

VOLVO 240 SPORTS HANDLING

© by [Anthony Hyde](#), Australia 1/2001 - latest update May 2006



The road and track handling of your 240 can be enhanced significantly. Volvo's R-Sport division proved this years ago supplying enthusiasts with items like hard-rubber bushes, gas shocks, springs, swaybars, steering wheels, chassis brace products. Volvo GpA machines sported alloy suspension components, carbon fibre composite diffs, light-weight panels, but these are specialist items. IPD & SAM continue to invest in Volvo aftermarket products and supply parts using modern designs and materials such as polyurethane. Even Volvo dealers still stocks 242GT springs and swaybars, at a price.

Reward for the sporting driver is less bodyroll for flatter cornering, and increased steering precision. **The aim of this article is to fill the 'literature void' with relevant Volvo sporty type information for all experience levels.**

Pic -Mike Saccone ITB 242

Improvements cost money, and in most cases are worth it. Improved handling is welcome and very noticeable if you have just replaced worn out bushes, bars and springs with new components. To assist you, a number of new part suppliers are listed in this article. Also keep an eye out for R-Sport & IPD 2nd hand parts through private sale and recyclers - you might find a bargain!

Enhancement is achieved with upgrades to : [Front & Rear Coil Springs](#), [Front Struts and Rear Shocks](#), [Strut Tower and Bracing](#), [Swaybars and End Links](#), [Negative Camber](#), [Upper Strut Bearings](#), [Trailing Arm Bushes](#), [Panhard Rod](#), [Torque Rods](#), [What about the Driving position](#)? And more.

WEB SITES for Volvo 240/740 products mentioned throughout this article:

[IPD \(USA\)](#), [MVP \(USA\)](#), [Energy Suspensions \(USA\)](#), [shox.com \(USA\)](#), [EuroSport Tuning \(USA\)](#), [SAM \(Sweden\)](#), and your local **Volvo** dealer for small diameter bushes, [Kings Springs](#) (Queensland, **Australia**)

POLYURETHANE BUSHES

Informative product information and a wide range of **poly bushes** in more advanced material to suit **Volvo's** can be found at the [Noltec](#) Australia website. Other poly suppliers are [Super Pro / Super Flex](#) (Australia, Europe, USA), and [IPD \(USA\)](#) for Volvo suspension bush kits.

In my experience with both Volvo rubber and poly bushes, the poly is fine but the centre steel bush is drilled oversize, or simply imperial tube sizes are used, eg 1/2" or 12.7 mm. For example, an M12 suspension bolt measures 11.9mm in diameter, but bushes are often 12.5 or more. Too much slop / clearance for my liking. If your fussy, remake the steel bush.

FRONT COIL SPRINGS:

Standard height - Volvo's sit rather high, ready to take on all terrain, so if you wish to retain ride height, less 15 mm, and improve handling, then genuine Volvo heavy duty front springs #1229337-9 being 35% stiffer than stock are hard to beat. The part # is found near the start of the first ring. In use, myself & others found the spring-rate matched front Bilstein struts very well indeed. A similar spec spring was used in the 1979 242GT.

Lowered - If you rarely venture off the tar and are keen to lower your 240's ride height to more modern settings, or desire a more aggressive look, there are plenty of suppliers that sell them. By reducing ride height, you lower the centre of gravity of the 'sprung mass' (mass of car above springs), always beneficial. With the McPherson strut 240 front end, ensure the lowered front springs minimum free length is near 335 mm so as to be fully captured when the wheel is raised off the ground. Some suppliers are IPD in the USA (35% stiffer), SAM in Europe, and Kings Springs in Australia. Expect these to lower your front end between 1"-1 1/4".

Coil-over small diameter springs are mentioned further down the page.

700/900 series volvo with big wheel and lowered spring can cause a factory defect to be revealed - [ARTICLE](#) courtesy of Turbobricks.

