VW/Audi 2.0T Gen1 TSI & Non-MQB Gen3 ECS Clutch & Lightweight Flywheel Kit Installation Instructions

Skill Level
3 - Advanced

Advanced Skills & Experience Required

INTRODUCTION

VW/Audi 2.0T Gen1 TSI ECS Clutch & Lightweight Flywheel Kit

ECS clutch & lightweight flywheel kits offer these impressive technical features and performance benefits:

- Heat treated billet chromoly 4140 steel flywheel
- Black Zinc plating for corrosion resistance
- Precision balanced
- SFI 1.1 tested and approved
- Designed in-house by ECS Tuning engineers
- Improved throttle response and acceleration
- Kits include a new pressure plate, clutch disc, throwout bearing/slave cylinder, alignment tool, flywheel bolts, pressure plate bolts, and slave cylinder bolts

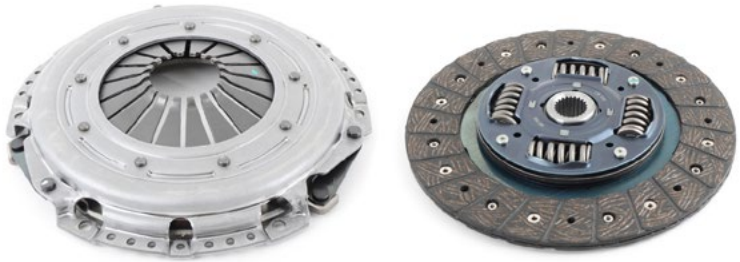
Installing an ECS clutch & lightweight flywheel kit is a weekend project that will reward you with the superior performance and durability of the finest products available. It would be best to plan on two full days to complete this installation. If you do not have previous experience it may take longer, but following these instructions closely will help you achieve a smooth, trouble-free installation. Plan your time accordingly based on your experience level. 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 clutch & lightweight flywheel kit, we appreciate your business!

TABLE OF CONTENTS

CAUTION: The most important tool for this job is patience. Please read each step thoroughly and do not omit any of them. Obtaining the proper clearance for transmission removal is very important and many of these steps are intended for that reason. Be sure to have a friend help you during transmission removal, the transmission is very heavy and difficult to maneuver.

KIT CONTENTS



ECS Clutch Assembly (Pressure Plate & Clutch Disc)

Throwout Bearing/Slave Cylinder Assembly

ECS Single Mass Lightweight Steel Flywheel (19lbs)

Clutch Alignment Tool

Flywheel Bolts (8)

Pressure Plate Bolts (6)

Throwout Bearing Bolts (3)

REQUIRED TOOLS

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

Standard Automotive Tools

- Protecta-Sockets (for lug nuts) ..... ES#2221243
- ⅜" Drive Ratchet ..... ES#2765902
- ⅜" Drive Torque Wrench ..... ES#2221245
- ⅜" Drive Deep and Shallow Sockets ..... ES#2763772
- ⅜" Drive Extensions ..... ES#2804822
- Hydraulic Floor Jack ..... ES#2834951
- Torx Drivers and Sockets ..... ES#11417/8
- ½" Drive Deep and Shallow Sockets ..... ES#2839106
- ½" Drive Ratchet
- ½" Drive Extensions
- ½" Drive Torque Wrench ..... ES#2221244
- ½" Drive Breaker Bar ..... ES#2776653
- Wheel Hanger ..... ES#2678092
- Oil Drain Pan ..... ES#2748892
- Hook and Pick Tool Set ..... ES#2778980

Required For This Install

- ¼" Drive Ratchet ..... ES#2823235
- ¼" Drive Deep and Shallow Sockets ..... ES#2823235
- ¼" Drive Extensions ..... ES#2823235
- Plier and Cutter Set ..... ES#2804496
- Flat and Phillips Screwdrivers ..... ES#2225921
- Jack Stands ..... ES#2763355
- Ball Pein Hammers
- Pry Bar Set ..... ES#1899378
- Electric/Cordless Drill
- Wire Strippers/Crimpers
- Drill Bits
- Punch and Chisel Set
- Hex Bit (Allen) Wrenches and Sockets ..... ES#11420
- Thread Repair Tools ..... ES#1306824
- Open/Boxed End Wrench Set ..... ES#2765907

Available On Our Website

Specialty Tools

- Engine Support Bar ..... ES#2804773
- Wheel Hanger ..... ES#2678092
- Triple Square Socket Set ..... ES#1910125
- Locking Spring Clamp Pliers ..... ES#2702616
- VAG Connector Release Tool ..... ES#2628676
- Brake Fluid Catch Bottle ..... ES#4557
- Transmission Jack
- ½" Drive Impact Wrench

SHOP SUPPLIES AND MATERIALS

Standard Shop Supply Recommendations: We recommend that you have a standard inventory of automotive shop supplies before beginning this or any automotive repair procedure. The following list outlines the basic shop supplies that we like to keep on hand. Shop supplies with a hyperlink are available on our website.

- Hand Cleaner/Degreaser - Click Here
- Pig Mats - for protecting your garage floor and work area from spills and stains - Click Here
- Spray detailer - for rapid cleaning of anything that comes into contact with your paint such as brake fluid - Click Here
- Micro Fiber Towels - for cleaning the paint on your car - Click Here
- Latex Gloves - for the extra oily and dirty jobs - Click Here
- Medium and High Strength Loctite Thread lock compound - to prevent bolts from backing out - Click Here
- Anti-Seize Compound - to prevent seizing, galling, and corrosion of fasteners - Click Here
- Aerosol Brake/Parts Cleaner - for cleaning and degreasing parts
- Shop Rags - used for wiping hands, tools, and parts
- Penetrating oil - for helping to free rusted or stuck bolts and nuts
- Mechanics wire - for securing components out of the way
- Silicone spray lube - for rubber components such as exhaust hangers
- Paint Marker - for marking installation positions or bolts during a torquing sequence
- Plastic Wire Ties/Zip Ties - for routing and securing wiring harnesses or vacuum hoses
- Electrical tape - for wrapping wiring harnesses or temporary securing of small components

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.

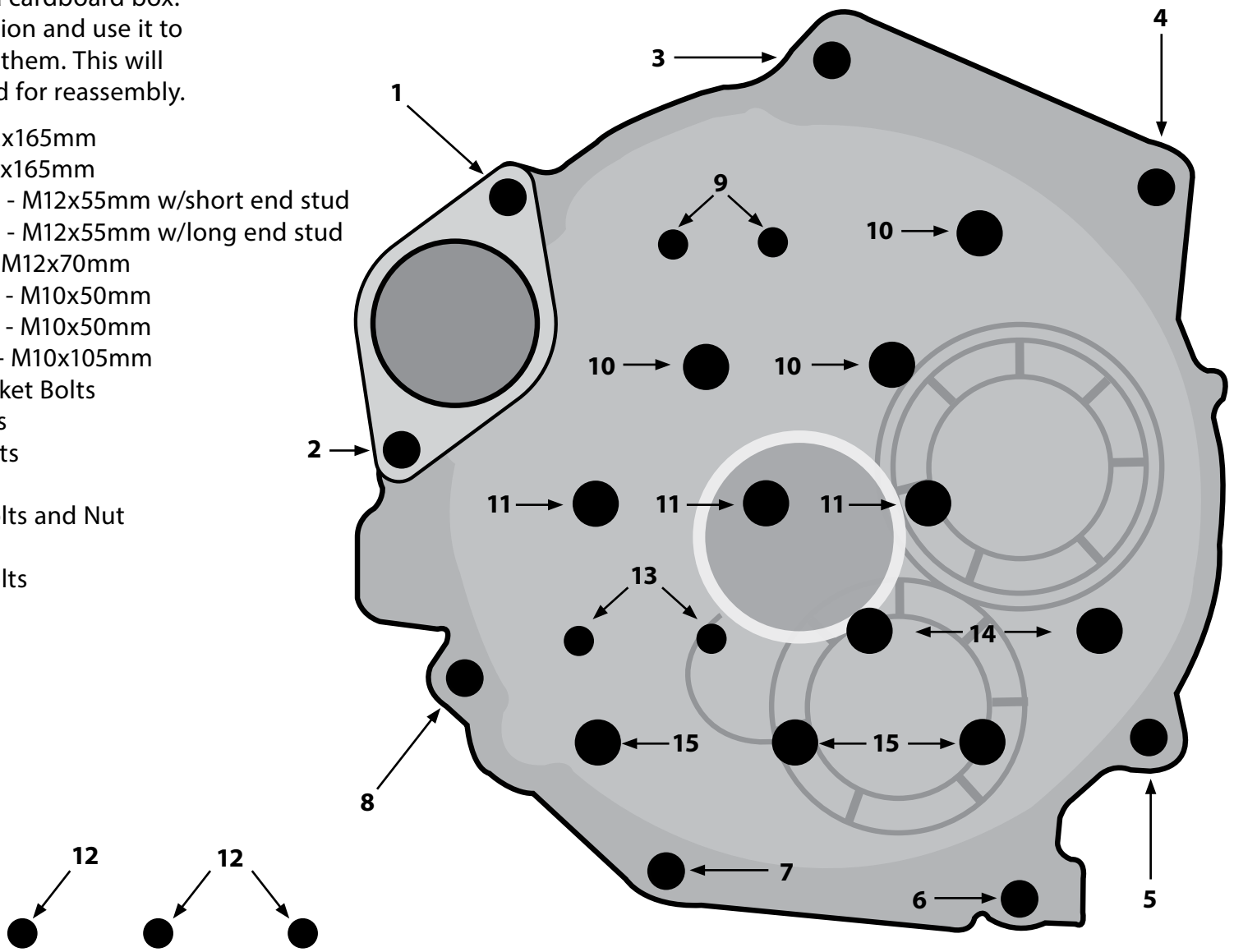
- Park your car in a safe, well lit, level area.
- Shut the engine off and remove the key from the ignition switch.
- Make sure any remote start devices are properly disabled.
- **ALWAYS** wear safety glasses.
- Make sure the parking brake is applied until the vehicle is safely lifted and supported.
- Whether lifting a vehicle using an automotive lift or a hydraulic jack, be sure and 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, and ALWAYS make sure that the vehicle is securely supported on jack stands.

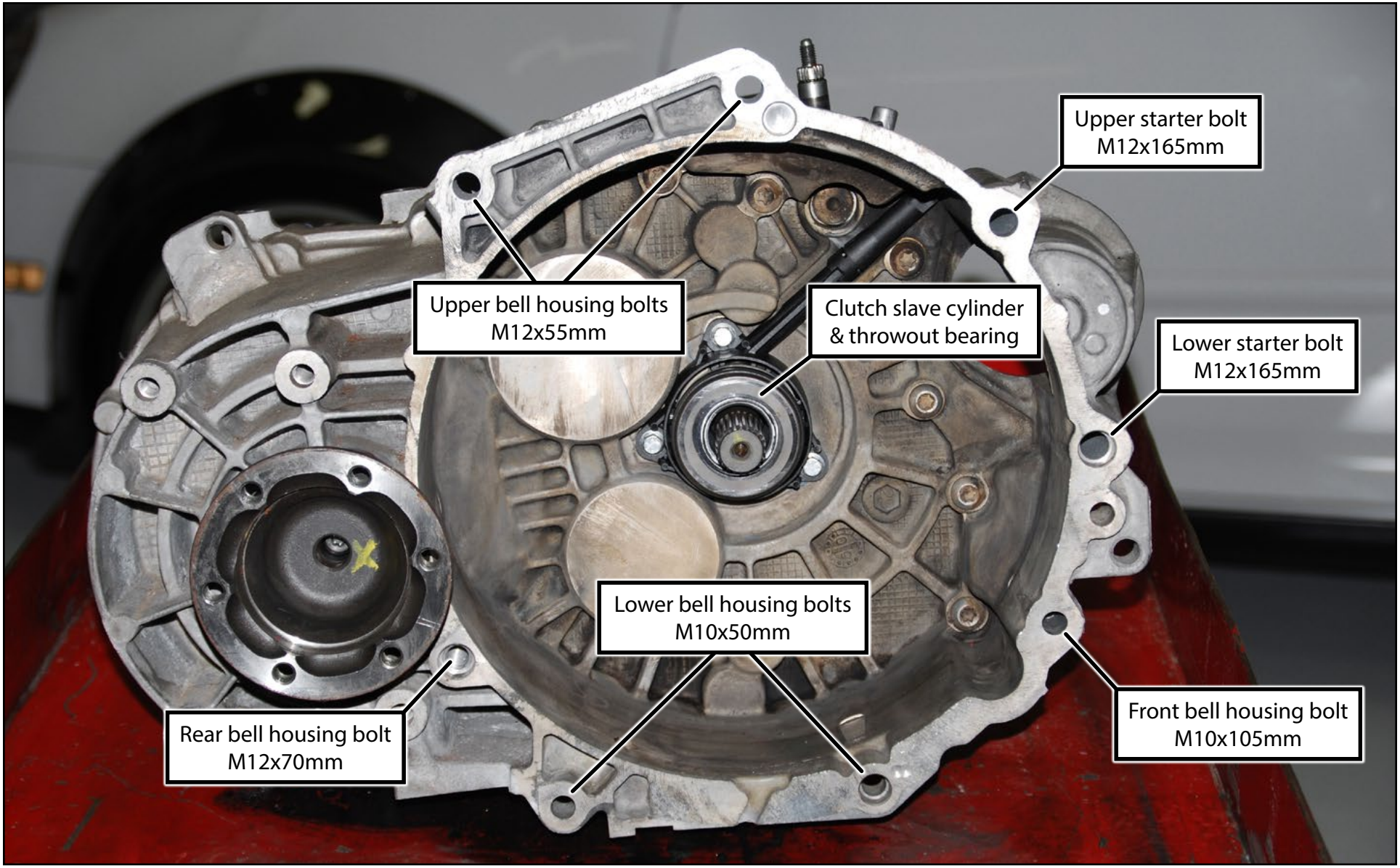
TRANSMISSION BOLT TEMPLATE

Print this page and tape it to a cardboard box. Punch holes at each bolt location and use it to store the bolts as you remove them. This will keep them perfectly organized for reassembly.

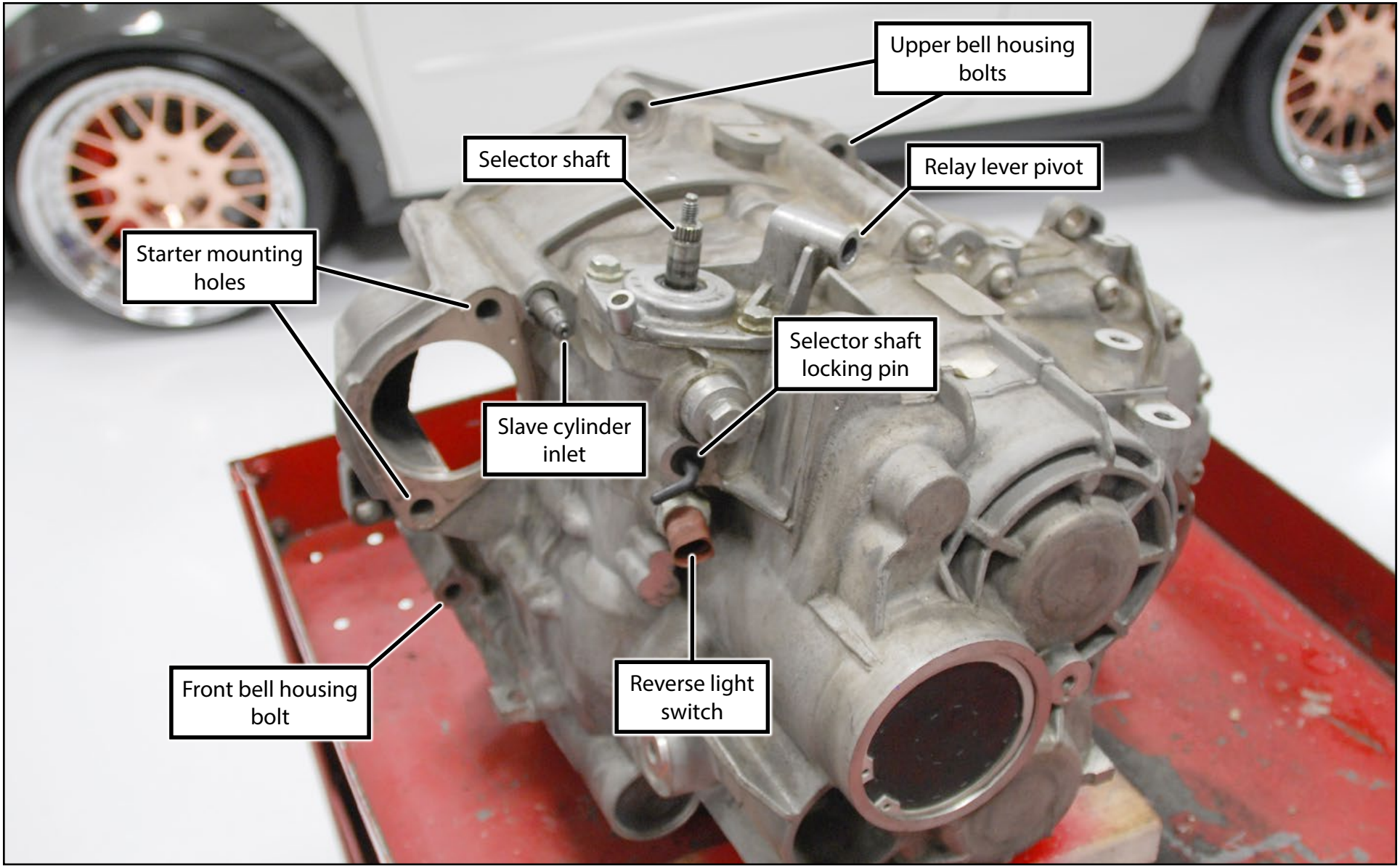
1. Upper Starter Bolt - M12x165mm
2. Lower Starter Bolt - M12x165mm
3. Upper Bell Housing Bolt - M12x55mm w/short end stud
4. Upper Bell Housing Bolt - M12x55mm w/long end stud
5. Rear Bell Housing Bolt - M12x70mm
6. Lower Bell Housing Bolt - M10x50mm
7. Lower Bell Housing Bolt - M10x50mm
8. Front Bell Housing Bolt - M10x105mm
9. Exhaust Downpipe Bracket Bolts
10. Pendulum Support Bolts
11. Transmission Mount Bolts
12. Battery Tray Bolts
13. Shifter Cable Bracket Bolts and Nut
14. CV Heat Shield Bolts
15. Transmission Bracket Bolts



TRANSMISSION COMPONENT LOCATIONS



TRANSMISSION COMPONENT LOCATIONS



REMOVING THE TRANSMISSION

Step 1:

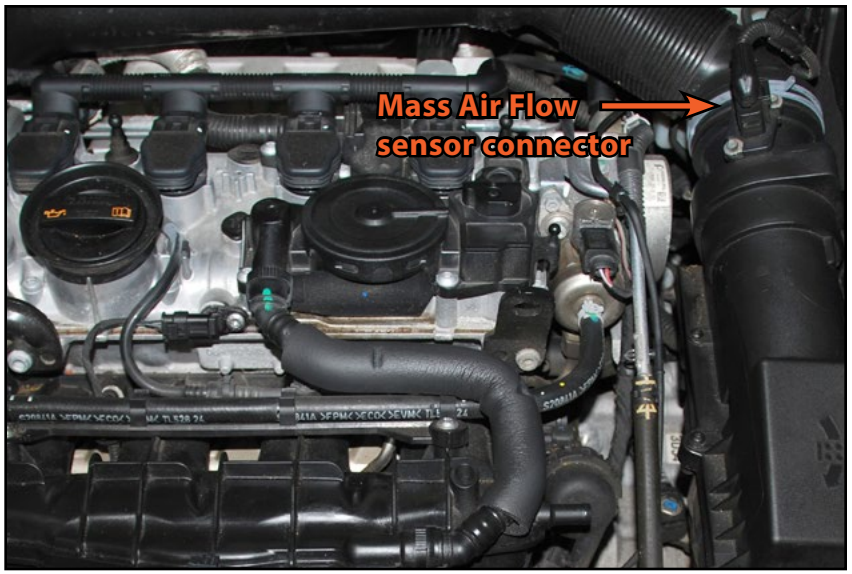
Pull up on the four corners of the engine cover to release the grommets and remove the cover.

