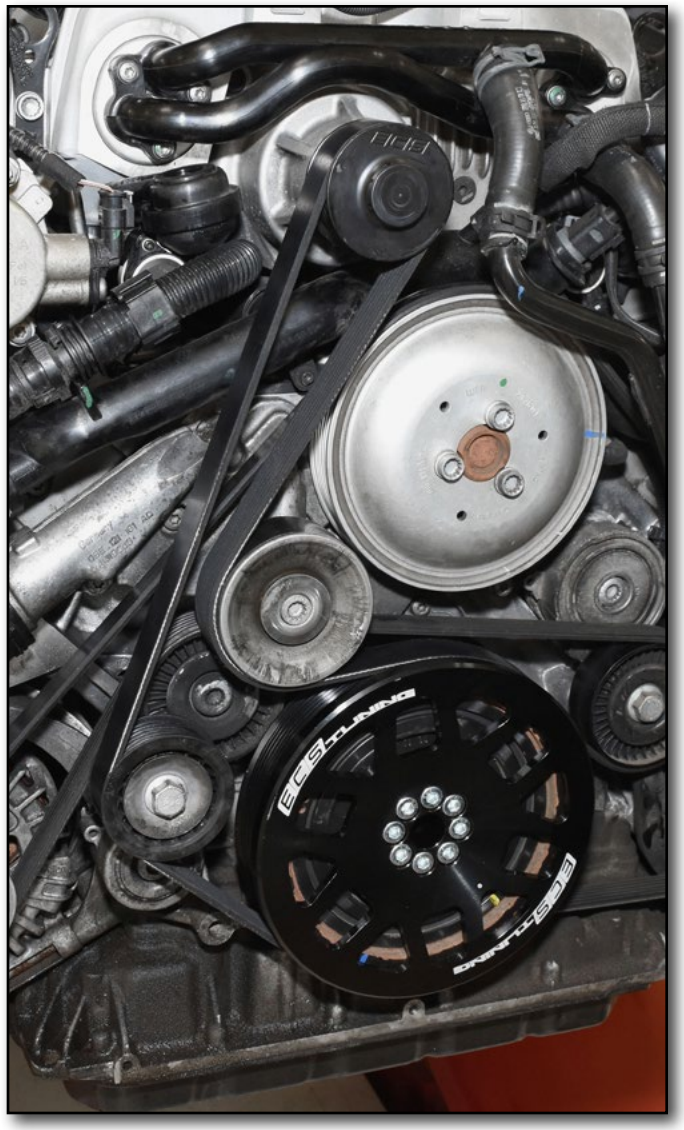
Audi B8 S4 3.0T ECS Supercharger & Crankshaft Pulleys Installation Instructions - Click HERE to Shop

Skill Level
2 - Moderate

Some Experience Recommended



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.

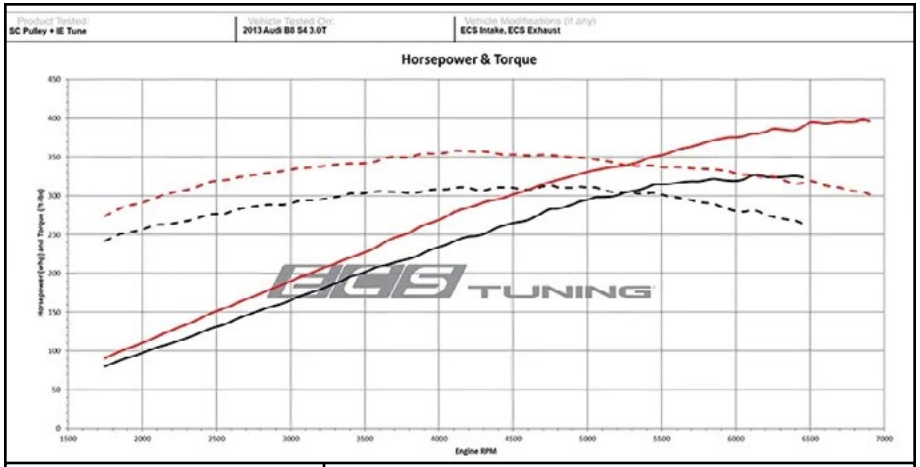
INTRODUCTION

ECS 3.0T Supercharger & Crankshaft Pulleys

Upgrading the supercharger & crankshaft pulleys on your B8 S4 3.0T is a very rewarding project that will bring large power gains across the rev range. The upgraded supercharger pulley features a smaller diameter than the stock pulley, causing the supercharger to spin faster, increasing boost and power. The upgraded crankshaft pulley is larger than stock, further overdriving the supercharger pulley. These pulleys require performance ECU tunes, and a performance heat exchanger is required for dual pulley configurations.

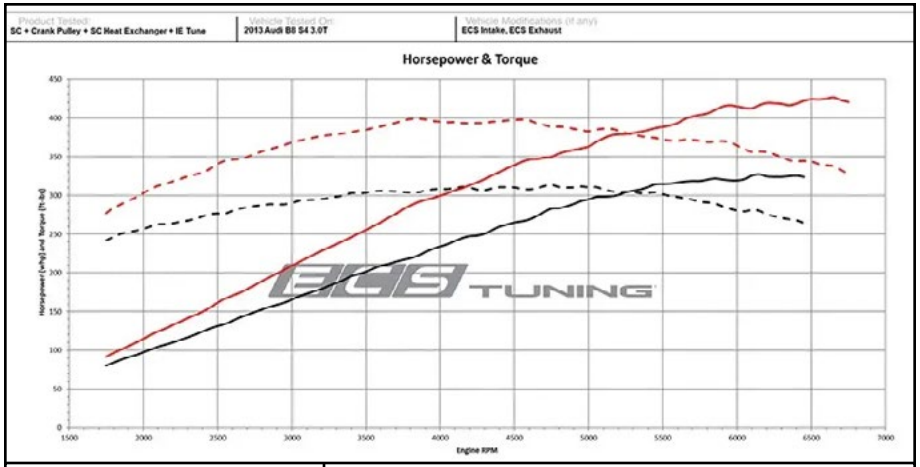
Both pulleys could be installed in a single day by an experienced technician, plan accordingly based on your own experience level. The dyno graphs below show the potential power gains based on the combination of tuning and pulleys.

Thank you for looking to ECS Tuning for all your performance and repair needs, we appreciate your business!



Stock SC Pulley	ECS SC Pulley, IE Stage 2 Tune, Stock Heat Exch.
327 WHP @ 6150 RPM 314 WTQ @ 4750 RPM	327 WHP @ 6150 RPM 314 WTQ @ 4750 RPM

Max Gains:
+64 WHP @ 6450 RPM
+53 WTQ @ 6450 RPM



Stock SC Pulley	ECS SC Pulley, IE Stage 2 Tune, Stock Heat Exch.
327 WHP @ 6150 RPM 314 WTQ @ 4750 RPM	427 WHP @ 6650 RPM 399 WTQ @ 3850 RPM

Max Gains:
+98 WHP @ 6450 RPM
+95 WTQ @ 3850 RPM

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KIT CONTENTS

ECS 3.0T Supercharger Pulley Upgrade
(Click HERE to Shop)

ECS 3.0T Crankshaft Pulley Upgrade
(Click HERE to Shop)

ECS 3.0T Dual Pulley Kit
(ES#4056965)

RELATED UPGRADES/TOOLS

ECS 3.0T Upgraded Supercharger Cooling System
(Coming in 2020)

Schwaben 3.0T Supercharger Pulley Removal Tool
(ES#3559093)

REQUIRED TOOLS

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

Standard Automotive Tools

- **Protecta-Sockets (for lug nuts)** ..... ES#2221243
- **⅜" Drive Ratchet** ..... ES#2765902
- **⅜" Drive Torque Wrench** ..... ES#2221245
- **⅜" Drive Deep and Shallow Sockets** ..... ES#2763772
- **⅜" Drive Extensions** ..... ES#2804822
- **Hydraulic Floor Jack** ..... ES#2834951
- **Torx Drivers and Sockets** ..... ES#11417/8
- **½" Drive Deep and Shallow Sockets** ..... ES#2839106
- **½" Drive Ratchet**
- **½" Drive Extensions**
- **½" Drive Torque Wrench** ..... ES#2221244
- **½" Drive Breaker Bar** ..... ES#2776653
- Bench Mounted Vise
- Crows Foot Wrenches
- Hook and Pick Tool Set ..... ES#2778980

Required For This Install

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

Available On Our Website

Specialty Tools

- **Triple Square Sockets** ..... ES#1910125
- **Schwaben Stubby Socket Driver Set** ..... ES#3103367
- **Air Grinder**
- **Paint Marker**

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.

Please read this entire page before proceeding

GETTING THE VEHICLE READY FOR INSTALL

If you are installing our supercharger pulley, now is a good time to get it in the oven at 400-450°F (**photo #1**). This will expand the steel just slightly, making it **MUCH** easier to install it onto the supercharger.

