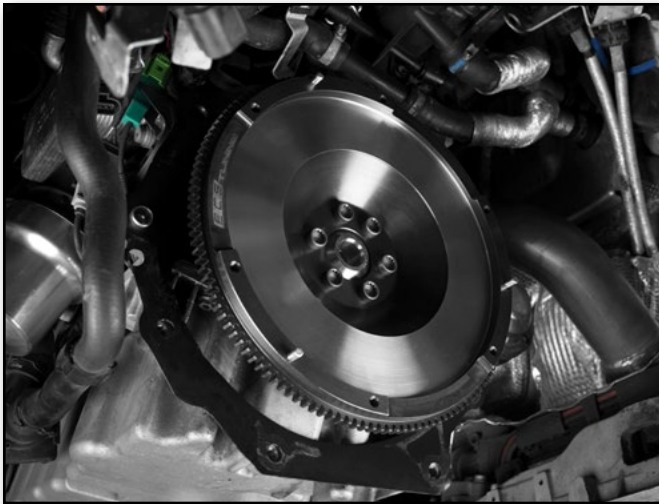




**VW/Audi 2.0T FSI 6-Speed
ECS Clutch & Lightweight Flywheel Kit
Installation Instructions**



**Skill Level
3 - Advanced
Advanced Skills &
Experience Required**



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.

INTRODUCTION

VW/Audi 2.0T FSI 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!

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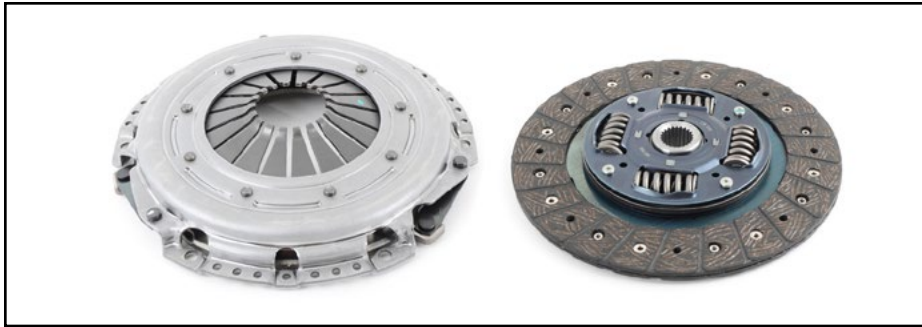
Clutch Hydraulic System: Pressure Bleeding..... [pg.55](#)

Torquing Tips..... [pg.56](#)

Torque Specifications..... [pg.57](#)



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 (6)



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](#)
- **3/8" Drive Ratchet** [ES#2765902](#)
- **3/8" Drive Torque Wrench** [ES#2221245](#)
- **3/8" Drive Deep and Shallow Sockets** [ES#2763772](#)
- **3/8" Drive Extensions** [ES#2804822](#)
- **Hydraulic Floor Jack** [ES#2834951](#)
- **Torx Drivers and Sockets** [ES#11417/8](#)
- **1/2" Drive Deep and Shallow Sockets** [ES#2839106](#)
- **1/2" Drive Ratchet**
- **1/2" Drive Extensions**
- **1/2" Drive Torque Wrench** [ES#2221244](#)
- **1/2" 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

- **1/4" Drive Ratchet** [ES#2823235](#)
- **1/4" Drive Deep and Shallow Sockets** [ES#2823235](#)
- **1/4" 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**
- **1/2" 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.

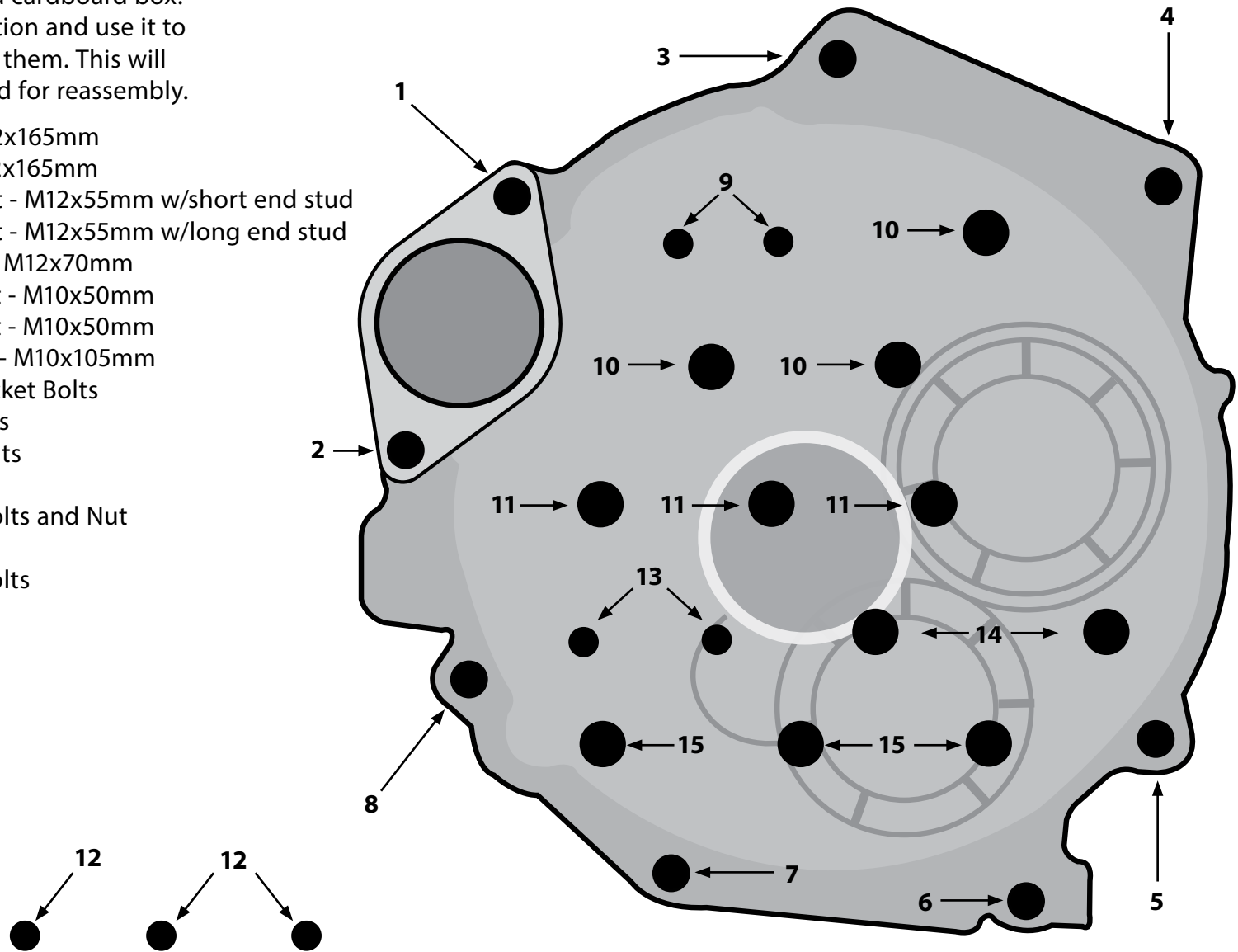


NEVER get underneath a vehicle that is supported only by a jack, and **ALWAYS** make sure that the vehicle is securely supported on jack stands.

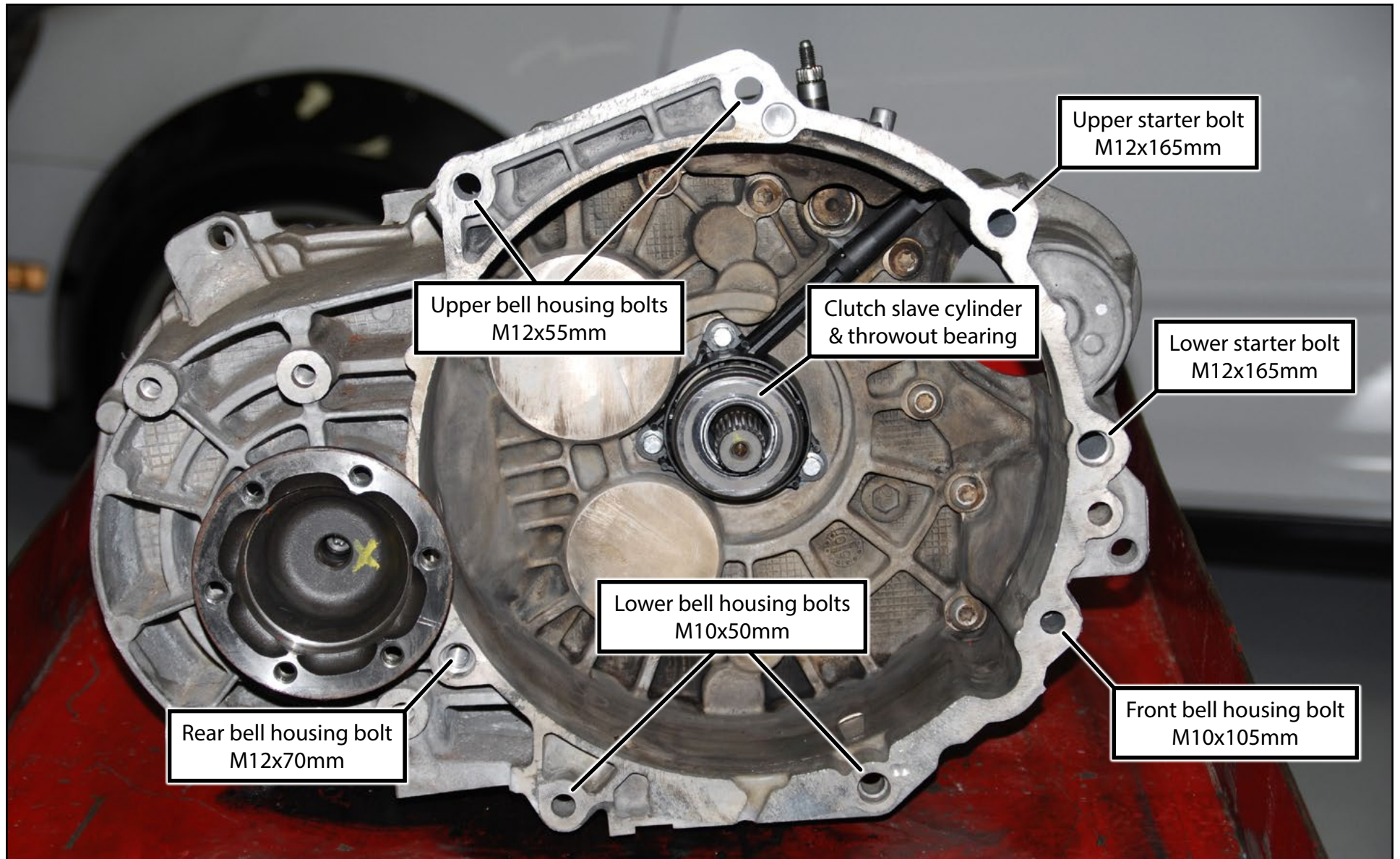
TRANSMISSION BOLT TEMPLATE

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.

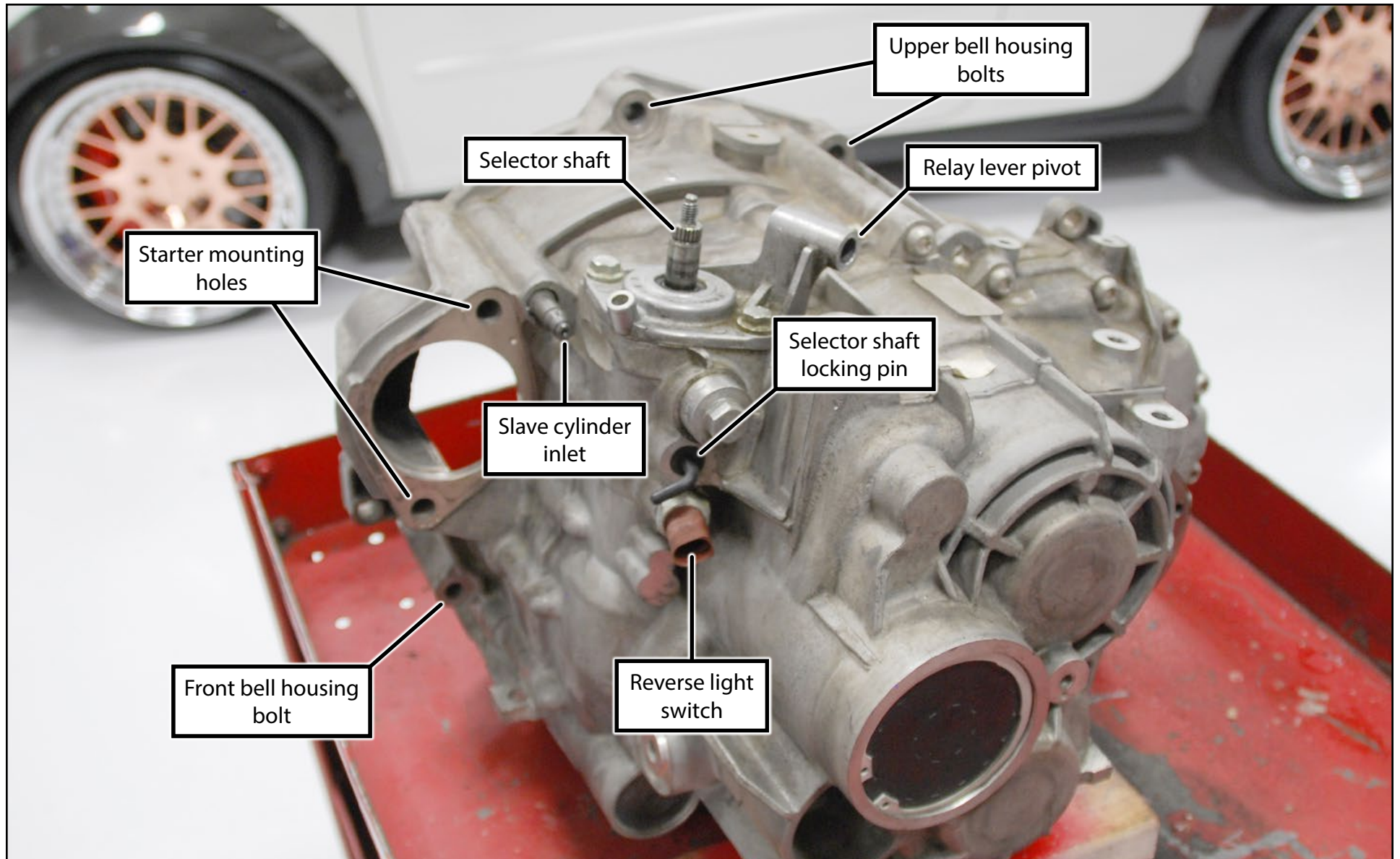
1. Upper Starter Bolt - M12x165mm
2. Lower Starter Bolt - M12x165mm
3. Upper Bell Housing Bolt - M12x55mm w/short end stud
4. Upper Bell Housing Bolt - M12x55mm w/long end stud
5. Rear Bell Housing Bolt - M12x70mm
6. Lower Bell Housing Bolt - M10x50mm
7. Lower Bell Housing Bolt - M10x50mm
8. Front Bell 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: Locking Spring Clamp Pliers

The first thing we are going to do is release the tension on the spring clamp (arrow) between the flexible intake tube and the air box.