FRONT STRUTS: (Dampers/Shock Absorbers)

Many users agree [Bilstein](#) are the premier after-market choice for 240, 740 and 940 McPherson strut suspension, being noted for keeping the heavy Volvo front end under tight control. They combine oil and gas with quite firm valving, are rebuildable with long product life. Although non-adjustable (to the user), specialist dealers can revalve bounce and rebound settings or de-stroke for lowered suspension (eg to 'Sprint' settings). If you already have a lowered car, then '**Bilstein Sprint**' struts feature a shortened stroke to reduce the possibility of bottoming out on road dips. USA suppliers - IPD and shox.com. In Australia, [Sydney Shocks with SPA Shock Dyno](#), and [Quadrant Suspensions](#) are Bilstein specialists.

[Koni](#) is also a very popular after-market choice offering an enticing **5 way adjustable 'Koni Sport'** (yellow version) for the 240 front strut, **#8641-1245 Sport**, (sourced from Holland). All struts and dampers are oil based and adjustable on rebound. 240 owners with Sport Konis' report the harder setting being the best for front end handling. In Australia, Koni distributors are [Topperformance Products](#) (Melbourne), [Proven Suspension](#) (Sydney). For those seeking a standard strut, **KYB** seem a popular inexpensive alternative to Volvo (Boge) units.

Rear Shocks are covered further down the page.

FRONT STRUT UPGRADE:

For performance driving and motorsport, the **1982-on struts feature a larger diameter stub axle** and are recommended over earlier 240 model years. **How to identify:** Stub diameter for the outer bearing (the Small one) increased from Ø19 to Ø22 and the inner bearing (the Big one) from Ø31.8 to Ø35 - the transition diameter from stub axle to strut body (the most important dimension for strength) increased from Ø42 to Ø45 - therefore all changes feature a diametrical increase of 3 mm. The 82-on strut tube also features a reduced inside diameter, meaning the strut insert is a lot tighter fit compared to earlier versions.

ISSUES WITH LOW and ADJUSTABLE HEIGHT SUSPENSION:

Volvo 240/740/940's use McPherson strut suspension, also known as a '**coil-over-strut**' system.

A) If you lower a 240 **MORE** than say an IPD lowered spring height or 1.5", you will need to reduce the strut length, as the strut's piston and valve body will also sit correspondingly further into the strut body. As road dips appear on the horizon you will breath-in as the strut suspension travel might not be enough to prevent momentary bottoming out. For struts that can be modified, shortening the stroke will overcome this issue. The following web page link to [ALUFORM](#) shows the components inside a front Bilstein strut.

B) Further lowering requires fitting an [Adjustable Ride Height](#) system, usually with smaller diameter springs, essentially a custom fitment typically used in motorsport. The basis of a '**coil-over-strut**' system is a screw threaded collar welded onto the outside of the strut tube replacing the fixed lower perch, and then fitted with a smaller diameter coil spring. **The stiffer the spring you select means the higher the chassis will sit up again as stiff springs reduce little in height. Choosing the length of a spring becomes an issue because you want the final chassis height to be well within the range of your threaded collar**, plus ensuring adequate clearance (approx 10mm) between the bottom of the spring adjusting collar and your tire.

C) By this stage you could be keen to fit an [Adjustable Ride Height](#) front end and have researched the **spring length issue**. With a Volvo 240 **the situation gets more difficult** due to the long length of the thick walled steel outer strut tubes. You soon notice **as you adjust the chassis down there is equally less suspension travel available**.

It's time for major strut surgery - [more suspension travel needs to be created](#) ! The Volvo thick wall outer strut tube needs to be reduced in length or height - (eg around 2.125" or 54 mm). For example, one strut modification procedure a specialist might perform is to cut the thick walled tube well below the existing top threaded section, then cut-out a length of tube (eg 55 mm) well below the thread. The threaded top section piece can then be TIG welded back to the tube, (tack with strut insert in place). The coil-over threaded collar is then slipped over the shortened strut and welded into position at either end to give a strong reinforced tube.