Regardless of which pulley you are installing onto your B8 S4, you will need to place the lock carrier into service position. Space is very limited in front of the engine, there's no avoiding having to do this. You can watch our YouTube video which covers this part of the procedure by clicking HERE or on **photo #3**. You can also reference the list below:

- Disconnect the negative battery terminal (**photo #2**).
- Remove the air box and radiator shroud cover.
- Disconnect the small plastic coolant return pipe from the reservoir.
- Unplug the headlights and fog lights.
- Lift the vehicle, then remove the belly pans and front wheels.
- Remove the screws from the radiator support braces.
- Remove the screws from the front of the inner fender liners, peel the liners back slightly, then loosen the 10mm nuts which secure the bumper cover to the fenders.
- Release the front bumper cover from each fender.
- Remove the T30 screws which hold the top of the bumper cover onto the radiator support.
- Slide the bumper cover off of the vehicle, disconnect any electrical connectors, then remove the bumper cover and set it aside.
- Remove one bolt from each crash beam bracket and install M8x1.25x45mm (or longer) bolts in their place.
- Remove the other crash beam bolts.
- Remove the T30 screws which secure the top of the radiator support to the chassis.
- Slide the lock carrier outward a few inches, be careful to not strain any wiring harnesses.

NOTE

You might notice that some of the following photos were taken with the lock carrier removed from the vehicle. We did this for better visibility, it is not a requirement.

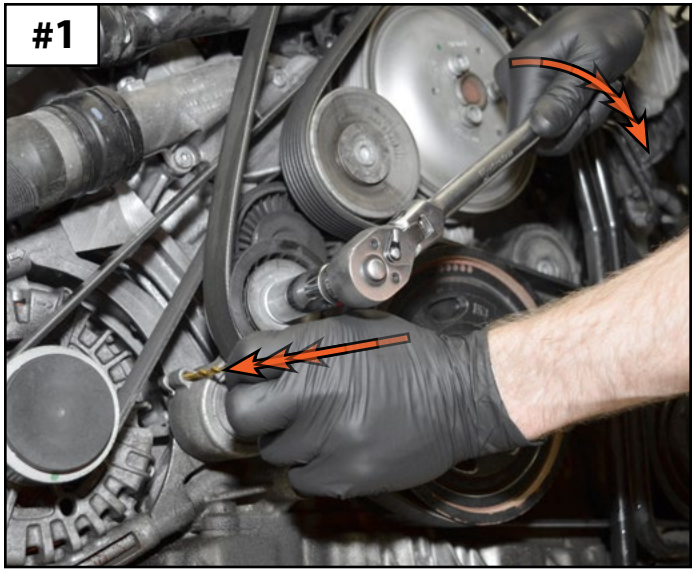
INSTALLING THE NEW CRANKSHAFT PULLEY

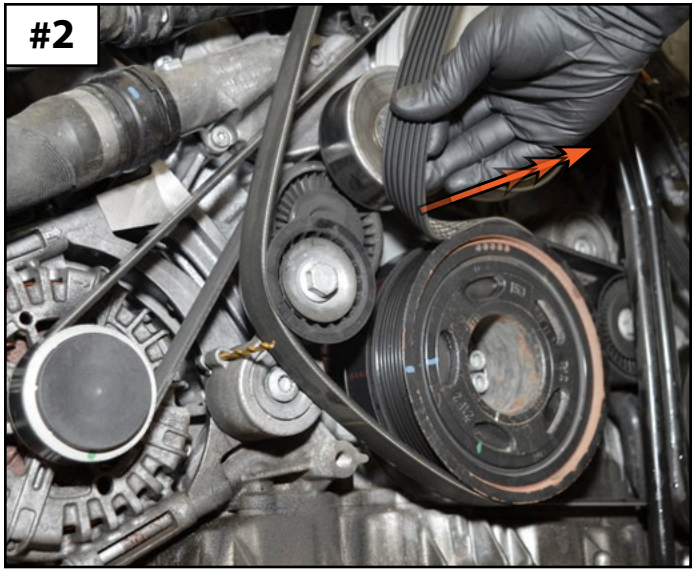
Step 1:

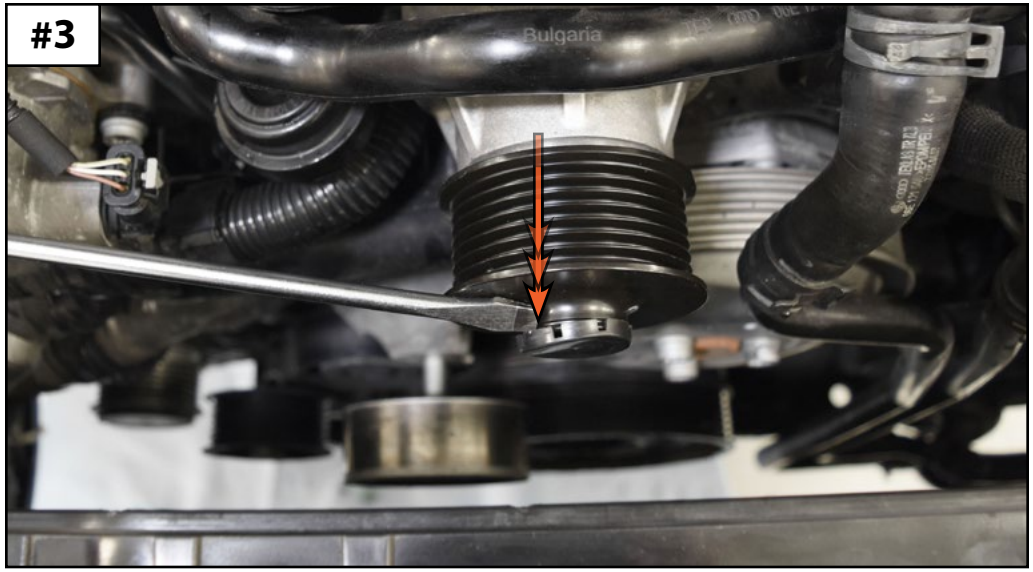
We need to release the supercharger belt tensioner so we can remove the belt. If you can see it, there is a retaining feature built into the tensioner assembly, when the tensioner rotated clockwise (tension is taken off of the belt) you can slide a 3⁄16″ drill bit through the tensioner to lock it in the released position. This makes removing and installing the belt **MUCH** easier!

Rotate the supercharger belt tensioner clockwise to release the tension from the belt (**photo #1**), then remove the belt (**photo #2**).

Remove the plastic cap from the supercharger pulley by gently prying it off (**photo #3**).





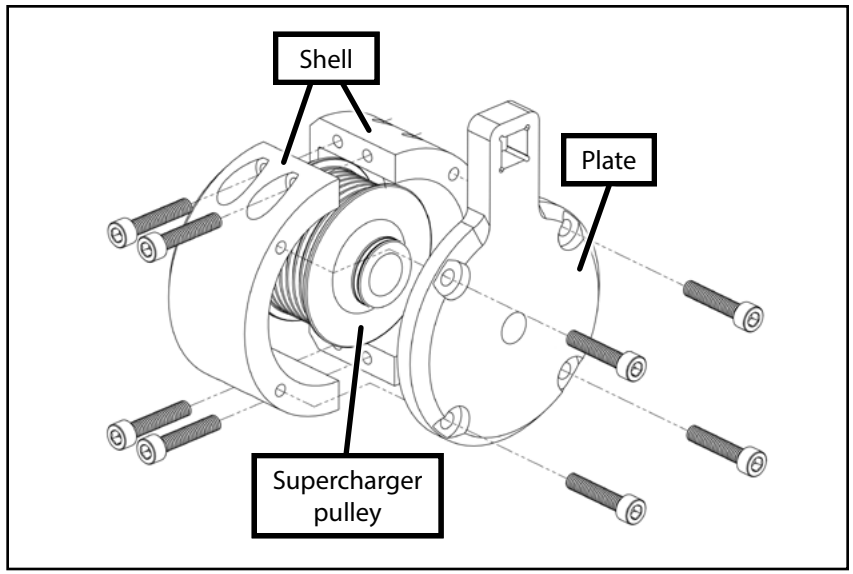


INSTALLING THE NEW SUPERCHARGER PULLEY

Step 2: 5mm Hex (Allen)

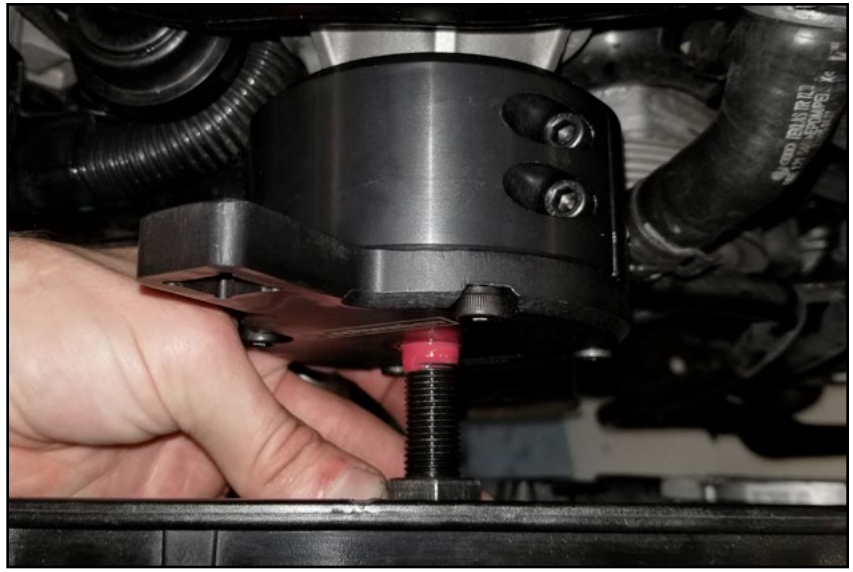
Now it's time to assemble our supercharger pulley removal tool:

- Completely disassemble the tool
- Slide the two halves of the shell in behind the pulley, then thread in the bolts by hand
- Line up the plate onto the end of the two shell halves, then thread in the bolts by hand
- Tighten all of the bolts until they make contact + ⅛ turn



Step 3:

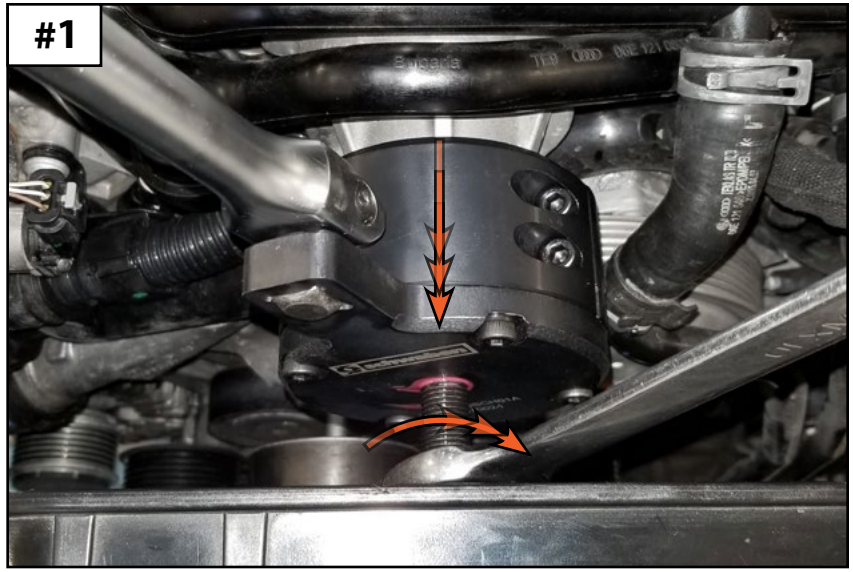
Apply grease to the threads of the large center bolt. Thread the bolt into the tool until it makes contact, then **STOP**. Proceed to the next page.



INSTALLING THE NEW SUPERCHARGER PULLEY

Step 4: ½″ Breaker Bar, 22mm or ⅞″ Wrench

Insert a ½″ breaker bar into the tool, then use a 22mm (or ⅞″) wrench to turn the bolt clockwise (**photo #1**). This will apply force to the back side of the pulley, causing it to be pulled off of the supercharger snout. Once the pulley has been removed from the supercharger you can pivot the tool to the side and remove it from the engine bay (**photo #2**).



INSTALLING THE NEW SUPERCHARGER PULLEY

Step 5:

CAUTION: This pulley will be extremely hot, use appropriate protection to avoid burns.

This next step must be done quickly. Be sure to read through all of the text below before beginning:

By now our new supercharger pulley should be nice and hot inside the oven. Heating this pulley will cause it to expand and make it a bit easier to slide onto the supercharger. We can make it even easier by blowing compressed air onto the supercharger snout, lowering its temperature and causing it to shrink (hold a can upside-down for best results, shown in **photo #1**).

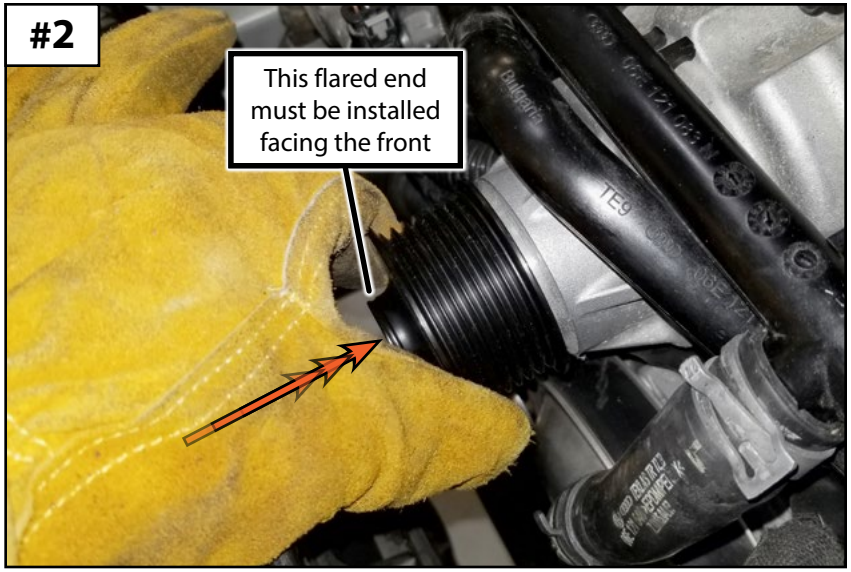
We would highly recommend the use of welding gloves (or comparable protective gloves) when handling the pulley.

Please note the orientation of the flared end on the pulley, this is where the OEM plastic end cap will be installed.

Install the pulley onto the supercharger immediately after removing it from the oven, it needs to still be hot for this to work (**photo #2**). It's very important that you push the pulley ***all the way*** onto the supercharger snout. If it cools down and gets stuck partway on you'll need to remove it with the pulley removal tool, then reheat and reinstall it.

#1

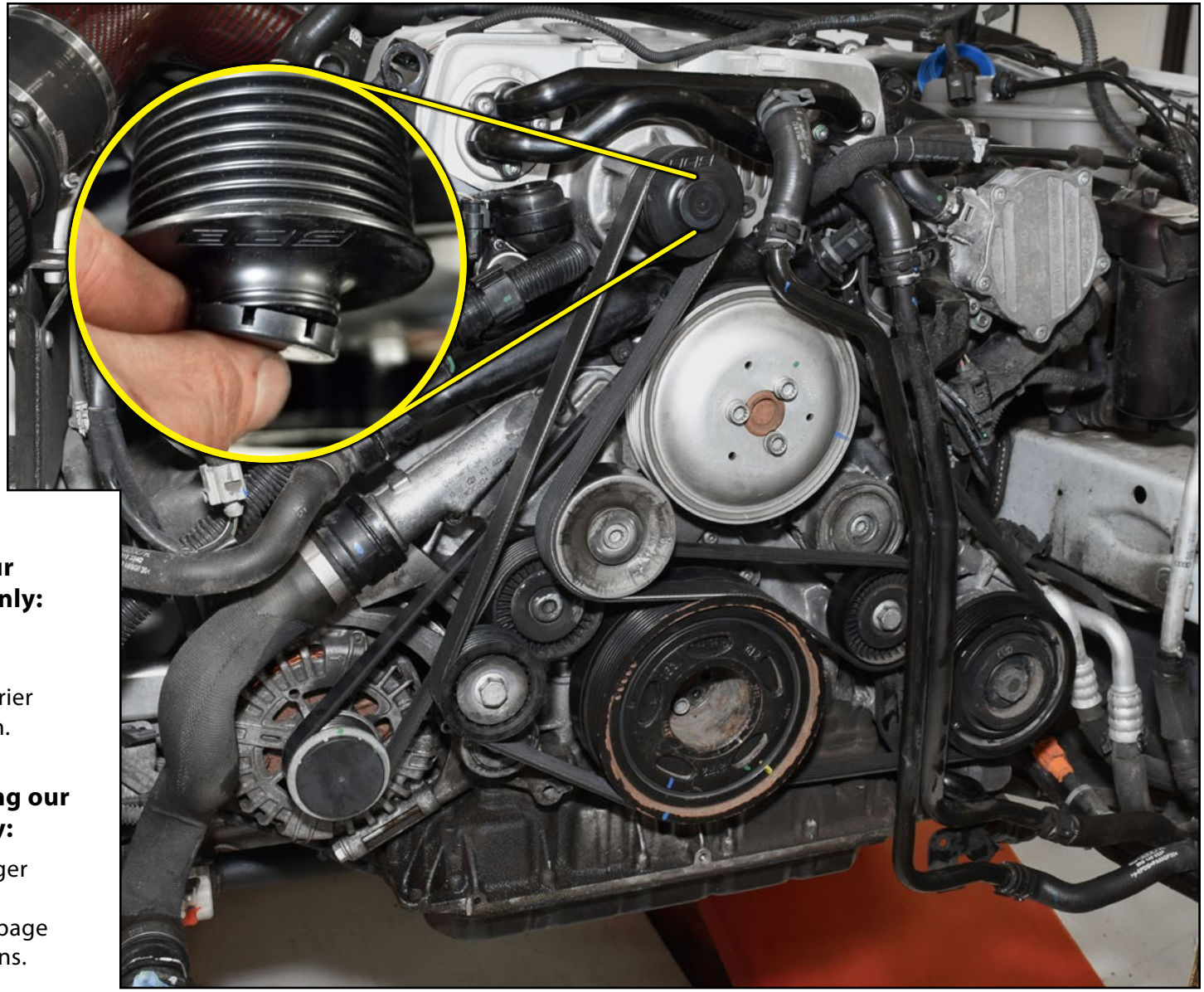
#2



INSTALLING THE NEW SUPERCHARGER PULLEY

Step 6:

Allow the supercharger pulley to completely cool down before continuing. Once the pulley has cooled you can install the OEM plastic end cap (inset photo).



