

FALL/WINTER 2018

v3 | n3

# VOLVO TECHTIPS

Information for the Independent Volvo Specialist



## SUSPENSION NOISES

IGNITION LOCK REPLACEMENT  
ABS AND TRACTION CONTROL  
CLASSIC VOLVO SERVICE 240

BROUGHT TO YOU BY YOUR LOCAL WHOLESALE DEALER



## VOLVO CAR LIFESTYLE COLLECTION: MORE THAN YOU IMAGINE

There is so much to discover in our Collection, from the exquisite beauty of the Volvo R DESIGN chronograph watch, to crafted leather bags and cases by Sandqvist.

Spend \$50 and receive a free Volvo Black Mesh Cap. Enter promo code TECHTIPS.\*

Visit [www.cmgestores.com/VolvoCollection](http://www.cmgestores.com/VolvoCollection)



\*Promotion valid while supplies last.



# VOLVO TECHTIPS



*Volvo TechTips* is a publication sponsored by Volvo Car USA LLC. No part of this newsletter may be reproduced without the express written permission of Volvo Car USA LLC.

Have a content idea, suggestion, or comment? Contact us:  
[feedback@VolvoTechTips.com](mailto:feedback@VolvoTechTips.com)

Volvo Senior Project Director  
 Ron Jenkins  
 Senior Manager, Business Strategy and Analytics

Volvo Project Lead  
 Rohit Mathew  
 Wholesale Program Manager

Group Publisher  
 Christopher M. Ayers, Jr.  
[cayers@AutomotiveDataMedia.com](mailto:cayers@AutomotiveDataMedia.com)

Editor  
 G. Quagmire  
[gquagmire@AutomotiveDataMedia.com](mailto:gquagmire@AutomotiveDataMedia.com)

Contributing Writers  
 Kevin Parkhurst, Sean Stephens,  
 Wayne Riley, Frank Walker

Automotive Data Media Project Mgr.  
 Tamra Ayers Banz  
[tbanz@AutomotiveDataMedia.com](mailto:tbanz@AutomotiveDataMedia.com)

Art Director  
 Christopher M. Ayers III  
[ayersc3@AutomotiveDataMedia.com](mailto:ayersc3@AutomotiveDataMedia.com)

Editorial and Circulation Offices:  
 134B River Rd., Montague, NJ 07827

**Caution:** Vehicle servicing performed by untrained persons could result in serious injury to those persons or others. Information contained in this newsletter 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

### IGNITION LOCK REPLACEMENT 1999-2009 S80/ V70/ XC90

Starting a Volvo involves a mechanical lock and an electrical switch, and each can develop issues after years of service. You must diagnose and service them separately.



### VOLVO SUSPENSION NOISES, PART 1

This series of articles will cover how to troubleshoot, diagnose and repair common suspension noises on Volvo vehicles.



### ABS AND TRACTION CONTROL — A TRUE DYNAMIC DUO

Today's Volvo's ABS (Antilock Braking System) works in concert with Traction Control to make driving safer than ever before.



### CLASSIC VOLVO 240 SERVICE AND REPAIR TIPS

This article will be about the care and feeding of the legendary Volvo 240 series cars.



## DEPARTMENTS

### CLUNKING/PULLING, BUSHING 18 IN REAR STAY BROKEN



# IGNITION LOCK REPLACEMENT 1999 - 2009 S80/V70/ XC90



Volvo's ignition lock assemblies for the 1999 - 2009 models are quite similar with a few different features through the years. These ignition locks had the basic key fitting into a tumbler connected to the steering column. Through the years basic wear will start to deteriorate the key and tumbler, and the ignition lock assembly will need to be replaced.

Replacing ignition lock assemblies can sometimes be quite difficult and sometimes hard to diagnose. The right tools and know-how make this job a lot less challenging.

There are many ways an ignition lock assembly can malfunction. Consider an ignition lock assembly in which the key just spins around in circles and sometimes works fine. Other times, the key won't turn at all. There are times the key will get stuck in a certain position and won't release. In most of these cases, replacing the ignition lock is required.



Electrical portion of ignition switch

The lock cylinder and ignition switch are two separate components. The lock cylinder is the portion that the key slides into, and allows the ignition switch to turn when the correct Volvo key is inserted in the ignition lock assembly. This is one of the vehicle's lines of defense against theft.

The lock sensor or antenna ring receives the ignition key and, if the proper key is inserted, small actuators on the lock cylinder will allow the lock cylinder, and ignition switch, to rotate. Also, the ignition switch on most vehicles should remain locked if the transmission is in Park or Neutral, and some models will only unlock once the brake is applied in Park or Neutral. This is a safety feature, called the shift ignition lock interface, that connects or communicates information from all three sensors to prevent the vehicle from starting in a harmful manner. The ignition lock cylinder must also be released by this system to turn.

The mechanical lock cylinder assembly wears out from normal use. Lock cylinders fail fairly commonly, but mostly on higher mileage vehicles. The lock cylinder may become difficult to turn or it gets jammed. If this is happening, try a different key before condemning the lock cylinder. Worn out keys over the years can cause problems, and sometimes a new key can cure the problem.

Often, people put other keys and items on their key rings, making them heavy on the ignition lock assembly when inserted in the lock. This pulls the lock angle down so that the key doesn't slide in as well, making the lock assembly wear out much faster. Suggest to your customers that they try not to weigh down the key ring.

The electrical switch also wears out, creating a no-start condition or electrical problems. In some instances this electrical switch can get jammed and cause the key not to turn. Make sure to check before replacing the complete ignition lock assembly.

Dash warning lights staying on, radios not working, and many other problems can be caused by a faulty ignition switch. If you find low voltage to fuses or other weird electrical problems, check the power out of the switch. It should match battery voltage. If it does not, there may be resistance inside the switch, dropping the voltage and causing the vehicle problem.

Ignition lock assemblies will need to be ordered through your local Volvo dealer. The lock assembly must be specified by VIN (Vehicle Identification Number) for that vehicle. This is so existing keys will match. This would be the time to order new keys if needed. Note that the lock assembly doesn't come with new keys. So any new keys would have to be programmed to the specific vehicle.

Some ignition locks get stuck in certain positions that make it more difficult to work with when replacing. For



example, if the key won't turn at all, this makes replacing a little more difficult.

As an example, here's the procedure for replacing the ignition lock assembly on a 2000 S80. Remove the negative cable at the battery to make sure not to short any electrical components. Lower and extend the steering column towards the driver's seat. This will give room to work on the lock assembly.

Remove the trim around the steering column so to expose the ignition lock assembly. Remove the T25 lower steering column trim screws. Then pull the upper trim straight up to remove. Removing the steering wheel makes the job much more accessible. When removing the steering wheel, remove the air bag first.

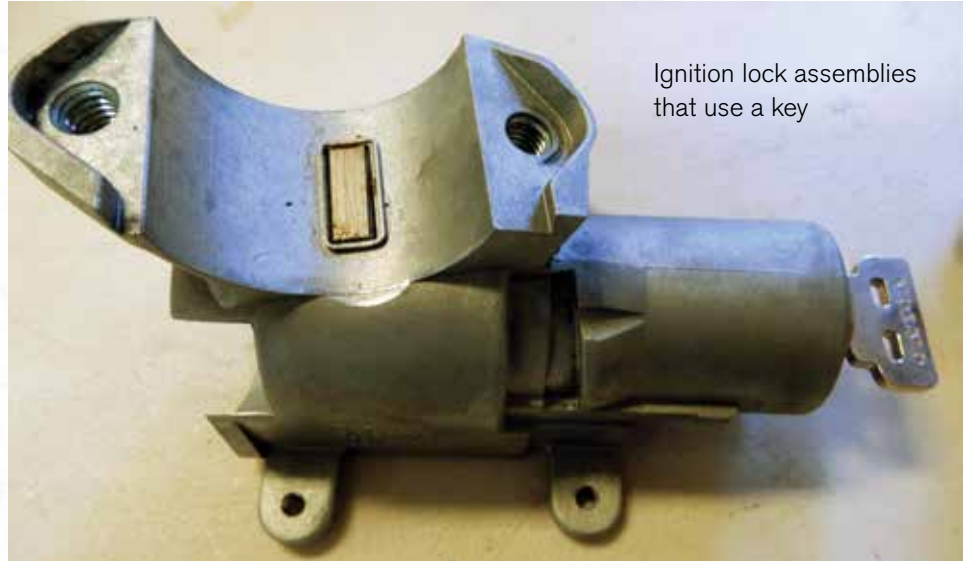
### WARNING!

The supplemental restraint system (SRS) is active for a certain length of time after the power supply has been disconnected. Wait for a minimum of 30 seconds before disconnecting or removing any SRS components.

Make sure to use the screw to hold down the clock spring that is supplied in the steering wheel. Not doing this can damage the clock spring. Make sure the steering wheel is pointed straight ahead and mark the steering wheel to the column so it is reassembled properly.

Now that the steering wheel is off and the trim has been taken off, unplug all electrical connectors. Unplug the connector to the electrical part of the ignition switch. This is the juice for the switching mechanism. Remove the switch with a T20 Torx driver.

