



Audi B8 S4/S5 Lightweight Flywheel Installation Instructions



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

ECS Tuning Audi B8 S4/S5 Lightweight Flywheel

The ECS Tuning Audi B8 S4/S5 Lightweight Flywheel offers the following features and benefits:

- Improved Throttle Response
- Impressive Weight Savings
- Superior Durability
- All New Components
- New Pilot Bearings

ECS Difficulty Gauge



1 - Easy

Pro - 4

2 - Moderate

Advanced - 3

Installing an ECS Tuning Lightweight Flywheel is a weekend project that will reward you with the superior performance and durability of the finest products available. Plan 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 ECS Tuning Lightweight Flywheel. We appreciate your business!

TABLE OF CONTENTS

Kit Contents.....	pg.4
Required Tools and Equipment.....	pg.5
Important Information	pg.6
Shop Supplies and Materials.....	pg.6
Installation and Safety Notes	pg.7
Bell Housing Bolt Chart	pg.8
Component Locations	pg.9
Removing the Transmission	pg.10
Removing the Clutch Module/Flywheel Assembly.....	pg.35
Servicing the Clutch Release Mechanism.....	pg.38
Assembling the new Clutch Module/Flywheel Assembly.....	pg.43
Replacing the Pilot Bearing in the Drive Plate	pg.50
Installing the Transmission	pg.54
Torque Specifications.....	pg.57

Symbols:

The following symbols may be used throughout these instructions indicating special attention:



FORK IN THE ROAD: When there are different options within any given kit, we will direct you to the proper page and step to continue.



YIELD: Pause for a moment to double check component installation before you continue. Ignoring this can cost you time later during the installation.

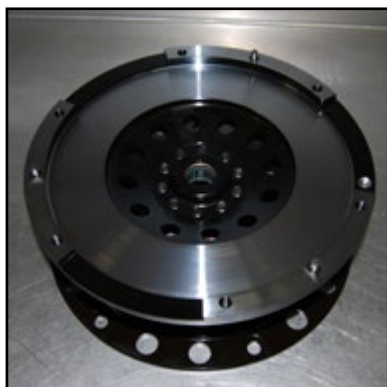


CAUTION: Pay close attention to these warnings and instructions. Difficult installation, personal injury or component damage may occur if ignored.



STOP: The upcoming steps require specific preparation and/or assistance in the interest of safety. Please read ahead in the instructions and prepare before continuing.

LIGHTWEIGHT FLYWHEEL KIT CONTENTS



Lightweight Flywheel



Pressure Plate



Clutch Disc



Guide Sleeve



Pilot Bearing



Drive Plate o-ring



Clutch Module Tool



Clamp



Clutch Alignment Tool



Throwout Bearing



Clutch Module Bolts



Pressure Plate Bolts



Drive Plate Bolts

REQUIRED TOOLS

NOTE

We recommend that you have a complete selection of tools and the necessary equipment for automotive repair. Below is a list of the specific tools that will be required to install your lightweight flywheel. Additional tools may be required for any issues that arise during installation such as rust, corrosion, or broken and stripped fasteners.

These tools are available at ecstuning.com

- 17mm Protecta-Socket (for lug nuts).....[ES#2221243](#)
- 3/8" Drive Torque Wrench[ES#2221245](#)
- 1/2" Drive Torque Wrench[ES#2221244](#)
- 14 x 1.25 Wheel Hanger[ES#2678092](#)
- Flat Blade Screwdriver(s)[ES#2225921](#)
- Torx Drivers T25 and T45[ES#11417](#)
- Standard Length Triple Square Sockets: M10, M12, M14[ES#1910125](#)
- Extended Length Triple Square Sockets: M10[ES#9011](#)
- 1/4" Drive Sockets: 10mm Deep or Shallow
- 1/4" Drive Ratchet, Extensions and U-Joint
- 3/8" Drive Sockets: 18mm and 16mm 12 Point Shallow, 13mm Deep or Shallow
- 3/8" Drive Ratchet, Extensions and U-joint
- 1/2" Drive Sockets: 18mm 12 Point, 16mm 12 point
- 1/2" Drive Ratchet and Breaker Bar
- Allen Sockets: 5mm, 6mm, 6mm Extended Ball End, 17mm
- Needle Nose Pliers
- Side Cutters
- Combination Wrenches: 12mm, 13mm, 16mm
- Pry Bar
- 1/2" Drive Impact
- Large Channel Locks
- Transmission Jack
- Engine Support Bar
- Exhaust Hanger Removal Tool
- Paint Marker

IMPORTANT INFORMATION

- This clutch and flywheel design is considerably different than what is generally recognized as a “traditional” design. This new assembly is referred to as a “clutch module” and also a “clutch module/flywheel assembly”.
- Due to the different stages of clutches that are offered with this flywheel, the actual appearance of your kit contents may differ.



The aluminum bell housing and starter bolts can only be used twice. Please reference page eight for additional bolt information.

- A note about torque to yield or “stretch” bolts: Many bolts will have a torque specification listed in the format - xx Nm+xx degrees (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 to torque **all of them first** to the Nm or Ft-lb specification, then tighten each one the additional specified number of degrees. To prevent a costly mistake it is important to mark each bolt with paint after tightening it the final specified number of degrees.

SHOP SUPPLIES AND MATERIALS

- G000100 Clutch Spline Lubricant Available at ecstuning.com..... [ES#465342](#)
- G000150 Paste Available at ecstuning.com..... [ES#2662951](#)
- G052128A1 Radial Seal Grease..... Available at ecstuning.com..... [ES#465368](#)
- Blue Threadlocker Available at ecstuning.com..... [ES#2167334](#)
- Hand Cleaner/Degreaser..... Available at ecstuning.com..... [ES#2167336](#)
- Absorbent Mats Available at ecstuning.com..... [ES#2626365](#)
- Aerosol Brake Parts Cleaner Available at your local auto parts store
- Nylon Cable Ties Available at your local auto parts store
- Shop Rags Available at your local auto parts store

INSTALLATION NOTES

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

GENERAL PREPARATION AND SAFETY INFORMATION

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

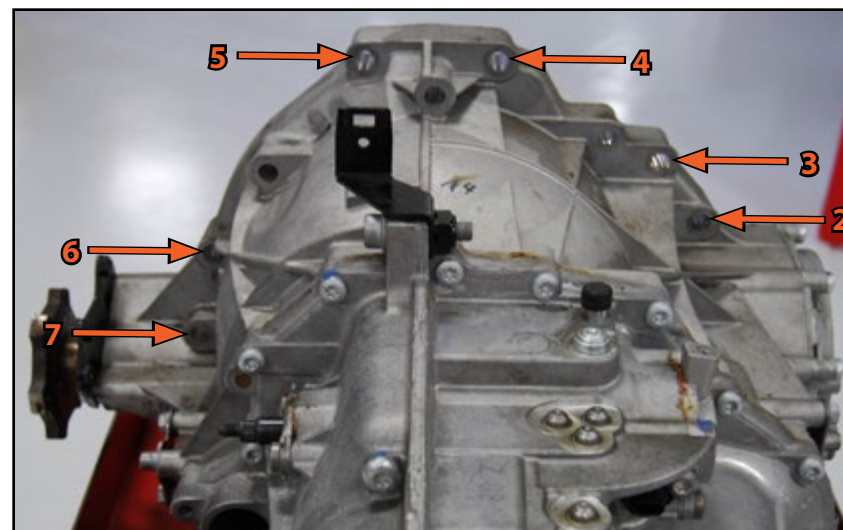
- Park your car in a safe, well lit, level area.
- Shut the engine off and remove the key from the ignition switch.
- Make sure any remote start devices are properly disabled.
- **ALWAYS** wear safety glasses.
- Make sure the parking brake is applied until the vehicle is safely lifted and supported.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



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

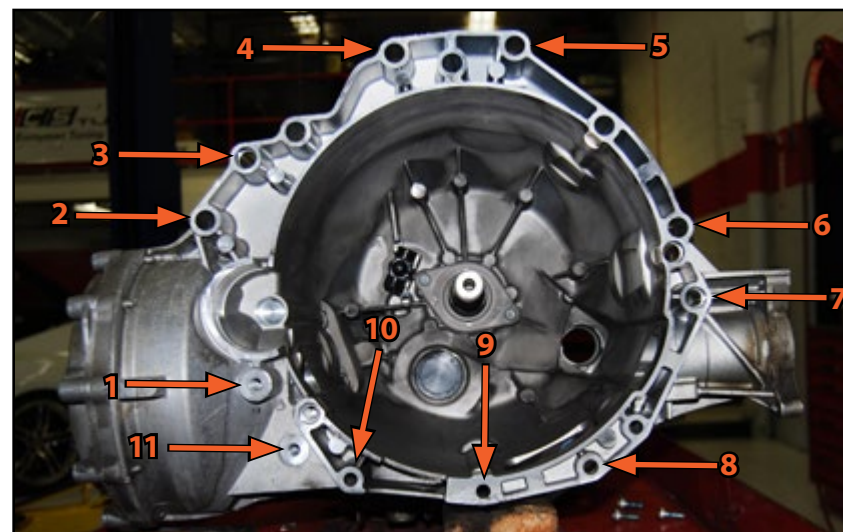
BELL HOUSING BOLT CHART

1. Lower Starter Bolt.....	M10 x 50
2. Bell Housing/Upper Starter Bolt	M12 x 100
3. Bell Housing Bolt.....	M12 x 100
4. Bell Housing Bolt.....	M12 x 100
5. Bell Housing Bolt.....	M12 x 100
6. Bell Housing Bolt.....	M12 x 100
7. Bell Housing Bolt	M12 x 125
8. Bell Housing Bolt	M10 x 60
9. Bell Housing Bolt.....	M10 x 95
10. Bell Housing Bolt.....	M10 x 95
11. Bell Housing Bolt	M10 x 60



