

## Volvo 240 Mods & Fixes

Just a few cool mods to keep you sane and properly entertained.

[Main Page](#)      [UPDATED: June 3, 2018](#)      [CONTACT](#)  
[D O M A I N S](#)  
[davebarton.com](#)      [PrancingMoose.com](#)      [240Turbo.com](#)  
[Payments/Policies](#)      [Newly Added Items](#)      [Cool Volvo Products](#)      [240 Mods & Fixes](#)  
[VOLVO STICKERS](#)      [VOLVO Steering Wheel LABELS](#)      [VOLVO WIRE HARNESSES](#)      [WIRE Harness PARTS](#)  
[Prancing MOOSE Stickers](#)      [Other Car Non-Volvo STICKERS](#)      [VOLVO RELAYS](#)      [COIL Repair HARNESSES](#)  
[VOLVO Body/Engine STICKERS](#)      [240 Window SCRAPERS](#)      [740 760 780 TURBO Boost Faces](#)      [VOLVO GAUGE FACES](#)  
[VOLTAGE Regulators](#)      [740/940 Window SCRAPERS](#)      [740 - 850 ODOMETER Repair](#)      [240 ODOMETER Repair](#)  
[HORN BUTTONS](#)      [GROUP A RACING VIDEOS](#)      [GROUP A RACING ARTICLES](#)      [CLASSIC AUTO AIR A.C. CONVERSION](#)      [240 HYDRAULIC CLUTCH](#)      [4 Speed Cooling Fan Project](#)  
[Modified 240s](#)      [ELECTRIC FAN Diagrams](#)      [TROPICAL Fan Clutches](#)      [SoCal Area Salvage Yards](#)      [Side Markers On Volvos](#)      [Modified 240s](#)  
[Unleaded Race Fuel at the Pump](#)      [B26FT Stroker Build](#)      [VOLVO Vacuum Diagrams](#)      [Dave's 245 Spec Page](#)      [USED Volvo Stuff](#)      [240 Big Brakes](#)  
[R-SPORT Shirts and Hats](#)      [PRANCING MOOSE Shirts and Hats](#)      [240 Mods & Fixes](#)      [Favorite Links](#)

### NAVIGATE THIS PAGE

			<a href="#">Electric Power Assist Steering</a>
<a href="#">240 Steering Rack Identification</a>	<a href="#">Classic Car Insurance</a>	<a href="#">Classic Auto Air AC Installation</a>	<a href="#">Mechman High Amp Alternator</a>
<a href="#">Cracked 240 Dashes</a>	<a href="#">Rear Wheel Spacers</a>	<a href="#">Wider Rear Wheel Clearance</a>	<a href="#">Calculating Wheel Offset</a>
<a href="#">Momo Steering Wheel Hub Fix</a>	<a href="#">240 V Belt Sizes</a>	<a href="#">240 Headlight Switch Plug</a>	<a href="#">Custom Turbo Oil Drain Tube</a>
<a href="#">Super Bright Dome Light</a>	<a href="#">Electric Cooling Fan Info</a>	<a href="#">4-Speed Fan Controller</a>	<a href="#">240 Hydraulic Clutch Info</a>
<a href="#">240 Driving Light Brackets</a>	<a href="#">240 Cup Holder Project</a>	<a href="#">G80 Diff in your 240</a>	<a href="#">Fixing Underhood Grounds</a>
<a href="#">Benefits of Anti-Corrosive Paste</a>	<a href="#">Fix or Hardwire Your 240 Taillights</a>	<a href="#">Lowering Your 240</a>	<a href="#">Later Windshield in your 240</a>
<a href="#">Headlight Relay Harness</a>	<a href="#">The 240 Headlight Step Relay</a>	<a href="#">Step Relay ELIMINATION</a>	<a href="#">Speedo Recalibration</a>
<a href="#">Bulb Failure Sensor Part 1</a>	<a href="#">Bulb Failure Sensor Part 2</a>	<a href="#">Bulb Failure Sensor Part 3</a>	<a href="#">Faster Better WIPERS</a>
<a href="#">Mods using RELAYS</a>	<a href="#">Komfort Blinker Upgrade</a>	<a href="#">M46 OD Harness</a>	<a href="#">Auto Trans OD Harness</a>
<a href="#">M46 / M47 Shifter Knob Fix</a>	<a href="#">In-Tank Pump Upgrade</a>	<a href="#">Fuel Pump Relay Mod</a>	<a href="#">240 Tach Install</a>
<a href="#">Plastic Fuel Line Repair</a>	<a href="#">240 (52 mm) Small Tach Install</a>	<a href="#">Bad 240 Door Lock Wires</a>	<a href="#">Temp Compensation Board</a>

I like 240s a lot and there's nothing I like better than modifying them for performance, handling, comfort, etc. In this page I have outlined some cool mods I have done to my 240s and others that have been provided by other 240 enthusiasts.

Your comments are welcome: [CONTACT](#)

### Electric Power Assist Steering

If you like having power steering, but for some reason the traditional hydraulic setup isn't quite right for your modified Volvo (or if you want to convert an older manual steering Volvo to power assist) here are some possible answers.

A number of years ago, Josh Sadler of Yoshifab converted his Volvo 242 to electric/hydraulic steering. Josh's system was fairly simple. It used the original Volvo power steering rack. He mounted an electric/hydraulic steering pump and reservoir from a Toyota MR2 in his trunk and had hydraulic hoses made to route all the way to the stock steering rack. The result worked pretty well.

Here's a discussion thread on his installation: <http://turbobricks.com/forums/showthread.php?t=135556>

See his YouTube video below.

Here's another more detailed thread on a different MR2 pump installation in a Volvo: <https://forums.tbforums.com/showthread.php?t=247548>

And here's the next generation mod.

It's an electric power assist unit from a Saturn Vue, Chevrolet Equinox or Pontiac Torrent. It's mounted in the steering column, so the level of tech is much higher.

This was an installation under the dash of a Volvo P1800 (pics below).

See the discussion thread here: <http://forums.turbobricks.com/showthread.php?t=341174>

Here's a supplier of just such kits that you may be interested in seeing: <http://www.epowersteering.com/index.html>



## Identifying a Power Steering Rack in your 240

**Volvo 240 Power Steering Rack Identification Info:** Volvo TP 31579/1 (1990 publication) shows both **CAM** and **ZF** power steering units being used in 240s from 1976 thru 1990. **CAM** units were used exclusively in 1975. **CAM** units had four different types, and **ZF** had two different types. **In most cases**, a **CAM** (or **TRW**) rack can be identified by the rubber boot outer end that will narrow down to a **small opening** where it's clamped to the tie rod. TRW bought Cam Gear Ltd. in the mid-1980s, so you will begin finding TRW racks in later year 240s.

With a **ZF** rack, the rubber boot outer end normally clamps to a **rubber bushing** on the tie rod. This information is reliant on parts being original. Keep in mind that different boots/tie rods may have been installed over the years.



<<< Here's a ZF rack where a "ZF" mark can be seen on the casting after cleaning.


More info here:

[http://people.physics.anu.edu.au/~amh110/STEERING/steering\\_camgears\\_trw.htm](http://people.physics.anu.edu.au/~amh110/STEERING/steering_camgears_trw.htm)

If you can improve this information, please email.

## Classic Car Insurance for your Classic Volvo

This is a bit of an unusual subject for a mods page, but I know it will be helpful to some Volvo owners out there.



David M. Burton  
Proper, TX 75078-5677

Date Received: 12/18/2017  
Action Date: 12/19/2017  
Payment Amount: \$186.00  
Account Number: 8312658

Policy Status:  
**DECLINED**

Dear Mr. Burton:

Thank you for your application. After careful review, your application has been declined for the following:

1. Value requested is unrealistic.
2. Book value is less than \$5,000.00.
3. Value below program minimum.
4. Vehicle is not a Collector or Limited Edition model.

Enclosed please find your check #1292 in the amount of \$186.00.

We are sorry we could not satisfy your needs.

Coverage is NOT BINDING unless acceptance or binding date is indicated above. Please contact our quoting department with any questions. Thank you for your cooperation and interest in our Collector Vehicle Insurance. We look forward to your reply. THE QUOTATION IS VALID FOR THIRTY (30) DAYS FROM THE QUOTATION DATE OR THE REQUESTED EFFECTIVE DATE.

400 Hartsam Road  
PO Box 1952  
Horsesham, PA 19044  
Tel: 610-667-8639  
Fax: 215-674-5685  
www.grundy.com

Many classic Volvos are certainly appreciating in value. It's not quite the same appreciation of more popular classics, but if you take really good care of your Volvo and it's a model that's desirable or may be collectable, then you may also see some appreciation in value. Many of us old Volvo owners have put a considerable amount of money and effort into restorations or modifications. Your standard car insurance company will likely not be on your side if something tragic happens to that Volvo. They will typically offer a lowball amount that they think is "comparable" to other random Volvo sales they think are "similar." I have had to fight for a better settlement on a few occasions for wrecked Volvos and it's not pleasant task.

There are classic car insurance companies who will offer "**Agreed Value**" policies for antique or collectable classics. You don't have to own an Italian exotic or 1960's muscle car to get such a policy either. An agreed value policy is one that's issued like any other policy with similar liability coverages, **except you set the value of your car** and the insurance company simply sets the premium if they agree on your valuation. In the event that your car is then totaled or stolen, the **payout is that agreed amount**. No arguments. No negotiation. Keep in mind that an insurance company may consider an exaggerated value too high if you shoot for the moon, so you need to exercise some reason. They also make it pretty clear that they will not cover your car if you damage it while racing, so this kind of policy probably won't work for a race car that is still raced.

**Agreed Value companies will also have other specific requirements. Most don't limit your miles driven, but they will probably have some expectations, such as:**

**Not a Daily Driver:** They will probably make you prove you have a different car for daily driving, since they expect a classic car to not be your "regular use vehicle."

**Stored Indoors:** This may not be an absolute requirement, but in most cases, it will be. Sometimes they will approve covered parking.

**My '84 242 qualified for these standards**, so with the above information in mind I set out to find such a policy. Unfortunately, I began with **Grundy Insurance**. They're well known for their collector car insurance and they advertise heavily on car enthusiast TV shows.

I read on Grundy's web page, "**Grundy insures most types of vehicles 25 years old and older. We also insure modern muscle cars and exotics of all years. Not only that, we insure modified vehicles with higher performance engines, suspensions, and modified bodies. We understand custom vehicle valuations very well, and in fact Grundy is the largest insurer of hot rods in the USA!**"

**Grundy's statement sounded hopeful**, so I went on their web page and submitted my info. I received an online quote for my **1984 242 Turbo, which I valued at \$13,000**. I then submitted my application and payment and waited.

A few weeks later I received the above DECLINE letter with my returned check. **You can read the DECLINE letter for yourself.** I was pissed that they wasted so much of my time. **They clearly do not insure cars as they claim to on their LYING website.**

**I recommend you don't waste your time on them either.**

I was then informed by a friend with a **very nice modified 240** that he had been carrying just such an agreed value policy with **Hagerty Insurance** for nearly ten years. His agreed value was considerable more than the \$13,000 I placed on my car. This was certainly hopeful. **So I tried an on line application with Hagerty and received a quote for a policy with a \$13,000 agreed value.** I sent my on-line application and payment and waited.

Approximately **one day after submitting an application I received an email APPROVAL from Hagerty** for my new policy.

So I can certainly recommend Hagerty Insurance if you're considering such a policy for your classic Volvo.

Hagerty sets their general parameters for **Antique** or **Classic** cars they insure as follows:

**"Antique vehicle" means a motor vehicle 25 years or more of age that: 1. Is maintained primarily for use in car club activities, exhibitions, parades, other functions of public interest or for a private collection; and 2. Is used only infrequently for other purposes.**

**"Classic vehicle" means a motor vehicle of unique or rare design and of limited production that is an object of curiosity and: 1. Is maintained primarily for use in car club activities, exhibitions, parades, other functions of public interest or for a private collection; and 2. Is used only infrequently for other purposes.**

**"Regular use vehicle" means a motor vehicle which is used for regular driving to work, school, shopping, errands or for general transportation and is not an "antique vehicle" or "classic vehicle."**

## Classic Auto Air all new Air Conditioning Installation

I finally grew tired enough of my mediocre Volvo AC in my 242 to explore an **extreme** option. This is a **complete new AC system installation from Classic Auto Air.** I also spent the time installing **Dynamat** while the interior was out of the car. It was a LOT of work, but sometimes hard work really pays off.

**I created a new web page all about the new AC conversion. CLICK HERE!**



## Mechman High Amp Custom Alternator

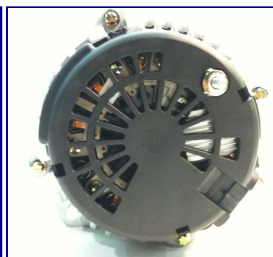
I did this installation a number of years ago in my 242.

I began a discussion thread in Turbobricks back then, which helped me get through some issues I was having. **That thread is here:** <http://forums.turbobricks.com/showthread.php?t=215613>.



<<< I wanted something bigger and badder than what I had. I was using a lot of amps in my 242 and the **old 100 amp Volvo Bosch unit I installed a few years earlier was not doing well at idle.** When running the air conditioning (with a big puller fan and dual condenser fans), voltage was suffering badly. The big puller fan I'm currently using is a **Lincoln Mark VIII** unit and it can pull close to 40 amps at full speed. More on this big fan setup can be found in my **Electric Fan Page HERE** and my **Custom Fan Controller Page HERE.**

The old Bosch units tend to suffer when they get hot (**and it sits next to a turbo!**). The difference between cold and hot voltage under load at idle was from 14v to 12v; a full 2 volt drop! I was assured by Mechman that the custom unit I was buying would improve that. **Skipping ahead: It did improve charging substantially.** That's what I needed.



