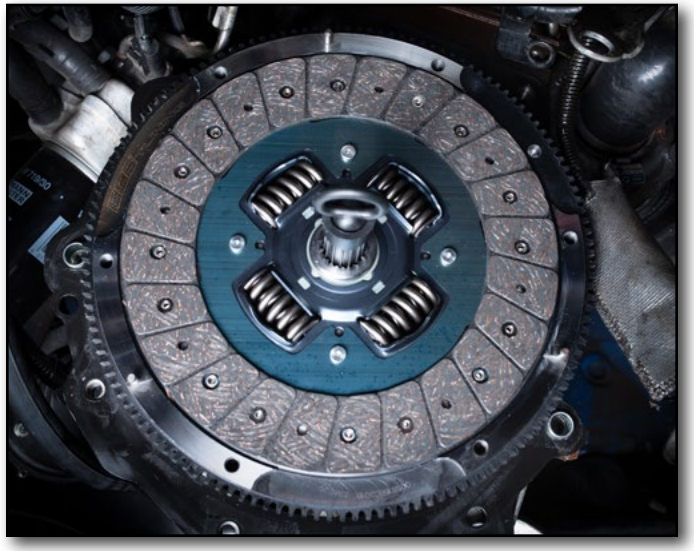
VW MK4 1.8T 6-Speed
ECS Clutch & Lightweight Flywheel Kit
Installation Instructions

Skill Level
3 - Advanced

Advanced Skills & Experience Required



INTRODUCTION

VW MK4 1.8T 6-Speed 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

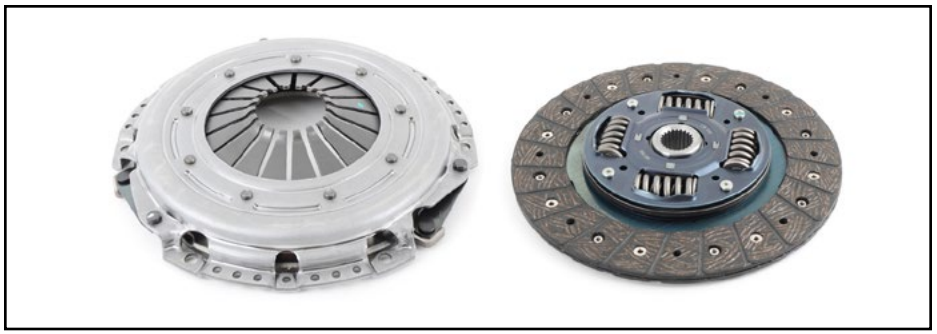
Installing an ECS clutch & lightweight flywheel kit is a weekend project that will reward you with the superior performance and durability of the finest products available. It would be best to plan on two full days to complete this installation. If you do not have previous experience it may take longer, 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!

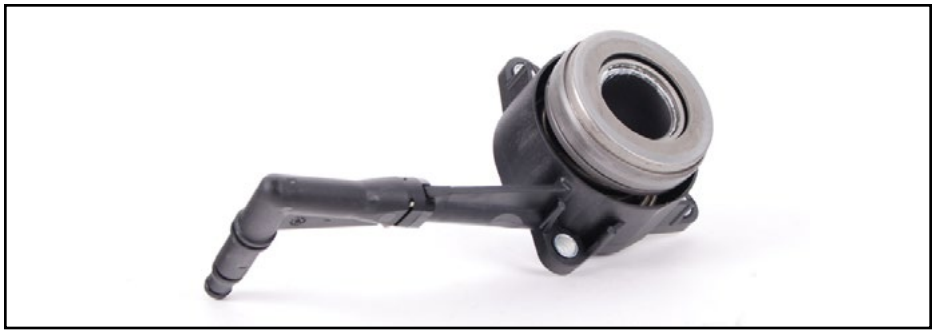
TABLE OF CONTENTS

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

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

Required For This Install

- **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

Available On Our Website

- **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

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**

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.

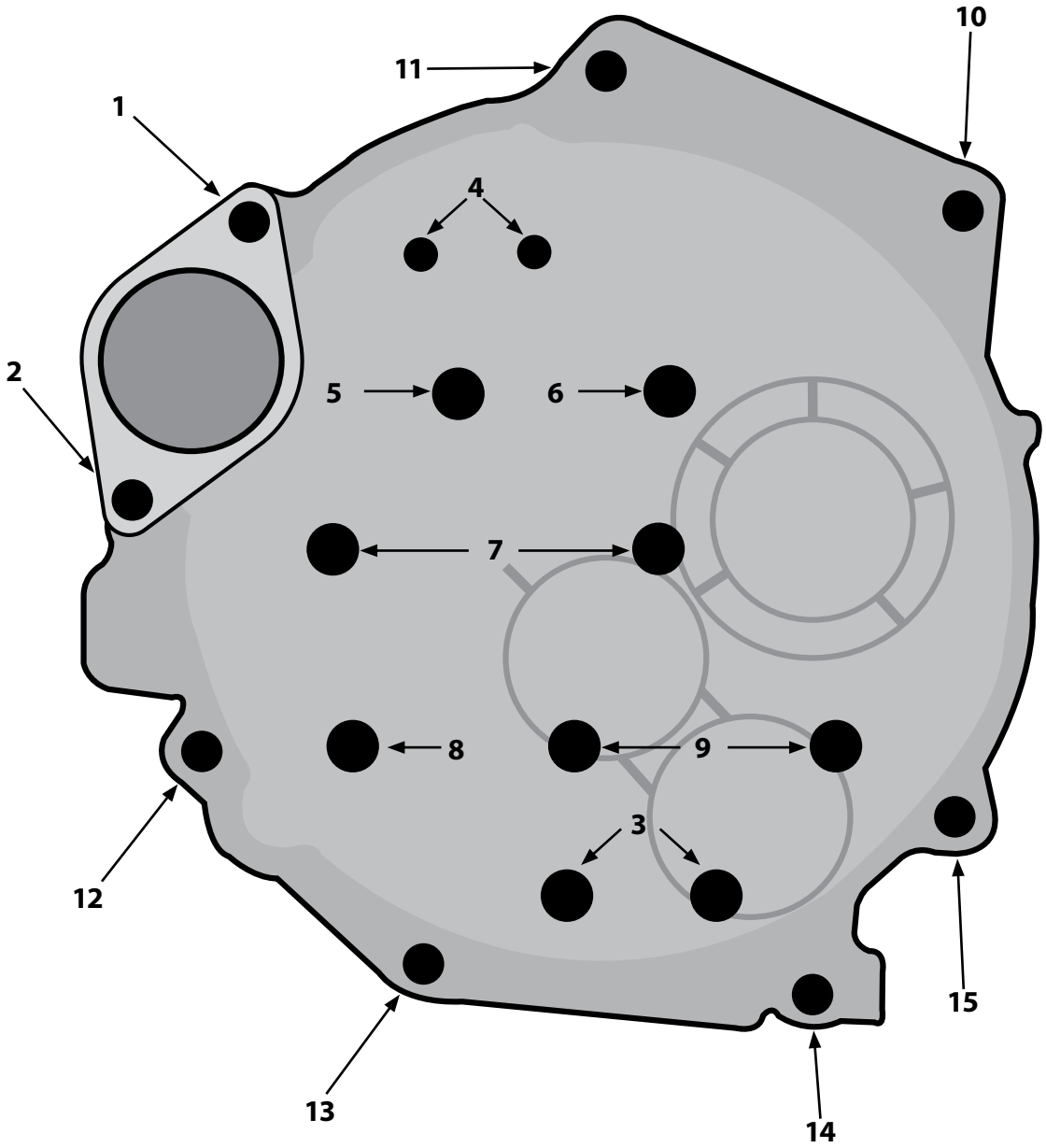
- Park your car in a safe, well lit, level area.
- Shut the engine off and remove the key from the ignition switch.
- Make sure any remote start devices are properly disabled.
- **ALWAYS** wear safety glasses.
- Make sure the parking brake is applied until the vehicle is safely lifted and supported.
- 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.

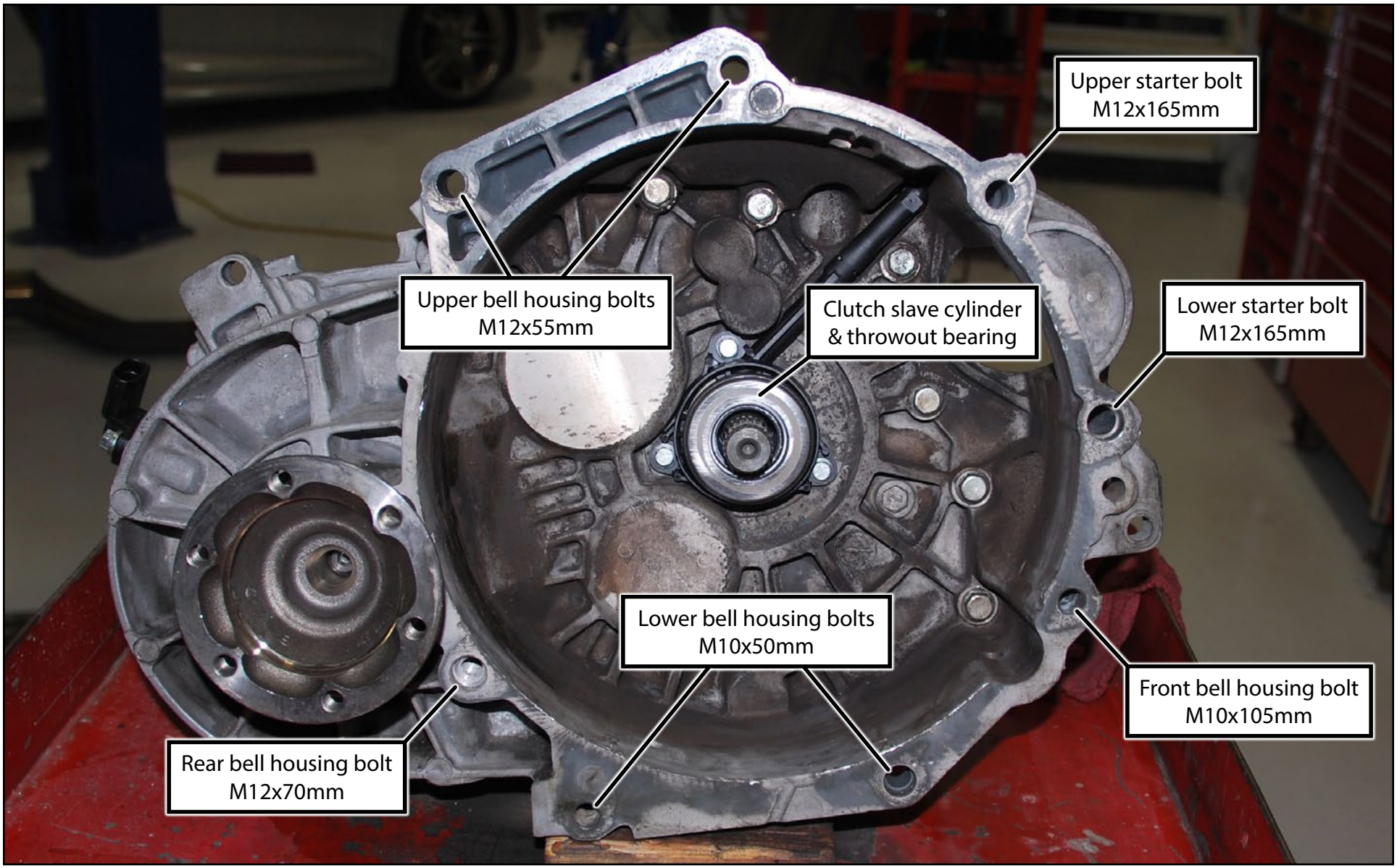
TRANSMISSION BOLT TEMPLATE

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.