An alternative method might be to cut the strut tube as required and arrange for a new thread to be cut (tapped) inside the tube to suit a new threaded collar. Only a specialist will have the large diameter fine pitch

tap to cut the thread, but any weld must be far enough away from the proposed re-tap area, otherwise the tap will blunten fast.

Next step involves shortening the eg. Bilstein strut's 'outer tube' by the same amount as the outer strut tube holder, (let the shop select the removal point). Your struts will require revalving, and repositioning of the internal bump stop to suit the new short springs (more new springs - not again). This modification will then enable the front end to be lowered properly. Other issues for consideration are bump steer, tie rod angles. The astute reader might notice that if you started with **A** then moved onto **B & C** you would have been through a few sets of springs and had your Koni or Bilstein strut length changed a few times as well. Plan as best you can from the above advice, then seek a specialist opinion.



Strut tube with welded collar



Click image to enlarge

Coil-over-strut system

Adjustable Ride Height - Benefits of adjustability - allows you to set ride heights eliminating ride height differences between passenger and driver sides; to fine tune heights for optimal corner weight distribution; and to setup additional negative camber as much smaller diameter springs are used.

SAM in Sweden can supply Volvo specific kits, with more general kits being available in most countries from good suspension shops but expect some mods to suit your Volvo. **Noltec**, Australia, has [Coil over hardware Kit #N44502](#). With reference to the hardware chart, none of the threaded tubes (internal diameters) comes close to the Volvo 240 strut shafts odd size at approx Ø52.6 to Ø53, so a sleeve or custom made collar will be required to build up to Ø54 ID. Coil-over spring inside diameter is typically around Ø65 mm. Eibach springs are smaller with inside diameter of Ø61 or Ø63.

Small Diameter Springs - There is typically a choice of spring rates for road and track use from world suppliers. [Kings Springs](#) in Australia have a massive 'website range' of **ProSport** coils to choose from.

I have experience with linear springs # KPS135 - 300 lbf/in @ 200 long, Inside Diameter 65 mm, coil spacing 20 mm, 5.5 active coils, 11 wire dia, compressed 84 mm. Helper springs are required. Also tried (175 lbf/in - good on road, too soft for track), stiffer 225 lbf/in, and 300 lbf/in (stiff on road, good on track). Ride characteristics can be altered with strut valving changes inside a rebuildable strut, eg Bilstein, Koni.

My **2005** choice is Eibach springs, based on their ERS system of a main spring plus a tender spring. The tender is strong enough to hold up the car and to give a little suspension movement before going to block. Main #160-60-70 (400 lbf), Tender #60-60-60

[Link](#): Additional pics and info on a MVP coil over-strut installation is found on [Dave Barton's web page](#).

BALL JOINTS:

'Power steering' - model ball joint assembly feature increased castor being forward offset by 13 mm (1/2") to the control arm axis (**therefore an increase in the Volvo's positive castor angle**) .

- And with a 20 deg angle of inclination a lot of strut housing negative camber can be set without issues. The cast part number on components is **LH side** #1330 821 = Volvo # 274 118, **RH side** #1330 820 = Volvo # 274 119.

'Manual steering' - The caster on the manual version enables steering self-centering at the expense of greater steering effort - not a problem with a power steering pump.

CASTER: This is essentially fixed on a 240 chassis. Caster is Positive between 5 to 6 degrees, depending on your setup. Angle goes to rear (feedback welcome on this point). 740 specs 4.5-5.5°

NEGATIVE CAMBER:

Performance driving requires some front wheel negative camber to reduce



excessive wear on the outside edge of the tire/tyre caused by road/track abrasion tearing off over-heated rubber molecules. The 240's existing adjustment slots are minimal in width, and can easily be extended inboard by hand-filing a longer arc as there's plenty of metal to spare. With standard ride height only about -0.5 degrees can be obtained. Lowering the suspension will achieve additional negative of at least 1 degree. With effort I achieved -2 degrees each side on a lowered 1980 chassis using standard upper strut bearing mounts. The limit to negative camber is when the large spring touches the inner strut tower when the steering is turned.

