



Testing Times

Issue 19

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Welcome

Welcome to Edition 19 of Testing Times.

We have another interesting collection of items for you again in this issue including some news about a new auditing group Vicroads has established. If you have comments on any of the articles here please e-mail to:

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TVs & VDUs

For some time now manufacturers have been providing video display units [VDUs] on the dashboard for use by the driver for such purposes as satellite navigation, to display the signals from closed circuit reversing cameras, to provide a whole host of information about the vehicle and its control systems and more recently, to act as a menu system for setting and adjusting just about every aspect of the car.

Some of these original equipment manufacturer [OEM] VDUs are also capable of displaying TV and DVD images. However, as required by the Australian Design Rules [ADRs], these OEM VDUs are installed and connected in such a way that they cannot display TV or DVD images when the vehicle is in motion.



The aftermarket industry also supplies replacement entertainment systems many of which have VDUs that fold out of the unit and can display remarkable quality TV or DVD images.

These aftermarket units are also fitted with provision for an interlock to prevent their operation in TV or DVD mode while the vehicle is in motion, usually by a connection to the park brake. However, rumour has it that some of the less reputable aftermarket installers don't bother connecting the interlock or, after installation, the owner chooses to disconnect it.

The Standards for Registration are quite clear. If a TV or VDU visible to the driver can display TV or DVD images when the vehicle is in motion then the vehicle is unroadworthy.

Erratic Steering

The steering of current cars has improved so much compared with a decade or two ago that it is amazing that we drove the old cars at the speeds we did particularly considering the condition of the roads back then. However these advances have come at a cost. Modern steering systems tend to be more sensitive to alignment – a gutter scrape or a large pot hole can require a trip to the front end aligners – and even slightly worn or damaged bushes may seriously upset the steering.

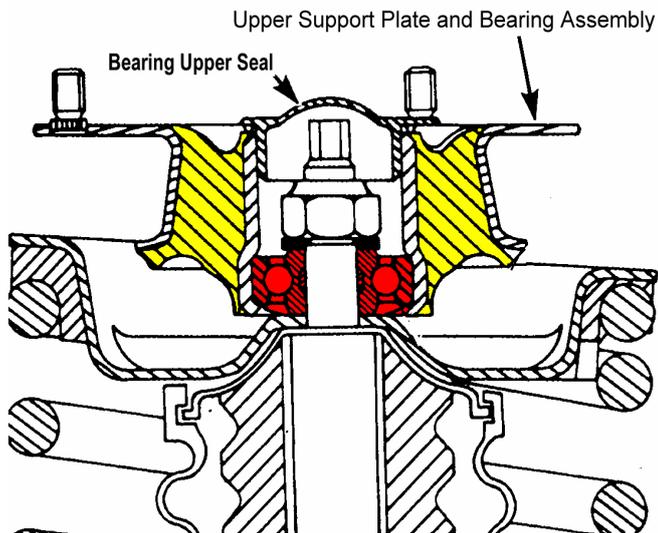
Have you ever road tested a car and found it won't track straight or it pulls to one side when braking yet the front end alignment appears correct and there is nothing obviously wrong with the brakes? There does not appear to be significant front suspension free play either. On some cars it is no longer easy to check free play at all the steering and suspension pivot points. The following articles are just two examples where worn or damaged components cannot be readily seen but they can have a significant effect on how the car handles as well as having other serious safety implications.

Commodore Front Strut Upper Bearings

The front strut upper bearings on Commodores consist of a ball race mounted inside or under a conical bush. Early versions of the bearings were crimped inside a steel sleeve bonded to a bush inside a steel support plate as shown.

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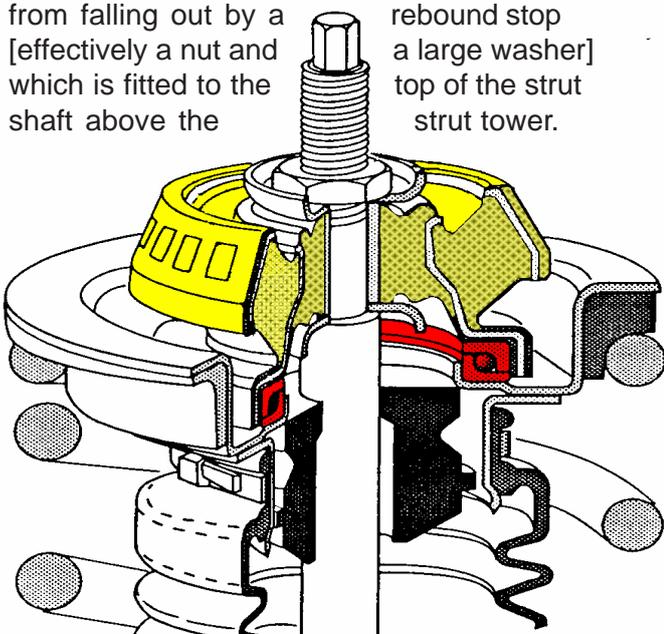
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Early Commodore Front Strut Upper Bearing and Bush

The support plate is fixed to the underside of the strut tower by studs that protrude through the top of the strut tower. The crimp around the underside of the bearing together with the nut on the top of the strut shaft prevents the strut from falling out on full rebound.

