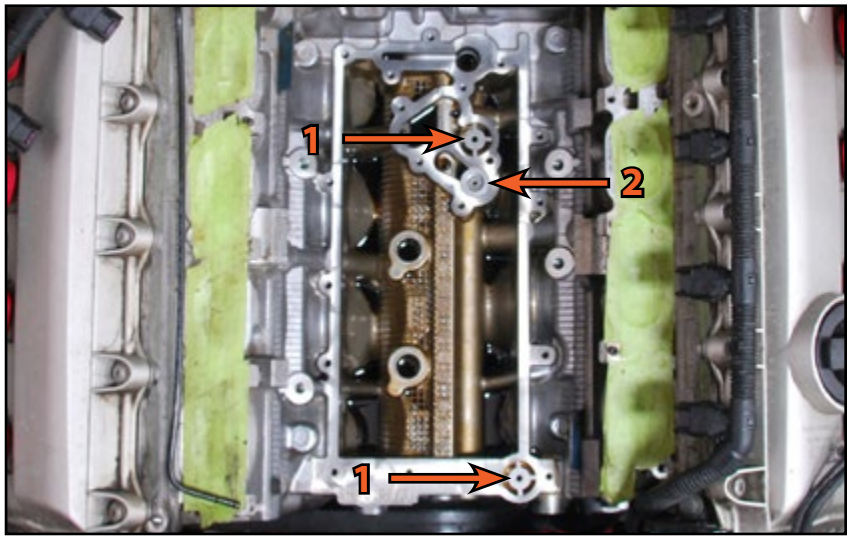
Step 31:

Remove the valley pan gasket from the engine compartment and discard it.



Step 32:

This photo shows the locations of the two oil check valves (#1) and the oil spray valve (#2).



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REMOVING THE OLD CHECK VALVES

Step 33: Needle Nose Pliers

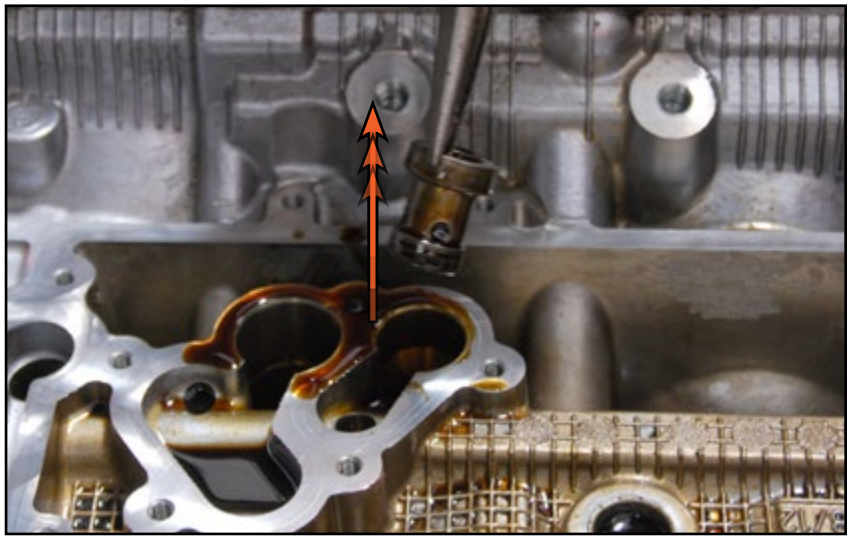
Remove both oil check valves by pulling them straight upwards out of the engine block.

NOTE

You may find these valves to be stuck in their bores and difficult to remove, pull upwards firmly and evenly and they will pop out.

Step 34: Needle Nose Pliers

Remove the oil spray valve by pulling it straight upwards out of the engine block.



NOTE

You may find this valve to be stuck in its bore and difficult to remove, pull upwards firmly and evenly and it will pop out.

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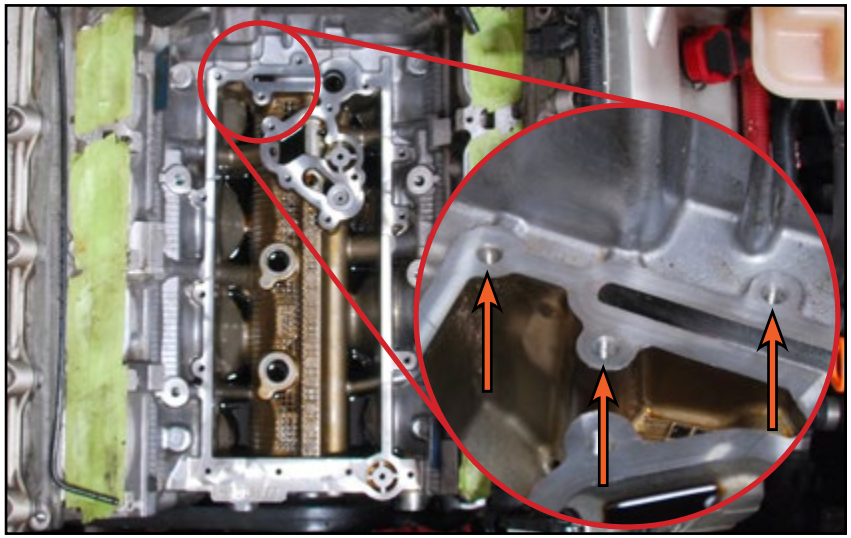
INSTALLING THE NEW CHECK VALVES

