vic roads

Testing Times

Issue 15 **December 2002**

Welcome

Welcome to Edition 15 of Testing Times. Unlike the last issue, we have a wide variety of subjects for this issue ranging from the real safety concerns with wheels in the first item through to general issues with light and heavy vehicles and some model specific items with AU Falcon ball joints and EA Falcon disc rotor thicknesses.

Flexible Wheels

All pressed steel wheel centres flex to some extent. This is not all bad as the flexing can help transfer the load more evenly between the rim and the hub and reduce the load on individual wheel studs and the welds or rivets fixing the centre to the rim. A flexible centre can also reduce the transfer of road noise and shocks but on the flip side it can make the steering and handling less precise. Also, excessive flexing can increase the risk of fatigue cracking.

To improve handling and road grip, manufacturers strive to reduce unsprung weight and the use of thinner gauge steel for the wheels can help but it generally increases flex. The trick is to get the best compromise between stiffness and light weight. To do this, in the last few years, Holden for one, has made several changes in the gauge of the steel used for its wheels as well as in the design of the welds between the centre and the rim .

There have been a couple of claims made that some Commodore wheels are not as good as others particularly when constantly loaded. LPG vehicles (taxis?) with an independent rear suspension that creates cyclic lateral loading as it moves up and down are said to be more at risk if the wheels have the thinner gauge centres.

However, at this stage there does not appear to be any real evidence of problems but if you do find any examples of wheel centres cracking for no apparent reason on any make or model of vehicle let your LVT supervisor know immediately. After all, there could be dozens of cases spread all over the State but no-one thinks it is important because each person has only seen one example.

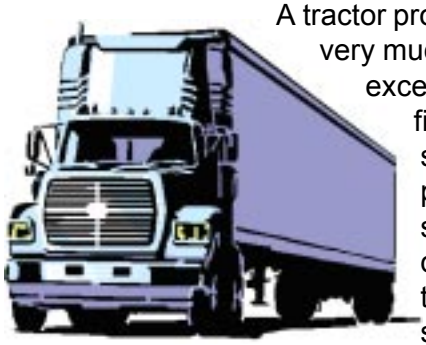
On this same subject, there appears to be a serious problem with too much wheel flex on the current Hyundai Sonata. At least one example has come to light of a wheel that has cracked badly as can be seen in the photo below

There are no signs of abnormal use or abuse suggesting that the cause is a design or manufacturing problem. Again, keep your eye out for it and if you see any examples of this sort of failure let your LVT supervisor know.

In this issue:

Tractor Protection Valves

Tractor Protection Valves are not mandatory on heavy vehicles equipped for towing but some means of ensuring that a towing vehicle with air or vacuum assisted brakes will retain it brake performance if the trailer breaks away or the trailer brake system fails is mandatory. Tractor protection valves are probably the most common means of doing this but they are not the only means. For example, the tow vehicle may be fitted with a separate air supply system for the trailer (including the control line supply) with a priority system to ensure its own needs are met first.



A tractor protection valve is very much like an excess flow valve fitted to LPG fuel systems. If the pressure on one side of the valve drops suddenly the valve will shut off immediately. But just like the LPG excess flow valve, a small bleed across the valve is provided to enable it to reset.

So how do you check that the protection system, whatever it is, works? Pulling out the trailer air or vacuum couplings and testing the tow vehicle brakes is no good as many coupling are self-sealing anyway.