BELL HOUSING BOLT REQUIREMENTS

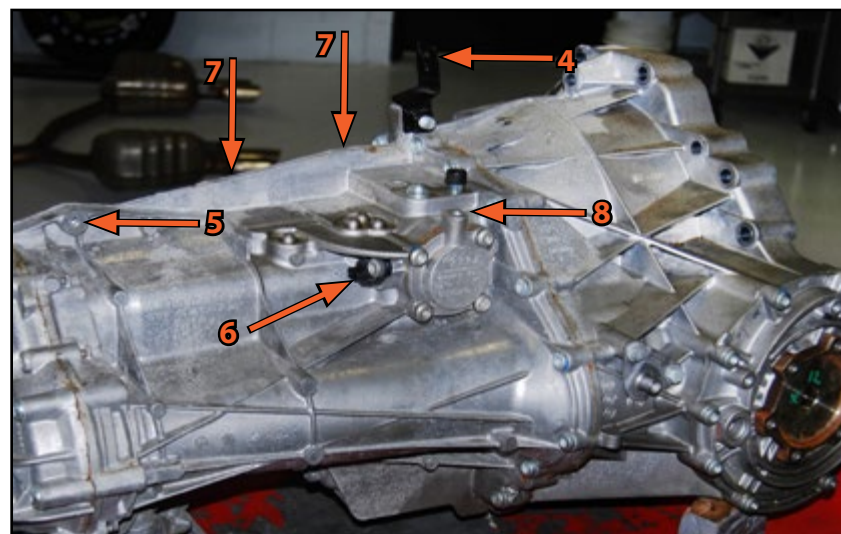
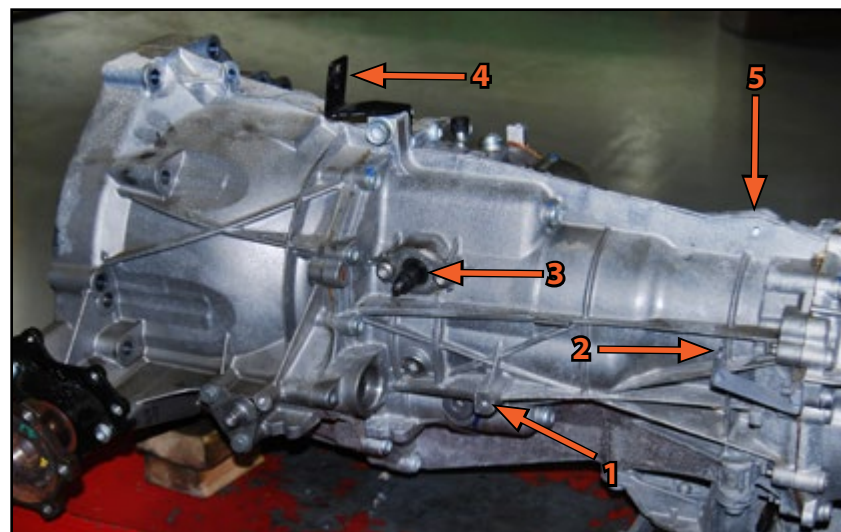
- The aluminum bell housing and starter bolts can only be used twice, then they must be replaced. Make sure you replace the bell housing bolts if required.
- If the aluminum bolts on your bell housing have an "X" on them, this means they have already been used a second time and must be replaced. If they do not have a marking on them, place an "X" on the head of each bolt to indicate that this is their second use.
- The steel lower starter bolt can be re-used any number of times.



COMPONENT LOCATIONS

Many of the items that you will need to remove are difficult to see and you will need to locate and remove some of them by “feel”. Use these charts as a reference before you begin and as you proceed with the installation. Be sure you do not forget to disconnect any of these items before lowering the transmission or they will be damaged.

1. Slave Cylinder Mounting Bolt
2. Mounting Grommet for Slave Cylinder Hydraulic Line
3. Selector Shaft
4. Heater Control Valve Mounting Bracket
5. Mounting Bolt for Shifter Push Rod
6. Gear Detector Switch
7. The wiring harness for the Gear Detector Switch is clipped on the top rib of the transmission at these two points.
8. Mounting Bolt for Shifter Connecting Rod



REMOVING THE TRANSMISSION

Step 1:

Using a 10mm socket, disconnect the negative battery terminal. (The battery is located in the trunk underneath the spare tire). Isolate the battery terminal so it does not accidentally swing over and contact the negative battery post.

CAUTION

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



Step 2:

Remove the two upper engine covers (arrows) by gripping them and pulling up to release the retainers.

NOTE

It is a good idea to place fender covers over both fenders and the front fascia of your car to protect the finish.



REMOVING THE TRANSMISSION

Step 3:

If you have a Carbon Fiber or aftermarket intake system, we recommend removing it at this time. These intake tubes are generally more rigid than the OE intake tube. The movement of the engine during this procedure could damage one of these systems. If you have an OE intake tube you do not need to remove it and you can proceed with step four.



Step 4:

Locate two diagonally opposing lift points on the top of the engine (arrows).



REMOVING THE TRANSMISSION

Step 5:

Install an engine support bar in place, securing the chains to the engine lift points located in step four. Tighten the screw on the engine bar just until the chains are taught. It is not necessary to lift the engine, the support bar is used to prevent the engine from rocking forward or back when the transmission is removed.

NOTE

Be careful not to place the legs of the engine bar on the lips of the fenders. They are thin and will bend. Place the legs just inside the lips on the main body structure (arrows).



Step 6:

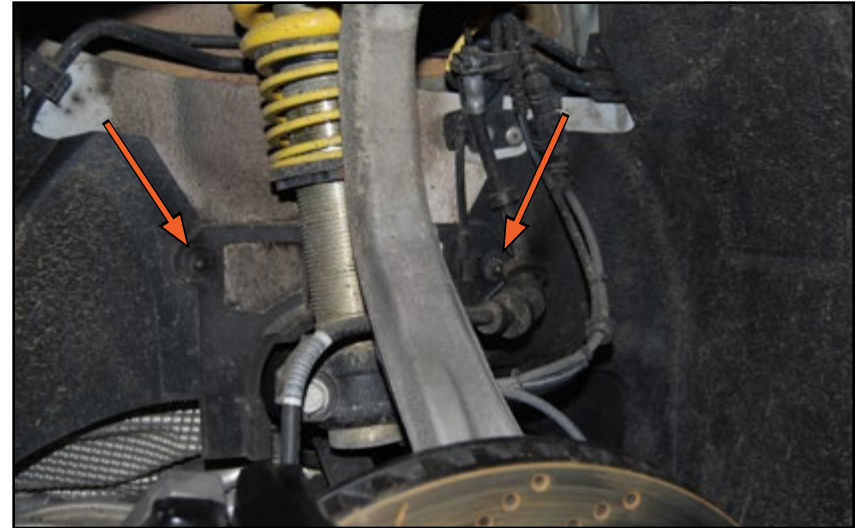
Place the transmission in neutral, raise and support the vehicle, and remove the front wheels. We recommend the use of a 17mm protecta socket to protect the finish on the wheels.



REMOVING THE TRANSMISSION

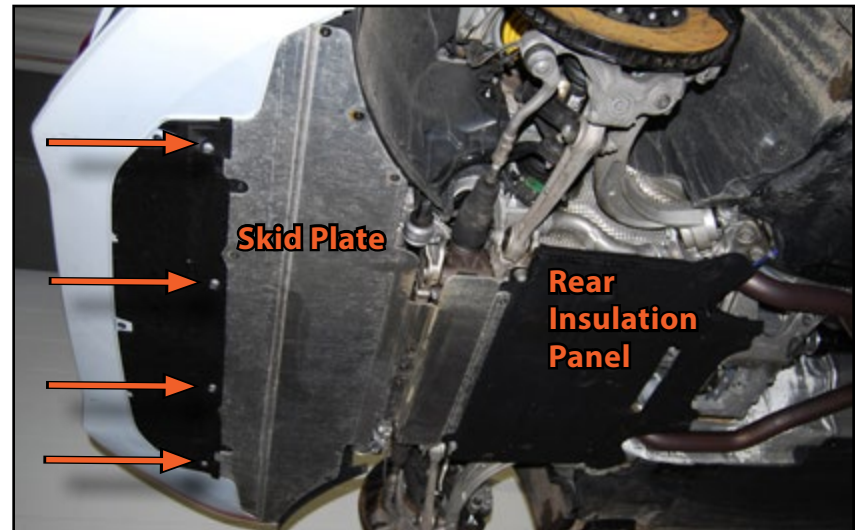
Step 7:

Using a 10mm socket, remove the two plastic nuts (arrows) securing the insulating guards around each front CV shaft. Pull the guards forward to clear the studs, then rotate them towards the rear of the vehicle and remove them.



Step 8:

Remove the lower insulation panels from underneath the transmission and engine. This may differ from car to car depending on whether or not you have factory insulation panels or a skid plate installed. You will need a flat blade screwdriver, a T25 torx driver, and a 5mm allen, depending on your application. Loosening the four lower radiator shroud screws (arrows) using a T25 Torx driver will make the front insulation panel or skid plate easier to remove.



TECH TIP

For an in depth installation guide and fastener location chart for B8 skid plates, refer to our ECS Street Shield Skid Plates, [ES#2771379](#) or [ES#2771912](#)

REMOVING THE TRANSMISSION

Step 9:

Disconnect the main cable connector from the electronic power steering rack. First slide the red locking tab back then push in on the retaining tab to release the connector.

NOTE

If your B8 has traditional hydraulic power steering, you will need to remove the power steering line from the subframe cross brace and remove lines from the steering rack as necessary for clearance.



Step 10:

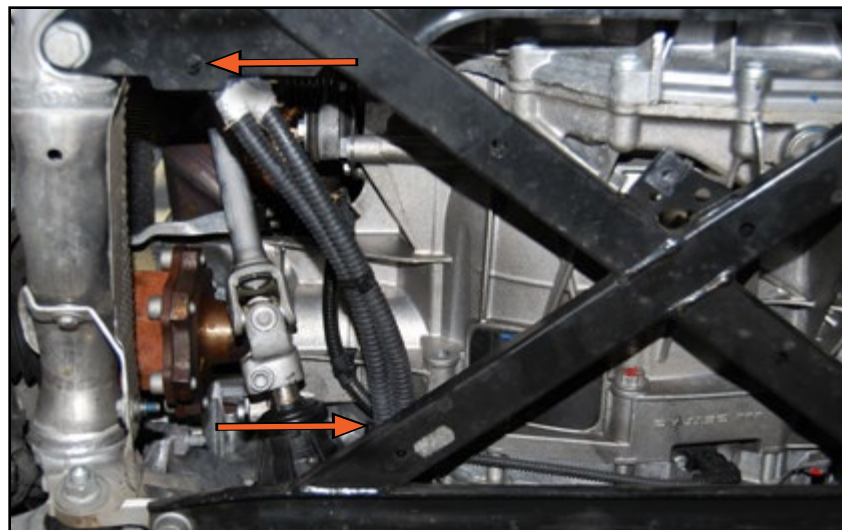
Disconnect the brown center connector from the electronic power steering rack. Use the same method of sliding the red locking tab back then pushing in on the retaining tab to release the connector.



REMOVING THE TRANSMISSION

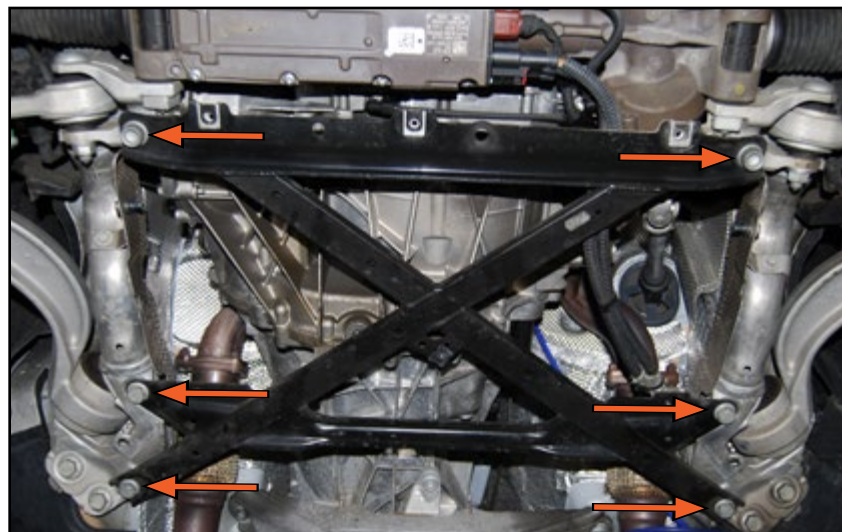
Step 11:

Using needle nose pliers, carefully remove the two push in wiring harness retainers from the subframe cross brace (arrows).