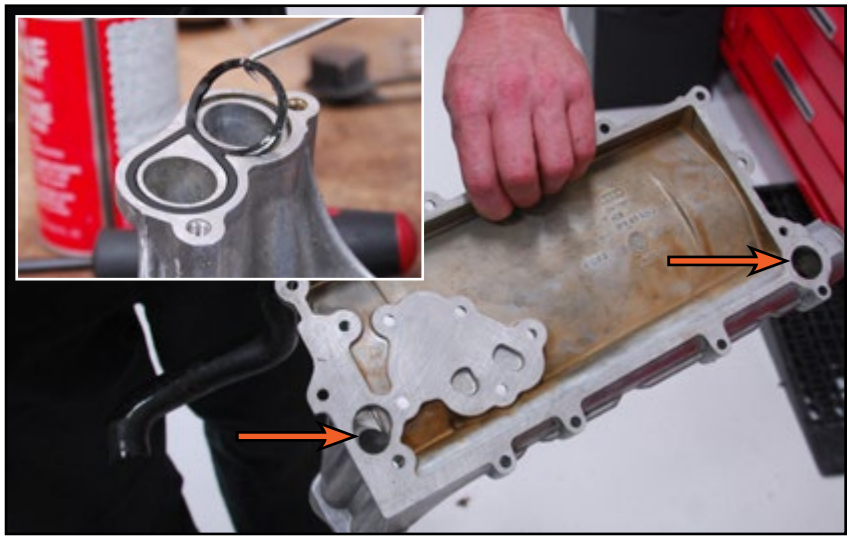
Step 1:

Lubricate the o-rings on the new oil check valves and the oil spray valve with clean engine oil, then install them into the engine. Thoroughly clean the valley pan gasket surface on the engine block, and be sure to clean the bolt holes, removing any oil or grit from the threads.



Step 2: O-Ring Pick

Remove the oil filter housing seal from the valley pan, then thoroughly clean the valley pan on both sides. It is also a good idea to flush out the oil passages (arrows) to flush out any debris or deposits which may have built up over time.



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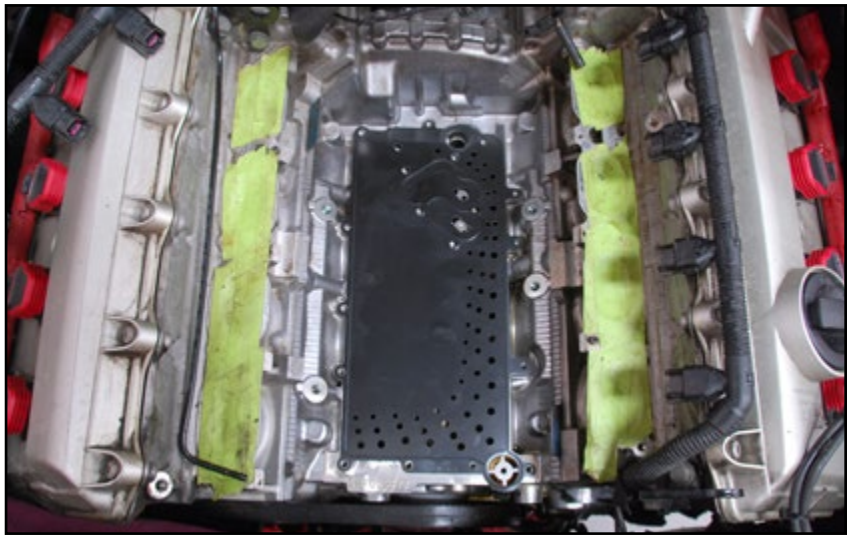
INSTALLING THE NEW CHECK VALVES

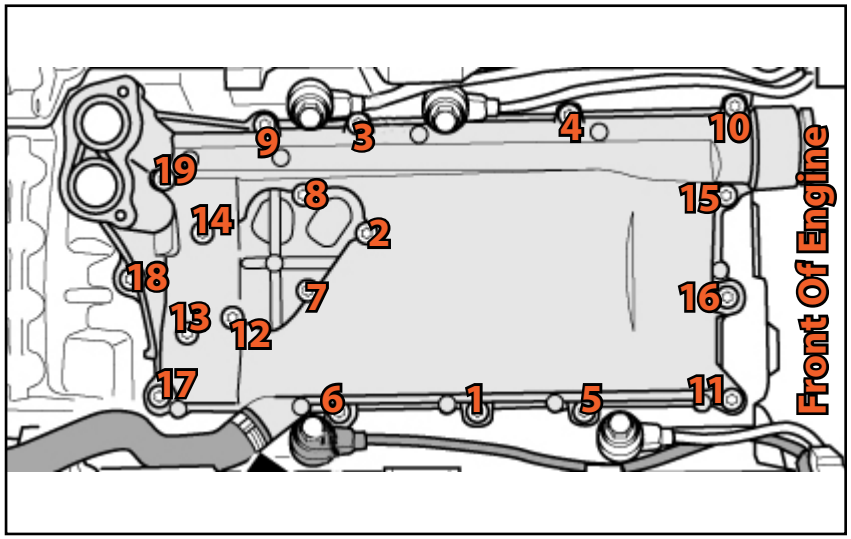
Step 3:

Lay the valley pan gasket into place on the engine block, ensuring all of the bolt holes are lined up and that the gasket is oriented properly.



Step 4: 3/8" Torque Wrench, T30 Socket

Install the valley pan onto the gasket, then torque the valley pan bolts in the order shown to 10 Nm (7.4 Ft-lbs).