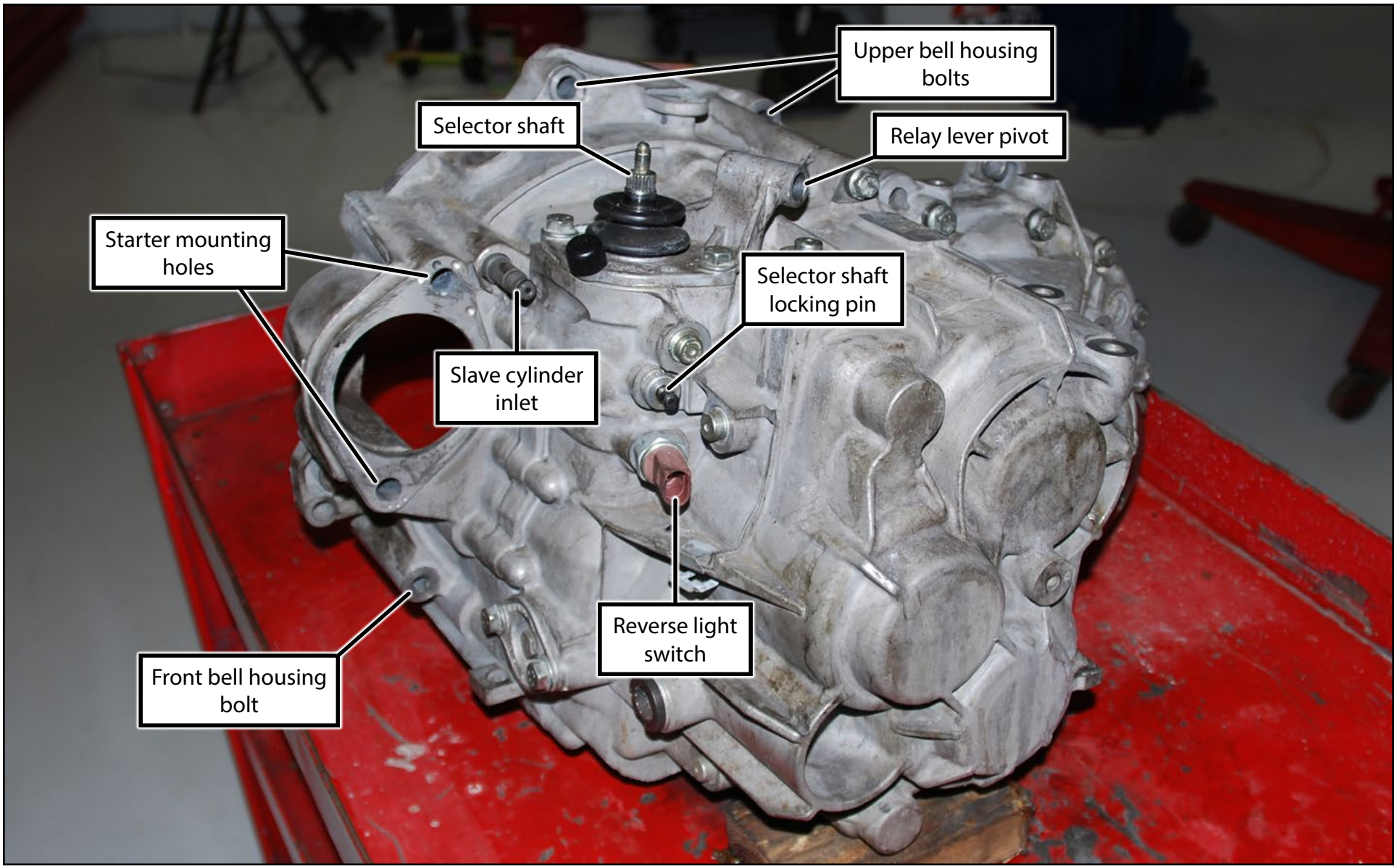
1. M12x165mm upper starter bolt w/end stud
2. M12x165mm lower starter bolt w/end stud
3. CV heat shield bolts
4. Pendulum mount to subframe bolts
5. Pendulum mount to transmission long bolt
6. Pendulum mount to transmission short bolt
7. Transmission mount bolts
8. Transmission mount bracket w/ end stud for power steering line
9. Transmission mount bracket bolts
10. M12x55mm upper bell housing bolt w/long stud for shifter cable bracket
11. M12x55mm upper bell housing bolt w/short stud for negative battery cable
12. M10x105mm front bell housing bolt
13. M12x70mm rear bell housing bolt
14. M10x50mm lower bell housing bolt
15. M10x50mm lower bell housing bolt



TRANSMISSION COMPONENT LOCATIONS



TRANSMISSION COMPONENT LOCATIONS



REMOVING THE TRANSMISSION

Step 1:

Let's begin under the hood. Remove the intake system, battery and battery tray.

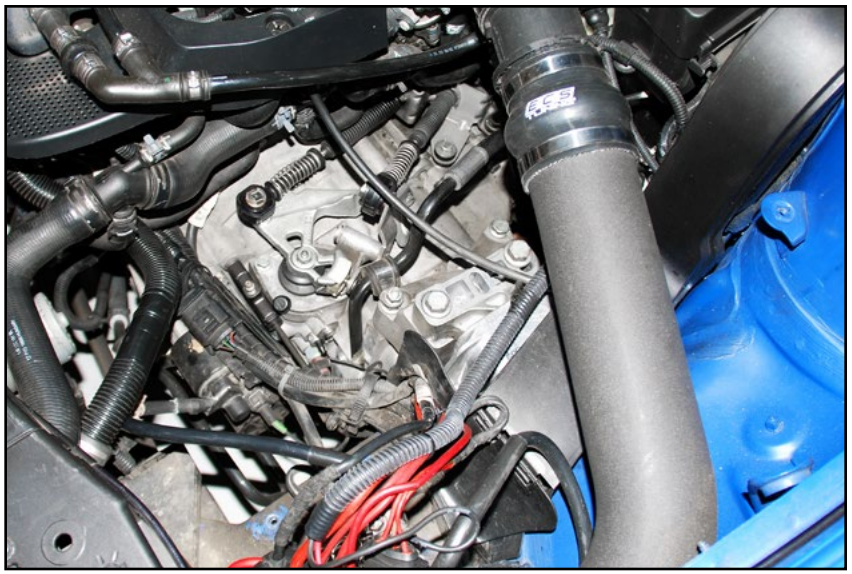
CAUTION: To reduce the risk of fire, explosion, or personal injury, **ALWAYS** disconnect the battery by removing the negative battery terminal first.

NOTE

If you have an aftermarket intake installed, you may have enough room to work around it, or you may just have to remove part of it.

Step 2:

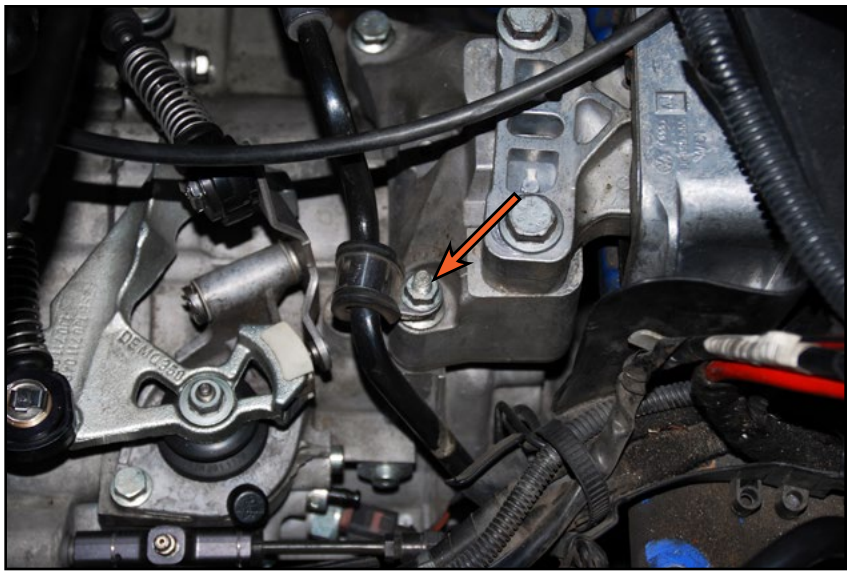
With the intake system, battery and battery tray removed, this is what we will be left with. Now let's get to it!



REMOVING THE TRANSMISSION

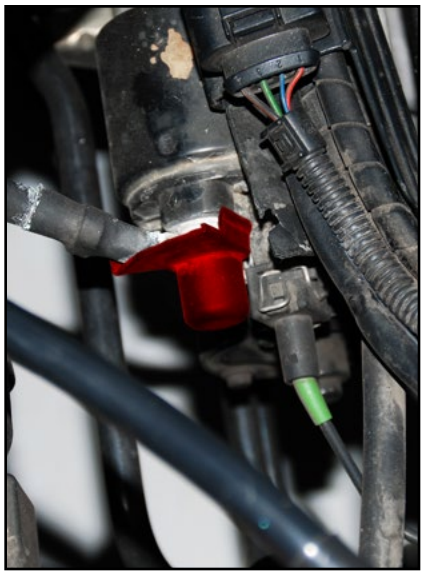
Step 3: 13mm Socket & Ratchet

Remove the nut (arrow) for the power steering line clamp, then lift the clamp up off of the mounting stud.



Step 4: 13mm Socket & Ratchet

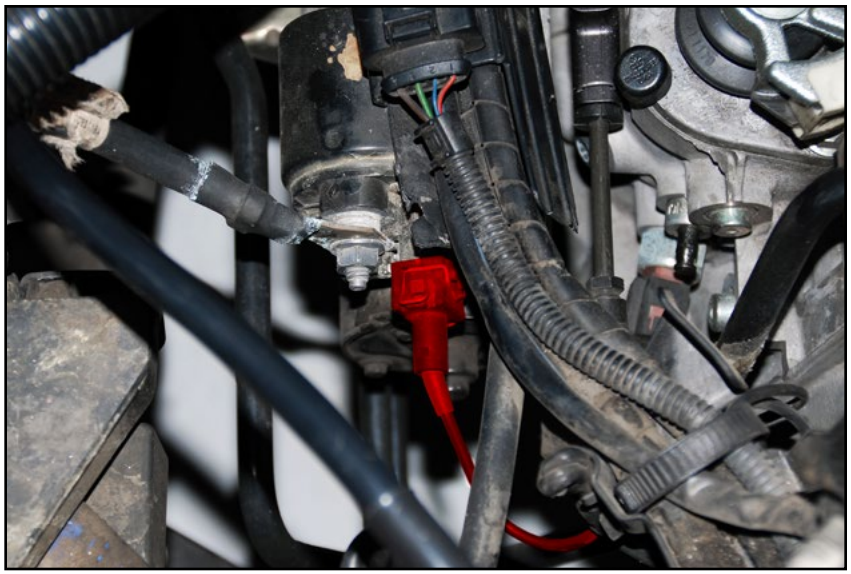
Pry the plastic cap (highlighted in **RED**) free to expose the nut on the battery cable where it connects to the starter. Remove the nut (arrow) and slide the cable free from the starter.



REMOVING THE TRANSMISSION

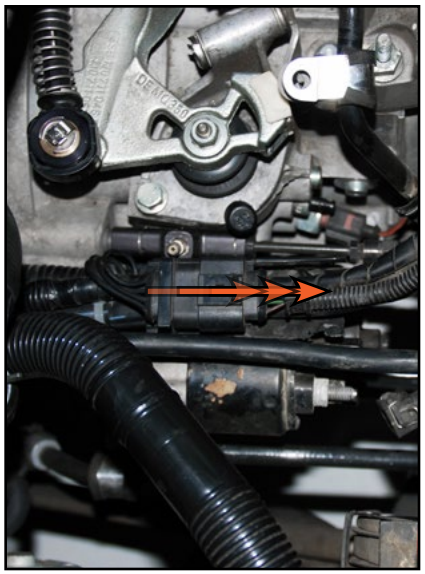
Step 5:

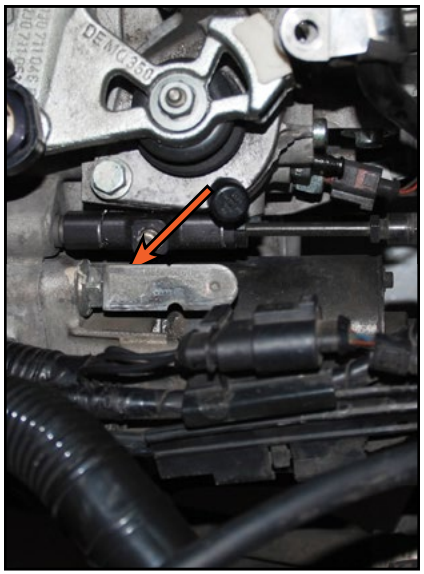
Disconnect the starter solenoid connector (highlighted in **RED**) by squeezing the metal tabs inward and pulling it off.



Step 6: 13mm Socket, Extension & Ratchet

Slide the plastic wiring harness channel off of the metal bracket (as shown in LH photo). Remove the nut (arrow in RH photo) on the upper starter bolt end stud and remove the wiring harness channel bracket.





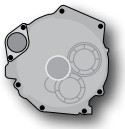
REMOVING THE TRANSMISSION

Step 7: 13mm Socket & Ratchet

Remove the nut (arrow) which secures the ground cable to the stud on the end of the upper bell housing bolt. Do not remove the upper bell housing bolt, we will remove this bolt in a later step. It may be helpful to thread the nut back onto the stud for now to keep from losing it.

Step 8: 18mm Socket & Ratchet

Remove the upper starter bolt (arrow).

