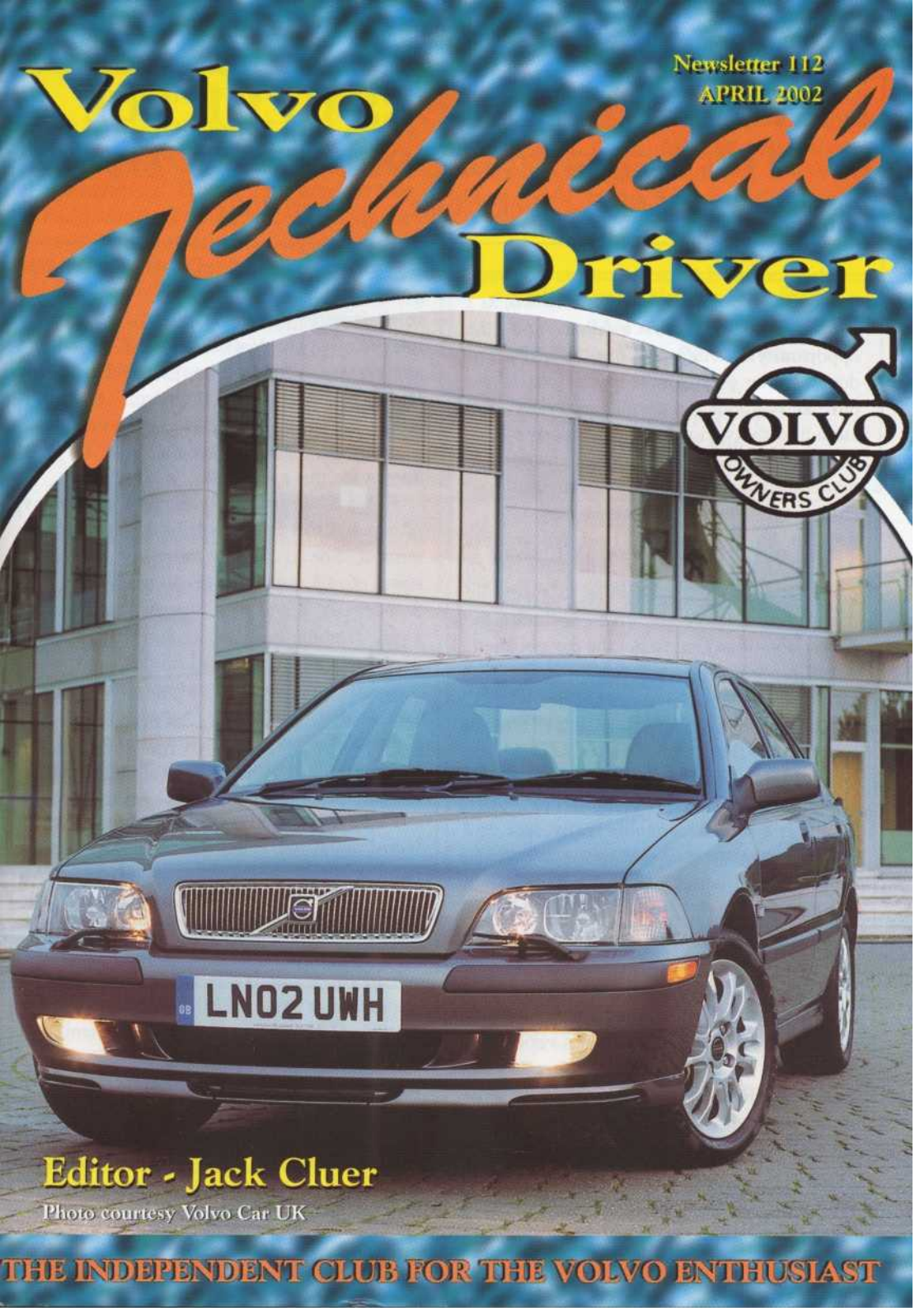
Newsletter 112
APRIL 2002

Volvo Technical Driver



Editor - Jack Cluer

Photo courtesy Volvo Car UK

THE INDEPENDENT CLUB FOR THE VOLVO ENTHUSIAST

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Joe Galant's page.

Think before installing non-standard parts or accessories.

The other day I had a chance to look at a car that came in for a minor service and a couple of promotions. This car was a nice looking C/70 2000 coupe and sounded different.

I waited until the car was in the air and I could see what it had for an exhaust system. To my surprise it had a Supersprint rear muffler. I had not seen one installed on this type of Volvo yet, and was just curious. The Supersprint was nice looking and fit very well under the car; it hung right where the old stock exhaust system did. I followed it up to the front of the car and then saw that someone had tried to improve on the front header/cat pipe by putting in another non-factory converter and making the inlet and outlet out of various pieces of exhaust pipes.

Needless to say it did not look like it had been well thought out or put into its proper place. The alignment of the cat was such that it was pulling down on the rear 02 sensor wire and it even pulled the connector out of the holder on the transmission.
This whole picture did not look like it would last long and the owner would be replacing the 02 sensor within a short period of time.

The reasons behind why you should be careful when you modify or change any of the factory pieces were certainly evident in this case. I would have left the front header alone and ordered the right upgrade if that is what they were trying to accomplish with the installation that was used here.

Also ordering the 3" header would have been the correct way to go for an even better upgrade. This gives you the proper alignment that does not compromise the 02 sensors and gives the smooth free flowing that the system was designed for.
I know that this can be expensive but look at the problems that are avoided in the long run as well as the extra costs that one can incur.

The next part of this story goes to the front of the car and this is where the story gets even more involved. I was looking under the hood to see if there were any modifications made there also and by the sound of it and because I know that Volvos don't make that much air intake noise my suspicions were right.

I looked at the new air cleaner and inlet setup that was kind of just sitting in the place where the air box was. There was a fresh air intake put into the system that was piped from the stock inlet to the front of the air filter. This was a crude attempt at giving the intake more cold air. It worked in conjunction with an auxiliary air fan that was very loud and did not get the flow from the front to the intake very well. I just stared at it and thought that with a little time and effort that the whole setup could have been put in better and made more effective.

What am I trying to get at here is that just bolting on parts is a way of improving your car but not taking the time to make sure that they have the proper improvement on its running condition tends to defeat the purpose. Spend the extra time to install and improve your, Volvo so it will meet and exceed your expectations.

I would like to thank Joe for this, especially as he has just lost his best friend in a freak accident and has found concentrating on writing very difficult lately. I know how you must be feeling Joe, as I have also lost two good friends recently and they will be sadly missed *Ed.*

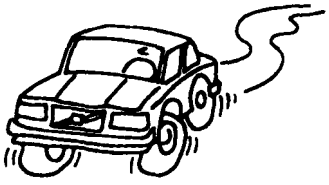
Back to Basics - Wheel Alignment.

All Models

*As with any specialist subject, automobile engineering has its own specialist terminology. **I am** sure many of you are confused by some of the terms used to describe wheel alignment and I hope to clarify some of them here*

General.

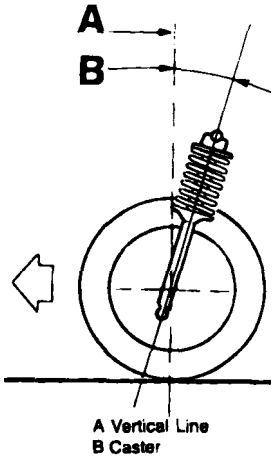
To ensure that the vehicle has good steering properties and minimum tyre wear, wheel angles must be set correctly. These angles include: CASTER, CAMBER, ACKERMAN ANGLE, KING PIN INCLINATION, TOE IN and TOE OUT.



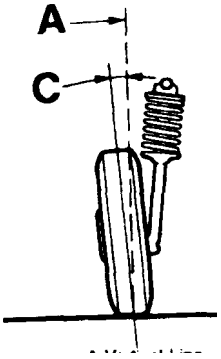
Caster (axle angle).

Caster angle (B) is the angle between the vertical (A) and a line which passes through the centre of the lower ball joint and the upper mount (i.e. a line through the centre of the spring strut).

Caster ensures that the wheels return to a straight-ahead position, making steering easier. In general, the larger the caster angle, the greater the self-centering effect. For adjustment of caster, there are different length control arms.

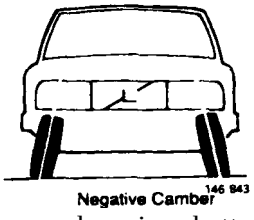


Camber.

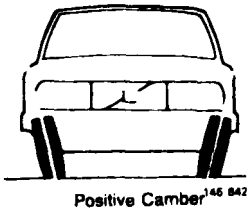


Camber (C) is the angle in degrees by which the wheel leans either outwards (positive camber) or inwards (negative camber) from the vertical.

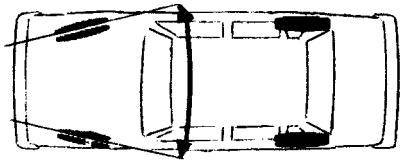
Negative camber tends to improve road holding in that the outer wheel becomes more vertical as the car rolls.



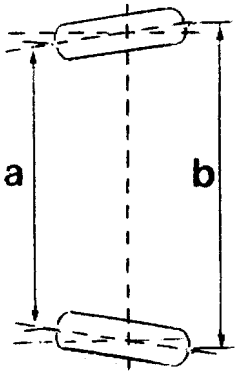
Positive camber gives better feel for the road in driving. An extreme incorrect camber can result in uneven tyre wear.



Toe-in.

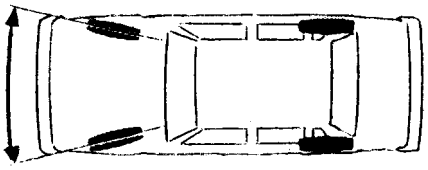


Toe -in is a term used to describe the extent to which the wheels point inwards. Toe in can either be be measured as an angle or as the difference between a and b.



Correct toe-in contributes to 'feel' in driving and also to directional stability. In rear wheel drive cars it counteracts the tendency of the wheels to turn outwards. Toe-in is adjusted by lengthening or shortening the steering outer steering track rods. (which must be of equal length, side to side).

Toe-out.



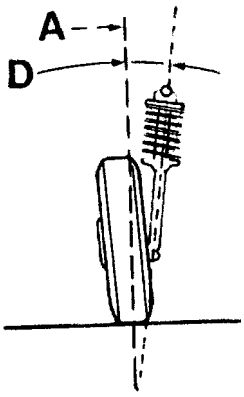
In front wheel drive cars, wheels are often set with a small amount of toe-out in order to counteract the tendency of the wheels to turn inwards.

Incorrect toe-in or toe-out can give rise to vibrations which increase tyre wear. Tyres 'slide' sideways. With large amounts of toe-in, there is often wear on the outer shoulder of the tyre.