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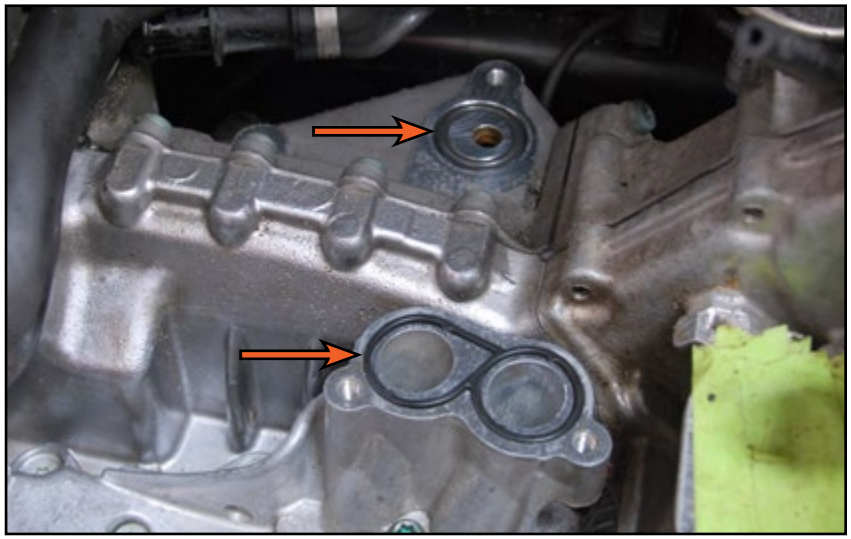
INSTALLING THE NEW CHECK VALVES

Step 5:

Remove the oil filter housing seal from the timing chain cover, then clean the gasket surface.

Step 6:

Install the supplied oil filter housing seals into their respective grooves.



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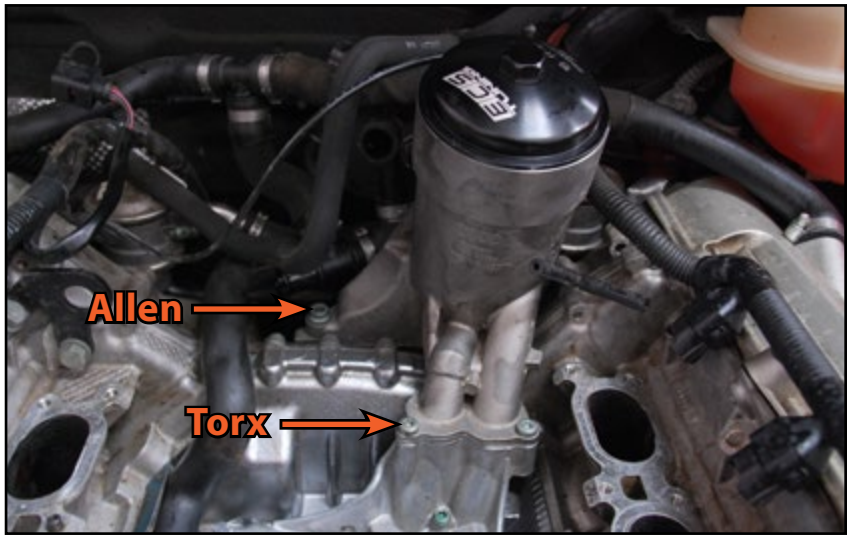
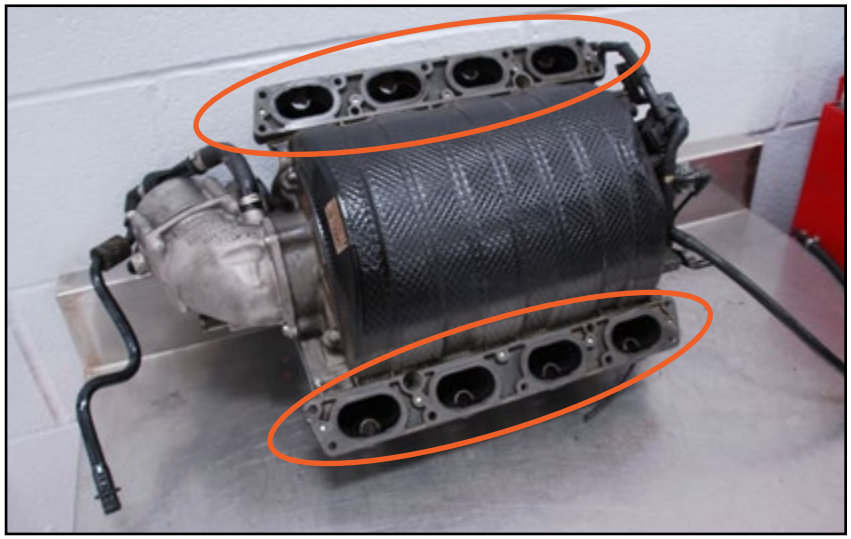
Reinstall the oil filter housing, then torque the front two Torx bolts to 10 Nm (7.4 Ft-lbs), and torque the rear two Allen bolts to 22 Nm (16.2 Ft-lbs).



☐ Reinstall all four knock sensors and torque bolts to 25 Nm (18.4 Ft-lbs)

Thoroughly clean the intake manifold gasket surfaces on the cylinder heads and the manifold.