Moving the upper strut mount 17 mm equals a one degree increase in negative camber.

It's worth mentioning that when the McPherson strut is turned, a small increase in negative camber occurs. With a wheel alignment, less toe is required, some people report a little toe-out assists cornering, others settle for a little toe-in.

<- **Pic** shows 3.5 degree negative camber for track days. This camber offset gives even tire/tyre wear across the whole width, rather than scrubbing out the outer edges during hard cornering.

REAR Shock Absorbers: (Dampers)

When comparing on-road performance between inexpensive **Volvo heavy duty** oil shocks **vs** expensive **Bilstein** oil/gas, the value of standard Bilstein high performance rear shocks on the 240 is not clear cut, so this speaks well for OEM Volvo (Boge) units. This is in contrast with the enormous benefit that Bilstein can make to 240/740 front end handling. On very undulating surfaces with big dips, Bilstein rear shocks give superb control, but this is not typical of road or good track surfaces. In my opinion, the valving on rear Bilsteins seems better suited for use as a rally shock than a road shock. For general road use, myself and others find them stiff in short stroke compression - meaning they **bang over the bumps**. Re-valving is the answer, in words asked for - softer on compression, firmer on rebound. See link to Dave Bartons's figures at end of his article.

Koni (Made in Holland) are a popular performance alternative to Bilstein, and offer a **sporty YELLOW 3 way adjustable 'Koni Sport'** rear shock, **#26-1129 Sport**. 240 owners prefer the middle softer setting. Your specialist suspension supplier will need to order them. A web article comparing Koni Red vs Yellow models is at the [Tirerack](#) site (search Koni). A Koni distributor in Melbourne, Australian is [Toperformance Products](#).

Again, **KYB** is often mentioned by owners as a good inexpensive standard replacement unit.

Shock Absorber BOLT (Lower) -Do you hear a rattle type noise at the rear? - really pay attention to the bottom shock absorber mounting - the steel spacer sleeve next to the shock can indent into the inner wall of the trailing arm, or the spacer sleeve can bruise on the ends, which means there is a tiny bit less length and hence play - resulting in a rattle. A thin shim washer or an undamaged replacement sleeve can help solve this issue.

Pay attention to the screwthread condition on the long fastening bolt (screw) (and locking nut) as the bolt's thread is often damaged from knocking through the trailing arm holes during shock removal and fitting, or from over-torquing. **Tech hint** - use two bolts to assist aligning either end, and a small trolley jack to raise the trailing arm so the bolt pushes through without damage. New Volvo Bolt (screw) #970986, Lock Nut M12 #971084 (same M12 lock nut is used for top and bottom shock mounts).

REAR COIL SPRINGS:

With lowered springs from sources such as IPD, SAM or KINGS a reasonable height reduction is achieved. Even with lowered rears, the rear end sits higher than the front which is a pity as on a 240 as a low rear looks aggressive.

If you require a standard height rear spring, Volvo have three wire diameters (hence stiffness) to choose from, see your dealer.

The 240 rear springs are only secured at the bottom of the pigtail, the top sitting free around a cup/hat. This means changing a rear spring/s can be done in minutes.

A longer spring = more compliance. A short stiff spring gives a poor ride and control over bumps. Author's favourite **rear spec: 2" lowered, 20% stiffer** - suit 240 Volvo from ALLSPRINGS, Moorebank, Australia. Go too low and the tailshaft universals complain.

Motorsport Use - at the track you are required to have an empty boot, so after removing the spare tire/tyre, toolbox, jack, and ready with a minimal fuel level - the rear ride height rises up at least 1/2" or more - being far from optimum - hence lowered springs are a head start. Under hard braking, the front springs compress down and correspondingly the chassis rear lifts up which upsets handling balance.

