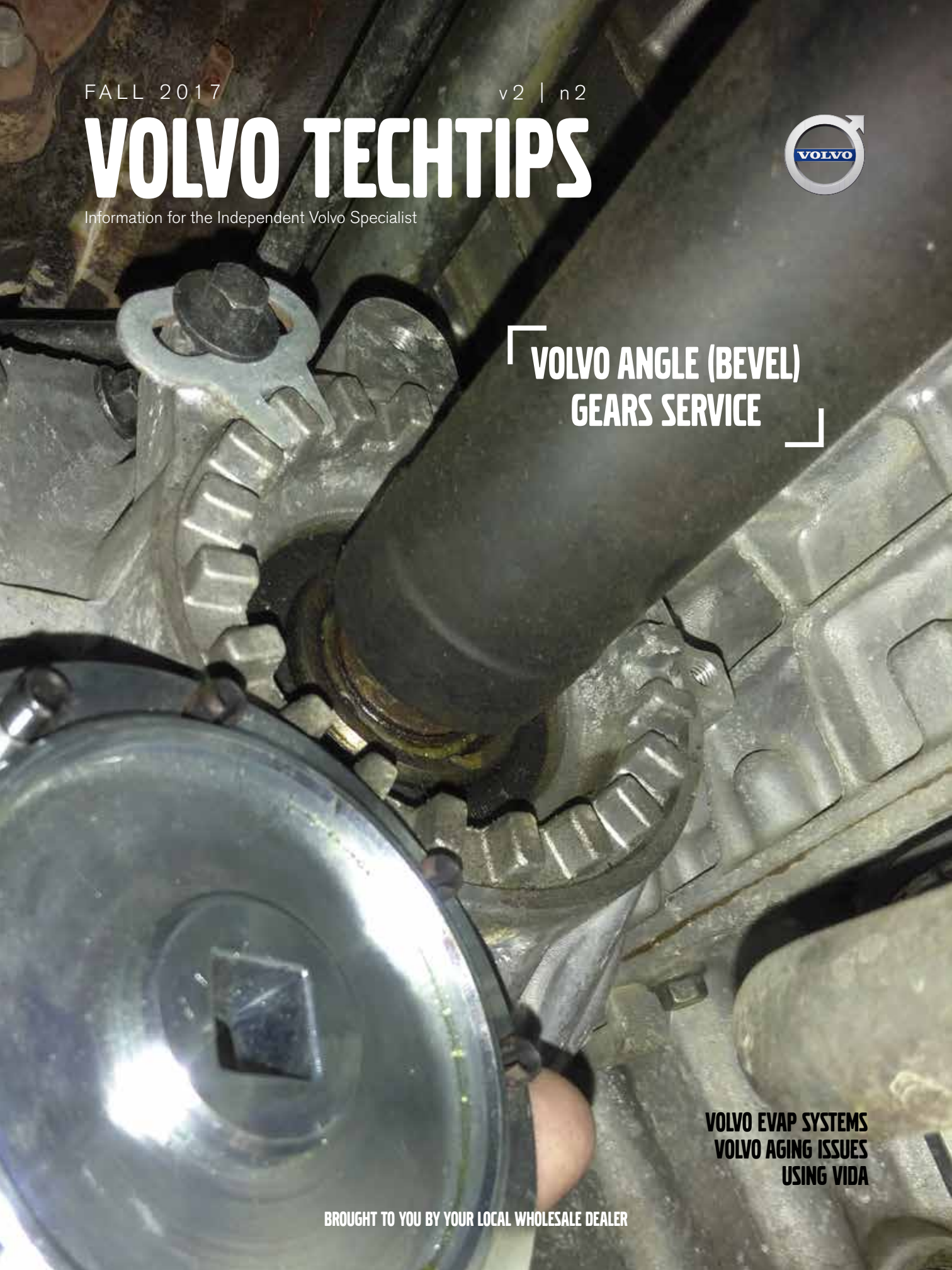
FALL 2017 v2 | n2

VOLVO TECHTIPS

Information for the Independent Volvo Specialist



VOLVO ANGLE (BEVEL) GEARS SERVICE

VOLVO EVAP SYSTEMS
VOLVO AGING ISSUES
USING VIDA

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VOLVO TECHTIPS

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FEATURES

VOLVO EVAP SYSTEMS

FUNCTION, TESTING, TIPS AND TRICKS

Ah yes, EVAP system diagnosis, every technician's favorite!

It's because the EVAP system is so easy to diagnose, right?

Actually these systems can be some of the most challenging to diagnose. The main reason is that, in a lot of cases, EVAP system problems can be very intermittent and hard to pinpoint. But with a good understanding of how these systems work and a good diagnostic strategy, it can become a lot easier to troubleshoot the Volvo EVAP system.

Volvo EVAP systems are normally very reliable, but as these cars get older and begin to clock a lot of miles, the stresses of the road start to wear on the hoses and various EVAP system components.

There are also many situations that can lead to early EVAP system malfunction, such as cars that are operated in areas with high heat or freezing temperatures.

Another common cause of EVAP system damage is a driver who has a habit of topping off the gas tank after the pump stops. This can cause excess fuel and fuel vapors to damage the vent valves and saturate the charcoal canister.

And if the car you are working on has recently been in an accident or just got out of the body shop, it very common to find damaged EVAP parts that were not replaced or hoses that are cracked, misrouted or even missing.

When you get a Volvo in your shop with EVAP codes stored in the ECM, you should always start your diagnosis with information gathered from the customer.

Questions like, when did the Check Engine light come on?

And when did you last put fuel in the car?

Has the car been in an accident or in a body shop recently?

These types of questions can help you to take your diagnosis down the right path.

After you read the codes and check for freeze frame data, make sure to check for TSBs or Volvo TJs that can often be related to a specific code or symptom. Volvo has issued many that are specifically related to the emissions system.

The most common EVAP system failures on Volvos are hoses that are cracked, broken or clogged.

A complete EVAP system visual inspection can sometimes quickly uncover causes for the codes stored in the ECM. You may often find a cracked or broken hose right away. But don't make the mistake of assuming that a cracked hose is the only problem in the system without testing the system function after the hose is replaced, because it's very common to have multiple EVAP issues in higher mileage Volvos.

One of the most valuable tools to have when performing EVAP system diagnosis next to a scan tool (preferably Volvo's VIDA) is a smoke machine made for EVAP system testing and is regulated for tank system pressures.

Depending on the year and model of the Volvo you are working on, there are several ways of commanding the EVAP system to run a self test.

On 1995-1998 Volvos, you can use the Volvo System Tester or a scan tool that is capable of bi-directional control to run a self check of the system. And on 1999-2017 Volvos, you will have the best results using Volvo's VIDA diagnostic software to perform accurate diagnosis.

If you don't have these scan tools, you can confirm your repairs by driving the car on two complete drive cycles and check to see if the EVAP monitors have run and passed. But this method can be very time consuming and hard to run correctly unless you have access to a closed race track.

On 1995-1998 Volvos, the following is what the ECM needs to see before it will even start the EVAP system test.

- There can't be any diagnostic trouble codes stored for: Vehicle speed signal, canister purge valve, EVAP canister shut-off valve or the fuel tank pressure sensor.
- The fuel trim must be active.
- The engine should be idling.
- The car can't be moving during the testing (0 mph).
- The car needs to be below 2500 meters (about 8,000 feet) and above sea level.
- The outside air temperature should be above -8 degrees C (17.6 degrees F).
- The engine coolant temperature must be above -8 degrees C (17.6 degrees F) and below 120 degrees C (248 degrees F).
- The pressure in the fuel tank should be above 1 Kpa (0.145 psi).

The diagnostic test will start at the earliest about 17 minutes after the engine has started when all conditions have been met, and takes approximately 30 seconds to complete.

If the diagnostic test is interrupted for any reason, the engine control module will try to start again the next time all conditions are met. The engine control module performs a maximum of four diagnostic attempts during an operating cycle. If no faults are detected, the diagnostic procedure is not active again until the engine is switched off and on again.

If a fault is detected, the ECM will make two further attempts to evaluate the fault.

On most of the early Volvo models the most common EVAP codes seen are ECM 611 and ECM 612. And

the most common causes of these codes seen in independent Volvo shops are:

- Cracked hose at roll over valve
- Cracked J hose at canister
- Sticking or leaking EVAP canister purge valve
- Clogged fuel tank vent at filler neck (usually with spider webs)
- Leaking gas cap or cracked gas cap seal
- Leaking fuel tank seals

Of course, there are a few less common possibilities for EVAP system problems on these cars, like the fuel tank pressure sensor or a broken or cracked canister.

And of course, these are the most common EVAP system problem seen on the early Volvos. But these cars are getting older every day, so we will begin to see problems that we have never seen before. ●

Cracked hose at roll over valve.

VOLVO EVAP CASE STUDY (2002 VOLVO V70 2.4L TURBO) — CHECK ENGINE LIGHT ON FOR EMISSION RELATED CODES

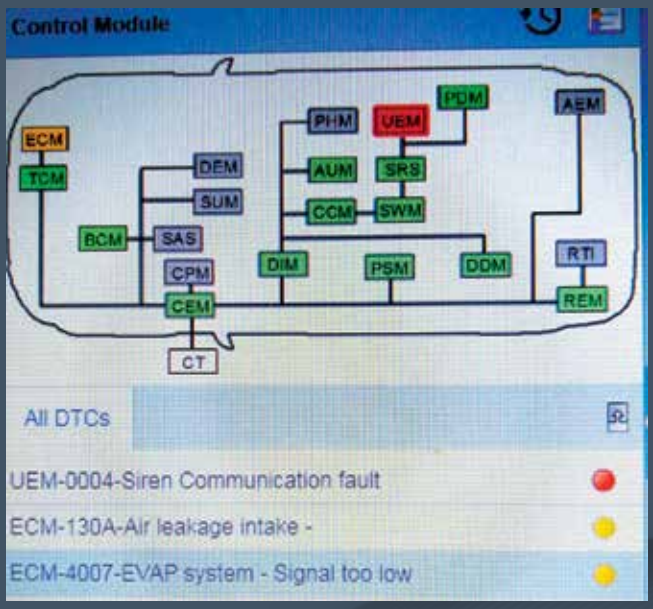
This car came in with a Check Engine light on and no other apparent symptoms according to the driver. When the car's owner was asked how long the Check Engine light has been on, the customer stated "a few weeks" (translation "a few months or as long as I can remember, in customer speak").

When the technician took the car out for an initial test drive, before checking out the car, the technician noticed that the car's brake assist performance was less than it should be, causing the driver to have to apply more pressure than normal on the brake pedal to get the car to stop.

Most technicians would automatically assume that this Volvo had a leaking brake booster, which in some rare cases could cause an intake air leak code to be generated in the ECU. In the case of this Volvo, it was not so cut and dry.