Step 12:

Remove the subframe cross brace by removing the six bolts that hold it in place (arrows). Use an 18mm socket for the 4 hex head bolts and an M14 triple square for the two forward bolts.



REMOVING THE TRANSMISSION

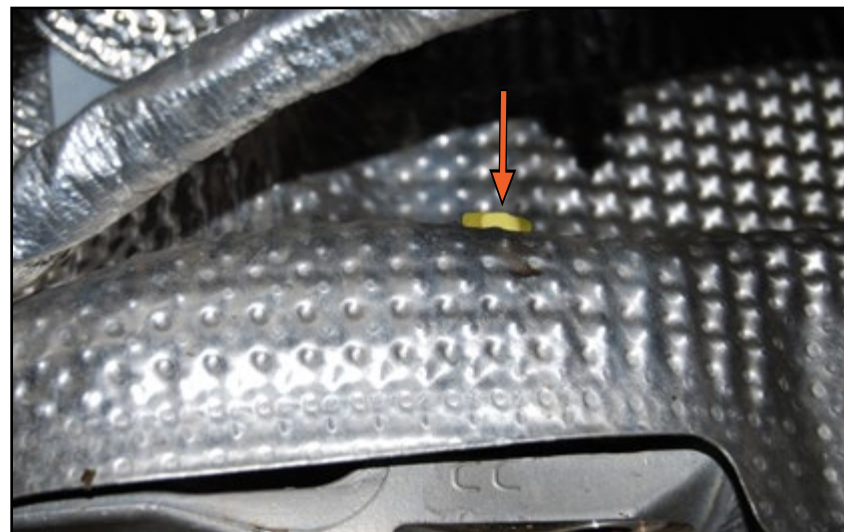
Step 13:

Use a 10mm socket to remove the two M6 bolts from each subframe side shield. The LH shield is shown, but both sides are very similar.



Step 14:

Using a 13mm wrench, remove the M8 nut holding each subframe side shield to the subframe on the inside, just above the location of the cross brace hex head bolts. Remove the side shields from the car.



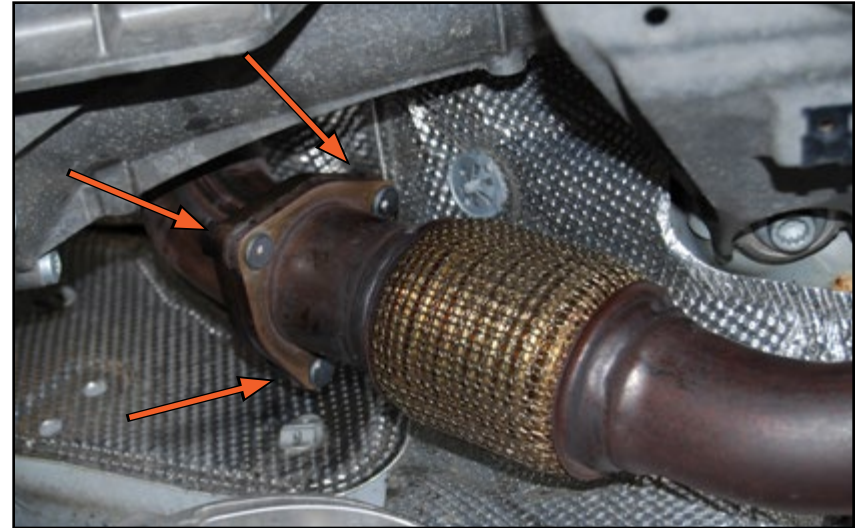
REMOVING THE TRANSMISSION

Step 15:

Using a 12mm socket or wrench, remove two of the nuts on each exhaust downpipe flange. Loosen and remove the third nut on each flange, then thread it a few turns back onto the stud to support the weight of the exhaust pipe until it is ready to be removed.

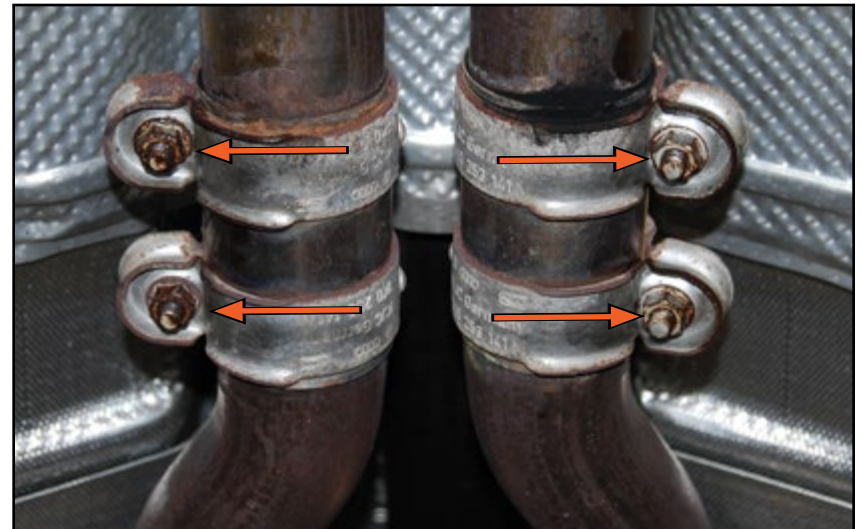
TECH TIP

You may need to use a short or "stubby" wrench to remove the nuts that are located closest to the underside of the car.



Step 16:

Using a 13mm socket, loosen the exhaust sleeves (2 nuts on each side) between the front and rear exhaust sections.



REMOVING THE TRANSMISSION

Step 17:

While supporting each exhaust pipe, slide the sleeve to the rear, remove the last nut on the downpipe flange, and remove each pipe from the car.

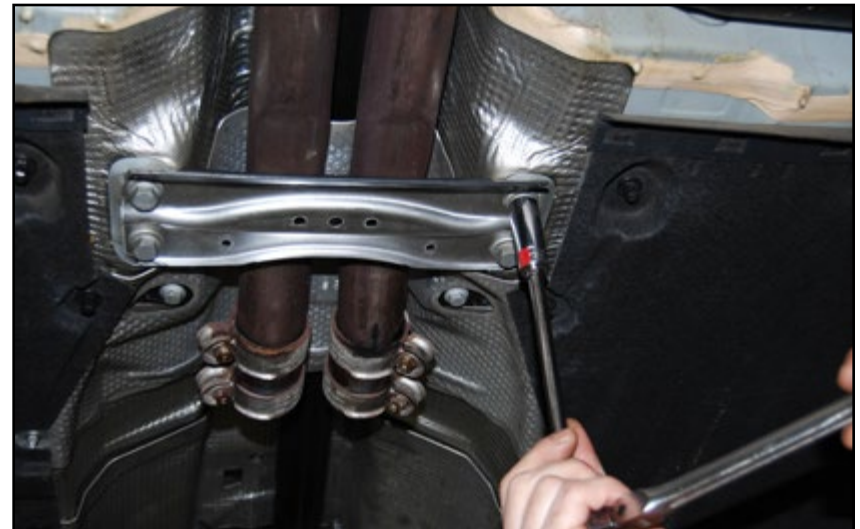
CAUTION

Do not let the weight of the exhaust hang free without supporting it or damage can occur to the flexible section of the pipe.



Step 18:

Using a 16mm socket, unbolt and remove the rear crossmember.



NOTE

Steps 18 through 24 are required for a flanged propeller shaft connection at the transmission. If your vehicle has a bolted connection, you can unbolt the front propeller shaft joint, secure it up, and skip to step 25. You may also reference our B8A4 Lightweight flywheel ([ES#2771111](#)) installation PDF which contains detailed instructions for a bolted propeller shaft connection at the transmission.

REMOVING THE TRANSMISSION

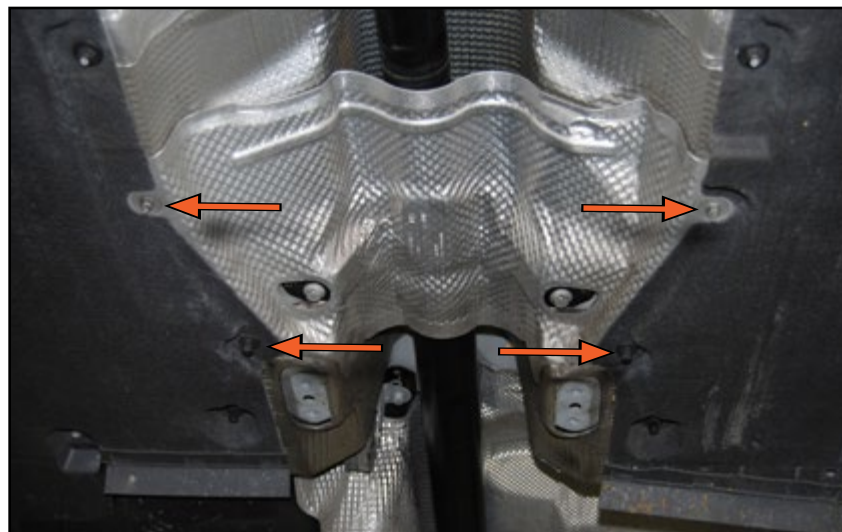
Step 19:

Remove the exhaust system from the car. Be careful, the exhaust system is very heavy. We recommend getting help to lower the system. To do this, simply remove one hanger at each rear muffler and two hangers at the center muffler. Using an exhaust hanger removal tool as we are here makes this much easier. If you do not have a hanger removal tool, you can use a pry bar to push the hangers off.



Step 20:

Remove the center aluminum heat shield by first removing the two 10mm speed nuts, then unbolt the two 10mm plastic nuts on the underbody insulation (these will stay trapped in place on the insulation). Pull the insulation down slightly out of the way and remove the shield.



REMOVING THE TRANSMISSION

Step 21:

Using side cutters, cut the clamp off the boot at the front propeller shaft connection.

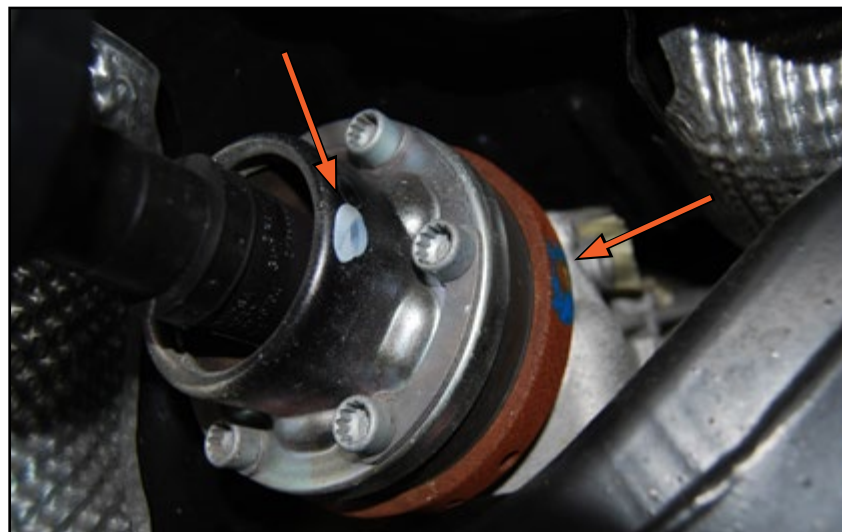
NOTE

If your vehicle is equipped with a heat shield over the front propeller shaft joint, you will need to remove it to access this clamp.