Now it's time to remove both switches on each side of the column, the turn signal switch and the windshield wiper switch. Remove the antenna ring around the ignition lock. This antenna ring is designed to communicate with the chip or transponder in the key that sends a signal to the immobilizer and ECM (Engine Control Module) to start the vehicle when the key is turned.



Ignition lock assemblies that use a key



Hold down screw in air bag and where to secure clock spring



Antenna ring that is fitted on ignition lock assembly

# SOLUTIONS FOR TOMORROW

Customers are at the heart of everything we do. Our Vision+ suite and best-in-class products were created to focus on the solutions of tomorrow.



Our Vision+ solutions create greater efficiency, productivity, profitability and sustainability for collision centers.



BASF Refinish world-renowned products answer the needs of every shop with our advanced paint technologies.



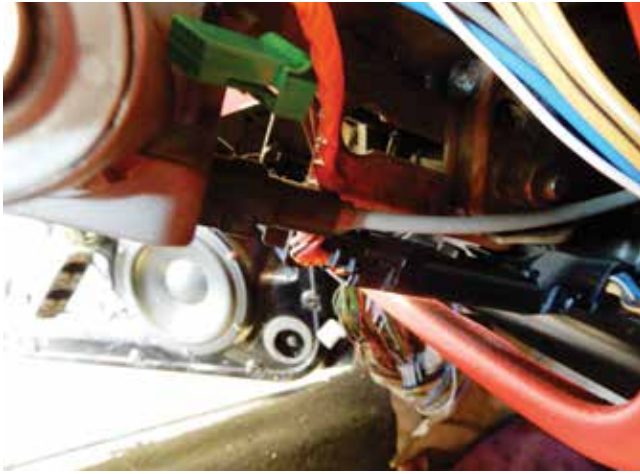
 **vision+**<sup>TM</sup>  
basrefinish.com

BASF AUTOMOTIVE REFINISH COATINGS



A brand of  
 **BASF**  
We create chemistry





This shows the cable attached to ignition switch.

Now that everything is out of the way, drilling the tamper proof bolts will be the next thing to do. Always protect your eyes with protective glasses when working with drilling of any kind. A good center punch, sharp drill bit and drill will be needed. Now this is a very important procedure. Make sure to center punch the bolts correctly. This is where removing the lock can get very hard to do. Always make sure to center punch in the middle of the bolt and drill slowly with a straight shot into the bolt. Starting with a smaller drill bit, like 1/8 inch, and then move up to a bigger bit that will be a perfect fit for an easy-out type tool to remove the bolts.

Once the bolts have been drilled, carefully unscrew the bolts from the lock assembly. Now that the bolts have been extracted, the lock assembly will be able to be removed. Make sure to turn the key to position 2. That way, removing the cable for the transmission shifter can release. Make sure to clean up all drilling debris so that particles don't get into any electrical parts or connectors. Using a magnet will help in this process.

The new lock assembly will come with two shear bolts or security bolts. Once the lock assembly is in place around the column, make sure the steering lock is properly engaged in the steering column slot. Tighten the bolts until the tips break off.

Once the ignition lock assembly is in place and tightened down, you can secure the cable into the lock from the shifter. Now we can connect wiring and install the antenna ring, turn signal



New lock assembly



Here we have tamper proof bolts that hold in the lock assembly. The heads will break off when tightening.

switch and wiper switch. Insert the key and make sure the ignition lock works properly. It's always a good idea to insert the key into the lock before installing just to make sure we have the right lock assembly.

Now that the lock assembly is installed and all wiring has been connected, it's time to reassemble the trim around the switch. Secure the steering wheel and remove the screw that was holding the clock spring in place. Set the air bag back into place and tighten down. Connect the battery and make sure all switches and the ignition lock work perfectly.

The following is the procedure for removing the ignition lock assembly from a Volvo XC90. Much like that in the S80, the mechanical ignition lock looks very similar. Tools you will need to replace the lock assembly are T25 and T20 Torx drivers, a socket for removing the steering wheel, and drill bits, drill, and center punch.

Turn the steering wheel 1/4 turn so both screw holes are accessible in the rear of the steering wheel. Insert a screwdriver of medium size on the back side of the wheel. The screwdriver must be at a right angle to the rear surface of the steering wheel. Position the screwdriver

point at the top of the spring inside the steering wheel. Pry the screwdriver up against the upper edge of the hole so the point of the screwdriver presses down the catch until the catch releases. Do the same with the other side. Remove





# VOLVO GENUINE PARTS

## NOTHING CAN REPLACE THEM

When a part needs replacement, a Volvo Genuine Part is the right choice. Manufactured to Volvo's exact specifications, they deliver the safety, quality and reliability your customers expect from the Volvo brand.

Volvo Genuine Parts fit perfectly and come with a 2-year limited warranty.\*

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



\*Warranty excludes consumable "wear item" parts, labor and Volvo accessories.

the electrical connector from the air bag and remove the bag. Place on flat surface face up.

Never tamper with an air bag or hook a volt meter to it. This could cause the air bag to deploy.

Now that the air bag is removed, turn the steering wheel to the straight ahead position, adjust the column and extend it towards the front seat. This will give room to work on the ignition lock assembly.

Insert the lock down screw into the clock spring so that the clock spring doesn't move. The screw should be in the steering wheel specifically for this reason. Now that the clock spring cannot move, remove the steering wheel and be sure to mark the position so you can reassemble it in the same place. Remove the steering column covers. Remove the three T25 screws and remove the cover over the ignition lock assembly. Pull the top cover straight up and fold it back out of the way.

Press in the snap connector and remove the antenna ring around the ignition lock and disconnect the electrical connector. Adjust the key to position 1 and remove the interlock cable from the shifter assembly. If for some reason the key will not move, it will be necessary to replace the cable for the interlock. Remove the screw that holds in the wiper switch and the turn signal/high low beam switch. The steering wheel module will need to be disconnected and removed.

Remove the electrical connector to the ignition switch opposite of key entry. Unscrew the two screws that hold in the ignition switch electrical part.

A 90 degree drill might work the best. Insert a 1/8 inch drill bit into drill. Center punch the very middle of the security/break-off bolts. This step is very important and should be done properly, so be certain to drill straight into the bolt and not at an angle. Not doing this correctly can make the job very difficult.

Now that both holes are drilled at 1/8 inch, use a bigger bit, 11/64, and drill both holes again. Using some sort of easy out tool, extract both bolts until they come out. The ignition lock assembly will now come apart from the steering column.

Make sure to clean up all debris and metal particles. A vacuum cleaner and magnet are good tools to do this.

Insert the ignition key into the new lock assembly. Check to make sure the key is in position 1 and that the locking lug on the steering assembly lock is down. Install the new steering lock against the cap on the steering column. Install the new security/break-off bolts and tighten until the heads break off.

Put the gear selector shifter into Park. Insert the key and turn to position 1. Press the cable for the gear selector into the ignition lock assembly and feel to make sure it's in position. Remove the key and make sure the vehicle doesn't come out of Park.



Tools for doing an ignition lock assembly



Screwdriver inserted in steering wheel to remove air bag

Install the electrical part of the ignition and connect. Install the steering wheel module and connect. Install both switches at the steering column and connect. Install the antenna ring around the ignition lock assembly and connect.

Install the lower steering column cover with the three T25 Torx screws. Make sure not to trap any wires when installing the cover. Fold down the top cover and snap into place. Make sure that all rubber trim is in the correct



Covers around steering column.

position. Install the steering wheel to the position previously marked and remove the screw for the clock spring. Tighten down the steering wheel and connect air bag wiring and snap the air bag into place.

Connect the battery and check that all key positions work properly and that the vehicle starts correctly. If other keys are ordered, downloading software will have to be performed to make the key work correctly. Check that the shifter works properly and that, with key out of the ignition, the shifter will not come out of Park.

Volvo's ignition lock assembly through the years has changed somewhat but the various designs are very similar, consisting of a basic tumbler coded for keys and fitted into an aluminum base that is secured at the steering column. There are some electronics involved, like the antenna ring for the immobilizer, so the chip in the key will communicate with the vehicle. This is also a theft deterrent provision.

The newer model Volvos will have a keyless entry that will have no key and only a remote device that will be able to communicate with the vehicle and be able to start it without turning a key. These systems will be more convenient for Volvo owners and will eliminate the old key lock assembly. ●

# WHEN SAFETY IS ON THE LINE, THE RIGHT PART IS VITAL

Find Volvo OE parts online

repairlink<sup>SM</sup> collisionlink<sup>®</sup>

With 24/7 online ordering, RepairLink<sup>SM</sup> and CollisionLink<sup>®</sup> gives shops access to competitively-priced OE parts. Increase speed of repairs, accuracy of orders and customer loyalty through state-of-the-art online technology and the preferred parts procurement solution of shops.

Visit [OEConnection.com/TechTips](http://OEConnection.com/TechTips) for more information

RepairLinkShop.com CollisionLinkShop.com







# VOLVO SUSPENSION NOISES; HOW TO FIND AND FIX THEM PART 1

THIS SERIES OF ARTICLES  
WILL COVER HOW TO  
TROUBLESHOOT, DIAGNOSE  
AND REPAIR COMMON  
SUSPENSION NOISES ON  
VOLVO VEHICLES.