NOTE

If you have an aftermarket intake or engine cover, remove them at this time then continue with step 14 on Page 17.

Step 2:

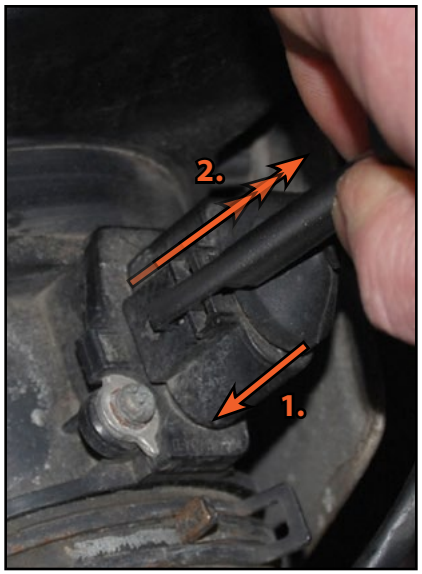
Locate the Mass Air Flow sensor connector.

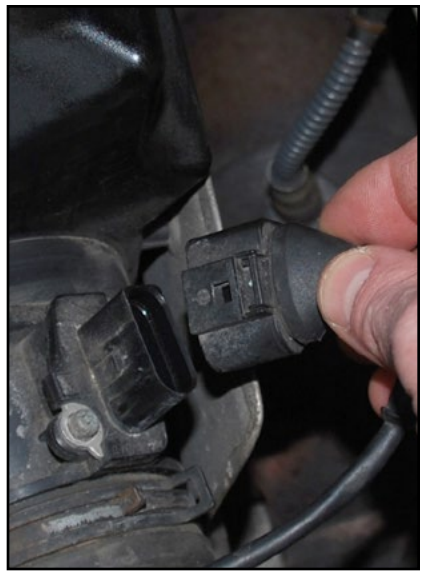


REMOVING THE TRANSMISSION

Step 3: VAG Connector Release Tool

Disconnect the Mass Air Flow sensor electrical connector using our Schwaben Connector Release or other suitable tool. The trick to removing these “push and pull” style of connectors is to first push and hold the connector down, which will release the tension between the locking tab and the catch on the sensor, then insert the tool and pull up. This will raise the locking tab in the connector just far enough to clear the catch on the sensor and it will slide off with ease.





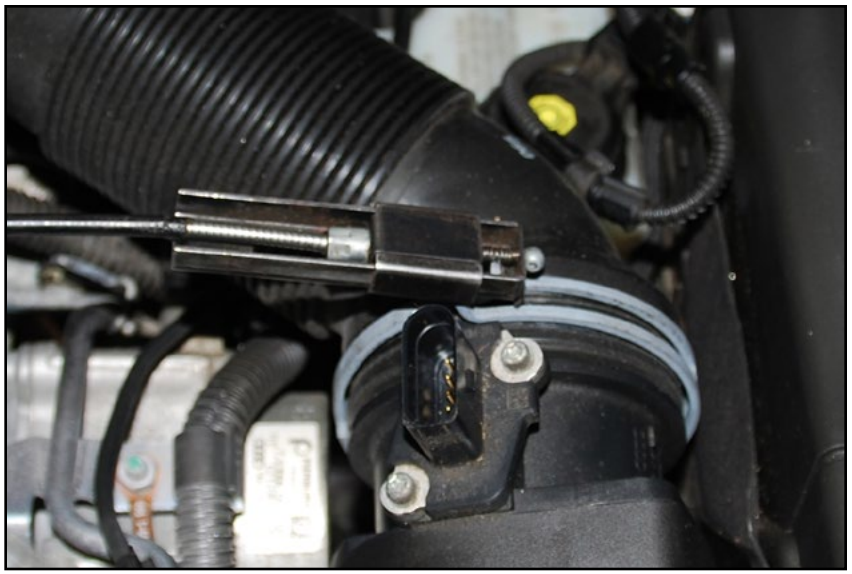
Step 4:

Pull the connector off the Mass Air Flow sensor and remove the tool.

REMOVING THE TRANSMISSION

Step 5: Locking Spring Clamp Pliers

Release the tension on the spring clamp which secures the flexible intake tube to the Mass Air Flow sensor.



Step 6:

Pull the flexible intake tube off of the Mass Air Flow sensor.

REMOVING THE TRANSMISSION

Step 7:

Pull the air box inlet tube off of the front air scoop.

NOTE

Note the location of the coolant air bleed hose (indicated by ////////). This will be relevant on Page 16, step 12.

Step 8: 5mm Hex (Allen)

Loosen the hold down screw for the original air box. This is a "trapped" screw and will remain in place in the air box after it is loosened.

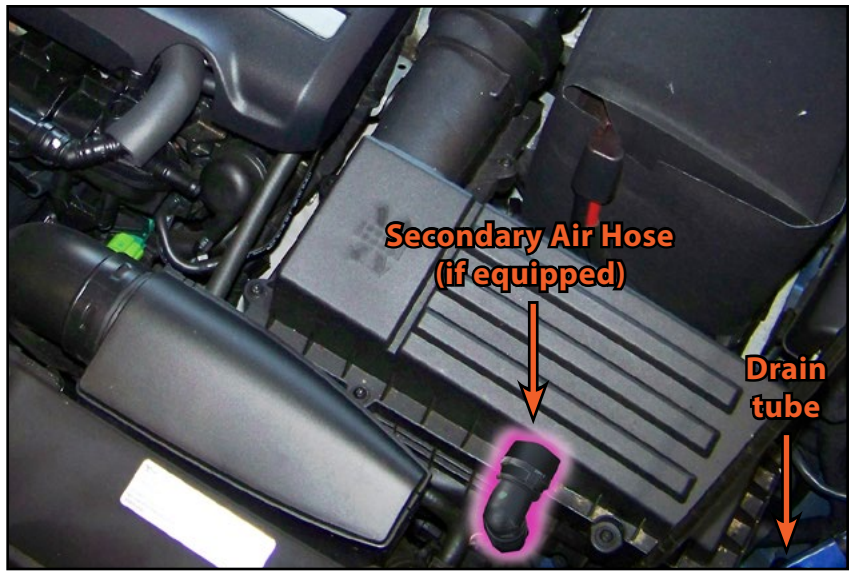
REMOVING THE TRANSMISSION

Step 9:

Look down between the air box and the fender and you will see where there is a drain tube attached to the bottom. It is very difficult to release the retaining clip, but by patiently following the next two steps, the air box can be removed without disconnecting this drain tube.

NOTE

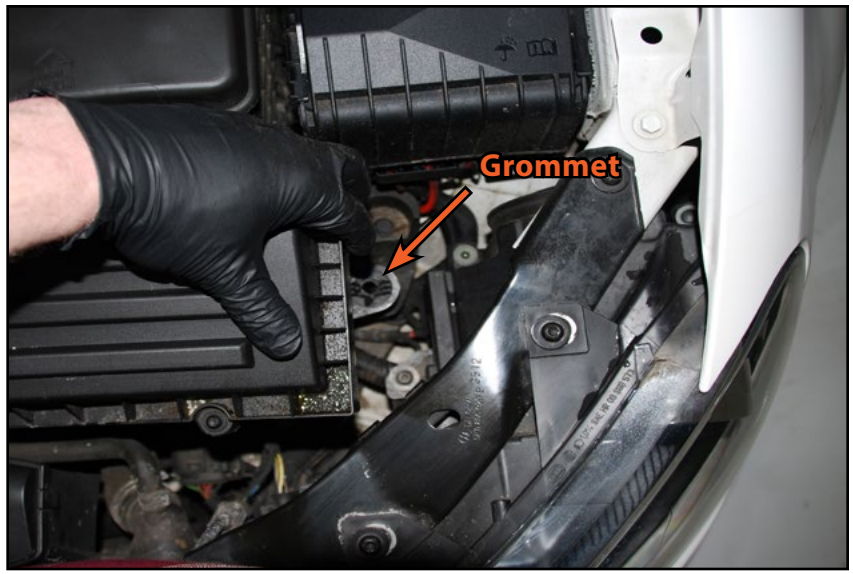
Some vehicles may also have a secondary air tube connected to the RH side of the air box. If you are not sure, carefully inspect your air box and remove this tube if equipped.



Step 10:

There are two rubber hold down grommets on the air box. First, pull up on the LH (driver's) side of the air box to release the grommet on the end, then using one hand on the front and one on the back, pull up on the center of the air box to release the grommet on the bottom side.

CAUTION: Pull up on the air box ***just enough*** to release the grommets but do not attempt to completely remove it at this time.



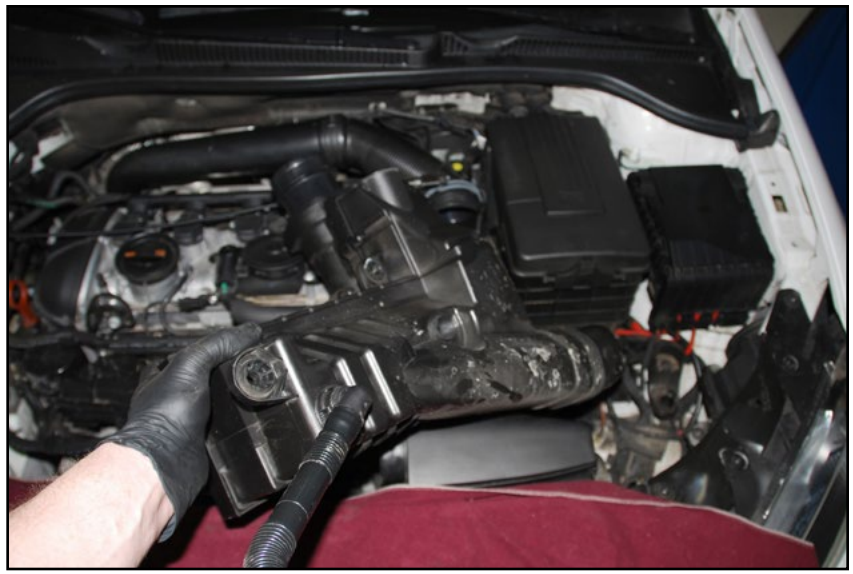
REMOVING THE TRANSMISSION

Step 11:

Lift the air box up slowly on the LH side and carefully guide the drain tube out.

Step 12:

Rotate the air box upside down so the curved inlet tube can be pivoted around the small coolant air bleed tube (see Page 14, step 7). You will now be able to lift the entire air box assembly out of the vehicle.



REMOVING THE TRANSMISSION

Step 13: T25 Torx

Remove the front air scoop by removing the two securing screws (arrows) and pulling it rearwards off of the core support.

Step 14:

Remove the battery cover by pushing the release tab in the direction of the arrow, then pivoting it upwards and unhooking it at the rear.

REMOVING THE TRANSMISSION

Step 15: 10mm Socket & Ratchet

Disconnect both battery terminals and position them out of the way.

CAUTION: To reduce the risk of fire, explosion, or personal injury, **ALWAYS** disconnect the battery by removing the negative battery terminal first.

Step 16:

Remove the front half of the battery box by lifting it upward to separate it from the rear half.

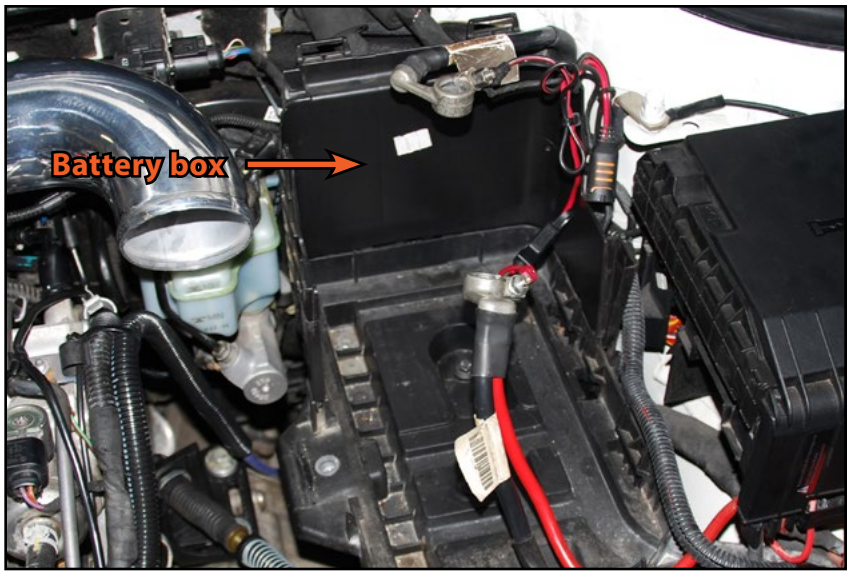
REMOVING THE TRANSMISSION

Step 17: 13mm Socket & Ratchet

Remove the battery hold down and lift the battery out of the vehicle.

Step 18:

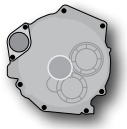
Remove the rear half of the battery box by lifting it upwards off of the battery tray.



REMOVING THE TRANSMISSION

Step 19: 10mm Socket & Ratchet

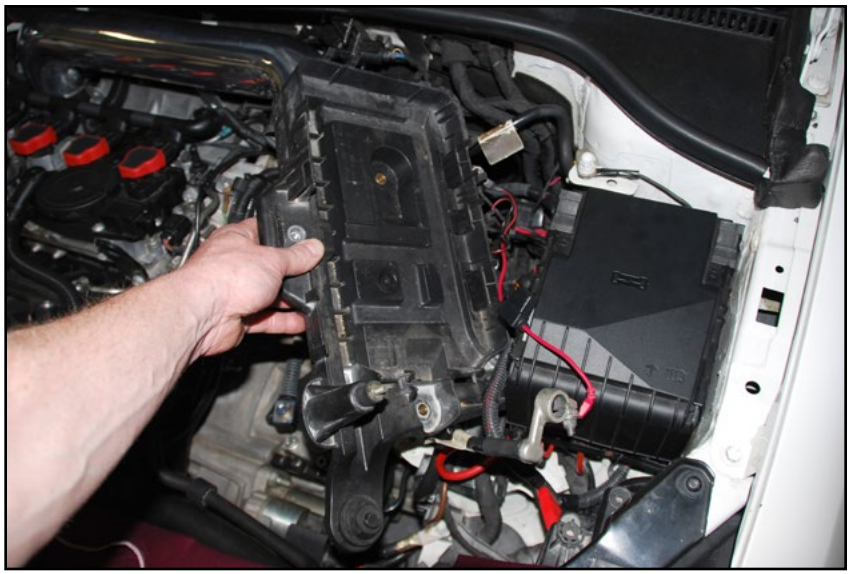
Remove the three battery tray bolts.



If you have decided to use our bolt storage template, store these bolts in location #12.

Step 20:

Lift the battery tray up to a vertical position then rotate it to guide the outboard air box mounting ear around the fuse panel wiring and remove it from the vehicle.

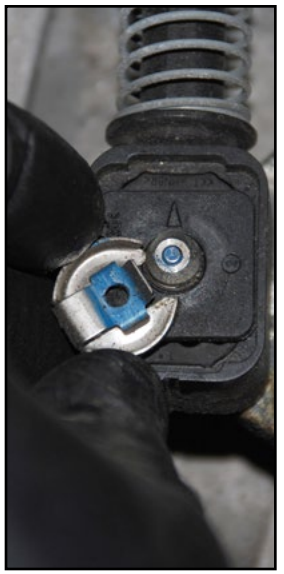


REMOVING THE TRANSMISSION

Step 21:

Remove the front-to-back shift cable from the selector lever using the following method:

1. Pull up lightly on the spring tab of each retaining clip then slide the clip off of the lever pin.
2. Slide the cable end off of the lever pin.



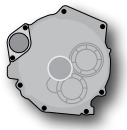
Step 22: Needle Nose Pliers

Remove the side-to-side shift cable from the relay lever. The cable end is retained by a small plastic nub on the end of the relay lever pin. You may be able to pull this cable end off by hand, however if it is too tight, insert a small pair of needle nose pliers between the cable end and relay lever and gently pry it off.