Ackerman angle.

When a vehicle corners, the wheels have to travel along circular paths of different radius. In order to ensure that they turn on the same centre and to reduce tyre wear as much as possible, front wheels have to be slightly offset from each other. This is done by the design of the steering arms and strut and cannot be adjusted.

King, pin inclination.



Originally king pin inclination (D) referred to the angle of the king pins themselves. Most cars today do not have king pins, the term now refers to the angle between the vertical line (A) and the line through the spring strut. K.P.I. ensures that the wheel is easy to turn while retaining a self centering effect. K.P.I. cannot be adjusted.

Precautions.

The following factors can effect wheel angles. Before measuring or adjusting they should be checked and if necessary corrected.

1/. Different tyre pressures or tyres.
2/. Different amounts of tyre wear.
3/. Play in front wheel bearing/s.
4/. Play in ball joints or linkages.
5/. Broken springs.
6/. Damaged steering gear or wheels.
7/. Play in steering strut fixings.
8/. Damaged upper shock absorber mount.
9/. Abnormal (temporary) equipment or loading.

Note! All measurements must be made with the vehicle unladen.

Twin Fog Lamps - Are They correct?

All Models

David Woodbridge, of Norwich, Norfolk, sent me this article in which he explains the possible reasoning behind the manufacturers' only fitting one rear 'high intensity' *fog lamp, as standard.* ***I*** *am often asked how to fit the 'extra one', but perhaps we should be aware of the consequences of so doing*

I am responding to the article written by Stephen Brotherhood, regarding the V40 2.0 TS only having the one rear fog light as standard but had the provision to have both the left and right hand units fitted. I feel that this is a safety feature not an oversight. Read on

Whilst I was studying towards my IAM test I learnt a very interesting yet worrying fact about the colour red including red lights, and the way the eye reacts. Not being an optician I must put these points over in layman terms.

Your eyes have millions of retinal receptors that look after, amongst other things, colour. From memory I think it was RGB (red, green, blue) separation. In tests carried out it was discovered that after intense use one set of these receptors 'Bum' out and almost stops responding, blinding you to the colour that it is tasked in dealing with.

This colour, if you have not already guessed, is RED. In other words the brighter the red lights you have stuck on your rear, (no pun intended) the more acute the problem becomes. Try this the next time you are following a car with two fog lights on the rear, see how difficult it is to tell when the brake lights have come on.

On some vehicles it is hard enough as soon as you start following a car with the fogs switched on. Newer Fords seem to be a good 'bad' example as the tail, brake and fogs are in the one unit, adding to the problem.

If on the other hand, you only have the one rear fog, as both my Golfs did and now my 740, you have at least a 50% better chance of seeing the one brake light come on, or at least assess an increase in colour. So yes Stephen I think you are correct in saying that Volvo prides itself on safety. along with VW.

I know of one modification I will not be doing as this layout does make sense. Another problem I feel that is connected to fog lights is not the lights themselves but the people who use them! I can count on two hands the number of times I have needed to use rear fog lights in 16 years of car driving.

This is the method in which I use fog lights. (Note:- This involves using the rear view mirror) When I'm certain that the vehicle behind me knows I'm there I will then turn off the rear fogs. If this vehicle then turns off or drops away I will then switch them back on until, once again, I know that the driver behind has seen me. This will then stop the problem with the red receptors being 'burnt out'. How many people do you see in a queue of traffic, in motion or at a standstill, with fog lights burning away?

Ten Years Not Out!

245GLT

Paul Killingbeck, of Billingshurst, West Sussex, kindly sent me this account of his experiences with his 245. Thank you Paul. I wish they still built them like this!

I would like to respond to your invitation and write about my 1988 245 GLT which I have now owned for ten years and which is just about to pass the 250k barrier.

She was bought in 1991 from a main dealer in Milton Keynes after a lengthy search - manual GLT's apparently being thin on the ground. She had had one owner and came with a full service history, 47K on the clock and an RAC report that found no problems. Initially run in tandem with a 340, she has been our sole means of transport for the last six years and has proved extremely reliable.

The only major replacements have been a new gearbox at 60K to which Volvo made a substantial contribution under their Lifetime Care scheme and a new tailgate following an argument with an obstreperous boat trailer. Fuel evaporation problems were fixed by fitting a high pressure pump following advice in *Technical Driver.*

Unlike David Rhodes, I have not experienced ignition problems, despite keeping the car outside, and am on only the second set of HT leads. However, I do use Volvo parts as a matter of course and am convinced that this pays in the long run.

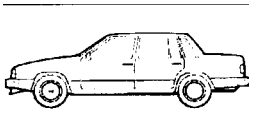
I have kept petrol records since I had the car and there has been no significant rise in fuel consumption over the years - she returns a regular 30mpg and up to 34mpg on a motorway run. Like David, I fitted a 'Broquet' but found this to be a complete waste of time with this engine. Eventually I bit the bullet and went for the twin head gasket option - wonderful!

The car has been professionally serviced throughout its life, in recent years by G & J Motors of Wisborough Green (01403 700730) who are Volvo specialists and do an excellent job. I always use Shell semi-synthetic engine oil (considerably cheaper if bought in French supermarkets) and fill up with either Texaco or Shell petrol whenever possible - she (especially her injectors) does not like supermarket petrol. The 340 did not like it either, something to do with the level of detergents I believe....

The car works pretty hard for its living, taxiing clients at work, carrying heavy loads both inside and on the roof, towing boats and doing about six 500 mile round trips to Yorkshire each year - easily making the journey in the day and in comfort. My only real criticism is the rear seat fold system which does not allow for full adjustment of the front seats with the rears folded down - the Mk 1 Cortina did it much better.

So, a great car which I hope and expect will see me through to retirement in five years time and as for safety? An elderly lady recently got her pedals mixed up and shot across the local garden centre car park, hitting the front of the Volvo and pushing it bodily a car length out of its parking space. Result - new single-use bumper shocks for the Volvo, Nissan Micra written off.

Cutting Out. ---(Fuel filter Blockage).



740 (1990 B230K carb.)

I had a chat with Niall Simpson a while ago about a recurring intermittent problem with his car. Whilst I suggested a possible source of the problem, it turned out to be something entirely different

A month or two after acquiring our 740 estate (1990 B230K carburettor model) the car began cutting out. After resting for a couple of minutes it would restart OK and run for anything between half a mile and about six before repeating the performance.

A long saga of trying things out started out with replacing the HT leads, plugs and distributor cap which despite a full service history up to 75K had seriously deteriorated. No result, so I started following up suggestions on dodgy relays, coil and even resoldering every joint on the ignition amplifier module.

Turning to the carburettor for a cure, I soon discovered that all the emission control plumbing is a vacuum leak waiting to happen. In passing I fixed several leaks including one round the EGR valve actuator seal. A valuable tool in finding leaks is an aerosol of 'EasyStart' or similar. ***(Be cautious with EasyStart, as it is highly flammable. Some folk use WD40 or carb. cleaner spray. ..Ed.).*** If a vacuum leak is in the vicinity of where this is sprayed while the car is idling, the idle speed will increase slightly due to the inflammable vapour being drawn in through the leak. ***(You get a similar result using WD40 in that the 'leak' is momentarily sealed, enriching the mixture..Ed).***

Anyway, to cut a long story short, the fuel starvation (for such it was) was traced to the filter on the fuel tank pickup pipe. This was clogged with what appeared to be tiny particles of plating from the resistance wire in the fuel gauge tank unit.

It took two attempts to clean this thoroughly enough blowing it out backwards using a carburettor cleaning spray. I now believe that it is OK to discard this filter as long as you have an in-line fuel filter fitted just before the carburettor. ***(You are absolutely right!).***

Ivan Henderson, A New Enthusiast and his 480 Turbo. and a Useful Volvo Breakers for Scotttish Members.

I've rescued a condemned Volvo 480 Turbo (Good heavens!!!) and in my retirement, I'm thoroughly enjoying its restoration. It's much better than gardening, window cleaning and performing with the vac! which is expected of me when not actively involved in the garage. I dare bet the logic of my newly acquired 'hobby' is universally recognised.

I've stripped out the seats, interior panelling etc to reveal a most colourful display of multi-coloured wiring: some flat and appealing, stretching neatly fore-and-aft, others, the majority, a cacophony of twists, bends, circles and even knots!

I'm gradually getting there though, thanks to the discovery of a 'specialist' Volvo breakers in Scotland. The only one in fact. It is in the little village of Denny, in central Scotland. In the Southern Counties you may have ready access to many such 'breakers', but for the benefit of any Scottish Members I would like to recommend Sandy or Neil at 'Headswood Garage', Denny, FK6 5NA, Tel. 01324 841636. They are very knowledgeable and have been of invaluable help to me

Thank you for this information Ivan. I have passed it on already to some Scottish Members who will be interested. Please remember that we are all here to help and advise you *if you need any assistance. Chris Wickers is an ardent 480 enthusiast and is very knowledgeable* *Ed.*

544 Brake Calliper Dust Seals.

A Useful Tip And Offer Of Help From Keith Wilson.

I thought that the following findings might be of interest to readers of the technical section of the VOC.

Whenever I came to change the disc brake pads on the PV544, I find that the calliper dust seals have disintegrated and stuck to the back of the disc brake pads. This entails the lengthy job of removing the callipers in order to take out the pistons to replace with some new calliper dust seals.

Having done this recently for the umpteenth time, I decided to talk to a brake expert, and having done so, I find that the seals we generally purchase now are not like the original rubber Girling items but are after market replacements made in what seems to plastic. They are patently not up to the job.

I have managed to trace the original Girling part number, and, yes they are still about but not in great quantities. I am given to understand that these will not stick to the pads nor disintegrate. To this end I am intending to buy a batch. If I purchase 10 sets they will cost £11.70 per set, plus the dreaded VAT. If anyone should be interested please contact me.

Front Shock Absorbers.

1990 240 GLT SALOON

Bill Walls of Stonehaven sent me this account of ***the puzzle he experienced when changing the front dampers on his car. Fortunately it all turned out all right in the end.***

Fellow GLT owners of 1990 vintage - be warned about what may appear the simple job of renewing the front suspension.

The car was booked in to my non-Volvo Garage, who have cared for it, and its predecessor for the last twelve years. As usual it was a case of: "You get the parts and we will fit them".

I acquired gas filled inserts from BOGE, top mountings (acquired from Europarts). The car was put on the ramp at Friday lunch time. The legs were removed, all was going well until the inserts were removed. They were not the same! "Those are 'upside down' inserts as fitted to 'rally' cars". I am informed.

Volvo cannot help, we could not find a part number, they did not recognise the thing from our description.