<<< I chose this 140 amp unit. It's a GM alternator (large case type) that Mechman offered with custom machined spacers so it would properly bolt into a Volvo and line up correctly.

<<< Here's a good comparison photo showing the Mechman next to a Volvo Bosch 100A alternator. They're almost the same size. The Mechman might be a little smaller.



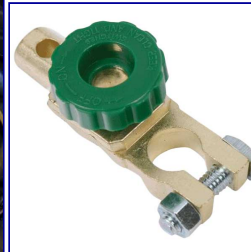
<<< Here's the new Mechman installed. It's a nice, snug fit. Not a lot of room for adjustment. Probably more than the Bosch offered though.



<<< The belt size I used for the Bosch unit was **10 x 925 mm**. This new alternator needed to be swung slightly further from the engine and the **new belt size used was 10 x 965 mm**.



<<< Attaching a ground was a bit different. **The Mechman alternator does not have a ground stud on its case**, so my best solution was pinching a ring terminal against the case as shown here. It's a decent solution as long as that bolt doesn't tend to loosen over time.



<<< **Don't use one of these things on your battery when using an alternator like this.** I had one of these disconnect devices on my negative battery terminal. After installing the Mechman I began experiencing some strange intermittent momentary voltage drops when the alternator was under load, such as when the AC was on. It took a while to figure it out. It turned out that disconnect knob was **creating some resistance** in the ground cable circuit and the Mechman was sensitive to it. I tossed it in the trash and properly connected my battery.

If you're interested in alternators like this, you can find them here: <http://www.mechman.com/>

## Dealing with a Cracked 240 Dash



If you own a 240, it probably has a cracked dash. An uncracked one is rare, especially for a 1981 to 1988.

There are a couple options. **One is very expensive.** [Justdashes.com](http://Justdashes.com) offers full dash refurbishing, even for a 240 dash of any year. Cost is quite high, about \$1300 for an all black dash from a 1981 and later 240 (and more money to match a color), but they claim the dash will be perfect and as new.

[Coverlaymfg.com](http://Coverlaymfg.com) offers thin ABS plastic covers for the dash top for a bit over \$200. This one is reported to be high quality.

Some people have used similar products over the years and have seen them crack over time if left in the sun. This may sound to you like a poor quality alternative, **but there are other people who have had great success with some extra effort.** Maybe cracking should be expected if you never garage your 240. If that's you, maybe just buy a cloth cover and be done with it.

[AmericanDashCaps.com/Volvo](http://AmericanDashCaps.com/Volvo) offers less expensive ABS dash covers. Their quality is not known to me.

Some have reported good results with these products and they advise to first fill the cracks with a strong adhesive, such as a high-quality RTV glue that will keep the crack from growing after the dash top is placed on.

**Here are some nice success stories:** If you are considering a plastic dash cover, this link below is a restoration thread for a 1981 Volvo 262C. The dash restoration begins at **Post #147**, which is on **Page 3**, and goes to **Post #161**: <http://forums.turbobricks.com/showthread.php?t=256460&page=3>. This dash turned out very nice.

Also a long time 240 owner I know bought a plastic dash cover from iPd in 2002. The car is always garaged and it has held up really well for a lot of years. There's been a small bit of 'warping' on the very thin cross section (due to the top center speaker opening) right under the windshield, but other than that, it's pretty flawless. He didn't "glue" it down using the provided silicone adhesive. Instead he used four black trim screws -- one on either side of the center speaker opening, and one on each end of the dash, such that it's hidden when the doors are closed. He drilled

the holes in the cover a bit larger than the screw and he didn't tighten them down completely tight, so that the cover can still expand and contract without causing any problems. iPod still offers 240 dash caps.

Other threads to read:

<http://forums.turbobricks.com/showthread.php?t=337660>

How to Restore Linked Photobucket Images (Firefox): <https://forums.tbforums.com/showthread.php?t=338909>

## Installing Rear Wheel Spacers

There are some good reasons why you might want wheel spacers or wheel adapters for your 240.

When my 242 had Eiker wheels (photos here: [www.240turbo.com](http://www.240turbo.com)) I was annoyed by the large gap between the rear tires and the fenders.



<<< As I mentioned, I didn't like the rear fender gap. I bought some 25 mm spacers for my 240. These spacers had the standard Volvo 5 x 108 mm bolt pattern for **both** mounting surfaces.

iPod offers a pair of 25 mm (hub-centric) spacers: [www.ipdusa.com/products/11525/125006](http://www.ipdusa.com/products/11525/125006)

Kaplhénke Racing offers a different style of (hub-centric) spacer. Their spacers come with longer wheel studs. They also offer other thicknesses besides 25 mm: [www.kaplhénke.com/collections/240/products/240-extended-wheel-studs-wheel-spacers](http://www.kaplhénke.com/collections/240/products/240-extended-wheel-studs-wheel-spacers)

That strange rear extra fender gap is caused by Volvo designing the rear wheel track **70 mm narrower than the front track**. I don't know why.

### 240 Wheel Track

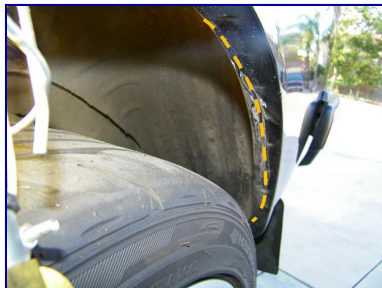
Front: 1420 mm (55.9 inches)

Rear: 1350 mm (53.14 inches)



<<< Here is the 25 mm spacer mounted on my 240 rear hub.

**It's important when choosing any spacer or adapter that you choose HUB-CENTRIC spacers.** This means that the center raised lip that fits into the wheel center is present. This centers the wheel properly and provides for greatly improved safety. There are many generic spacers on line that do not have that hub-centric lip. I don't recommend those.



<<< Before adding these spacers I did not have any tire contact on the outside of the tire (inner fender lip). AFTER installing the spacers, I needed to make some extra room in this area. If you push your wheels closer to your fenders as I did, you too may find you may need to make more room for those tires on the outside. Many people will tell you that you can easily **roll your fender inner sheet metal**. Most people have never actually tried doing that. You can try. It's not as easy as it sounds. That steel lip in a 240 is **double thickness** and rolling it is VERY hard with very limited results. Most people who insist on rolling will end up finishing it off with a sledge hammer. **You need to be aware that the rolling and hammer method will probably result in cracks in your paint.** Heating the paint with a heat gun during this process can help reduce that issue.

I've done many fenders over the years and I no longer mess with rolling/pounding. A sawzall is very fast for this kind of trimming. A rotary cutter or grinder works too, but is slower.

If you're looking for Eiker wheels, Kaplhénke Racing offers them in their site: [www.kaplhénke.com/collections/240/products/eiker-classic-e1](http://www.kaplhénke.com/collections/240/products/eiker-classic-e1)

## Wider Rear Wheel/Tire FENDER CLEARANCE for your 240

When going with wider tires on your 240, you'll need to deal with the likely result of rear tire rubbing on bumps, especially if your car is lower than stock. The back half rear arch may need to be trimmed by 1/2 inch or more, depending on your ride height and how far the tires need to tuck inside the fender when compressed. Some people prefer to **ROLL** the inner sheet metal instead of trimming. On many cars this is a pretty easy thing to do, but not on a 240. The 240 sheet metal at that place is **TWO LAYERS**, which makes rolling very hard. Most people who use the rolling method on a 240 end up finishing with a **sledge hammer** because rolling alone didn't work.

The area marked in **RED** is the general area that needs rolling to **reduce** tire rubbing on medium bumps. This is the **FIRST (but not only) rubbing area** you will encounter when your tires get pretty **CLOSE** to the fenders.



Here's a good thread with pics that outlines the ROLLING/HAMMERING METHOD pretty well:  
<http://forums.turbobricks.com/showthread.php?t=338190>

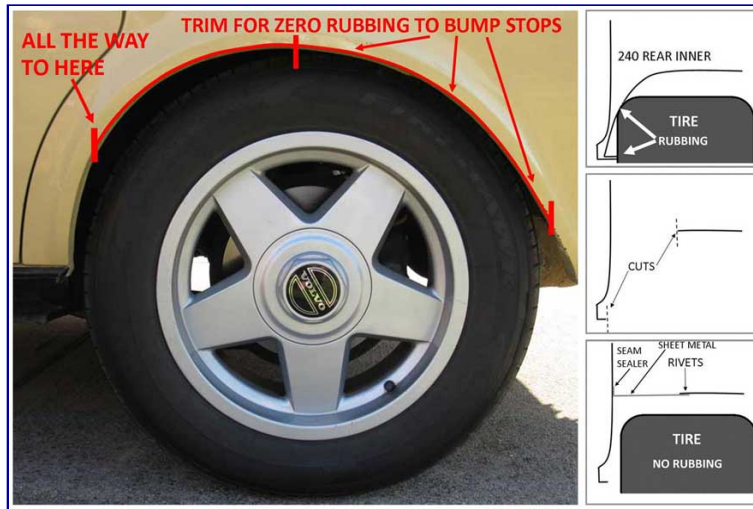


In my opinion the above rolling/hammering modification **does not go far enough** if your car is lowered and you want to **TUCK the rear tires without hitting metal** or if you want to **retain full suspension travel all the way to bump stops**. Rolling the outer lip reduces rubbing at the back arch only. <<< **If you need your wider tires to go HIGHER in the fenders like this photo, you will need to do much more.**

The below illustration will help explain what I did on my 242 when I went with the BMW mesh style wheels and adapters with 235/40-17 tires that are pushed out fairly close to the fenders. My trimming of the outer lip started out slowly, a little at a time in a trial and error method. Then I cut and removed the inner sheet metal curvature that prevents the wheel from tucking all the way up. This resulted in perfect clearance and the car could **FULLY BOTTOM OUT** the rear suspension in a hard dip with **ZERO rubbing**. That means **hitting the bump stops with no rubbing**. That's never gonna happen with rolling alone.

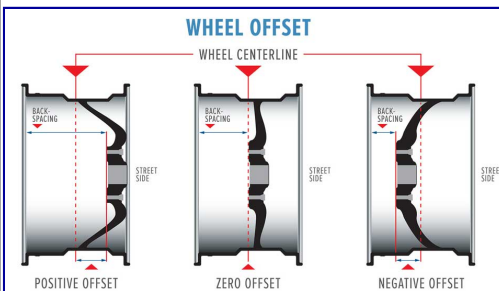
### **The below illustrations show how this was done.**

I have been told this is similar to the modification made to Group A race Volvos to fit their large wheels/tires. The pic to the lower right was the final result on my 242 and there is zero rubbing.



## Calculating Correct Wheel Offset for your 240

There are plenty of sites out there that will explain offset for you, so I will try to stick with how I calculated the right offset for my 242 when I added the multi-spoke 17 inch wheels (with BMW bolt pattern) and billet adapters.



<<< Here's a good image that quickly explains how offsets are classified or measured. Most wheels for a Volvo will have **POSITIVE** offset. The amount of offset for the wheels you choose will be key.

**Start with the wheels on your car now.** If you have 240 wheels, it's a good bet they have 20 mm offset. If you have 700/900 wheels, they probably have 25 mm offset. If you have front-wheel-drive wheels, they will have a lot more positive offset than 240 wheels, as much as 40 mm offset.

When I began my calculations, my 242 had a set of **Eiker E1 wheels**. These wheels are **7.5 inches wide and have 20 mm POSITIVE offset**. At that time I had also already installed **25 mm spacers** behind the rear wheels ([info on those spacers HERE](#)). So this meant that **with the spacers, my wheels actually had 5 mm NEGATIVE offset**.

I had a good look at the **REAR fenders** and decided that I generally liked the position and distance between the tire and outer fender.

Looking at my **front wheels**, which did not have a spacer, I decided the 20 mm **POSITIVE** offset of the Eikers seemed to be a good fit. When checking **FRONT** wheel/tire clearances, be sure to also look at the **spacing between the tire and your strut tube** (or your coilovers, if you have them). You don't want to do all this work and later discover your wide tire is **TOO CLOSE to your strut**.

When I was shopping for wheels to replace the Eikers, I knew I would need to concentrate on something with **more offset than the Eikers**, since I would be **adding a new adapter behind each wheel**. I eventually settled on wheels that were **7.5 inches wide with 35 mm POSITIVE offset**. I calculated that adding a **40 mm adapter** behind the 35 mm **POSITIVE** offset **REAR** wheels, that would make the **combined offset 5 mm NEGATIVE**, the **exact same net offset** as the Eiker wheels with adapters I had on the rear.

On the **FRONT** wheels, the ideal adapter thickness would have seemed to be **15 mm if it existed**. Since that would have changed my new 35 mm **POSITIVE** offset wheels to 20 mm offset, the exact same as the front Eiker wheels. The adapter maker I chose was <http://www.motorsport-tech.com>. When I contacted them, they said the **minimum thickness they could do was 20 mm**. So I went with a **20 mm thick front adapter**. This made the net offset of my new front wheels 15 mm. The extra 5mm pushed the wheels 5 mm more to the outside. Hardly noticeable.



There it is. That's how it's done. Draw yourself some diagrams if it helps you visualize all this.