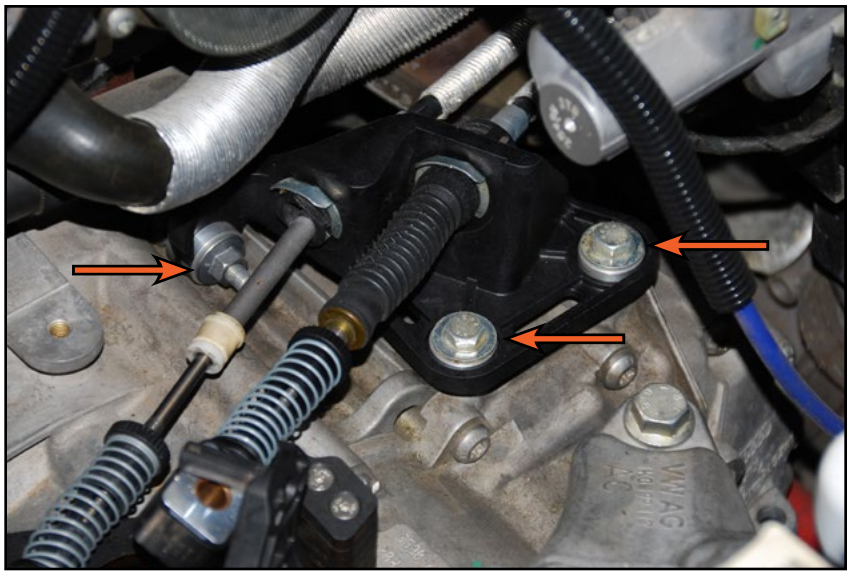
REMOVING THE TRANSMISSION

Step 23: 13mm Deep Socket & Ratchet

Locate the two bolts and one nut that hold the shifter cable bracket in place. Remove them and secure the cable bracket up out of the way using mechanics wire.

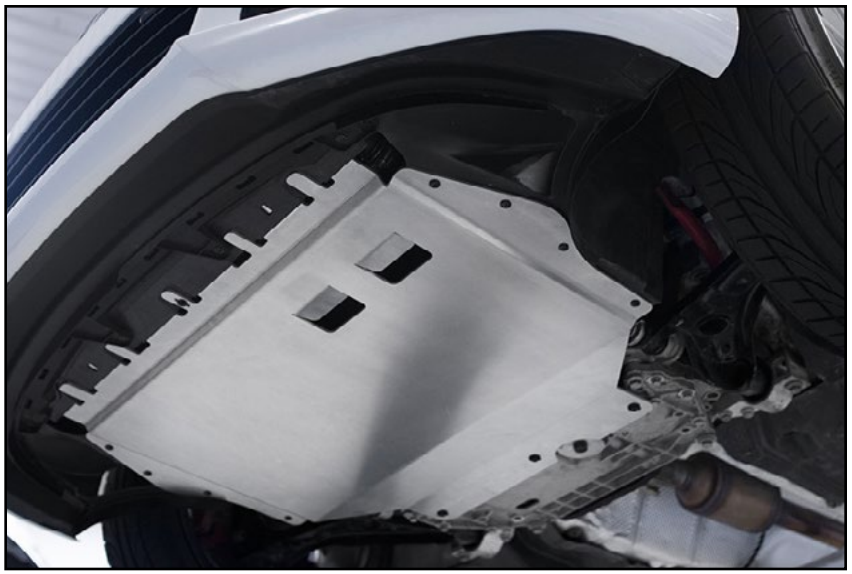


If you have decided to use our bolt storage template, thread the nut onto one of the bolts, then store these bolts in location #13.



Step 24: T25 Torx

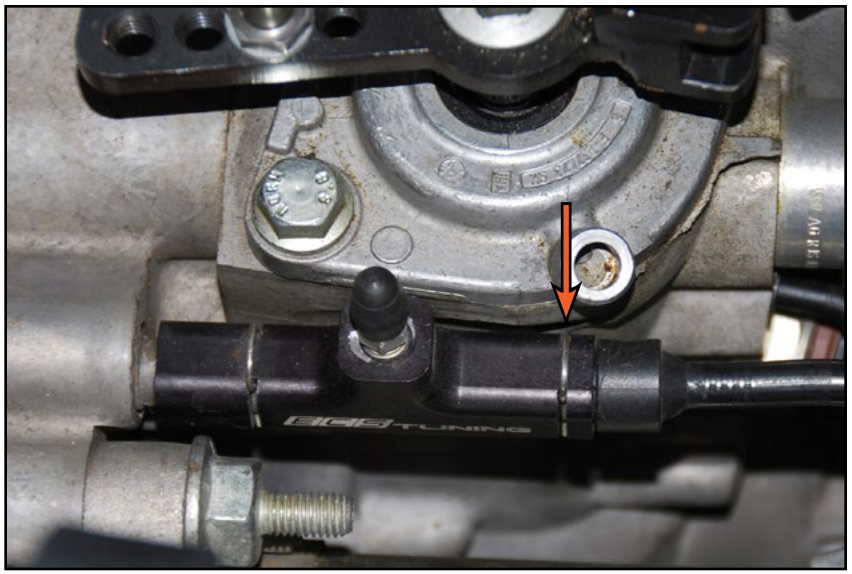
Safely raise and support the vehicle, then remove the lower insulation panel or skid plate, depending on how your vehicle is equipped.



REMOVING THE TRANSMISSION

Step 25: Small Hook or Pick Tool

Remove the clip holding the clutch hydraulic line to the bleeder block.



Step 26: Drain Pan

Pull the clutch hydraulic line out of the bleeder block. Brake fluid will begin to run out, be sure to it in a drain pan. Let the fluid drain out, then cap the end to prevent any residual fluid from dripping out.

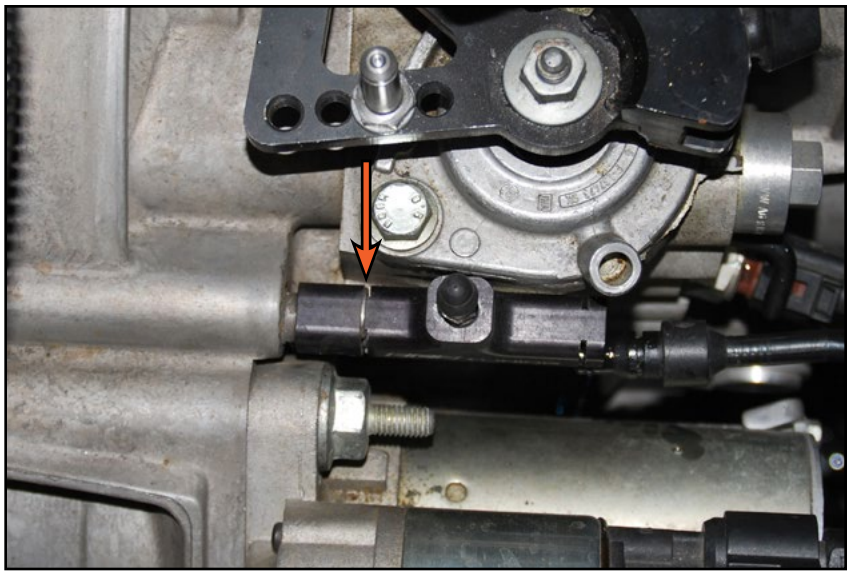
CAUTION: Do not attempt to pinch the rigid plastic line or it will be damaged.

CAUTION: Brake fluid is extremely harmful and corrosive. Be sure to wear safety glasses and gloves. Clean up any spills immediately and avoid any contact with painted surfaces.

REMOVING THE TRANSMISSION

Step 27: Small Pick or Hook Tool

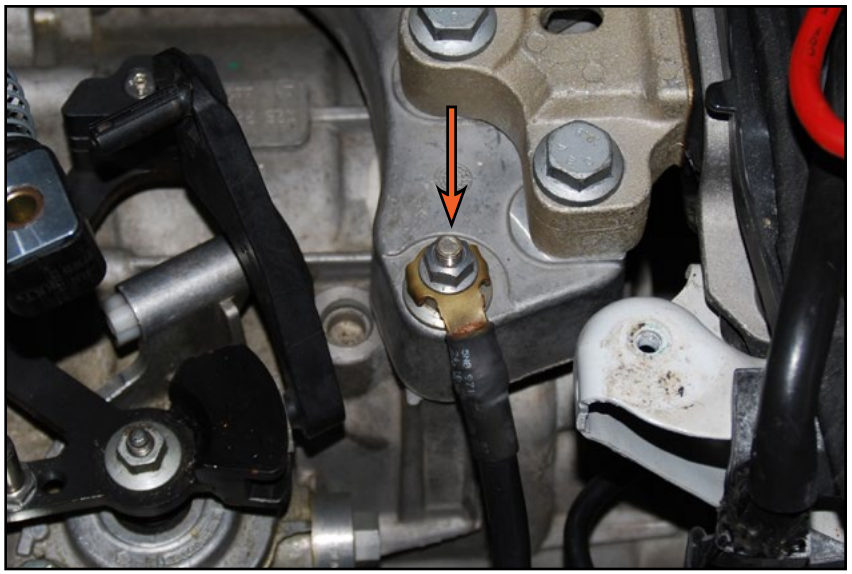
Remove the remaining clip on the bleeder block and remove it from the inlet of the clutch slave cylinder.



CAUTION: Brake fluid is extremely harmful and corrosive. Be sure to wear safety glasses and gloves. Clean up any spills immediately and avoid any contact with painted surfaces.

Step 28: 13mm Socket & Ratchet

Remove the ground cable from the transmission mount bracket.



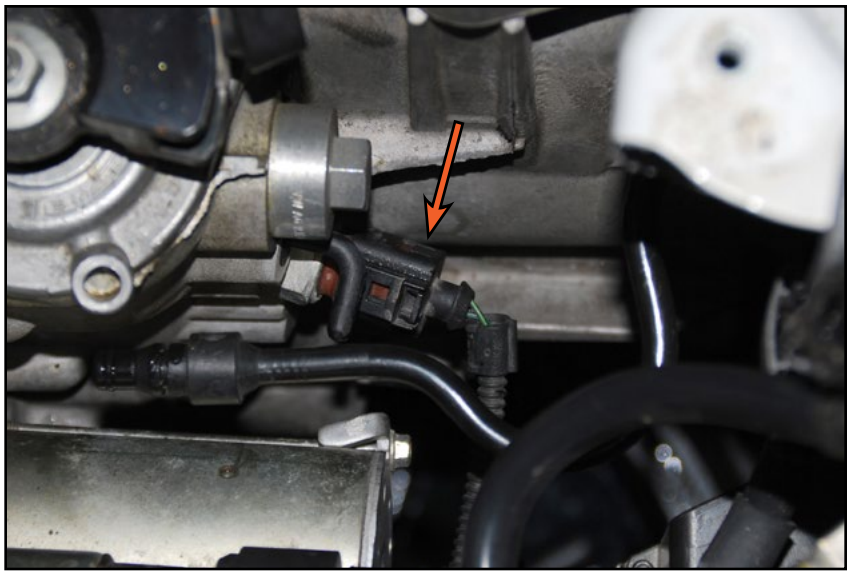
NOTE

Some vehicles may have the ground cable located on the end stud of one of the bell housing bolts.

REMOVING THE TRANSMISSION

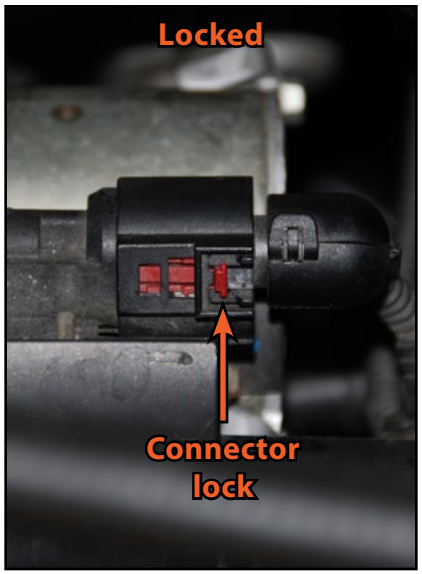
Step 29: VAG Connector Release Tool

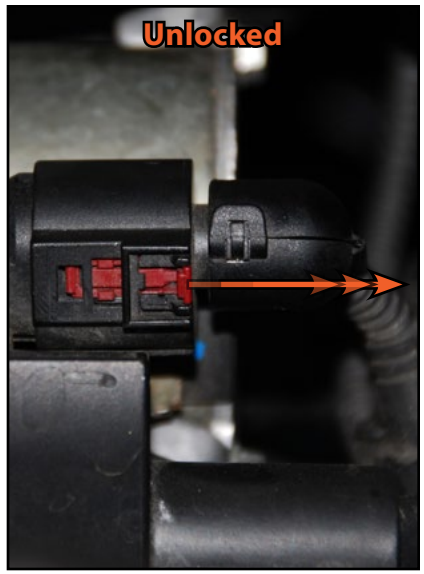
Disconnect the reverse light switch, located between the starter and the transmission.



Step 30:

Disconnect the starter solenoid by pulling the connector lock out, then squeezing the end of the connector and pulling it off.



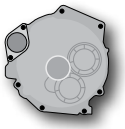


REMOVING THE TRANSMISSION

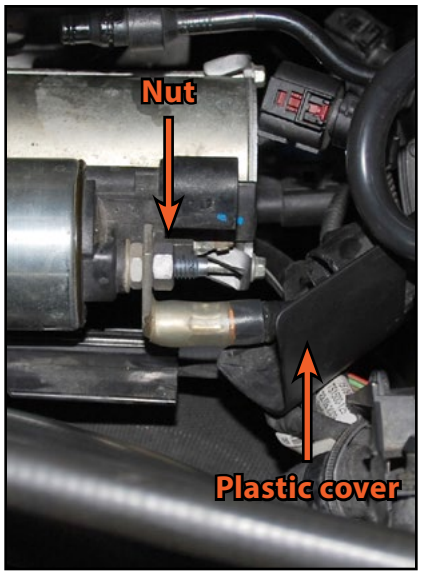
Step 31: 13mm Wrench, 18mm Socket & Ratchet

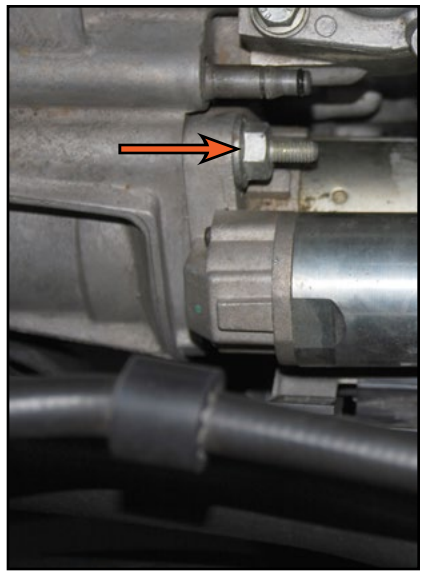
Slide back the plastic cover on the end of the starter cable, then remove the nut holding the cable to the starter stud, pull the cable off and position it out of the way.

Remove the upper starter bolt.



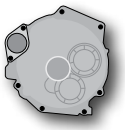
If you have decided to use our bolt storage template, store this bolt in location #1.



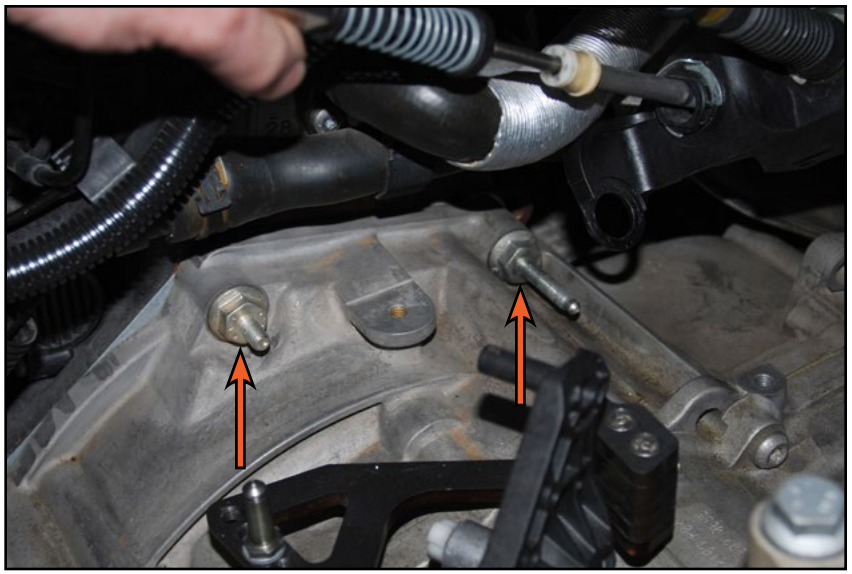


Step 32: 18mm Socket & Ratchet

Remove both upper bell housing bolts.



If you have decided to use our bolt storage template, store these bolts in location #'s 3 & 4.



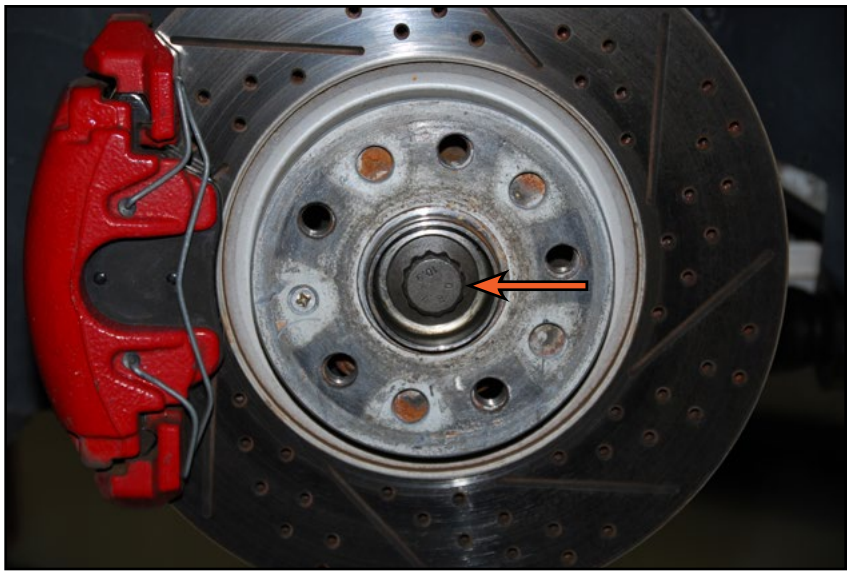
REMOVING THE TRANSMISSION

Step 33: 17mm Protecta-Socket & Impact, Wheel Hanger

Remove the LF wheel. Here we are using a wheel hanger to support the weight of the wheel while we remove the lug bolts.

Step 34: 24mm 12-Point Socket, Impact Wrench or Breaker Bar

Remove the bolt which secures the LF outer CV joint into the spindle.