If you have been working on Volvos for a while, you would know that most 1999-2015 Volvos that have a leak in the brake booster diaphragm will make an audible "hiss" noise from under the dash on the driver's side when the brakes are applied at idle.

Now this is one of the many areas where using Volvo's VIDA system is far superior to using a generic scan tool for diagnosing this type of problem. When you use VIDA, you can click on the codes and go right to Diagnostic Procedure, Possible Causes, and DTC Setting Conditions. And with VIDA, you can click on the Vehicle Communication



When the technician hooked the car up to VIDA and ran vehicle diagnostics, the relevant codes that were stored were ECM - 130A (AIR LEAKAGE INTAKE) and ECM - 4007 (EVAP SYSTEM SIGNAL TOO LOW).

tab, click on the ECU and, under the Advanced tab, you can run a quick test of the fuel tank system.

Try that with a generic scan tool.

The quick test is not always that quick. It depends on a lot of factors. Of course it's a lot quicker than trying to get the car to run the tank system monitor by itself. The fuel

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.

tank system quick test runs a complete test of the car's EVAP system and can detect most leaks, blockages and component malfunctions.

And on 1999-2005 Volvos, the first part of the fuel tank quick test is to check and see if the car's ECU has the latest version of the ECU software loaded. In some cases the ECU can generate fault codes like ECM - 130A falsely if the software has not been updated; this can only be checked with VIDA.

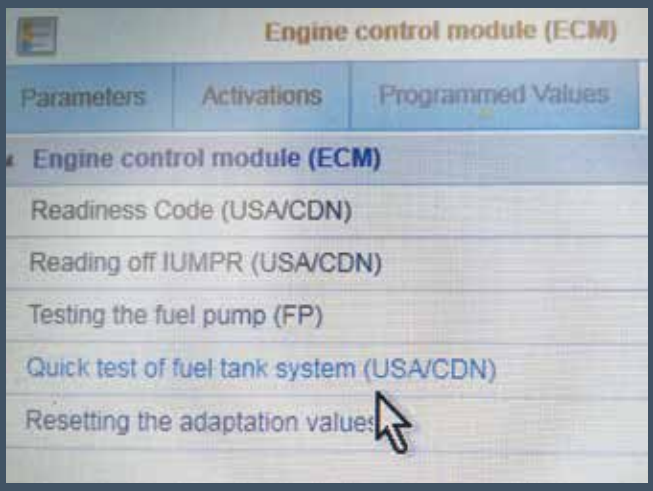
On this Volvo, the code ECM - 130A could be caused by any unmetered air leak in the engine's intake system, a defective air mass sensor (not likely), or a blocked PCV system, which is very common and should be checked on every Volvo you service. A clogged PCV system can cause a lot of problems, but for it to set a code is rare.

Do not replace the air mass sensor just because you have this code; this is a rookie mistake that is made all too often.

The code ECM - 4007 (Evap System Signal Low) could be caused by a blocked hose between the EVAP canister and the EVAP canister purge valve, a blocked hose between the EVAP canister purge valve and the intake manifold or, more commonly, a faulty EVAP canister purge valve.

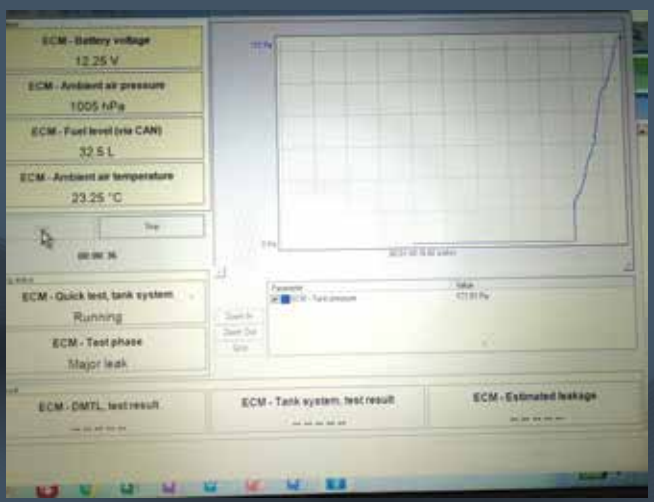
The EVAP canister purge solenoid valves on these cars may fail after they have been in service for a lot of miles. As they age, the plunger starts to stick and can become misaligned. There is actually a Volvo service bulletin about these valves, TJ 28228.

On the 2002 V70 in this case study, the two codes ECM - 130A and ECM - 4007 were not caused by the usual suspects like leaking vacuum hoses or even a weak canister purge solenoid.

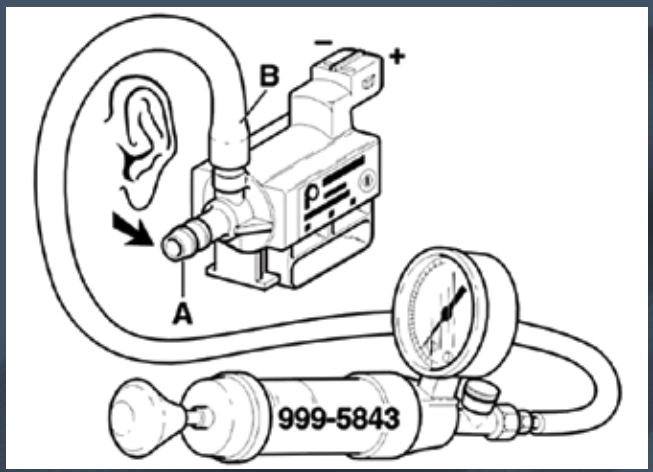


With Volvo's VIDA system you can run a fuel tank system quick test, which runs a complete test of the car's EVAP system and can detect most leaks, blockages and component malfunctions.

ECM - 130A (Air Leakage Intake System) could be caused by any unmetered air leak in the engine's intake system, a defective air mass sensor (not likely), or a blocked PCV system, which is very common and should be checked on every Volvo you service. A clogged PCV system can cause a lot of problems, but for it to set a code is rare.



With Volvo's VIDA, you can click on the Vehicle Communication tab, click on the ECU and under the Advanced tab, you can run a quick test of the fuel tank system.



A good way to test the Volvo canister purge solenoid valve is to use a hand-held vacuum pump and apply vacuum to the connector side of the valve. If the valve bleeds off the vacuum, replace it.

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The technician noticed that when the car had the key on and the engine off (KOEO), the brake vacuum pump would cycle on and off constantly. This is usually caused by a leak in the vacuum pump check valve or hoses.

During the visual inspection under the hood, the technician also noticed that a lot of the hoses for the EVAP purge valve, and the brake vacuum pump check valve had recently been replaced.

The hose that was used was aftermarket bulk fuel hose and was not designed to be used for this application. This kind of hose was designed to carry liquid under low to medium pressure; it was not made to stand up to engine vacuum, and is prone to get soft and kink in high heat conditions.

During the visual inspection under the hood, the technician noticed that a lot of the hoses for the EVAP purge valve and the brake vacuum pump check valve had recently been replaced.

Remember, when replacing hoses always replace them with the same type of hose that came on the car from the factory. Using just any hose could become a safety problem for your customers.

The cause of the vacuum pump cycling on and off turned out to be a cracked and leaking brake vacuum pump check valve.

The causes that led the ECM to log the codes ECM 130 - A and ECM - 4007 turned out to be hidden in plain sight.

The first sign of trouble was at the hose that connects to the intake manifold. Since the hose was replaced with the wrong type of hose, it would soften and collapse as the engine warmed up, causing the flow to the EVAP and Brake Vacuum Assist to be cut off.

The collapsed hose and leaking check valve could have been the cause for all the codes and symptoms. But wait! There's more!

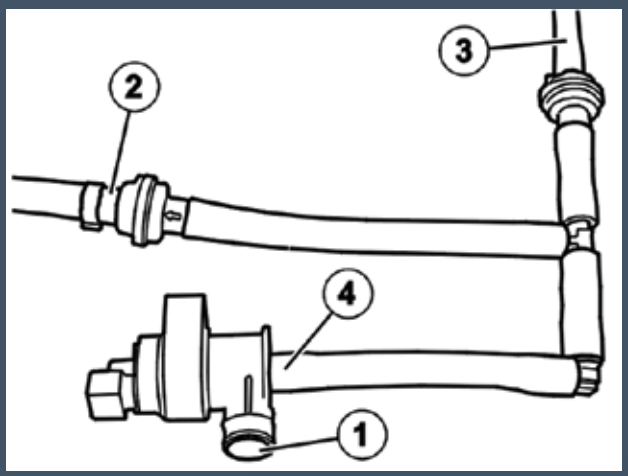
When the technician was replacing the hoses and brake vacuum check valve on this car with new Volvo factory parts, he noticed that the anti-backfire valve in the hose that goes to the turbo inlet had been installed backwards. Yes folks, those little arrows mean something.

These anti-backfire valves are like air diodes; the vacuum only flows one way, which means that, with the valve installed backwards at position 3 in the diagram, fuel vapors from the canister would be bled off away from the intake manifold and into the turbo.

The cause of the vacuum pump cycling on and off turned out to be a cracked and leaking brake vacuum pump check valve (note the zip tie that was holding it together).

When the service advisor called the customer to sell the hoses and check valve, they asked the customer if they knew anything about the "new" hoses that had been installed in the EVAP system. After some coaxing, the customer stated that his brother, who "used to work on

The first sign of trouble was at the hose that connects to the intake manifold. Since the hose was replaced with the wrong type of material, it would soften and collapse as the engine warmed up.