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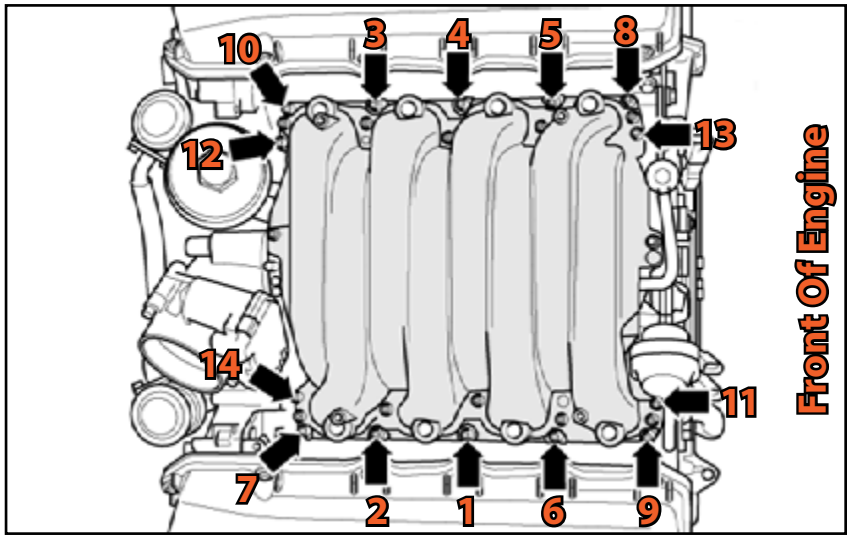
3/8" Torque Wrench, 5mm Allen Socket

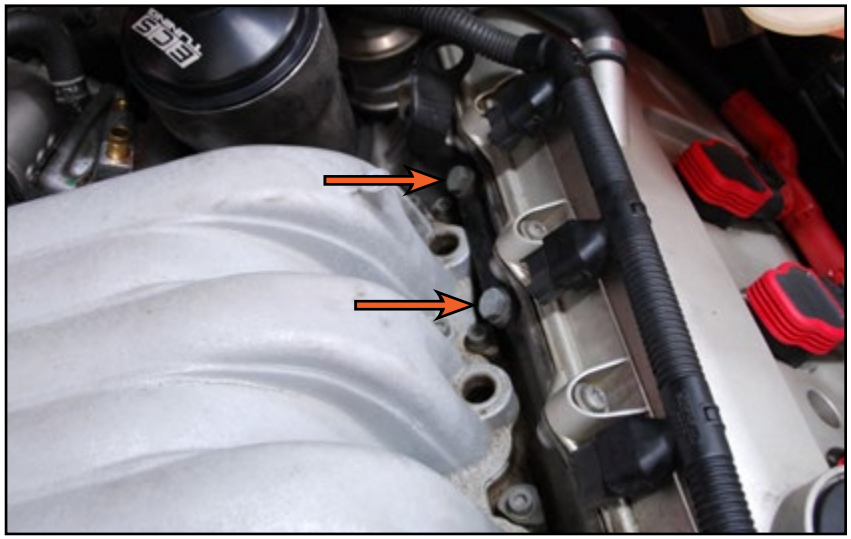
Install the supplied new intake manifold gaskets onto the cylinder heads, and install the intake manifold into place. Torque the bolts in the order shown in the photo to 10 Nm (7.4 Ft-lbs).



☐ Reconnect all electrical connectors on the front of the intake manifold

3/8" Torque Wrench, 13mm Socket

Install the engine lift eye and torque the bolts to 22 Nm (16.2 Ft-lbs).



☐ Reconnect the vacuum lines to the intake manifold

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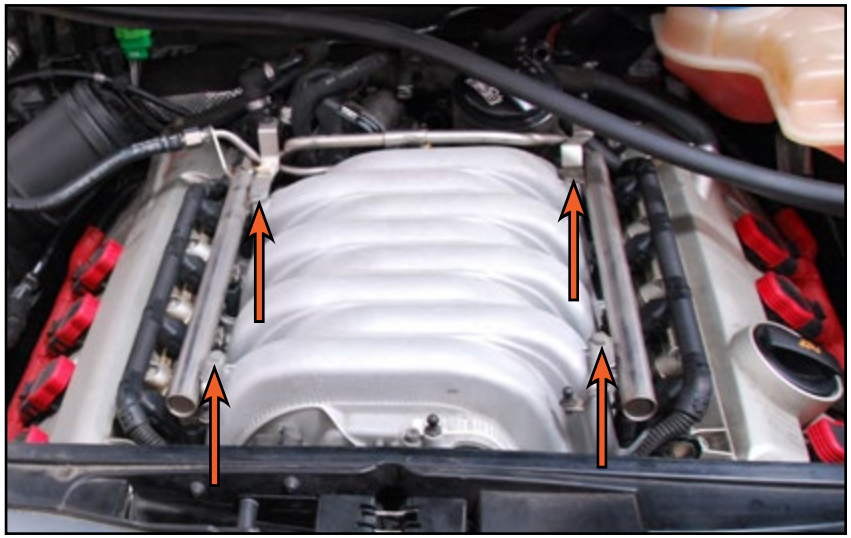
Lubricate all eight fuel injector o-rings with silicone spray, then install the fuel rail into the intake manifold, making sure each injector is lined up before attempting to push down. Install the four fuel rail bolts and torque them to 10 Nm (7.4 Ft-lbs).