Ashley Banks, of Peterborough, suspension specialist, sent them by Securicor, and they were to arrive on the Saturday morning - problem solved! Alas no parts had arrived by Saturday lunch time and it was a Holiday weekend! The parts were collected on the following Tuesday forenoon from the Securicor Depot, in Aberdeen marked URGENT SATURDAY DELIVERY.

When the were parts opened, they were the wrong ones! Ashley Banks could not understand, and asked us to return them.

After more panic telephone calls to Jack, Cliff, and other experts, we were still in the dark and car was still on garage ramp. I 'phoned Terry Atkinson at Stoke-on-Trent, usually a mine of information. He had never seen this before, but had a 1990 GLT just in to his garage for a similar job, so he had a look and 'phoned back to say that his were 'upside down' and that he had never seen this before. He said he would think about it and let me know.

Early on Wednesday morning, Allan, from the garage, 'phoned to say he had been thinking about the problem and looking at the legs and had found a liner in each leg with a No. 3530082, colour coded Pink. Volvo, eventually 'phoned back to say that this was discontinued several years ago.

There is, however, a Conversion Kit -

Adaptor	1229423/7
Bump Stop	1221647/9
Bracket	1229659/6

This, of course was not in stock but could possibly be obtained from SWEDEN! Alternately they could supply two new legs, at a cost, of course!

I had another telephone call from the garage, asking if I was prepared to take a chance? They found that the BOGE inserts could go in the legs without the liners, but there was a slight danger that they might be a fraction too long, and could be damaged when the knurled nut was tightened.

I suggested that they go ahead that we would take the chance. The BOGEs were well greased, as we could not put oil in the leg, because of the hole in the bottom of the leg.

Well, fortune favours the brave, and by eleven o'clock I was driving home with the car going better than it had for a long time.

Finally my thanks to Jack, Paul, Terry Atkinson and all the others who helped me during my time of need. What it is to be a Club Member!

I am glad you finally got this sorted out Bill. It is worth 240 GLT owners taking note of this and so be prepared when it is their turn to replace their front dampers. Thanks for letting me know Ed.

200/700 Series Injection Relays

***One** of the regular queries **I** get concerns the injection relay (or as **I** sometimes refer to it, the fuel pump relay). These have a habit of failing with embarrassing regularity! Whilst browsing through the 'web' **I** came across this very valid explanation and cure for the fault. I do not know who posted the tip but I do thank him (or her) for it.*

Here is an explanation solution, regarding the fuel pump relay burn out problem on the 200/700 series. I (had) a 1978, 265 GL estate and still have a well preserved 1981, 260 GLE.

Both of these cars produced the relay bum-out symptoms as you describe. However, I seem to have eliminated the problem by soldering the wire and connector to correct or reduce resistance heat. The problem seems to be poor connectivity at the terminal end of the wire.

Cause:-

After the cars were at least five years old, the problem of heat and a burned out relay began. Time is worth noting since there is no other known variable. With time and the various effects of aging in mind, it is possible that the factory crimped wire and connector did not remain as a good conductor of electricity. Since I soldered the wires and connectors and then reconnected the new relay, there has been no heat and no relay failure. Previous to this repair, the relay would last about 12,000 miles.

Repair:

Unplug the relay and cut back the wire insulator just slightly. Prepare the surface areas and solder a bridge between your wires and connectors. You do not have to put on new crimped connectors. Re-insulate the exposed areas with a liquid insulator. Re-connect the relay.

I have heard about this burning of the relay base several times. Sometimes the base has been so badly burned that the socket had to be completely replaced.

You may remember my writing that the relay itself can (sometimes) be repaired by prising the cover off and re-soldering the connections to the printed circuit board. This has proved to work on many, but not all occasions Ed.

The Joys and Pain of Buying 2nd. Hand

240

I think Richard Jewell will be the first to agree that there is a moral in his story, a sort of 'look before you leap'. On the other hand if you do what I have done and prevaricate sometimes, you can miss out on that 'bargain'. I am sure that Richard is a lot wiser from his experience as he freely admits in his amusing anecdote

I am a fairly new member to the club and despite being a long standing Volvo enthusiast, (I learned to drive at 17 in my Dads '84 245 2.1) have only recently taken the plunge and bought a Volvo of my own.

I was looking for a large estate car and had been viewing Vauxhall Carltons and Ford Granadas as well as keeping my eyes peeled for a 245. 1 eventually found 'Bjorn' advertised for £550. He is an '86 245 GL seven seater with the B230 Pierburg carb engine.

I went round to the seller's house to have a look and he straight away admitted he was a dealer and had taken the. 'brick' in part exchange and was going to dispose of it at auction if it didn't sell soon. It was filthy dirty inside and out but looked ok with no rust or dents (sadly turned out wrong about the rust).

A test drive showed he drove ok but a walk around the vehicle afterward showed water ingress into the cabin by the drivers feet and the tail lamps all inoperative. The seller agreed to repair the rear lamps (corroded fuses) and I used the water leak to knock £50 off.

Upon getting him home I proceeded to give him a good clean and discovered..Nooooo! Under the dirt and grime the sills were rotten and had more holes than Bruce Sprinsteen's best jeans. After a deep breath I stuck my my head under the car and found the floor under the drivers feet wafer thin from corrosion. Why oh why did I not check this?

Feeling faint and somewhat suicidal I started pulling carpets and prodding further. More holes were found inside the rear where the arches meet the floor under the seat, in the auxiliary seat well at the trailing edge and the rear panel under the bumper.

At the time I felt depressed beyond belief but a few days work in the evenings with a borrowed MIG welder and some sheet steel robbed from an old Vauxhall Astra bonnet, (never throw ANYTHING away!) cured my ills. The rear panel was only minor so I fibre glass'ed that.

The sills looked a bit obvious afterwards so I used some P38 filler to blend the patches in and then carefully 'Hammerited' the sills black. Doesn't look half bad. To prevent further grief I undersealed and waxoyled every bit of underbody and structure I could find (thanks to the users of the Volvo Club of Americas 'Brickboard' who advised me of the likely corrosion spots).

OK. The car was now clean, tidy and running well. No sooner did I start to pat myself on the back and the radiator

failed. £?0 and some barked knuckles later that job was done.

OK. The car was now clean, tidy and holding its coolant (the heater now worked better as well). Then the clutch master cylinder started gobbing great gouts of clutch fluid over my left foot. I was becoming VERY frustrated by now and my consumption of cigarettes and alcohol had risen alarmingly. Still, £65 and a bit of swearing later and I had sorted that problem.

OK. The car was now clean, tidy, holding its coolant and clutch fluid. That's when rain water started leaking into the cabin over the drivers feet. Why can't my passengers suffer for once'? Grubbing about under the dash whilst my youngest daughter sprinkled the car with a watering can (she LOVED that!) revealed that water was coming in where the wiper spindle goes up through the scuttle drain channel. A quick dismantle and a gob of black silicone RTV cured this (although I have formed the habit of parking facing downhill as a precaution).

OK. The car was now clean, tidy, holding its coolant and clutch fluid, and not leaking through the scuttle. Then it started leaking through the windscreen. Why do you mock me, 0 lord? More silicone and masking tape cured this.

In between all these shinanegans I managed to give the beast a full service and replace the leads, rotor arm. dissy cap etc. I'm now getting used to 245 ownership and after much web surfing and magazine reading I'm pretty clued up on the likely faults.

The tailgate had been rewired by a previous owner and it looks like a well made piece of improvisation so I'll leave well alone. While I was inspecting this I cleaned and lubricated the tailgate lock and wiper assemblies.

What is the point of this? Well, mainly to act as a warning to check over a potential purchase better than I did. It doesn't matter if it is January and is snowing - it will save you time and grief later on. With the parts this car cost me nearer £750.

The beauty for me is I now know the car to be A 1 (I could have spent £700 buying a car to find it was rubbish) and I learned a lot about fixing 240s into the bargain. I just need those GLT alloys and I'll be happy.

Thank for this Richard. I am glad that you managed to keep your sense of humour during your first encounters with a Volvo. Many a lesser person would have given it all up as a bad job. It served at least one good purpose, as you suggest in that you are far more knowledgeable by having to do what you did than by just driving off into the sunset with everything all 'hunky-dorey'. Long may you continue to enjoy your 'Bjorn'.

480 Trip computer failure. A couple of tips from Ted Brown.

I found two problems which may contribute to computer failure:--

1/. Instrument (computer) earth fault. To either prove or disprove, run an earth wire from the instrument, direct to the battery earth.

2/. Check the supply voltage to the instrument, it should be l2volts D.C. At times, when everything warms up, the cable resistance increases and this drops the supply voltage.

Thanks for this Ted. ..Ed.

Fog Lamp Protection.

I am grateful to Terry Cunnane for the following useful information...

Although headlamp protectors are available and can be obtained from the Club or Volvo, for most current models, there are no such protectors for fog lamps. Nor are replacement lenses available for most lamps either, necessitating the purchase of a complete lamp in the unfortunate event of breakage.

There is a company though, who can supply protector material for virtually any type of lamp at a cost of about £15.00. the protection is easy to put on but does not like pressure washers! The company will be pleased to give you all the information you need:-

ARMOURFEND', Unit 33, Hillgrove Business Park,
Nazeing Road, Nazeing, Essex, EN9 2HB. Tel. 01922 892896.

Underbonnet Sound Insulation.

Ted Brown, our 300 Register Keeper sent me this useful info. regarding sound insulation for use under the bonnet. Thank you Ted.

It's black, it looks like egg boxes and as it ages, it crumbles! This is the stuff used to help keep underbonnet noise limits down. The Volvo dealer price for a replacement pack was quoted as £74.00 (payable in advance too!)

After searching up and down the country, everybody knew exactly what I wanted but could not help. Finally, I approached Wyns of Redcar, telephone number 01642 481779, who supplied, cut to my patterns (4 pieces) at a cost of £12.50. Quite a saving!
The colours available include, Yellow, blue and black.

Specialist Components For The Older Vehicle.

This is just a reminder that I have dealt with this company mentioned below and have found them to be most helpful indeed:-

They can supply:- Brake pads and shoes, Wheel cylinders/kits/hoses , Brake discs/drums, Brake calipers/kits, Master cylinders/ kits, Servos/kits, Clutch kits and parts, Master cylinders and slave cylinders/kits. They also supply Steering and Suspension parts and Shock absorbers, Water pumps, Wheel hearing kits, etc. etc.

They can also re-condition your own brake master cylinder by boring out and re-sleeving in stainless steel to the standard bore. (About £90.00, I believe).

I got all Betsy's caliper kits from them and a replacement piston after I broke one!

