

Volvo TechTips

Information for the Independent Volvo Specialist

VolvoTechTips.com

Spring 2023

v8 | n1

Supercharger Service

Also Inside:
3.2L Engine Timing
Chain Replacement

Volvo Seats and
Seat Belts

Interior Repairs

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V O L V O

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Caution: Vehicle servicing performed by untrained persons could result in serious injury to those persons or others. Information contained in this publication is intended for use by trained, professional auto repair technicians ONLY. This information is provided to inform these technicians of conditions which may occur in some vehicles or to provide information which could assist them in proper servicing of these vehicles.

Properly trained technicians have the equipment, tools, safety instructions and know-how to perform repairs correctly and safely. If a condition is described, DO NOT assume that a topic covered in these pages automatically applies to your vehicle or that your vehicle has that condition. Volvo Car USA LLC, the Volvo name and Volvo logo are registered trademarks of Volvo Corporation.

Features

Timing Chain Replacement on a Volvo 3.2L Engine

The 3.2 liter engine is a six cylinder non-turbo engine. In this article, we will cover the replacement of the engine timing chain and related components.



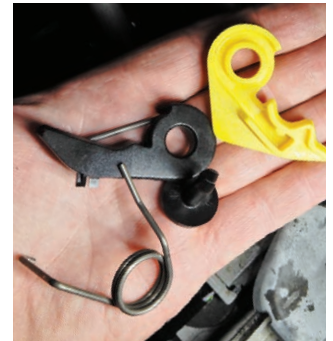
Testing, Repairing, and Servicing Volvo Seats and Seat Belts

This article covers various repairs on seats and seat belts that you may find helpful, should they come through your shop.



Three Common Interior Repairs on Volvo Vehicles

In this article, we will cover a few different repairs that don't take a lot of time, but knowing these situations can definitely help with repairing these vehicles.

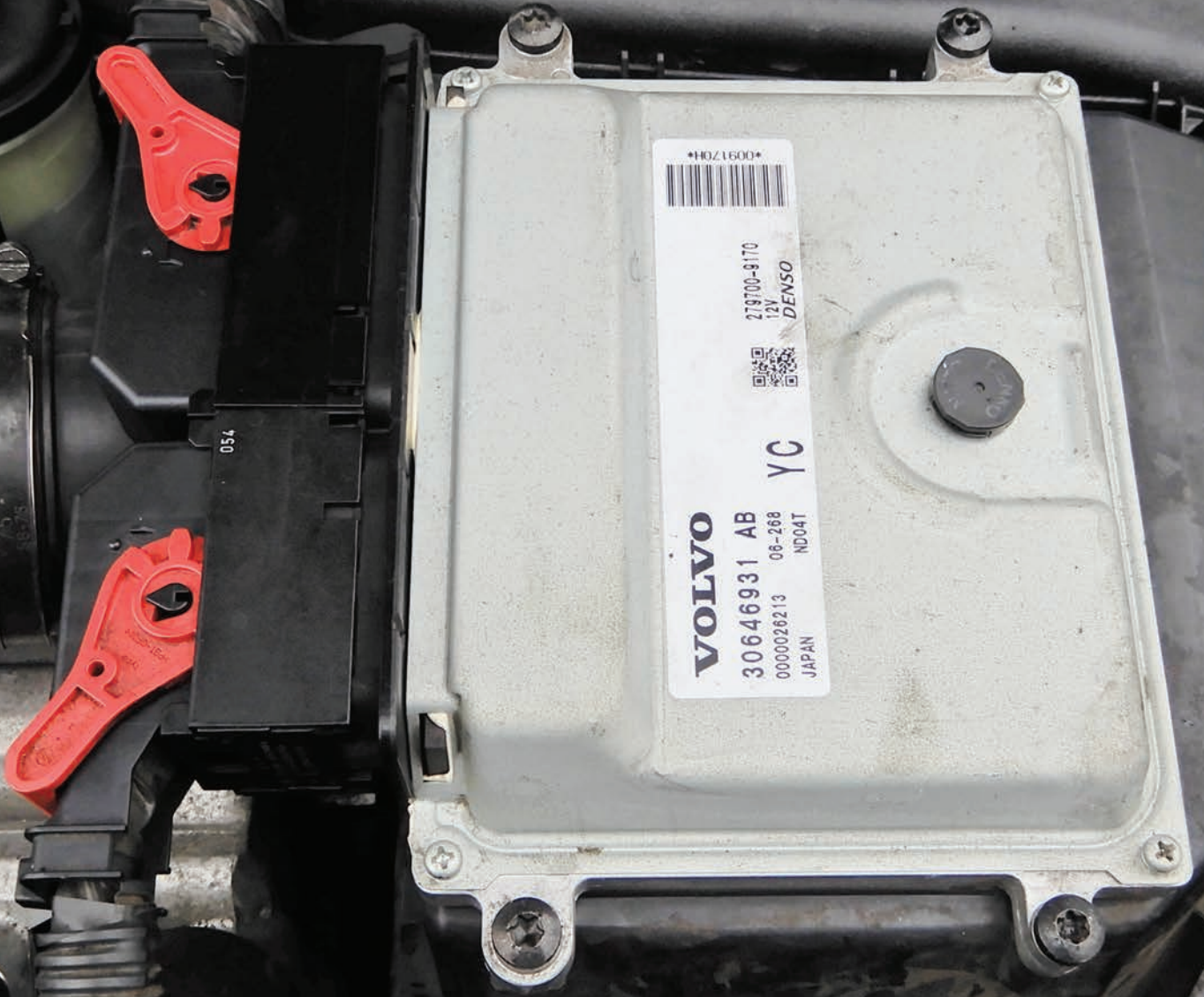


Supercharger Service on High Mileage Volvos

This is part of a continuing series of articles that cover some common issues that you may experience on Volvos with higher mileage and age.



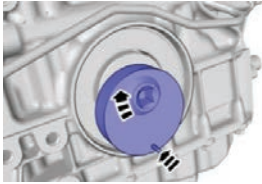
Timing Chain Replacement on a Volvo 3.2L Engine



1021500
009170H
219700-9170
12V DENSO
VOLVO
30646931 AB
06-268
0000026213 ND04T
JAPAN

Shown here:
ECM on top of
air filter housing

The 3.2 liter engine is a six-cylinder non-turbo engine. In this article, we will cover the replacement of the engine timing chain and related components on an XC90. The procedure may differ on other models.



Volvo special tool 9997257 installed on front of crankshaft

To do this job you will need some special tools: front crankshaft tool number 9997257; front camshaft tool lock number 9997261; the anvil block, two of them (they hold the camshaft gears on the timing chain

side); intake side Volvo tool number 9997264; and exhaust side, number 9997263. You will need a torx T60 wrench for the center bolts for these gears, Volvo part number 9997272. The position sensors for the timing chain cover when assembling, two of them, are Volvo part numbers 9997266 and 9997267.

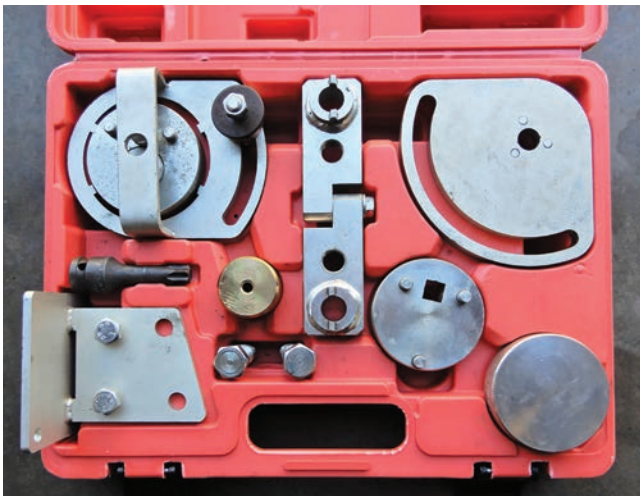
Set the vehicle on a hoist and drain the coolant and oil. Remove the front right tire and inner fender. Remove the plastic plug at the crankshaft and insert tool number 9997257 and turn with a ratchet until it lines up in position. The little pin on the tool will lock into place when correctly installed.

Remove the top cover over the engine and set it aside. Remove the coolant expansion tank from the vehicle. Remove the torque mount and bracket to get access to the front camshaft plug seals. Using a screwdriver, puncture the front plastic plugs and pop both out. Insert tool number 9997261 on the front of the camshafts and tighten down. This will lock the camshafts in place.

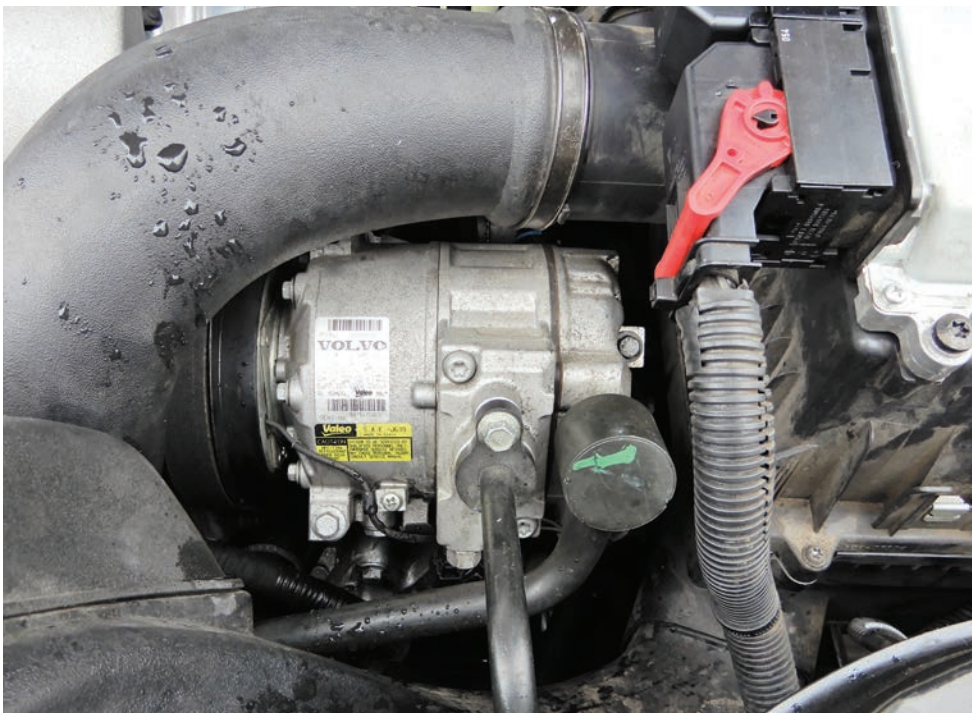
On the other side of the engine, remove the fresh air intake hose to air filter housing; two bolts hold it in place. Remove the plastic cover over the ECM on top of the air filter housing. Disconnect the two

electrical connectors to the ECM. It's a good ideal to squirt the connectors with a good penetrant/lubricant to help in removing them. Remove the cover over the fuse box and disconnect the positive cable and plug at the fuse box, tuck wires out of the way. Disconnect the hose at the air filter housing and disconnect the air mass meter electrical connector. Remove the air filter housing from the vehicle.