If you have an aftermarket intake or engine cover, remove them at this time then continue with step 9 on [Page 15](#).



Step 2:

Pull the intake tube off of the air box and release the tension on the clamp, leaving it over the opening.



REMOVING THE TRANSMISSION

Step 3: T25 Torx

Remove the two screws which secure the air intake tube to the air duct.



Step 4:

Pull the intake tube off of the air duct.



REMOVING THE TRANSMISSION

Step 5: VAG Connector Release Tool

Disconnect the MAF sensor.



Step 6: Flat Blade Screwdriver

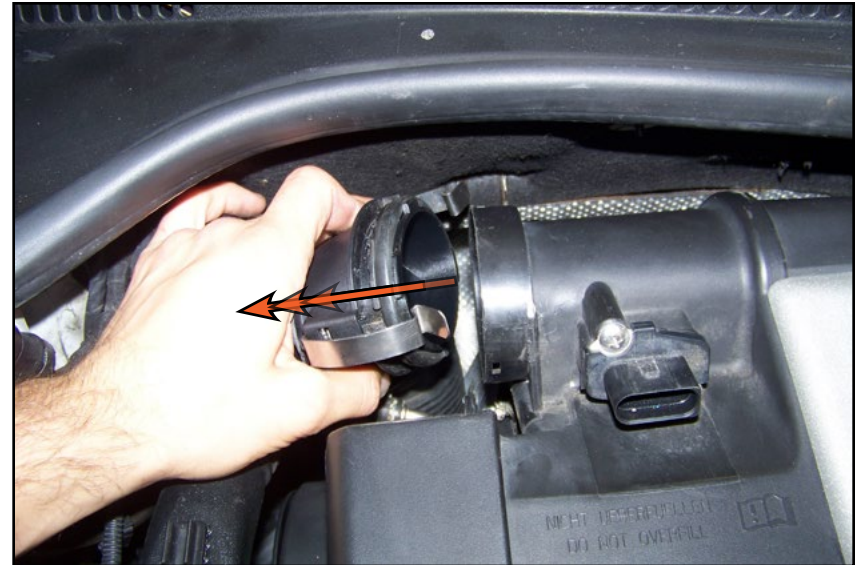
Release the two clips which secure the turbo inlet pipe to the air box.



REMOVING THE TRANSMISSION

Step 7:

Separate the turbo inlet pipe from the air box.



Step 8:

Remove the air box by first pulling it up **one corner at a time**, in the order shown below, reaching your hand underneath to get as **close as possible** to the grommets. This will prevent you from cracking the air box.

1. LH (Driver's side) Front
2. LH rear
3. RH Rear
4. RH Front

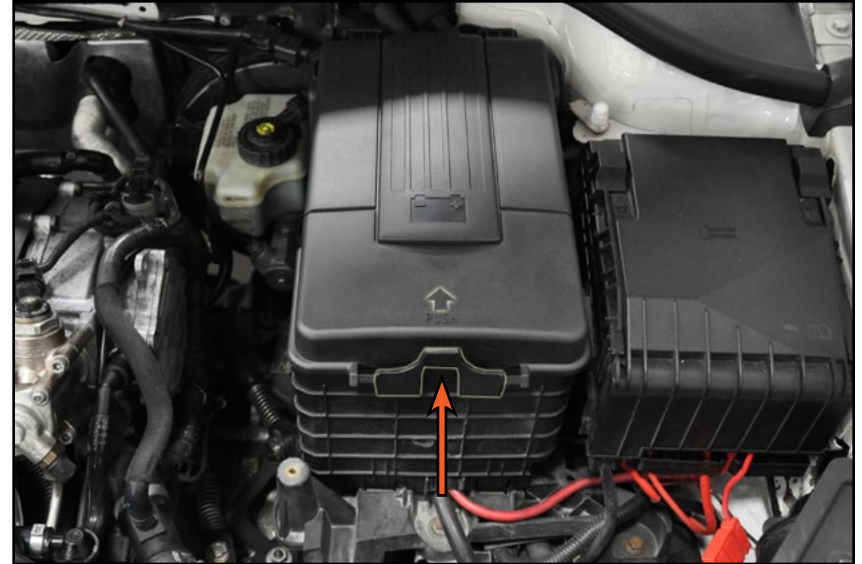
Grommet location and removal order is indicated in the photo. Once all four grommets are released, lift the air box off and remove it.



REMOVING THE TRANSMISSION

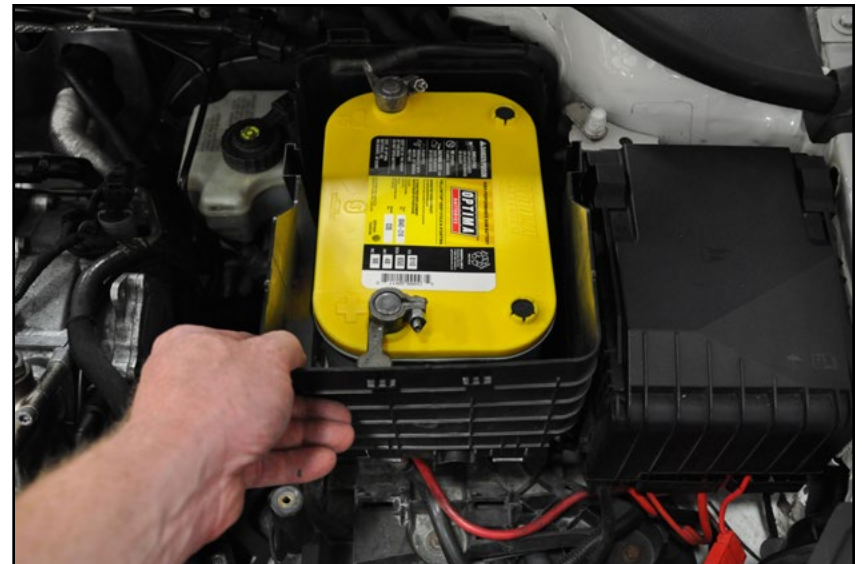
Step 9:

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.



Step 10:

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



REMOVING THE TRANSMISSION

Step 11: 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 12: 13mm Socket & Ratchet

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



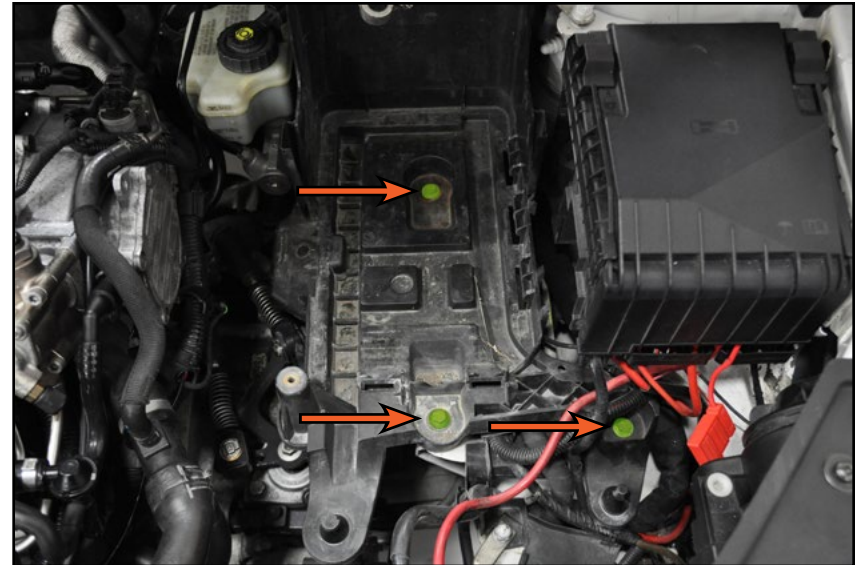
REMOVING THE TRANSMISSION

Step 13: 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.

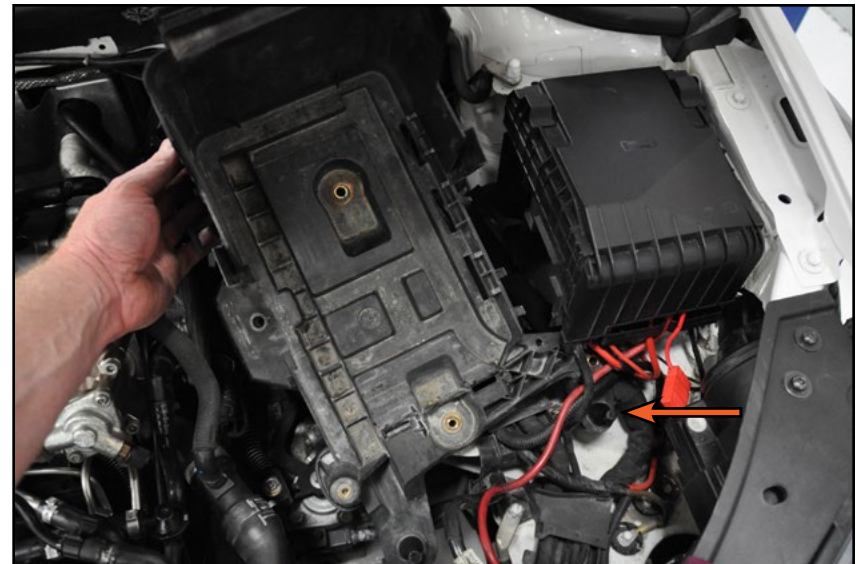


Step 14:

Lift the rear of the battery tray upward and tilt it towards the front of the vehicle. Guide the lower LH mounting ear around the relay panel wiring, then remove the battery tray.



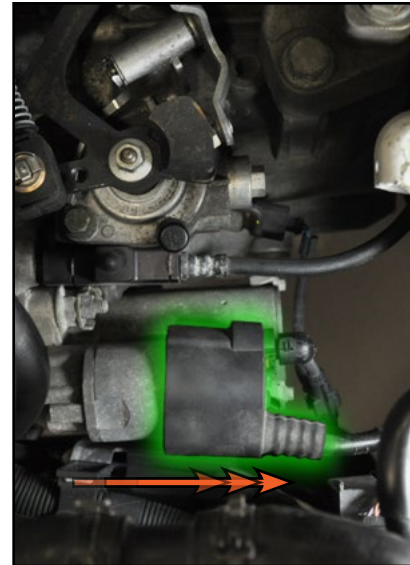
The rear of the battery box can remain attached to the battery tray.



REMOVING THE TRANSMISSION

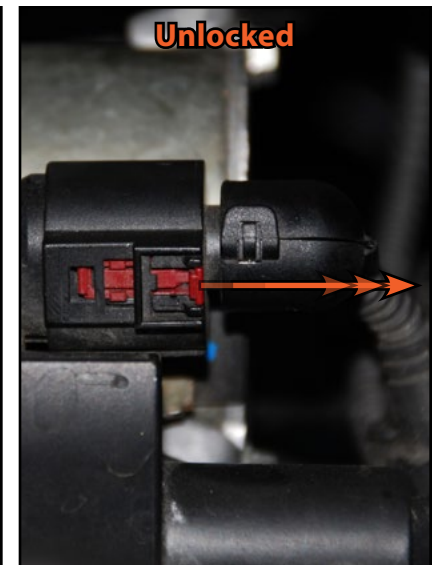
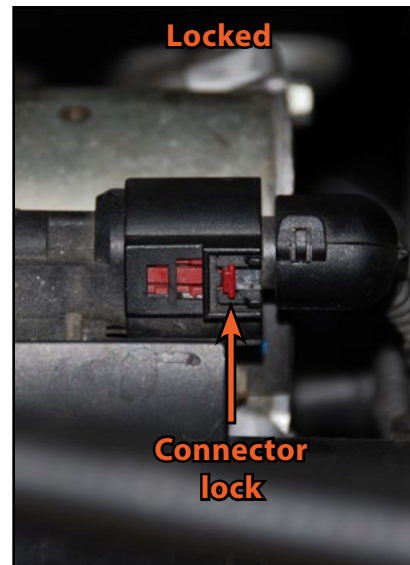
Step 15:

Slide the rubber boot off of the starter solenoid to expose the electrical connections underneath.



Step 16:

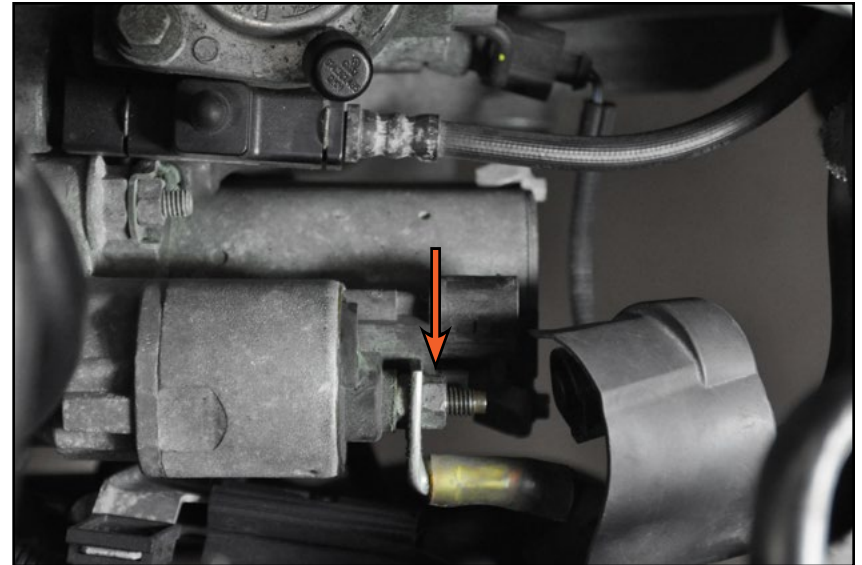
Disconnect the starter solenoid by pulling the connector lock out, then squeezing the end of the connector and pulling it off.