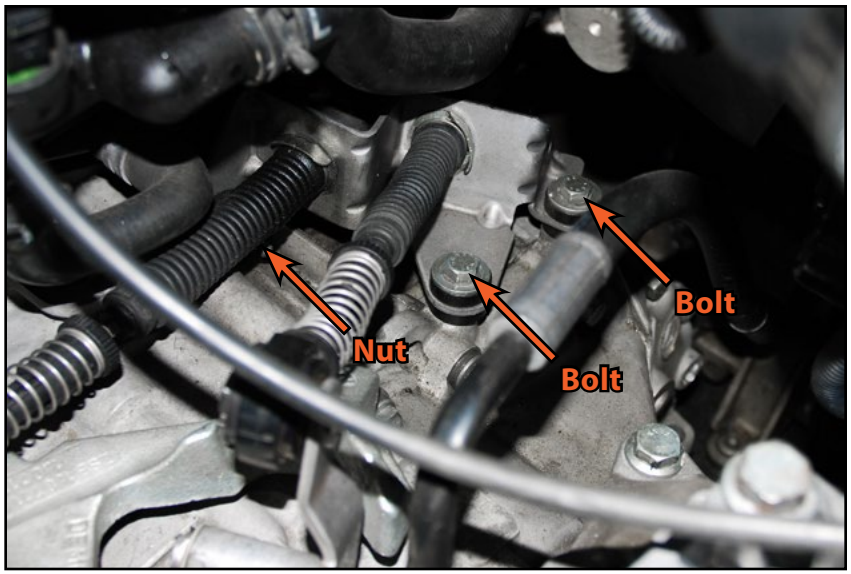


If you have decided to use our bolt storage template, thread the nut from step 6 onto this bolt and store them in location #1.

REMOVING THE TRANSMISSION

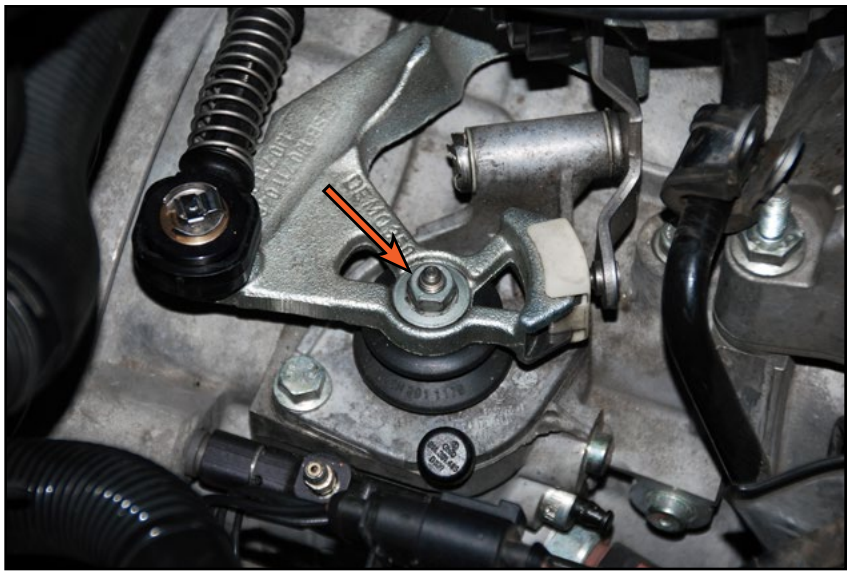
Step 9: 13mm Socket, Extension & Ratchet

Locate the two bolts and one nut that hold the shifter cable bracket in place. Remove them all and secure the cable bracket up out of the way using mechanics wire. Do not remove the upper bell housing bolt, we will remove this bolt in a later step. It may be helpful to thread the nut back onto the stud for now to keep from losing it.



Step 10: 13mm Socket & Ratchet

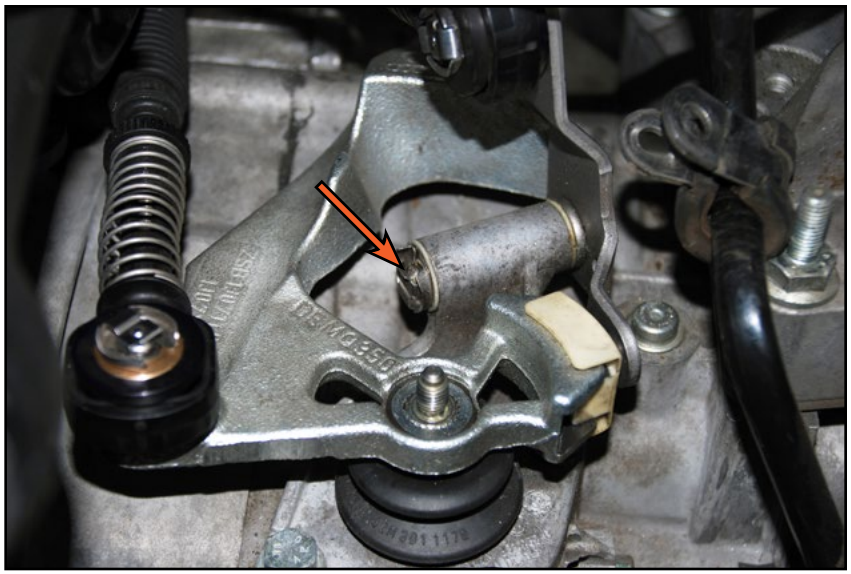
Remove the selector shaft nut (arrow).



REMOVING THE TRANSMISSION

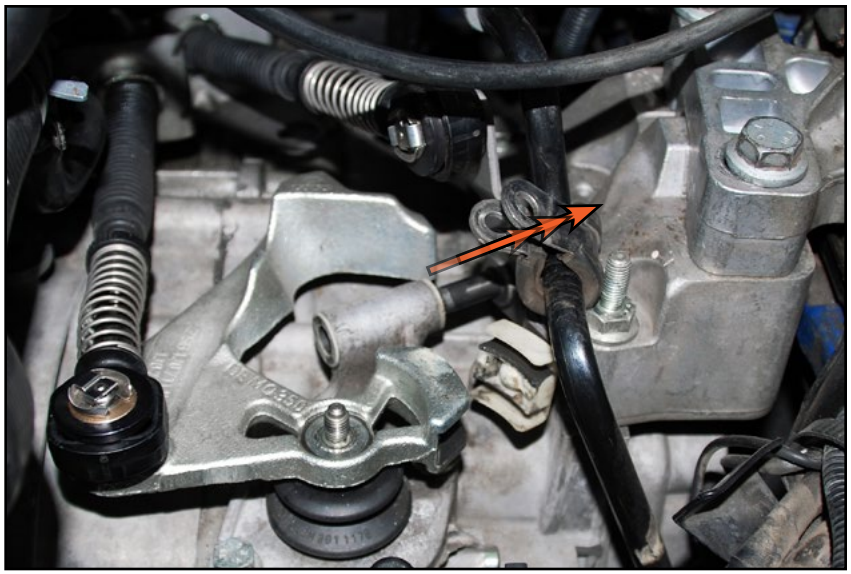
Step 11:

Remove the relay lever clip (arrow). Pull out gently on the clip tab with your thumb or finger and the clip will slide off easily.



Step 12:

Slide the relay lever away from the selector lever as shown.



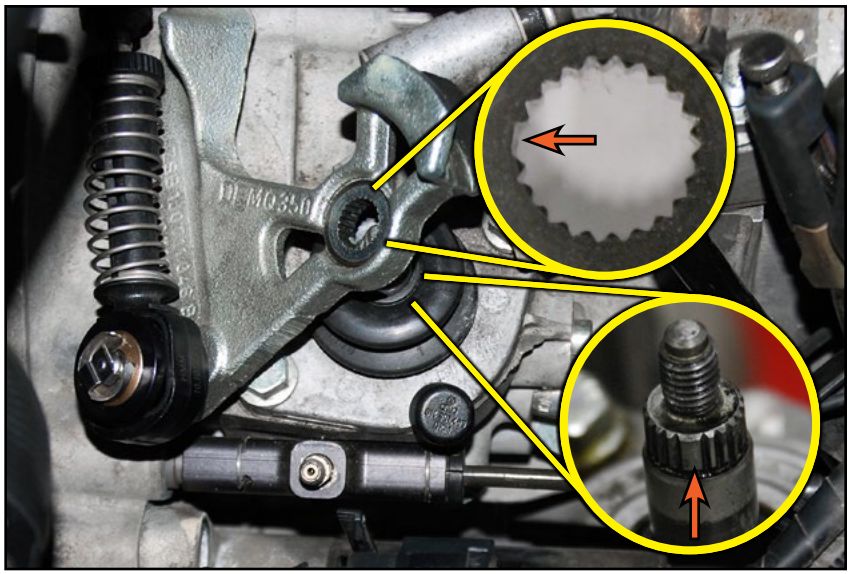
NOTE

You will not be able to completely remove the relay lever at this step because the transmission mount bracket is in the way.

REMOVING THE TRANSMISSION

Step 13:

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.



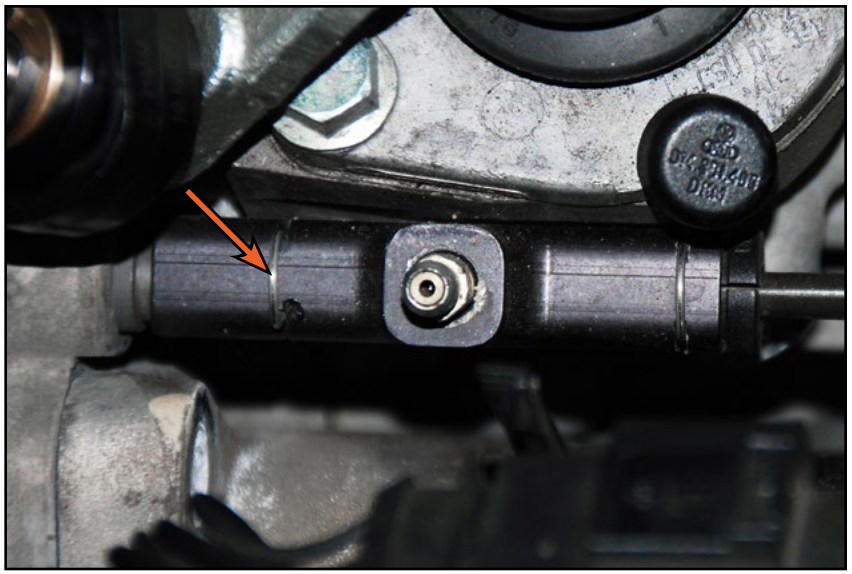
NOTE

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.

Step 14: Small Hook or Pick Tool

Remove the retaining clip (arrow) on the transmission side of the bleeder block, then gently pull the bleeder block off of the clutch slave cylinder inlet. 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.

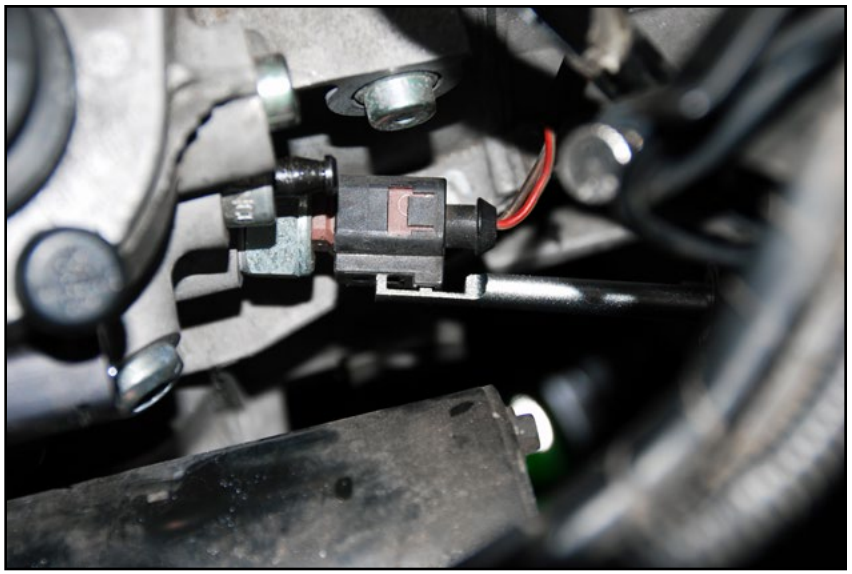


CAUTION: Brake fluid is extremely harmful and corrosive. Be sure to wear safety glasses and gloves. Clean up any spills immediately and avoid any contact with painted surfaces.

REMOVING THE TRANSMISSION

Step 15: Schwaben Connector Release Tool

Disconnect the reverse light switch (reference page 9 for location). This type of connector is referred to as a "push and pull" connector in reference to the removal method. First *push* the connector towards the switch and hold gentle pressure on it. Next hook the release tool into it as shown and *pull* back on the tool. The connector will easily slide off.



Step 16: Engine Support Bar

Now it's time to install an engine support bar to hold the engine in place while we work. Begin by positioning the legs of the engine support bar securely inside the fenders. Secure the lifting hook of the engine bar to the engine lift bracket, then tension the lifting hook until it just begins to lift the engine.