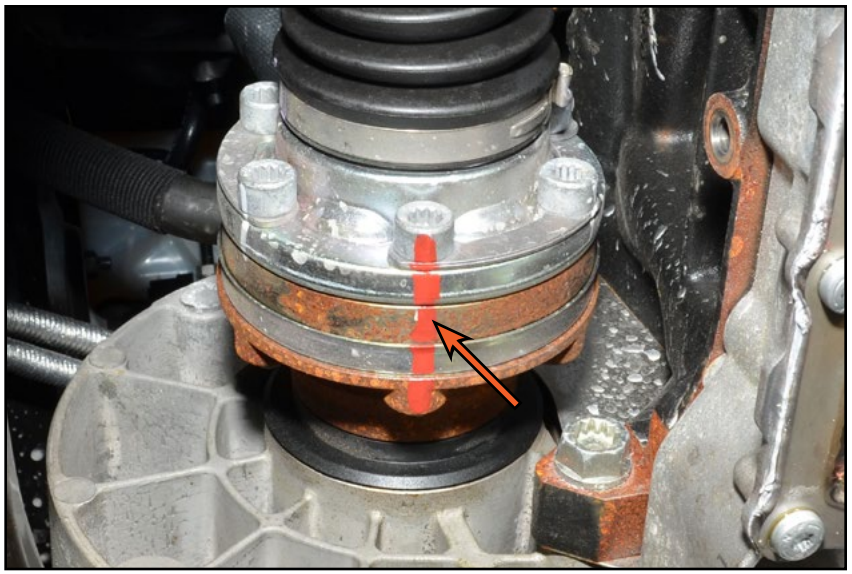
NOTE

This bolt is very tight. If you do not have an impact, you can loosen it using a breaker bar, but do not loosen it with the wheel on the ground. This will damage the wheel bearing. Have someone keep firm pressure on the brakes to keep the drive hub from rotating while you loosen the bolt.

REMOVING THE TRANSMISSION

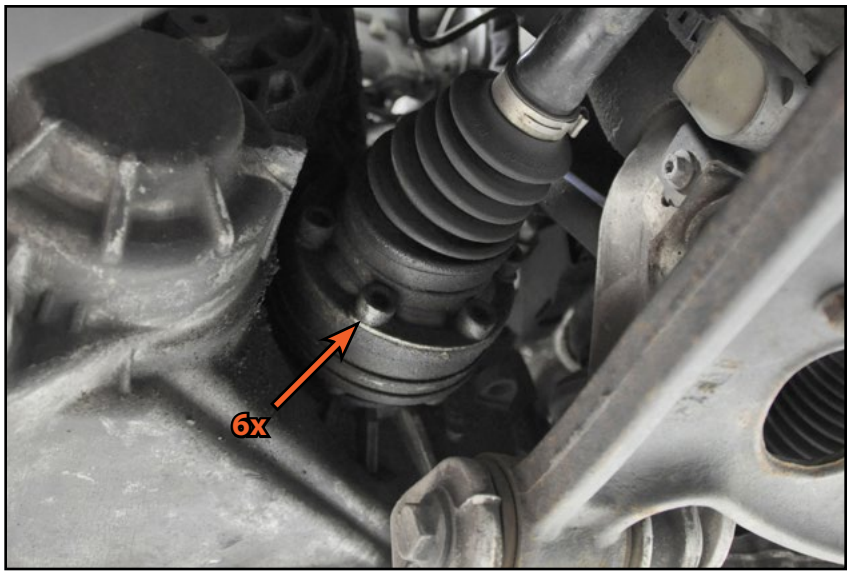
Step 35:

Mark **BOTH** axles with paint for easy alignment during reassembly.



Step 36: M10 Triple Square Socket & Ratchet

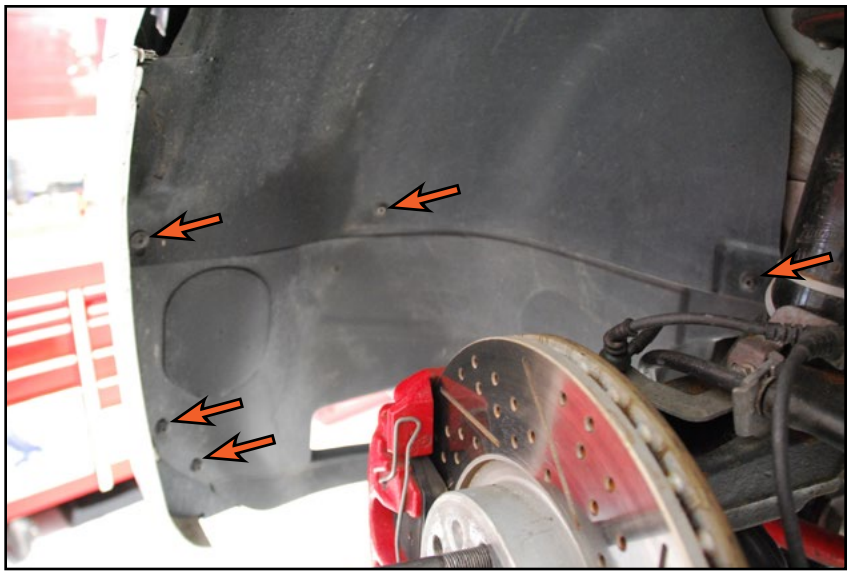
Remove the inner bolts from **BOTH** axles, then tie the RH CV shaft up and out of the way using mechanics wire.



REMOVING THE TRANSMISSION

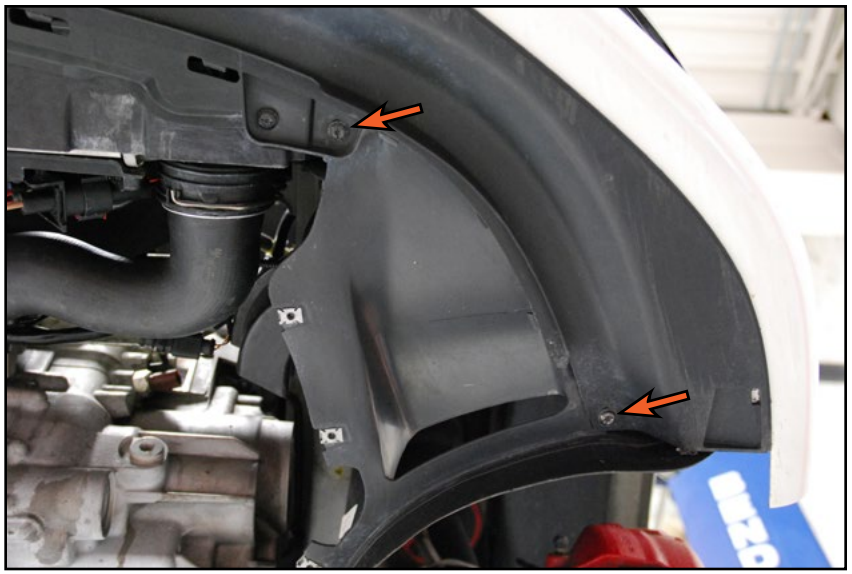
Step 37: T25 Torx

Remove the five LF fender liner screws shown in the picture.



Step 38: T25 Torx

Remove the two fender liner screws underneath, then remove the LF lower fender liner from the vehicle.



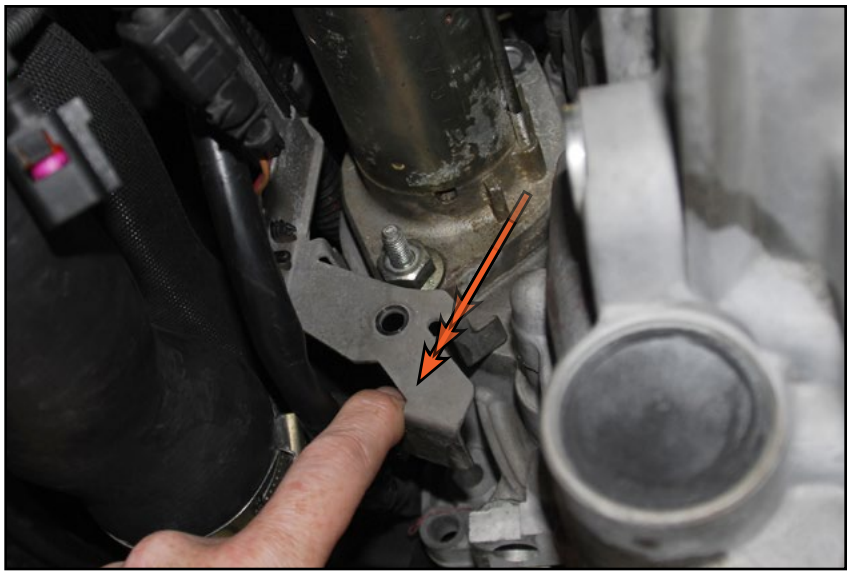
REMOVING THE TRANSMISSION

Step 39: 13mm Socket & Ratchet

Remove the nut on the lower starter mounting bolt.

Step 40:

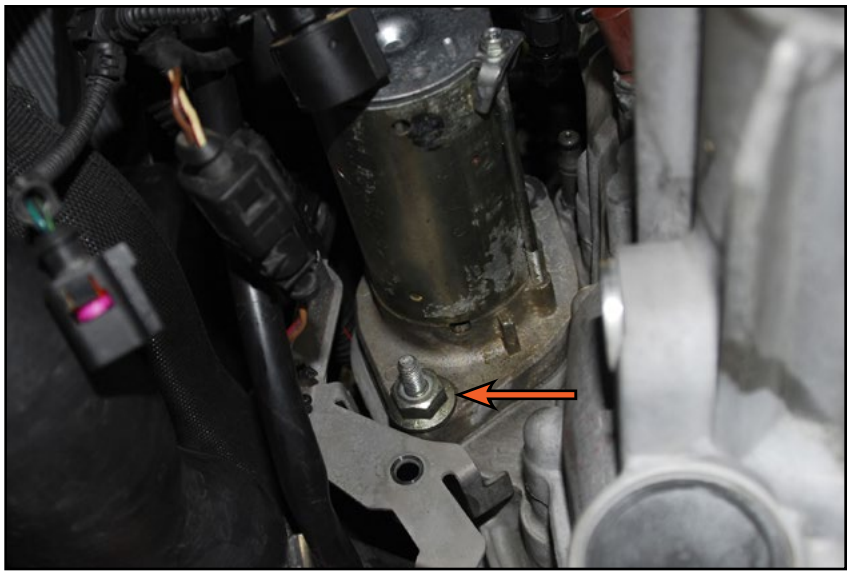
Pull the wiring harness bracket off of the lower starter mounting bolt.

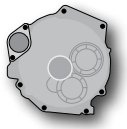


REMOVING THE TRANSMISSION

Step 41: 18mm Socket & Ratchet

Remove the lower starter bolt and remove the starter from the bell housing.





If you have decided to use our bolt storage template, thread the nut from step 40 onto this bolt and store them in location #2.

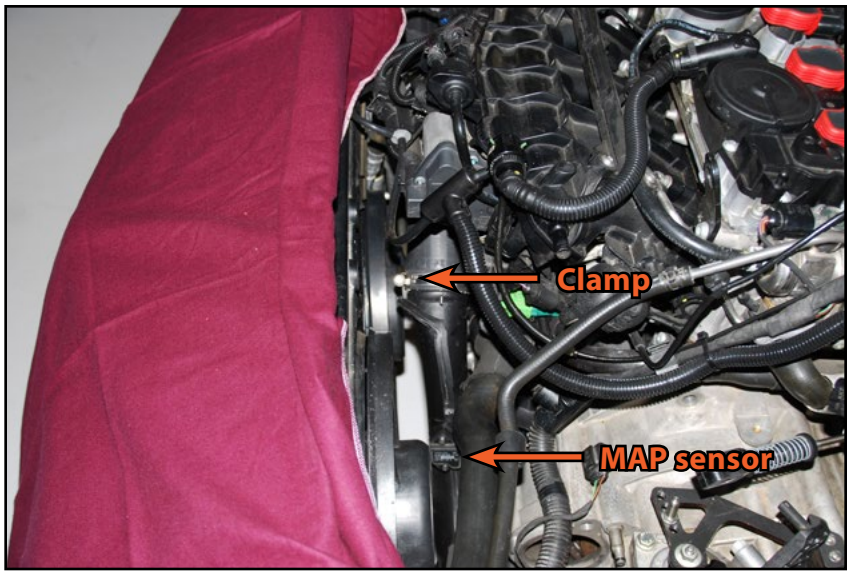
Step 42: Flat Blade Screwdriver

Loosen the clamp between the LH charge air hose and duct, then pull out the clip between the LH charge air hose and intercooler, and pull the hose off on both ends.

REMOVING THE TRANSMISSION

Step 43: Flat Blade Screwdriver

Loosen the clamp on the top of the charge air duct. Also note the location of the MAP sensor.



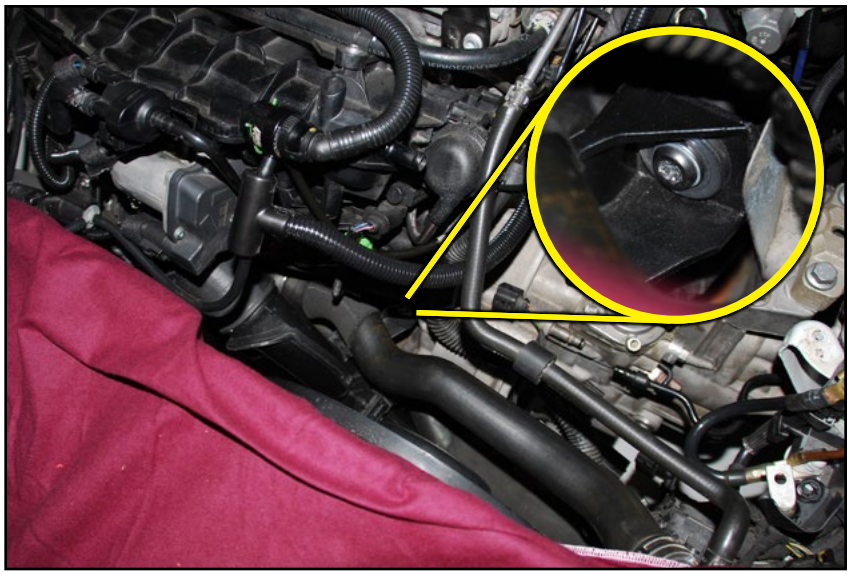
Step 44: VAG Connector Release Tool

Disconnect the MAP sensor, located on the charge air duct, just behind the radiator fans.

REMOVING THE TRANSMISSION

Step 45: T30 Torx

Remove the upper charge air duct mounting screw. It is normally hidden from view but can be located by moving the wiring harnesses aside.



NOTE

After they are removed from the engine block, the charge air duct screws will remain "trapped" in place in the charge air duct.

Step 46: T30 Torx

Remove the lower charge air duct mounting screw. It is located just above the front LH corner of the oil pan. Pull down on the charge air duct to separate it from the hose on top, then rotate it and guide it downwards and out between the engine and radiator fans.

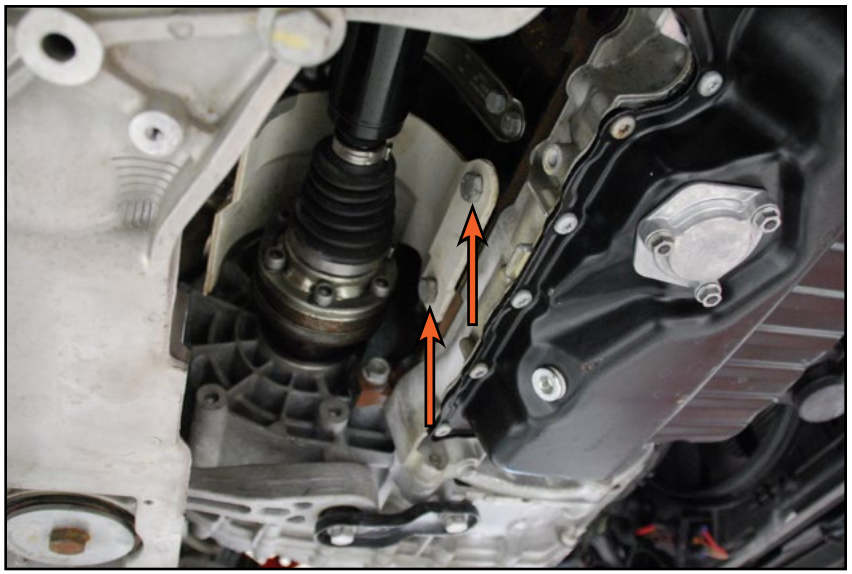
REMOVING THE TRANSMISSION

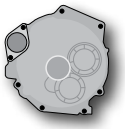
Step 47: Flat Blade Screwdriver

Remove the clip on each end of the RH charge air hose, then pull the hose off from each end.

Step 48: 17mm Socket & Ratchet

Remove the two bolts for the RH inner CV heat shield then rotate the shield around the half shaft and remove it.



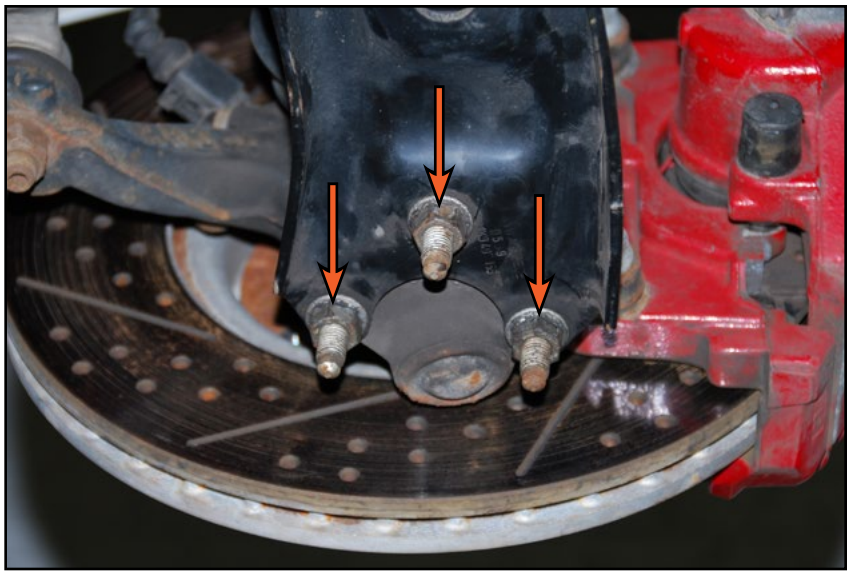


If you have decided to use our bolt storage template, store these bolts in location #14.