Customers come into shops every day, all around the world and say the same thing: "My car is making a noise when I go over bumps," or some version of that question.

"What does it sound like," you ask?

The customer will say something like "I don't know" or try their best to verbally imitate the noise.

This is where asking the customer the right questions can be the key to quickly and accurately solving the customer's problem. Because more often than not, when you or any technician takes the customer's car out for a test drive, he or she may hear multiple noises, especially on higher mileage cars.

Or, more commonly, the technician that test drives the car cannot get the car to reproduce the noises the customer is experiencing. This happens for many reasons.

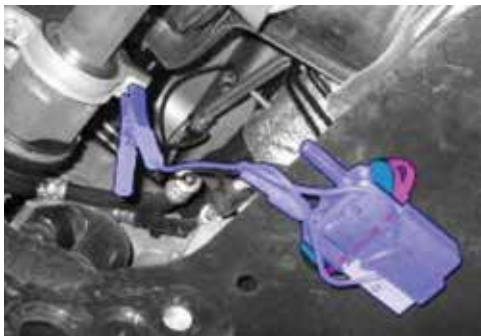
The customer may not know how to explain the symptoms or noises to the service adviser, or the person that drops off the car may not be the primary driver and he or she gives a third-hand vague explanation of the noise and symptoms.

The service writer needs to get as much information about the noise or noises as possible. Questions like, When, Where and How Often are the basic ones, but in a lot of cases you or the service adviser will have to dig deeper to get the clues to help the technician that's working on the car save time, money and be able to accurately find the causes of the noises and be able to recommend the needed repairs and parts.

Questions about how the car is used, and what kind of roads cause the customer to hear the noises can be very helpful in reproducing the noise complaint, and that's what it's all about. That's what the customer brought the car in for, and they want answers, not guesses.

If you can't reproduce the noise, how can you verify that you fixed it?

Of course the best thing that you can do is to have the tech that will be working on the car go on a test drive with the customer. This will not only help pinpoint the noise



Chassis ear

that the customer is concerned with, but will also allow the tech to eliminate and point out other noises that the customer may have gotten used to or just blocked out.

If on the test drive with the customer you cannot reproduce the noise, try to have the customer drive and observe their driving style for clues.

While on the test drive with the customer, ask them again under what conditions does the noise happen. Is the car cold or will the noise only happen on turns at 90 mph?

More questions about the symptoms and noises while driving with the customer may help him or her be able to explain them better.

What about the other noises you hear that the customer may be oblivious to?

Have you ever had a customer bring a car in for a noise complaint that he/she thought was a very minor issue, only to find that the noise that they have gotten used to, and may think is normal, turns out to be a major problem?

Yes, we all have, but before we start concerning the customer about what it could be, you should perform a complete inspection on the car with extra focus on the problem areas.

It's a good idea to keep in mind that the noise the customer brought the car in for in the first place is very important to them, even if it's a minor problem that will not affect anything.

Don't just dismiss it because it's a very minor problem like a rattling cup holder; always address their initial complaint before you talk to them about the "real" problems with their car. Let them make the decisions about fixing the minor issues or not.

Are all suspension noises easy to find?

Sometimes yes, sometimes no, but as with anything in life, the more you experience something the easier it is to identify the noises and get to the cause.

If you do this long enough, you will get to the point that you will be able to identify most noises and their causes just by taking the car for a short test drive.

Volvo has issued a lot of service bulletins and technical journals (TJs) for suspension noises over the years on all of their models.

The right service bulletin can save you a lot of time and misery. So, as always, it's a good idea to check for any available information first, on the Volvo that you are working on.



Rattle on acceleration from a stop on the 2006 - 2010 XC90 with the 3.2L SI six cylinder engine

Tools like the chassis ear tool can help you find some elusive suspension noises but will not work in all cases. Here are a few common worn parts that can cause suspension noises on some Volvo models.

On the Volvo XC90 with the 3.2L engine, the upper torque rod mount, located on the right side of the engine, will start to rattle under light to medium load while accelerating from a stop. This noise can fool you if you don't know what to look for. The noise that this one makes is unusual and can sound like it's coming from the transmission or angle gear.

Some shops that have heard this sound have mistakenly replaced the bevel gear and even the transmission to try to "fix" this noise, only to find out that the noise was caused by a much cheaper part.

The noise usually presents itself under light acceleration at around 10 to 20 mph. It sounds like grinding gears in the transmission, much like a metallic rattle.

The noise usually sounds like it's coming from the area where the transmission meets the angle gear and can make the same noise as worn or broken gear teeth inside a gear box. But before you start pulling apart the drive train, try this.

On the right side of the engine is the upper engine torque mount rod. During your regular inspections on these cars, you should make it a habit of checking these rods for play and rattles.

The best and simplest way to check the upper engine torque rod on a Volvo XC90 with the 3.2L SI engine is to simply grasp the bottom of the rod with two fingers and shake it. If the bushings at either end of the torque rod are worn and dried out it will feel loose and rattle when you shake it.



It can be very difficult to visually check the condition of the torque rod bushings while the rod is installed on the engine, since the bushings are under aluminum covers. The best way to check the bushings for wear is to just grasp the torque rod in the middle and shake it. When they are worn out the rod will rattle.



One of the more common suspension noises on Volvos (and most other cars on the road) is caused by worn or loose sway bar links.

## SWAY BAR LINK RODS ALL VOLVO YEARS AND MODELS

Sway bar end links are suspect. You have probably changed a lot of these parts in your day to day work for various reasons.



Most of the time these rods are easy to spot when they need replacement; either the dust boots are torn, they have excessive play, or they are simply broken. But when you are checking for suspension noises, don't overlook them just because they don't exhibit the descriptions above or they look new. They can fool even the most experienced technicians.

One of the most common noise problems with these sway bar links can be hard to spot. That's because the most common sway bar link noise is caused by one or more of the nuts on the end links becoming slightly loose, allowing the end link to rattle when the car is driven over bumpy roads. So always check the end link nuts with a wrench for tightness; you will be glad you did.

When installing new sway bar link rods on a Volvo, too many technicians are in the habit of using air tools to tighten the end link nuts. This is a bad habit even though it will save time. In a lot of cases using an impact gun can under- or over-tighten the nut, which can cause a noise comeback or, in the case of over-tightening, can cause the end link stud to break prematurely.

The right way to tighten the sway bar end link nuts is with a combination wrench and a Torx or Allen socket to hold the stud in place as you tighten the nut.

You can use a ratcheting box wrench to speed up this process.



The best way to check for looseness and tighten sway bar end link nuts is to use a box or an open end wrench and hold the stud with either a Torx or Allen socket.

## FRONT SPRING SEATS (OR STRUT MOUNTS)

If you have been working on Volvos for a while you have replaced your fair share of these. Of course they should be replaced when they are broken, but if you make it a habit of closely inspecting the spring seats on every Volvo that comes through your shop, you could prevent the customer from having to find out about the worn spring seats only after they hear that loud popping sound when they go over a bump.

The best way to inspect these spring seats is with the car fully on the ground so that the struts are loaded. Use a flashlight to look under the strut washer and check to see if the seat is starting to crack or is completely torn. They don't always make noise when they are damaged or broken.

When you make a recommendation to your customer to replace the spring seats, always recommend them in pairs.



If you work on Volvo vehicles, you know what this part is and you have replaced a few broken ones. But the key is to recognize when the spring seat is about to fail and inform your customer before they hear that popping noise over bumps.



If the customer's struts are worn or have a lot of miles on them, explain to the customer that replacing the struts at the same time as the seats will save them a lot of money on labor since they have to be removed to replace the spring seats anyway.

## A WORD ON REPLACEMENT PARTS

Parts like spring seats are available from multiple parts suppliers, and the price of some of these parts can be very low, but of course so can the quality of the parts. The materials used to manufacture these parts can vary too.

## SO WHY USE OE VOLVO PARTS?

Volvo engineers have designed these replacement parts to the highest standards of quality. They are made of the same quality materials that the originals were, and they are tested in all possible driving conditions for performance and longevity. OE Volvo parts will always fit properly the first time and outperform the aftermarket parts.

In the case of the spring seat, which is just rubber bonded to steel and has a relatively high failure rate, don't you want to install the best quality part you can?

## WORN AND LOOSE FRONT STRUT PISTONS ON P1 VOLVOS CAUSING INTERMITTENT RATTLE NOISE WHEN DRIVING OVER BUMPS AND ROUGH ROADS

When evaluating the condition of struts on cars, most technicians only look for leaks and the number of times the car bounces when the car goes over a bump.

Of course every technician has their own way of evaluating the condition of shocks and struts. And the opinions about the number of miles that shocks and struts should be replaced vary from technician to technician and from one parts manufacturer to another.

There is evidence out there to prove that a strut or shock with a lot of miles on it is not as responsive as a new one that has not been cycled over a million times. And the way the car is used and where it is driven is a major factor on how long the struts will last.