Step 22:

Check for reference/alignment marks between the rear propeller shaft joint and the rear drive flange. If there are no marks present, use a paint marker to mark the joint and the flange.



REMOVING THE TRANSMISSION

Step 23:

Using an M10 triple square socket, remove the six rear propeller shaft bolts. An impact wrench will save you a lot of time and effort here, but if you do not have one, an effective method to keep the propeller shaft from turning is to grip the outside of the triple square bolts with a large pair of channel lock pliers and loosen them with a breaker bar.

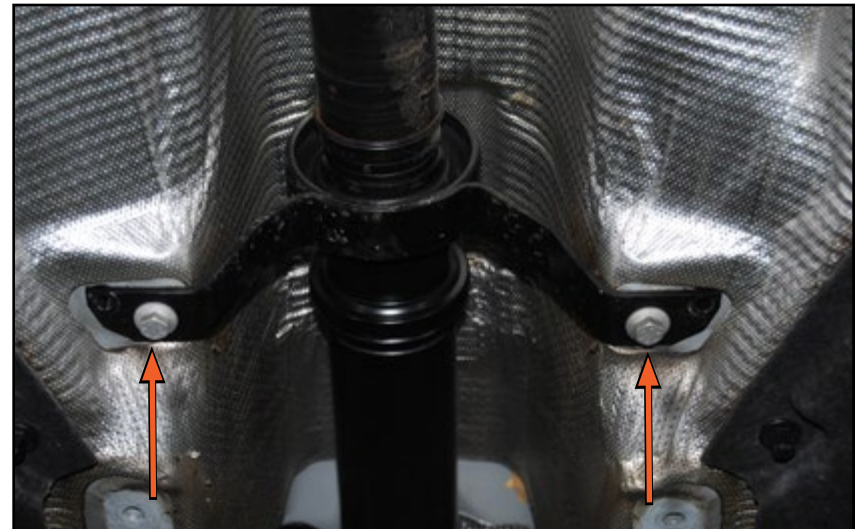
CAUTION

Support the rear of the propeller shaft as necessary to keep it from falling down. Do not allow the propeller shaft to bend excessively at the center bearing or it could be damaged.



Step 24:

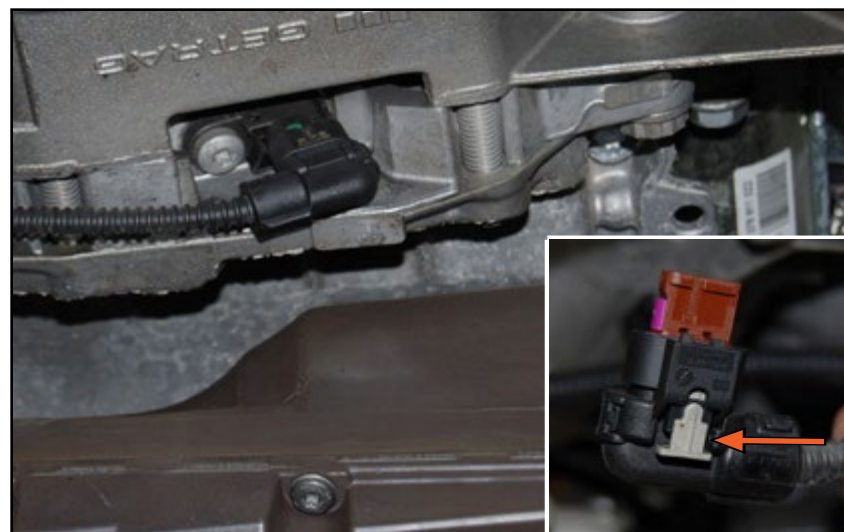
Using a 13mm socket, remove the two center propeller shaft support bracket bolts. Lower the propeller shaft in the rear keeping it as straight as possible. Pull it rearwards to slide it off of the transmission output shaft and remove it from the vehicle.



REMOVING THE TRANSMISSION

Step 25:

Disconnect the speed sensor, located underneath between the engine and transmission bell housing. As with the steering rack, the connector will have a locking tab (inset photo) that will need to be disengaged before it can be released.



Step 26:

Unclip the speed sensor harness from the bell housing (arrows).



REMOVING THE TRANSMISSION

Step 27:

Pull the access plate off the lower bell housing.



Step 28:

It will be necessary to rotate the engine to access the clutch module bolts. There is a special tool designed to allow you to do this from the front of the crankshaft (VAG T40058). If you do not have this tool, an acceptable method of rotating the engine is to insert a flat blade screwdriver into the bell housing near the speed sensor, engaging the teeth on the drive plate, and “walking” the engine around one tooth at a time as shown in the picture at right. Determine which method you are going to use and proceed to step 29.

CAUTION

Do not attempt to rotate the engine using the serpentine belt or the crank pulley bolts. This could cause damage to the belts and possibly loosen or over torque the crank pulley bolts.



REMOVING THE TRANSMISSION

Step 29:

Rotate the engine in a clockwise direction until one of the clutch module bolts is visible through the opening in the bell housing.



Step 30:

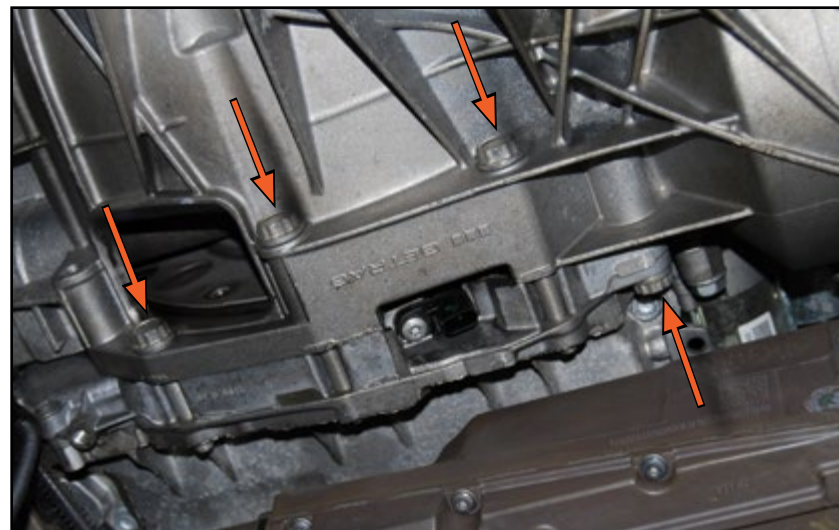
Using a 16mm 12 point wrench or socket, loosen and remove the first clutch module bolt. Next, rotate the engine in a clockwise direction to access the remainder of the bolts and remove them all. You will have to keep the engine from turning while loosening these bolts. If you do not have the special crankshaft turning/holding tool, use a similar method as you used to rotate the engine: Firmly hold a screwdriver in place between two of the drive plate teeth, then apply a constant and increasing pressure on your wrench and the bolts will break free with no trouble. Do not quickly or sharply pull on the wrench or you may break the tip of your screwdriver.



REMOVING THE TRANSMISSION

Step 31:

Using a 16mm 12 point box end wrench, remove the four lower bell housing bolts.



Step 32:

Using an 18mm 12 point socket, remove the bell housing bolt on the LH side just above and forward of the clutch slave cylinder. Reference page eight, bolt number seven for location.



REMOVING THE TRANSMISSION

Step 33:

Using an M12 triple square, remove the bolt securing the steering shaft to the steering rack.



Step 34:

Pull the steering shaft off the steering rack and push it all the way up towards the firewall, out of the way.

CAUTION

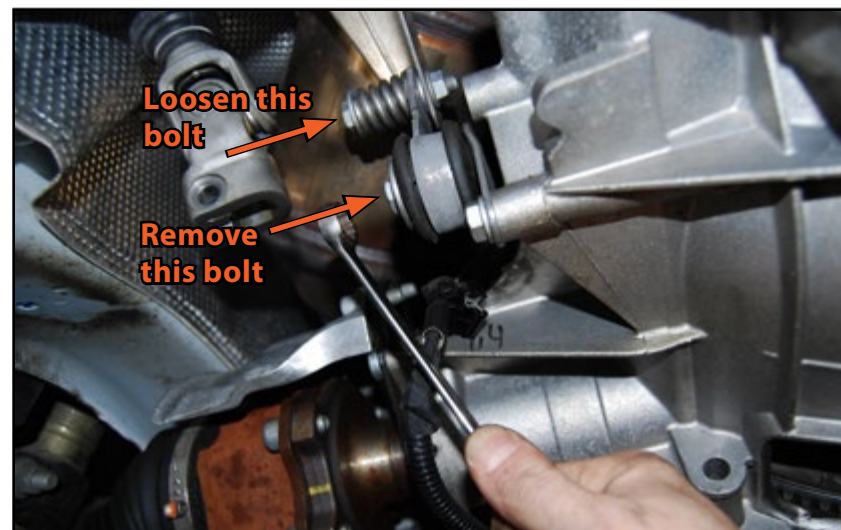
Once the steering shaft is disconnected from the steering rack, make sure that the steering wheel remains centered. Do not unlock the steering wheel or move it from center or the airbag spring will be damaged.



REMOVING THE TRANSMISSION

Step 35:

Using a 13mm wrench, loosen the upper bolt securing the LH downpipe support bracket to the transmission. Loosen the bolt until the nut is close to the end of the threads, but do not remove it. Next, remove the lower bolt, then pull the support bracket off of the transmission and swivel it up out of the way.



Step 36:

Using an M10 triple square socket, remove the bolt securing the clutch slave cylinder to the transmission (arrow).



REMOVING THE TRANSMISSION

Step 37:

First, push the steel slave cylinder line out of the retaining bracket on the side of the transmission (arrow). Then pull straight back on the slave cylinder to remove it from the bell housing. Secure the slave cylinder out of the way using a nylon cable tie.

CAUTION

Do not depress the clutch pedal with the slave cylinder removed from the transmission or the slave cylinder will be damaged.



Step 38:

Using a 13mm wrench, loosen the gearbox selector lever nut (arrow). Do not remove the nut at this time, but leave it threaded onto the end of the selector shaft.



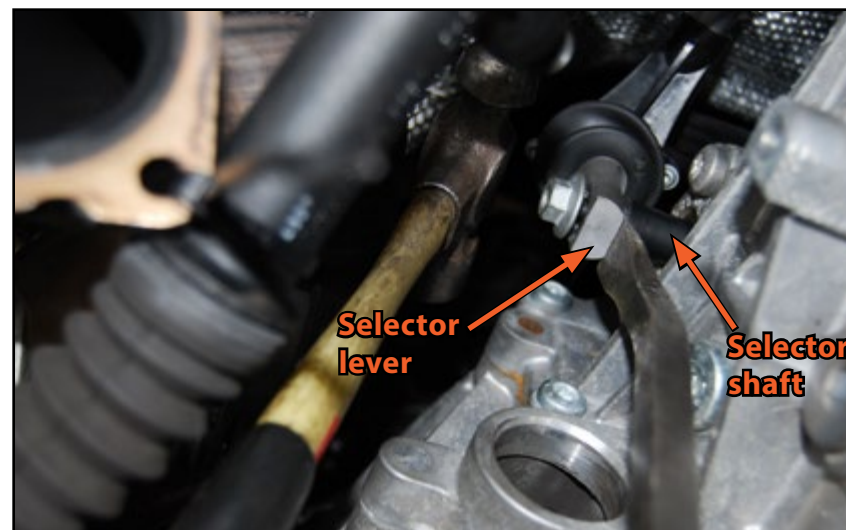
REMOVING THE TRANSMISSION

Step 39:

Remove the selector lever from the selector shaft. There is a special puller designed for this, however the following procedure works very well in absence of the puller: Using a pry bar, *gently* lever the selector shaft out of the transmission. Then, *tap* very lightly on the end of the selector lever nut and the selector lever will easily loosen on the selector shaft. As soon as the selector lever is loose, remove the nut and pull it the rest of the way off.