REMOVING THE TRANSMISSION

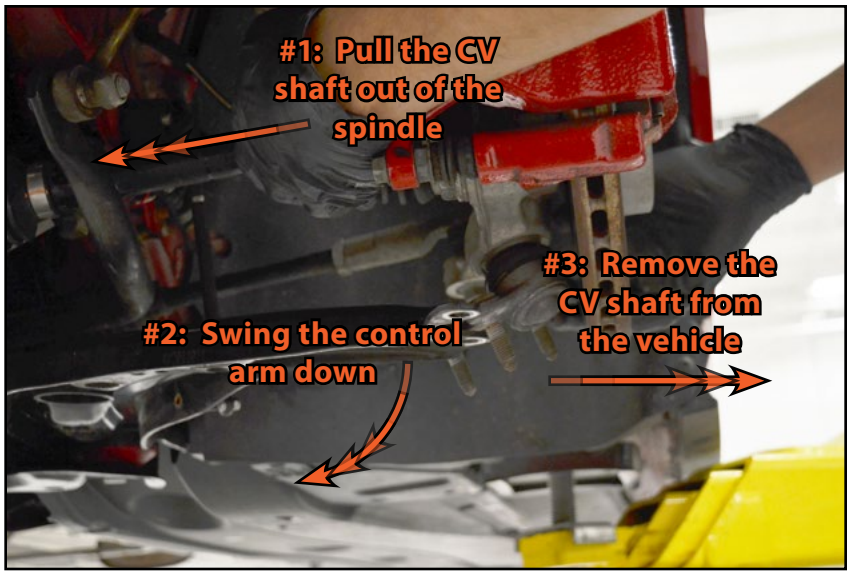
Step 49: 16mm Socket & Breaker Bar

Remove the three LH lower ball joint nuts



Step 50:

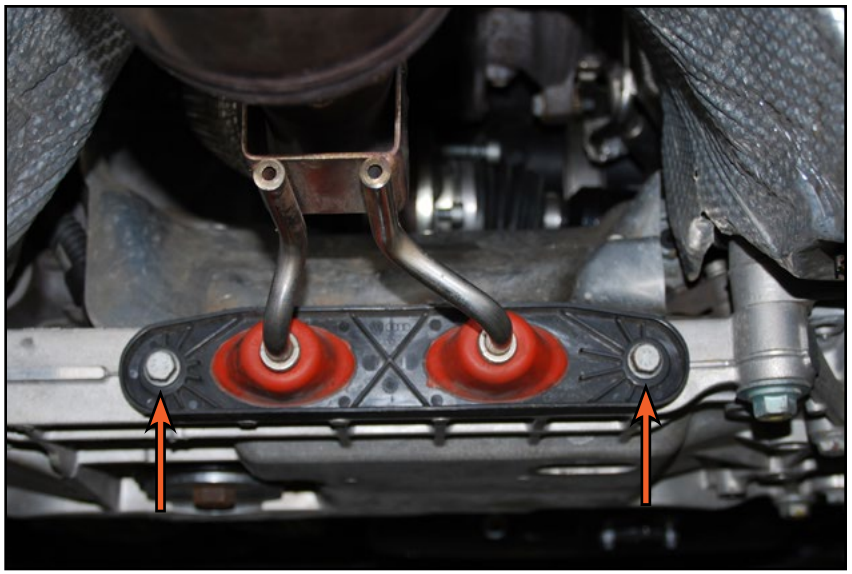
Pull the CV shaft out of the spindle, then swing the control arm down and remove the CV shaft.

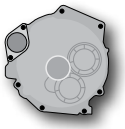


REMOVING THE TRANSMISSION

Step 51: 13mm Socket & Ratchet

Remove the two 13mm bolts holding the exhaust downpipe bracket to the subframe.

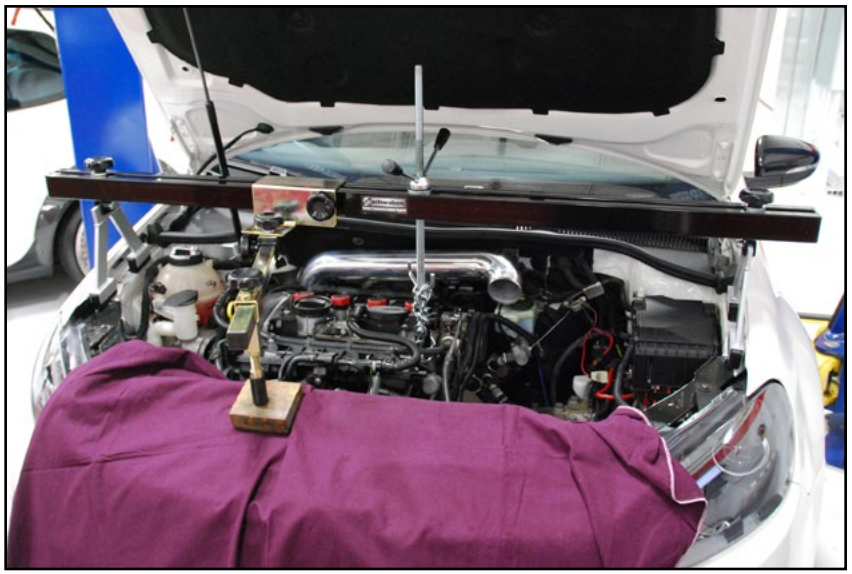




If you have decided to use our bolt storage template, store these bolts in location #9.

Step 52: Engine Support Bar

Now it's time to install the engine support bar. Locate the engine lift bracket on the cylinder head. Position the legs of the engine support bar securely inside the fenders, then position an extension arm out onto the radiator core support. Secure the lifting hook of the engine bar to the engine lift bracket using a chain. Tension the lifting hook and chain until it just begins to lift the engine.

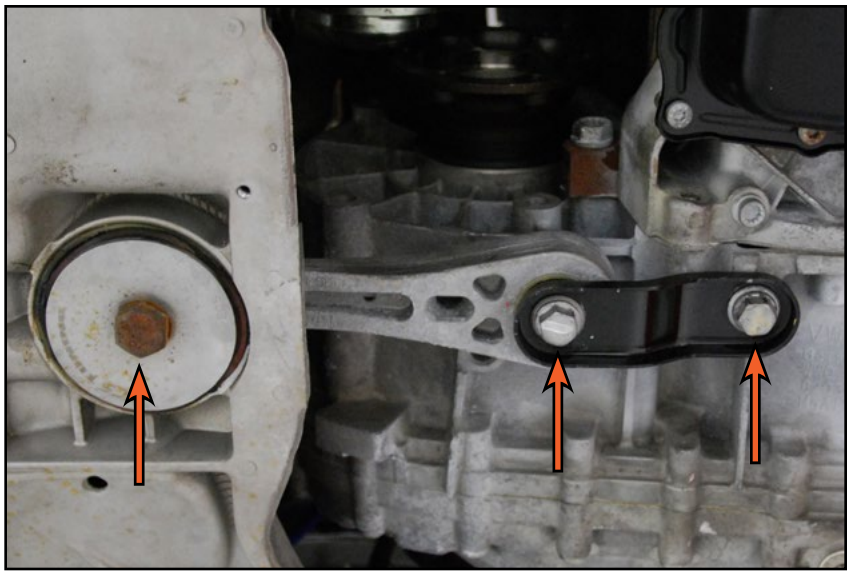


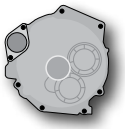
We are using a block of wood here since the radiator core support is plastic, this will distribute the weight evenly to prevent damage.

REMOVING THE TRANSMISSION

Step 53: 16mm & 22mm Sockets, Breaker Bar

Remove the three pendulum support bolts and slide the support out of the subframe.

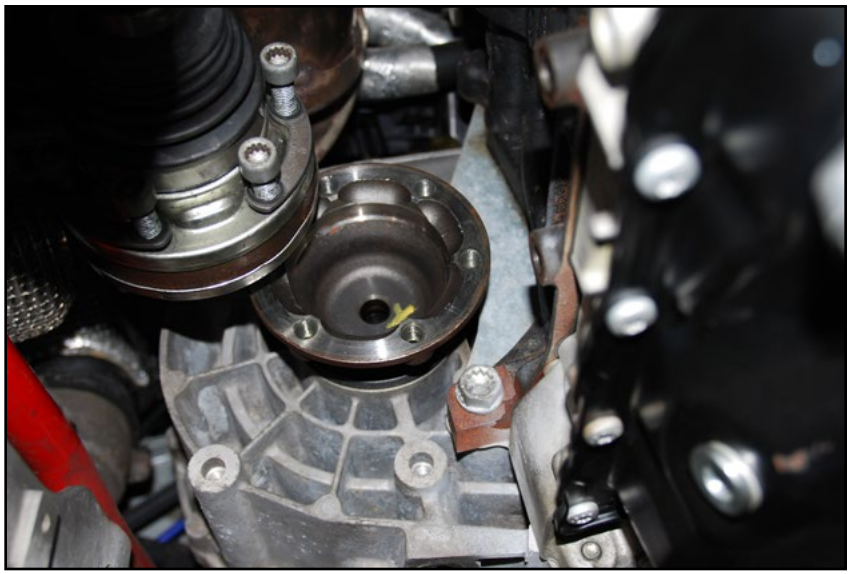




If you have decided to use our bolt storage template, store these bolts in location #10.

Step 54:

Look between the RH CV drive flange and the back of the engine. Some vehicles are equipped with an additional flywheel shield in this location, our vehicle is not. If yours is equipped with this shield, you must remove it at this time so the drive flange will clear the shield when removing the transmission.



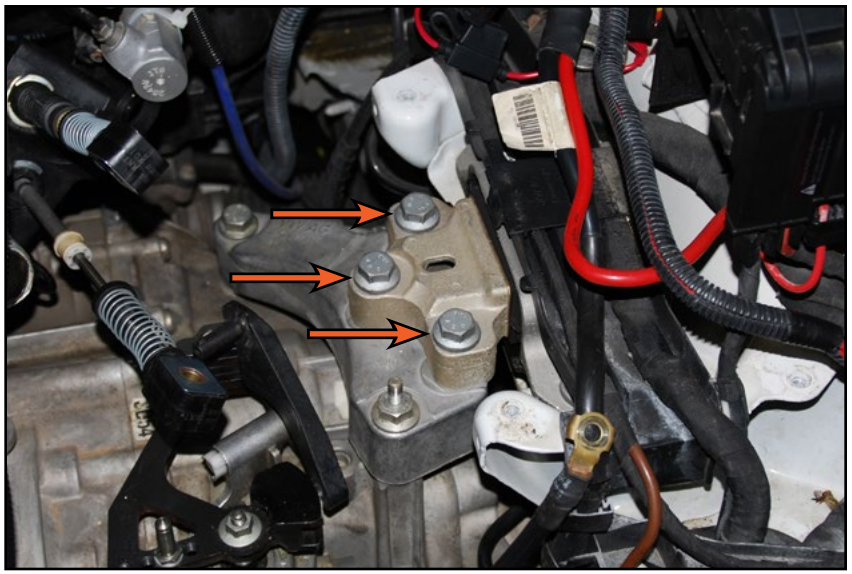
REMOVING THE TRANSMISSION

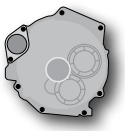
Step 55:

If your vehicle is equipped with an oil level sensor on the bottom of the oil pan, disconnect it at this time so the wiring harness is not stretched when tilting the engine for transmission removal. Our vehicle is not equipped with one, but the location will be the same as indicated by the photo.

Step 56: 18mm Socket & Breaker Bar

Remove the three transmission mount bolts.





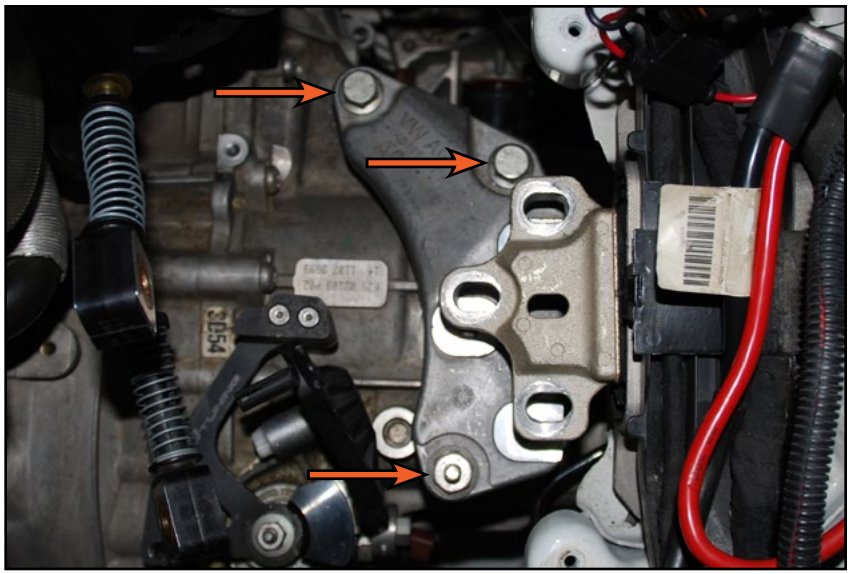
If you have decided to use our bolt storage template, store these bolts in location #11.

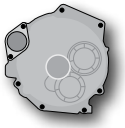
REMOVING THE TRANSMISSION

Step 57:

18mm Socket & Breaker Bar

Loosen the engine bar and lower the transmission about two inches. Remove the three transmission bracket bolts and remove the bracket.

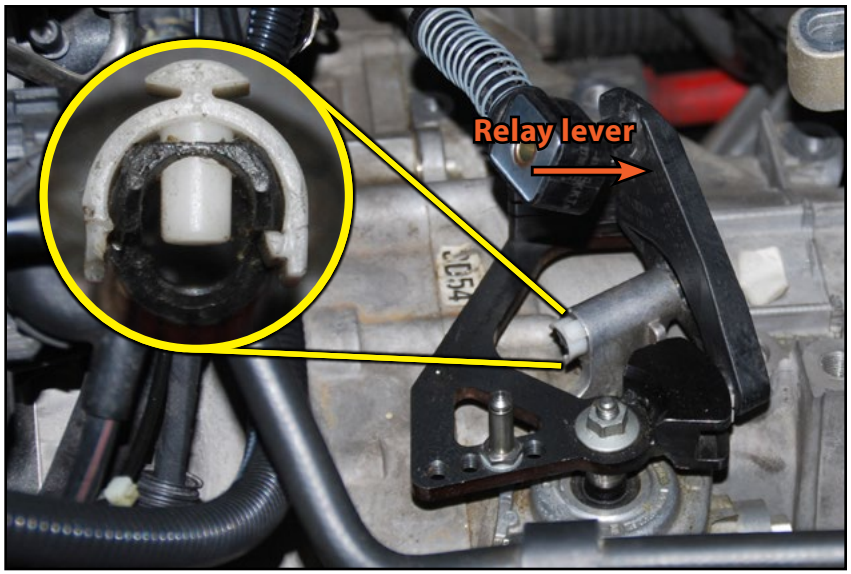




If you have decided to use our bolt storage template, store these bolts in location #15.

Step 58:

Pull the plastic retaining clip off by hand, then slide the relay lever out and remove it.



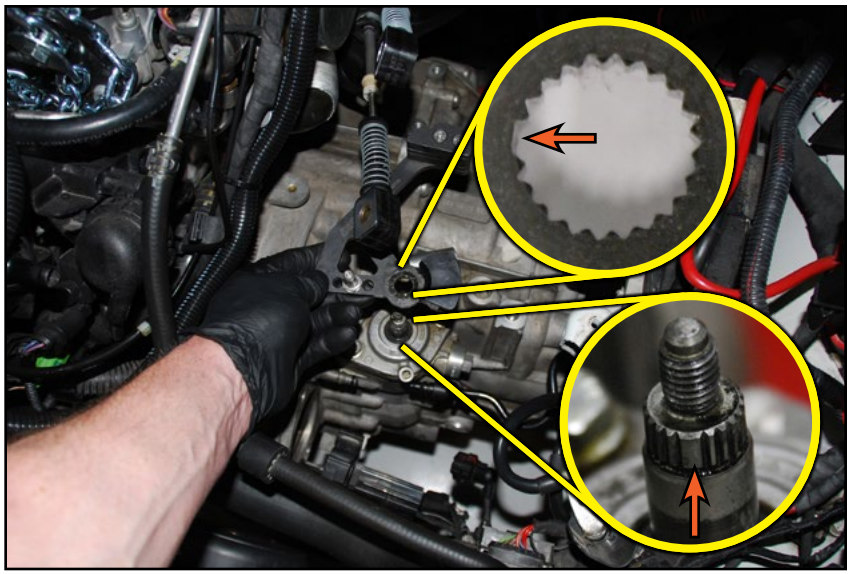
REMOVING THE TRANSMISSION

Step 59: 13mm Socket & Ratchet

Remove the selector shaft nut.

Step 60:

Pull the selector lever off of the selector shaft. You may have to gently wiggle it side to side until it releases. Be patient and work the lever gently until it is free. You may have to use a puller if it is stuck, but it can normally be removed without one.



NOTE

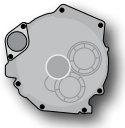
There is one double tooth on the selector lever and selector shaft, this allows the lever to only be installed one way.

CAUTION: Do not hammer on the end of the selector shaft or pry on the selector lever or the selector shaft can be damaged.

REMOVING THE TRANSMISSION

Step 61: 18mm Socket & Ratchet

Remove the rear bell housing bolt.

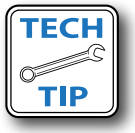


If you have decided to use our bolt storage template, store this bolt in location #5.

We have found that it is considerably easier to remove and install the transmission if you remove the RH CV drive flange. It is easy to remove and will save you a lot of time and effort. Continue with step 62 for instructions on how to remove it, or skip to step 64 to proceed with the clutch install.

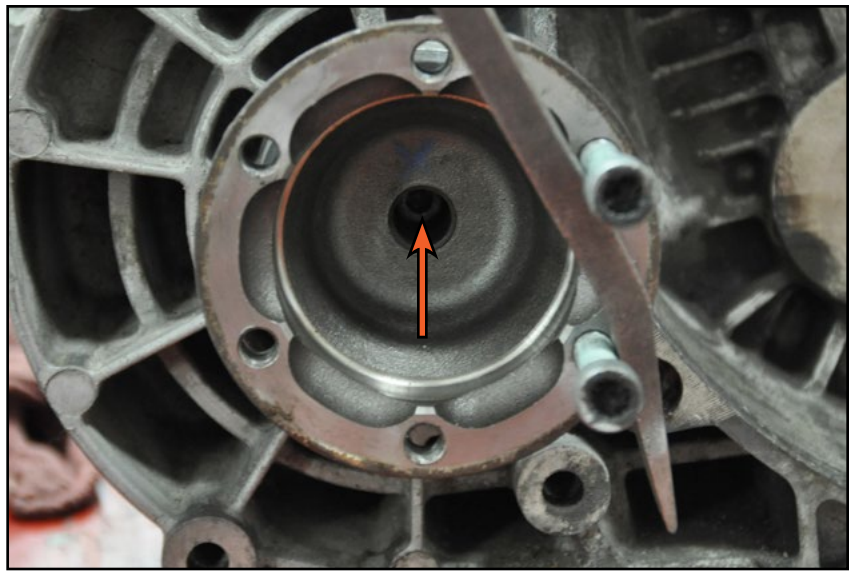
Step 62: Pry Bar, 6mm Allen

To remove the allen-head bolt, thread two CV bolts into the CV flange. Then lever a pry bar between the two as shown in order to hold the flange stationary. You will now be able to loosen and remove the bolt.



