vic roads

Testing Times

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Welcome

Welcome to Edition 26 of Testing Times. Another varied collection of items for you in this issue. Some of it has been said before but it seems that it needs repeating while other items are new issues that have emerged.

If you have comments on any of the articles here please e-mail to:

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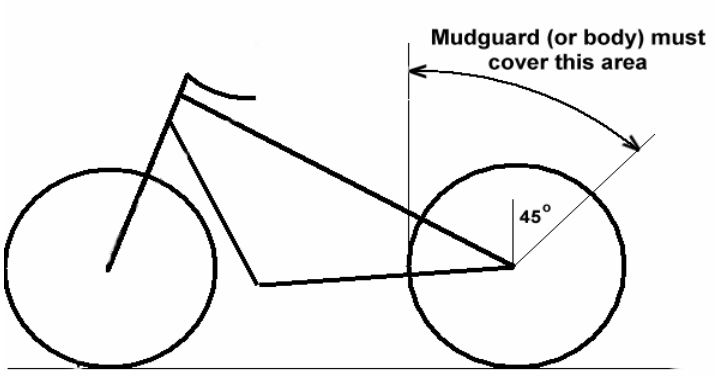
Motor Cycle Rear Mudguards

You might get the impression that motorcycles don't need mudguards when you see many of the sports bikes getting around showing off their massive rear tyres. The truth is a little different though. There are very specific mudguard requirements in the ADRs.

A rear mudguard (with or without a flexible flap) or the body, or a combination of both, must extend over the full width of the tyre cross section and from the front edge of the rear wheel and down to a point at least 45° behind the axle line as shown below.



It appears that manufacturers are providing all sorts of bits on the back of the bike so that it can be certified as ADR compliant. These bits are often removable components (as can be seen in the next image) that satisfy the mudguard specifications above but perhaps do not give the appearance the customer desires. Those assemblies are then removed after registration making the bike non-compliant.

Motorcycle testers need to be aware of this practice so they don't get caught out. They should also explain to customers that it is illegal to remove components and make a bike non-compliant. It is also an additional offence to do so while a RWC is current.

You should also note that many bikes, particularly off-road or trail bikes with soft suspensions and long suspension travel may not meet this requirement when you just look at them sitting there. The picture below is a typical example. However, the ADR specifies that the checking of the mudguard must be done when a mass of 45kg is on the seat so you need to take this into account when you check the

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Motorcycle Turn Signals

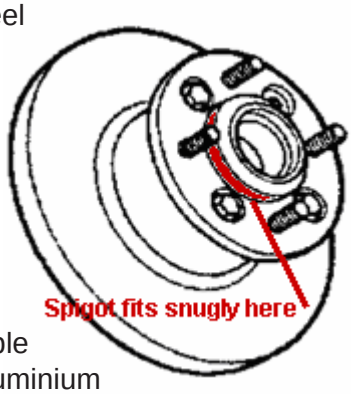
The Motorcycle Lights article in Testing Times 25 could give the impression that all motorcycle turn signal lamps must be at least 300mm apart but this is not strictly correct.

The Australian Vehicle Standards Rules (AVSRs - the registration standards that apply to pre ADR vehicles) require that the **centres** of front and rear turn signals on motorcycles must be at least 300mm apart. When the ADR which covers lights and signals on motorcycles (ADR 19/00) was introduced it required that the **inner edges** of the illuminating surfaces of front turn signals be at least 300mm apart (an even greater centre to centre spacing than that required by the AVSRs). This ADR also specified that the inner edges of rear turn signal lamps be at least 240mm apart which realistically means that the centre to centre spacing will still be about 300mm. However, later ADR versions (ADR19/01 & ADR 19/02) relaxed these spacing provisions with the inner edges of front turn signals being only required to be at least 240mm apart and the inner edges of rear turn signals being only required to be at least 180mm apart. While this still effectively means that the centre to centre spacing of front turn signals will be about 300mm (there is also a minimum clearance requirement from the low beam headlamp which could result in an even greater distance between the turn signal lamps) the rear turn signal lamps can now be significantly closer together than previously.

Because the registration standards exempt a vehicle from complying with a standard applicable to it because of its date of manufacture if it complies with a later standard it really means that the minimum spacing of turn signals on any motorcycle are those allowed by ADR 19/02.

Mag Wheel Centre Spigot

The function of the spigot hole in the centre of aluminium alloy wheels is a controversial subject. The diameter of the central spigot hole in OEM aluminium alloy wheels is precisely machined to match the vehicle model for which they are intended. The central spigot hole then fits snugly over the wheel bearing hub or axle stub and centres the wheel much more accurately than the wheel nut holes allow.



As this spigot hole diameter can vary between models it may not be physically possible to (properly) fit OEM aluminium alloy wheels designed for one model onto another model unless the spigot hole is machined out to suit. The other situation is when OEM wheels designed for one model are fitted onto another model and a significant clearance in the spigot hole results.

This latter situation raises the question “Should a wheel that has a significant clearance between the spigot hole and the wheel bearing hub or axle stub be considered roadworthy?”

Fitting a wheel with a bigger spigot hole size should not create an immediate safety problem. Why? While many claim that a snug fit in the spigot hole is essential to take the shear loadings off the wheel studs, this is not so as the studs have to be designed to take both the tensile and shear loads by themselves. They have to be this way as the manufacturing tolerances on pressed steel wheels (which are often fitted to the base models) are not good enough to ensure any shear load transfer via the spigot hole.

But what this lack of a snug fit can do is potentially misalign the wheel when it is being fitted and create vibration problems which can lead to accelerated wear in the suspension components. The reduction in vibration problems provided by the snug fit is one reason why good aftermarket aluminium alloy wheels also come with a press-in sleeve that fits into the wheel centre to accurately locate the wheel on the hub.