- [ ] Reconnect the fuel rail harness to the fuel injectors

- [ ] Take the lock carrier out of “service position”
- [ ] Reconnect all breather, vacuum, and coolant hoses
- [ ] Reinstall the intake boot
- [ ] Reinstall the throttle body connector
- [ ] Reinstall the engine beauty covers
- [ ] Top off oil and coolant levels (an oil change is **HIGHLY** recommended)

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FRONT LOCK CARRIER - SERVICE POSITION

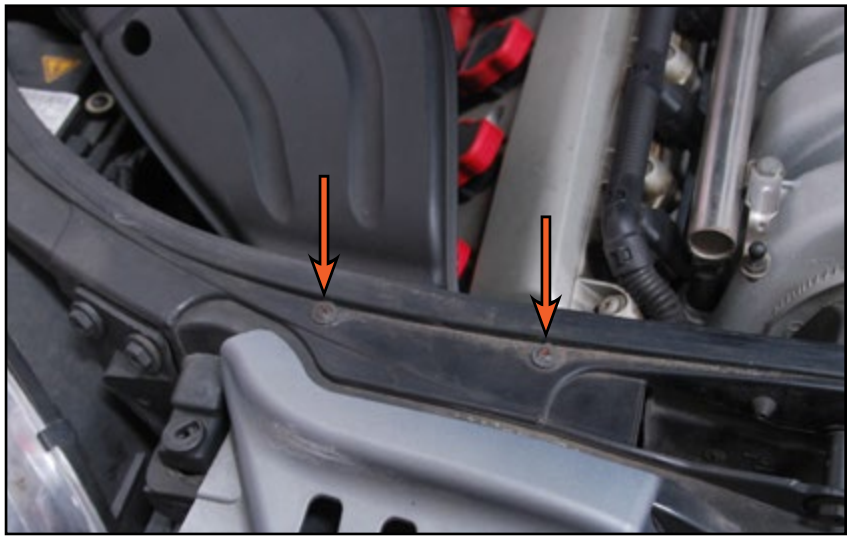
Step 1:

The following instructions show how to place a B7 S4 lock carrier into "service position", your vehicle may differ slightly.

Remove the hood seal from the front vehicle and set it aside.

Step 2: Phillips Screwdriver

Remove the two screws securing the front intake pipe to the core support.



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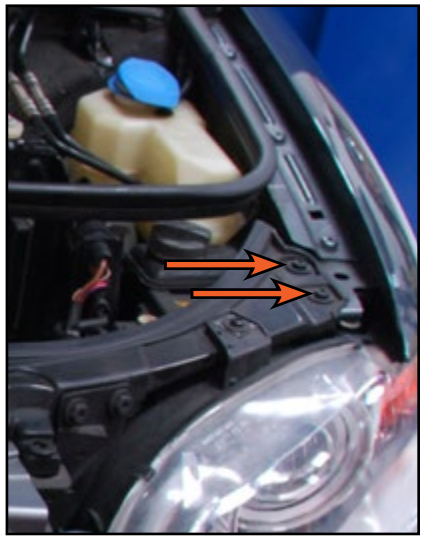
FRONT LOCK CARRIER - SERVICE POSITION

Step 3:

Remove the connector harness from the front intake tube by simply pulling the mount off of the tube. You do not need to disconnect the harness, simply push the harness out of the way. Remove the tube from the vehicle by lifting it up and out of the engine compartment.

Step 4: 3/8" Drive Ratchet, T30 Socket

Remove the four bolts securing the lock carrier to the chassis, there are two on each side.



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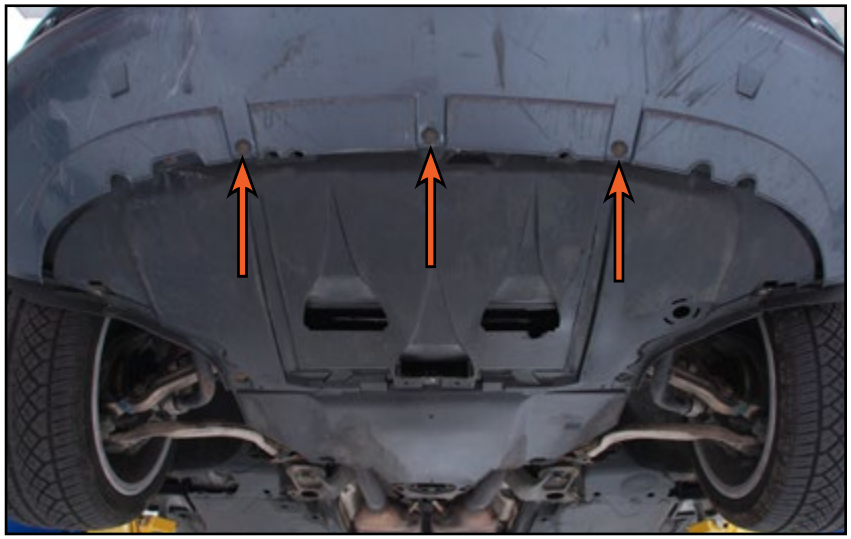
FRONT LOCK CARRIER - SERVICE POSITION

Step 5: 3/8" Ratchet, T30 Torx Socket

Remove the three bolts which secure the top of front bumper cover to the vehicle.

Step 6: Flat Blade Screwdriver

Safely lift and support the vehicle, then remove the three 1/4 turn screws securing the belly pan to the front bumper cover.



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FRONT LOCK CARRIER - SERVICE POSITION

Step 7: 1/4" Ratchet, T25 Torx Socket

Remove the two screws securing the fender liner to the bumper cover on each side of the vehicle.

Step 8: 1/4" Ratchet, T25 Torx Socket

Gently pull the fender liner out of the way with one hand while removing the two remaining screws on the inside.

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FRONT LOCK CARRIER - SERVICE POSITION

Step 9:

Remove the fog lamp grille by grasping the bottom of the grille and pulling the outwards as shown in the photo.

Step 10: 1/4" Ratchet, T20 Torx Socket

Remove the three screws securing the fog lamp to the bumper cover, then disconnect the fog lamp connector by releasing the tab and sliding the connector off of the lamp.