A long allen wrench or an extended allen bit socket will work best for this bolt.

We are showing drive flange removal with the transmission out of the vehicle in order to show you clearer pictures.



REMOVING THE TRANSMISSION

Step 63:

With the bolt removed, simply slide the drive flange out.

NOTE

When removing the drive flange with the transmission still in the vehicle, you may have to drop the RH CV shaft down to gain adequate clearance.

Step 64: Transmission Jack

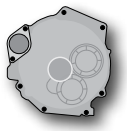
Raise the transmission jack in place and secure the transmission to the jack using hold down straps.

STOP

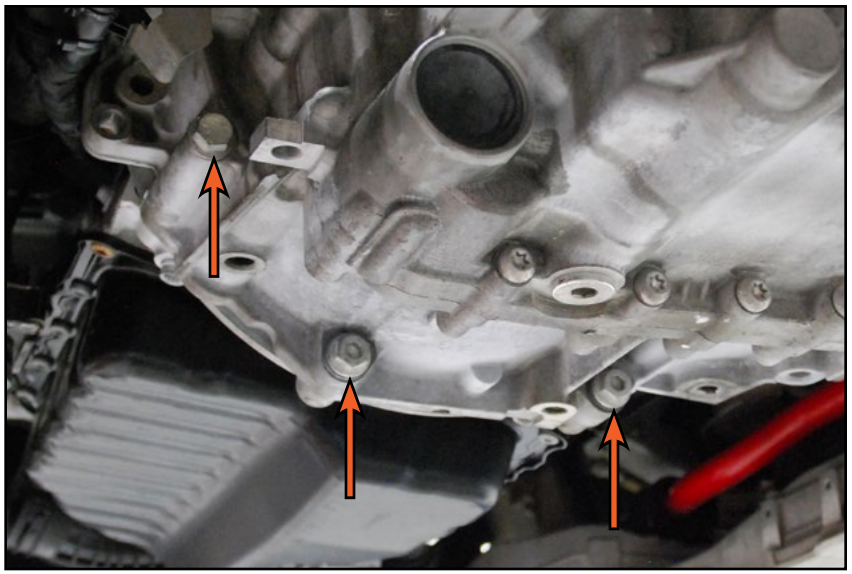
Double check the engine support bar to make sure it is secure and the engine is properly supported. Also be sure to have a friend help you remove the transmission, it is very heavy.

18mm Socket & Ratchet

Remove the front transmission bell housing bolt and the two lower bell housing bolts, shown here without the jack in place for clarity.

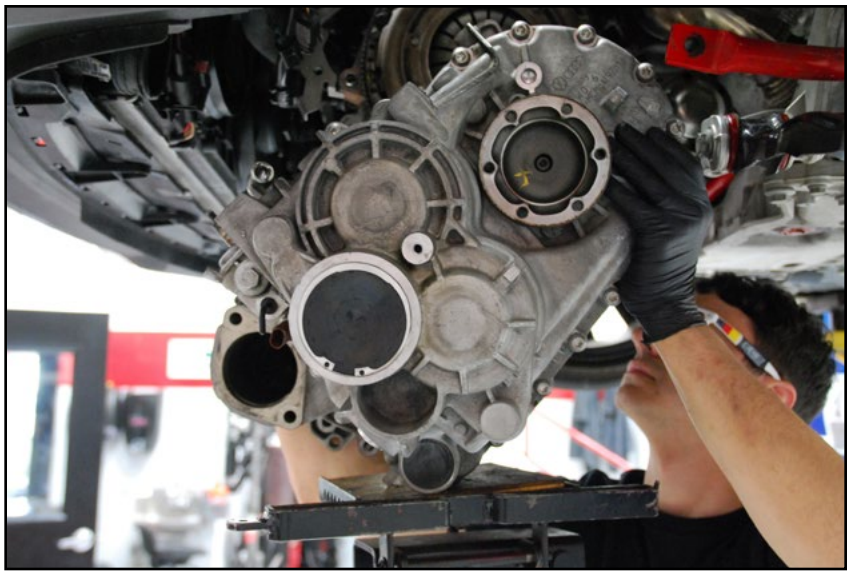


If you have decided to use our bolt storage template, store the front bell housing bolt in location #8, and store the two lower bell housing bolts in location #'s 6 & 7.



Remember to work slowly and cautiously during removal and follow these general steps and tips:

- ☐ Separate the transmission from the engine by pulling it back from the engine block.
- ☐ Rotate the differential upwards, then angle the transmission toward the front and guide it around the flywheel.
- ☐ Pull the transmission back until it completely clears the flywheel and clutch.
- ☐ Slowly lower and adjust the engine bar and transmission jack as necessary to gain the required clearance for removal.
- ☐ Once the transmission is clear, lower it completely and transfer it to a work surface.

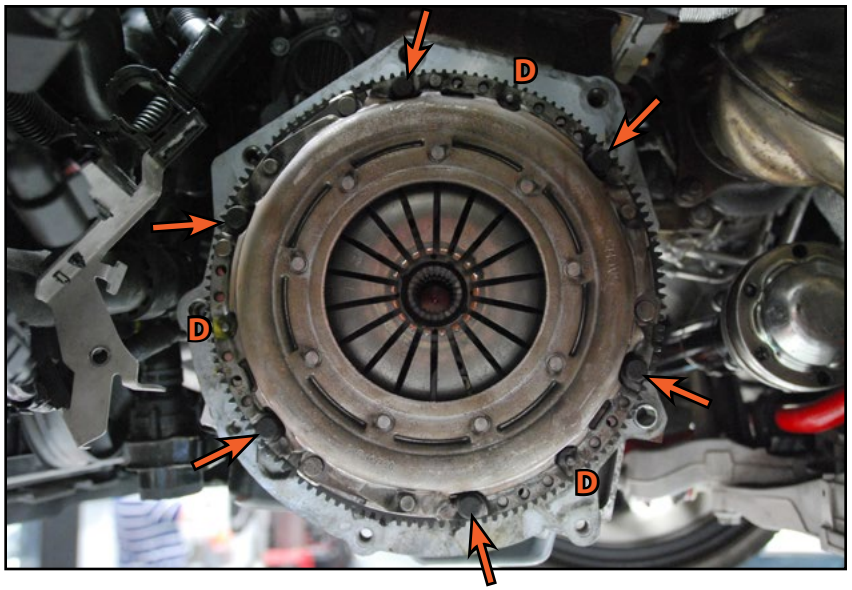


REMOVING THE ORIGINAL FLYWHEEL AND CLUTCH

Step 1: 9mm 12-Point Socket & Ratchet, Flat Blade Screwdriver

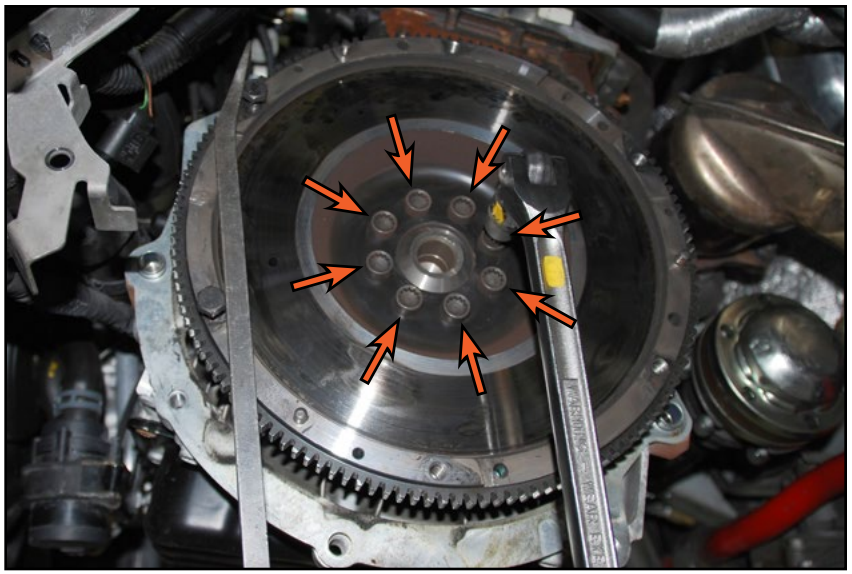
READ THIS ENTIRE STEP BEFORE PROCEEDING

Loosen, but do not remove all six pressure plate bolts (arrows). Next, keep a flat blade screwdriver within reach, then place one hand on the pressure plate to keep it in place and remove all six bolts in an alternating pattern. Now, using both hands, slowly pull the pressure plate off of the flywheel dowel pins (D). As you pull it off, make sure that you grab the clutch disc so it does not fall and remove it along with the pressure plate. You may have to pry the pressure plate off the dowel pins (D) using a flat blade screwdriver. Depending on whether the pressure plate bolts are original or not, the socket size required for removal may vary.



Step 2: M12 Triple Square Socket & Breaker Bar, Pry Bar

Loosen all eight flywheel bolts, then remove seven of them. Firmly grip the flywheel and remove the last bolt, then pull the flywheel off the end of the crankshaft. Depending on whether the flywheel bolts are original or not, the socket size required for removal may vary.

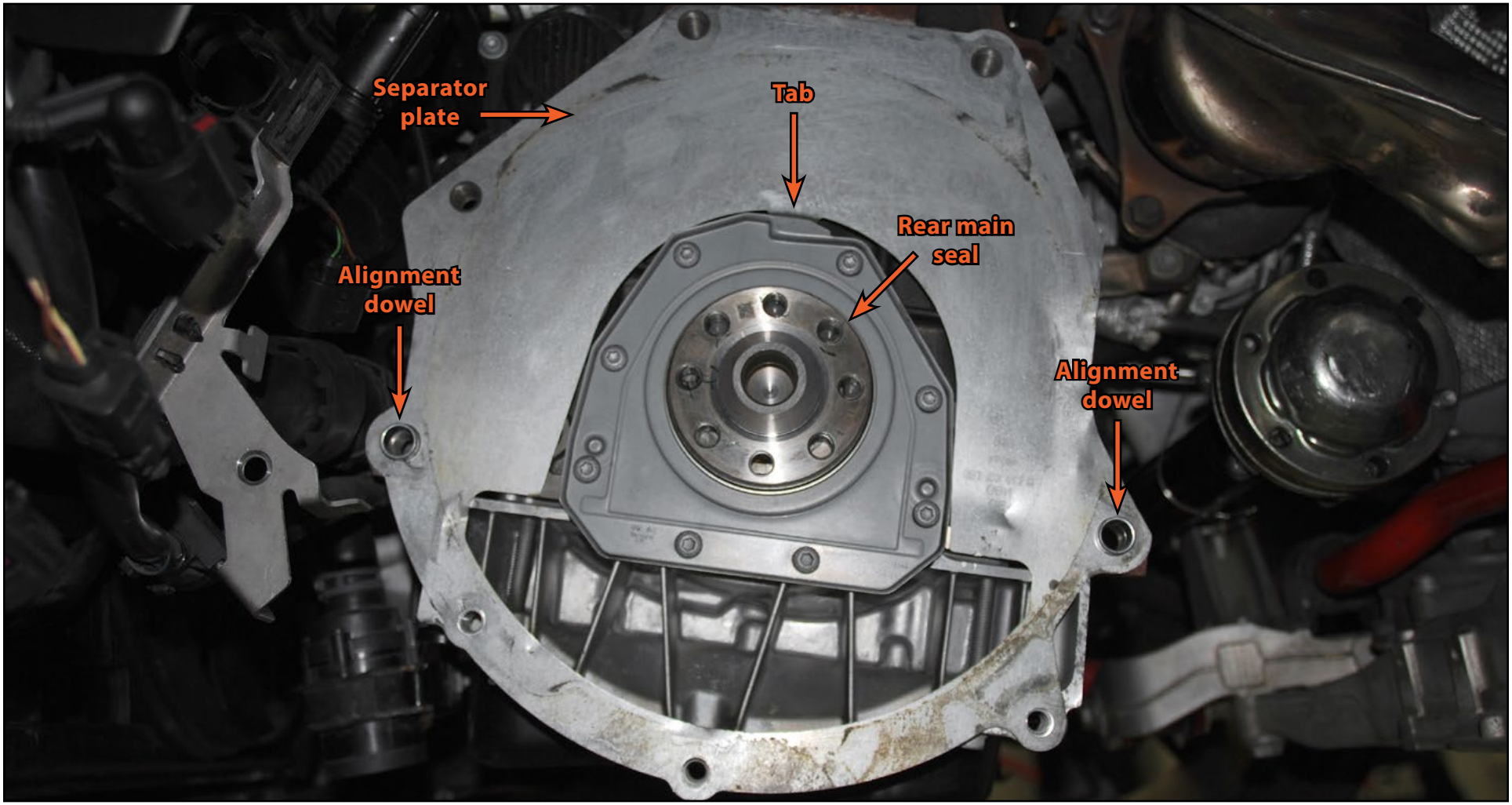


TECH TIP

An impact can be used to easily remove the flywheel bolts. If you do not have an impact, thread two of the old pressure plate bolts back into place and lever a pry bar between them to keep the engine from turning while you break the flywheel bolts loose.

CLEANING THE ENGINE BLOCK

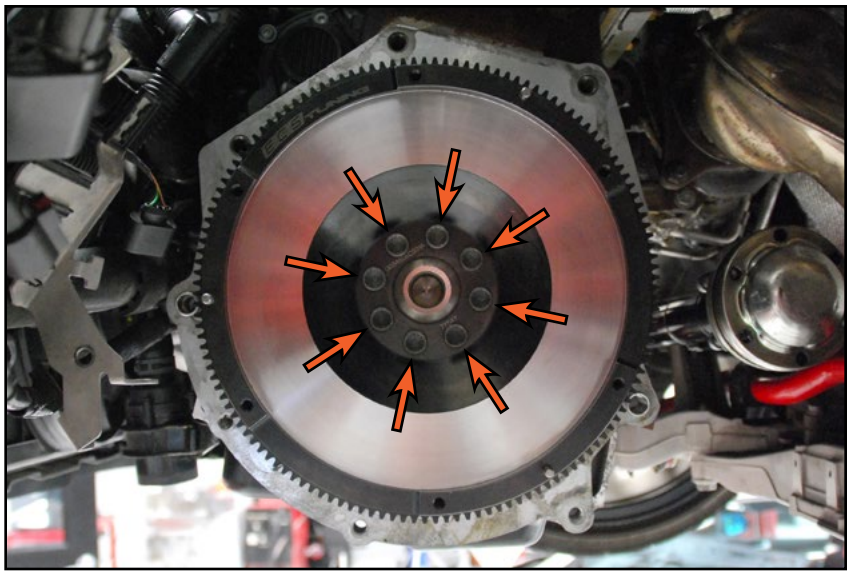
Thoroughly clean the end of the crankshaft, engine block, and separator plate. Closely inspect the rear main seal for any signs of leakage, replace it if necessary. Make sure that both alignment dowels are located in the block in the locations shown. If not, remove them from the transmission bell housing and reinstall them in the block. It is common for the separator plate fall off during transmission removal. Reposition it by hooking the center tab behind the rear main seal plate then resting it on the two alignment dowels.



INSTALLING THE NEW FLYWHEEL AND CLUTCH

Step 1: M12 Triple Square Socket & Ratchet

Install the flywheel into place on the end of the crankshaft, then install all eight bolts and thread them in just until they are fully seated. The new bolts have loctite pre-applied on the threads so you may have to use a ratchet to thread them in.



NOTE

The flywheel bolt holes are offset, they will only line up in one position.

Step 2: M12 Triple Square Socket, Torque Wrench, Breaker Bar, Paint Pen

Torque the flywheel bolts in the sequence shown on the right in the three different stages listed below.

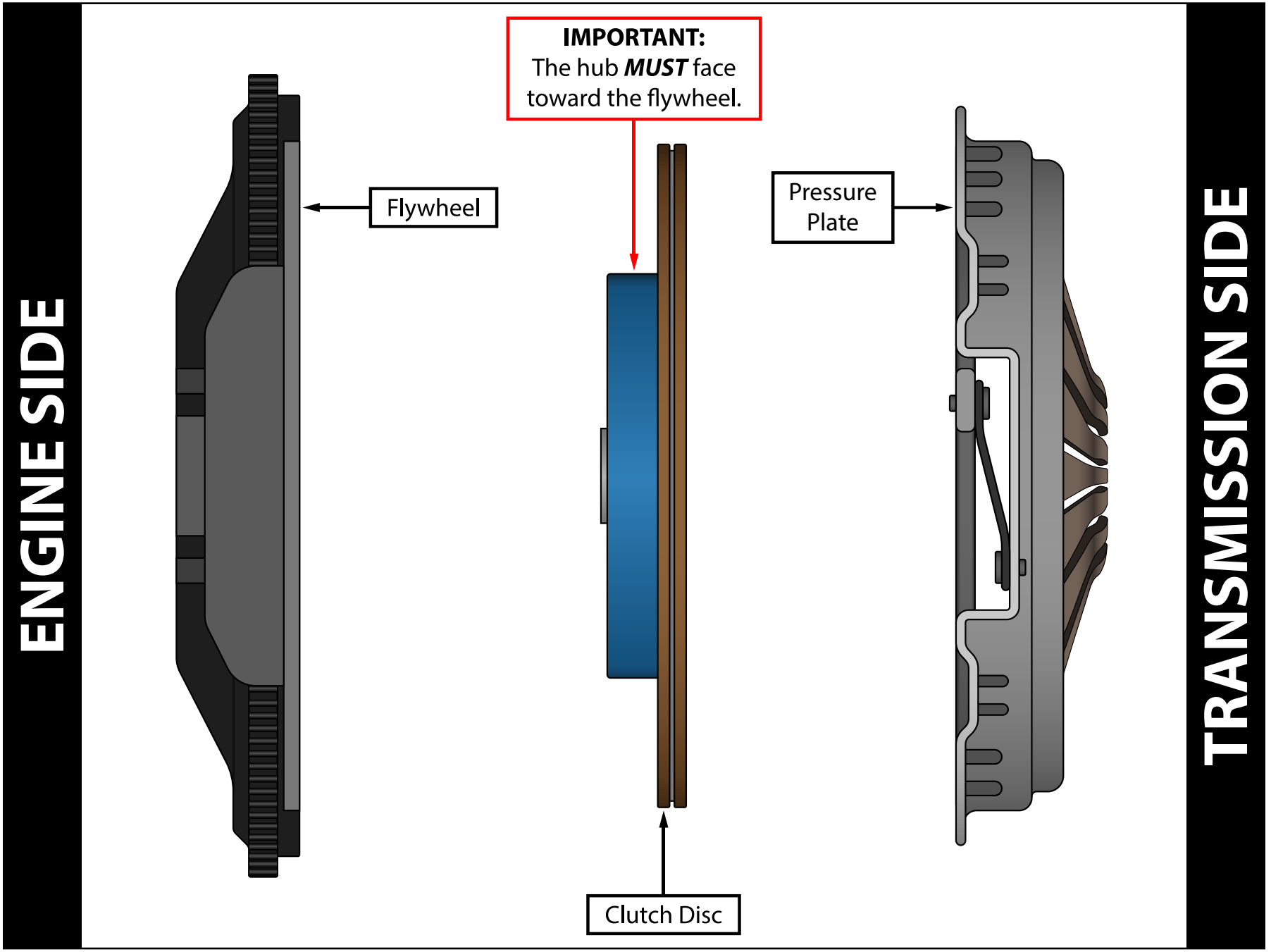
1. 30 Nm (22 Ft-lbs)
2. 60 Nm (44 Ft-lbs)
3. Additional 90°

TECH TIP

When you begin stage 3, mark each bolt with paint after you tighten it the additional 90° so you don't lose track of which ones have been tightened.