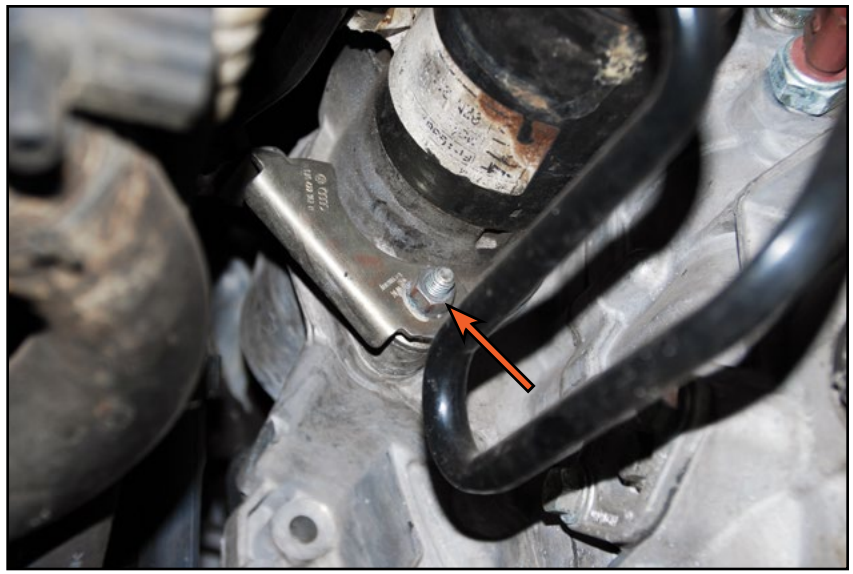
REMOVING THE TRANSMISSION

Step 17: T25 Torx

Safely raise and support the vehicle. Remove the lower insulation panel or skid plate and the LH plastic side shield (highlighted in **RED**).

Step 18: 13mm Socket & Ratchet

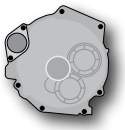
Remove the nut (arrow) that secures the power steering line bracket to the lower starter bolt end stud. Pull the power steering line bracket off of the stud and hang it safely out of the way.



REMOVING THE TRANSMISSION

Step 19: 18mm

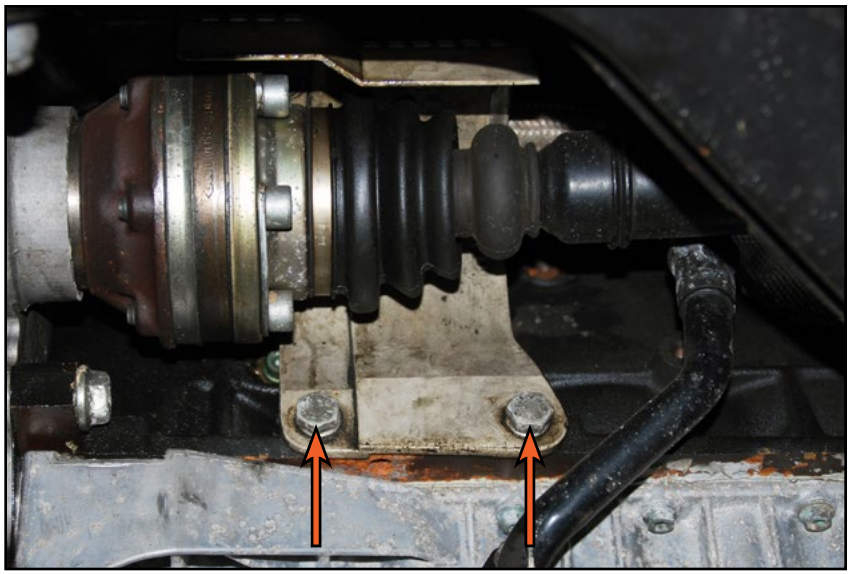
Support the starter with one hand, then loosen and remove the bolt and remove the starter from the bell housing.

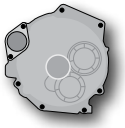


If you have decided to use our bolt storage template, thread the nut from step 18 onto this bolt and store them in location #2

Step 20: 16mm Wrench or Socket & Ratchet

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





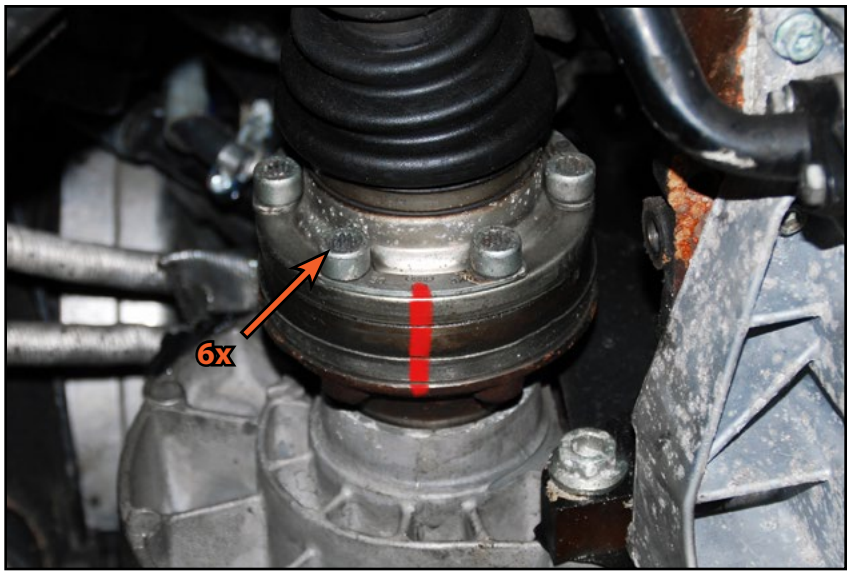
If you have decided to use our bolt storage template, store this bolt in location #3.

REMOVING THE TRANSMISSION

Step 21: M10 Triple Square Socket & Ratchet

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

Remove the inner bolts from **BOTH** axles, then tie the RH CV shaft up and out of the way using mechanics wire (not shown).



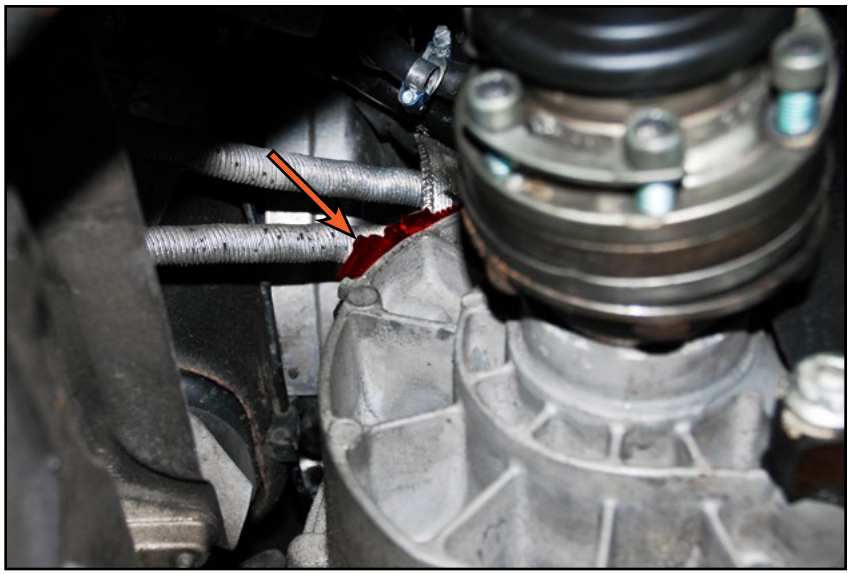
Step 22: 13mm Socket & Ratchet

In order to obtain enough clearance to remove the transmission, remove the three lower ball joint bolts on the LH side, slide the ball joint out of the control arm and swing the CV shaft out of the way as shown. Tie the RH CV shaft up and out of the way using mechanics wire (not shown).

REMOVING THE TRANSMISSION

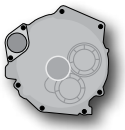
Step 23:

Disconnect the vehicle speed sensor (highlighted in **RED**). It is located on the back of the differential housing (see transmission component locations on page 9). You can access it from the RH side, just above the RH inner CV joint.

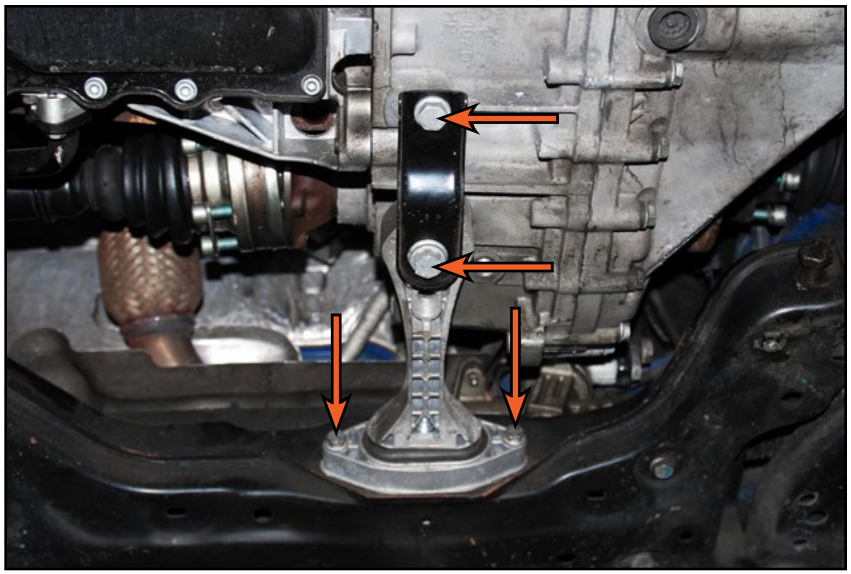


Step 24: 13mm, 16mm Socket & Ratchet

Remove the four pendulum mount bolts (arrows) and remove it from the vehicle.



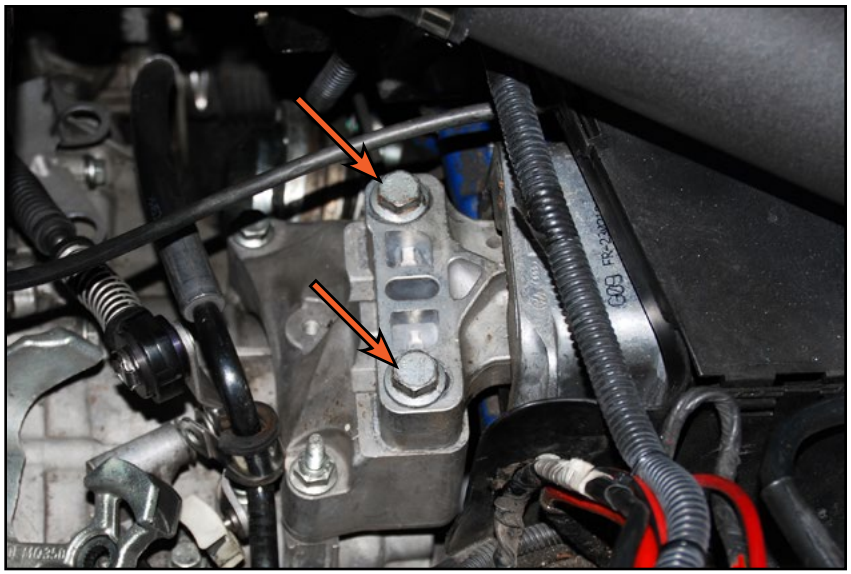
If you have decided to use our bolt storage template, store these bolts in locations #4, #5 & #6.

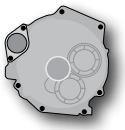


REMOVING THE TRANSMISSION

Step 25: 18mm Socket & Ratchet

Remove the two transmission mount bolts (arrows).

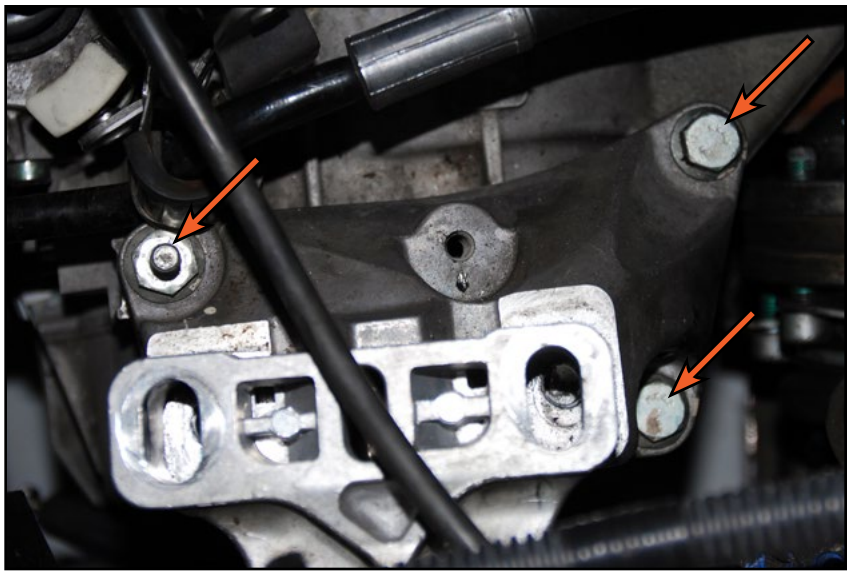


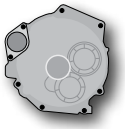


If you have decided to use our bolt storage template, store this bolt in location #7.