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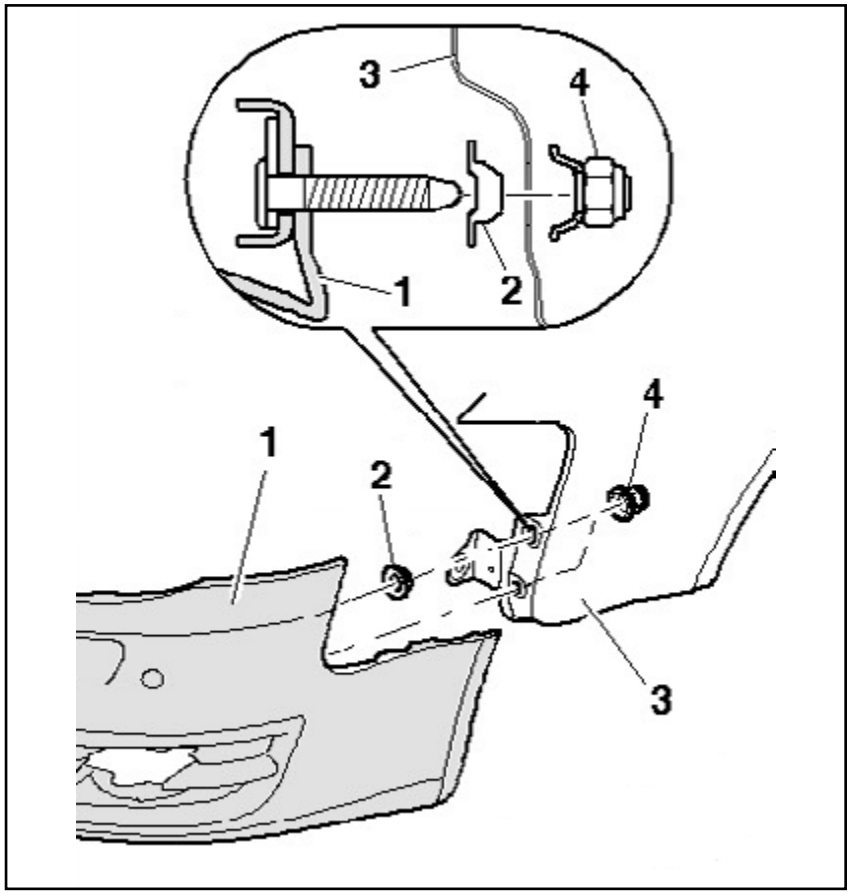
FRONT LOCK CARRIER - SERVICE POSITION

Step 11: 3/8" Ratchet, 10mm Socket

Pull the fender liner back in order to access and remove the four bolts which secure the front bumper cover to the fender. Reference the diagram shown on the right for the location of the nuts.

NOTE

Depending on the VIN range your vehicle falls into there may be four or six nuts securing the bumper cover, however the removal process remains the same for both options.



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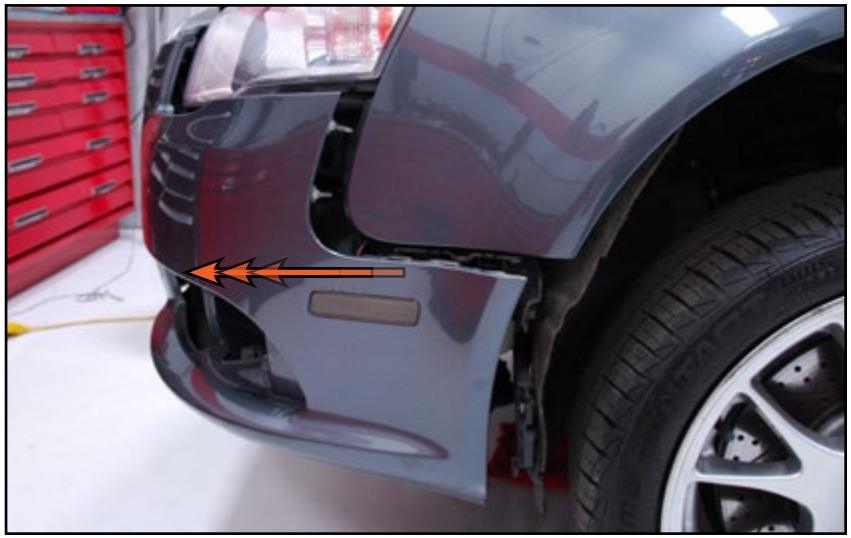
FRONT LOCK CARRIER - SERVICE POSITION

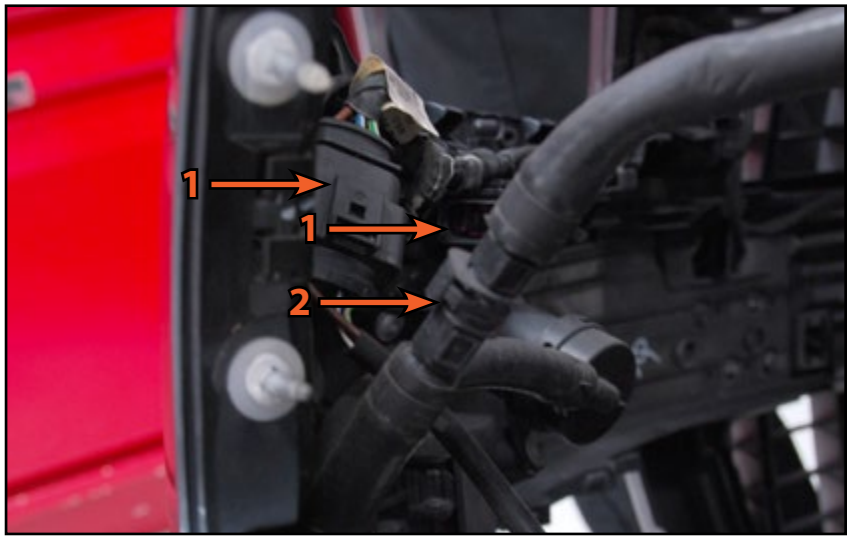
Step 12:

Enlist the help of a friend, then pull the bumper cover forward slowly using extreme caution to not damage on any connectors which may still be attached.