Hook up an A/C machine and recover the refrigerant from the system. Disconnect



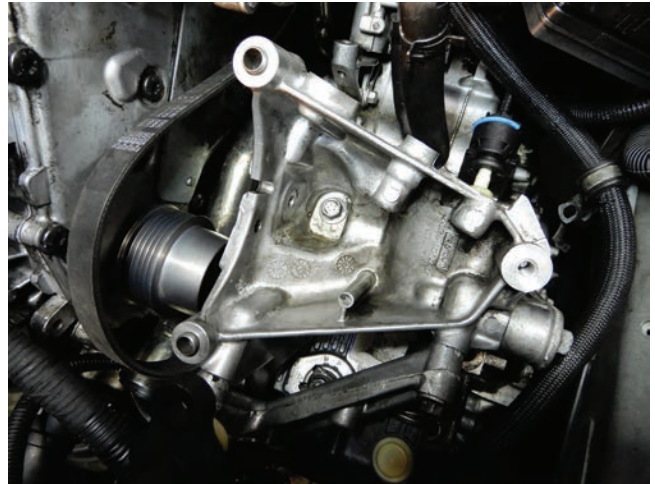
Special tools needed to replace the timing chain on the 3.2L engine



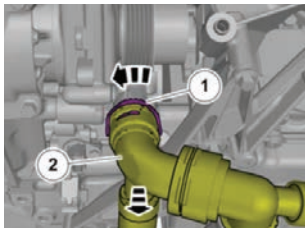
A/C compressor that will need to be removed



Drive belt tensioner that needs to be removed



Air conditioning bracket at top of transmission with tool installed



Radiator hose to remove and how to do it

both A/C hoses, plug the hoses and compressor so moisture and debris cannot contaminate the A/C system. This will make it easier to remove the hose to the throttle housing. Once the hose to the throttle housing is removed, we can then remove the A/C compressor. Disconnect the two electrical connectors at the compressor.

Disconnect the two bolts for the power steering reservoir and remove the bracket. Using an open end 19 mm wrench, relieve tension on the belt and insert a 3 mm pin to hold it in place. Remove the bracket from the A/C compressor to the engine.

Remove the three bolts on top of the compressor and the ones at the front of the compressor. Maneuver the A/C compressor out and set it aside. Remove the drive belt tensioner at the A/C mounting bracket.

Remove the radiator hose at the bottom of the radiator and the hose that is attached to it.



Power steering pump connected to water pump

The bracket that the A/C compressor mounts to needs to be removed. There are seven bolts that hold this bracket down; remove them and the bracket.

Once this bracket is out of the way, we can now start to remove the power steering pump. Extract the power steering fluid from the reservoir as much as possible. Disconnect the hoses at the bottom of the reservoir and set the reservoir aside.

Cabin Filter

CLEANER AIR FOR EVERYONE

All Volvos are equipped with a cabin filter that cleans the incoming air to ensure a healthier in-car environment.

Replace the cabin filter every other maintenance visit, or more frequently if driving in high traffic areas or on dusty roads.

Contact your Volvo dealer for a complete selection of Volvo Genuine Parts.

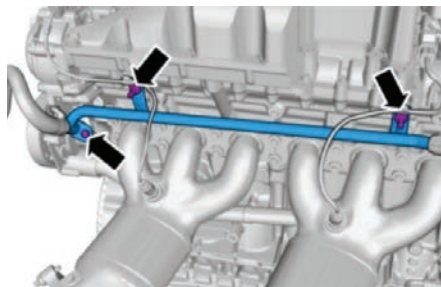


Now we will want to remove the fuse box. There is a bolt under the positive cable which we already removed. Remove that bolt and the one on the other side of the fuse box. Using a tie strap, connect it to the fuse box and tie strap it out of the way. Remove the transmission gear selector cable and bracket. Remove the three bolts at the brake module and pump bracket, and pull up on the assembly so that there is room to get to the power steering pump.

Disconnect the high pressure hose at the pump. Remove the bracket at the back of the pump. With a long stem T25 torx bit, remove the two bolts at the power steering pump pulley to water pump.

Now remove the two bolts at the bottom of the pump on both sides, and maneuver the power steering pump from the water pump and set it aside. Remove the drive belt and idler pulley.

On the back side of the engine, on the exhaust side, there is a coolant pipe that is connected to the water pump. This pipe needs to be disconnected; there are two bolts above the exhaust manifold on each side that need to come out. There is also a bolt right at the water pump that needs to be removed, and then pulled loose from the water pump.

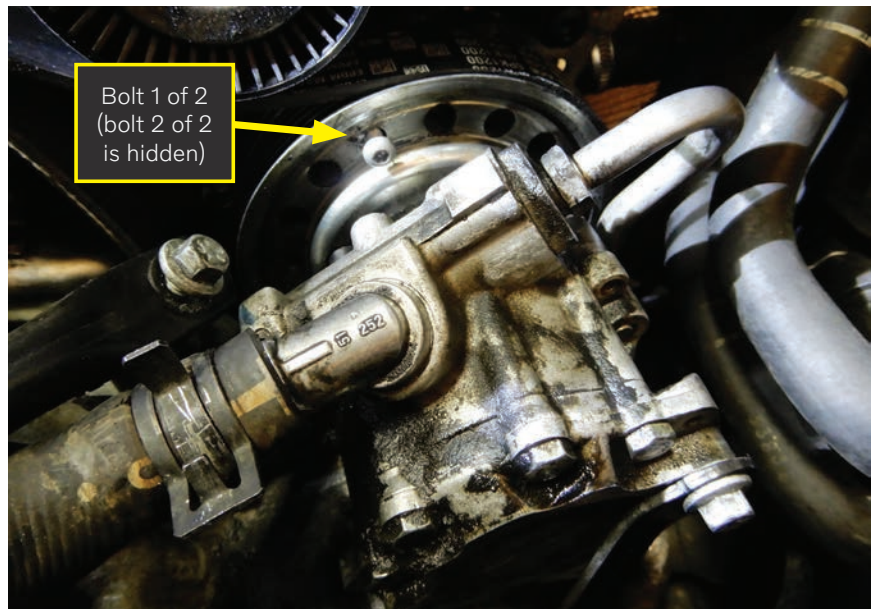


Water pipe at back of engine that connects to water pump

The drive belt pulley at the front of the timing chain cover will need to be removed using special tool numbers 9995760 and 9512926. Insert a screwdriver at the center of the plastic cover at the pulley and pop out the cover and discard. Use the tools to unbolt and remove the pulley.

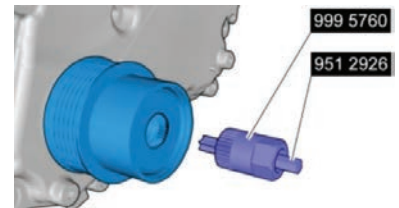
Remove the coolant pipe at the bottom of the timing cover that inserts into the water pump housing; there are two bolts at the bottom of the cover to remove.

Remove the coolant pipe at the bottom of the timing cover that inserts into the water pump housing; there are two bolts at the bottom of the cover to remove.



Two bolts at power steering pump pulley to water pump that need to be removed

Remove the vacuum pump at the timing cover; two bolts hold it on. Now the timing cover can be disassembled. Remove the two center bolts and the 20 outside bolts, and pop the outer cover off.



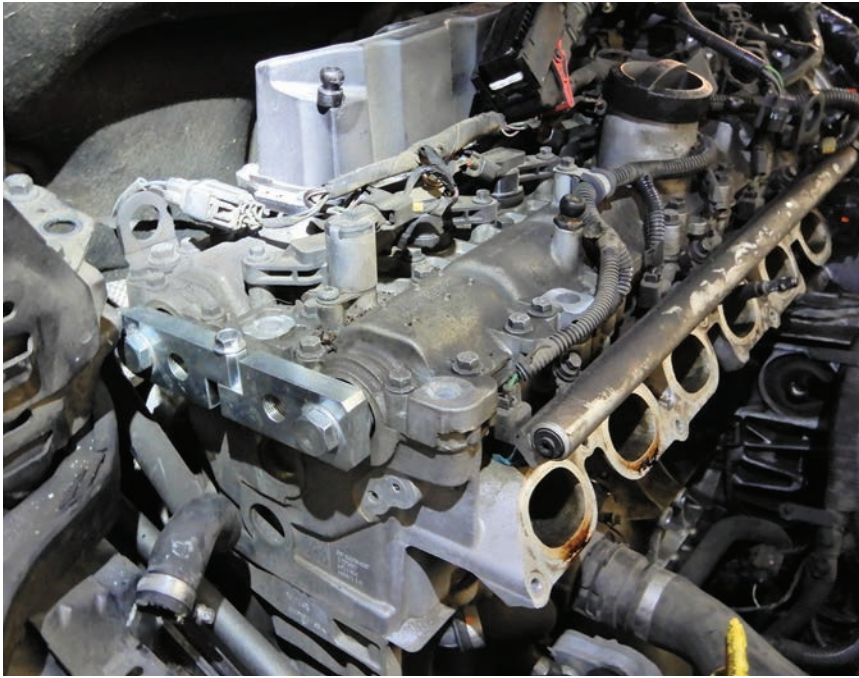
The two tools used to remove pulley at READ assembly

On the front of the timing chain tensioner is a little tab; insert a small screwdriver and pry it open enough to push the tensioner down and lock it into place, so tension is loose at the chain. Insert the pin into the tensioner to hold it in place.

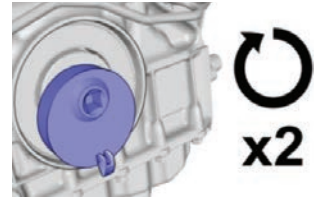
Install special tools on front of timing chain gears at camshafts, 9997264, 9997263, and 9997272 to remove the center bolts on both gears. (See image next page.)

Remove the bolt at the tensioner guide and remove the guide. Mark the gears so you can reinstall them the same way they came off. Slide both camshaft gears off with the timing chain and remove from engine. Try to keep the chain on the gears and install the new chain onto the gears at the same position. This will help when installing the new chain.

This will be a good time to replace the gasket at the inner timing cover. Remove the two bolts at the tensioner guide and remove the inner cover with the water pump assembly. Clean the area really well and



Special tools installed at camshaft gears



Spinning engine over at front of engine crankshaft, using tool number 9997257

the tab with a small screwdriver and pull out the pin. Let the tensioner expand and remove the small screwdriver at the tab.

Reinstall the two anvil tools at camshaft gears, 9997264 and 9997263. Use tool number 9997272 to tighten both camshaft bolts. On the exhaust side, torque to 75 Nm and then 90 degrees. On the intake side, torque to 110 Nm. Remove the tools after the center bolts at the camshaft gears are tight. Also remove tool number 9997261 at the front of the engine which is locking down the camshafts. At the front of the crankshaft, turn the engine over a couple of times just to make sure everything is lined up correctly.