REMOVING THE TRANSMISSION

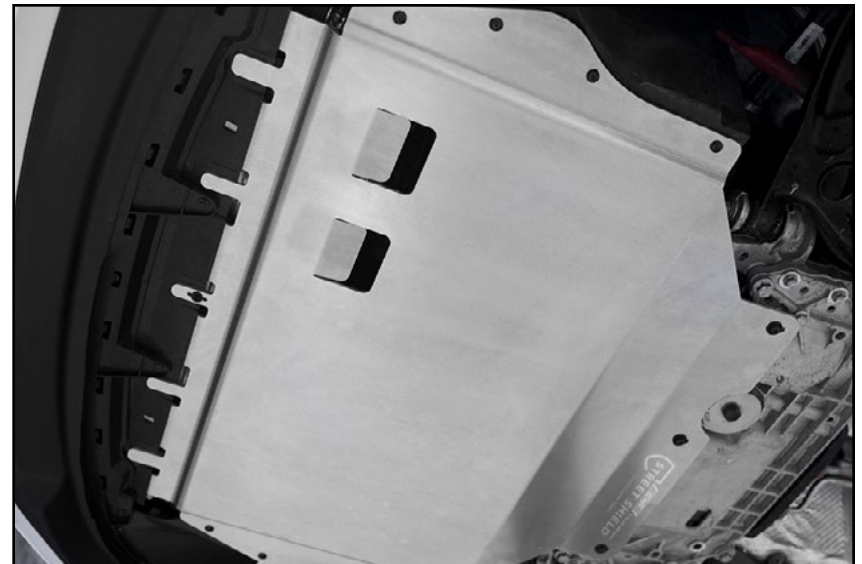
Step 17: 13mm Wrench or Socket & Ratchet

Remove the nut (arrow), pull the starter cable off the solenoid stud, and move it off to the side.



Step 18:

Safely raise and support the vehicle and remove the skid plate or lower insulation panels, whichever you have installed.



REMOVING THE TRANSMISSION

Step 19: Small Hook or Pick Tool

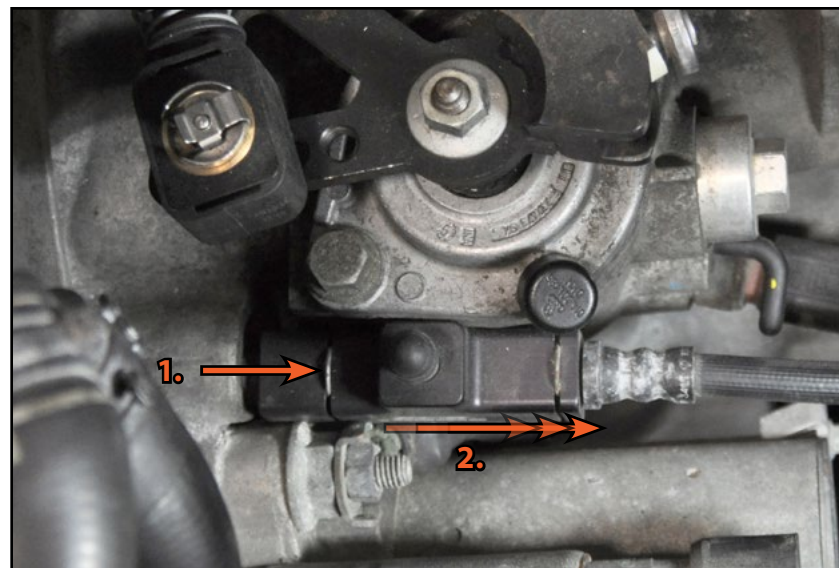
Remove the retaining clip on the transmission side of the bleeder block, then gently pull the bleeder block off of the inlet of the clutch slave cylinder. Have a rag nearby to wipe up any spills, and be sure to keep the brake fluid inside the line from dripping onto any painted surfaces.



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 20: 13mm Wrench or Socket & Ratchet

Remove the nut and pull the ground cable off of the end stud on the upper starter mounting bolt.



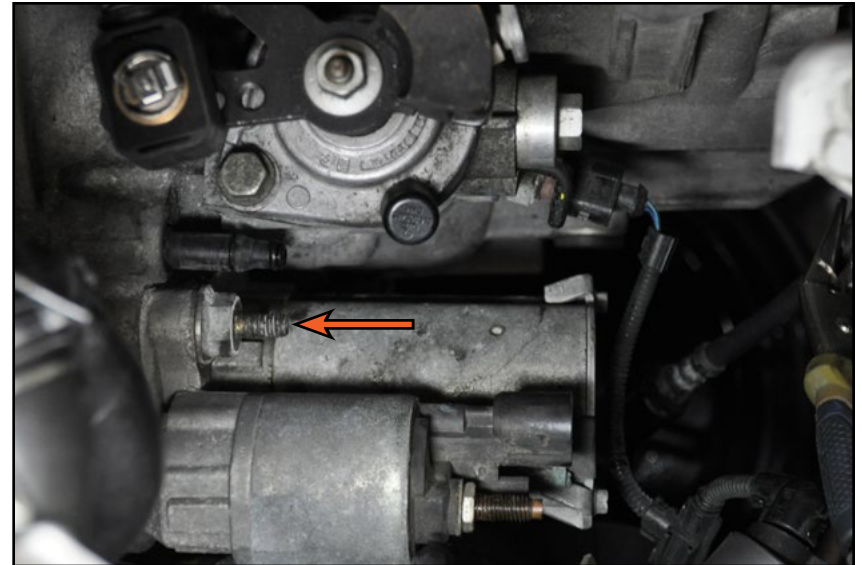
REMOVING THE TRANSMISSION

Step 21: 18mm Socket & Ratchet

Remove the upper starter bolt.

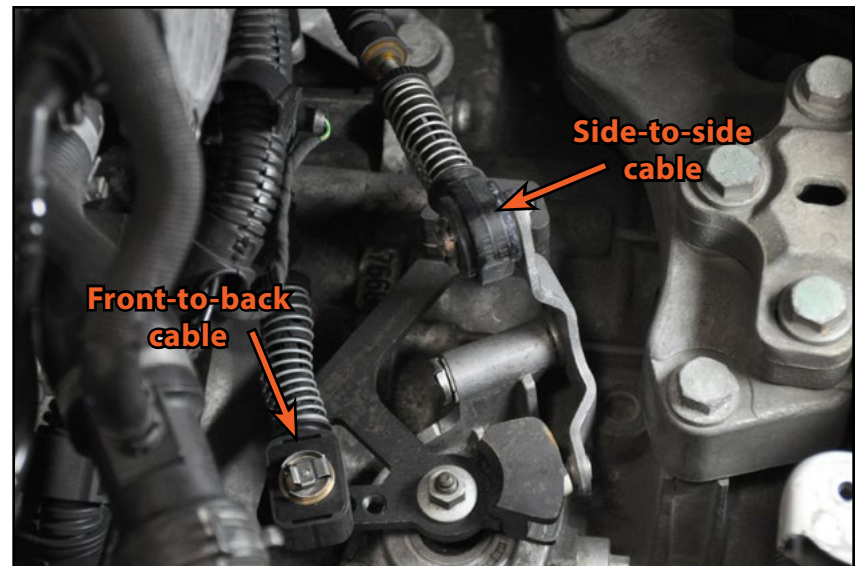


If you have decided to use our bolt storage template, thread the nut from step 20 onto this bolt and store them in location #1.



Step 22:

Locate both of the shifter cables.

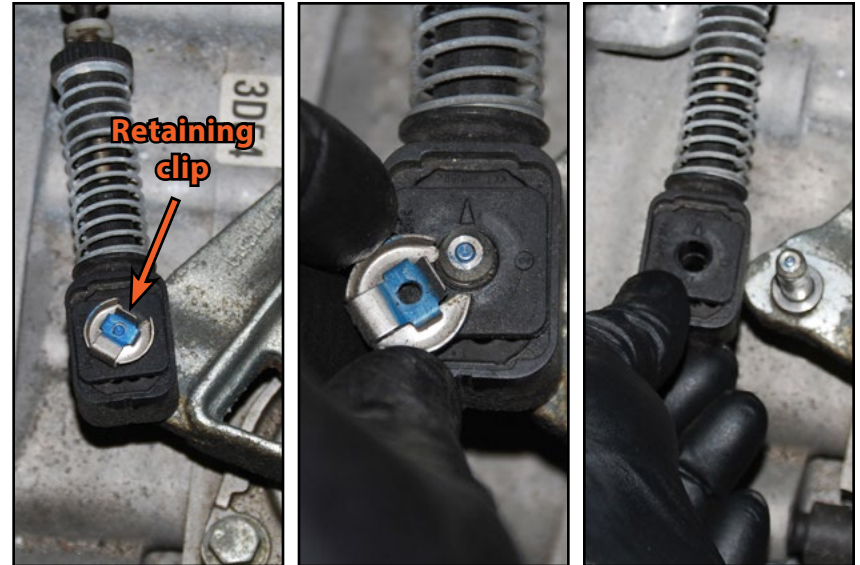


REMOVING THE TRANSMISSION

Step 23:

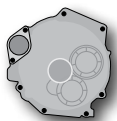
Remove the shift cables from the selector and relay levers using the following method:

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.

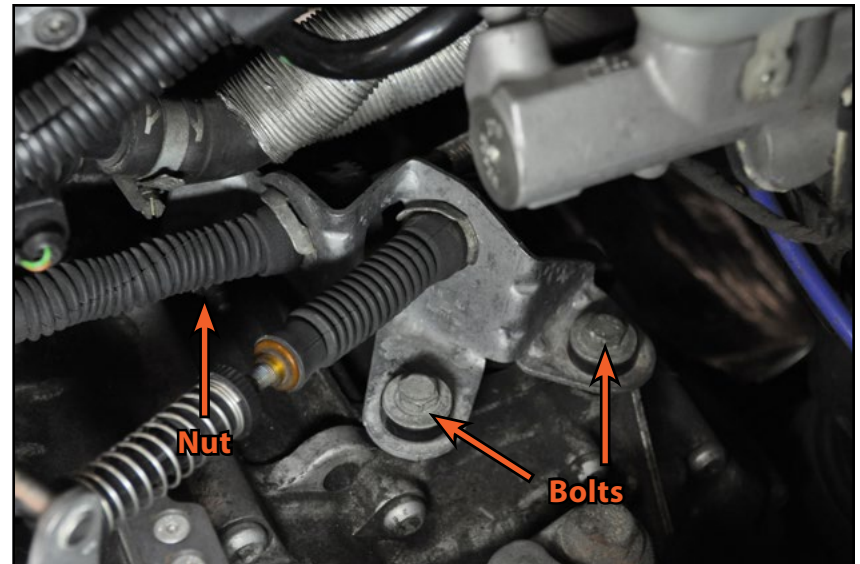


Step 24: 13mm Deep Socket & Ratchet

Remove the two shifter cable bracket bolts and one nut. The nut is located on the end stud of one of the upper bell housing bolts.



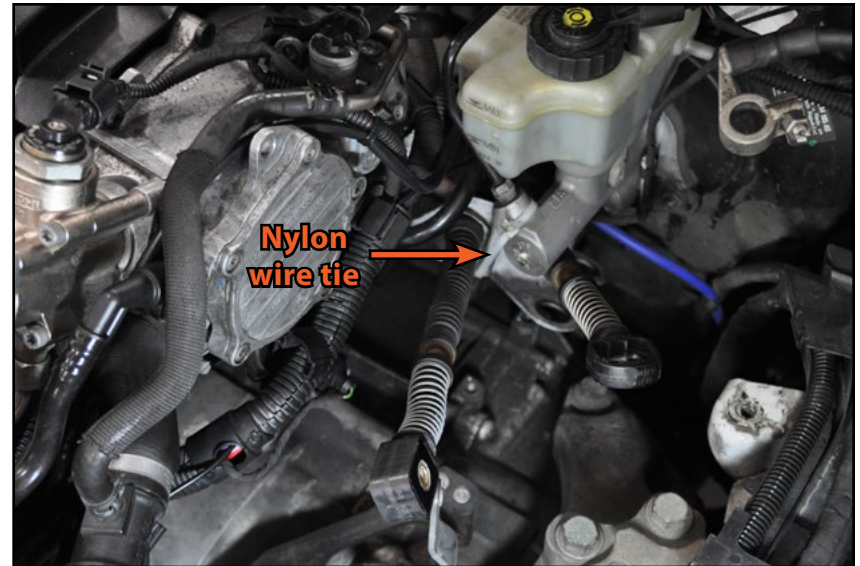
If you have decided to use our bolt storage template, thread the nut onto one of the bolts, then store these bolts in location #13.



REMOVING THE TRANSMISSION

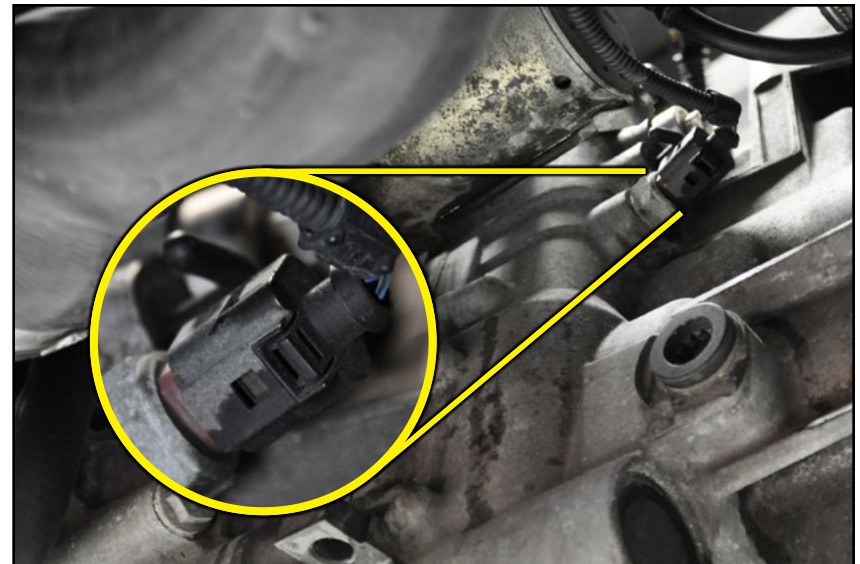
Step 25:

Secure the shifter cable bracket up out of the way using a nylon wire tie or mechanics wire.



Step 26: VAG Connector Release Tool

Disconnect the reverse light switch, located on the transmission just behind the starter.