Step 13: Small Flat Blade Screwdriver, VAG Connector Tool

Disconnect the two wiring harness connectors (#1) in the Front LH of the bumper cover, and disconnect the headlight washer hose (#2) by removing the quick disconnect clip as shown in the photo. Remove the bumper cover from the vehicle and set it aside.



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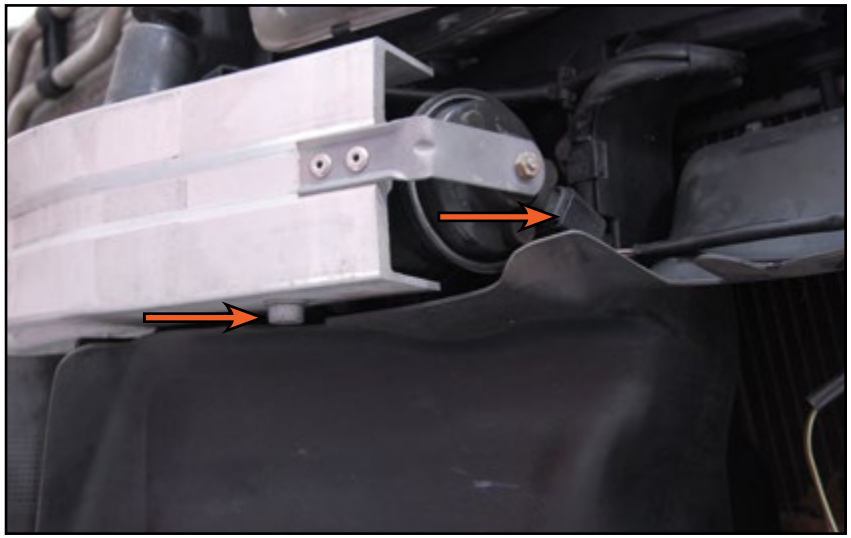
FRONT LOCK CARRIER - SERVICE POSITION

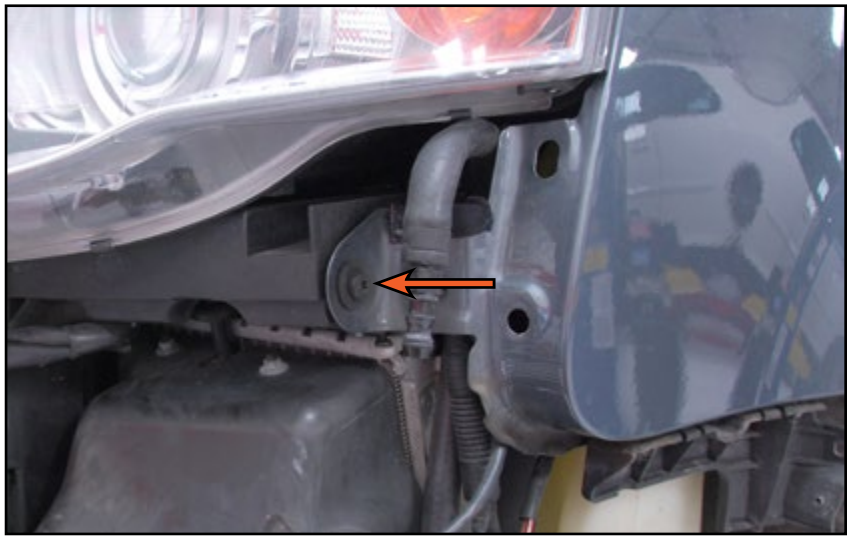
Step 14: 1/2" Breaker Bar, M10 Triple Square Socket, VAG Connector Tool

Disconnect the electrical connector on each horn, then remove the bolts which secure the front bumper to the bumper support. Remove the bumper from the vehicle and set it aside.



Step 15: 3/8" Ratchet, T30 Torx Socket

Remove the bolt securing each front fender to the lock carrier.



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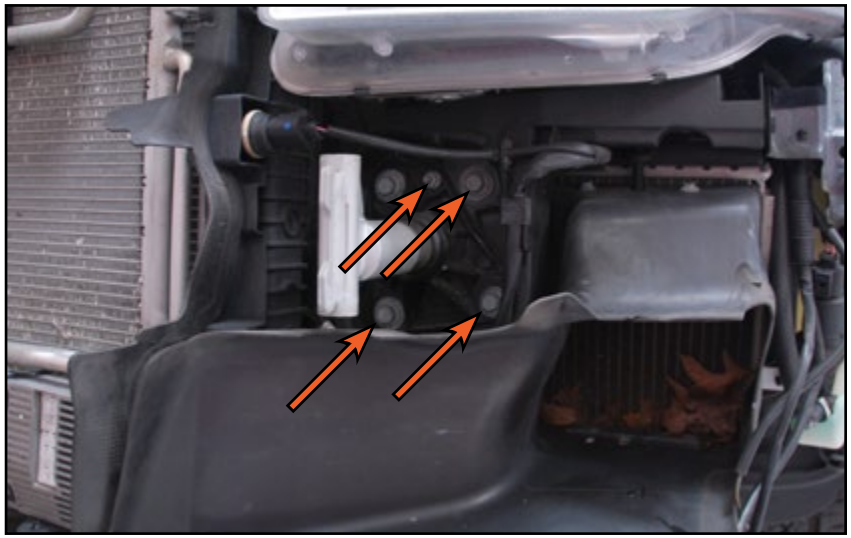
FRONT LOCK CARRIER - SERVICE POSITION