Now make sure to clean the surfaces of both the engine block and the outer timing chain cover. Install the new gasket and set the cover into place. Install three bolts in the cover but do not tighten them completely. Using special tool numbers 9997267 and 9997266,

insert them in front of the cover to align the cover up into place. See image next page.

Insert the twenty 7 mm bolts and the two 8 mm bolts but don't tighten them yet. Tighten the three center bolts at the center of the timing chain cover to 17 Nm. Now tighten the twenty bolts on the outside of the cover, in order, to 17 Nm. Remove the alignment tools from the cover. See image next page.

Using the 9 mm allen wrench socket, turn the two fasteners in until they touch. Install the two 8 mm bolts and tighten to 24 Nm. See image next page.

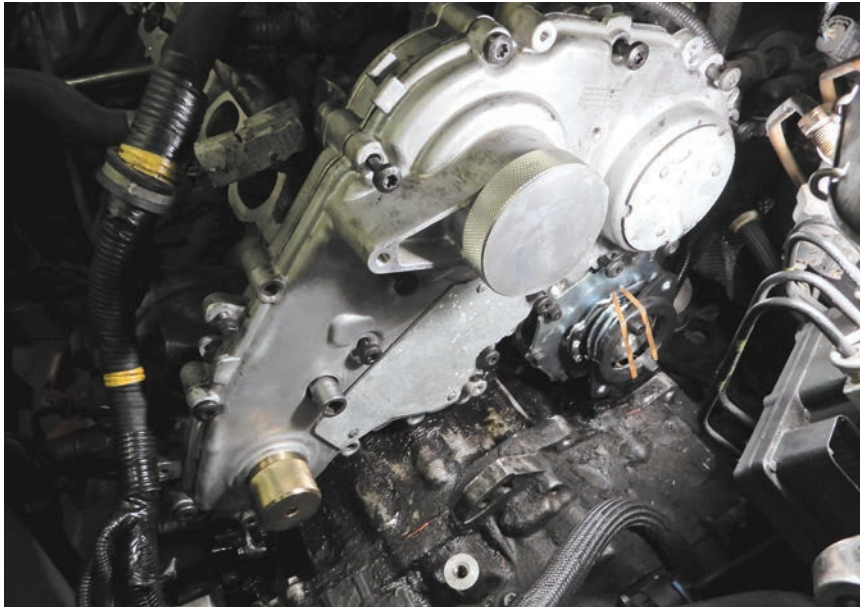


Inner timing cover that needs to come off and replace inner gasket

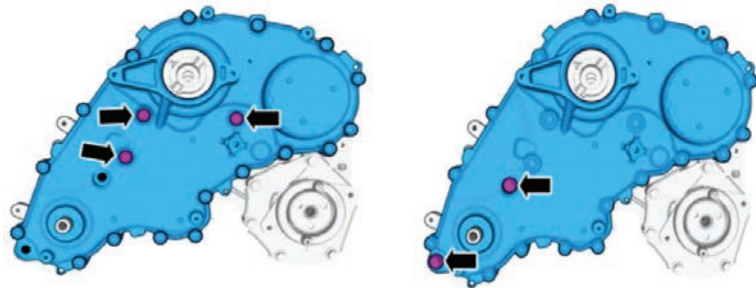
install a new gasket. There is also a rubber seal at the READ assembly that should be replaced at the same time, and replace the O-ring at the water pump pipe.

Back out the two 9 mm fasteners at the inner cover a couple of turns. Install the inner cover onto the engine and tighten down the two bolts to 17 Nm. Install new guide rails. Now with the new chain on the gears, install the gears and chain to the engine. Install the center bolts at the camshaft gears and leave them loose for right now.

Install the tensioning arm and new tensioner and torque down to 10 Nm. On the new tensioner, pull back



Special Volvo tool to align front timing chain cover tool numbers 9997267 and 9997266

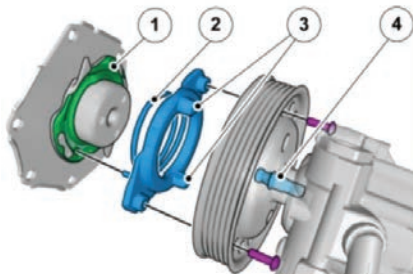


The three center bolts that need to be tightened first; then the twenty bolts that need to be tightened in order

The two 9 mm allens that need to be turned in until they touch

Install the pipe that inserts into the water pump and secure with the two bolts that hold it to the engine. Install the coolant pipe at the back of the engine by the exhaust manifold that connects to the water pump. There is one bolt at the pump and two bolts that secure the pipe near the exhaust manifold; torque bolts to 17 Nm.

Install the power steering pump onto the water pump coupling pulley, making sure to fit it into place properly. Install the drive belt first around the pulley before inserting the power steering pump to the water pump.



Correct way to install power steering pump onto water pump

There is a plastic pin that fits into the center of the power steering pump that fits into the water pump.

Once the power steering pump is correctly installed to the water pump, install the two bolts that secure the pump to the engine and tighten down. Install the bracket at the back of the pump and tighten down. Install the two screws at the power steering pump to water pump coupling pulley and tighten down. Connect the high pressure power steering hose to the pump using a new O-ring at the pressure hose.

Install the vacuum pump at the intake camshaft at the timing chain cover, lining up the vacuum pump drive to the camshaft. Two bolts hold the pump in place, tighten down. Install the idler pulley to the front timing chain cover and tighten down.

Install a new lip gasket at the intermediate shaft using tool number 9997265. Install a new coupler pulley and tighten down using tools 9995760 and 9512926. The correct torque is 60 Nm.

Install a new bottom radiator hose onto the pipe from the water pump. Turn the collector at the radiator hose counterclockwise to secure it to the pipe. Secure the other end of the radiator hose to the radiator and tighten the clamp.

Now set the air conditioning bracket into place on top of the transmission, and start the bolt in the center of the bracket to the transmission finger tight. Use tool number 9997262 to align the A/C bracket. Set the tool into place and start the bolts, but just finger tight at this time. Make sure that the tool is in place correctly and that the coupler pulley turns counterclockwise.

Install the bolts at the bracket except the two that have the allen wrench adjusters, and finger tighten them for now. Tighten the two bolts at the tool and then tighten the center bolt at the bracket to the transmission to 50 Nm. Insert an allen wrench at the bolt hole on top of the bracket and torque to 1 Nm, then insert the bolt and torque to 50 Nm.

Tighten the other bolts at the front of the bracket, 8 mm to 24 Nm and the 10 mm to 50 Nm. The allen

bolt at the front of bracket screws in and gets torqued to 1 Nm. Install the bolt and torque to 24 Nm. Remove the tool from the bracket.

Run the drive belt around the power steering pump pulley to the idler pulley and down to the coupler pulley. Install the belt tensioner at the bracket and leave the pin in place at this time for the tensioner.

Install the air conditioning compressor into the bracket, and route the drive belt around the pulley. Install the bolts for the compressor and tighten down. Connect the electrical connectors to the compressor.

Install the bracket from the engine to the compressor and the bracket for the power steering reservoir. Connect the hose to the reservoir to the power steering pump. Set the reservoir into the bracket and secure.

Install the three bolts at the bottom of ABS module bracket and tighten. Put the fuse box back in place and secure the two bolts that hold it down. Tighten down the positive cable and plug in the connector at the fuse box. Set the air filter box, with the ECM module on top, into place. Install the plastic pipe to the throttle housing and the air filter housing and tighten both clamps.

Connect the two A/C lines to the compressor and secure. Secure the bracket for the A/C lines near the intake manifold. Evacuate the A/C system and charge.

Install the camshaft plugs and install the torque mount at the front of the engine, right side. Set the expansion tank into place, use the proper tool to vacuum the system, and install new coolant. Install the plug at the crankshaft, the inner fender, and the wheel on the right side.

Add oil to the engine and power steering fluid to the power steering reservoir. With the vehicle still on the hoist and the cap off of the power steering reservoir, turn the steering wheel back and forth to get air out of the steering system. This could take a little while.

Start the vehicle up and check the power steering fluid; you might have to shut the engine off and turn the wheel back and forth again to let air escape from the reservoir. Start the engine back up and let it warm up. Look around just to make sure everything looks good.

Test drive the vehicle and then check again making sure fluids are full.

Replacing the timing chain on this vehicle isn't something you do every day, but next time around will definitely be easier. ●

Volvo Genuine Parts

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Get all the benefits of Volvo Genuine Parts by contacting your Volvo retailer.



Testing, Repairing and Servicing Volvo Seats and Seat Belts



PASS AIRBAG OFF
SERVICE URGENT

We all know that Volvo has always made it a point to set the standard in automotive safety. Over the years, Volvo has helped develop and perfect a lot of the safety systems that have become standard in most of the cars on the road today.

That includes the most common and oldest safety system—the modern seat belt.

It was an engineer at Volvo named Nils Bohlin that invented the 3-point seat belt in 1959; before that, the cars that had seat belts only had lap-style belts that would allow the driver and passenger's upper body to fly forward in a collision. This type of seat belt was far from safe.



Volvo engineer Nils Bohlin did not invent the seat belt, but he made it better by inventing the 3-point seat belt that is used in every production car and truck on the planet.

His design was as obvious as it was intelligent, perfectly suited to the seat occupant's body.

Since the 1960s, Bohlin's belt has saved hundreds of thousands of lives and prevented or reduced the severity of injuries among millions. This makes the 3-point safety belt the single most important safety device in the car's 120-year history. And that's not just Volvo's claim.

As confirmation of its effectiveness, Bohlin's invention has been identified by German patent registrars as one of the eight patents to have the greatest significance for humanity during the hundred years from 1885 to 1985. Bohlin shares this honor with patent holders such as Benz, Edison, and Diesel.

Volvo Seats

If you have driven a lot of different Volvos over the years, you may have noticed what they have in common...

Volvos have some of the most comfortable seats of any car on the road today and it's been that way for a

lot of years. If you own a Volvo and have taken it on a long trip, you know what I mean. Even the older Volvo models have seats that stand the test of time.

And since the introduction of the Side Impact Protection System (SIPS), the front seats of the Volvo have played a major role in the overall safety of the car.

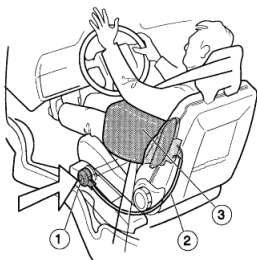
Compared to today's side impact air bag systems, the early versions were pretty basic. The early Volvo SIPS air bags had three basic parts—the bag assembly, the wire harness, and the impact crush sensor that is mounted on the seat rails that face the inside of the doors.

The early versions would only deploy if the impact to the side of the car was bad enough for the inside of the door to push into the impact sensor.