REMOVING THE TRANSMISSION

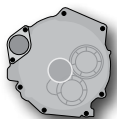
Step 27: 13mm Socket & Ratchet

Remove the nut and pull the wiring harness bracket off of the lower starter mounting bolt.



Step 28: 18mm Socket & Ratchet

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



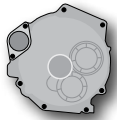
If you have decided to use our bolt storage template, thread the nut from step 27 onto this bolt and store them in location #2.



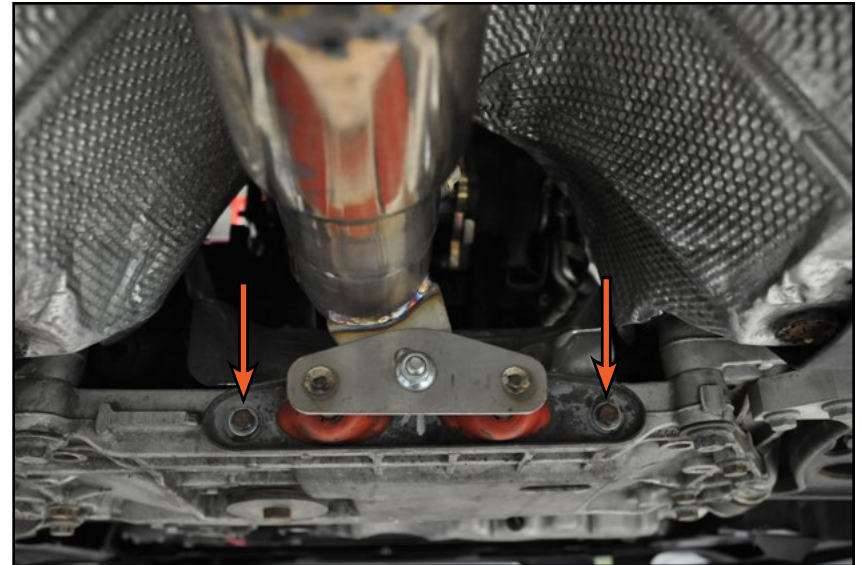
REMOVING THE TRANSMISSION

Step 29: 13mm Socket & Ratchet

Remove the two exhaust hanger bracket bolts.

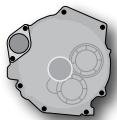


If you have decided to use our bolt storage template, store these bolts in location #9.



Step 30: 16mm & 22mm Sockets, Breaker Bar

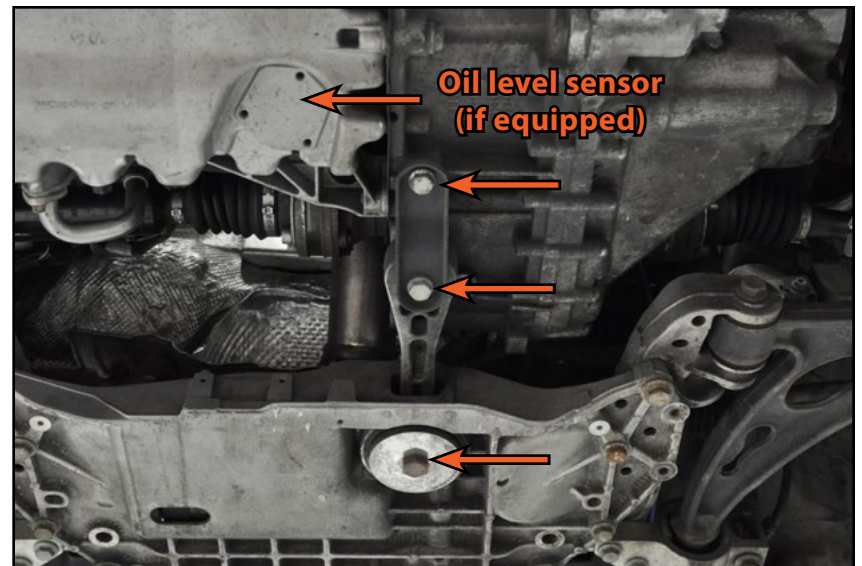
Remove the two front pendulum support bolts, then remove the rear bolt and slide the pendulum support out of the subframe.



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



If your vehicle is equipped with an oil level sensor, disconnect it at this time to prevent damaging the wires when lowering the engine.



REMOVING THE TRANSMISSION

Step 31: 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 32: 24mm Socket & Impact Wrench or Breaker Bar

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



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 33:

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



Step 34: 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.



Some vehicles may be equipped with a heat shield over the RH inner CV boot. Remove this shield if equipped and store the bolts in location #14.



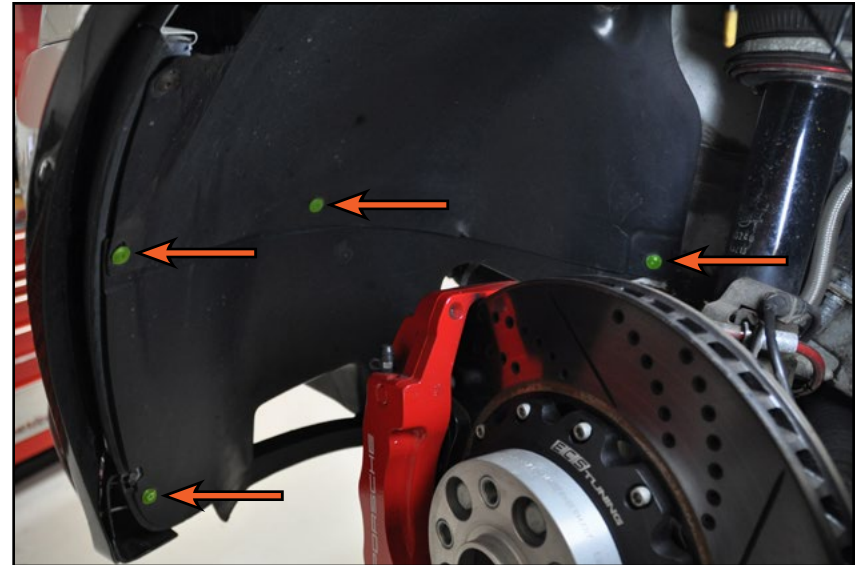
Some vehicles may be equipped with a small plate behind the RH CV drive flange. If equipped, remove it at this time.



REMOVING THE TRANSMISSION

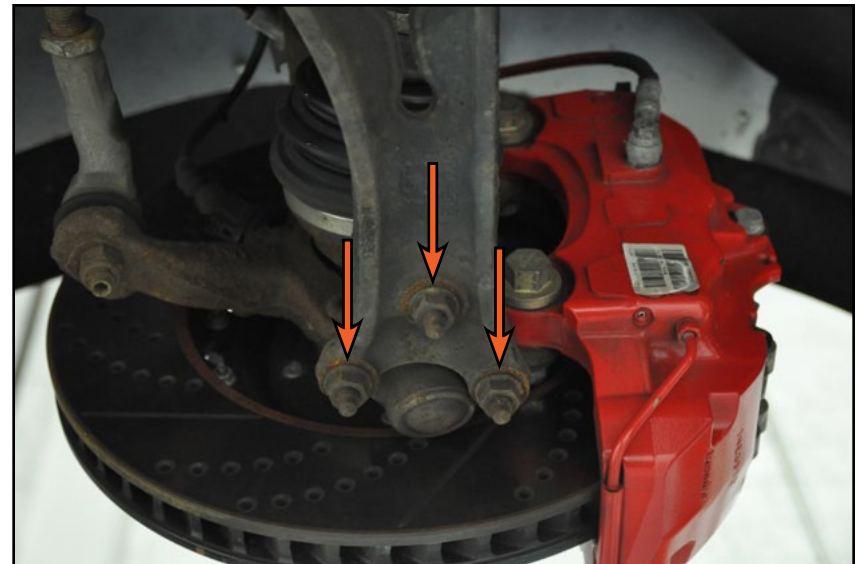
Step 35: T25 Torx

Remove the six screws holding the lower fender liner in place on the LF. Four are located in the wheel well (arrows) and two more located underneath the front. Once the screws are out, remove the lower fender liner.



Step 36: 16mm Socket & Ratchet

Remove the three LF lower ball joint nuts.



REMOVING THE TRANSMISSION

Step 37:

Pull the LF lower control arm down off of the ball joint, then hold the CV shaft, pull the steering knuckle outwards off of the outer CV joint splines, and remove the shaft from the vehicle.



Step 38: Flat Blade Screwdriver

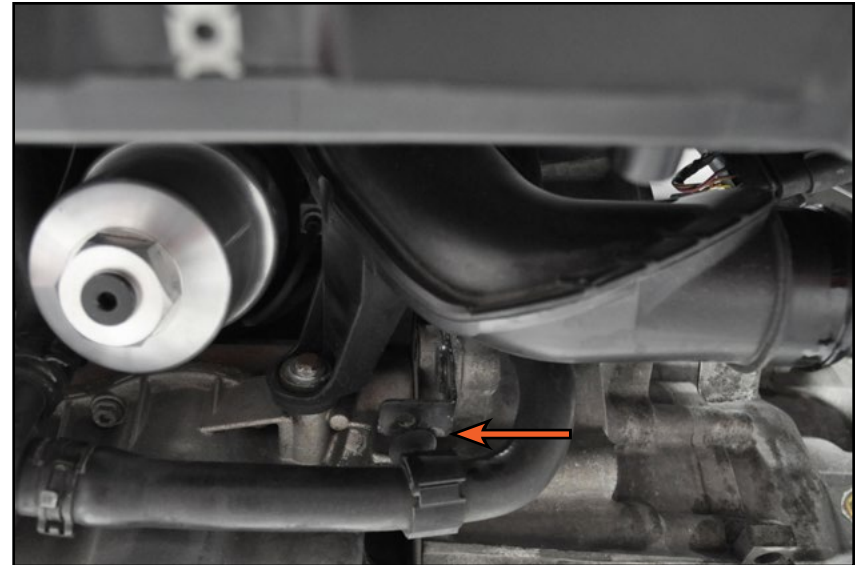
Loosen the clamp and pull the charge air hose off of the intercooler outlet.



REMOVING THE TRANSMISSION

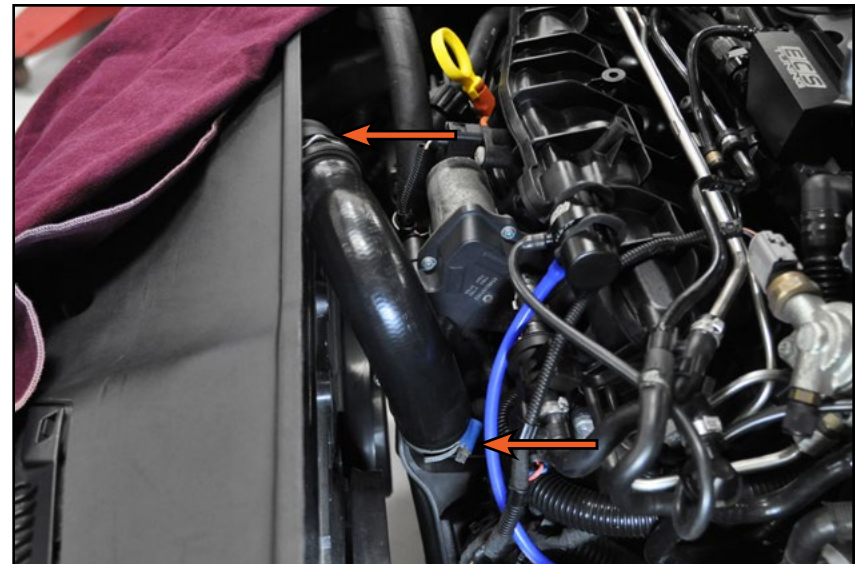
Step 39:

Pull the auxiliary coolant hose retainer out of the bracket on the front of the bell housing.



Step 40: Flat Blade Screwdriver, Hook Tool

Remove the hose between the charge air pipe and the noise pipe. It is secured by a clamp on one end and a wire clip on the other. Loosen the clamp, then pull the wire clip up to unlock the connection. Pull the hose off both ends.



REMOVING THE TRANSMISSION

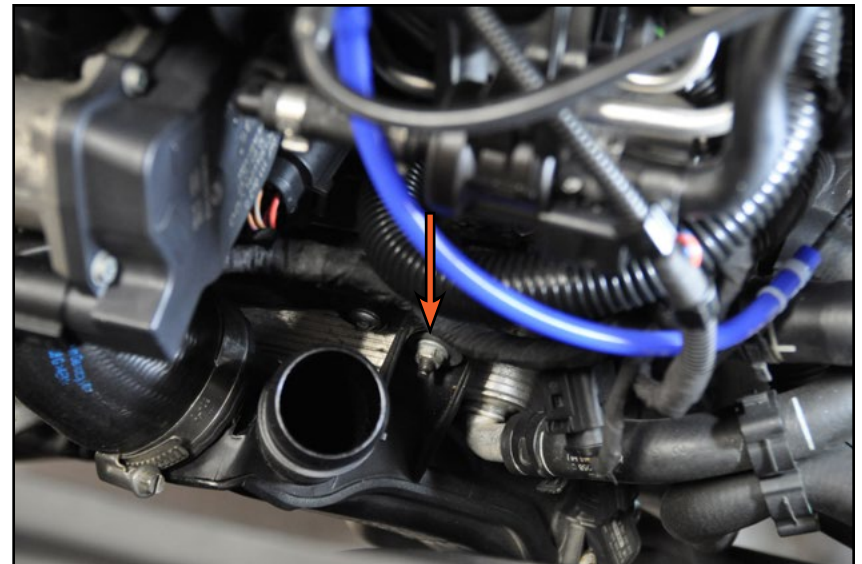
Step 41: Flat Blade Screwdriver

Loosen the clamp which secures the top of the charge air pipe to the throttle body hose.



Step 42: 10mm Socket & Ratchet

Remove the nut which secures the top of the charge air pipe.



REMOVING THE TRANSMISSION

Step 43:

Disconnect the MAP sensor. It is located on the charge air pipe, just behind the LH cooling fan motor.



Step 44: T30 Torx

Remove the bolt which secures the bottom of the charge air pipe.