1 - Canister Purge Valve
2 - Hose to intake manifold
3 - Hose to turbo inlet
4 - Hose to Purge valve

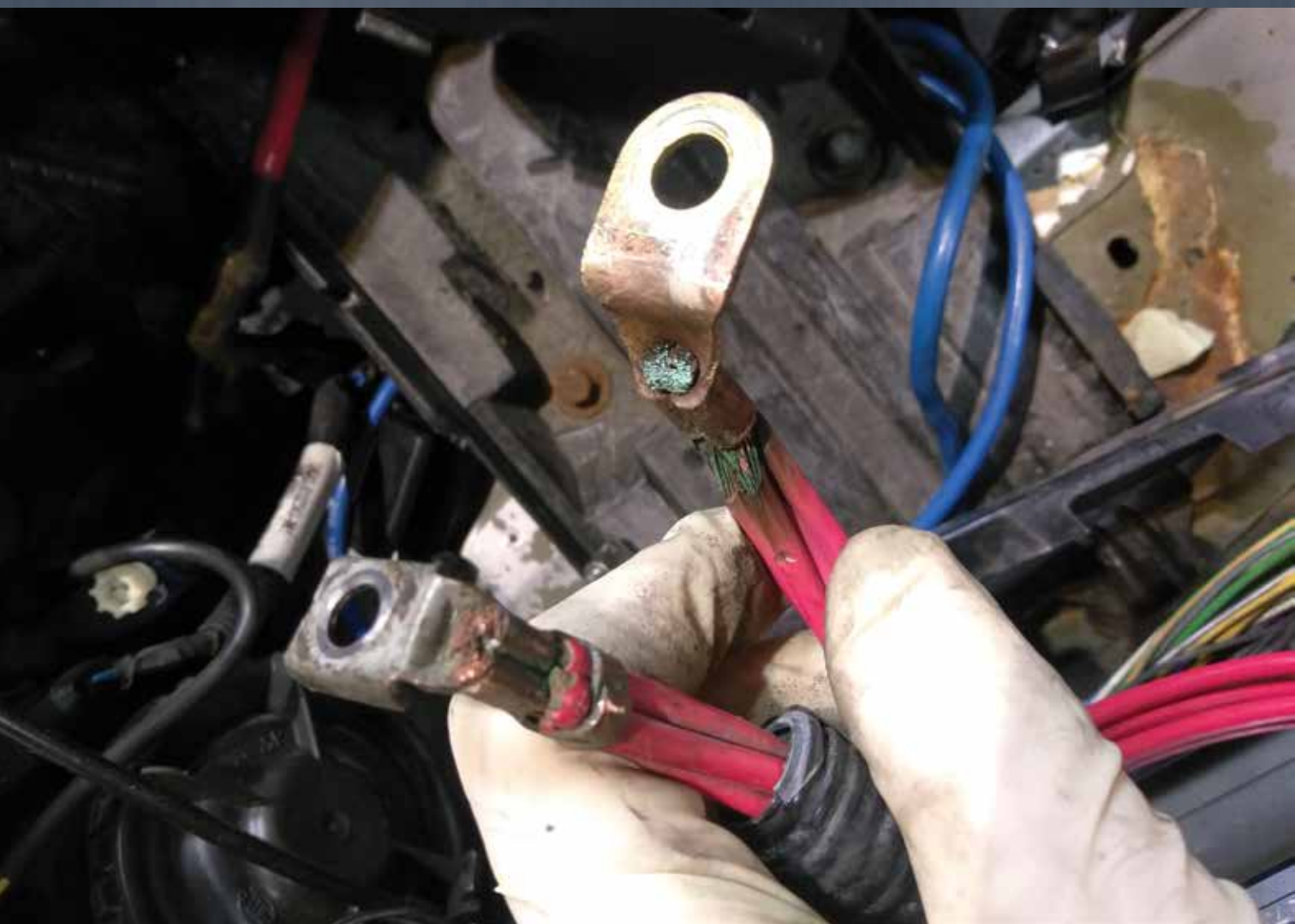
cars," had "fixed" some leaking hoses for him. When the customer was asked if the Check Engine light came on soon after his brother had "fixed" the car, the customer stated, "Come to think about it, yes it did." Well, hopefully his brother did not "fix" anything else on this Volvo.

After the technician repaired all the damage caused by the brother of the customer, the rest of the EVAP system was checked. Then, the technician ran the fuel system quick test with Volvo's VIDA tool and test drove the car to see if the monitors would run.

The moral of this story is to keep your eyes open, and remember that attention to detail is one of the modern technician's greatest tools. ●

VOLVO AGING ISSUES

MECHANICAL VACUUM PUMP LEAK (SI 6 3.2L ENGINE 2007-2016)



As Volvos equipped with the SI 6 3.2L engines start to accumulate higher mileage, you may begin to see cars come into your shop with signs of oil seepage under the left side of the engine. In a lot of cases, this type of oil leak can usually be traced back to the vacuum pump mounted on the left side of the cylinder head.

The seals in these pumps start to harden and shrink over time and allow engine oil to start to leak from the side of the cylinder head were the pump's drive shaft is. If the pump seals have been leaking for a while it can make a real mess and look like a much larger oil leak than it is.

If there is oil residue all over the engine and you want to confirm that the pump seals are the main culprit, you can use an ultraviolet engine oil dye to pin down the leak's source or sources.

If you don't have UV dye or don't have time to use one, you can clean as much of the oil as possible and use some parts cleaner and a rag, top up the oil and watch the area with a flashlight while the engine is warmed up and idling.

It is not advisable to pressure wash the engine area because of possible damage due to high pressure water intrusion into electrical components and wire connectors.

In most cases, you don't have to replace the pump; you can just remove it and re-seal it. Volvo has a re-seal kit for the pump, part number 31401556.

CORRODED FUSE BOX POWER SUPPLY CABLE THAT RUNS FROM BATTERY (B+) TO FUSE AND RELAY BOX IN ENGINE COMPARTMENT (S/V/C 70 SERIES CARS 1998-2000)

You should make checking this wire harness part of your regular inspection procedure on these Volvos.

This is a very important wire harness that starts at the positive battery clamp and runs under the air cleaner assembly to provide direct battery power (B+) to the main fusible link bus bar inside the fuse and relay box. This box is located on the left side of the engine compartment in front of the brake master cylinder.

If the fuse box power supply cable harness is left to corrode, it can cause high resistance and, as loads are applied, the wires will heat up. Over time, this condition can lead to wires being shorted and result in damage to other electrical components and systems.

This harness supplies power to most of the car's electrical systems, and when this harness starts failing, it can cause voltage drops which can cause intermittent electrical system malfunctions.

One problem that can be caused by this cable is the engine stalling right after starting; this can be due to low voltage being supplied to the immobilizer system and ignition antenna ring.

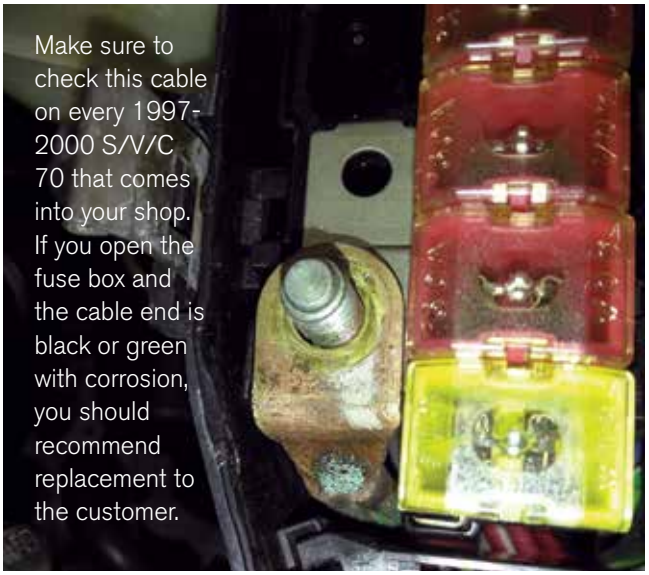
When the immobilizer is supplied with low voltage, the antenna ring will sometimes not be able to read the ignition key's transponder and will interpret this as a key that is not coded for this car.

And since this cable harness provides power to most of the car's systems, the customer can experience symptoms like intermittent blower fan speeds, or headlights dimming when the rear window defrost is on, or when the ABS pump is activated.

This repair should only be done by an experienced technician, since it involves opening up one of the main engine wire harnesses and disassembling the fuse and relay box.

Opposite page: If the fuse box power supply cable harness is left to corrode, it can cause high resistance which can cause the harness to overheat and damage other wiring and electrical components.

You usually don't have to replace the pump; you can just re-seal it. Volvo has a re-seal kit for the pump, part number 31401556.



Make sure to check this cable on every 1997-2000 S/V/C 70 that comes into your shop. If you open the fuse box and the cable end is black or green with corrosion, you should recommend replacement to the customer.

The cable can be replaced separately from the engine harness; the Volvo part number for the cable is 8628771.

It's a good time to check and replace the main battery cables if they are needed. On the Volvo in this case study you can see that the insulation on the positive and negative cables has been getting hot and these cables need to be replaced due to high resistance.

Some of you are thinking, "I'll just MAKE a new harness." Yes, most automotive technicians have the skills and the tools to MAKE a new harness. But if you were to replace this harness with one you made — as opposed to the Volvo factory replacement part — think about this: Say you use a wire that isn't the correct gauge. Perhaps the connectors are not tight or soldered securely. Your made harness can fail. You have to think, is your customer's safety worth saving a couple of bucks?

Here is just a partial list of the systems that this little harness provides power for:

- (SRS) Supplemental restraint system
- (ABS) Antilock braking system
- (ECM) Engine control module
- (TCM) Transmission control module
- (ETM) Electronic throttle module

And many more, folks, so make sure you take this little wire harness seriously.

This is also a good time to check and replace the main battery cables if they are needed. On the Volvo in this case study, you can see that the insulation on the positive and negative cables has been getting hot, and these cables need to be replaced due to high resistance.

ALTERNATOR DRIVE PULLEY BOLT LOOSENS UP CAUSING INTERMITTENT LOW VOLTAGE OR NO VOLTAGE OUTPUT FROM THE CHARGING SYSTEM (SI 6 3.2L ENGINE 2007-2016)

If you get a Volvo in your shop that is equipped with the SI 6 3.2L engine and the customer is complaining about a charging system problem or a battery that keeps going dead, make sure to check to see if the alternator's pulley

Use a flashlight to look though the gap in the intake manifold and you may see the pulley slipping or not spinning at all.

is spinning. You can usually see this happen when the engine is at operating temperature and is at idle. Use a flashlight to look through the gap in the intake manifold, and you may see the pulley slipping or not spinning at all.

This symptom will usually correspond with a low or no voltage output reading on your scan tool.

If you have a Volvo with this problem, it is relatively easy to correct. You will have to remove the intake manifold and alternator to get to the drive pulley; it is connected to the alternator with a small toothed belt that should be replaced at the same time you do this repair.

BATTERY CURRENT CONSUMPTION AND RDAR

VEHICLE TYPE	XXX
ENG	
ENG DESC	
SALES	
BODY	
GEAR	
STEER	
MODEL YEAR	1927-9999
PLANT	
CHASIS RANGE	
STRUC WEEK RANGE	0-0

NO: TJ 20756
FUNC GROUP: 3117
FUNC DESC.: BATTERY, GENERAL
STATUS: RELEASED
PARTNER: 3 US 7510 VOLVO CARS NORTH AMERICA

REFERENCE:

CODE	DESCRIPTION
LM	Battery/Dead battery
LN	Battery/Weak or low electrical power

DTC = Diagnostic Trouble Codes
CSC = Customer Symptom Codes
CCA = Cold Cranking Amps

If using a printed copy of this document, always check for the latest online version.

DESCRIPTION:

It has come to our attention that there is an increasing replacement rate of Sirius control units (RDAR) due to high quiescent current. Reports have been submitted stating that a value of 30 to 70 milliamperes is causing a flat battery within a time frame anywhere from overnight to several days.

Although the value above could be a contributor in a drained battery over extended periods, it is important to understand how a small current drain of, for example, 50 milliamperes (0.050 amperes), will affect a healthy automotive battery.