PAST PARTS LTD.,
Chamberlayne Road, Moreton Hall Industrial Estate,
Bury St. Edmunds, Suffolk. IP32 7EY
Tel. 01284 750729. Fax. 01284 756240.
internet: http://www.pastparts.com
e-mail: restore@pastparts.com

Some Notes on Car Polishes and Polishing

By Ian Milne (and his trusty 360GLT).

Over the past 30-plus years I don't think that there is a polish that has been manufactured that I have not tried due to my association with several car clubs and the motor trade. We all have our favourite tried and tested polishes. Simonize. Turtle Wax, Mer. Dinaglaze. and the most popular one at this time seems to be good old Autoglym.

This was my choice as it was the product I was instructed to use when I did my car valet course many years ago in fact it was the only course to be recognised at the time by a number of car manufacturers. I used it on cars at several car shows with car clubs that I have belonged to in the past and have had several 1st. places for my efforts. Well. I have just read about a product that Lord Montague has kept to himself for some time, I believe about 5 years. and that is Meguiar's Car products. *Yes,* they are an American company and yes, they do have a web site:-

www.meguiars.co.uk & expert@meguiars.com Their tel. number is 0870 241 6696 Ed.

Recently they had an article published in Practical Classics magazine. I have now purchased the products and it lives up to the company claims. It's easy to use, no streaking and no light powder polish dust that you sometimes get with other polishes. I only wish that I had heard of this superb company in the days of doing the rounds of car shows.

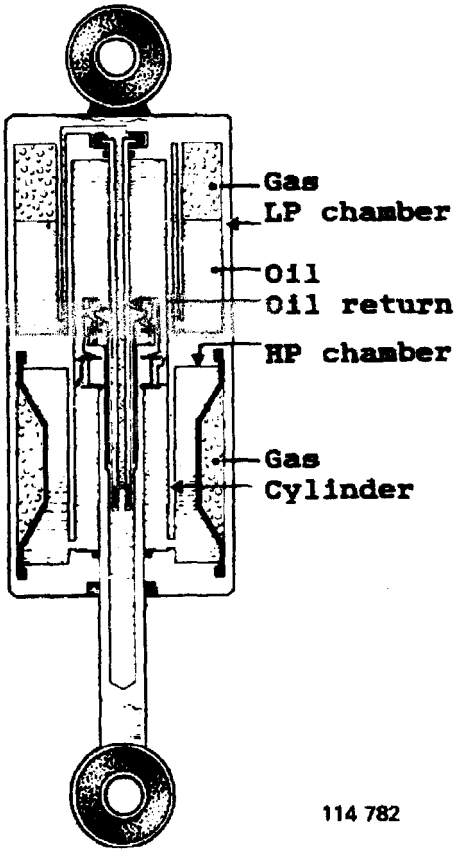
Points to remember when cleaning and polishing your cherished car.

Wash with car shampoo and **not** house-hold washing up liquid as this has salt in its make up. Always leather the car dry and leave it for about one hour before polishing. That way the car is totally dry and gives you time for a cup of tea. And never polish it in the direct sunlight as this will only tend to bake the polish on even if you are using a silicone polish, This in turn will take longer to remove and may add to the dreaded streaking marks in the final finish. I am fully aware that most of the Club's show Members will say, "We know all this already." but for new Members this article may be of help.

Nivomat Self Levelling Dampers.

Information Courtesy of Volvo Car UK.

Volvo 760s and 780s are equipped with Nivomat self-levelling dampers. This type of unit incorporates both a damping function and a pumping function.



The dampers are frequently replaced in the belief that the damping function is faulty. In many cases, however, examination has actually shown that the units are perfect.

The following is a description of the damper operation and the method of checking the unit.

Description.

When the car is loaded, the damper is pumped up until the correct level is reached. This level is preset and is a function of both load and spring stiffness. The normal damper level is then reached after driving a few kilometres.

Settlement of the car after parking for a few hours, or when loading. does not necessarily mean that a damper is faulty. However, the difference in level between the left and right-hand sides should not exceed 15 mm.

Level adjustment commences as soon as driving commences and normal level is reached soon afterwards-

Settlement of the car below the preset level while driving indicates leakage of gas or oil. This means that at least one of the dampers is faulty and should be replaced.

Note: If only one damper is faulty, only that unit need be replaced.

Inspection of the dampers on the car:-

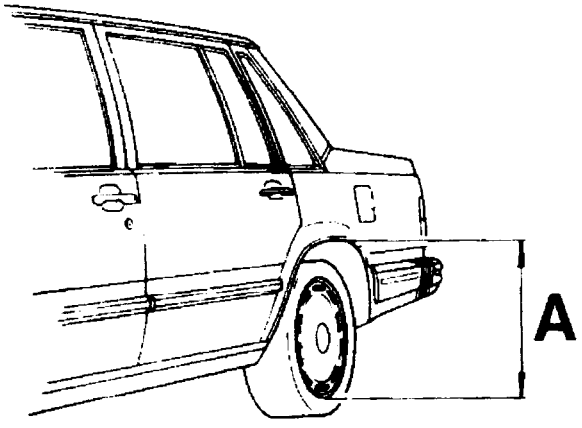
Check the damper for excessive oil leakage. Note: Slight 'sweating' around the piston rod actually consists of tiny droplets produced by movement of the rod and does not indicate that the unit is faulty.

Unload all heavy objects which are not part of the standard equipment of the car.

Drive approximately 2 km to ensure that the normal damper level is reached.

Park the car on a flat, level surface. measure the distance (A) between the lowest point on the wheel rim and the highest point of the wheel arch, on both left and right hand sides of the vehicle. The **difference** between the measurements must not exceed 15 mm.

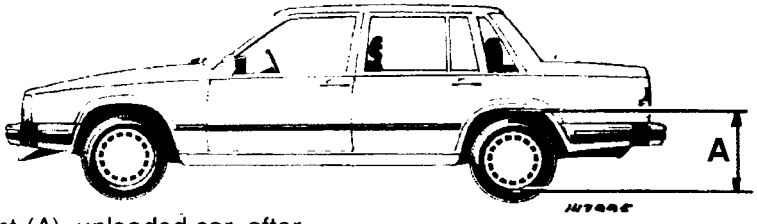
Load the luggage compartment with 150 kg of cargo, evenly distributed on both sides. The distance (A) should now decrease due to the extra load.



Drive the car, (still loaded with the extra weight) 2 - 4 km on an uneven surface and again measure the distance (A) on both sides. The distance should be the same as on an unloaded car - subject to a permissible deviation of -20 mm. to +8 mm. the difference between the left and right-hand sides must still not exceed 15 nun.

The damper/s in question must be replaced if the results of measurements are outside the above limits.

Inspection Report - Nivomat Dampers (on car).



Measurement (A), unloaded car, after driving approx. 2 km. Left..... Right.....

Load luggage compartment with 150 kg. of cargo.

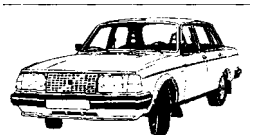
Measurement (A), loaded car, after driving approx. 4 km. Left..... Right.....

Difference between unloaded and loaded car. Left..... Right.....

Permissible deviation: -20mm to +8mm.

Remarks:-.....

Now Something completely Different!



240 Turbo

Paul Clifton passed this interesting article from Paul Simson on to me a while ago and it just goes to show what you can do with a bit of initiative and imagination

I know they made them in foreign countries but not like this. (This one was home made). They were only 2.1 Turbos, this is a 2.3 pumping out 173 bhp and running through a standard 2.3GLT gear box (4 speed & overdrive), it's a lot of fun. Dan, Mark and myself spent considerable time down at the pub talking about this so called project of ours.

The plan was to buy a 240, remove the engine and replace it with a 760 Turbo version. The problems were:- 1/. Effort and 2/. Distributor position. Mark, who works for a Volvo specialist, Kings of Witcham reckoned that the engines were basically the same apart from that on 240s, the distributor is located on the front/side of the engine where as on the 760 Turbo engines it was located on the rear, (or so he thought). That would mean chopping the bulkhead about.

Then one day we decided the time had come. So off we went to some small place in Norfolk and purchased a 1983 Silver 240GLT estate 160,000 on the clock for £200, tax and MOT included (bargain). I was quite impressed with the drive having never driven a 240 before. It flew us home at a ton quite happily. (Careful!!)

A few weeks later, a 760 was found in the paper, an early, 1983 model. Upon inspection of the car I couldn't believe my eyes, the distributor was fitted at the front of the engine, due to it's being an early model I suppose, who knows.

That was good enough for me so £200 cash changed hands and we were now the proud owners of a 240GLT and a 760Turbo. The engine was removed from the 240, which didn't take long. The 760 engine was removed and all the wiring was coded and labelled due to it being electronic injection - wires everywhere!

The 760 engine fitted in the 240 ok. The air box didn't fit though - (not enough room) - so was replaced with a K&N Filter. The exhaust had to be slightly modified to avoid the steering column. The mounts were removed from one engine and swapped to the other. The bolt holes lined up with the bell housing.

Basically it bolted straight in. A blanking plate was removed from the gearbox bell housing to accommodate the crankshaft sensor. Throttle linkages were swapped and connected. All other ancillaries were connected.

The engine was in. All that remained to do was the wiring of the ECU. This took a while to do with some serious head scratching, cigarette smoking, and wiring diagram poking but eventually it was up and running.

When we took it for a test drive the thing went like a rocket. 1st gear is great when the Turbo cuts in (due to the 240 manual box) especially if it's remotely wet! The suspension was lowered for handling reasons and there you have it, a 240 Turbo. Total cost £600. What's more there's a chip available for the ECU that could give it another 35BHP!

The car is now for sale. Why? I now have project no. 2. A `68 144DL.

Whatever next! First a V-8 in a 740, now a 2.3litre turbo in a 240 - perhaps a diesel Amazon or 140? What are you going to do to your 144? Well done to you Paul and your team of intrepid mechanics Ed.

Loose Cambelt Cover Bolt.

440 SI

Bob Edmonds, *of Plymstock, Devon, called me a while ago to enquire if I had a spare Technical No. 109 and whilst chatting told me this tale which I feel all 400 Series owners should take note of,*

My wife and I were descending one of Devon's long steep hills on a dark, dank evening. I had put the CVT into 'low hold' to avoid over-running the vehicle in front and apart from the hum of 3,000 revs. all was well. As we reached the bottom *of* the hill, the engine gave the most awful noise I have ever heard. It sounded like a bucket *of* old nuts and bolts, or, as my wife said, 'old chains'. Many years ago a Humber engine gave up on me in a very serious way, but this noise was worse!

We coasted to a halt, under the canopy of a deserted garage, now a farmers' supply outlet. I took a look under the bonnet but there was nothing to see. I checked the oil and found it to be OK so it was time to call for the 'cavalry'. The RAC arrived just as they said they would. They checked the oil, peered inside the cam-belt cover and said " Um, tow truck". So while my wife was whisked away home, I waited for the tow truck. The driver arranged to deliver my car to my nearest Volvo main dealer in the morning, while I retired to 'The Fisherman's Rest' for a coffee and something more warming.