Please reference the illustration below ***BEFORE*** installing your new ECS Tuning Clutch Kit.

The clutch disc hub is to be installed inside the recess in the flywheel. Failure to properly orient the clutch disc hub will cause higher than normal clutch pedal engagement height, poor clutch feel/performance, clutch slip, and reduced service life.



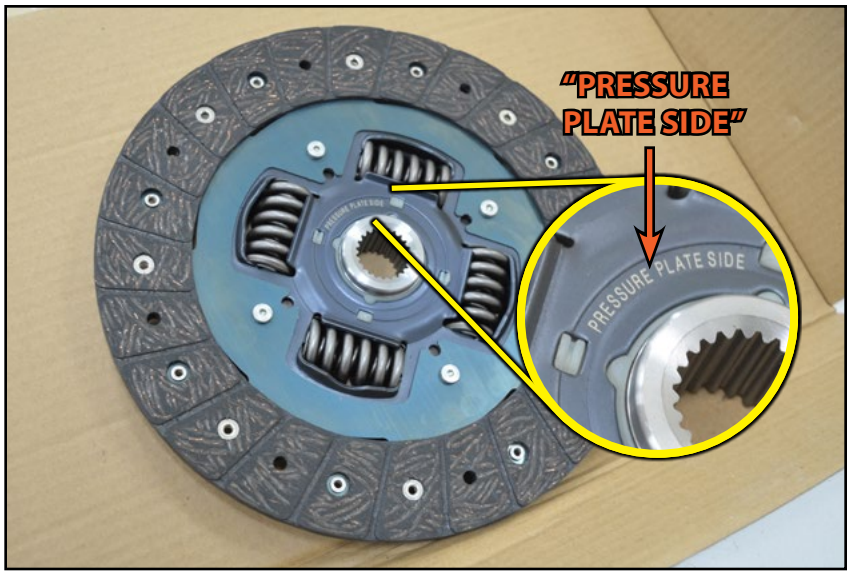
INSTALLING THE NEW FLYWHEEL AND CLUTCH

Step 3:

Wipe the surface of the new flywheel using brake cleaner and a rag to remove any dirt, oil, or contaminants.

Step 4:

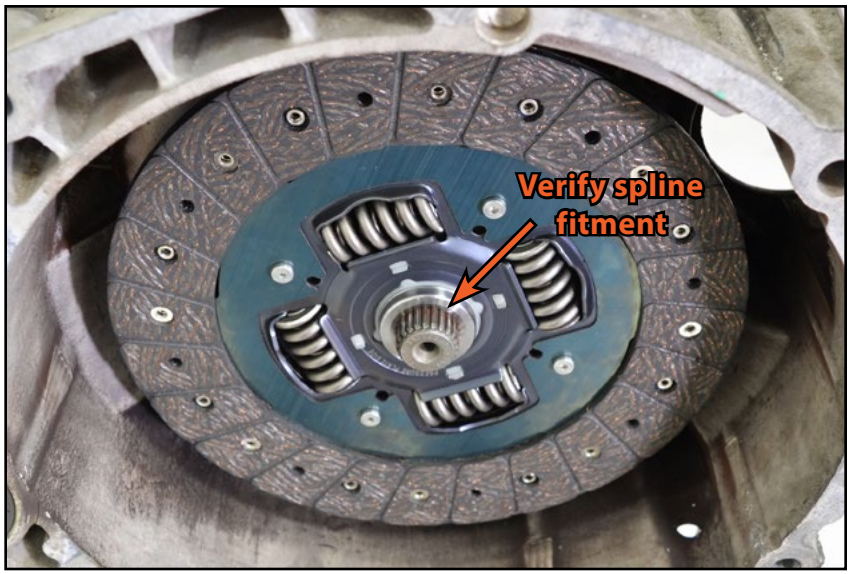
Inspect the new clutch disc. You will see “PRESSURE PLATE SIDE” etched into one side. This side needs to face **AWAY** from the engine when installed.



INSTALLING THE NEW FLYWHEEL AND CLUTCH

Step 5:

Slide the clutch disc onto the splines of the transmission input shaft to make sure it fits correctly and slides on easily.

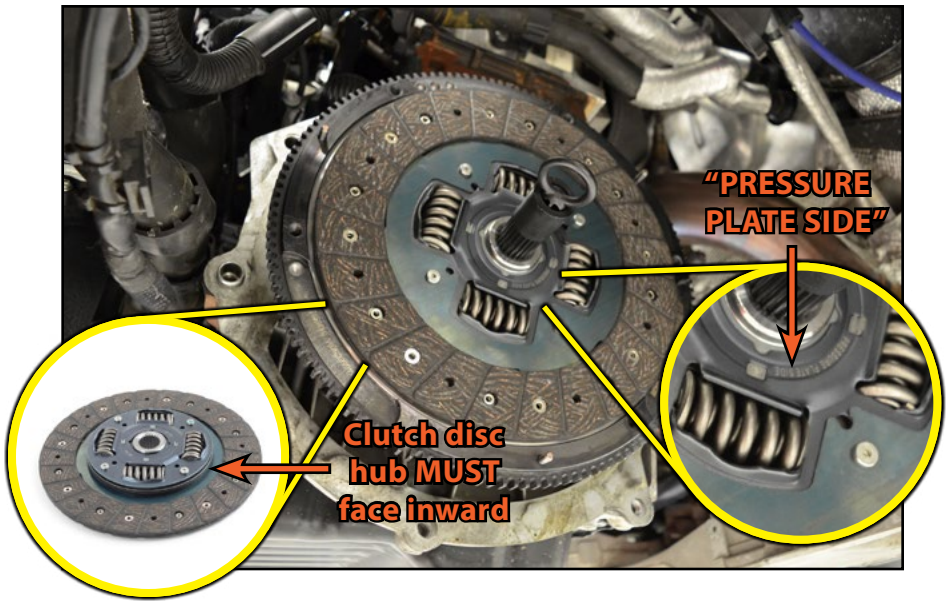


NOTE

This is a general precaution which should be taken with every clutch installation. It is very uncommon that you would encounter a problem such as a clutch disc that was packaged wrong or manufactured incorrectly, but it is always better to check.

Step 6: Clutch Alignment Tool

Hold the clutch disc onto the surface of the flywheel with the "PRESSURE PLATE SIDE" facing you, then insert the alignment tool through the disc and into the end of the crankshaft.

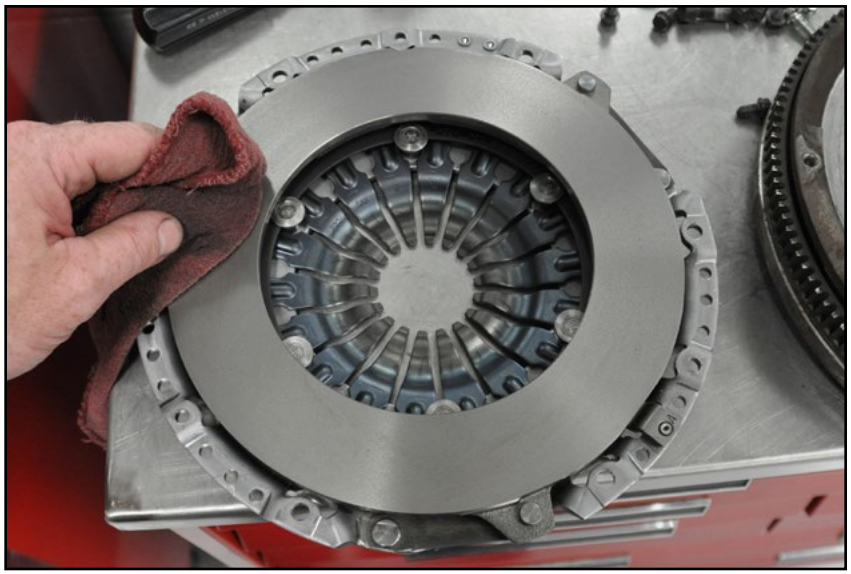


CAUTION: Make absolutely sure to install the clutch disc in the proper orientation. If the clutch disc is installed backwards it **WILL NOT** function properly.

INSTALLING THE NEW FLYWHEEL AND CLUTCH

Step 7:

Wipe the surface of the new pressure plate using brake cleaner and a rag to remove any dirt, oil, or contaminants.

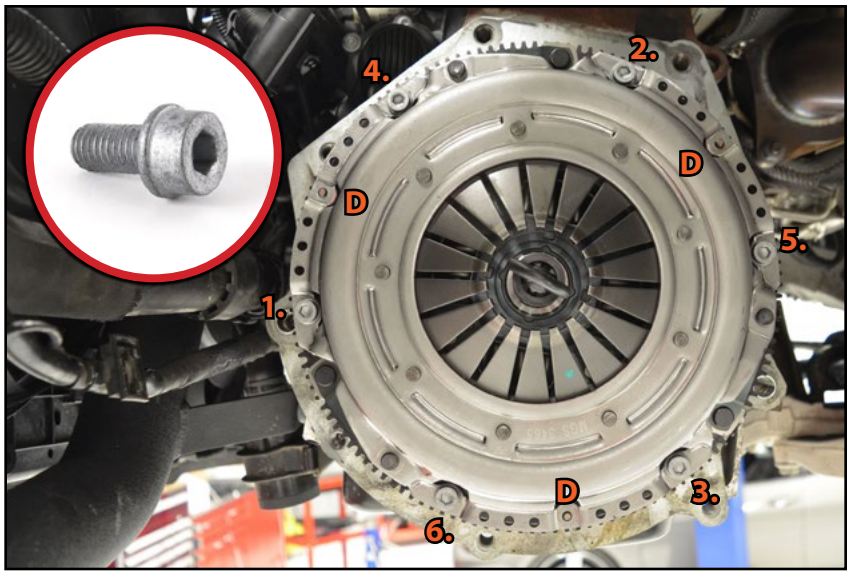


Step 8: 6mm Hex (Allen) Socket & Torque Wrench

Install the pressure plate over the alignment tool and disc, onto the flywheel. Make sure all three dowel pins are lined up (D), then push the pressure plate into place.

Start each of the pressure plate bolts by hand, then tighten them evenly in the sequence shown on the right until they are fully seated. Be sure to use the new pressure plate bolts included in the kit (inset photo).

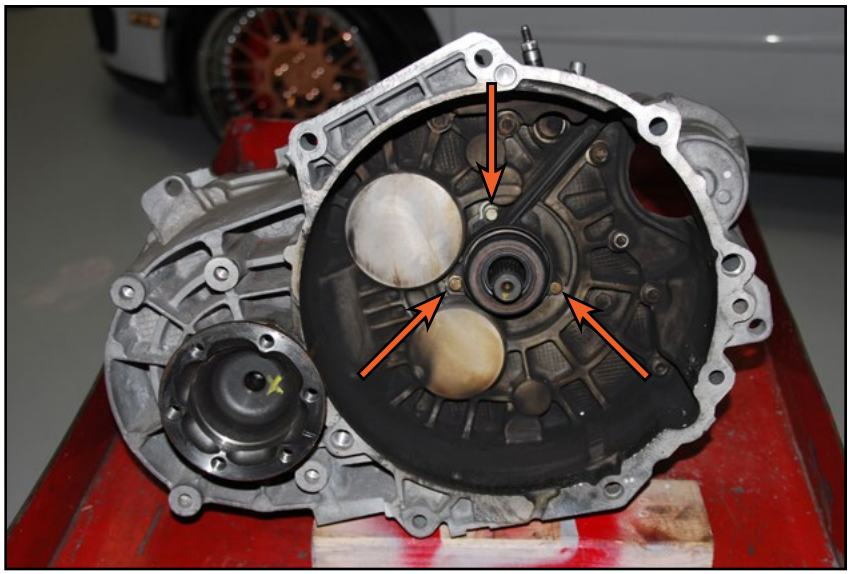
Torque the pressure plate bolts to 20 Nm (15 Ft-lbs) using the same sequence shown on the right. Remove the alignment tool after the bolts are torqued.



PREPARING THE TRANSMISSION FOR INSTALLATION

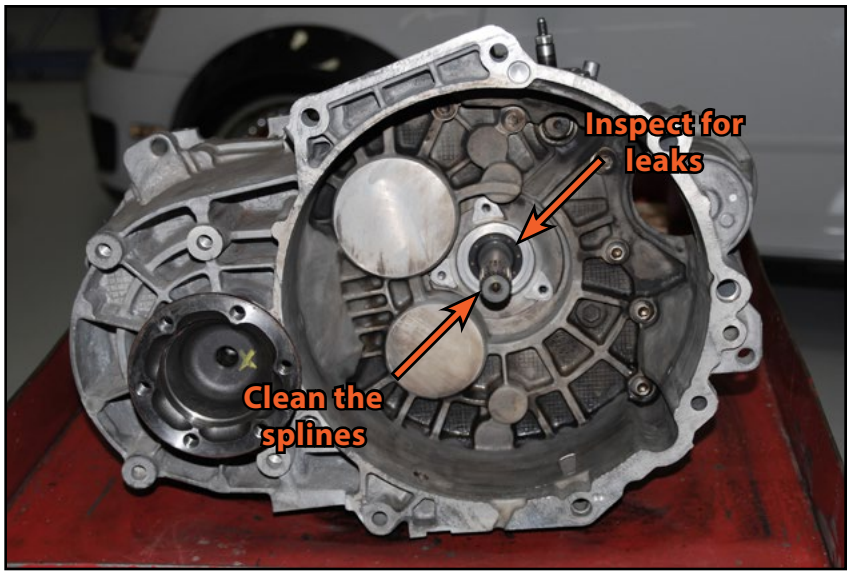
Step 1: 9mm Deep Socket & Ratchet

Remove the three retaining bolts and pull the throwout bearing/ slave cylinder off of the bell housing.



Step 2:

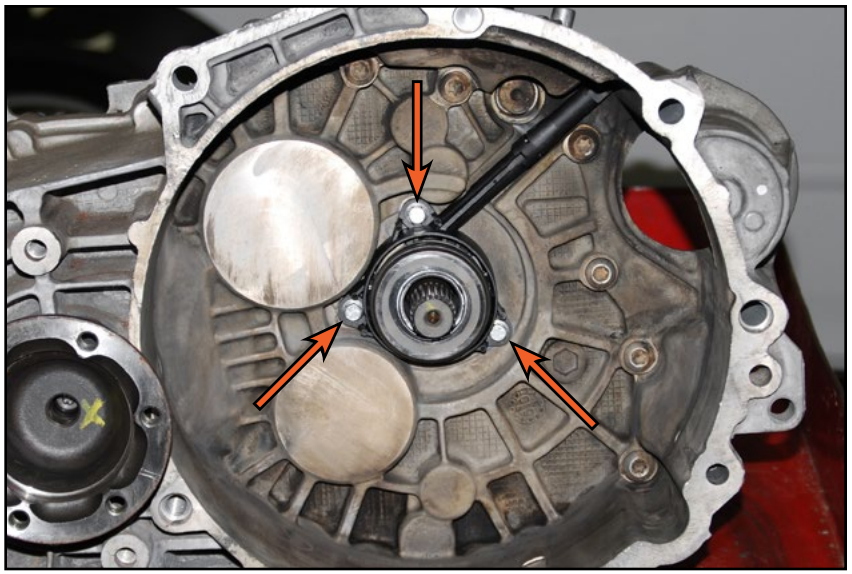
Thoroughly clean the bell housing and the splines on the input shaft. Inspect the input shaft seal for any signs of leakage, replace if necessary.



PREPARING THE TRANSMISSION FOR INSTALLATION

Step 3: 9mm Deep Socket & Torque Wrench

Install the new throwout bearing/slave cylinder into place using the new bolts included with the kit and torque them to 12 Nm (9 Ft-lbs).



Step 4:

Evenly apply a very light coating of grease onto the input shaft splines. You don't want to put very much grease on here, any excess grease could be slung onto the clutch friction surface and undo all of your hard work!

You are now ready to install the transmission!

Reinstalling the transmission is basically the reverse of removal, however for convenience and accuracy we have provided this checklist along with tips and important information.

- [ ] Secure the transmission on a transmission jack, then raise it up and guide it into place until it is fully seated against the engine block. Be patient and adjust the angles of the engine and transmission until they easily slide together.
- [ ] Install the two lower bell housing bolts until they are fully seated but do not tighten them at this time.
- [ ] Install the front bell housing bolt until it is fully seated but do not tighten it at this time.
- [ ] Install the rear bell housing bolt until it is fully seated but do not tighten it at this time.
- [ ] Remove the transmission jack.
- [ ] Install the two upper bell housing bolts until they are fully seated but do not tighten them at this time.
- [ ] Check to make sure no wires or cables are pinched between the bell housing and engine block.
- [ ] Torque the upper bell housing bolts to 80 Nm (59 Ft-lbs).
- [ ] Torque the lower bell housing bolts to 40 Nm (30 Ft-lbs).
- [ ] Torque the front bell housing bolt to 40 Nm (30 Ft-lbs).
- [ ] Torque the rear bell housing bolt to 80 Nm (59 Ft-lbs).
- [ ] Install the RH CV drive flange (if removed during transmission removal) and torque the bolt to 33 Nm (24 Ft-lbs).
- [ ] Install the selector lever and shaft nut and torque the selector shaft nut to 20 Nm (15 Ft-lbs).
- [ ] Install the relay lever and retaining clip.