That would mean that deployment of these early side impact air bags would usually only happen in a direct impact to the side of the car that is severe enough to push the door into the seat's crash sensor.

These early SIPS bags were mounted to the upper seat frame on the side that faces the door; when they deployed they would tear open the upholstery on the outside of the backrest and cover the area on the side of the driver's head and upper body.

The latest Volvos with advanced ADAS systems will use the side impact bags if the system even thinks there is going to be a crash event that will affect that side of the vehicle.



Early SIPS bags on Volvos used an impact sensor attached to the sides of the driver and passenger seat rails to send a deployment signal to the side impact air bags mounted on the upper back rests of front seats. Later versions also deployed the curtain air bags mounted in the sides of the headliner.

Seat Memory

Remember, on most Volvos, when the battery is disconnected, the customer's seat memory settings may be lost. This is rarely an issue unless the car you are working on is shared by two people and they have set the seat to specific positions.

Using Scan Tools to Diagnose Seat and Seat Belt Problems

The best scan tool for performing testing on a Volvo is still a laptop with VIDA system. VIDA has all the features you need—codes, bi-directional control, software installation and a lot more.



| Software Installation | | | | |
|---|----------|-------------------------------|--|-----------------------|
| Available Installations | | Order History | Order for INdependent Dealership | |
| Work List | Upgrades | Hardware Changes | Function Changes | All |
| Description | Part No. | Size (kB) | Average Installation Time (min) | |
| Remote key application | 9438429v | -- | -- | Order |
| Residual heater appt | 9488735 | -- | -- | Order |
| RTI application (au) | 30737868 | -- | -- | Order |
| RTI application (eu) | 8666626 | -- | -- | Order |
| Seat heater 28-35c appl | 8651385 | -- | -- | Order |
| Seat heater 32-38c appl | 8651382 | -- | -- | Order |
| Seat heater 36-43c appl | 8651379 | -- | -- | Order |
| Spanish application | 9483155 | 78 | 1 | Order |
| Swedish application | 9483148 | 78 | 1 | Order |
| Towbar fog light off appl | 9438244 | -- | -- | Order |
| Turkish application | 30668012 | 78 | 1 | Order |

VIDA is still the best tool out there when it comes to working with Volvos. It can help you get to the root cause of a problem quickly and is a great way to confirm a "fix." Fun fact: You can use VIDA software to set custom seat temperatures if your customer thinks they're too hot or not hot enough. (Although, you may or may not want to let your customers know about this because they may expect results that are beyond the available settings.)

Technical Journals

Volvo has issued multiple technical journals (TJs) over the years that cover seats and seat belts, so as with any problems you are dealing with or trying to repair, start by checking for any applicable service bulletins. This habit will serve you well in your career as an automotive technician.

A common issue that customers come in for is seat belt catches that won't allow the seat belt to lock in place or that will not even let the seat belt's male tab to be inserted into the catch.

The service bulletin TJ19383.8.0 covers this.

In a lot of cases the seat belt catches can be cleaned out with some compressed air. You would be surprised how much stuff can collect inside the average seat belt catch over the years, especially in the case of cars that transport kids or dogs a lot.

Seat Belts Not Retracting, Sticking or Worn Seat Belt Catches or Worn Straps Causing Sticking

Don't try or offer to fix a customer's seat belt. If it's broken or malfunctioning in any way, replace it with a new OE Volvo part. If your customer is educated about the realities of worn-out safety system parts, they will make the right choice.

If you have to replace a seat belt in a Volvo that has an active pretensioner as part of the assembly, you need to take precautions when removing the old part and installing a new unit.

Warning! Under no circumstances use an ohmmeter or other live measuring instrument to take readings



A lot of complaints about sticking or inoperative seat belt catches can be fixed by cleaning out the dirt and debris that gets stuck in the mechanism.

on a disconnected non-deployed seat belt tensioner. There is a risk that the seat belt tensioner could deploy.

Warning! The seat belt tensioner must never be taken apart, repaired, or moved to another vehicle.

Installation

Before you install a new seat belt catch, make sure you ordered the right one by plugging the male end into the new catch before you disassemble, to ensure the right fit. You don't want to find out you got the wrong part after you remove the seat.

Seat Heaters

One of the best options that Volvo and other car manufacturers have come up with is electrically heated seats.

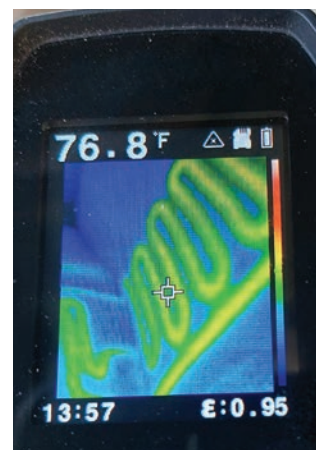
If your car has them, you know this: in colder climates this option is a must.

Volvo has been offering heated seats as an option for a lot of years now. Even some old 240 series Volvos came equipped with them.

Volvo's heated seats are very reliable, but from time to time you will get a customer in that has a problem with them.

The main problems you will see are broken wires or damaged heating grids. In some rare cases, on worn-out seats, you may encounter a shorted heating grid.

One of the quickest ways to check if a seat's heating grid is fully working or is partially broken is to use a quality thermal imager.



A cool way of checking out the heating grids in heated seats is to use a quality thermal imager. Just turn on the seat heater switch and you can "see" the grid through the upholstery and see breaks in the grids too.

This cool tool is very useful around the modern auto shop; it can allow you to actually "see" temperature changes in parts and components.

If a seat heater grid is broken or open, you will be able to see what part of the heating grid is not heating up without removing the upholstery.

If you turn on the seat heater switch and you don't see any heat in the thermal imager display after a couple of minutes, it's time to get into electrical diagnosis.

Depending on the year of the Volvo you are working on, a problem with the seat heating circuit may have set a trouble code in the CEM.

The number one cause of a seat heater not warming up is a break or open in the seat heater grid; the switches tend to be pretty bulletproof.

This usually happens in older high mileage cars in which the seat cushions are well worn in and starting to sag.



New Volvo seat belt catch

A Word About Seat Belt and Safety System Replacement Parts

If you are replacing any seat belt or safety system parts on a Volvo or any other car you work on, new OE factory made and tested parts are the only real choice. As far as aftermarket seat belts, air bags and other such parts, thankfully not much is available.

If you are tempted to install a used part, just don't! There are so many reasons why not to.

You are responsible for your customer's safety when you repair these systems and replace worn parts, so do it right and only use new OE Volvo parts from your local Volvo dealer's parts department.

Improved Cycle Times

We know quality repairs matter at your shop, and we're here to help.

Get all the benefits of Volvo Genuine Parts by contacting your Volvo retailer.



Power Seats

Volvo has offered power seats in most of their models for a long time; these days all Volvos come standard with at least a power driver's seat.

Volvo power seats are overall very reliable and most problems that your customers will complain about are from lack of knowledge on the operation of the seat controls. This is especially true when it comes to the seats' memory functions.

It's all covered in that magic book that's under all that stuff in the glove box. You know, the one that is still covered in plastic and has only been flipped through one time when the customer picked up their brand new car from the dealership.

Of course, part of every technician's job is to educate your customer, but remember that old proverb, "If you give someone a fish, they can eat that day, but if you teach them how to fish, they can eat their whole life."

Of course, your customer may not want to learn.

The other most common issue that you may see (not just on Volvos) is a jammed or frozen lower power seat that won't move forward or backwards.

One of the most common problems that your customers will have with their power seats is caused by coins and debris that fall under the seat cushions and jam into the track system when the seats are moved back and forth.

In most cases you can fix this problem by unbolting the seat and using some pliers to pry the bent coin or coins out. Make sure to clean and lube the tracks when you have the seat loose.

You can usually do this repair by just unbolting the seat and leaning the seat back. Try not to damage the seat's wire connectors when you are removing and installing the seat assembly.

If you have to disassemble the seat tracks, make sure to mark the positions of the upper, lower, right, and left track sections in relation to each other before disassembly; this will save you a lot of frustration later.

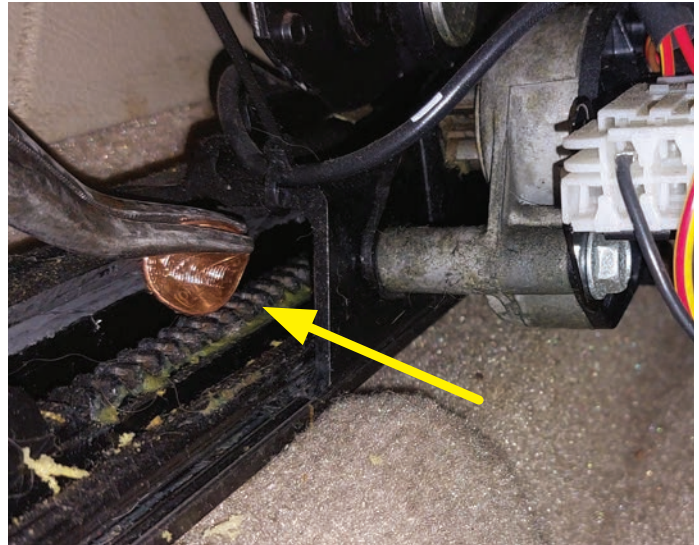
Disposing of Active (Explosive) Seat Belt Pretensioners and Air Bags

Check with your area's waste disposal and toxics office for regulations on proper disposal of this kind of waste.

In a lot of cases you will have to safely deploy these devices before you throw them away.

Remember just because that seat belt or air bag component is old and malfunctioning, does not mean that it will not accidentally deploy on you if you don't take the right precautions.

If you are not sure about air bag safety you can find information on Volvo's website volvotechinfo.com or on the NHTSA website (nhtsa.gov). ●



Sometimes the coins that fall out of pockets end up in the power seat's tracking system. And, when some one decides to adjust the seat forward or backward, the tracks try to "eat" the coin and jam.



Check your local regulations before disposing of active seat belt pretensioners and other live SRS components. In most states, the shop may be responsible for safely deploying the assembly before throwing it in the trash.

Every Internal Combustion Volvo Starts with Castrol® Inside

Volvo Cars recommends
Castrol® EDGE® Professional V 0W-20



Castrol EDGE Professional V 0W-20 is exclusively engineered in collaboration with Volvo Cars for use in Volvo Drive-E engines. Every litre is certified CO₂ neutral according to the highest global standard.

Engineered with patented **Fluid TECHNOLOGY**, Castrol EDGE Professional transforms to be stronger under pressure and reduces metal-to-metal contact to unlock the true performance of the engine.

Castrol EDGE Professional V 0W-20 is exclusively available for Volvo Cars authorized retailers.

The Castrol logo, featuring a red and white shield with a green and yellow flame-like shape, followed by the word "Castrol" in red. Below it, the words "EDGE" and "PROFESSIONAL" are written in a stylized, metallic font.