Here's a good Turbobricks discussion thread with related info: <https://forums.tbforums.com/showthread.php?t=339645>  
 Turbobricks Wheel Guide: <http://forums.turbobricks.com/showthread.php?t=72501&highlight=wheel+guide>

Rim and Tire Size Calculator for Custom Offset calculations: <https://www.wheel-size.com/calc/>  
 How to Restore Linked Photobucket Images (Firefox): <https://forums.tbforums.com/showthread.php?t=338909>

## Momo Steering Wheel Hub for the 240

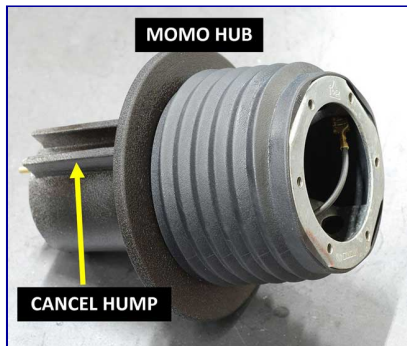
Installing a Momo (or similar type) steering wheel in your 240 can really improve your driving experience. It gives you lots of options for choosing a stylish or sporty steering wheel in a variety of sizes.

You probably already know all this and luckily for you, that's NOT what this article is about.



This is about correcting or improving a **common and annoying problem found in Momo** (and similar) hubs that are available for your 240.

**<<< LOOK HERE.** These are typical 240 steering wheels. The turn signal stalk has a small plastic lever that protrudes into and touches the TURN SIGNAL CANCEL HUMP when you activate the blinker. That cancel hump is what cancels the blinker after your turn.



**<<< HERE** we have a Momo steering hub for a 240. Hubs like these can be found online. A good place to look is [www.kapphenke.com](http://www.kapphenke.com). They actually offer two different brands; a Momo and an OMP. Both are similar.

**<<< The problem with this Momo hub is the CANCEL HUMP.** It's made into **two rails with a channel in the middle instead of one solid hump** like the original steering wheel. This causes the blinker cancellation to act differently and I find it annoying.



**<<< HERE WHAT I DID.**

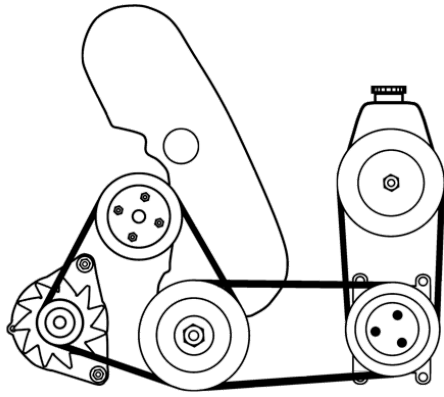
That is a simple piece of thin aluminum sheet that I trimmed and bent to fit in there tight. Since it fits tight inside that channel, I found no need to glue it in. Just about any material would work for this. It could be a piece of plastic or a block of wood. If it doesn't wedge in there tight, use some glue to keep it in place.

## 240 V Belt Sizes

Information on 240 accessory V belt sizes used to be easier to find, but it seems to have mostly disappeared from many useful sites. I put this info together many, many years ago for my own 240 uses. I thought I would share it here.

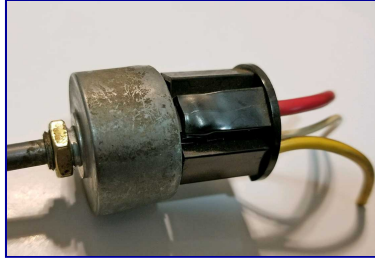
**If you can add to or help with this info, please email.**

ACCESSORY	Volvo PN	Size	Notes
Alternator	966908	10 x 925	2 needed. 76-83 240. Also 977260.
Alternator	973538	9.5 x 918	2 needed. 84-93 240. Also 10 x 918.
AC to PS	967114	13 x 1075	77-84 240. Also 12.5 x 1075.
AC to PS	973535	10 x 850	85-92 240.
AC to PS	977759	11.9 x 835	93 240.



PS (no AC)	966909	10 x 938	77-89 240.
Crank to AC	967103	13 x 925	76-84 240. Also 978678.
Crank to AC	979631	13 x 975	85-92 240.
Crank to AC	979277	13 x 938	93 240.

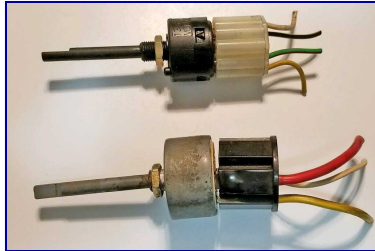
## 1981-85 240 Headlight Switch Plug Problems



<<< From 1981 to 1985 the 240 was equipped with this headlight switch. It's a metal case design with a 5-pole plastic plug (the switch itself only has 3-poles, so only 3 wires). **As you can see in this photo, there is some melting deformation on this plug.** This is at the **RED** wire, which is the power supply from the battery. This is a very common occurrence that has happened to **almost every pre-1986 240 I have ever seen.** Some I've seen are much worse than this photo.

Some might suggest that **too much current** caused this melting. That is obvious, but it's not the problem. The cause is usually a slow build-up of corrosion at that terminal, which caused a less than optimal circuit connection. This condition causes arcing and resistance and heat build-up. That heat build-up melted this plug. Stock headlights generally don't draw too much current as long as the connections are clean and tight. However, adding high wattage halogen headlights can easily overwhelm that plug terminal.

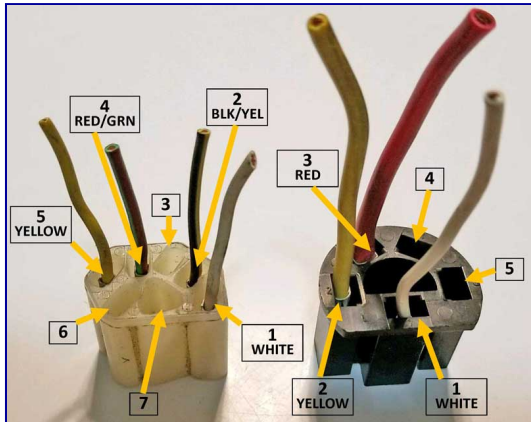
Better designed terminals with more contact area (i.e. bigger terminal) between the male and female sides might have kept this from happening, but if the corrosion had not been there, this plug would probably have been fine. There are ways we can keep this from happening in the future. One way is by eliminating the high current load of all those headlights through that small terminal. This is done by **adding a headlight relay** that takes the bulk of the direct battery load. This is in fact what Volvo did for the 240 beginning in 1986. This is a great idea. **One other great idea is to smear some Anti-Corrosive Zinc Paste on these terminals** ([click here for more info](#)).



For those of you who want to replace that melted black plug, good luck. **It's no longer available from Volvo.** You can dig through old Volvos at salvage yards, but all you'll find will be more melted plugs. Keep reading and I'll show how you can switch to a **later style headlight switch** found in 1986 and later 240s. **CAUTION:** I recommend taking steps to eliminate the cause of plug melting first before fitting a later style switch. Install the headlight relay upgrade ([more info below](#)) and get some **anti-corrosive zinc paste**.

<<< Here are two 240 headlight switches. The **top switch is the 1986 and later style** headlight switch. The **bottom one is the pre-1986** switch. If your early style plug is melting, you cannot just use the new style plug on an older switch. They are not the same. If you want to use the newer plug, you will have to use the newer style switch. Below I will show how you can swap the wire terminals

from an early plug to a later plug and then you can use a later switch.



<<< These plugs have numbers molded into them on the backsides. The newer white plug will have one extra wire that you won't need to plug in.

Here are the wire circuits for these plugs:

- Early Plug:**
- 1. White: Goes through fuse panel, then to parking lamp circuit.
  - 2. Yellow: Goes to step-relay pole 56 to turn on low beams.
  - 3. Red: Goes to battery +.
  - 4. empty
  - 5. empty
- Later Plug:**
- 1. White: Goes through fuse panel, then to parking lamp circuit.
  - 2. Blk/Yellow: Goes through fuse panel, then to key switch power (not needed for earlier 240).
  - 3. empty
  - 4. Red/Green: Goes to battery +.
  - 5. Yellow: Goes to headlight relay to turn on low beams.

- 6. empty      empty
- 7. empty      empty

So here's the formula needed to swap in a newer headlight switch and plug.

1. White wire from old plug goes to position 1 in new plug.
2. Yellow wire from old plug goes to position 5 in new plug.
3. Red wire from old plug goes to position 4 in new plug.

[Click here for tips on removing wire terminal inserts from these plugs.](#)

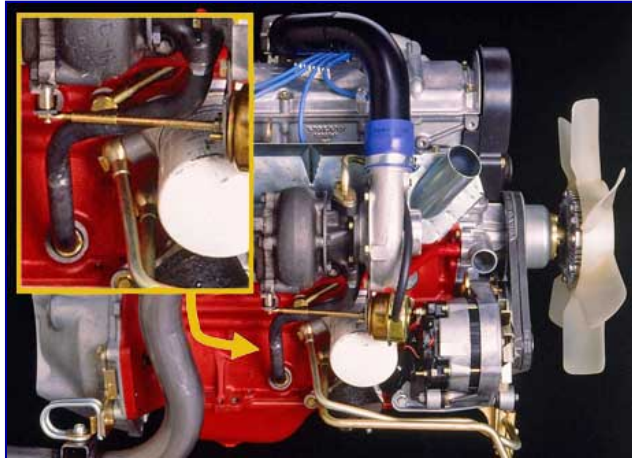
More information on adding a RELAY to upgrade your early 240 headlights can be found here:

<http://forums.turbobricks.com/showthread.php?t=250740>

<https://www.danielsternlighting.com/tech/relays/relays.html>

How to Restore Linked Photobucket Images (Firefox): <https://forums.tbforums.com/showthread.php?t=338909>

## Custom Turbo Oil Drain Hose for Volvo Red Blocks



<<< When Volvo designed their 240 Turbo engine they used a rigid steel drain pipe for the turbo oil return (same design for later 740 and 940 Turbo). The lower part of the pipe was suppose to seal into a hole in the block. Despite having a rubber o-ring on the pipe, these tubes usually leaked. I'm happy to report that **Yoshifab** has brought the red block drain pipe into the 21st century by introducing a **new custom hose fitting** that fits into the existing hole in the block and allows you to use modern racing hose and fittings for a much better drain hose.



<<< This was really good news to me because I really hated the drain tube I had cobbled together to fit my Mitsubishi TD04 turbo (from an 850 Turbo). I love the turbo. I had retrofitted it to my late model exhaust manifold, but that meant a standard drain pipe would not fit. The pipe I made was functional, but I didn't trust the soft hose there in the middle due to the extreme heat it was subjected to (even though it was reinforced silicone construction). It's not designed for such heat and I just knew it would eventually fail at a bad time.



<<< So I bought the Yoshifab **Turbo Red Block -10 Oil Return Conversion Kit** and installed it in my 242 Turbo. The kit can be found at: <https://yoshifab.com/store/turbo-red-block-10-oil-return-conversion-kit.html>. This fitting is designed to fit precisely into the existing Volvo block drain hole.



<<< The fit is so precise that the instructions call for the fitting to be placed in the freezer before tapping it into the hole. Yoshifab supplies an adhesive to seal and secure the fitting. This fitting is threaded for a standard -10 AN hose end fitting that you can buy anywhere.

<<< I bought **TWO** of these AN fittings at Summit Racing: **SUM-250090B Hose End, for PTFE -10 AN Female Black Aluminum**. Found here: <https://www.summitracing.com/parts/SUM-250090B>.

<<< And I bought a 3 foot section of hose to go along with the fittings. I chose **PTFE** hose, which has a **Teflon inner core**. This hose is designed for oil and has a high temperature rating. This item: **SUM-2201010 Hose, PTFE, Braided Stainless Steel, -10 AN, 3 ft. Length**. Found here: <https://www.summitracing.com/parts/SUM-2201010>.



\*This hose **requires** the use of PTFE hose ends.



<<< I found this **-10AN Aluminum Turbo Oil Return Drain Flange** on eBay to fit my TD04 turbo. Assembling the new hose is not difficult, but you'll need some guidance if it's your first time. There are good instructions here: <http://anfittingguide.com/install-ptfe-hose-fittings/>. It's important to note that **if you disassemble one of these fittings later you must replace the ferrule** because it's designed to get crushed during assembly and **it's NOT reuseable**.

Here is a decent video on assembling PTFE fittings:  
[https://www.youtube.com/watch?v=978BYt\\_MUK0](https://www.youtube.com/watch?v=978BYt_MUK0)



<<< Here is my new assembled drain hose ready to go in. Overall length for mine was 16 inches . . . .



<<< . . . however it could have been shorter by at least 2 inches and it would still fit just fine. Now I have piece of mind that if something is going to break, it will not be that drain hose.



### Getting a Super Bright 240 Dome Light

The easiest mod on this page by far.  
Simple as this. I bought an LED bulb from the below source for my 242 dome light.  
Dim light gone. Bright light now working very well.  
Done.

<https://www.superbrightleds.com/moreinfo/dome-light-bulb/578-led-bulb-8-led-festoon-44mm-car/3582/>

#### MORE VOLVO BULB REFERENCES

Matthews Volvo Site Bulb Guide: <https://www.matthewsvolvosite.com/forums/viewtopic.php?f=1&t=61483>  
Other 240 interior and exterior bulb info in this Turbobricks thread: <http://forums.turbobricks.com/showthread.php?t=283706>  
iPd Bulb Reference: <https://www.ipdusa.com/techtips/10096/what-light-bulbs-fit-my-volvo>  
Volvo has owner's manuals going back many years (bulb info is in "Specifications"): <https://www.volvocars.com/us/own/owner-info/owners-manuals>

How to Restore Linked Photobucket Images (Firefox): <https://forums.tbforums.com/showthread.php?t=338909>

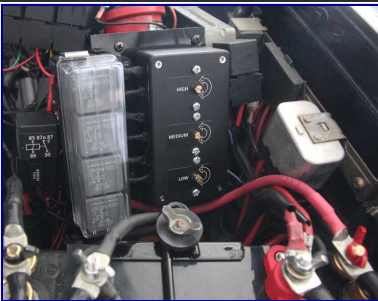
## Options and Experiments in the Installation of a Primary Electric Cooling Fan for your 240



When in good working order, **the original belt-driven clutch fan in your 240 can handle most cooling needs.** But if you have been thinking that your 240 needs an electric primary cooling fan, here is a page I put together on my experiences with a number of electric fan conversions over the years, from small 14 inch GM fans to big Ford or Lincoln fans. Plus a variety of wiring diagrams are included for building your own relay fan control systems if you like.