If you are installing our supercharger pulley only:

- Install the new supercharger belt.
- Reinstall the lock carrier in its normal position.

If you are also installing our upgraded crank pulley:

- Leave the supercharger belt off for now.
- Proceed to the next page for further instructions.

Please read this entire page before proceeding

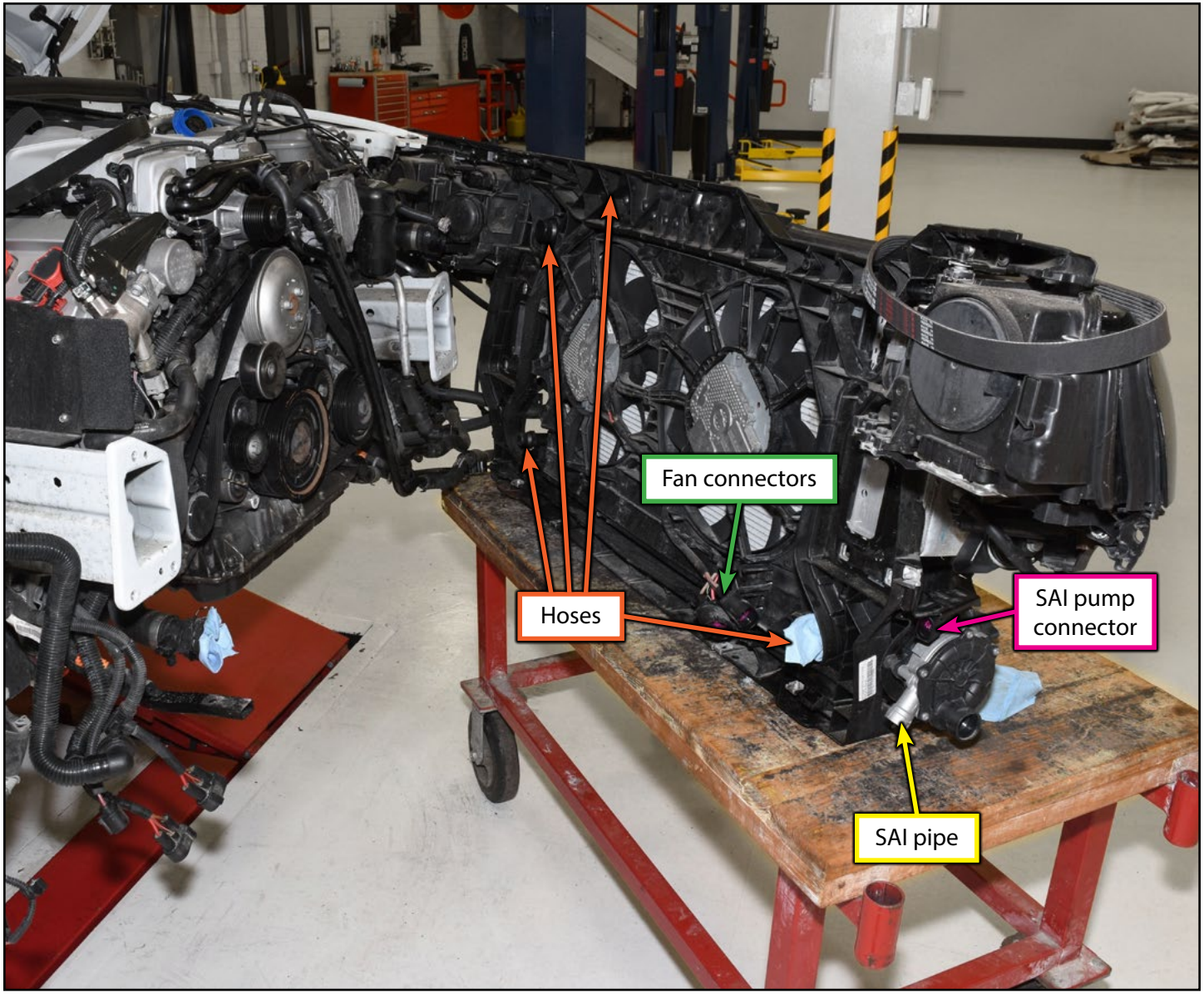
INSTALLING THE NEW CRANKSHAFT PULLEY

Step 1:

NOTE: This is ***COMPLETELY OPTIONAL***.

For our install we ended up swinging the lock carrier outward so we could provide the best photos possible. Even though you could install the crank pulley without doing this, we would still recommend doing it if you feel comfortable with the extra work. It only takes around 20-30 minutes to go from service position to what you see in the photo, and what a difference it makes!

To do this you'll need to drain the coolant, disconnect the hoses from the radiator (**ORANGE** arrows), the fan connectors (**GREEN** arrows), the SAI pipe (**YELLOW** arrows), and the connector on the SAI pump (**MAGENTA** arrows). You'll also need to disconnect the headlight washer nozzles (if equipped). Support the lock carrier from below, then swing it out.



INSTALLING THE NEW CRANKSHAFT PULLEY

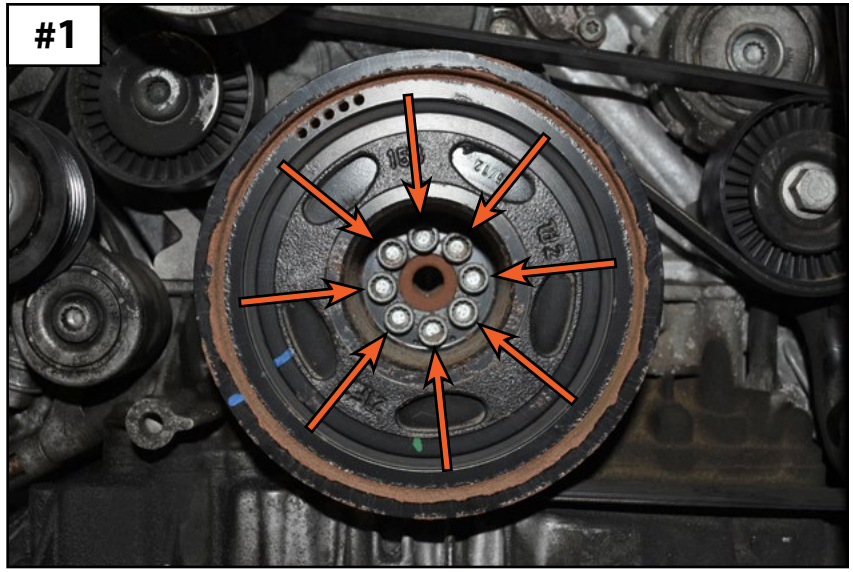
Step 2: M10 Triple Square Socket & ½" Breaker Bar

We need to start by loosening the crank pulley bolts (**photo #1**). The easiest way to do this is with the accessory belt still installed, this will provide some resistance and keep the crank pulley from rotating while you're trying to loosen the bolts.

We found that we were able to use our Schwaben triple square socket and ½" breaker bar even with the lock carrier in service position (**photos #2 & #3**).

Loosen the bolts by ¼ - ½ turn, then continue to the next page.