Like the case with the front coils, to keep captured, aftermarket suppliers are restricted to a minimum spring length. One method used to safely fit shorter rear springs is to fit a strap (eg. seat belt material) so when the axle assembly is raised, droop is reduced to keep the spring located. With two holes at either end of the strap, they can be securely attached under the hat at the top, and at the base under the trailing arm secured by springs bolt, washer and retaining nut. This will also remove strain from the shock absorber shafts, that on a standard car are the only components that hold up the enormous weight of the rear-end when off the ground or on a hoist.

Coil Spring Rate Conversions:

To Convert lbf/in to N/mm (Pounds-force per inch to Newtons per millimetre)

lbf/in x 0.175 = N/mm, Example: 100 lbf/in x 0.175 = 17.5 N/mm

To Convert N/mm to lbf/in

N/mm x 5.714 = lbf/in or N/cm x 0.5714 = lbf/in

Bare in mind that the combination of stiff front springs, large dia. swaybars, performance struts (eg Bilstein/Koni) and low profile tires/tyres can give a harsh ride.

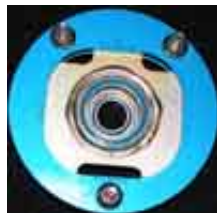
STRUT TOWER & LOWER CHASSIS BRACES:

Strut towers on 240/740 Volvos are quite high to enable long suspension travel. As part of an overall handling package a number of suppliers sell **strut braces** to triangulate the towers to the chassis firewall. If your improving an early model 240, fit a set of **firewall to tower chassis braces**. The under-car '**lower chassis brace**' (pair) are also recommended as they add more bracing to the crossmember, and provide a skidbar to protect the underside of the front end. This brace is standard fitment on early 264s. I tried out the lower chassis brace at the track and agree that it was of benefit. With all three braces fitted, a typical response is "**just a little bit more held together**". Braces are available from a number of sources eg. MVP, IPD, SAM and small manufacturers.

UPPER STRUT BEARING MOUNTS:

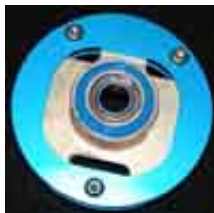
STANDARD: This bearing is a critical upper pivot point for steering and suspension. The mount would require replacement if the internal bearing is tight or notchy in rotation, or the vulcanised rubber surrounding the top section is peeling away or deteriorating. Original Volvo parts are recommended. Usually around 1 deg negative camber can be obtained using a standard mount, and is quite driveable. A bit under 2 deg negative can be obtained with a combination of slotting and lowered springs.

UPGRADE: For the 240 and 740 a good example of an adjustable camber and caster kit is made by [Noltec Australia](#). They seem well made and I estimate they increase negative camber adjustability to around -2 deg. This is a good head start to reducing outside tire scuffing, but for regular track use around 3-3.5 deg is req'd for even tyre wear. They are a sports item, so expect a bit more feedback and clunk through suspension. All pictures below kindly supplied by Ashley Saunders (Australia).



Noltec Strut top mount

[Click all to enlarge](#)



Noltec Bottom



Noltec Strut parts

MOTORSPORT: GpA racing 'offset centre' strut bearing mounts are available from SAM to enable a -2 to -4

deg negative camber setting. Group A rules specified that the original mounting points must be preserved - these achieved that. The SAM catalog details them for the 240, being normally combined with a smaller diameter spring in a coil-over suspension. Coil-over has been discussed in the Front Strut section. Bare in mind when SAM say their upper strut mounts give -2 to 4 deg negative camber, -2 is the lowest angle you can go back to.