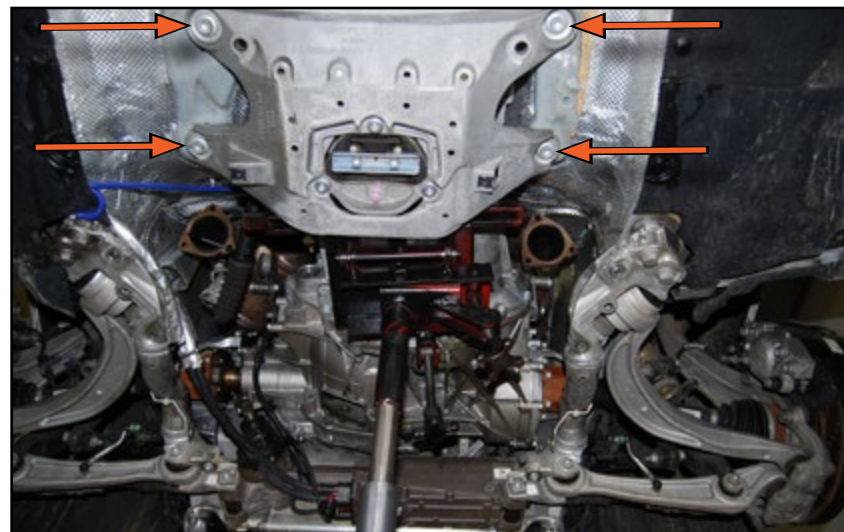
CAUTION

This will work very easily but be sure to be gentle. If you pry or hammer on the selector shaft, you can damage the transmission.



Step 40:

Position a transmission jack in place as shown in the picture. Raise it until it is in contact with the transmission. Next, using an M12 triple square, remove the four transmission crossmember bolts (arrows).



REMOVING THE TRANSMISSION

Step 41:

Slowly lower the transmission just until there is a distance of approximately 100mm between the crossmember and the body. This will give you enough clearance to remove the remaining components required for transmission removal, but do not lower it any more than this or you can cause damage to drivetrain components.

NOTE

Double check the engine support bar at this point to make sure it is still properly connected and securely supporting the engine.



Step 42:

The following items are difficult to see. You will access them from reaching across the top of the transmission. Reference page nine for component location, then perform the following:

- Disconnect the gear detector switch
- Unclip the gear detector wiring harness from the top of the transmission
- Remove the shifter push rod using a 13mm deep socket
- Remove the shifter connecting rod using a 13mm wrench

The shifter connecting rod has a heat shield over the end that is held in place with the connecting rod bolt. The shield is shown (with the transmission removed for clarity) in the picture at right.



REMOVING THE TRANSMISSION

Step 43:

Using a 6mm allen socket, remove the LH and RH inboard CV joint heat shields. There are 3 bolts holding each shield in place. You may need to use a universal joint or a long 6mm ball end allen socket to access these bolts. The RH shield (shown removed for clarity) will be the more difficult one to access. It is two separate shields held on by the same bolts.



Step 44:

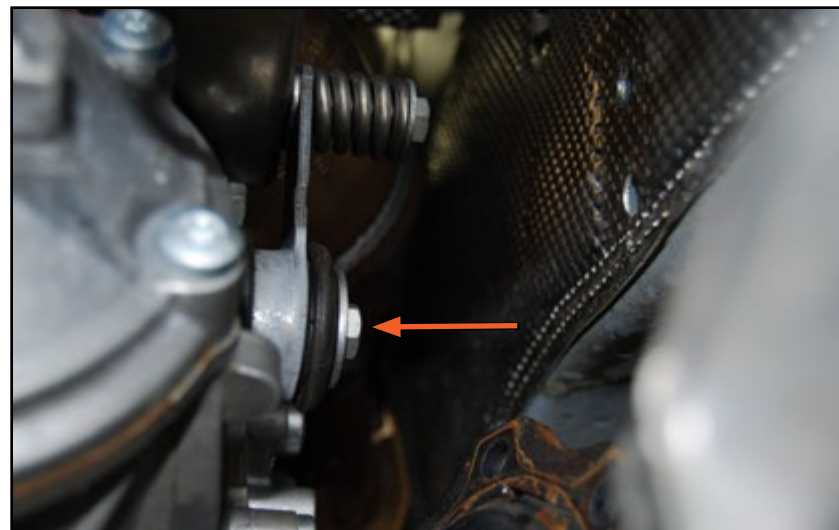
Using an M10 triple square, unbolt the LH and RH inboard CV joints. There are six bolts on each side. Using an impact wrench is the easiest method to remove these bolts. If you do not have an impact, you can loosen them using a breaker bar, but you will have to keep the CV joint from turning. You can do this by holding the axle stationary using a 17mm allen socket on the outer axle bolt.



REMOVING THE TRANSMISSION

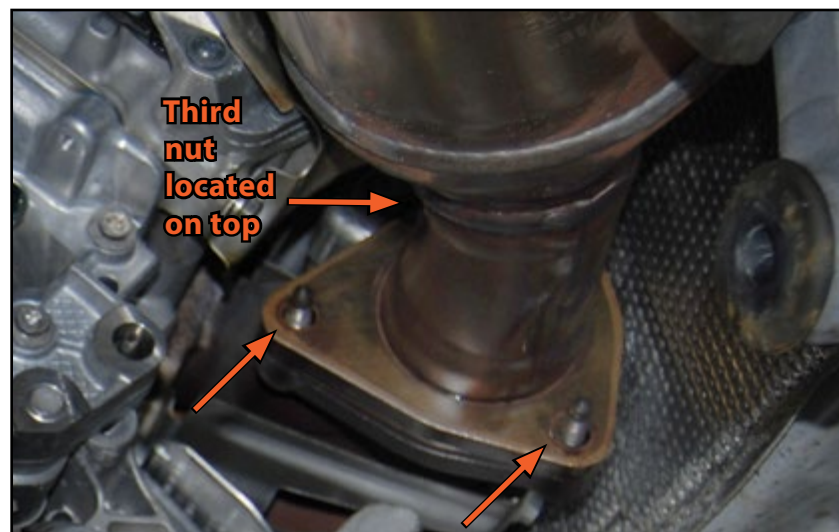
Step 45:

Using a 13mm wrench, remove the bolt for the RH downpipe support bracket (arrow), pull it off the transmission, and swivel it up out of the way.



Step 46:

Using a 12mm socket, remove the two lowest nuts securing the RH catalytic converter to the exhaust manifold. Next, loosen the third nut, but leave it threaded onto the end of the stud. Swing the converter to the side to gain the necessary clearance to remove the transmission. These nuts will be difficult to access, you will have to use extensions and a universal joint to reach them. The picture at the right shows the converter and nut locations with the transmission removed for clarity.



REMOVING THE TRANSMISSION

Step 47:

Remove the upper starter/bell housing bolt using an 18mm 12 point socket, then remove the lower starter bolt using a 16mm 12 point socket. Reference page eight, bolt numbers one and two for locations. The lower starter bolt can be easily removed from the front side of the bell housing. The upper starter/bell housing bolt is difficult to access, and as you can see in the picture at right, you will have to use a number of extensions to access it.

NOTE

The starter cables can remain connected and the starter does not need to be removed from the car.



Step 48:

Secure the transmission to the jack using ratchet straps. Be careful not to trap any shift linkages or wiring between the straps and the transmission.

CAUTION

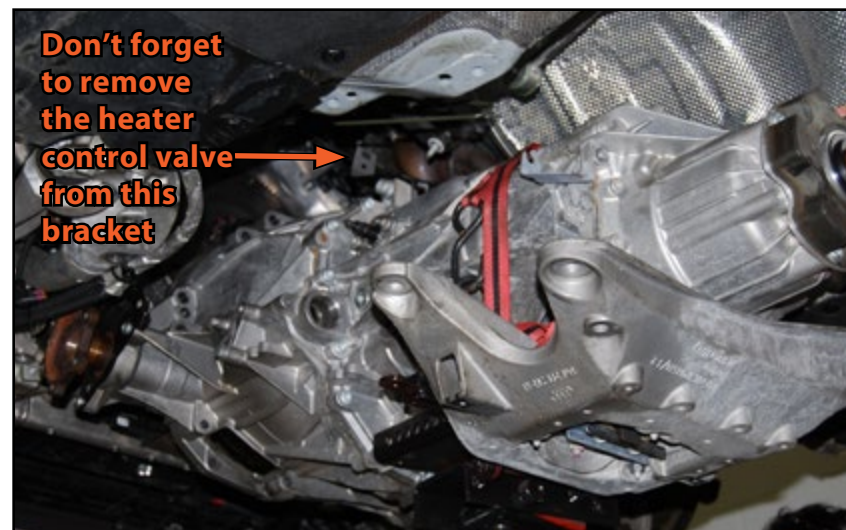
Before proceeding, we strongly recommend the help of an assistant to remove the transmission. It will be very top heavy on the jack and an assistant can help stabilize it during removal.



REMOVING THE TRANSMISSION

Step 49:

Using an 18mm 12 point socket, remove the remaining bell housing bolts. Reference page eight, bolt numbers three, four, five, and six. Then, pull the transmission rearward until it is clear of the pilot bearing housing on the drive plate (about 2 inches). Lower the transmission slightly (about 1/2 inch) and see if you can access the heater control valve that is connected to a bracket on top of the transmission. (Reference page nine). Lower the transmission only just enough until you can access this valve and slide it off the bracket.



Step 50:

Lower the transmission very slowly while carefully checking for any wiring or linkages that are trapped or did not get disconnected. Once you are sure that everything is clear, lower the transmission completely, roll it out from underneath the car and transfer it to a work surface.



REMOVING THE CLUTCH MODULE/FLYWHEEL ASSEMBLY

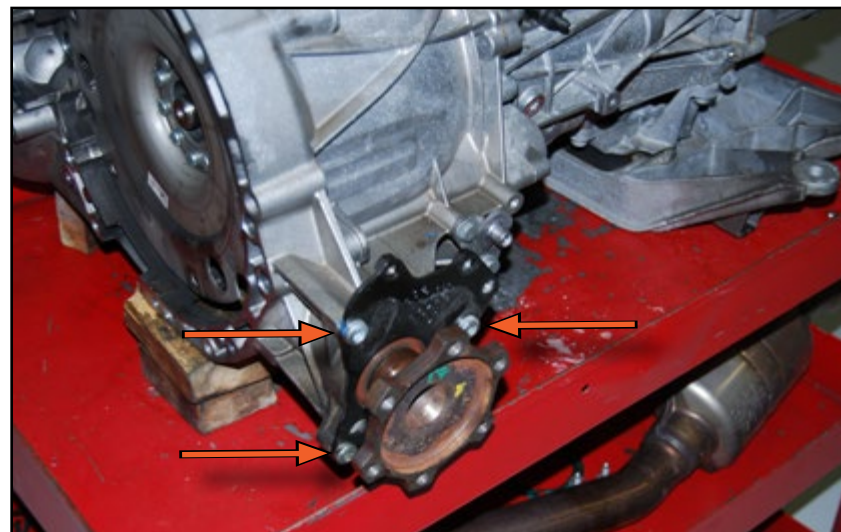
Step 1:

Raise and support the bell housing so the transmission tailshaft is slightly lower than the bell housing. This will prevent gear oil from leaking out when the LH axle shaft is removed.