Step 26: 18mm Socket & Ratchet

Remove the three transmission bracket bolts (arrows) and remove the bracket.



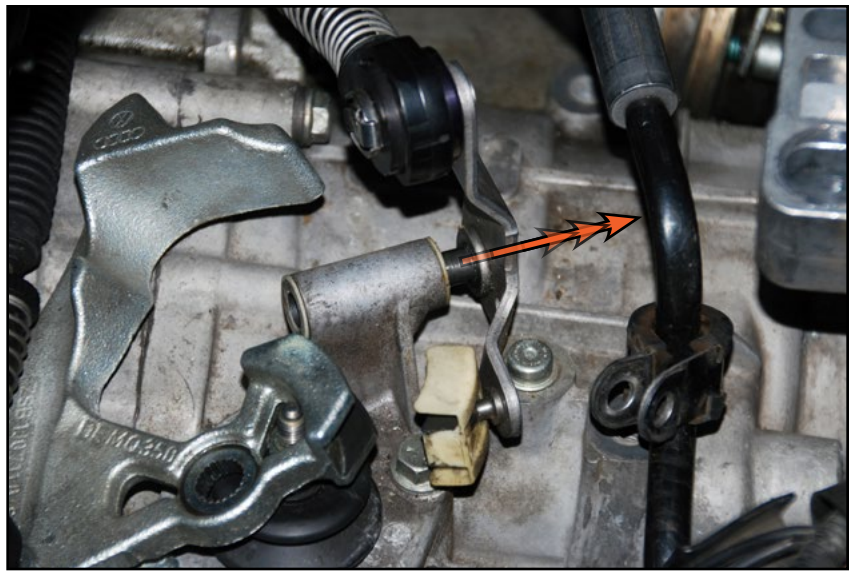


If you have decided to use our bolt storage template, store these bolts in locations #8 & #9.

REMOVING THE TRANSMISSION

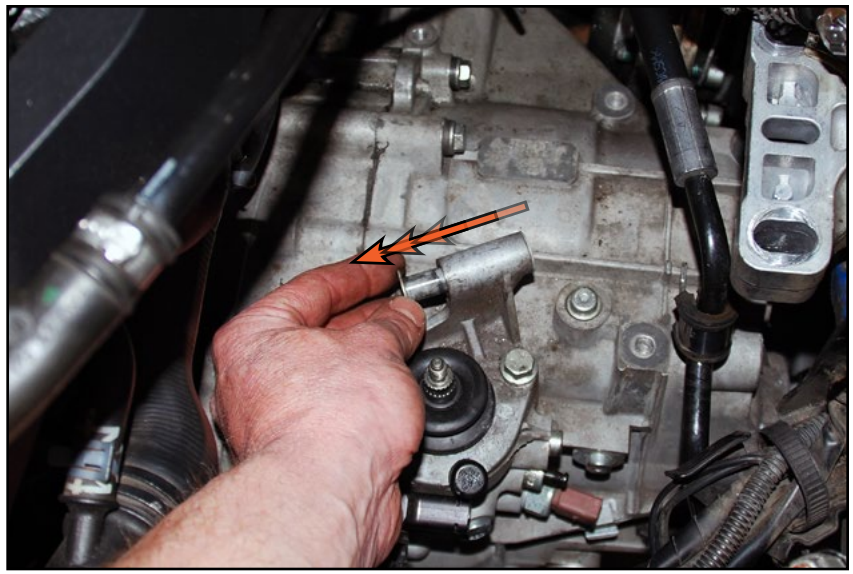
Step 27:

Slide the relay lever out as shown.



Step 28:

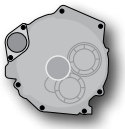
Tie the shifter cables, power steering line, and wiring harnesses up and out of the way using mechanics wire. Slide the relay lever bushings out as shown and set them aside. They tend to fall out easily and you may lose them if you leave them installed.



REMOVING THE TRANSMISSION

Step 29: 18mm Socket & Ratchet

Remove both upper bell housing bolts (arrows).



If you have decided to use our bolt storage template, store these bolts in locations #10 & #11.

Step 30: 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.

REMOVING THE TRANSMISSION

Step 31: 16mm Socket & Ratchet

Remove the front bell housing bolt (arrow).

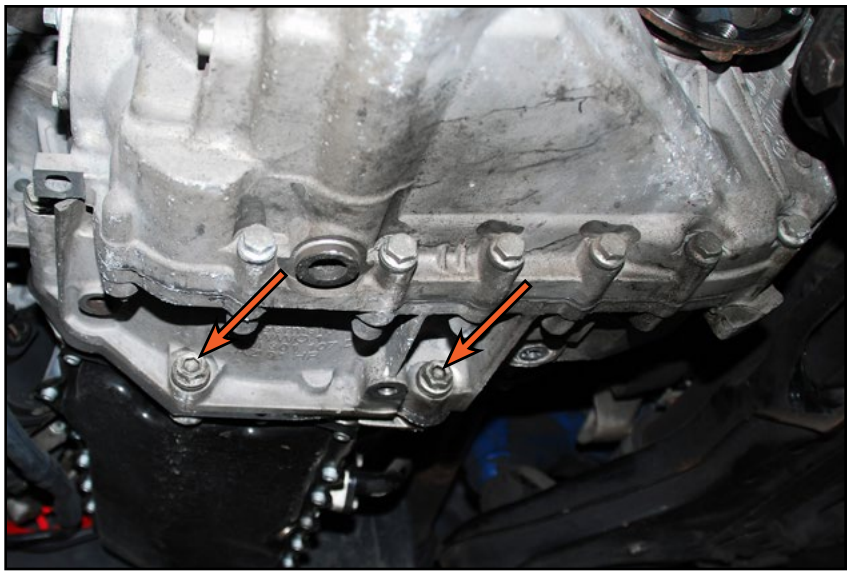
NOTE

The bell housing bolts are shown here without the transmission jack in place for clarity.

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

Step 32: 16mm Socket & Ratchet

Remove the two lower bell housing bolts (arrows).



NOTE

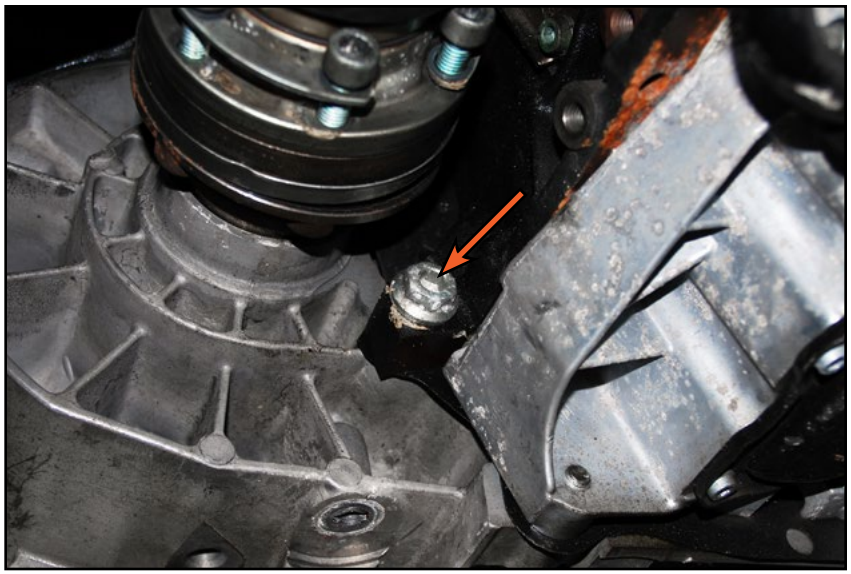
The bell housing bolts are shown here without the transmission jack in place for clarity.

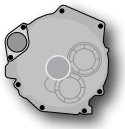
If you have decided to use our bolt storage template, store these bolts in locations #13 & #14.

REMOVING THE TRANSMISSION

Step 33: 18mm Socket & Ratchet

Remove the rear bell housing bolt (arrow) which in installed in the opposite direction of all the rest and is accessible just below the RH inner CV joint.



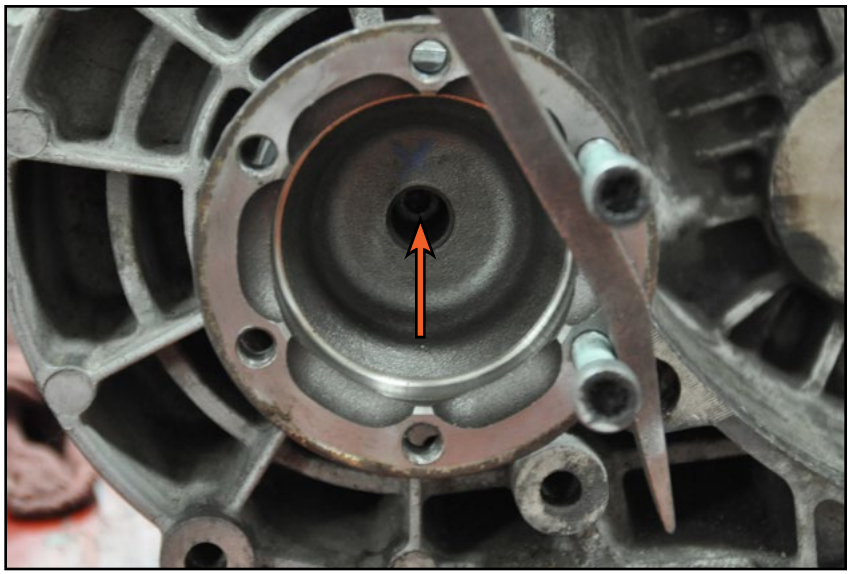


If you have decided to use our bolt storage template, store this bolt in location #15.

Step 34: Pry Bar, 6mm Allen

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.

To remove the allen bolt (arrow), 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.



NOTE

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

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

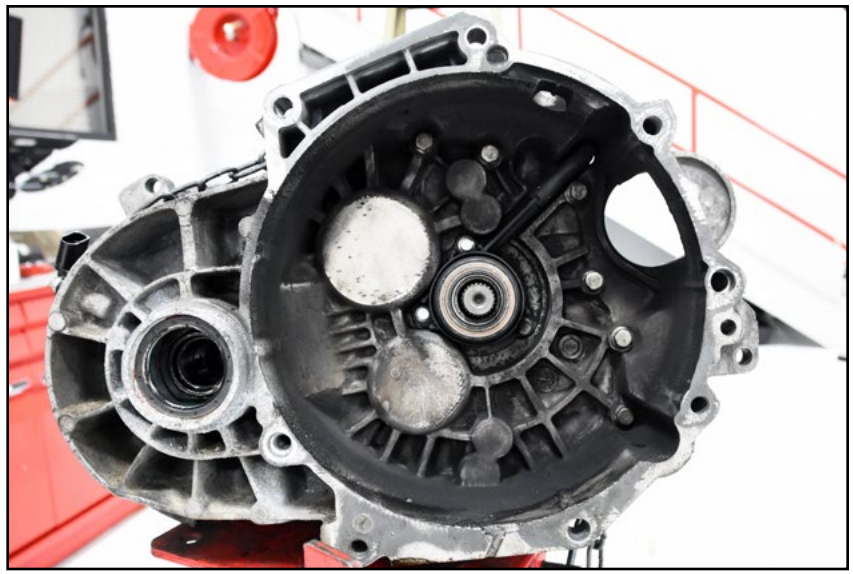
NOTE

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.

STOP

There is minimal clearance for removal and it takes a lot of patience and repositioning of the transmission to clear the body. Also be sure to have a friend help you remove the transmission, it is very heavy.