Castrol
EDGE
PROFESSIONAL

Seat Memory Position 3 lost or changed, Power Seat Module, PSM

No: TJ 23715

Func Group: 8526

Func Description: Adjustment device, assembly parts

Partner: 3 US 7510 Volvo Cars North America

Issue Date: November 26, 2013

Vehicle Type

| Type | Model Year | Plant | Chasis range | Struc Week Range |
|------|------------|-------|-----------------|------------------|
| 124 | 2007-2013 | | 0000850-0173451 | 200640-201319 |
| 134 | 2011-2013 | | 0000194-0234407 | 201020-201319 |
| 135 | 2008-2010 | | 0000395-0165430 | 200720-201019 |
| 136 | 2008-2013 | | 0000400-0169647 | 200720-201319 |
| 156 | 2010-2013 | | 0000212-0468378 | 200835-21319 |

CSC Customer Symptom Codes

| Code | Description |
|------|--|
| TM | Front seat/Power seat adjustment/folding does not work |
| UO | Front seat/Automatic adjustment (memory) does not work |

Diagnostic Trouble Codes (CTC)

Rows beginning with * are modified

Note! If using a printed copy of this Technical Journal, first check for the latest online version.

Description

Customers may experience Seat Memory Position 3 being lost or changed because of accidentally pressing the Power Seat Module (PSM) memory buttons with the back of their left leg while entering or exiting the car.

Service

Perform a PSM SW Upgrade. A new PSM SW is available with a 1 second delay added to the seat memory function to prevent accidentally changing the memory with a very short press of the buttons.

The length of the delay can be adjusted by using VIDA (version 2013D or later). This step is not necessary to do, but is available if desired.

NOTE:

The PSM has two types of memory:

- Seat Memory: Seat and mirror positions stored into PSM buttons 1/2/3.
- Key Memory: Seat and mirror positions connected to the ignition keys (remote controls).

These 2 memory types are independent of each other; the keys are not linked to the buttons 1/2/3. This TJ concerns only the seat memory stored in buttons 1/2/3, not any issues with the key memory.

Model Year/Class: XC70 (06-), 2006, 020044 13.9 V Pos2

ControlDICE-211073 (VCC-351787-1, version 1.0)

Programming the seat memory's delay time and acknowledgement

Information

The seat memory's delay time can be set after the latest software has been downloaded to the Power Seat Module (PSM). This applies to the following vehicle models: V40 (13-), V40 Cross Country, XC60, S60, V60, V70, XC70, S80 (07-) and S80L.

Acknowledgement of the seat memory can be received after software download in the Driver Information Module (DIM) and this applies to vehicles with combination instrument panel in the different versions "Standard Line" (with analogue presentation) and "High Line" (with graphic presentation) as follows:
 All vehicle models: S60, V60, XC60, V70, XC70, S80 (07-), V40 Cross Country as well of S80L with MY 2014- and V40 (13-) with structure week 1246-.
 Only vehicles with "Standard Line" for: V40 (13-) with structure week 1220 - 1245.
 Only vehicles with "High Line" for: V60 PLUG-IN HYBRID.

The following settings are recommended:
 Without acknowledgement: Delay time 1 second.
 With acknowledgement: Delay time 1.5 seconds.

Actual values

PSM - Seat Memory Storage Delay Time

PSM

Current software does not have support to adjust the delay time. Go to tab SOFTWARE and download the latest software to the Power Seat Module (PSM).

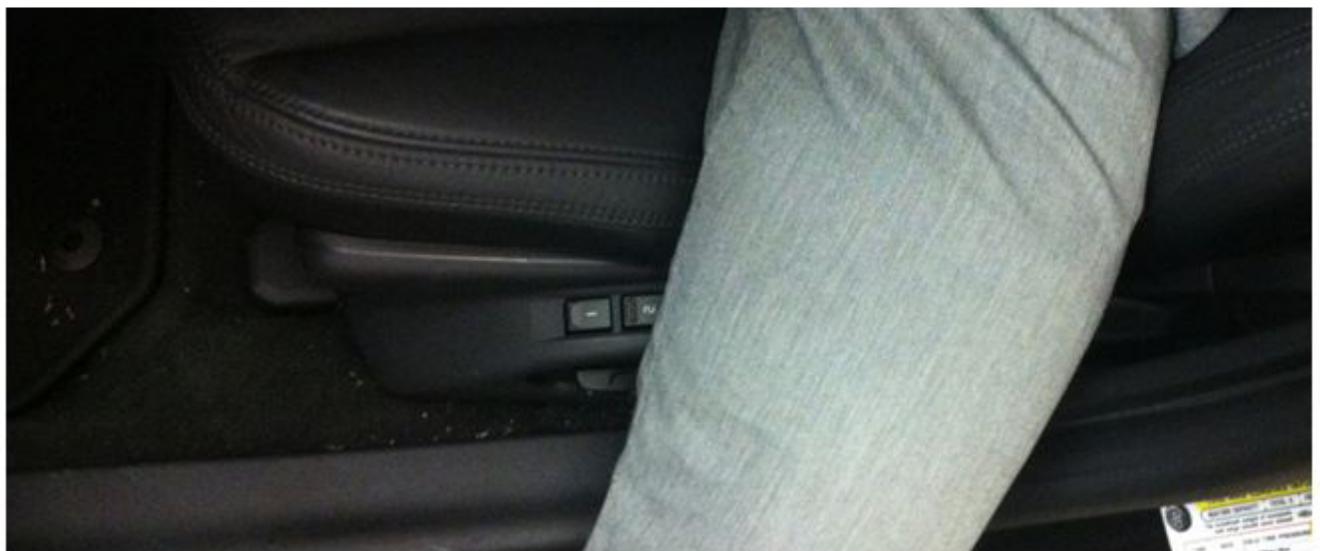
DIM - Acknowledge of Seat Memory Storage

DIM

Current software does not have support to adjust acknowledgement of the seat memory. Go to the SOFTWARE tab and download the latest software to the Driver information module (DIM).

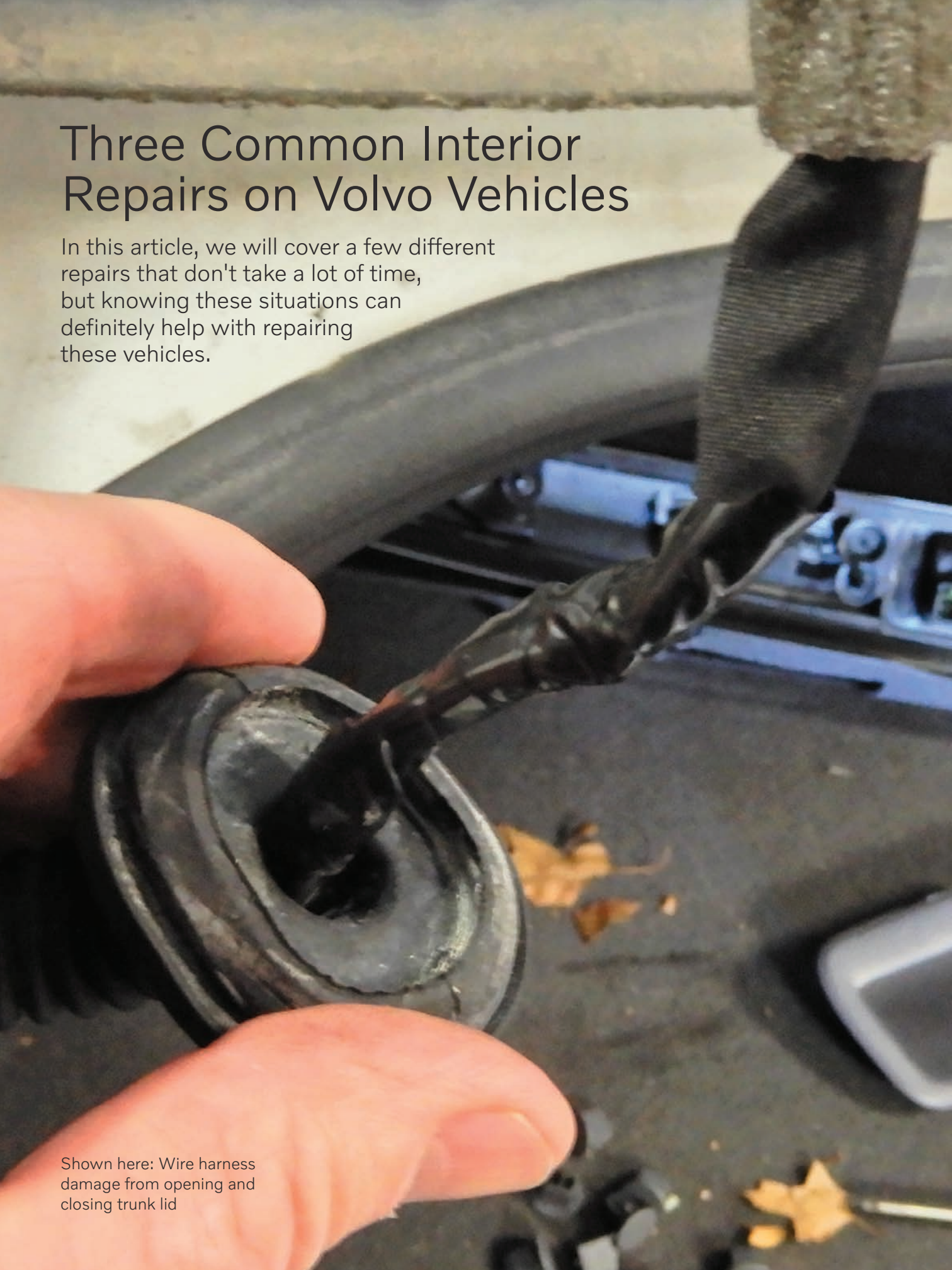
Select new delay time (in seconds) for the seat memory

Select setting for acknowledgement of seat memory



Three Common Interior Repairs on Volvo Vehicles

In this article, we will cover a few different repairs that don't take a lot of time, but knowing these situations can definitely help with repairing these vehicles.



Shown here: Wire harness damage from opening and closing trunk lid

Electric Trunk Repair

Here we have a customer with a 2010 S40, stating that the trunk will not operate correctly (will not open without going inside and pulling the release). This can be due to a few different things. Perhaps a trunk latch is to blame, or maybe the micro switch in the release mechanism is not working correctly. It could also be a harness problem.

First off, let's connect the vehicle to VIDA and read the system to see if there are any current codes for this problem. If there are no codes for the rear tailgate, go

Check the function of the tailgate switch by clicking on the VCT2000 symbol.



to the symptom related diagnostic procedures in VIDA. Go to Electrical Systems, Other Electrical Equipment, number 36, scroll down to Checking Selector Switch In

Tailgate and click on it. Here you will be able to check the function of the switch on the tailgate by clicking on the VCT 2000 symbol.

Press in the tailgate switch; it should be activated when the switch is pressed in. If not, remove the handle at the tailgate to check the connection.