REMOVING THE TRANSMISSION

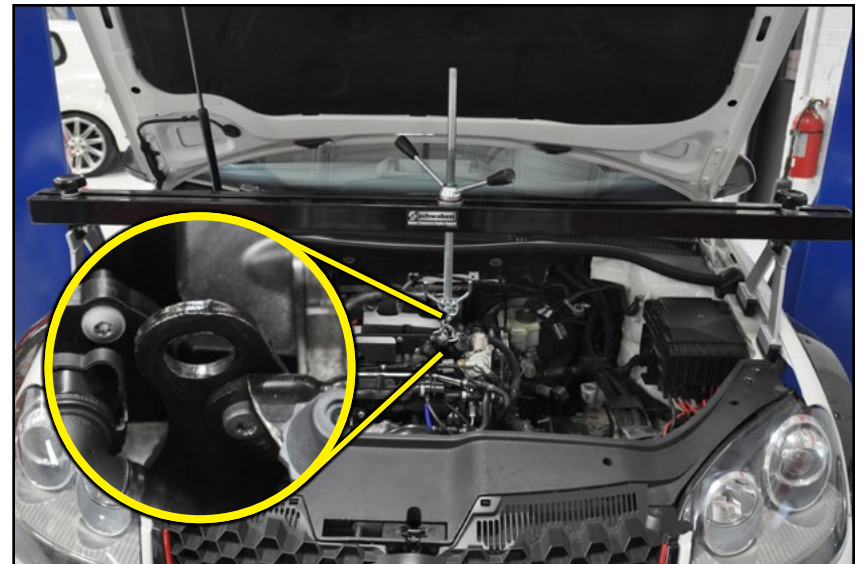
Step 45:

Pull the charge air pipe out of the throttle body hose at the top, then pull it down and out between the engine and radiator.



Step 46: Engine Support Bar

Securely install an engine support bar in place, chaining it to the engine lift hook located on the end of the cylinder head near the fuel pump. Tighten the center screw until there is no slack on the chain, then add one more rotation so that there is slight tension and the engine and transmission are being held firmly in place.



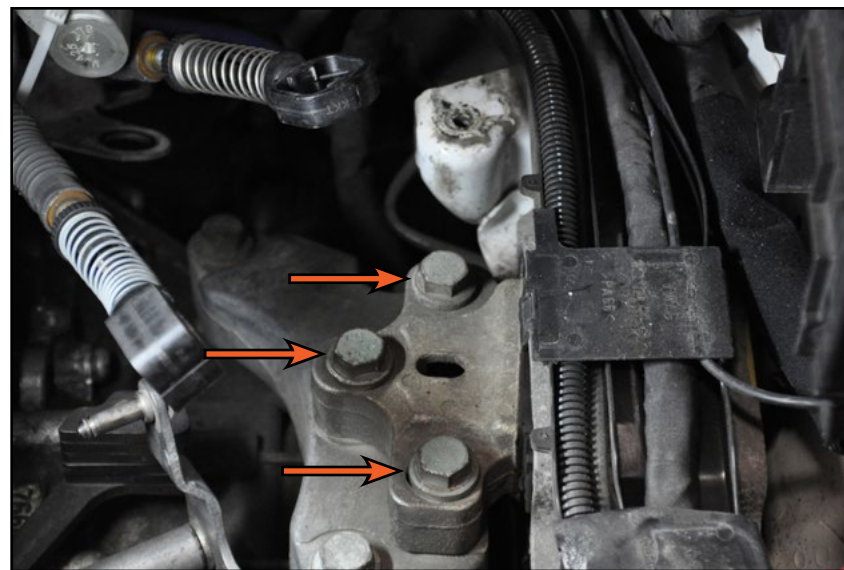
REMOVING THE TRANSMISSION

Step 47: 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.

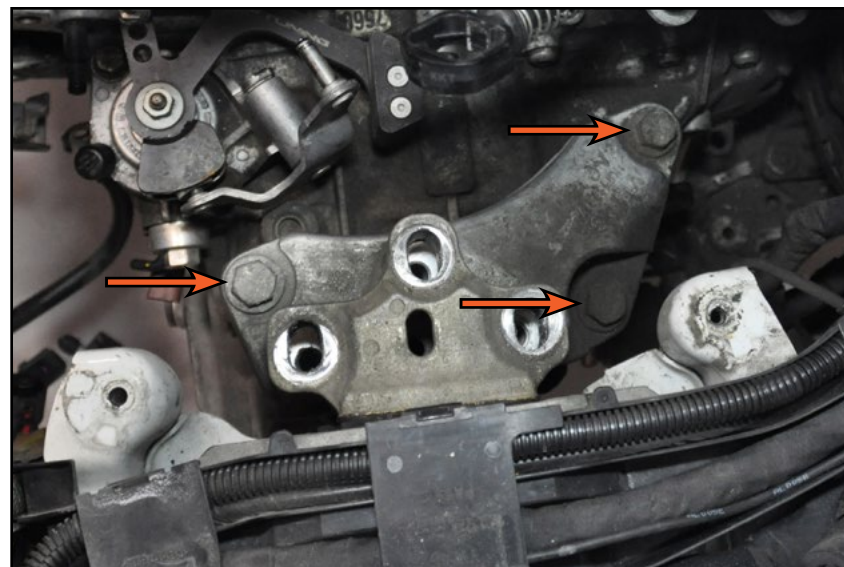


Step 48: 18mm Socket & Breaker Bar

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



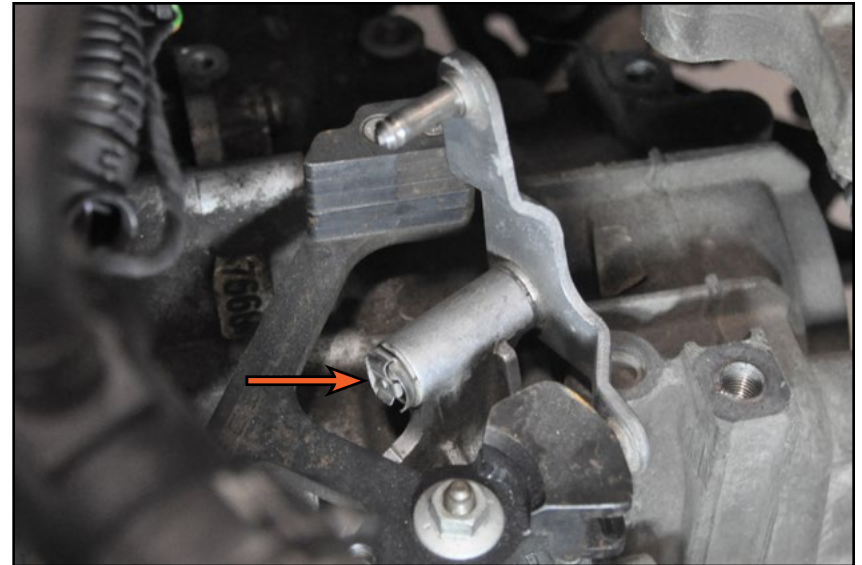
If you have decided to use our bolt storage template, store these bolts in location #15.



REMOVING THE TRANSMISSION

Step 49:

Remove the clip on the transmission relay lever.



Step 50:

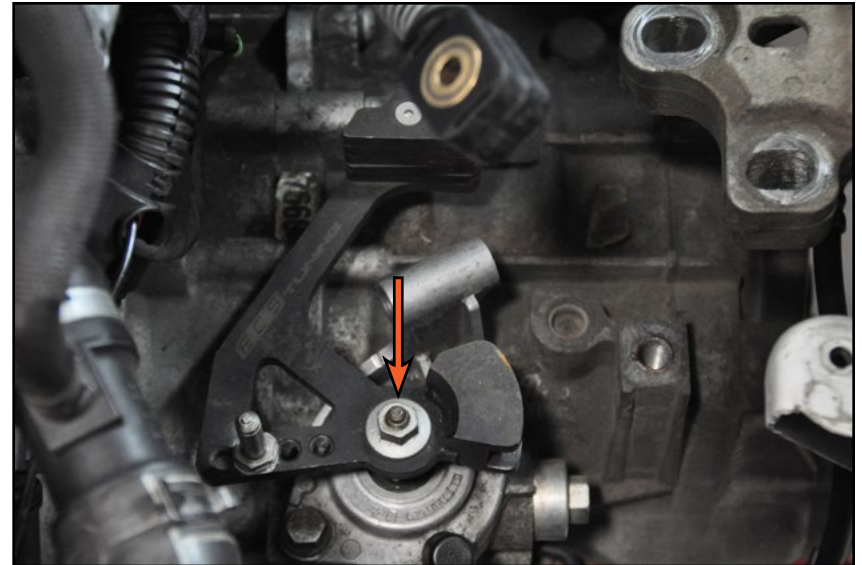
Slide the relay lever out and remove it. Remove the small relay lever bushings and store them with the lever. If left in the transmission, they may fall out and get lost.



REMOVING THE TRANSMISSION

Step 51: 13mm Socket & Ratchet

Remove the selector shaft nut.



Step 52:

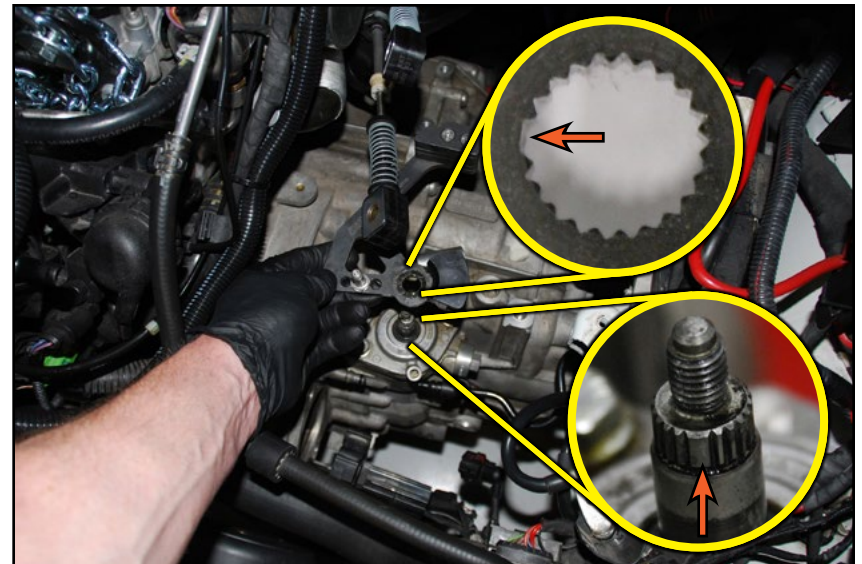
Pull the selector lever off of the selector shaft. You may have to gently wiggle it side to side until it releases. Be patient and work the lever gently until it is free. You may have to use a puller if it is stuck, but it can normally be removed without one.



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



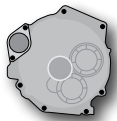
CAUTION: Do not hammer on the end of the selector shaft or pry on the selector lever or the selector shaft can be damaged.



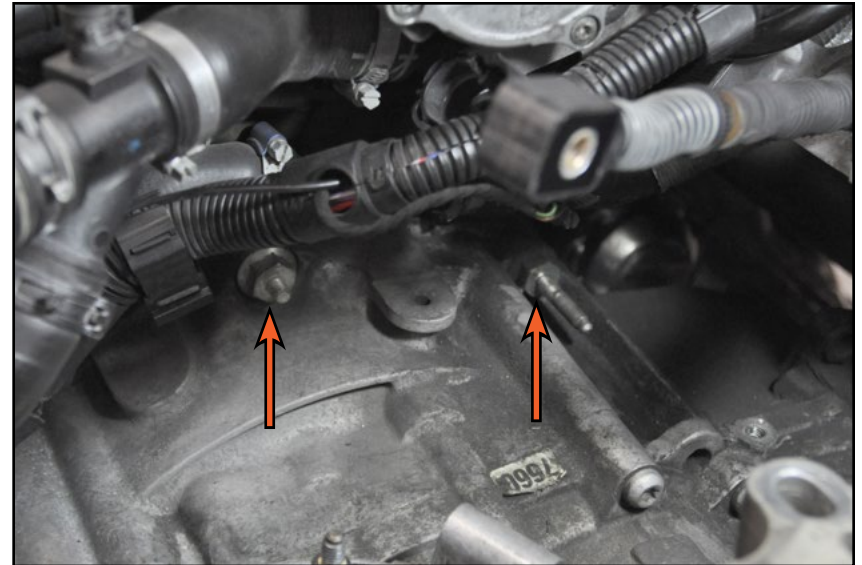
REMOVING THE TRANSMISSION

Step 53: 18mm Socket & Ratchet

Remove the two upper bell housing bolts.



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



Step 54: 18mm Socket & Ratchet

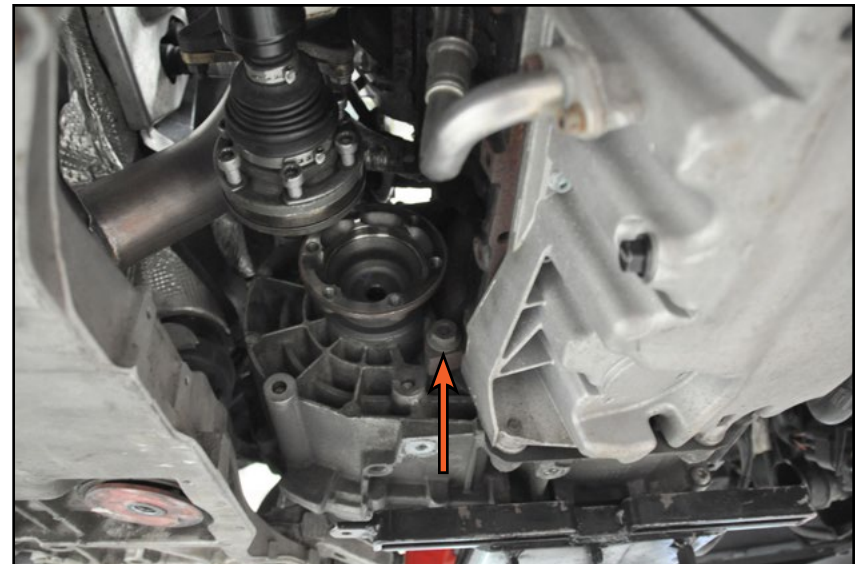
Remove the rear bell housing bolt.



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



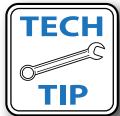
We have found that it is considerably easier to remove and install the transmission if you remove the RH CV drive flange. It is easy to remove and will save you a lot of time and effort. Continue with [step 55](#) for instructions on how to remove it, or skip to [step 58](#) to proceed with the clutch install.



REMOVING THE TRANSMISSION

Step 55:

The RH side CV drive flange is held in the transmission with a 6mm allen-head bolt.



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



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



Step 56: 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.



REMOVING THE TRANSMISSION

Step 57:

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



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 58: Transmission Jack

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



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.