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



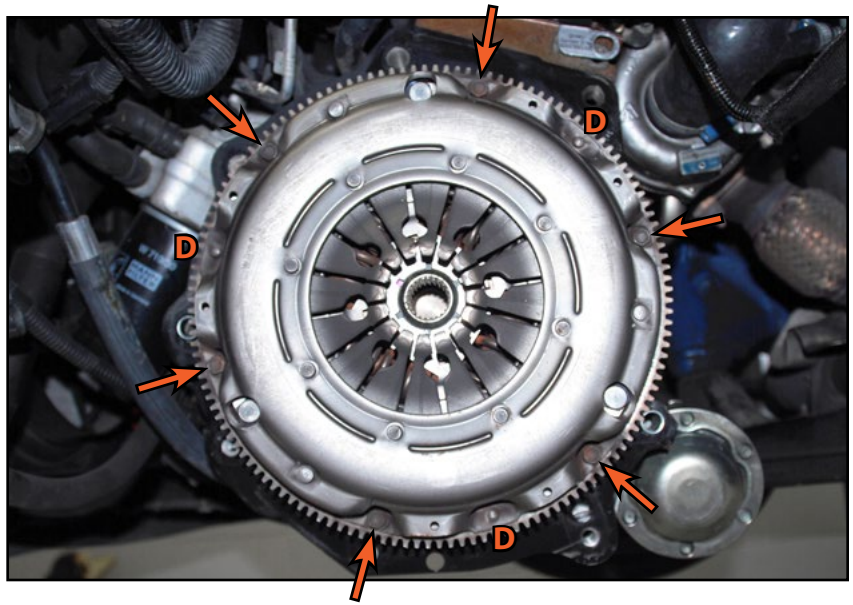
- ☐ Separate the transmission from the engine by pulling it back from the engine block.
- ☐ Rotate the differential upwards, then angle the transmission toward the front and guide it around the flywheel.
- ☐ Pull the transmission back until it completely clears the flywheel and clutch.
- ☐ Slowly lower 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

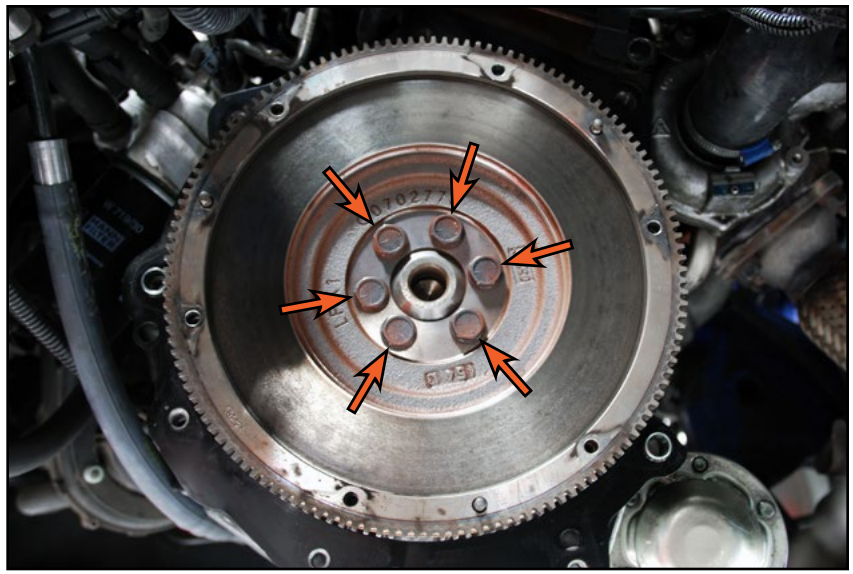
READ THIS ENTIRE STEP BEFORE PROCEEDING

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: 17mm Socket & Breaker Bar, Pry Bar

Loosen all six flywheel bolts (arrows), 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.

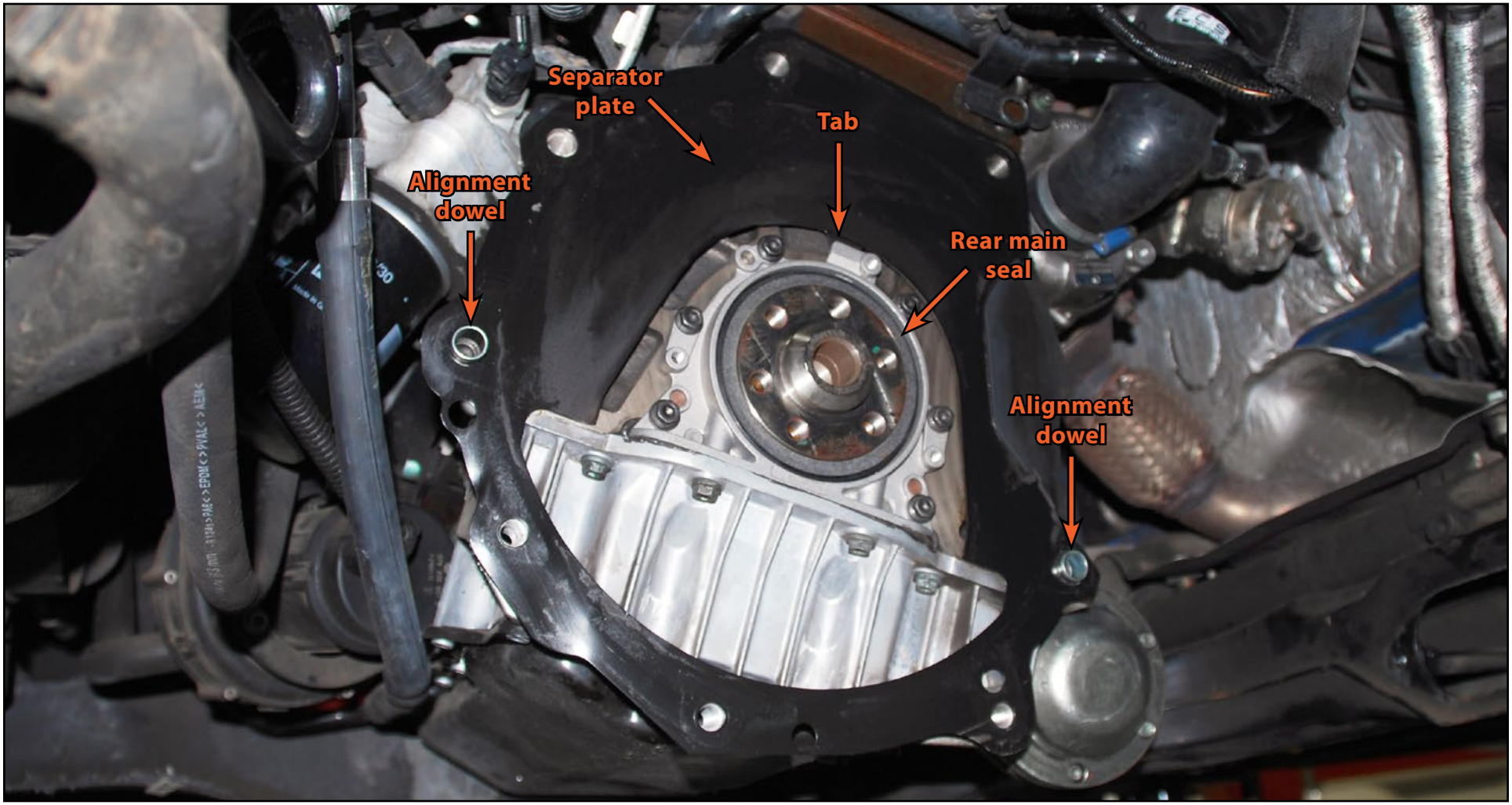


TECH TIP

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

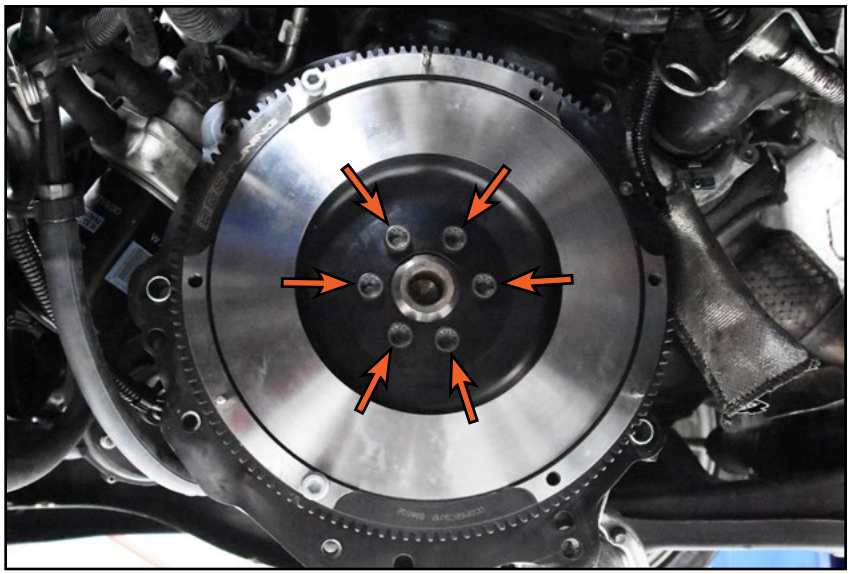
Thoroughly clean the end of the crankshaft, engine block, and separator plate. Closely inspect the rear main seal for any signs of leakage, replace it if necessary. Make sure that both alignment dowels are located in the block in the locations shown. If not, remove them from the transmission bell housing 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 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.



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

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

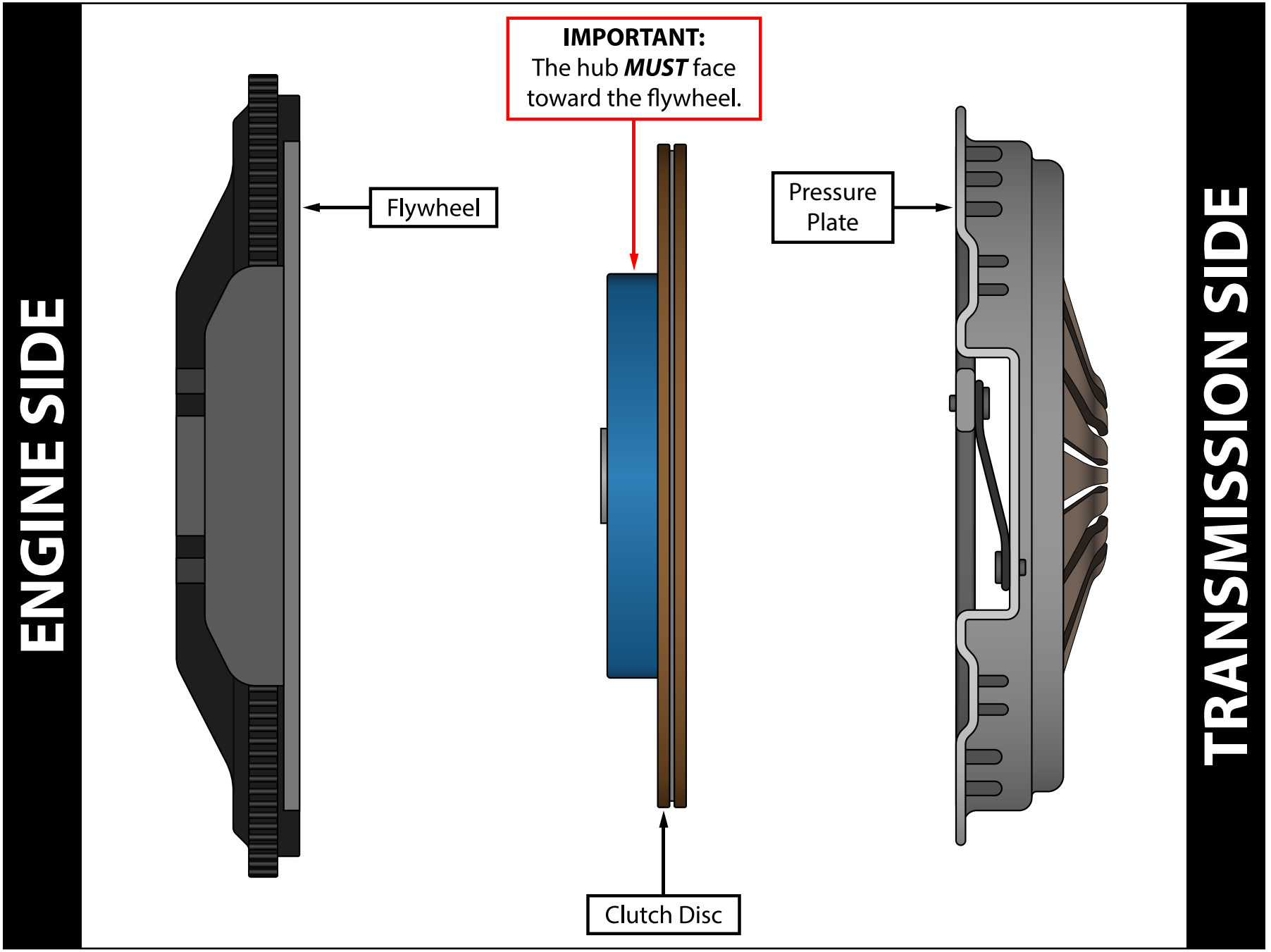
1. 30 Nm (22 Ft-lbs)
2. 60 Nm (44 Ft-lbs)
3. Additional 90°

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.