[CLICK HERE](#)

Or check out my **4-Speed Fan Controller Project Page BELOW.**



## 4-Speed Cooling Fan Controller Project (for my LINCOLN MARK VIII fan)

I got tired of **failing** high-tech fan controllers that would burn up after a year or two when trying to control my big **Lincoln Mark VIII fan.** They always failed in the worst places. So I decided to design and build **my own fan controller with FOUR speeds** using what I know. **RELIABLE RELAYS.** Works great! You can build one too if you like.

Click here: <http://www.240turbo.com/fanharness.html>



## Hydraulic Clutch Info Page for your 240

I have a pretty heavy clutch in my 240. Back in 2011 I got tired of stretching, adjusting, stretching and then snapping clutch cables, so I installed a hydraulic setup for the clutch. I recently updated the master cylinder from the Volvo unit to an aftermarket one and created a web page to help keep track of the parts and information for others to see.

Here's the new page below:

<http://www.240turbo.com/hydraulicclutch.html>

## Mounting Driving Lights on your 240 without Drilling your Bumper!



If you're one that likes the look or function of **killer driving lights** on your 240, but **don't want holes in the top of your bumper**, I'm here to show you an alternative to drilling holes in your bumper.

<<< The first two photos to the left show 240s with holes drilled in their bumpers.



### Auxiliary Driving Lights (Canada Only)

Headlight lamps are 500mm (20") in diameter and are available in a long range of colors. They are available in a variety of sizes and colors. They are available in a variety of sizes and colors. They are available in a variety of sizes and colors.

### Headlamp Inserts

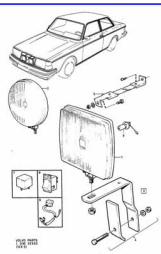
Headlamp inserts are available for all models in Canada only. See your authorized Canadian Volvo Dealer for a complete listing.

### Adjustable Light Bracket

An 8" hole bracket will hold the top of the light (bring light in the hole) and the bottom of the light (bring light in the hole).

### Mounting Brackets

Mounting brackets with adjusting slots have been designed to hold your driving light in the correct position on all models. They are available in a variety of sizes and colors. They are available in a variety of sizes and colors.



<<< These photos to the left are what I found in some old Volvo optional accessory literature. It turns out that Volvo actually produced **brackets that mounted behind the bumper** and then came through below the grill. The last photo offers a good view of this bracket.

I'm pretty sure it will be impossible to actually **locate an original bracket**, but I think making them would not be all that hard to do using these images. Just try to use **fairly thick steel** so the lights don't bounce from bracket flex.

<<< I did a similar thing when I mounted driving lights on my old 760 Turbo way back in the 1980s and then **removed them before I sold the car with zero visible damage to anything.** I used 1/4" steel plate. That was overkill, but they did not flex at all. If you do a project like this or have already done one, please [CONTACT ME](#). I would like to hear from you about it.



## Making a Custom Cup Holder for your 240



We all know our beloved 240s never came with cup holders. There have been a number of cup holder projects in the internet over the years. When I saw this one in the Turbobricks forum, I felt it really needed to be shown. The thoughtful design allows it to be securely anchored over the e-brake handle, using the e-brake handle button to help pin the front against the shifter hump. It's a nice design feature to keep in mind when you build (or adapt) such a thing for your car.

See more photos and dimensions here: <http://forums.turbobricks.com/showthread.php?t=328054>

How to Restore Linked Photobucket Images (Firefox): <https://forums.tbforums.com/showthread.php?t=338909>

## Installing a G80 Locking Differential (from a 700/900) into your 240



The G80 Locking Differential is a special differential that Volvo began putting in the 740/940 model rear ends beginning about 1992. It was manufactured by Eaton. This differential is designed to provide positive locking of the rear wheels during low speeds (typically under 25 mph). As speed increases, the differential can sense the speed change and it unlocks for speeds typically above 25 mph. It does this by way of a centrifugal weight that changes position as speed increases.

240 owners have discovered that this differential is a (nearly) simple direct bolt-in to the 240 Dana 1031 and 1041 rear ends. In many cases, these differentials will bolt in and run fine with no adjustments, usually even without replacement of any bearings, shims or gears. There are some that will tell you that the "correct" way is to fit the unit just as you would any new differential replacement, using a professional technician. The choice is yours, however many "junkyard" DIY mechanics have already done it successfully

In most cases when fitting this differential to a 240 rear end, you will need to **trim a small amount of steel off the inner end of the right side axle**. This is because the right axle will not fit all the way in with the G80 in place. That's the only part that is not a direct bolt-in. The trim amount is about 1/4 inch. It's also common for modifications to be made to the G80 to alter the locking to un-locking transition speed to make it stay locked later, unlocking at a higher speed, or to even stay locked at all speeds. This is done by a couple different methods and these are outlined in the attached links below. Not all of the methods are the same, so if this parts interests you, read it all.

### HELPFUL ARTICLES:

<http://forums.turbobricks.com/showthread.php?t=338768>  
<http://www.turbobricks.com/mods.php?content=art0027>  
<http://forums.turbobricks.com/showthread.php?t=321262>  
<http://forums.turbobricks.org/showthread.php?p=5136009>  
<http://retrorides.proboards.com/thread/150384/volvo-series-locker-diffs-eaton>  
<http://www.autoevolution.com/news/a-simple-guide-to-the-g80-locking-differential-94874.html>  
<https://www.youtube.com/watch?v=xevx06aay7E>



Also, here's the link to my old [240 Limited Slip Rear End Page](#). Some info is out of date, but I leave it up for those who can use the info.

How to Restore Linked Photobucket Images (Firefox): <https://forums.tbforums.com/showthread.php?t=338909>

## Fixing Common Corroded Ground Points (and power connections) In Your 240

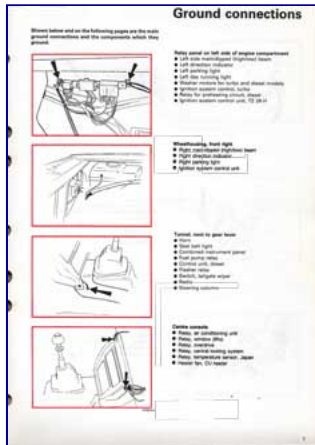
I hear about strange intermittent electrical problems from frustrated 240 owners quite often. These problems occur so often because of a few good reasons . . . .

- #1: These cars are old and . . . .
- #2: Electrical connections tend to slowly corrode over time, and . . .
- #3: Cars that spend most of their lives **outdoors always suffer more corrosion in electrical connections and ground points.**

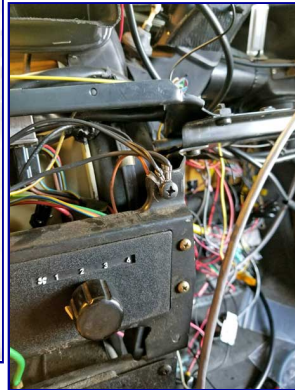
Spending some time **cleaning connections and making sure they are tight** can go a long way in keeping your 240 running well, especially if your car has lived outdoors in the weather for many years (this is really bad for long electrical life for any car).

**WATCH THIS VIDEO (also read the COMMENTS section):**

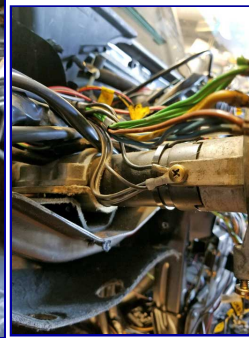
## 240 GROUND CONNECTIONS



<<< Click the diagram image at left to access a **three page pdf file** showing 240 ground locations.



<<< Here's a look at a 240 center dash ground point.



<<< And here's a ground point on the **steering column** that the Volvo diagrams forgot to mention.



<<< Here's another mystery hidden ground point that no diagram mentions. It's found on the **left side of the transmission hump** below the blower fan enclosure.



<<< And yet another ground point not mentioned. This one is on one of the screws securing the left side lower fresh air vent. It's for an accessory relay, so it may not be found on all 240s.



<<< And this one is well hidden, but at least it was mentioned in the Volvo Ground Connection pages. It's next to the left side vertical dash brace on the **left side of the transmission hump**. It may be hidden by your carpet.

On a related note . . . . .

## BENEFITS OF USING ANTI-CORROSIVE PASTE OVER DIELECTRIC GREASE

If I have not yet fully convinced you of the importance of clean and tight electrical connections, I will repeat it again and again. If we can just just keep our connections clean and tight, almost all of the electrical issues would be gone forever. That would be nice, right?



I have owned a number of Volvos over the last 30 years and my current 240 is way over 30 years old. It almost never has electrical problems. Nothing like the endless numbers of other 240s out there that I hear about often by email. What's the difference you ask? The difference is that my 240 has been always garaged all of its life. Why is that important? Because leaving any car out in the open elements for years and years slowly introduces corrosion to grounds and power connections until things begin to go wrong.

So if you own one of those cars that has been outside forever, it's not too late. You can still clean as many grounds and electrical connections as possible. And while you're at it, **I recommend that you smear a little anti-corrosive zinc paste on those connections.** Read more about that below.

**The below information was contributed by Ron Kwas and should come in very handy to old Volvo owners:**

**Anti-Corrosive Zinc Paste** (a generic name for zinc dust contained in a grease) was originally developed for and later required by electrical codes for use on aluminum to copper electrical connections (or other dissimilar metal connections). **No, it's not the same as Dielectric Grease**, which is often incorrectly recommended. Dielectric Grease can offer some protection in the form of **encapsulation from moisture**, but it also carries with it the potential disadvantage of locking in moisture or corrosion which may have already begun. Anti-Corrosive Zinc Paste (or ACZP) is the next evolution of the encapsulation principle, because zinc (the

lowest on the Galvanic nobility chart) neutralizes corrosion on a micro-scale to truly protect connections on a long-term basis during the encapsulation, INCLUDING an added protection from corrosion which may otherwise begin to form in that connection.

Ron Kwas has used for years and recommends **Penetrox A (by Burndy)**. I found it was easily available on line and now have a bottle in my tool box. Ron has studied the effects and downsides of other manufacturer's versions and has found some to be less suitable. He says he is a big advocate of treating **ALL electrical connections** on our cars (except of course High Voltage Ignition connections) with a suitable version of this material.

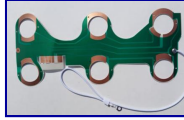
You can learn more about this stuff at Ron's page here:

[http://www.sw-em.com/anti\\_corrosive\\_paste.htm](http://www.sw-em.com/anti_corrosive_paste.htm)

## Hardwiring your 240 Taillights (Tail Lamps)

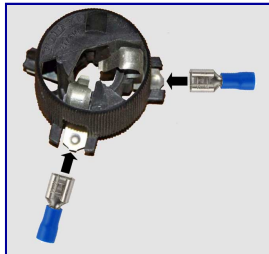


I get a pretty fair number of emails about failing tail lamps in 240s, so I decided to compile some info about that here. This applies to 240 sedans with **large 6-panel tail lights only**, since all wagons and early sedans with 5-panel tail lights don't have the **fragile circuit boards** on the backside. Most people with these tail lamps know what it's like to have bulbs stop working due to connection issues between the plastic bulb holder and the circuit board conductor. It can be frustrating. Hardwiring them sounds like a big deal, but it's not hard at all. It means you will be tossing out your old circuit boards and then attaching wires (with crimp connectors or solder) directly to the contacts on your bulb holders.



Certainly you can just buy **new circuit boards** on the internet, **but those will just fail again**. My advice to anyone having such bulb problems is to **do the hardwire project, enjoy your perfect taillights and never look back**. If you're completely inept at mechanical and wiring issues, find someone who can help or show you how.

**Having taillights that ALWAYS WORK when they're supposed to is absolutely worth the effort.**



I won't go into great detail here about the procedures because there are several good sites listed below on how this is done. I just want to cover a couple things from my own experiences. There are **two options** when attaching wires directly to bulb holder contacts;

**1. Soldering them.**

**2. Using crimp female spade terminals.**

My personal preference is using crimp terminals, because it makes it less likely that connections will break when changing bulbs or if something rattles. I did my 242 many years ago this way and I have never had a single rear bulb problem since.

**You will need to trim the metal contacts slightly if you use .250 inch (6.3 mm) crimp terminals**, since the contacts will be a bit too wide for these terminals. Trimming the contacts can be done with sheet metal snips.

Or you can just use **larger female crimp terminals**. It turns out that **.312 inch (7.9 mm) female crimp terminals** fit perfectly onto the bulb holder tabs. These are available cheap in my [Harness Parts Page](#). **.312 inch (7.9 mm) terminals** are available as straight terminals or flag (90 degree) terminals. It doesn't matter, except the flag terminals are a bit harder to crimp.

The hardest part about this project is figuring out what wires go to which terminal on which bulb holder. My advice is to get pencil and paper and start drawing diagrams of the wire colors going to the tail lights and use a test light to trace those colors to each bulb holder and each terminal on those bulb holders. Then figure out which tab on each bulb holder should receive each wire. Keep in mind that some bulbs and holders have two tabs and a ground for a total of three circuits. **If you're using a diagram from someone else, remember that 1981-85 240s with 6-panel lights will have slightly DIFFERENT CIRCUITS than 1986-93 cars.**

Helpful free on-line Volvo wiring diagrams are available at [volvowiringdiagrams.com](http://volvowiringdiagrams.com).