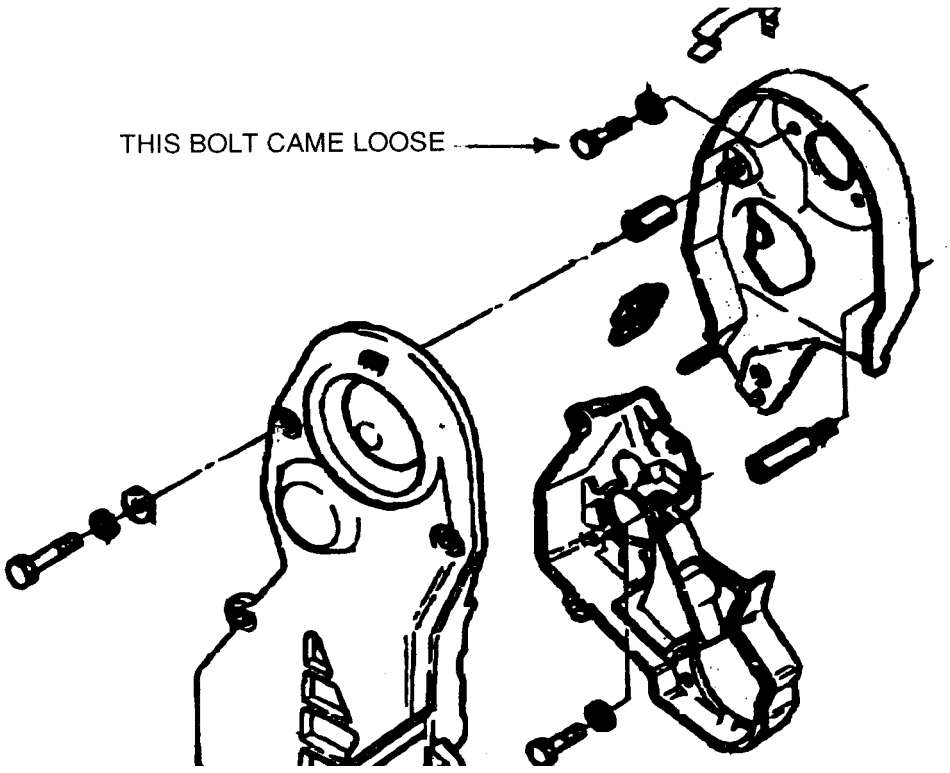
At the end of the next day, Kastners *of* Plymouth phoned to apologise for not telling me they had received the car and that it would be ready the following day. when it had been cleaned and valeted..They always present you with a clean car. I was duly collected and presented with a smile, not a bill!

The problem.

The cam belt cover fits on to a back plate which bolts on to the front end of the engine. The top bolt (item 16 in the sketch). had worked its way out and was just touching the inside of the top toothed wheel. Another half a turn and there would have been a disaster - a broken toothed wheel, camshaft stopping, valves/pistons damaged etc.

Thank you *for this Bob.* ***I*** *know it would add cost to the building of the engine but I feel that some form of locking would have prevented this bolt coming loose. In many applications - crankshaft and con rod bearing caps, flywheel bolts etc. - this practice is the norm but there are other situations where a small hole drilled through the bolt heads and a length of locking wire would have prevented this sort of problem arising.*

It is a credit to Kastners of Plymouth to have looked after Bob as they did. So many times ***I*** *am told horror stories about garages but this is a refreshingly excellent change. Well Done Kastners!* *Ed.*



L.P.G. for Turbo Engines.

Bob Isaac kindly forwarded this information to me from Matt Bloor. I know that more and more Members are becoming interested in LPG conversions and all information on this topic is *of great interest*

Recent innovations in LPG technology mean that Turbo based vehicles can now be converted to LPG using LPI (Liquid Petroleum Injection) where computer controlled injectors are fitted directly to the inlet manifold of the car. These are now very reliable and do not require constant recalibration as previous old style LPG conversions did. The injection system is better because it does not interfere with the petrol system in any way and the computer system controls the gas flow, allowing it to increase significantly as the Turbo 'kicks' in - the main problem area with LPG conversions. I have just enquired about converting my 940 LPT to LPG using an LPI system from VIALLE (who supply LPI kits to Volvo's dual fuel new cars). This will cost approximately £1350.00 including the 70 litre gas tank. I wanted to point this out because I was mislead by the statement on the Website about conversions on non-turbo charged cars. I have since done some investigation and have found that conversion on a turbo charged car is common if slightly more expensive.

TIPS & EXPERIENCES.

Amazon

This most useful and informative article was sent to me by Jan Ziomek from South Wales. I am sure it will be avidly read by all Amazon enthusiasts!

Windscreen.

I bought a new laminated windscreen from UROGLAS, Bromsgrove, 01527 577477 direct out of their stock because score marks made wet night vision difficult. I had tried to remove the marks with jewellers rouge, and other advertised products but it just gave the score marks a lovely shine; these were deep marks.

Sealing mastic was applied between the screen and rubber, and rubber and the body. The traditional string method was used starting at the top, behind where the mirror would be and finishing at the bottom centre. I found that by screwing the inner screen steel finishing sections, mastic would ooze from the joints. So using the system as cylinder head bolts, i.e. working from the centre, screw the self-tappers a little at a time to allow the mastic to ooze and seal.

I've had no leaks or problems since fitting, although the external trim was difficult to fit, made worse by the slight distortion in the corners during removal, because I was keeping the seal which was new.

If you are keeping the screen but just want to cure a leak DO NOT attempt to remove the screen from the rubber. CUT THE RUBBER and carefully lift the screen out. I guarantee you will crack a laminated screen if you try to lift the rubber from the screen!! A new rubber is cheaper!

J Type Overdrive.

I bought a 2nd hand overdrive/gearbox which had a large output flange, which I believe was from a Volvo 140. The overdrive was refurbished by **Overdrive Repair Services, Ellisons Road, Sheffield,** who arranged the pick-up and delivery to, my home. They prefer to service your own unit because there could be a small difference in performance that you are used to. Although they will send you one to reduce the time the car is off the road.

For info the first numbers of the serial number indicate the percentage reduction. i.e. 25/105634 is a 25% reduction.

Included in the service (at my request) was a change to a small output flange to fit the Amazon propshaft. This also made the overall length 15mm shorter.

A new Volvo overdrive rear gearbox rubber mount was fitted. This mount soon compressed and the gearbox contacted the cross member on acceleration and road bumps. A friend who prepares Historic Rally cars advised the use of an early (1972) Range Rover front engine mount because these are designed to endure engine braking loads.

These mounts are dimensionally very close to the Volvo type but approx 5mm had to be removed from the threaded end which could contact the gearbox. This has prevented the sag.

If you have a torque wind up problem on your engine try using these mounts instead of stabiliser bars because the Volvo engine and gearbox mounts are the same (except the overdrive mount is a larger diameter).

My 1963 4 door 122s Amazon prior to fitting the overdrive was 1100kg (without my weight of course) after fitting it is 1132kg.

I had to buy (now only available used, although I have just seen the same type on a TR6) and fit an INHIBITOR SWITCH. The main function of the switch is to prevent you engaging overdrive reverse because this has serious consequences. The J type can handle larger torque values so with a bit of ingenuity you could have overdrive 3rd and 4th. A friend has a race set-up Triumph 2000 wired this way.

There is a cast boss in the top cover of the Volvo gear box ready to accept a 16mm x 2mm pitch thread. I had to convert my existing cover because the gearbox bought was coverless. The position of this boss is such that a metal 'flag' on the 3rd/4th selector shaft makes the switch only in 4th gear.

The power to the switch is fed via a relay from a fused supply, then into the overdrive solenoid.

I have fitted an illuminated push/pull switch to the dashboard just above the gear-stick; because my brain is accustomed to 5 speed cars and to engage/disengage the overdrive is more natural with my left hand rather than my right where the Amazon stalk would be. The switch can be operated during the change from 4th to 3rd.

A switch could be incorporated into the knob of the gear stick but with the amount of movement involved in gear changing the wires would not last very long.

The smoothest engagement of the overdrive is achieved by allowing the engine speed to fall before operating the switch, the engagement is immediate'.

The overdrive has within it a hydraulic circuit which does not allow the pressure to fall instantly when it is disengaged. This is done to reduce shock loads on the driveline, but it is still smoother to disengage using the clutch.

Noise Reduction.

From past experience of a PV 544 many years ago, induction roar with the twin S.U.s and pancake filters is a Volvo problem. A Triumph 2000 air filter housing was found in a local scrapyard, this is a compact unit to give clearance around the steering shaft, master-cylinders, etc., also if it has the capacity to handle 2 litres then 1.8 litres should be o.k.

I had to modify the mounting holes to align with the S.U. holes and to keep the same filter elements. A spacer is needed to keep the flat face of the housing from vibrating against the piston chamber of the carbs., 5mm thick nylon is used although any non-metallic material would be o.k., mainly to act as a damper.

There has been a significant reduction in noise. I have not been scientific enough to measure performance or fuel consumption before and after the change, the performance does not feel any less in fact because there is less noise it can be used more.

One problem emerged later when the rear filter got sucked into the carb mouth, since then heavy duty double-sided adhesive carpet tape hold them in position.

The later model Volvos have a one piece filter housing which I will try when I can find one.

Interior Carpet.

The one piece rubber mat that came with the car was in a poor state, and had a strange smell (they are all like that Sir!). So after many phone calls a company called **Motor Upholstery Supplies,** (phone was 0933 227166/ 0933 223602) had either a dark green or dark brown carpet to fit the Amazon. The dark green was bought, my car is Mist Green.

The seats had to be removed because the carpet was in one piece and it came with a good quality noise suppression underfelt. The original pattern for the carpet must have been an automatic car because the carpet is 'full', over my gearbox tunnel.

An Aluminium foil blanket was also fitted over the gearbox tunnel and under the felt to reduce the heat in summer. This works because it is comfortable even in the hottest days.

The original rear footwells were salvaged from the old rubber mat and lie on top of the carpet to save it from muddy boots. This has also significantly reduced the noise inside the car.

Seats.

The original seats that came with the car made you feel as if you were sitting on top rather than sitting in them. They also had a shiny finish which caused you to slide about. When I tried an Amazon with the post '65 seats, the difference in comfort was so great, my car soon had these fitted.

The fitting was quite easy, the rear squab and backrest just lift out. The brackets that hold the front seat frames to the floor need to swap sides, i.e. the bracket nearest the door goes nearest the transmission tunnel.