Volvo original equipment batteries are rated at a capacity of 60 ampere hours for the 600CCA battery and 80 ampere hours for the 700CCA battery. In the simplest of terms, a 1.0 ampere drain would take 50 hours to drain a 50 amp hour battery. Therefore, if we use a 50 milliamp (0.050 amp) drain as an example for a 80 amp hour capacity battery, it would take 1600 hours (66.6 days) to completely drain the battery.

80 amp hour batt capacity divided by 0.050 amp drain = 1600 hours

The above example is given the battery has not had any charge applied to it and has remained static for 66 days.

SERVICE:

Although 70 mA is out of specification for the complete vehicle current consumption, it is not enough to drain the battery in a few days.

Do NOT replace the RDAR as a repair for battery drainage if the RDAR current consumption is less than 100 milliamp unless the customer reports that the vehicle is not used for extended periods.

Sometimes this little belt can get stuck on pretty tightly, but it will come off with a little finesse. In most cases, the bolt for the alternator's drive pulley will be finger loose. You should replace this bolt with the OE Volvo updated bolt (988566).

CV AXLE NOISE, VIBRATION, LOSS OF GREASE WITHOUT ANY VISIBLE BOOT DAMAGE OR SIGNS OF LEAKS (LATE 2004-P1 PLATFORM CARS S40/C30/V50/C70), FWD ONLY

There can be a lot of causes for vibration on acceleration on the Volvo P1 cars such as collapsed motor mounts or worn CV axles. If you get one of these P1 cars in your shop with a vibration, make sure you pay close attention to the CV axles. A lot of shops have had these cars in and spent many hours trying to figure out why the car vibrates under acceleration even when the CV boots look perfect.

A lot of shops have replaced these axles and, after cutting open the CV boot, have found out that all the grease had somehow disappeared without any signs of leakage or damage to the boot.

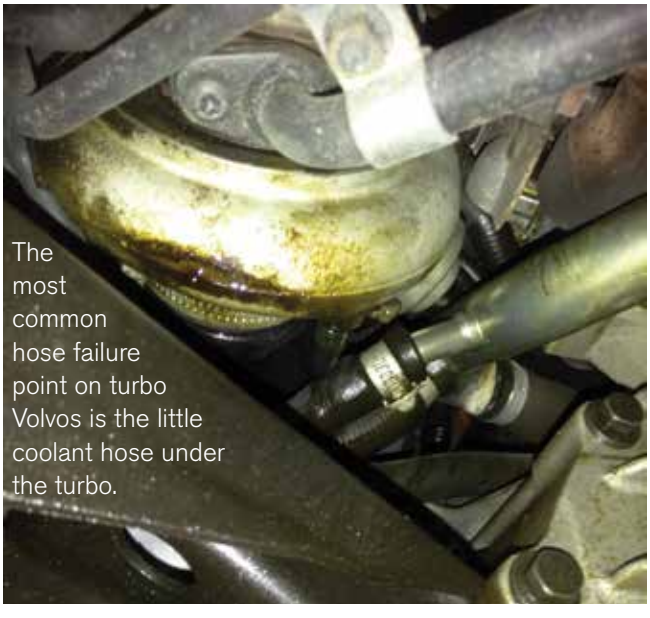
Customers may complain of a vibration, especially while in 2nd or 3rd gear, at an engine speed between 1000 and 2000 RPM. Vibrations may be worse in a heavily loaded vehicle or while driving uphill with a heavily loaded vehicle.

If you end up replacing the CV axle on one of these P1 Volvos (TJ 19245), make sure to use only the latest version OE Volvo factory replacement parts.

TJ 19245 will help you in identifying Volvo platforms, models, types, and years.

A lot of shops have tried replacing these axles with aftermarket rebuilt or newly-manufactured parts, only to find out that the customer's symptom did not go away and may have even gotten worse. And after replacing the axles over and over with aftermarket parts and even replacing the motor mounts, they still could not fix the problem until they finally installed new factory axles. They are a bit more expensive than aftermarket axles, but what are your time and reputation worth? Volvo has a Technical Journal about axle vibrations on the P2 cars (TJ 19271).

A lot of shops have replaced these axles and, after cutting open the CV boot, have found out that all the grease had somehow disappeared without any signs of leakage or damage to the boot.



The most common hose failure point on turbo Volvos is the little coolant hose under the turbo.

LOWER ENGINE COOLANT HOSES BURSTING AND CAUSING ENGINE OVERHEATING, MOST TURBO MODEL VOLVOS

This topic may seem pretty basic, but it's something that is often overlooked or ignored during regular inspections and can cause you and your customer a lot of trouble if overlooked.

We all know there are still a whole lot of older Volvos on the road with the original coolant hoses on them, and a lot of these older Volvos have well over 100K miles on the odometer. So often we judge the condition of these hoses by the way they look on the outside and, if they are not leaking, a lot of us don't pay much attention to them. Has this ever happened at your shop?

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VOLVO GENUINE BRAKES

Did you know Volvo brake pads are actually 3mm thicker than generic brands? They fit perfectly and provide more stopping power. Combine them with Volvo brake discs, and you maintain the integrity and safety of the braking system.

You are working on a Volvo that has been in your shop a few times, and maybe you are doing an everyday job like replacing the timing belt. When you do this job on most Volvos, you will have to move the coolant reservoir out of the way. To do this, you will have to disconnect the coolant level sensor. The wires on these sensors are very delicate, especially on sensors that have been on the car for a few years. In a lot of cases, the coolant level sensors can get damaged and the tech working on the car may not notice.

In the case of this example, let's say the sensor is damaged in a way that if the coolant starts to leak out, the warning light on the dash will not illuminate. You finish the timing belt job, and all seems good. The customer picks up the car and drives off to his vacation.

The next day you receive a call from the customer saying their car overheated and will not start. But it gets better. They are 100-plus miles away from your shop!

What happened?

The most common hose failure point on turbo Volvos is the little coolant hose under the turbo. When these burst on the freeway, the customer may only notice if the car comes to a stop or if the coolant level sensor is working. Since the coolant is leaking so low under the car, the customer may not notice until it's too late. So check and recommend replacement of the old coolant hoses. ●

RARE VOLVO AGING PROBLEMS

NOT-SO-COMMON NOISE FROM THE XC90 4.4L V8 2004-2014

Here is a story that is strange but true. In a few rare cases, there have been some shops that have had one of these V8 XC 90s come into their shops with the customer complaining about an intermittent loud pop or crack noise coming from the engine compartment.

If you get one of these Volvos in your shop that actually is displaying this symptom, you will know it because the pop or crack is so loud you will hear it from way across the shop.

At first, some shops will mistake this sound for a secondary ignition leak. But in most of the cases, the crack noise is very loud and very irregular and only happens at idle. It usually displays itself randomly when the engine is at operating temperature, and it will pop or crack once every couple of minutes. Believe it or not, this loud crack noise is caused by an electrostatic discharge from a worn auxiliary belt and worn pulleys.

To check for this, put the XC90 up on a lift and remove the right front tire. Next, remove the splash shield from the right side wheel well and start the engine. Allow the engine to reach operating temperature, and watch the space between the crank pulley and the engine block. It's best to see this without a flashlight. When you hear the crack noise, you will see a powerful electrostatic spark jump across the gap. This is caused by dragging pulleys and a worn, dry auxiliary belt. Make sure you replace the belt and all three pulleys, including the auxiliary belt tensioner assembly, when you do this repair. Here are the instructions for replacing the belt and tensioner bearings.

REMOVAL

REMOVING THE UPPER ENGINE COVERS

Remove the upper engine covers by pulling them straight up.

REMOVING THE COVER OVER THE SERVO PUMP

Remove:

- One end of the ground cable between the engine and body and the hose between the expansion tank and engine
- The 2 screws on the cover over the servo pump
- The cover.

REMOVING THE SERVO OIL LINE

Remove:

- The nut of the clamp
- The screw on the oil feed pipe

Plug the openings and wipe up any spills.

Bend aside the servo oil line.

REMOVING THE AUXILIARY BELT

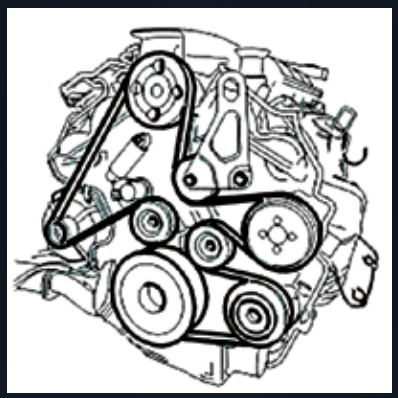
Caution! Relieve the load on the belt tensioner by turning it clockwise to max. 230 Nm and lock the tensioner with relevant tool.

Caution! Ensure that 230 Nm is not exceeded when the belt tensioner is relieved. The torque takes more than 20 seconds to carry out without risk of affecting the belt tensioner.

999 7195 Holder (See: Tools and Equipment\999 7195 Holder)

Lift off the auxiliary belt.

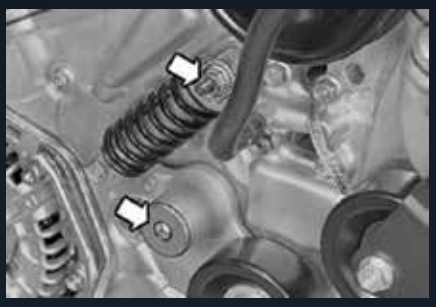
Hint: Note the routing of the belt to facilitate reinstallation.



REMOVING THE BELT TENSIONER

Remove:

- The screw of the tensioning and damping element
- The center screw to the belt tensioner. 999 7279 Wrench
- The belt tensioner

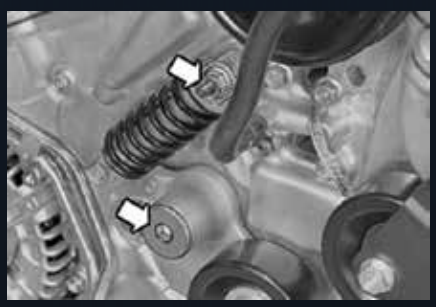


INSTALLATION

INSTALLING THE BELT TENSIONER

Install:

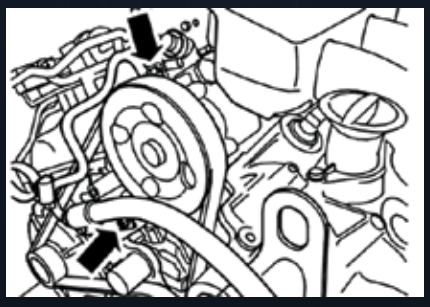
- The belt tensioner
- The center screw to the belt tensioner
- The screw of the tensioning and damping element; tighten



INSTALLING THE SERVO OIL LINE

Install:

- A new gasket
- The servo oil line
- The nut on the clamp; tighten
- The screw on the oil feed pipe; tighten.
- Wipe up any spills.



INSTALLING THE AUXILIARY BELT

Rotate the belt tensioner clockwise to max. 230 Nm and remove tool: 999 7195 Holder.