### HELPFUL ARTICLES:

[http://cleanflametrapp.com/tony/tail\\_light\\_color\\_code\\_v0.htm](http://cleanflametrapp.com/tony/tail_light_color_code_v0.htm)

<https://www.youtube.com/watch?v=LFouOkHW8ho>

<https://brickwalla.wordpress.com/2011/11/16/hard-wiring-my-tails>

<http://www.turbobricks.net/forums/hardwiring240taillights>

How to Restore Linked Photobucket Images (Firefox): <https://forums.tbforums.com/showthread.php?t=338909>

## Quick Fix to get your 240 Taillight Bulbs to Work Again (using aluminum foil).

If you have the **above circuit board issues** and don't have the time or patience to hard wire your bulbs (above), here's a quick fix. Thank you to Michael Yount for offering this solution.

Simply cut some small pieces of aluminum foil and place them on your circuit boards as shown in the photos. Use some hobby tacky glue to keep them in place. They will help bridge the bulb holder circuit if you have worn out circuit boards.





## Lowering Your 240



Should you change the ride height of your 240? That's a question that comes along often enough. You have to decide if you like your car at the original ride height (cause you drive in floods?) or if it looks better to you a little lower. Sometimes the road conditions in your area will help you decide, since lowering a car means a more firm ride and less undercar clearance. If you decide you want to lower it, here are some options to consider.

**Sport Springs:** Most sport springs that are available ([iPd Sport Lowering Springs](#) being the most popular brand) will lower your 240 about 1.5 to 2 inches. Other spring companies offering 240 springs: [B & G Suspension](#), [King Springs \(Australia\)](#), [Classicswede.co.uk \(UK\)](#). The ride will be a little stiffer, but it will be very important to use good struts and shocks that will be able to control a stiffer spring. Bilstein HD shocks or Koni adjustable shocks are a pretty good

match to this type of spring.

**Adjustable Coil Suspension (Coil-overs):** These are nice if you can find them. They offer a wider range of adjustability allowing the use of a variety of coil stiffness and adjustable ride heights. Occasionally there are people who produce kits in small quantities for 240s. Usually not though. If you're handy, you can build your own set.

Here are some good resources:

[240 Coilovers: The Kyote Way](#)

[DIY 240 Series Coilover Instructions](#)

<http://forums.turbobricks.com/showthread.php?t=334283>

Search the [Turbobricks forum](#) for more.

### Cutting your Stock 240 Springs:

There are people online who will scream at you to **never try this!** I think it's because there are more failures from inexperience than great successes. The key to getting it right is experience and getting it right is definitely possible.

Go here:

<http://www.tuff242.com/lowering.htm>

And for more you can read the following threads, **particularly the posts from Tuff240** (author of the above page), who has more experience cutting 240 springs than anyone I know. This is the best information possible on this subject:

<http://forums.turbobricks.com/showthread.php?t=310040>

<http://forums.turbobricks.com/showthread.php?t=337116>

How to Restore Linked Photobucket Images (Firefox): <https://forums.tbforums.com/showthread.php?t=338909>

## Installing a Later Windshield in an early Volvo 240 or 140

This is a fairly common 240 mod with a fair amount of info already out there. But since I still get regular questions about this, I decided to post this guide.

The 240 was built from 1974 (1975 model year) to 1993 and the body design changed very little over the 18 year production run. The windshield structure had no changes whatsoever between 1974 and 1993. **Even in an earlier 140, the windshield structure is identical to the 240.** You may have noticed that all 1991-93 240s came with a different type of windshield trim than those found on earlier models. It's all black and made of rubber. No metal trim is used like on earlier 240s.



<<< **1975-90 240 (and 140) windshield with metal trim:** This early type of windshield was glued in place using a soft, messy butyl rubber. Plastic trim clips were inserted into the soft rubber to hold the metal trim in place. This trim tended to stick up from the windshield too far and in many cases it created lots of wind noise. Thanks go to Ben Buja for supplying this photo.

<<< **1991-93 240 windshield with integral rubber trim:** As you can see, this later type black rubber trim is nearly flush with the body. It's cleaner looking and can reduce nasty windnoise. **This newer 1991+ windshield always comes with this new rubber trim already attached around the edge. The trim is NOT available separately that I know of.** The installer will use a newer style urethane rubber when gluing it in, instead of the soft, gooey, messy butyl.

Fitting a later windshield to an earlier 240 (or even a 140) is not a problem at all. **It goes right in with no difference in the installation.**



Be aware that there are installers out there who aren't aware that the 240 design never changed and they may be skeptical about doing this install on an earlier 240. **Some will even refuse to do such an install because they won't believe you when you insist it fits.** But rest assured, the newer windshield WILL fit. Many 240 owners have had this done over the years.

**If you want to avoid the argument, just tell the installer the car is a '91, '92 or '93.**

Here's a great story from T.M. of White Marsh, Virginia: "I took your advice about using a 1991 windshield in my 1987 240 Volvo. Just like you suggested, in your article, I told the installer I needed a 1991 windshield for my car. When I brought my car in, the receptionist goes out and looks at my car's ID tag and sees it's an '87. She freaked out. She was all like, "it won't fit", "I won't give you a warranty," and if I insisted on putting this windshield in the car I would be responsible when it all went wrong. I told this receptionist that it would fit, it would be easier for the workers to install, it would look just fine, and that she already told me I wouldn't have a warranty anyway, because she said I had rust in the channel. So what is the difference? She got all huffy when I told the installers to proceed anyway and to ignore her. She was in a bigger snit when she saw that it fit and looked just fine too. There was NO rust in the channel, but I didn't really care about her silly warranty anyway."

"You were totally right, the wind noise is much less, and the installation was so much cleaner. I'm glad I took your advice everything is great; not original, but actually better. One freaked out receptionist, two satisfied installers, one happy customer, and one slightly improved Volvo. A good day was had by most of us anyway. I don't think the receptionist is ever going to forgive me for "lying" to her about the year and having it all work out just fine. lol."

Here's a discussion of different available windshield brands:  
<http://forums.turbobricks.com/showthread.php?t=342415>



<<< **Side note regarding 140 series back glass:** This photo was submitted by Johnny J. of Sparks, Nevada. His 1973 142 needed a new rear windshield, which was obsolete. So he took a chance on a rear glass from a 1990 244. The glass fits perfectly and wire connectors even line up perfectly for the defrost element. And the newer rubber seal from the 1990 glass went right in. So this shows that any 240 back glass will perfectly replace the back glass in a 140 series in case you need to know.



## Build a Badass HEADLIGHT HARNESS using Relays

This is a good project for anyone with any older Volvo, especially if you have or want to upgrade to brighter bulbs or headlights.

For the best info I know, read Daniel Stern's page on this subject. He also has several useful diagrams for designing and building your own relay harness.

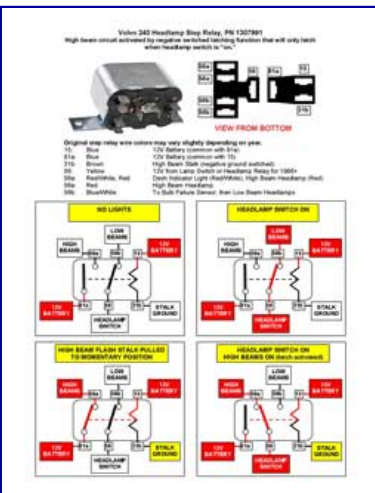
<http://www.danielsternlighting.com/tech/relays/relays.html>

Here are some Volvo specific diagrams that have been available on-line for many years. These use the same principles:

<http://www.vclassics.com/archive/relays.htm>

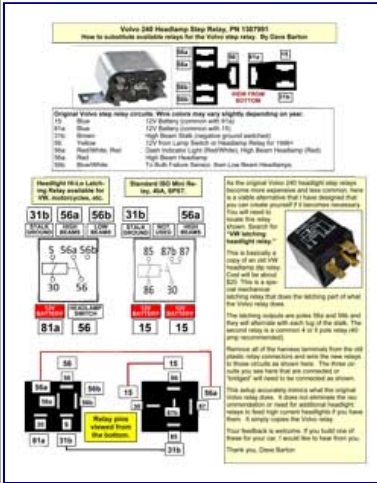
UPDATE 2018: [Wagonmeister](#) is now offering 240 headlight relay harnesses.

## Unlocking the Mysteries of the 240 Headlight Step Relay. And Test Procedure.



This relay is rather special in that it has a LATCHING function. A latching function is where you can click and release a momentary button or switch (such as a high/low beam stalk) and the relay will LATCH (or lock) in the ON or OFF position until the switch or stalk is clicked again. For this Volvo relay, one click latches it "ON" and another click latches it "OFF." I have created the **diagram PDF at the left** for anyone who wants to better understand how these relays work. **I have also added a test procedure on page 2 if you think you might have a broken one.**

## How to Substitute Available Relays and ELIMINATE your Volvo 240 Headlight Step Relay



As original Volvo 240 headlight step relays become more expensive or less common, here I offer an alternative that you can assemble yourself to completely eliminate the Volvo 240 Step Relay if you want to. This method uses two readily available relays to accomplish the same functions.

**<<< Click on image for 2-page PDF.**

You will need to locate two relays to complete this project:

1. A standard SPST mini relay (5 pole) ([such as this one in my Relay Page](#)), and
2. A special latching relay known commonly as a **VW Latching Headlight Relay**. This is basically a copy of an old VW headlamp dip relay and they are used for a variety of things these days. Cost is about \$18-\$25 on Amazon or eBay. Search for "VW latching headlight relay" or "LR35 relay".

Here's a page created by a 245 owner who did this for his car in 2017. He added relays for high high and low beams, as well as driving lights. <https://brokedownbrick.wordpress.com/2017/11/21/headlights-and-under-hood-power-distribution/>

I don't offer the latching relay, but if you need a standard SPST relay, this one will do: <http://www.240turbo.com/volvorelays.html#pickerrelay>

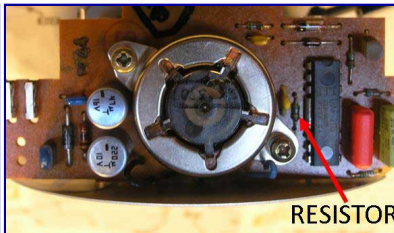
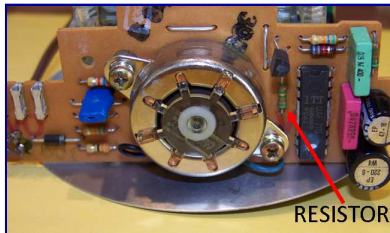
Your feedback is requested if you decide to do this for your 240. [CONTACT ME](#)

## 240 Electric Speedometer Custom Re-Calibration

(Applies to 1986 and later 240 models. 700/900 models too)

This information has been compiled from discussion threads in Turbobricks, the Brickboard and from customer contributions. It's a simple mod, but some clarification was needed to make it simple for the rest of us. Using modern electronics, you may add a variable trimpot (rheostat) to alter or adjust the signal the speedometer receives from the speed sensor in the rear axle.

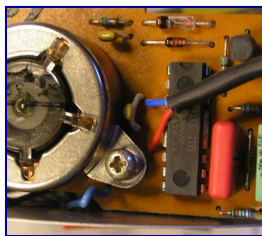
First thing you'll need to do is disassemble your instrument cluster and remove your speedometer. If you don't know how, instructions for that can be found in my [240 Odometer Repair Page](#).



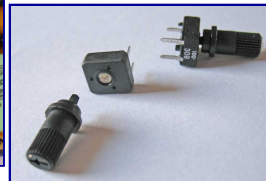
<<< Depending on the year of your 240, you'll see a resistor like one of these two photos. That is the calibration resistor. It is static (or non-adjustable). It was installed by Volvo to alter the speed signal for the specific speedometer they selected for your car. The original resistor has been measured by others at around 51 to 56 ohms. By changing the value of that resistor, you can change the signal received by the speedometer. Some have installed different static resistors to reset their calibration. A few have installed **variable resistors** so the calibration can be fine tuned

when driving. **That's what this article is about.**

1. Using a soldering iron, heat the solder behind the original resistor and remove it. Simple task.



- <<< 2. Next insert a stripped wire into each hole and solder them on the back so they're secure. You may use 18 to 22 gauge wire or smaller. If the holes need to be opened up a little, use a small drill, then solder.



- <<< 3. Here is an example of a **100 ohm variable resistor** (adjustable between zero and 100 ohms). A "linear" type is preferred. These can be found on eBay and are very cheap (usually made in China). Often they're offered in lots of 5 or 10 for under \$10. Feel free to put an ohm meter on it and find the two pins needed for the wire hookups. Polarity is not important. While you're at it, set it somewhere in the middle (50-55 ohms).



<<< A customer of mine sent this pic. He mounted a variable resistor behind the hole formerly occupied by the clock adjuster. This way he could tune it easily after the dash was assembled and it looks very clean. There's no need to get this fancy if you don't want to. The resistor can also be put under the dash or anywhere within reach depending on wire length.

If you can offer any new information or better ideas for this mod, please email.

Resources for more info: <https://www.brickboard.com/RWD/volvo/853622>, <http://forums.turbobricks.com/showthread.php?t=239021>, <http://forums.turbobricks.com/showthread.php?t=258248>

How to Restore Linked Photobucket Images (Firefox): <https://forums.tbforums.com/showthread.php?t=338909>

## Understanding and Dealing with a Volvo Bulb Failure Sensor Part 1 of 3

The Bulb Failure Sensor (or Bulb Failure Relay) is a device found in 1978 and newer 240, 700, 900 models that alerts the driver of a failed **low-beam headlamp, parking lamp, tail lamp or brake lamp** by sensing the balance of current draw between the **left and right** side lighting circuits. When that dash light comes on, it means the sensor recognizes that one side is drawing more current than the other. This is supposed to alert you that a bulb is out, but sometimes it can be triggered by incorrect or mismatched bulbs, or even when one side has a newer bulb than the other. Some mystery dash light activations can also be caused by a bulb holder with a small bit of corrosion, so keeping connections clean can help a lot.