But when it comes to suspension noise, some of the higher mileage P1 Volvos have come into shops with worn strut pistons that can cause a rattling noise over rough roads even though there are no visible signs of fluid leaks coming from the strut assembly.

So if you have one of these Volvos come in with a rattle in the front suspension that has no obvious causes, take a closer look at the struts.

Of course the only way to check for this kind of play in the piston is to disassemble the strut and spring assembly and shake the piston side to side.

You will feel the piston moving and hitting the sides of the cylinder.

2001 - 2015 V70/XC90/XC70/S80/S60

Volvo suspension bushings are very high quality and can last for a lot of miles and a lot of years. But as with



S40 2004 - 2011

C30 2008 - 2013

V50 2004 - 2011

C70 2006 - 2013



Front lower control arm bushings.



## VIDA

### VEHICLE INFORMATION AND DIAGNOSTICS

Improve your workshop efficiency and reduce cycle times by having instant access to Volvo repair methods and technical information.

Visit [VolvoTechInfo.com](http://VolvoTechInfo.com), and click on VIDA for more information.



any high mileage parts that are subjected to constant pressure, varied loads, extreme temperatures and exposure to all kinds of road conditions, there is a lifespan.

When these bushings break down and crack, they don't usually make noise themselves. But by allowing the suspension to move further than it was designed to, the worn lower control arm bushings can be responsible for a lot of front end noises.

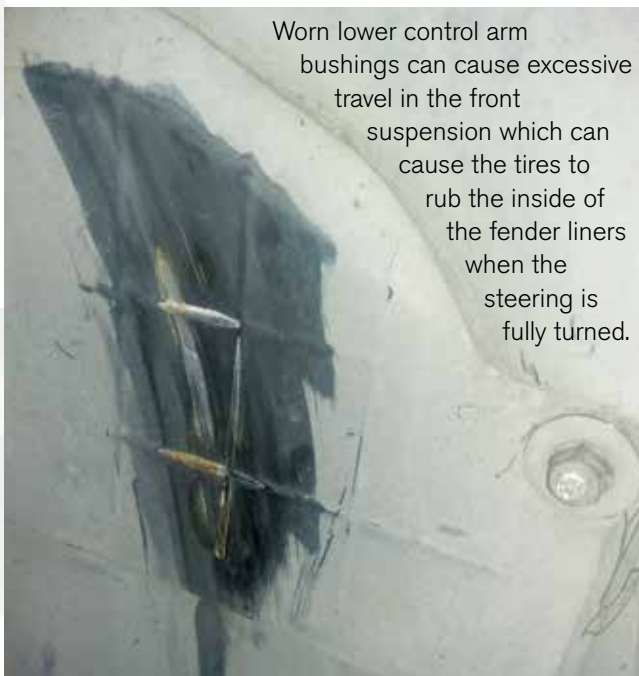
The most common noise heard by drivers when they have worn out lower control arm bushings happens when the wheels are turned to the full lock position. The excess travel in the suspension can cause the inner sidewall of the tire to rub against the inner fender well.

The other common noise that can be caused by worn or cracked lower control arm bushings is a clunking noise on sharp application of the brakes or on fast acceleration from a stop.

On a car with badly cracked lower control arm bushings, the control arm will travel hard rearward on braking which can cause the front tires to rock back until they almost hit the back of the fender liners. When these bushings are in this condition they can cause problems like poor handling, oversteer and uneven tire wear.

The best way to impress the importance of these bushings to your customer is to have your customer stand outside the car and look at the front tires as you slowly drive the car forward and jab on the brakes.

The sight of their front tires moving 3 to 5 inches to the rear, will convince even the most cynical customer. ●





# CLUNKING/PULLING, BUSHING IN REAR STAY BROKEN

**NO:** TJ 25336

**FUNC GROUP:** 6522

**FUNC DESC.:** CROSS STAY

**PARTNER:** 3 US 7510 VOLVO CARS  
NORTH AMERICA

**ISSUE DATE:** NOVEMBER 28, 2011

Type	Eng	Eng Desc	Sales	Body	Gear	Steer	Model Year	Plant	Chassis range	Struc Week Range
124							2007-9999		0000001-9999999	200606-999999
134							2011-9999		0000001-9999999	201020-999999
135							2008-9999		0000001-9999999	200720-999999
136							2008-9999		0000001-9999999	200720-999999
156							2009-9999		0000001-9999999	200835-999999

Code	Description
QF	Steering/Constant pull to left
QG	Steering/Constant pull to right
QH	Steering/Other steering/handling problems
E7	Suspension/Unusual noise
WZ	Suspension/Clicking/clonking noise

## DESCRIPTION:

The front bushing in the rear longitudinal stay may fail, causing one or more symptoms:

- Knocking / clunking noise from rear suspension on uneven roads.
- Pulling / drifting due to incorrect wheel alignment / rear wheel camber angle.
- Unstable rear suspension on curvy roads.

The analysis indicates that there could be some corrosion on the bushing's outer metal ring, which causes the vulcanized rubber to loosen.

## PRODUCTION MODIFICATION

Waxed bushings, which may reduce corrosion, were introduced in production from 2012w10.

Approx. chassis breakpoints:

124-161000  
135-242000  
136-140000  
134-134000  
156-324000

## SERVICE

Replace the bushing according to the attached TJ Instruction.

After installing the new bushing, spray rust proofing wax on the bushing outer metal ring to prevent repeat repair (picture #3).

## PARTS

Note: Parts will be listed in Parts Catalogue from VIDA 2012DU2.

Bushing, left side with standard attachment (see picture #4):  
PN 31387280

Bushing, left side with large attachment (see picture #5):  
PN 31387282

Bushing, right side: PN 31387281

Rust proofing wax: PN 9510226 (500ml/1.8fl.oz).

Use 25ml/0.85fl.oz on each side (50ml/1.8fl.oz total).

Note: Never use other rust preventers! Solvent based chemicals will damage the rubber bushing!

**AFFECTED VEHICLES:**

Year	Model
2011 - 2013	S60 (11-)
2007 - 2013	S80 (07-)
2008 - 2013	S80L
2011 - 2013	V60
2008 - 2013	V70 (08-)
2009 - 2013	XC60
2008 - 2013	XC70 (08-)

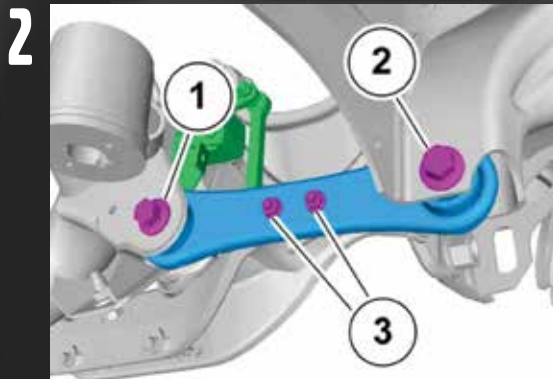
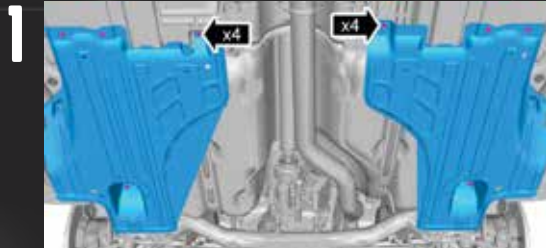
**SPECIAL TOOLS:**

Description	Part No.
Ring	999 7469
Drift	999 7467
Hydraulic hole cylinder	951 2923
OK	999 7468