Note! Make sure the belt is properly seated in the groove.

INSTALLING THE COVER OVER THE SERVO PUMP

Install:

- The cover over the servo pump
- The 2 screws; tighten
- The ground cable between the engine and body and the hose between the expansion tank and engine

INSTALLING THE UPPER ENGINE COVERS

Position the upper engine covers and press them into the retainers.

VOLVO ANGLE (BEVEL) GEARS

SERVICE, DIAGNOSTICS,
REPAIRS AND RE-SEALING

The first generation of Volvo all wheel drive cars (1998-2000) used a viscous coupler attached to the rear differential.

Volvo angle gears are sometimes called the bevel gears as incorporated into the front differential on four-wheel-drive vehicles. Volvo first offered a four-wheel-drive model in 1998 with the introduction of the XC70 and the rare AWD version of the S70.

If you work on a lot of Volvos, you have probably seen your fair share of these AWD cars come through your shop, and you may have done your fair share of repairs on these angle gears.

The first versions of the Volvo all-wheel-drive systems used the angle gear to transfer power from the transmission through a center driveshaft that connected to a viscous coupler unit and rear differential.

All later Volvos use various versions of the Haldex electronically-controlled rear differential, but still stuck with the same type of angle gear for the front differential.

The later Volvos with the Haldex rear end are a lot more effective at active traction control and more forgiving of things like mismatched tires and wheel slip, either of which could cause damage to the angle gear on cars that came equipped with the viscous coupler type rear end.

All-wheel-drive Volvos from 1998-2000 equipped with the viscous coupler type rear end, have to have all four tires changed at the same time, because even a slight variance in the wheel and tire circumference can cause damage to the angle gear and other driveline parts over time.

A lot of shops will have these early AWD Volvos come in with the customer complaint of no four-wheel drive. In a lot of these cases, mismatched tires have caused the teeth in the drive sleeve that connects the transmission to the angle gear to strip out the teeth on the inside of the sleeve, causing the angle gear not to transfer power to the rear wheels.

Early all-wheel-drive Volvos have special requirements for tires and wheels. It is very important that the tire replacement guidelines below are followed. Failure to do so can result in damage to the AWD components (angle gear, viscous coupling/freewheel unit).

Here is a brief description of Volvo's recommendations for tires and wheels on 1998-2000 Volvos that use a viscous coupler type rear end.

- Always drive on tires of identical brand, size, construction (radial), tread pattern, load-, speed-, traction-, temperature-, and tread wear rating.
- Never drive on mixed tires, except for brief periods when the temporary spare tire is in use.
- Always use properly inflated tires of correct dimensions. Tire size and inflation pressures are shown on the tire pressure label located inside the fuel filler door.

Caution! Failure to always drive on properly inflated, identical tires of correct dimensions may result in a circumference difference between tires on the front and rear axles. This will cause excessive tire wear and may damage the transmission and all-wheel-drive system.

REPLACING THE TIRES

- When tire replacement is necessary, Volvo strongly recommends replacing all four tires at the same time with identical tires as explained above. Failure to do so can result in circumference differences that may damage the transmission and all-wheel-drive system.

- If only one or two tires are replaced, the new tire(s) must be identical to the tires with which the car was built, and must be mounted on the FRONT AXLE ONLY! Failure to do this may damage the transmission and all-wheel-drive system.

Volvo started using various versions of the Haldex electronically controlled rear differential starting in 2001 instead of the viscous coupler type.

SPARE WHEEL TEMPORARY SPARE

The temporary spare tire is for temporary, low-speed, short-distance use only. Do not drive on the

temporary spare at speeds above 50 mph (80km/h) or for distances greater than 50 miles (80 km) or transmission and all-wheel-drive system damage may result.

SNOW CHAINS, ALL-WHEEL DRIVE (AWD)

On all-wheel-drive cars (AWD), snow chains must only be mounted on the front wheels. Only snow chains intended for all-wheel-drive (AWD) cars can be used. Never install snow chains on a temporary spare tire.

Volvo's angle gears are very tough and can deliver relatively problem-free performance for well over 100K miles, with proper care and service of course.

GEAR OIL LEAKS FROM THE ANGLE GEAR

The most common problems that shops deal with on these units have to do with gear oil leaks. Gear oil leaks from the angle gear should be taken seriously, since Volvo's angle gears only hold about .85 quarts of gear oil when they are full.

If you see gear oil leaking from the angle gear it should always be taken seriously, since Volvo's angle gears only hold about .85 quarts of gear oil when they are full. So it won't take much time for the angle gear to run dry.

SERVICE

It's always a good idea to check the level and condition of the gear oil any time you get one of these cars in for a regular service. Check not only the angle gear, but the rear differential too, as these fluids are all too often neglected.

When filling or topping off the gear oil, remember to make sure to use the correct Volvo fluid. In most cases the front and rear differentials DO NOT use the same fluid type, so check with your local Volvo parts department for the correct fluid.

Volvo's service interval for changing the gear oil varies from year to year and model to model, and in some cases Volvo, like most car manufacturers, states that the fluid does not need to be changed and is a "lifetime fill." Naturally, that lifetime all depends on how the customer uses the car. But of course, as with most fluid change intervals, you should customize the maintenance services to meet your customers' individual driving needs.

For instance, if a customer uses their Volvo to tow their boat or likes to go off-road driving a lot, they should be advised to change their fluids more often, because fluids' additive packages will break down at a faster rate than if the car is driven under normal driving conditions.

If you're refilling or just topping off the angle gear oil, remember to make sure to use the correct Volvo fluid for the year and model Volvo you are working on. Check with your local Volvo parts department for the correct fluid.

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.

They are critical in Volvo Active Safety Systems including:

- Antilock Braking System (ABS) with Electronic Brake Distribution (EBD) and Electronic Brake Assistance (EBA)
- Automatic Braking
- City Safety
- Collision Warning with Auto Brake
- Pedestrian Detection

Get the replacement brake parts designed and engineered by Volvo. Contact your local Volvo dealer for a complete selection of Volvo Genuine Parts.

Of course, if the fluid in the angle gear looks more like molasses than gear oil, you should recommend a fluid change to your customer. And if the fluid is more of a black paste than fluid and has a lot of metal particles in it, the customer may be looking at a larger problem in the near future.

Since Volvo's angle gearbox has only a fill plug and no drain plug, you will have to drain and fill through the same plug. You can use a vacuum drain tool or any fluid evacuator with a small hose to drain as much of the old gear oil as possible. Make sure to insert the hose as far as you can into the filler hole; you will have to force the tube past the gears to reach the fluid at the bottom.

GEAR OIL LEAKS FROM THE ANGLE GEAR

The Volvo angle gears or bevel gears tend to develop leaks from three different places — the vent valve (an updated vent valve is offered by Volvo to fix this problem and is covered in Volvo TNN46-08), the bearing adjuster nut or crown nut seals and, in some cases, the angle gear can start to leak from the case halves or input seals between the angle gear and transmission. In that case, you will have to remove the entire angle gear and re-seal it (the complete re-seal procedure is covered in Volvo TJ 18513). OR you can just replace the entire angle gear assembly with a Volvo remanufactured assembly, available from your local Volvo dealership's parts department.

The most common oil leaks seen on Volvo angle gears come from the large o-ring seal on the large aluminum bearing adjustment nut that holds the output bearing on the right side of the gearbox. The o-ring gets brittle and shrinks over time. If there are traces of gear oil seeping from the bottom of this large bearing nut, you will have to replace this seal. This is one of the easiest and most common of the angle gear reseal jobs — that is, of course, if you have the right tools.

The most important tool to have when working on the angle gear is Volvo special service tool 9995371.

To replace just the three outer angle gear seals, you should start by driving the car and getting it up to normal operating temperature. This will make removing the large crown bearing pre-load nut a lot easier.

Next, put the car up on a lift with the transmission in neutral and remove the right front tire and CV axle. Use a punch and mark the crown nut's position so you will have the correct bearing pre-load position when you reassemble the crown nut.

Remove the 12mm bolt that holds the crown nut in position, and use a long ½ inch ratchet or breaker bar to turn the nut counterclockwise to remove it (DO NOT USE AIR TOOLS).

This crown nut can be very tight and difficult to remove, but be patient and it will come out. In some cases you will have to replace this large crown nut because the threads can get damaged beyond repair.

Once the crown nut is removed, use a vacuum drain tool with a small tube to suck out as much of the old fluid as possible.

The one tool you should have in the shop when working on the Volvo angle gear is Volvo special service tool 9995371. This tool is the only way to get the pre-load adjustment nut off without damage.

Clean the threads and crown nut with parts cleaner and replace the two seals and crown nut o-ring. Lube the threads and carefully tighten the crown nut back to its original pre-load location.

Reassemble the CV axle and A arm, always using a new nut or bolt on the end of the axle when reassembling it.

Now fill the angle gear with the correct Volvo fluid and replace the fill plug washer with a new one.

After putting the right front wheel on and torquing the lug bolts, test drive the car and check for noise and leaks.

NOISE DIAGNOSIS

Volvo angle gears rarely make noise on their own unless the gears and bearings inside are badly worn or damaged.

You should run the car on a lift, and use a stethoscope to pinpoint where the driveline noises are coming from before jumping to any conclusions. Also, it's always a good idea to check for TSBs or Volvo Technical Journals. Volvo has several concerning driveline noises.

One of the most common noises you will encounter is main driveshaft slip yoke wear causing ping and rattle noise. When performing a test drive on one of these all-wheel-drive Volvos, especially the early versions, you may hear a pinging or rattling noise on acceleration, usually coming from under the shifter tunnel area.

You can check the drive shaft slip yokes for play just by grabbing the shaft near the slip yokes and pushing up and down. There should not be very much play. Make sure to check the slip yoke boots for damage. If a boot is torn or damaged, the slip yoke will probably need to be replaced soon.

In a lot of cases, you will have to replace the entire drive shaft assembly because Volvo has a new updated version. But in some cases you can just replace one slip yoke and boot with a kit that Volvo sells. ●

During your regular inspections, check the slip yoke boots for damage. If a boot is torn or damaged, the slip yoke or yokes will probably need to be replaced soon.

VOLVO CERTIFIED COLLISION FACILITIES PROGRAM

No one engineers for safety like Volvo does. Only Certified Collision Facilities are guaranteed to meet our commitment to owners.