### Variations of this sensor:

**Yellow case**, PN 1362278 (1978-85 240 and 740 through 1985)

**Black case**, PN 1235271 (1978-85 240, other years probable, but details unknown)

**Red case** (pictured at left), PN 1362370, which fits the 1986-93 240, 1986 and later 740, 780, and 1991-94 940

**Yellow case**, PN 3545704, for 1988-90 760, 1991-94 940 SE and 960

**Blue case**, PN 9128814, also fitting 1988-90 760, 1991-94 940 SE and 960.

This information is taken from the best sources I have for **USA and Canada** models. It may not correctly apply to all **European or Australian** models. I have received information that there are some **Australian models with a different red case sensor** from above, which I have not yet identified. **If you can help with info and/or photos, please email.**

**#1 Recommendation:** My best advice for those who are simply tired of seeing the bulb failure light come on when a bulb hasn't really failed is as follows.

**Step 1:** Reach under the dash and find the offending bulb in the back of the instrument cluster.

**Step 2:** Twist and remove.

**Step 3:** Take it outside and throw it as far as you can.

## Dealing with a Volvo Bulb Failure Sensor Part 2 of 3

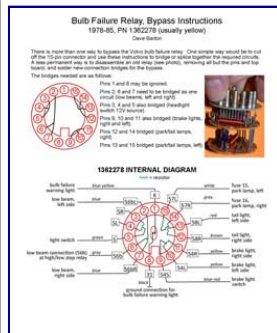
### Making a "By-Pass" Sensor out of an old Bulb Failure Sensor



Sometimes the failure sensor can fail internally, rendering some of your lights inoperable. This is becoming more common as they age.

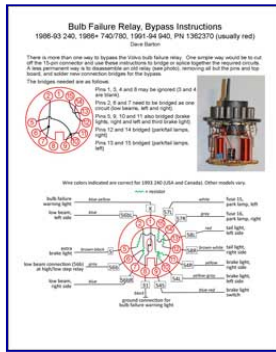
**FAILURE SYMPTOMS:** The symptoms of failure can be headlights or tail lights (or sometimes just one whole side) that will not work even after verifying the fuses, switches, headlight relays and wiring are all in good order.

**<<< Black Sensor 1235271:** Referring to the diagram at left, for those of you who have had enough of the BLACK 1978-85 bulb failure sensor, here is a diagram showing the internal workings and instructions for bypassing or eliminating its function if needed. Bypassing this sensor will eliminate the bulb failure light in your dash, but more importantly, it will eliminate the fragile circuits inside this sensor which can kill your **low-beam headlamps, parking lamps, tail lamps and brake lamps** if it fails. **Diagram view is from top of sensor or top face of plug.**



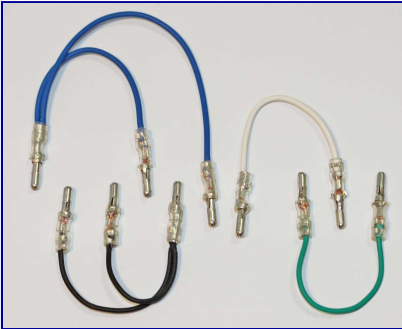
**<<< Yellow Sensor 1362278:** Diagram at left is for the YELLOW 1978-85 bulb failure sensor (1978-85 240, 260 and 740). **Diagram view is from top of sensor or top face of plug.**

**<<< Red Sensor 1362370:** Diagram at left is for the RED 1986-93 bulb failure sensor (1986-93 240, 1986 and later 740, 780, and 1991-94 940). **Diagram view is from top of sensor or top face of plug.**



## Bypassing a Volvo Bulb Failure Sensor Part 3 of 3

### Making some simple BYPASS LEADS for a Quick and Easy Fix.

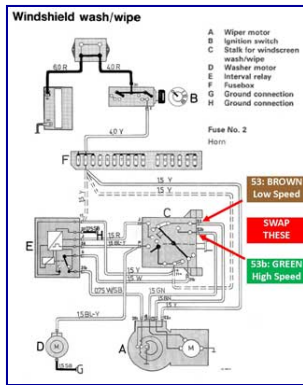


If you don't feel like modifying a Bulb Failure Sensor, there is a simpler way to bypass these circuits without using one. And I don't mean to suggest cutting off the multi-pin plug and splicing wires together (which of course you can do if you like). A better method, with no barbaric butchery, is to assemble some simple crimp terminals with a few short pieces of wire. Then insert them into the multi-pin connector, respective of the bypass diagrams shown above. As it turns out, the multi-pin connectors for these sensors use fairly common 3.5 mm bullet terminals. So all you need are some male bullets and wire. Coincidentally, **these 3.5 mm male terminals and insulators are available cheap in my [Harness Parts Page HERE](#).**

In the photo at left, you can see how these will look. The configuration is different for some sensors, so pay attention to the diagrams above.

## Better Faster Better Windshield Wipers

Helping with some common complaints among 240 owners. Here are some suggestions to make your life better.



<<< Referring to the diagram at left, this will show you a very simple mod I have done to my 240s over the years. By swapping two wires on your wiper switch (terminals 53 and 53b), you can reverse your wiper switch function. This means when your stalk is pushed to the **first position**, instead of the slow (crawl) speed, your wipers go to **high-speed**. Slow speed becomes the second position instead of the first. I never use slow speed anyway. This modification also makes it so your **intermittent wipers run at high-speed**. This particular diagram is for a 1985 240. I have noticed that on some other year diagrams the wire colors are reversed. Either way, terminals 53 and 53b are the ones to swap no matter what. Try it out.



Also remember your 240 is a pretty old car. Wire connections on older 240s can get corroded over time and have been known to loosen up sometimes. **As a point of maintenance, you should inspect electrical connections (and grounds) on occasion to make sure they look clean and tight.** The harness plug going to your wiper motor under your hood has probably never been checked. Now is a good time to clean it. Unplug it and have a look. And keep this in mind . . . if you have ever find a melted plastic connector anywhere in your car, it's because of excess heat generated by high resistance from a poor connection. So good clean connections are important.

Lastly, use a volt meter to check the battery voltage while your engine is running. Low voltage makes for slow wipers too. Most 240s are lucky to put out 13.8 volts. Many will be lower and some less than 13 volts. That makes your wipers very sad. Dirty, corroded or loose power or ground connections between the battery, starter or alternator and things like wiper motors can have a big effect here. If you want to see higher battery voltage, clean the related connections, including grounds. **So many people assume old ground connections are ok. Check for yourself!**

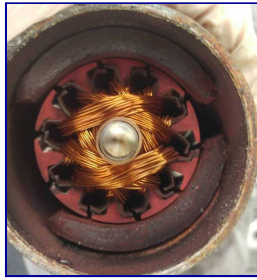
You might also consider an **adjustable voltage regulator** if you want to bring up system voltage. I prefer **14.2V to 14.5V** charging voltage if at all possible.

Adjustable voltage regulators are available [HERE](#).

Here's a page created by a 245 owner who shows how to fix a sad wiper motor that has its internal magnets coming loose. Pretty common malfunction when these motors age. It's a much easier repair than you might think since a little glue is all that's needed.  
<https://brokedownbrick.wordpress.com/2017/11/22/windshield-wipers/>

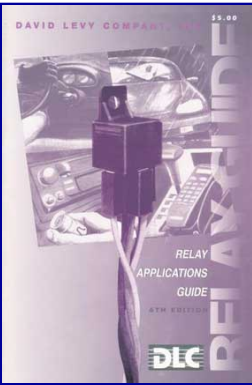
Here's a better way to re-seal the weatherproof seal between the wiper motor and the 240 body:  
<https://forums.tbforums.com/showthread.php?t=293022>

And here's an extensive page covering just about EVERYTHING you would ever want to know about how these wiper work and how to make repairs.  
<http://cleanflametrapp.com/wiper.html>



How to Restore Linked Photobucket Images (Firefox): <https://forums.tbforums.com/showthread.php?t=338909>

## Modifying your Volvo using Relays



I'm putting this here because having an understanding of simple relay functions can help any DIY Volvo mechanic in so many places for your car projects. Many of the suggestions in this 240 modification page rely on relays. Not too many years ago my relay knowledge was limited to installing a pair of fogs lights. The internet has helped a lot in this area and most of you can now be really successful with relays.

This **Relay Guide** is not Volvo specific, but it's a great resource for expanding your general auto relay knowledge and offers some interesting diagrams.

<http://www.davebarton.com/pdf/RelayGuide.pdf> (3.3mb PDF)

Here are some other pages with more relay explanations and configurations:

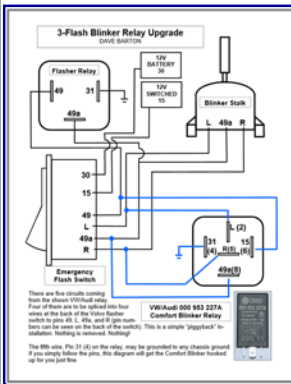
<http://www.the12volt.com/relays/page5.asp>

<http://www.12voltplanet.co.uk/relay-guide.html>

<http://www.danielsternlighting.com/tech/relays/relays.html> <<< And this is the best site I know for improving your auto lighting with added relays.

If you know of any other useful resources that would be a good fit here, please email me.

## Turn Signal (Blinker) 3-FLASH UPGRADE to a 240 using a VW/Audi Komfort Blinker Relay



Back in 2010 I drove a late model BMW M5 (E60) across the state and I fell in love with the **Comfort Blinker** (or "Komfort Blinker") feature that BMW was putting in their cars. This feature allows you to momentarily tap the turn signal stalk left or right and you get three flashes from your blinkers. This makes lane changes a bit nicer. Ok, for those of you who aren't as lazy as I am, I guess you can just pull and hold the stalk for three flashes when you change lanes or pass. I thought it was a great feature. This feature is now standard in many new cars makes, so evidently it's pretty popular too.

I liked this feature enough that in 2010 I decided to figure out how to make it work for my 240.

As it turned out, Volkswagen and Audi also began adding this feature to some of their cars beginning in about 2006. They use a small simple looking, but special relay, **VW or Audi PN 000 953 227A**. After obtaining one of these relays on-line (cost was about \$60 shipped from Germany), I set out to discover how it functioned and if it could be wired into my 240 blinker circuit. This took some studying and experimentation, but I was successful. Installing this relay into a 240 makes the blinkers work exactly the same way as the BMW, VW, Audi or any new cars with this feature. Also, it does not affect the normal operation of the blinkers cancelling automatically after a turn or the emergency 4-way flashers. A pleasant surprise I also discovered was that in addition to getting 3 flashes when you momentarily tap the lever, **if you hold it for about 1/2 second you get 4 flashes**. I don't

know if that's an intended feature in VW/Audi cars, but it works great in a Volvo.

I created a diagram for those of you who want to do this in your own Volvo (link below or click image at left). The VW/Audi relay has five poles, just like any standard 5-pole power relay. Connecting it to the blinker system is as simple as splicing four wires at the flasher switch and connecting one wire to ground. This operation might also be successful in any Volvo 700 or 900 series, or in any car (probably any European car) that uses an emergency flasher switch and a blinker flasher relay similar to the Hella 3-pole flasher relay used in these Volvos.

Completed 2010. Check the diagram and see for yourself.

[www.davebarton.com/pdf/blinkerdiagram2.pdf](http://www.davebarton.com/pdf/blinkerdiagram2.pdf)

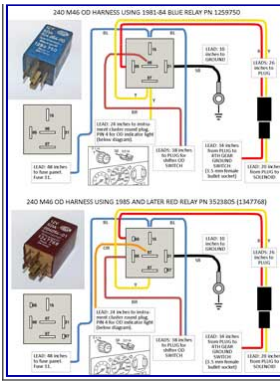
I also did this mod on my brother's 1988 BMW M5 (E28) and it was successful. Diagram below.

[www.davebarton.com/pdf/blinkerdiagram-E28.pdf](http://www.davebarton.com/pdf/blinkerdiagram-E28.pdf)

## 240 M46 Overdrive Wire Harness Design, Construction, Mods

A few years ago after the auto transmission went south in my 242 Turbo 120 miles from home (Thank you AAA for your extended towing coverage), I swore off autos and decided to retrofit an M46 (4-speed plus OD). I'm not going into the retrofitting of an M46, but I am going to reveal the secrets of the M46 wire harness that you'll need if you ever do this in your 240 and need some wiring info. When I began working on the swap, I found an old M46 harness in a junk yard 240. It was in really bad condition, so I used it to construct a new one. The PDF diagrams here are the result of my research. Using these diagrams, you can make your own harness from scratch like I did, using a few salvage yard 240 parts, some common connectors and some wire. Some of the wire lengths mentioned in this diagram are actually a bit longer than original. I added some when I made my new harness.

If your car originally had an auto trans, you'll need to add one terminal to the round multipin connector on the back of your instrument cluster to

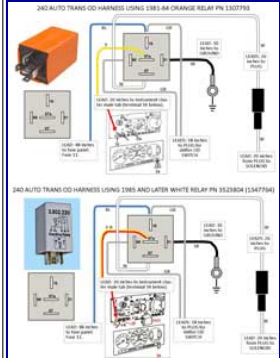


power the "OD" indicator light. There will be no terminal in that spot in an auto transmission car. And the 4th gear ground switch in the transmission uses a common female bullet found in many places under the hood of a Volvo. This is the female bullet with the silicone sleeve. If that can't be found, a 3.5 mm female bullet terminal works fine.