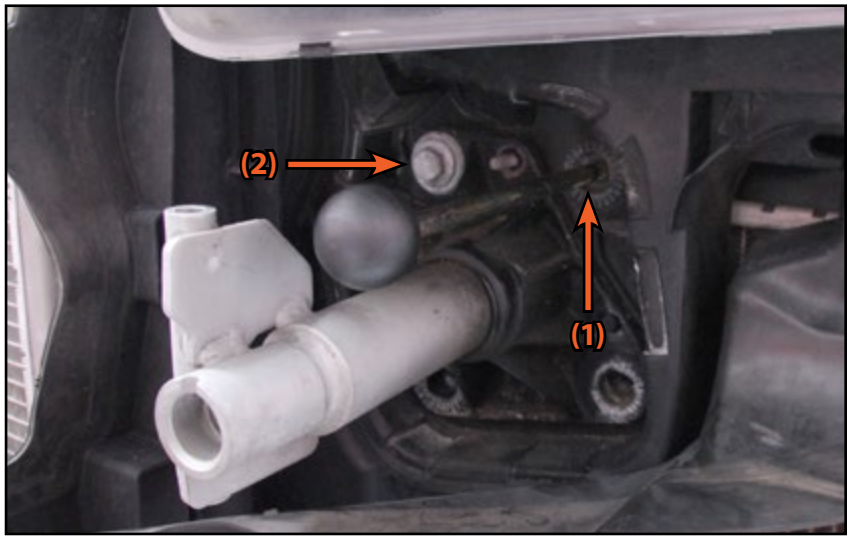
Step 16: 1/2" Breaker Bar, 13mm Socket, 3/8" Ratchet, 10mm Socket

Remove the three bolts and one nut from the front bumper support as shown in the photo, DO NOT remove the remaining bolt at this time. Repeat this on the other side of the vehicle.



Step 17: Lock Carrier Tool, 1/2" Breaker Bar, 13mm Socket

Install a lock carrier tool into the bolt location as shown in the photo **(1)**, repeat this on the other side of the vehicle. You can now remove the last bolt securing the bumper support **(2)** and remove it from the vehicle.



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FRONT LOCK CARRIER - SERVICE POSITION

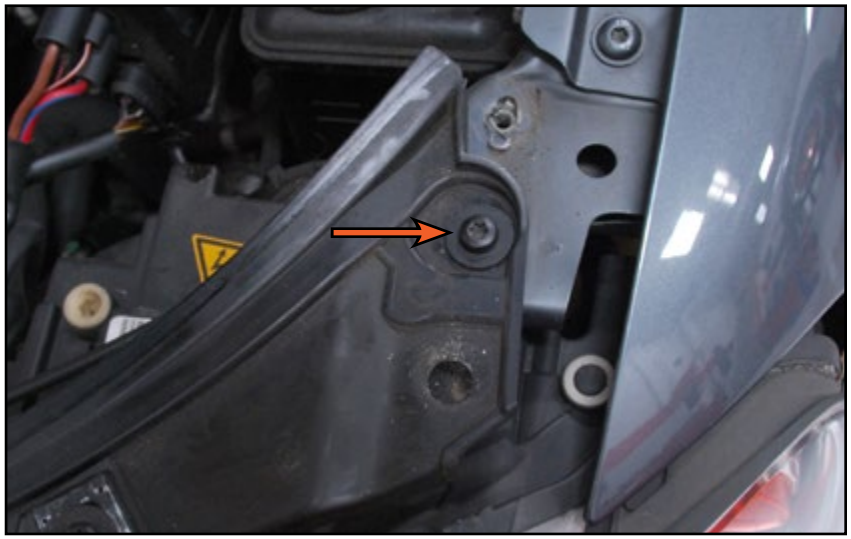
Step 18:

Pull the lock carrier forward approximately two inches, anything more than that will risk damaging wiring harnesses and hoses to the front end components.

Step 19:

You can secure the lock carrier in place by loosely reinstalling one of the bolts into the outer hole as shown in the photo. This will prevent the lock carrier from being able to shift while performing any repairs or service. Reverse removal to take the lock carrier out of service position.

To continue with the oil check valve replacement, please go back to Step 14 on Page 13.



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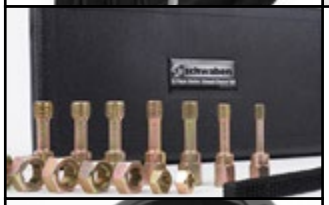




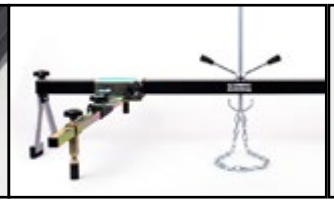





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Your Audi B6/B7 S4 Oil Check Valve Service Kit installation is complete!

These instructions are provided as a courtesy by ECS Tuning

Proper service and repair procedures are vital to the safe, reliable operation of all motor vehicles as well as the personal safety of those performing the repairs. Standard safety procedures and precautions (including use of safety goggles and proper tools and equipment) should be followed at all times to eliminate the possibility of personal injury or improper service which could damage the vehicle or compromise its safety.

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