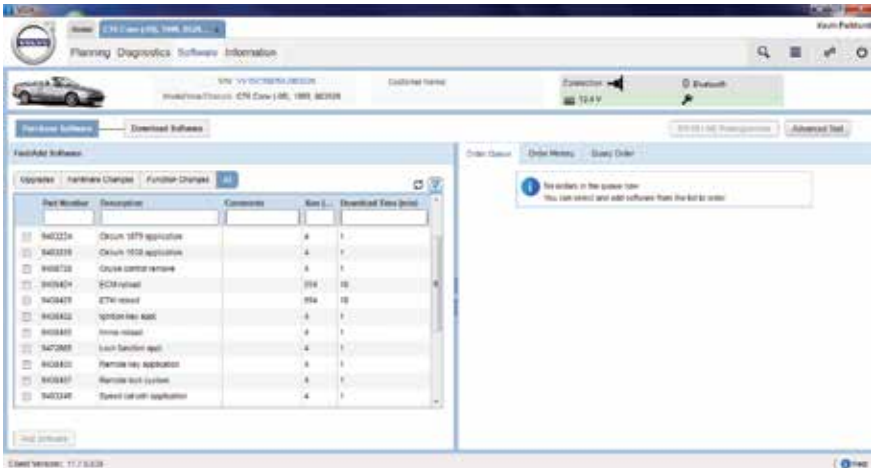
If interested in learning more about the Volvo Certified Collision Facility Program, please contact us at CertColl@volvocars.com

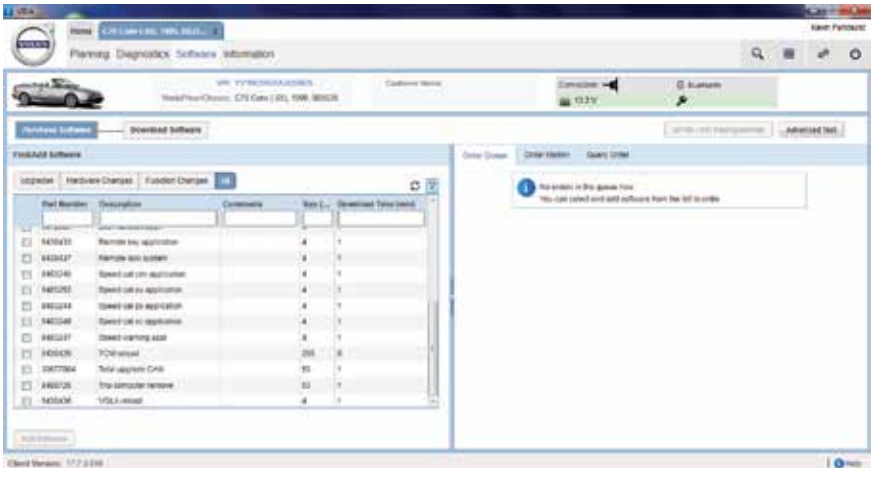
USING VIDA

A POWERFUL AND VALUABLE TOOL FOR PRODUCTIVITY

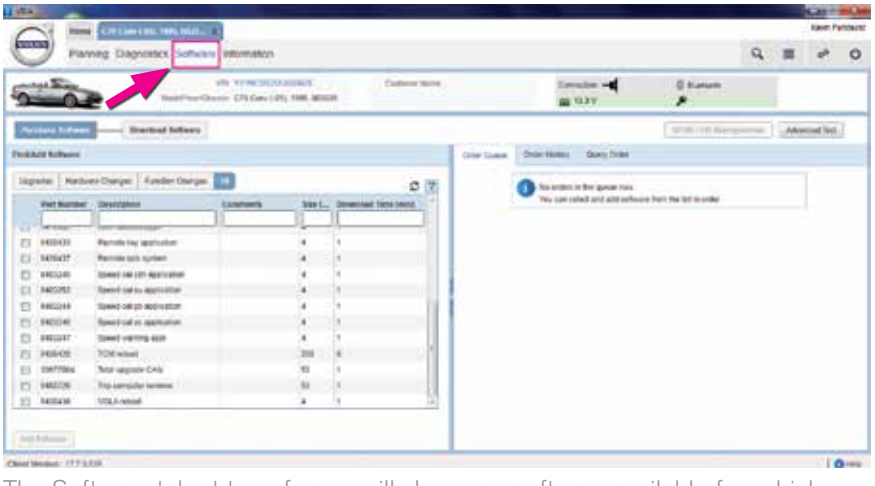
VIDA is the Volvo program and database that can be ordered and purchased through the Volvo online site. The database tracks the various systems in Volvo vehicles, and monitors and analyzes vehicle information and vehicle configuration, software, and various operational and security codes for control modules.

In a previous issue of Volvo TechTips, we provided an introduction to VIDA describing some of the features of this powerful package and some brief information on how to connect and upload this package.





Here you will find the different types of software, upgrades, reloads and function changes.



The Software tab at top of page will show you software available for vehicle.

Many readers were interested in learning more about VIDA, about the process for installing it, and learning more about how it can be used for diagnosis and repair of Volvo vehicles.

So, in this installment, we'll provide detailed information about the process for acquiring and installing VIDA, along with several examples showing how VIDA can be used in the independent shop. Then, in a future issue, we'll delve into more detailed examples showing how to use VIDA for diagnosing problems in many different vehicle systems, how to zero in on specific fixes, and how to use VIDA as a quality control system to verify the effectiveness of repairs.

The database is updated at all times for Volvo vehicles. The communication is tamper proof and connects via the internet. In order to download software for Volvos, you will need to purchase a subscription for VIDA. There is no other way to download this factory software except through VIDA. The ordering system is called PIE (Product Information Exchange).

With VIDA installed on your laptop, you will now be able to diagnose and download software when needed. To install VIDA, you will need to go to volvotechinfo.com. Once you have registered and set up your account, and purchased a VIDA subscription of 3, 30 or 365 days you can now start purchasing software via VIDA.

Select the Software tab to access all software listings. You must have a full VIN (vehicle identification number) for a specific vehicle to order individual software. The software product list will show you all software available for the vehicle you're servicing. After download is completed, the order info will be moved to history.

The Purchase tab is the beginning process to initialize software. After your order is complete, you will need to retrieve the software. Your order history will show you all software you have downloaded.

DICE

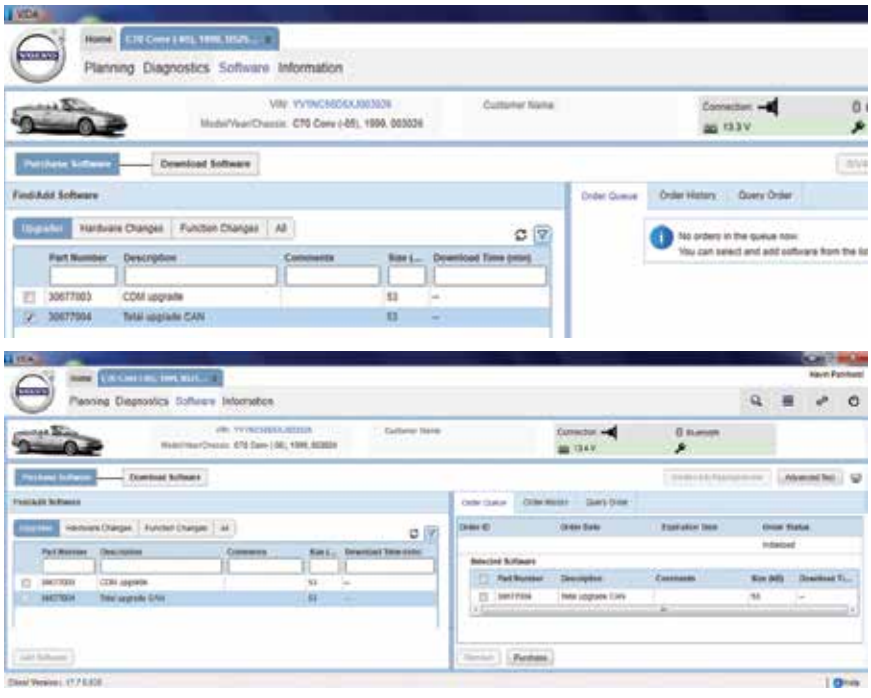
DiCE (Diagnostic Communication Equipment) is a tool to allow a vehicle to communicate with VIDA. You will need this to download software, as well as for diagnosing problems. Make sure that your DiCE has the newest firmware installed, version 5.6.2.

When downloading software, DiCE can be used in Bluetooth, or you can hook power directly to DiCE. Hooking direct 12 volt power could help in communication problems and provide fewer interruptions.

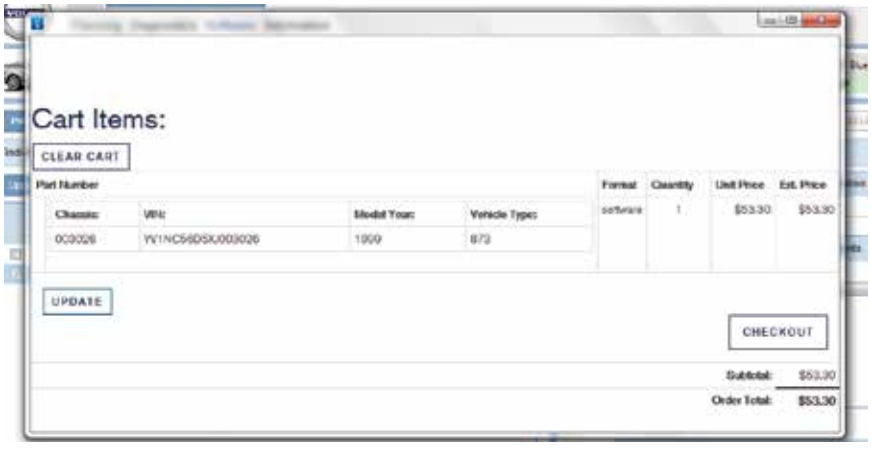
It is possible to use more than one DiCE at one time to download software. Each DiCE unit has the own identification number. Click on the drop down menu and click the DiCE unit that is not being used. You must do this before vehicle read-out is done.

Upgrading software with a new version can be performed when software is out of date. In this case, when VIDA is connected, you will be able to select the Software tab and see what updates are needed. Updates are needed periodically, so it's a good thing to check them when customers come into your facility for service and/or repair. Upgrading software can definitely affect emission controls, so if you need to smog your vehicle, this is very important and another reason to purchase VIDA.

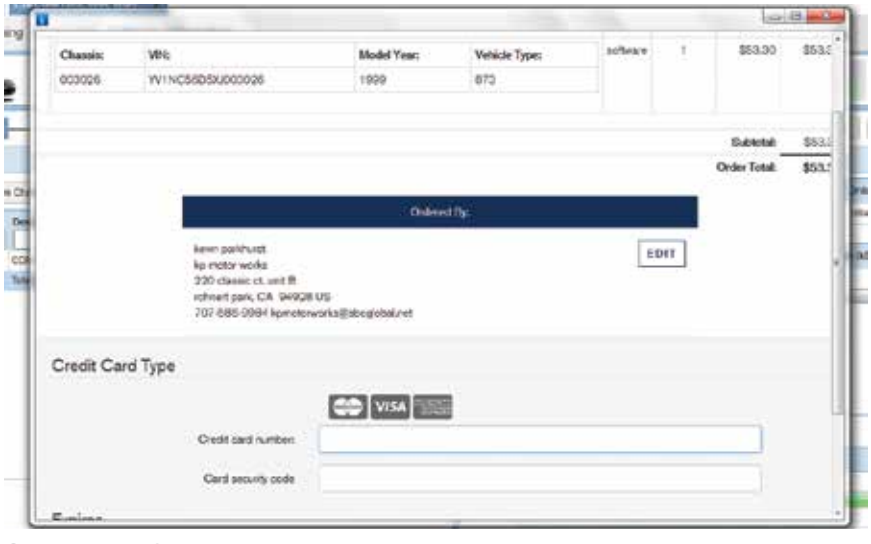
Software is downloaded while VIDA is connected to a vehicle. Make sure to connect a battery charger to the vehicle while software is being downloaded, since the vehicle must have battery voltage



When ordering software you will need to select the Purchase Software tab.