These diagrams will also show you the differences between the 1981-84 BLUE relay and the 1985 and later RED relay system, so you may choose either harness design, since both harnesses and relays ultimately do exactly the same thing and will work on any M46 overdrive. **Or you may use these diagrams to convert from a BLUE relay to a RED relay or vice versa.**

I now offer [NEW M46 Wire Harnesses for all year 240s if you need one:](#)  
[CLICK HERE to find them in my Harness Page.](#)

## 240 Auto Transmission Overdrive Wire Harness Design and Construction



Since I did the above M46 diagrams I thought it would be good to illustrate how the 240 auto trans **ORANGE and WHITE overdrive relays** work. There is almost no difference in the relay circuits between these two relays. **They are essentially interchangeable, EXCEPT** that the OD light on the dash seems to come on opposite of when it's supposed to when the other relay is installed.

## Shifter Knob Fix (M46 or M47) Manual Transmission

If you drive a Volvo with the M-46 or M-47 manual transmission, then you will likely already know (or you will) what it's like to have the shifter knob come off in your hand during a rapid 1-2 shift. It's very annoying, especially when it yanks the wires off of your OD switch and you have to put things back together on the side of the road. Here's a very simple cure.



First, pull off your shifter knob and if you have OD wires, tuck them off to the side and out of the way. Get out your drill and start by drilling a hole in the knob just like you see in the photos. Then continue the hole into the metal shifter tube. The hole should be just slightly smaller than the screw you decide to use.



I used a countersink type screw, so I also drilled a shallow countersink hole in the knob. I screwed the screw into the tube to test how tight it would be and decided the tip of the screw was a bit too long, so I snipped it off. I didn't want it to interfere with the wires. The last photo shows the finished result. That should fix it for good.

## Upgrade the In-Tank Fuel Pump in your 240 with a Larger 740 Turbo Pump

The Bosch in-tank fuel pump found in your 240 Turbo will be the same pump used in all 240/260 models from 1976 to 1984. It's very small and while it will provide adequate fuel for a non-turbo Volvo, it has been considered by many to be too small for a turbo motor with any increased engine performance. The Volvo part number for the original in-tank pump up to 1984 is **1276330**. In 1985, that part number changed to **3507436**, which was used through 1993. The 740 Turbo pump I used for this conversion, which was used from 1986 and later in 700 and 900 Turbo models, as well as 960 models, is PN **3517845**. This pump retails for between \$150 and \$200 new. It is also widely available in salvage yards for a lot less, although you should be cautious, because some pumps found in salvage yards may be dead already. For my 240 Turbo, I chose to install a used pump from a salvaged Volvo. If you need to test a pump with a battery, do it very briefly... only a second. These pumps are not designed to run dry and it can damage them quickly.

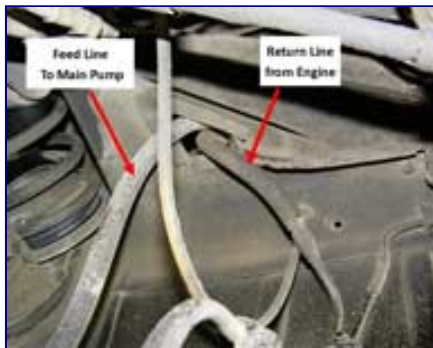
[CLICK PHOTOS FOR LARGER ONES.](#)

<<< The photos shown here are from a 240 sedan trunk. The 240 wagon will be a little extra work getting to the top of the fuel tank, but otherwise it's the same.



<<< Begin by removing the access cover plate above the tank. The two hoses shown here are the **main feed line** going to the main pump and the **return line** going from the engine.

I have also included a photo **BELOW** showing these two fuel lines under the car.



**Main Feed Line:** The original main fuel hose was a **cloth braided type** and it's normally secured with hose clamps on the tank exit assembly at the top of the tank and also at the main fuel pump under the car. When this type of hose gets old, it will usually begin to weep fuel. When weeping, it may begin so slowly that it only gets the outer cloth braid wet. If you are noticing a fuel smell shortly after parking the car or you see any fuel dripping near the left rear tire, check this hose to see if fuel is weeping through. Replace it if it's questionable, since it will only get worse with age. The hose size is **12 mm** if you need to replace it (about 4 feet is needed). 12 mm hose is common in Europe, but not so common in the USA. 7/16 inch fuel hose is a close substitute (it's best to choose high-pressure fuel injection hose), however even 7/16 inch is hard to find in auto parts stores in the USA. Some people have used 3/8 inch hose, but I think it's too small and will be difficult to stretch onto the fittings. Both 12mm and 7/16 inch fuel line are available on-line.

**Return Line:** This line transitions from a metal line under the car to a flexible plastic line (covered with a rubber sheath) going to the top of the tank. This line will rarely ever need to be replaced unless you damage it in this procedure, but as you will discover if you do this type of work, it's very hard to manipulate this line when removing the pump assembly from the tank access hole. It does not disconnect from the pump assembly (unless you cut it off). After doing this job a few times and finding how much it sucked, I now choose to cut it off. When the plastic line is cut off of the end fittings on both ends, you'll see that the end fittings are just ordinary barbed nipple fittings and normal fuel line can then be secured on them with hose clamps. The size for this line should be **8 mm** (or 5/16 inch will work).



<<< **Main Feed Line Cutting (optional):** In this instance I was replacing the main fuel hose because it was old and beginning to weep. Cutting it off at the fitting was the easiest way to remove it. **Otherwise, this is a good time to disconnect this line.**



<<< I like having the right tool for a job. [iPd sells this tool](#) for turning the top retaining ring on the pump assembly to release it from the top of the tank. If you don't have one, you can try using two large screwdrivers crossed over each other, or setting a large set of Channels Lock pliers in there and turning, or the hammer and chisel method to tap the ring. **The retaining ring will need to turn about 1/8 turn to the left, or counter-clockwise, to remove it.**

<<< Before you can try lifting the pump assembly up and out of the tank, you must first disconnect the return line. This is done under the car. It's a simple flair fitting. Use two open end wrenches (**14 or 15 mm I think**).





<<< Then you can slowly work the hose out toward the pump assembly. I found that the hose needs to come up and out first, then you can gently lift out the pump assembly. When you do this you will know why I chose to toss out the original plastic return hose and use a normal fuel injection hose with a clamp instead.



<<< Here is the pump assembly out of the tank. Also, it will be a good idea to get a new pump filter sock. See it in the photo?



<<< You can see the size difference between the two pumps.



<<< If you need to remove the pump assembly from the trunk area to work on it elsewhere, pull up that plastic cover to the left and you'll find the power and ground connections there that you can disconnect.

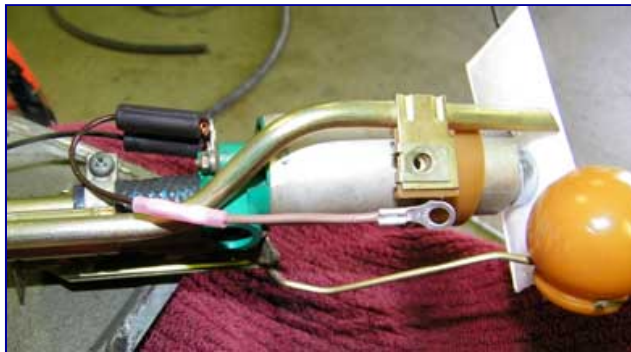


<<< Remove the ring terminal from the old pump. I think that size is 6 mm. Also release the orange plastic band holding the pump. Remove the hose clamps and the fuel hose and pump from the metal tube.

<<< Since the 740 Turbo pump is longer than the old one, the metal feed tube needs to be cut off. You'll need to trim about 1.5 inches. Carefully measure it yourself to be sure. Keep in mind that the bottom of the new pump needs to be in the same position near the tank bottom as the old pump. If you cut off a little too much of the metal tube, you can always just put a longer hose on. It's not rocket science.



<<< **CAUTION:** If you find a rubber "accordion" hose that looks like these, **DO NOT reuse it.** It's a **weak hose that deteriorates with age. It will rupture** (if it hasn't already).



<<< Here's the final product.  
When you re-insert the pump assembly back into the tank, be very careful to avoid damaging the wires.

**More info on the subject of 240 in-tank pumps and related parts may be found here:** <http://cleanflametrapp.com/transferPump.htm>

If you know of any helpful hints not mentioned here, please write me.  
Thanks, Dave

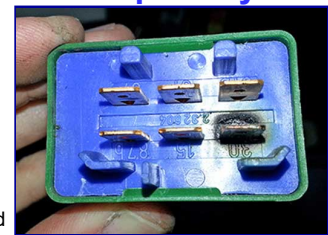
## Add a Secondary Relay to take the Load off your 240 Fuel Pump Relay

The fuel pump relay in your 240 takes a lot of abuse and it's expected to run your fuel pumps for years and years without fail. Well fail they do, usually because of unwanted heat after years of use. They often run hot because; 1. They handle a heavy load. 2. The heat causes their plug connections to develop higher resistance, which then causes more heat, which makes failure occur even faster.

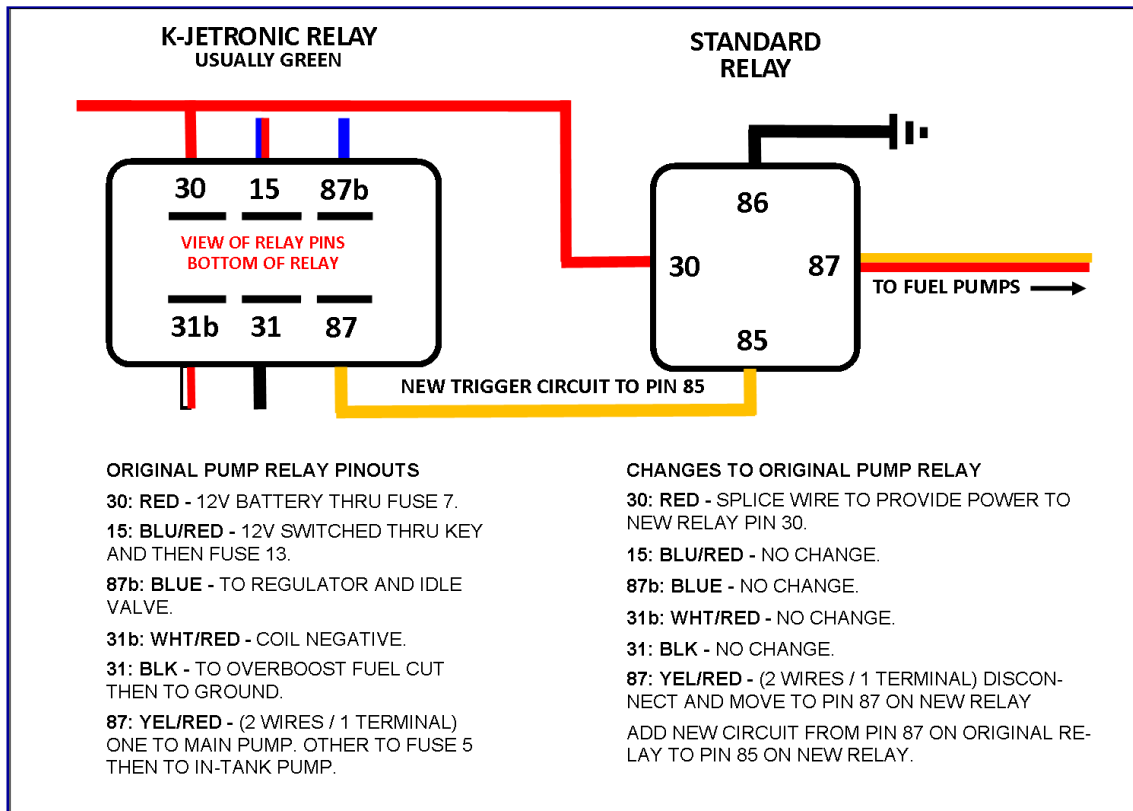
Below I have outlined how I added a standard 4-pin relay (or 5-pin will work too) to handle the pump loads, giving the original pump relay a much welcomed rest. The new added relay can be any standard 4 or 5 pin type relay with a load rating of 15 amps or higher, such as the ones I offer in my relay page here: <http://www.240turbo.com/volvorelays.html#1324749-006brown>

What this does is take the heavy load off of the expensive Volvo relay and puts it on the inexpensive standard relay. Then the Volvo relay is only used as a low current switch to activate the standard relay.

The new standard relay is triggered by pin 87 on the original fuel pump relay and receives its main battery power from pin 30 of the original relay circuit. As an option, you may instead run a dedicated battery wire to pin 30 on the new relay. I suggest 12 gauge wire. This should provide a bit more voltage to your pumps. If you do this, then the wire should always contain a fuse between the battery and relay.



**Below diagram is for K-Jetronic Volvo 240.**  
CLICK TO ENLARGE PHOTO

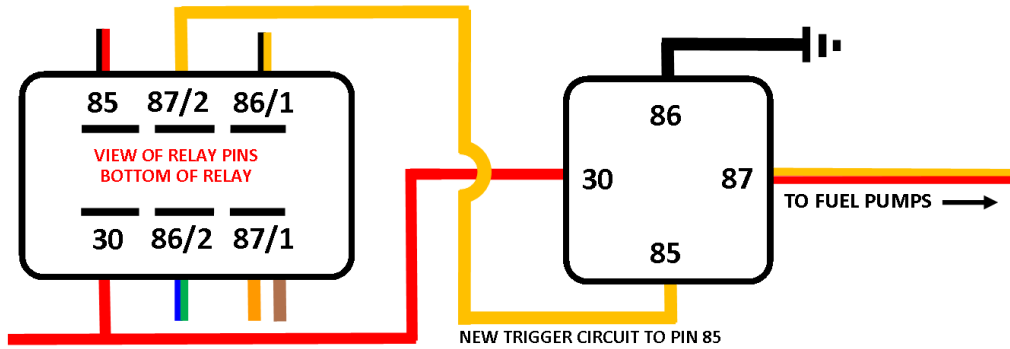


Below diagram is for LH-Jetronic Volvo 240.