Later versions [VS onwards shown below] consisted of a bearing under a large conical bush that seats directly into a socket on the underside of the strut tower. Up to VT, this socket was bolted to the underside of the strut tower but from VT onwards the socket is permanently welded in place. In these later versions [VS onwards] the strut is prevented from falling out by a rebound stop [effectively a nut and a large washer] which is fitted to the top of the strut shaft above the

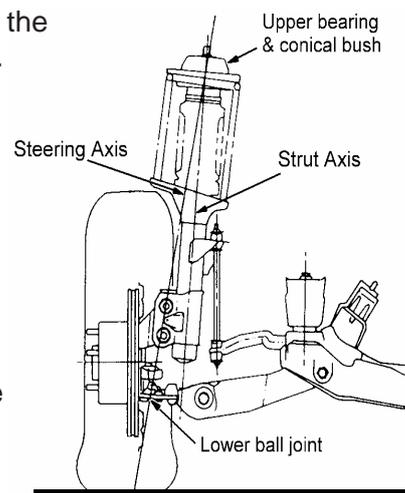


Recent Commodore Front Strut Upper Bearing and Bush

In each case the conical bush centres the bearing and allows it to oscillate. This provision to oscillate is very important because the axis of the strut is not the same as the steering axis so the angle changes as the steering is turned.

This can be seen in the diagram to the right.

Also, the revised steering geometry setup introduced on the VT Commodore onwards created an even greater need for this freedom to oscillate and a special "fluid filled" conical bush was introduced.



With all this movement it is important that it be strictly controlled to ensure proper steering alignment. Also, the upper bearing and bush have to resist the torque generated by the brakes. If the bush starts to break down, the steering, particularly under braking, can become erratic and a worn or degraded bush can also contribute to brake judder.

Even more importantly for the earlier version is that if the bush breaks down completely there is nothing to stop the strut from falling out on full rebound. This will be obvious if you put the car up on a body hoist but if you use a wheel-lift hoist or ramps it could go un-noticed. But if the bush has only partially deteriorated it may still retain the strut on full suspension droop. However this may not last for long!!!

Unfortunately, because of the location of the bush its condition is difficult to effectively inspect without significant disassembly. However, all is not lost. For the older type of bush/bearing setup, look closely at the projection of the upper bearing seal through the strut tower. If the bush is chewed out, the seal will project further than normal through the strut tower. Also, if you then check it again after you have jacked the front of the car up you will get a good indication of the bush condition. A lot of movement means a shot bush!!!

With the later version there is no risk of the strut dropping out as it will be retained by the rebound stop but the steering and brake problems may still be present. Again, you can get an indication of the condition of the bush by the clearance between the rebound stop and the top of the strut tower and also by checking the movement of the top of the strut when the front of the car is lifted off the ground. Don't get caught out by the apparently large movement of the VT onwards versions, though.

On these versions the steel washer of the rebound stop is fitted with a “rubber tyre” which sits about 10mm clear of the top of the strut tower [as shown in this picture] to provide for all that extra oscillation needed. When the car is lifted off the ground the strut drops until the “rubber tyre” on the rebound stop rests on the top of the strut tower.



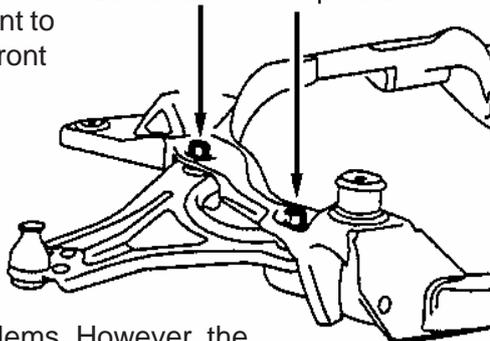
If the bush is badly worn or deteriorated the top of the strut shaft will project further through the strut tower taking the rebound stop with it and the clearance between the “rubber tyre” and the top of the strut tower will be greater than normal. This will also result a greater than normal movement of the rebound stop between the on-ground and raised conditions.

Mondeo Tracking

On the Mondeo, the lower control arms pivot on two bushes at the inner ends but unusually, the bolts through these bushes are vertical instead of horizontal as shown in the diagram below.