There are four screws that hold the handle on; remove the screws and access the micro switch. With a test light, we can check for power and ground coming into the switch. If power and ground are present and the tailgate is still not opening correctly, its most likely the micro switch in the handle. Replace the handle.

Many times on this model, the wire harness can wear out from repeated opening and closing the trunk lid, and the harness and the wires will become bare or even broken at times.



Trunk handle switch assembly removed from vehicle

When replacing a harness of any sort, it's a good idea to disconnect the battery to avoid any electrical issues with the vehicle. Always disconnect the negative side of the battery first. On some models, it's a good idea to wait five minutes to let the modules in the vehicle go to sleep.

Remove the inner trim panel using a trim removal tool for the clips that hold it in place. This will expose the wire harness; now you can disconnect all the connectors at the lock mechanism, license plate lights, and so on. Disconnect all of the wire harness hold-down clips and tie downs that hold it in place.



Trunk lid with inside trim removed and exposing wire harness

Remove the wire harness from the trunk lid and where it connects inside the trunk. Install the new wire harness; insert the harness the same way it

came out. Secure the grommets from the trunk to trunk lid, and connect all electrical connectors. Secure the clips and tie downs for the harness.

Once the wire harness is in place, connect the battery negative terminal and check the function of the trunk lid, making sure that it closes and opens correctly, and that the locking and unlocking functions work perfectly.

Reinstall the trunk trim panel, making sure that the clips and fasteners are secure in place.

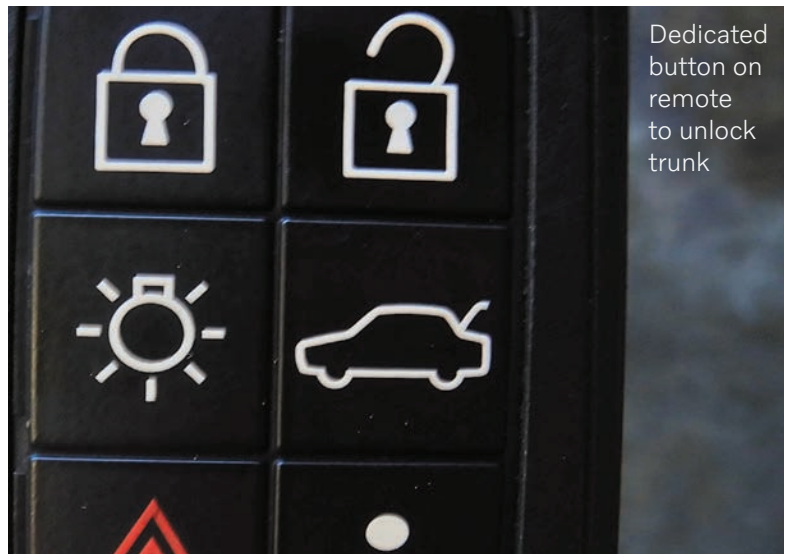
On a 2014 S60, the trunk system operation is a little different. The system has a keyless entry system that is integrated into the central locking system. There is no locked mode on the trunk lid. The Central Electronic Module (CEM) will activate the trunk lid when the switch on the trunk lid has been pressed.

The trunk lid can also be opened inside the vehicle via the switch at the Light Switch Module (LSM). The remote key can also unlock and lock the doors and the trunk. There is a button on the remote that is dedicated to unlocking only the trunk.

Like the S40, when the system doesn't work correctly, troubleshoot the problem depending on what doesn't work. Check all the functions of opening the trunk lid. Try opening the trunk via remote control, the switch on the dash at headlight panel, and the button on the trunk handle.

If the trunk can be opened with the switch at the headlight panel and the remote control, but not at the button at the trunk handle, the problem is probably downstream. It is possible there is a break in the wire harness between the switch and the button on the trunk handle and the CEM.

Check the fuses for the trunk handle, making sure they are not burned out. Make sure that the glove compartment is not locked and in valet mode; this will also lock the trunk and you won't be able to activate the unlock function from the trunk handle button.



Switch for opening trunk on dash at light switch panel

You can check this function in VIDA under Vehicle Communication in the CEM under Private Locking.

To check the switch in the trunk handle in VIDA, go to Vehicle Communication CEM Parameters and read out the switch in the handle while pushing the switch. If nothing happens you will need to remove the inside panel at the trunk.

Measure the voltage drop at the switch—not activated and then activated. Battery voltage should be present when not activated, and activated should be close to 0 voltage. If the switch has battery voltage, the switch is supplied correctly. If the switch voltage is not close to 0 voltage when activating, then the switch is bad and will need to be replaced.

If voltage drop is not approximately battery voltage at the switch when the switch is not activated, but is continuously 0 volts, this indicates a fault. Either the switch is short circuited or the switch doesn't have the correct power.

Disconnect the switch and check voltage drop at the harness. If the voltage drop between the wires in the harness is approximately the same as battery voltage, then the wire harness is OK and the switch has the right amount of voltage.

If you can measure the resistance of the switch, and if the switch closes the circuit continuously, the switch will need to be replaced in the trunk handle. If, when measuring the voltage drop in the harness to the switch is always 0 volts, there is a problem with the wire harness to the switch at the trunk handle.

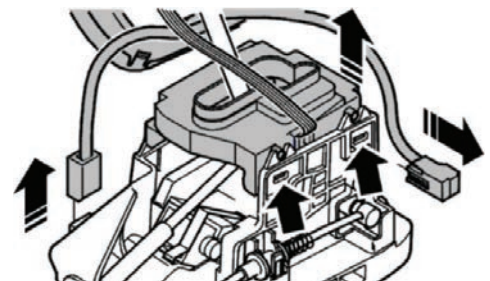


To check the latch motor, go into VIDA, CEM Activation; if the trunk does not unlock, measure the voltage drop at the latch motor. If the voltage drop is battery voltage, it's most likely a problem with the latch motor and it will need to be replaced. If the voltage drop is close to 0 volts, check the wire harness for a problem.

Replacing Gear Selector Lever Assembly with Geartronic Transmission

On these vehicles with Geartronic transmission, you might have a customer complaining about the shifter falling over into Neutral and not feeling stable. Over time, the gear selector lever assembly can become broken and will need to be replaced.

First off, you will have to remove the locking bracket at the bottom of the gear knob and the top of the boot.



Gear selector knob that will have to come off on a Geartronic system

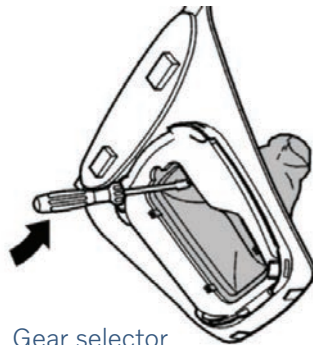
Using a small screwdriver, pry the locking tab down away from the gear selector lever knob to release. To remove the gear selector knob, grab it with both hands and pull it straight up with a hard jerk.

Remove the panel that covers the gear selector shaft, use a small screwdriver to pop loose. At the front of the console, remove the small trim that is under the climate control unit. Just pull it straight out.

After the panel is loose, be careful—there will be wires attached. At the bottom of the panel there are four clips that need to be released with a small screwdriver to separate the panel from the gear selector boot panel.

Now to remove the center console around the gear selector assembly. Pop up the trim at the emergency

brake handle and remove, sliding it over the handle. Remove both side panels at the bottom of the console on the driver and passenger side and set aside.



Gear selector boot panel that needs to be released using small screwdriver

Remove two screws at the front of the console at the bottom of the climate control module. Remove the two screws at the top of the console near the shifter assembly. Open up the console and pop up the rubber insert; under the rubber insert you will see two more screws that will need to be removed.

At the back of console, remove the panel and disconnect the electrical connector and let it hang loose. Lift out the console; you will need to turn the key and put the gear selector shaft down into Drive. Pull the emergency brake up and remove the console from the shifter tunnel.

Slide a screwdriver at the tabs on each corner of the selector top and remove, going straight up. Just flip it over with the wire harness connected but out of the way.

On the top of the shifter assembly you will see a yellow and black component with two springs that will need to be replaced. Usually the yellow piece will be broken, so make sure to remove all of its parts from the shifter assembly. The automatic shifter repair kit is Volvo part number 9463559.

Remove the old shifter kit, making sure to remember the correct way to put it back together. Once the old pieces are removed from the shifter assembly, clean the area and blow out any debris that might have fallen down into the shifter assembly.

Install the new shifter kit, put a little grease on the bottom piece and a little on the yellow piece that fits around the gear shift shaft. This will help for movement around the gear selector shaft. After the gear selector kit is in place and you have installed the pin that secures it, test it out to see how it works.

Turn the key on and move the gear selector shaft back and forth from gear to gear, and slide it over to make sure the manually shifting mechanism works correctly.

Install the top black plastic cover stop on top and secure into place, making sure that all four ends snap



Broken shifter kit that will need to be replaced



Shifter assembly with shifter kit removed

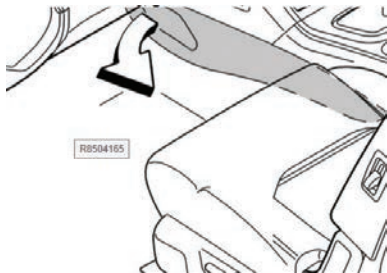
into place. Now that the top cover is in place, just check again to make sure everything is good.

Slide the center console back into place, making sure it fits correctly into place. Install the electrical plug in at the back of the console and secure it into place. Install the trim piece that fits at the back of the console. Install the six screws that hold the center console down.

Install the emergency brake boot and trim and snap into place. Put the cup holder back into place; you should be able to just push down on it to secure. Flip over the selector circuit board and cover, with the shifter boot over the shifter shaft. Install the outer cover and snap the circuit board cover into the trim piece around it.

Snap the cover into place at the center console at the shifter shaft. Install the locking ring at the top of the shifter boot. Slide the shifter knob into the shaft and push down until it locks into place. Push the locking ring at the boot up and lock it into place at the shifter knob. This can sometimes be challenging, so make sure that it's aligned correctly; then push on the shifter knob until it's secure.

Install the trim piece at the front of the shifter assembly, under the climate control. Put both side panels at the center console in place and secure.



Side panels at sides of console that will need to come off and then back into place during reassembly.

This job doesn't take a long time; you just need to be careful not to break any plastic pieces while installing the shifter kit. Start the vehicle up and test drive to make sure operation is successful.

Replacing Blower Motor and Power Unit Resistor on the Early XC90 Vehicles

This job would be pretty easy if it wasn't for one screw on the back side of the blower motor. You will need to pop the dash out just enough to remove that back screw at the blower motor.

First off, disconnect the negative side of the battery. Remove the kick panel at the passenger side of the vehicle and set aside. Remove the glove

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compartment; nine screws hold it in place and one electrical connector. Remove the cover at the end of the dash at the passenger side.

Remove the sun sensor at top/middle of dash. The center console will need to be removed. Now to remove shifter knob, disconnect the lock ring at the top of the boot and the bottom of the shifter knob with a small screwdriver. Grab the shifter knob with both hands and pull up to release and remove.