REMOVING THE TRANSMISSION

Step 59: 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 transmission bell housing bolt in location #8, and store the two lower bell housing bolts in location #'s 6 & 7.

Final Removal Steps:

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

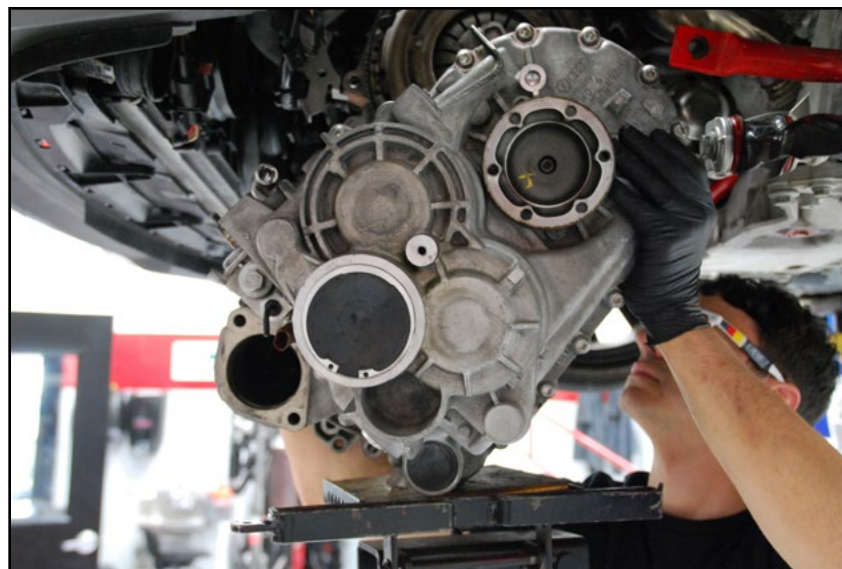
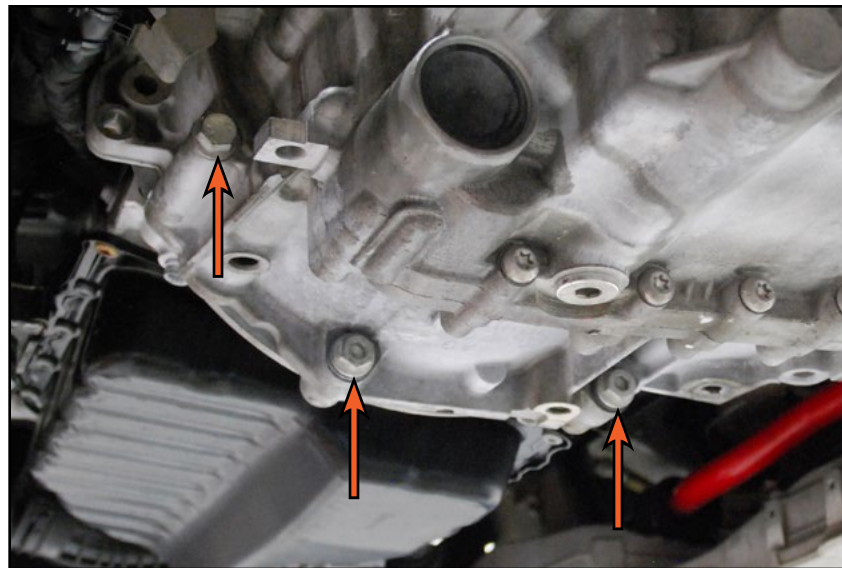
Separate the transmission from the engine by pulling it back from the engine block.

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

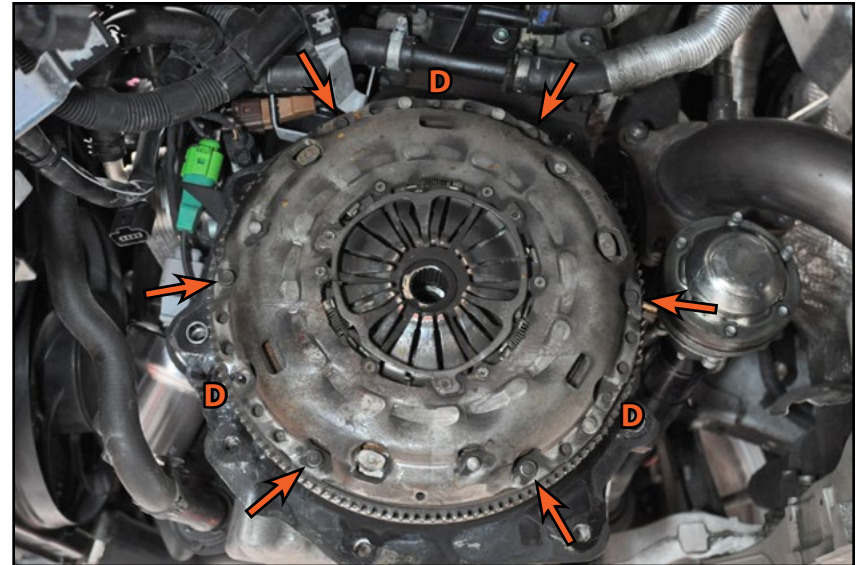
Step 1: 9mm 12-Point Socket & Ratchet, Flat Blade Screwdriver



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.

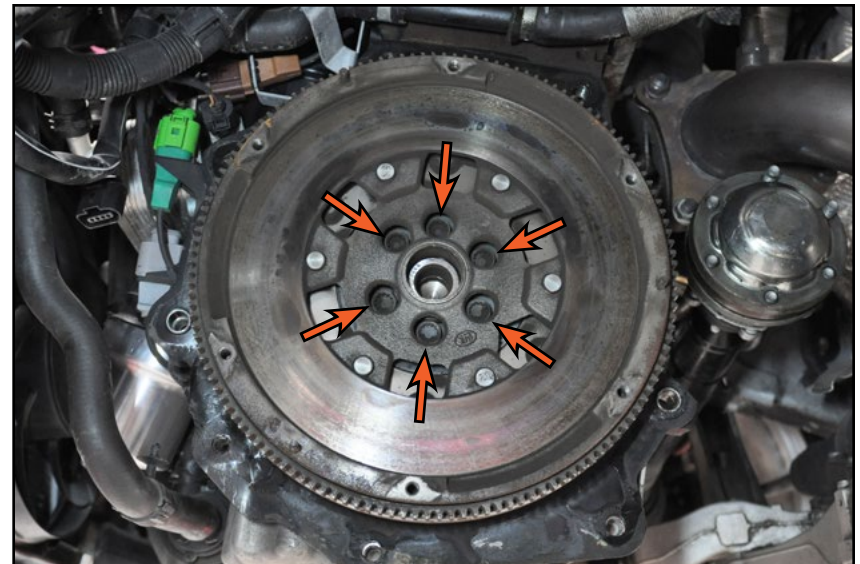


Step 2: M12 Triple Square Socket & Breaker Bar, Pry Bar

Loosen all six flywheel bolts, then remove five 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.

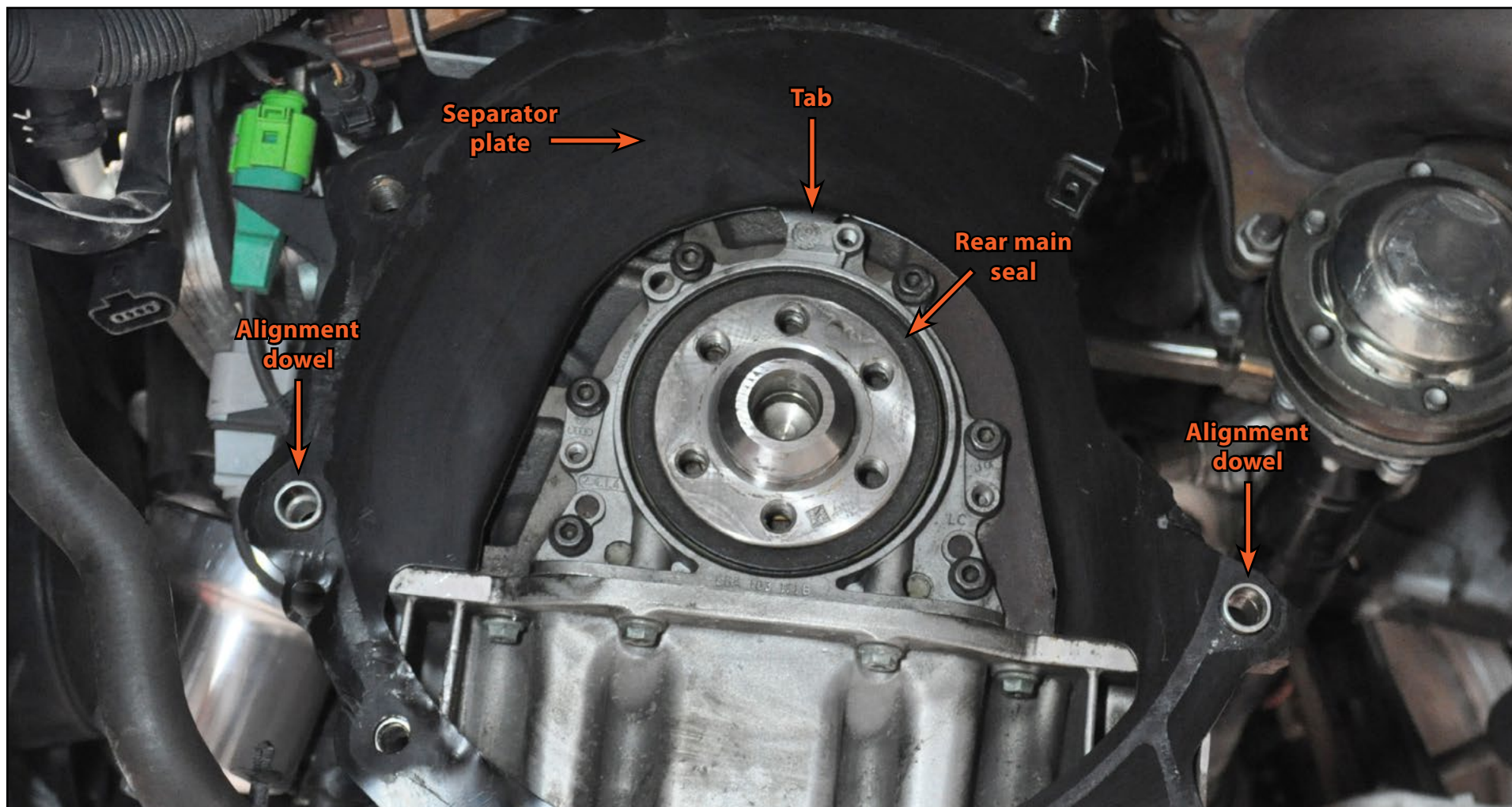


An impact can be used to easily remove the flywheel bolts. If you do not have an impact, thread two of the old pressure plate bolts back into place and lever a pry bar between them to keep the engine from turning while you break the flywheel bolts loose.



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.



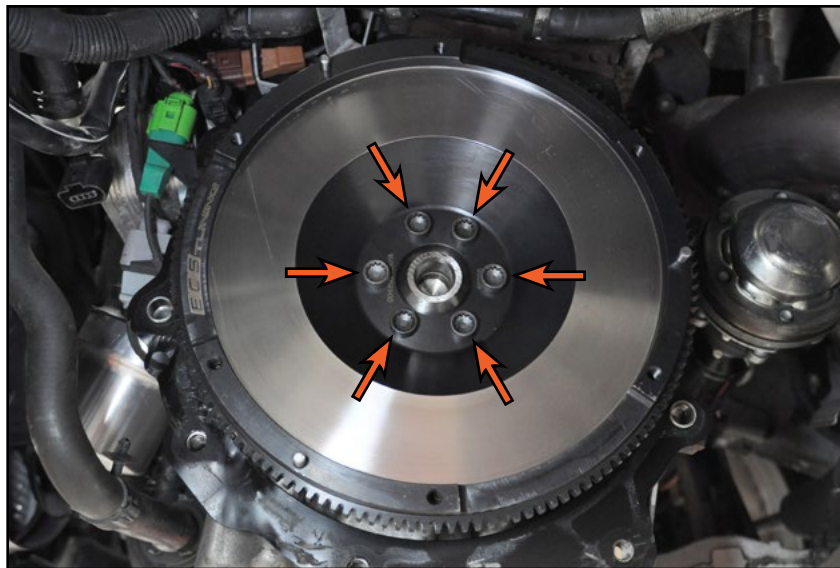
INSTALLING THE NEW FLYWHEEL AND CLUTCH

Step 1: M12 Triple Square Socket & Ratchet

Install the flywheel into place on the end of the crankshaft, then install all six bolts (arrows) 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.



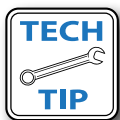
Some of the flywheel bolt holes are offset, they will only line up in one position.