It is certainly not good practice to fit a wheel which does not have a snug fit between the spigot hole and the wheel bearing hub or axle

stub. This is supported by a requirement in the National Light Vehicle Modification Code of Practice (VSB14) which is called up in Victorian legislation that states "*Replacement aluminium alloy rims must be located on the hub/axle by the same diameter centre spigot as the original wheel, using metal adaptor rings where necessary*".
Therefore, if you encounter a situation where an aluminium alloy wheel does not fit snuggly on the central spigot, this is a cause for rejection in a roadworthiness test.

Seatbelt Pretensioners

Many vehicles are fitted with mechanical seatbelt buckle pretensioners. These are stored energy devices (often a strong spring in a tube under the seat) that drag the buckle down about 50mm when triggered, effectively taking about 100mm of slack out of the whole seatbelt assembly. This is often essential for the vehicle to meet the occupant protection requirements of the ADRs so it is mandatory that any pretensioners fitted are serviceable. These seatbelt pretensioners are "single shot" mechanisms, that is, they must be replaced once triggered. To enable checking that they are still serviceable, the manufacturer usually fits some sort of indicator like a brightly coloured tag which only appears when the pretensioner has been triggered as can be seen below.

Some of these mechanical seatbelt buckle pretensioners can be inadvertently triggered if the proper removal and replacement procedures are not followed.

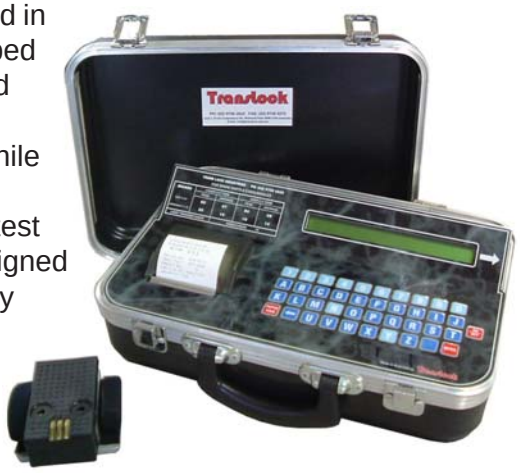
There have been some instances where Holden Barina's have had the front seats removed without the seat belt pretensioners having their safety lock clips applied as shown below resulting in the pretensioners activating.

Then the seats are re-fitted still with the deployed pretensioners and to hide the problem the warning tags are cut off.

Also, some unscrupulous repairers are resorting to the same trick when repairing crashed vehicles. So, just as you must ensure airbags are functional (refer to Testing Times 13 & 14) you must also make sure that all seat belt pretensioners are still serviceable. Check that you cannot see the warning tags and as a double check compare the buckle position in relation to the seat cushion and/or look at the stalk just below the buckle – the concertina section should not have collapsed.

Calibrating Brake Test Meters

Automotive testing equipment is sometimes subjected to some fairly rough treatment - bouncing around in a vehicle, dropped on site, knocked against hard objects, etc. While testing devices such as brake test meters are designed to be reasonably rugged, they are still precision instruments and can be affected by severe mishandling. Even if they are always treated carefully, changes in ambient temperatures, humidity levels and deteriorating component tolerances can cause a shift in readings over time.



Consequenlty, the manufacturers of these instruments advise regular maintenance and calibration and usually offer calibration and other support services that include calibration-due notification, calibration status reports, calibration certificates, telephone technical support and loan brake meters.

Remember, if it is important to measure something it is also important that the measurement be accurate and repeatable.

Also, a record of the maintenance and calibration of your brake decelerometer in accordance with the manufacturer's recommendations may be a key factor in your favour if it is ever required as evidence in a court of law.

Brake Lines

The importance of a thorough inspection of brake lines cannot be stressed enough.

Metal pipes, used where there is no relative movement between components, need to be checked for leaks at all joints and fittings AND for signs of wear or damage at all support clips and any other location where they pass through or close to the vehicle's structure. Remember, while there is no significant relative movement between components, vibration can still cause the metal pipe to rub on adjacent parts and mounting clips, etc with resultant damage.

Flexible hoses (sometimes protected with a metal braid) need to be checked for any damage or fraying where they join the end fittings and the whole length needs to be checked for damage, abrasion and cracking.

The check should include a careful inspection at any intermediate supports and don't just do the check when the hose is in the static position or with the wheels straight ahead. It is necessary to move the hoses to different positions to see if there are cracks that open up when the hose is bent or twisted.

Flexible brake hoses should not touch or rub on anything except at the end fittings and any intermediate supports and, as stated in Testing Times 25, they should not pull tight in any normal combination of suspension and/or steering movement.

"Trailer Only" Wheels

There have been occasions recently where aluminium alloy wheels marked "Trailer Only" have appeared on vehicles presented for a RWC inspection. The origin of these wheels is not clear but given the marking, it is unlikely that they would meet ***Australian Standard AS 1638 - 2008 Motor vehicles - Light alloy road wheels*** or any of the other acceptable standards set out in Vehicle Standards Information sheet No 8.

The illustration below shows the marking on a 14 x 6JJ alloy wheel; a typical wheel size used on many passenger cars and light trailers.

One of the requirements of AS 1638 is impact testing to simulate kerb impacts and as can be seen from the picture below, these wheels seem to be very brittle. What appears to have been a relatively light impact to the lip of the rim has caused a very significant failure to the body of the rim.

The rules for light motor vehicles also apply to light trailers so that unless an alloy wheel is marked as conforming to AS 1638 or one of the other acceptable standards listed in VSI No8 it is not acceptable on a car or a trailer.

Note:

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