With a plastic trim tool, pop up the trim around the shifter shaft and press the trim frame out of the gear shift selector panel.



Glove compartment that needs to be removed



Trim tool used to remove trim at shifter shaft

Remove the side panel at the console. Inside the console box there are two screws that need to come out. Remove the other four screws, disconnect the electrical connector at the rear of the console and pop the console out of place and set aside.

The speaker on the dash will need to come out; after speaker is removed, there will be a screw under the speaker that needs to come out. Remove the Drivers Information Module (DIM). Pop out the cowling around the DIM, remove the four screws that hold it in place and remove the DIM. There are two screws just above the steering column that will need to be removed.

Remove both bolts on both sides at the A pillar that secure the dash to the frame.

Remove the four bolts that hold down the passenger front seat. You don't have to remove the seat, but tip it backwards so you can remove the carpet. Now cut the soundproofing insulation around the blower motor. This will give you the room needed to get to that back screw at the blower motor.

Now just pull the dash out enough to get to the back screw at the blower motor. Disconnect the electrical connector at the motor, and remove all screws at the blower motor. Remove the blower motor from the vehicle. Remove two screws at the electrical connector side and slide out the blower motor.

Remove the two screws that hold the power unit in place and remove the power unit. Install the new power unit and blower motor back into the plastic hub.

Install the blower motor back into the vehicle, tighten all screws and connect the electrical connectors. Connect the drain tube at the bottom of the blower motor.



Screws at dashboard that need to be removed



Cutting the soundproofing insulation around blower motor

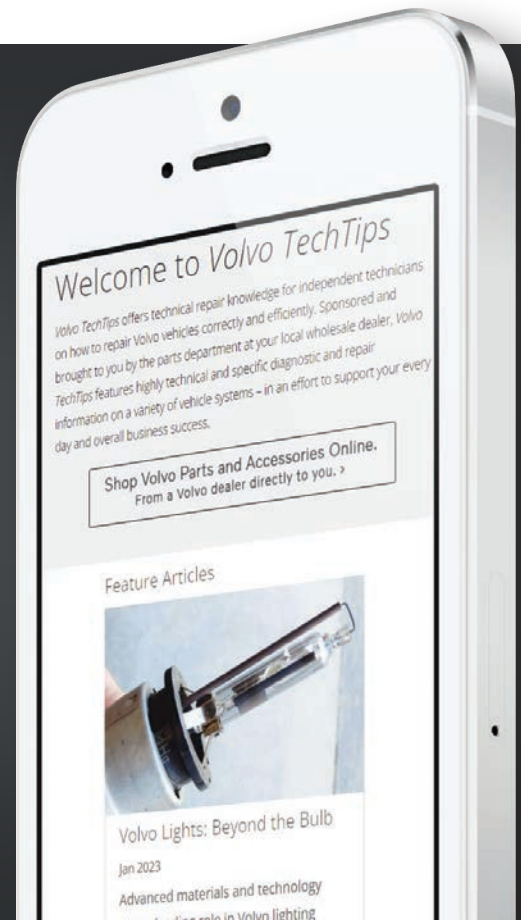
Now to reassemble everything... The soundproofing insulation that was removed needs to be glued back into place. Push the dashboard back into place and install the nine screws that hold it in place.

Connect the battery terminal and check to make sure the blower motor works correctly. Install the carpet and bolt down the passenger seat. Install the DIM, the top speaker, the glove compartment and the center console. Install both A pillar dash end trim pieces.

Check to make sure there are no codes in system using VIDA. Now that the job is complete, make sure again that everything works correctly. ●

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Supercharger Service on High Mileage Volvos

This is part of a continuing series of articles that cover some common issues that you may experience on Volvos with higher mileage and age.

Supercharger Air Leaks, Late Style 2.0L Twin-Charged Engines (2015 and up)

In the new-to-most-of-us-in-the-aftermarket world, the 2.0L engines that Volvo is using across their entire line of cars these days have been around for more than a few years now.

The first Volvos to be offered with this new powerplant (in the U.S.) were the 2015 S60 and V60 models.

The 2.0L has become standard, as it is small but powerful—and with a variety of induction systems.

With the launch of XC90 T8 in 2016, Volvo introduced the first hybrid variant of a Volvo Engine Architecture (VEA)—with Electric Rear Axle Drive (ERAD) for electric propulsion and AWD capabilities.

The hybrid engine—or as Volvo calls it, the "twin-charged" engine—is equipped with a Crankshaft Integrated Starter Generator (CISG), which starts the engine, saves energy when slowing down, and, by acting as an additional supercharger, causes less lag.

The twin-charged versions of this engine are capable of producing a lot of power for such a small engine size due to the amount of air that can be moved through the intake manifold. It is boosted by the supercharger, and then the turbocharger after the engine has reached 3,000 rpm, and the induction is switched to the already spooled-up turbo.

These systems are put through a lot of heat and pressure, so over a lot of miles and years, these parts will wear. With such a complex air induction system, unmetered air leakage can be a real problem.

You will probably have one of these cars come into your shop with a Check Engine light complaint at first, but if you interview the customer, they will probably complain about poor fuel mileage and in some cases loss of power.

When you start your testing you will probably pull up a stored code from the ECM like PO171.

If your scan tool has the ability to display freeze frame data, take a look at the fuel trim numbers at the time the code was set. In most cases PO171 indicates a lean condition in the fuel mixture.

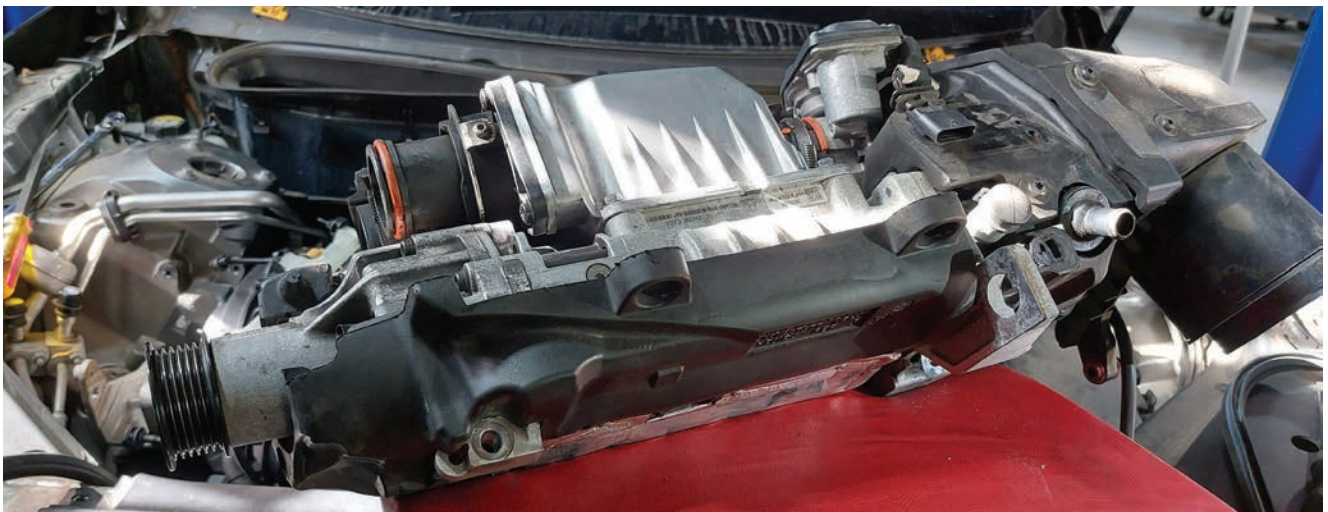
This code can be caused by a wide variety of issues, but just like an unmetered intake air leak, an exhaust leak near the manifold, or everyone's favorite, a malfunctioning sensor or sensors that are not setting a code.

Of course, less common causes can include clogged fuel injectors or internal engine wear or damage.

One issue a lot of non-Volvo specialty shops run into is the fact that most generic scan tools are limited in what information they can get from a late Volvo.

The only scan tool out there that will give you complete and accurate scan data and information in one place is not just one stand-alone scan tool; it's VIDA installed on a laptop.

VIDA is constantly updated and is the only tool that you can use to install and update software in a Volvo.



Supercharger assembly removed from the engine

Opposite Page: Checking for smoke coming out of the supercharger check valve

Where There's Smoke, There's Fire (But, Not Always)

Your shop should also have a good diagnostic smoke machine. Most of us know that a smoke machine is a must-have for the modern automotive shop.

Using a smoke machine to check for intake leaks should be a regular part of all engine system diagnostics, codes or not.

Even tiny unmetered intake air leaks can have big effects on many parts of the engine.

An example is Long Term Fuel Trim (LTFT). A regular small intake leak may not set a trouble code, but may be enough for the fuel system to adjust to try to mitigate the extra oxygen.

Extra oxygen may cause the air/fuel sensors to command the ECM to add more fuel, and the extra oxygen can shorten the life of the O₂ sensors and catalytic converters.

Case Study

The XC90 in this case study came in with a complaint of poor fuel mileage and a Check Engine light on.

The first thing the technician did was to hook the car up to a laptop that had VIDA installed and running to check the stored codes, freeze frame, and live data.

VIDA will check all the modules for any issues all at one time, so it's easy to see if any other modules are having issues that may or may not be related to the current problem.

The code that was active in the ECM was PO171.

If you use VIDA, the stored code data will give you a more precise trouble code description, like if the code is permanent, intermittent, high, low, or missing signal. A lot of generic scan tools will only give you the basic OBD code.

The technician ran the car at idle until the engine was at operating temperature.

The technician then decided to check the intake system for air leaks as a first step based on the live data.

The first year of the second generation XC90 (2016) can be prone to develop intake air leaks over time, especially in the twin-charged versions with both turbo and supercharger.

There are two common causes of unmetered intake air leaks that can develop on the twin-charged 2.0L engines.

Fault Tracing Information

ECM-P017200 System Too Rich (Bank 1). General Failure Information. No sub type information

[Diagnostic trouble code \(DTC\) information ECM-P017200](#)
[Fault-tracing](#)

Diagnostic trouble code (DTC) information ECM-P017200

Condition

Engine Control module (ECM) receives information from the heated oxygen sensor about fuel/air mixture in different load areas. If Engine Control Module (ECM) registers that fuel/air mixture deviates too much from target lambda, so that adaptations for bank 1 end up in any of its end-positions, the diagnostic trouble code is generated.

Substitute value

- Nothing

Possible source

- Clogged air filter.
- Leak of crankcase ventilation.
- Oil level too high.
- Contaminated engine oil (gasoline mixed in oil).
- Leaking injectors.
- Leaking EVAP-valve.
- High fuel pressure.
- Damaged mass air flow sensor.

VIDA ECM-P017200 failure information

The most common and easiest to fix is a breached check valve in the oil trap (or PCV box) bolted to the top of the engine.