Step 2:

Using an T45 Torx bit, remove the three bolts (arrows) holding the LH axle retainer to the transmission bell housing.



REMOVING THE CLUTCH MODULE/FLYWHEEL ASSEMBLY

Step 3:

Pull the LH axle out just far enough to clear the seal in the bell housing. As you begin to pull the axle out, be sure to support the weight of it at the end until it clears the seal. This seal can be easily damaged if you do not support the weight of the axle during removal.

NOTE

If the axle shaft does not easily pull straight out, you may need to use a slide hammer/puller for removal.



Step 4:

Carefully pull the LH axle the rest of the way out.



REMOVING THE CLUTCH MODULE/FLYWHEEL ASSEMBLY

Step 5:

Install the clutch module removal tool into one of the holes near the top of the clutch module. If you have trouble accessing the back side of the tool to install the nut, simply install the tool into the bottom of the clutch module near the access hole in the bell housing, then rotate the clutch module so the tool is located at the top. It is not necessary to tighten the nut, you only need to thread it all the way on.



Step 6:

Firmly grip the clutch module tool and pull the clutch module straight out from the bell housing until it is fully clear of the transmission.

CAUTION

The clutch module is very heavy. Be sure to pull it straight out or you may damage the seal and the pilot bearing housed in the flywheel.



SERVICING THE CLUTCH RELEASE MECHANISM

Step 1:

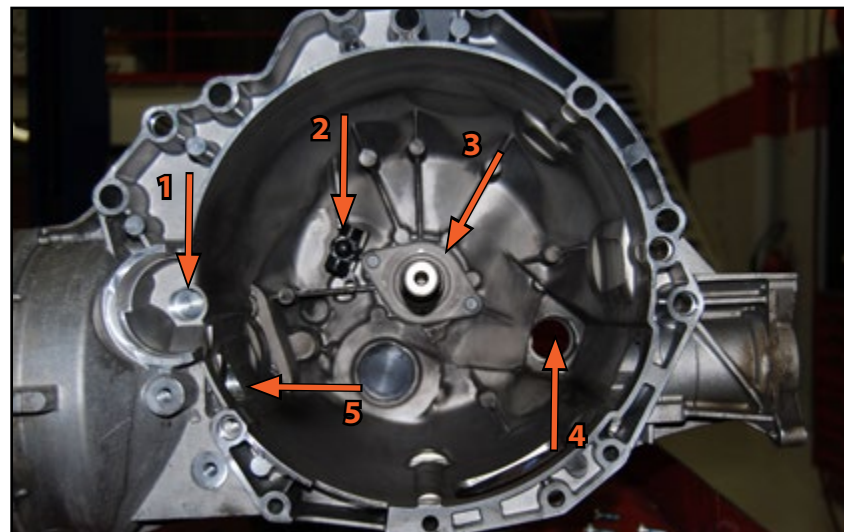
Remove the clutch release lever and throwout bearing together by pushing in on the retaining spring (arrow) and pulling the end of the release lever off the pivot ball. Remove the old throwout bearing by simply pulling it off of the clutch release lever. Make sure to install the retaining spring back in place.



Step 2:

Cover the opening for the axle shaft, then thoroughly clean the inside surface of the bell housing using brake cleaner. Also carefully clean the hole for the slave cylinder, the release lever pivot ball, and the hole for the starter nose.

1. Hole for Starter Nose
2. Release Lever Pivot Ball
3. Guide Sleeve
4. Hole for Slave Cylinder
5. Opening for Axle Shaft (Cover this when cleaning)



SERVICING THE CLUTCH RELEASE MECHANISM

Step 3:

Clean the opening for the axle shaft by wiping outward with a rag so no dirt is pushed onto the axle shaft seal. The axle shaft seal requires a special radial seal grease ([ES#465368](#)) in the valley of the seal. If any of this grease is wiped away, it must be replenished.



If this radial seal grease is wiped away, it must be replenished

Step 4:

Using a T30 Torx bit, remove the two bolts securing the throwout bearing guide sleeve and remove it by pulling it forward off the input shaft.



SERVICING THE CLUTCH RELEASE MECHANISM

Step 5:

Clean the area under the guide sleeve and carefully inspect the input shaft seal for signs of leakage. Replace the seal if any signs of leakage are present.



Step 6:

Apply blue threadlocker to the guide sleeve bolts, install the new guide sleeve and torque the bolts to 8 Nm (6 Ft-lbs).



SERVICING THE CLUTCH RELEASE MECHANISM

Step 7:

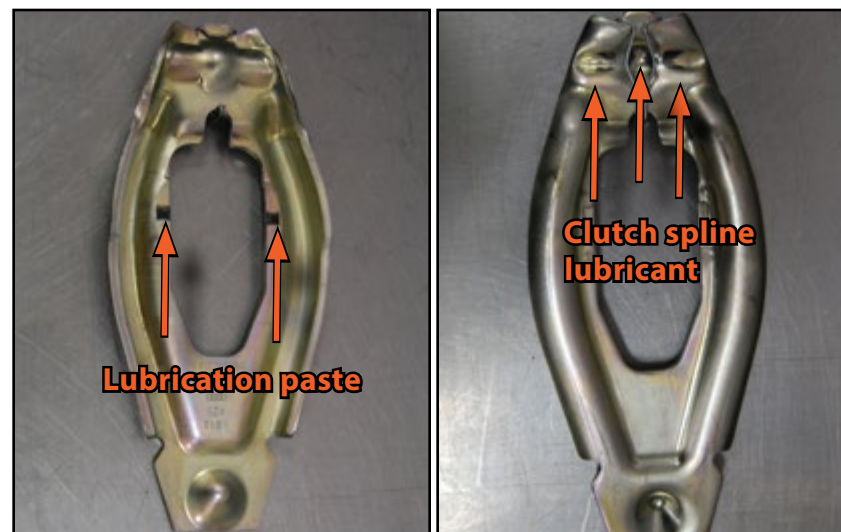
Apply clutch spline lubricant ([ES#465342](#)) to the splines on the transmission input shaft.

Also, inspect the end of the transmission input shaft for any signs of wear or galling where the pilot bearings ride. It is normal to see light discoloration as you can see in this picture. Only excessive wear will require replacement of the input shaft.



Step 8:

Thoroughly clean the clutch release lever using brake cleaner. Then sparingly apply clutch spline lubricant ([ES#465342](#)) to the clutch release lever at the pivot points and lubrication paste ([ES#2662951](#)) where the throwout bearing contacts the clutch release lever. These locations are shown by arrows in the pictures.



SERVICING THE CLUTCH RELEASE MECHANISM

Step 9:

Install the new throwout bearing onto the clutch release lever by pressing it into place and also make sure the retaining spring is correctly installed as shown.



Step 10:

Install the clutch release lever and throwout bearing onto the guide sleeve, then push on the clutch release lever at the pivot point to engage the retaining clip. Make sure the release lever and throwout bearing move back and forth freely.

NOTE

Make sure the guide sleeve is clean and free of grease where it contacts the throwout bearing.



ASSEMBLING AND INSTALLING THE CLUTCH MODULE

Step 1:

Thoroughly clean the surface of the flywheel using brake cleaner and a clean shop rag.



Step 2:

Test fit the clutch disc by sliding it onto the input shaft and make sure that it fits correctly and slides on with ease. It is extremely uncommon to experience any type of trouble with this, but in the rare case it's better to find out now than when the transmission is back in the car.



NOTE

Be sure to have clean hands and be careful not to get any grease or contaminants on the surface of the clutch disc.

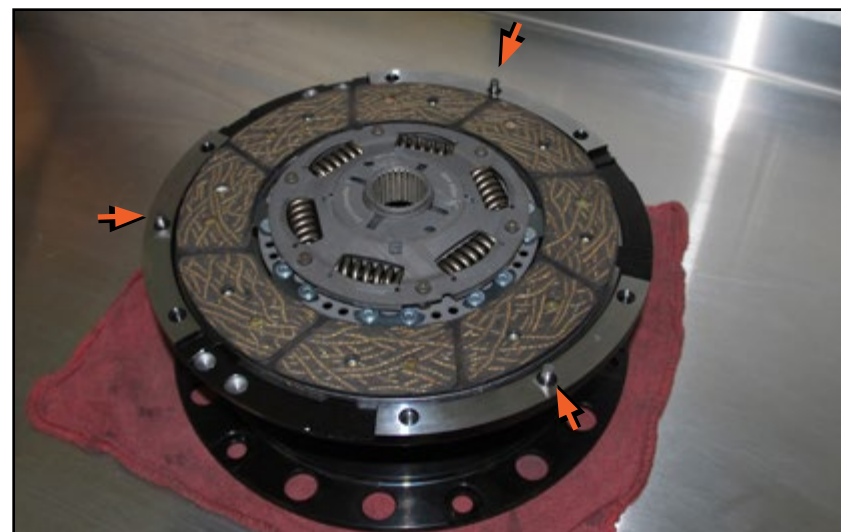
ASSEMBLING AND INSTALLING THE CLUTCH MODULE

Step 3:

Place the new clutch disc on the flywheel. The new disc will have a marking for “flywheel side” or “transmission side”. Make sure the disc is installed with the correct side mating to the flywheel. Note the location of the three dowel pins in the new flywheel (arrows). These will be relevant on page 45, step 6.

NOTE

The clutch disc will only fit and sit flush on the flywheel one way. If you cannot find a marking, you will see that the clutch disc will not sit flush against the flywheel if it is upside down



Step 4:

Push the clutch disc alignment tool (included with the kit) down through the center of the clutch disc and into the pilot bearing of the flywheel until it is fully seated.



ASSEMBLING AND INSTALLING THE CLUTCH MODULE

Step 5:

Clean the surface of the pressure plate using brake cleaner and a clean shop rag. Note the location of the three dowel pin holes in the pressure plate (arrows) which will be relevant in the next step.



Step 6:

Set the pressure plate in place on top of the clutch disc, making sure to align the three dowel pins with the three dowel pin holes in the pressure plate.



ASSEMBLING AND INSTALLING THE CLUTCH MODULE

Step 7:

First install all six new pressure plate bolts (included with the kit) through the pressure plate and into the flywheel, just until they are finger tight. Next using an M10 Triple Square Socket, slowly tighten each of the pressure plate bolts 1/4 turn at a time, alternating between them in the sequence shown at the right until the pressure plate and the bolts are fully seated onto the flywheel.



Step 8:

Using an M10 Triple Square socket, torque the pressure plate bolts to 22 Nm+90 degrees (16 Ft-lbs+90 degrees) using the same tightening sequence as used in the previous step. You can now remove the clutch alignment tool.