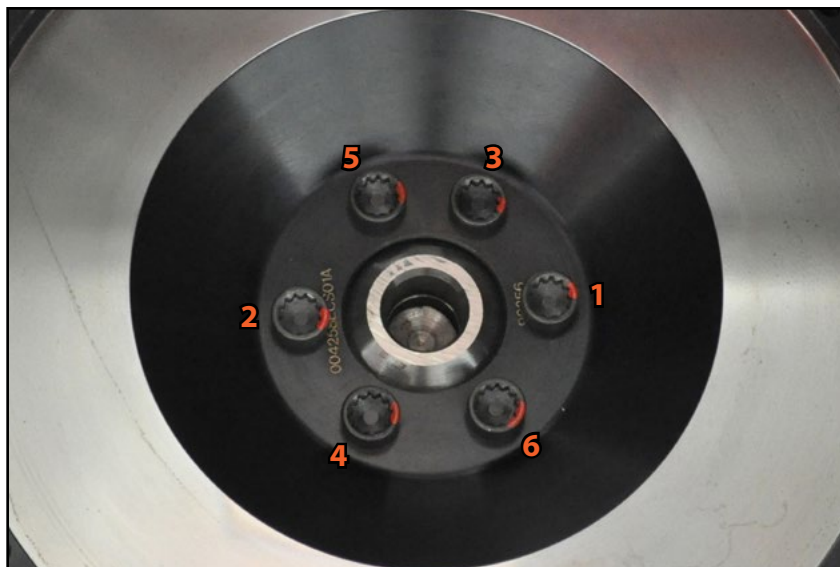
Step 2: M12 Triple Square Socket, Torque Wrench, Breaker Bar, Paint Pen

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°

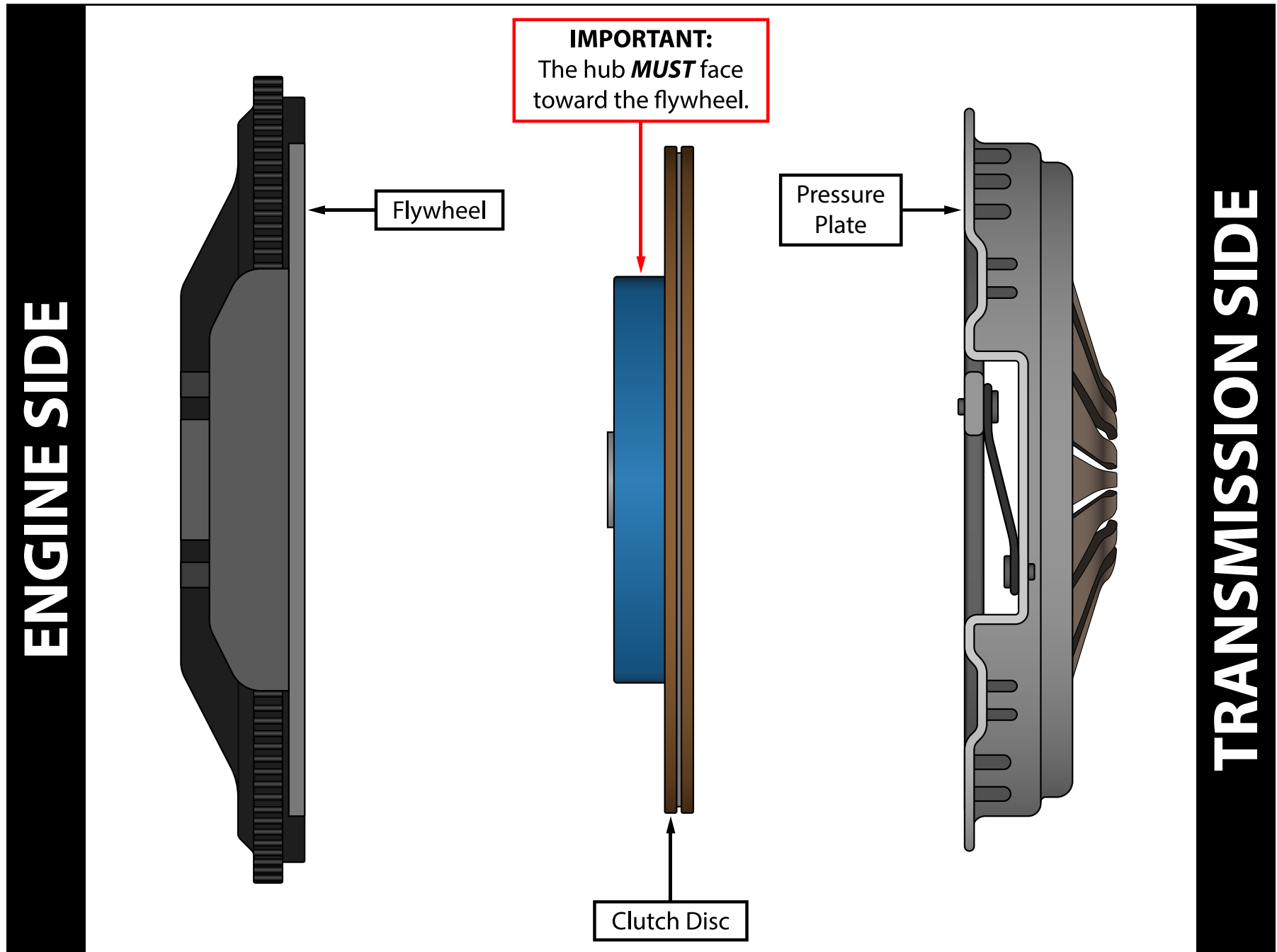


When you begin stage 3, mark each bolt with paint after you tighten it the additional 90° so you don't lose track of which ones have been tightened.



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

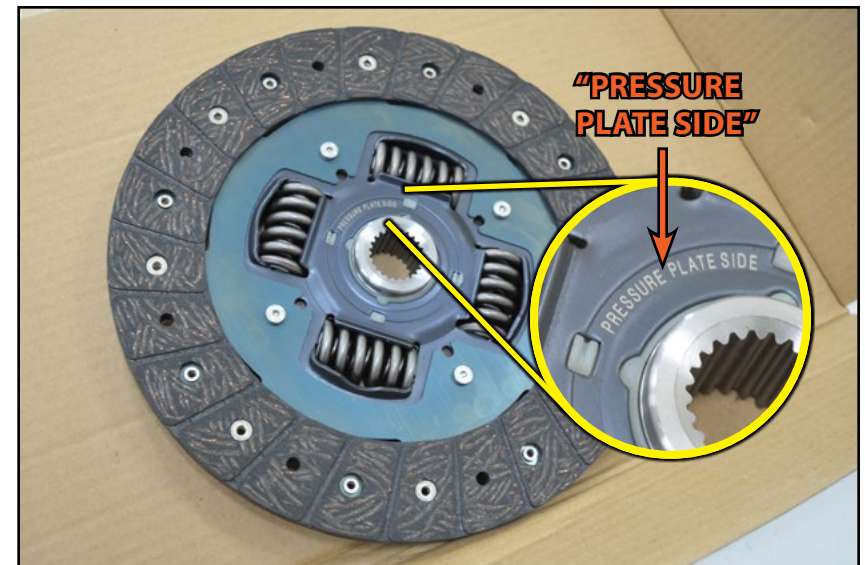
Step 3:

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.



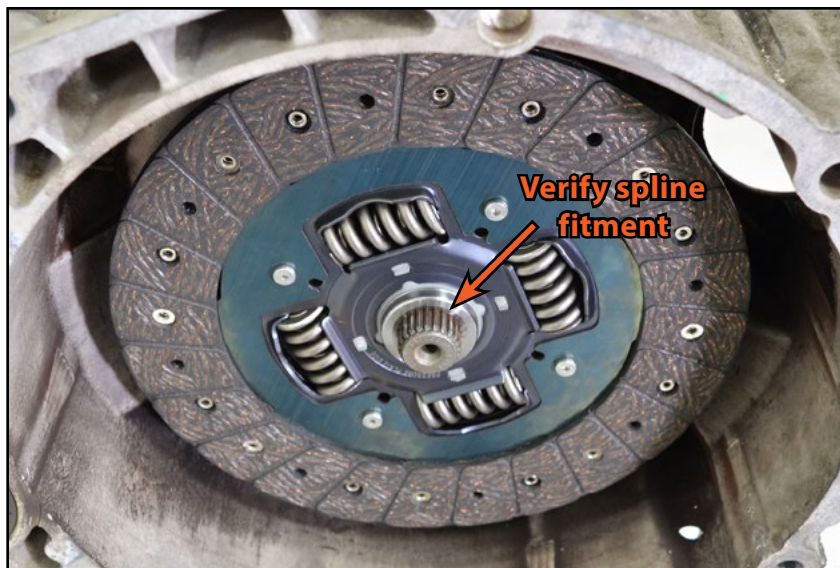
INSTALLING THE NEW FLYWHEEL AND CLUTCH

Step 5:

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



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.

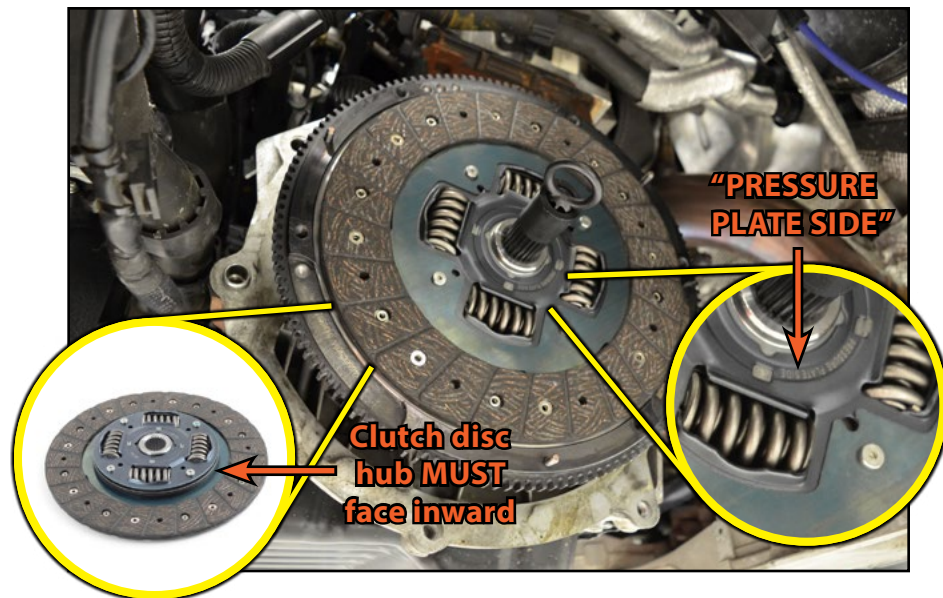


Step 6: Clutch Alignment Tool

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.



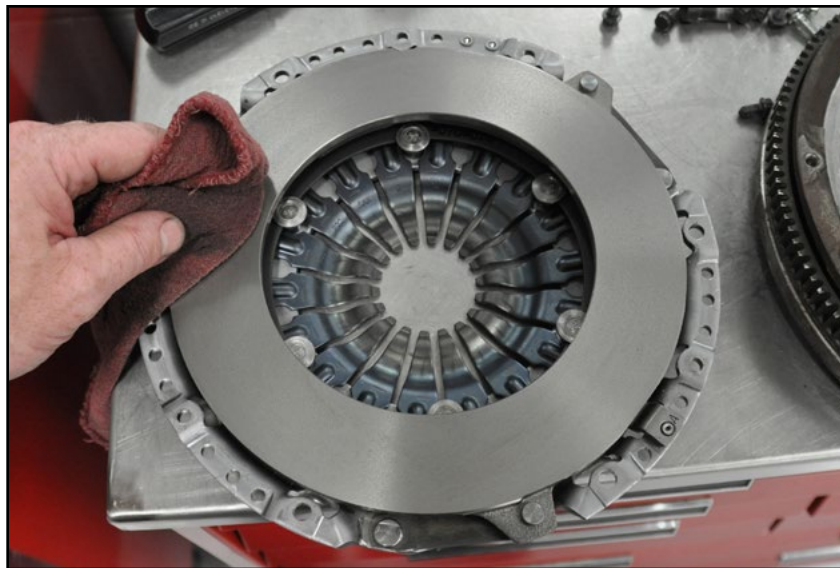
CAUTION: Make absolutely sure to install the clutch disc in the proper orientation. If the clutch disc is installed backwards it **WILL NOT** function properly.



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.

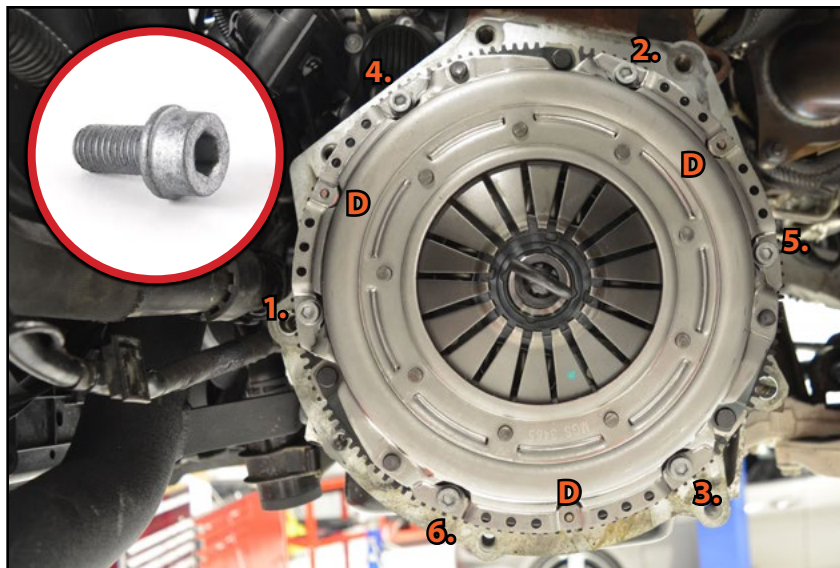


Step 8: 6mm Hex (Allen) Socket & Torque Wrench

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).

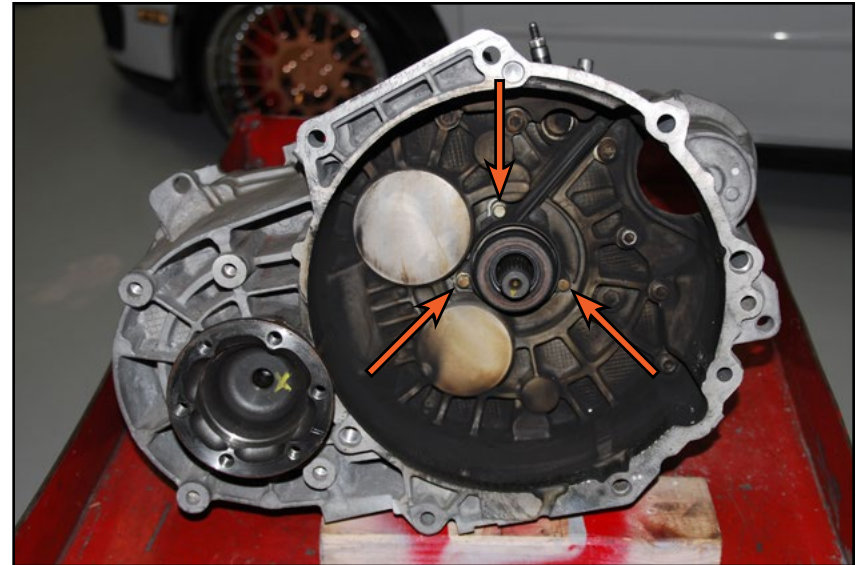
Torque the pressure plate bolts to 20 Nm (15 Ft-lbs) using the same sequence shown on the right. Remove the alignment tool after the bolts are torqued.