Also interestingly, the bushes are different front to back. The front bush is a normal one piece type and does not usually

Lower arm inner pivots



cause problems. However, the rear bush is a split design with the centre tube only bonded to part of the bush perhaps to

provide for some movement or to better dampen road noise.

If either of the bushes has degraded it may result in the vehicle pulling to one side in a road test but the only way the bushes can be checked is to remove them – not a quick and easy process.

Consequently, if you get a vehicle with this type of suspension bush that is quite erratic in the road test, but everything else seems OK, you can fairly confidently record “worn lower control arm suspension bushes” on your RWC report.

Audits & Auditing

New Audit Group

VicRoads has created a new group to audit businesses that are licensed or contracted to do work on behalf of VicRoads. This will include LVTs. The new staff will be working in close consultation with the Roadworthiness Section. Their role will include routine audits of your roadworthy licence requirements as well as random checking of vehicles that have been issued with certificates. This will not only help to establish ‘benchmarks’ for operating standards but will free up the roadworthiness section to conduct more industry liaison and training as well as more in-depth investigation of complaints.

Audits? What are they?

You have been audited already although you may not have called it that. When the roadworthy supervisors call in and check your books, premises and equipment that is one type of audit.

Some people think audits are something to be feared or that they are time consuming and unnecessary. VicRoads’ audits of LVTs can be just the opposite. In any work process mistakes can occur or poor work practices can develop. One of the roles of an audit is to identify problems so that they can be remedied. This helps to ensure that the system can be relied upon by all concerned. An important and worthwhile part of the audit is to provide you with some assurance when you are doing all the right things and applying the correct standards.

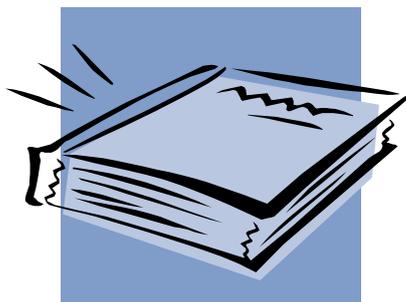


This should be very important to you, because, apart from your own satisfaction in a job well done, if you are doing everything correctly you are unlikely to un-intentionally end up with a problem on your hands.

Let's look at a few areas/benefits of the audit.

Reference Materials

Time moves on and standards change. What was acceptable last year might not be OK this year. You may need to be able to show the customer the current standards to avoid a dispute.



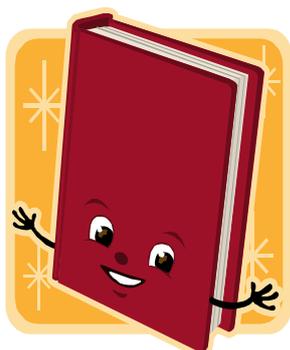
In fact you should be in the habit of showing customers what the standards are every time they have a query about your testing. It helps to make sure that you know the requirements. If you

don't keep up with the current requirements, you might let through something you should not have accepted. This may leave you liable for a compensation claim by the person who purchased the vehicle.

Alternatively, if you reject something you should not have rejected and put the customer to some expense to get the vehicle up to your requirements, then they may also be able to claim those additional costs from you. And it may not be just the actual cost. The initial rejection could have resulted in a loss of sale or some other significant inconvenience and people are more and more likely to take legal action for even minor things these days. It is therefore important that you have current copies of the Regulations, all the Vehicle Standards Information sheets and other reference material.

Recording Keeping

This is the key to keeping yourself out of trouble. If you have good records and they are up to date and properly filed so you can get them when you need them, then you are more than half way there.



But if someone makes a claim against you and all you have is your memory to refute it, then you could be in a spot of bother. This is one of the reasons why you are required to complete the RWC on the day of the inspection and to keep your register current.

Remember, the job isn't finished until **ALL** the paperwork is done.

If you've got half completed documents lying all around the place and they don't have all the details of the vehicle, then how can you correctly complete the paperwork later? You are likely to get further and further behind as time passes and much more likely to make errors that could result in serious problems for your business.

Unfortunately, VicRoads has been unable to support several testers who had claims against them recently because they didn't even have records to show that the vehicle had actually been there on the day.

As a result, VicRoads is currently looking at providing information on setting up a basic internal audit system (self checking) for your own workshop to help you minimise these concerns.

Communications

Probably the biggest value of the audit is that it gives you a chance to talk to your area supervisor face to face and ask all those curly little questions about the problems that have been bugging you.



Once you have come to an agreement on how the problem should be handled you can go ahead with your work with confidence knowing your actions have VicRoads' support.

*All LVT supplies can be obtained from
VicRoads' Bookshop*

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