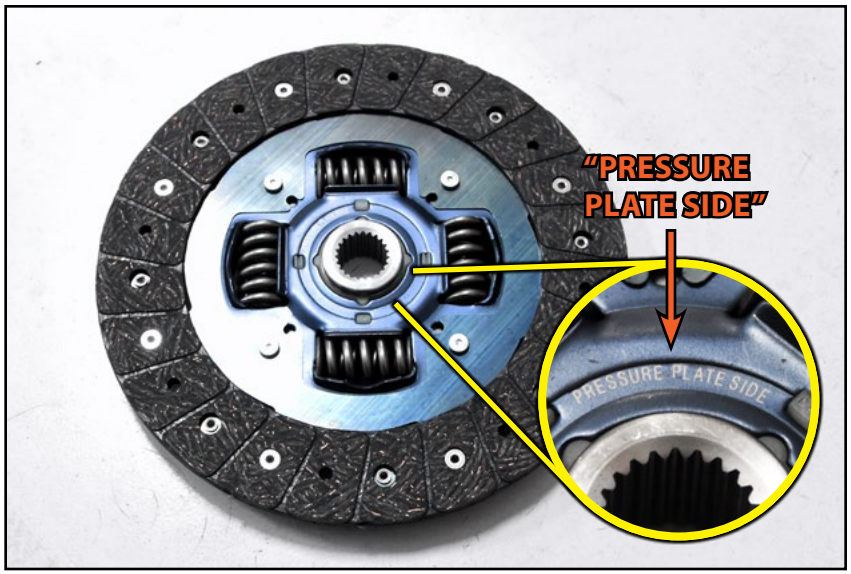
INSTALLING THE NEW FLYWHEEL AND CLUTCH

Step 3:

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

Step 4:

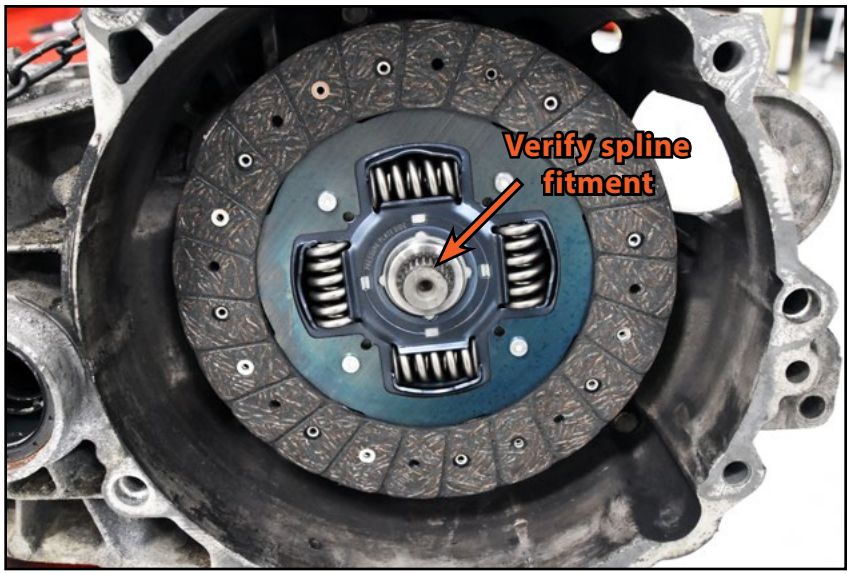
Inspect the new clutch disc. You will see “PRESSURE PLATE SIDE” etched into one side. This side needs to face **AWAY** from the engine when installed.



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.

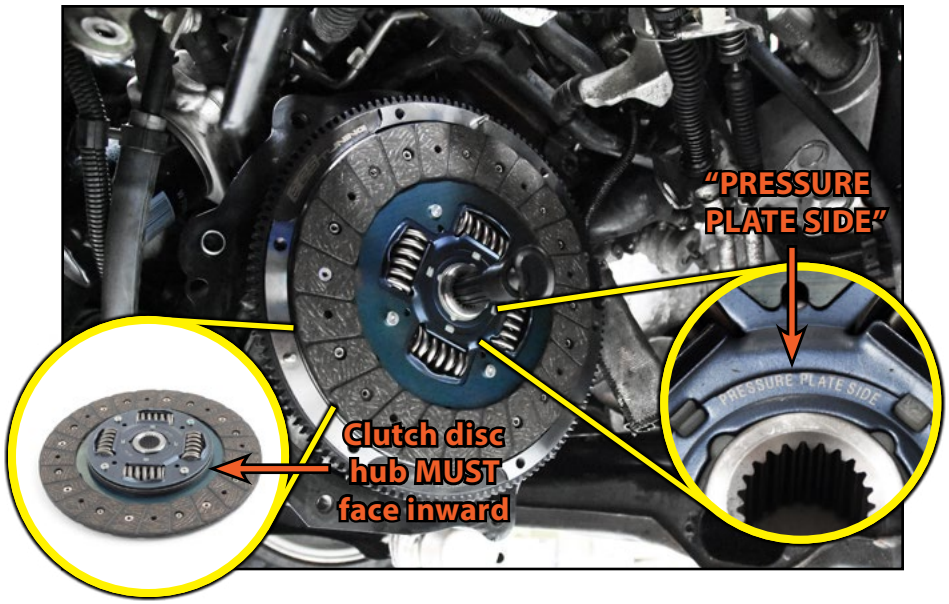


NOTE

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 provided 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:

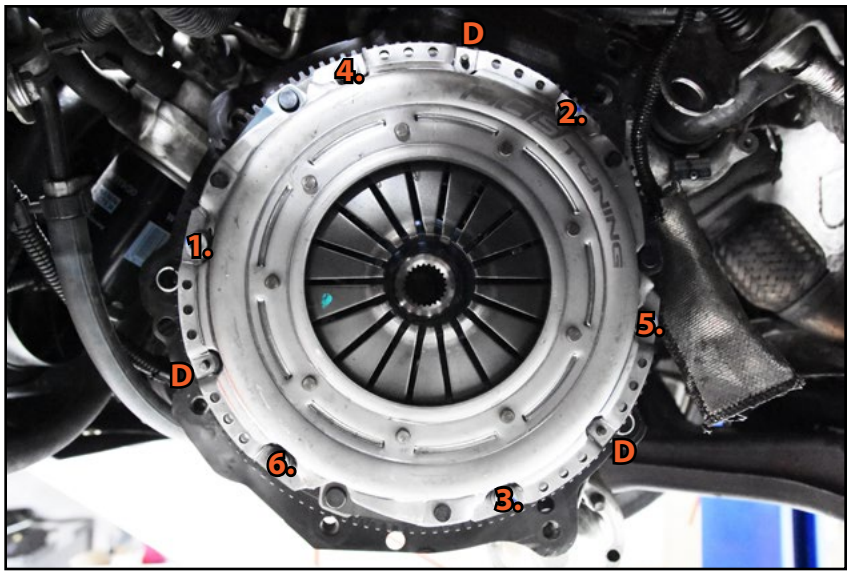
Wipe the surface of the new pressure plate using brake cleaner and a rag to remove any dirt, oil, or contaminants.

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.

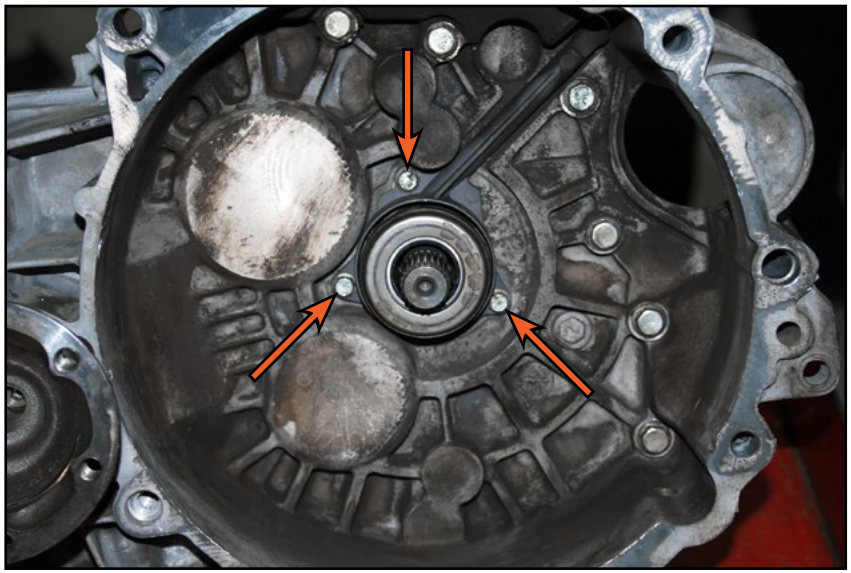
Torque the pressure plate bolts to 20 Nm (15 Ft-lbs) using the same sequence shown on the right. Remove the alignment tool after the bolts are torqued.



PREPARING THE TRANSMISSION FOR INSTALLATION

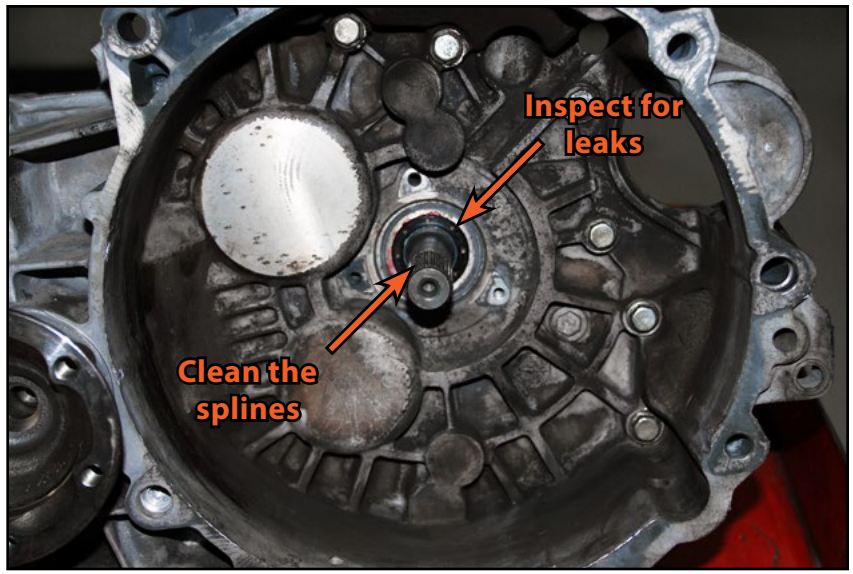
Step 1: 9mm Socket & Ratchet

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



Step 2:

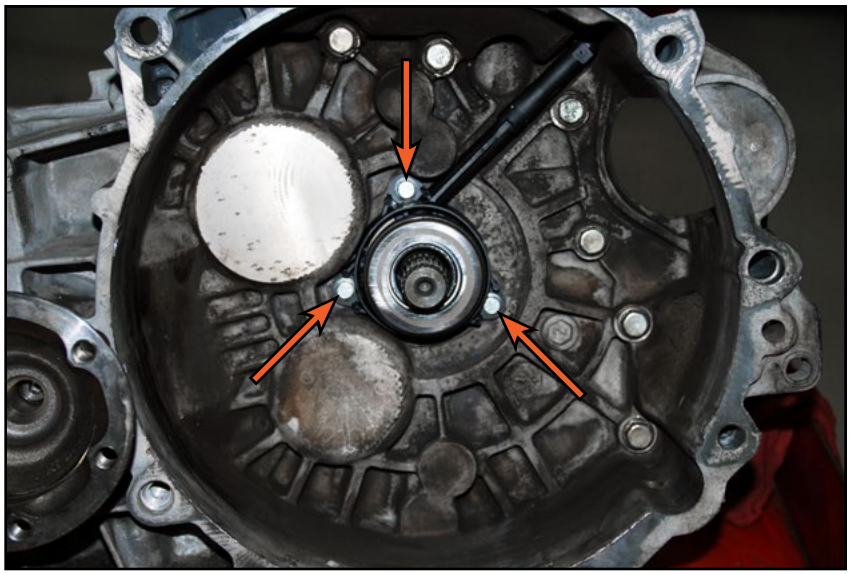
Thoroughly clean the bell housing and the splines on the input shaft. Inspect the input shaft seal for any signs of leakage, replace if necessary.



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 rear bell housing bolt until it is fully seated but do not tighten it at this time.
- [ ] 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.
- [ ] 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 60 Nm (43 Ft-lbs).
- [ ] Torque the rear bell housing bolt to 80 Nm (59 Ft-lbs).
- [ ] Align the selector lever with the selector shaft (it will only install in one position). Once installed, torque the nut to 20 Nm (15 Ft-lbs).
- [ ] Install the relay lever and retaining clip.
- [ ] Install the transmission bracket and torque the bolts to 50 Nm (37 Ft-lbs) + 90 degrees.