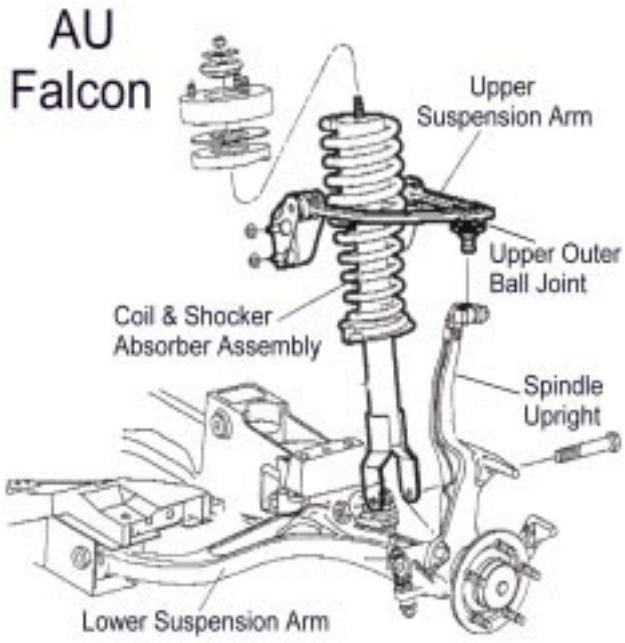
What you need are suitable couplings (preferably with a short piece of open ended hose attached for ease of handling) that you can plug into the tow vehicle couplings (supply and control) to simulate broken lines. Once these are plugged in with the engine stopped and all air flow has stopped (other than the small bleed flow if a tractor protection valve is used) check that the tow vehicle's brakes do actuate properly.

AU Falcon Ball Joints

Ford have indicated that the upper outer front suspension ball joints on the AU (and later) Falcon have considerable vertical free play even when new but because they carry virtually no vertical load this free play is not an issue.

However, it does mean that if they dry out they could start to chatter on bumps and corrugated roads.

If you are not convinced that there really isn't a problem with the vertical movement look at the diagram below and consider how the units are installed. They are simply pressed in from under the suspension arm. A flange stops them being pushed right through and friction stops them possibly working back out. The upper control arm simply restrains the spindle upright in the horizontal plane. All vertical loads are carried by the lower control arm and the coil/shock absorber assembly and this assembly also provides the upper and lower bump stops.

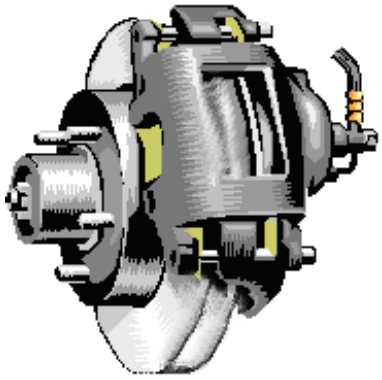


While all parts are in position, even with the suspension on full droop (when the vehicle is on a body hoist) there is no significant vertical load on the upper ball joint.

Provided the horizontal free play of the ball joint is within specification (according to Ford - no perceptible horizontal movement only) vertical free play does not constitute a safety problem and should not be cause for rejection. By the time the upper ball joint is worn to the point that there is a risk of it separating there will be obvious horizontal free play.

EA Falcon Disc Rotor Quandary

The rear brake disc rotors on the EA Series I Falcon start out at 15mm new and have a minimum thickness of 14mm (marked on the rotor) while the Series II start out at 13mm with a minimum of 12mm. All other parts of the rear brake system are identical.



The question is, "When the vehicles are virtually identical, why should you reject the rotors on a Series I at just less than 14mm thick when they are still thicker than brand new rotors on a Series II?"

The plot thickens further when we find that the major manufacturer of aftermarket rotors uses exactly the same metallurgy for the two units and simply machines them to slightly different sizes – and marks them with different minimum thicknesses - to be consistent with the Ford specification and workshop manual.

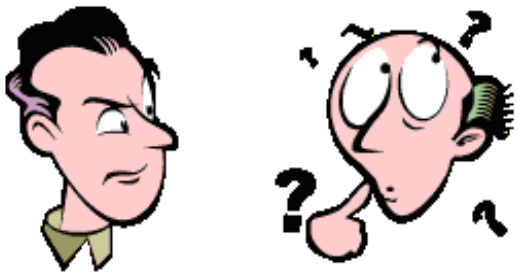
The problem is we cannot be sure that the very original Series I Ford units had the same metallurgy as the first of the Series II units and it would have been on the basis of testing the original units on each model that Ford would have set the minimum thickness specifications. Understandably, Ford, like other manufacturers has produced its workshop manuals and is not prepared to go back and re-assess the specifications for a model that is getting close to 15 years old – particularly when sticking to the original published specifications does not have any safety implications.