In a previous Volvo Technical Driver was the good idea of adding webbing to the seat in the extra North/South direction. I had a concern that this may produce a seat that sat you too high and gave less back support, but this has proved to be not so. During long journeys of more than an hour I found the original webbing would sag but with the extra webbing this is not noticeable.

To achieve more leg-room in the front an extra inch was found by changing the holes that the mounting bolts that hold the seat frame to the runner are in. These are accessed by removing the seat squab and below the webbing.

Seat Belts.

The original seat belts which clip onto the centre ring attached to the transmission tunnel have always been difficult to adjust to my different passengers and when one is attached to the ring its hard to get the second one clipped.

Modem Inertia Reel belts would be more practical but would defeat the object of running an old car. A compromise has been found in the use of later belts (in my case from a 1968 123GT). These secure into individual slots of a large bracket anchored in the same way to the tunnel.

Be careful that the anchor bolt does not foul on the propshaft flange below. The other belt anchors are secured to the body in the same way as the original.

The adjustment is easier, by gripping with one hand the 2 black plastic lugs and pulling the lap belt with the other hand. Once clipped to the centre the excess length can be pulled back to suit.

To release, a small lever on the centre bracket is pulled towards the rear of the car and out pops the belt.

The Amazon, since very early in its design and manufacture has the ability to fit rear seat belts. I found by feeling under the head lining on either side of the rear window about 85mm vertically above the top piping of the rear seat is a ready tapped hole for the seat belt bolt. By lifting out the seat squab you can find the other.

For a complete lap and diagonal I had to drill another anchor on the wheel arch.

Ignition Keys.

In previous Volvo publications there was a warning about the fragility of Amazon Ignition Keys. When one of mine twisted, due to the repeated force to move the switch from the Ignition On position, to the Starter position, and nearly leaving the broken part inside the switch I fitted a separate spring loaded push button below the key switch to engage the starter.

Exhaust System.

Having read that Volvo made a worthwhile improvement to the Amazon by changing to a twin down-pipe exhaust manifold and **Brookhouse** had a special offer on a Simonz sports system and my original system was on its last legs opportunity was knocking.

A twin outlet manifold came my way but it was a single Stromberg with cast-in hot spot which would interfere with my twin S.U,s. So a few minutes with a good hacksaw blade and angle grinder the hot-spot was removed. Three new studs were fitted and the mating faces cleaned and checked for flatness.

During fitting to the car it was difficult to determine which way around the section over the rear axle went, needless to say, the first was wrong because the rear silencer did not properly engage with the pipe. You have to be impressed by the way the Simonz system just clears everywhere and has used the undercar space to good effect. It is also of a sturdy construction and sensible wall thickness to the tubes.

Since fitting the car responds better. The acceleration up to 50 mph appears the same but its moves thereafter noticeably quicker. Fuel consumption on long runs appears better but again I have not carried out any detailed checks, my car only does about 3000 miles a year.

One drawback with the system is on the overrun there is what appears to be a shockwave that travels back up the tailpipe and causes an unpleasant vibration. Those with memories of Morris Minors will understand. A 90% cure of this was found by fitting a short tailpipe about 70mm long into the end of the Simonz silencer. This has also taken away a boom that occurred when pulling uphill on the motorway at speed.

Parcel Tray.
While trying to secure a loose tray I used a larger self-tapping screw without realising the battery was just the other side. Make sure you don't make this silly mistake, I only found it when the car became difficult to start!

Road Holding.
Over the 8 years, various improvements have been tried , starting with cut down coil springs, I've bought higher rated but shorter coil springs, and these gave super cornering power but the ride was poor.

The car when bought came with newish tyres with name **Pneumant** on them. These were responsible for a lot of the roll and deflection in side winds. With no previous experience with Amazons it was not appreciated that tyres made such a difference.

Even today if the car needs to be in a comfort mode, i.e. it has been used as a wedding car three times, the tyre pressures are set to 24psi (on 165x15 radials). Or if in a performance mode, when its used as the Closing Car on our Historic Road Rally then the pressures are raised to 28psi front and 30psi rear.

The car today uses standard springs front and rear, to give confidence on ground clearance and suspension travel, especially when 4 up, or a boot full of logs for our open fire. (We used the Amazon recently to man the end of the first forestry stage on the Network Q Rally Recce.)

There is less chance of damage being done to the underside, there are no vulnerable injection pipes, or catalytic converters to hit when travelling through the forest tracks.

There is an extra front anti-roll bar of 12mm dia clamped to the existing one. This was a technique I first saw on competition Ford 105E Anglias and still works today.

There are also urethane bushes on the top front wishbones these sharpened things up but were supposed to produce more harshness but none that I've noticed.

For information, I found the gap between the front lower wishbone bump rubber and the cross member to be significant. The less the gap the less suspension travel and the bump rubber becomes a spring which is not good in cornering because load transfer is rapid. Also, once the bump rubber is hit the anti-roll bar becomes less effective.
Too large a gap is good for ride but is poor for roll.

Here are some typical figures;
A= Floor to wheel arch height
B= Bump rubber clearance
C= Ground clearance(front cross-member)
Dimensions in mm.

A	B	C
640	22	150
660	45	180
690	55	200

Brake Hoses.
The Amazon has a single circuit braking system and a good steering lock, this combination and the early front brake hose routing caused me some concern when I noticed that the tyres can contact the hoses on full lock. The hoses have been changed to stainless steel braided types supplied by a local specialist company at a very reasonable cost and the routing is such that contact is unlikely.

Water Leaks.

240

Cliffe ***Pope kindly*** *responded with this account of a water leak problem he experienced on his 240. It is unfortunate that the fuse* ***location is where it is on these excellent models.*** *Volvo had it right with the 140s,* ***then got it right with the 740s and 760s***

Steve Woodward's article and the other contributions in the last issue of Technical Driver were very timely. I had been trying ineffectually for some time to cure a small but persistent leak by the fuse box, first drawn to my attention by the partial failure of several circuits caused by corroded fuses. Then the leak got worse.

I have, I hope (!) now cured it. Thank you everyone. I would just add a few further observations:-

1) Do not assume because the water appears near the bottom corner of the windscreen that that is where the leak is. Water can enter anywhere around the windscreen, and then run along behind the trim until it finds a way through.

2) The jug of water test is not infallible. Air flow up the windscreen can blow water uphill under the trim and over the metal lip.

3) Be careful trying to re-seal the trim from the outside. Lifting the rubber to squirt in more sealant can break the seal further along. I found it was better to remove the plastic trim from the door pillar and pull back the rubber strip in front of the dashboard, and squeeze more sealant in from the inside. The square end of a pencil is ideal for squidging old and new sealant down between the glass and the metal frame, without disturbing the seal on the outside.

4) I am not convinced about the value of tarred paper to block holes. Water should not be there anyway, and merely diverting it away from the fusebox seems like a dubious expedient that will just store up trouble somewhere else. My instinct would be to rip off all such paper and to encourage ventilation instead.

On a similar water ingress theme, I recall the time I parked facing downhill for a wet week at a camp site. When I drove the car I could hear large quantities of water sloshing about inside the box sections. I concluded that the drainage channels inside the scuttle do not function properly if the car is not on the level.

Thank you for this Cliffe. I would further draw Members' attention to the excellent article by Kay Campbell in Technical No. 111, in which she covers the problem of leaks in 700 series models. In principle, these measures equally apply ***to other models so do read that article, it may well help you.***

I quite agree with what you say, Cliffe about the non-advisability of using tarred paper around the fuse area but can also see the other point of view. No, there should not be any water present under any circumstances! A 'deflector shroud' could do no harm though. Bear in mind what Cliffe says regarding ventilation though, don't overdo the 'shrouding'! ***Ed***

News and Views From 'Down Under'.

164, 740 and V-8 Conversions etc.

It is always good to receive correspondence from our Overseas Members and this, from John Pearey, in Australia is no exception. It is always enlightening to read of the variations on the Volvo theme from abroad

The January copy of Volvo Driver was in our mailbox at the post office this morning, so I was able to read a bit of it in the doctor's waiting room. A couple of things that may be of interest.

We bought our current 'new' car (a 1971 164E) about 4 years ago with 40,000 miles on the clock. The front shock absorbers had been replaced with Monroe Gas units just before we bought the car.

The car has now done just over 80,000 miles but for the last couple of months there has been a bit of a knock in the front suspension and I finally located it when I took out the O/S shock absorber.

I had undone the top nut, but when I unscrewed the bottom two bolts everything fell out including the captive nuts. The captive nuts and the area around them had been punched out of the lower wishbone, how everything had stayed in position I do not know !

Our roads where we live are formed gravel and they soon develop corrugations that can play havoc with any car not well built. Both shock absorbers looked fine, no oil leaks or any sign of wear, but I think the O/S unit must have been tending to seize up, and the wishbone gave up with the extra strain.

An ex rally driver told me how they repaired and reinforced the lower wishbones, so after that was done I fitted a pair of Sachs 863001s that I had in stock. They appear quite good and a great improvement on the Monroe units. The moral seems to be, 'don't be fooled by the outside appearance'.

My second thing may help Terry Roberts of Milton Keynes. Several years ago I had a 1989 740GL with the B230E engine (we don't get the smaller 2 ltr. units here). I had quite a few problems with intermittent bad starting and eventually traced it down to the fuel pump relay.

The relay itself was fine, but the socket connecting pins seemed to have lost their tension and hence the electrical connection. I found by having the relay at a slight angle (with a small piece of wood) solved the problem. I should have taken the whole assembly out, but I had too many other things to do.

It was interesting to see the info about installing a V8 into a 7 series. It is has been a common modification out here for a few years, but using either Ford or GM units of about 5 ltrs. At our recent National Meeting in Geelong, a 245 fitted with a 5.7 ltr. Ford won the people's choice prize for the 2 series because it had been so well finished in an eye-catching pale lilac !!.

There were five cars with V8 conversions and another with a Nissan V6 turbo. If anyone is interested I could get some local contacts, it is now so easy on the web.

I am thinking a rebuilding another 120, but this time for my wife to use, however she finds the steering very heavy at parking. Do you know of any info. for fitting power steering to a 120? 1 know a 164 unit can be made to fit, but it is large and I wondered if anyone knew of a smaller unit that could be fitted.

Although I concentrate on the older cars, I still read all the magazine sections as people in our club still need advice on the modem cars. One of our members has acquired a 340 CVT, a model not sold in Australia, so he has a problem finding out anything about it. I passed on the info from issues 108 & 109 and he was very grateful.

Very many thanks for this John. I have heard of this lower wishbone failure and the reinforcement before and suggest that all 140 owners do inspect theirs as a matter of course.