- [ ] Install the transmission bracket and torque the bolts to 60 Nm (44 Ft-lbs) + 90 degrees.
- [ ] Raise the transmission up to its normal installation position.
- [ ] Install the three transmission mount bolts and torque them to 60 Nm (44 Ft-lbs) + 90 degrees.
- [ ] If equipped, reconnect the oil level sensor on the bottom of the oil pan.
- [ ] If equipped, reinstall the flywheel shield behind the RH CV drive flange.
- [ ] Slide the pendulum support into place.
- [ ] Install the pendulum support to transmission bolts and torque them to 50 Nm (37 Ft-lbs) + 90 degrees.
- [ ] Install the pendulum support to subframe bolt and torque it to 100 Nm (74 Ft-lbs) + 90 degrees.
- [ ] Remove the engine support bar.
- [ ] Install the exhaust downpipe bracket.
- [ ] Install the LH CV shaft back into place.
- [ ] Install the ball joint nuts and torque them to 60 Nm (44 Ft-lbs) for a cast steel control arm or 100 Nm (74 Ft-lbs) for a sheet steel or forged aluminum control arm.
- [ ] Install the inner CV joint bolts for both axles, then torque them to 70 Nm (51 Ft-lbs) for 10mm bolts or 40 Nm (30 Ft-lbs) for 8mm bolts.
- [ ] Install the RH inner CV joint heat shield.
- [ ] Install the RH charge air hose.

- [ ] Install the charge air duct on the front of the engine.
- [ ] Reconnect the MAP sensor and tighten the clamp on the top of the charge air duct.
- [ ] Install the LH charge air hose.
- [ ] Install the starter and torque both starter bolts to 80 Nm (59 Ft-lbs).
- [ ] Install the harness bracket on the lower starter bolt.
- [ ] Install the LF fender liner.
- [ ] Install the outer CV bolt and torque it to the proper specification depending on whether it is a ribbed or non-ribbed bolt. (See pages 59, & 60).

  NOTE: Once the initial torque is applied to the outer CV bolt, you can lower the vehicle to the ground to perform the final tightening of the bolt.
- [ ] Remove the wheel center cap (so you can access the outer CV bolt for the final torque setting).
- [ ] Install the wheel and torque the bolts to 120 Nm (89 Ft-lbs).
- [ ] Install the starter cable and plastic cover.
- [ ] Connect the starter solenoid.
- [ ] Connect the reverse light switch.
- [ ] Install the ground cable.
- [ ] Install the clutch bleeder block.

- [ ] Install the shifter cable bracket.
- [ ] Install the shift cables onto the relay lever and selector lever.
- [ ] Install the battery tray and battery.
- [ ] Bleed the air from the clutch hydraulic system and top off the brake fluid
  - See Pages 57 & 58 for details on how to bleed the clutch hydraulic system.
- [ ] Install the air box/intake system.
- [ ] Reconnect the MAF sensor.
- [ ] Install the lower insulation panel or skid plate.
- [ ] Lower the vehicle to the ground and tighten the outer CV bolt the additional specified number of degrees (if required).

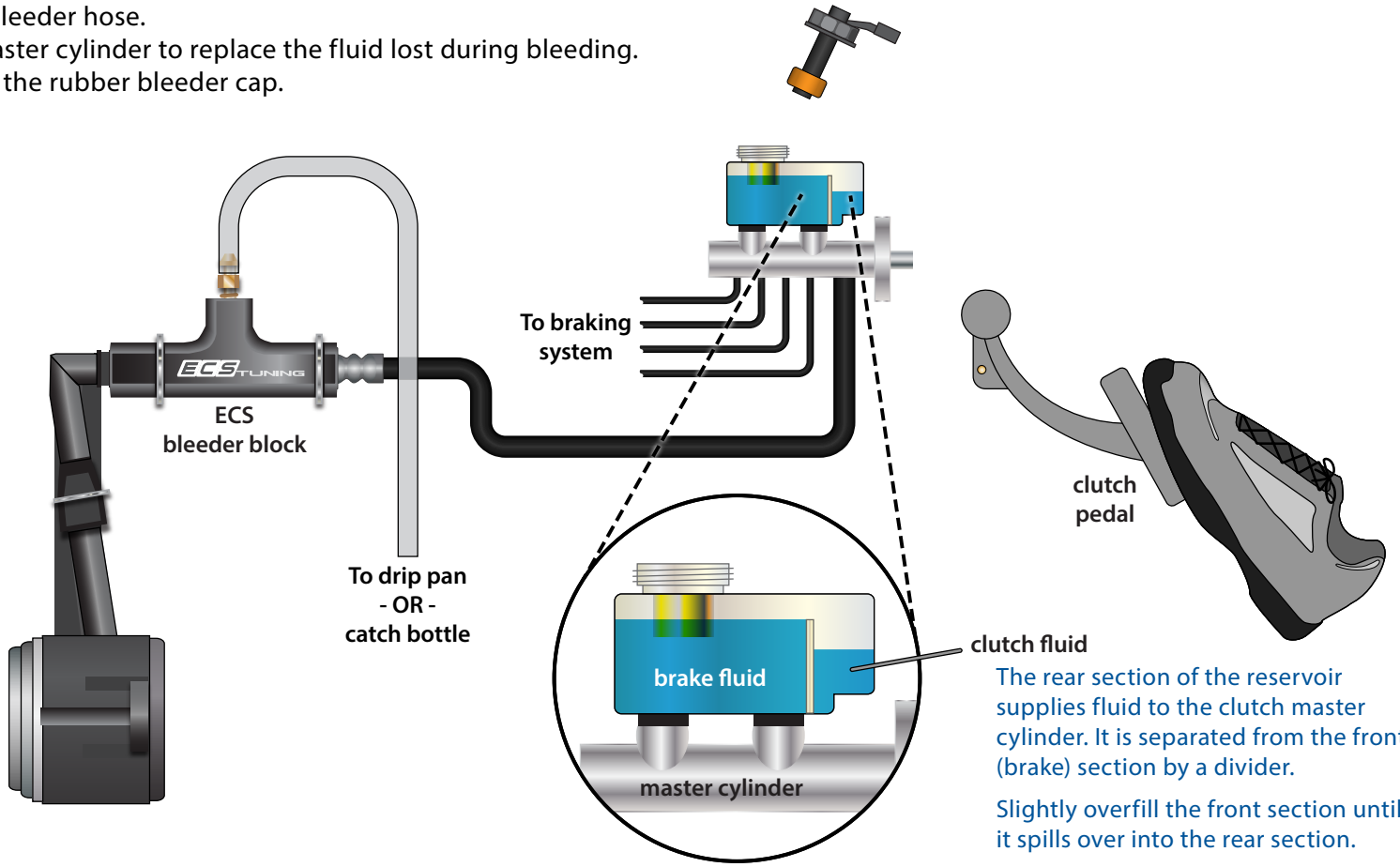
- [ ] We strongly recommend 500-1,000 miles of light throttle driving (shifting under 4,500 RPM) to break-in your new clutch and flywheel.
- [ ] Make an effort to shift through the gears as much as possible to evenly break in the clutch and flywheel.
- [ ] Try to avoid over slipping the clutch (I.E.: prolonged bumper-to-bumper traffic, etc.) during the break-in period.
- [ ] Avoid hard launches or quick shifting until after the break-in period has passed.

CLUTCH HYDRAULIC SYSTEM: MANUAL BLEEDING

The ECS Tuning Clutch Bleeder Block has a one-way valve built into the bleeder screw. This makes bleeding the clutch hydraulic system an easy one-man job, there's no need for power or vacuum bleeding equipment. **If you have a stock bleeder block you will need someone to open and close the bleeder screw for you (same process used to manually bleed brakes)**.

Here's the procedure:

- Remove the rubber bleeder screw cap.
- Using an 8mm wrench, crack the bleeder screw open by no more than ¼ turn.
- Attach a clear flexible hose to the bleeder screw.
- Inside the vehicle, push the clutch pedal to the floor by hand, then pull it up again slowly. Do this several times until the brake fluid runs clear and bubble-free through the bleeder hose.
- Add fresh brake fluid to the master cylinder to replace the fluid lost during bleeding.
- Close the bleeder and reinstall the rubber bleeder cap.
- Check clutch operation.



The rear section of the reservoir supplies fluid to the clutch master cylinder. It is separated from the front (brake) section by a divider.

Slightly overfill the front section until it spills over into the rear section.

CLUTCH HYDRAULIC SYSTEM: PRESSURE BLEEDING

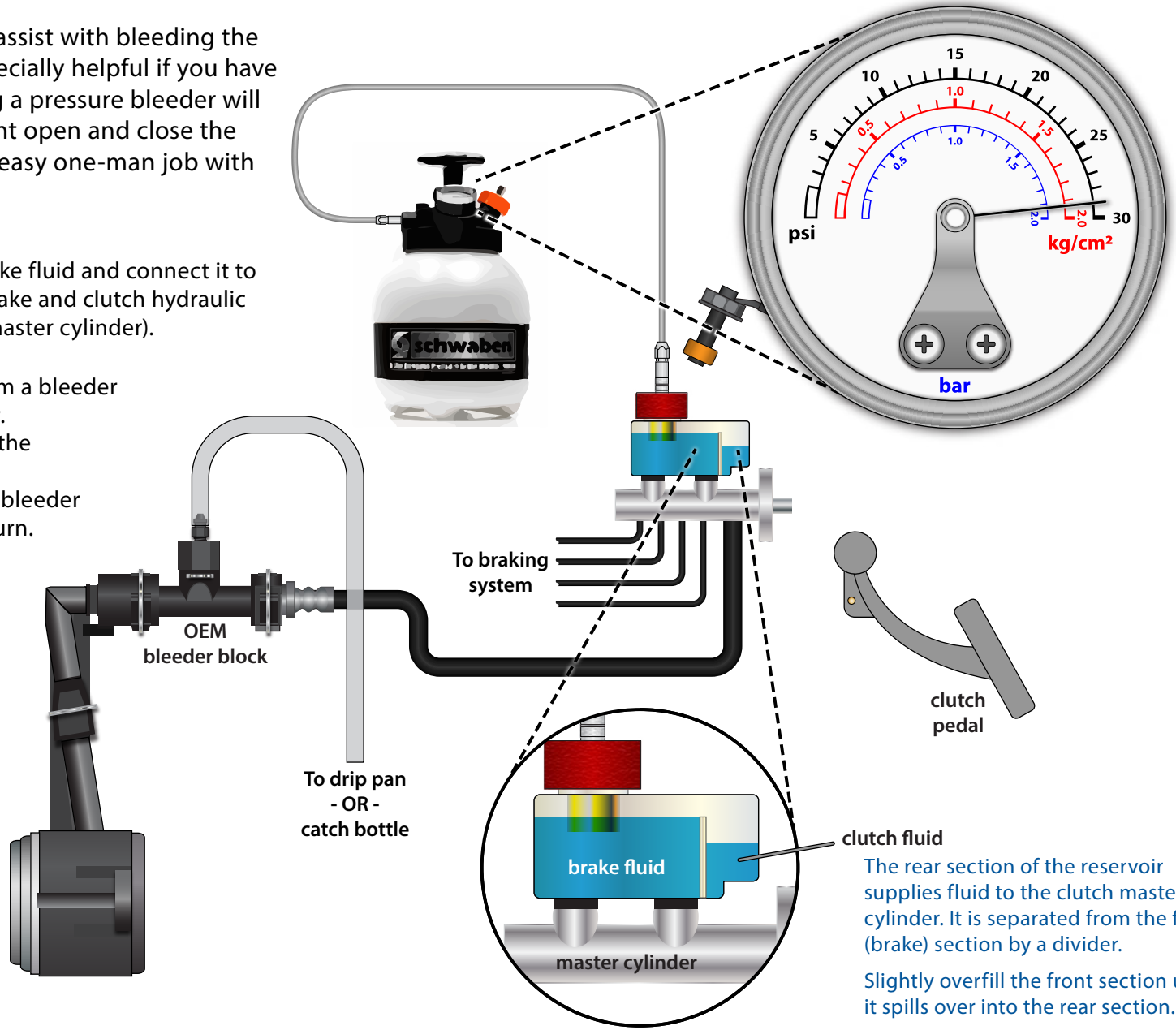
A pressure bleeder can be used to assist with bleeding the clutch hydraulic system. This is especially helpful if you have an OEM clutch bleeder block. Using a pressure bleeder will negate the need to have an assistant open and close the bleeder screw for you, so this is an easy one-man job with the proper equipment.

Here's the procedure:

- Fill the pressure bleeder with brake fluid and connect it to the brake master cylinder (the brake and clutch hydraulic systems are fed from the brake master cylinder).
- Remove the bleeder screw cap.
- Attach the clear flexible hose from a bleeder catch bottle to the bleeder screw.
- Pump the pressure bleeder until the gauge reads 25-30 psi.
- Using an 8mm wrench, crack the bleeder screw open by no more than ¼ turn.

****DO NOT PUSH DOWN ON THE CLUTCH PEDAL ONCE THE BLEEDER SCREW HAS BEEN OPENED****

- Watch the fluid inside the clear flexible hose, wait until you can see the brake fluid running clear and bubble-free through the hose.
- Close the bleeder and reinstall the rubber bleeder cap.
- Add brake fluid to the master cylinder as needed to bring the fluid up to the appropriate level.
- Check clutch operation.



The rear section of the reservoir supplies fluid to the clutch master cylinder. It is separated from the front (brake) section by a divider.

Slightly overfill the front section until it spills over into the rear section.

TORQUING TIPS

Torque to Yield or "Stretch" Bolts

Many bolts will have a torque specification listed in the format - xx Nm (xx Ft-lbs) + xx degrees. These bolts are torque to yield bolts, commonly referred to as "stretch" bolts. The correct procedure for torquing these bolts is:

Stage One - Torque the bolt(s) to the initial Nm or Ft-lb specification. If there is more than one, be sure to torque them in the correct sequence.
Stage Two - Tighten or "stretch" the bolt(s) the additional specified number of degrees. If there is more than one, be sure to follow the correct sequence.

Note - Some bolts may have two or more stages of torquing before the final stage of "stretching" the bolts.

When tightening more than one bolt in a specified sequence, be sure to mark each fastener with paint ***immediately*** after performing the final stage or "stretching" of the bolts. This will ensure that you keep track of which bolts have already been "stretched".

All Torque to Yield bolts should only be used once and should be replaced each time they are removed. If they are reused, they will not be able to achieve the proper clamping force with the specified torque.

Lubrication

Torque specifications are always listed for a dry fastener (***no*** lubrication) unless specified otherwise.

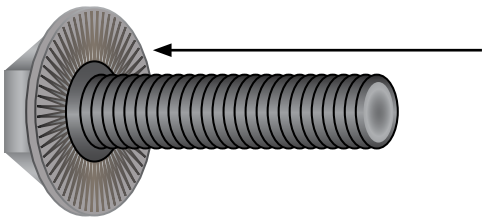
Some fasteners require lubrication on the threads -or- on the contact surface while torquing. These fasteners will be listed with the specific location and type of lubrication required. Always follow manufacturers recommendations exactly.

Lubricating a fastener that is intended to be installed dry and then torquing it to factory specifications will increase the clamping force and stress on the fastener and components, which can result in damage or failure.

Do not lubricate the threads of any fastener unless it is specifically recommended by the manufacturer.

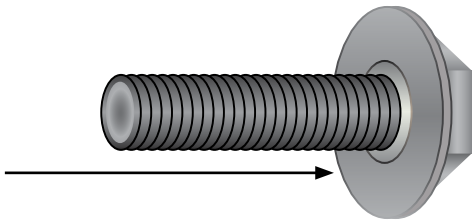
Ribbed vs. Non-Ribbed Bolts

Ribbed and Non-Ribbed bolts in the same location generally require a different torque specification.



A ribbed bolt is identified by the ribs on the contact surface

A non-ribbed bolt is identified by the smooth contact surface



TORQUE SPECIFICATIONS

Ball Joint Nuts (Cast Steel Control Arm)	60 Nm (44 Ft-lbs)	(Page 54)
Ball Joint Nuts (Sheet Steel or Forged Alum Control Arm)	100 Nm (74 Ft-lbs)	(Page 54)
Front Bell Housing Bolt (M10x105mm)	40 Nm (30 Ft-lbs)	(Page 53)
Lower Bell Housing Bolts (M10x50mm)	40 Nm (30 Ft-lbs)	(Page 53)
Rear Bell Housing Bolt (M12x65mm or M12x70mm)	80 Nm (59 Ft-lbs)	(Page 53)
Upper Bell Housing Bolts (M12x50mm or M12x55mm)	80 Nm (59 Ft-lbs)	(Page 53)
CV Drive Flange (if removed during transmission removal)	33 Nm (24 Ft-lbs)	(Page 53)
Flywheel Bolts	*Stage One:* 30 Nm (22 Ft-lbs) *Stage Two:* 60 Nm (44 Ft-lbs) *Stage Three:* Tighten an additional 90 degrees	(Page 46)
Inner CV bolts (8mm)	40 Nm (30 Ft-lbs)	(Page 54)
Inner CV bolts (10mm)	70 Nm (51 Ft-lbs)	(Page 54)
Outer CV bolt (Ribbed)	70 Nm (51 Ft-lbs) + 90 degrees	(Page 55)
Outer CV bolt (Smooth)	200 Nm (147 Ft-lbs) + 180 degrees	(Page 55)
Pendulum Support to Subframe	100 Nm (74 Ft-lbs) + 90 degrees	(Page 54)
Pendulum Support to Transmission	50 Nm (37 Ft-lbs) + 90 degrees	(Page 54)
Pressure Plate Bolts	20 Nm (15 Ft-lbs)	(Page 50)
Selector Shaft Nut	20 Nm (15 Ft-lbs)	(Page 53)
Slave Cylinder Bolts (Metal Slave)	12 Nm (9 Ft-lbs)	(Page 52)
Slave Cylinder Bolts (Plastic Slave)	15 Nm (11 Ft-lbs)	(Page 52)
Starter Bolts (M12x165mm)	80 Nm (59 Ft-lbs)	(Page 53)
Transmission Bracket Bolts	60 Nm (44 Ft-lbs) + 90 degrees	(Page 53)
Transmission Mount Bolts	60 Nm (44 Ft-lbs) + 90 degrees	(Page 54)
Wheels	120 Nm (89 Ft-lbs)	(Page 55)

Your ECS Clutch & Lightweight Flywheel 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.