PREPARING THE TRANSMISSION FOR INSTALLATION

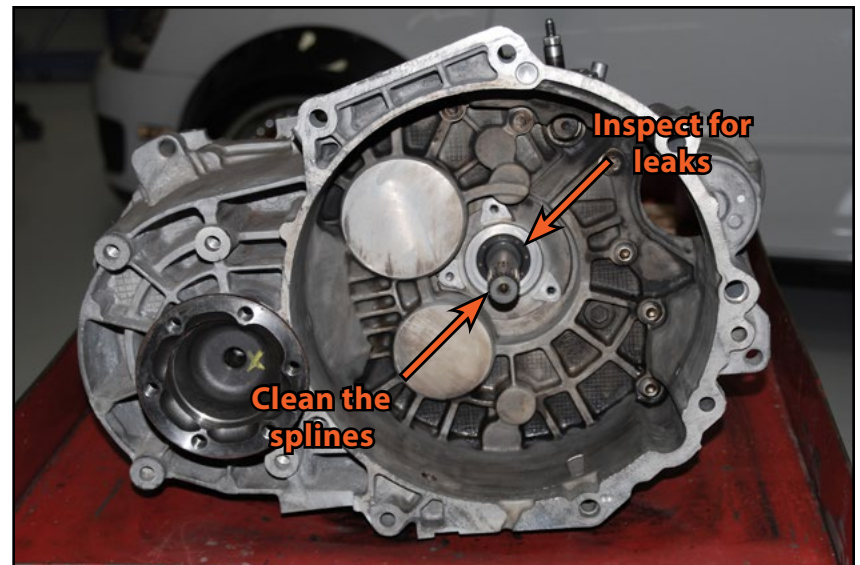
Step 1: 9mm Deep Socket & Ratchet

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



Step 2:

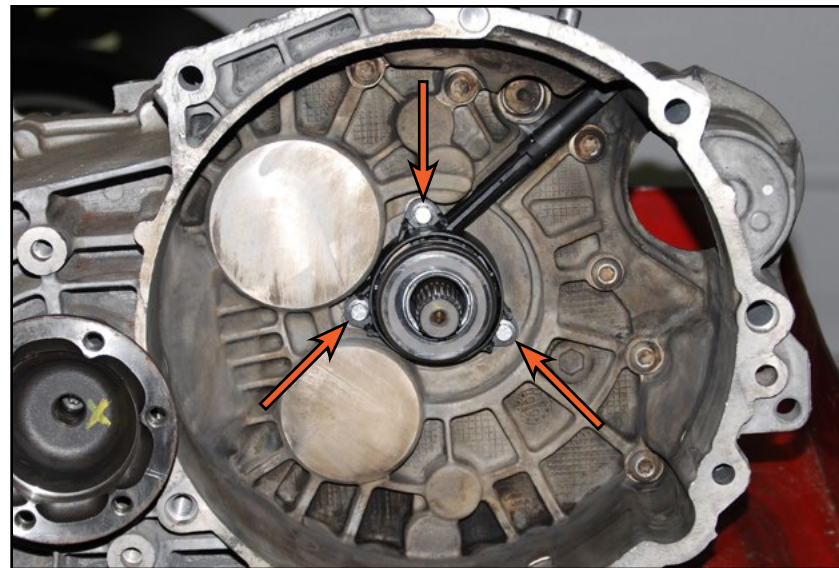
Thoroughly clean the bell housing and the splines on the input shaft. Inspect the input shaft seal for any signs of leakage, replace if necessary.



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

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.

REINSTALLING THE TRANSMISSION

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.

REINSTALLING THE TRANSMISSION

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 LH outer CV bolt and torque it to the proper specification depending on whether it is a ribbed or non-ribbed bolt. (See pages 56, & 57).

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.

FINAL INSTALLATION STEPS

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 54 & 55 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).

CLUTCH BREAK-IN PERIOD

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.

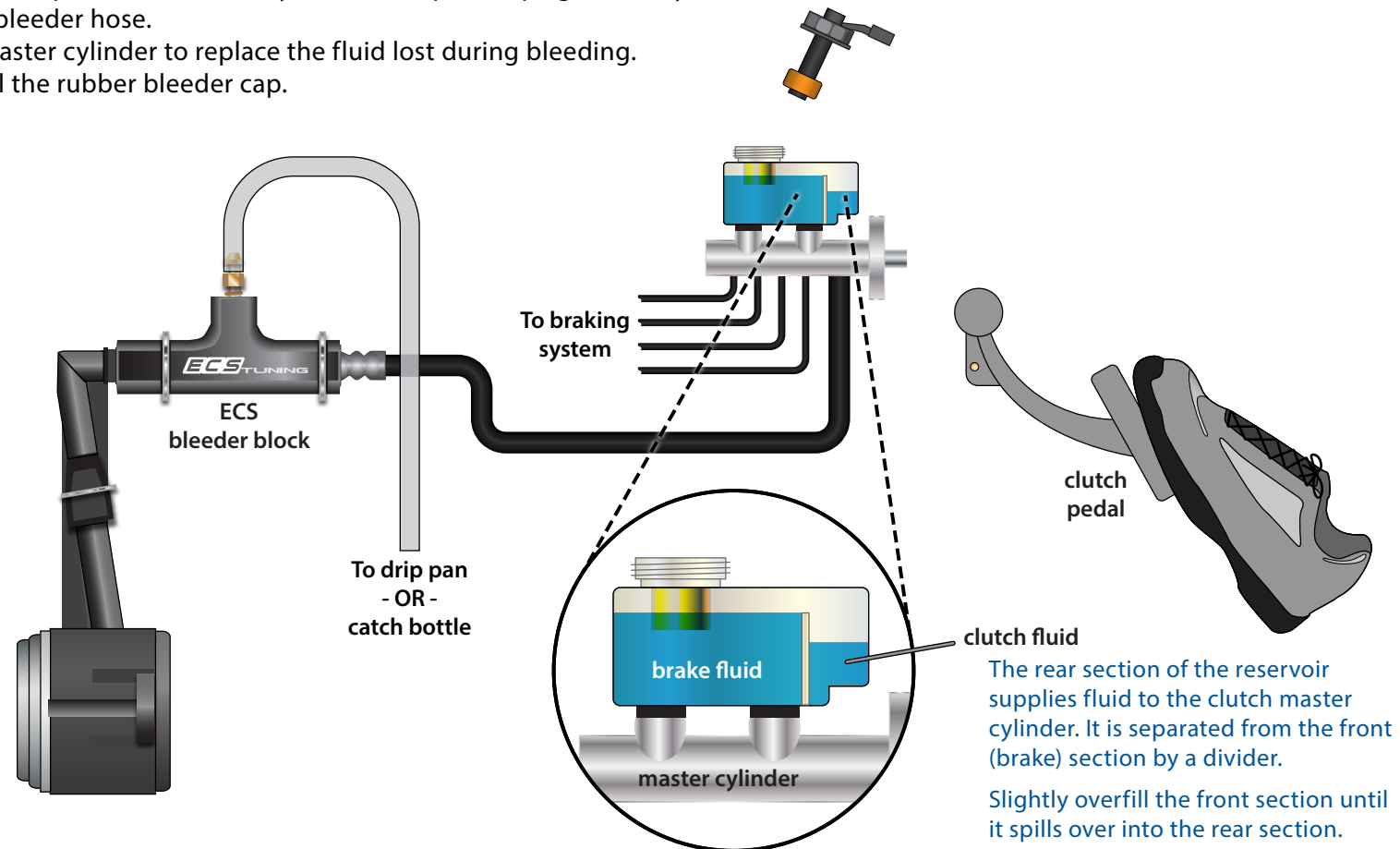
Avoid hard launches or quick shifting until after the break-in period has passed.

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.



CLUTCH HYDRAULIC SYSTEM: PRESSURE BLEEDING

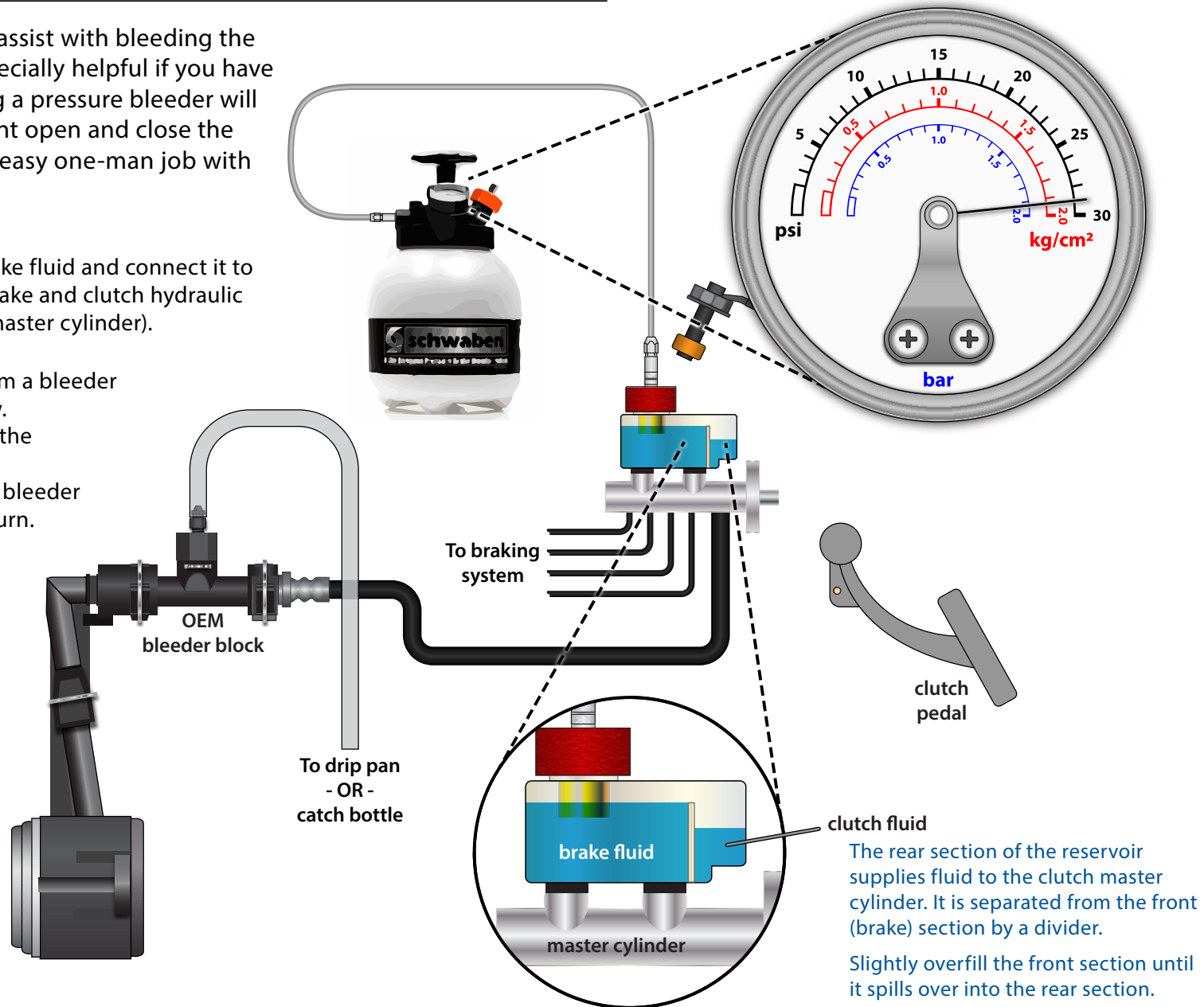
A pressure bleeder can be used to assist with bleeding the clutch hydraulic system. This is especially helpful if you have an OEM clutch bleeder block. Using a pressure bleeder will negate the need to have an assistant open and close the bleeder screw for you, so this is an easy one-man job with the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

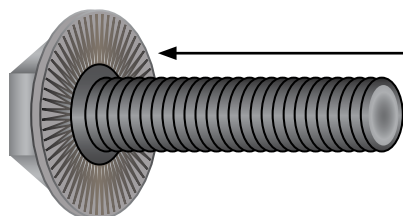
Some fasteners require lubrication on the threads -or- on the contact surface while torquing. These fasteners will be listed with the specific location and type of lubrication required. Always follow manufacturers recommendations exactly.

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.

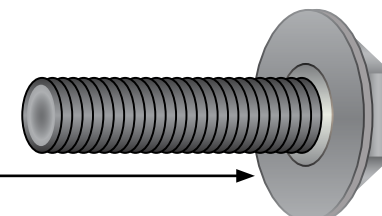
Ribbed vs. Non-Ribbed Bolts

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 51)
Ball Joint Nuts (Sheet Steel or Forged Alum Control Arm)	100 Nm (74 Ft-lbs).....	(Page 51)
Front Bell Housing Bolt (M10x105mm).....	40 Nm (30 Ft-lbs).....	(Page 50)
Lower Bell Housing Bolts (M10x50mm)	40 Nm (30 Ft-lbs).....	(Page 50)
Rear Bell Housing Bolt (M12x65mm or M12x70mm).....	80 Nm (59 Ft-lbs).....	(Page 50)
Upper Bell Housing Bolts (M12x50mm or M12x55mm)	80 Nm (59 Ft-lbs).....	(Page 50)
CV Drive Flange (if removed during transmission removal).....	33 Nm (24 Ft-lbs).....	(Page 50)
Flywheel Bolts	<i>Stage One:</i> 30 Nm (22 Ft-lbs) <i>Stage Two:</i> 60 Nm (44 Ft-lbs) <i>Stage Three:</i> Tighten an additional 90 degrees.....	(Page 43)
Inner CV bolts (8mm).....	40 Nm (30 Ft-lbs).....	(Page 51)
Inner CV bolts (10mm).....	70 Nm (51 Ft-lbs)	(Page 51)
Outer CV bolt (Ribbed)	70 Nm (51 Ft-lbs) + 90 degrees	(Page 52)
Outer CV bolt (Smooth)	200 Nm (147 Ft-lbs) + 180 degrees.....	(Page 52)
Pendulum Support to Subframe	100 Nm (74 Ft-lbs) + 90 degrees	(Page 51)
Pendulum Support to Transmission	50 Nm (37 Ft-lbs) + 90 degrees	(Page 51)
Pressure Plate Bolts.....	20 Nm (15 Ft-lbs)	(Page 47)
Selector Shaft Nut	20 Nm (15 Ft-lbs)	(Page 50)
Slave Cylinder Bolts (Metal Slave).....	12 Nm (9 Ft-lbs)	(Page 49)
Slave Cylinder Bolts (Plastic Slave)	15 Nm (11 Ft-lbs).....	(Page 49)
Starter Bolts (M12x165mm)	80 Nm (59 Ft-lbs).....	(Page 52)
Transmission Bracket Bolts.....	60 Nm (44 Ft-lbs) + 90 degrees.....	(Page 51)
Transmission Mount Bolts	60 Nm (44 Ft-lbs) + 90 degrees.....	(Page 51)
Wheels.....	120 Nm (89 Ft-lbs).....	(Page 52)

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.

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