The dreaded fuel pump relay is a very common source of trouble (I've often said that they should come with a Government Health Warning!) The socket is likewise well renowned for its loosening off and even burning up. (See also page 17).

With regard to the V-8 etc. conversions you tell us of, please see if you can get us some more information and perhaps some pictures. It is a shame that our tax laws make such conversions prohibitive from the fuel consumption point of view but never-the-less it is interesting to see what can be done.

Re. the power steering. You lucky lot in Australia did import 140s with PAS when they were current. I wonder if you have seen any of these? Could one be made to fit an Amazon? Kay Cambell suggested even having a look at a Range Rover or Land Rover 'Defender' steering box as one of these may be a viable solution. You never know!

Ed.

Variable Intermittent Wipe With Memory for 850

Those of you with 850s may be frustrated by the 'fixed interval' screen wipe on their cars. I was told about, that on the Volvo Owners Club Message Board, was an interesting modification, which I am printing here as there are still many of you out there who do not have (or even wish to have) a computer.

I believe this was originated by ***Duncan Hancox and I thank him for the tip:-***

There is a relay that will give you programmable variable intermittent wipe. you switch on the intermittent for one wipe only, then wait until you need the wipers again, switch on again to intermittent and leave on. The relay remembers the interval and keeps going at this rate until you turn off the intermittent wipe.

This can be made to vary from between 1 second and about 45 seconds between wipes.

There is no wiring or modification needed at all.

To get the relay, ask your Audi Main Dealer for Part No. 357 955 531. this is smaller than the standard Volvo relay, but just plugs in as a direct replacement. The cost is £37.00 plus V.A.T.

The relay is located under the driver's side dashboard - remove the plastic panel under the steering wheel (3 screws) and it is the top row of relays, 2nd. from the left. You can feel it 'clicking' when you leave the intermittent wipe switched on.

Intermittent Tailgate Wiper Mod.

140/240 Series but could apply to others.

I received this very comprehensive article from Mike Garrard who has contributed much useful information to this magazine. ***I feel sure some of you will want to follow his example and fit a similar system to your pride and joy, I might even do it myself.***

Here's some information on windscreen wiper motors. It's drawn from Volvo 140 and 240 series but is highly likely to apply to other series - certainly the Lucas systems on old British cars use the same circuits, albeit with less reliable electrics!

Episode 1 covers the fitting of an intermittent action to the tailgate wiper on my 1968 145S. I wanted this so that when driving during damp or rainy conditions, I could leave the switch on rather than pulsing it when I wanted to see rearward. Episode 2, to follow, will cover front wipers.

To understand the operation of self park wipers, refer to Figure 1. The dash switch is shown in the off position. The park switch is operated by the motor, and is shown in park position. When the motor is rotating, the park switch spends most of the time connected to battery: it briefly connects to the dash switch when the wiper arm is in the park position.

Let's look at a single wipe action: the driver pulls (activates) the dash switch, which applies power to the motor. Moments later, the park switch also connects the motor to battery in parallel. Sometime later, the driver pushes the switch off. The motor continues to operate using power supplied through the park switch. When the arm returns to the park position, the park switch connects back to the dash switch, and the motor is shorted to ground. This latter action brakes the motor, which might otherwise freewheel past the park position.

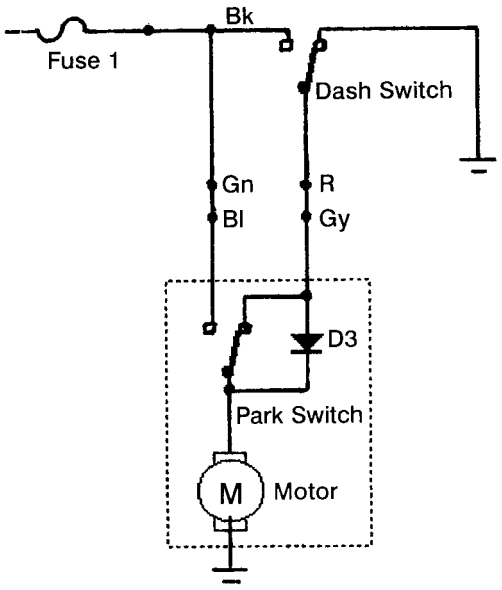
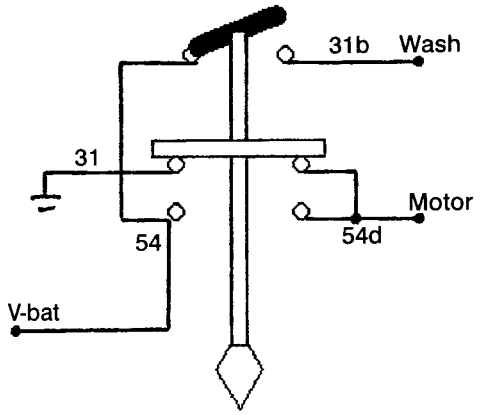


Figure 1 - Volvo 145S rear wiper circuit.

One further action is available: if the driver leaves the dash switch on, it continues to supply power and the wiping continues. The diode is required to bridge the changeover of the park switch. If it were not there, then there would be a brief moment after the park switch had disconnected power from the dash, but before it reconnected the motor to battery. At best this would cause a jump in wiper operation, and at worst the arm would stall.



Volvo 1968
Switch pull

The 145 pull switch diagram (above) is shown, so it can be related to the schematic. The first pull changes the motor contacts, and the second activates the washer (not shown on the schematic for simplicity).

Note that front intermittent wipers usually use an arrangement without the diode. This requires an additional lead to the motor, which would cost more than the diode.

Now to intermittent relays. The one I used was a six pin blue item extracted from a 1983 265 GLE, above the passenger footwell, but I think they also come in brown, & black for the front relay. Use the wiring colours below to identify the correct one. The contact numbers can be seen after the connector is removed. Get the connector and 6 inches of wiring too.

The wipers operate when the switch is first thrown, so a single wipe action is available. In addition, the wipers operate continuously during and for a few seconds after washing. But without changing the dash switch, a continuous wipe only action is no longer available.

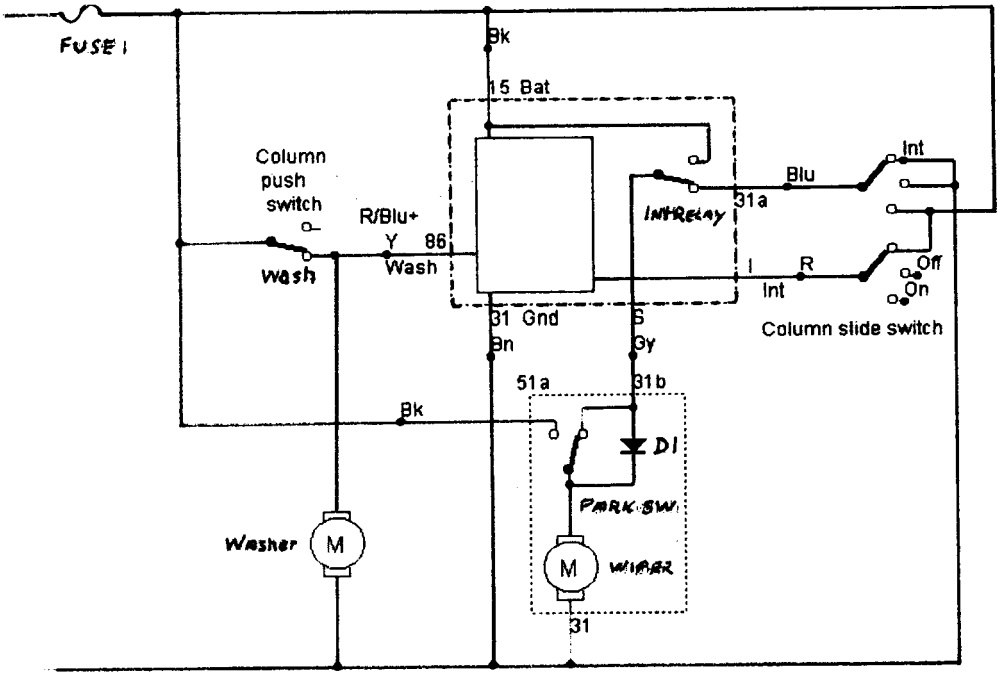


Figure 2 Volvo 245 rear intermittent wipers

The schematic Figure 2 comes from a 245 manual but appears to match the 265 wiring. The wipers are operated by a 3 position slide switch, giving Intermittent-Off-Continuous action. When the slide switch is in the intermittent position, the relay contacts are wired up to act like the dash switch in the 145 installation. The relay is instructed to pulse by connecting the `I' contact to battery. There is also a connection to the washer circuit, which instructs the relay to remain closed during and for a few seconds after the washer switch is closed.

The intermittent action on the 145 combines the two circuits, as shown in Figure 3.
One point of note is that on the 145 switch, both battery power and ground wires are black, so the terminal numbers above must be used to identify them. Much of the wiring can be left as is. To connect the relay, the battery connection must be made. The relay connector has two wires so I spliced both in at the switch. The brown and blue wires are both connected to ground, and I used the switch black wire. I cut and insulated the spare R/Blu wire, and spliced the yellow from the relay into the yellow from the switch. The relay power control sits in series with the red from the switch to the motor. The red from the relay l connected to the red from the switch. The wire just cut, that heads to the motor, is connected to the grey from the relay. For reliable connections, avoid the 'Scotch' blue tap in connectors. After a while they can fail. I solder wires then use heat shrinkable sleeving (-www.maplin.co.uk) but screw terminals and crimp connectors are also usually reliable.

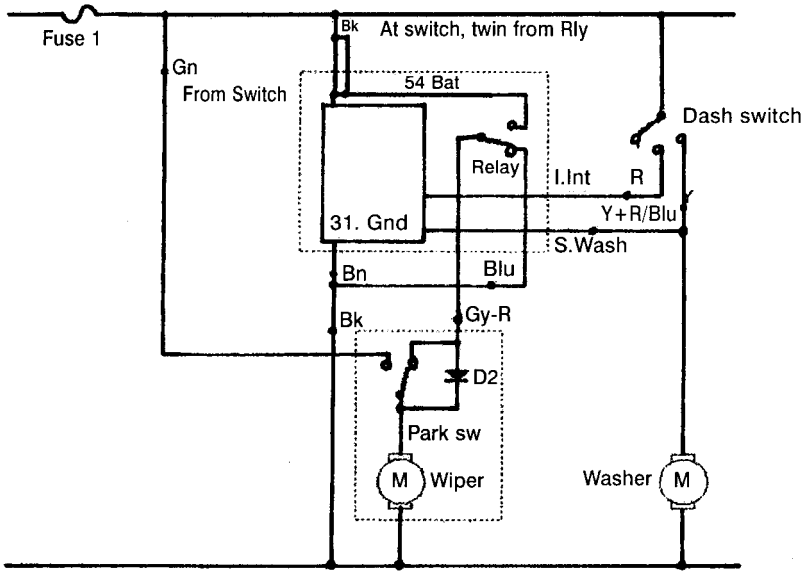


Figure 3 Intermittent wiper relay from 265 installed on 145 rear wash wipe

Preparing Your Car To enter A Competition.