[CLICK TO ENLARGE PHOTO](#)

**LH-JETRONIC RELAY  
USUALLY WHITE**

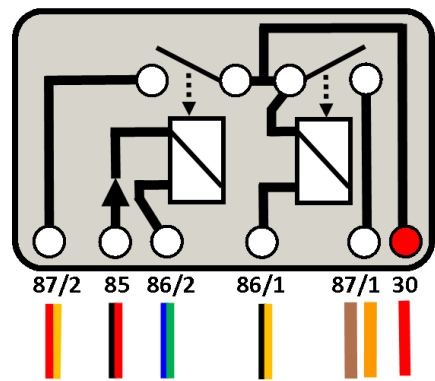
**STANDARD  
RELAY**



**ORIGINAL PUMP RELAY PINOUTS**  
**85: RED/BLK** - TO ECU PIN 18 AND TO IGN SWITCH PIN 15.  
**87/2: YEL/RED** - TO FUSE 4 THEN TO PUMPS. ALSO TO IDLE VALVE PIN 4, INJECTORS, AND OXYGEN SENSOR.  
**86/1: YEL/BLK** - TO ECU PIN 21.  
**30: RED** - TO BATTERY 12V.  
**86/2: BLU/GRN** - TO ECU PIN 17.  
**87/1: ORG, BRN** - ORG TO AMM PIN 5. BRN TO ECU PIN 9.

**CHANGES TO ORIGINAL PUMP RELAY**  
**85: RED/BLK** - NO CHANGE.  
**87/2: YEL/RED** - DISCONNECT AND MOVE TO PIN 87 ON NEW RELAY  
**86/1: YEL/BLK** - NO CHANGE.  
**30: RED** - SPLICE WIRE TO PROVIDE POWER TO NEW RELAY PIN 30.  
**86/2: BLU/GRN** - NO CHANGE.  
**87/1: ORG, BRN** - NO CHANGE.  
 ADD NEW CIRCUIT FROM PIN 87/2 ON ORIGINAL RELAY TO PIN 85 ON NEW RELAY.

Here is a simplified internal diagram of this relay, showing the coils and contacts. It may help some of you understand more about how it works.



**Adding a Tachometer to your Volvo 240 Gauge Cluster in place of the Clock**

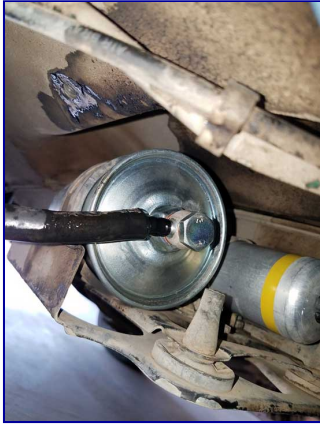


Adding a tach to my '83 240 DL way back in 1990 was the first 240 mod I ever did. It's a very basic install, but can be a bit puzzling for a beginner. These instructions will also show you how the small clock is installed. [CLICK HERE FOR INSTRUCTIONS \(pdf\)](#)

**Plastic Fuel Line Repairs**

Volvo used semi-rigid plastic fuel lines on all 200, 700 and 900 series. Probably a lot more models, but I'll deal mainly with cars made in the 1980s and 1990s for this article. Special thanks goes to Roger Brown of Pueblo, Colorado for the photos and details from his own fuel line repair. The photos below are of 740 fuel lines, but the principle is the same for 240s.

You'll find that the plastic hoses used in these cars are fitted to fairly standard brass or steel barbed nipples. Volvo fitted them when the hose or nipple or both are heated to a point the plastic becomes more flexible. Removing these hoses from existing nipples can be difficult and you may find that cutting or slitting them at the barb is the best treatment.



Some will suggest using a hair dryer or boiling water to heat the hose or fittings. In Roger's project, he found that neither seemed to create enough heat to soften the black plastic hose to his satisfaction. After cutting the hose from the barb, he began by trimming it to clean new end. The heating was done using a **small butane torch** he bought from Harbor Freight, although a heat gun would be a good choice.

**CAUTION needs to be inserted here when putting any flame anywhere near fuel. Please use common sense and make your repairs on clean, fuel-free hoses.**

<<< Pic 1: This first photo is where he encountered a leaking fitting bolted to the filter. Fuel was leaking past the barbed nipple on this banjo fitting, so the plastic fuel hose had become loose. He removed the banjo bolt and metal banjo fitting from the filter.



<<< Pic 2 shows a method for releasing one of the fuel line clamps holding the fuel line to the body.



<<< Pic 3 is the leaky plastic line being removed from the banjo fitting. The plastic fuel line is the thin black thing you can see on the barbed nipple. The fatter line is just protective insulation.



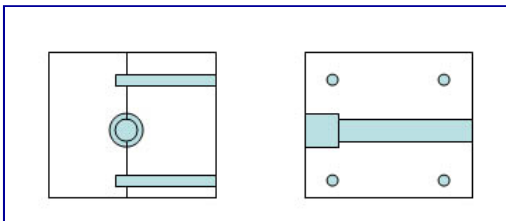
<<< Pic 4 shows a 1/4 inch brass repair fitting Roger bought to lengthen the line that was shortened by cutting (the extension was made using normal fuel injection hose). In the photo you can see the plastic line is clamped to a jack stand for handling stability. The torch is lit and the brass repair fitting is held by needle nose pliers and ready for heating.



<<< Pic 5: Bingo! After heating the brass fitting and inserting it in the plastic hose end, twisting left/right while inserting, the heated fitting slipped in past the last rib...success!



<<< Pic 6: Fuel injection hose clamp installed on the outer hose. There would have never been one there from the factory, but it's there to provide some extra confidence that nothing is going to leak when finished.

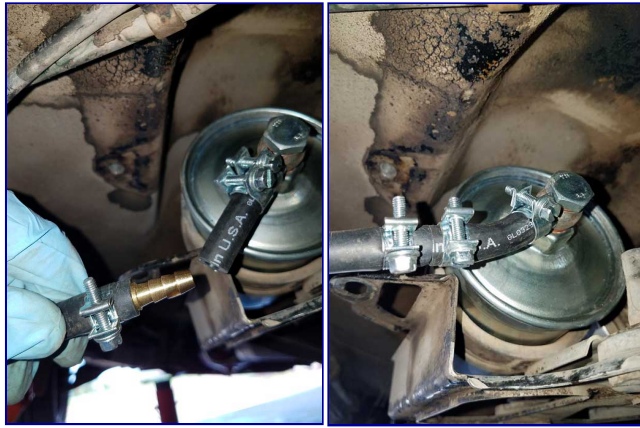


<<< Here's a suggestion for a tool you can make to securely hold the fuel line in place. I found this in a different European car forum. Using a block of wood (hardwood would be best) drill a hole through the block that is **slightly smaller than the outside diameter of your plastic fuel line**. Then drill a slightly larger hole only a short depth. This depth can be the length of the barbed nipple on one end. You can also drill a couple small pilot holes for screws that can hold the two block halves together. **Then cut the block in half**, cutting through the center of the first hole.

The hose can then be clamped in this block using screws or you can clamp it in a vise. It will help hold the line while you insert a barbed fitting.

<<< Pic 7: Roger elected to use a 2 inch length of regular high-pressure 1/4 inch fuel injection hose that has been clamped to the banjo fitting. The old plastic fuel line with the 1/4 inch repair fitting is ready to be inserted into the fuel injection hose.

<<< Pic 8: Lines are joined. Clamps tightened.



<<< Pic 10: Engine running. Found a slight drip from one of the banjo washers, so after making a cautious 1/16" turn to snug the bolt, NO MORE LEAKS!

Roger then reinstalled an old section of slit hose insulation as a shield for the repaired section to keep it protected from rubbing body metal.



**If you can add to or help with this info, please email.**

**Here's a video of the general idea.**



## Adding a Small 52 mm VDO/Volvo Tachometer to your 240

While less popular than adding a large tachometer to your gauge cluster, Volvo made a small 52 mm tachometer available for 240 owners.

They are fairly rare these days, but they can still be found used. Here are diagrams for wiring it up.

**[CLICK HERE FOR INSTRUCTIONS \(PDF - Right Click and Save\)](#)**

## Fixing Bad 240 Driver Door Lock Switch Wires

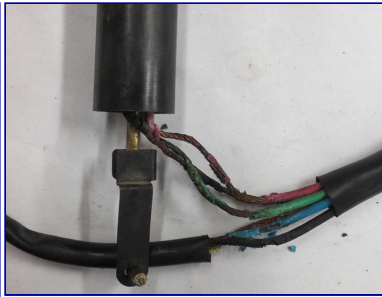
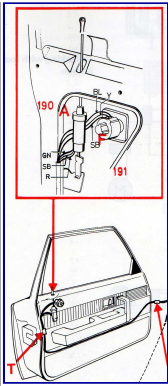
**I have seen a fair number of emails like this one:**

*"I own a 1993 Volvo 240 Sedan. It has about 100,000 on it and runs beautifully. The only problem is that the central locking system seems to be malfunctioning. It makes a fast clicking sound when driving and sometimes goes up and down when one tries to unlock the other doors from the drivers side. In the past two days the battery died due to something being left on. I pulled the #8 fuse (courtesy lights, clock, trunk light, glove box light, central lock system, power antenna, radio) and today the battery was fine."*

**This is an extremely common problem that literally affects ALL YEAR 240s equipped with CENTRAL DOOR LOCKING. Not just failing harness wire years..**

How do I know this problem is common in all year 240s? Because when I discovered this years ago i spent a day at junkyards pulling off door panels on a lot of 240s up to the 1993 model year.

They are all the same. All Bad!



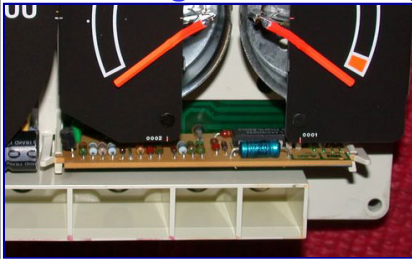
The problem is old, bad wires inside the driver door. Specifically, the wires going to the **key lock switch** ("F" in diagram at left) and also likely the **door lock plunger switch** ("A" in diagram at left). It should be pretty obvious once you open the door up and look closely at these wires. The insulation on these wires will crumble and fall off, allowing the wires to short. This causes the rapid lock-unlock to occur. And when the car is parked, the shorted wires may allow the locks be stuck in UP or DOWN mode, which will kill your battery in a few hours. The solution is to cover the bad wires with heat-shrink tubing, liquid electrical tape, etc., or cut them out and crimp or solder in new wires. You will probably only have to do this to about 8 inches of wires, but keep an eye out for more than that.

Here are a couple good threads with more photos:

<http://forums.turbobricks.com/showthread.php?t=323301>,  
<http://forums.turbobricks.com/showthread.php?t=322700>

How to Restore Linked Photobucket Images (Firefox): <https://forums.tbforums.com/showthread.php?t=338909>

## Dealing with the Temperature Compensation Board in your 1986-93 240



I won't go into great detail here, since there is already an excellent article on this subject linked below. In a nutshell, Volvo got tired of people complaining about fluctuating needles on temp gauges. For the 1986 model they began installing a circuit board in the gauge cluster that changed the function of the temp gauge so that it would remain stable in the "normal" range at all times unless the engine was cold or very hot. The gauge then had only a few set readings instead of a true variable reading. The compensation boards generally work fine until they get old and cause mysterious high-low fluctuations for no reason. If you're trying to determine what your high-low fluctuations REALLY mean, you can buy an infrared (IR) temperature reader and check your top radiator hose temps for abnormal changes. To fix the problem, **iPd** offers a simple bypass wire you can buy for cheap here: <http://www.ipdusa.com/products/5670/108262-temperature-board-bypass-kit>. They also offer replacement compensation boards for more money. Or you can follow the below instructions for your own DIY repair . . .

ARTICLE HERE: <http://cleanflametrapp.com/tempFaker.html>

Here are the instructions for the **iPd** bypass: <http://home.comcast.net/~brucepick1/brickstuff/TempCompensatorBypass.pdf>

And if your interested in a DIY repair, Peter A. submitted the following:

*"The circuit is kind of clever. It can be repaired rather than just eliminating it. It does require a soldering iron and a solder sucker to desolder the old parts.*

*Pretty much the only things that will fail is the integrated circuit U1 or output transistor Q1, both of which can be purchased on-line from Digikey or similar places for about a dollar. U1 was bad on my board. After 25 plus years it would also be wise to replace the electrolytic capacitor C1."*

Click here for a PDF diagram and photo of these circuits: <http://www.davebarton.com/pdf/TempBoardCircuits.pdf> (270kb)

And Dirk W. submitted the following for those interested:

*"Lots of people will claim you need a new temperature compensation board (PCB), but that's not what's really wrong most of the time. I have found that the metal pins that are mounted to the main cluster PCB are generally not properly soldered to the PCB. They APPEAR to be soldered, but if you touch a soldering iron to the solder blobs that cover the heads of the pins, you will find that the solder is not wetted to the pin heads and these connections are almost always bad somewhere. A little work with some sandpaper on the heads of the pins and resoldering the heads of the pins to the PCB will fix most temperature gauge issues."*

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