Top View 'offset centre' left hand strut bearing mounts GpA Underside View -2 to -4 deg

SWAYBARS: (anti-roll/anti-sway bars)

SWAYBARS and quality front strut inserts are among the first practical improvements 240/740 owners can make. The 240 Turbo spec 23 mm Fr/R Set are a good combination for resistance to body roll and offer an improvement over standard 240 sizings. I found the next size up - IPD's popular aftermarket 25 mm Fr/R combination gives the 240 added manoeuvrability in autocross/hillclimb situations as well as flatter front cornering. Volvo still sell new 23mm bars being quite expensive.

A ride trade-off with the big 25 mm bars is the suspension rides harder on bumps due to their rigidity, and with the front bar more resonance/fine vibration can be felt in the steering wheel. The angle on the ends of the IPD 25 mm bar is better suited to lowered suspension than standard bars. **Tech note:** My Front & rear IPD swaybar diameters measured 25.7 mm or 1.015", being much closer to 26 mm than the advertised 25 mm size. With 27 mm (1 1/16") and larger diameter bars, increased understeer can be an issue. IPD bars are cold formed using 4040 steel.

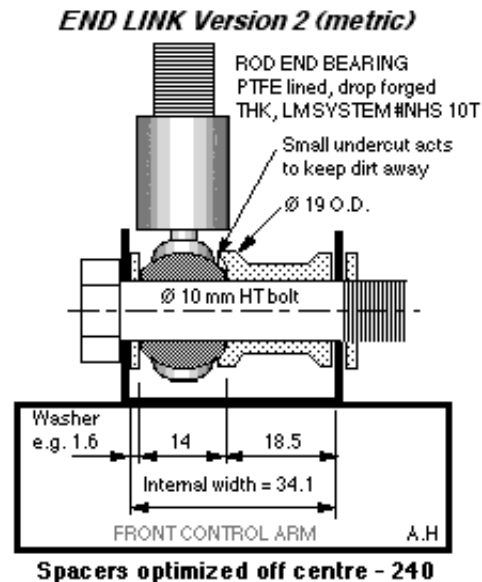
Polyurethane bushes are recommended for both the two main support bushes and the sets of doughnut bushes on the ends of the bar - Sources: IPD, Noltec, Super Flex, Energy Suspensions. Users' report that the firmer red/black/yellow coloured poly bushes (termed Nolathene in some countries) are better for the bar support bushes and are quite easily adapted.

Swaybars and handling - To quote from Volvo enthusiast Balu Vador "In general, adding roll stiffness (with stiffer springs and/or swaybars) to the rear end will bring handling closer to oversteer, while adding roll stiffness to the front will bring it closer to understeer. The stiffness of a swaybar increases with the 4th power of diameter, so even a small increase in diameter should bring noticeable results. The handling balance can also be fine-tuned by changing the tire pressures in the front and rear tires in comparison to each other."

Swaybar 'END LINKS' - ADJUSTABLE: End Links attach the ends of a front swaybar to the control arms. If your car is fitted with lowered suspension, adjustable links can give an effective upgrade to handling. Standard Volvo end links are rubber bushed and not adjustable in length. Without adjustability, a lowered cars swaybar 'ends' are likely to have quite an upward angle on them - far from optimal. In one case a reduction of 20 mm (over 3/4") was required to level the arms on both swaybar-ends.

Adjustable links consist of a threaded rod that screws into a steel spherical bearing replacing the bottom rubber bush. Positioned along the threaded rod are Nyloc nuts, and you position the original small doughnut bushes and cup washers either side of the sway bar ends.

Bearing shops can supply spherical **rod end bearings in metric sizes (bore 10 mm)** and price depends on quality. The bearings with a thin PTFE lining are good as there self lubricating. Grease versions can suffer additional wear in the gritty road wheel environment.



Spacers optimised (SEE PICTURE) - pay attention to the angle of the 'End Link' where it mounts into the control arm relative to the above sway bar hole, as I found it positioned best with a thin spacer one end, thicker the other, rather than equal width spacers.