If you are unfamiliar with this type of torque specification, reference page 57 for an explanation of the procedure.

TECH TIP

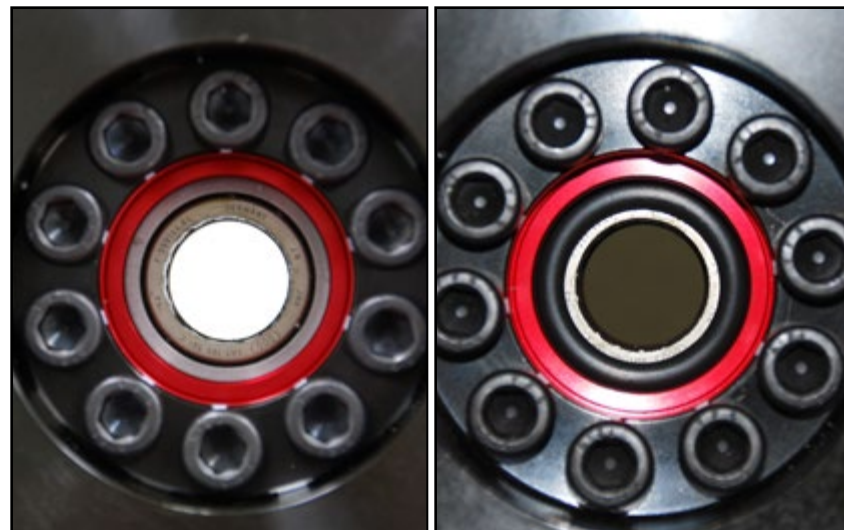
A second person may be required to hold the clutch module while torquing these bolts. Do not place the clutch module in a vise or anything that will damage or distort the flywheel.



ASSEMBLING AND INSTALLING THE CLUTCH MODULE

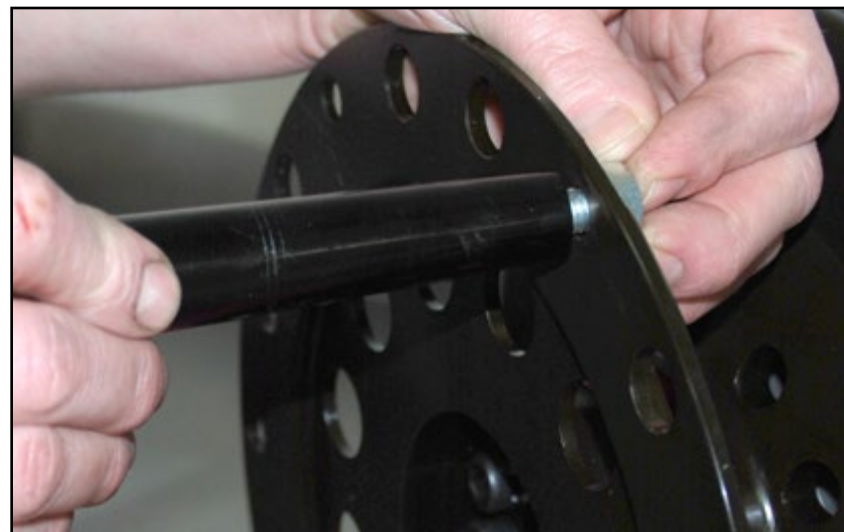
Step 9:

Push the drive plate o-ring into the center of the flywheel as shown. The o-ring should fit tight enough so it does not fall out while installing the flywheel. If the o-ring seems loose or falls out, apply a small amount of light bearing grease around the seal to hold it into place.



Step 10:

Install the clutch module tool into one of the holes around the perimeter of the new flywheel.



ASSEMBLING AND INSTALLING THE CLUTCH MODULE

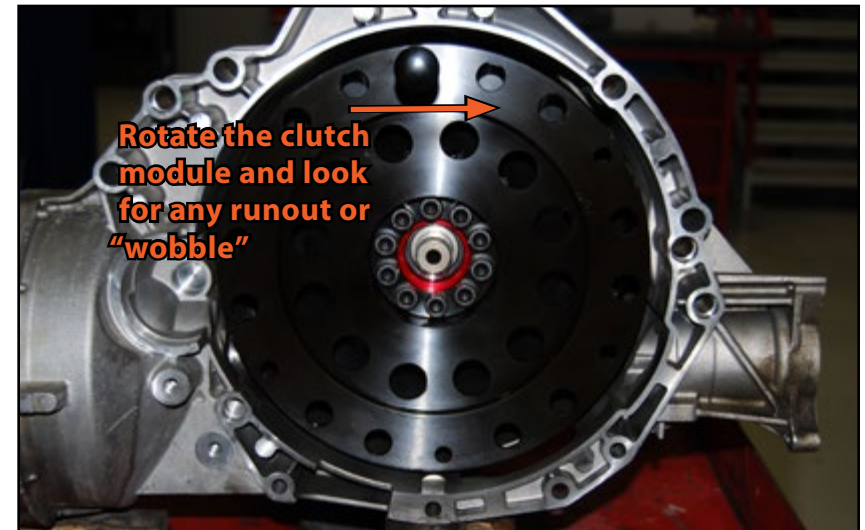
Step 11:

Slide the clutch module/flywheel assembly onto the transmission input shaft. Be sure to keep the assembly centered while you are installing it or you can damage the seal on the pilot bearing. Rotate or “wiggle” the clutch module back and forth as necessary until it slides all the way on and is fully seated.



Step 12:

Turn the clutch module continuously in one direction and watch closely at the edges to make sure it rotates smoothly and does not wobble (runout). Even with the clutch disc properly centered, you may still notice a small amount of runout (approximately 1mm) but this is an acceptable amount. If you experience excessive runout, make sure the flywheel is fully seated onto the input shaft and if necessary, remove the flywheel and check the centering of the clutch disc using the clutch alignment tool.



ASSEMBLING AND INSTALLING THE CLUTCH MODULE

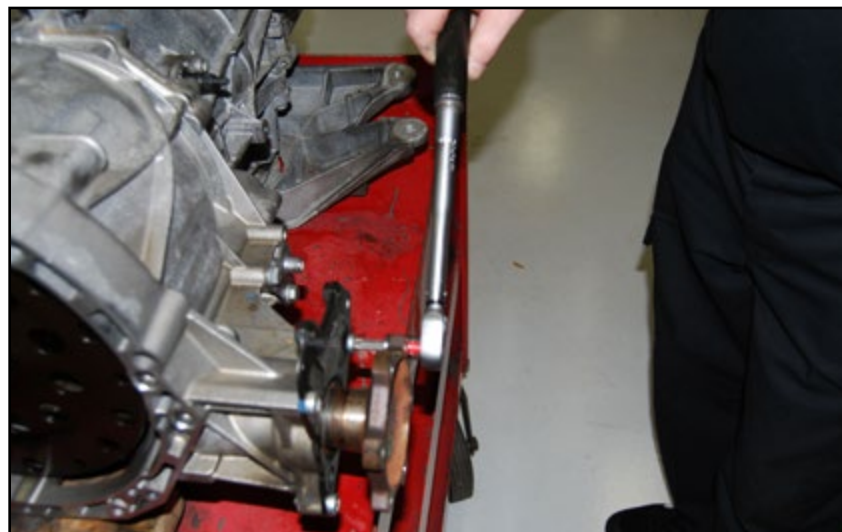
Step 13:

Insert the axle back into the bell housing and through the clutch module until it is fully seated in place. Make sure to support it as shown so it remains centered during installation and does not damage the axle seal.



Step 14:

Apply blue loctite to the three axle retainer bolts, thread them in and torque them to 24 Nm (18 Ft-lbs).



REPLACING THE PILOT BEARING IN THE DRIVE PLATE

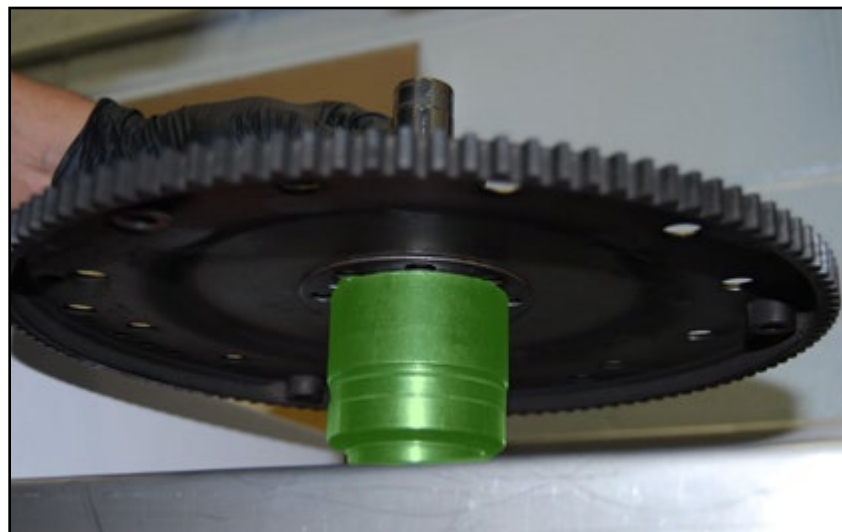
Step 1:

Using an M12 triple square, remove the 10 drive plate bolts and pull the drive plate off the end of the crankshaft. An impact wrench works well to remove these, but if you do not have one, you can keep the engine from turning by installing two of the original drive plate bolts and lever between them with a pry bar.



Step 2:

Support the center bolt flange of the drive plate using a large socket or suitable tool as shown in the picture.



REPLACING THE PILOT BEARING IN THE DRIVE PLATE

Step 3:

Using a socket and a soft faced hammer, drive the old pilot bearing out of the drive plate.



Step 4:

Turn the drive plate over and once again support the center bolt flange using a large socket or suitable tool. Place the pilot bearing into the bore of the center bolt flange (inset photo). Then, using a socket or suitable tool that closely fits the outer diameter of the new pilot bearing, drive it into place.

NOTE

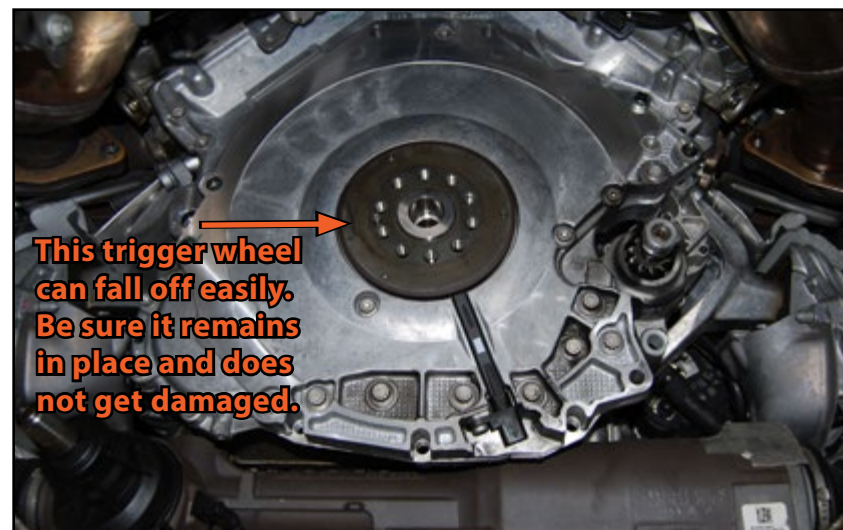
There is a step in the center bolt flange which the pilot bearing will seat against when it is fully installed. When driving it into place you will be able to feel and hear an audible change when it hits this step.