In earlier Volvos, like the 2005-2012 V50, S40, C70, and C30, when the oil trap diaphragm cracks, the engine can make what some technicians have called a "flying saucer sound" at idle.

That's not the case when it comes to Volvo's 2.0L engines, where a leak in the PCV oil trap diaphragm will usually only result in a lean code being stored in the ECM.

You can check to see if the diaphragm is broken by removing the engine oil filler cap while the engine is idling.

If the oil trap diaphragm is intact, the filler cap will be easy to remove; but if there is excessive vacuum in the crankcase caused by a broken oil trap diaphragm, the oil cap will be difficult to remove while the engine is running.

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On the early twin-charged models, however, the intake leaks may go a lot deeper than just a defective oil trap.

The 2017 XC90 T6 in this case study had a defective oil trap, but the intake air leaks went a lot deeper.

The superchargers on these late Volvos are very complex assemblies, with lots of parts.

There are lots of plastic and aluminum parts that are constantly exposed to heat, vibration, pressure, and vacuum.

Over time, some of these parts can shrink, warp, or even crack, causing an unmetered intake air leak into the engine or, in some cases, supercharger pressure to leak out.

This was the case with this 2017 XC90 T6, but there was a catch. When the technician used the smoke machine to check for leaks, the engine was not that warm and there were no apparent leaks, no "smoking gun" (pun intended).

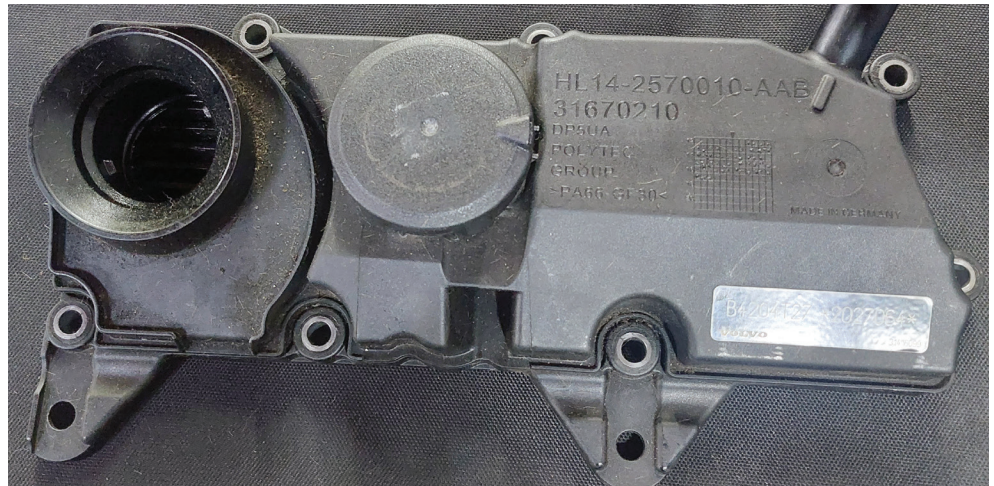
But the live data indicated that there was an active intake air leak.

The technician was thinking it was probably just the oil trap leaking internally, so he recommended replacement as a first step.

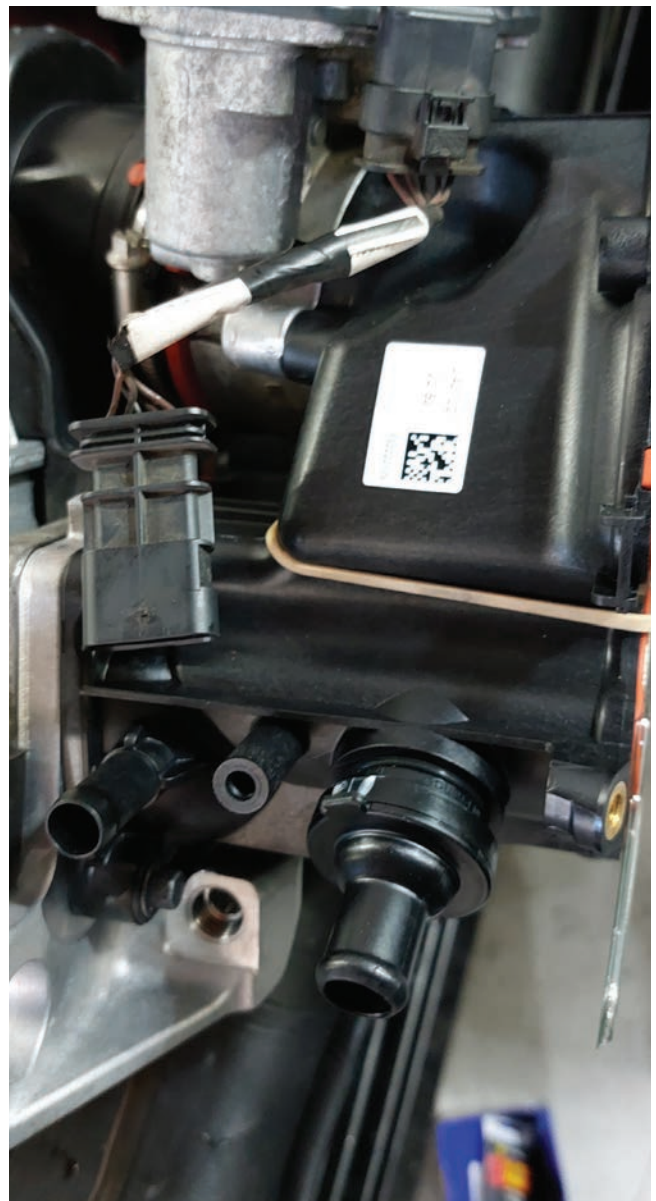
The supercharger has a check valve that connects to the oil trap (PCV) by a hose. This check valve is like a diode; air is only supposed to flow one way.

When you have one of these late-style supercharged XC90s with a PO171 and you are checking for intake air leaks the traditional way, you will most likely seal off the intake and pump smoke into the sealed part of the intake. If you only do it this way, you may not see that the check valve is leaking because the leak will be between the supercharger and the oil trap.

When you are smoke-checking these intake systems, you should remove the end of the hose that connects to the oil trap and pump smoke into the supercharger. If the check valve is good, no



One of the most common causes of unmetered intake air leaks in late Volvo 2.0L engines is an internally leaking oil trap diaphragm.



New supercharger check valve



When you have to remove the supercharger on one of these XC90s to replace a leaking part, you should replace all the old seals and worn parts at the same time.

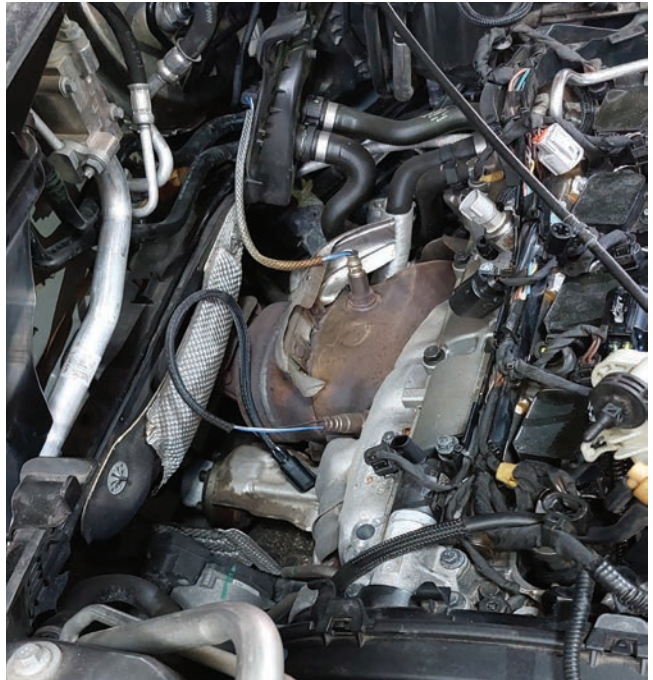
smoke should come out of the hose. If it does smoke, the check valve is bad and needs to be replaced.

The check valve is not replaceable on its own though; it's part of an assembly that's part of the supercharger called a resonator assembly, and to replace it you will need to remove the supercharger from the engine.

The problem is that when this check valve fails, it's usually not the only leak in the supercharger; there are multiple parts, seals, and chambers in this assembly, and if you are going to remove it from the engine anyway, you should replace all the worn parts.

Here is a list of the recommended replacement parts and gaskets you should get when resealing one of these superchargers:

1. 32222165 Resonator
2. 32222167 Fresh air intake
3. 32252302 Sound insulation
4. 31492821 Sound insulation
5. 31657599 Bellows
6. 31459808 Gasket
7. 31459809 Bracket
8. 31657725 Plug
9. 31657726 O-Ring
10. 314744343 Sealing Ring
11. 32222126 O-Ring



You should include a new upstream oxygen sensor in your estimate because of wear and the access to the sensor when the supercharger assembly is removed.



Supercharger removed

12. 982758 Flange Supercharger 1
13. 30622986 Flange Supercharger 2

You should probably include a new (B1S1) upstream oxygen sensor in your list of replacement parts because of the possibility of the sensor being worn; with the supercharger assembly removed, you will have easy access to remove and replace the sensor.

You will have to remove the supercharger assembly from the engine to replace the worn parts and seals.

NOTE: Removing the supercharger was covered in "Diagnosing and Repairing Manifold Exhaust Leaks, Part 1" in *Volvo TechTips* Fall/Winter 2022. Visit VolvoTechTips.com to read this article and access the complete Volvo TechTips archives.

This is a fairly large job and not for everyone, but once you do your first one, the next one will be a lot easier to get through.



Using a top side creeper to access back of the engine compartment

These newer style XC90s are large and the engine compartment is high off the ground for those of us who are less than six feet tall, especially when performing this job, since a lot of the work is done in the back of the engine up against the firewall.

If you work on a lot of the later XC90s, and other big trucks in your shop, you should consider getting a topside creeper. This useful piece of equipment will make this, and other underhood jobs on taller vehicles, more comfortable to do. And it will also help save your back.

When you get the supercharger assembly out of the engine compartment, you can seal it up and use a smoke machine to check for leakage; it will probably come from multiple worn seals in the assembly.

When you start to disassemble the supercharger assembly, in some cases you will be able to see the areas that were not sealing well due to age and wear.

Make sure to keep track of all your bolts and screws when you disassemble the supercharger, and perform your overhaul on a clean work bench; you don't want a stray nut or bolt to end up inside the supercharger when you reassemble it and install it back on the car.

You can imagine the possibilities if that happened!

Clean all surfaces and reassemble the supercharger with new seals and parts.

Double check your work before you reinstall the supercharger back onto the engine by sealing any openings with plugs and using a smoke machine to check for any leaks.

After you reinstall the resealed supercharger assembly, make sure to reset the adaption and clear the codes in the ECM. Take a good long test drive and recheck for any codes that may pop up. ●



A smoke check of the supercharger assembly when it is first removed will show most of the leaks.



Worn supercharger parts

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