We also don't know for sure if the current Ford OE replacement units (for the EA Series I or II) have the same metallurgy as each other or the aftermarket replacement units but it is likely that they will all be at least equivalent or superior to the very original units so there will certainly be no problems if you stick to the manufacturer's minimum thicknesses.

Another problem arises when Series II rotors are fitted to a Series I. They will fit perfectly as the overall "top hat" height of the two units is 1mm different ensuring that the rubbing surfaces of the rotor remains centred in the calliper irrespective of which model the rotor is fitted to. They will also be quite suitable as all other relative aspects of the vehicles are the same. But which minimum thickness do you use now – the workshop manual or the rotor marking? The answer is that the rotor marking should take precedence if you can find it.

The same would apply if a vehicle has an upgraded brake system. For example, you could not use the manufacturer's workshop manual minimum thickness for a vehicle that was originally fitted with solid rotors if that vehicle is now fitted with vented rotors from the performance model. If you did you would be passing a car with just vent ribs and these do not make for good brakes!

What do you say to the vehicle owner who knows that the Series II rotors can go down to 12mm but you reject his Series I rotors at 13.5mm?



You simply point out the minimum thickness marked on the rotor and tell him you cannot over-rule the person who authorised that marking to be put there. This is a very good reason for sticking to the minimum thickness marked on the rotor rather than using the workshop manual. Also you could get caught out badly (at least in a legal sense) if you passed 12.5mm thick rear rotors on a Series II on the basis of the workshop manual figure, if that vehicle had Series I rotors fitted and marked with a minimum thickness of 14mm.

Highlighted Numbers

You no doubt have had difficulty at some time or other in finding the VIN or engine number of a vehicle and almost certainly have had difficulties reading some of them. When you find the numbers you should ensure that the area is thoroughly cleaned so that they can be read correctly. It is also requested that you get into the habit of highlight the numbers and the area around them with chalk or a wax crayon - nothing permanent though.

Not only will this make them easier for you to read reducing the risk of a mistake but it will also help VicRoads' registration office staff find and read the same numbers you used to identify the vehicle.

RWC Not Required!!!

There are a number of cases where the transfer of a registered vehicle does not require a RWC. For example, a RWC is not required for transfers to or between LMCTs, when the transfer is between spouses, and when the transfer is to the surviving spouse when the vehicle owner dies.

However, there is another occasion you might not be aware of where a RWC is not required. This is where the vehicle is being transferred from interstate but remains in the same ownership. You might win a few brownie points if you mention this to any person presenting an interstate registered vehicle for a RWC. If they are moving to Victoria and this exemption applies you might miss out on the RWC fee but because you were such a helpful, honest fella you might end up doing their vehicle's ongoing maintenance and servicing. In the long run this is probably worth much more to you than one quick RWC fee.

Self-cancelling Turn Signals

The ADRs are funny sometimes and some things that seem so logical are often taken for granted. Self-cancelling turn signals are one of those things.

Motorcycles are probably the only modern motor vehicles that are not routinely fitted with self-cancelling turn signals yet the ADRs do not require them on any vehicle.

The steerable front wheel on a motorcycle is more for balance than going round corners and very little steering lock is applied in all but the slowest of turns. In fact the front wheel is often turned slightly the opposite way in sweeping corners to compensate for the steering effect of leaning the bike over. This may be why motorcycles are not usually fitted with simple self-cancelling turn signal switches - they may never self-cancel anyway.

While turn signals that self-cancel are extremely convenient and they come as standard on most four wheeled vehicles, because self cancelling is not mandatory so the absence of self-cancelling cannot be grounds for refusing to issue a RWC.

However, it would be wise to note their absence or failure on the test report, as a service to the owner, because it is an offence to leave a turn signal operating after completing a turn.

Fees

Annual renewal of your licence is $15.50.

A new licence, or if you change the location of your testing premises, or to add additional premises onto your licence, costs $78.00 per site.

A book of 100 Roadworthiness Certificates now costs $118.00 (including GST)

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