As ***the Summer is*** *approaching and with it the prospect of* ***attending a few shows, this advice .from Ted Brown is most appropriate***

If you decide to enter into the challenging world of competitions, perhaps I may offer some help towards your preparation.

Materials required.

Both Interior and Exterior Shampoos, Wash Leather,
Cotton Polishing Cloths, Polish
Colour Touch [Paint],
Brushes Different sizes, shapes, and bristles; for example, wire, brass, and nylon.
Glass Polish, Wheel Cleaner, Trim Dressing, T Cut,
Kitchen Gloves [Some cleaners attack your skin]

First start by, looking under the bonnet. If it's dirty and oily, cover all electrics with polythene bags, then have it steam cleaned. (This is when bits of dirt fly all over.) I find brushes and T cut valuable aids in cleaning this part of the car. ***(Be*** *very* ***cautious with steam cleaning as you can cause untold problems with electrics if you are not*** *careful!.Ed)*

Examine gaps between panels, doors, bonnet, boot/hatch. They should all be equal. Any imperfections in paint, scratches. Dents, rust and bumper damage should be corrected at this stage. The same applies to all five wheels. Shampoo outside the car. Rinse & leather off.

Apply polish in small circles to the roof, and then polish with in-line strokes, using cotton cloth. Finally buff off using clean cotton cloths.

Clean and polish doors and apertures, boot & bonnet. Polish windows inside and outside. Vacuum inside the car. Then shampoo and finally apply trim dressing. Apply the same loving care and attention to the wheels. (A clean body with dirty wheels is like having a smart suit with dirty shoes.) Treat the tyre walls with tyre dressing. Empty the boot/ hatch totally and apply T.L.C. Recondition any tools. If your car shines like a new pin, you are more than half way to winning your class. Take your cleaning material, water and a bucket to shows. I use Autoglym products but there are plenty of other good products on the market. If anyone wishes to borrow Autoglym's expert guide video 'How to keep your car in showroom condition,' please give me a ring on 01287-654990.

Best Kept Volvo Competition dates and venues are to be found in the February edition of 'Driver' Magazine.

For information on Autoglym Concours please contact Mr John Cole, Series Organizer, Retrocar Ltd., P.O. Box 239. Western Super Mare, Somerset. BS24 9YF.

Classic Car Weekly is another good source of WHAT'S ON.

I hope you find this helpful and I look forward to seeing you at some of the competitions.

Repairing the electronic heater control.

400 Series

Many 480 owners amongst you will have no doubt encountered one of the several problems with this otherwise excellent car: namely water leaks and electrical problems. Here Chris Wickers gives of his considerable experience, with a useful tip for you

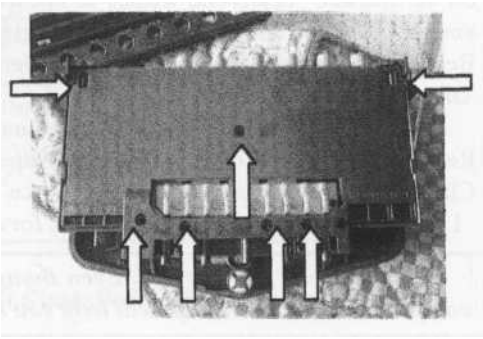
The electronic heater control on the 400 series appears to become fairly unreliable with age. Unfortunately a new module from Volvo will cost in excess of £350 - however I have found (twice now!) that it can be effectively repaired subject to some very basic skills with a soldering iron and solder. The pictures and screw locations are based on a 480 dashboard.

Although out of context, I often read part of an article, commence work, and then get to the end and discover I haven't got the necessary implements and have huge problems - in view of this I recommend the following prior to starting this lovely task! You will need - Soldering iron, solder, Ideally a magnifying glass (or exceptional eyesight!) screwdrivers, pliers, and blue-tac is useful for holding screws on the end of a screwdriver! New bulbs for the heater display could also be worth fitting! If you are going to replace the dash surround, you will need new vent parts! (see below)

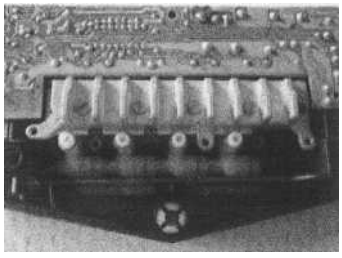
Firstly. the whole procedure can take around 2 - 3 hours, and for obvious reasons it is not desirable to stop in the middle with the dash 'hanging out'!

In order to gain access to the control unit it is necessary to remove the dashboard surround. This is held in place by many obvious screws, and two hidden ones. At the top left hand corner above the air vent there is a blanking plate which hides one, and the other is hidden behind the fan speed control panel. A slightly more obvious one is behind the headlight switch which just pulls out on the 480. At this point a word of caution - if like me you decide that the dashboard surround has seen 'better days' and needs replacing at a cost of £30ish, don't forget to order the vent parts as well! I would defy anyone to remove the vent fittings from the old one to the new one! (cost £l6ish)

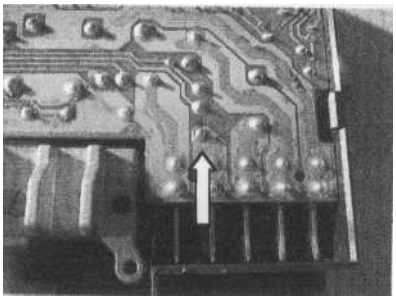
Once this panel is off the heater control is exposed and can be removed. Start by removing the two screws, one either side. and then with some careful manipulation. access can be gained to the temperature control cable which needs to be disconnected along with the electrical connectors, and vacuum tubes.

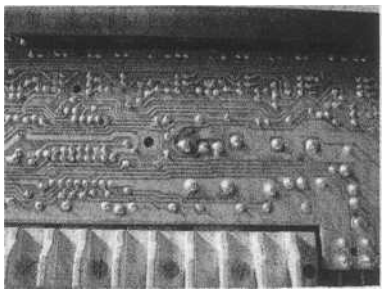


Having got the unit out, taking care not to lose the little rubber washers, it needs to be dis-assembled to gain access to the circuit board. This is done by un-screwing the cover, and releasing the clips at the edge.



At this point a magnifying glass would be very useful - no doubt there will be one or more obvious failed connections which require re-soldering - THERE WILL ALSO BE MANY THAT ARE ONLY OBVIOUS UNDER MAGNIFICATION. In view of the aggravation in doing the repair it is well worthwhile to re-solder any that appear to be failing!





Re-fitting is the opposite of removal. Check it all works (inc. illumination bulbs) prior to refitting the dash surround. (Note! In order for the switches to function the engine MUST be running) Make sure the dash surround fits properly before screwing it into position, and that it doesn't rattle - this is most irritating if not rectified.

Thank you for this Chris. The failure of printed circuit boards in cars seems to be fairly common. Whether this is due to the environment in the car, (changes in humidy, temperature, vibration etc.), or just the passage of time or what, I don't know. Some fluxes are corrosive in time.

There are some specialised companies who can help you if delicate work like this is not your scene. One is:
The Cardman, 40-40B St. Vincent Road, Southsea, Hants., P05 2QR.
Tel. 023 9283 3792, *Ed.*

Short Journeys Spell Trouble For Lubricants.

I am indebted to Elspeth Barley, of the Technical Department of Castrol Automotive (The Liquid Engineers), for kindly sending me some very interesting and informative papers concerning automobile lubricants and future developments in that field. I reproduce one of them here (others in the future) which should make us think before we undertake short journeys!

If you think that changing your oil at the specified mileage or when indicated is sufficient for engines doing short journeys then think again.

Although some manufacturers specify oil change intervals of up to 20,000 km/12,000 miles, none will allow the oil to remain in an engine for more than one year.

Unfortunately, your manual or handbook may not tell you that engines operating on short journeys or used infrequently have an adverse effect on lubricant performance. Any engine regularly worked hard on short runs or stop/start operation should have its oil changed at half the normal interval.

The Cause	Short Journeys
The Problem	Acid Build Up Water Condensation Fuel Dilution Sludge Build Up
The Effect	Corrosion from Acid Attack Rust from Water Wear due to Fuel Dilution Engine Malfunction from Sludge Deposit

The manufacturer's manual also overlooks that not changing your oil when it needs it will hit you in your pocket.

I have been running my 850, 2litre, 20 valve saloon on Castrol Magnatec IOW. 40, for the past four years. A friend brings it back from France for me. (It's cheaper!) this time however, I noticed that the bottles were marked FULLY Synthetic, (not SEMI Synthetic as previously. Also the grade was SW. 40.

Having checked with my friends at Castrol, they informed me that, yes, that is the case. The FULLY synthetic oil is manufactured over here and shipped directly to France (possibly elsewhere too, but I didn't ask. The oil is recommended by Castrol for my engine and it certainly -seems to run extremely well on it and I am sure the fuel consumption seems to be better, but I will be accurately checking that soon *Ed.*

Mayonnaise

Again I am indebted to Elspeth Barley of Castrol Oils, for permission to reproduce this helpful article on a very common problem. I hope it will dispel some of the mystery surrounding this sometimes worrying occurrence

Definition

An oil and water emulsion, white or cream in colour, which usually forms on the cooler engine internal parts, rocker box, crankcase breather system and dip stick tube. It is a consequence of low temperature running.

The Cause

Fuels such as petrol or diesel are hydrocarbon compounds and "combust" by reacting with oxygen from the air, liberating heat and energy as well as oxides and WATER. The main Oxides formed are carbon dioxide, carbon monoxide and nitrogen oxides.

Petrol + 01 >) CO + NOx + HI 0 + Energy

Water (HI 0) is produced in equal quantities to the fuel if combusted with sufficient oxygen.

1 gallon PETROL)) combustion = 1 gallon WATER

The majority of water is exhausted with other unwanted gases through the exhaust system. However, water also enters the crankcase with blow-by gases (piston blow-by).

The lubricating oil is designed to hold onto the water until the bulk oil temperature reaches the evaporation point of the water, the vapour is then drawn out of the crankcase via the crankcase breather system.

This is the theory, however, in practice some engines never reach the correct temperature or always have areas that remain cool enough for water vapour to condense, this is usually Rocker Covers and Crankcase breather systems.

Any good quality diesel or petrol lubricating oil will hold onto the water. If emulsified oil is detected, the engine temperature must be raised or air flow over this region redirected again to raise the temperature.