#1



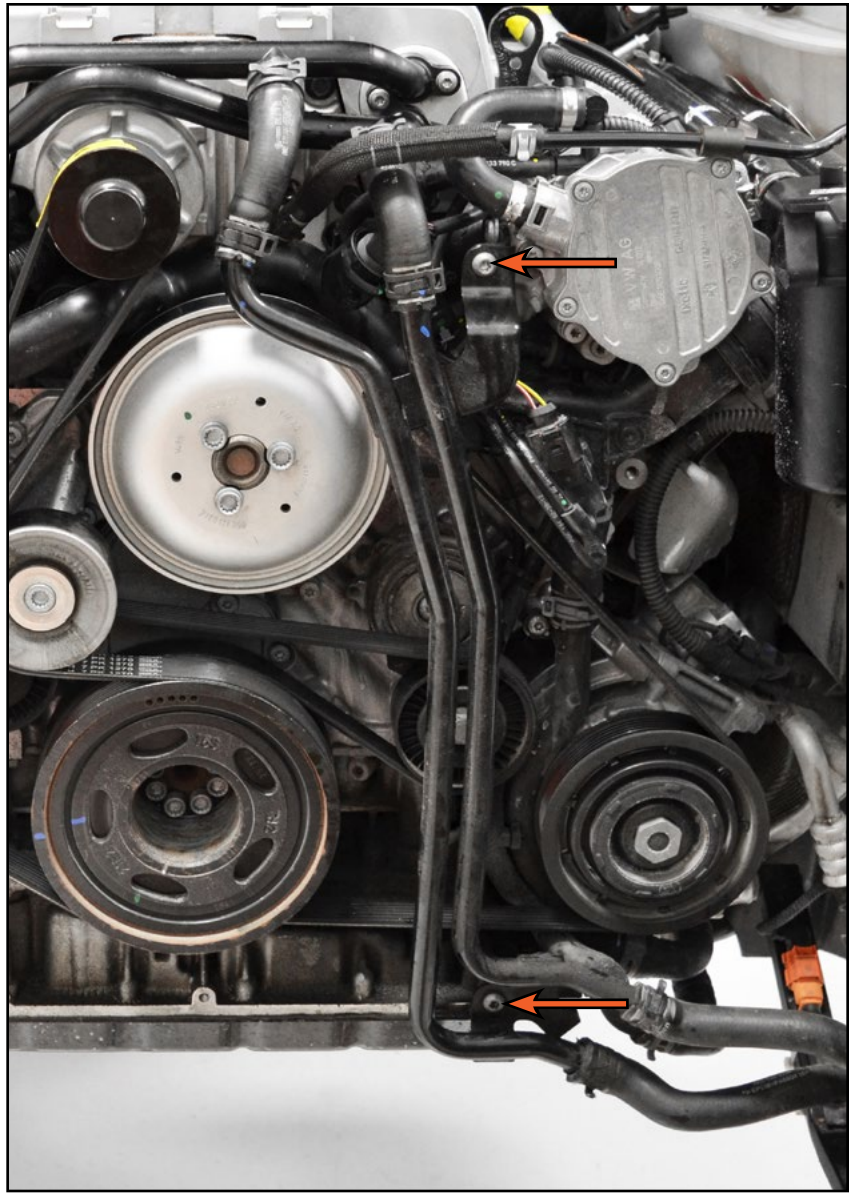
#2

#3

INSTALLING THE NEW CRANKSHAFT PULLEY

Step 3: T30 Torx

The coolant pipe assembly is in our way and needs to be removed. Locate and remove the two bolts which secure the pipe to the front of the engine (arrows).

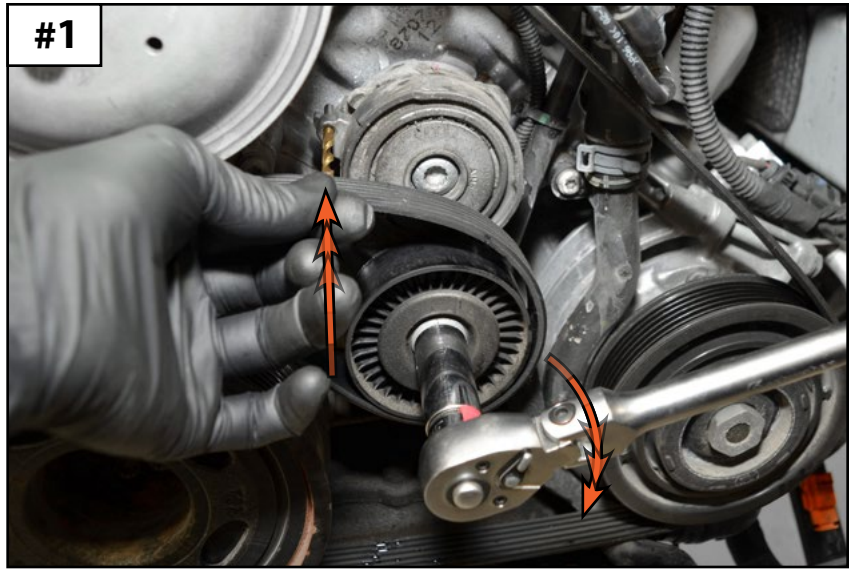


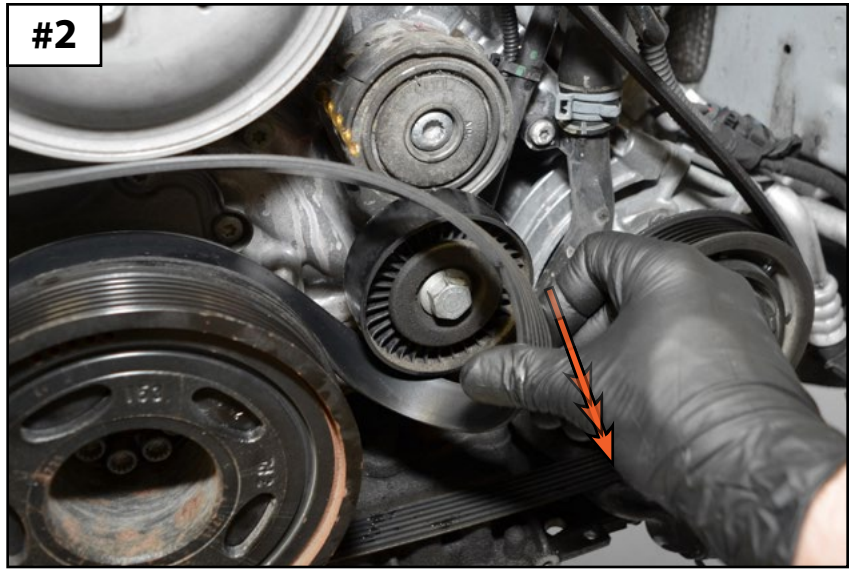
INSTALLING THE NEW CRANKSHAFT PULLEY

Step 4: 17mm Socket & Ratchet, or 17mm Wrench

We need to release the accessory belt tensioner so we can remove the belt. If you can see it, there is a retaining feature built into the tensioner assembly, when the tensioner rotated clockwise (tension is taken off of the belt) you can slide a 5⁄32" drill bit through the tensioner to lock it in the released position. This makes removing and installing the belt **MUCH** easier!

Rotate the accessory belt tensioner clockwise to release the tension from the belt (**photo #1**), then remove the belt (**photo #2**).

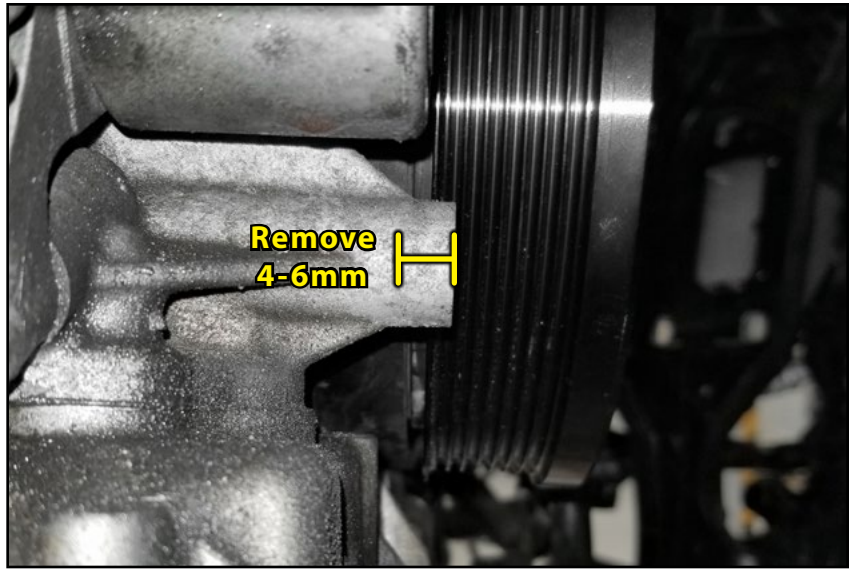




INSTALLING THE NEW CRANKSHAFT PULLEY

Step 5:

There is a threaded mounting post located next to the crank pulley. This post will interfere with the supercharger belt once the new crank pulley is installed, so we need to remove 4-6mm from the end (reference the photo on the right). For this we used an angle grinder with an abrasive disc on it.

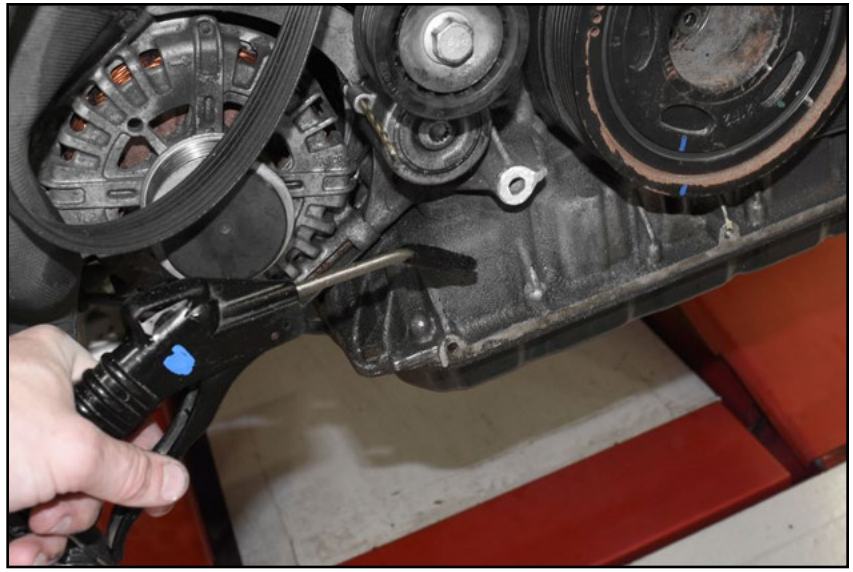


TECH TIP

This step can be performed with the crank pulley on or off. We chose to leave the stock pulley on for this step to protect the area around the crank seal from any flying metal shavings or debris from while grinding.

Step 6:

Remove any metal shavings from the area with compressed air or water.