The software cart window will pop up to show you what you've ordered.



Credit card info will be entered here.

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.*

Don't let your Volvo customers leave your shop with less Volvo than they came in with. Contact your local Volvo dealer for a complete selection of Volvo Genuine Parts.

2-YEAR WARRANTY

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

at all times. Remember, as we reported in the inaugural issue, Volvo recommends the Midtronics battery charger/maintainer.

If you know the product number, enter it now. If not, scroll down the list of software until you find the correct software. You'll have to re-load if the control module was replaced with a new unit.

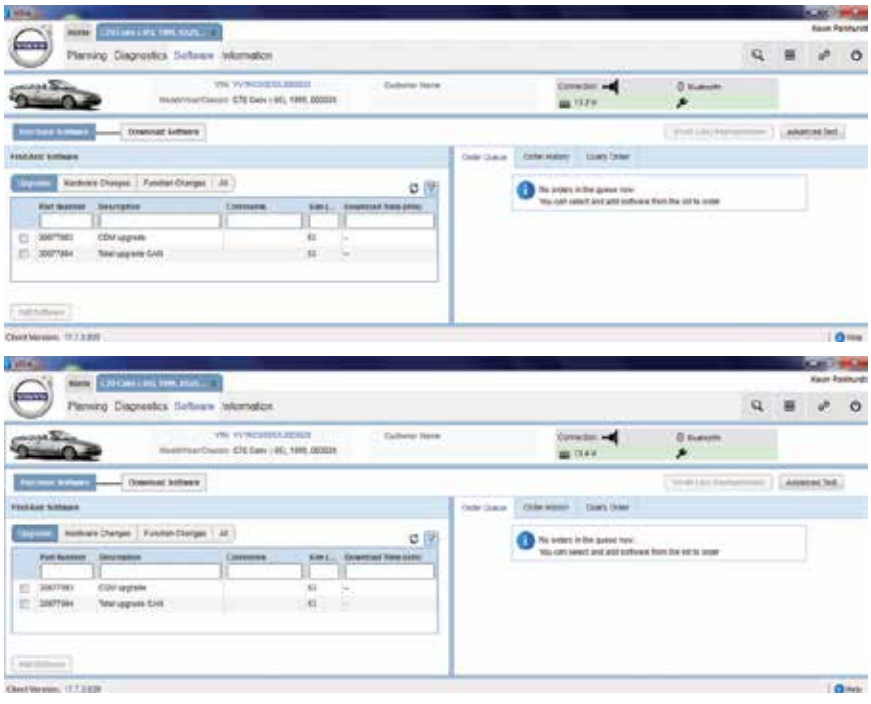
Highlight software needed and click Add tab. The software will now appear in the software list. Click on the Purchase tab. A pop-up window will appear from Volvo Tech Info. You will need to enter your credit card info to purchase software. Once this is done, the software will appear in the description area. Now you will need to select the Add To Order tab and then select Retrieve. A box will pop up asking for your order reference number. Here you will add the last six digits of the VIN and click OK.

A software status message will show you the status of the software download.

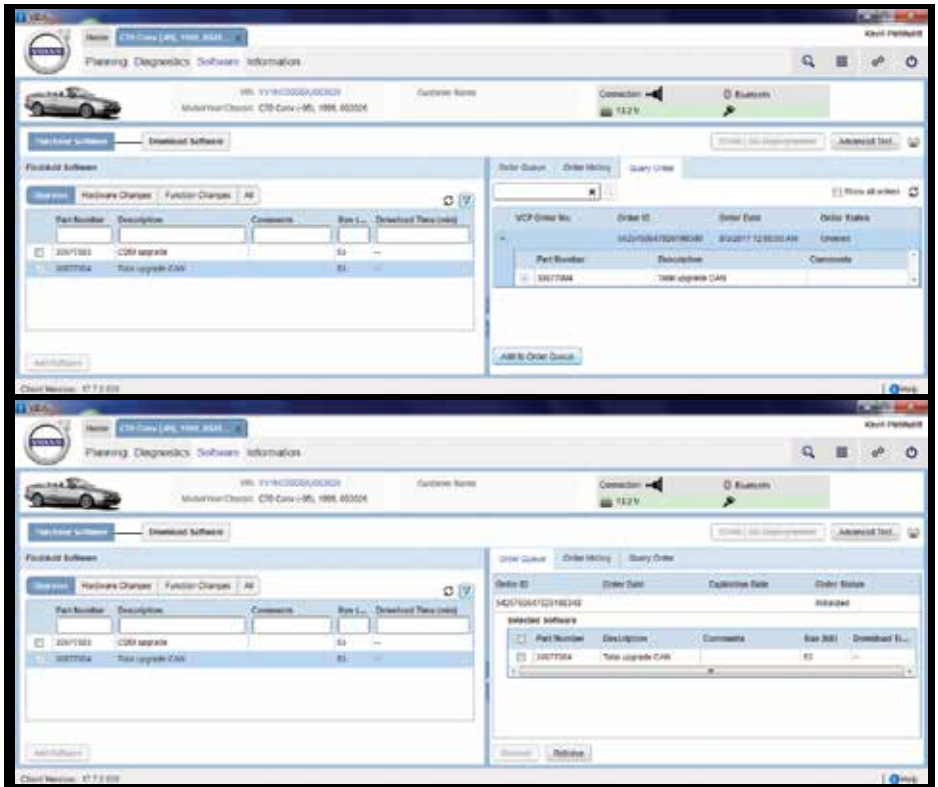
The vehicle information will read out again. The Order Details window will show the software and how long it should take to download into vehicle. Click Continue. Then, you will need to start the download by selecting Start.

Once you select the Start button, an invoice will be generated and sent to your email address with all details. During software download, the vehicle will make some clicking sounds, and the DIM (Drivers Information Module) will go blank. Do not panic — this is just the process of waking up modules in the system and downloading software.

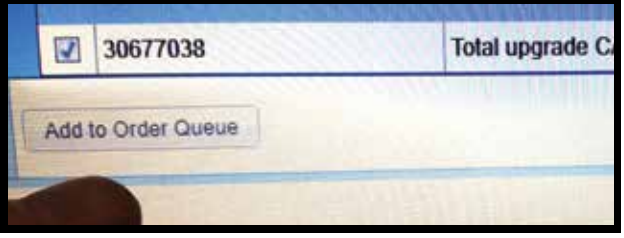
A USB memory stick is good to use on files larger than 1.5 mb. You must use a Volvo certified memory stick for this to work



Select the Upgrades tab while the vehicle is connected to VIDA and you will see all upgrades needed for that particular vehicle.



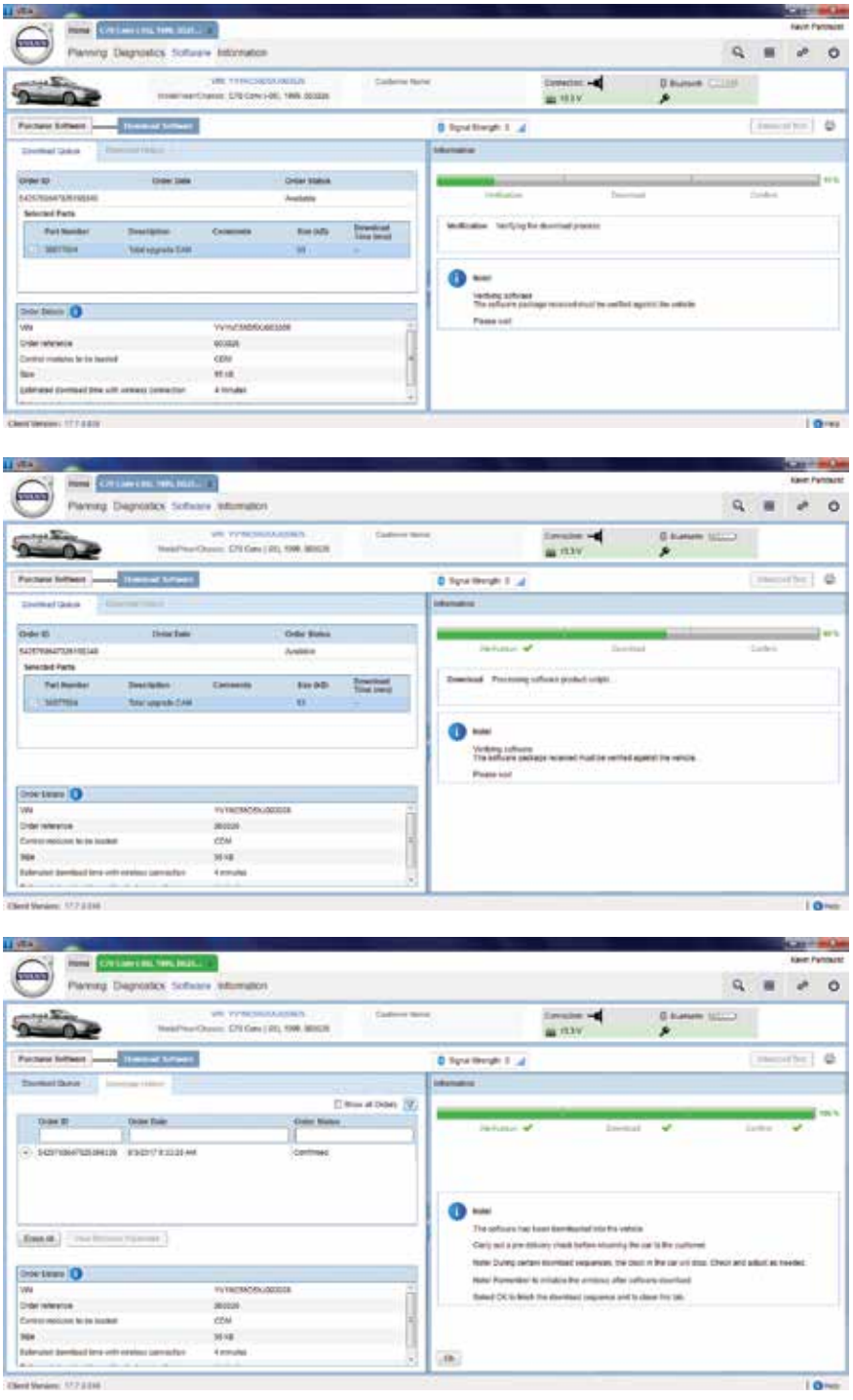
First you will Add To Order queue and then Retrieve Software.