On good road surfaces, slower corners could be taken at higher speed. I found the difference quite noticeable, with ride and tracking being uncanny in smoothness. Took me days to understand the change, it's as if the swaybars exert more control, being consistent with a reduction in play, and the improved end link angle. On rougher roads there seems to be a small steering reaction on bumps. As there is no lower rubber bush anymore, more road vibration is transmitted.

So far as finishing off a swaybar upgrade, this optimum positioning is to me fine tuning, **the icing on the cake**. As mentioned in [Swaybars](#), poly doughnut bushes are ideal. [MVP](#) are a source of Endlinks.

REAR END COMPONENT UPGRADE - VOLVO 240

TORQUE RODS (REACTION Rods / Upper trailing arms) and BUSHES:

240 series rear suspension is very similar to a four link design being quite reasonable for differential control. Newer style torque rods with stiffer bushes can give increased security on higher speed corners, and better diff location control under acceleration.

Two types of Volvo torque rods exist and function to keep the rear axle/differential square to the chassis and to limit diff windup or rotation. The **older type rods**, (1975-83?) are fitted with very flexible small diameter curved bushes (also called butterfly or dog-bone due to shape). Replacement butterfly bushes are expensive and very tricky to press in, but the problem is, there's far too much bush compliance for performance use.

Newer type torque rods feature a much larger round bush of stiffer design. For bush upgrades, IPD offer an excellent two piece polyurethane unit that features generous side wall diameters, ideal for keeping the axle better located in dynamic use. Noltec, Super Flex and Energy Suspensions also offer poly torque rod bushes.

It's really worth upgrading to the newer rods, 1984 onwards - a parts recycler being a good source. Suitable for performance cars is much harder rubber bushes **as used in Volvo Cup** competition (x4 req'd) from SAM #1273622RF

TRAILING ARM BUSHES: (2x long trailing arms locate the differential/rear wheels to chassis)

The small Volvo **bush (at front of arm)** is rigid and recommended, but the **large rear bush** mounted in the

Dana diff 'rear axle bracket' can be improved by upgrading to a more rigid harder rubber version having less bush flex. Suitable for road cars is the harder rubber bush **used in Volvo Cup** competition (x2 req'd) from SAM #95086520 (old Volvo number on bush is #1205796). Modern polyurethane varieties such as Notec come with a steel outer sleeve, but the Super Flex bush requires the same original steel outer sleeve to be reused and its no simple task removing the vulcanised innards.

Fitting - Due to the large bush diameter and long length, removal and installation of the two bushes requires a rather **special Volvo tool** to fit the one piece bush into the axle brackets. This is best done on a garage hoist, so let your mechanic raise a sweat on this job.

PANHARD ROD:

This critical steel tube keeps the chassis from swaying from side to side as it **links the rear axle to the chassis** so movement to one another is relative over a wide arc. Trailing arms, torque rods and springs assist the axle attach squarely to the chassis. Therefore, its most important panhard rod bushes are in top condition with no play whatsoever.

Standard Volvo rubber bushes are good hard and rigid, no argument. Polyurethane bushes are an alternative and offered by Noltec, SuperFlex, with Nylon offered by SAM - racecars use uniballs/rosejoints.

Tech hint - if upgrading the chassis end panhard bush to a poly unit with steel sleeve, it is recommended you check the play/clearance between the steel sleeve and the securing bolt. A tighter tolerance steel sleeve might need to be made eg. 12.0 mm ID. **Tech hint** - For the axle attachment end bush, if upgrading to a poly unit with steel sleeve (where a standard rubber bushes are vulcanised to the steel sleeve), a point to consider is the poly bush is free to slide along the fixed steel sleeve and will most likely butt up against the axle which itself is OK, but this means the sleeve is then too long (ie the poly is not being clamped into position). A remedy is to shorten the sleeve to 38 mm and to put a big washer at the nut end. From an alignment perspective, if you lower the chassis with shorter spring height, the panhard rod sits closer to a level position, meaning the rod is at its optimum position, moving the chassis a little further left, relative to the axle.