INSTALLING THE NEW CRANKSHAFT PULLEY

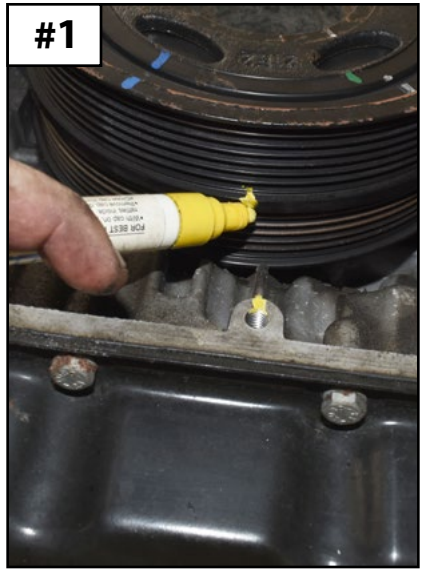
Step 7: M10 Triple Square Socket & ½" Breaker Bar

Use a paint marker (or equivalent) to make an alignment mark on the crank pulley and the timing case (**photo #1**). This mark must be made in the area between the two belt channels on the pulley, and it will make it much easier to install the crank pulley later on.

Once you've made your alignment mark you can remove all of the crank pulley bolts (**photo #2**) and continue to the next step.

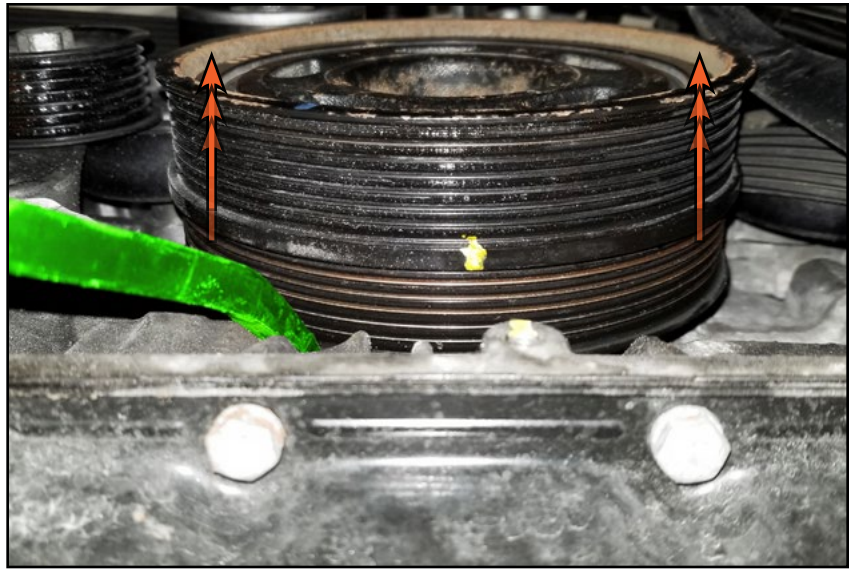
TECH TIP

We highly recommend removing the OE crank pulley for this install. It is possible to install our upgraded pulley without removing the stock one, but one of the bolts is slightly offset from the rest. This offset bolt can be very difficult to line up, and we found that it wasn't worth the frustration.



Step 8: Pry Bar

Use a pry bar (highlighted in **GREEN**) to gently pry off the pulley. You may find that you need to alternate prying on the LH and RH side of the pulley to help "walk" it off of the hub.

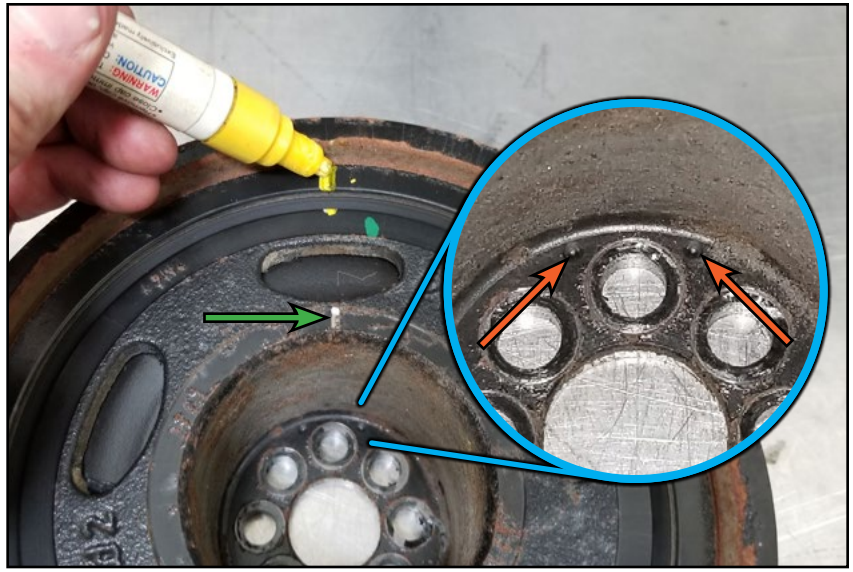


INSTALLING THE NEW CRANKSHAFT PULLEY

Step 9:

One of the bolt holes in the OE crank pulley will be offset by 1mm. This is very important to identify because you won't be able to install the new pulley without aligning this offset bolt hole properly. The offset bolt hole can be identified by the machined divots on either end of the bolt hole inside the hub bore (**ORANGE** arrows in the inset photo), and the white mark on the front face of the pulley (**GREEN** arrow).

Use a paint marker (or equivalent) to extend the white alignment mark on front face of the OE crank pulley.



Step 10:

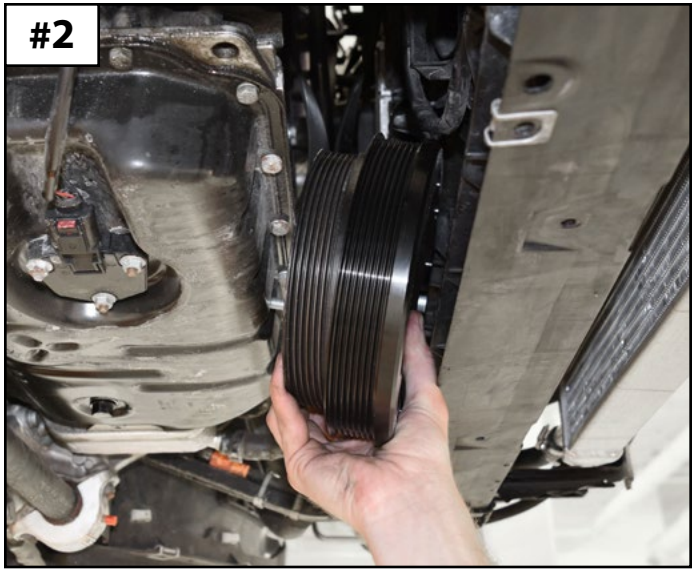
Slide the new crank pulley into the OE crank pulley. Be sure to line up the machined hole on our pulley with the paint mark we made on the OE pulley in step 9 (arrows). Insert one of the supplied bolts to keep the pulleys in alignment, then continue to the next step.

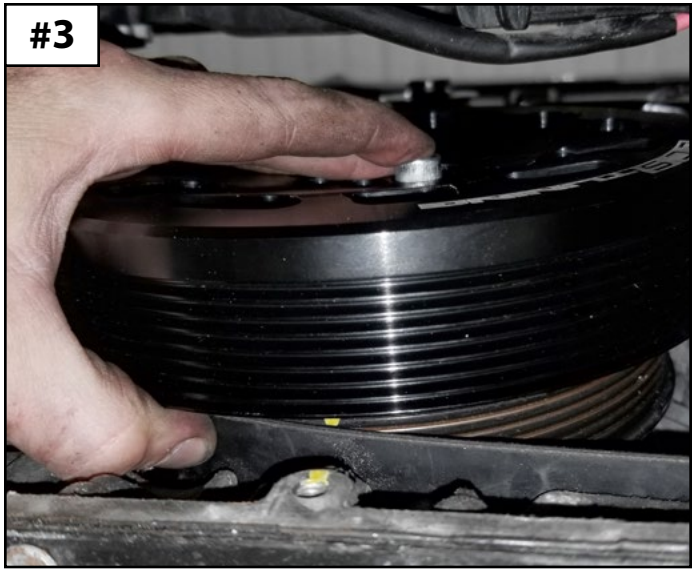
INSTALLING THE NEW CRANKSHAFT PULLEY

Step 11:

We're almost ready to install the crank pulley into place. Before we do, it's important to make sure that the accessory belt is routed around where the crank pulley will sit once installed (**photo #1**). It's ***much*** easier to route the belt around now, rather than once the pulley has been installed.

Slide the crank pulley between the engine and the lock carrier (**photo #2**), then align the paint mark we made on the OE crank pulley and the mark on the timing case, and thread the crank pulley bolt in by hand (**photo #3**).





INSTALLING THE NEW CRANKSHAFT PULLEY

Step 12: 6mm Hex (Allen)

Working on one bolt at a time, apply 2-3 drops of threadlocker to the threads (**photo #1**), then insert them through the crank pulleys and thread them in by hand (**photo #2**).

Even with the lock carrier in service position there is very little room to work on this step. We found that we had to get a little creative in order to get the bolts into position, the bolts are obviously too long to simply be inserted into the holes in the upgraded pulley. Be patient and try to use the open spaces in the fan shroud to slide the heads of the bolts into while lining them up with the bolt holes.