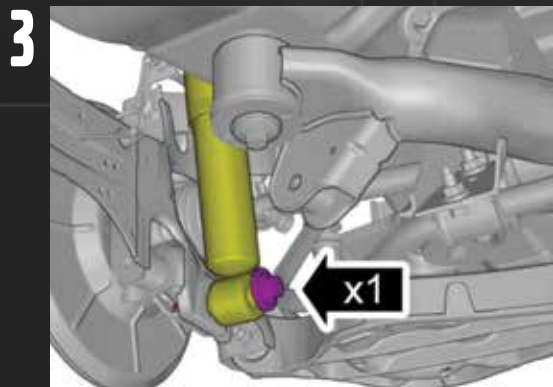
**EQUIPMENT:**

Description	Part No.
Hydraulic press	

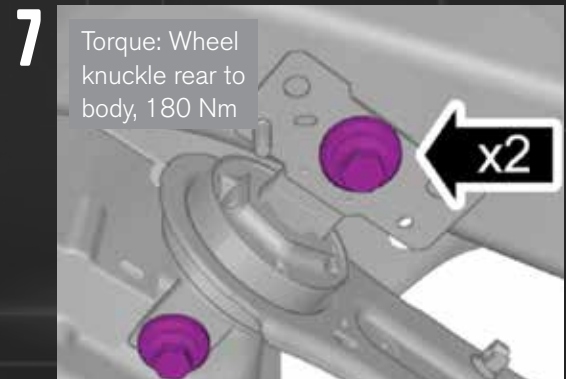
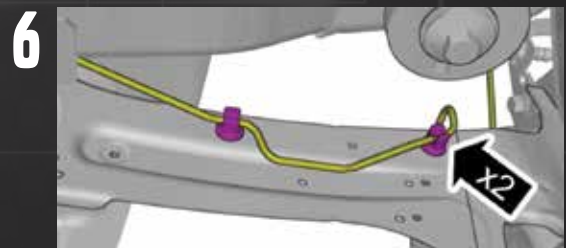
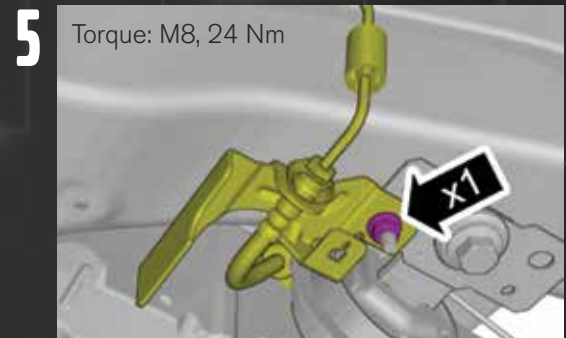
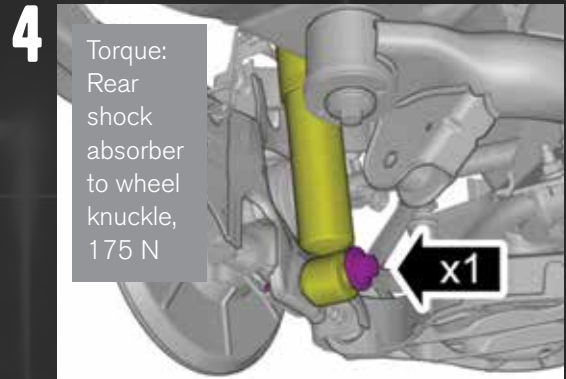
**NOTE! REMOVAL STEPS IN THIS PROCEDURE MAY CONTAIN INSTALLATION DETAILS.**



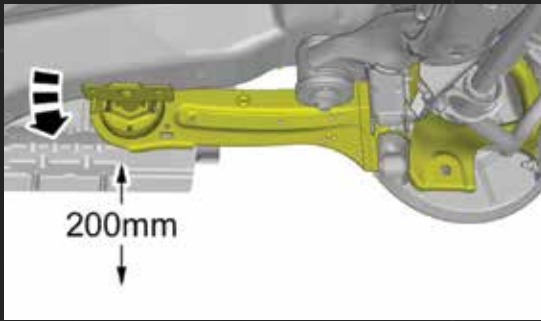
Remove the following components:  
 1. Torque: Tie rod to subframe, 110 Nm  
 2. Torque: Tie rod to longitudinal stay, 110 Nm  
 3. Torque: M6, 10 Nm



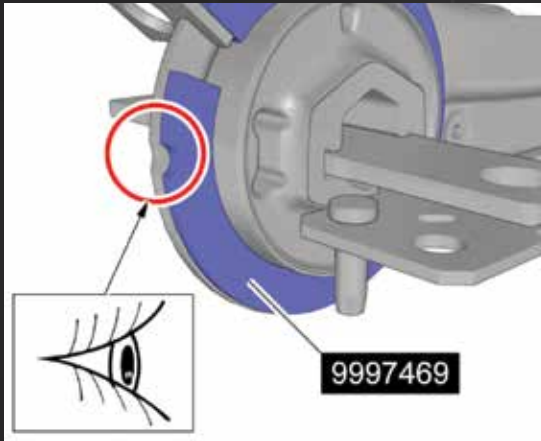
Rear shock absorber to wheel knuckle (Nivomat), 280 Nm



8



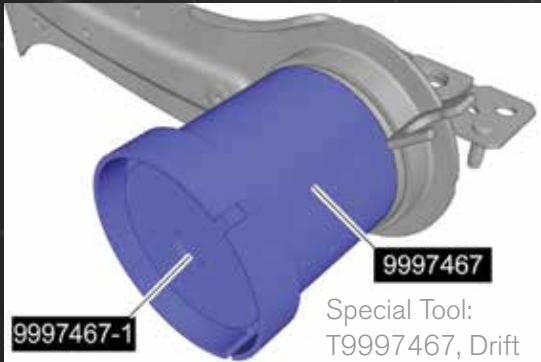
9



Caution! Make sure that the component is positioned correctly.

Special Tool: T9997469, Ring

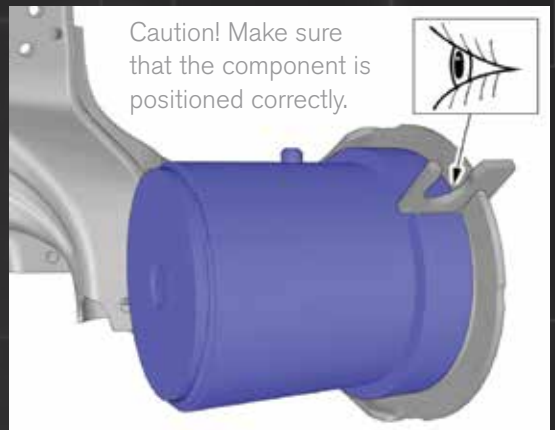
10



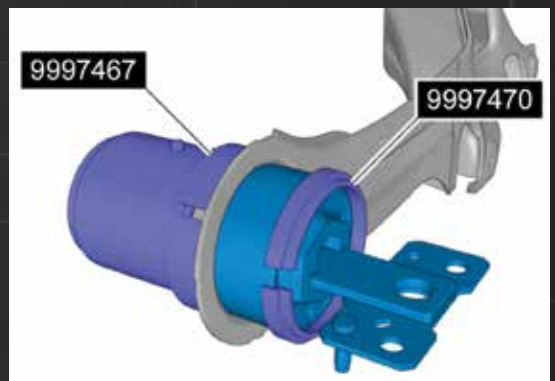
12



13



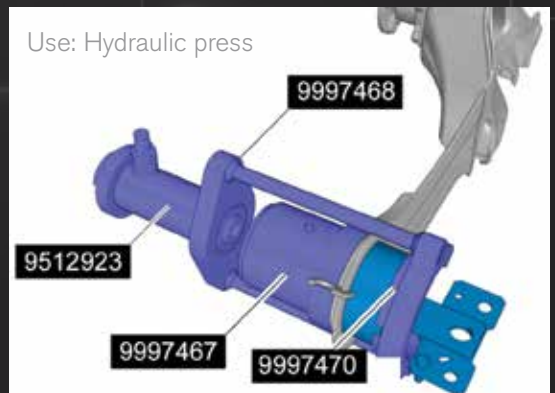
14



11



15



TO INSTALL, REVERSE THE REMOVAL PROCEDURE





## Collision Advantage

In support of the collision repair market, Volvo Car USA has introduced Volvo Collision Advantage, powered by CollisionLink®. Volvo Collision Advantage supports body shops with faster estimates and cycle times, and also offers price matching on a select group of parts. Volvo wants to help repair shops get the Volvo Genuine Parts they need to help ensure the vehicle will be repaired properly.

Contact your local Volvo dealer to learn more.

**collisionlink**®



# ABS AND TRACTION CONTROL – A TRUE DYNAMIC DUO

TODAY'S VOLVO ABS  
(ANTILOCK BRAKING  
SYSTEM) WORKS IN  
CONCERT WITH TRACTION  
CONTROL TO MAKE DRIVING  
SAFER THAN EVER BEFORE.



Testing  
speed  
sensor with  
ohmmeter



The antilock braking system on a vehicle is a safety feature found on most modern vehicles. The ABS system is designed to help prevent wheels from locking during heavy braking situations, preventing the vehicle from skidding or hydroplaning. The ABS system is made up of the ABS sensors and reluctors that are located on each wheel and the ABS control unit. The sensors detect wheel speed, and will send a message to the ABS module to rapidly pump the brakes when it is detected that the vehicle is skidding or has lost traction.

When the ABS system is not functioning properly, then loss of traction, skidding and hydroplaning are far more likely to occur under heavy braking conditions. The ABS system on most vehicles is usually designed to give plenty of warning signs when there is any trouble with the system. Being aware of these warning signs, and addressing the problem as soon as they arise will help ensure that the ABS system and vehicle remains functioning for maximum safety.

## 1. UNRESPONSIVE BRAKE PEDAL

In certain cases, depending on the model of vehicle, when the ABS module fails, the brake pedal may become unresponsive. This is an obvious problem as an unresponsive brake pedal will not stop a vehicle, or will not

be able to do so in an adequately safe manner. In most cases, this will happen slowly, over time. Usually the brake pedal will become increasingly hard to press until it is no longer responsive.

## 2. BRAKE PADS REQUIRE MORE PUSH EFFORT

When all components of the braking system are working properly, the pedal should require very little effort. It should be very easy to press down on and, once pressed, should have an immediately noticeable effect in slowing the vehicle. If you start to notice that over time the pedal requires increased effort in order to achieve the same amount of braking force, then that may be a sign of a possible issue with the ABS module.