For more precise side positioning of the chassis-to-axle location, an **adjustable panhard rod** can be fitted that uses a L&RH thread system (eg. 3/4" dia) sourced from a suspension manufacturer/shop, (in Australia - Whiteline #KTB180). I tried a 4 mm shorter rod length and noticed a handling improvement. Before modification, do your math then hacksaw out a section on the large dia tube (eg 80 mm length), suggest near LH end for adjustment accessibility. Machine 2 off supplied nuts on the O.D. for most of their length so they press into ends of rod tube (27.1 mm dia) and have welded-in professionally. **A suggested adjustment reference point is the chassis-rail** near the top of rear spring hat, measure inside of tire/tyre to square chassis rail (not inside of guards), make equal, and if required obtain a thrust wheel alignment.

TIRES/TYRES: Use the best you can afford. Per dollar, better quality tires with low slip angles will improve your driving and reduce lap times more than engine work will.

WHEEL SPACERS: Visit my web page [CUSTOM REAR WHEEL SPACERS](#)

WHAT ABOUT THE DRIVING POSITION ?

THE SEAT: Original equipment seats are comfortable, but don't hold you so well when cornering, especially if a leather or vinly fabric. Volvo cloth and aftermarket seat types provide more friction. To stress the importance of good seat, compare these two scenarios; Imagine driving quickly along a winding road or racetrack. Your body is moving from side to side, bum, shoulders, back and head all trying to keep straight (to stop moving your even pressing your arm into the door trim) - you haven't got close to the control required for precise cornering!

Compare this to **SITTING-INTO** a body hugging sports seat, where your firmly located and as road input requires you just move/rotate the steering wheel for precise cornering - driver input is efficient as your not

compensating for excessive body movement, you can instead concentrate on driving well.



SPORTS SEATS: There are several brands to choose from e.g. [Recaro](#), Sparco, Cobra, available in either a one piece or reclinable design. If your going racing the seat must be a one piece. Some have brackets to suit a Volvo, others need to be adapted. Since I required adjustability, the very low in height Volvo seating rails were ideal, enabling new seat securing brackets to be attached on top. Position the L shaped seat brackets in a position to suit your seat width and drill new holes in the L bracket.

Volvo **R-Sport** offered quality seat covers with high side bolsters to keep the driver well positioned. On the 2nd hand market these are sought after items, and are still available new from Volvo but at a premium price.

STEERING WHEEL: A large diameter wheel has added mechanical advantage when turning, but your arms also rotate further around on the large arc. **A smaller diameter wheel** requires less exaggerated arm movement, and I believe less movement enables more precise driver input whilst cornering. Most Volvos have power steering, so to turn a small steering wheel requires little effort.

FOOT REST: Most modern cars have them standard, but I'm yet to hear of one standard in a 240! Its worth fitting one to place your left leg on as this can reduce twisting of your upper body whilst cornering. Instead you can **focus on accurate steering input**.

FINAL WORD: As most of us have experienced with a standard 240, once the initial sway is passed, the car takes a 'corner set' and they usually handle sharply. After improvements described in this article, a typical drivers comment is **'the car now goes around corners like its on rails!'**

2nd FINAL WORD: This is from a Road&Track comparison test of sports sedans, Aug 1991:

After completing one of the twistiest, most challenging portions of our [test] loop, we came away with respect for this upright rather boxy live-rear-axle sedan that could keep pace with cars of obviously more sporting intent. "It's your worst nightmare," said one of us, "to be going along at a really good clip and see this *Volvo* right on your bumper." [thanks Mike Justeen]

Hope you enjoyed the content of this article.

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* I have no links with any of the companies listed, other than having purchased some of their products.

* **DISCLAIMER** *

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Further web reading:

[Bilstein Re-Valving figures](#) -by Dave Barton 245 Turbo

[Front Suspension Theory](#)

[Physics of Racing](#) - weight transfer,

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