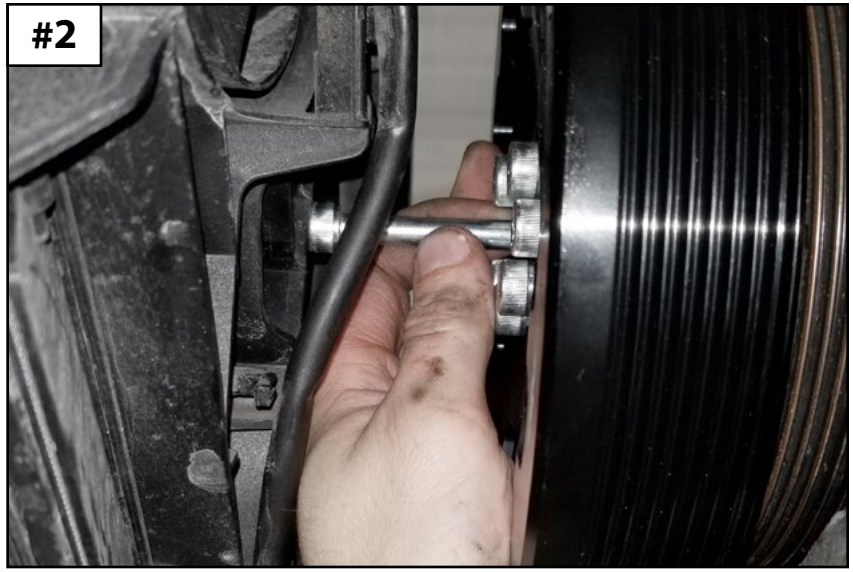
Once all of the bolts have been threaded into place you can snug them by hand and continue to the next step. We will come back and apply final torque to these bolts shortly.

TECH TIP

The Schwaben Stubby Socket Driver Set (ES#3103367) makes it much easier to tighten these bolts in such a tight space!

#1

#2



INSTALLING THE NEW CRANKSHAFT PULLEY

Step 13:

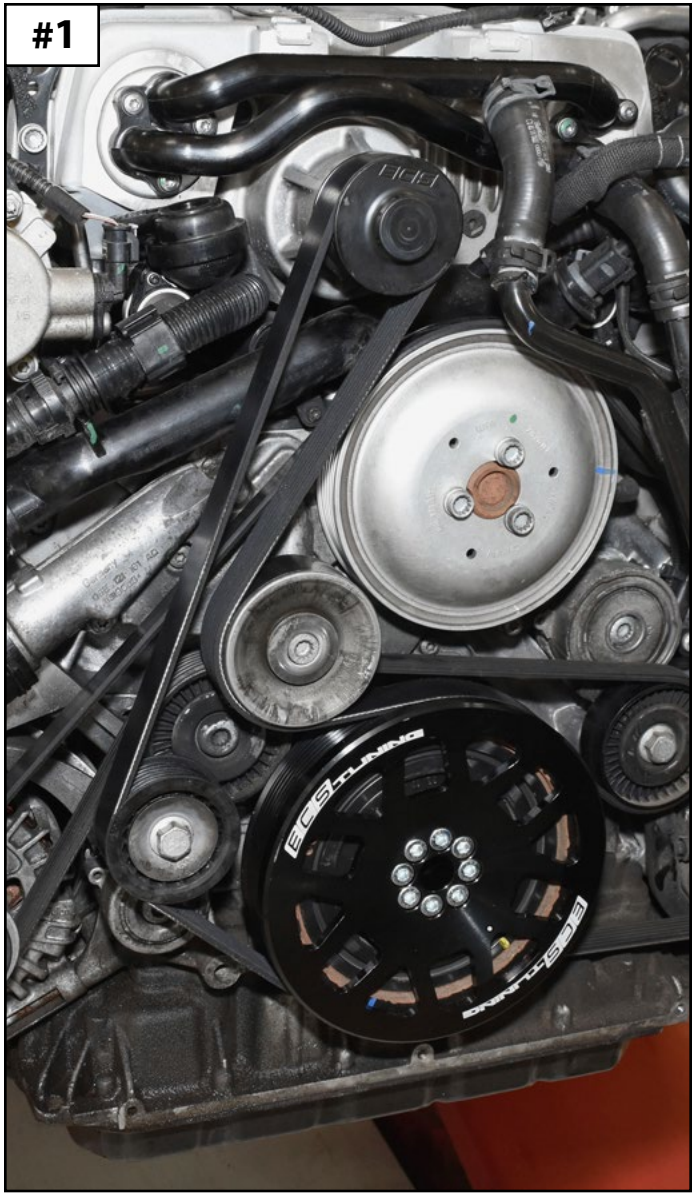
Install the new supercharger belt (**photo #1**). We've included a belt routing diagram on Page 23 for you to reference if needed.

Torque the crank pulley bolts in a star pattern, first to 20 Nm, then turn them an additional 90° (**photo #2**).

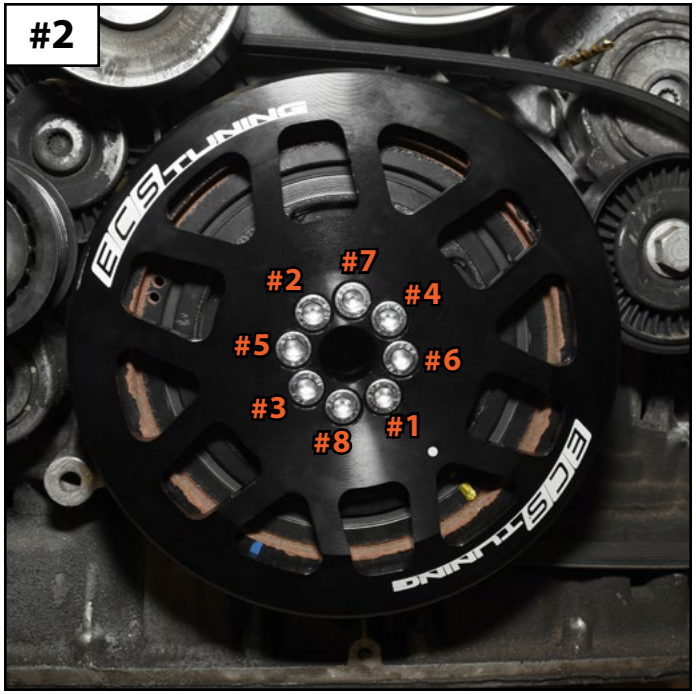
Please note that due to the size of the upgraded crank pulley, the accessory belt won't be able to be removed without loosening or removing the supercharger idler pulley (**photo #3**).

Your installation is complete!

#1



#2



#3

NOTE: The supercharger idler pulley will need to be removed in order to replace the main drive belt in the future.

BELT ROUTING DIAGRAM

Please reference the photo on the right for the locations of belt driven accessories and the routing of both the accessory belt and the supercharger belt.

Supercharger Belt

Accessory Belt

SC: Supercharger Pulley

I: Supercharger Belt Idler

T: Supercharger Belt Tensioner

CRANK: Crank Pulley (drives both belts)