- [ ] Raise the transmission up to its normal installation position, then install the transmission mount bolts and torque them to 100 Nm (74 Ft-lbs) + 90 degrees.
- [ ] Slide the pendulum mount into place.
- [ ] Install the pendulum mount to transmission bolts and torque them to 40 Nm (30 Ft-lbs) + 90 degrees.
- [ ] Install the pendulum mount to subframe bolts and torque them to 20 Nm (15 Ft-lbs) + 90 degrees.
- [ ] Remove the engine support bar.
- [ ] Install the starter and torque both starter bolts 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).
- [ ] Swing the both inner CV shafts into place and reinstall the LH lower ball joint.
- [ ] Torque the ball joint bolts to 20 Nm (15 Ft-lbs) + 90 degrees.
- [ ] Install the inner CV joint bolts for both axles, then torque them to 70 Nm (51 Ft-lbs).
- [ ] Install the RH inner CV joint heat shield.
- [ ] Install the power steering line bracket onto the end stud of the lower starter bolt.
- [ ] Connect the vehicle speed sensor.
- [ ] Reinstall the plastic lower side shield.
- [ ] Reinstall the lower insulation panel or skid plate.

- [ ] Connect the reverse light switch.
- [ ] Install the clutch bleeder block.
- [ ] Install the shifter cable bracket and torque all three bracket mounts to 25 Nm (18 Ft-lbs).
- [ ] Install the negative battery cable onto the end stud of the upper bell housing bolt and tighten the nut.
- [ ] Install the wiring harness channel bracket.
- [ ] Install the wiring harness channel into the bracket.
- [ ] Install the positive battery cable onto the starter and tighten the nut.
- [ ] Install the plastic positive battery cable cap.
- [ ] Connect the starter solenoid.
- [ ] Install the power steering line clamp onto the end stud of the transmission mount bracket and tighten the nut.
- [ ] Bleed the air from the clutch hydraulic system and top off the brake fluid
  - See Pages 41 & 42 for details on how to bleed the clutch hydraulic system.
- [ ] Install the battery tray, battery and the air box/intake system.

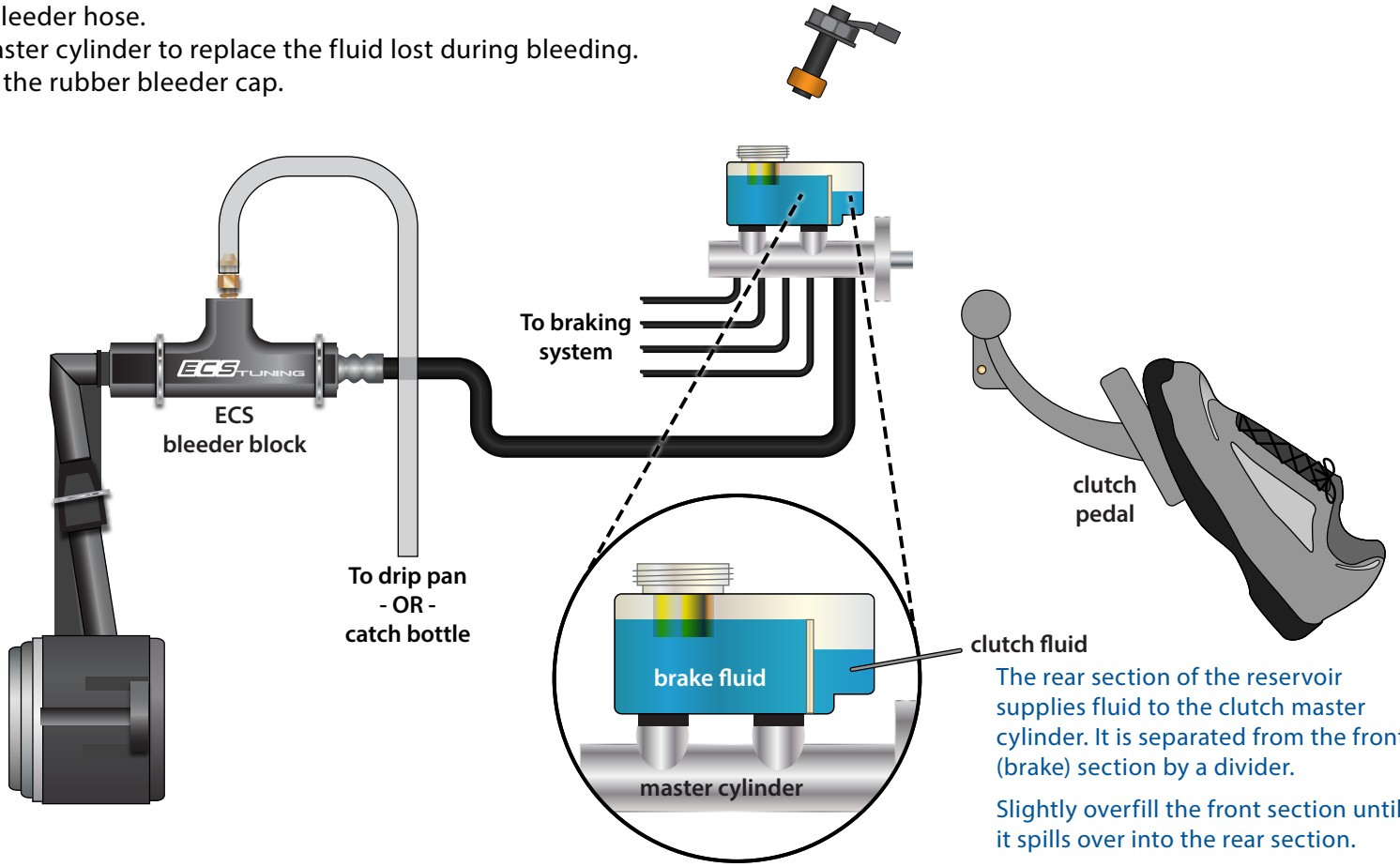
- [ ] We strongly recommend 500-1,000 miles of light throttle driving (shifting under 4,500 RPM) to break-in your new clutch and flywheel.
- [ ] Make an effort to shift through the gears as much as possible to evenly break in the clutch and flywheel.
- [ ] Try to avoid over slipping the clutch (I.E.: 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

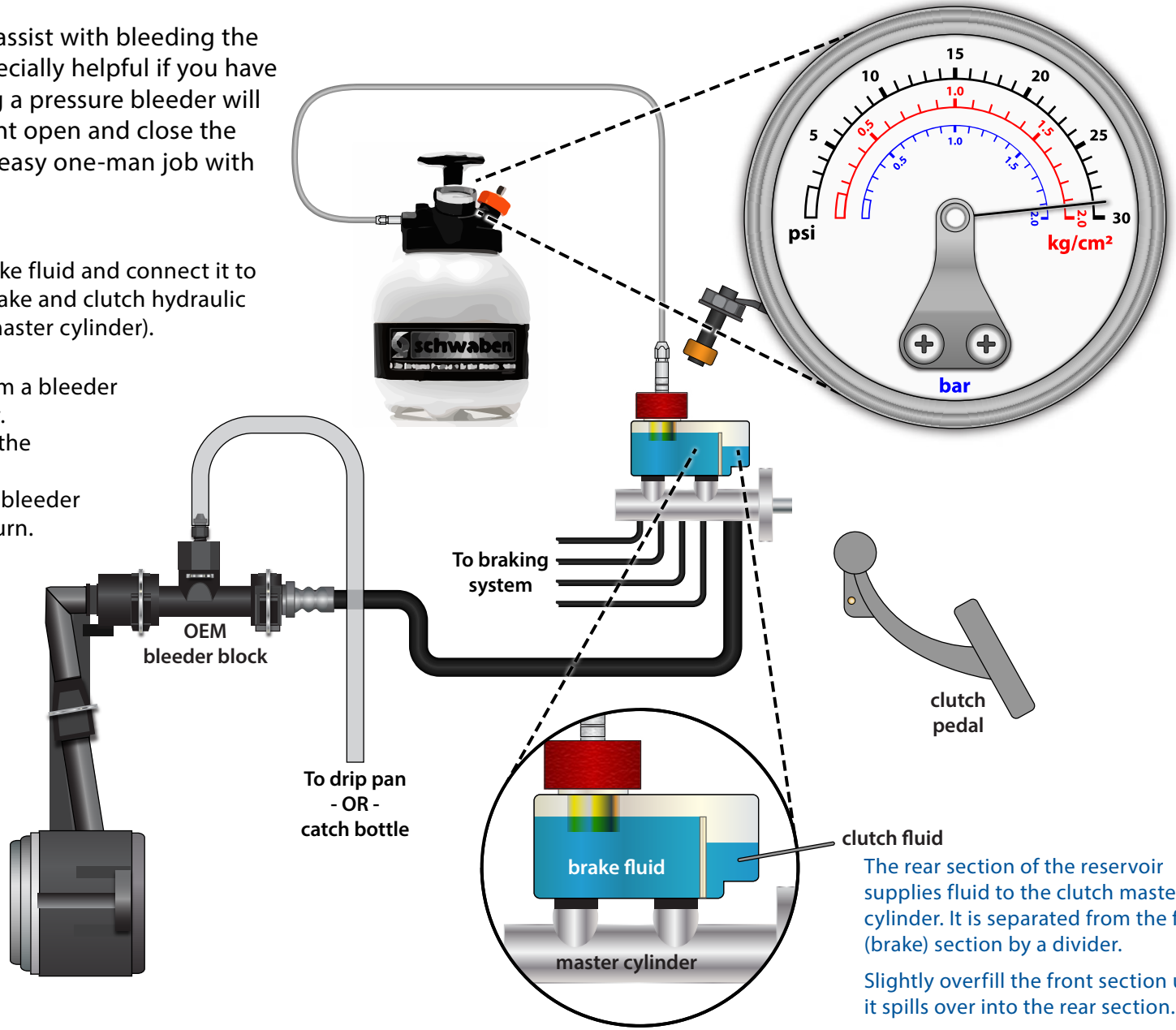
A pressure bleeder can be used to assist with bleeding the clutch hydraulic system. This is especially helpful if you have an OEM clutch bleeder block. Using a pressure bleeder will negate the need to have an assistant open and close the bleeder screw for you, so this is an easy one-man job with the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

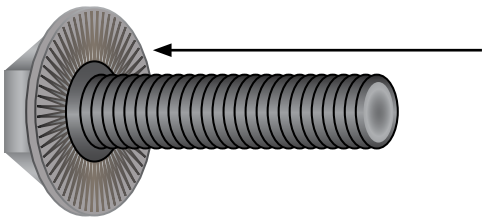
Some fasteners require lubrication on the threads -or- on the contact surface while torquing. These fasteners will be listed with the specific location and type of lubrication required. Always follow manufacturers recommendations exactly.

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.

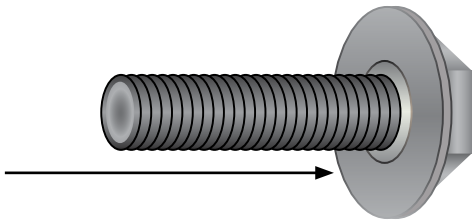
Ribbed vs. Non-Ribbed Bolts

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

Flywheel Bolts	*Stage One:* 30 Nm (22 Ft-lbs) *Stage Two:* 60 Nm (44 Ft-lbs) *Stage Three:* Tighten an additional 90 degrees	(Page 30)
Pressure Plate Bolts	20 Nm (15 Ft-lbs)	(Page 34)
Slave Cylinder Bolts	12 Nm (9 Ft-lbs)	(Page 36)
Upper Bell Housing Bolts (M12x50mm or M12x55mm)	80 Nm (59 Ft-lbs)	(Page 37)
Lower Bell Housing Bolts (M10x50mm)	40 Nm (30 Ft-lbs)	(Page 37)
Front Bell Housing Bolt (M10x105mm)	60 Nm (43 Ft-lbs)	(Page 37)
Rear Bell Housing Bolt (M12x65mm or M12x70mm)	80 Nm (59 Ft-lbs)	(Page 37)
Selector Shaft Nut	20 Nm (15 Ft-lbs)	(Page 37)
Transmission Bracket Bolts	50 Nm (37 Ft-lbs) + 90 degrees	(Page 37)
Transmission Mount Bolts	100 Nm (74 Ft-lbs)	(Page 38)
Pendulum Mount to Transmission	40 Nm (30 Ft-lbs) + 90 degrees	(Page 38)
Pendulum Mount to Subframe	20 Nm (15 Ft-lbs) + 90 degrees	(Page 38)
Starter Bolts (M12x165mm)	80 Nm (59 Ft-lbs)	(Page 38)
CV Drive Flange (if removed during transmission removal)	33 Nm (24 Ft-lbs)	(Page 38)
Ball Joint Bolts	20 Nm (15 Ft-lbs) + 90 degrees	(Page 38)
Inner CV bolts	70 Nm (51 Ft-lbs)	(Page 38)
Shifter Cable Bracket Mounts	25 Nm (18 Ft-lbs)	(Page 39)

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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