## 3. THE ABS LIGHT IS ON

The most common sign of an issue with the ABS system is the ABS light will illuminate. The ABS light will show an amber color, and is the equivalent of a Check Engine light except it is only to diagnose problems with the ABS system. Older vehicles equipped with earlier ABS systems may not have an ABS light, and may use a Check Engine light instead. If the ABS light comes on, then that is a sure sign there is a problem with the ABS system.

## 4. THE BRAKES ARE LOCKING UP

When it is functioning correctly, the ABS system is designed specifically to prevent the wheels from locking up during heavy braking, preventing loss of traction. However there can be certain instances where a faulty ABS module can behave erratically, causing brakes to lock up even under normal driving conditions. If you are experiencing sporadic behavior from the brakes, such as random clicking noises, and/or pumping of the brakes, then the ABS control unit will likely need to be replaced.

The ABS control unit is attached to the ABS pump, which will need to be unbolted when the control unit is replaced.

## COMPONENTS AND WHAT THEY DO, ABS BRAKING SYSTEM

### TRACS

This was Volvo's original traction control system which used the ABS sensors to monitor and brake the wheels that were slipping. As many 850 owners experienced, the ABS control module could eventually fail and disable both ABS and TRACS. Often a failing module could falsely trigger and attempt to brake one of the wheels. Now TRACS can be turned off at the push of a button.



ABS control module and wheel sensor



## STC, STABILITY TRACTION CONTROL

During the turn of the century, most Volvos came equipped with traction control as a standard feature. STC is composed of multiple sensors and traction control components which apply the brakes or cut engine power to the wheels that are slipping. This system was often a frustration to drivers because it could dramatically slow down the car's acceleration under certain conditions. Thankfully, holding the STC button for three seconds would partially disable traction control and provide drivers with the ability to select a different driving mode if needed.

## DSTC, DYNAMIC STABILITY AND TRACTION CONTROL

Just like STC, the purpose of this system is to prevent the car from skidding or sliding by slightly applying the brakes or cutting engine power to the wheels experiencing a loss of traction. Being dynamic, it consists of even more components than STC but can still be partially disabled at the push of a button.

## TRACTION CONTROL

A component of both DSTC and STC, Volvo's modern traction control detects a wheel slipping and immediately cuts power to that wheel while applying more power to the other wheels. The purpose of this system is to prevent the car from sliding.

## SPIN CONTROL

Another modern component of DSTC and STC, this system limits power to the wheels so that they do not spin. Spin control is the main reason why Volvo owners have such a hard time performing burnouts or achieving rapid acceleration from a standstill. When disabling either STC or DSTC, this is the main traction control component which gets turned off.

## ACTIVE YAW SENSOR

A bit more advanced than the standard traction control system, the yaw rate sensor monitors for any wheel slipping and determines how to distribute the engine's power to keep the car under control.

## EDC, ENGINE DRAG CONTROL

When using lower gears for engine braking, EDC prevents the wheels from locking up. A wheel locking up while driving down a wet or icy hill could have serious consequences.

## CTC, CORNER TRACTION CONTROL

Because all modern Volvos are either front wheel or all wheel drive, it's likely that a driver might experience

understeer if they enter a turn too quickly. Understeer occurs when the wheels are turned, but the car's excessive forward momentum prevents it from making the turn as expected. CTC applies the brakes and distributes power as necessary to keep the nose of the car pointed in the direction you want it to go.

## TRAILER STABILITY ASSIST

The trailer stability assist function is to stabilize the vehicle and the trailer combination, particularly if the trailer begins to sway back and forth. The function applies brakes to one side or the other to slow down and correct the swaying motion of the trailer. Trailer swaying is a common problem when a trailer is loaded with insufficient, or negative, tongue weight. Industry standard is to have at least ten percent of the total loaded trailer weight as tongue weight.

Replacing components in the ABS system and reading ABS codes in the system requires the capability to read the data within the control module. Using Volvo's VIDA system can help read and diagnose problems with the ABS system. A qualified technician will have little to no problem replacing components in the ABS system.

## TROUBLESHOOTING

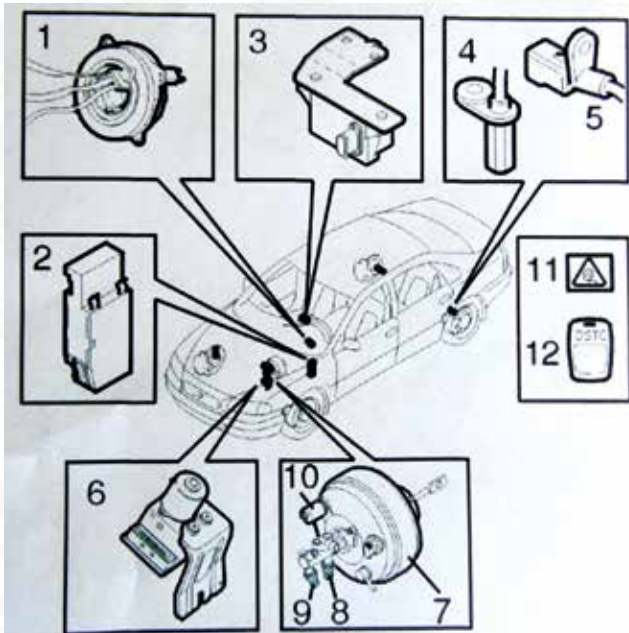
Let's talk about the 1996 to 2000 850, S/V70, and the S80. That annoying ABS or Traction Control light can come on and go off and then on again, and is a good sign that the control unit is bad.

ABS control modules are a known problem and sometimes can be replaced more than once in a vehicle's lifetime. Make sure to troubleshoot all codes that are present before just replacing a control unit.

Speed sensors rarely fail but are easy to check with a ohmmeter. Connect a meter to the sensor and spin the wheel. Testing sensor resistance should be 900-1,380 ohms. Usually if there is open sensor reading, most of the time there will be a wiring problem, possibly wire worn through from chafing on something. In such cases it's not a bad idea to clean sensors while troubleshooting. (See image on page 16.)

Sometimes pump codes will be present. Be sure to check the wires at the pump-to-control unit connection. The outside insulation on the wire can start to fall apart, leaving wires exposed that could short out. Rarely will the pump motor fail, but that is possible. Excessive resistance or an OL (Over Limit) reading from a meter means the pump motor is bad and will need to be replaced. Always check the connection at the control module and clean it with electrical cleaner and dry it, making sure no corrosion remains.

Always check fuses first before troubleshooting further. A loose axle nut, or a torn axle boot that's spilling grease everywhere could cause a wheel sensor code.



## CONTROL MODULE PART NUMBERS

ABS control modules for all 1996 - 1998 front wheel drive 850, V70, S70, and C70 models with Tracs may carry part numbers 9162675, 9140774, or 8602266. These numbers are all compatible.

For 1996 - 1998 front wheel drive Volvos without Tracs, the part numbers are 9140773 and 8602265.

For 1998 all wheel drive vehicles, including the XC70, V70R, V70AWD, and S70 AWD, the control modules are part number 9162675, 9140774, and 8602266.

The newer model Volvos become more sophisticated with more components and of course safer for the driver and passengers.

The Volvo XC90 AWD model had a more modern system with new components in the ABS system. When an anti-skid or a brake warning light comes on, many new codes are introduced into the system, making diagnosing somewhat more challenging. Although these control modules were a bit more reliable than those in the 850 models, other components in the system could malfunction.

Using Volvo's VIDA to read and diagnose problems will make this process a lot less challenging.

Making sure the system is updated with the most recent software is a good place to start when diagnosing problems in the system. Making sure the alternator is putting out sufficient voltage for battery is key.

One problem with the system is water entering into the cabin. Sunroof drains that leak and fill up the floor board of the vehicle can cause electrical issues with many things, one being the yaw sensor. This sensor is located under the passenger seat, so when water enters the cabin of the vehicle this sensor can become water contaminated.

Move the passenger seat towards the back to make room to expose the yaw sensor. Remove the 10 mm bolts and remove the amplifier. Look to see if the compartment is filled with water. If water is present, vacuum it out, remove the seats and carpet and dry out.

Two 10 mm bolts hold down the sensor. Remove them and pull the sensor out. Now that the yaw sensor is exposed, remove the connector and check for water corrosion. If the connector and sensor are corroded, replace both parts using genuine Volvo parts along with a new electrical connector.

After the new unit and connector are replaced and installed under passenger seat, make sure there are no codes in system and test drive vehicle.

ABS component and location starting 2001 model year.

1. Contact reel/ steering angle sensor applies only to vehicles with DSTC (Dynamic Stability and Traction Control).
2. Control module for steering wheel angle sensor applies only to vehicles with DSTC.
3. Active yaw sensor applies only to vehicles with DSTC.
4. Front wheel sensor.
5. Rear wheel sensor.
6. ABS modulator with control module.
7. Servo unit.
8. Pressure sensor.
9. Pressure sensor.
10. Pedal position sensor.
11. Warning lamp.
12. Switch for DSTC.



Underneath the passenger seat is where the yaw rate sensor lives.

Make sure that the charging system in the vehicle is up to snuff, at least 13.4 volts. Overcharging or undercharging can set off ABS codes.