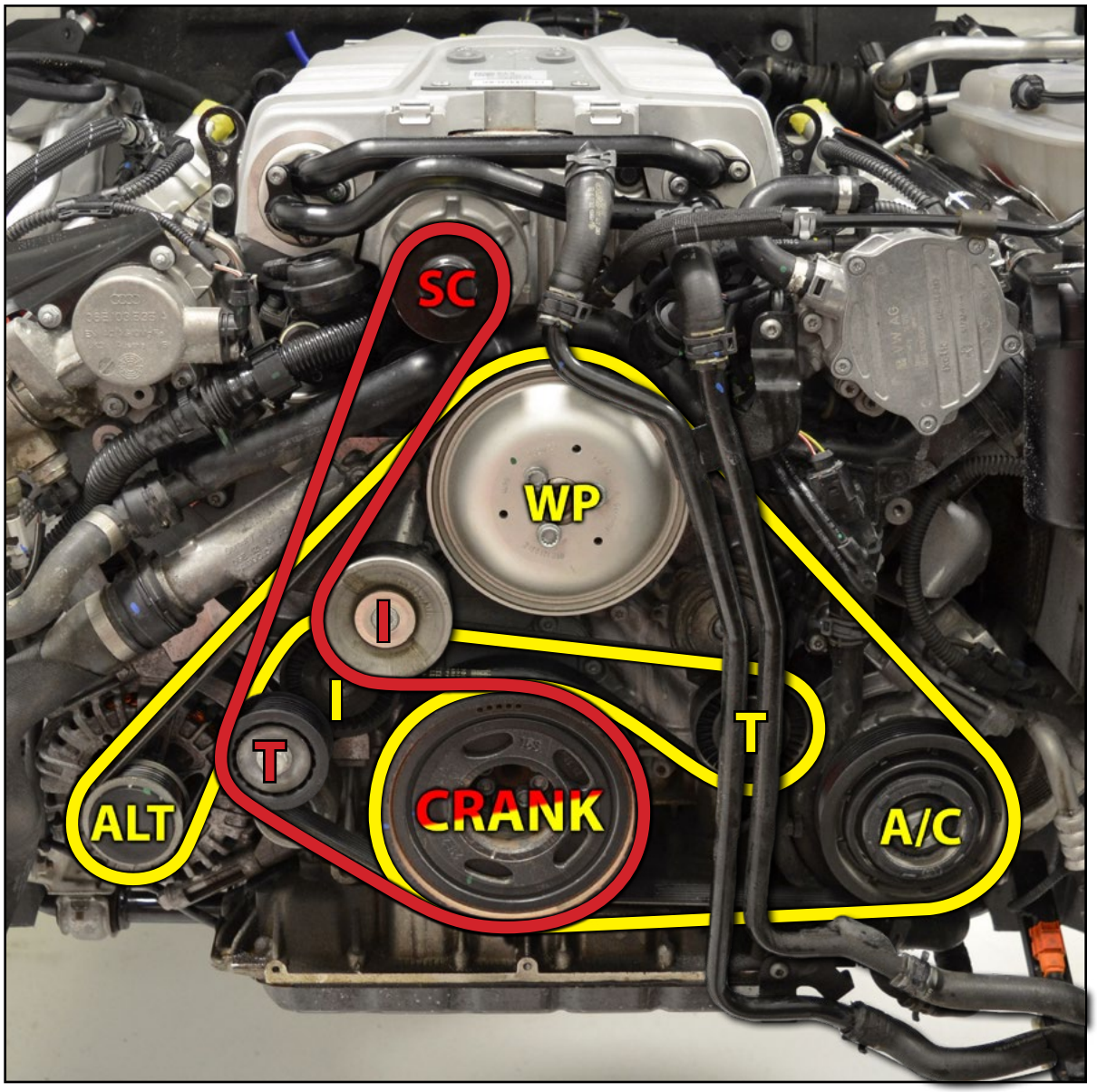
WP: Water Pump Pulley

I: Accessory Belt Idler

T: Accessory Belt Tensioner

A/C: A/C Compressor

ALT: Alternator



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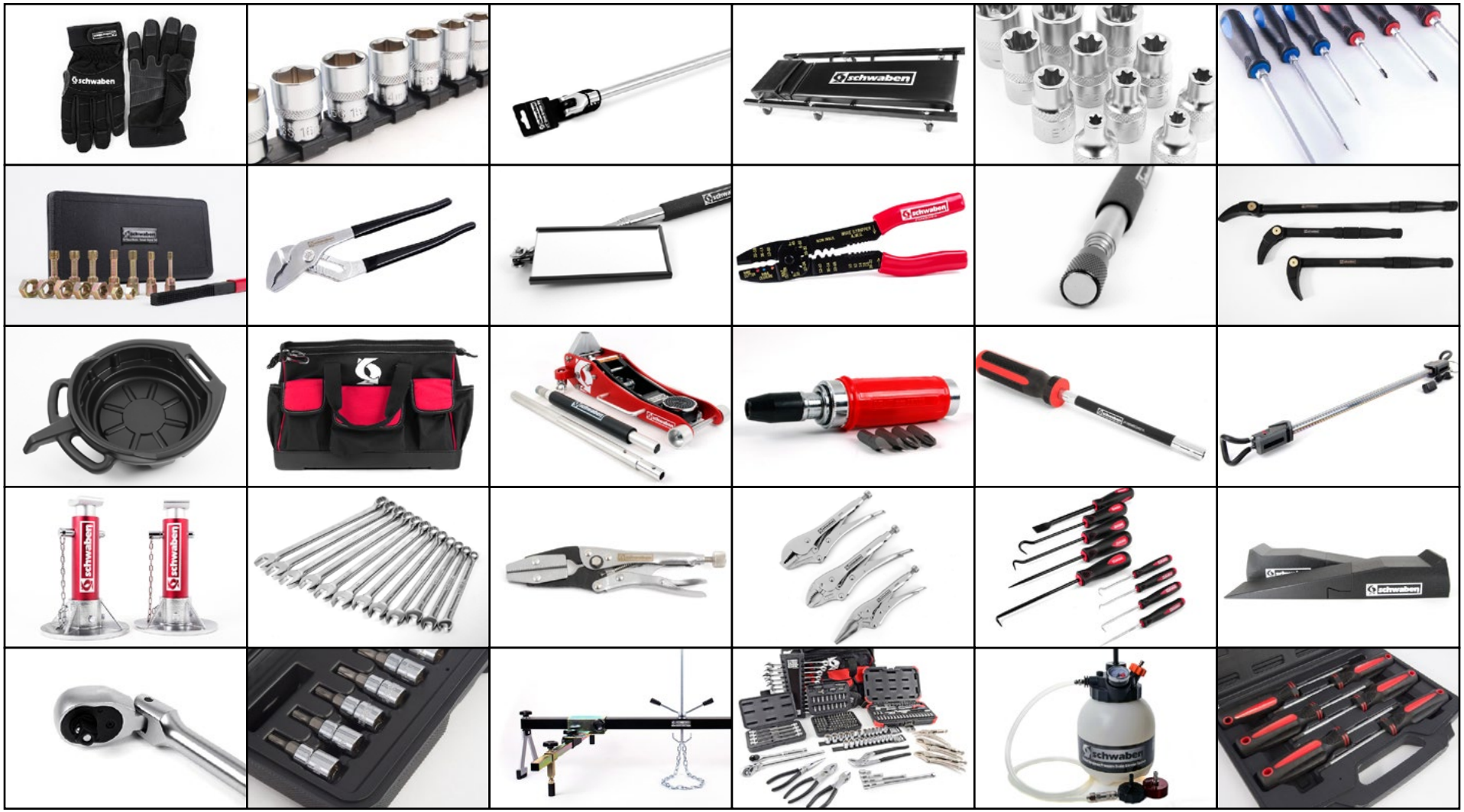
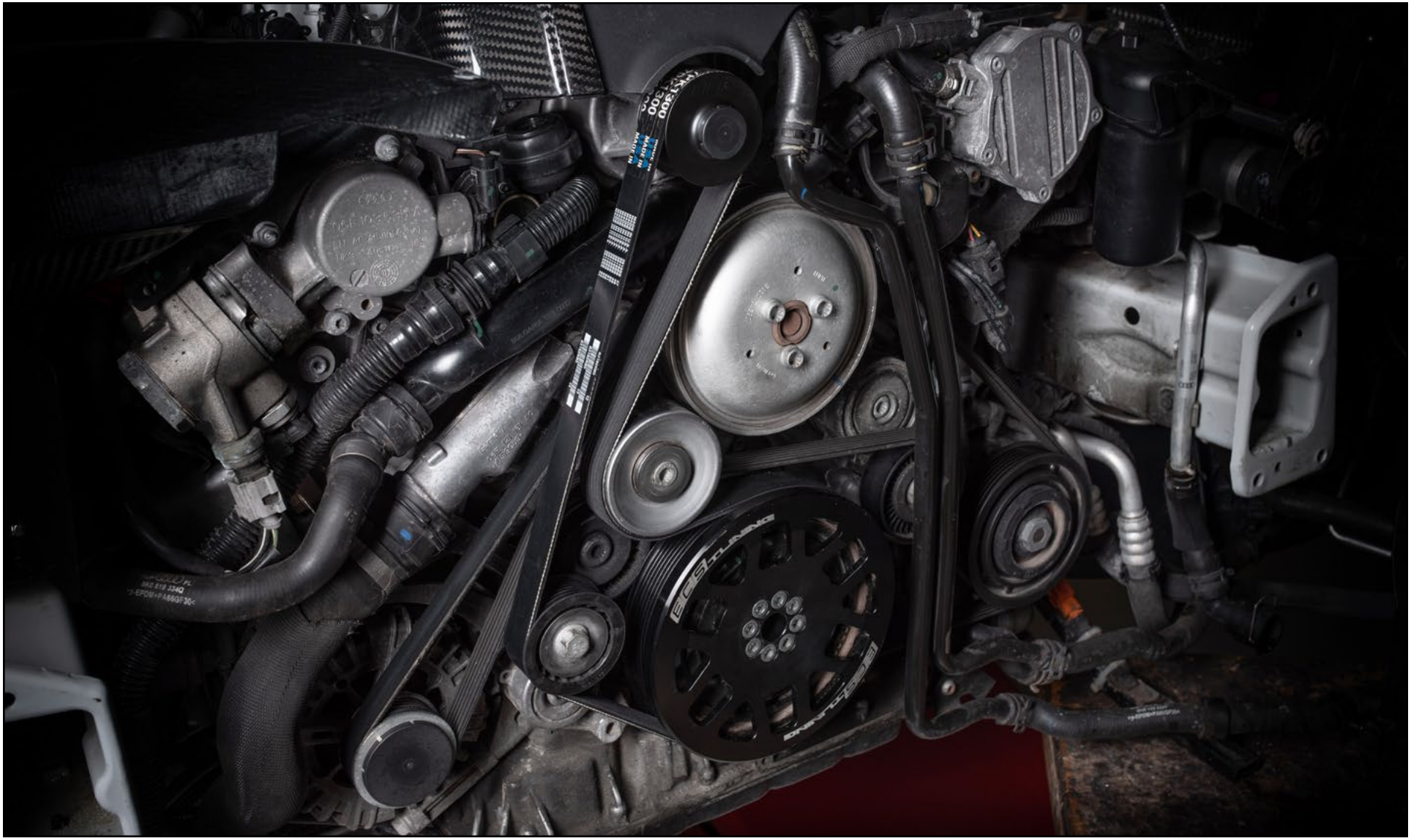


Your 3.0T Pulley Upgrade installation is complete!



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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