(Part number 951-2999). You can buy Volvo tools through SPX volvodealersolutions.com.

The software will be uploaded to the memory stick from VIDA, then will be installed through the center console USB port. Then, select the Continue button. VIDA will program the control unit via memory stick.

VIDA will only monitor download through DiCE, so you must keep DiCE connected. Progress will be seen in percentages. When software download is complete, VIDA will send confirmation to central system. Select OK when finished. 100 percent will show when completed.



Software download progress is shown in percentages.

Large software files can also be done without the use of a USB memory stick. Go to Advanced in Software tab, and click on the box for large files without memory stick. This, of course, will take longer. Uncheck box after completion.

If at some point you try to order software and get a screen saying "124- client ID is not registered," you will need to log into VIDA admin and save all info and delete user. Then add new user. Reregister VIDA, again running the registration guide. This will take time, so wait a few minutes before ordering software. Reference Service Product Journal 31721.

In some cases you might have problems downloading software. For example, your software download may have been interrupted. Or the communication between VIDA and the vehicle during software downloading may be locked in Program mode.

There is a Reset command in the Advanced tab to bring all control modules out of Program mode. There is also a Send Program tab. Send Program is a command to the CEM to allow communication with all control modules so downloading can continue.

Send Reset will allow communication with all control modules to return to original status before downloading attempt. In certain circumstances, software will need to be reordered and another attempt made to download.

When downloading software, it's always a good idea to check Volvo's technical journals to see if any related problems coincide with the job you are doing.

Volvo is always making new updates for software, so the technician will have to check periodically to see if updates are available for each model.

USING VIDA

VIDA is an extraordinarily versatile tool and can be used when servicing virtually any system in a Volvo. Here are just a few examples of how VIDA can be used in the shop.

Suppose, for example, a technician finds a problem with a customer's transmission. After further diagnosis, the technician comes to the conclusion that the TCM (Transmission Control Module) is faulty. The technician removes the old module and installs a new module. After installation, new TCM software will need to be purchased and downloaded into the vehicle for the transmission to operate correctly. The total reload can be done to all control units at one time. Refer to RTJ23502 for additional information on upgrading and reloading software.

Security software can be downloaded for keys and remotes when adding or removing to vehicle. They must communicate with the immobilizer in the vehicle. The keys and remote must be coded to the immobilizer so you are able to start vehicle, and lock and unlock vehicle.

When adding keys and/or remotes after software has been purchased and during download, VIDA will tell you how many keys and/or remotes are being programmed. A vehicle can only program a certain number of these devices, so you might have to erase old or lost keys or remotes in order to add more.

When purchasing keys or remotes, you will get a code that you will have type in when you download software. A window will pop up and ask you for the numbers and letters to enter. After doing this, you will be able to add keys one at a time with the same software at that time of hook up. The same will work with remotes.

Software application is adding software for functionality, for lights, radios and other accessories. For

DiCE is easily connected and DiCE units can be used on multiple vehicles concurrently.

example, if a vehicle comes equipped with halogen lights and you want to change to HID (xenon) lamps, you can do this by installing new headlights then downloading software to change from halogen to xenon.

Or, suppose a technician is working on a 2002 XC70 that came in to the shop with DIM (Drivers Information Module) going blank sometimes. Plug in DiCE and connect with vehicle. Perhaps the technician cannot communicate with DIM but can see that other control modules are working fine, thus determining that DIM is not working correctly any more.

A new DIM must be ordered from the local dealer. Note that you cannot use a previously-used unit since it will not work due to non-matching VINs. Before installing the new unit, make sure the battery is disconnected first. You must wait five minutes after key is cycled before disconnecting the battery. After installing the new DIM and connecting the battery, new software will need to be installed to match the VIN and be able to work correctly.

It is possible to remove software when removing and transferring an accessory such as a radio. To do so, you must first download Remove software into the vehicle from which you are removing the radio. The application software will be used in the vehicle into which you are installing the radio.

Upgrading software is an important service procedure. For example, when updating an ECM, your order is placed and sent to your hard drive. When software is downloaded into the vehicle, if the vehicle already has the latest software, VIDA will recognize that this is the case.

If you are reloading a control module with functions, you need to read them off first and make notes. Then, after replacing the control module and downloading software, you will need to program values into the new control module. Such functions can include lights, seat heaters, and alarm settings.

During certain downloads, calibration must be performed — climate control modules, for example. The Download tab will turn yellow. A window will pop up. Simply follow the instructions.

When replacing certain control modules, it can be very helpful to take a picture to identify relays and shunt positions to make it easier to replace. Examples include CEM and REM. This makes for less confusion for technicians.

Sometimes during software upgrades, you may receive a software download error code 131, indicating that you will need to replace the Infotainment head unit. Here are tech journals to go along with the problem: TJ 32512 and TJ 31543.

Battery draining can also have to do with software. For instance convertibles from model years 2007-2010 might come in with the customer complaining about their battery being dead and the car will not start. In these cases, software in the CRM (Convertible Roof Module) might need to be updated.

Lets talk about the newer generation of Volvos. Volvo S60 models with a new driver's control interface may afford the challenge of loading larger software files. The older Volvos would take three to six minutes to download. The newer model, being more complex, now could take thirty to sixty minutes depending on the vehicle. These files can have 30mb of data in them, and this means DiCE could be hooked up to a vehicle for as long as an hour.

For this reason, you can now use more then one DiCE at a time and the USB memory stick to download

software. Using more then one DiCE, software can be downloaded into more then one vehicle at a time. As an example, you can be downloading software into one vehicle and diagnosing and working on another vehicle at the same time. This way you don't waste a lot of down time.

After software is downloaded, you should check to make sure everything is working correctly. You may need to reset the clock and possibly resync windows under Vehicle Communication, DDM (Drivers Door Module). To do this, go to the Vehicle Communication tab. Then select DDM. Once the DDM comes up, select Advanced and scroll down to initializing the window positions. You should initialize both windows.

Always remember there is a lot of information on volvotechinfo.com to help with problems you may encounter.

As you can see from these few examples, VIDA is an unusually smart and powerful package that can make diagnosis faster and more accurate, speeding throughput in your shop. It can also verify that repairs you've made have indeed corrected the customer's original complaint. And, importantly, it can confirm the service you've performed has not introduced any extraneous issues or fault codes that were not present when the car came into your shop.

In future issues of Volvo TechTips we will explore, in greater detail, how VIDA can analyze and zero in on faulty components and even software issues, helping you to quickly and accurately identify and repair customers' Volvos.

VIDA is a powerful tool. Perhaps VIDA could stand for Valuable Identification and Diagnostic Asset... ●

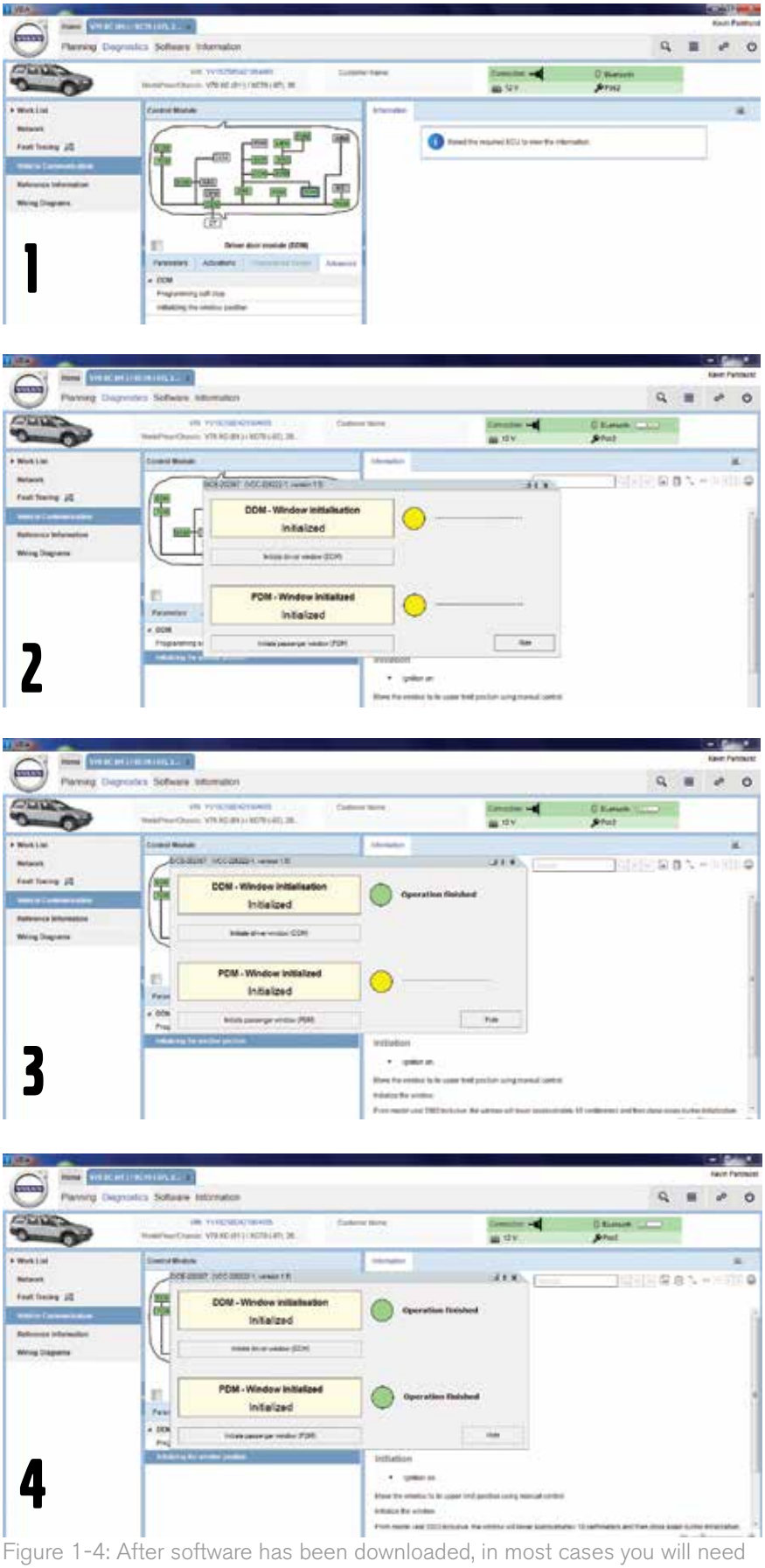


Figure 1-4: After software has been downloaded, in most cases you will need to initialize window controls.

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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.

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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.