## DRIVESHAFT SERVICE AND R&R

Volvo vehicles equipped with all wheel drive starting with the 1998 Volvo S70 and V70 will have a driveshaft from the angle gear to the differential. The angle gear could also be called the transfer case. These drive shafts are a two piece shaft with center support and bearing. The ends are not your regular u-joints like in the past but rather are a new style propeller shaft universal joint. There is one on each end and one in the middle near the center support bearing.



Propeller shaft universal joint

The driveshaft or propeller shaft can sometimes make a clunking sound, rattling or even a scraping noise when driving, or when moving from Park to Reverse or forward gears. This is a sure sign of wear and deterioration on the universal joints and/or center support bearing. Excessive vibration while driving can also be a driveshaft problem. Driveshafts are finely balanced before installation to make sure there is no vibration. A vibration in the driveshaft can also cause other parts on a Volvo to fail, so it's very important to check the vehicle carefully when vibration is present.



Mark driveshaft with marker

## REPLACING THE DRIVESHAFT

Before lifting the vehicle up, make sure to leave the gear selector in Neutral so the driveshaft will spin. This will make it easier to remove connecting bolts. Disconnect the battery just to make sure of no problems.

Once the vehicle is lifted up, mark both ends of the driveshaft if you'll be installing the same driveshaft after repair. If you'll be installing a new driveshaft, this procedure is not necessary.

Remove the exhaust system and heat shields. The exhaust can be unbolted in front and removed at the hanger in the rear, so you can remove the system all at once. After the exhaust and heat shields are removed, the driveshaft will be exposed. Remove all bolts at the angle gear and differential, or in some models, from the Haldex. Remove bolts from the center support. Remove the driveshaft from the vehicle. Replacing the front universal joint is possible. But check all three universal joints for

play. If there are any other problems with the driveshaft, a new shaft will have to be installed.

To replace the front universal joint, secure the driveshaft into a vise to hold it in place. Remove the front cover by tapping the edge with a small drift or punch and remove the snap ring. Remove clamps on both sides of the universal joint. The universal joint should now be able to be removed; just slide it off the shaft. In some cases the universal joint will be stuck on the shaft. Removing the rubber boot and using a drift punch and tapping with a hammer may be necessary. Clean the end of the shaft from all grease and debris. Install a new joint and be sure to grease properly. Install a new e-clip after the joint is on the shaft. Secure the clamps on the boot to protect the universal joint. Using Volvo Genuine parts will make the job easier and durable.

Install the driveshaft back into the vehicle. Tighten the bolts at both ends of the shaft and at the center support. Install all heat shields and the exhaust system. Test drive the vehicle to make sure no vibration or noises remain. ●





# CABIN FILTER

CLEAN AIR FOR EVERYONE

All Volvos are equipped with a cabin filter that cleans the incoming air to ensure a healthy 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 local Volvo dealer for a complete selection of Volvo Genuine Parts.**





# CLASSIC VOLVO 240 SERVICE AND REPAIR TIPS

THIS ARTICLE WILL  
BE ABOUT THE CARE  
AND FEEDING OF THE  
LEGENDARY VOLVO  
240 SERIES CARS.



Volvo produced over 2.8 million of these beauties worldwide from the years 1974 - 1993, and, even though the newest one of these cars you will see is over 25 years old, there are still a whole lot of these cars on the road today.

The 240 is what most non-Volvo people still think about when they see or hear the word, "Volvo."

That's because these cars stand out in a crowd these days, and if you look closely, they have been used in countless TV shows and movies, even today.

We will focus on later versions of the 240 (1986 - 1993) in this article, but a lot of this information can be useful for some of the very rare earlier years (1975 - 1985) of the 240.

If you get these cars coming into your shop, don't be surprised if they have well over 150K on the odometer, and don't make the mistake of assuming the car is worn out and should go to the junk yard just because of high mileage. It all depends on how they were taken care of over the years.

But be aware that most of the 240s that come through your door should be treated like a restoration project; let's face it, the 240 is a classic car.

The fact is, the mighty 240's chassis and body were built so well that the main reasons they are retired from service are usually collision damage or just slowly rusting away in cities that use a lot of salt on their roads during the winters.

The 240's body may be still sound, but the mechanical parts do wear out and you should keep that in mind while working on these cars and giving estimates. You should also consider that some of the parts may be challenging to source.

Your local Volvo dealership may still be able to get many of the replacement parts, especially common service parts, so make sure to check with them first for availability.



Main fuel pump

## NO START DIAGNOSIS

When a 240 is towed into your shop with a no start symptom or even an intermittent hard start condition, there are a few things common to aging 240 Volvos that you should check first before jumping down the diagnostic rabbit hole.

Besides checking the basics, like having fuel in the tank and tight and clean battery connections, you should be checking the Volvo 240's list of usual suspects.

The most common causes of a crank but no start condition on a 240 are...

### 1. MAIN FUEL PUMP FAILURE (MOST YEARS)

These pumps can take a lot and there are still 240s out there with original pumps on them. When these pumps fail they will usually lock up when the car is hot and may start pumping again when the car cools down.

### 2. FUEL PUMP RELAY (MOST YEARS)

The main fuel pump relay can be troublesome, causing intermittent stalls and hard starting. The most common failure is overheating of the main 12V power connection to the point that the solder joint fails. This is usually caused by a failed pre-pump in the gas tank, which in turn causes the main fuel pump to be overworked and draw excessive amperage that overheats the circuit. You can confirm this failure by popping the cover off the relay and inspecting the solder joints on the circuit board.

The fuel system relay (located behind the passenger side kick panel) is a combined function relay. It combines the fuel pump and fuel injection relay into one unit. The system relay provides current to the fuel pumps, suppressor relay, idle air valve, air mass meter, oxygen sensor pre-heating resistor, and to other ECU controlled functions or components.

The fuel injection ECU controls the relay ground connection. When ground is supplied, the system relay is activated and current can flow to all the related components. If the ground connection is interrupted, no current can reach the components. This enables the fuel injection ECU to control the fuel pump operation. The fuel pumps are activated only when the ECU receives an engine speed signal.

Should the engine stop in case of an accident or other reason, the power supply to the fuel pumps will be interrupted by the system relay, reducing the risk of fire in case of a fuel leak.



On most of the 240s that will come through your shop, you will find the main fuel pump relay located under the passenger side dash, mounted or hanging from the firewall.

If you have a no start condition, even an intermittent one, you should pay close attention to this relay; these relays are usually dated with the year and month that they were manufactured. So even if the relay is not the root cause of the symptom, if it's over 10 years old you should replace it anyway, especially if you are replacing the main pump.

### 3. FUEL SYSTEM FUSIBLE LINK NEAR BATTERY

On some later 240s (1988 - 1991) with LH 2.2 Jetronic fuel injection, Volvo used a fuse holder with a 25 amp fuse, installed near the battery as a type of fusible link for the fuel system.

These fuse holders were unprotected from the elements, and over time, begin to corrode. As the contacts corrode they build resistance and heat, causing the housings to break down. This 25 amp fuse provides direct battery voltage at all times to the fuel pump relay, so check this first in a crank, no start situation.

If you can't source a factory replacement fuse holder, you should install a good quality, water-tight fuse holder, with a new fuse in its place.

Make sure to solder and heat shrink your wire splices.

### 4. CORRODED OR CRACKED FUSES IN MAIN FUSE PANEL NEXT TO DRIVER'S FEET

The main fuse box is located in the driver side kick panel and suffers from a few design flaws. First, the fuse box is susceptible to corrosion from water that can enter the interior and drip directly onto the fuses. Second, the small contact area of the European ceramic-style fuses also leads to corrosion due to electrolysis. You can prevent numerous problems associated with the fuse box by pulling all fuses and cleaning them annually.

If you encounter an intermittent or no start issue on your 240, you can often get going again by simply spinning the fuses in their holders, which re-establishes electrical contact.

When checking this type of ceramic fuse, the old rules don't always apply. Sure, they are very easy to see if they have been overloaded and are blown, but in a lot of cases the fuse that is causing a problem won't be blown.

When inspecting these fuses, use a flashlight and look closely for cracks at the ends of the fuses and for heavy corrosion in the holders.



If you can't find a factory replacement fuse holder you should splice in a good quality water tight replacement with a new 25 amp fuse.



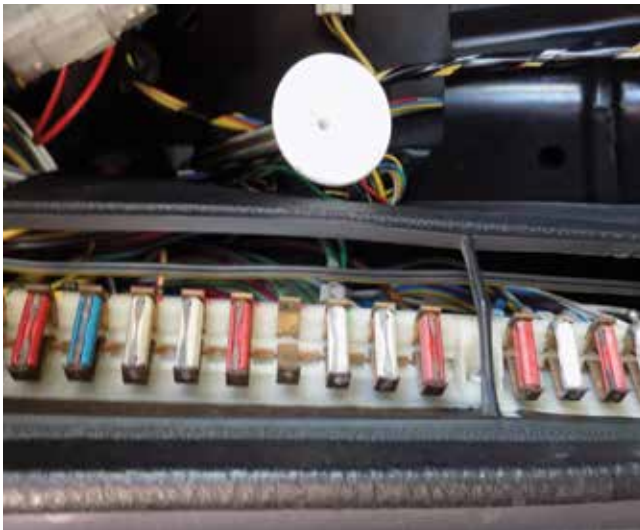
Fuse box



## VOLVO GENUINE PARTS

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

Get all the benefits of Volvo Genuine Parts with one simple phone call.