REPLACING THE PILOT BEARING IN THE DRIVE PLATE

Step 5:

Wipe the drive plate and crankshaft mating surfaces with a rag to ensure that the drive plate will seat fully against the crankshaft. Make sure you do not damage or lose the trigger wheel for the crankshaft position sensor.



Step 6:

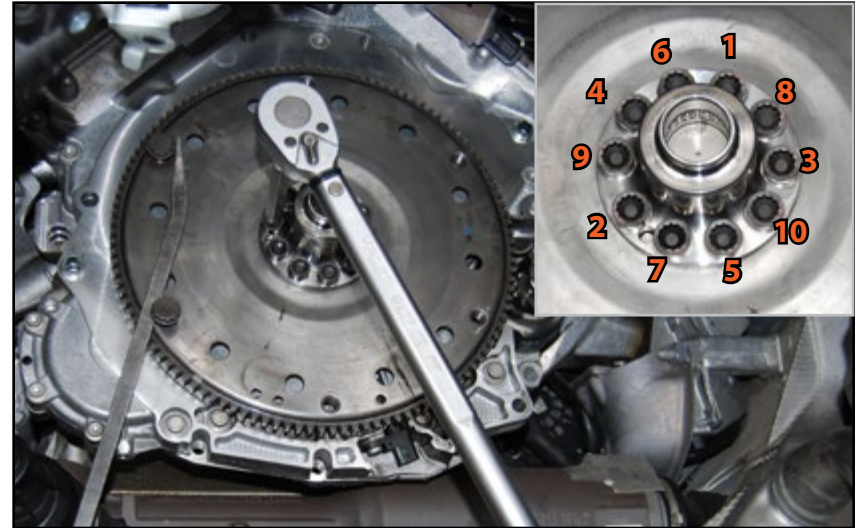
Hold the drive plate in position on the crankshaft. There is an alignment dowel (arrow) which will only allow the drive plate to be installed in one position. Install the new bolts included with the kit. The bolts will not thread in by hand. They have loctite on the threads and will require the use of a ratchet to be threaded in. Thread them in until they are completely seated.



REPLACING THE PILOT BEARING IN THE DRIVE PLATE

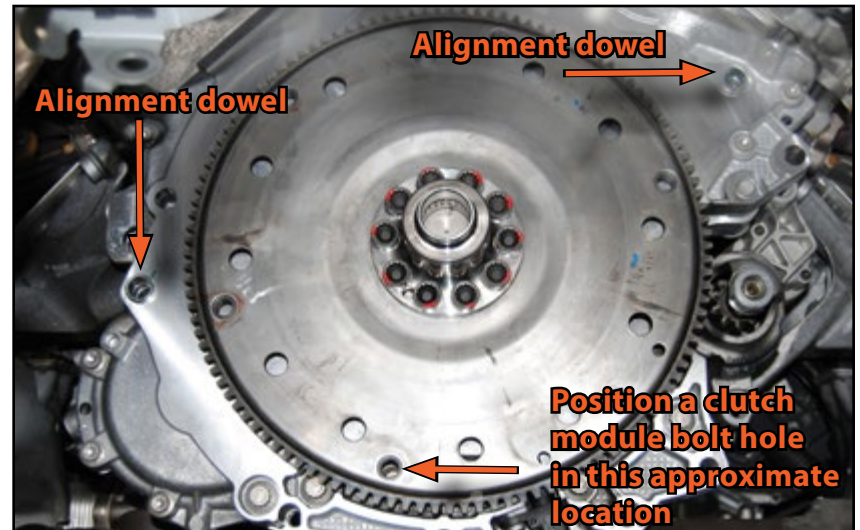
Step 7:

While holding the crankshaft to prevent it from turning, torque the drive plate bolts to 60 Nm+90 degrees (44 Ft-lbs+90 degrees). Torque these bolts alternately in a criss-cross pattern. During the second stage of torquing the bolts, make sure to mark each bolt with paint as you turn it the additional 90 degrees.



Step 8:

Rotate the crankshaft so one of the clutch module bolt holes will be in alignment with the access hole on the bottom of the transmission bell housing. Make sure that both of the alignment dowel sleeves are still in place in the rear of the engine block. You are now ready to install the transmission.



INSTALLING THE TRANSMISSION

The basic transmission Installation steps are the reverse of removal, however for ease of installation and accuracy, we have provided this checklist, complete with torque specifications and installation tips.

Secure the transmission on the transmission jack and raise it back into position behind the engine. Work slowly and adjust the angles and height of the transmission jack as necessary.

Install the heater control valve back onto it's bracket.

Slide the transmission forward until the bell housing is fully seated against the engine block.

Install the four lower bell housing bolts and thread them in until they are fully seated.

Lower the rear of the transmission to obtain a distance of 100mm between the cross member and the body.

Install the remaining bell housing and starter bolts just until they are fully seated. Don't forget bolt number 6 (page 8) has a wiring harness bracket that mounts underneath it.

Rotate the clutch module and engine as necessary to bring a bolt hole in the clutch module into alignment with a bolt hole in the drive plate. The clutch module should rotate separately from the drive plate at this time with no resistance or binding. *If you cannot rotate the clutch module, the module may not be seated correctly on the input shaft or the clutch disc may not be centered.*

Install a new clutch module bolt (included with the kit) until it is fully seated. Rotate the engine and install the remaining clutch module bolts. Rotate the engine around one more time, torquing the bolts to 60 Nm (44 Ft-lbs).

Torque all of the bell housing and starter bolts.

10mm Aluminum Bell Housing Bolts: 15 Nm+90 degrees (11 Ft-lbs+90 degrees)

12mm Aluminum Bell Housing Bolts: 30 Nm+90 degrees (22 Ft-lbs+90 degrees)

Lower Starter Bolt: 65 Nm (48 Ft-lbs)

Upper Starter Bolt: 30 Nm+90 degrees (22 Ft-lbs+90 degrees)

INSTALLING THE TRANSMISSION

Install the shifter connecting rod and push rod. Don't forget the heat shield on the connecting rod, and torque them both to 20 Nm (15 Ft-lbs).

Connect the gear detector switch and clip the wiring harness in place to the rib on top of the transmission.

Install and tighten the nuts on the RH catalytic converter flange.

Install both inboard CV joints. Torque the bolts to 70 Nm (52 Ft-lbs).

Install both CV joint heat shields.

Raise the transmission so the crossmember contacts the body.

Install the four crossmember bolts and torque them to 70 Nm (52 Ft-lbs).

You can now safely remove the transmission jack and engine support bar.

Install the selector rod. Tighten the nut to 20 Nm (15 Ft-lbs).

Install the clutch slave cylinder into the bell housing and the slave cylinder line grommet into the bracket. Torque the slave cylinder bolt to 20 Nm (15 Ft-lbs)

Install the LH downpipe support bracket.

Install the steering shaft. Torque the bolt to 30 Nm+90 degrees (22 Ft-lbs+90 degrees).

Install the bell housing access plate.

Connect the speed sensor and clip the wiring harness back in place.

INSTALLING THE TRANSMISSION

Install the propeller shaft. Torque the rear bolts alternately in a criss-cross pattern to 30 Nm+90 degrees (22 Ft-lbs+90 degrees) Torque the propeller shaft center bearing bolts to 20 Nm (15 Ft-lbs) . Install a new clamp (included with the kit) on the front propeller shaft boot.

Install the center heat shield.

Install the rear exhaust onto the car.

Install the body cross brace.

Install both front exhaust pipes.

Install both front subframe side shields.

Install the subframe cross brace and torque the bolts to 90 Nm+90 degrees (66 Ft-lbs+90 degrees).

Install the wiring harness in place across the top of the subframe cross brace.

Connect both steering rack electrical connectors.

Install the skid plate and lower insulation panel.

Install both front CV shaft insulating guards.

Install both front wheels and torque them to 120 Nm (89 Ft-lbs).

Reconnect the negative battery terminal.

TORQUE SPECIFICATIONS

10mm Aluminum Bell Housing Bolts	15 Nm+90 degrees (11 Ft-lbs+90 degrees).....	(Page 54)
12mm Aluminum Bell Housing Bolts	30 Nm+90 degrees (22 Ft-lbs+90 degrees).....	(Page 54)
Axle Retainer Bolts (Use Loctite)	24 Nm (18 Ft-lbs).....	(Page 49)
Clutch Module to Drive Plate Bolts (Always Replace).....	60 Nm (44 Ft-lbs)	(Page 54)
CV joint to Transmission Flange (Always Replace)	70 Nm (52 Ft-lbs)	(Page 55)
Drive Plate to Crankshaft Bolts (Always Replace)	60 Nm+90 degrees (44 Ft-lbs+90 degrees).....	(Page 53)
Gearbox Selector Lever Nut (Always Replace).....	20 Nm (15 Ft-lbs).....	(Page 55)
Guide Sleeve Bolts (Apply Loctite)	8 Nm (6 Ft-lbs).....	(Page 40)
Pressure Plate Bolts (Always Replace).....	22 Nm+90 degrees (16 Ft-lbs+90 degrees)	(Page 46)
Propeller Shaft Center Bearing	20 Nm (15 Ft-lbs).....	(Page 56)
Rear Propeller Shaft Bolts (Always Replace).....	30 Nm+90 degrees (22 Ft-lbs+90 degrees).....	(Page 56)
Shifter Connecting Rod	20 Nm (15 Ft-lbs).....	(Page 55)
Shifter Push Rod	20 Nm (15 Ft-lbs).....	(Page 55)
Slave Cylinder Bolt	20 Nm (15 Ft-lbs).....	(Page 55)
Starter Bolt Lower	65 Nm (48 Ft-lbs)	(Page 54)
Starter Bolt Upper	30 Nm+90 degrees (22 Ft-lbs+90 degrees).....	(Page 54)
Steering Shaft Bolt (Always Replace)	30 Nm+90 degrees (22 Ft-lbs+90 degrees).....	(Page 55)
Subframe Cross Brace Bolts (Always Replace)	90 Nm+90 degrees (66 ft-lbs+90 Degrees).....	(Page 56)
Transmission Cross Member Bolts	70 Nm (52 Ft-lbs)	(Page 55)
Wheels.....	120 Nm (89 Ft-lbs)	(Page 56)

• A note about torque to yield or “stretch” bolts: Many bolts will have a torque specification listed in the format - xx Nm+xx degrees (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 them to the Nm or Ft-lb specification. **Stage Two** - tighten each one the additional specified number of degrees. To prevent over torquing it is important to mark each fastener with paint **immediately** after performing the second stage or “stretching” of the bolts.

Your B8 S4 Lightweight Flywheel 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.

Although this material has been prepared with the intent to provide reliable information, no warranty (express or implied) is made as to its accuracy or completeness. Neither is any liability assumed for loss or damage resulting from reliance on this material. SPECIFICALLY, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY IS MADE OR TO BE IMPLIED WITH RESPECT TO THIS MATERIAL. In no event will ECS Tuning, Incorporated or its affiliates be liable for any damages, direct or indirect, consequential or compensatory, arising out of the use of this material.