When you are testing these old-style ceramic fuses for a problem, don't always expect them to "look" like other fuses when they are bad. One of the more common problems can be intermittent open circuits caused by tiny cracks at the ends of the fuses.

### 5. OPEN IN DISTRIBUTOR COIL WINDINGS (1974 - 1988)

If you have a no spark symptom it could be caused by an open or short inside the ignition coil's pickup windings. This is a rare condition and usually only exhibits symptoms when the engine is hot.

You can check for this on distributors with 2 terminals by using an ohmmeter and checking resistance between the 2 terminals. The resistance should be between 950-1,250 ohms.

### 6. BAD CONNECTIONS AT IGNITION CONTROL UNIT CONNECTOR LOCATED IN RIGHT FRONT OF THE ENGINE COMPARTMENT (1986- EARLY 1989)

If you have a (1986 - 1989) Volvo 240 in your shop with an active or intermittent crank, no start symptom and you suspect a no spark condition, make sure to inspect the connector and pins on the ignition control unit located in the right front of the engine compartment next to the washer tank.

You can use a spark tester or a timing light to see if the spark comes back. If it does, pull off the main connector and clean and tighten the pin connectors.

### COMMON ISSUES WITH THE 240 OIL LEAKS

Oil leaks can be common on an old 240, but you should make sure that you are recommending the correct repair







When you are checking out a 240 that has an active or intermittent no spark symptom, you should pay close attention to the connections and wire terminals at the ignition control unit located in the right front of the engine compartment. You can check the quality of the connection by wiggling the connector while remotely cranking the engine over with the key on position 2.

when talking to the customer. A lot of techs will mistake a leaking oil pan gasket or leaking rear cam plug seal for a rear main seal leak.

To confirm that you are not looking at a rear crank seal leak, you can just remove the 6 bolts that hold on the lower support bracket at the bottom rear of the engine and look right at the rear main seal with a flashlight and small mirror.

## CRACKED BRAKE HOSES AND RUSTED BRAKE LINES

When performing brake inspections on these 240s, always keep in mind the age of these cars.

Look closely at the soft brake hoses and check for cracks near the fittings. In states where they use salt on roads, you should pay special attention to the steel brake lines that run from the front to the rear of these cars. If the lines are heavily rusted, it is time to recommend replacement.

## AIR BOX THERMOSTAT

Since the early years of emission control, most manufacturers used some sort of intake air cold start warm up system; the Volvo 240 is no exception.

The Volvo 240 uses a thermostatically controlled shutter valve in the air filter box. This thermostat regulates the flow of fresh and pre-heated air into the intake system. Pre-heated air comes into the air filter box through the aluminum pre-heat hose that is connected between the air filter box and the exhaust manifold or downpipe.



The air box thermostat should be in the closed position in most cases unless the ambient temperature is less than 50 degrees F. Usually the thermostatic valve will fail in the open position, causing hot air from the exhaust to be sucked through the air mass sensor at all times, causing inaccurate readings and damage to the air mass sensor itself.

It is common for the thermostatic valve to fail in the pre-heated air (open) position. This routes superheated air through the Mass Air Flow sensor (air mass meter) at all times.

If this condition is allowed to continue for a long period of time, it will cause premature failure of the air mass sensor. It will also cause the engine to run very inefficiently as the engine management system will excessively lean out the fuel mixture in response to the hot air.

The engine management systems were never designed to run with an ambient air charge that can be in excess of 400 degrees F at all times.

Check your system on a day when the ambient temperature is above 50 degrees F. The valve should be fully open to fresh air (not pre-heated). If it is open to the pre-heat side, then you should replace the thermostat. Also, if the valve fails to reach full extension at hot and cold extremes, replace it.

If you have had the pleasure of working on a 240 Volvo's tail lights, especially a 240 sedan's tail lights, you will know it can be challenging to get them to work reliably.

These tail lights are unique in that they use individual bulb sockets that get their power and ground from a flexible plastic circuit card that is embedded with copper.





## THERE'S NO SECOND CHANCE

### VOLVO GENUINE BRAKES

Volvo Genuine Brakes are more than simply replacement discs and pads. They are essential components that interact with sophisticated systems and software to help ensure the safety and performance of Volvo cars.

Installing Volvo Genuine Brakes is an investment in reliability and quality – the best option in the marketplace for keeping your customers safe.

Get the replacement brake parts designed and engineered by Volvo.

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



When these cars were new, this system worked very well and was very reliable. But over the years, being subjected to conditions like dust, vibration, heat and especially moisture intrusion, the tail lights can become tricky to keep working all the time.

Luckily most of the 240 sedan's tail light problems can be easily fixed by cleaning and tightening the connections at the main circuit card connector or just cleaning the contact surface of the card itself.

## SERVICE

### VALVE ADJUSTMENT

It's a good idea to check and adjust the valves on these cars every 90K miles, and here is how to do it.

Incorrect valve adjustment can result in low performance, poor economy, and noisy engine operation.

The replacement shims come in increments of 0.05 mm.

1. Start by positioning the camshaft at TDC for cylinder 1.
2. Cam lobes for cylinder 1 must point obliquely upwards and the ignition mark on the crank pulley must be at 0 degrees BTDC.
3. Measure and note the valve clearance for cylinder 1.

NOTE: It's the same clearance for intake and exhaust valves.

Clearance when checking. Allowable clearances are:

- Cold engine: 0.30 - 0.40 mm (0.012 - 0.016 in)
- Hot engine: 0.35 - 0.45 mm (0.014 - 0.018 in)

Check and note the valve clearance of the remaining cylinders:

- Turn the crankshaft 180 degrees clockwise and check cylinder 3.
- Turn the crankshaft another 180 degrees clockwise and check cylinder 4.
- Turn the crankshaft yet another 180 degrees clockwise and check cylinder 2.



Tail lights

### ADJUST VALVE CLEARANCE

Clearance when adjusting. Note that the tolerances are closer than when checking valve clearances:

- Cold engine: 0.35 - 0.40 mm (0.014 - 0.016 in)
- Hot engine: 0.40 - 0.45 mm (0.016 - 0.018 in)

1. Turn camshaft to "clearance checking" position.
2. Remove adjustment shim:
  - Rotate the tappets so that the groove is completely to the side.
  - Use Volvo press tool 999 5022 (or equivalent) to depress tappets.
  - Use pliers 999 5026 (or equivalent) to remove valve shim.
3. Select an adjustment washer of the correct thickness:
  - Valve shims are available in thicknesses of 3.30 - 4.50 mm (0.130 - 0.180 in) at increments of 0.05 mm (0.002 in).
  - Only use new valve shims if available.
  - Use micrometer to measure the thickness of the old shim.
  - Oil and install the new valve shim.
  - Turn the shim with marking pointing downwards.
  - Remove press tool 999 5022.
  - Turn the engine over a few times with the starter motor.
  - Then check clearance again.
  - Adjust if necessary.

The Volvo 240 uses a simple yet effective design to recirculate the engine's excess crankcase vapors. Instead of the typical PCV valve used in most cars, the 240 uses a fitting with a screen and a vacuum fitting to draw crankcase gases back into the intake manifold.

These flame trap screens can clog up with carbon over the years and miles and cause excess pressure to start to push out oil seals and cause the engine to burn excess oil.

The flame trap should be changed and the vacuum fittings cleared every 30K miles. ●



PCV (flame trap)



# DON'T LET YOUR CUSTOMERS GET STRANDED. TEST THE BATTERY.

## CONSUMER BATTERY MINDSET

77% of consumers wait until the battery fails to replace

74% choose another outlet for batteries

## PROACTIVE BATTERY TESTING

95% of your current customers are willing to have a battery test

84% will proactively replace a battery if the test shows it will fail soon

The best opportunity to sell batteries is to the customer who's already in your shop

TEST EVERY BATTERY. IT'S THE HIGHWAY TO SATISFIED CUSTOMERS AND GREATER PROFITS.





# A PARTNERSHIP FOR SATISFIED VOLVO OWNERS

What's the most important thing that independent repair facilities and Volvo dealers have in common? We think it's our shared commitment to make Volvo drivers happy. One way to do that is to be sure everyone driving a Volvo car is always able to get Volvo Genuine Parts installed.

The advantages are clear. Today's sophisticated safety and performance features demand replacement parts that precisely replicate the originals. Volvo Genuine Parts also fit perfectly on the first try, which saves you time and money. Add to that a 2-year limited warranty\* and you have a formula for satisfaction that's unmatched.

But there's more. Volvo can support your business on many levels. We cater to your needs with easy ordering, unrivaled availability, and you get access to technical information.

Satisfied Volvo customers –  
the basis of a rewarding relationship.

\*Warranty excludes consumable "wear item" parts, labor and Volvo accessories. U.S. only.